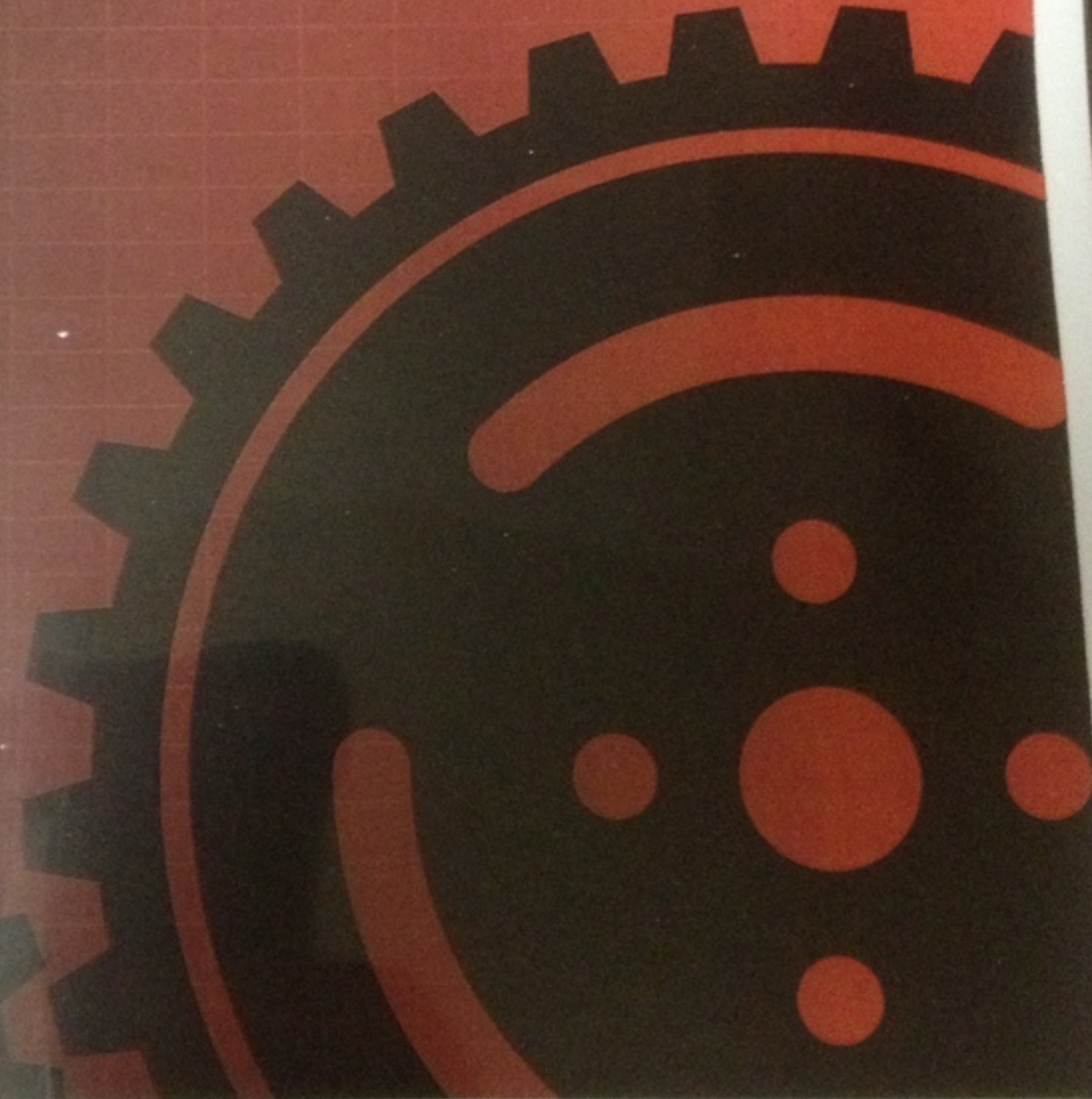


2013-2015



HONDA

SERVICE MANUAL



NCH50
METROPOLITAN™

How To Use This Manual

This manual describes the service procedures for the CBR500R/RA, CB500F/FA and CB500X/XA.

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

Section 4 through 21 describe parts of the motorcycle, grouped according to location.

If you are not familiar with this motorcycle, read Technical Feature in Section 1.

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the motorcycle is in peak operating condition and emission levels are within the standards set by the U.S. Environmental Protection Agency, California Air Resources Board (CARB) and Transport Canada.

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

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


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

Refer to the troubleshooting in each section according to the malfunction or symptom. In case of an engine trouble, refer to PGM-FI section troubleshooting first.

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

You must use your own good judgement.

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

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

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

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












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

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

HOW TO USE THIS MANUAL

SYMBOLS

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

	Replace the part(s) with new one(s) before assembly.
	Use the recommend engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).
	Use multi-purpose grease (lithium based multi-purpose grease NLGI #2 or equivalent).
	Use molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent). Example: <ul style="list-style-type: none">• Molykote® BR-2 plus manufactured by Dow Corning U.S.A.• Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan
	Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent). Example: <ul style="list-style-type: none">• Molykote® G-n Paste manufactured by Dow Corning U.S.A.• Honda Moly 60 (U.S.A. only)• Rocol ASP manufactured by Rocol Limited, U.K.• Rocol Paste manufactured by Sumico Lubricant, Japan
	Use silicone grease.
	Apply locking agent. Use a medium strength locking agent unless otherwise specified.
	Apply sealant.
	Use DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified.
	Use fork or suspension fluid.

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MEMO

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GENERAL INFORMATION

SERVICE RULES

1. Use Honda Genuine or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown in the Cable and Harness Routing (page 1-24).
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
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
IACV	Idle Air Control Valve
IAT sensor	Intake Air Temperature sensor
MAP sensor	Manifold Absolute Pressure sensor
MCS	Motorcycle Communication System
MIL	Malfunction Indicator Lamp
O ₂ sensor	Oxygen sensor
PAIR	Pulse Secondary Air Injection
PGM-FI	Programmed Fuel Injection
SCS service connector	Service Check Short service connector
TP sensor	Throttle Position sensor
VS sensor	Vehicle Speed sensor

DESTINATION CODE

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

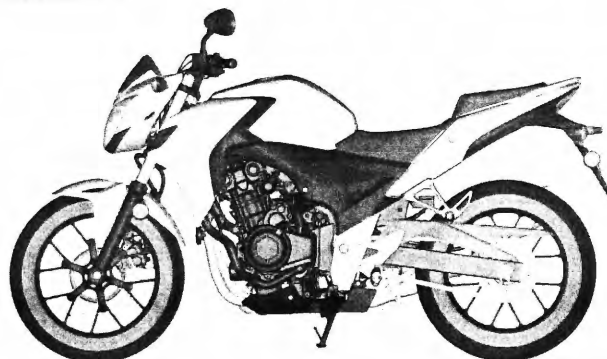
DESTINATION CODE	REGION
A	49-State
AC	50-State (meets California emissions standards)
CM	Canada

MODEL IDENTIFICATION

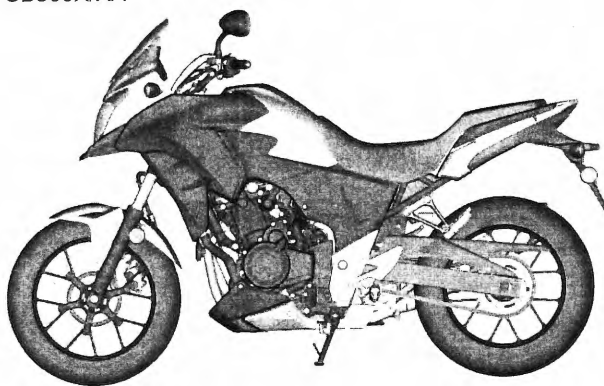
CBR500R/RA



CB500F/FA



CB500X/XA



(ABS model shown)

This manual covers following models:

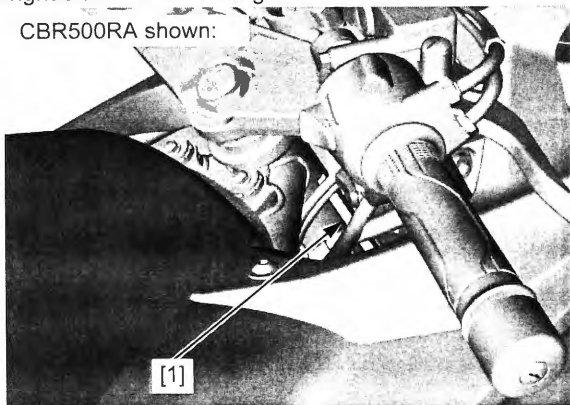
- CBR500R (Conventional Brake)
- CBR500RA (ABS)
- CB500F (Conventional Brake)
- CB500FA (ABS)
- CB500X (Conventional Brake)
- CB500XA (ABS)

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

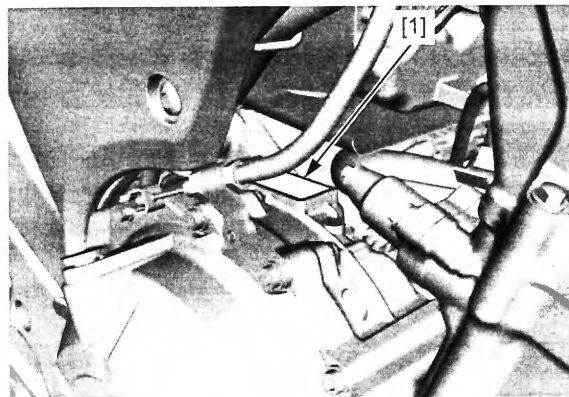
SERIAL NUMBERS/LABELS

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

CBR500RA shown:

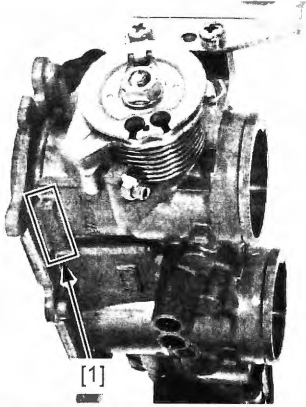


The engine serial number [1] is stamped on the upper right side of the crankcase.

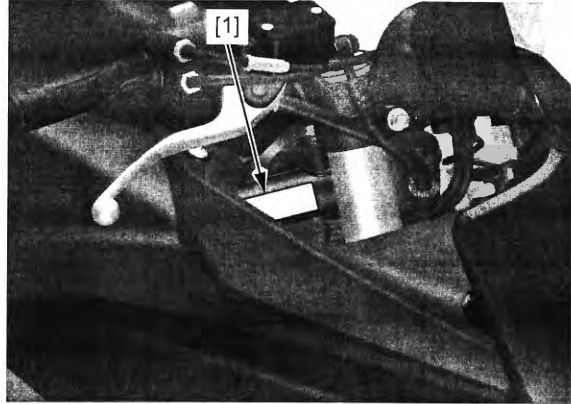


GENERAL INFORMATION

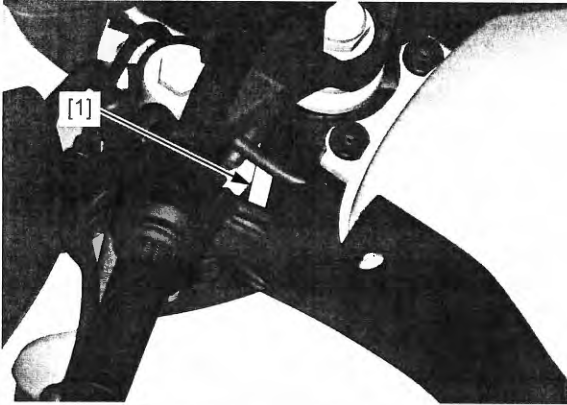
The throttle body identification number [1] is stamped on the lower right side of the throttle body.



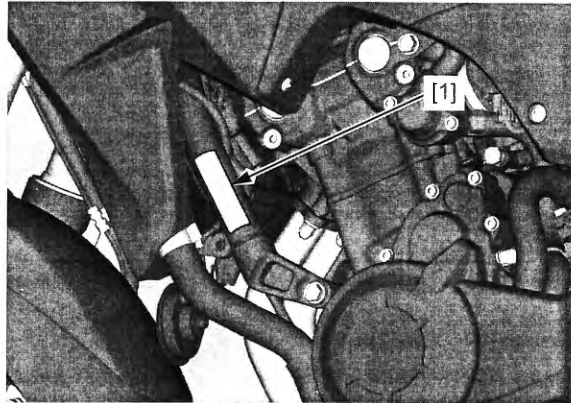
CBR500R/RA: The Safety Certification Label [1] is attached on the right front side of the frame.



CB500F/FA: The Safety Certification Label [1] is attached on the left side of the steering head.

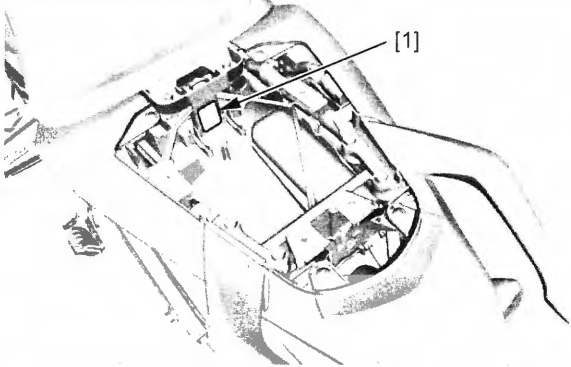


CB500X/XA: The Safety Certification Label [1] is attached on the left lower side of the frame pipe.

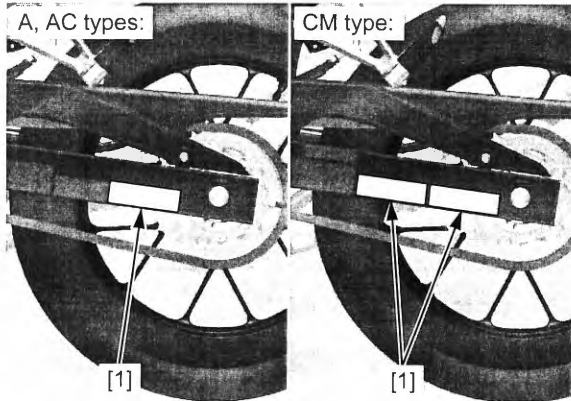


The color label [1] is attached on the rear fender B under the seat. When ordering color-coded parts, always specify the designated color code.

CBR500R/RA shown:



The Emission Control Information Label [1] is attached on the left side of the swingarm.



SPECIFICATIONS

GENERAL SPECIFICATIONS

CBR500R/RA

ITEM			SPECIFICATION	
DIMENSIONS	Overall length		2,075 mm (81.7 in)	
	Overall width		740 mm (29.1 in)	
	Overall height		1,145 mm (45.1 in)	
	Wheelbase		1,410 mm (55.5 in)	
	Seat height		785 mm (30.9 in)	
	Footpeg height		312 mm (12.3 in)	
	Ground clearance		140 mm (5.5 in)	
	Curb weight	CBR500R	A, CM types	192 kg (423 lbs)
			AC type	193 kg (425 lbs)
		CBR500RA	A, CM types	194 kg (428 lbs)
AC type			195 kg (430 lbs)	
Maximum weight capacity		168 kg (370 lbs)		
FRAME	Frame type		Diamond	
	Front suspension		Telescopic fork	
	Front axle travel		108 mm (4.3 in)	
	Rear suspension		Swingarm	
	Rear axle travel		119 mm (4.7 in)	
	Front tire size		120/70ZR17M/C (58W)	
	Rear tire size		160/60ZR17M/C (69W)	
	Front tire brand		D222F (DUNLOP), ROADTEC Z8 INTERACT E (METZELER)	
	Rear tire brand		D222 (DUNLOP), ROADTEC Z8 INTERACT (METZELER)	
	Front brake		Hydraulic single disc	
	Rear brake		Hydraulic single disc	
	Caster angle		25° 30'	
	Trail length		102 mm (4.0 in)	
	Fuel tank capacity		15.7 liters (4.15 US gal, 3.45 Imp gal)	
	ENGINE	Cylinder arrangement		2 cylinders in-line, inclined 20° from vertical
Bore and stroke		67.0 x 66.8 mm (2.64 x 2.63 in)		
Displacement		471 cm ³ (28.7 cu-in)		
Compression ratio		10.7 : 1		
Valve train		Chain driven DOHC with rocker arm		
Intake valve		opens	at 1 mm (0.04 in) lift	- 5° BTDC
		closes	at 1 mm (0.04 in) lift	35° ABDC
Exhaust valve		opens	at 1 mm (0.04 in) lift	33° BBDC
		closes	at 1 mm (0.04 in) lift	- 13° ATDC
Lubrication system		Forced pressure and wet sump		
Oil pump type		Trochoid		
Cooling system		Liquid cooled		
Air filtration		Viscous paper element		
Engine dry weight		52.7 kg (116.2 lbs)		
Firing order		1 - 2		
Cylinder number		Left: 1, Right: 2		
FUEL DELIVERY SYSTEM	Type		PGM-FI (Programmed Fuel Injection)	
	Throttle bore		34 mm (1.3 in)	

GENERAL INFORMATION

ITEM		SPECIFICATION	
DRIVE TRAIN	Clutch system	Multi-plate, wet	
	Clutch operation system	Cable operating	
	Transmission	Constant mesh, 6 speeds	
	Primary reduction	2.029 (69/34)	
	Final reduction	2.733 (41/15)	
	Gear ratio	1st	3.285 (46/14)
		2nd	2.105 (40/19)
		3rd	1.600 (32/20)
		4th	1.300 (26/20)
5th		1.150 (23/20)	
6th		1.043 (24/23)	
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	FET shorted/triple phase full wave rectification	
	Lighting system	Battery	

CB500F/FA

ITEM		SPECIFICATION		
DIMENSIONS	Overall length	2,075 mm (81.7 in)		
	Overall width	780 mm (30.7 in)		
	Overall height	1,060 mm (41.7 in)		
	Wheelbase	1,410 mm (55.5 in)		
	Seat height	785 mm (30.9 in)		
	Footpeg height	312 mm (12.3 in)		
	Ground clearance	155 mm (6.1 in)		
	Curb weight	CB500F	A type	190 kg (419 lbs)
			AC type	191 kg (421 lbs)
		CB500FA	A, CM types	192 kg (423 lbs)
			AC type	193 kg (425 lbs)
Maximum weight capacity	168 kg (370 lbs)			
FRAME	Frame type	Diamond		
	Front suspension	Telescopic fork		
	Front axle travel	108 mm (4.3 in)		
	Rear suspension	Swingarm		
	Rear axle travel	119 mm (4.7 in)		
	Front tire size	120/70ZR17M/C (58W)		
	Rear tire size	160/60ZR17M/C (69W)		
	Front tire brand	D222F (DUNLOP), ROADTEC Z8 INTERACT E (METZELER)		
	Rear tire brand	D222 (DUNLOP), ROADTEC Z8 INTERACT (METZELER)		
	Front brake	Hydraulic single disc		
	Rear brake	Hydraulic single disc		
	Caster angle	25° 30'		
	Trail length	102 mm (4.0 in)		
	Fuel tank capacity	15.7 liters (4.15 US gal, 3.45 Imp gal)		

GENERAL INFORMATION

ITEM			SPECIFICATION	
ENGINE	Cylinder arrangement		2 cylinders in-line, inclined 20° from vertical	
	Bore and stroke		67.0 x 66.8 mm (2.64 x 2.63 in)	
	Displacement		471 cm ³ (28.7 cu-in)	
	Compression ratio		10.7 : 1	
	Valve train		Chain driven DOHC with rocker arm	
	Intake valve	opens	at 1 mm (0.04 in) lift	- 5° BTDC
		closes	at 1 mm (0.04 in) lift	35° ABDC
	Exhaust valve	opens	at 1 mm (0.04 in) lift	33° BBDC
		closes	at 1 mm (0.04 in) lift	- 13° ATDC
	Lubrication system		Forced pressure and wet sump	
	Oil pump type		Trochoid	
	Cooling system		Liquid cooled	
	Air filtration		Viscous paper element	
	Engine dry weight		52.7 kg (116.2 lbs)	
Firing order		1 - 2		
Cylinder number		Left: 1, Right: 2		
FUEL DELIVERY SYSTEM	Type		PGM-FI (Programmed Fuel Injection)	
	Throttle bore		34 mm (1.3 in)	
DRIVE TRAIN	Clutch system		Multi-plate, wet	
	Clutch operation system		Cable operating	
	Transmission		Constant mesh, 6 speeds	
	Primary reduction		2.029 (69/34)	
	Final reduction		2.733 (41/15)	
	Gear ratio	1st		3.285 (46/14)
		2nd		2.105 (40/19)
		3rd		1.600 (32/20)
		4th		1.300 (26/20)
5th			1.150 (23/20)	
6th			1.043 (24/23)	
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		FET shorted/triple phase full wave rectification	
	Lighting system		Battery	

CB500X/XA

ITEM			SPECIFICATION	
DIMENSIONS	Overall length		2,095 mm (82.5 in)	
	Overall width		830 mm (32.7 in)	
	Overall height		1,260 mm (49.6 in)	
	Wheelbase		1,420 mm (55.9 in)	
	Seat height		810 mm (31.9 in)	
	Footpeg height		320 mm (12.6 in)	
	Ground clearance		170 mm (6.7 in)	
	Curb weight	CB500X	A type	192 kg (423 lbs)
			AC type	193 kg (425 lbs)
		CB500XA	A, CM types	194 kg (428 lbs)
			AC type	195 kg (430 lbs)
Maximum weight capacity		171 kg (377 lbs)		

GENERAL INFORMATION

ITEM		SPECIFICATION	
FRAME	Frame type	Diamond	
	Front suspension	Telescopic fork	
	Front axle travel	125 mm (4.9 in)	
	Rear suspension	Swingarm	
	Rear axle travel	118 mm (4.6 in)	
	Front tire size	120/70ZR17M/C (58W)	
	Rear tire size	160/60ZR17M/C (69W)	
	Front tire brand	SCORPION TRAIL E (PIRELLI)	
	Rear tire brand	SCORPION TRAIL (PIRELLI)	
	Front brake	Hydraulic single disc	
	Rear brake	Hydraulic single disc	
	Caster angle	26° 30'	
	Trail length	108 mm (4.3 in)	
	Fuel tank capacity	17.3 liters (4.57 US gal, 3.81 Imp gal)	
ENGINE	Cylinder arrangement	2 cylinders in-line, inclined 19° from vertical	
	Bore and stroke	67.0 x 66.8 mm (2.64 x 2.63 in)	
	Displacement	471 cm ³ (28.7 cu-in)	
	Compression ratio	10.7 : 1	
	Valve train	Chain driven DOHC with rocker arm	
	Intake valve	opens	at 1 mm (0.04 in) lift
		closes	at 1 mm (0.04 in) lift
	Exhaust valve	opens	at 1 mm (0.04 in) lift
		closes	at 1 mm (0.04 in) lift
	Lubrication system	Forced pressure and wet sump	
	Oil pump type	Trochoid	
	Cooling system	Liquid cooled	
	Air filtration	Viscous paper element	
	Engine dry weight	52.7 kg (116.2 lbs)	
Firing order	1 - 2		
Cylinder number	Left: 1, Right: 2		
FUEL DELIVERY SYSTEM	Type	PGM-FI (Programmed Fuel Injection)	
	Throttle bore	34 mm (1.3 in)	
DRIVE TRAIN	Clutch system	Multi-plate, wet	
	Clutch operation system	Cable operating	
	Transmission	Constant mesh, 6 speeds	
	Primary reduction	2.029 (69/34)	
	Final reduction	2.733 (41/15)	
	Gear ratio	1st	3.285 (46/14)
		2nd	2.105 (40/19)
		3rd	1.600 (32/20)
		4th	1.300 (26/20)
5th		1.150 (23/20)	
6th		1.043 (24/23)	
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	FET shorted/triple phase full wave rectification	
	Lighting system	Battery	

PGM-FI SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Engine idle speed	1,200 ± 100 rpm
ECT sensor resistance (40°C/104°F)	1.0 - 1.3 kΩ
IAT sensor resistance (20°C/68°F)	1 - 4 kΩ
Fuel injector resistance (20°C/68°F)	11 - 13 Ω
O ₂ sensor heater resistance (20°C/68°F)	10 - 40 Ω
IACV resistance (25°C/77°F)	110 - 150 Ω

IGNITION SYSTEM SPECIFICATIONS

ITEM	SPECIFICATION
Spark plug	CPR8EA-9 (NGK)
Spark plug gap	0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil peak voltage	100 V minimum
CKP sensor peak voltage	0.7 V minimum
Ignition timing ("F" mark)	6° BTDC at idle speed

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	A, CM types GQBJA
	AC type GQBJB
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)	319 cm ³ (10.8 US oz, 11.2 Imp oz) minimum/10 seconds
PAIR control solenoid valve resistance (20°C/68°F)	24 – 28 Ω
EVAP purge control solenoid valve resistance (20°C/68°F)	30 – 34 Ω

COOLING SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Coolant capacity	Radiator and engine 1.4 liters (1.5 US qt, 1.2 Imp qt)
	Reserve tank (Upper level) 0.12 liter (0.13 US qt, 0.11 Imp qt)
Radiator cap relief pressure	108 – 137 kPa (1.1 – 1.4 kgf/cm ² , 16 – 20 psi)
Thermostat	Begin to open 80 – 84°C (176 – 183°F)
	Fully open 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 2.5 liters (2.6 US qt, 2.2 Imp qt)	–
	At oil filter change 2.7 liters (2.9 US qt, 2.4 Imp qt)	–
	At disassembly 3.2 liters (3.4 US qt, 2.8 Imp qt)	–
Recommended engine oil	Pro Honda GN4 4-stroke oil (U.S.A. & 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 EOP switch	93 kPa (0.9 kgf/cm ² , 13 psi) at 1,200 rpm/80°C (176°F)	–
Oil pump rotor	Tip clearance 0.15 (0.006)	0.20 (0.008)
	Body clearance 0.15 – 0.21 (0.006 – 0.008)	0.35 (0.014)
	Side clearance 0.02 – 0.09 (0.001 – 0.004)	0.12 (0.005)

GENERAL INFORMATION

CYLINDER HEAD/VALVES SPECIFICATIONS

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression at 450 rpm			1,372 kPa (14.0 kgf/cm ² , 119 psi)	–
Valve clearance		IN	0.16 ± 0.03 (0.006 ± 0.001)	–
		EX	0.27 ± 0.03 (0.011 ± 0.001)	–
Rocker arm, rocker arm shaft	Arm I.D.	IN/EX	10.000 – 10.015 (0.3937 – 0.3943)	10.10 (0.398)
	Shaft O.D.	IN/EX	9.972 – 9.987 (0.3926 – 0.3932)	9.75 (0.384)
	Arm-to-shaft clearance	IN/EX	0.013 – 0.043 (0.0005 – 0.0017)	0.10 (0.004)
Camshaft	Cam lobe height	IN	30.3955 – 30.6355 (1.19667 – 1.20612)	30.376 (1.1959)
		EX	30.1424 – 30.3824 (1.18671 – 1.19616)	30.122 (1.1859)
	Oil clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
	Runout		–	0.04 (0.002)
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)	4.54 (0.179)
	Stem-to-guide clearance	IN	0.005 – 0.042 (0.0002 – 0.0017)	0.07 (0.003)
		EX	0.015 – 0.052 (0.0006 – 0.0020)	0.08 (0.003)
	Valve guide height	IN/EX	14.10 – 14.30 (0.555 – 0.563)	–
Valve seat width	IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)	
Valve spring free length	Inner (IN/EX)	29.78 (1.172)	28.58 (1.125)	
	Outer (IN/EX)	39.98 (1.574)	38.78 (1.527)	
Cylinder head warpage			–	0.10 (0.004)

CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS

ITEM			STANDARD	SERVICE LIMIT
Clutch lever freeplay			10 – 20 (0.4 – 0.8)	–
Clutch	Spring free length		43.2 (1.70)	42.0 (1.65)
	Disc thickness		2.30 – 2.50 (0.091 – 0.098)	2.27 (0.089)
	Plate warpage		–	0.30 (0.012)
Clutch outer guide	I.D.		22.000 – 22.021 (0.8661 – 0.8670)	22.031 (0.8674)
	O.D.		27.987 – 28.000 (1.1018 – 1.1024)	27.977 (1.1015)
Mainshaft O.D. at clutch outer guide			21.967 – 21.980 (0.8648 – 0.8654)	21.95 (0.864)

ALTERNATOR/STARTER CLUTCH SPECIFICATIONS

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear boss O.D.	51.705 – 51.718 (2.356 – 2.0361)	51.685 (2.0348)
Starter clutch outer I.D.	68.362 – 68.392 (2.6914 – 2.6926)	68.402 (2.6930)

CRANKCASE/TRANSMISSION SPECIFICATIONS

ITEM			STANDARD	SERVICE LIMIT
Transmission	Gear I.D.	M5	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
		C1	24.007 – 24.028 (0.9452 – 0.9460)	24.04 (0.946)
		C2	31.000 – 31.025 (1.2205 – 1.2215)	31.04 (1.222)
	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)	30.94 (1.218)
		C3, C4	30.950 – 30.975 (1.2185 – 1.2195)	30.93 (1.218)
	Gear-to-bushing clearance	M5	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
		C2	0.005 – 0.055 (0.0002 – 0.0022)	0.07 (0.003)
	Bushing I.D.	M5	25.000 – 25.021 (0.9843 – 0.9851)	25.04 (0.986)
		C2	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
Mainshaft O.D.	at M5 bushing	24.967 – 24.980 (0.9830 – 0.9835)	24.96 (0.983)	
	at C2 bushing	27.967 – 27.980 (1.1011 – 1.1016)	27.95 (1.100)	
Bushing-to-shaft clearance	M5, C2	0.020 – 0.054 (0.0008 – 0.0021)	0.07 (0.003)	
Shift fork, fork shaft	Shift fork shaft O.D.		11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)
	Shift fork I.D.		12.000 – 12.018 (0.4724 – 0.4731)	12.03 (0.474)
	Shift fork claw thickness		5.93 – 6.00 (0.233 – 0.236)	5.9 (0.23)

CRANKSHAFT/PISTON/CYLINDER/BALANCER SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Crankshaft	Connecting rod big end side clearance	0.05 – 0.20 (0.002 – 0.008)	0.25 (0.010)	
	Crankpin bearing oil clearance	0.030 – 0.052 (0.0012 – 0.0020)	0.06 (0.002)	
	Main journal bearing oil clearance	0.017 – 0.035 (0.0007 – 0.0014)	0.05 (0.002)	
	Runout	–	0.05 (0.002)	
Cylinder	I.D.	67.000 – 67.015 (2.6378 – 2.6384)	67.10 (2.642)	
	Out-of-round	–	0.10 (0.004)	
	Taper	–	0.10 (0.004)	
	Warpage	–	0.10 (0.004)	
Piston, piston pin, piston ring	Piston O.D. at 7 mm (0.3 in) from bottom	66.970 – 66.990 (2.6366 – 2.6374)	66.905 (2.6340)	
	Piston pin hole I.D.	16.002 – 16.008 (0.6300 – 0.6302)	16.02 (0.631)	
	Piston pin O.D.	15.994 – 16.000 (0.6297 – 0.6299)	15.98 (0.629)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)	
	Piston ring end gap	Top	0.10 – 0.20 (0.004 – 0.008)	0.4 (0.02)
		Second	0.21 – 0.31 (0.008 – 0.012)	0.5 (0.02)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)	1.0 (0.04)
	Piston ring-to-ring groove clearance	Top	0.030 – 0.060 (0.0012 – 0.0024)	0.10 (0.004)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.08 (0.003)
Cylinder-to-piston clearance		0.010 – 0.045 (0.0004 – 0.0018)	0.10 (0.004)	
Connecting rod small end I.D.		16.030 – 16.044 (0.6311 – 0.6317)	16.05 (0.632)	
Connecting rod-to-piston pin clearance		0.03 – 0.05 (0.001 – 0.002)	0.07 (0.003)	

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Minimum tire thread depth		–	1.5 (0.06)	
Cold tire pressure	Up to 90 kg (200 lbs) load	250 kPa (2.50 kgf/cm ² , 36 psi)	–	
	Up to maximum weight capacity	250 kPa (2.50 kgf/cm ² , 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	CBR500R/RA	405.3 (15.96)	
		CB500F/FA	381.3 (15.01)	
		CB500X/XA	386.8 (15.23)	
	Tube runout		–	0.20 (0.008)
	Recommended fork fluid		Pro Honda Suspension Fluid SS-8 (10W)	
	Fluid level	CBR500R/RA/ CB500F/FA	130 (5.1)	–
		CB500X/XA	160 (6.3)	–
	Fluid capacity	CBR500R/RA	503 ± 2.5 cm ³ (17.0 ± 0.08 US oz, 17.7 ± 0.09 Imp oz)	–
		CB500F/FA	480 ± 2.5 cm ³ (16.2 ± 0.08 US oz, 16.9 ± 0.09 Imp oz)	–
CB500X/XA		453 ± 2.5 cm ³ (15.3 ± 0.08 US oz, 15.9 ± 0.09 Imp oz)	–	
Steering bearing pre-load		9.8 – 14.7 N (1.0 – 1.5 kgf, 2.2 – 3.3 lbf)		

GENERAL INFORMATION

REAR WHEEL/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire thread depth		–	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lbs) load	290 kPa (2.90 kgf/cm ² , 42 psi)	–
	Up to maximum weight capacity	290 kPa (2.90 kgf/cm ² , 42 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel balance weight		–	60 g (2.1 oz) max.
Drive chain	Size/link	DID520V0/112	–
	Slack	35 – 45 (1.4 – 1.8)	–
Shock absorber pre-load adjuster standard position		3rd position from minimum	–

HYDRAULIC BRAKE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Front	Specified brake fluid	DOT 4	–
	Brake pad wear indicator	–	To groove
	Brake disc thickness	4.8 – 5.2 (0.19 – 0.20)	4.0 (0.16)
	Brake disc warpage	–	0.3 (0.01)
	Master cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Master piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
	Caliper cylinder I.D.	27.000 – 27.050 (1.0630 – 1.0650)	27.06 (1.065)
	Caliper piston O.D.	26.918 – 26.968 (1.0598 – 1.0617)	26.91 (1.059)
Rear	Specified brake fluid	DOT 4	–
	Brake pad wear indicator	–	To groove
	Brake disc thickness	4.8 – 5.2 (0.19 – 0.20)	4.0 (0.16)
	Brake disc warpage	–	0.3 (0.01)
	Master cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Master piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
	Caliper cylinder I.D.	38.18 – 38.23 (1.503 – 1.505)	38.24 (1.506)
	Caliper piston O.D.	38.098 – 38.148 (1.4999 – 1.5019)	38.09 (1.500)

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS	
Battery	Type	FTZ10S, YTZ10S	
	Capacity	12 V - 8.6 Ah (10 HR)	
	Current leakage	0.3 mA max.	
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.4 V
	Charging current	Normal	0.9 A/5 – 10 h
Quick		4.5 A/1 h	
Alternator	Capacity	500 W/5,000 rpm	
	Charging coil resistance (20°C/68°F)	0.1 – 1.0 Ω	

LIGHTS/METERS/SWITCHES SPECIFICATIONS

ITEM		SPECIFICATION	
Bulbs	Headlight	CBR500R/RA	12 V – 55 W x 2
		CB500F/FA/X/XA	12 V – 60/55 W
	Front turn signal/position light		12 V – 21/5 W x 2
	Rear turn signal light		12 V – 21 W x 2
	Brake/taillight		12 V – 21/5 W
	License light		12 V – 5 W
	Instrument light		LED
	Turn signal indicator		LED
	High beam indicator		LED
	Neutral indicator		LED
	Engine oil pressure indicator		LED
	High coolant temperature indicator		LED
	MIL		LED
	ABS indicator (CBR500RA/CB500FA/XA)		LED
Fuse	Main fuse		30 A
	Sub-fuse		15 A x 3, 7.5 A x 4
	ABS motor fuse (CBR500RA/CB500FA/XA)		30 A
	ABS main fuse (CBR500RA/CB500FA/XA)		7.5 A
ECT sensor resistance	40°C (104°F)	1.0 – 1.3 kΩ	
	100°C (212°F)	0.1 – 0.2 kΩ	

GENERAL INFORMATION

TORQUE VALUES

STANDARD TORQUE VALUES

FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm bolt and nut	5.2 (0.5, 3.8)	5 mm screw	4.2 (0.4, 3.1)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw	9.0 (0.9, 6.6)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head; small flange)	10 (1.0, 7)
10 mm bolt and nut	34 (3.5, 25)	6 mm flange bolt (8 mm head; large flange)	12 (1.2, 9)
12 mm bolt and nut	54 (5.5, 40)	6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
		8 mm flange bolt and nut	27 (2.8, 20)
		10 mm flange bolt and nut	39 (4.0, 29)

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

ENGINE & FRAME TORQUE VALUES

FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rearview mirror mounting socket bolt (CBR500R/RA)	4	6	5.2 (0.5, 3.8)	
Headlight mounting bolt (CB500X/XA)	2	6	8.5 (0.9, 6.3)	
Headlight mounting screw (CB500X/XA)	2	6	4.5 (0.5, 3.3)	
Drive sprocket cover bolt	2	6	12 (1.2, 9)	
PAIR control solenoid valve nut	1	6	8.5 (0.9, 6.3)	
Sidestand pivot bolt	1	10	10 (1.0, 7)	
Sidestand pivot nut	1	10	30 (3.1, 22)	U-nut
Rider footpeg bracket bolt	4	8	37 (3.8, 27)	
Passenger footpeg bracket bolt	4	8	37 (3.8, 27)	
Exhaust pipe joint nut	4	8	18 (1.8, 13)	
Muffler band bolt	1	8	22 (2.2, 16)	
Muffler mounting nut	1	8	22 (2.2, 16)	
Muffler cover socket bolt	1	6	10 (1.0, 7)	
Muffler tail cap socket bolt	3	6	10 (1.0, 7)	
Exhaust pipe cover bolt	3	6	12 (1.2, 9)	
Exhaust pipe stud bolt	4	8	9.0 (0.9, 6.6)	See page 2-29
Seat rail mounting bolt	4	10	60 (6.1, 44)	

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel tank mounting bolt (front side)	2	6	10 (1.0, 7)	
Throttle cable adjuster lock nut (throttle grip side)	1	7	3.8 (0.4, 2.8)	
Throttle cable adjuster lock nut (throttle body side)	1	6	3.0 (0.3, 2.2)	
Air cleaner element washer-screw	4	5	1.5 (0.2, 1.1)	
Air cleaner lid tapping screw	4	5	1.1 (0.1, 0.8)	
Spark plug	2	10	16 (1.6, 12)	
Crankshaft hole cap	1	45	18 (1.8, 13)	Apply grease to the threads.
Rocker arm shaft plug bolt	2	12	15 (1.5, 11)	Apply engine oil to the threads.
Engine oil drain bolt	1	12	30 (3.1, 22)	
Engine oil filter boss	1	20	18 (1.8, 13)	See page 3-11 Apply locking agent to the threads.
Engine oil filter cartridge	1	20	26 (2.7, 19)	Apply engine oil to the threads.
Drive chain adjuster lock nut	2	8	21 (2.1, 15)	
Rear axle nut	1	16	88 (9.0, 65)	U-nut
Drive sprocket bolt	1	10	54 (5.5, 40)	
Driven sprocket nut	5	12	108 (11.0, 80)	U-nut
Front master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Rear brake 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
Sensor unit torx screw	3	5	3.4 (0.3, 2.5)	
ECT sensor	1	10	12 (1.2, 9)	
VS sensor bolt	1	6	12 (1.2, 9)	
O ₂ sensor	1	18	44 (4.5, 32)	
Bank angle sensor nut	2	6	8.5 (0.9, 6.3)	

IGNITION SYSTEM

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

ELECTRIC STARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Positive brush terminal nut	1	6	10 (1.0, 7)	

FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Throttle cable holder screw	2	5	3.4 (0.3, 2.5)	
IACV body screw	3	5	3.4 (0.3, 2.5)	
IACV setting plate torx screw	2	4	2.1 (0.2, 1.5)	
Fuel injector joint bolt	4	5	5.1 (0.5, 3.8)	
Fuel tank mounting bolt (front side)	2	6	10 (1.0, 7)	
Fuel tank mounting nut (rear side)	1	6	12 (1.2, 9)	
Fuel pump mounting nut	6	6	12 (1.2, 9)	See page 7-10
Air cleaner housing assembly tapping screw	6	5	1.1 (0.1, 0.8)	
Wire junction stay tapping screw	1	5	1.0 (0.1, 0.7)	
Throttle cable joint bolt (at throttle body)	1	6	3.0 (0.3, 2.2)	
PAIR check valve cover bolt	2	6	12 (1.2, 9)	Apply locking agent to the threads.

GENERAL INFORMATION

COOLING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fan motor shroud bolt	4	6	8.5 (0.9, 6.3)	
Fan motor screw	3	4	2.8 (0.3, 2.1)	
Cooling fan nut	1	3	1.1 (0.1, 0.8)	Apply locking agent to the threads.
Water pump mounting bolt	3	6	12 (1.2, 9)	
Water pump cover bolt (including drain bolt)	2	6	13 (1.3, 10)	
Cylinder drain bolt	1	6	12 (1.2, 9)	
Thermostat cover bolt	2	6	12 (1.2, 9)	
Water hose joint stud bolt	2	6	-	See page 8-11 Apply locking agent to the threads (crankcase side).

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head bolt	6	9	47 (4.8, 35)	Apply engine oil to the threads and seating surface.
Camshaft holder bolt	12	6	12 (1.2, 9)	Apply engine oil to the threads and seating surface.
Rocker arm shaft plug bolt	2	12	15 (1.5, 11)	Apply engine oil to the threads.
Cylinder head cover bolt	4	6	10 (1.0, 7)	
Cam chain tensioner pivot bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads.
Right crankcase cover bolt	1	6	12 (1.2, 9)	

CLUTCH/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil pump driven sprocket bolt	1	6	15 (1.5, 11)	Apply locking agent to the threads.
Clutch center lock nut	1	18	128 (13.1, 94)	Lock nut; replace with a new one and stake. Apply engine oil to the threads and seating surface.
Primary drive gear bolt	1	10	103 (10.5, 76)	Apply engine oil to the threads and seating surface.
Shift drum stopper arm bolt	1	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.
Clutch lifter plate bolt	4	6	12 (1.2, 9)	
Gearshift spindle setting plate bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads.
Gearshift spindle oil seal setting plate bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads.
Gearshift pedal pivot socket bolt	1	8	27 (2.8, 20)	
Right crankcase cover bolt	14	6	12 (1.2, 9)	

ALTERNATOR/STARTER CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Starter clutch socket bolt	6	8	29 (3.0, 21)	Apply locking agent to the threads.
Flywheel bolt	1	12	138 (14.1, 102)	Apply engine oil to the threads and seating surface.
Alternator stator bolt	4	6	10 (1.0, 7)	Apply locking agent to the threads.
CKP sensor bolt	2	6	12 (1.2, 9)	Apply locking agent to the threads.
Left crankcase cover bolt	11	6	12 (1.2, 9)	

GENERAL INFORMATION

CRANKCASE/TRANSMISSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Balancer/right mainshaft bearing setting plate bolt	4	6	12 (1.2, 9)	Apply locking agent to the threads.
Left mainshaft bearing outer race setting plate bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads.
Shift drum bearing setting washer-bolt	2	6	12 (1.2, 9)	Apply locking agent to the threads.
Crankcase main journal bolt	6	8	15 (1.5, 11) + 120°	See page 13-7 Replace with a new one.
Crankcase 10 mm bolt	1	10	39 (4.0, 29)	
Crankcase 8 mm bolt	3	8	24 (2.4, 18)	
Crankcase 6 mm bolt	10	6	12 (1.2, 9)	

CRANKSHAFT/PISTON/CYLINDER/BALANCER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Connecting rod bearing cap nut	4	8	33.3 (3.4, 25)	Apply engine oil to the threads and seating surface.
Balancer/right mainshaft bearing setting plate bolt	4	6	12 (1.2, 9)	Apply locking agent to the threads.

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front engine hanger bolt	2	10	45 (4.6, 33)	See page 15-8
Upper engine hanger bolt	2	10	60 (6.1, 44)	See page 15-8
Rear engine hanger nut	2	10	55 (5.6, 41)	See page 15-8
Drive sprocket bolt	1	10	54 (5.5, 40)	
Right crankcase cover bolt	1	6	12 (1.2, 9)	
Rider footpeg bracket bolt	2	8	37 (3.8, 27)	
EOP switch terminal screw	1	4	2.0 (0.2, 1.5)	

FRONT WHEEL/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Handlebar pinch bolt (CBR500R/RA)	2	8	27 (2.8, 20)	
Handlebar holder bolt (CB500F/FA/X/XA)	4	8	27 (2.8, 20)	
Handlebar switch housing screw	4	5	2.5 (0.3, 1.8)	
Throttle cable A joint nut (at switch housing)	1	10	1.5 (0.2, 1.1)	
Throttle cable B joint nut (at switch housing)	1	12	1.5 (0.2, 1.1)	
Front master cylinder holder bolt	2	6	12 (1.2, 9)	
Front brake disc bolt	6	8	42 (4.3, 31)	ALOC bolt; replace with a new one.
Front axle	1	16	54 (5.5, 40)	
Front axle pinch bolt	1	8	22 (2.2, 16)	
Fork socket bolt	2	8	20 (2.0, 15)	Apply locking agent to the threads.
Fork cap	2	37	22 (2.2, 16)	
Top bridge pinch bolt	2	8	22 (2.2, 16)	
Bottom bridge pinch bolt	2	10	32 (3.3, 24)	
Front brake caliper mounting bolt	2	8	30 (3.1, 22)	ALOC bolt; replace with a new one.
Steering bearing adjustment nut	1	26	23 (2.3, 17)	See page 16-30 Apply engine oil to the threads.
Steering bearing adjustment lock nut	1	26	-	See page 16-30
Steering stem nut	1	24	103 (10.5, 76)	

GENERAL INFORMATION

REAR WHEEL/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear brake disc bolt	4	8	42 (4.3, 31)	ALOC bolt; replace with a new one.
Driven sprocket nut	5	12	108 (11.0, 80)	U-nut
Rear axle nut	1	16	88 (9.0, 65)	U-nut
Shock absorber mounting nut	2	10	44 (4.5, 32)	U-nut
Shock linkage nut	3	10	44 (4.5, 32)	U-nut
Drive chain slider tapping screw	2	5	5.9 (0.6, 4.4)	
Swingarm pivot nut	1	14	88 (9.0, 65)	Apply engine oil to the threads and seating surface. U-nut

HYDRAULIC BRAKE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake hose oil bolt	4	10	34 (3.5, 25)	
Brake caliper bleed valve	2	8	5.4 (0.6, 4.0)	
Brake caliper pad pin	2	10	17 (1.7, 13)	
Front master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Front brake lever pivot bolt	1	6	1.0 (0.1, 0.7)	
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)	
Front master cylinder holder bolt	2	6	12 (1.2, 9)	
Front brake caliper pin	1	8	22 (2.2, 16)	Apply locking agent to the threads.
Front brake caliper mounting bolt	2	8	30 (3.1, 22)	ALOC bolt; replace with a new one.
Rear brake reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Rear master cylinder push rod joint nut	1	8	17 (1.7, 13)	
Rear master cylinder hose joint screw	1	4	1.5 (0.2, 1.1)	Apply locking agent to the threads.
Rear master cylinder mounting bolt	2	6	12 (1.2, 9)	
Rear brake caliper pin bolt	1	12	27 (2.8, 20)	
Rear brake caliper bolt	1	12	22 (2.2, 16)	ALOC bolt; replace with a new one.
Rider footpeg bracket bolt	4	8	37 (3.8, 27)	

ANTI-LOCK BRAKE SYSTEM (ABS; CBR500RA/CB500FA/XA)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake pipe joint nut	4	10	14 (1.4, 10)	Apply brake fluid to the threads.
Brake hose oil bolt	2	10	34 (3.5, 25)	
Rider footpeg bracket bolt	2	8	37 (3.8, 27)	

LIGHTS/METERS/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Headlight mounting bolt (CBR500R/RA)	3	6	8.5 (0.9, 6.3)	
Headlight mounting bolt (CB500F/FA)	2	6	8.5 (0.9, 6.3)	
Headlight mounting screw (CB500F/FA)	2	6	4.5 (0.5, 3.3)	
Front turn signal/position light mounting nut (CBR500R/RA/CB500X/XA)	2	6	10 (1.0, 7)	
Rear turn signal light mounting nut	2	6	10 (1.0, 7)	
Brake/taillight mounting screw	2	4	0.9 (0.1, 0.7)	
Combination meter mounting screw	3	5	1.0 (0.1, 0.7)	
Wire clamp tapping screw (at rear fender A)	1	4	0.9 (0.1, 0.7)	
EOP switch	1	PT 1/8	12 (1.2, 9)	Apply liquid sealant to the threads.
EOP switch terminal screw	1	4	2.0 (0.2, 1.5)	
Ignition switch mounting bolt	2	8	24 (2.4, 18)	One-way bolt; replace with a new one.
Neutral switch	1	10	12 (1.2, 9)	
Neutral switch terminal nut	1	4	1.0 (0.1, 0.7)	

OTHERS

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rider footpeg bank sensor cap bolt	2	8	12 (1.2, 9)	
Gearshift spindle return spring pin	1	8	23 (2.3, 17)	Apply locking agent to the threads.
Crankcase 10 mm socket sealing bolt	1	10	18 (1.8, 13)	
Engine sub-wire harness connector stay tapping screw (at air cleaner housing)	1	5	1.0 (0.1, 0.7)	
Air cleaner housing intake duct tapping screw	2	5	1.1 (0.1, 0.8)	
Clutch lever pivot bolt	1	6	1.0 (0.1, 0.7)	
Clutch lever pivot nut	1	6	5.9 (0.6, 4.4)	
Turn signal light stud stay screw	4	6	2.5 (0.3, 1.8)	
Tail reflex reflector nut	1	5	1.5 (0.2, 1.1)	U nut
Lateral reflex reflector nut	4	6	1.5 (0.2, 1.1)	U nut

GENERAL INFORMATION

LUBRICATION & SEAL POINTS

ENGINE

MATERIAL	LOCATION	REMARKS
Sealant (TB1207B manufactured by ThreeBond or an equivalent)	EOP switch threads	See page 21-16
	Alternator/CKP wire grommet sealing surface	
	Crankcase mating surface	See page 13-6
	Crankcase mating areas (left side)	See page 12-4
	Crankcase mating areas (right side)	See page 11-6
Sealant (TB5211 manufactured by ThreeBond, KE45T manufactured by Shin-Etsu Silicone or an equivalent)	Cylinder head semi-circular edges	See page 10-8
Engine oil (without molybdenum additives)	Engine oil filter cartridge threads	
	Fuel injector seal ring	
	Cam chain	
	Camshaft holder bolt threads and seating surface	
	Rocker arm shaft plug bolt threads	
	Valve stem seal fitting area	
	Cylinder head bolt threads and seating surface	
	Piston sliding surface and ring grooves	
	Piston pin hole inner surface	
	Piston ring entire surface	
	Gearshift spindle shaft outer surface	
	Clutch disc and plate entire surface	
	Clutch center lock nut threads and seating surface	
	Primary drive gear bolt threads and seating surface	
	Starter one-way clutch contacting surface	
	Flywheel bolt threads and seating surface	
	Connecting rod bearing cap nut threads and seating surface	
	Each gear teeth and rotating surface	
	Each bearing rotating area	
	Each O-ring	Except sensor unit, IACV and water passage O-rings
Multi-purpose grease	Other rotating and sliding areas	
	Crankshaft hole cap threads	
	Each oil seal lips	
Molybdenum oil solution (a mixture of engine oil and molybdenum disulfide grease in a ratio of 1:1)	Valve stem end and sliding surface	
	Camshaft journals, lobes and thrust surfaces	
	Rocker arm shaft outer surface	
	Rocker arm sliding areas and thrust surfaces	
	Clutch outer guide entire surface	
	Starter reduction gear shaft outer surface	
	Transmission gear bushing entire surface (M5, C2)	
	Transmission gear spline bushing outer surface (M6, C3, C4)	
	Transmission gear shifter groove (M3/4, C5, C6)	
	Transmission needle bearing rotating area (C1)	
	Shift fork guide area and guide pin	
	Shift fork shaft outer surface	
	Balancer driven sub-gear and washer sliding surfaces	
	Primary drive gear and sub-gear sliding surfaces	
	Crankshaft thrust surfaces	
	Crankshaft main journal bearing sliding surface	
	Crankpin bearing sliding surface	
	Connecting rod small end inner surface	
Piston pin outer surface		
Heat-resistant locking agent (TB1360 manufactured by ThreeBond or equivalent)	Shift drum center socket bolt	Coating width: 6.5 mm (0.26 in) from tip

GENERAL INFORMATION

MATERIAL	LOCATION	REMARKS
Medium strength locking agent (TB1322N manufactured by ThreeBond, LOCTITE 648 manufactured by LOCTITE or equivalent)	PAIR check valve cover bolt threads	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
	Oil pump driven sprocket washer-bolt threads	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
	Cam chain tensioner pivot bolt threads	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
	Gearshift spindle setting plate bolt threads	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
	Gearshift spindle oil seal setting plate bolt threads	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
	Shift drum stopper arm bolt threads	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
	Alternator stator bolt threads	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
	CKP sensor bolt threads	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
	Starter clutch socket bolt threads	Coating width: 6.5 mm (0.26 in) from tip
	Water hose joint stud bolt threads (crankcase side)	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
	Balancer/right mainshaft bearing setting plate bolt threads	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
	Left mainshaft bearing outer race setting plate bolt threads	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
	Shift drum bearing setting bolt threads	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
	Gearshift spindle return spring pin threads	
Engine oil filter boss threads	Coating width: 6.5 mm (0.26 in) from tip	

GENERAL INFORMATION

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 race sliding surface	3 – 5 g (0.1 – 0.2 oz) per each bearing
	Steering bearing dust seal lips	
Multi-purpose grease	Sidestand pivot sliding area	
	Seat catch sliding area	
	Throttle grip cable groove and roll-up area	
	Clutch lever pivot sliding area	
	Front wheel dust seal lips	
	Rear wheel dust seal lips	
	Rear wheel hub O-ring	
	Rear shock absorber needle bearing rotating area	
	Final driven flange dust seal lips	
	Rear shock absorber dust seal lips	
	Shock link needle bearing rotating area	
	Shock link dust seal lips	
	Swingarm needle bearing rotating area	
	Swingarm ball bearing rotating area	
	Swingarm dust seal lips	
	Brake pedal pivot sliding area (grease groove)	
	Gearshift pedal pivot sliding area (grease groove)	
Gearshift pedal tie-rod ball joint		
Engine oil	Footpeg pivot sliding area	
	Steering bearing adjustment nut threads	
Silicone grease	Swingarm pivot nut threads and seating surface	
	Front brake lever pivot sliding area	0.10 g (0.004 oz)
	Front brake lever-to-master piston contacting area	0.10 g (0.004 oz)
	Rear master cylinder push rod-to-master piston contacting area	0.10 g (0.004 oz)
	Rear master cylinder boot push rod fitting area	0.10 g (0.004 oz)
	Front brake caliper pin sliding area	0.4 g (0.01 oz)
	Front brake caliper bracket pin sliding area	0.4 g (0.01 oz)
	Rear brake caliper pin bolt sliding area	0.4 g (0.01 oz)
	Rear brake caliper sleeve sliding area	0.4 g (0.01 oz) (inside of boot)
	Brake caliper dust seal	
	Brake caliper pad pin stopper ring	
DOT 4 brake fluid	Brake master piston and cups	
	Rear master cylinder hose joint O-ring	
	Brake caliper piston seal	
	Brake caliper piston outer surface	
	Brake pipe joint nut threads (CBR500RA/CB500FA/XA)	
Cable lubricant	Clutch cable inside	
	Seat opener cable inside	
Pro Honda Suspension Fluid SS-8 (10W)	Fork oil seal lips	
	Fork dust seal lips	
	Fork cap O-ring	
Honda Bond A or Honda Hand Grip Cement (U.S.A. only)	Left handlebar grip inner surface	
	Brake pad retainer seating surface	
Pro Honda HP Chain Lube or an equivalent	Drive chain entire surface	
High strength locking agent (LOCTITE 638 manufactured by LOCTITE, TB1305N manufactured by ThreeBond or equivalent)	Final driven sprocket stud bolt threads (driven flange side)	

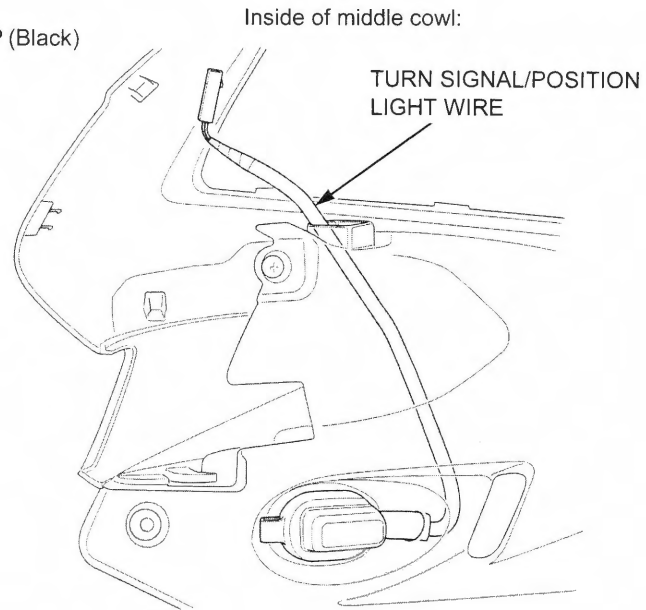
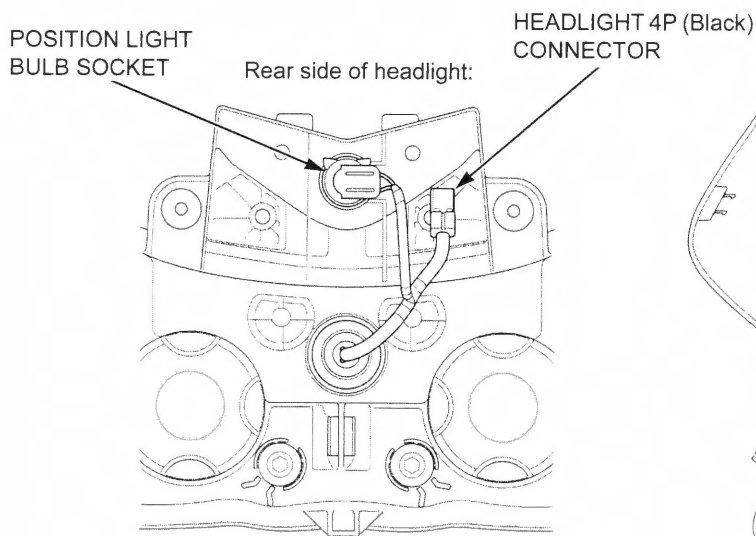
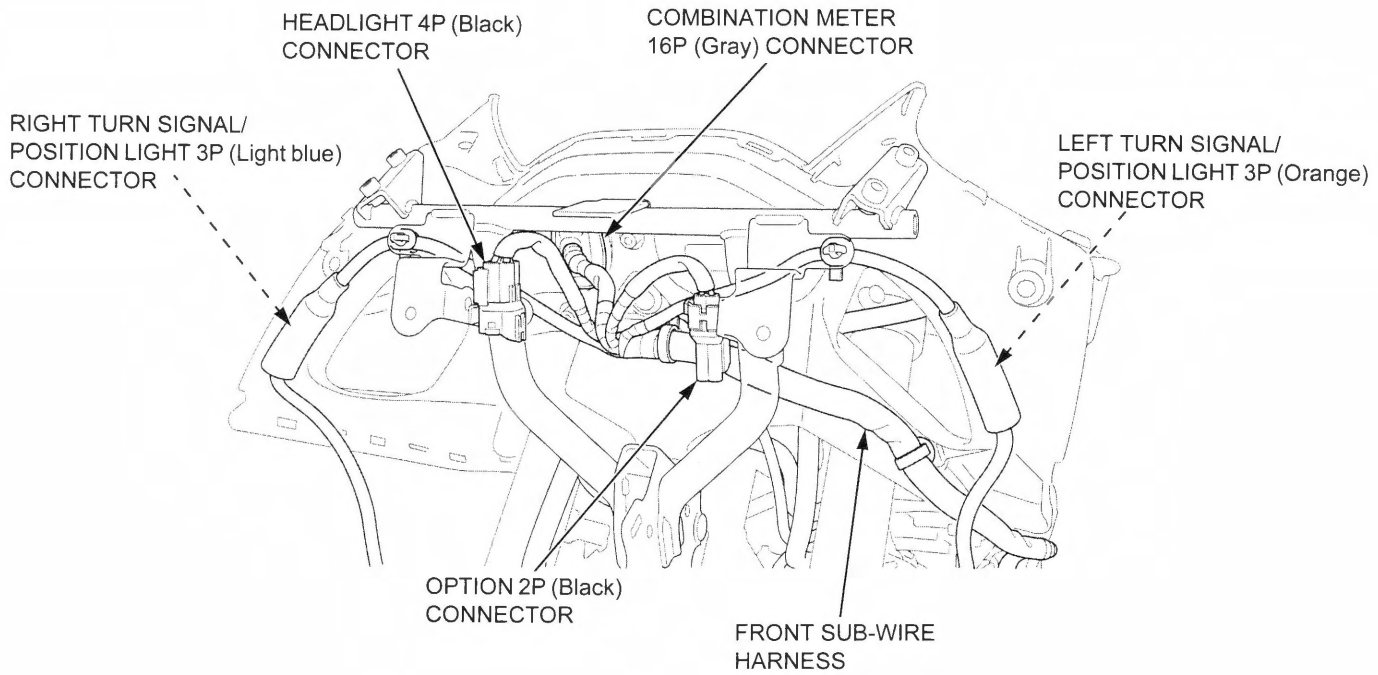
GENERAL INFORMATION

MATERIAL	LOCATION	REMARKS
Medium strength locking agent (TB1322N manufactured by ThreeBond, LOCTITE 648 manufactured by LOCTITE or equivalent)	Fork socket bolt threads	
	Rear master cylinder hose joint screw threads	
	Front brake caliper pin threads	
	Cooling fan nut threads	

GENERAL INFORMATION

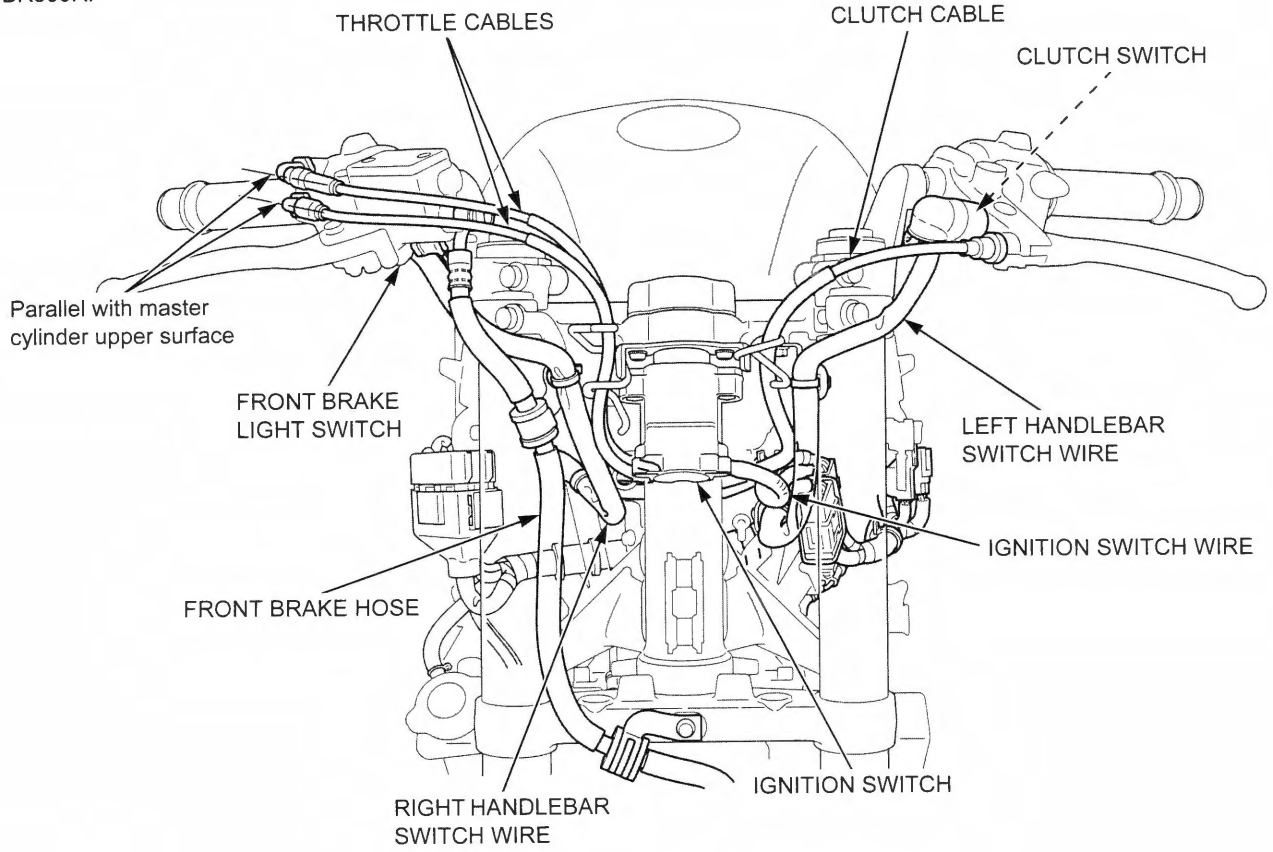
CABLE & HARNESS ROUTING

CBR500R/RA

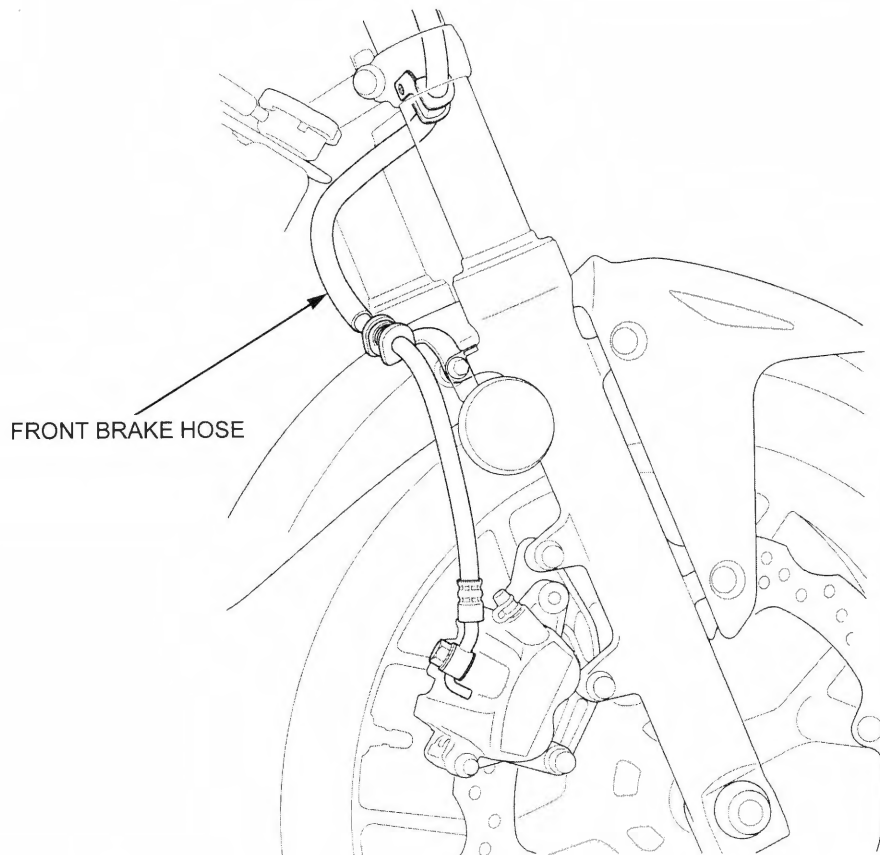


CBR500R/RA

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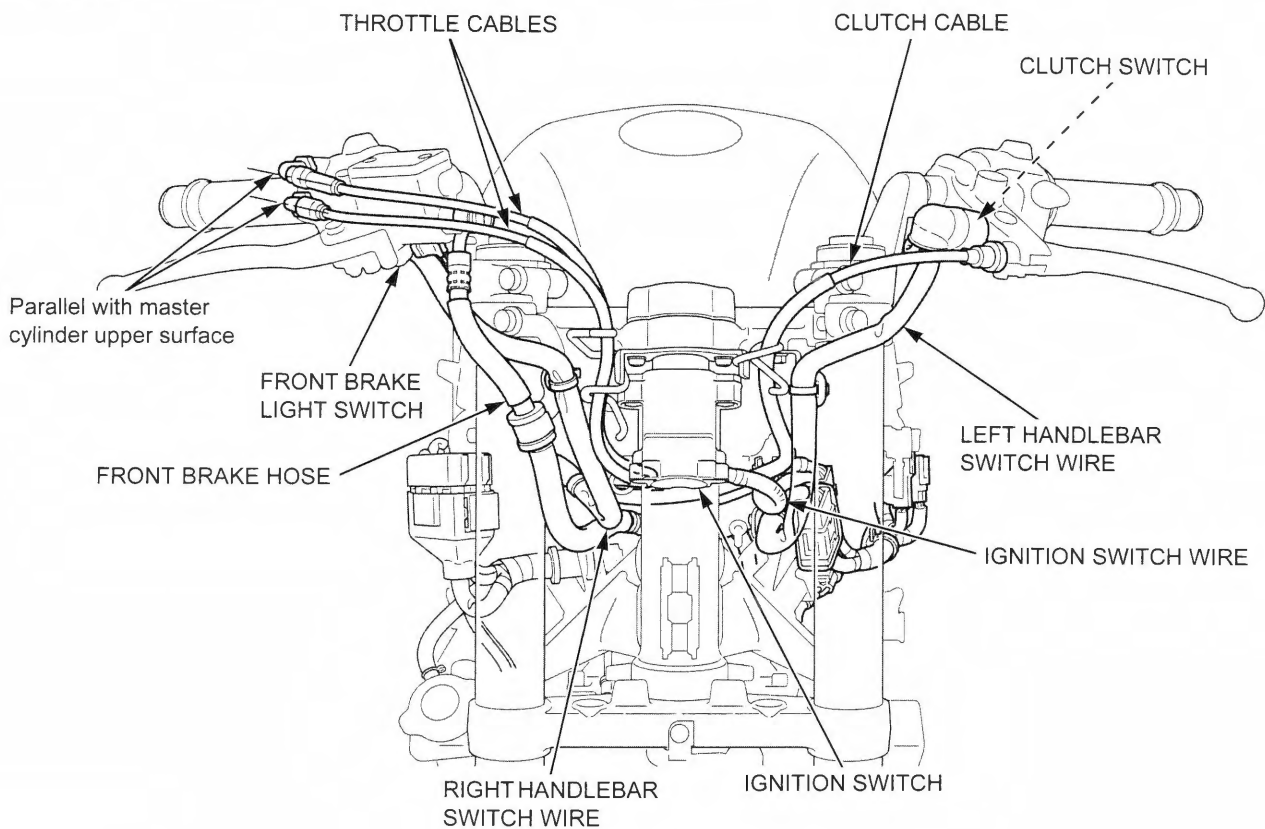
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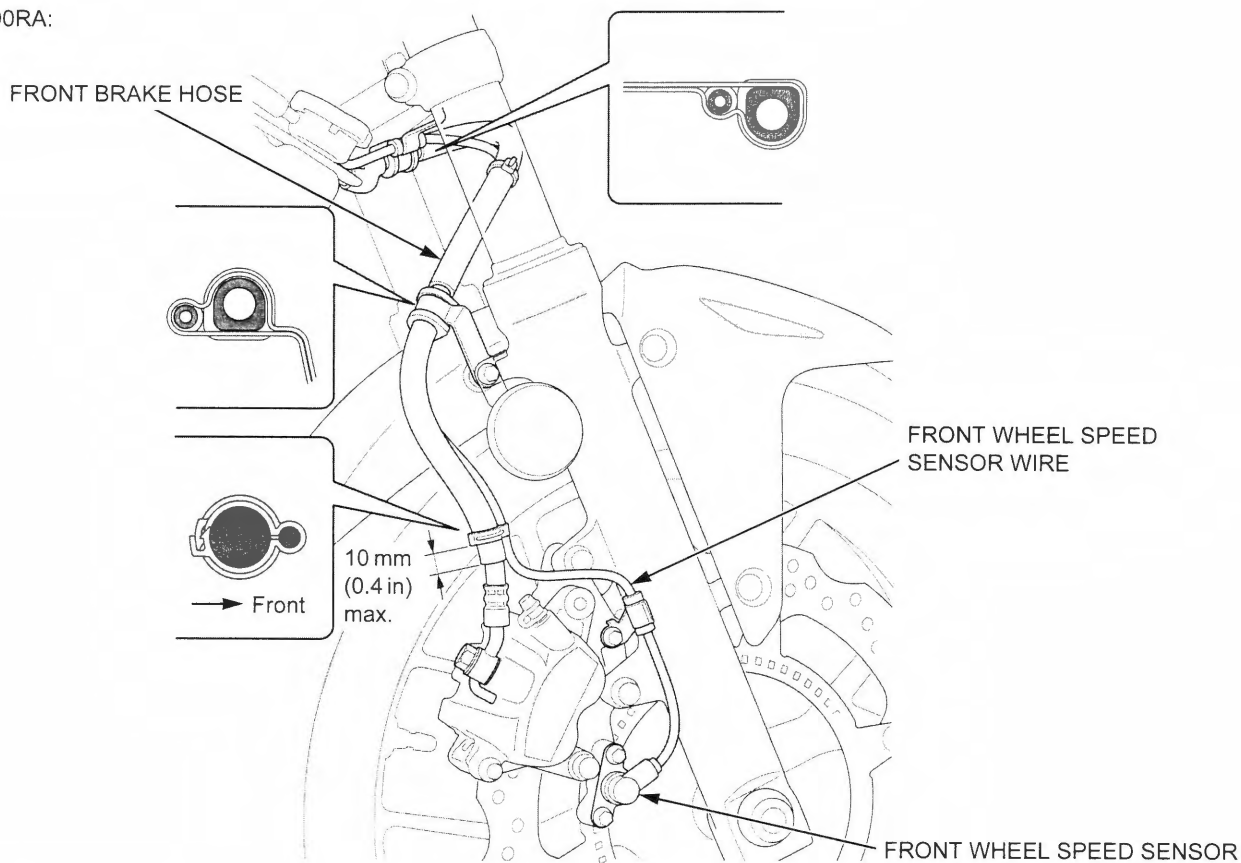
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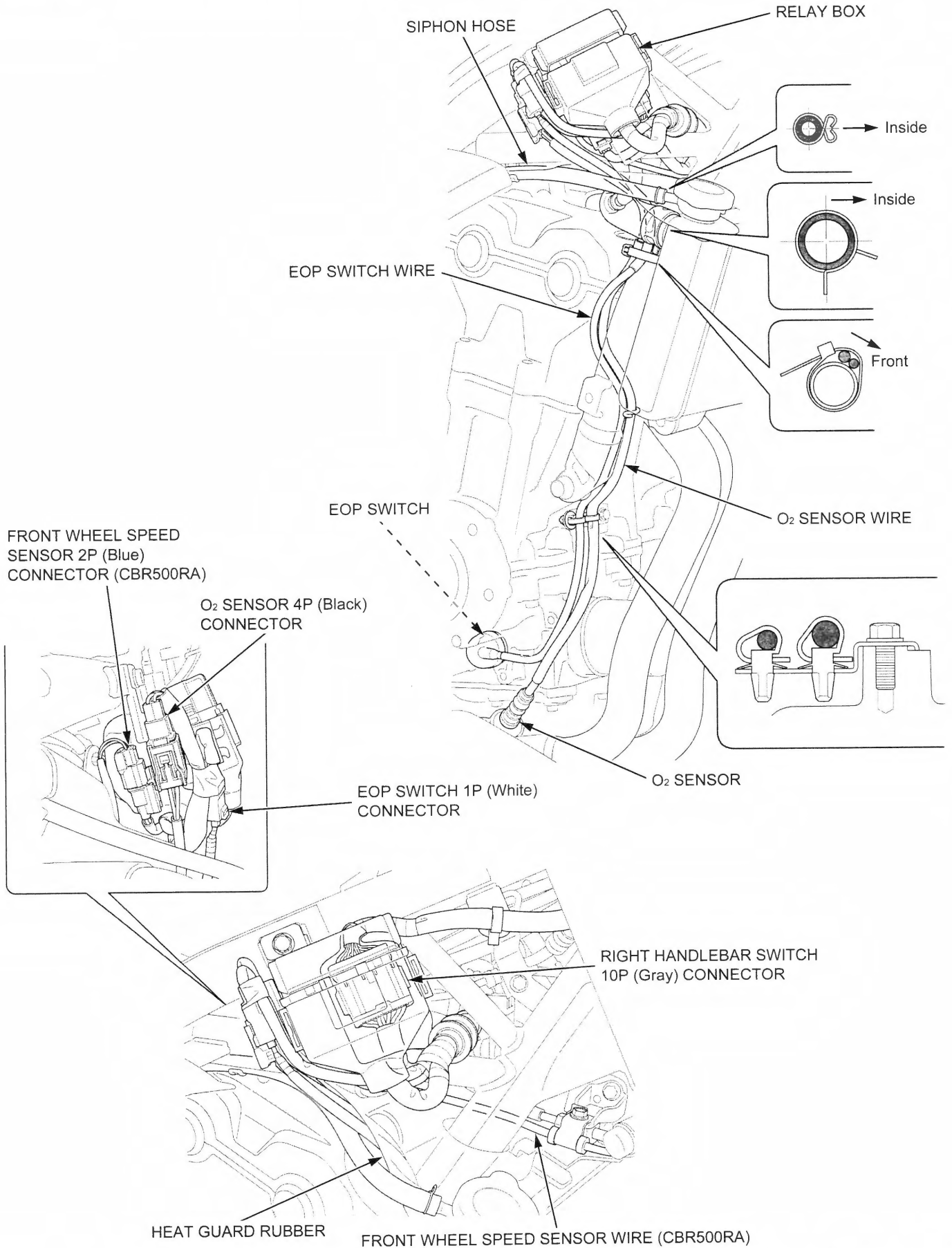
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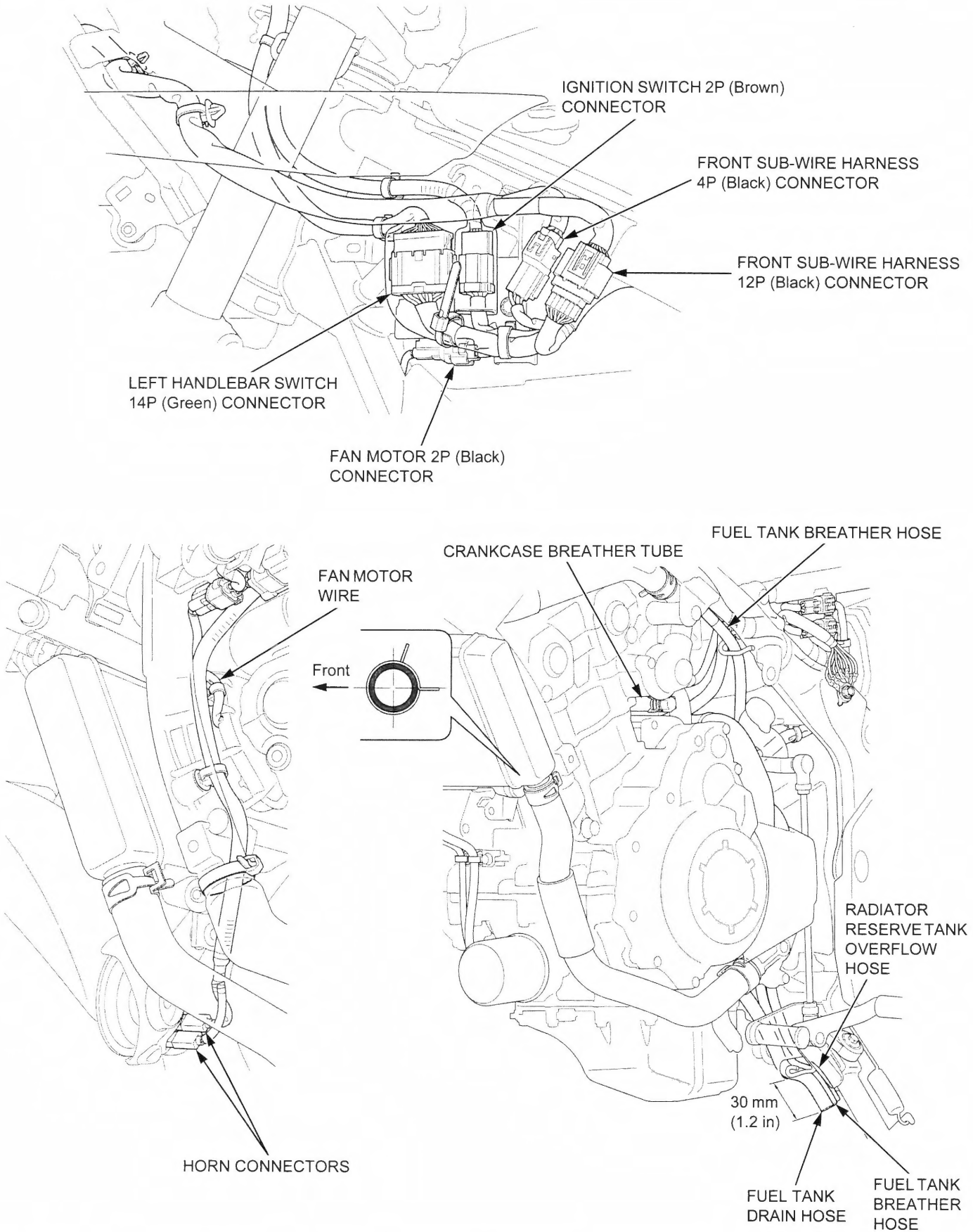
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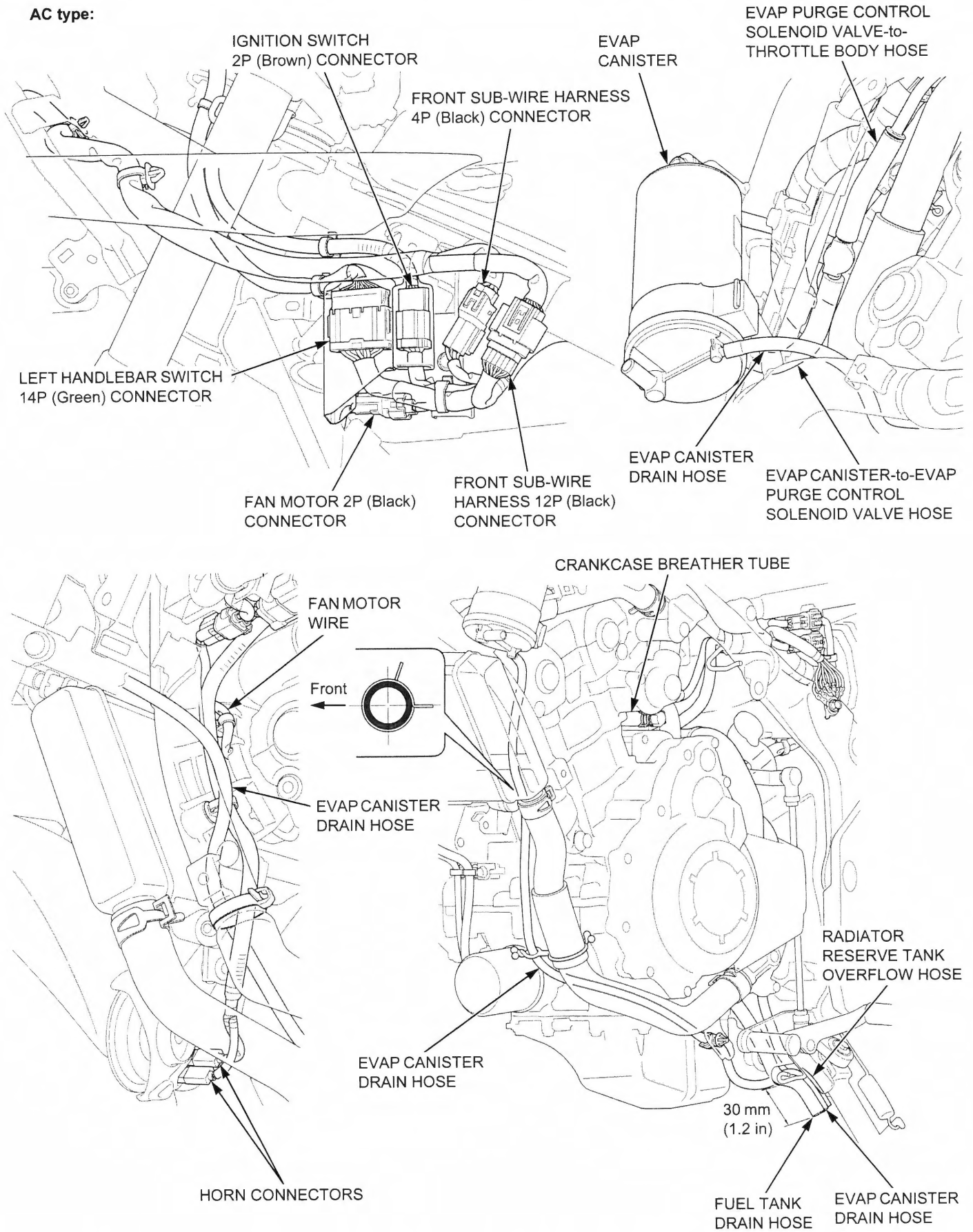
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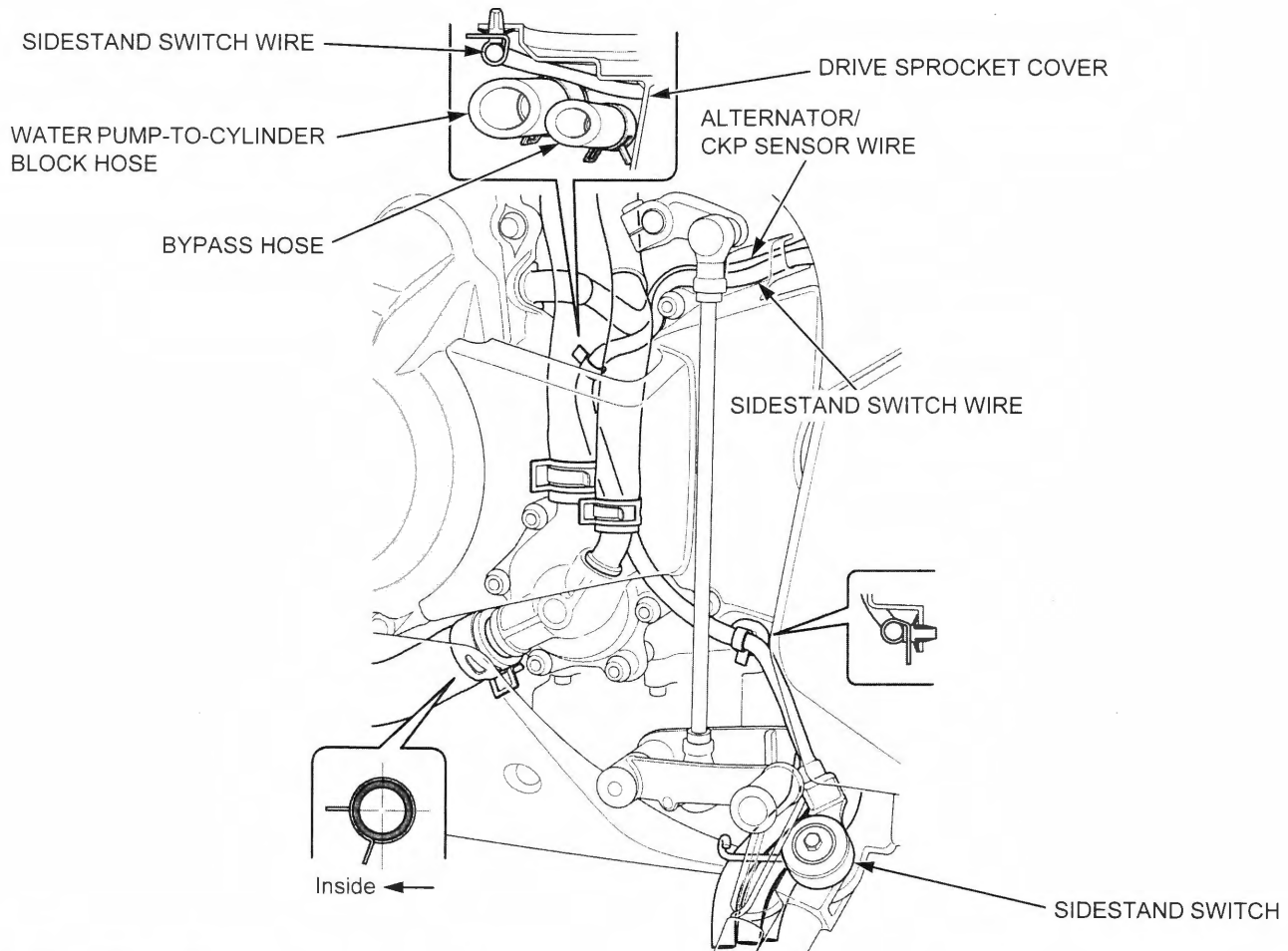
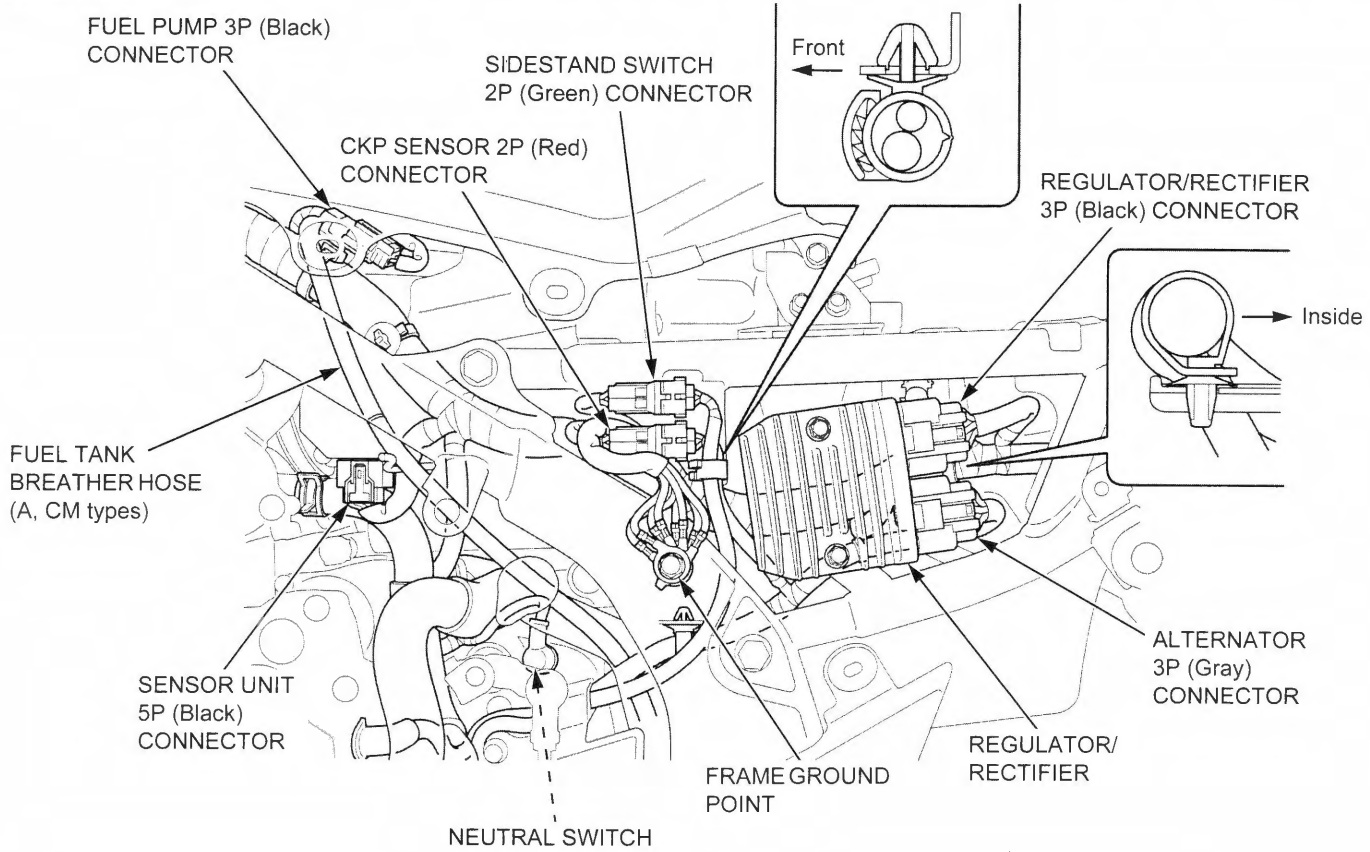
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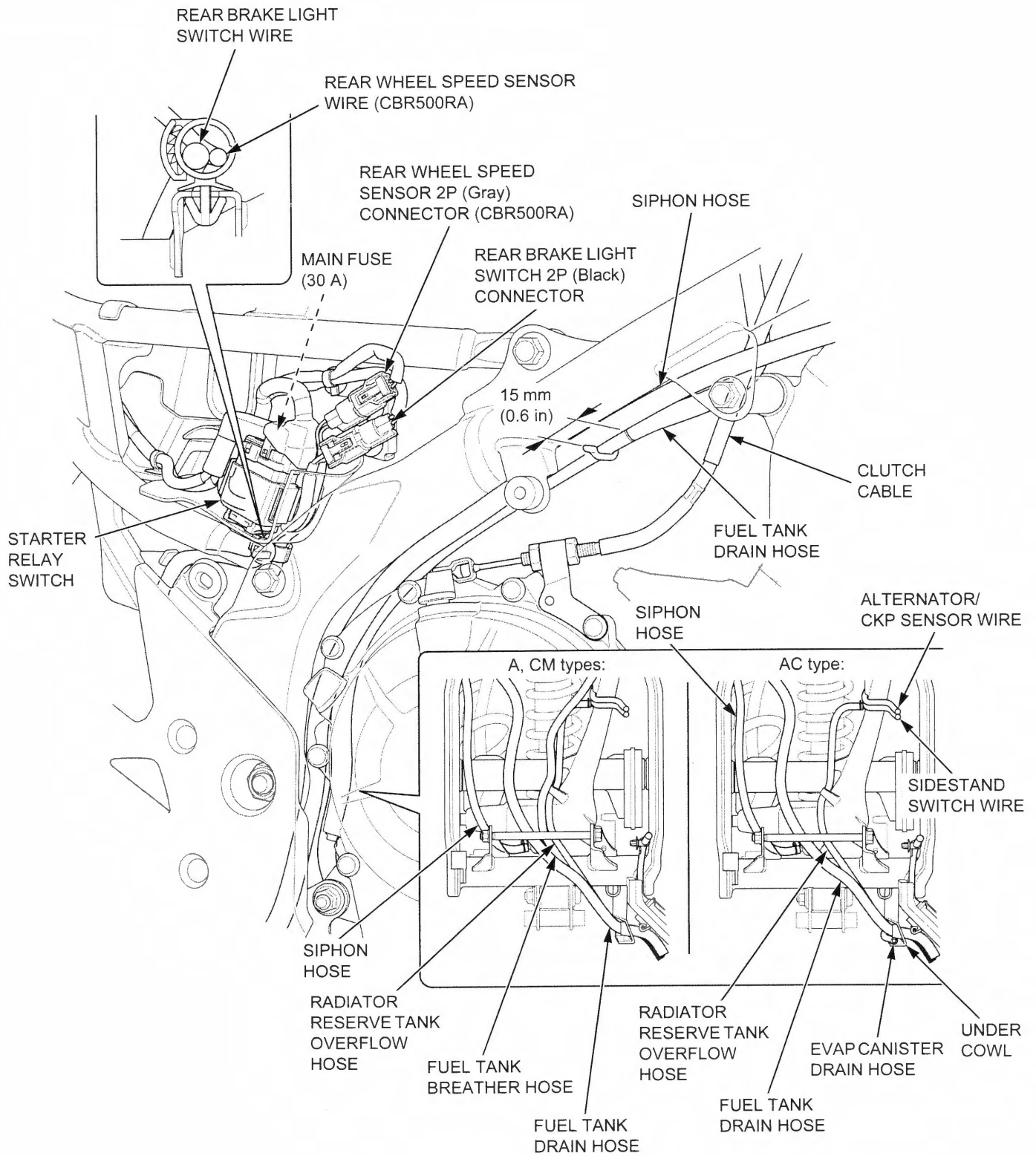


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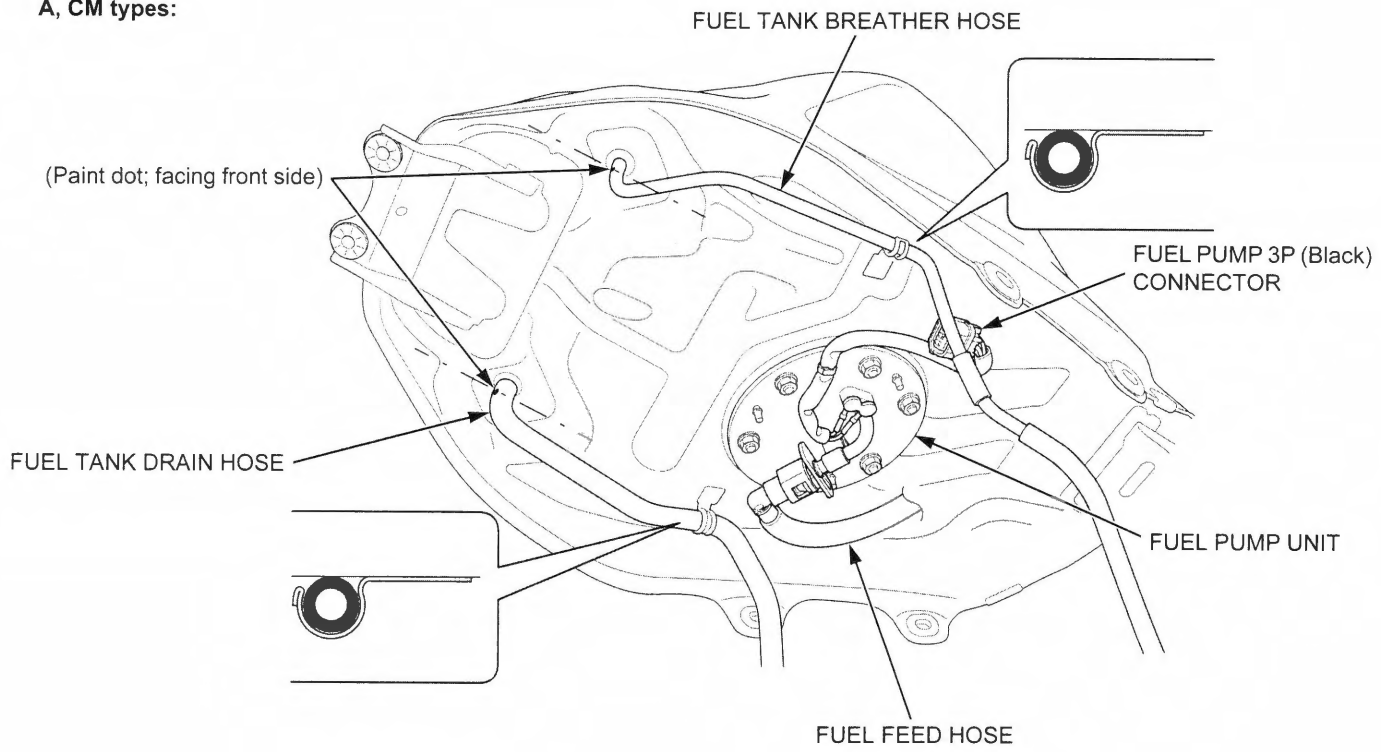
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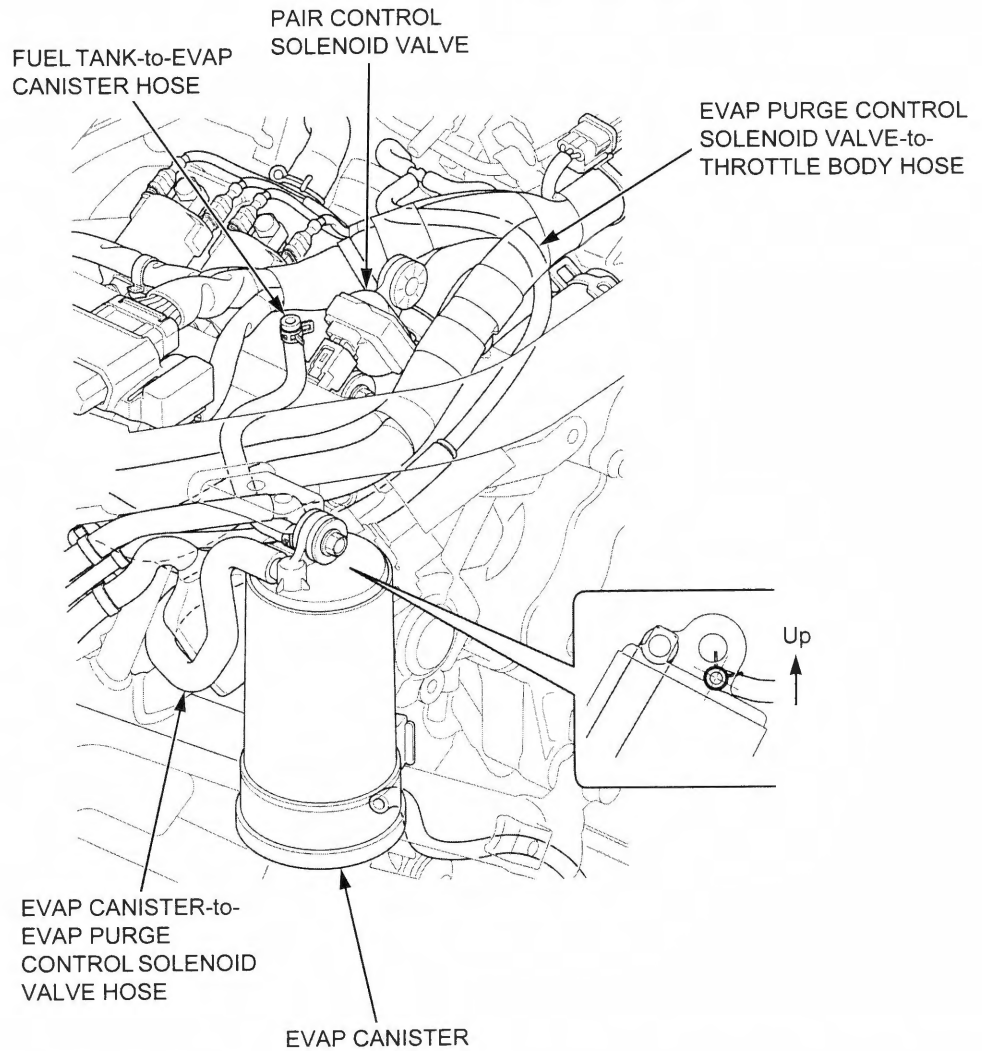
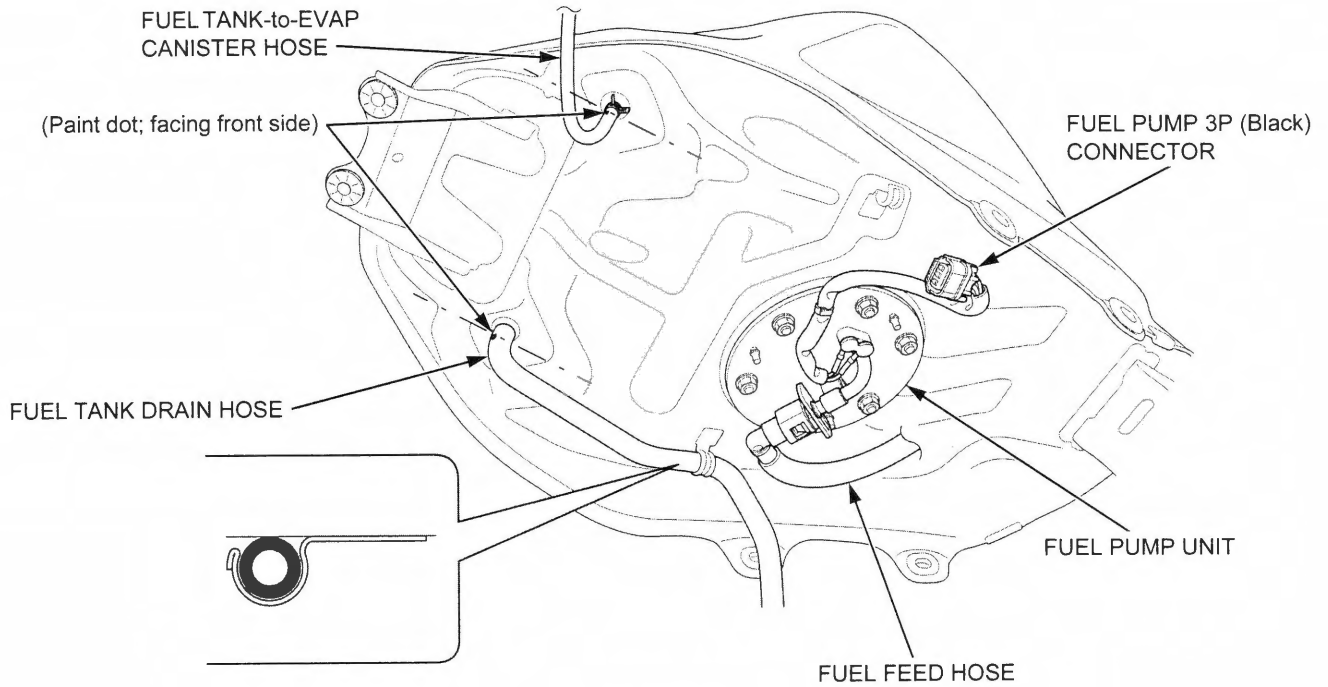
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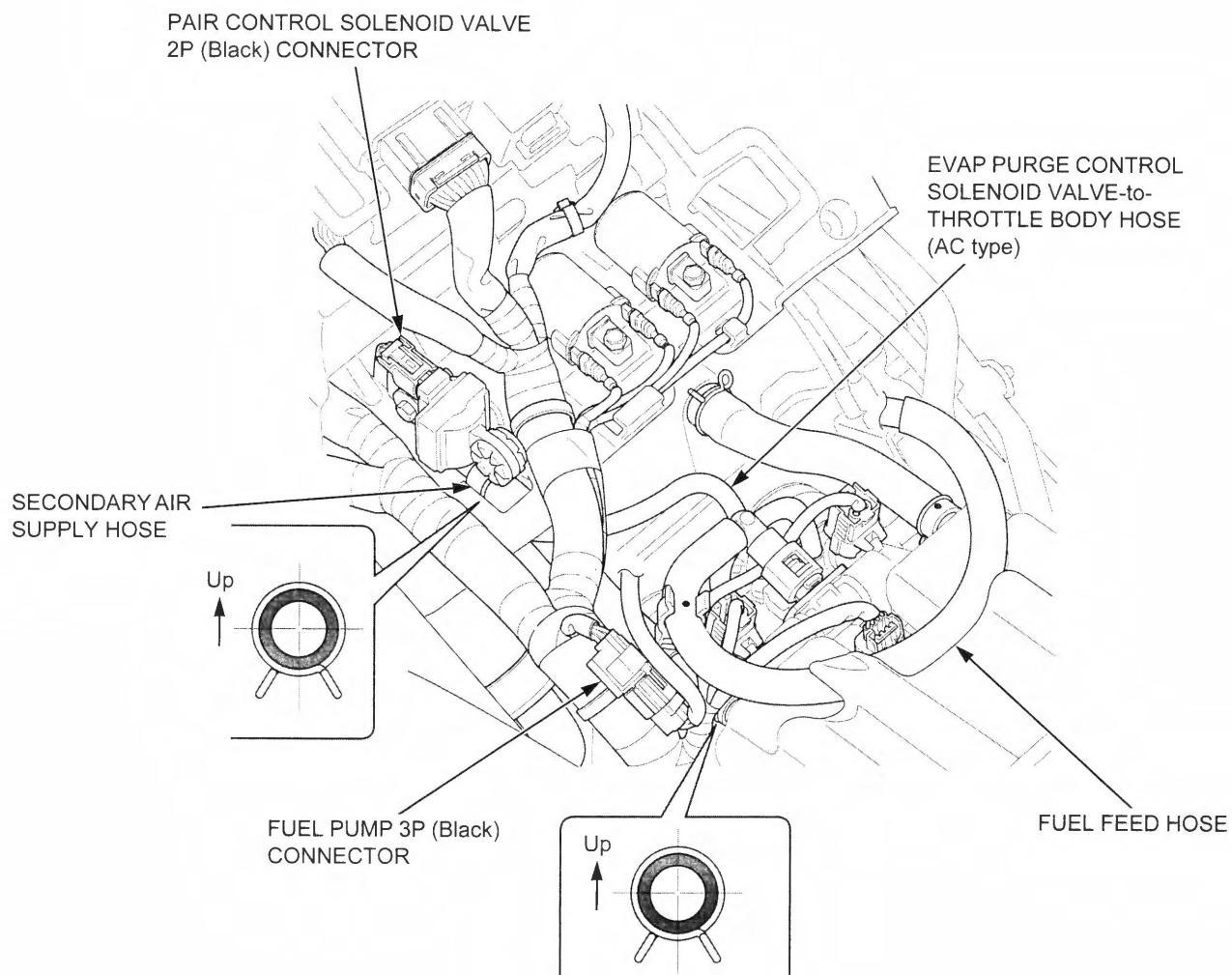
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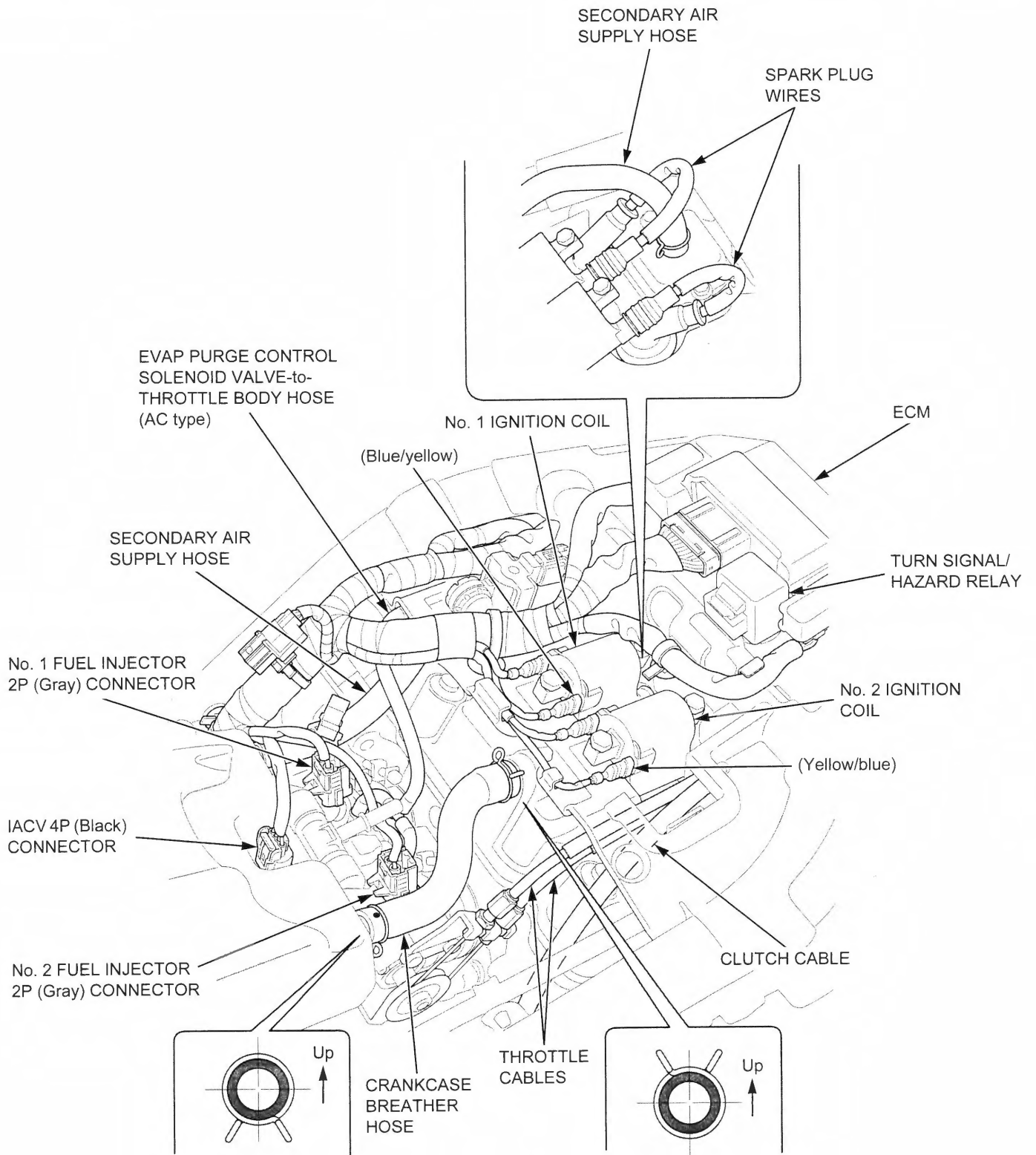


GENERAL INFORMATION

CBR500R/RA



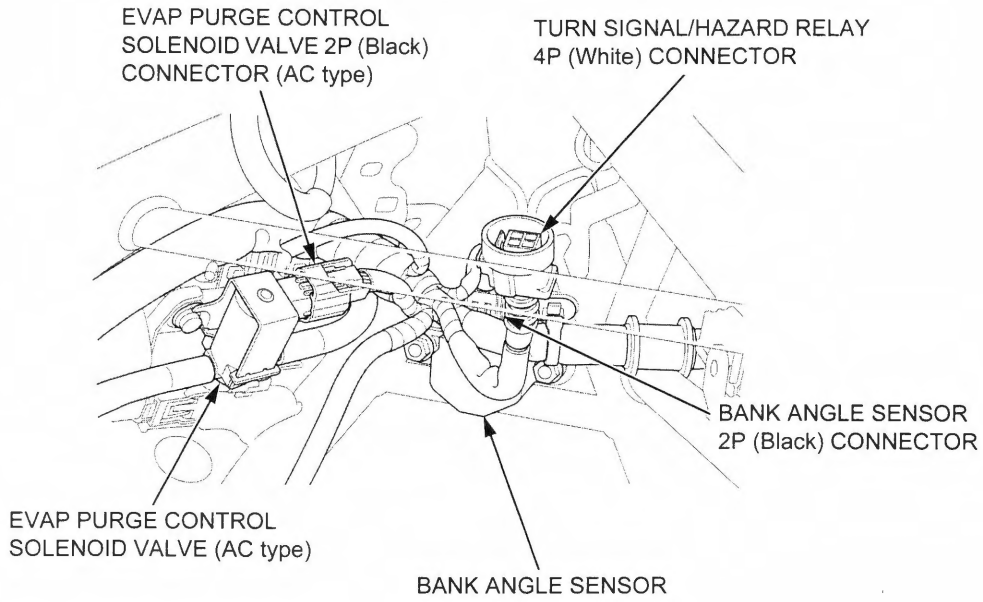
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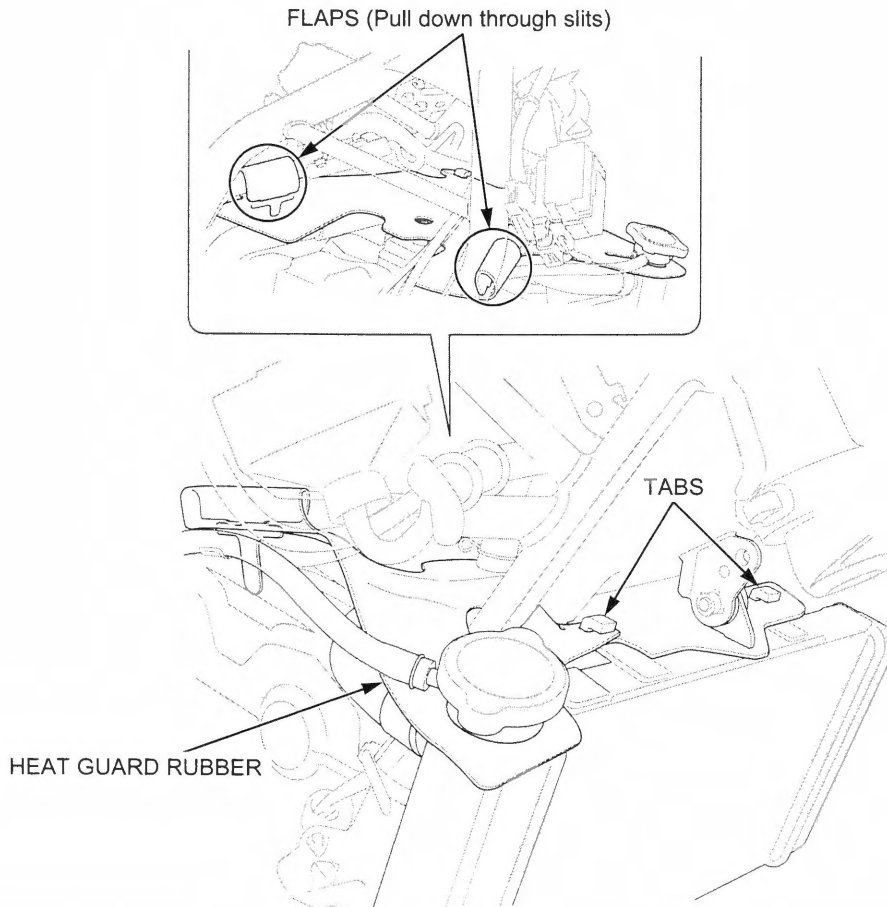
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CBR500R/RA

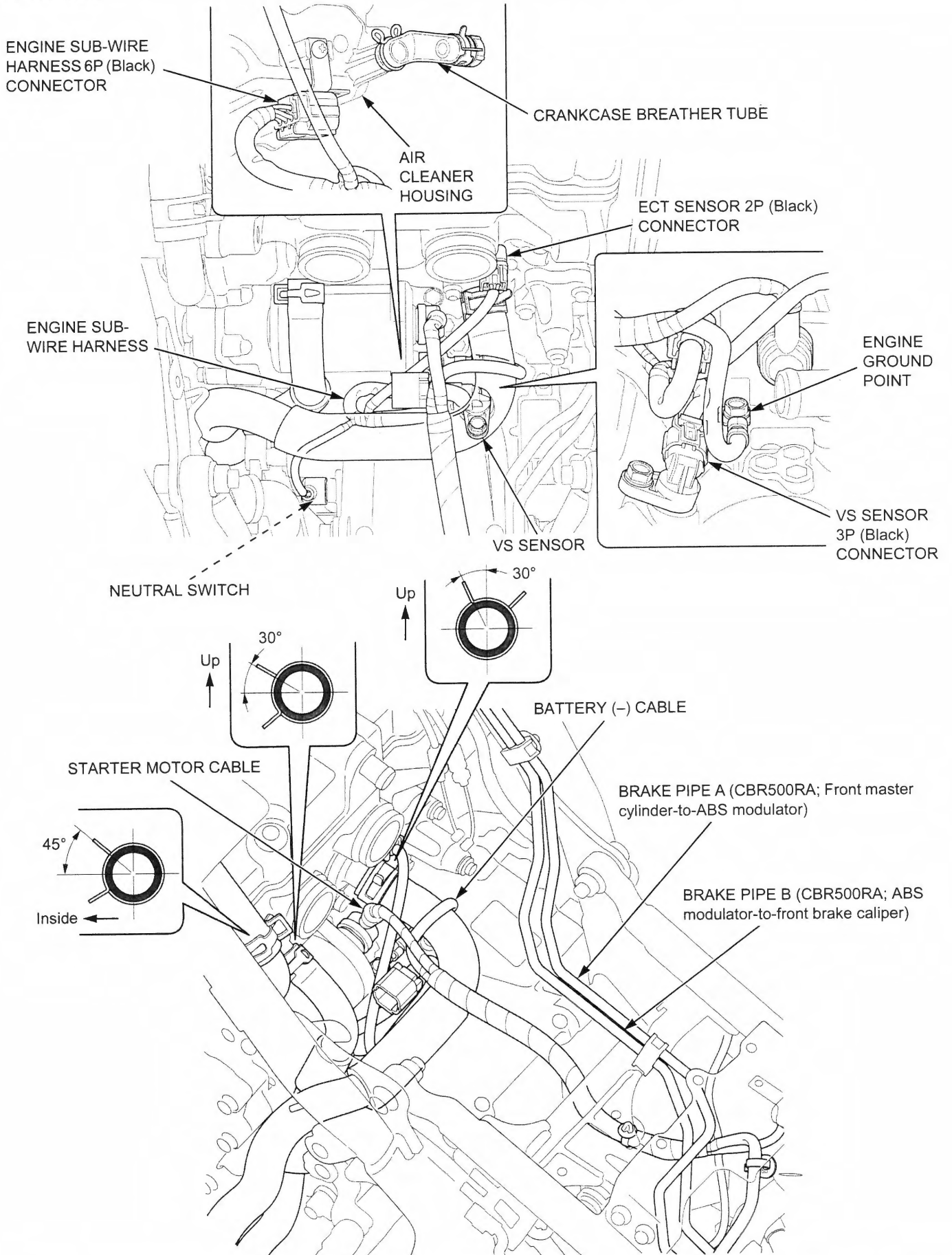
Behind steering head pipe (viewed from rear side):



Front heat guard rubber setting points:



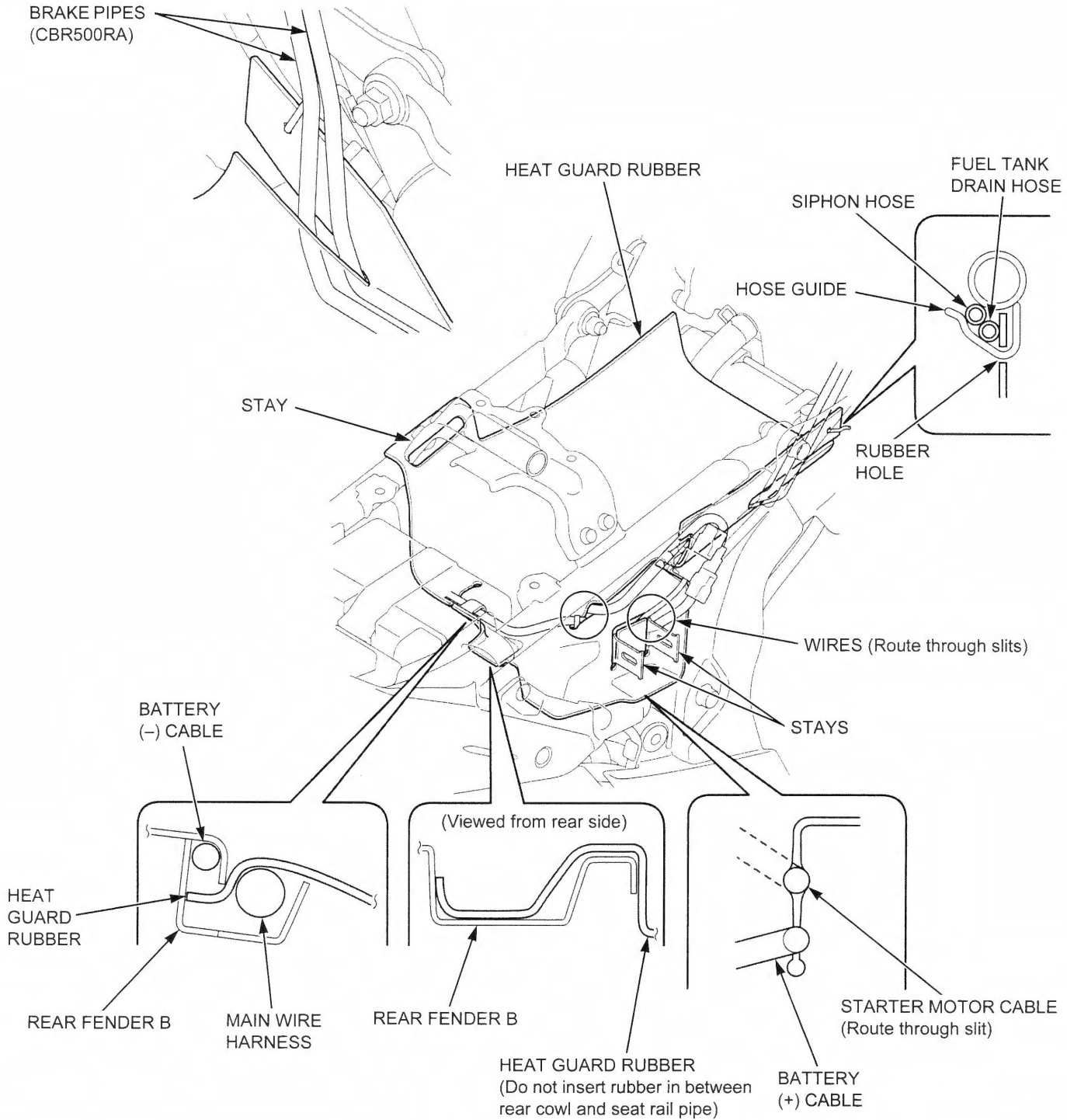
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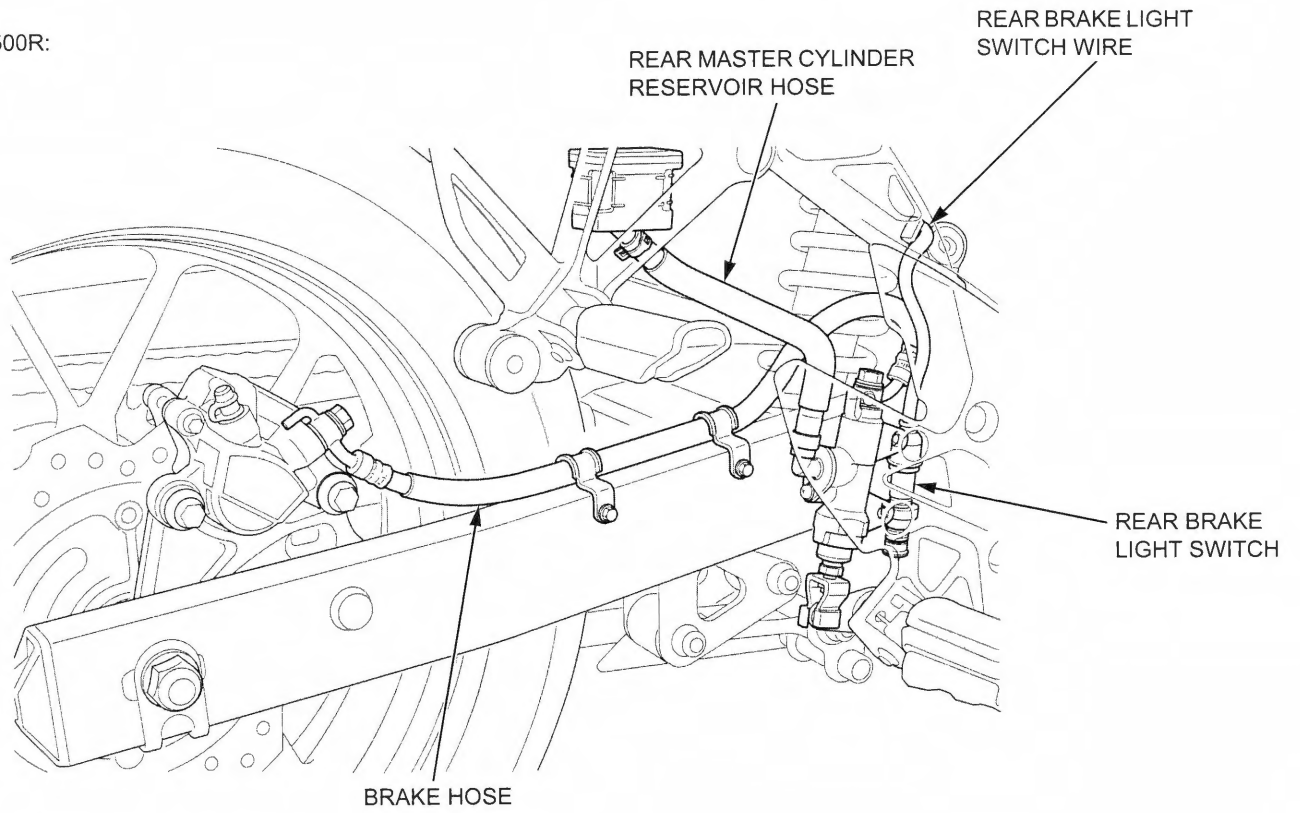
CBR500R/RA

Rear heat guard rubber setting points:



CBR500R/RA

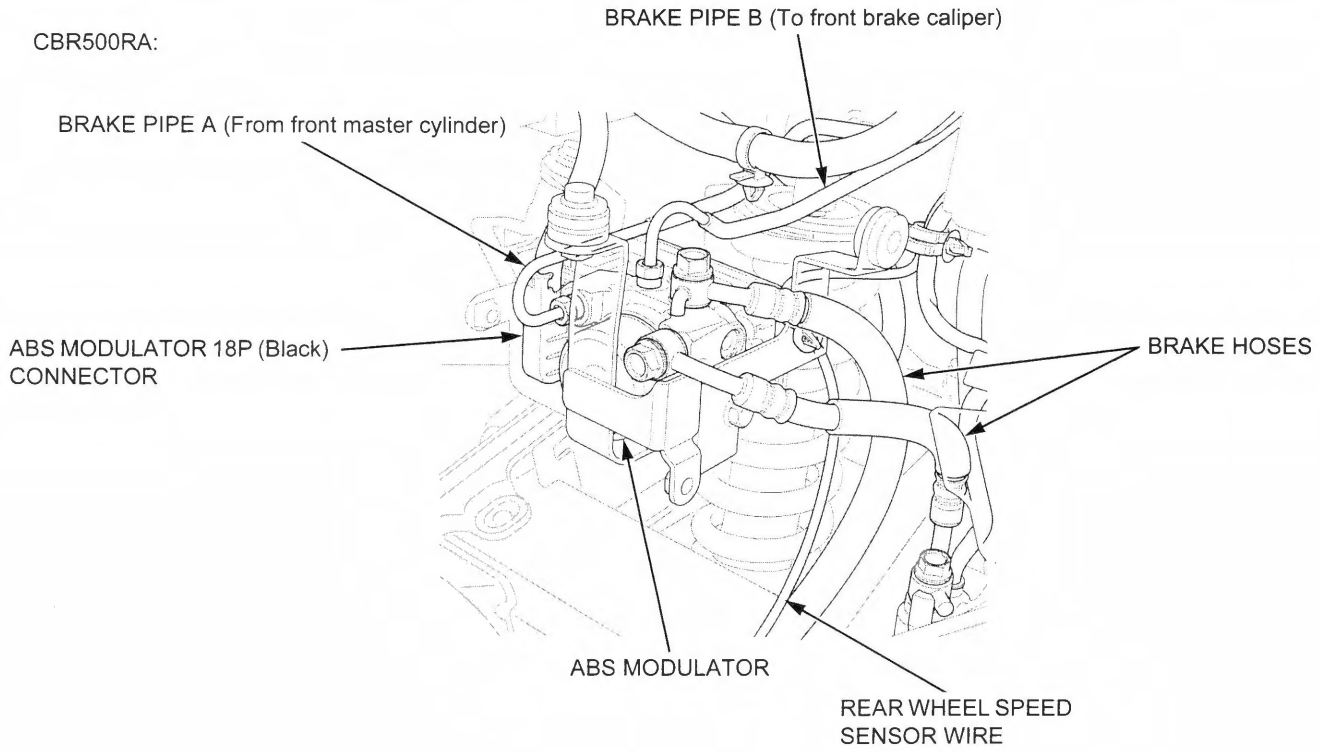
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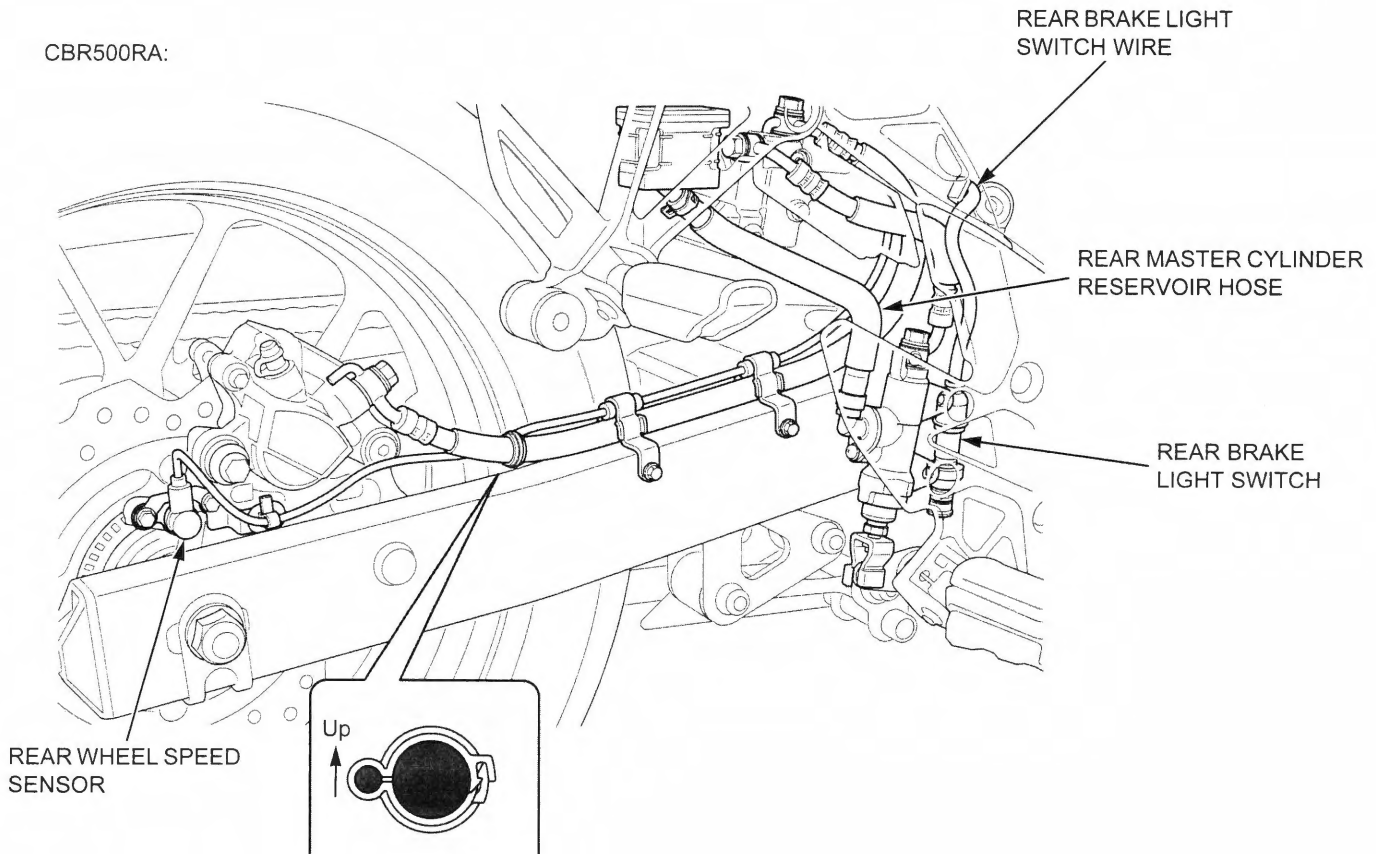
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CBR500R/RA

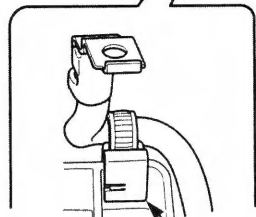
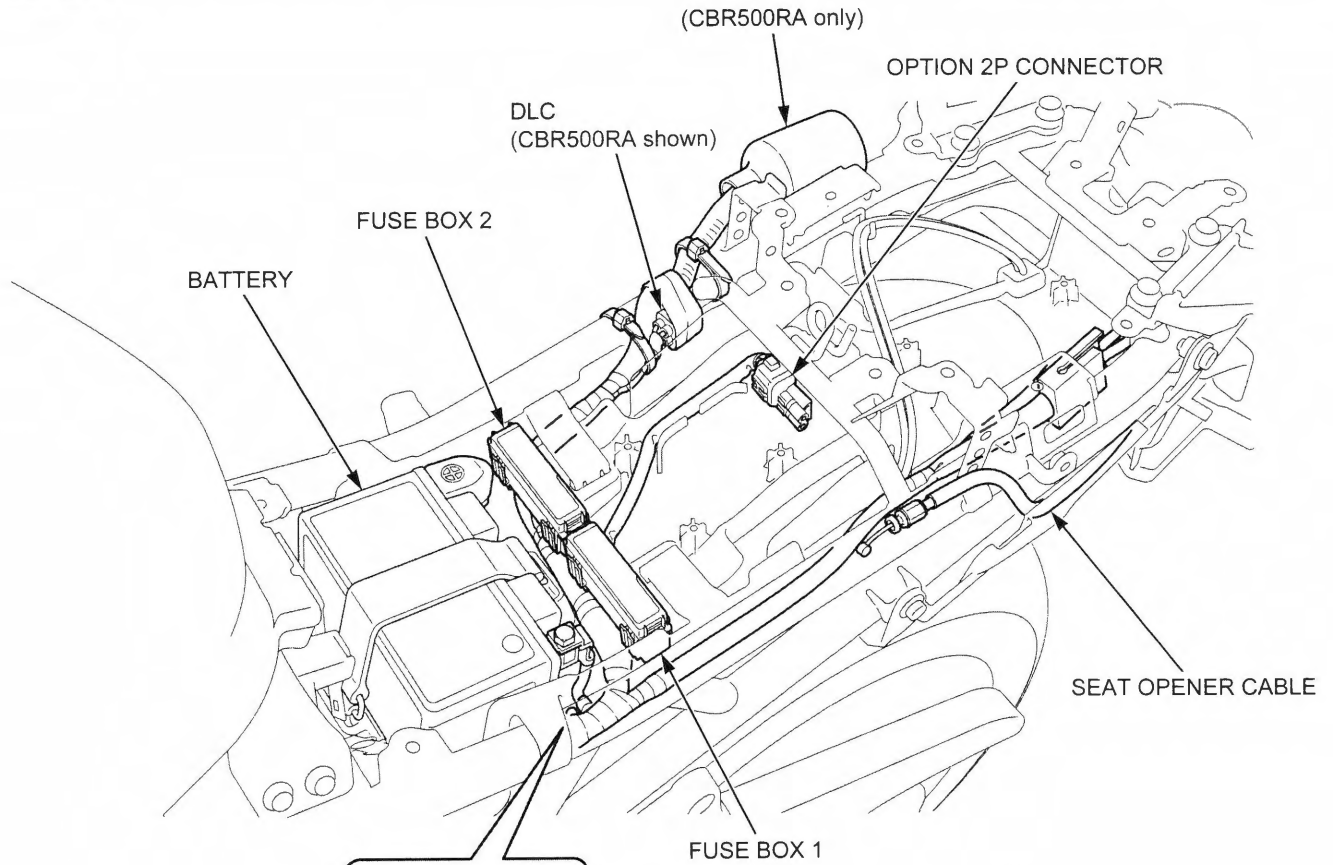
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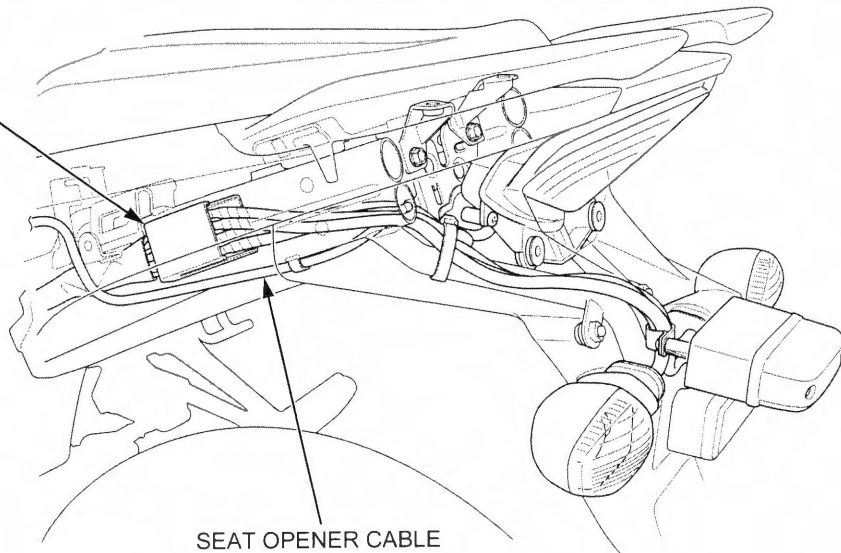
CBR500RA:



CBR500R/RA

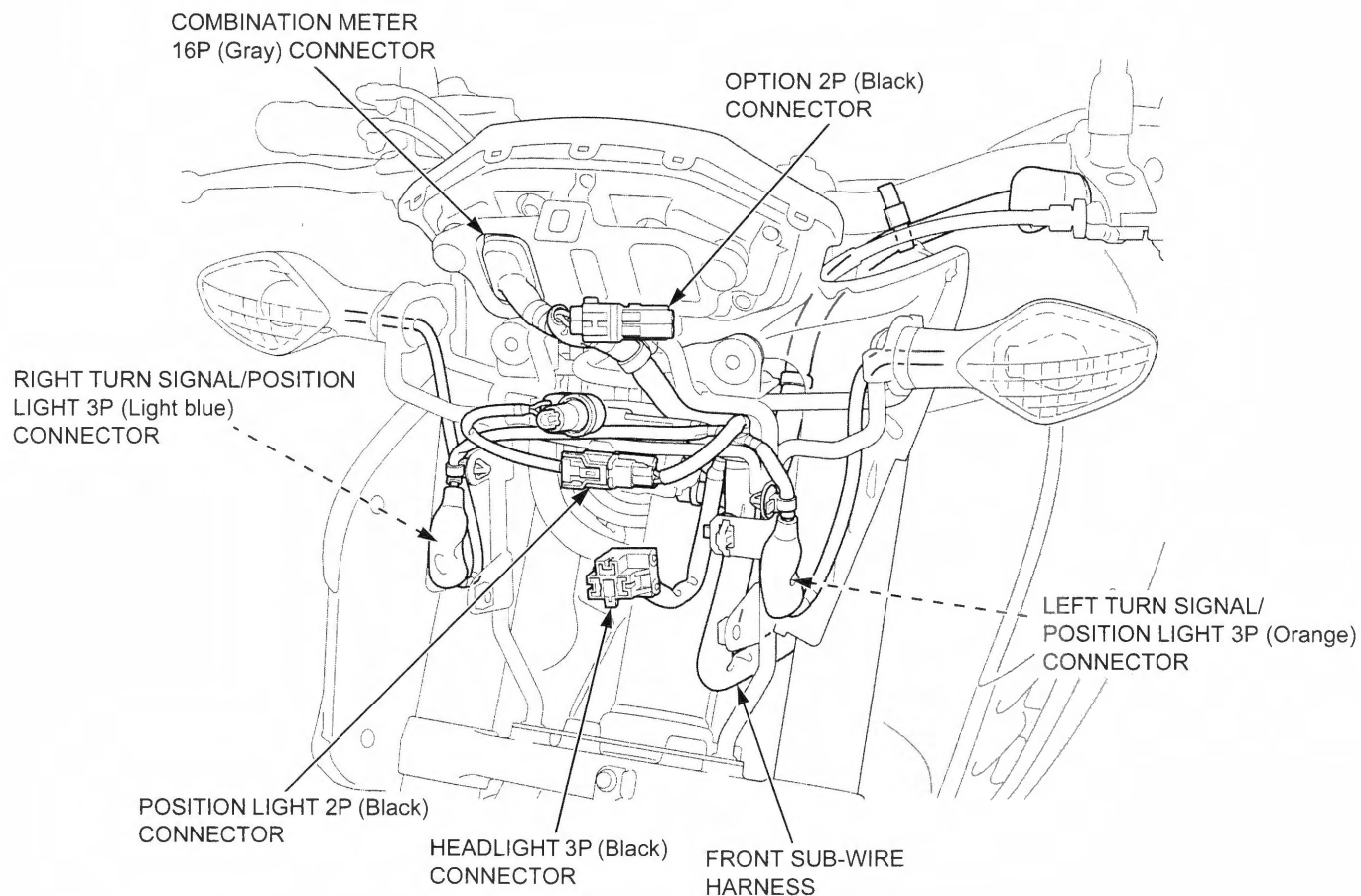


- CONNECTORS (From upper side):
- RIGHT TURN SIGNAL LIGHT 2P (Light blue)
 - LEFT TURN SIGNAL LIGHT 2P (Orange)
 - LICENSE LIGHT 2P (White)
 - BRAKE/TAILLIGHT 3P (White)



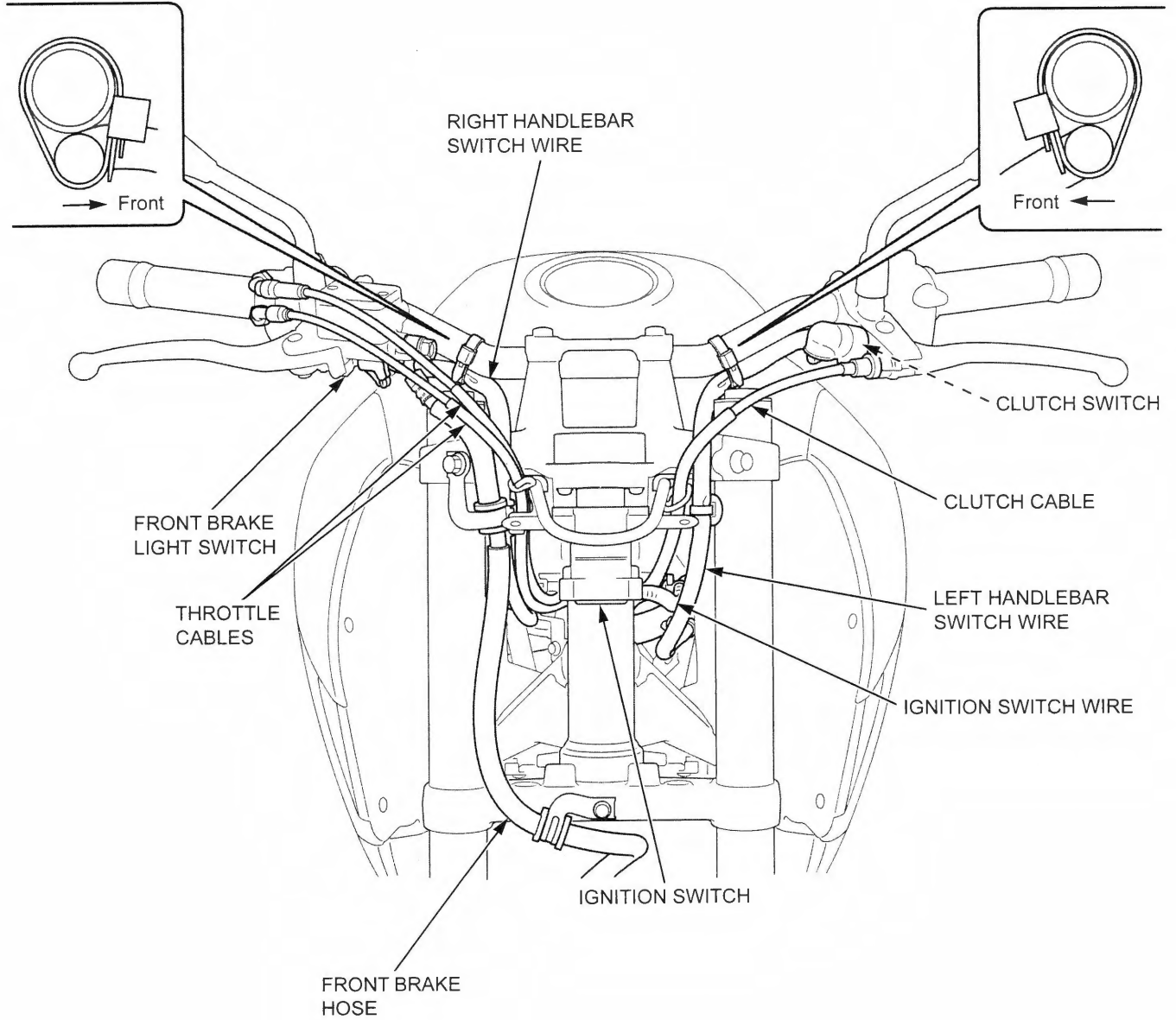
GENERAL INFORMATION

CB500F/FA



CB500F/FA

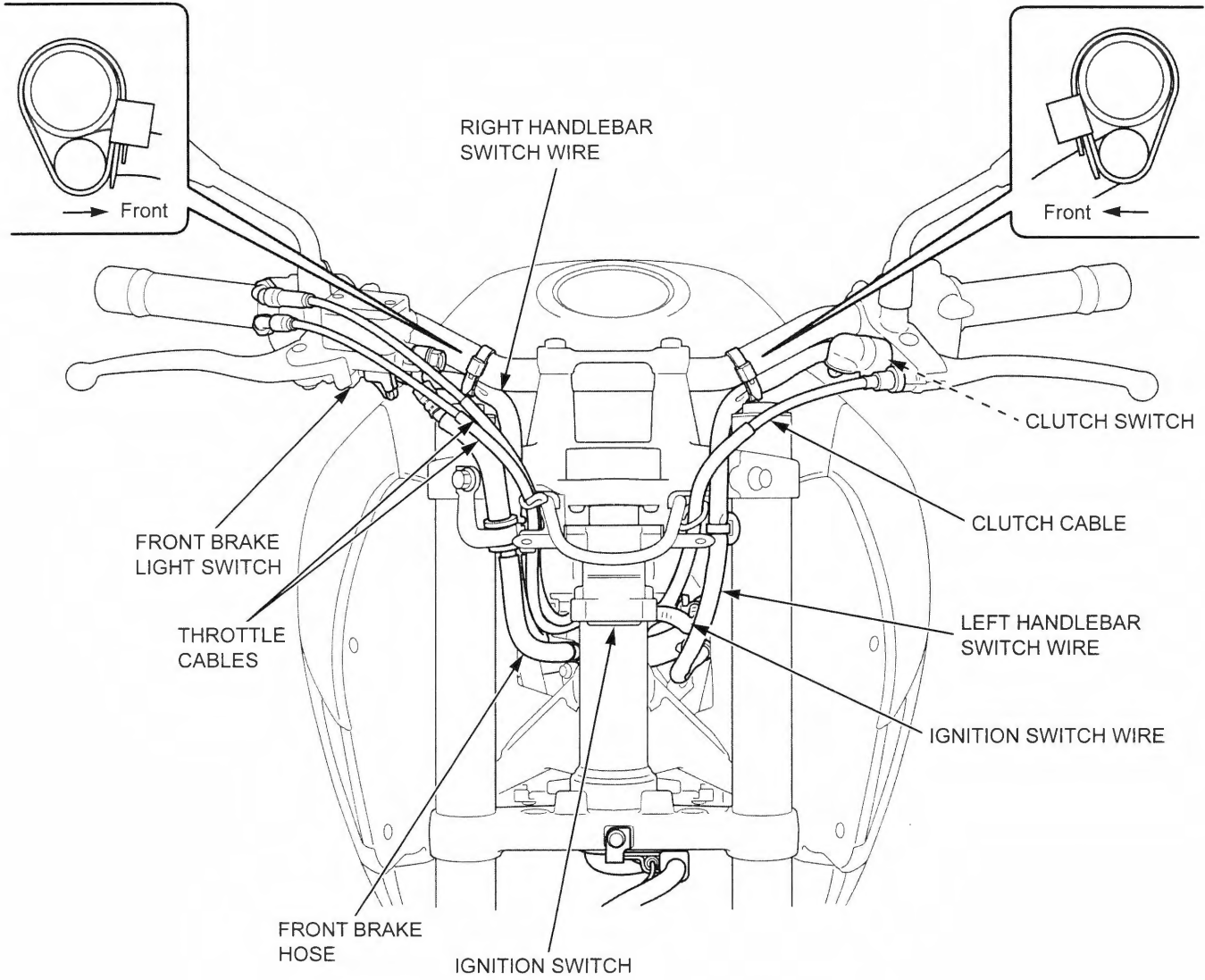
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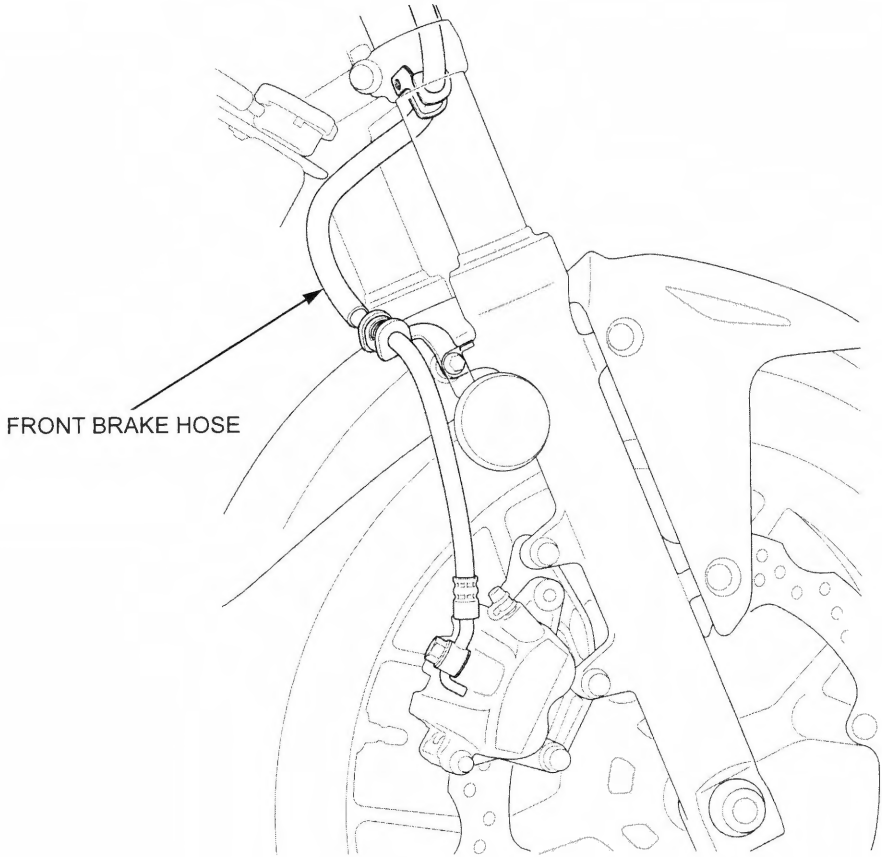
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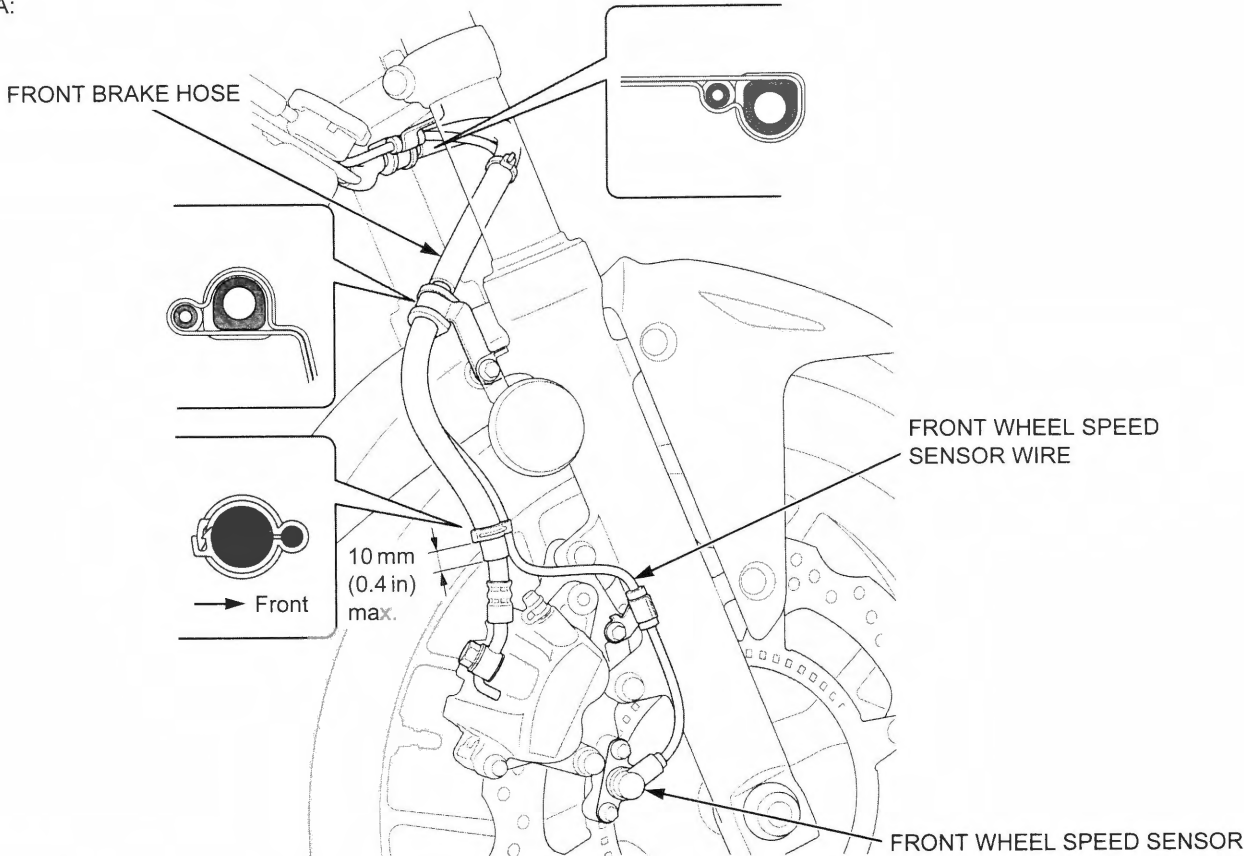


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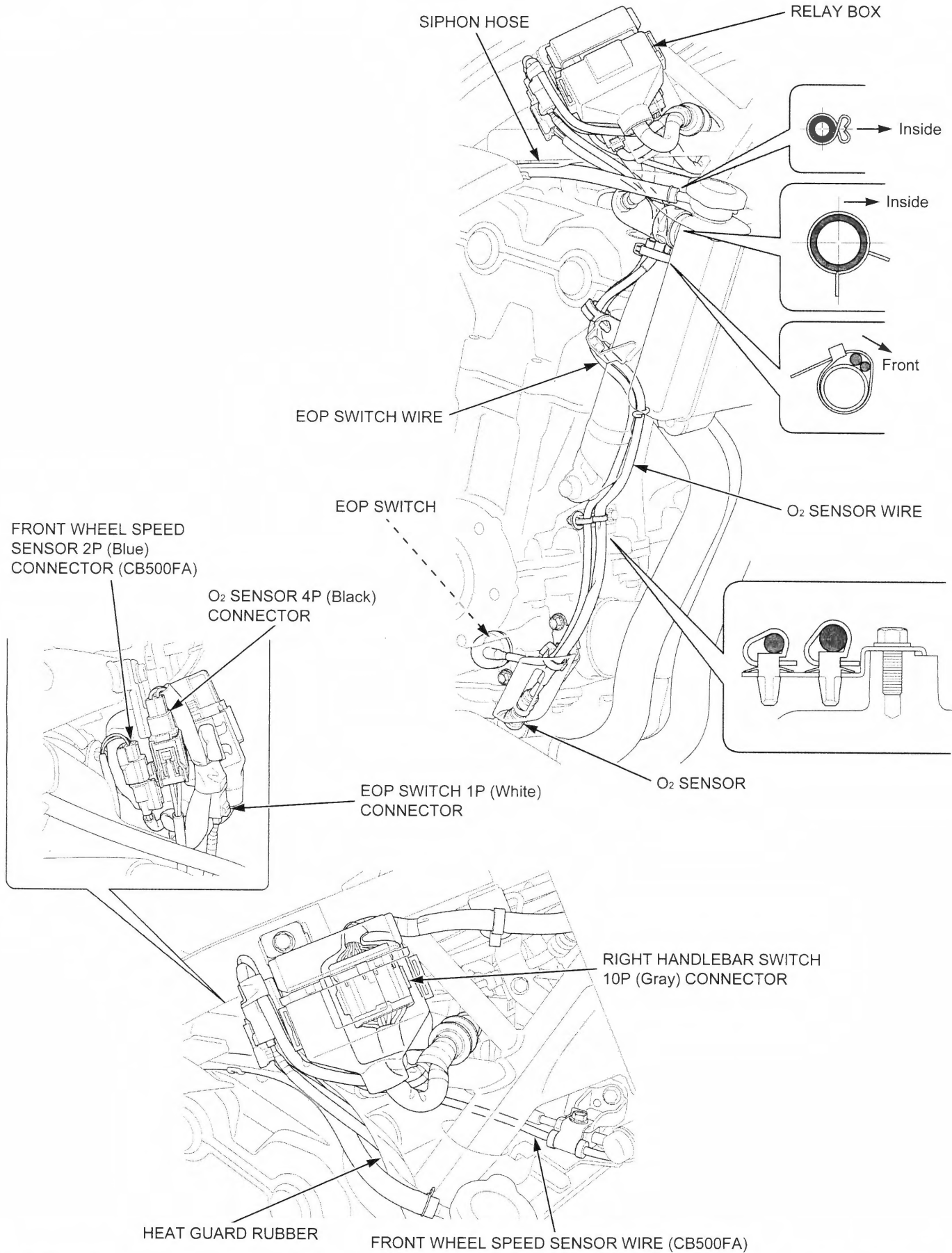


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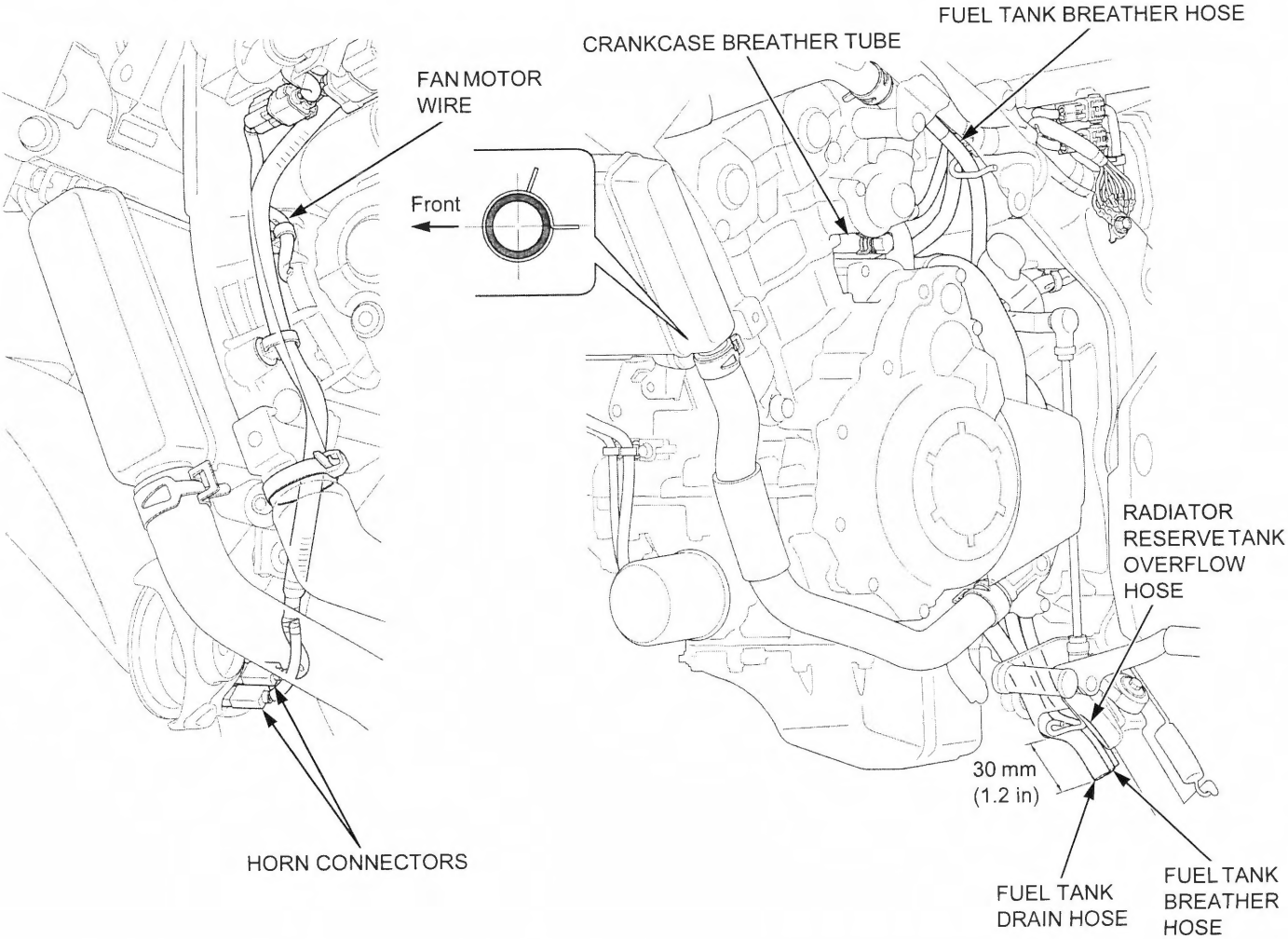
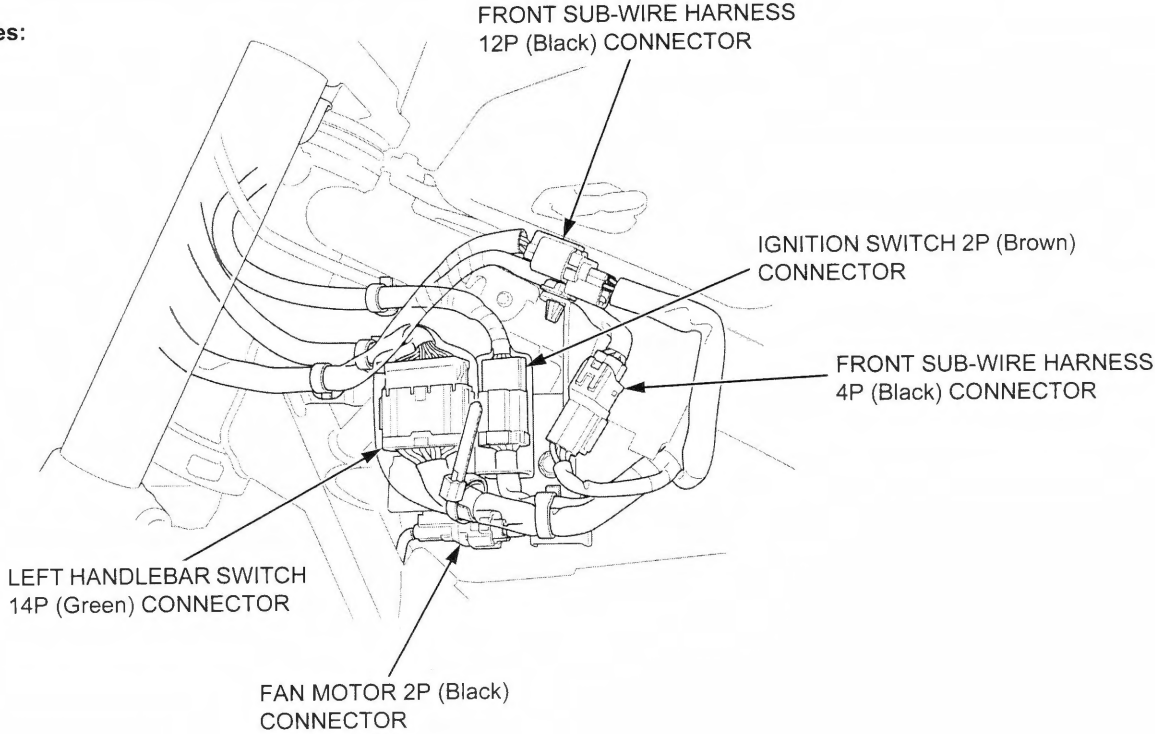
GENERAL INFORMATION

CB500F/FA



CB500F/FA

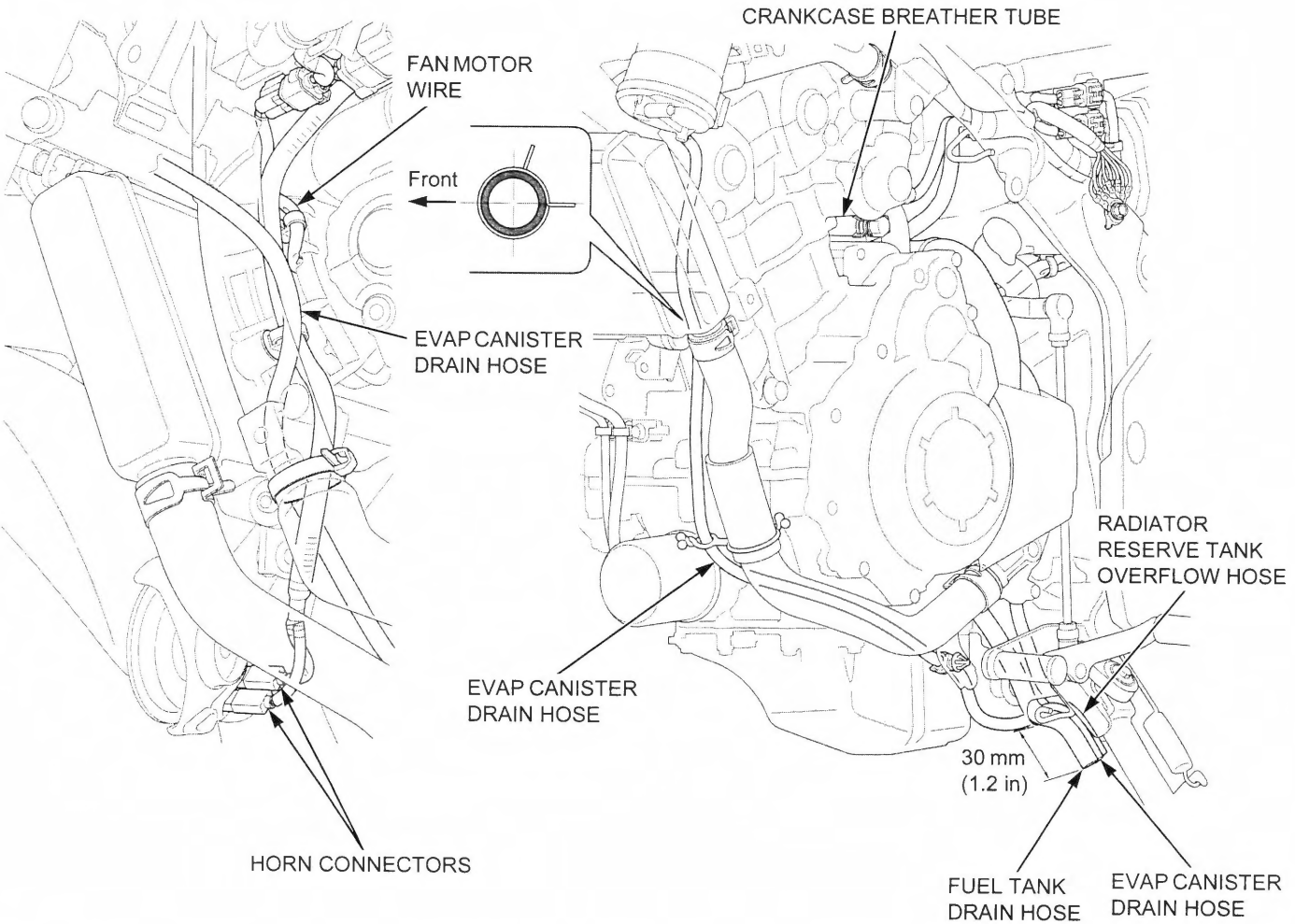
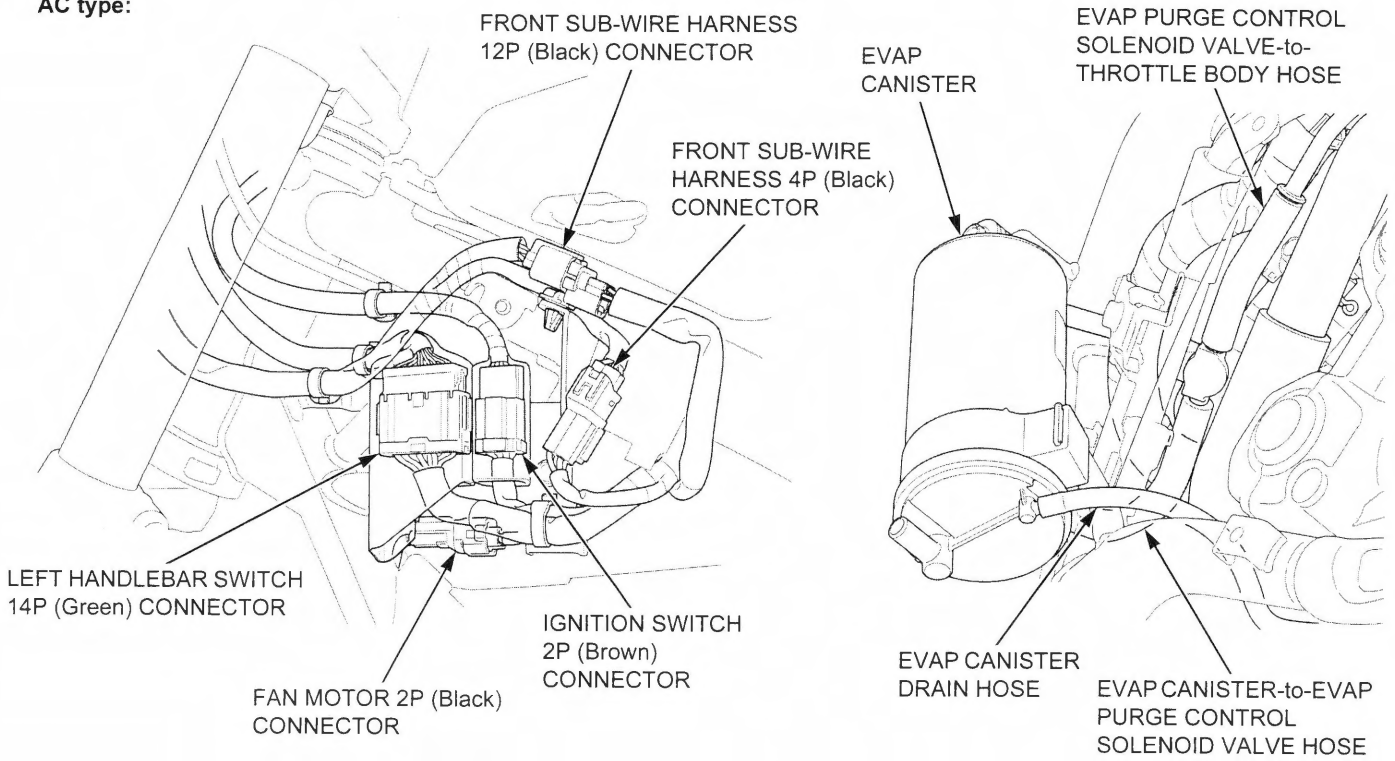
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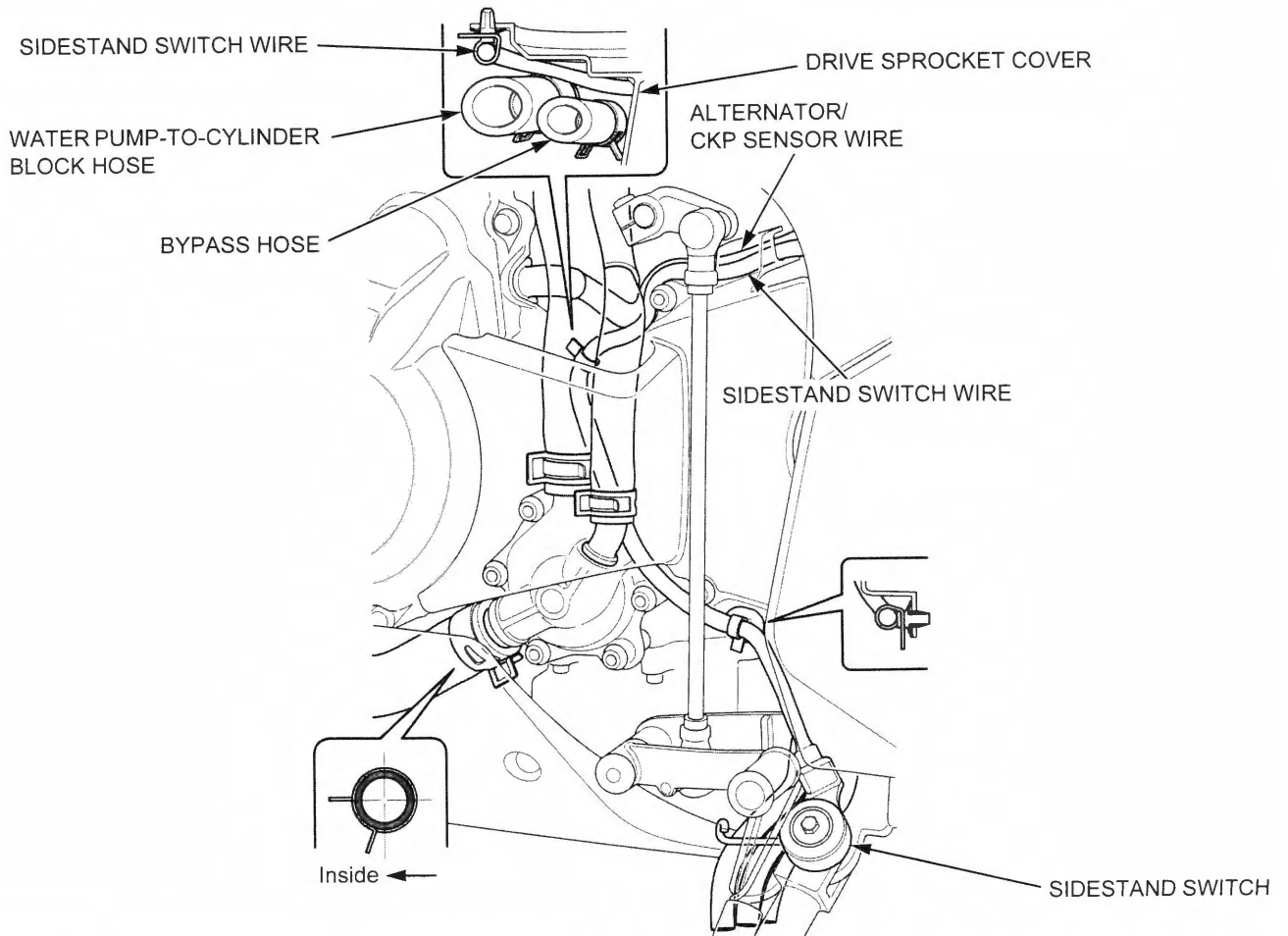
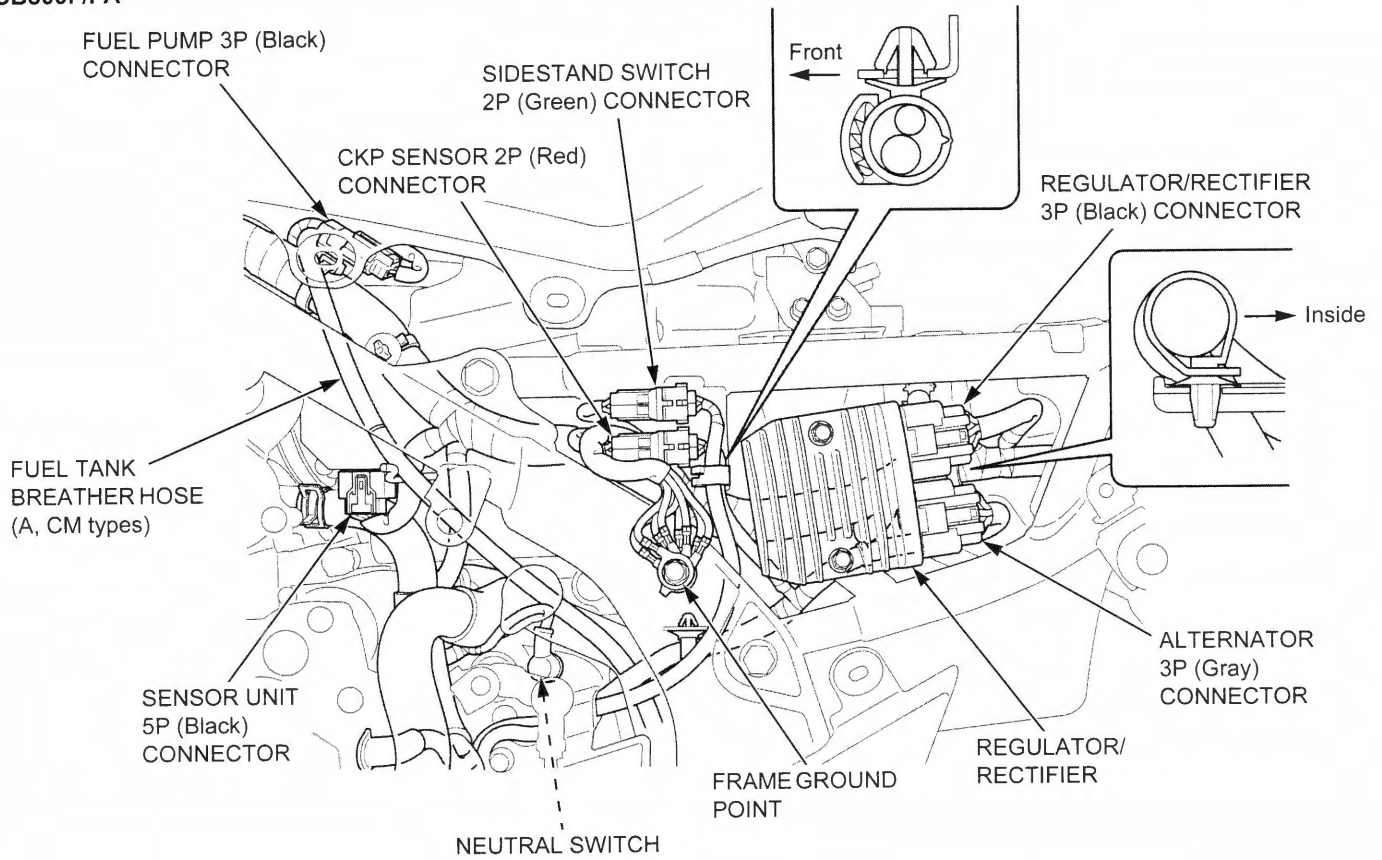
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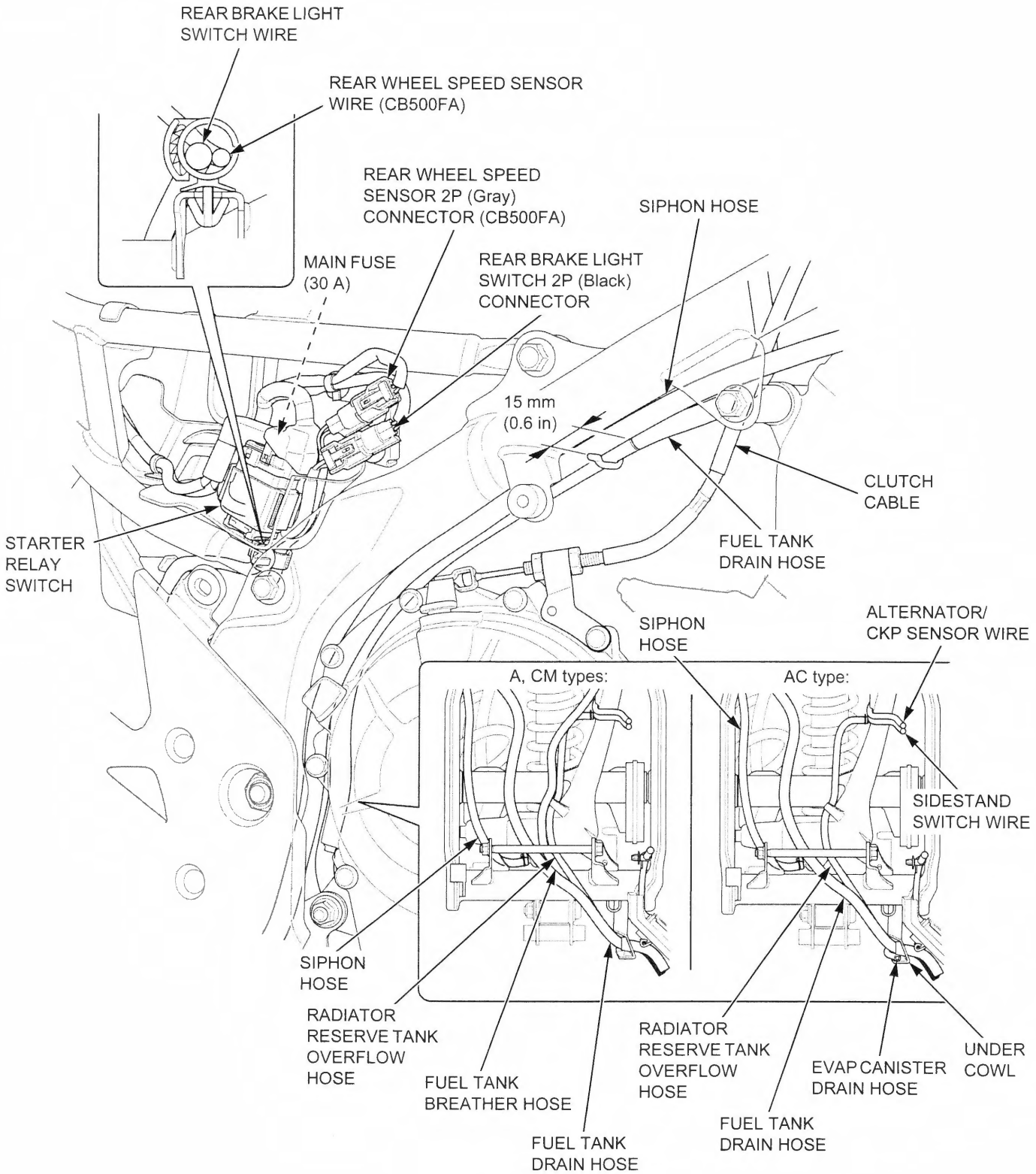


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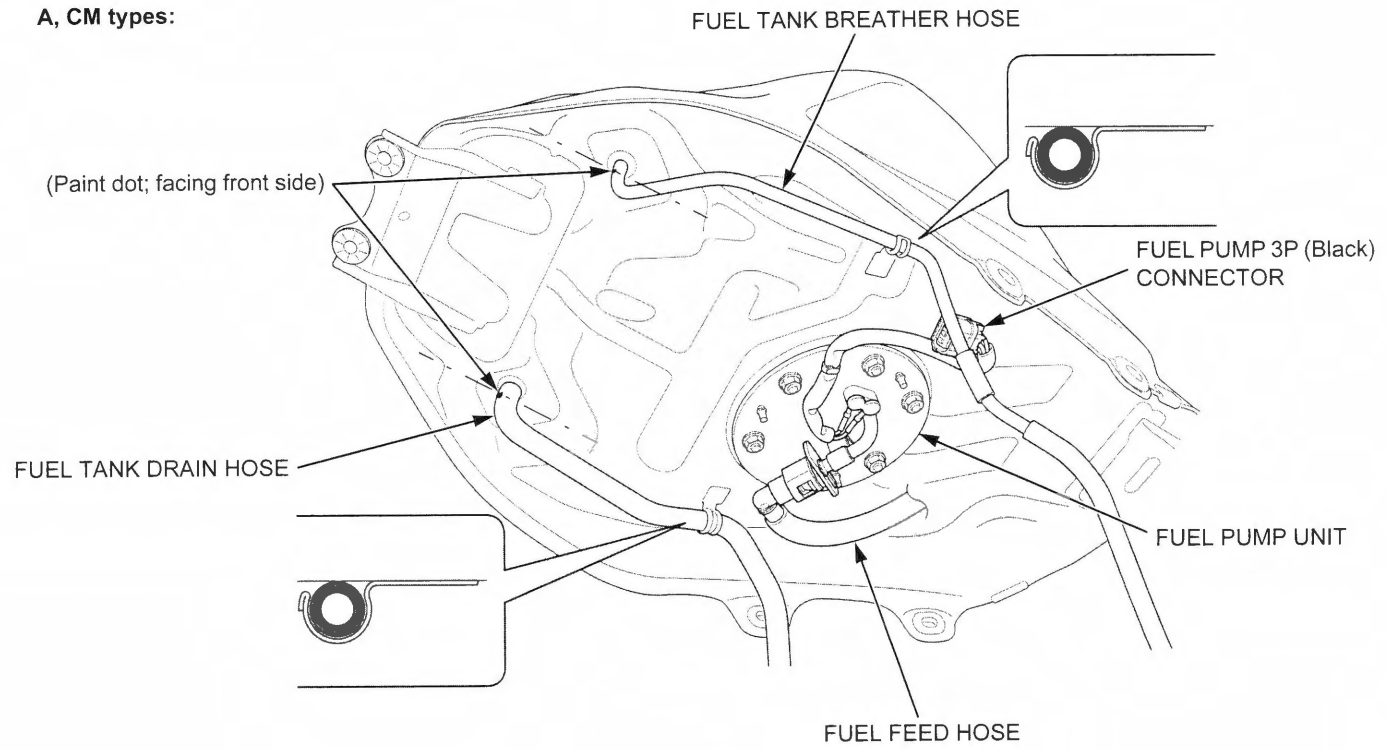
GENERAL INFORMATION

CB500F/FA



CB500F/FA

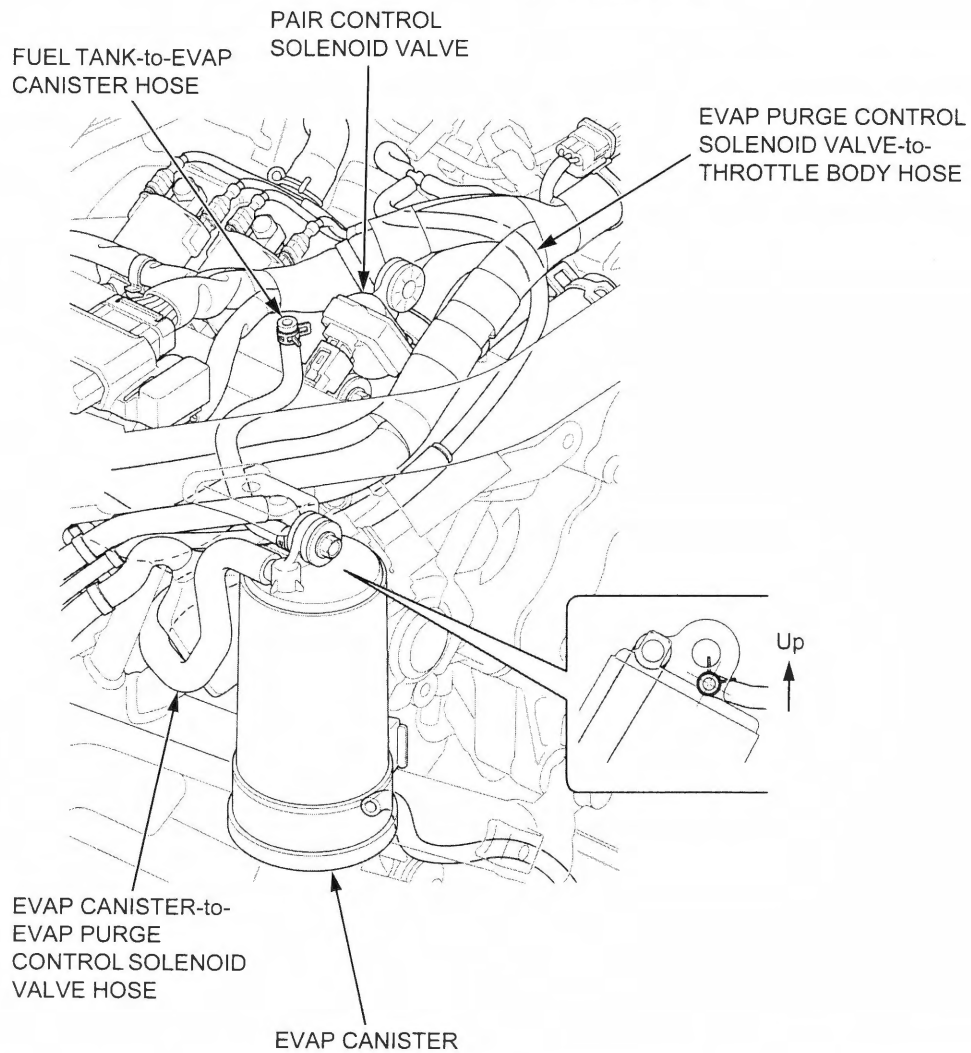
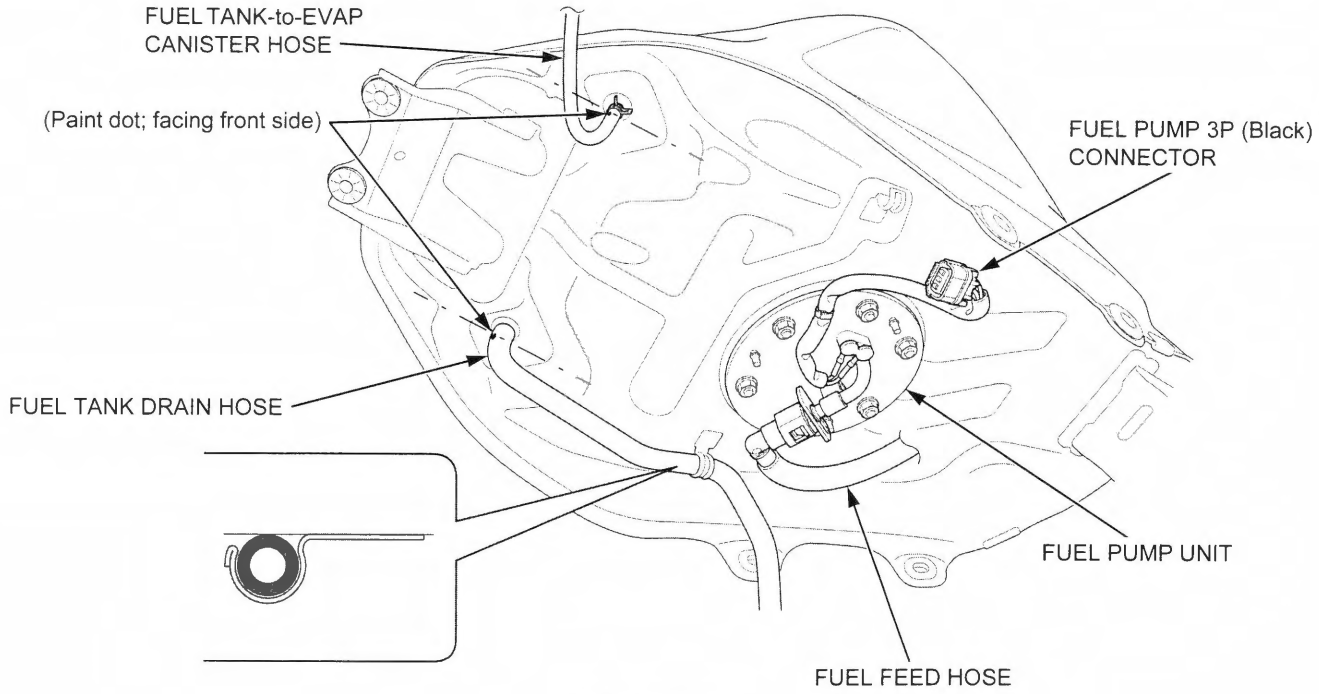
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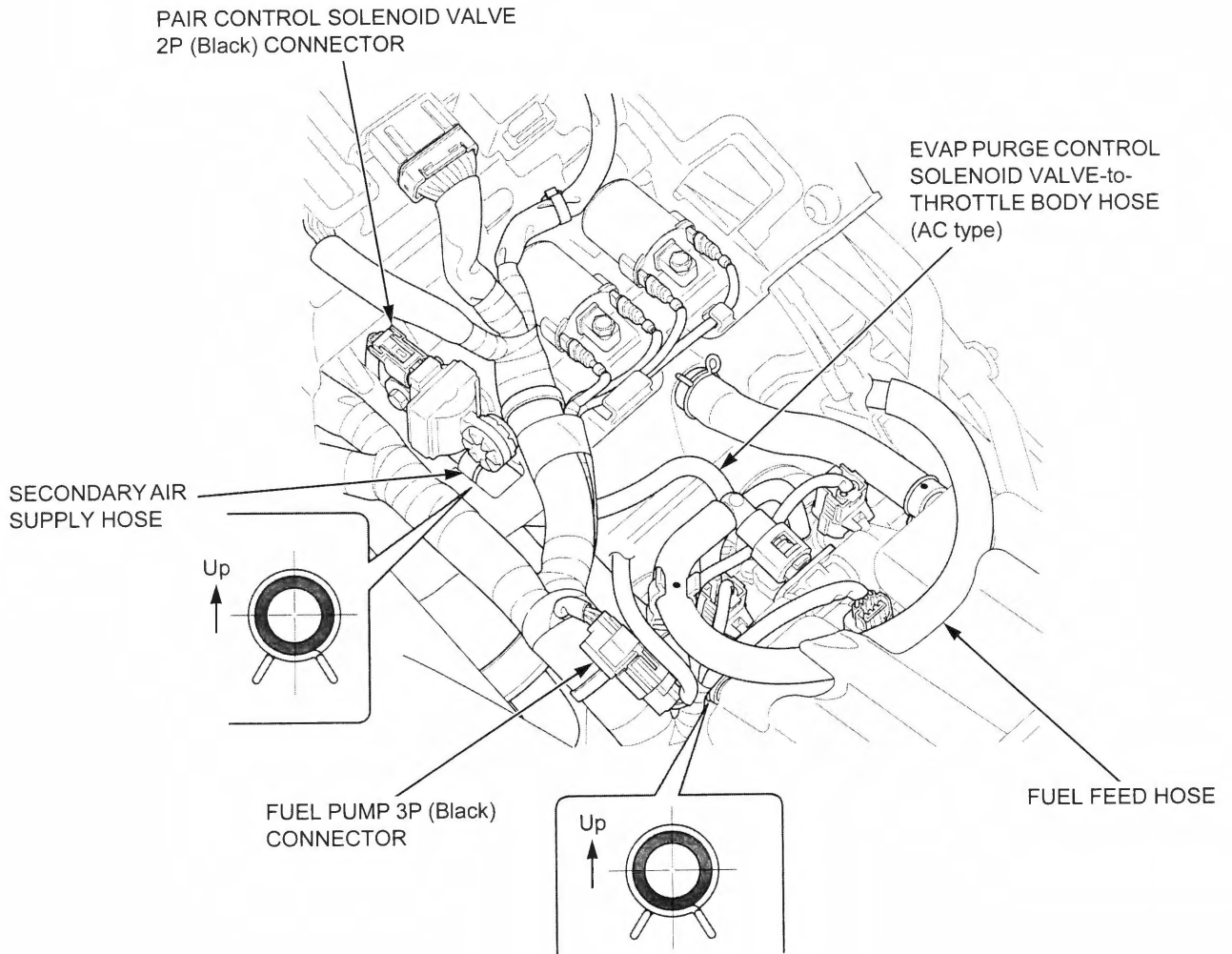
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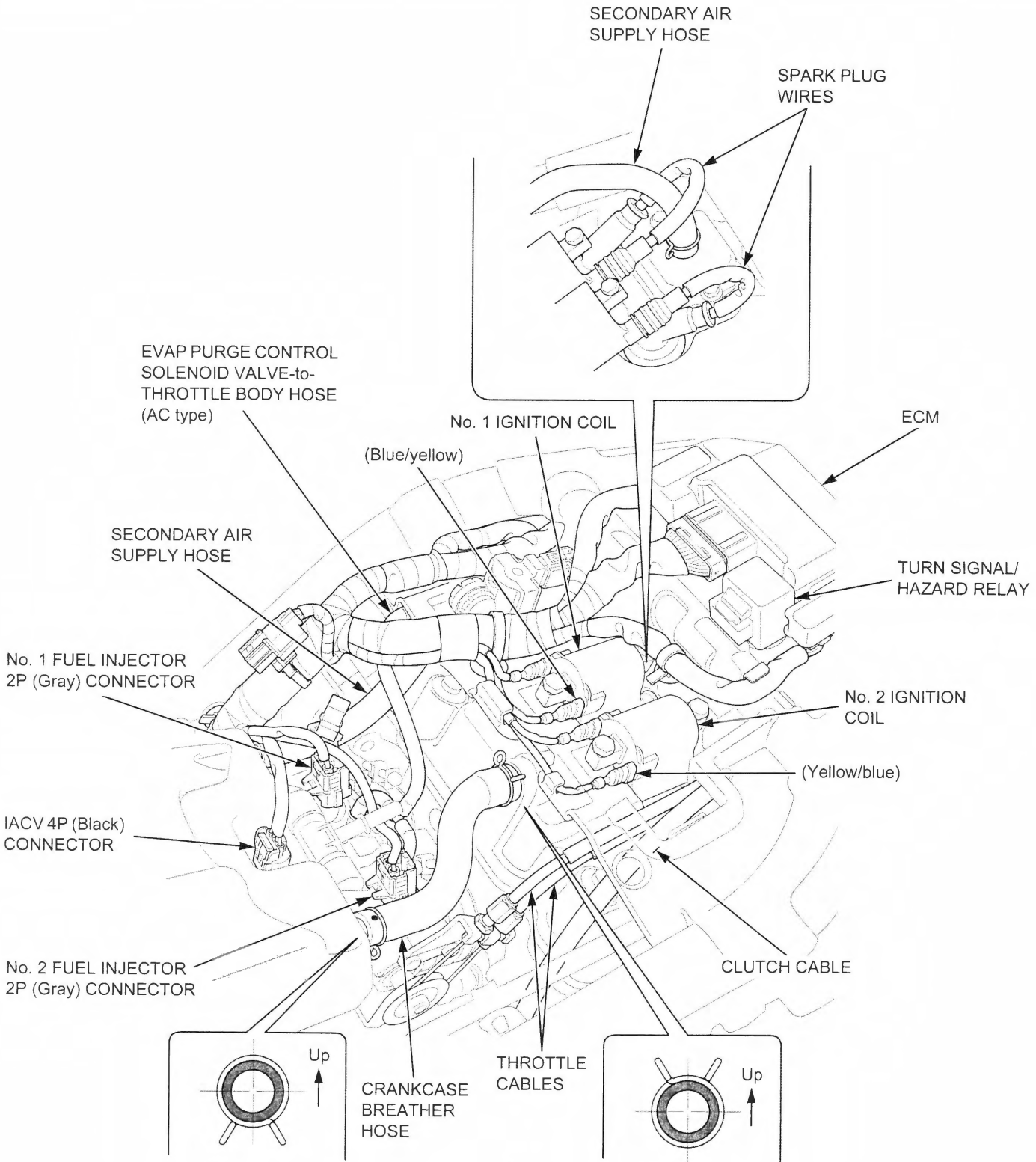


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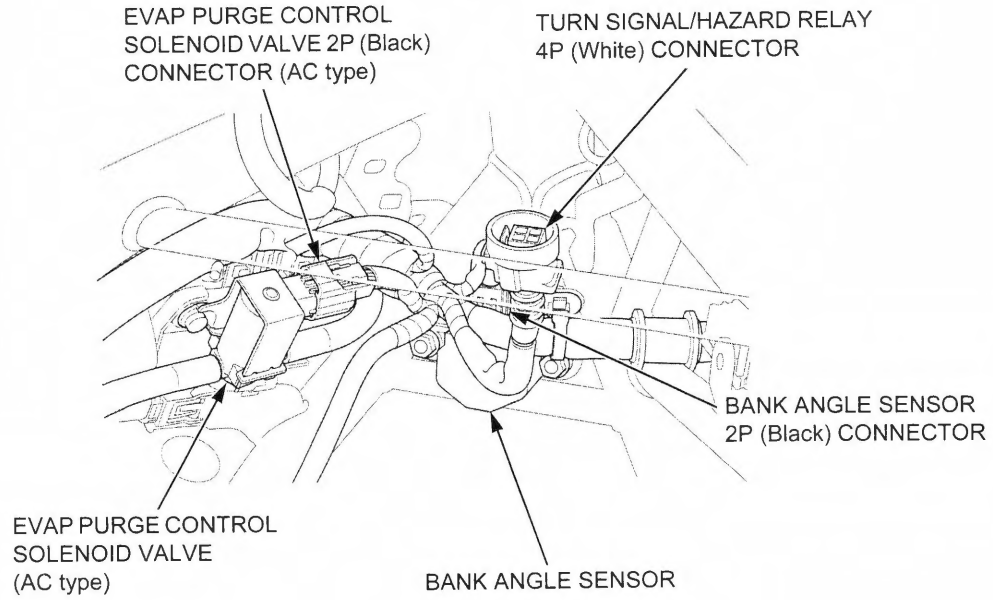
GENERAL INFORMATION

CB500F/FA

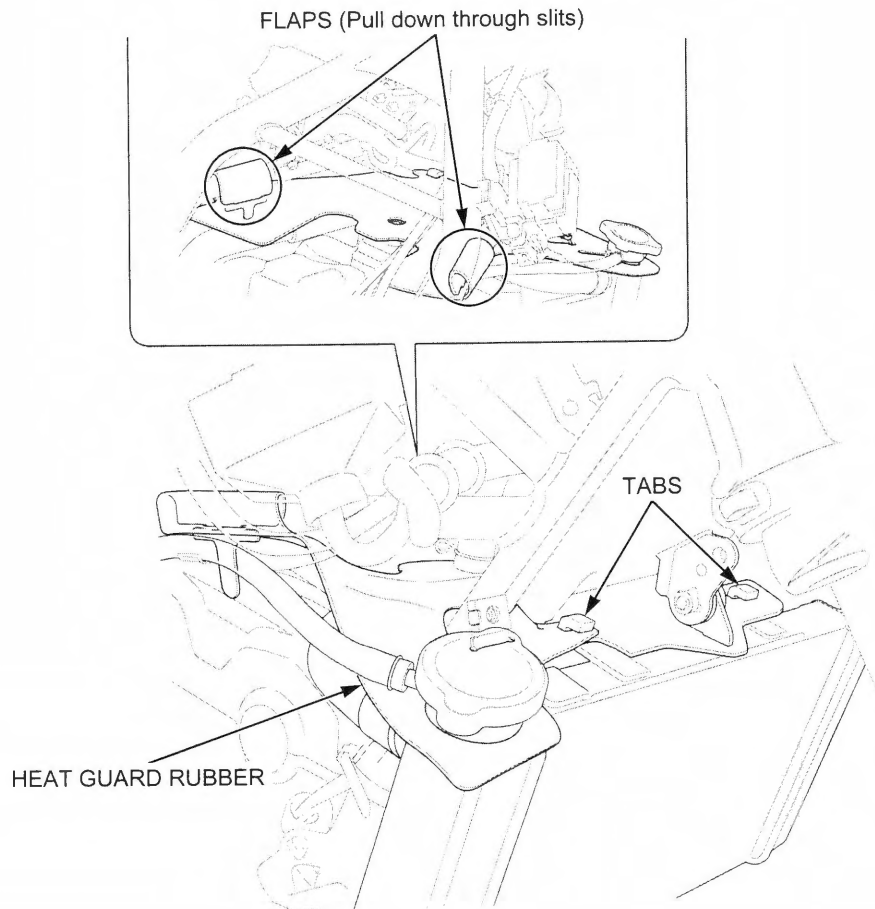


CB500F/FA

Behind steering head pipe (viewed from rear side):

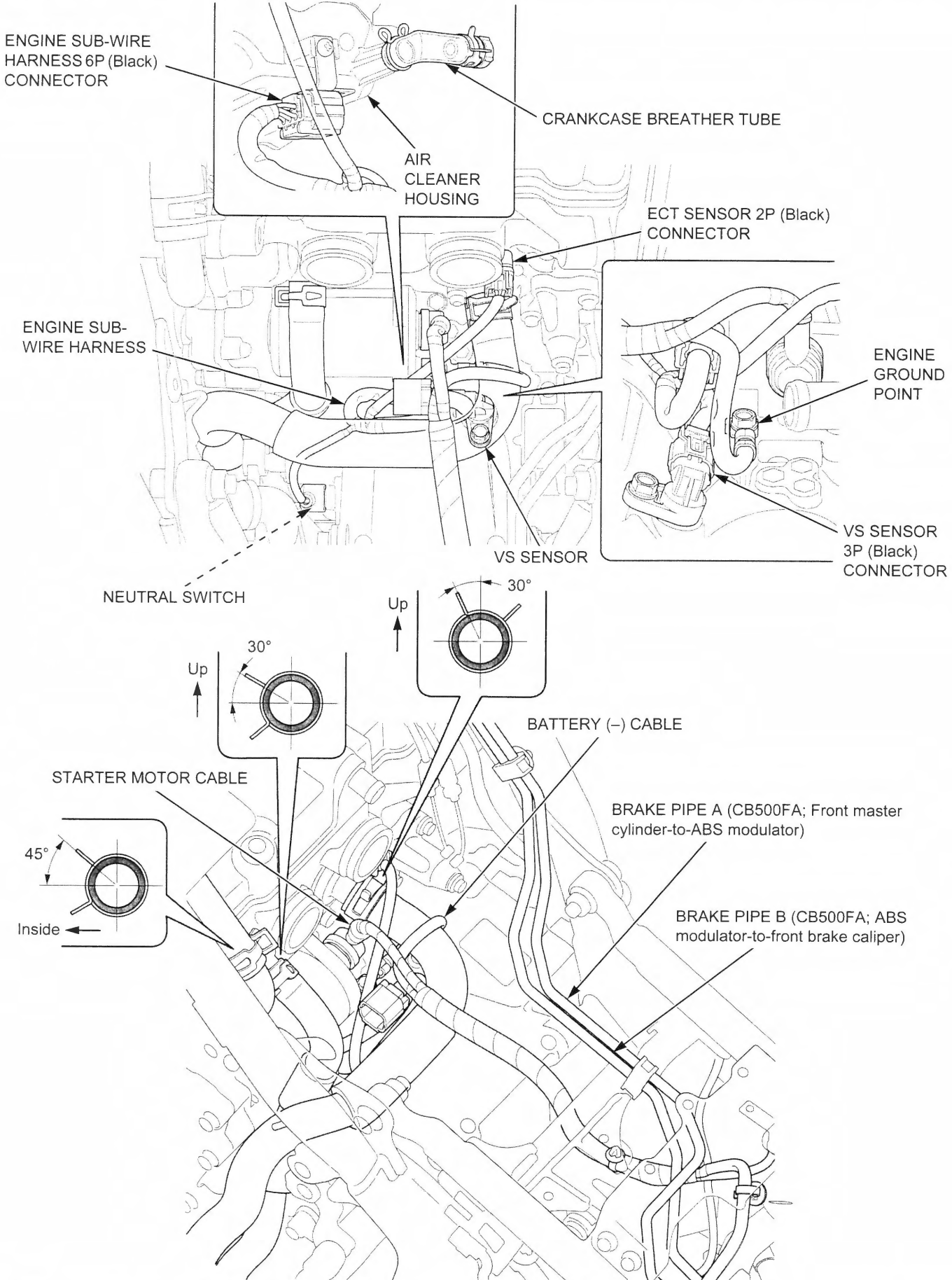


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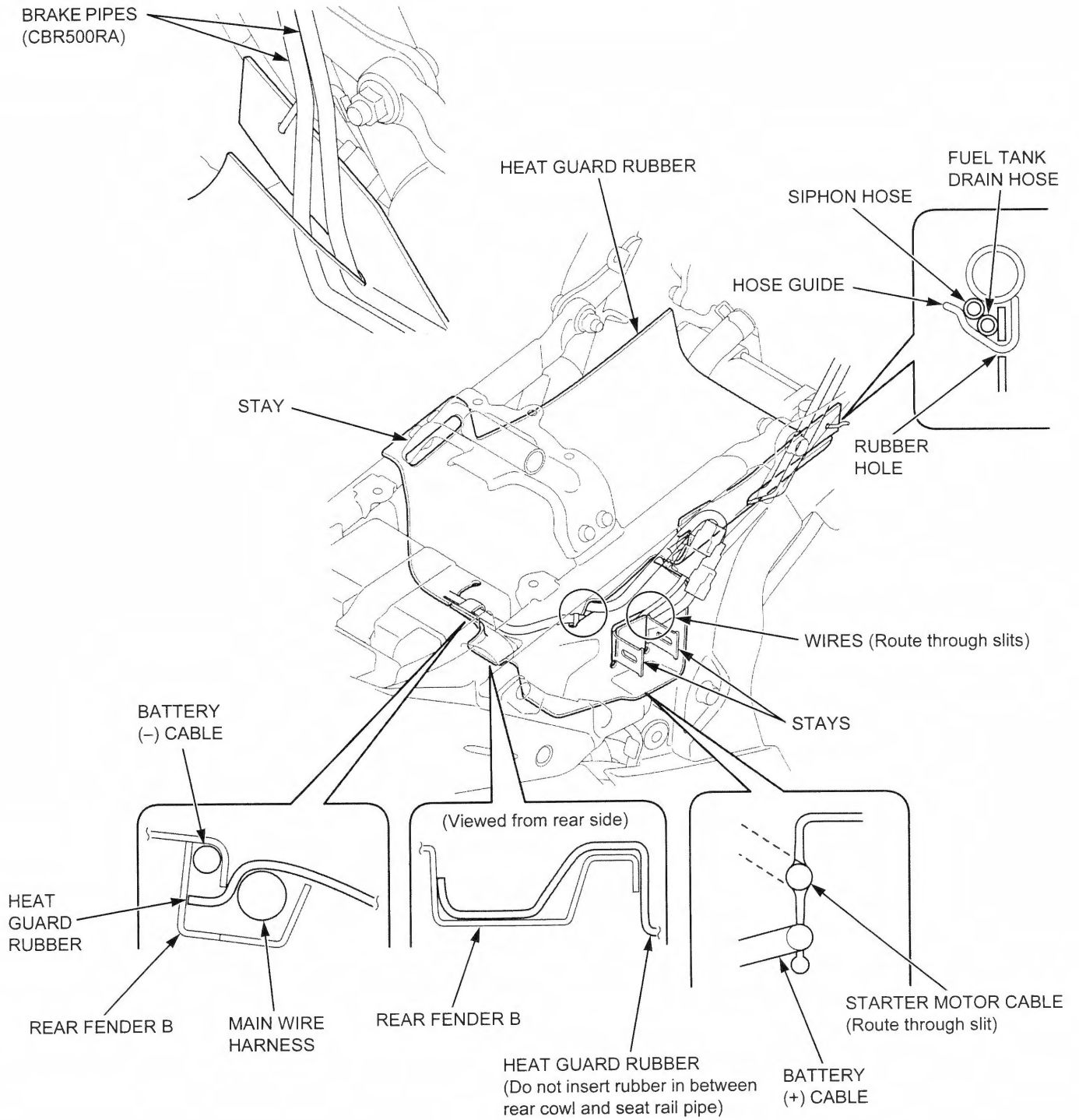
GENERAL INFORMATION

CB500F/FA



CB500F/FA

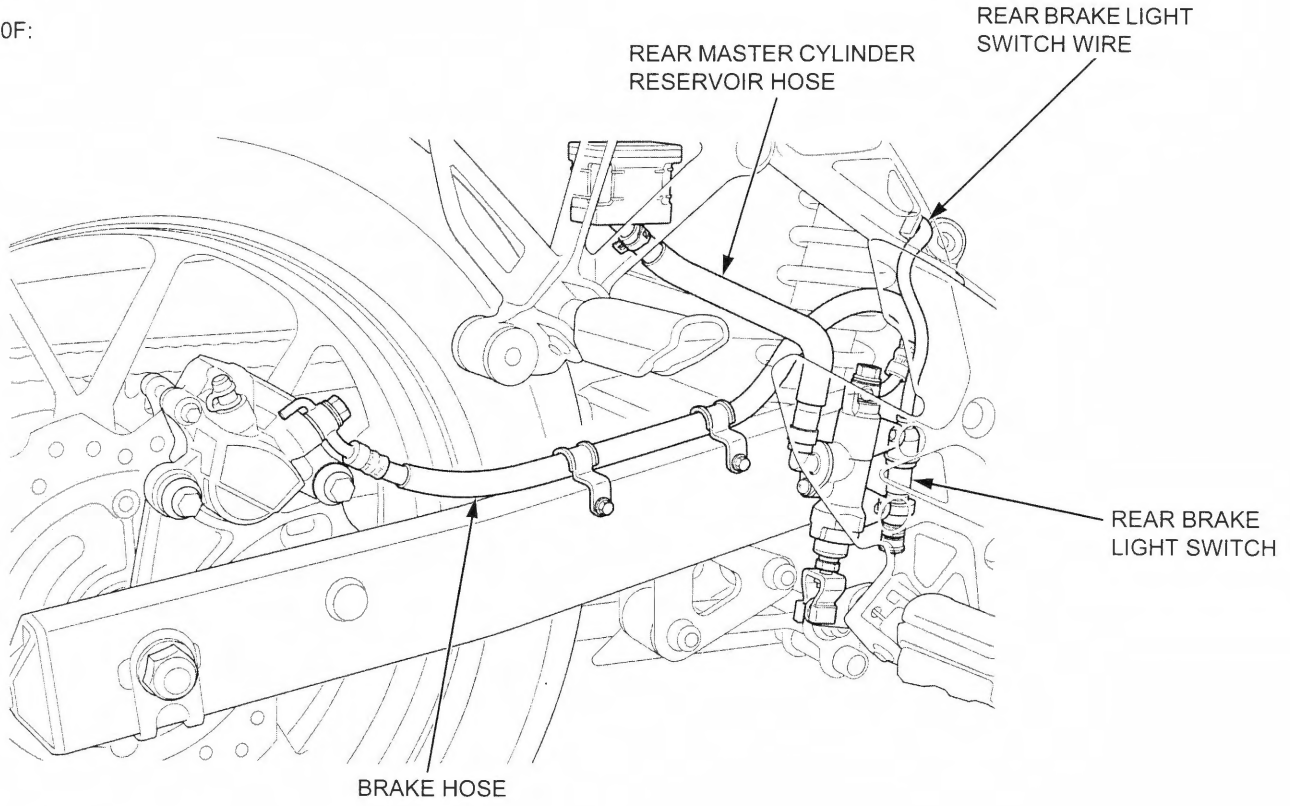
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GENERAL INFORMATION

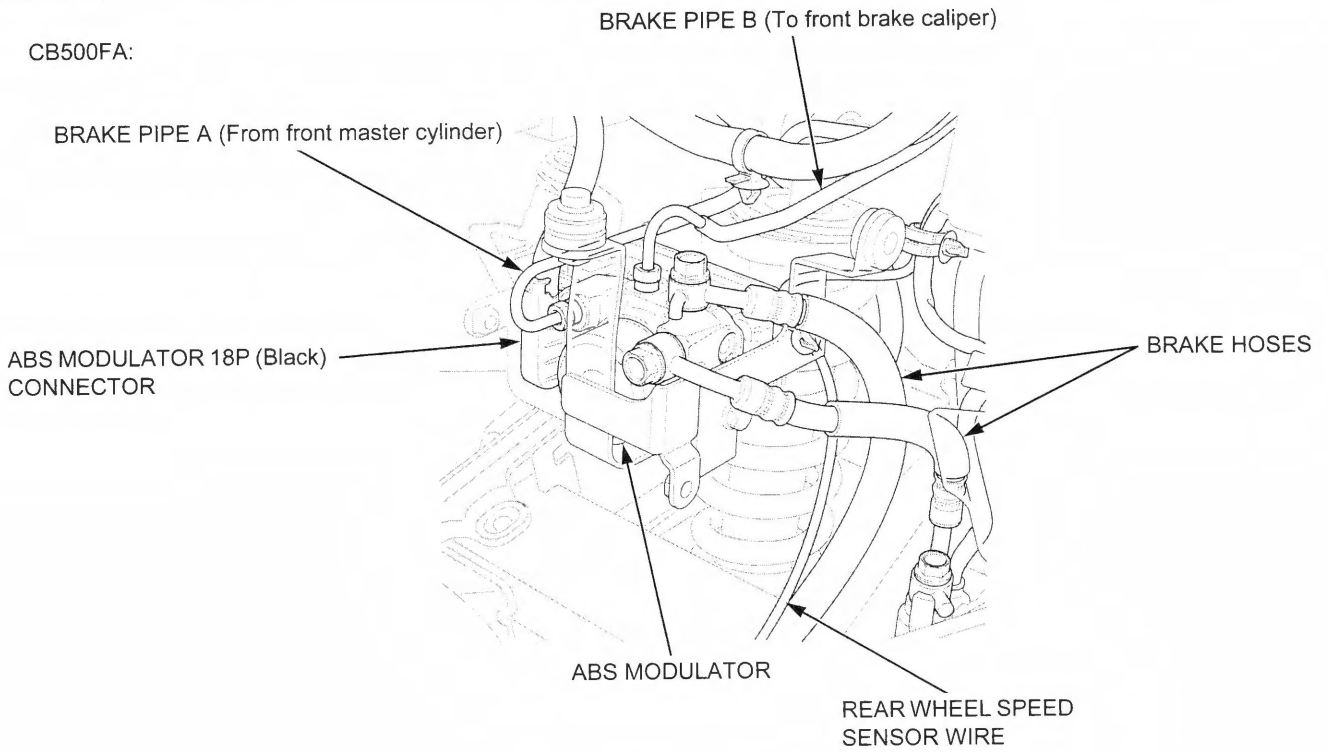
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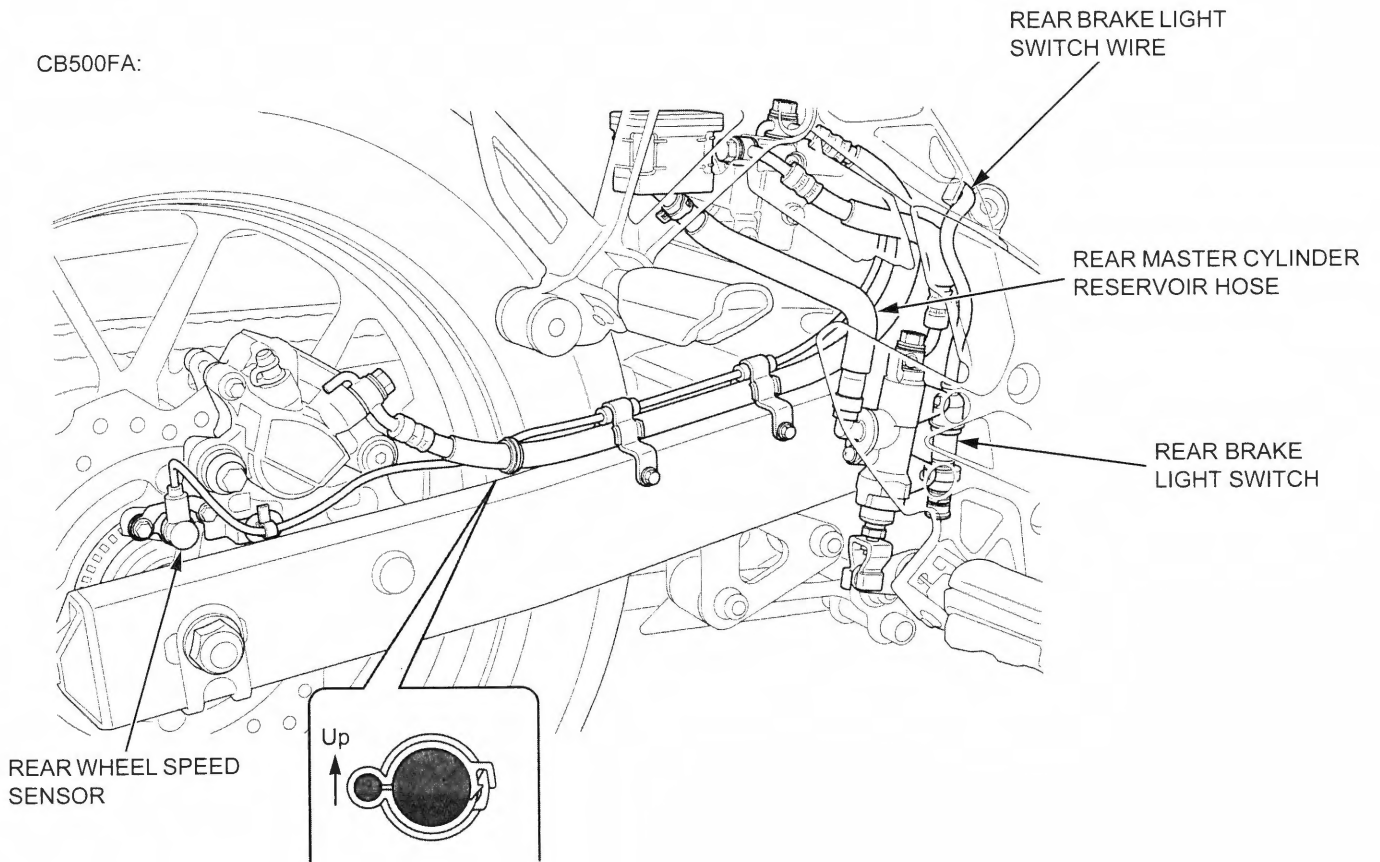


CB500F/FA

CB500FA:

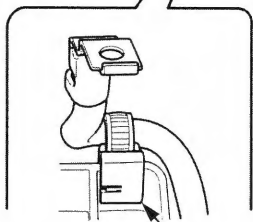
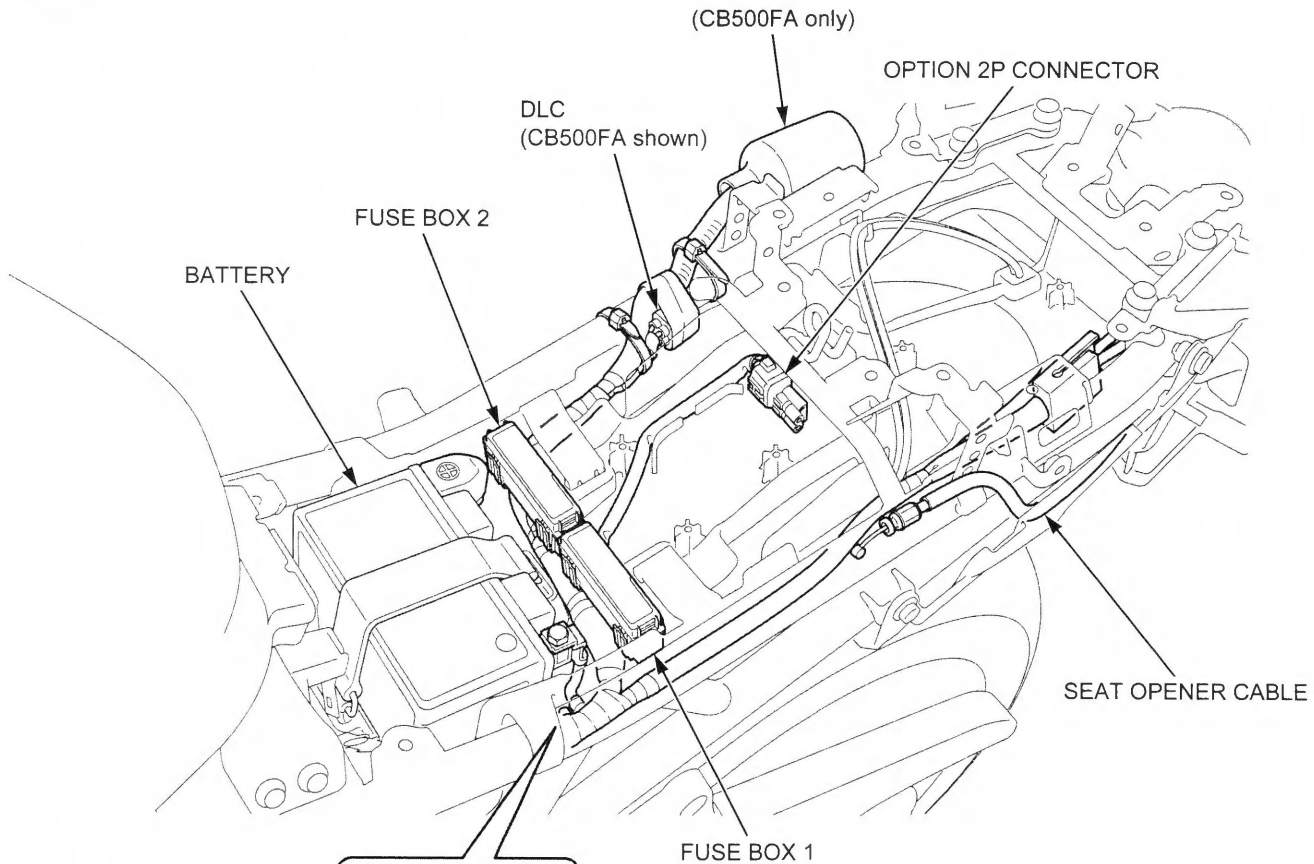


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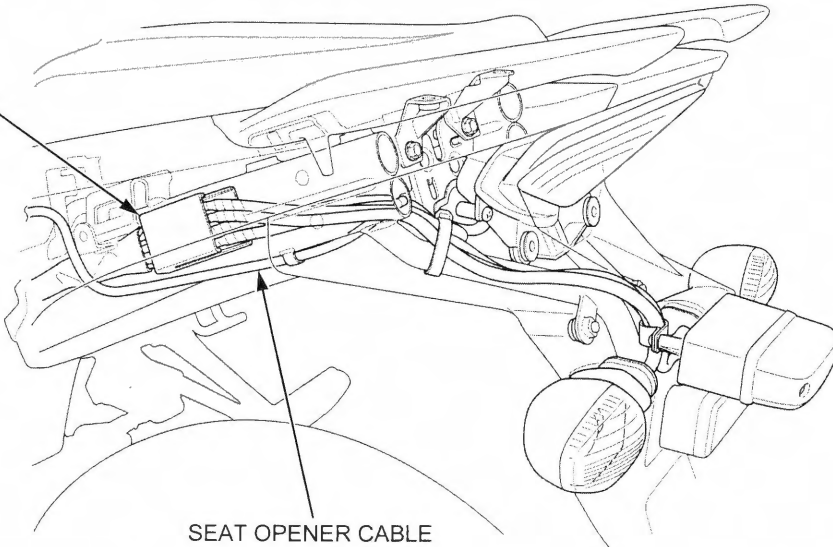


GENERAL INFORMATION

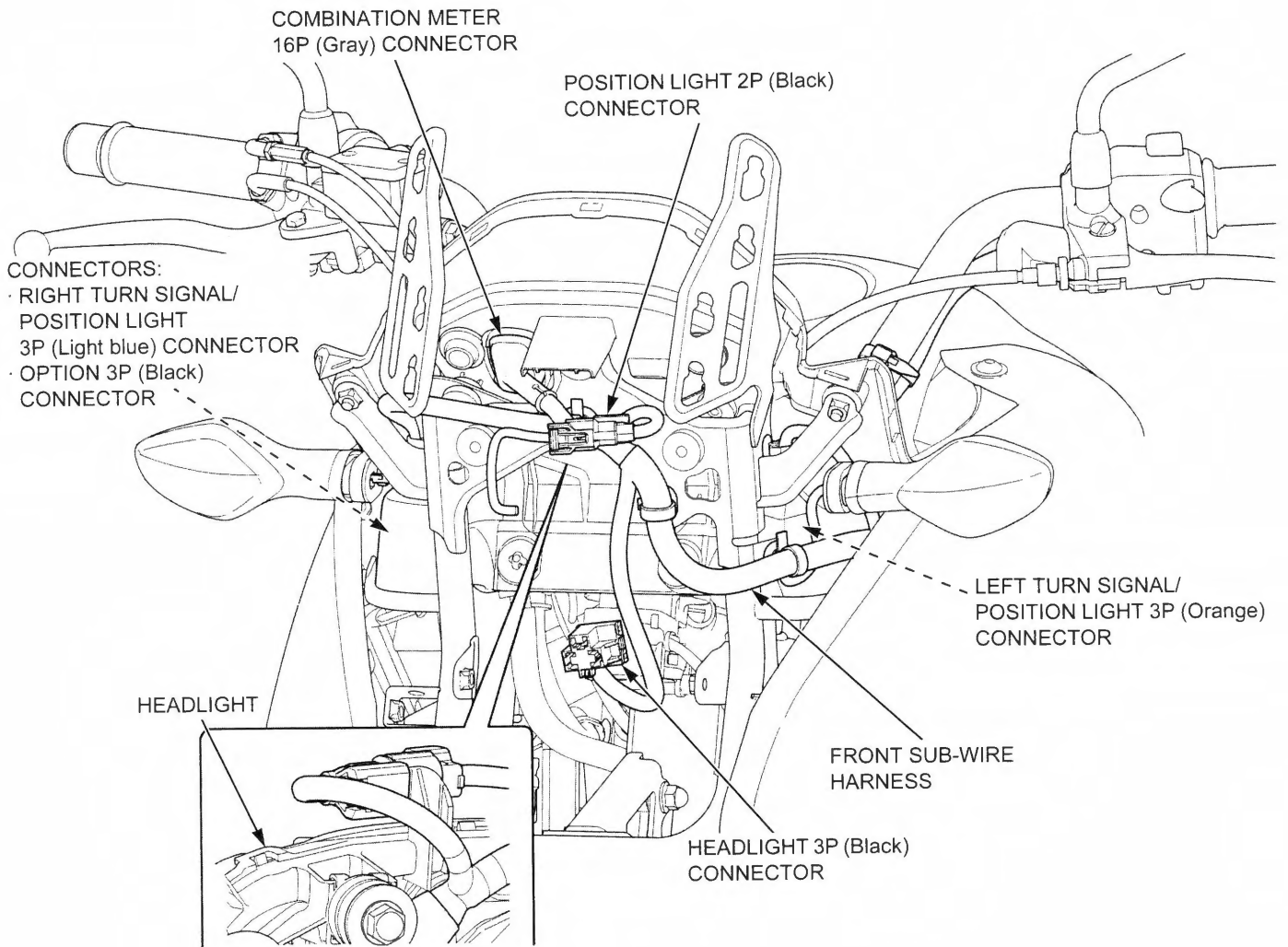
CB500F/FA



- CONNECTORS (From upper side):
- RIGHT TURN SIGNAL LIGHT 2P (Light blue)
 - LEFT TURN SIGNAL LIGHT 2P (Orange)
 - LICENSE LIGHT 2P (White)
 - BRAKE/TAILLIGHT 3P (White)



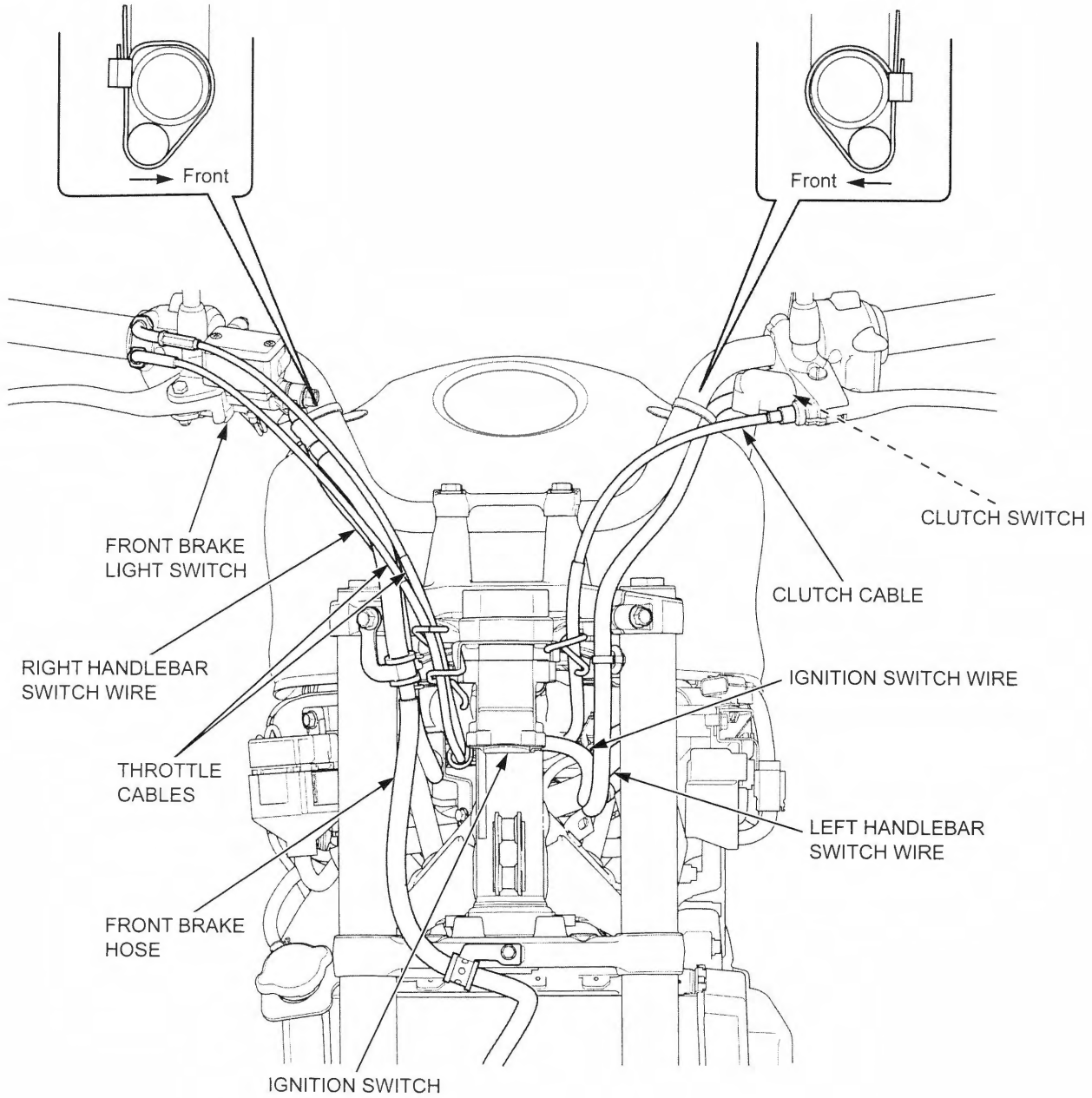
CB500X/XA



GENERAL INFORMATION

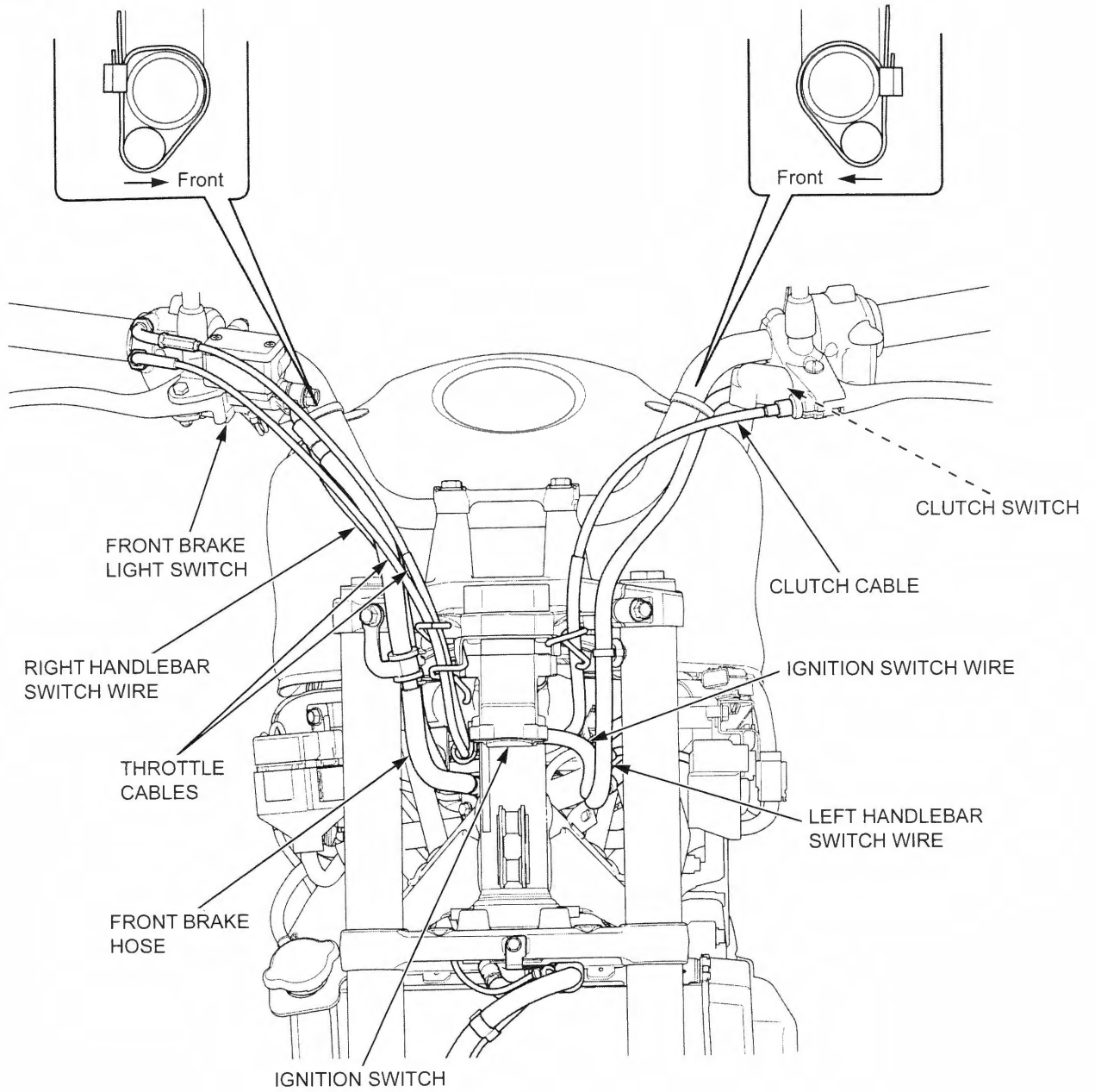
CB500X/XA

CB500X:



CB500X/XA

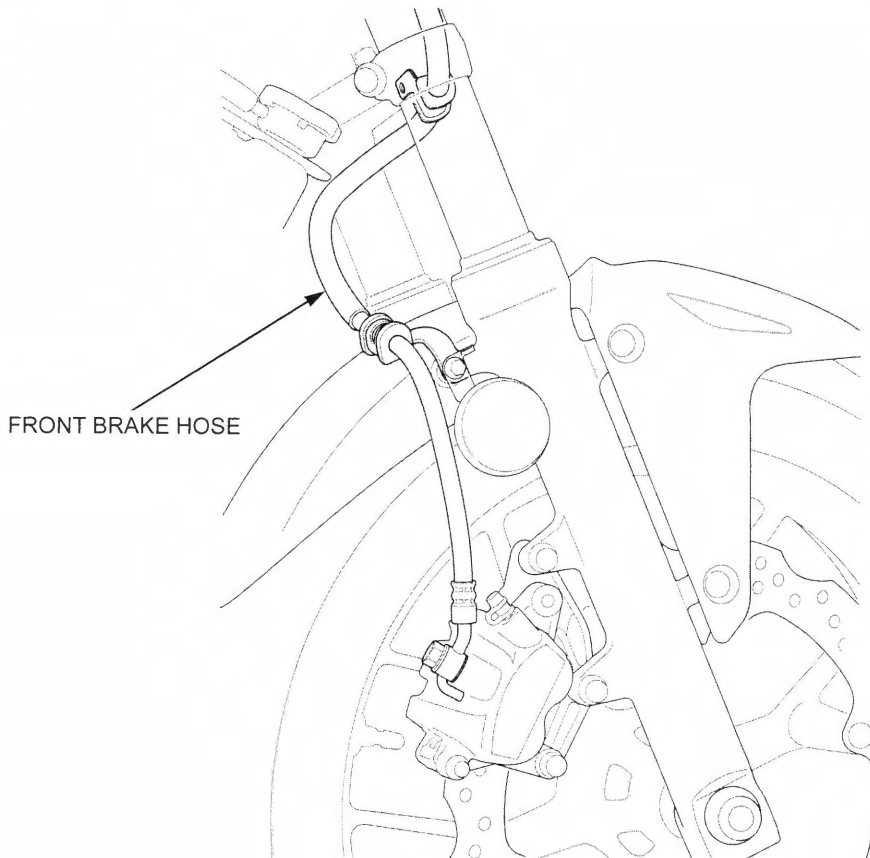
CB500XA:



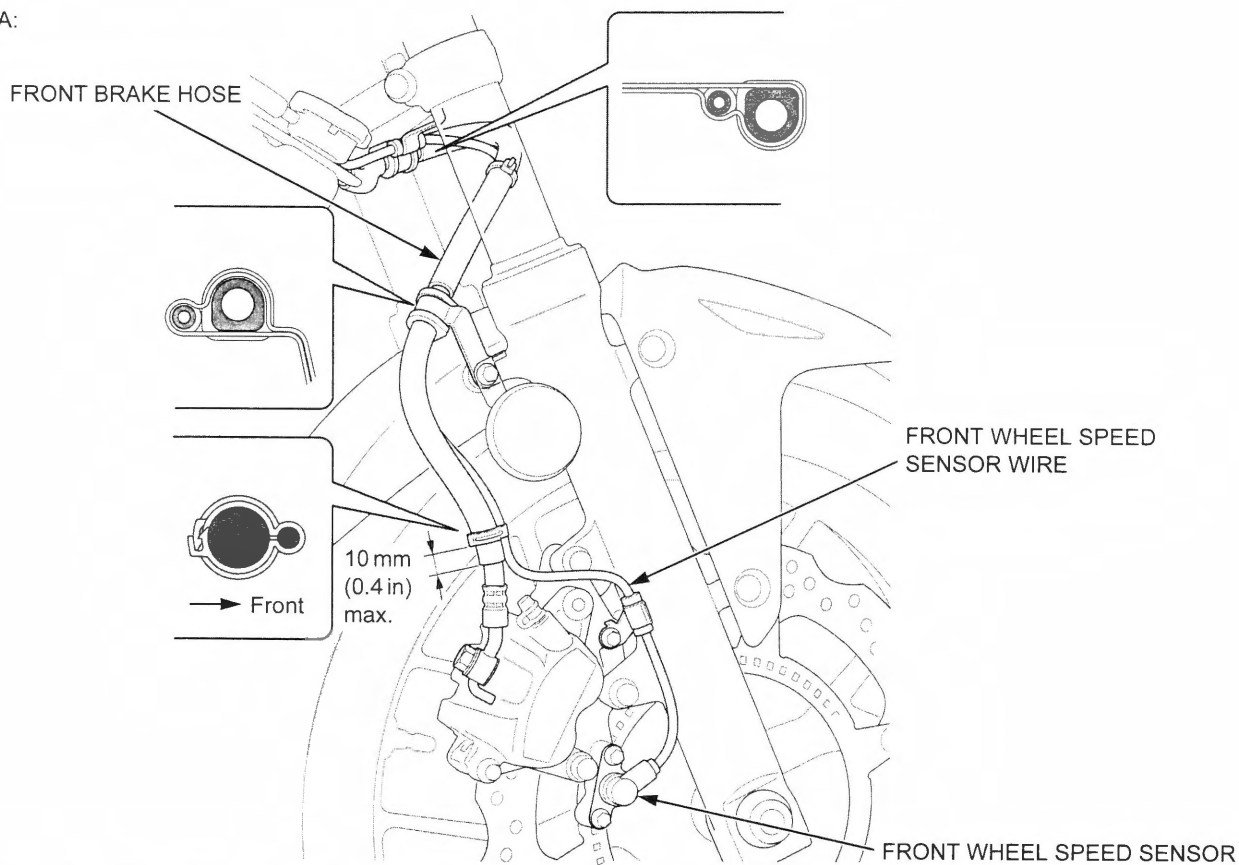
GENERAL INFORMATION

CB500X/XA

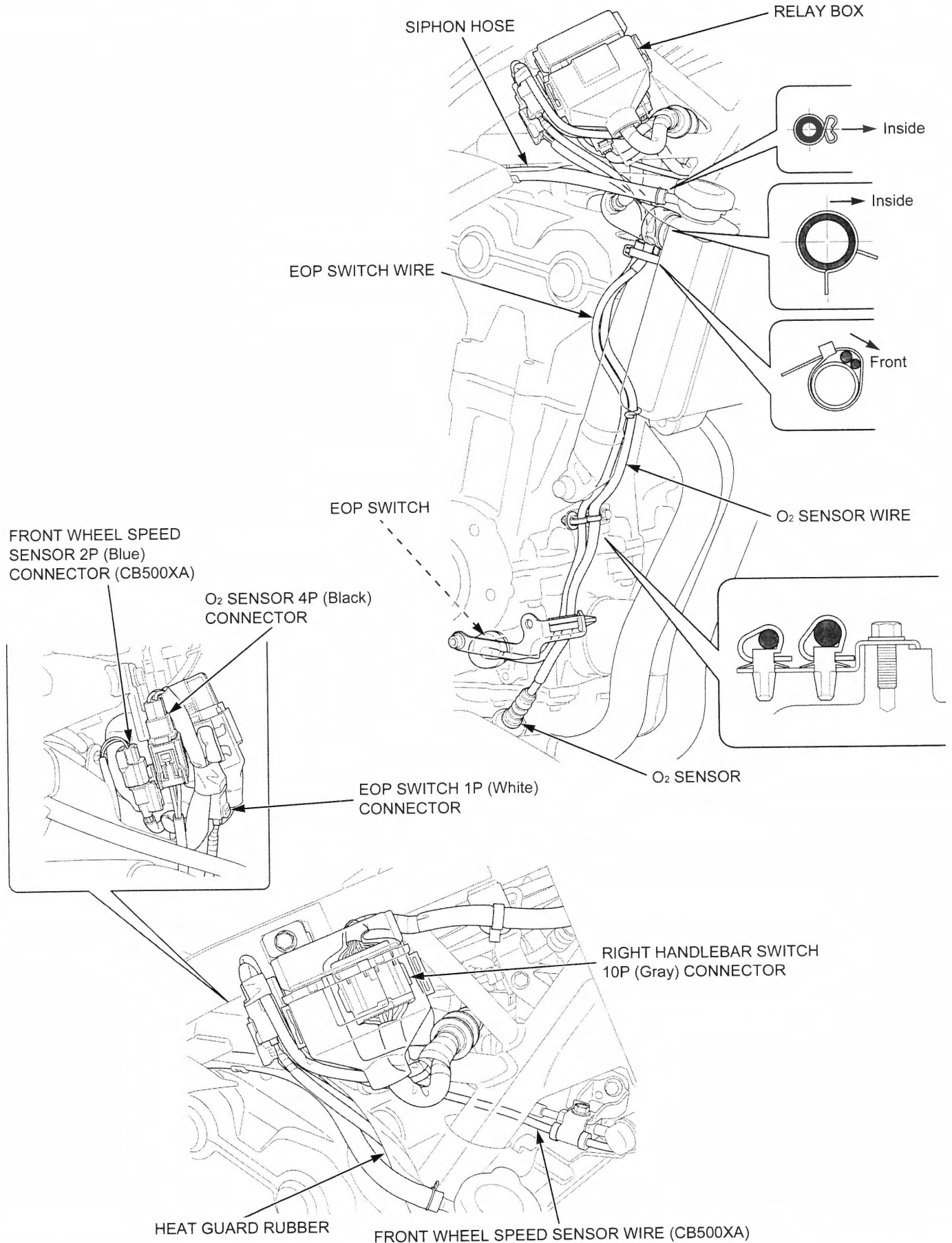
CB500X:



CB500XA:



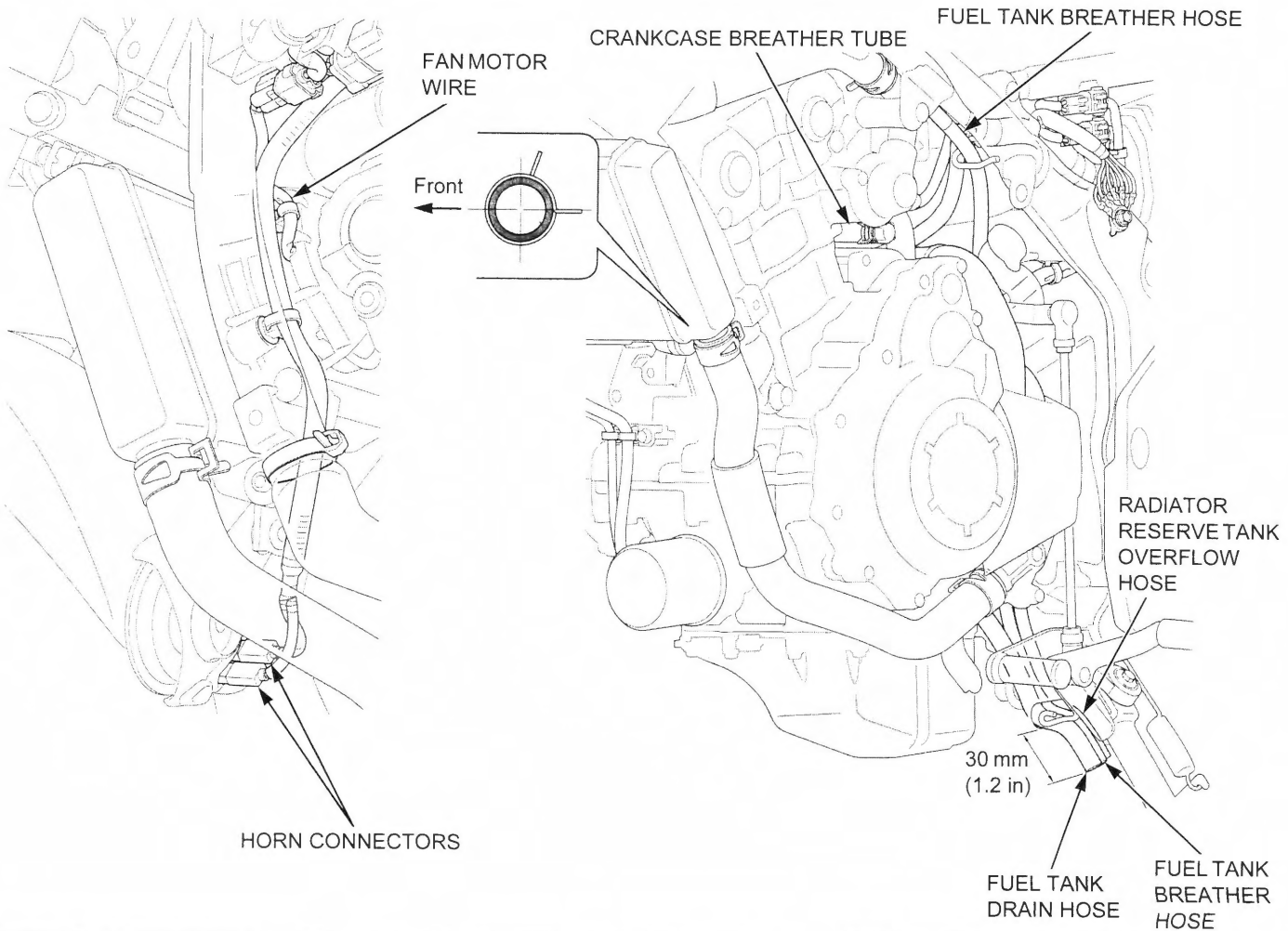
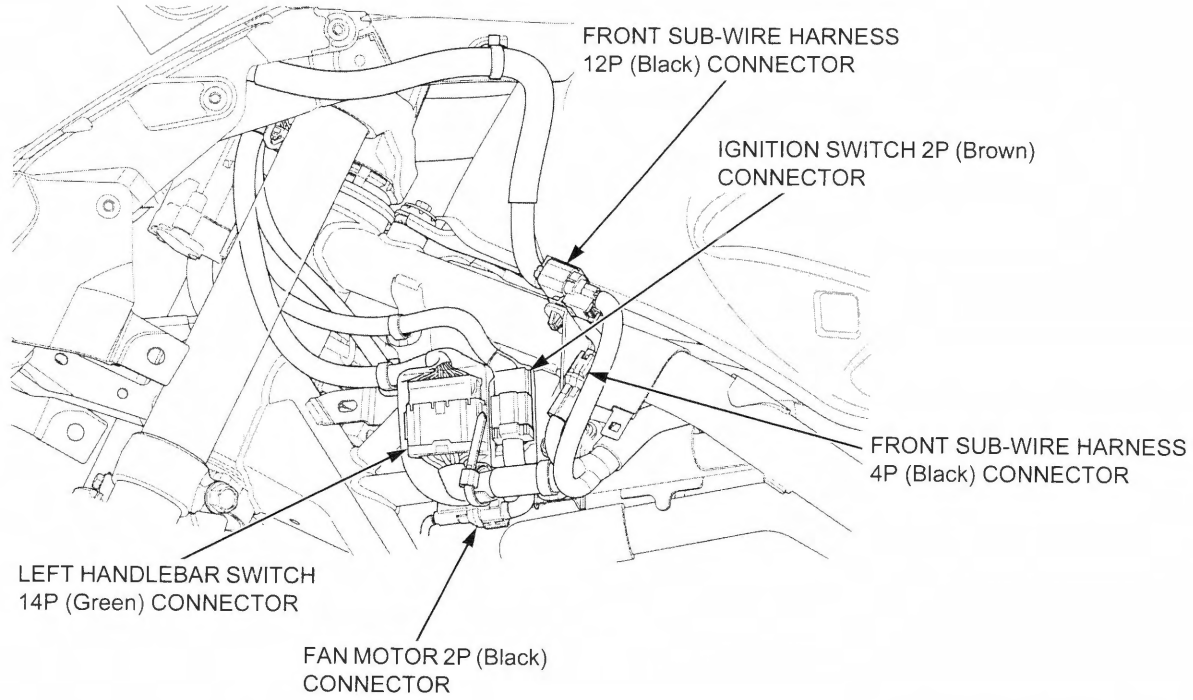
CB500X/XA



GENERAL INFORMATION

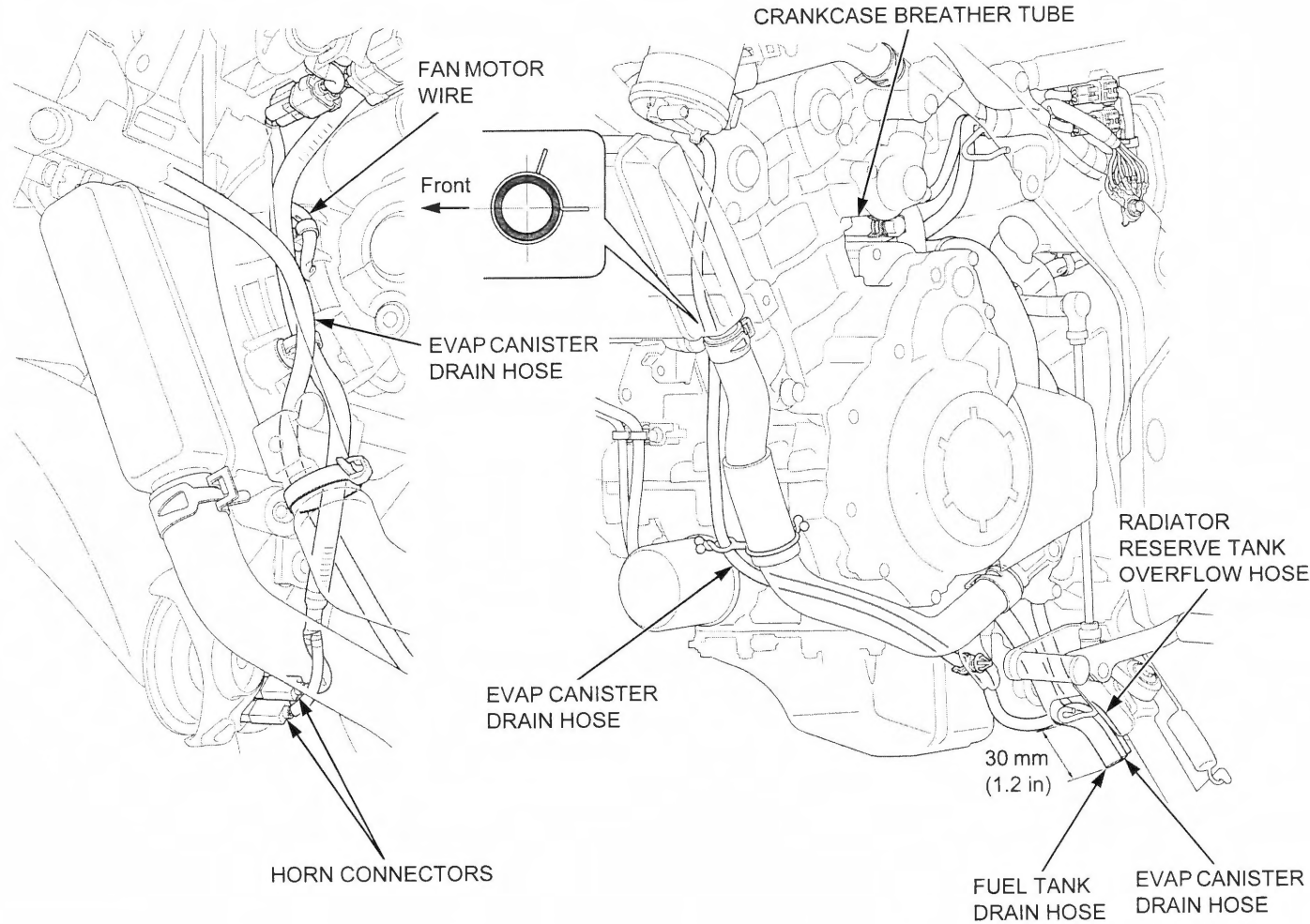
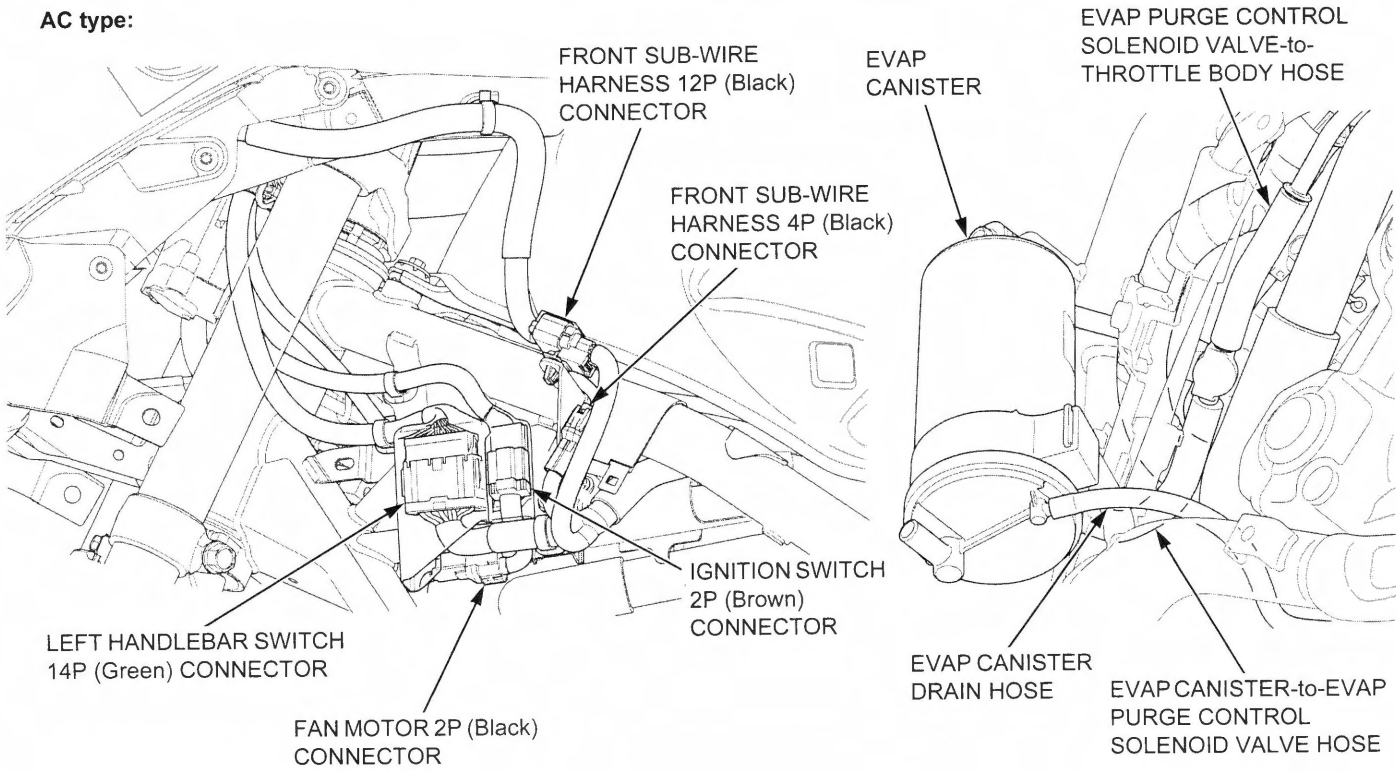
CB500X/XA

A, CM types:



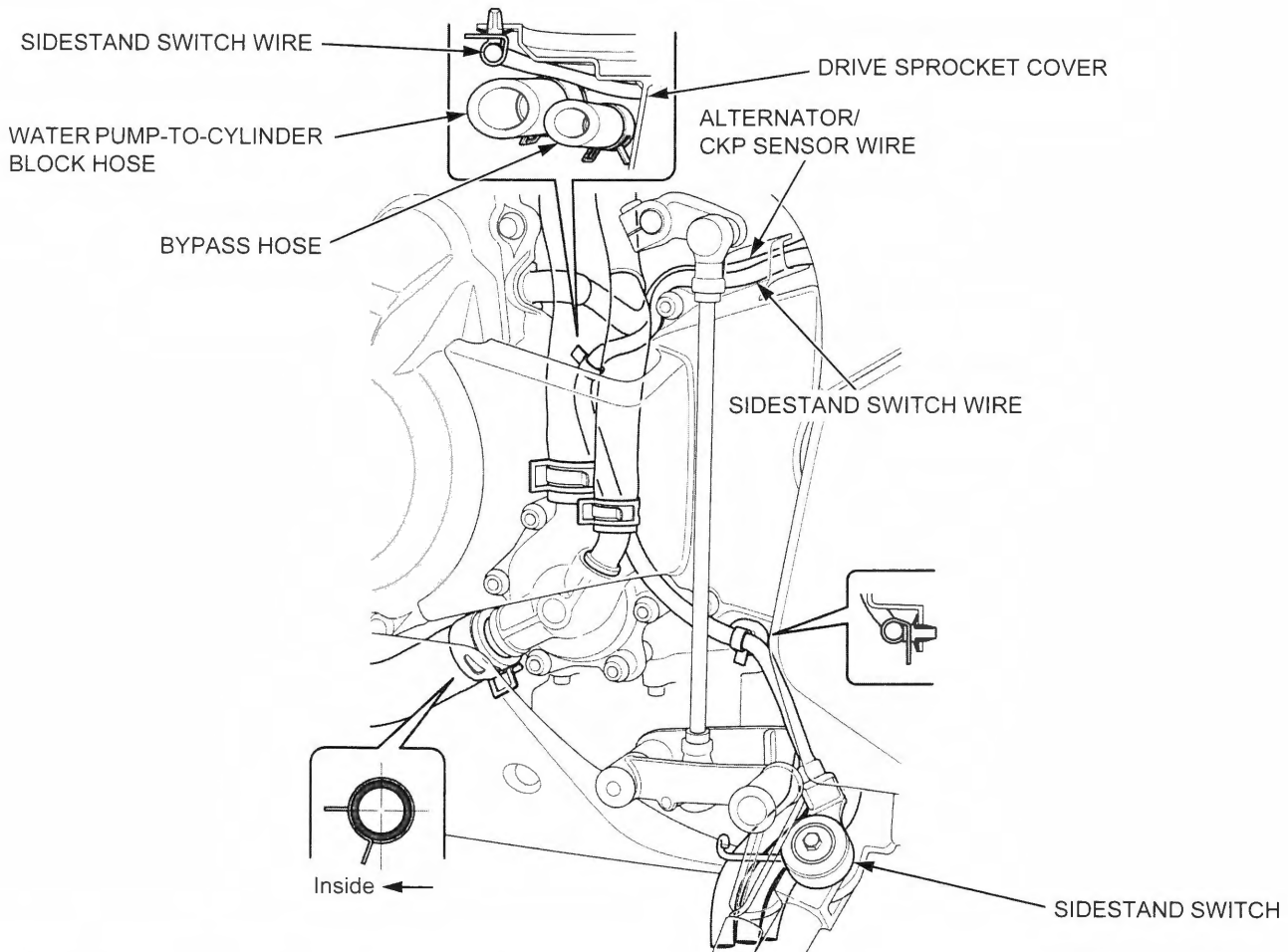
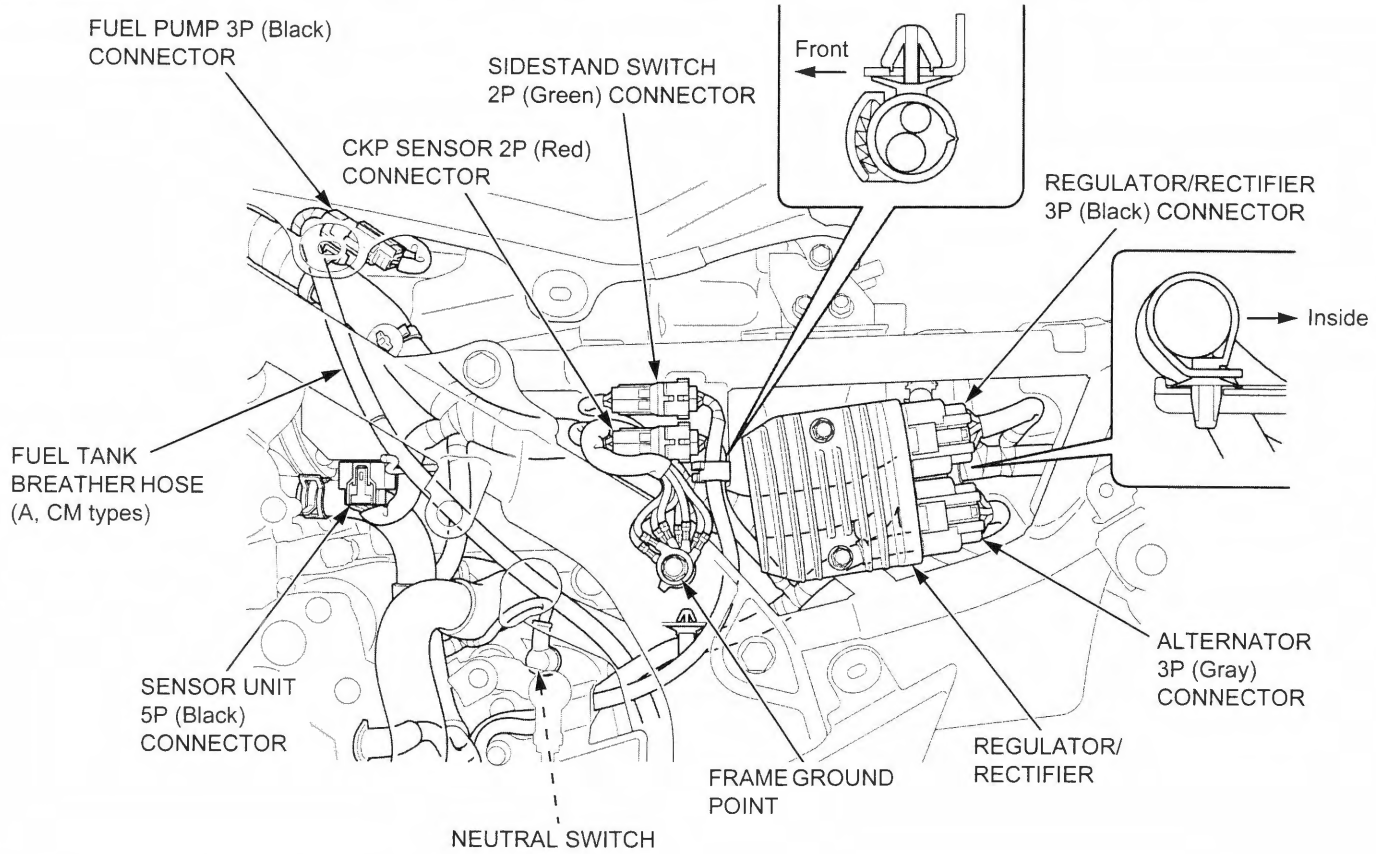
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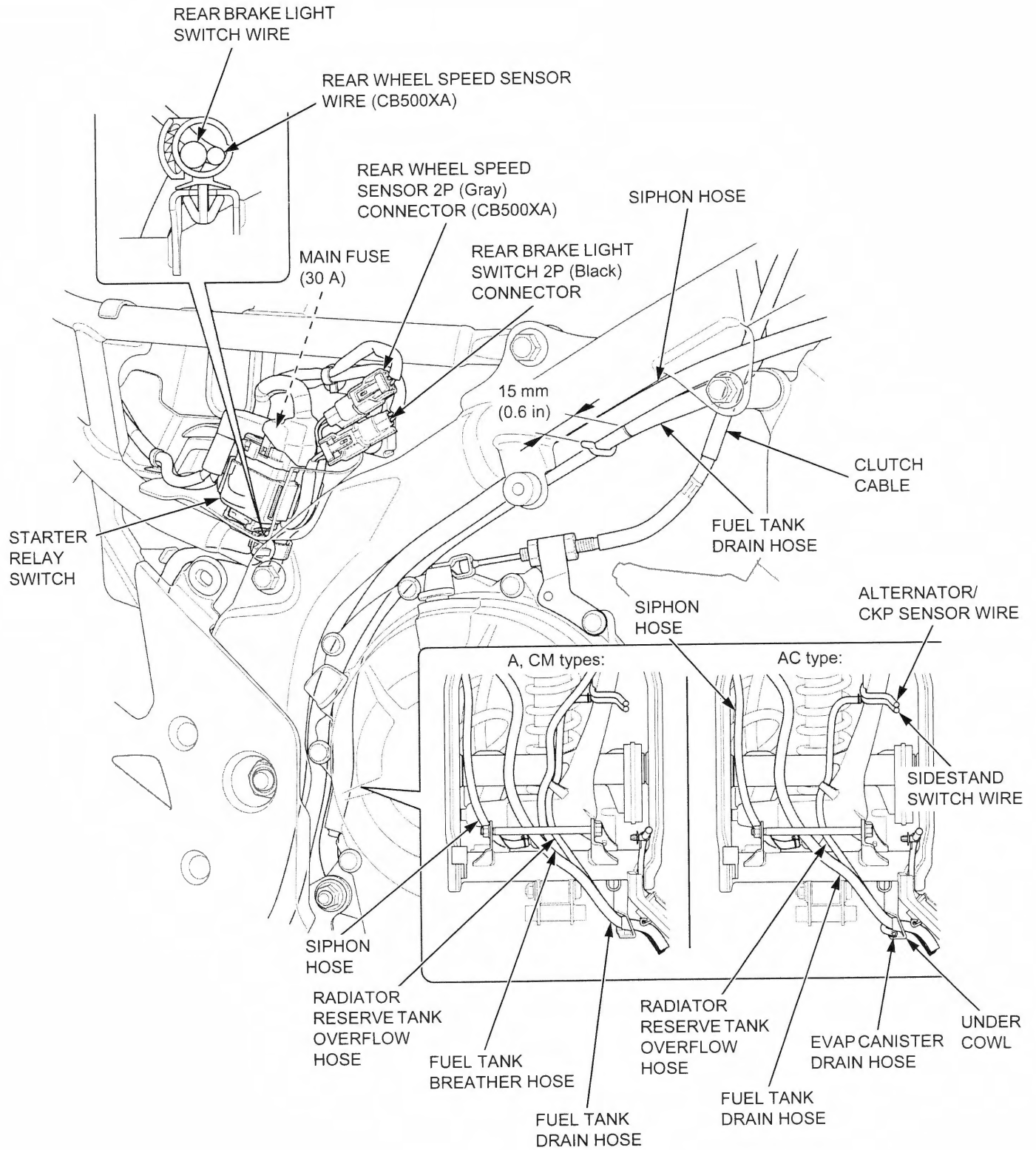


GENERAL INFORMATION

CB500X/XA



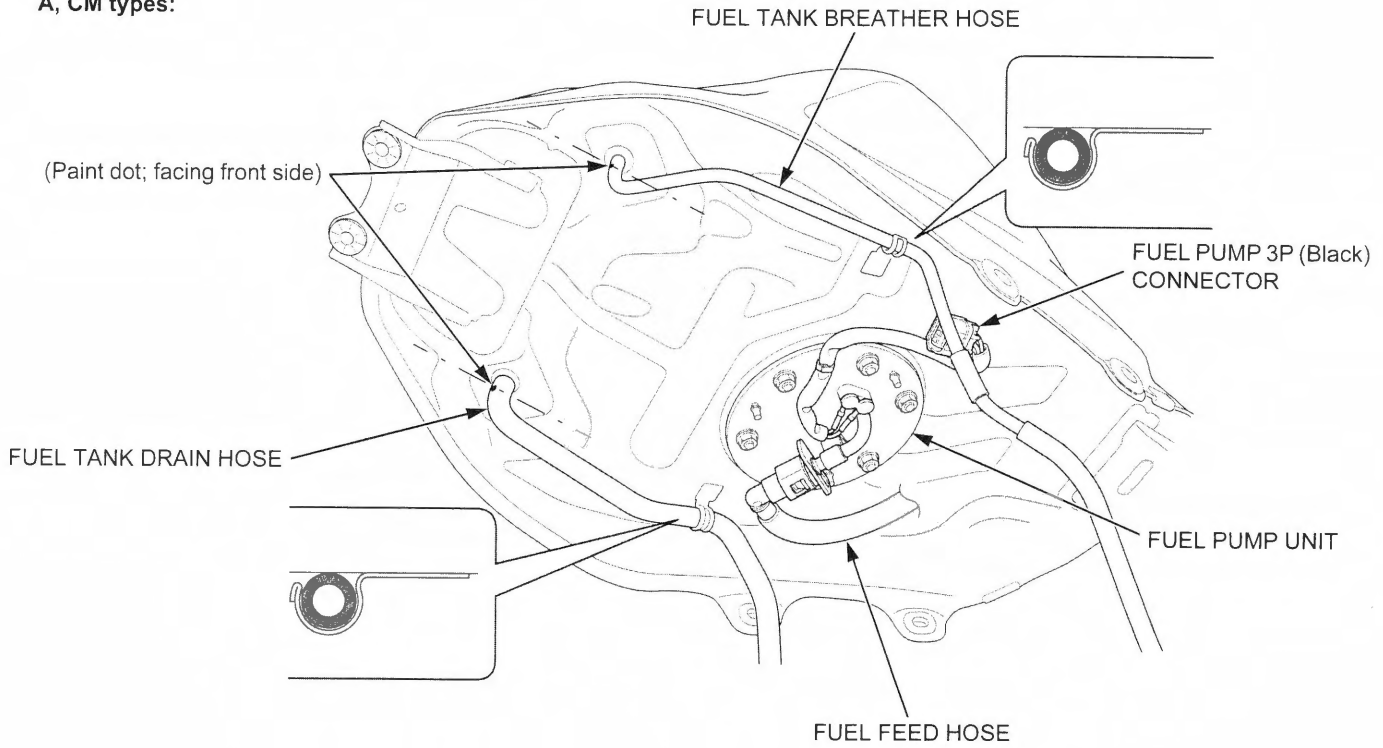
CB500X/XA



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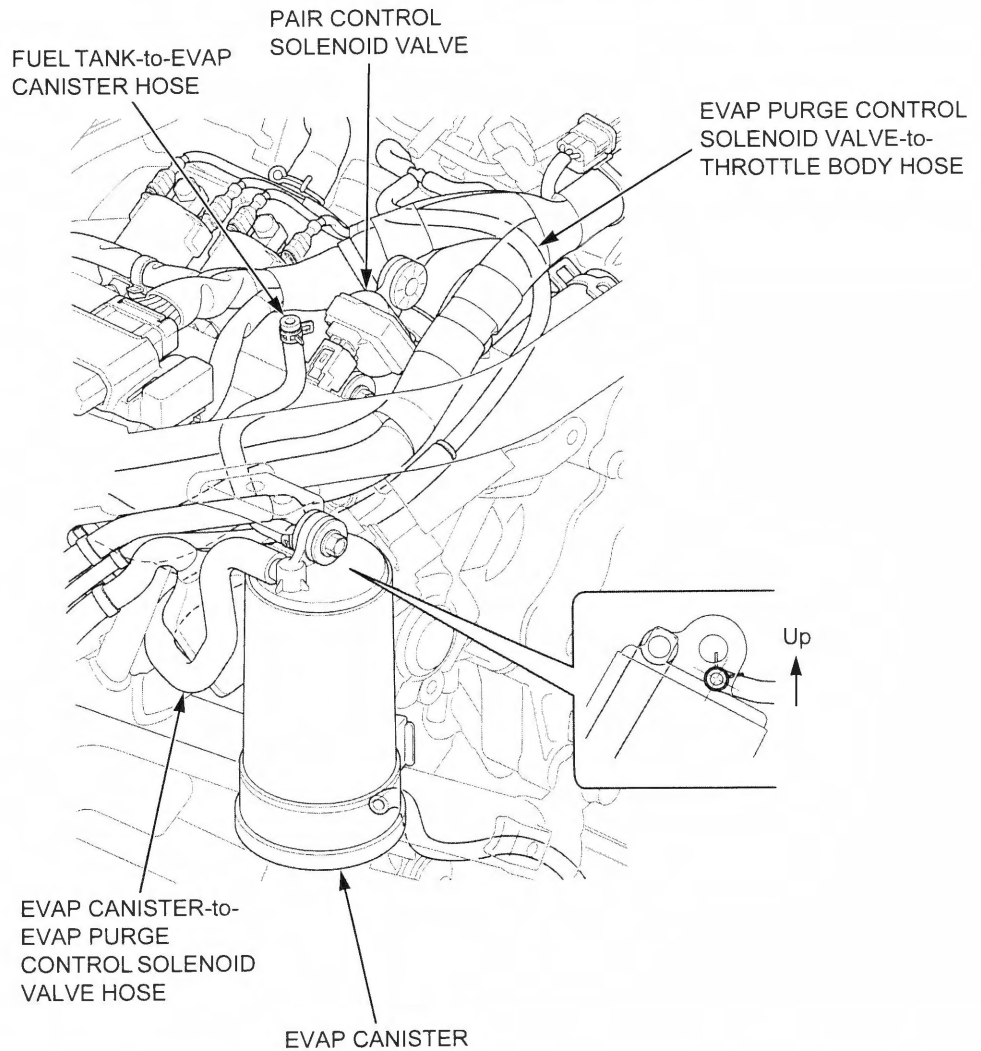
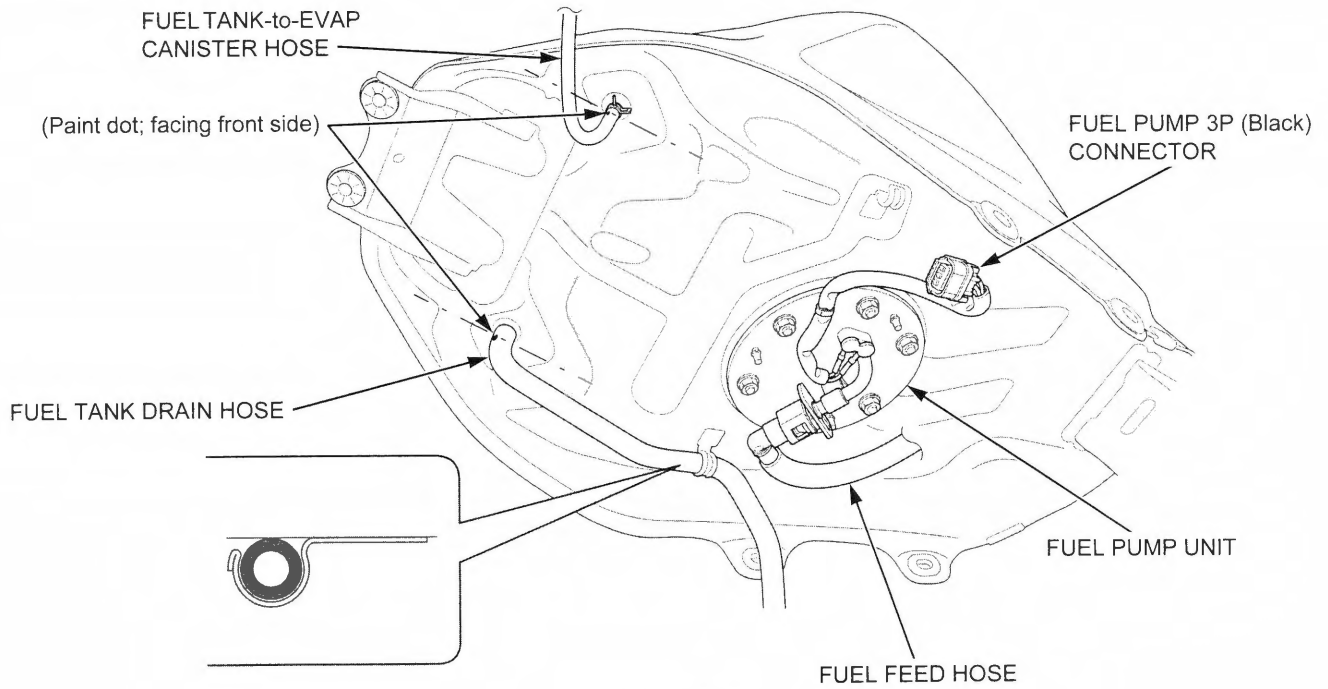
CB500X/XA

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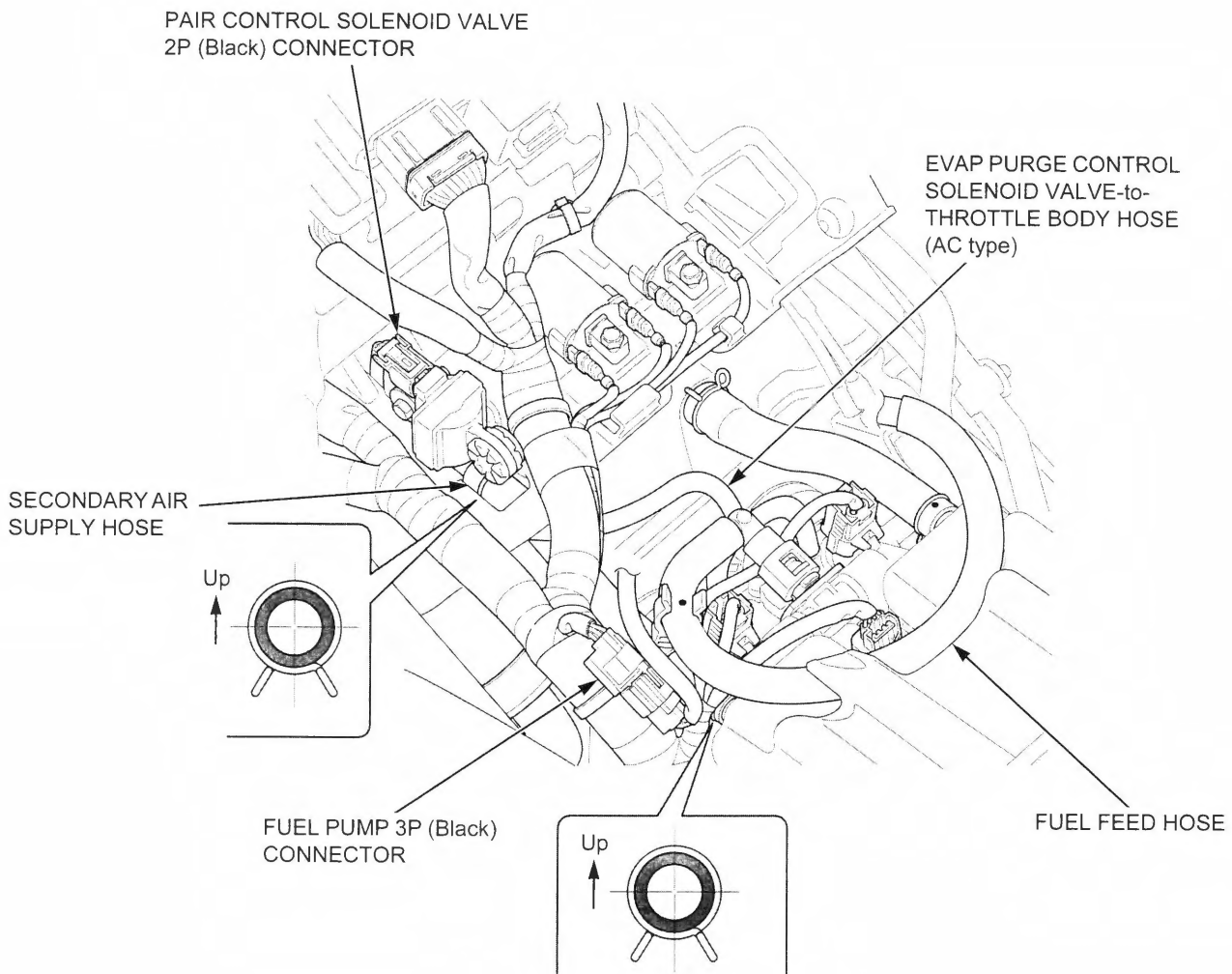
CB500X/XA

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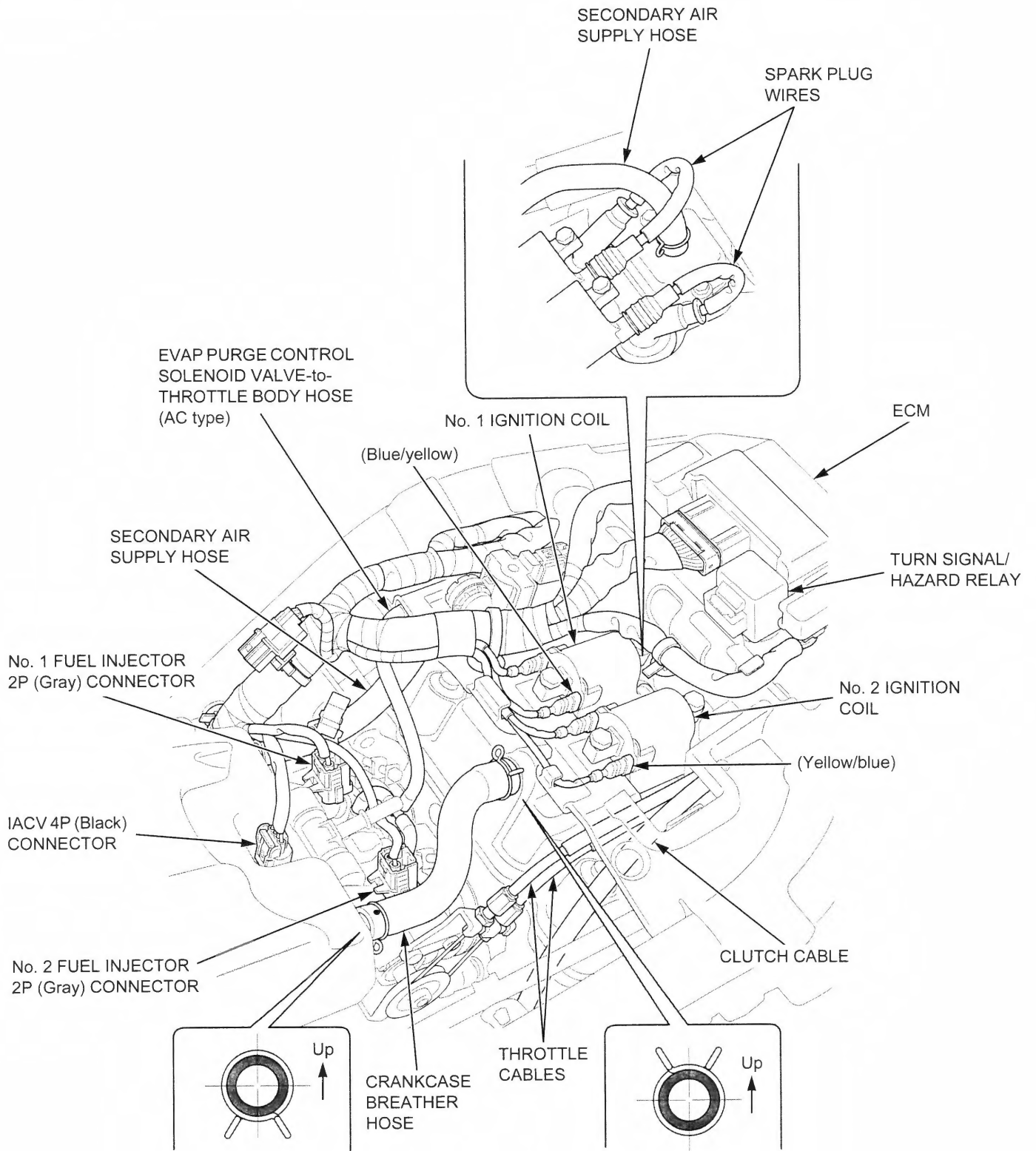


GENERAL INFORMATION

CB500X/XA



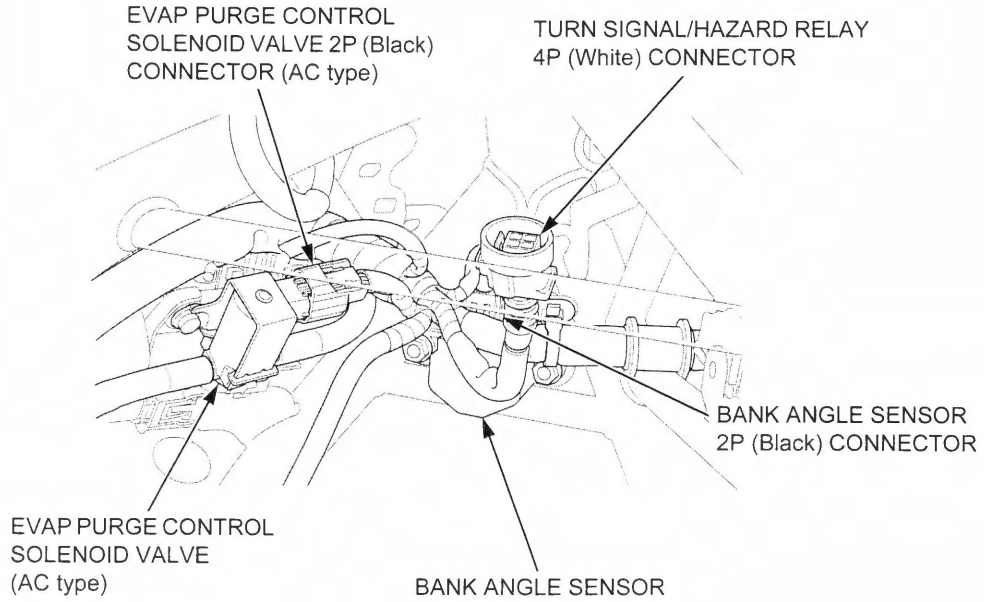
CB500X/XA



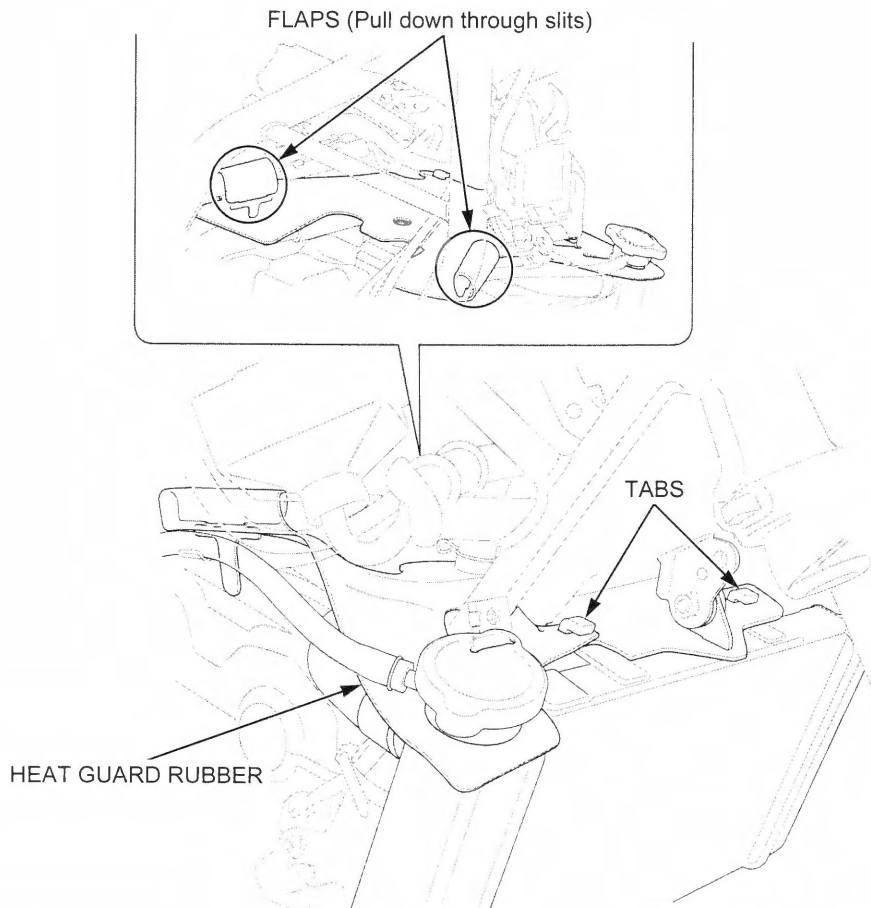
GENERAL INFORMATION

CB500X/XA

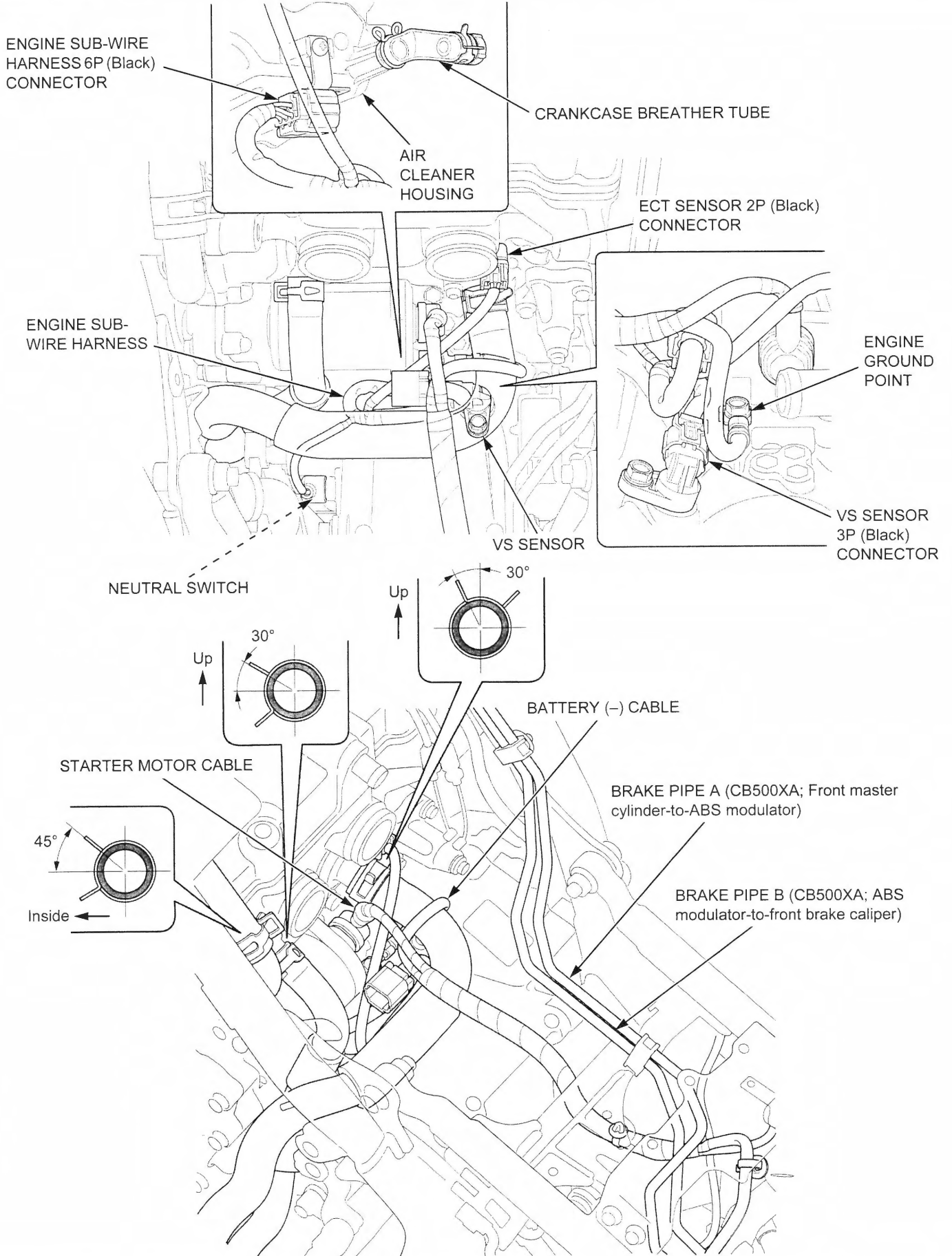
Behind steering head pipe (viewed from rear side):



Front heat guard rubber setting points:



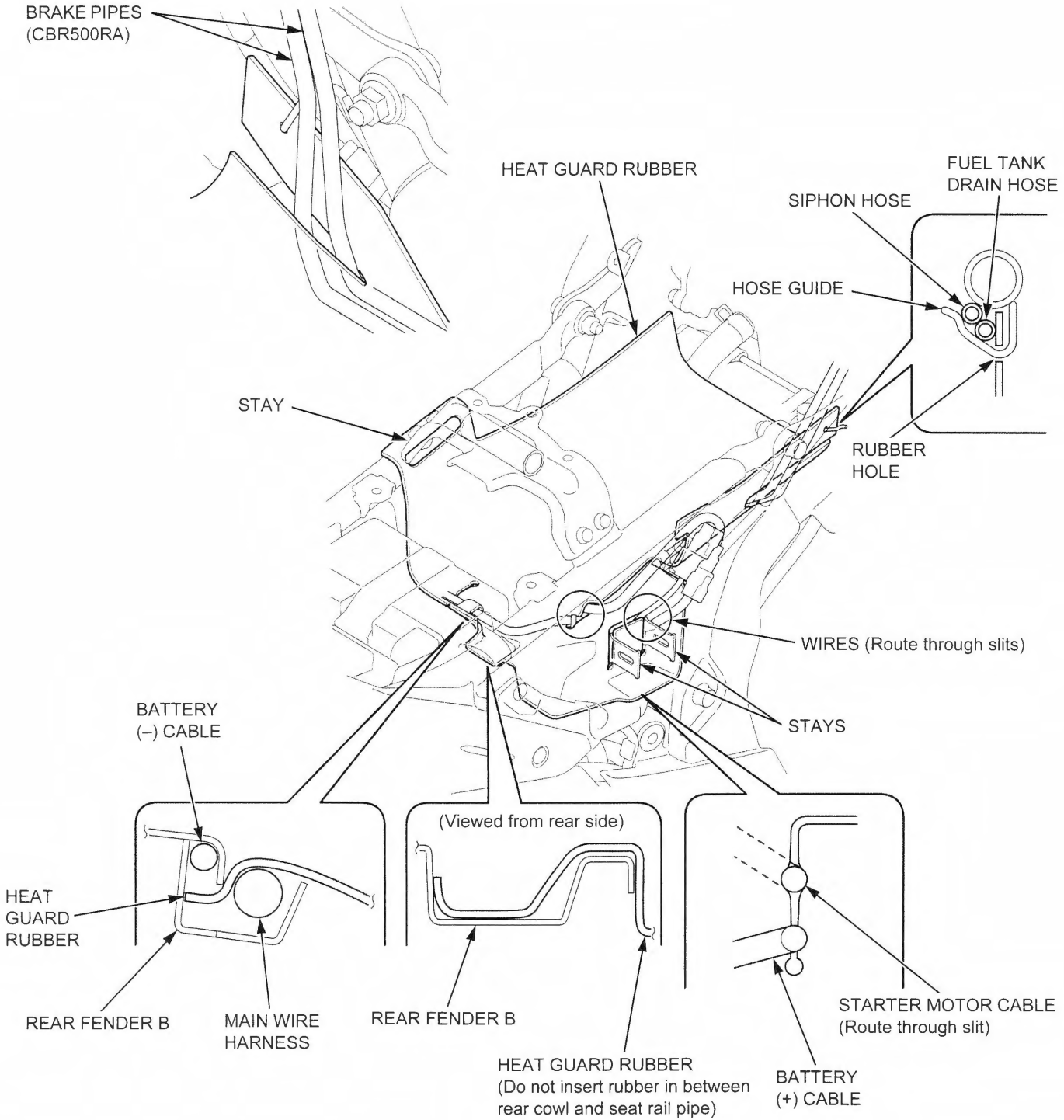
CB500X/XA



GENERAL INFORMATION

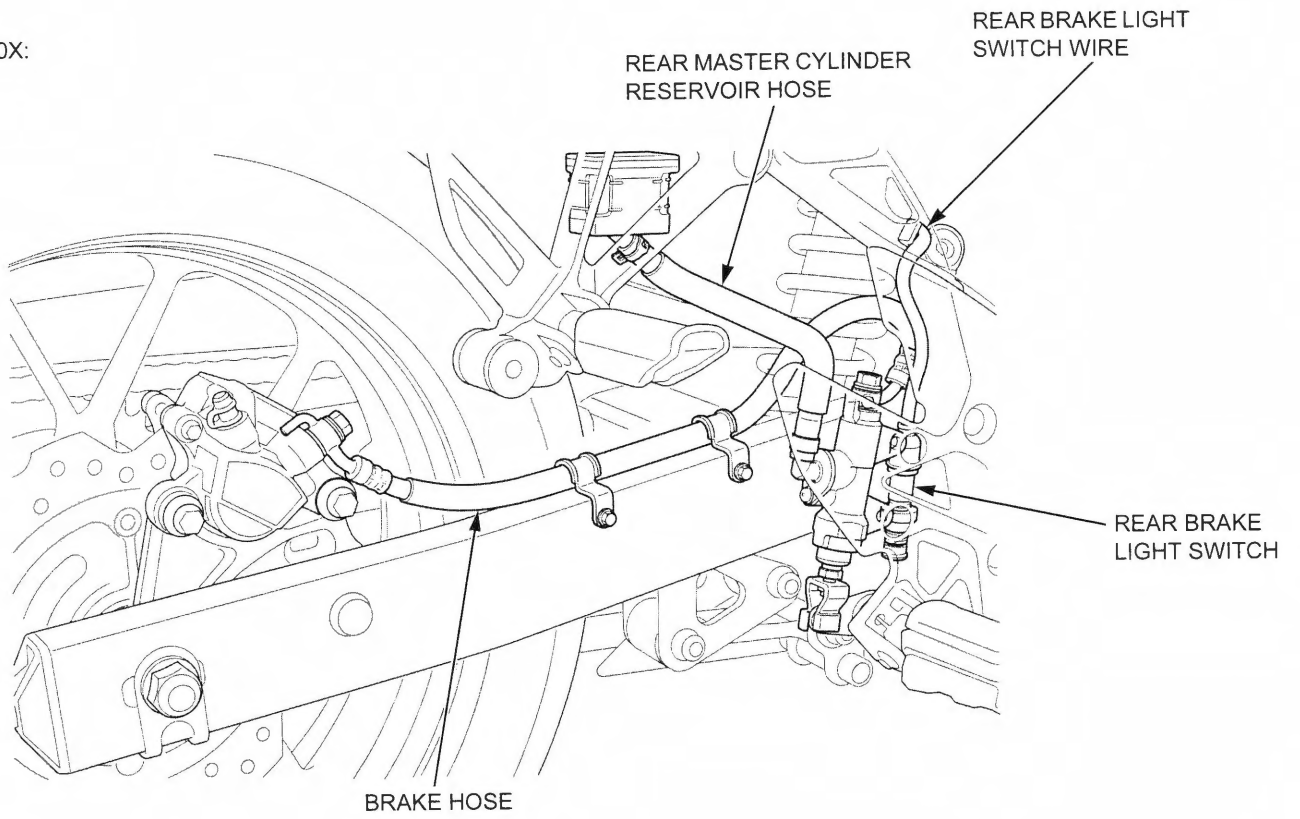
CB500X/XA

Rear heat guard rubber setting points:



CB500X/XA

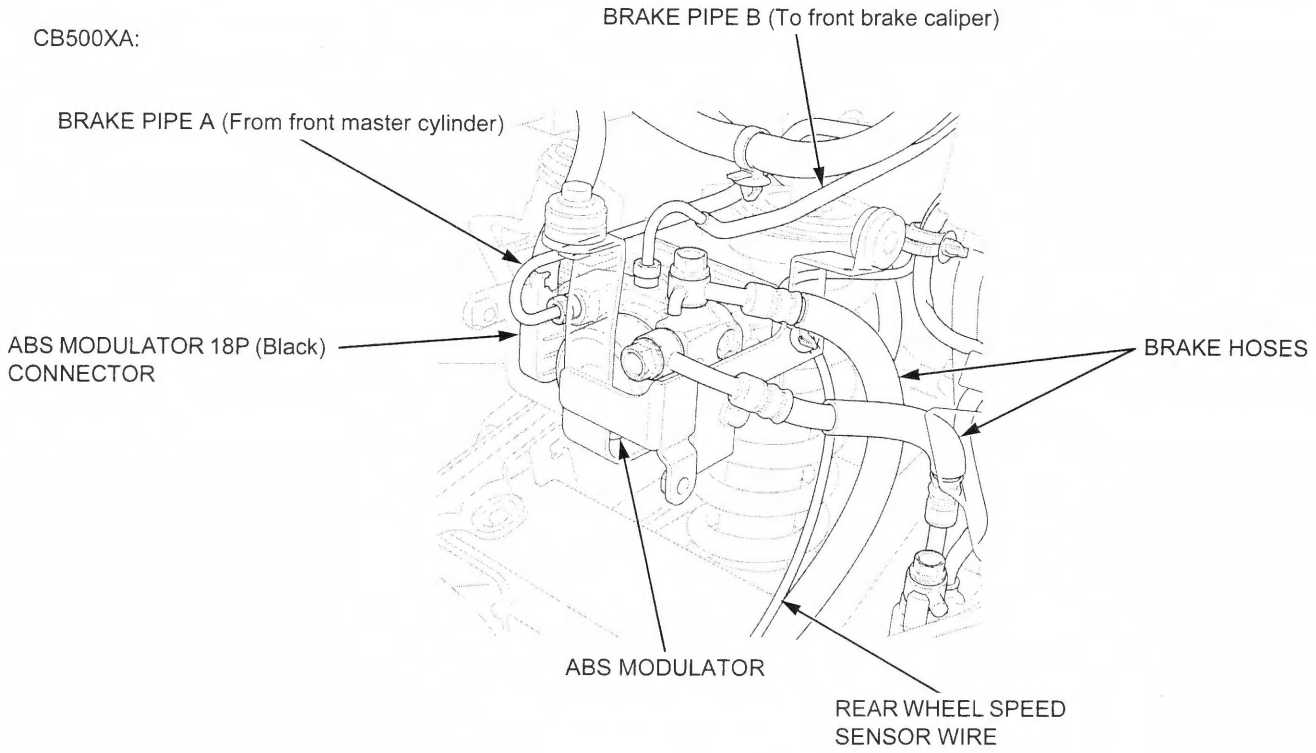
CB500X:



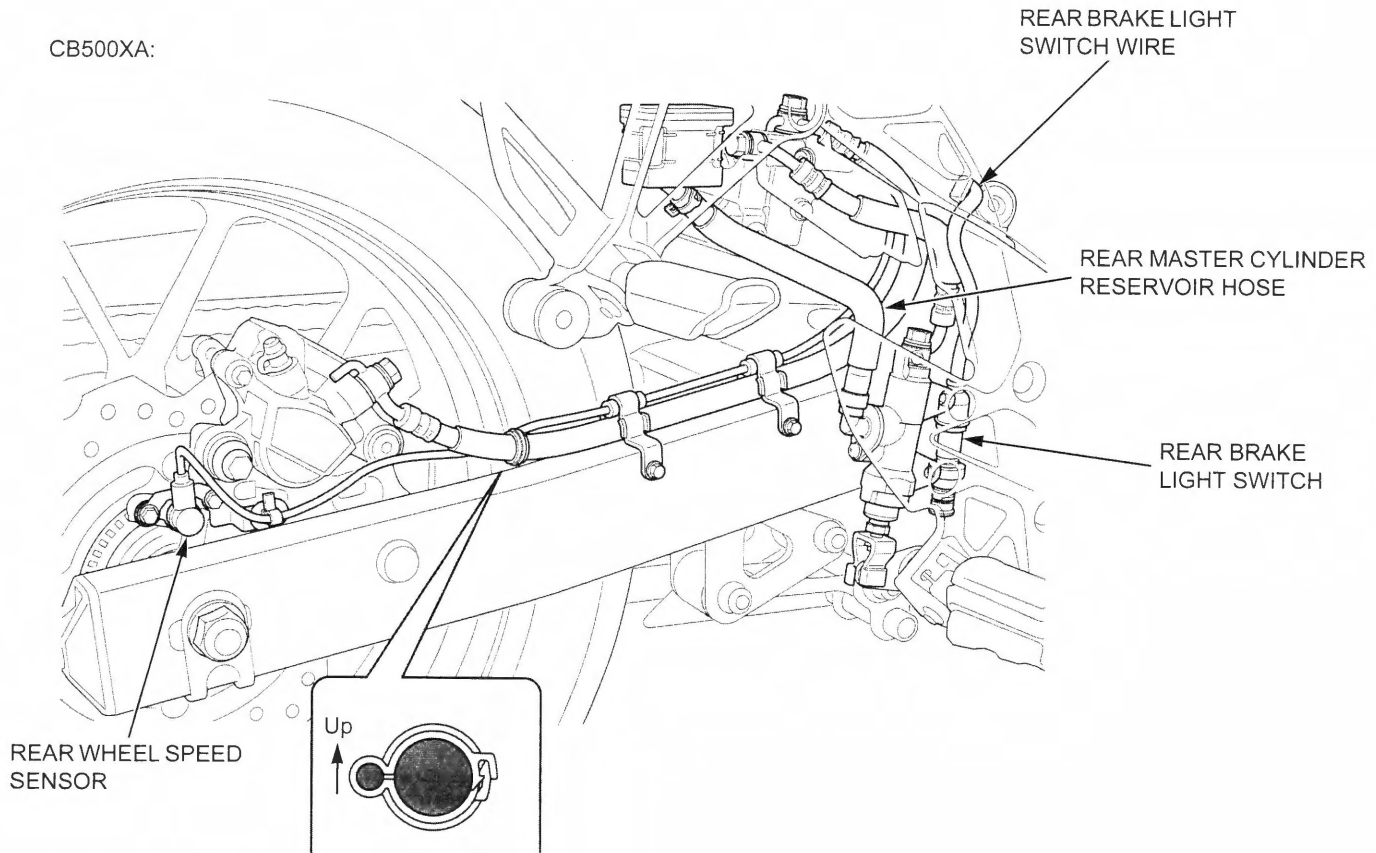
GENERAL INFORMATION

CB500X/XA

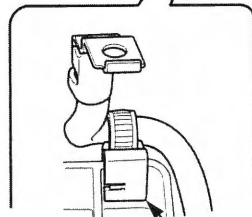
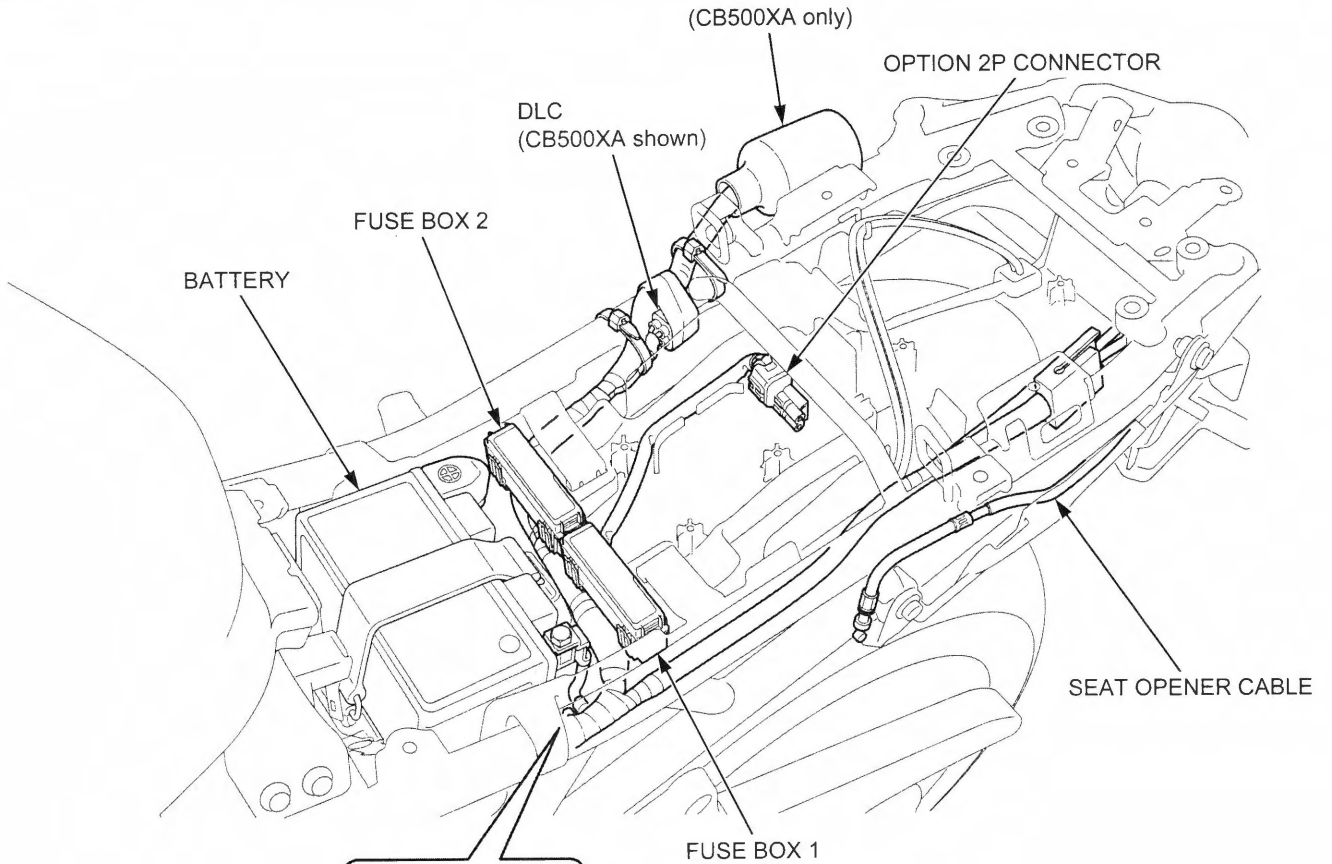
CB500XA:



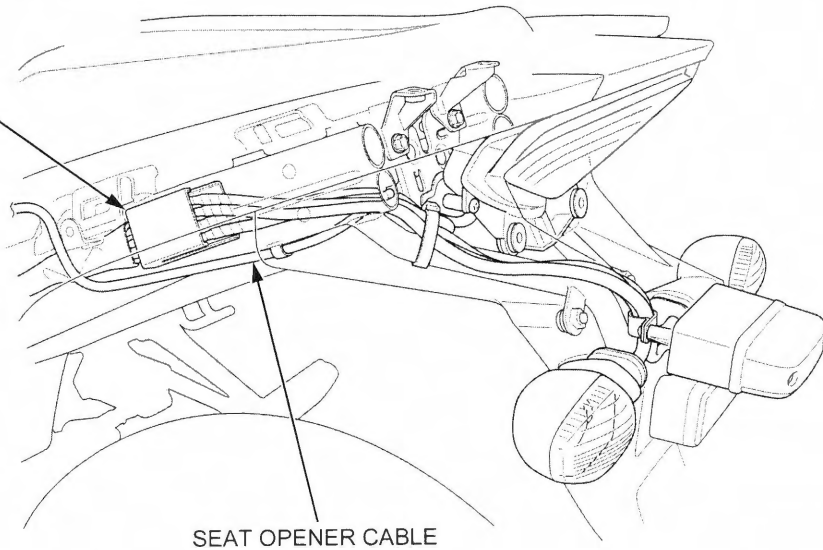
CB500XA:



CB500X/XA



- CONNECTORS (From upper side):
- RIGHT TURN SIGNAL LIGHT 2P (Light blue)
 - LEFT TURN SIGNAL LIGHT 2P (Orange)
 - LICENSE LIGHT 2P (White)
 - BRAKE/TAILLIGHT 3P (White)



GENERAL INFORMATION

EMISSION CONTROL SYSTEMS

EXHAUST EMISSION REQUIREMENT

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

NOISE EMISSION REQUIREMENT

The EPA also requires that 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.

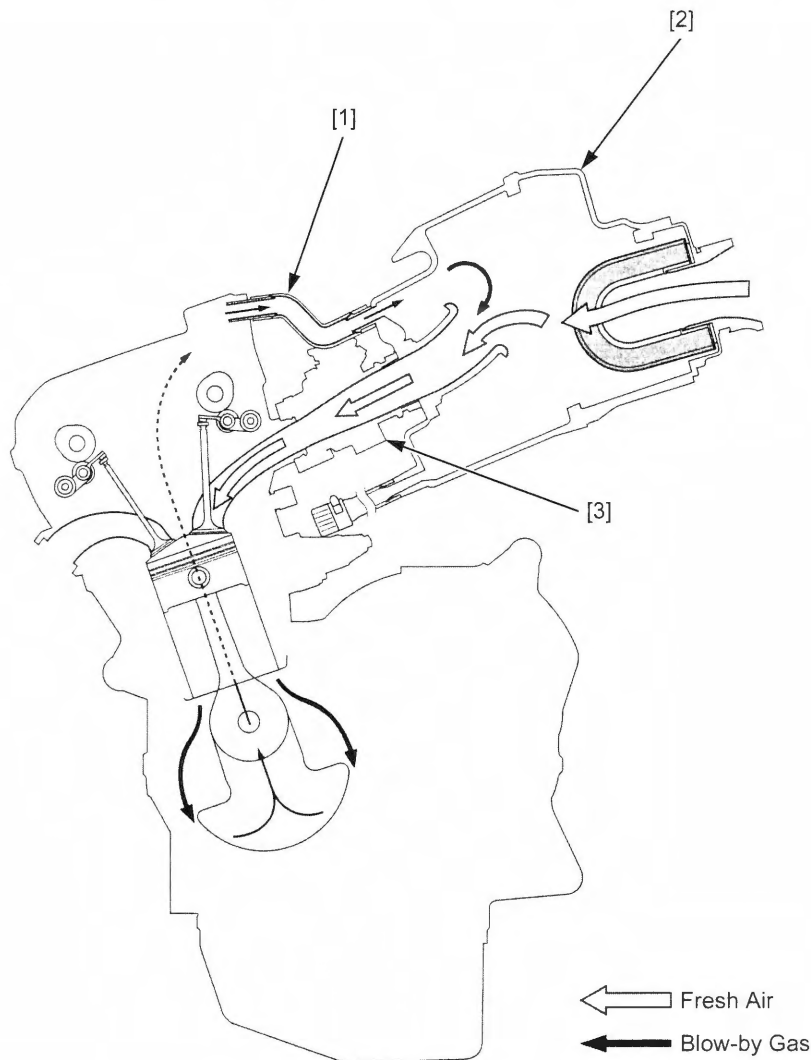
SOURCE OF EMISSIONS

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

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

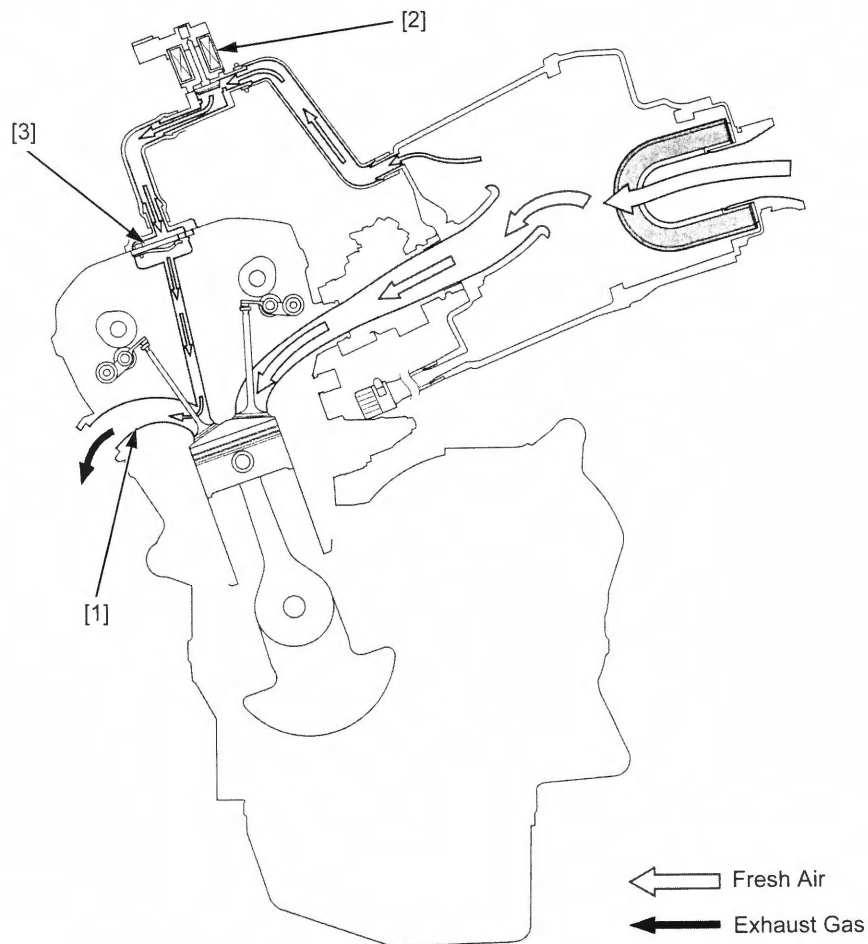
SECONDARY AIR SUPPLY SYSTEM

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, 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.



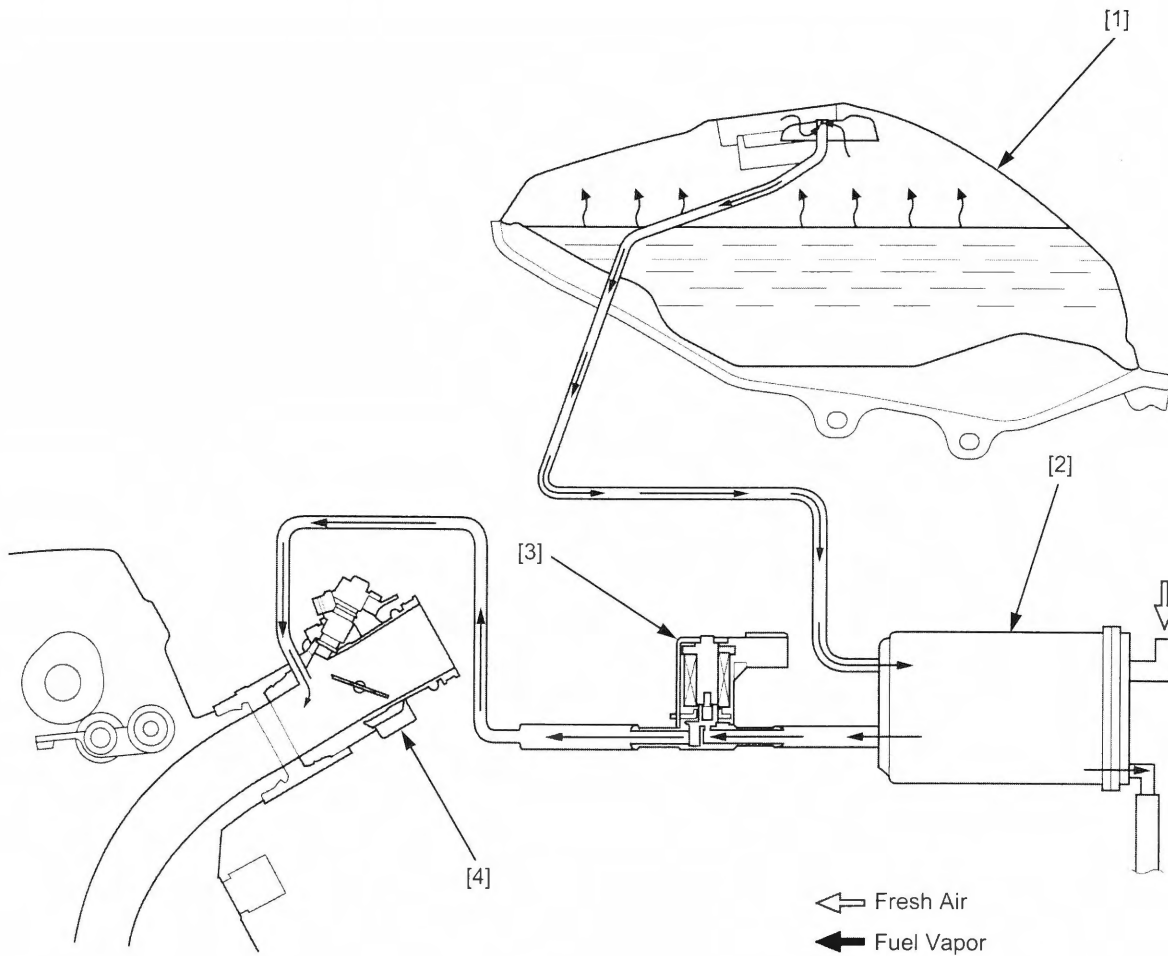
3-WAY CATALYTIC CONVERTER

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 (CO₂), nitrogen (N₂), and water vapor.

GENERAL INFORMATION

EVAPORATIVE EMISSION CONTROL SYSTEM (AC type)

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

ECM-to-COMBINATION METER TWO-WAY SERIAL COMMUNICATION

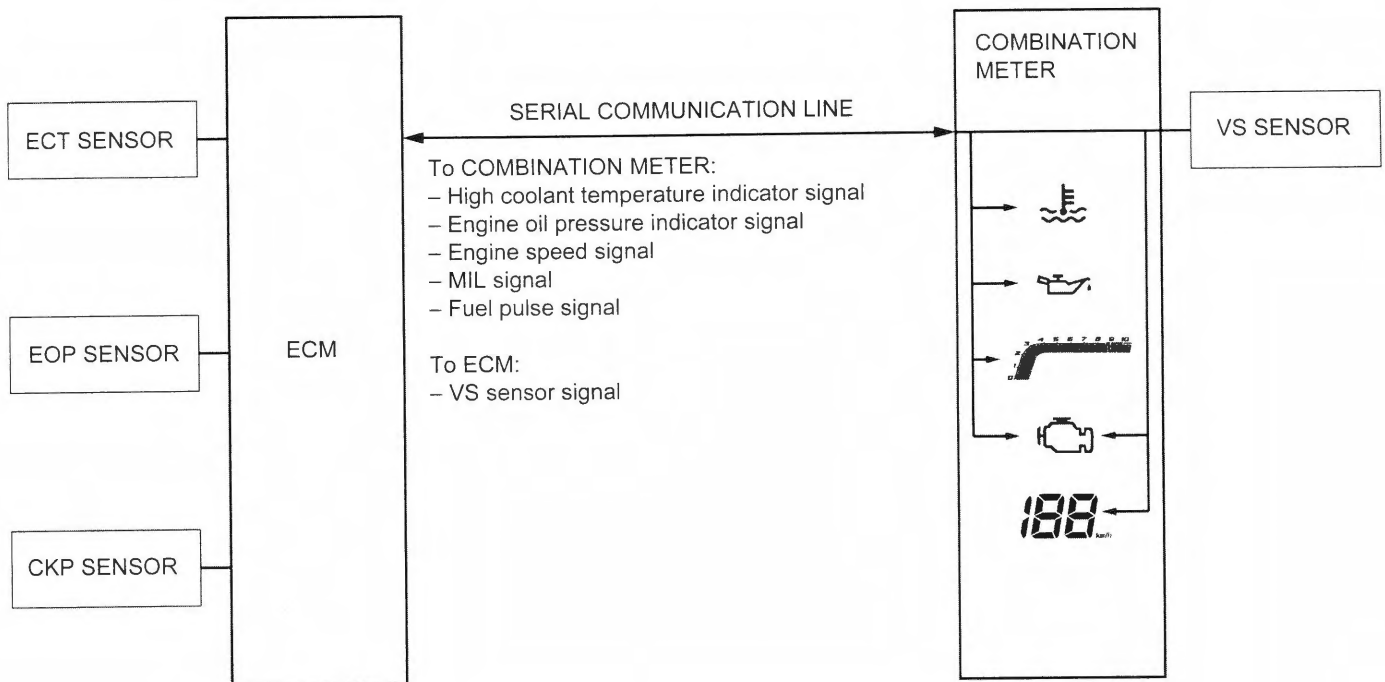
This motorcycle is equipped with a ECM-to-combination meter two-way serial communication system.

The ECM sends the following information to the combination meter.

- High coolant temperature indicator signal
- Engine oil pressure indicator signal
- Engine speed signal
- MIL signal
- Fuel pulse signal (for fuel mileage meter)

The combination meter sends the vehicle speed signal information to the ECM.

These signals are communicated between the ECM and combination meter via one wire. This wire is called the serial communication (TXD/RXD) line.



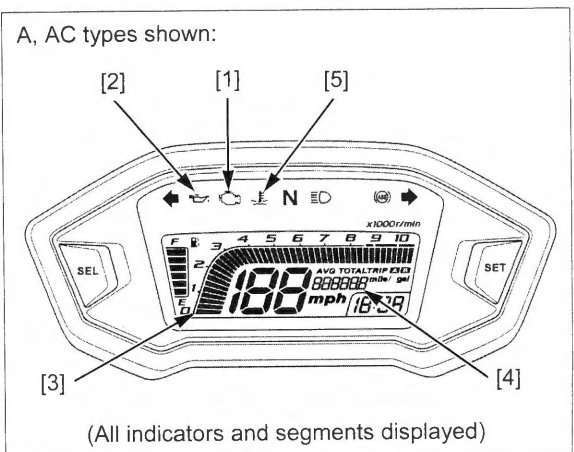
COMBINATION METER INDICATION WHEN THE SERIAL COMMUNICATION LINE IS ABNORMAL

If there is any problem in the serial communication line, the combination meter will show all of the following:

- MIL [1] and engine oil pressure indicator [2] stay on
- tachometer [3] does not operate (though the engine is running)
- odometer, tripmeter or fuel mileage meter [4] indicates "-" (while the engine is running)
- high coolant temperature indicator [5] does not come on (except for the initial operation)

Serial communication line troubleshooting (page 21-11).

If there is any problem in the serial communication, the ECM stores the DTC 86-1 (page 4-6).



MEMO

2. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION	2-2	REAR FENDER COVER	2-20
TROUBLESHOOTING	2-2	REAR FENDER A	2-20
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SIDE COVER	2-7	UNDER COWL	2-22
MIDDLE COWL	2-8	DRIVE SPROCKET COVER	2-24
BULB MAINTENANCE LID (CB500X/XA)	2-10	DRIVE CHAIN COVER	2-24
REARVIEW MIRROR	2-11	ABS MODULATOR COVER (CBR500RA/CB500FA/XA)	2-25
METER PANEL (CBR500R/RA/CB500X/XA)	2-11	FUEL TANK UNDER TRAY	2-25
FRONT COWL	2-13	SIDESTAND	2-26
WINDSCREEN (CBR500R/RA/CB500X/XA)	2-16	FOOTPEG BRACKET	2-27
GRAB RAIL	2-17	MUFFLER	2-28
REAR COWL	2-18	EXHAUST PIPE	2-29
		SEAT RAIL	2-30

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 the exhaust pipe joint nuts first, then tighten the mounting bolt.
- Always inspect the exhaust system for leaks after installation.

TROUBLESHOOTING

Excessive exhaust noise

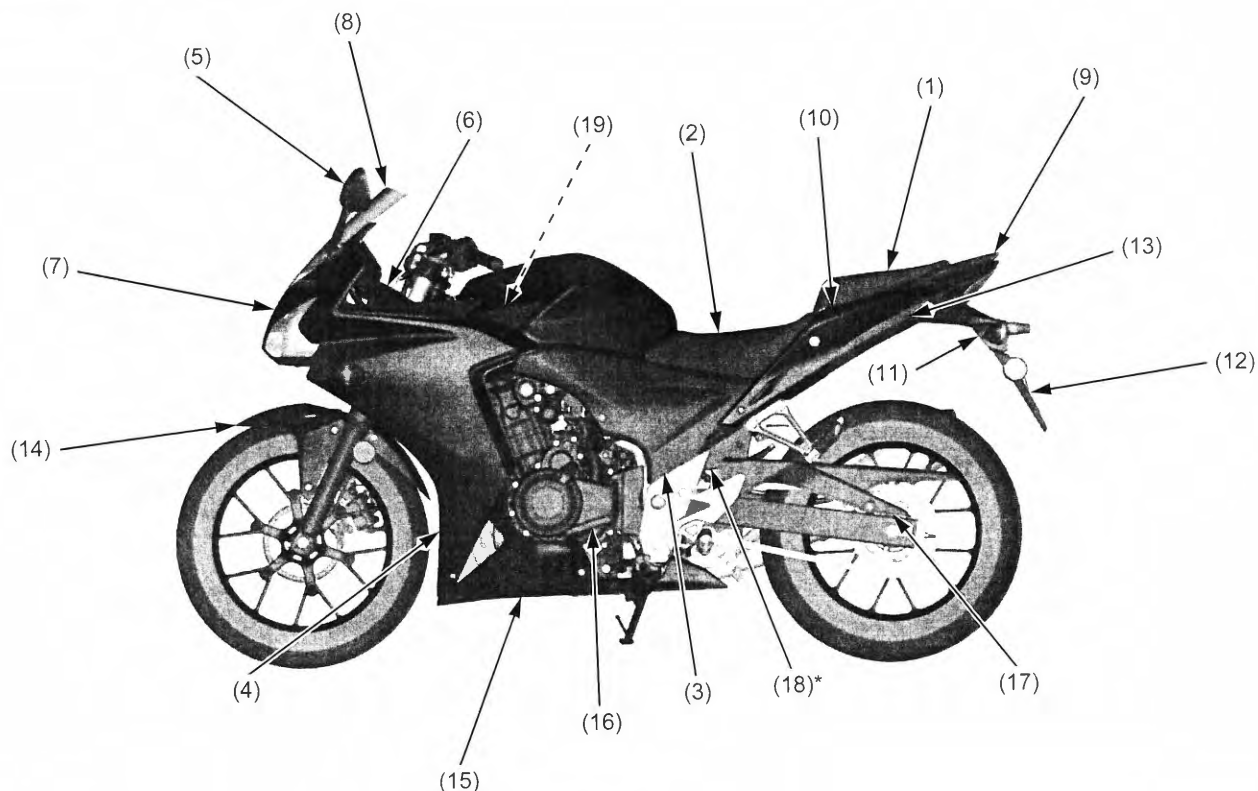
- Broken exhaust system
- Exhaust gas leak

Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

BODY PANEL LOCATIONS/REMOVAL CHART

CBR500R/RA



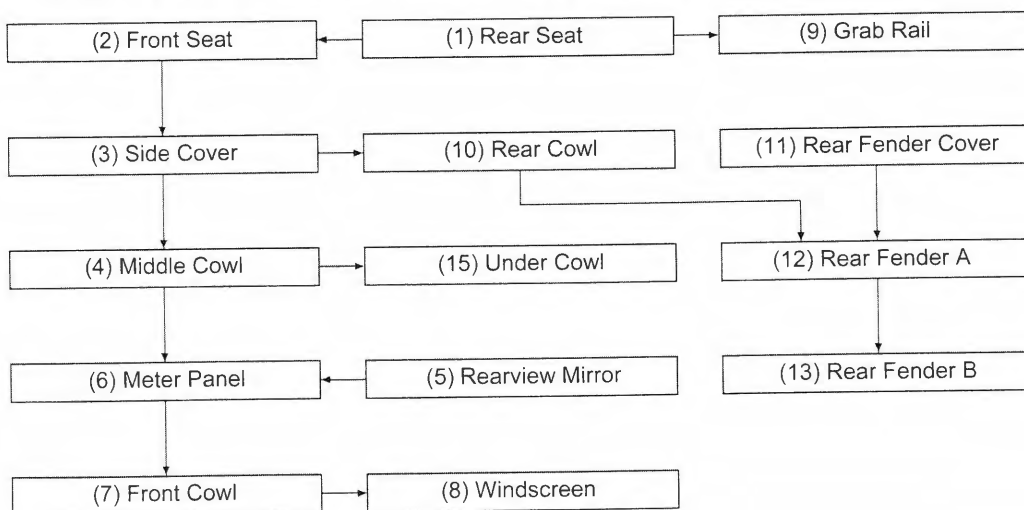
- (1) Rear Seat (page 2-6)
- (2) Front Seat (page 2-6)
- (3) Side Cover (page 2-7)
- (4) Middle Cowl (page 2-8)
- (5) Rearview Mirror (page 2-11)
- (6) Meter Panel (page 2-11)
- (7) Front Cowl (page 2-13)

- (8) Windscreen (page 2-16)
- (9) Grab Rail (page 2-17)
- (10) Rear Cowl (page 2-18)
- (11) Rear Fender Cover (page 2-20)
- (12) Rear Fender A (page 2-20)
- (13) Rear Fender B (page 2-21)
- (14) Front Fender (page 2-22)

- (15) Under Cowl (page 2-22)
- (16) Drive Sprocket Cover (page 2-24)
- (17) Drive Chain Cover (page 2-24)
- (18)* ABS Modulator Cover (page 2-25)
- (19) Fuel Tank Under Tray (page 2-25)

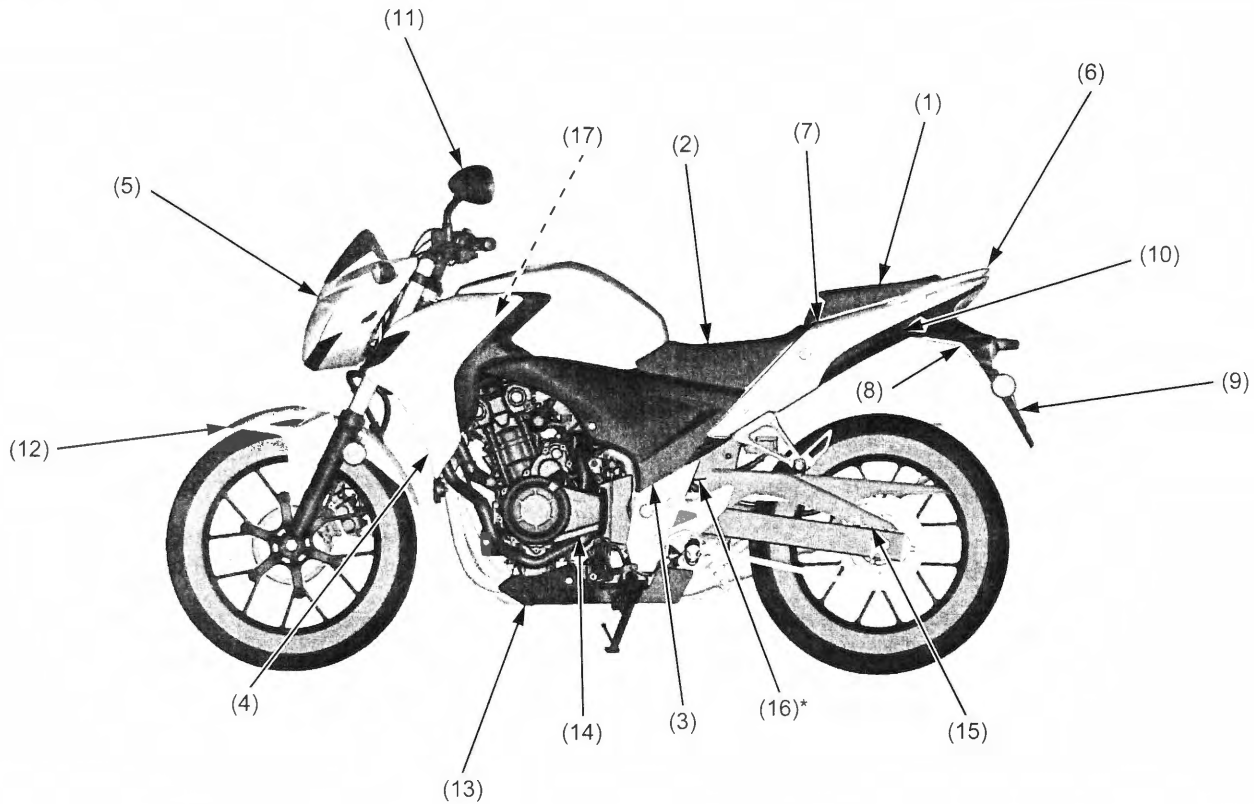
* CBR500RA only

• This chart shows removal order of frame covers by means of arrow.



FRAME/BODY PANELS/EXHAUST SYSTEM

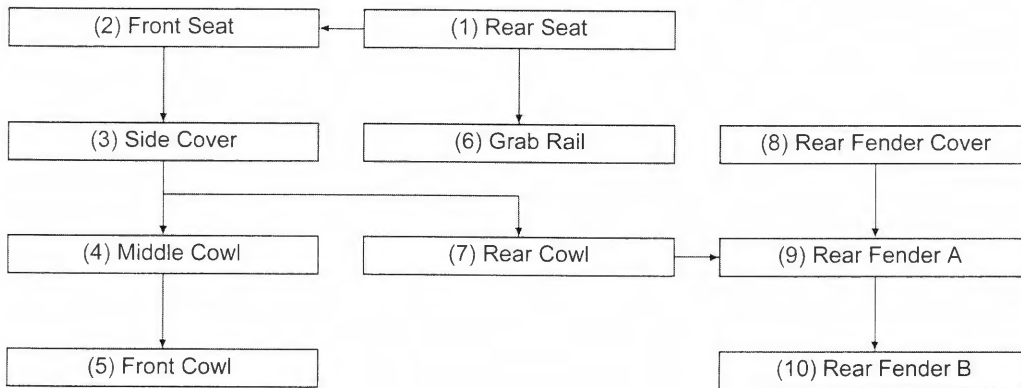
CB500F/FA



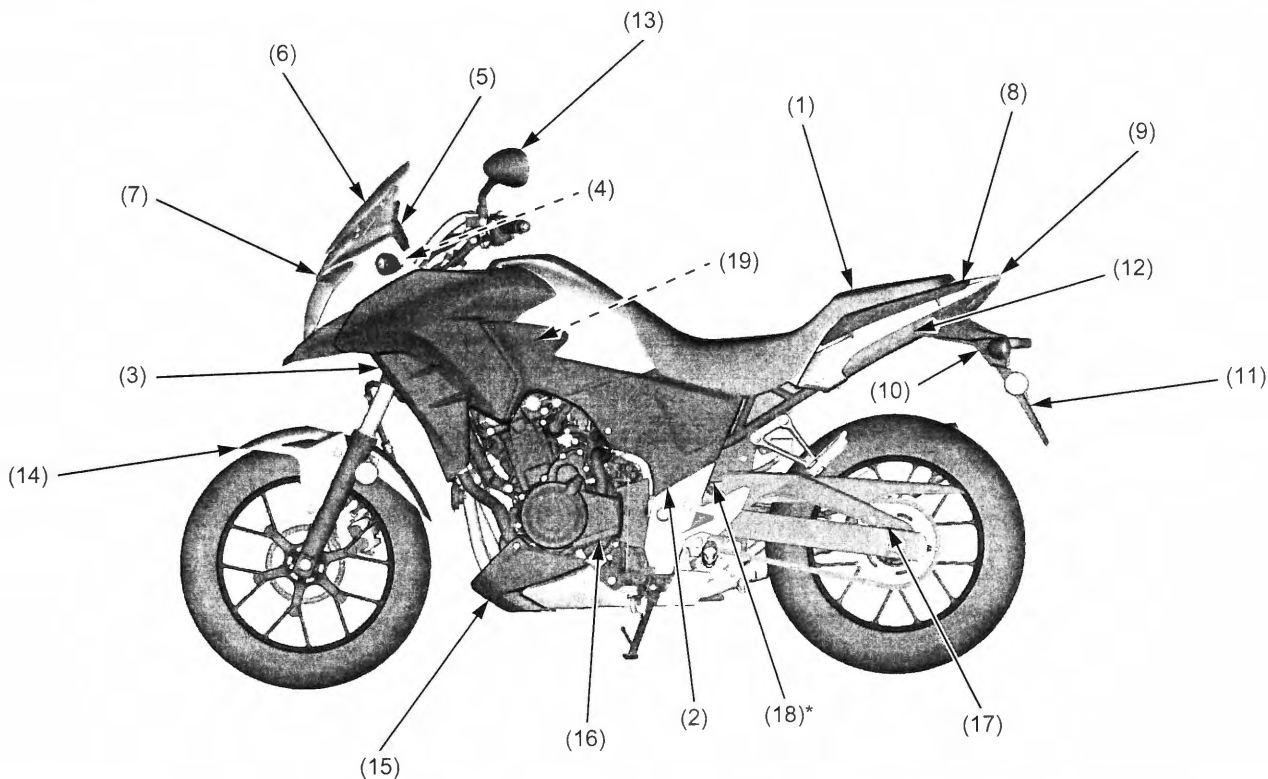
- | | | |
|----------------------------|-----------------------------------|---------------------------------------|
| (1) Rear Seat (page 2-6) | (7) Rear Cowl (page 2-17) | (13) Under Cowl (page 2-23) |
| (2) Front Seat (page 2-6) | (8) Rear Fender Cover (page 2-20) | (14) Drive Sprocket Cover (page 2-24) |
| (3) Side Cover (page 2-7) | (9) Rear Fender A (page 2-20) | (15) Drive Chain Cover (page 2-24) |
| (4) Middle Cowl (page 2-9) | (10) Rear Fender B (page 2-21) | (16)* ABS Modulator Cover (page 2-25) |
| (5) Front Cowl (page 2-13) | (11) Rearview Mirror (page 2-11) | (17) Fuel Tank Under Tray (page 2-25) |
| (6) Grab Rail (page 2-17) | (12) Front Fender (page 2-22) | |

* CB500FA only

• This chart shows removal order of frame covers by means of arrow.



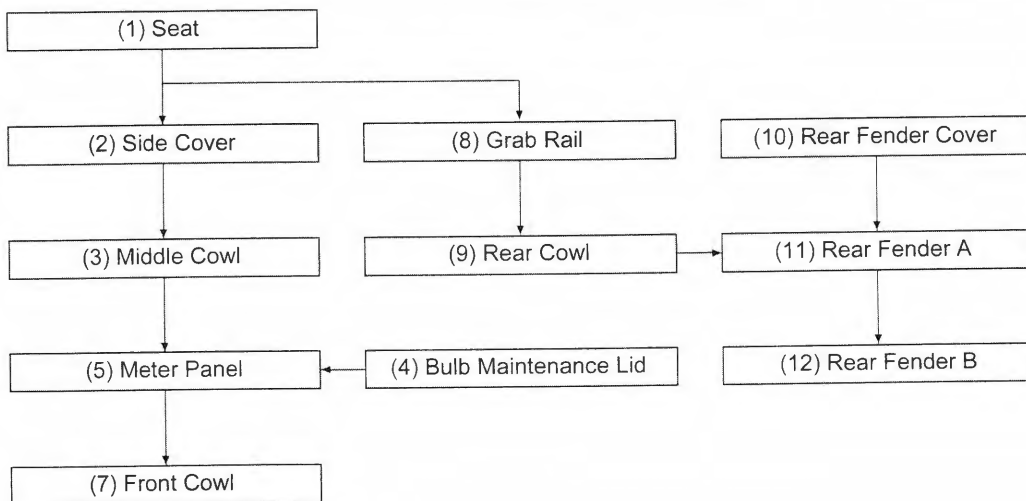
CB500X/XA



- | | | |
|--------------------------------------|------------------------------------|---------------------------------------|
| (1) Seat (page 2-6) | (8) Grab Rail (page 2-17) | (15) Under Cowl (page 2-23) |
| (2) Side Cover (page 2-7) | (9) Rear Cowl (page 2-19) | (16) Drive Sprocket Cover (page 2-24) |
| (3) Middle Cowl (page 2-9) | (10) Rear Fender Cover (page 2-20) | (17) Drive Chain Cover (page 2-24) |
| (4) Bulb Maintenance Lid (page 2-10) | (11) Rear Fender A (page 2-20) | (18)* ABS Modulator Cover (page 2-25) |
| (5) Meter Panel (page 2-12) | (12) Rear Fender B (page 2-21) | (19) Fuel Tank Under Tray (page 2-25) |
| (6) Windscreen (page 2-16) | (13) Rearview Mirror (page 2-11) | |
| (7) Front Cowl (page 2-14) | (14) Front Fender (page 2-22) | |

* CB500XA only

• This chart shows removal order of frame covers by means of arrow.



SEAT

REMOVAL/INSTALLATION

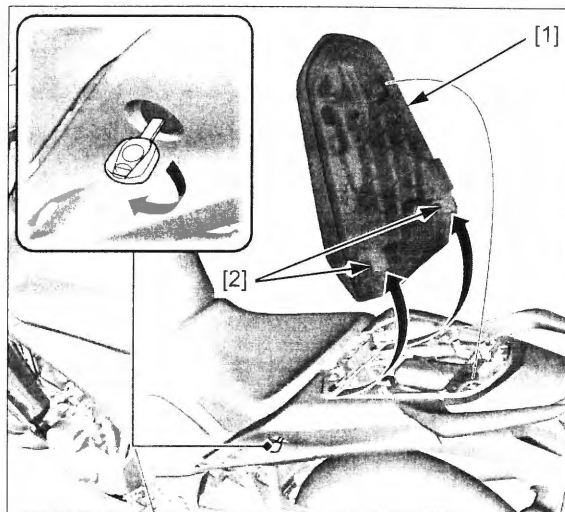
CBR500R/RA/CB500F/FA: REAR SEAT

Unhook the seat with the ignition key.

Remove the rear seat [1] by pulling it rearward.

Install the rear seat by inserting the prongs [2] under the frame.

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



CBR500R/RA/CB500F/FA: FRONT SEAT

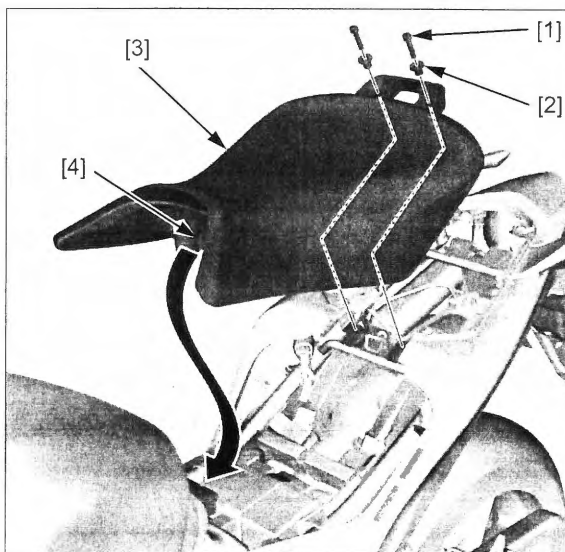
Remove the rear seat (page 2-6).

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

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

Install the front seat by inserting the prong [4] into the seat retainer.

Install the socket bolts with the collars and tighten them.



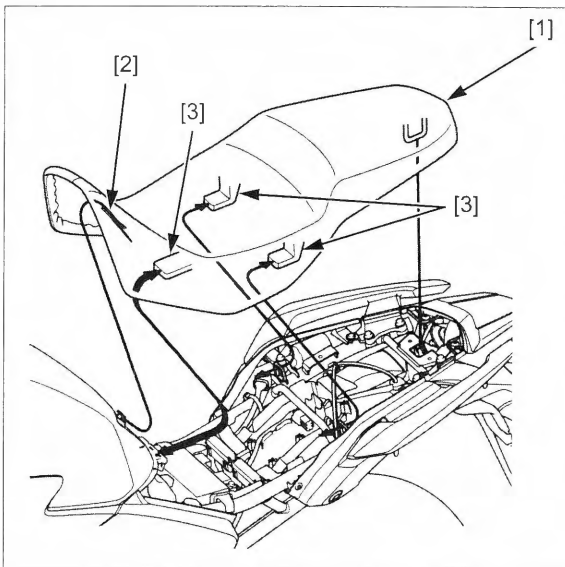
CB500X/XA

Unhook the seat with the ignition key.

Slide the seat [1] rearward and remove it.

Install the seat while aligning the groove [2] with the stopper on the fuel tank, and insert the prongs [3] under the frame.

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



SIDE COVER

REMOVAL/INSTALLATION

CBR500R/RA/CB500F/FA

Remove the front seat (page 2-6).

Remove the following:

- trim clip (pin head) [1]
- socket bolt [2]

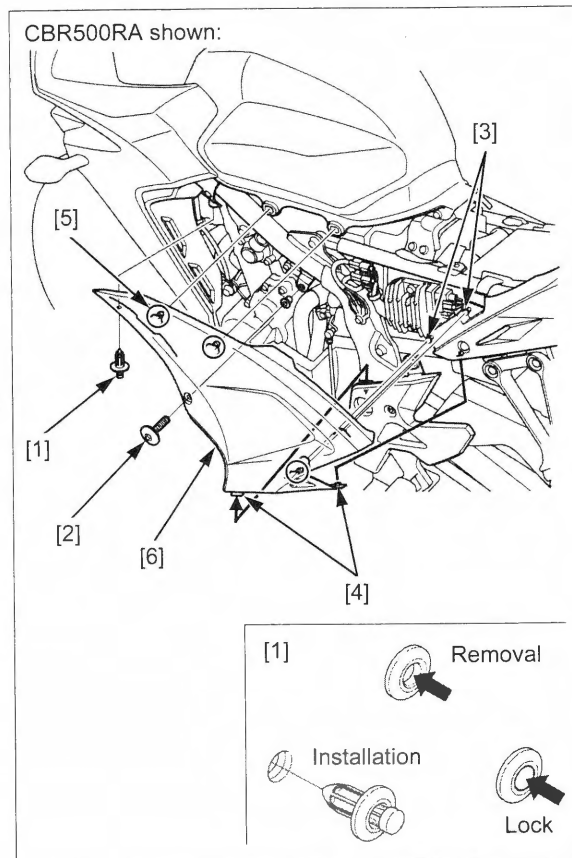
Release the two grommets from the bosses [3] of the rear cowl, and the two tabs [4] from the footpeg bracket and rear cowl.

Release the three bosses [5] from the grommets and remove the side cover [6].

Installation is in the reverse order of removal.

NOTE:

- Before installing the fasteners, be sure to set the two tabs into place properly.



CB500X/XA

Remove the seat (page 2-6).

Remove the following:

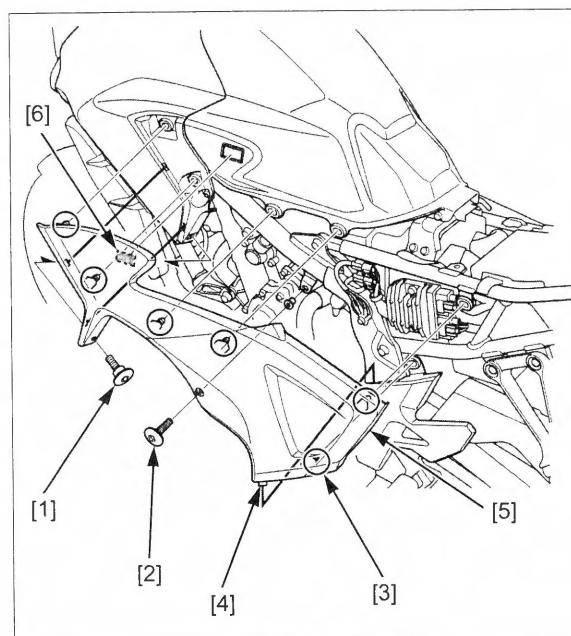
- 5 x 8 mm setting socket bolt [1]
- 6 x 22 mm socket bolt [2]

Release the six bosses [3] off of the grommets from the rear side, and the lower tab [4] from the footpeg bracket to remove the side cover [5].

Installation is in the reverse order of removal.

NOTE:

- Insert the bosses in the sequence from the front side, being careful not to dislodge the grommets, and press the hook and loop fastening area [6] of the cover to attach it onto the fuel tank securely.



MIDDLE COWL

REMOVAL/INSTALLATION

CBR500R/RA

Remove the side cover (page 2-7).

Remove the following:

- two trim clips (pin head) [1]
- socket bolt (6 x 10 mm) and washer [2]
- three setting socket bolts
(two 5 x 10 mm) [3]
(6 x 10 mm) [4]

Release the snap fit clip [5] by pulling it straight out of the under cowl.

Release the hook and loop fastening [6]. Release the meter panel [7] and middle cowl [8] from the bolt hole stud [9] on the fuel tank.

Press the meter panel inward and release the six side tabs [10] while spreading the middle cowl slightly.

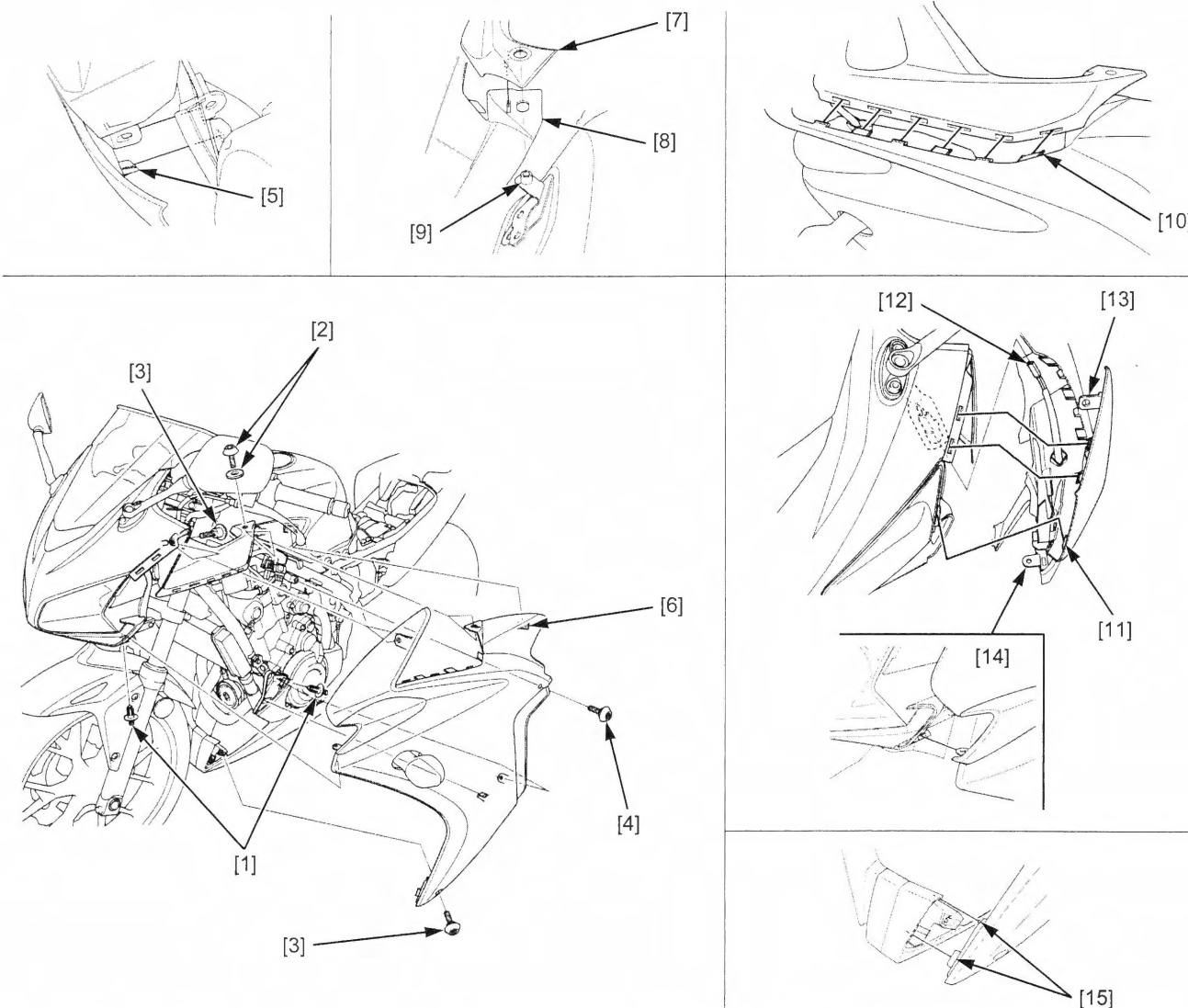
Release the three front tabs [11] by turning the rear side of the middle cowl downward, then disconnect the turn signal/position light 3P connector [12].

Installation is in the reverse order of removal.

NOTE:

- When engaging the three front tabs, insert the bolt fixing stay [13] behind the meter panel and the trim clip fixing stay [14] into the front cowl.
- When attaching the snap fit clip, align the two lower tabs [15] with the slots in the under cowl.

Do not hang the cowl by the turn signal/position light wire.



CB500F/FA

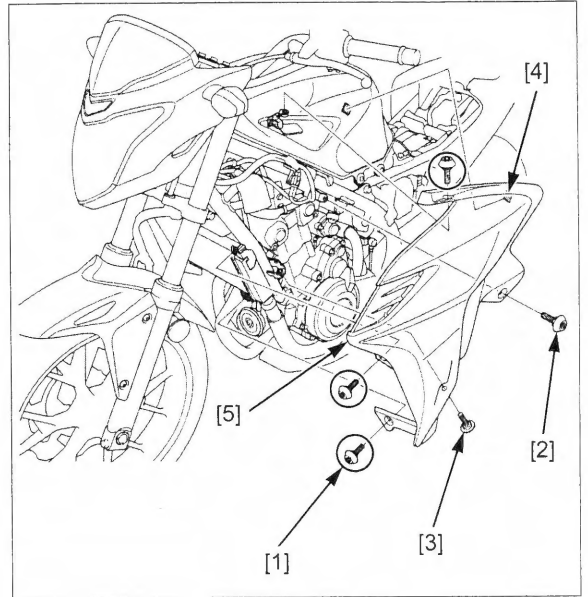
Remove the side cover (page 2-7).

Remove the following setting socket bolts:

- three 6 x 10 mm (black) [1]
- 6 x 10 mm (silver) [2]
- 6 x 14 mm (black) [3]

Release the hook and loop fastening [4], and remove the middle cowl [5].

Installation is in the reverse order of removal.



CB500X/XA

Remove the side cover (page 2-7).

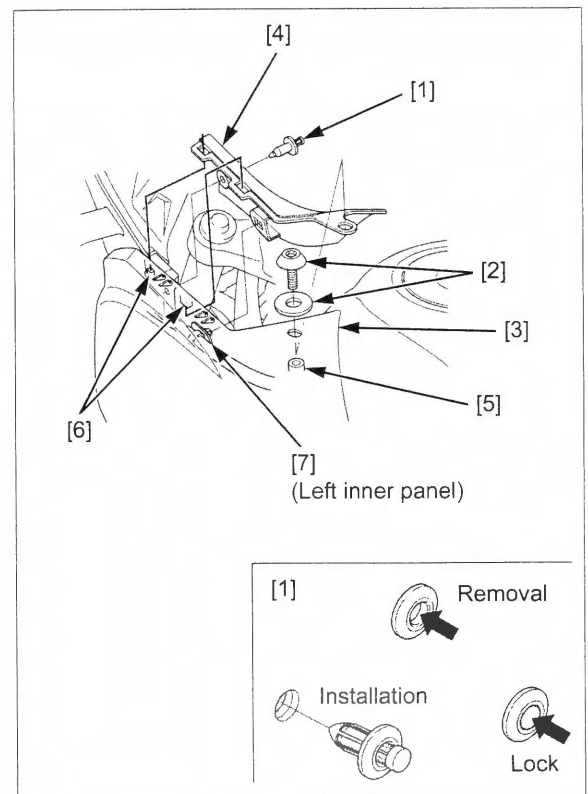
Remove the following:

- trim clip (pin head) [1]
- socket bolt (6 x 10 mm) and washer [2]

Release the middle cowl [3] and inner panel [4] from the bolt hole stud [5] on the fuel tank.

Pull the inner panel inward while pushing it down and remove it from the tabs [6] of the middle cowl and meter panel.

Left inner panel: Remove the band clip [7] to remove the inner panel.



FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the following:

- trim clip (Phillips head) [1]
- 6 x 10 mm setting socket bolt (silver) [2]
- two 6 x 10 mm setting socket bolts (black) [3]

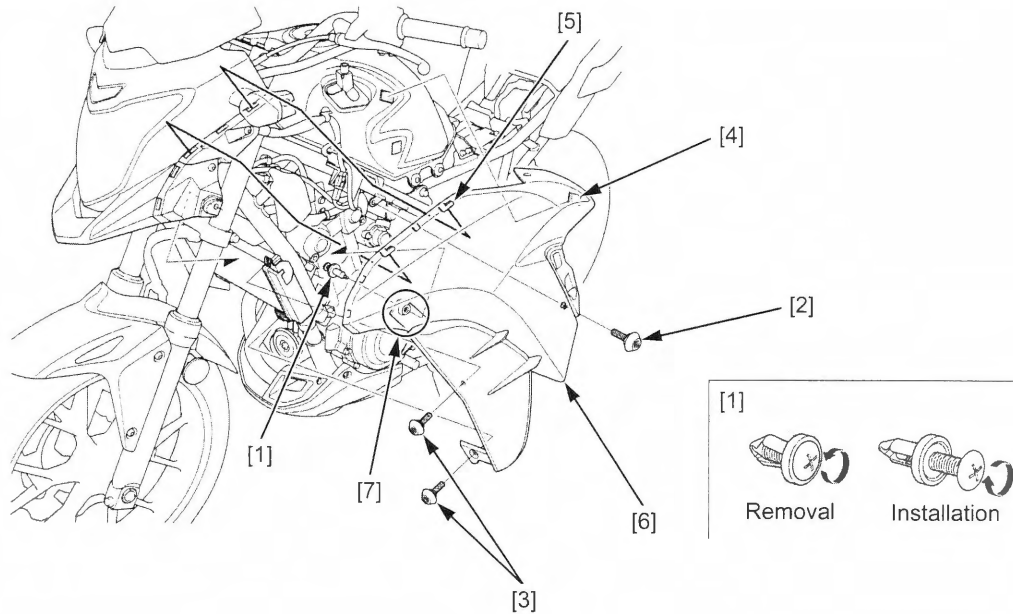
Release the hook and loop fastening [4].

Release the five tabs [5] by sliding the middle cowl [6] forward and remove it.

Installation is in the reverse order of removal.

NOTE:

- Set the front end of the inner shroud [7] on the middle cowl onto the inside of the front cowl.



BULB MAINTENANCE LID (CB500X/XA)

REMOVAL/INSTALLATION

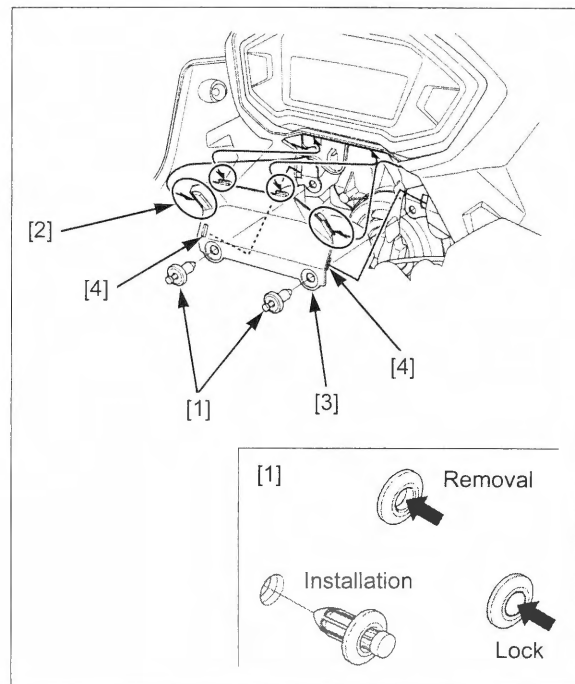
Remove the two trim clips (pin head) [1].

Release the four tabs [2] and remove the bulb maintenance lid [3].

Installation is in the reverse order of removal.

NOTE:

- Set the two lower tabs [4] into the grooves in the meter panel properly.



REARVIEW MIRROR

REMOVAL/INSTALLATION

CBR500R/RA

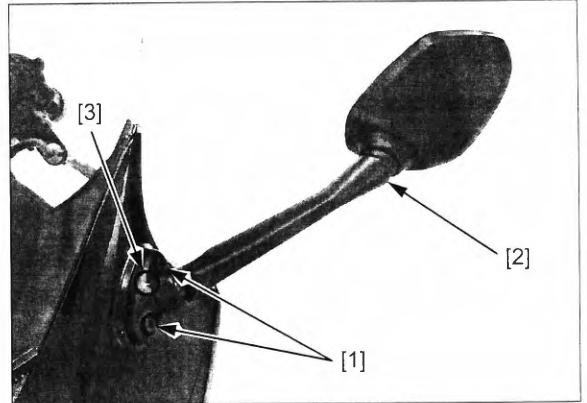
Remove the two socket bolts [1] and rearview mirror [2].
Installation is in the reverse order of removal.

NOTE:

- Install with the reference mark [3] facing the rear side.

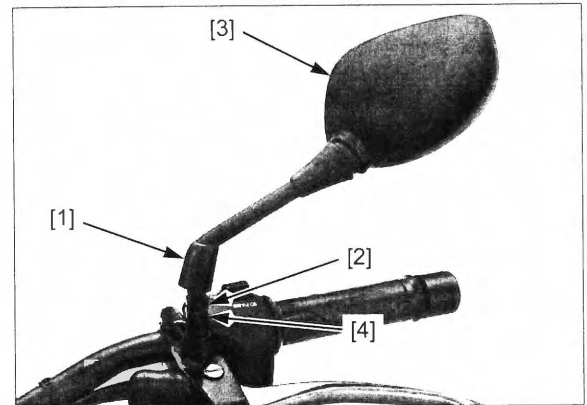
TORQUE:

Rearview mirror mounting socket bolt:
5.2 N·m (0.5 kgf·m, 3.8 lbf·ft)



CB500F/FA/X/XA

Slide the boot [1] off from the lock nut [2].
Loosen the lock nut (left-hand threads) and remove the rearview mirror [3].
Remove the mirror adaptor [4].
Installation is in the reverse order of removal.



METER PANEL (CBR500R/RA/CB500X/XA)

REMOVAL/INSTALLATION

CBR500R/RA

Remove the middle cowls (page 2-8).

If you plan to remove the front cowl and windscreen, you must remove the rearview mirrors (page 2-11).

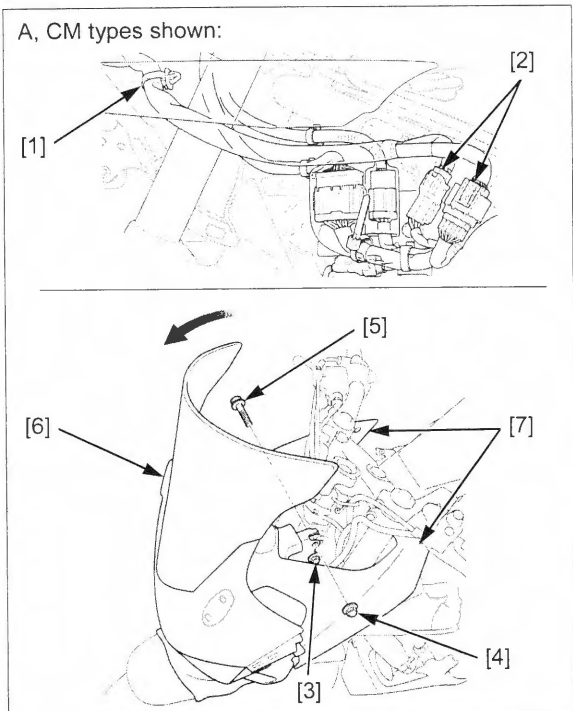
Remove the band clip [1] from the meter panel.

Disconnect the front sub-wire harness 4P (Black) and 12P (Black) connectors [2].

Cover the front fender with shop towels.

Loosen the lower mounting nut [3] of the cowl stay. Remove the upper mounting nut [4] and bolt [5], then rest the front cowl assembly [6] against the fender.

Position the front cowl assembly so the meter panel ends [7] are not interfered with the handlebars.



FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the following:

- two setting socket bolts (5 x 10 mm) [1]
- two washers [2]
- two rubber washers [3]

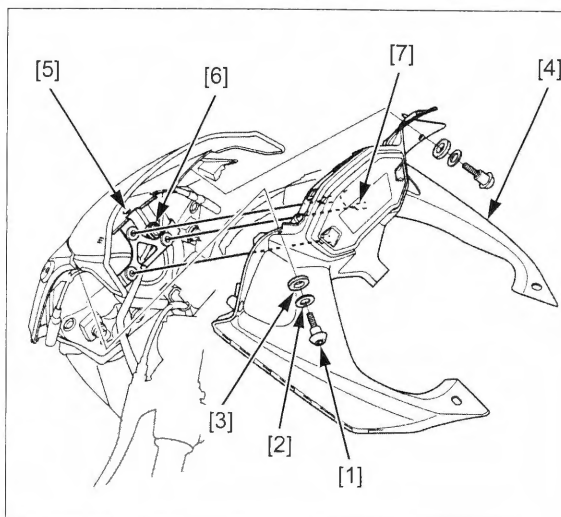
Raise the front side of the meter panel [4] and release the tabs [5].

Disconnect the 16P (Gray) connector [6] to remove the meter panel.

Installation is in the reverse order of removal.

NOTE:

- When connecting the 16P (Gray) connector, install the connector boot into the groove in the combination meter properly.
- Align the three bosses [7] of the combination meter with the grommets and engage the tabs.
- Install the cowl stay mounting bolt from the right side.



CB500X/XA

Remove the following:

- middle cowls (page 2-9)
- bulb maintenance lid (page 2-10)
- two 5 x 10 mm socket bolts (lower side) [1]
- two 6 x 10 mm socket bolts (upper side) [2]

Release the four tabs [3] on both sides of the front cowl by spreading it.

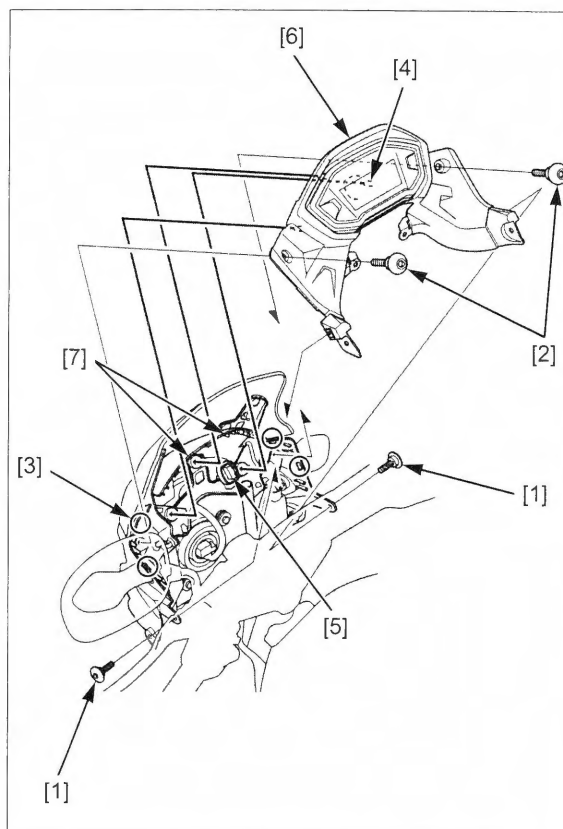
Release the three bosses [4] from the grommets.

Disconnect the 16P (Gray) connector [5] to remove the meter panel [6].

Installation is in the reverse order of removal.

NOTE:

- When connecting the 16P (Gray) connector, install the connector boot into the groove in the combination meter properly.
- Set the upper edge of the meter panel into the guides [7] and then engage the three tabs with the groove in the meter panel.



FRONT COWL

REMOVAL/INSTALLATION

CBR500R/RA

Remove the meter panel (page 2-11).

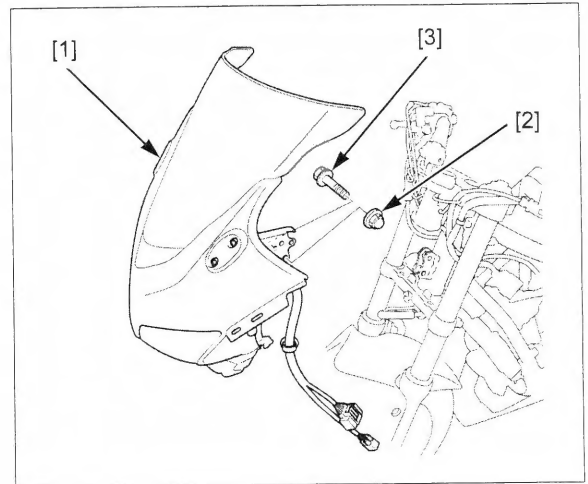
Support the front cowl assembly [1] securely and remove the cowl stay lower mounting nut [2] and bolt [3], then remove it.

For disassembly/assembly, refer to Windscreen (page 2-16).

Installation is in the reverse order of removal.

NOTE:

- Install the cowl stay mounting bolt from the right side.



CB500F/FA

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

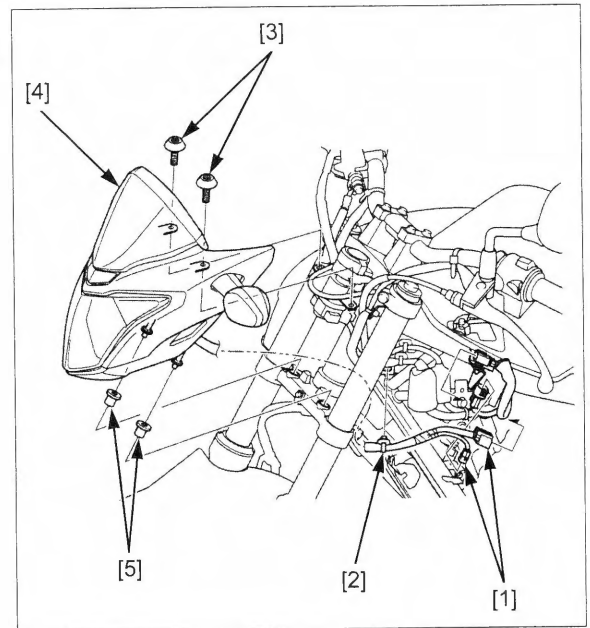
Disconnect the front sub-wire harness 4P (Black) and 12P (Black) connectors [1].

Remove the following:

- band clip [2]
- two socket bolts (6 x 10 mm) [3]
- front cowl assembly [4]
- two mounting grommets [5]

For disassembly/assembly (page 2-14).

Installation is in the reverse order of removal.



FRAME/BODY PANELS/EXHAUST SYSTEM

CB500X/XA

Remove the meter panel (page 2-12).

Disconnect the following connectors:

- headlight 3P (Black) [1]
- turn signal/position light 3P (Orange) [2]
- turn signal/position light 3P (Light blue) [3]

Remove the position light 2P (Black) connector [4] from the stay and disconnect it.

Support the front cowl assembly [5] securely.

Remove the following fasteners and remove the front cowl assembly.

- four socket setting bolts (outside; 6 x 10 mm) [6]
- two bolts and washers (inner side) [7]
- two screws and washers (upper side) [8]

For disassembly/assembly, refer to Lights/Meters/Switches section:

- headlight (page 21-6)
- turn signal/position light (page 21-8)

Installation is in the reverse order of removal.

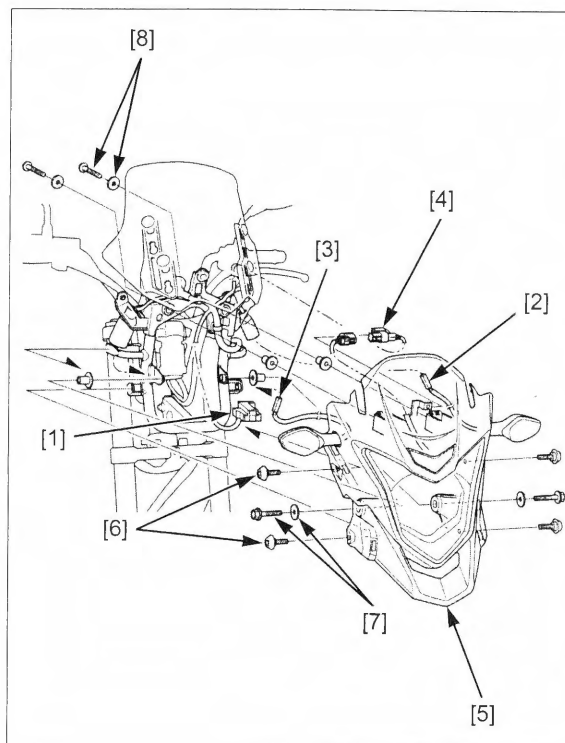
TORQUE:

Headlight mounting bolt:

8.5 N·m (0.9 kgf·m, 6.3 lbf·ft)

Headlight mounting screw:

4.5 N·m (0.5 kgf·m, 3.3 lbf·ft)



DISASSEMBLY/ASSEMBLY (CB500F/FA)

METER COVER

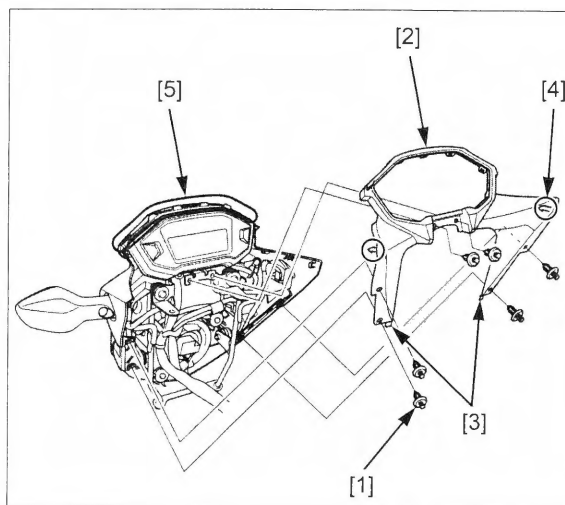
Remove the front cowl assembly (page 2-13).

Remove the six trim clips (pin head) [1].

Release the following tabs in the sequence as follows and remove the meter panel [2].

- two lower tabs [3]
- two side tabs [4]
- five upper tabs [5]

Installation is in the reverse order of removal.



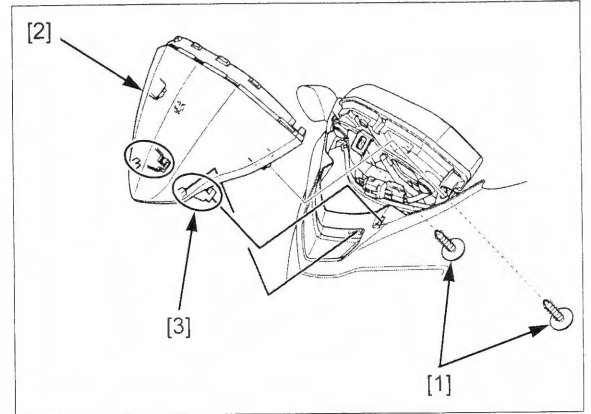
METER VISOR

Remove the meter cover (page 2-14).

Remove the two tapping screws [1].

Slide the meter visor [2] forward to release the four tabs [3] and remove it.

Installation is in the reverse order of removal.



REAR HEADLIGHT COVER

Remove the meter cover (page 2-14).

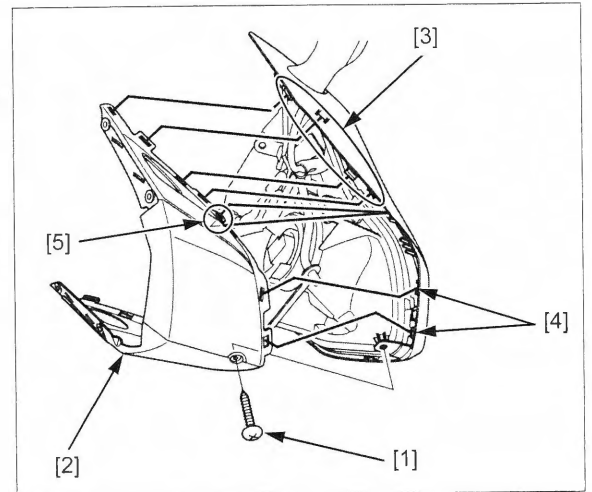
Remove the tapping screw [1].

Release the rear headlight cover [2] from each four side tabs [3] and four lower tabs [4], and remove it.

Installation is in the reverse order of removal.

NOTE:

- Insert the guide areas (holes) [5] in between the front cowl and front headlight cover, and align them with the guide bosses.



FRONT COWL

Remove the following:

- turn signal/position lights (page 21-7)
- meter visor (page 2-15)
- rear headlight cover (page 2-15)

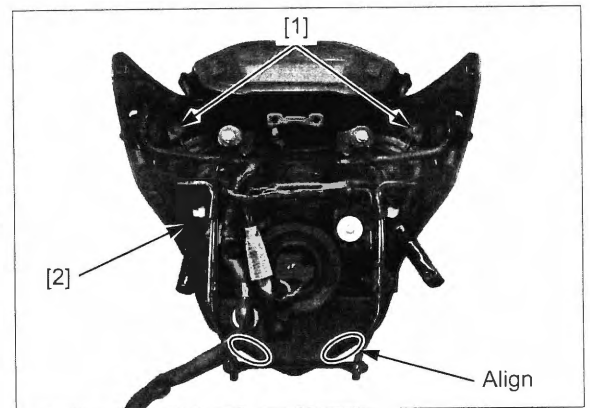
Remove the two tapping screws [1].

Release the upper ends of the headlight housing off of the screw hole studs and remove the headlight assembly [2].

Installation is in the reverse order of removal.

NOTE:

- Align the two tabs with the grooves in the front cowl properly.



WINDSCREEN (CBR500R/RA/CB500X/XA)

REMOVAL/INSTALLATION

CBR500R/RA

Remove the front cowl assembly (page 2-13).

Remove the following:

- two setting screws [1]
- setting socket bolt (5 x 10 mm) [2]
- two washer-bolts [3]

Release the two tabs [4] on both sides of the front cowl [5].

Release the front cowl off of the bolt hole studs [6] and remove it.

Remove the two collars [7].

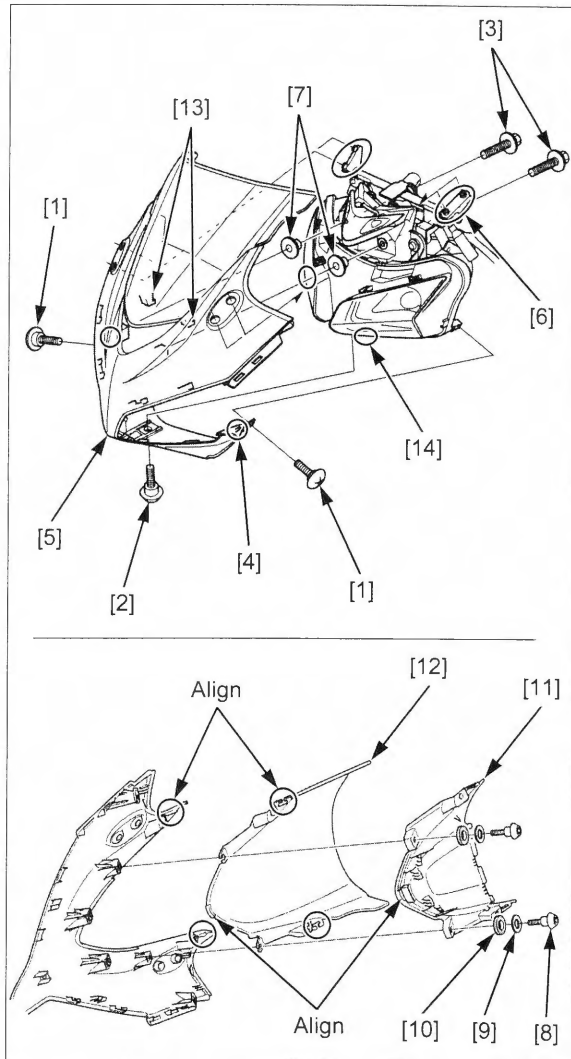
Remove the following:

- two setting socket bolts (5 x 10 mm) [8]
- two washers [9]
- two rubber washers [10]
- windscreen inner cover [11]
- windscreen [12]

Installation is in the reverse order of removal.

NOTE:

- Install the windscreen onto the inner cover, aligning the tab with the slot, and the windscreen/inner cover assembly onto the front cowl, aligning the slots with the tabs.
- When installing the front cowl, align the following tabs with the grooves properly.
 - two front cowl inner tabs [13]
 - two headlight housing lower tabs [14]

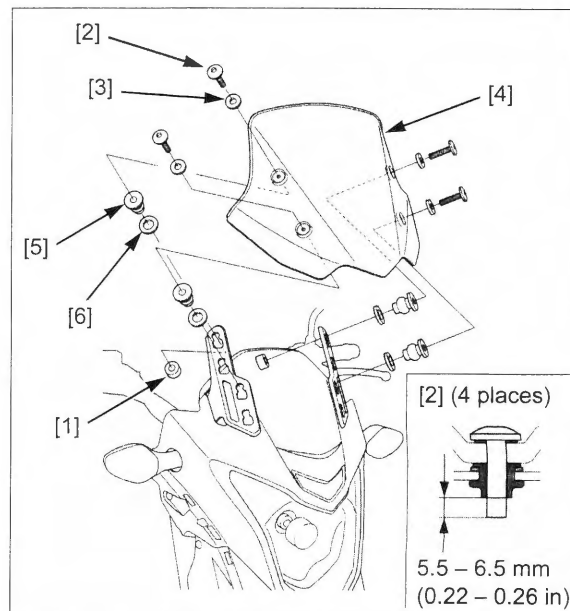


CB500X/XA

Remove the following:

- two rubber caps (rear side) [1]
- four socket bolts [2]
- four plastic washers (small) [3]
- windscreen [4]
- four setting nuts [5] (by sliding them down)
- four plastic washers (large) [6]

Installation is in the reverse order of removal.



GRAB RAIL

REMOVAL/INSTALLATION

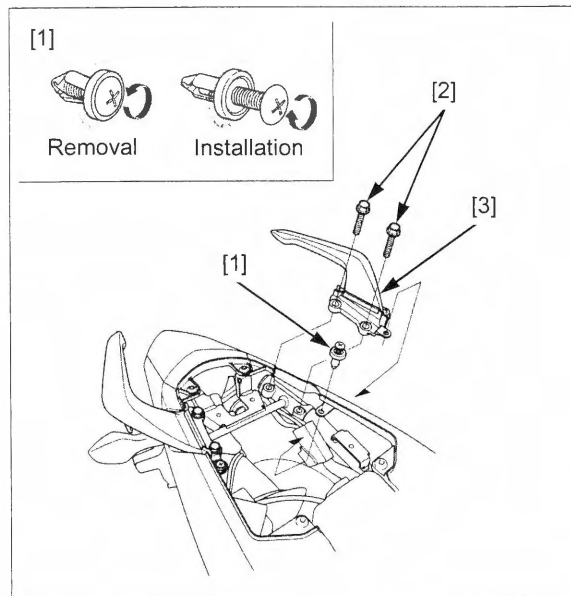
CBR500R/RA/CB500F/FA

Remove the rear seat (page 2-6).

Remove the following:

- trim clip (Phillips head) [1]
- two bolts [2]
- grab rail [3]

Installation is in the reverse order of removal.



CB500X/XA

Remove the seat (page 2-6).

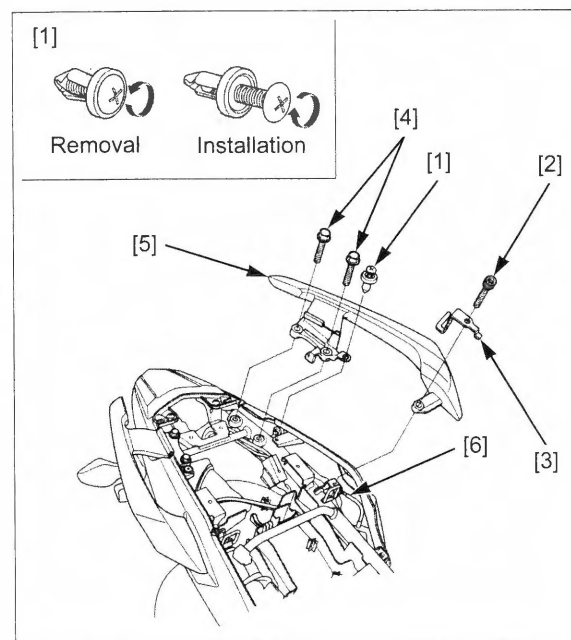
Remove the following:

- trim clip (Phillips head) [1]
- socket bolt [2] and cable guard plate [3]
- two bolts [4]
- grab rail [5]

Installation is in the reverse order of removal.

NOTE:

- Make sure the seat opener cable [6] is positioned under the cable guard plate.



REAR COWL

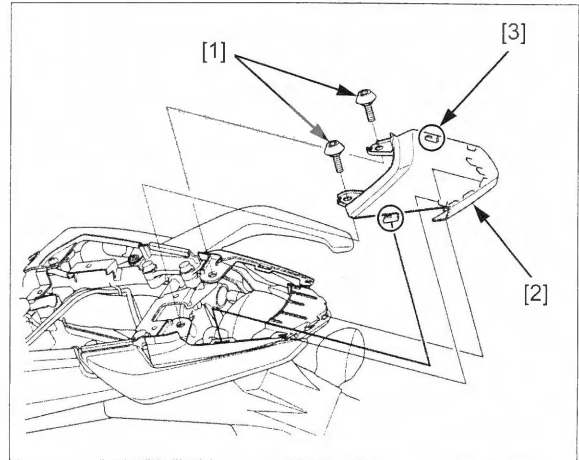
REMOVAL/INSTALLATION

CBR500R/RA/F/FA

Remove the side cover (page 2-7).

Remove the two setting socket bolts (6 x 10 mm) [1].

Slide the rear center cowl [2] rearward to release the tabs [3] carefully and remove it.



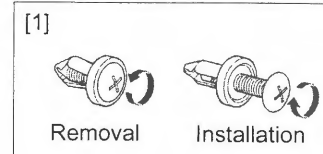
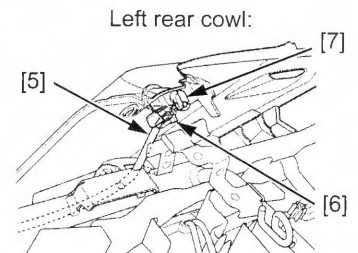
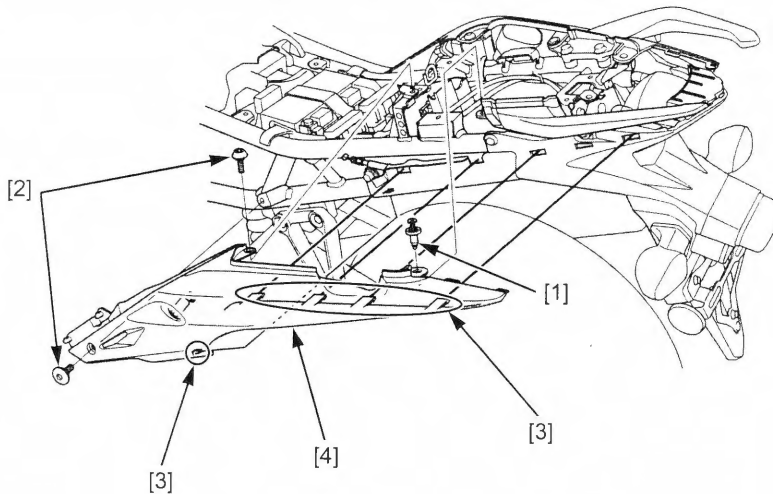
Remove the following:

- trim clip (Phillips head) [1]
- two setting socket bolts (6 x 10 mm) [2]

Be careful not to scratch the rear cowl on the grab rail. Raise the bottom of the cowl slightly and release the five tabs [3], then remove the rear cowl [4] from the rear fender.

Left rear cowl: Release the seat opener cable [5] off of the cable holder [6] and disconnect it from the lock arm [7] to remove the rear cowl.

Installation is in the reverse order of removal.

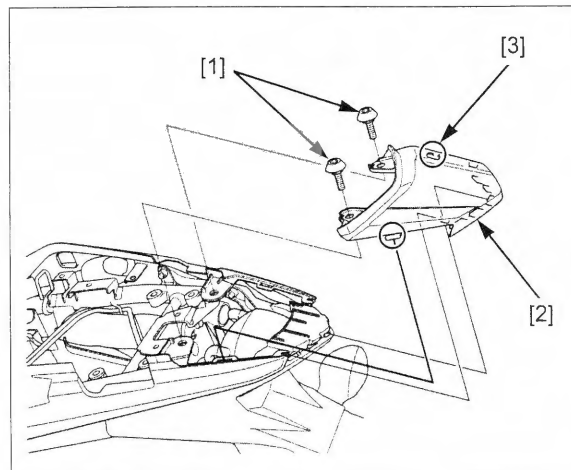


CB500X/XA

Remove the grab rail (page 2-17).

Remove the two setting socket bolts (6 x 10 mm) [1].

Slide the rear center cowl [2] rearward to release the tabs [3] carefully and remove it.



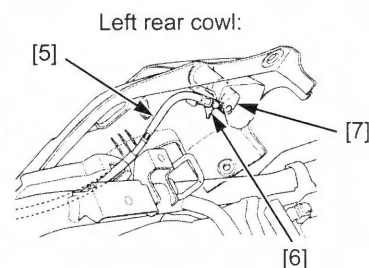
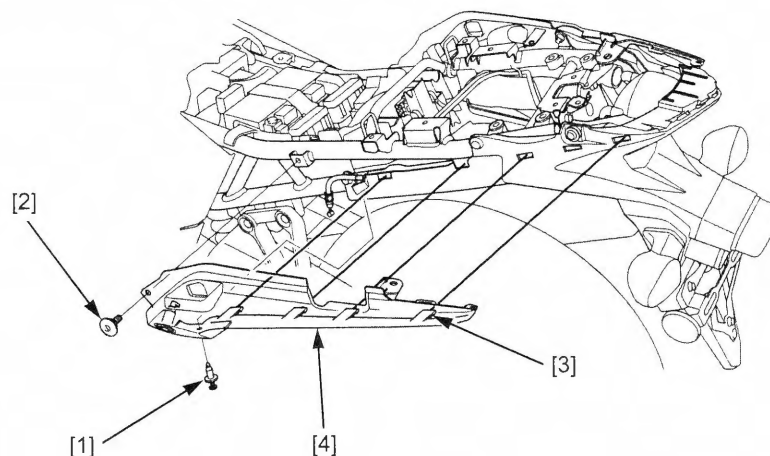
Remove the following:

- trim clip (Phillips head) [1]
- setting socket bolt (5 x 8 mm) [2]

Raise the bottom of the cowl slightly and release the four tabs [3], then remove the rear cowl [4] from the rear fender.

Left rear cowl: Release the seat opener cable [5] off of the cable holder [6] and disconnect it from the lock arm [7] to remove the rear cowl.

Installation is in the reverse order of removal.



REAR FENDER COVER

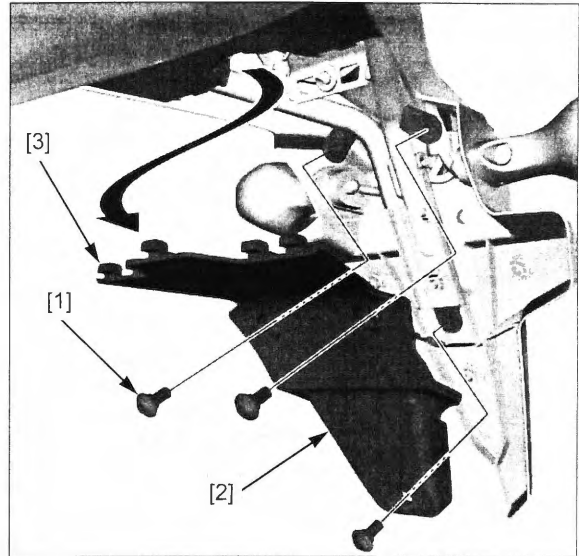
REMOVAL/INSTALLATION

Remove the three setting socket bolts (6 x 10 mm) [1].

Raise the lower portion of the rear fender cover [2] and release it from the rear fender A.

Pull the rear fender cover rearward and release the five tabs [3] to remove it from the rear fender B.

Installation is in the reverse order of removal.



REAR FENDER A

REMOVAL/INSTALLATION

Remove the following:

- rear cowls (page 2-18)
- rear fender cover (page 2-20)

Disconnect the following connectors [1] in the connector boot:

- turn signal light 2P (Light blue)
- turn signal light 2P (Orange)
- license light 2P (White)
- brake/taillight 3P (White)

Remove the wire band [2].

Remove the three nuts [3], collars [4] and bolts [5], and the number plate bracket [6].

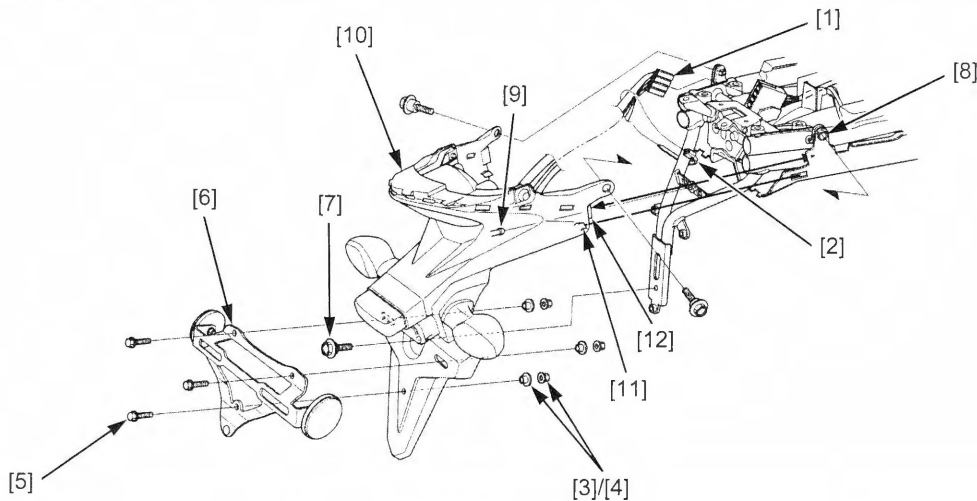
Remove the three setting bolts [7].

Release the front ends off of the bolt hole guides [8] and the boss [9] from the grommet to remove the rear fender A [10].

Installation is in the reverse order of removal.

NOTE:

- Insert the two setting tabs [11] into the slots and set the two guide tabs [12] onto the inner wall of the rear fender B properly.



REAR FENDER B

REMOVAL/INSTALLATION

Remove the following:

- battery (page 20-5)
- rear fender A (page 2-20)
- tool kit strap [1] (from the hook of the frame)
- cable clip [2]
- battery rubber sheet [3] (from the strap holders)
- connector boot [4]
- option 2P connector [5]
- fuse boxes [6]
- three setting bolts [7]

Release the fender arms [8] and remove the main wire harness [9] out of the fender B [10].

Remove the following:

- two band clips (right side; battery cables) [11]
- band clip (left side; main wire harness) [12]

Release the prongs [13] and setting guides [14] from the frame by pulling the rear fender B rearward and remove the following:

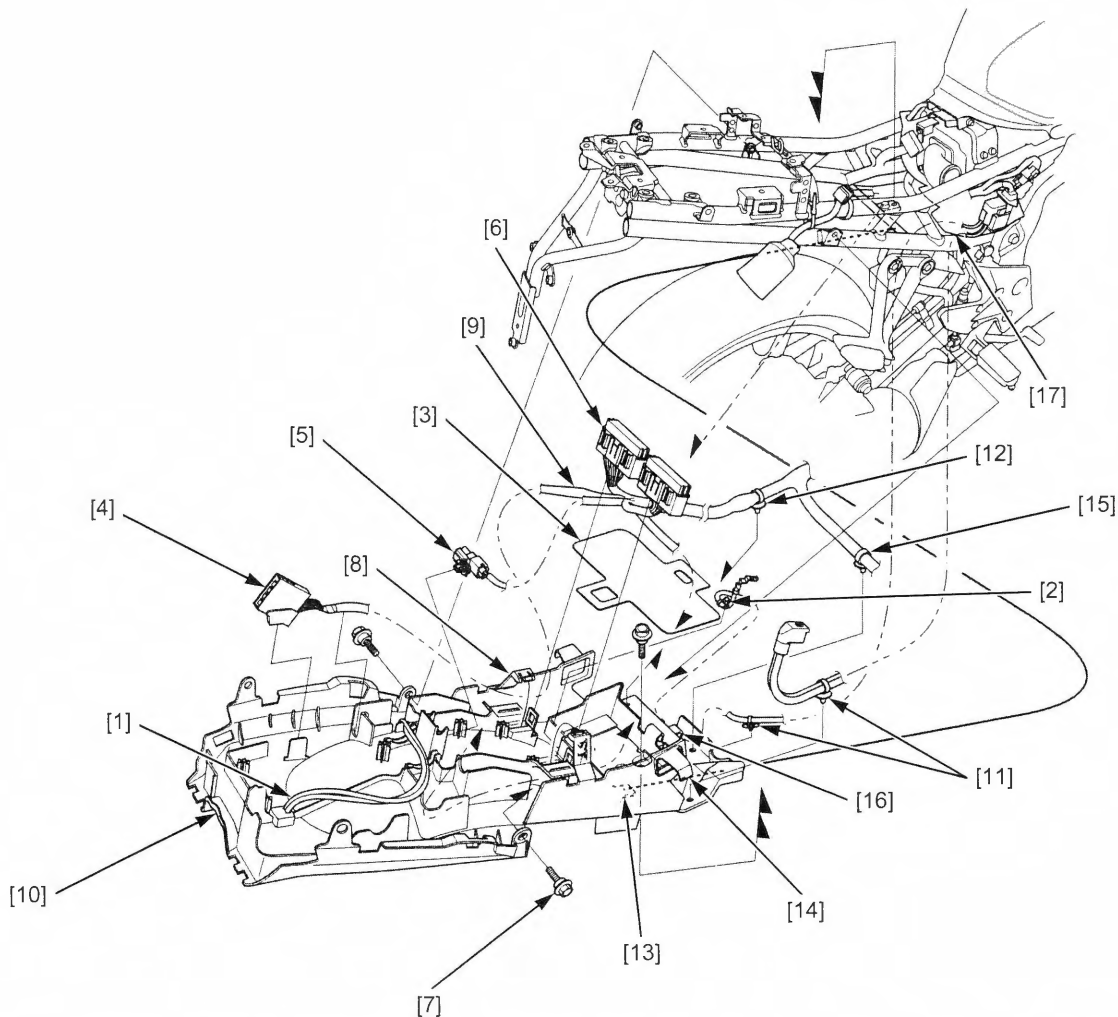
- band clip (front side; main wire harness) [15]
- battery (-) cable (from the guide [16])

Slide the rear fender B downward and remove it out of the frame.

Installation is in the reverse order of removal.

NOTE:

- Position the heat guard rubber [17] over the front end of the rear fender B (page 1-24).



FRONT FENDER

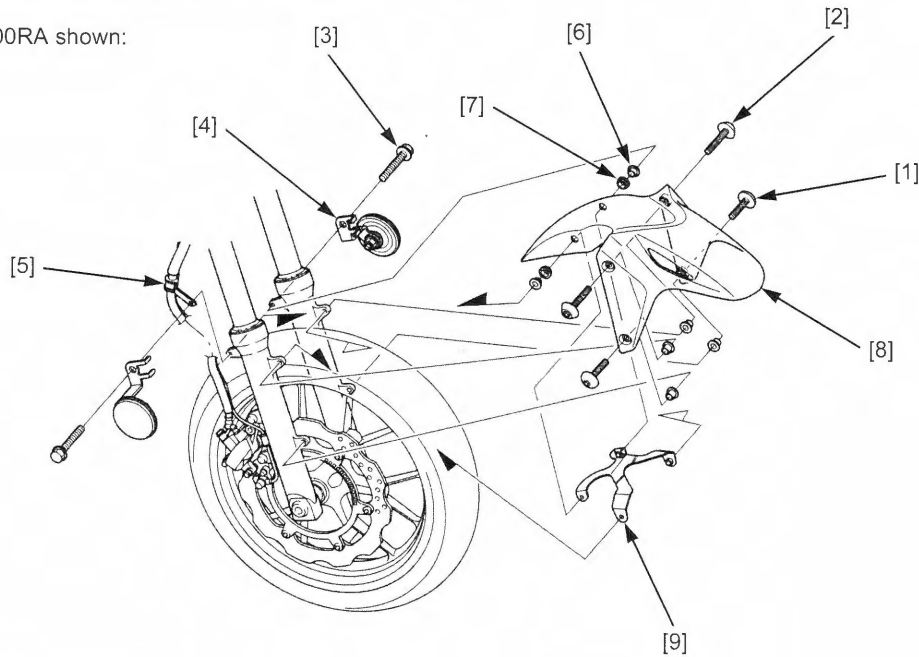
REMOVAL/INSTALLATION

Remove the following:

- two 6 x 22 mm socket bolts [1]
- two 6 x 30 mm socket bolts [2]
- two 6 x 28 mm bolts [3]
- two reflex reflectors [4]
- brake hose clamp [5]
- two collars [6] and grommets [7]
- front fender [8]
- fender bracket [9]

Installation is in the reverse order of removal.

CBR500RA shown:



UNDER COWL

REMOVAL/INSTALLATION

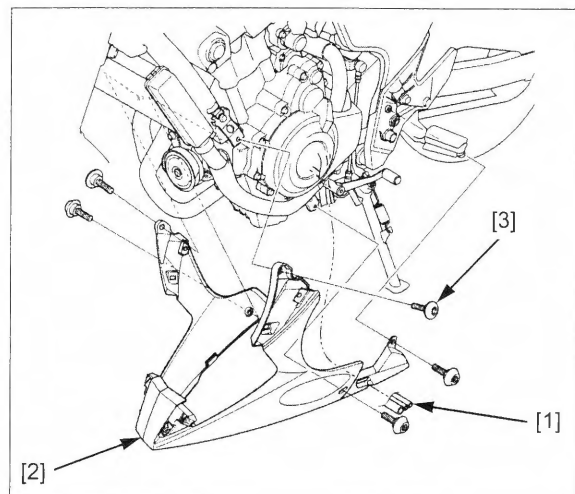
CBR500R/RA

Remove the middle cowls (page 2-8).

Release the hoses [1] from the under cowl [2].

Remove the five setting socket bolts (6 x 10 mm) [3] and under cowl.

Installation is in the reverse order of removal.

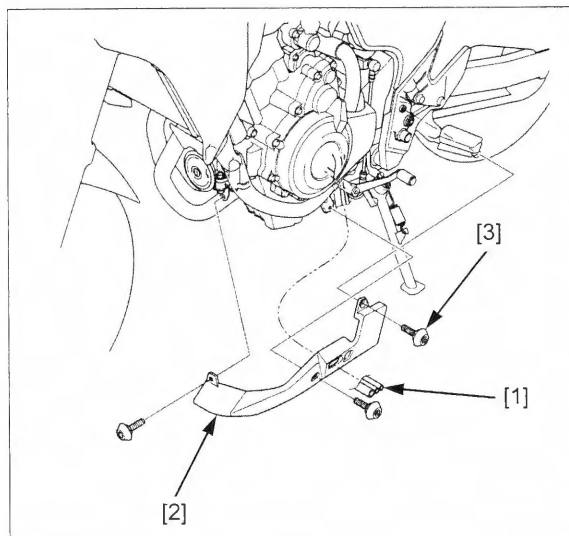


CB500F/FA

Release the hoses [1] from the under cowl [2].

Remove the three setting socket bolts (6 x 10 mm) [3] and under cowl.

Installation is in the reverse order of removal.

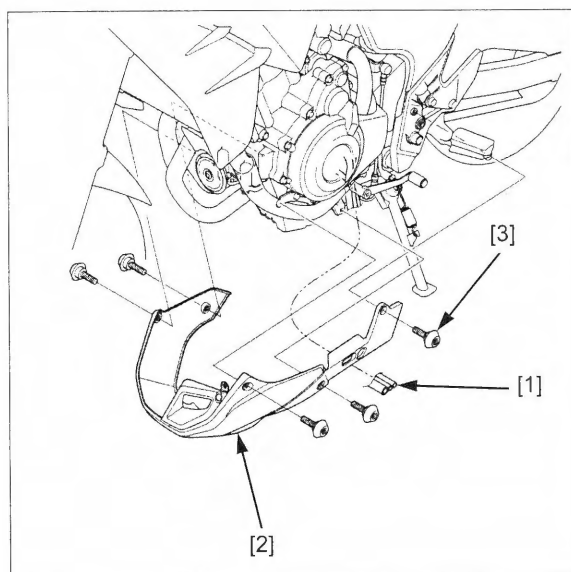


CB500X/XA

Release the hoses [1] from the under cowl [2].

Remove the five setting socket bolts (6 x 10 mm) [3] and under cowl.

Installation is in the reverse order of removal.



DRIVE SPROCKET COVER

REMOVAL/INSTALLATION

Remove the left rider footpeg bracket (page 2-27).

Remove the following:

- pinch bolt [1]
- gearshift arm [2]
- band clip (lower side) [3]
- two bolts [4]
- band clip (front side) [5]
- drive sprocket cover [6]
- drive chain guide [7]

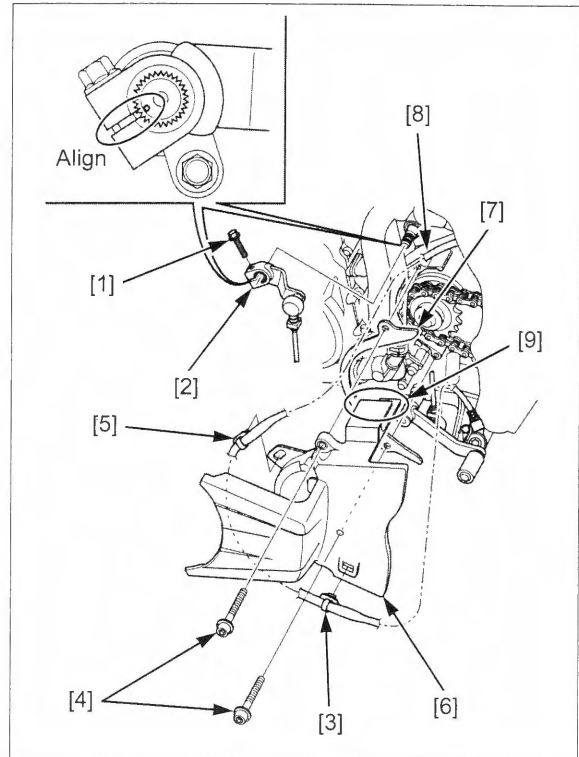
Installation is in the reverse order of removal.

NOTE:

- Temporarily hang the chain guide on the water pump lug and drive chain, and then install the drive sprocket cover with the upper bolt to set the chain guide and sprocket cover properly.
- Route the sidestand switch wire [8] into the guide [9] in the sprocket cover.
- Align the slit in the gearshift arm with the punch mark on the spindle.

TORQUE:

Drive sprocket cover bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)



DRIVE CHAIN COVER

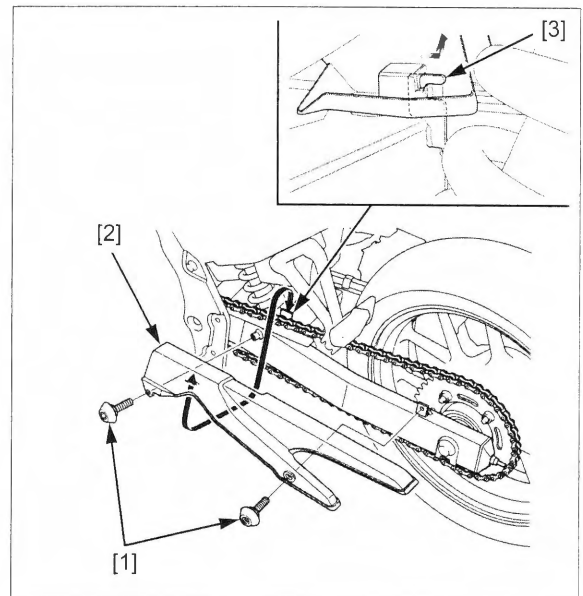
REMOVAL/INSTALLATION

Remove the left rider footpeg bracket (page 2-27).

Remove the two setting socket bolts (6 x 10 mm) [1].

Slide the drive chain cover [2] forward and remove it from the stay [3].

Installation is in the reverse order of removal.



ABS MODULATOR COVER (CBR500RA/CB500FA/XA)

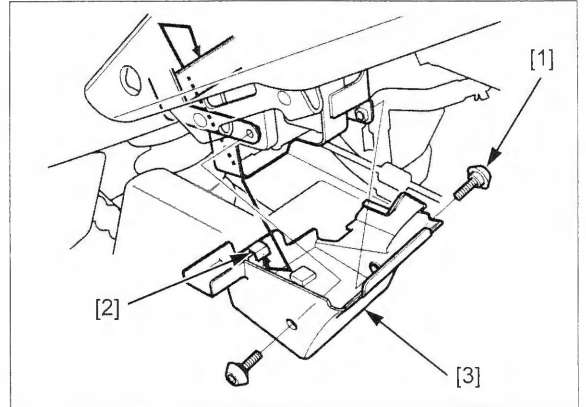
REMOVAL/INSTALLATION

Remove the left passenger footpeg bracket (page 2-27).

Remove the two setting socket bolts (6 x 10 mm) [1].

Release the tab [2] and remove the ABS modulator cover [3].

Installation is in the reverse order of removal.



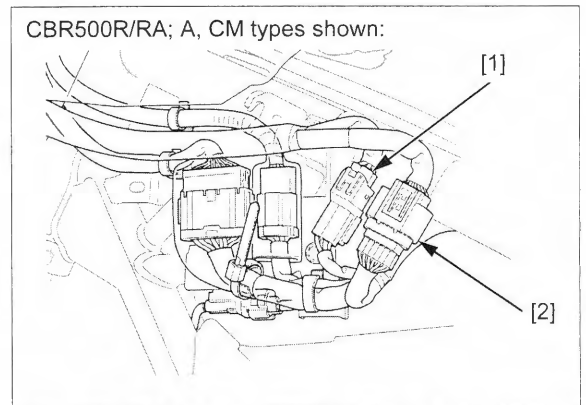
FUEL TANK UNDER TRAY

REMOVAL/INSTALLATION

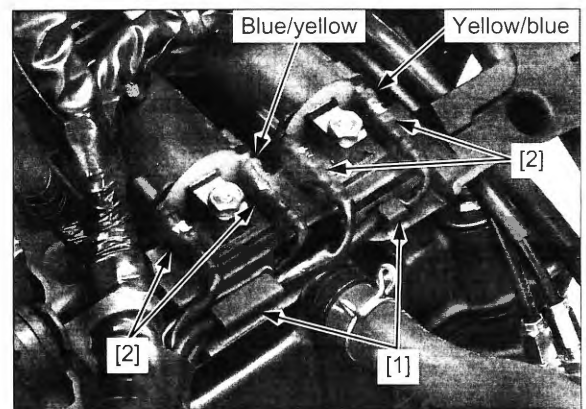
Remove the following:

- ECM (page 4-36)
- turn signal/hazard relay (page 21-23)

Disconnect the front sub-wire harness 4P (Black) [1] and 12P (Black) [2] connectors and remove them from the stay.

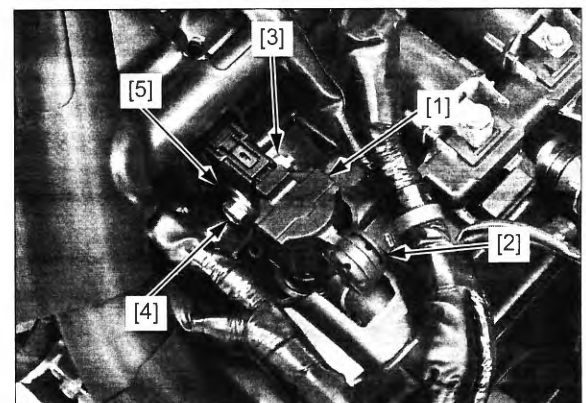


Release the ignition coil wires from the wire guides [1] and disconnect the connectors [2].



Remove the following and release the PAIR control solenoid valve [1] from the stay [2].

- nut [3]
- bolt [4]
- collar [5]



FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the setting bolt [1].

Pass the turn signal/hazard relay 4P (White) connector [2] through the tray.

Release the clutch and throttle cables off of the cable guide [3].

Release the right setting guides [4] from the frame to raise it and remove the three band clips [5] from the tray.

Release the left setting guides [6] from the frame and clear them out of the main wire harness [7].

Disconnect the spark plug caps [8] and remove the fuel tank under tray [9].

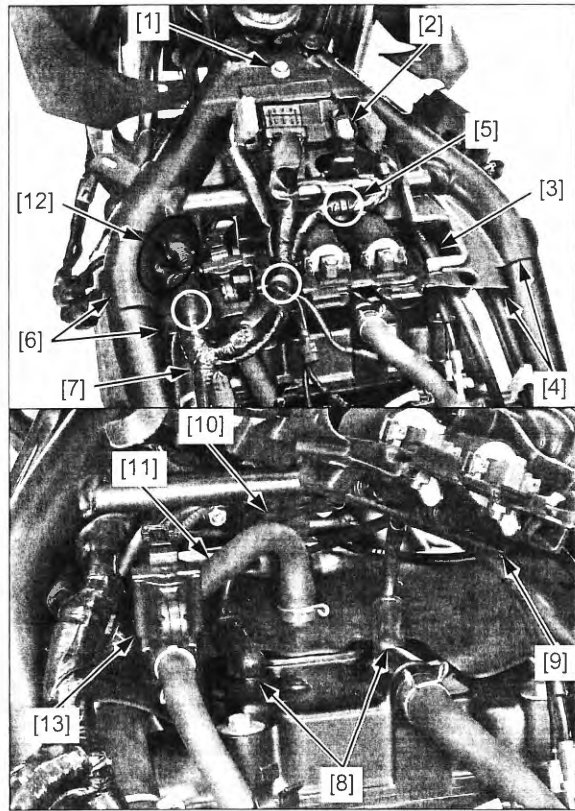
Installation is in the reverse order of removal.

NOTE:

- Route the left spark plug wire [10] over the secondary air supply hose [11] and connect the spark plug caps with their ends facing to the front side.
- Fit the tray cutout [12] on the main wire harnesses.
- When setting the tray, insert the PAIR control solenoid valve [13] and turn signal/hazard relay 4P (White) connector into each opening properly.

TORQUE:

PAIR control solenoid valve nut:
8.5 N·m (0.9 kgf·m, 6.3 lbf·ft)



SIDESTAND

REMOVAL/INSTALLATION

Remove the sidestand switch from the sidestand pivot (page 21-21).

Retract the sidestand and remove the following:

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

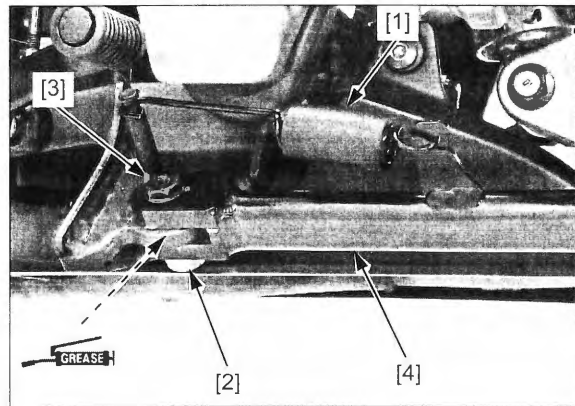
Installation is in the reverse order of removal.

NOTE:

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

TORQUE:

Pivot bolt: 10 N·m (1.0 kgf·m, 7 lbf·ft)
Pivot nut: 30 N·m (3.1 kgf·m, 22 lbf·ft)



FOOTPEG BRACKET

REMOVAL/INSTALLATION

NOTE:

- For right rider footpeg bracket removal/installation, refer to following:
 - brake pedal (page 18-15)
 - rear master cylinder (page 18-10)

LEFT RIDER FOOTPEG BRACKET

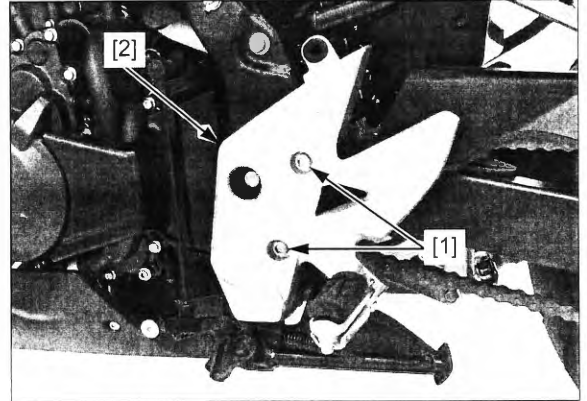
Remove the left side cover (page 2-7).

Remove the two bolts [1] and footpeg bracket [2].

Installation is in the reverse order of removal.

TORQUE:

Rider footpeg bracket bolt:
37 N·m (3.8 kgf·m, 27 lbf·ft)



PASSENGER FOOTPEG BRACKET

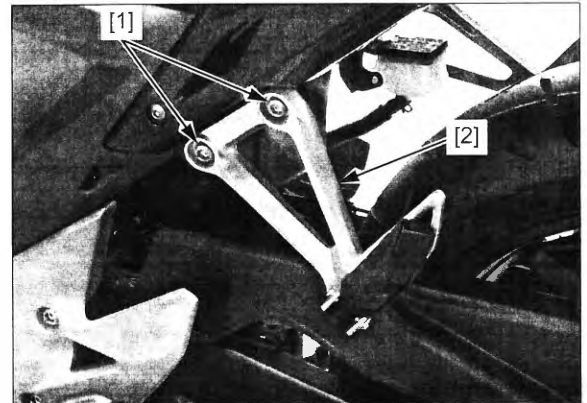
Right bracket only: Remove the muffler (page 2-28).

Remove the two bolts [1] and footpeg bracket [2].

Installation is in the reverse order of removal.

TORQUE:

Passenger footpeg bracket bolt:
37 N·m (3.8 kgf·m, 27 lbf·ft)



MUFFLER

REMOVAL/INSTALLATION

Loosen the muffler band bolt [1].

Remove the following:

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

Be sure that the muffler band tab is aligned with the muffler groove in position.

Install a new gasket and the collar.

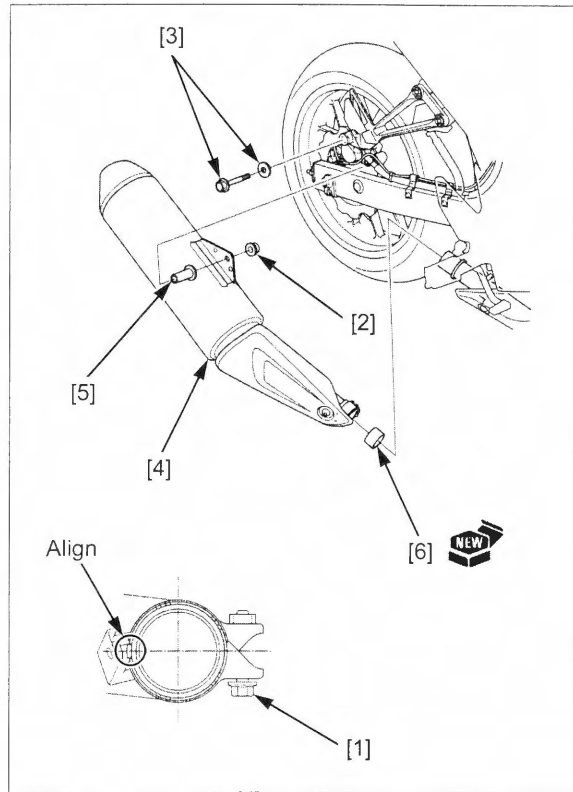
Install the muffler with the washer, bolt and nut, and loosely tighten it.

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

TORQUE:

Muffler band bolt: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Muffler mounting nut: 22 N·m (2.2 kgf·m, 16 lbf·ft)

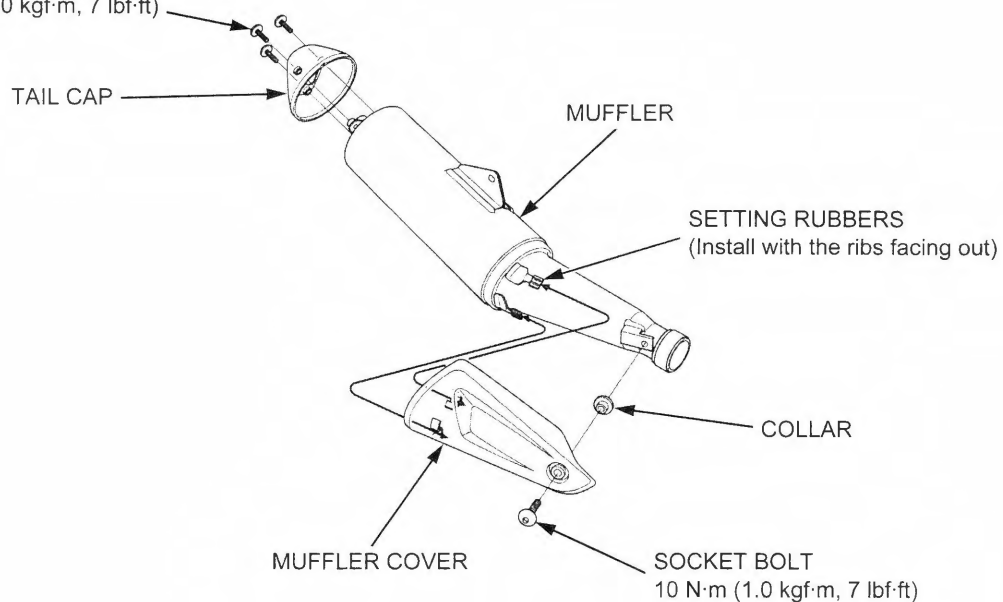


DISASSEMBLY/ASSEMBLY

Disassemble and assemble the muffler components as following illustration.

SOCKET BOLTS

10 N·m (1.0 kgf·m, 7 lbf·ft)

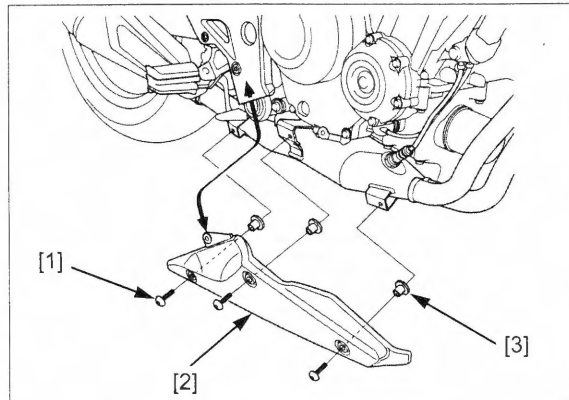


EXHAUST PIPE

REMOVAL/INSTALLATION

*CBR500R/RA/
CB500X/XA:* Remove the under cowl (page 2-22).

CB500F/FA/X/XA: Remove the right middle cowl (page 2-9).
Remove the three socket bolts [1], and the exhaust pipe cover [2].
Remove the three collars [3].



Disconnect the O₂ sensor 4P (Black) connector and remove the O₂ sensor wire out of the frame (page 4-40).

Remove the following:

- muffler (page 2-28)
- four joint nuts [1]
- mounting bolt [2]
- exhaust pipe [3]
- collar [4]
- gaskets [5]

Be sure to verify the length from the stud bolt head to the cylinder head surface (page 2-29).

Install new gaskets and the collar.

Install the exhaust pipe with the mounting bolt and joint nuts by setting the exhaust pipe flanges onto the stud bolts, and screw all the fasteners in fully.

Tighten the joint nuts first to the specified torque, then tighten the mounting bolt.

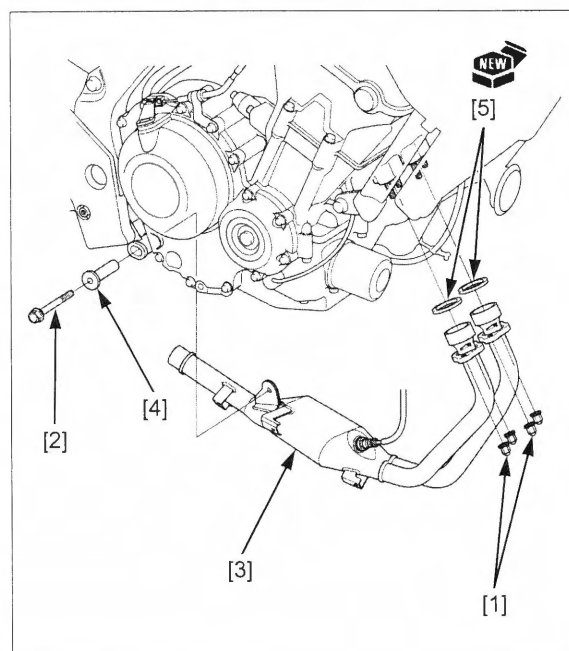
TORQUE:

Exhaust pipe joint nut: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Install the removed parts in the reverse order of removal.

TORQUE:

Exhaust pipe cover bolt: 12 N·m (1.2 kgf·m, 9 lbf·ft)



STUD BOLT REPLACEMENT

Remove the exhaust pipe (page 2-29).

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

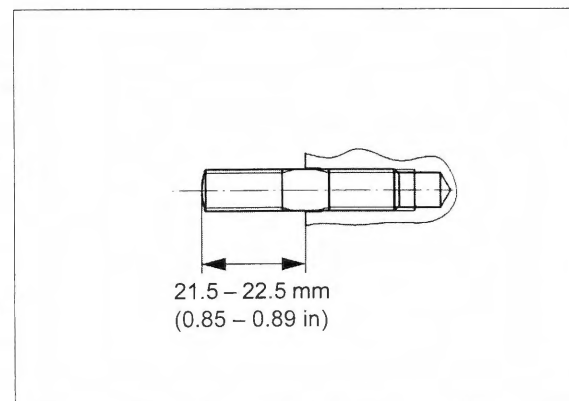
Install a new stud bolt with the short threads facing the cylinder head.

Tighten the stud bolt to the specified torque.

TORQUE: 9.0 N·m (0.9 kgf·m, 6.6 lbf·ft)

After installation, check that the length from the bolt head to the cylinder head surface is within specification.

Install the exhaust pipe (page 2-29).



SEAT RAIL

REMOVAL/INSTALLATION

Remove the following:

- fuel tank (page 7-9)
- passenger footpeg brackets (page 2-27)
- rear fender B (page 2-21)
- starter relay switch (page 6-9)
- regulator/rectifier (page 20-7)
- ABS modulator cover (CBR500RA/CB500FA/XA) (page 2-25)

Loosen the air cleaner housing retaining bolt [1], and remove the four bolts [2] and fuel tank bracket [3].

Remove the following from the seat rail [4]:

- heat guard rubbers [5] (from the fuel tank bracket and starter relay switch stays)
- wire clip [6]
- band clip [7]
- 2P (Gray) connector [8]
- 2P (Black) connector [9]
- wire bands [10]
- reservoir mounting bolt [11] (keep the reservoir upright to prevent air from entering the hydraulic system)
- wire clip [12]
- band clip [13]
- 2P (Green) connector [14]
- 2P (Red) connector [15]

*CBR500RA/
CB500FA/XA:* Support the bottom of the ABS modulator [16] with suitable wooden blocks and remove the two modulator mounting bolts [17]. Release the ABS modulator from boss [18] by sliding it to the left slightly.

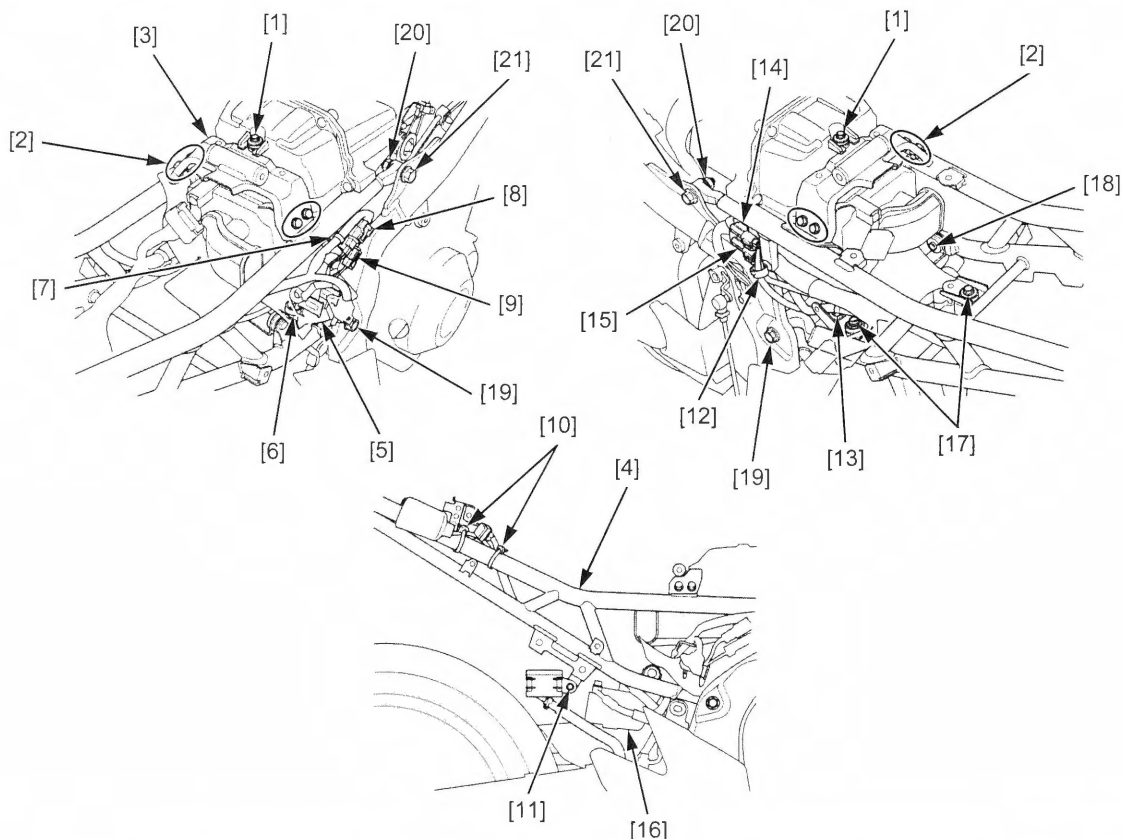
Remove the following fasteners and remove the seat rail.

- two 10 x 45 mm bolts (lower) [19]
- two nuts [20] and 10 x 35 mm bolts (upper) [21]

Installation is in the reverse order of removal.

TORQUE:

Seat rail mounting bolt: 60 N·m (6.1 kgf·m, 44 lbf·ft)



SERVICE INFORMATION	3-2	EVAPORATIVE EMISSION CONTROL SYSTEM (AC type)	3-13
MAINTENANCE SCHEDULE	3-3	DRIVE CHAIN	3-14
FUEL LINE	3-4	BRAKE FLUID	3-17
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ENGINE OIL FILTER	3-11	SUSPENSION	3-21
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COOLING SYSTEM	3-13	STEERING HEAD BEARINGS	3-22
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MAINTENANCE

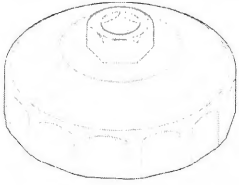
SERVICE INFORMATION

GENERAL

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

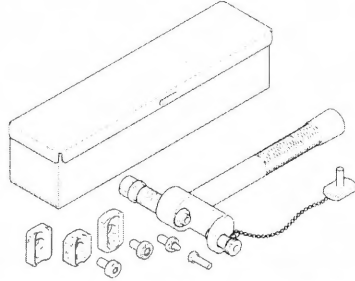
TOOLS

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)

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	FREQUENCY	WHICHEVER COMES FIRST	ODOMETER READING (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
	CRANKCASE BREATHER	NOTE 3			C	C	C	C	C	C	3-6
	** SPARK PLUG							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	3-12
	RADIATOR COOLANT	NOTE 5				I		I		R	3-12
	* COOLING SYSTEM					I		I		I	3-13
	* SECONDARY AIR SUPPLY SYSTEM					I		I		I	3-13
	* EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE 4						I		I	3-13
NON-EMISSION RELATED ITEMS	DRIVE CHAIN			Every 800 km (500 mi) I, L						3-14	
	BRAKE FLUID	NOTE 5			I	I	R	I	I	R	3-17
	BRAKE PAD WEAR				I	I	I	I	I	I	3-18
	BRAKE SYSTEM			I		I		I		I	3-19
	BRAKE LIGHT SWITCH					I		I		I	3-19
	HEADLIGHT AIM					I		I		I	3-20
	CLUTCH SYSTEM			I	I	I	I	I	I	I	3-20
	SIDESTAND					I		I		I	3-21
	* SUSPENSION					I		I		I	3-21
	* NUTS, BOLTS, FASTENERS			I		I		I		I	3-22
** WHEELS/TIRES					I		I		I	3-22	
** STEERING HEAD BEARINGS			I		I		I		I	3-22	

* 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:

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

FUEL LINE

FUEL TANK LIFTING/LOWERING

Remove the middle cowls (page 2-8).

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

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

Lift the front of the fuel tank slightly and disconnect the following:

- A, CM types: fuel tank breather hose [4] (at the hose joint)
- AC type: fuel tank-to-EVAP canister hose [5]
- fuel tank drain hose [6] (at the hose joint)

Support the fuel tank by placing a suitable support block between the air cleaner housing (flat surface area) and tank.

Installation is in the reverse order of removal.

NOTE:

- Be sure to route the fuel feed hose [7] into the guide [8] in the air cleaner housing.
- Check that the fuel tank breather hose (A, CM types) and fuel tank drain hose are not bent or pinched.

TORQUE:

Fuel tank mounting bolt: 10 N·m (1.0 kgf·m, 7 lbf·ft)

INSPECTION

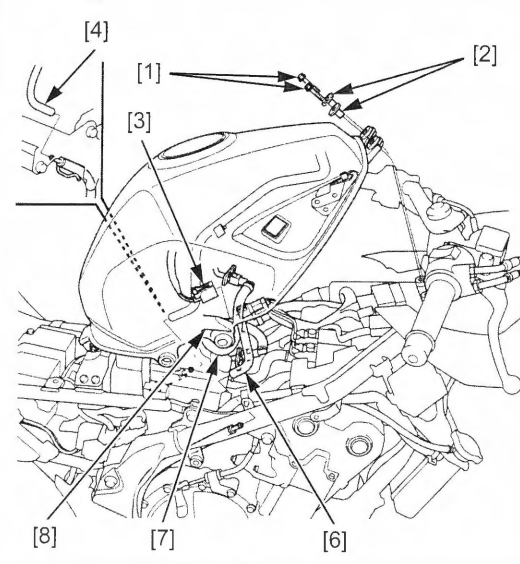
Lift the fuel tank and support it (page 3-4).

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

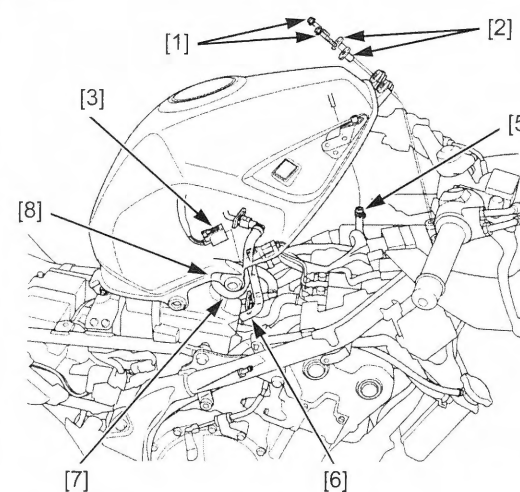
Also, check the hose fittings for damage or looseness.

Replace the fuel feed hose if necessary.

A, CM types:



AC type:



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 16-10).

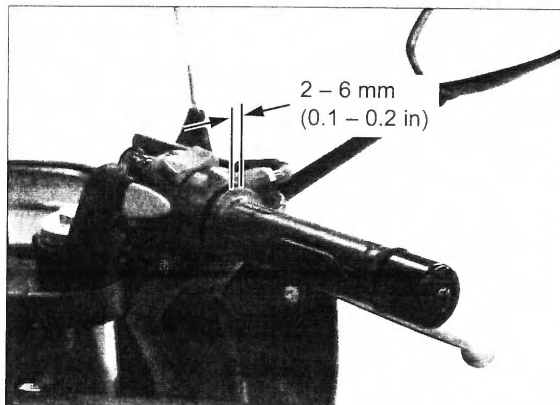
If the throttle grip still does not return properly, replace the throttle cables.

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.

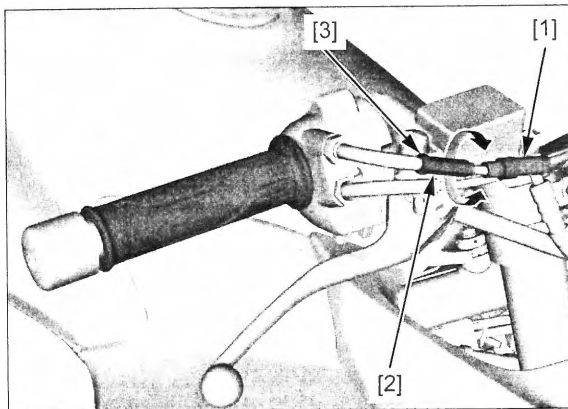
Slide the boot [1] to remove it from the adjuster [2].

Loosen the lock nut [3] and turn the adjuster as required.

Tighten the lock nut to the specified torque while holding the adjuster.

TORQUE: 3.8 N·m (0.4 kgf·m, 2.8 lbf·ft)

Install the boot over the adjuster properly.



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

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

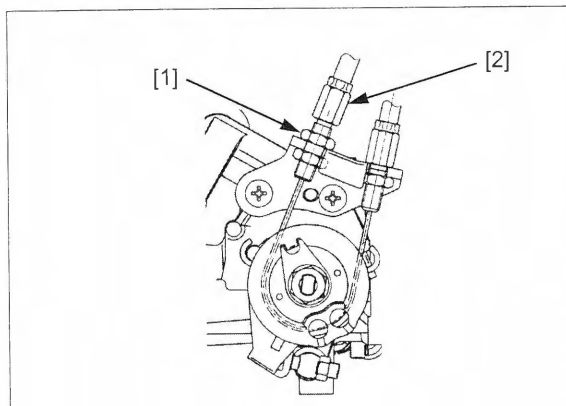
Loosen the lock nut [1] and turn the adjuster [2] as required.

Tighten the lock nut to the specified torque while holding the adjuster.

TORQUE: 3.0 N·m (0.3 kgf·m, 2.2 lbf·ft)

After adjustment, recheck the throttle operation.

Install the fuel tank (page 3-4).



AIR CLEANER

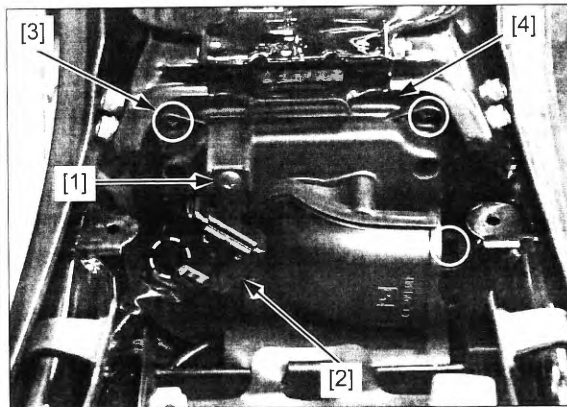
NOTE:

- 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.

Remove the battery (page 20-5).

Remove the following:

- tapping screw [1]
- wire junction [2]
- four tapping screws [3]
- air cleaner lid/element assembly [4]



- four washer-screws [1]
- air cleaner element [2]

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 lid and housing. Make sure the rubber seal [3] in the lid is in position and in good condition.

Installation is in the reverse order of removal.

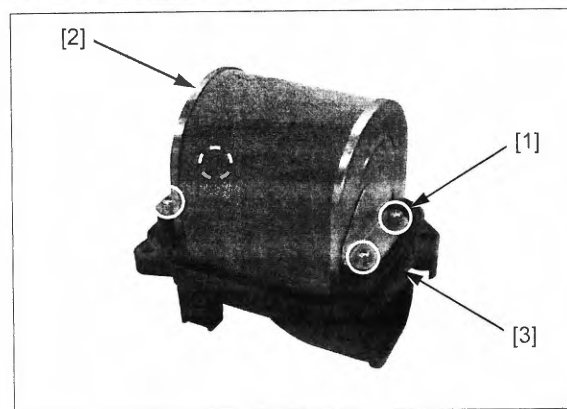
TORQUE:

Air cleaner element washer-screw:

1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)

Air cleaner lid tapping screw:

1.1 N·m (0.1 kgf·m, 0.8 lbf·ft)

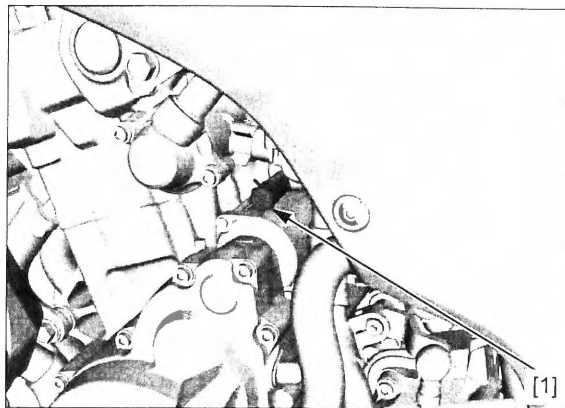


CRANKCASE BREATHER

NOTE:

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

Remove the crankcase breather tube plug [1] and drain the deposits into a suitable container, then reinstall the plug securely.

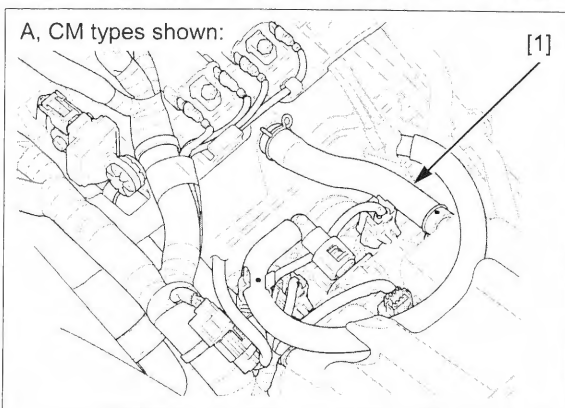


Lift the fuel tank and support it (page 3-4).

Check the crankcase breather hose [1] for cracks, deterioration, damage or loose connections.

Replace the breather hose if necessary.

Install the fuel tank (page 3-4).



SPARK PLUG

Remove the fuel tank under tray (page 2-25).

Remove the spark plug [1].

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

SPECIFIED SPARK PLUG: CPR8EA-9 (NGK)

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

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

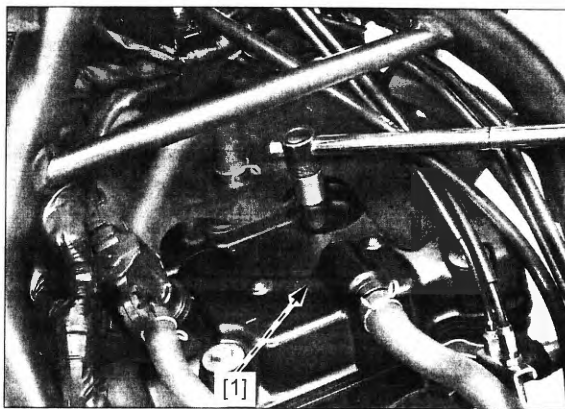
SPARK PLUG GAP: 0.80 – 0.90 mm (0.031 – 0.035 in)

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

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 fuel tank under tray (page 2-25).



VALVE CLEARANCE

INSPECTION

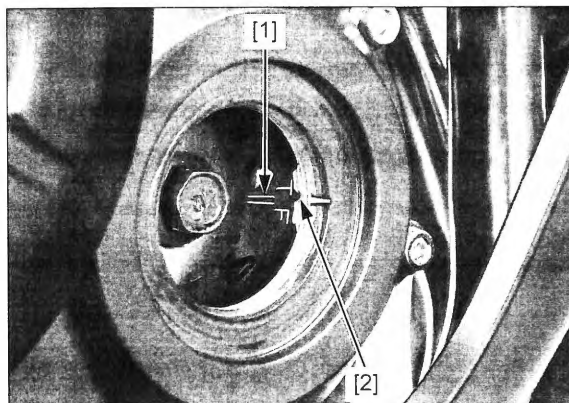
NOTE:

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

Remove the following:

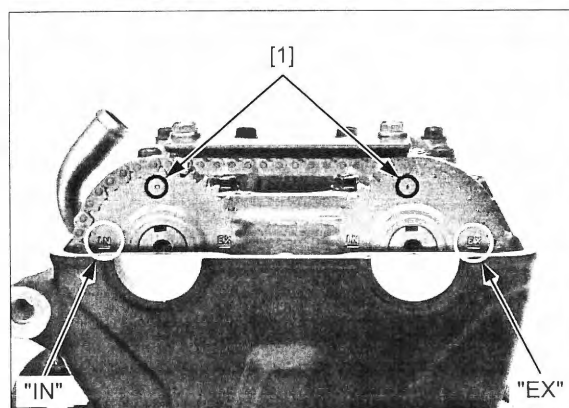
- cylinder head cover (page 10-6)
- crankshaft hole cap and O-ring

Rotate the crankshaft clockwise slowly and align the "T" mark [1] with the index notch [2] in the crankcase cover.



Make sure the timing marks ("IN" and "EX") on the sprockets are flush with the cylinder head surface, and punch marks [1] are facing up.

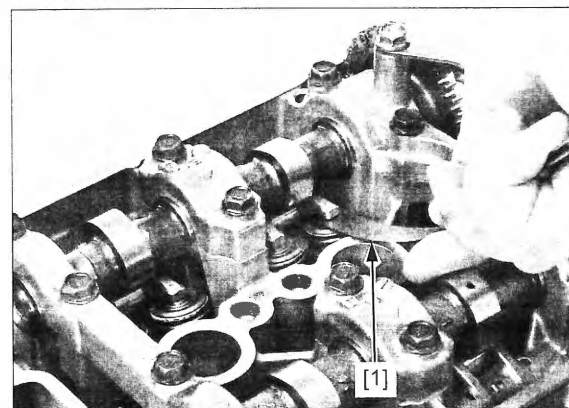
If the marks are not in this position, turn the crankshaft clockwise one full turn (360°) and realign the "T" mark with the index notch.



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

Check the exhaust valve clearances of the No. 1 (left) and No. 2 (right) cylinders by inserting a feeler gauge [1] between the rocker arm and shim.

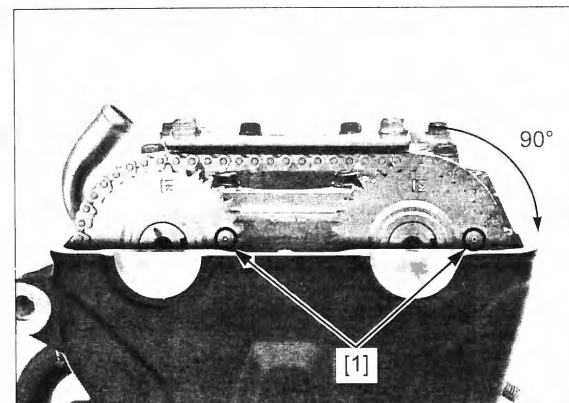
VALVE CLEARANCE:
EX: 0.27 ± 0.03 mm (0.011 ± 0.001 in)



Turn the crankshaft clockwise 1/2 of a turn (180°) from the previous position, and align the timing marks (punch marks) [1] on the cam sprockets with the cylinder head surface (the camshafts are turned 90°).

Check the intake valve clearances of the No. 1 and No. 2 cylinders.

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



ADJUSTMENT

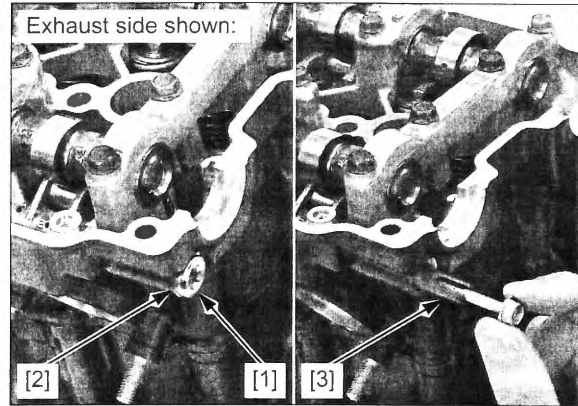
NOTE:

- The valve clearance adjustment is performed by removing the rocker arm shaft.

Before removing each rocker arm shaft, make sure the cam shaft is in the proper position to allow removal of the rocker arms (page 3-7).

Remove the plug bolt [1] and washer [2].

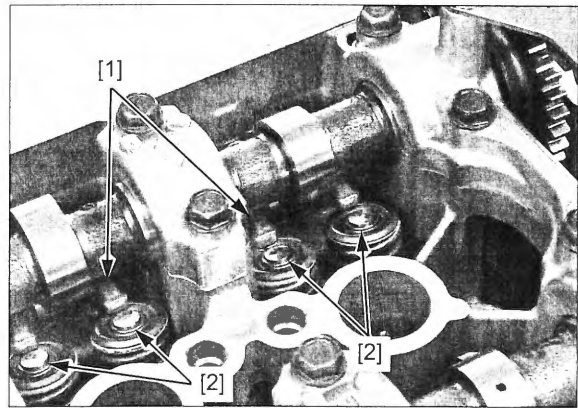
Remove the rocker arm shaft [3] using a 6 mm bolt while holding the rocker arms.



Slide the rocker arms [1] outward and remove the shims [2].

NOTE:

- Do not allow the shims to fall into the crankcase or spark plug holes.
- Mark all shims to ensure correct reassembly in their original locations.
- The shims can be easily removed with tweezers or a magnet.



Measure the shim [1] thickness and record it.

NOTE:

- Sixty-nine different thickness shims are available in increments of 0.025 mm (from 1.200 mm to 2.900 mm).

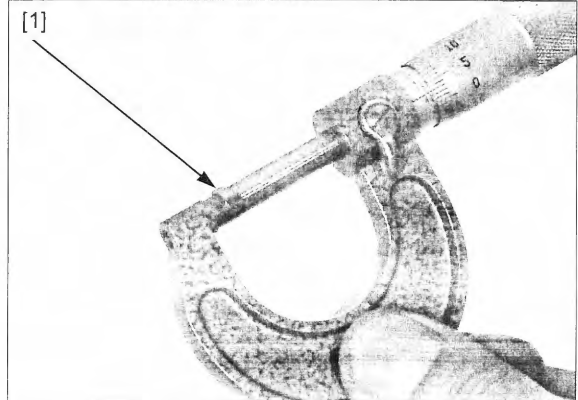
Calculate the new shim thickness using the equation below.

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

- 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 by micrometer.
- Reface the valve seat if carbon deposit results in a calculated dimension of over 2.900 mm.



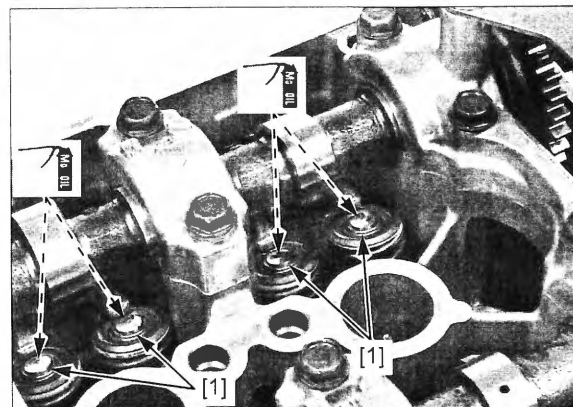
Apply molybdenum oil solution to the stem ends.

Install the newly selected shims [1] into the valve spring retainers.

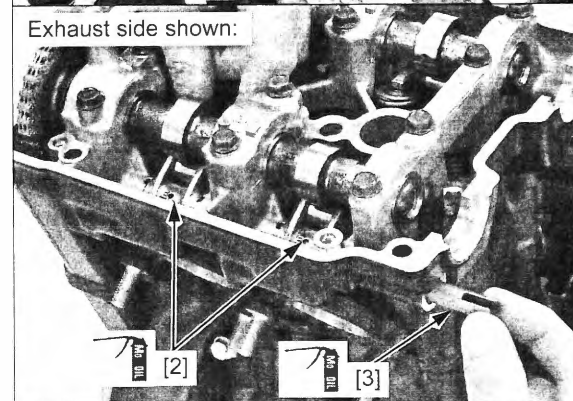
Apply molybdenum oil solution to the rocker arm sliding areas and thrust surfaces, and rocker arm shaft outer surface.

Set the rocker arms [2] into place.

Insert the rocker arm shaft [3] through the cylinder head and rocker arms while holding the rocker arm claws as shown.



Exhaust side shown:



Apply engine oil to the threads of plug bolt [1] and install it with a new sealing washer [2], aligning the blade with the groove.

Tighten the plug bolt to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

Rotate the camshafts by rotating the crankshaft clockwise several times.

Recheck the valve clearance.

Coat a new O-ring with engine oil and install it into the groove in the crankshaft hole cap.

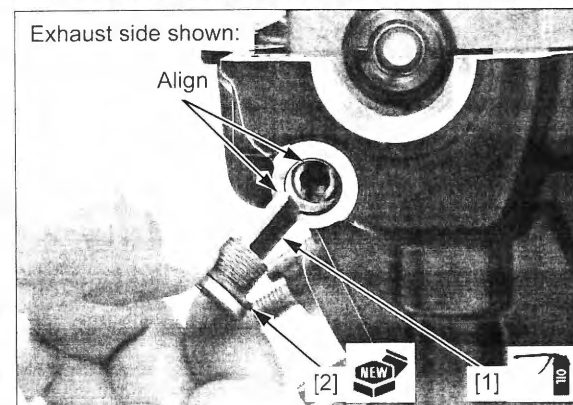
Apply grease to the threads of the crankshaft hole cap and install it.

Tighten the crankshaft hole cap to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Install the cylinder head cover (page 10-6).

Exhaust side shown:



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 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)

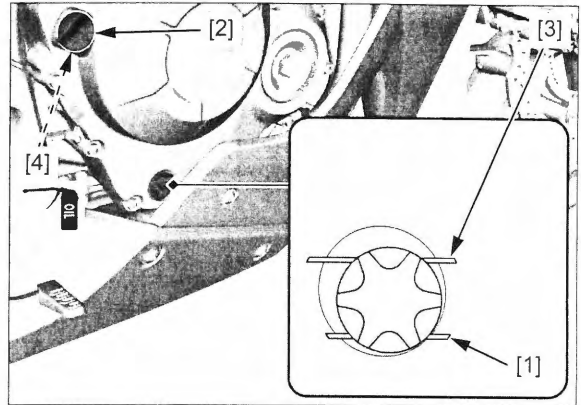
JASO T903 standard: MA

Viscosity: SAE 10W-30

Check that the O-ring [4] 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

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:

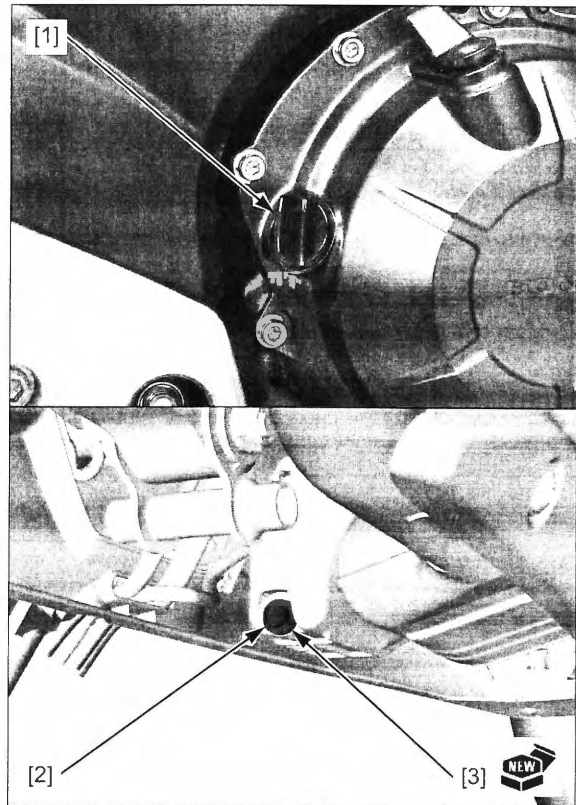
2.5 liters (2.6 US qt, 2.2 Imp qt) at draining

2.7 liters (2.9 US qt, 2.4 Imp qt) at oil filter change

3.2 liters (3.4 US qt, 2.8 Imp qt) at disassembly

Check the oil level (page 3-10).

Make sure there are no oil leaks.



ENGINE OIL FILTER

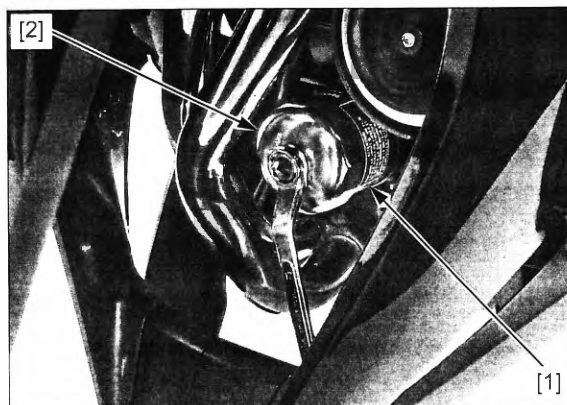
Drain the engine oil (page 3-10).

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

TOOL:

[2] Oil filter wrench

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



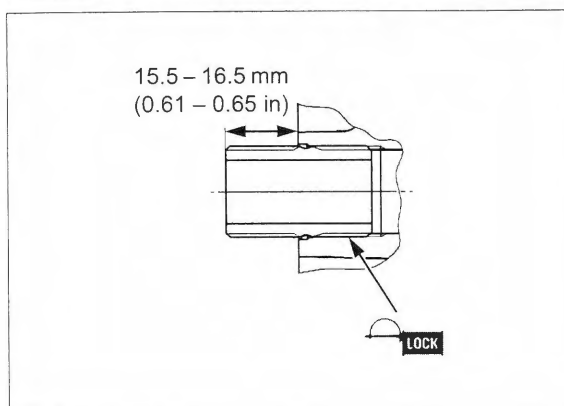
Check that the oil filter boss protrusion from the crankcase is specified length as shown.

SPECIFIED LENGTH: 15.5 – 16.5 mm (0.61 – 0.65 in)

NOTE:

- If the oil filter boss is removed, apply locking agent to the oil filter boss threads and install it (page 1-20).

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



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.

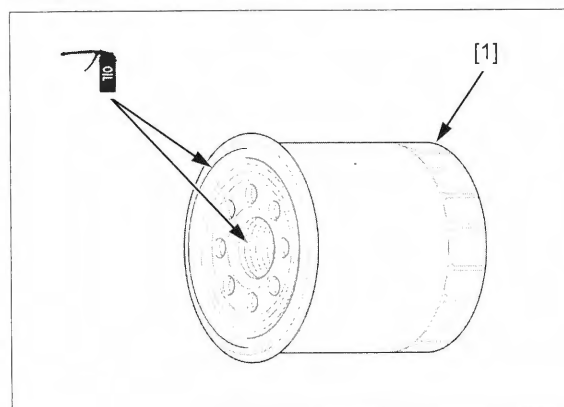
TOOL:

Oil filter wrench

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

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)

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



ENGINE IDLE SPEED

NOTE:

- Inspect the idle speed after all other engine maintenance items have been performed and are within specifications.
- Before checking the idle speed, inspect the following items:
 - no MIL blinking
 - spark plug condition (page 3-6)
 - air cleaner element condition (page 3-5)
 - throttle operation and throttle grip freeplay (page 3-4)
- The engine must be warm for accurate idle speed inspection.
- This system eliminates the need for manual idle speed adjustment.

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

Check the idle speed.

IDLE SPEED: 1,200 ± 100 rpm

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

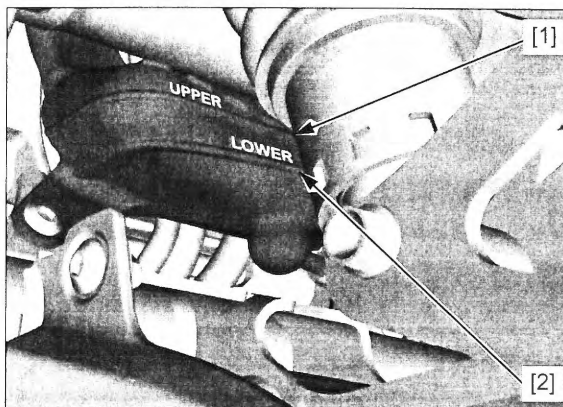
- intake air leak or engine top-end problem (page 10-4)
- IACV operation (page 7-17)

RADIATOR COOLANT

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

The level should be between the "UPPER" [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 left side cover (page 2-7).

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:

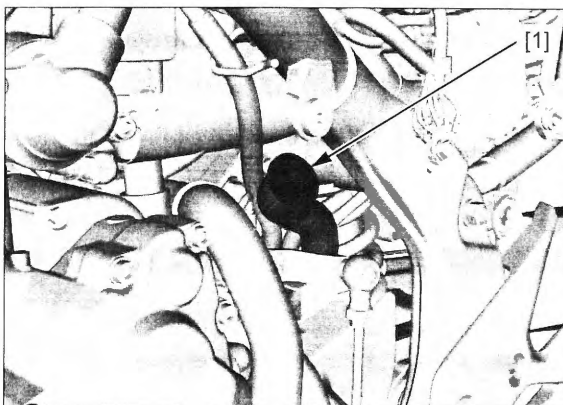
Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors

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

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

Install the reserve tank cap.

Install the left side cover (page 2-7).



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.

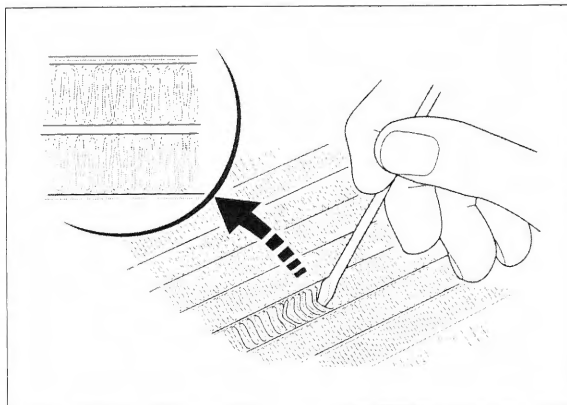
Remove the middle cowls (page 2-8).

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 middle cowls (page 2-8).



SECONDARY AIR SUPPLY SYSTEM

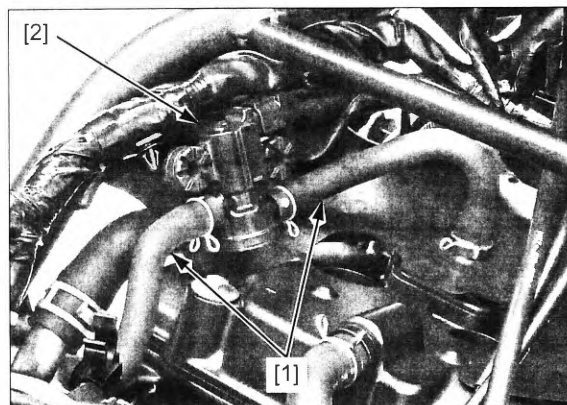
Remove the fuel tank under tray (page 2-25).

Check the air supply hoses [1] between the air cleaner housing, PAIR control solenoid valve [2] and cylinder head cover 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 7-20).

For secondary air supply system inspection (page 7-18).



EVAPORATIVE EMISSION CONTROL SYSTEM (AC type)

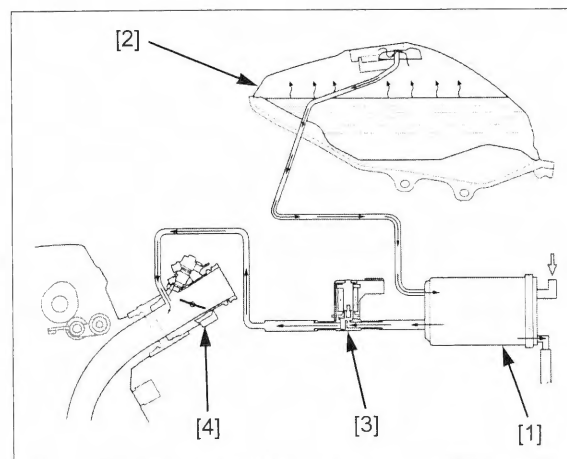
Remove the fuel tank under tray (page 2-25).

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 1-24).



MAINTENANCE

DRIVE CHAIN

DRIVE CHAIN SLACK INSPECTION

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

Turn the ignition switch OFF.

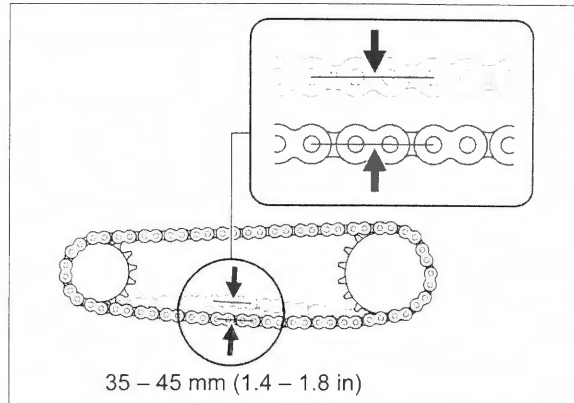
Place the motorcycle on its sidestand and shift the transmission into neutral.

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

DRIVE CHAIN SLACK: 35 – 45 mm (1.4 – 1.8 in)

NOTICE

Excessive chain slack, 60 mm (2.4 in) or more, may damage the frame.



ADJUSTMENT

Loosen the rear axle nut [1] and adjuster lock nuts [2].

Turn the adjusting nuts [3] an equal number of a turn until the correct drive chain slack is obtained.

A scale is included on the adjusters. Be sure the reading on the scale is same for both sides.

Tighten the axle nut to the specified torque.

TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)

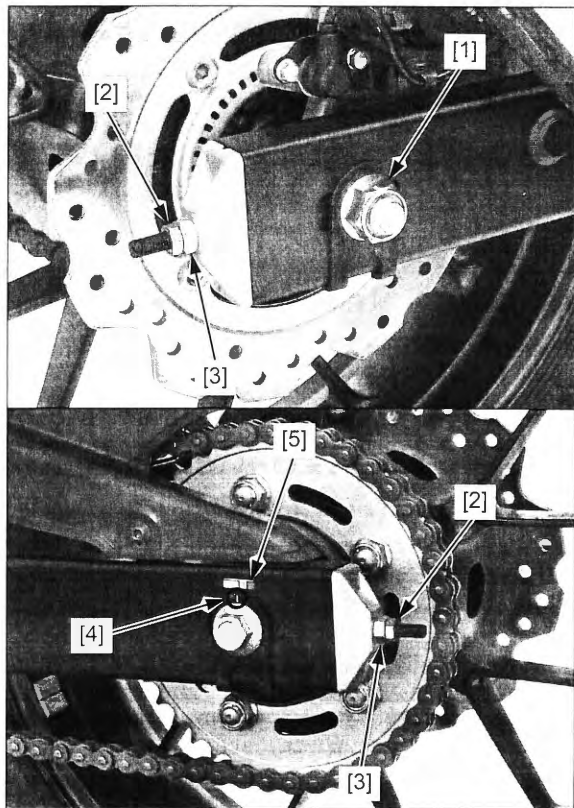
Tighten each lock nut while holding the adjusting nut to the specified torque.

TORQUE: 21 N·m (2.1 kgf·m, 15 lbf·ft)

Recheck the drive chain slack and free wheel rotation.

Check the drive chain wear indicator label attached on the left swingarm.

If the index line [4] on left setting plate reaches the red zone [5] of the wear indicator label, replace the drive chain with a new one (page 3-16).



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.

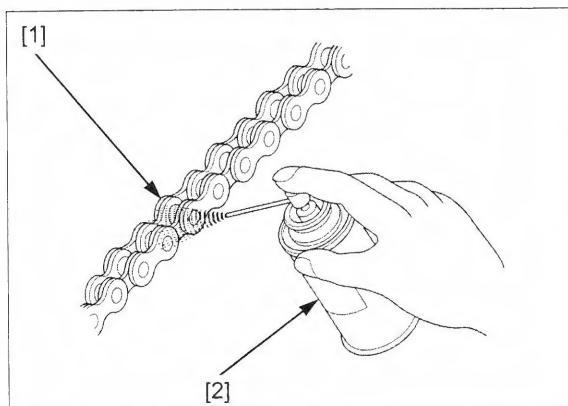
Be sure the drive chain has dried completely before lubricating.

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 2-24).

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 new replacement chain will wear rapidly.

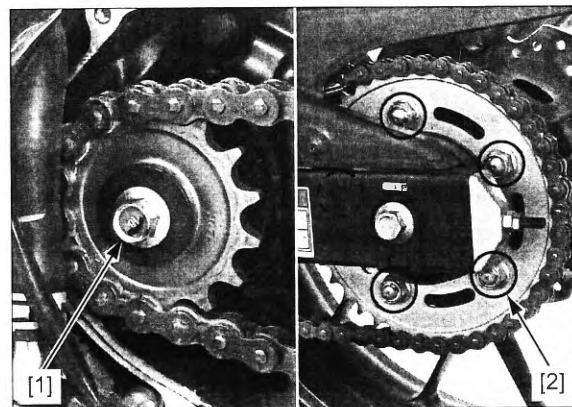
Check the attaching bolt and nuts on the drive and driven sprockets.

If any are loose, torque them to the specified torque.

TORQUE:

- [1] Drive sprocket bolt:
54 N·m (5.5 kgf·m, 40 lbf·ft)
- [2] Driven sprocket nut:
108 N·m (11.0 kgf·m, 80 lbf·ft)

Install the drive sprocket cover (page 2-24).



REPLACEMENT

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

Fully slacken the drive chain (page 3-14).

Remove the drive chain using the special tool.

TOOL:

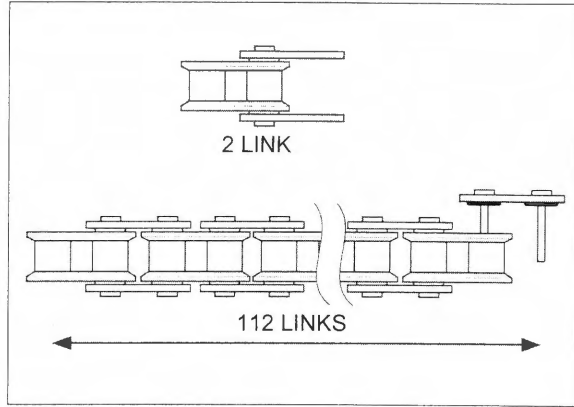
Drive chain tool set

**07HMH-MR10103 or
07HMH-MR1010C
(U.S.A. only)**

NOTE:

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

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



SPECIFIED LINKS: 112 LINKS

REPLACEMENT CHAIN: DID520V0

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

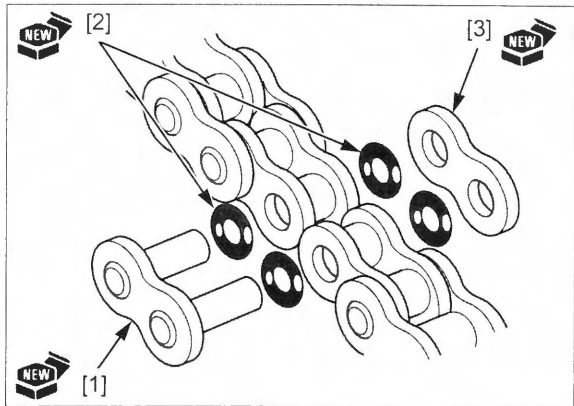
Insert a new master link [1] with new O-rings [2] from the inside of the drive chain, and install a new plate [3] and O-rings with the identification mark facing out.

Assemble the master link, O-rings and plate.

TOOL:

Drive chain tool set

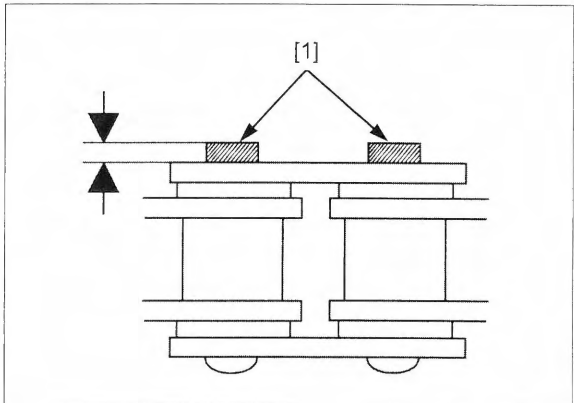
**07HMH-MR10103 or
07HMH-MR1010C
(U.S.A. only)**



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

STANDARD LENGTH: Approx. 1.3 mm (0.05 in)

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



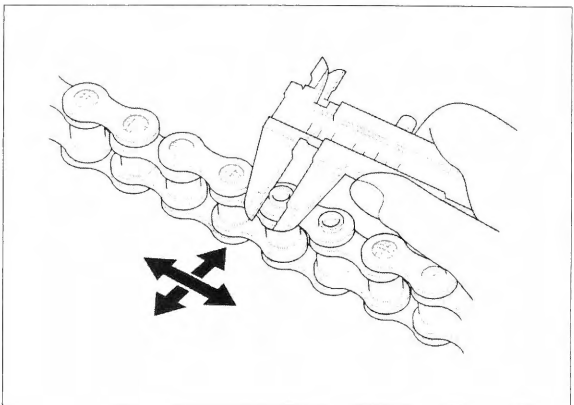
Make sure the pins are staked properly by measuring the diameter of the staked area.

DIAMETER OF STAKED AREA:

5.40 – 5.60 mm (0.213 – 0.220 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.



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 3-18).

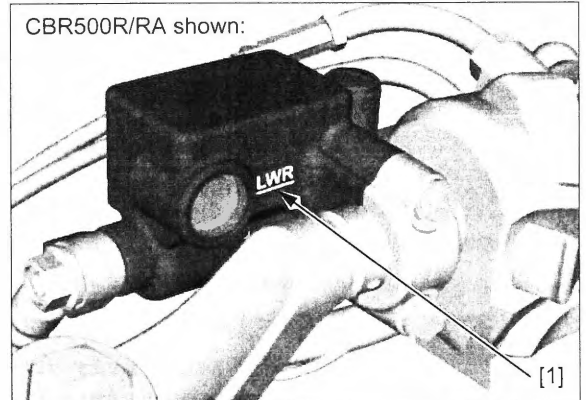
A low fluid level may be due to wear of the brake pads. If the brake pads are worn and caliper pistons are pushed out, this accounts for a low fluid level. If the brake pads are not worn and fluid level is low, check the entire system for leaks (page 3-19).

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 "LWR" level line [1], fill the brake fluid as follows.

CBR500R/RA shown:



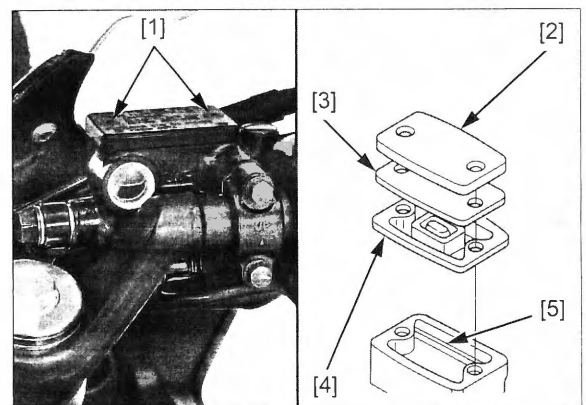
Remove the following:

- two screws [1]
- reservoir cap [2]
- set plate [3]
- diaphragm [4]

Fill the reservoir with DOT 4 brake fluid from a sealed container to the upper level line (casting ledge) [5].

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)

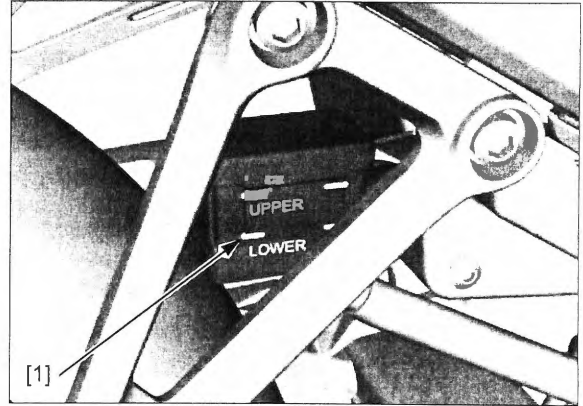


MAINTENANCE

REAR BRAKE

Support the motorcycle 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 [1]
- two screws [2]
- reservoir cap [3]
- set plate [4]
- diaphragm [5]

Temporarily install the reservoir onto the stay with the mounting bolt through the locating pin hole [6] and secure it using a 6 mm nut [7] so the reservoir is level.

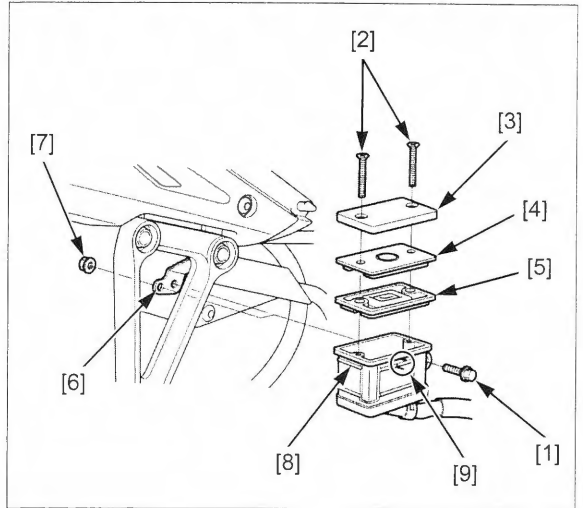
Fill the reservoir with DOT 4 brake fluid from a sealed container to the upper level line [8].

Carefully remove the reservoir from the stay by removing the 6 mm nut and mounting bolt.

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)

Install the reservoir, aligning the locating pin [9] with the hole in the stay and tighten the mounting bolt.



BRAKE PAD WEAR

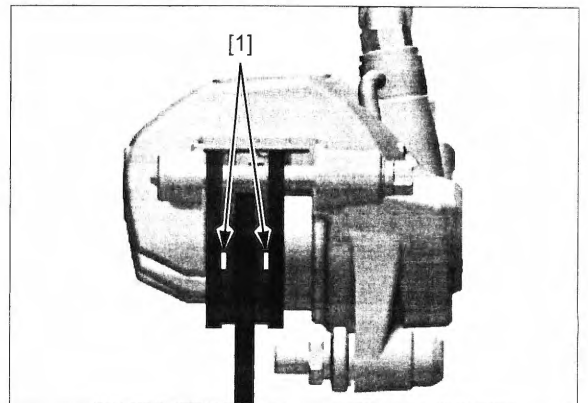
FRONT BRAKE PADS

Check the brake pads for wear.

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

For brake pad removal/installation (page 18-7).

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



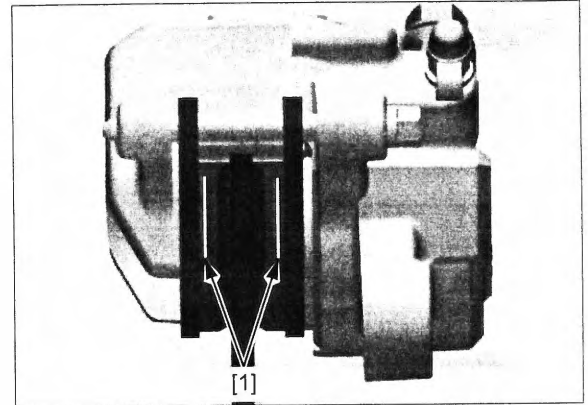
REAR BRAKE PADS

Check the brake pads for wear.

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

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

For brake pad removal/installation (page 18-7).



BRAKE SYSTEM

INSPECTION

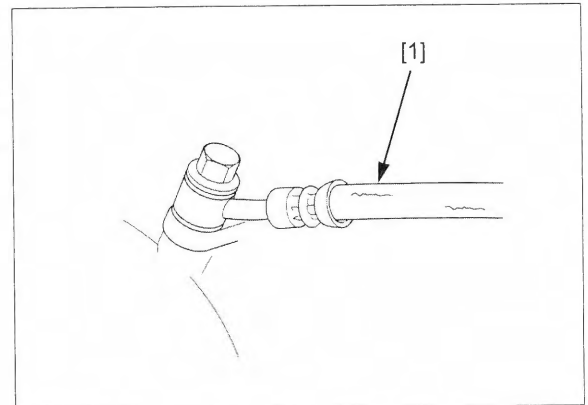
Firmly apply the brake lever or pedal, and check that no air has entered the system.

If the lever or pedal feels soft or spongy when operated, bleed the air from the system (page 18-5).

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 LIGHT SWITCH

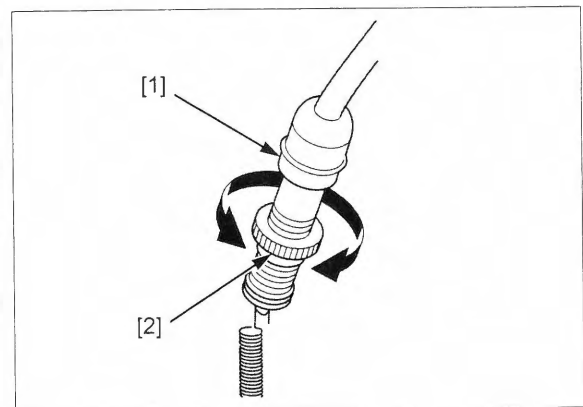
NOTE:

- 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 the vertical adjusting screw (lower side) [1]. A clockwise rotation moves the beam down.

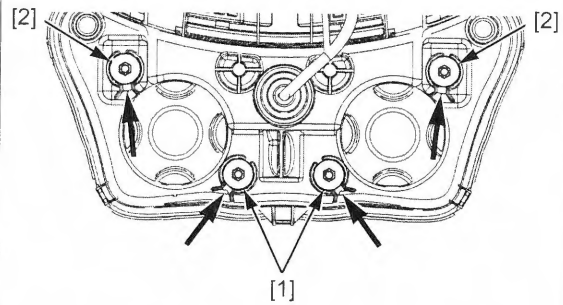
Adjust horizontally by turning the horizontal adjusting screw (upper side) [2].

Dual headlight model: Left headlight (High beam): A clockwise rotation moves the beam toward the left.

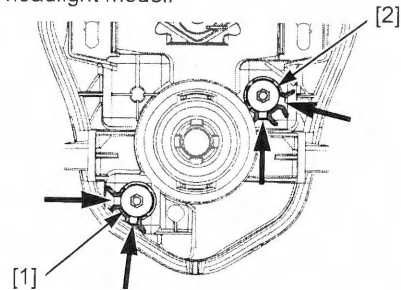
Right headlight (Low beam): A clockwise rotation moves the beam toward the right

Single headlight model: A clockwise rotation moves the beam toward the right.

Dual headlight model:



Single headlight model:



← : Screwdriver access direction

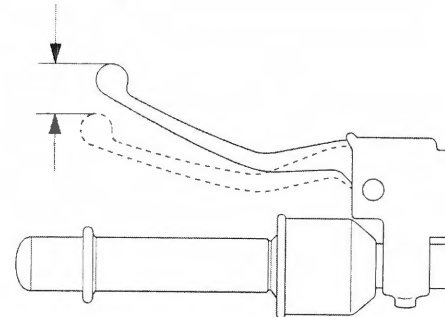
CLUTCH SYSTEM

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

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

FREEPLAY: 10 – 20 mm (0.4 – 0.8 in)

10 – 20 mm
(0.4 – 0.8 in)



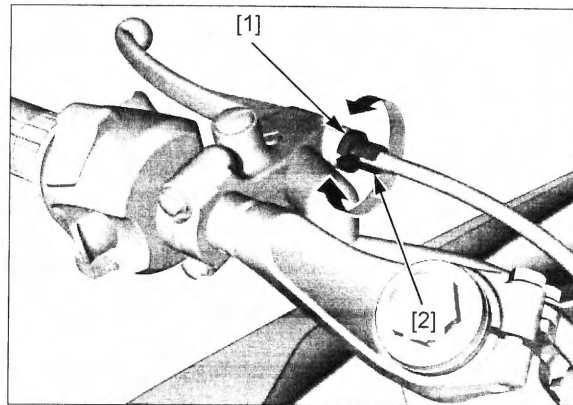
Minor adjustment is made with the upper adjuster at the clutch lever.

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

Tighten the lock nut while holding the adjuster.

If the adjuster is threaded out near its limit and the correct freeplay cannot be obtained, turn the adjuster all the way in and back out one turn, then perform the adjustment at major adjuster as follows.

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

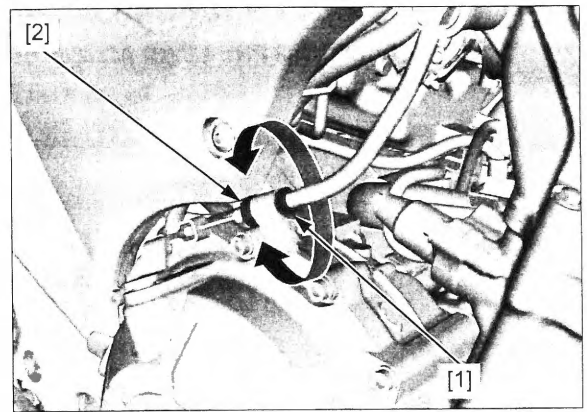


Major adjustment is made with the lower adjusting nut [1] at the clutch lifter arm.

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

Tighten the lock nut while holding the adjusting nut.

If the proper freeplay cannot be obtained, or the clutch slips during test-ride, disassemble and inspect the clutch (page 11-2).



SIDESTAND

Support the motorcycle using a safety stand or hoist.

Check the sidestand spring for damage or loss of tension.

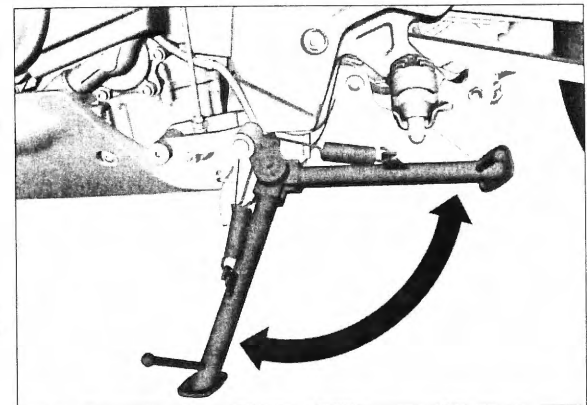
Check the sidestand for movement and lubricate the sidestand pivot if necessary.

For sidestand removal/installation (page 2-26).

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 21-21).



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 16-19).

REAR SUSPENSION INSPECTION

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

Replace damaged components which cannot be repaired.

Tighten all fasteners.

For shock absorber service (page 17-10).

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

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

Replace the bearings if any looseness is noted.

For swingarm service (page 17-13).

MAINTENANCE

REAR SUSPENSION ADJUSTMENT

SPRING PRE-LOAD ADJUSTER

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

TOOL:

Pin spanner

07AMA-MFLA100
(U.S.A. only)

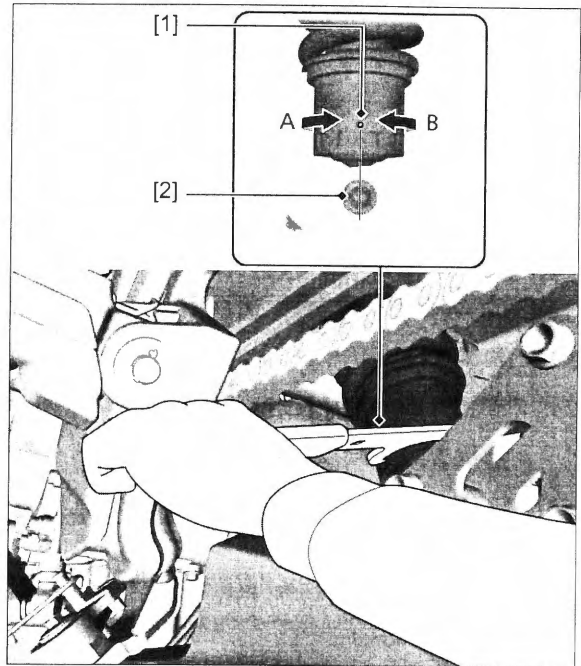
STANDARD POSITION:

3rd position from minimum (aligning index mark [1] with lower mounting bolt head [2])

ADJUSTABLE RANGE: 9 positions

Turn the adjuster in the direction A to decrease the pre-load.

Turn the adjuster in the direction B to increase the pre-load.



NUTS, BOLTS, FASTENERS

Check that all chassis nuts, screws and bolts are tightened to their correct torque values (page 1-14).

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

WHEELS/TIRES

Support the motorcycle 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 16-16).

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

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

For rear wheel service (page 17-6).

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

- Front tire (page 1-11)
- Rear tire (page 1-12)

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 limits.

- Front tire (page 1-11)
- Rear tire (page 1-12)

STEERING HEAD BEARINGS

Support the motorcycle 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 16-26).

SERVICE INFORMATION	4-2	MIL CIRCUIT TROUBLESHOOTING	4-36
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SYSTEM DIAGRAM	4-4	SENSOR UNIT	4-38
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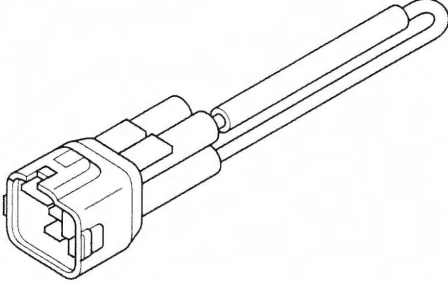
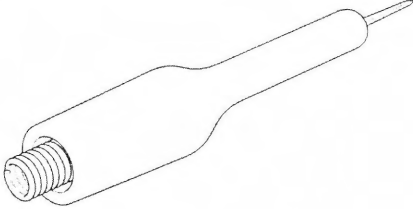
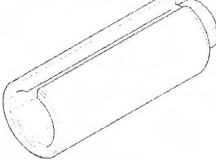
SERVICE INFORMATION

GENERAL

- This section covers electrical system service of the PGM-FI system. For other service and fuel supply system, see Fuel System section (page 7-2).
- The PGM-FI system is equipped with the self-diagnostic system. When performing the troubleshooting, read "PGM-FI Troubleshooting Information" carefully (page 4-5), and inspect and troubleshoot according to the DTC.
- A faulty PGM-FI system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- Use a digital tester for PGM-FI system inspection.
- The MAP, IAT and TP sensors are integrated in one sensor unit that is located on the left side of the two cylinders throttle body. The MAP and IAT sensors are measured at the left (No. 1) cylinder of the throttle body and the ECM calculates the value in the right (No. 2) cylinder on the basis of the left cylinder measurement.
- The following color codes used are indicated through out this section.

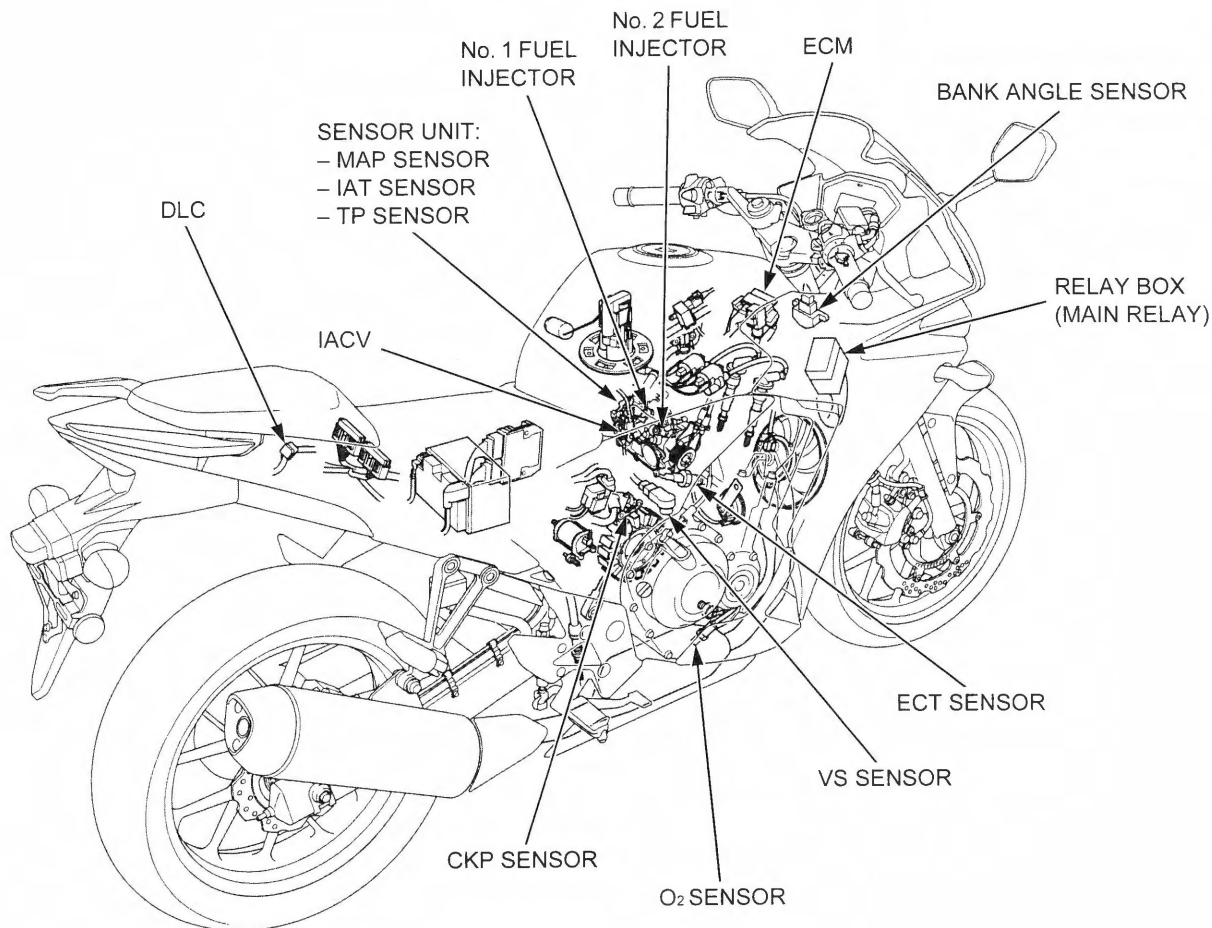
Bl = Black	G = Green	Lg = Light Green	R = Red	Y = Yellow
Br = Brown	Gr = Gray	O = Orange	V = Violet	
Bu = Blue	Lb = Light Blue	P = Pink	W = White	

TOOLS

<p>SCS service connector 070PZ-ZY30100</p> 	<p>Test probe (2 required) 07ZAJ-RDJA110</p> 	<p>Sensor socket wrench, 22 mm 07LAA-PT50101</p>  <p>or equivalent commercially available in U.S.A.</p>
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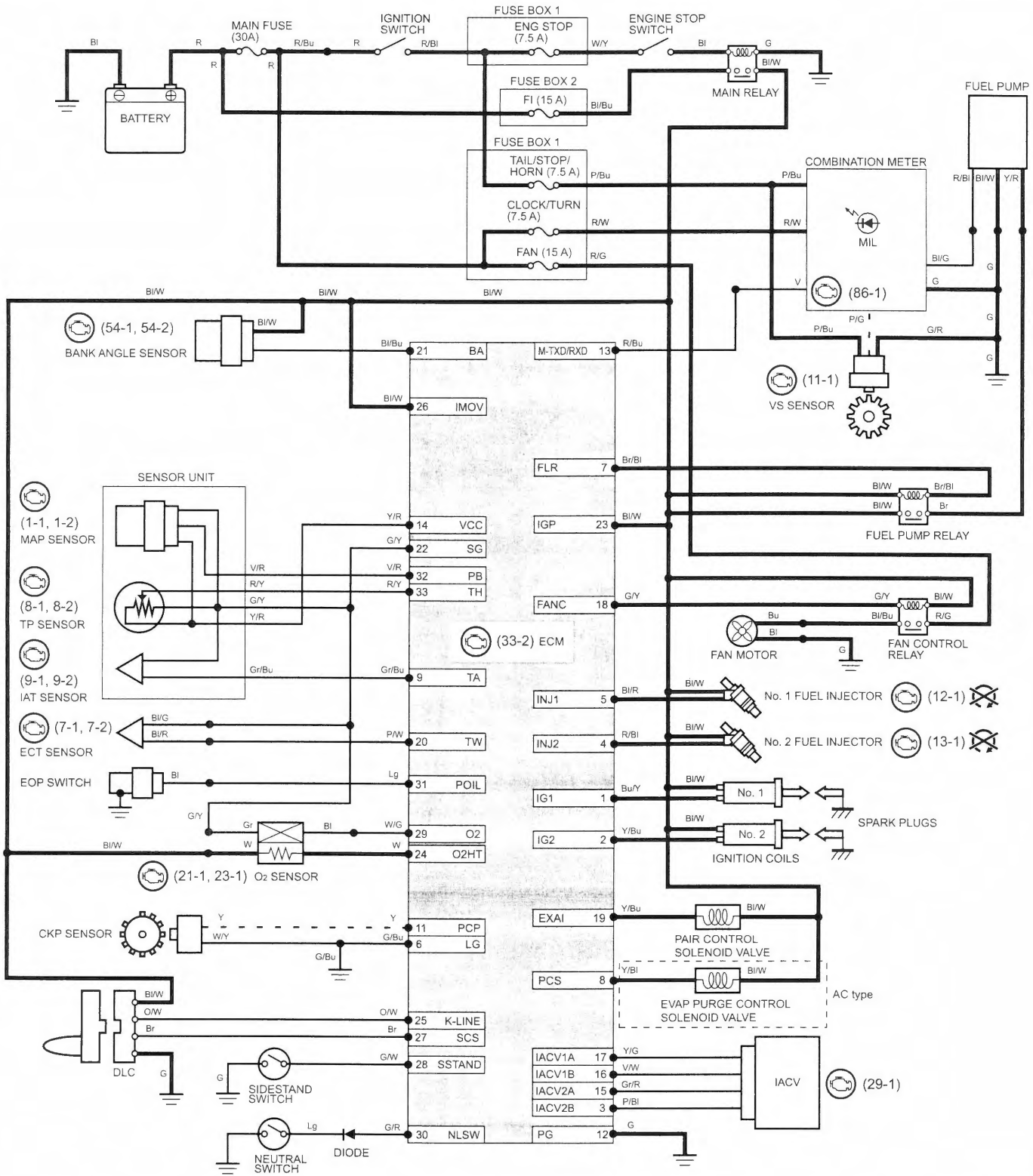
SYSTEM LOCATION

CBR500RA shown:



PGM-FI SYSTEM

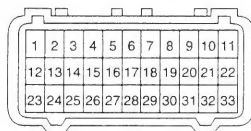
SYSTEM DIAGRAM



() = DTC

⊗ = Engine does not start when detecting DTC

⌚ = Short terminals for reading DTC



ECM 33P (Black) CONNECTOR (ECM side)

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

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-programmed value in the simulated program map. When any abnormality is detected in the injector, 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 "O" or idling with the sidestand down. The MIL will stay ON when the engine speed is over 1,900 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 nine short blinks, the DTC is 29 (two long blinks = 20 blinks, plus nine 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 "O", 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 4-36).

PGM-FI SYSTEM

CURRENT DTC/STORED DTC

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

- In case the ECM detects the problem at present, the MIL will start blinking as its DTC. It is possible to read out the MIL blink pattern as the current DTC.
- In case the ECM does not detect any problem at present but has a problem stored in its memory, the MIL will not blink. If it is necessary to retrieve the past problem, read out the stored DTC by following the DTC Readout procedure (page 4-6).

MCS INFORMATION

- The MCS can read out the DTC, stored data, current data and other ECM condition.

How to connect the MCS

Remove the following:

- CBR500R/RA/CB500F/FA: front seat (page 2-6)
- CB500X/XA: seat (page 2-6)

Turn the ignition switch OFF.

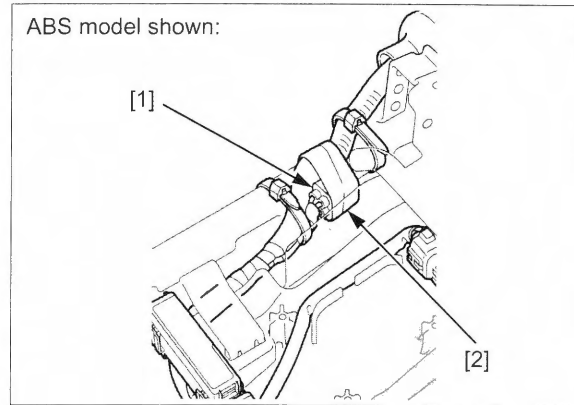
Remove the DLC [1] from the dummy connector [2].

Connect the MCS to the DLC.

Turn the ignition switch ON with the engine stop switch "O" and check the DTC and stored data.

NOTE:

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



DTC READOUT

Current DTC

Turn the ignition switch ON with the engine stop switch "O" and check the MIL.

Start the engine and check the MIL. If the engine will not start, turn the starter motor for more than 10 seconds and check that the MIL blinks.

If the MIL blinks, connect the MCS to the DLC (page 4-6).

Read the DTC, stored data and follow the DTC index (page 4-9).

- If the MIL does not blink, the system is normal at present. If you wish to read the stored DTC, connect the MCS to the DLC.
- If the MCS is not available, note how many times the MIL blinks and follow the DTC index (page 4-9). If you wish to read the stored DTC, perform the following.

Reading stored DTC with the MIL

Remove the following:

- CBR500R/RA/CB500F/FA: front seat (page 2-6)
- CB500X/XA: seat (page 2-6)

Turn the ignition switch OFF.

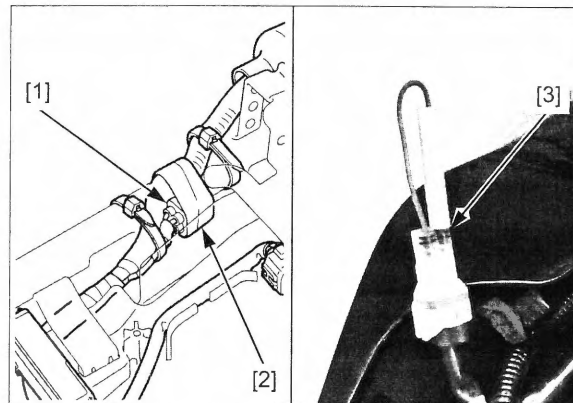
Remove the DLC [1] from the dummy connector [2] and short the DLC terminals using the special tool.

TOOL:

[3] SCS service connector 070PZ-ZY30100

CONNECTION: Brown – Green

Turn the ignition switch ON with the engine stop switch "O", read the MIL blinks and refer to the DTC index (page 4-9).



- If the ECM has stored DTC in its memory, the MIL will illuminate 0.3 seconds and go off, then start blinking as its DTC when you turn the ignition switch ON.
- If the ECM has no stored DTC, the MIL will illuminate and stay on when you turn the ignition switch ON.

ERASING STORED DTC

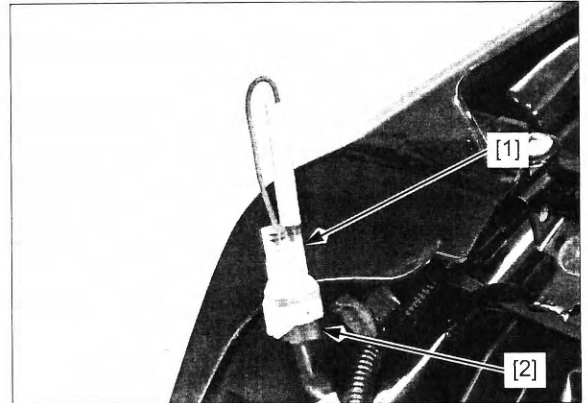
NOTE:

- 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 to the DLC (page 4-6).
2. Turn the ignition switch ON with the engine stop switch "O".
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

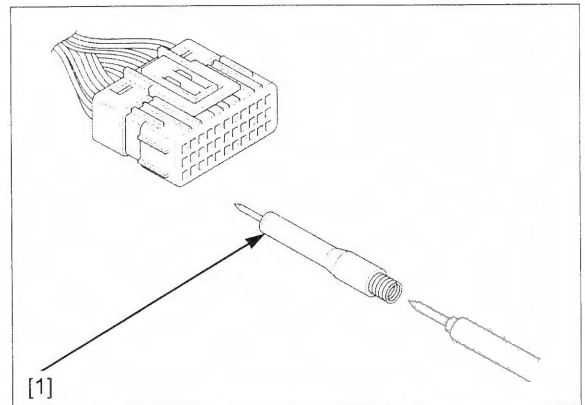
INSPECTION AT ECM CONNECTOR

- Always clean around and keep any foreign material away from the ECM 33P (Black) 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 (Black) connector (including IACV 4P 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

07ZAJ-RDJA110



PGM-FI SYMPTOM TROUBLESHOOTING

When the motorcycle has one of these symptoms, check the DTC or MIL blinking, refer to the DTC index (page 4-9) and begin the appropriate troubleshooting procedure. If there are no DTC stored in the ECM memory, do the diagnostic procedure for the symptom, in sequence listed below, until you find cause.

Symptom	Diagnosis procedure	Also check for
Engine cranks but won't start (No DTC and MIL blinking)	<ol style="list-style-type: none"> 1. Crank the engine for more than ten seconds and check the MIL (page 4-6) and execute the troubleshooting according to the DTC. 2. Inspect the ignition system (page 5-3). 3. Inspect the fuel supply system (page 7-6). 4. Check the spark plug condition (page 3-6). 5. Check the cylinder compression (page 10-6). 	<ul style="list-style-type: none"> • No fuel to fuel injector <ul style="list-style-type: none"> – Clogged fuel filter – Pinched or clogged fuel tank breather hose (A, CM types) or fuel tank-to-EVAP canister hose (AC type) – Pinched or clogged fuel feed hose – Faulty fuel pump – Faulty fuel pump circuits • Intake air leak • Contaminated/deteriorated fuel • Faulty fuel injector • IACV stuck
Engine cranks but won't start (No fuel pump operation sound when turning the ignition ON)	<ol style="list-style-type: none"> 1. ECM power/ground circuits malfunction (page 4-37). 2. Inspect the fuel pump system (page 7-10). 	<ul style="list-style-type: none"> • Open circuit in the power input and/or ground line of the ECM • Short circuit in sensor unit line • Faulty main relay and related circuit
Engine stalls, hard to start, rough idling	<ol style="list-style-type: none"> 1. Check the idle speed (page 3-12). 2. Check the IACV (page 7-17). 3. Inspect the fuel supply system (page 7-6). 	<ul style="list-style-type: none"> • Restricted fuel feed hose • Contaminated/deteriorated fuel • Intake air leak • Restricted fuel tank breather hose (A, CM types) or fuel tank-to-EVAP canister hose (AC type) • Faulty ignition system
Afterburn when engine braking is used	<ol style="list-style-type: none"> 1. Inspect the secondary air supply system (page 7-18). 2. Inspect the ignition system (page 5-3). 	
Backfiring or misfiring during acceleration	Inspect the ignition system (page 5-3).	
Poor performance (driveability) and poor fuel economy	Inspect the fuel supply system (page 7-6).	<ul style="list-style-type: none"> • Air cleaner element contaminated • Pinched or clogged fuel feed hose • Faulty pressure regulator (fuel pump) • Faulty fuel injector • Faulty ignition system
Idle speed is below specifications or fast idle too low (No DTC and MIL blinking)	<ol style="list-style-type: none"> 1. Check the idle speed (page 3-12). 2. Check the IACV (page 7-17). 	<ul style="list-style-type: none"> • Faulty fuel supply system • Faulty ignition system
Idle speed is above specifications or fast idle too high (No DTC and MIL blinking)	<ol style="list-style-type: none"> 1. Check the idle speed (page 3-12). 2. Check the throttle operation and freewheel (page 3-4). 3. Check the IACV (page 7-17). 	<ul style="list-style-type: none"> • Faulty ignition system • Intake air leak • Engine top-end problem • Air cleaner condition
MIL stays on or MIL never comes on at all	Inspect the MIL circuit (page 4-36).	

DTC INDEX

NOTE:

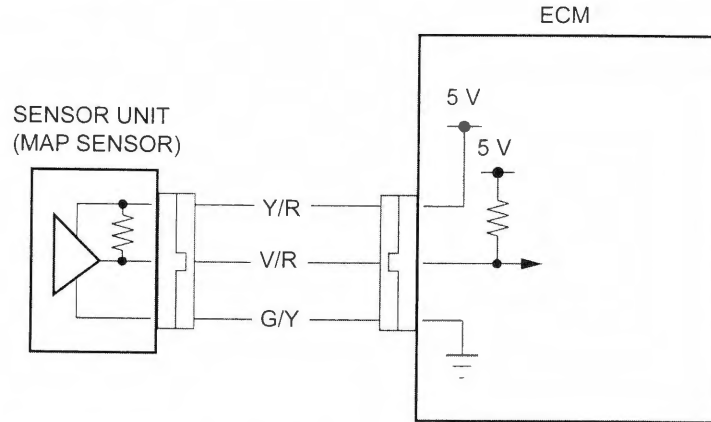
- If the MCS is not used, perform all of the inspection on the corresponding main code (digits in front of hyphen) of the DTC.

DTC	Function Failure	Symptom/Fail-safe function	Refer to
1-1	MAP sensor circuit low voltage (less than 0.029 V) • MAP sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 60 kPa (450 mmHg)	4-10
1-2	MAP sensor circuit high voltage (more than 3.809 V) • Loose or poor contact of the sensor unit connector • MAP sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 60 kPa (450 mmHg)	4-11
7-1	ECT sensor circuit low voltage (less than 0.049 V) • ECT sensor or its circuit malfunction	• Hard start at a low temperature • Pre-program value: 110°C (230°F)	4-13
7-2	ECT sensor circuit high voltage (more than 4.946 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)	4-14
8-1	TP sensor circuit low voltage (less than 0.122 V) • Loose or poor contact of the sensor unit connector • TP sensor or its circuit malfunction	• Poor engine acceleration • Pre-program value: 0°	4-16
8-2	TP sensor circuit high voltage (more than 4.966 V) • TP sensor or its circuit malfunction	• Poor engine acceleration • Pre-program value: 0°	4-17
9-1	IAT sensor circuit low voltage (less than 0.049 V) • IAT sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 35°C (95°F)	4-19
9-2	IAT sensor circuit high voltage (more than 4.946 V) • Loose or poor contact of the sensor unit connector • IAT sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 35°C (95°F)	4-20
11-1	VS sensor malfunction • Loose or poor contact of the VS sensor connector • VS sensor or its circuit malfunction	• Engine operates normally	4-22
12-1	No. 1 (left) fuel injector malfunction • Loose or poor contact of the fuel injector connector • Fuel injector or its circuit malfunction	• Engine does not start • Fuel injector, fuel pump and ignition coil shut down	4-24
13-1	No. 2 (right) fuel injector malfunction • Loose or poor contact of the fuel injector connector • Fuel injector or its circuit malfunction	• Engine does not start • Fuel injector, fuel pump and ignition coil shut down	4-24
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	4-26
23-1	O ₂ sensor heater malfunction • Loose or poor contact of the O ₂ sensor connector • O ₂ sensor or its circuit malfunction	• Engine operates normally	4-28
29-1	IACV malfunction • Loose or poor contact of the IACV connector • IACV or its circuit malfunction	• Engine stalls, hard to start, rough idling	4-30
33-2*	ECM EEPROM malfunction	• Engine operates normally • Does not hold the self-diagnosis data	4-32
54-1	Bank angle sensor circuit low voltage (less than 0.020 V) • Loose or poor contact of the bank angle sensor connector • Bank angle sensor or its circuit malfunction	• Engine operates normally • Engine stop function does not operate	4-32
54-2	Bank angle sensor circuit high voltage (more than 4.986 V) • Bank angle sensor or its circuit malfunction	• Engine operates normally • Engine stop function does not operate	4-34
86-1	Serial communication malfunction • Loose or poor contact of the related connector • Faulty combination meter or its circuit malfunction • Faulty ECM	• Engine operates normally	4-34

* The MIL does not blink (DTC can be readout/erased only by MCS)

DTC TROUBLESHOOTING

DTC 1 (MAP SENSOR)



Probable cause

- Open circuit in Yellow/red or Green/yellow wire between the sensor unit and ECM
- Open or short circuit in Violet/red wire between the sensor unit and ECM
- Faulty sensor unit (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 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Sensor Unit Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the sensor unit 5P (Black) connector [1].
Turn the ignition switch ON with the engine stop switch "O".

Measure the voltage between the wire harness side sensor unit 5P (Black) connector terminals.

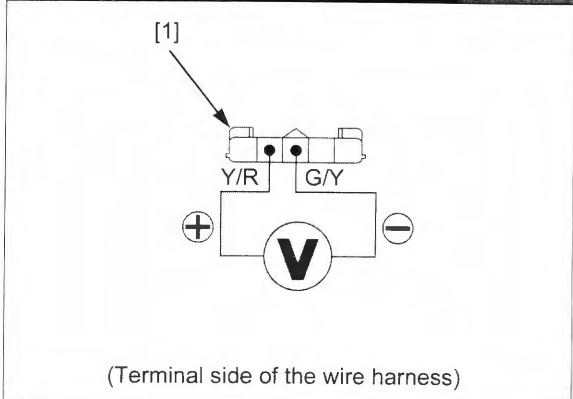
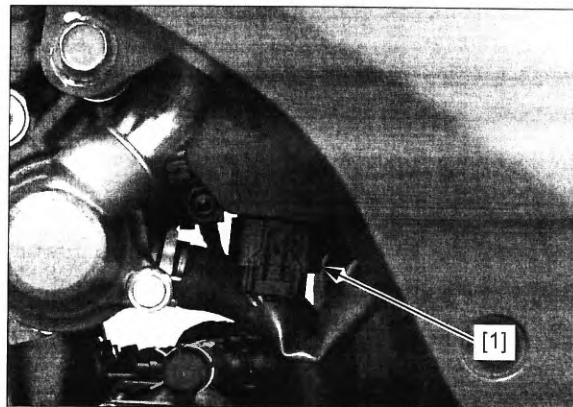
CONNECTION: Yellow/red (+) – Green/yellow (-)

STANDARD: 4.75 – 5.25 V

Is the voltage within standard value?

YES – GO TO STEP 4.

NO – GO TO STEP 3.



3. Sensor Unit Input Line Open Circuit Inspection

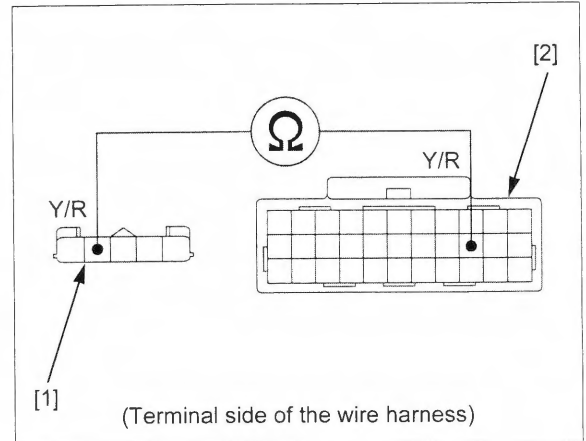
Turn the ignition switch OFF.
 Disconnect the ECM 33P (Black) connector (page 4-36).
 Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] and ECM 33P (Black) connector [2] terminals.

TOOL:
Test probe 07ZAJ-RDJA110

CONNECTION: Yellow/red – Yellow/red

Is there continuity?

- YES** – Replace the ECM with a known good one, and recheck.
NO – Open circuit in Yellow/red wire



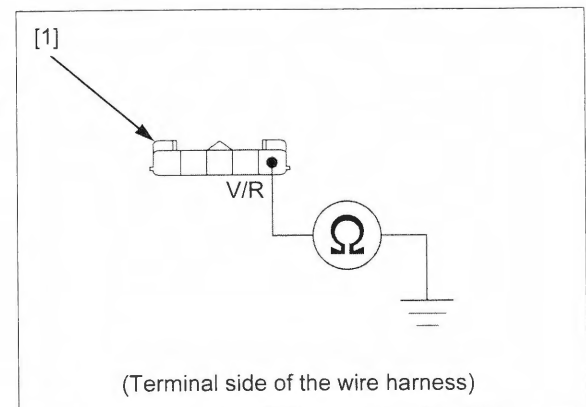
4. MAP Sensor Signal Line Short Circuit Inspection

Turn the ignition switch OFF.
 Disconnect the ECM 33P (Black) connector (page 4-36).
 Check for continuity between sensor unit 5P (Black) connector [1] terminal and ground.

CONNECTION: Violet/red – Ground

Is there continuity?

- YES** – Short circuit in Violet/red wire
NO – GO TO STEP 5.



5. MAP Sensor Inspection

Replace the sensor unit with a known good one (page 4-38).
 Connect the ECM 33P (Black) connector.
 Erase the DTC (page 4-7).
 Check the MAP sensor with the MCS.

Is DTC 1-1 indicated?

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

DTC 1-2 (MAP SENSOR HIGH VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the sensor unit 5P (Black) and ECM 33P (Black) connectors, and recheck the DTC.

1. MAP sensor system inspection

Check the MAP sensor with the MCS.

Is about 5 V indicated?

- YES** – GO TO STEP 2.
NO – Intermittent failure

2. Sensor Unit Input Voltage Inspection

Turn the ignition switch OFF.
 Disconnect the sensor unit 5P (Black) connector [1].
 Turn the ignition switch ON with the engine stop switch "O".
 Measure the voltage between the wire harness side sensor unit 5P (Black) connector terminals.

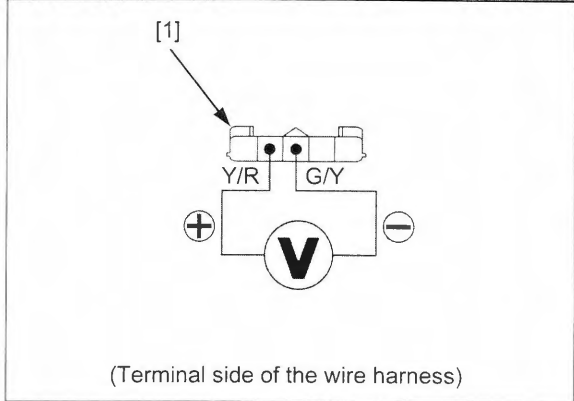
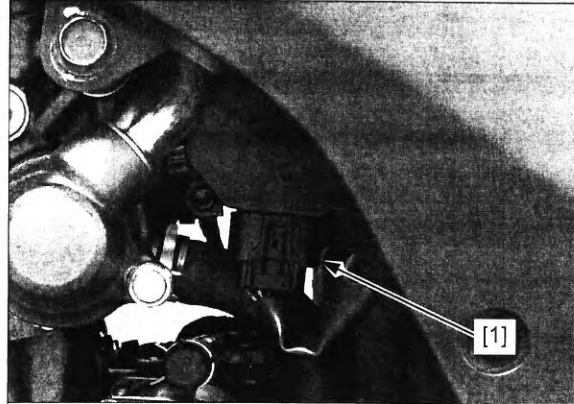
CONNECTION: Yellow/red (+) – Green/yellow (-)

STANDARD: 4.75 – 5.25 V

Is the voltage within standard value?

YES – GO TO STEP 3.

NO – Open circuit in Green/yellow wire



(Terminal side of the wire harness)

3. MAP Sensor System Inspection with Jumper Wire

Turn the ignition switch OFF.
 Connect the wire harness side sensor unit 5P (Black) connector [1] terminals with a jumper wire [2].

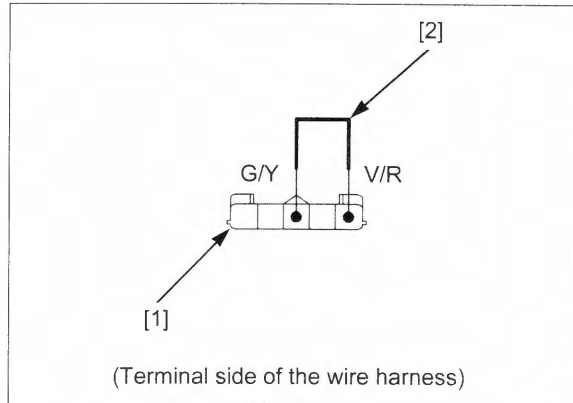
CONNECTION: Violet/red – Green/yellow

Check the MAP sensor with the MCS.

Is about 0 V indicated?

YES – Faulty sensor unit (MAP sensor)

NO – GO TO STEP 4.



(Terminal side of the wire harness)

4. MAP Sensor Signal Line Open Circuit Inspection

Turn the ignition switch OFF.
 Disconnect the ECM 33P (Black) connector (page 4-36).
 Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] and ECM 33P (Black) connector [2] terminals.

TOOL:

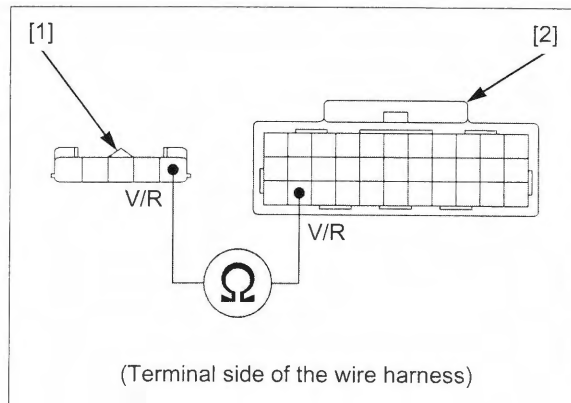
Test probe 07ZAJ-RDJA110

CONNECTION: Violet/red – Violet/red

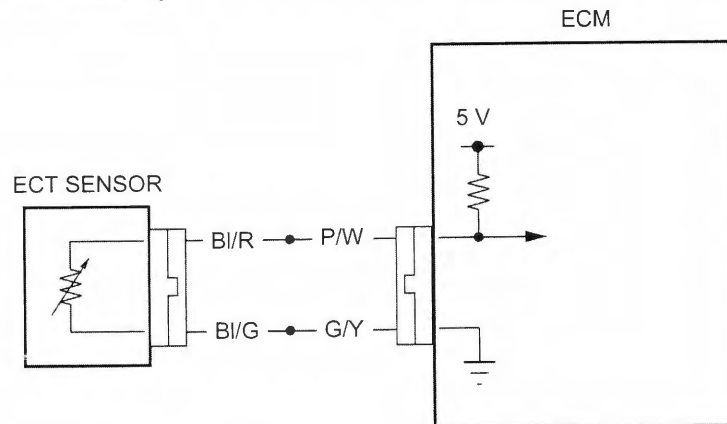
Is there continuity?

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

NO – Open circuit in Violet/red wire



(Terminal side of the wire harness)

DTC 7 (ECT SENSOR)**Probable cause**

- Open or short circuit in Black/red or Pink/white wire between the ECT sensor and ECM
- Open circuit in Black/green or Green/yellow 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.

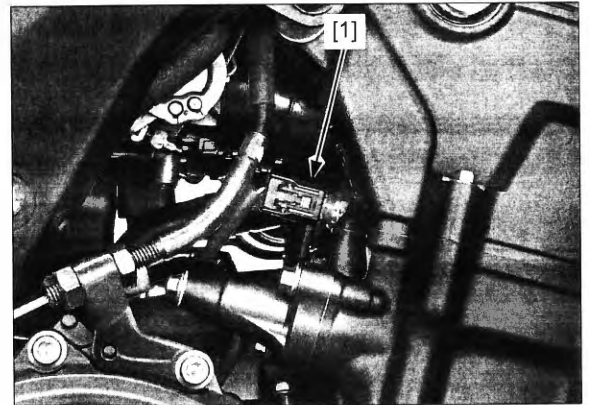
Disconnect the ECT sensor 2P (Black) connector [1].

Check the ECT sensor with the MCS.

Is about 0 V indicated?

YES – GO TO STEP 3.

NO – Faulty ECT sensor



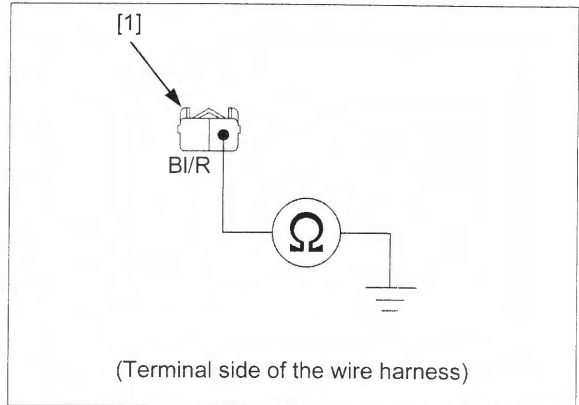
3. ECT Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.
 Disconnect the ECM 33P (Black) connector (page 4-36).
 Check for continuity between the wire harness side ECT sensor 2P (Black) connector [1] terminal and ground.

CONNECTION: Black/red – Ground

Is there continuity?

- YES** – Short circuit in Black/red or Pink/white wire
- NO** – Replace the ECM with a known good one, and recheck.



DTC 7-2 (ECT SENSOR HIGH VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the ECT sensor 2P (Black), engine sub-wire harness 6P (Black) and ECM 33P (Black) connectors, and recheck the DTC.

1. ECT Sensor System Inspection

Check the ECT sensor with the MCS.

Is about 5 V indicated?

- YES** – GO TO STEP 2.
- NO** – Intermittent failure

2. ECT Sensor System Inspection with Jumper Wire

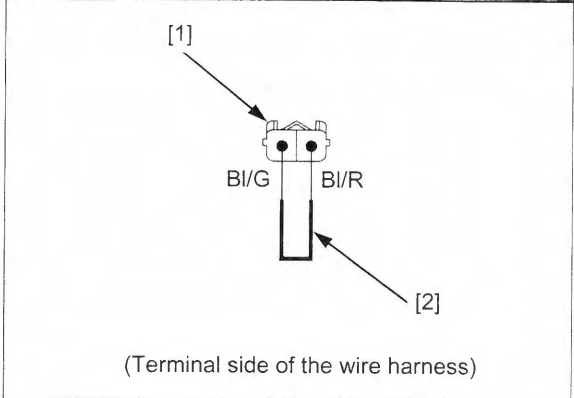
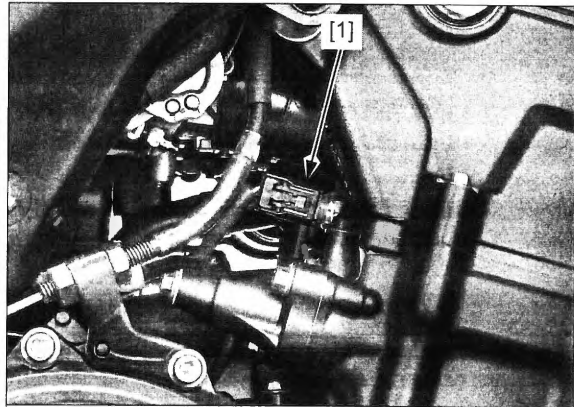
Turn the ignition switch OFF.
 Disconnect the ECT sensor 2P (Black) connector [1].
 Connect the wire harness side ECT sensor 2P (Black) connector terminals with a jumper wire [2].

CONNECTION: Black/red – Black/green

Check the ECT sensor with the MCS.

Is about 0 V indicated?

- YES** – GO TO STEP 4.
- NO** – GO TO STEP 3.



3. ECT Sensor Line Open Circuit Inspection

Turn the ignition switch OFF.
 Disconnect the ECM 33P (Black) connector (page 4-36).
 Check for continuity between the wire harness side ECT sensor 2P (Black) connector [1] and ECM 33P (Black) connector [2] terminals.

TOOL:

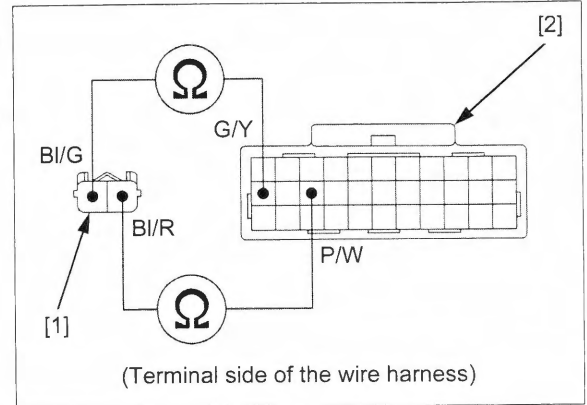
Test probe 07ZAJ-RDJA110

CONNECTION:

- Black/red – Pink/white
- Black/green – Green/yellow

Is there continuity?

- YES** – Replace the ECM with a known good one, and recheck.
- NO** –
- Open circuit in Black/red or Pink/white wire
 - Open circuit in Black/green or Green/yellow wire



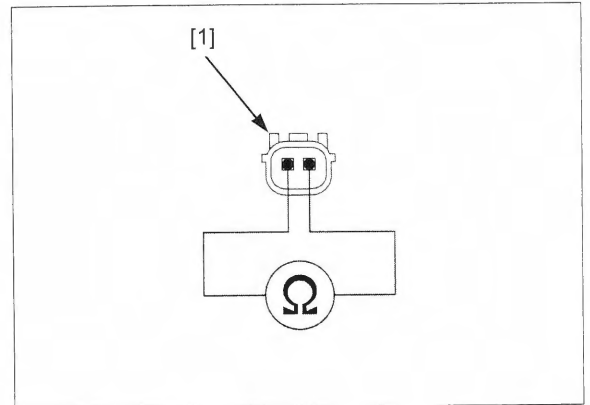
4. ECT Sensor Resistance Inspection

Turn the ignition switch OFF.
 Remove the ECT sensor (page 4-39).
 Measure the resistance between the 2P connector terminals of the ECT sensor [1].

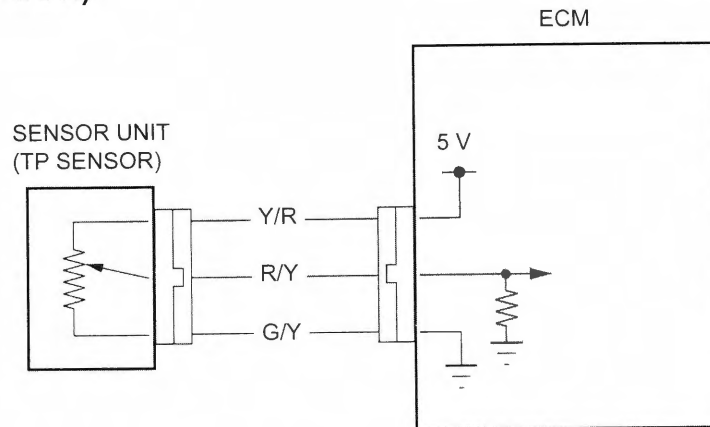
STANDARD: 1.0 – 1.3 kΩ (40°C/104°F)

Is the resistance within 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 Yellow/red or Green/yellow wire between the sensor unit and ECM
- Open or short circuit in Red/yellow wire between the sensor unit and ECM
- Short circuit between Yellow/red and Red/yellow
- Faulty sensor unit (TP sensor)
- Faulty ECM

DTC 8-1 (TP SENSOR LOW VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the sensor unit 5P (Black) and ECM 33P (Black) connectors, and recheck the DTC.

1. TP Sensor System Inspection

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

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Sensor Unit Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the sensor unit 5P (Black) connector [1]. Turn the ignition switch ON with the engine stop switch "O".

Measure the voltage between the wire harness side sensor unit 5P (Black) connector terminals.

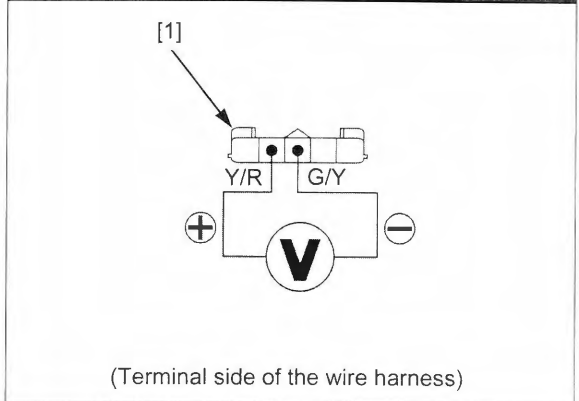
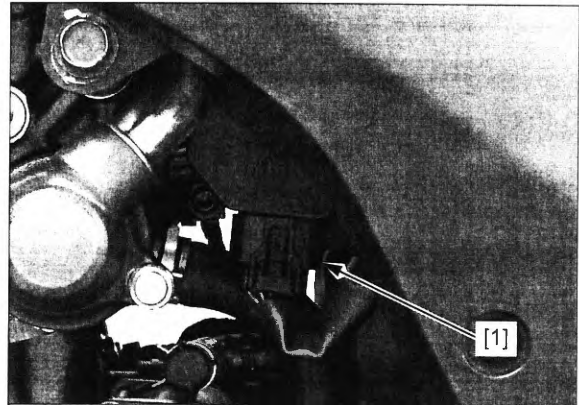
CONNECTION: Yellow/red (+) – Green/yellow (-)

STANDARD: 4.75 – 5.25 V

Is the voltage within standard value?

YES – GO TO STEP 4.

NO – GO TO STEP 3.



3. Sensor Unit Input Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector (page 4-36).

Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] and ECM 33P (Black) connector [2] terminals.

TOOL:

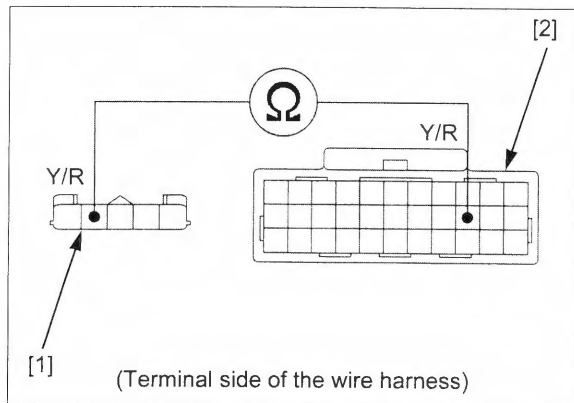
Test probe **07ZAJ-RDJA110**

CONNECTION: Yellow/red – Yellow/red

Is there continuity?

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

NO – Open circuit in Yellow/red wire



4. TP Sensor Signal Line Open Circuit Inspection

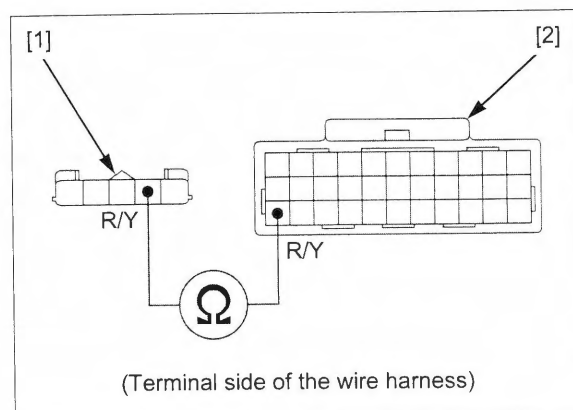
Turn the ignition switch OFF.
 Disconnect the ECM 33P (Black) connector (page 4-36).
 Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] and ECM 33P (Black) connector [2] terminals.

TOOL:
Test probe 07ZAJ-RDJA110

CONNECTION: Red/yellow – Red/yellow

Is there continuity?

- YES** – GO TO STEP 5.
- NO** – Open circuit in Red/yellow wire



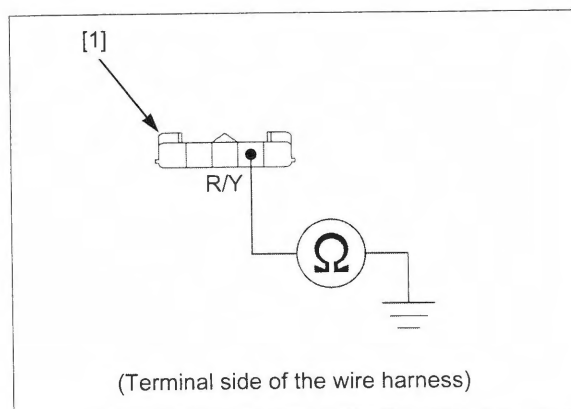
5. TP Sensor Signal Line Short Circuit Inspection

Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] terminal and ground.

CONNECTION: Red/yellow – Ground

Is there continuity?

- YES** – Short circuit in Red/yellow wire
- NO** – GO TO STEP 6.



6. TP Sensor Inspection

Replace the sensor unit with a known good one (page 4-38).
 Connect the ECM 33P (Black) connector.
 Erase the DTC (page 4-7).
 Check the TP sensor with the MCS.

Is DTC 8-1 indicated?

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

DTC 8-2 (TP SENSOR HIGH VOLTAGE)

1. TP Sensor System Inspection

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.

Is the voltage increase continuously?

- YES** – Intermittent failure
- NO** – Faulty sensor unit (TP sensor)

3. Sensor Unit Input Voltage Inspection

Turn the ignition switch OFF.
 Disconnect the sensor unit 5P (Black) connector [1].
 Turn the ignition switch ON with the engine stop switch "O".

Measure the voltage between the wire harness side sensor unit 5P (Black) connector terminals.

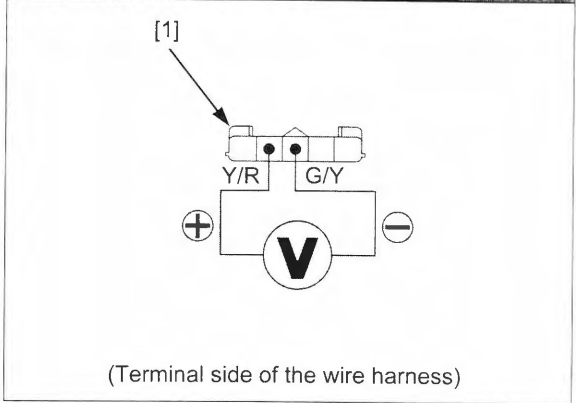
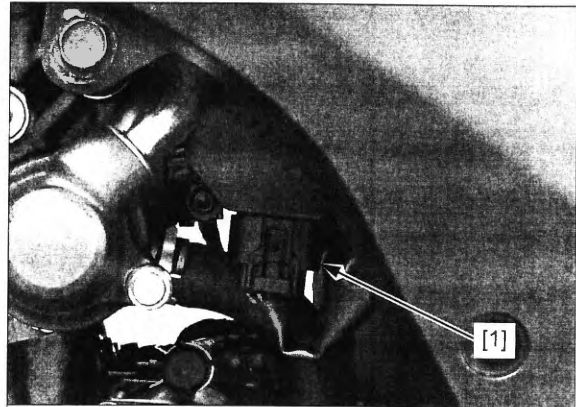
CONNECTION: Yellow/red (+) – Green/yellow (-)

STANDARD: 4.75 – 5.25 V

Is the voltage within standard value?

YES – GO TO STEP 4.

NO – Open circuit in Green/yellow wire



(Terminal side of the wire harness)

4. TP Sensor Line Short Circuit Inspection

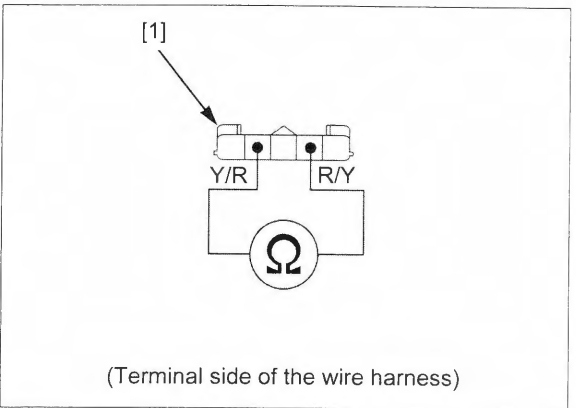
Turn the ignition switch OFF.
 Disconnect the ECM 33P (Black) connector (page 4-36).
 Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] terminals.

CONNECTION: Yellow/red – Red/yellow

Is there continuity?

YES – Short circuit between Yellow/red and Red/yellow wires

NO – GO TO STEP 5.



(Terminal side of the wire harness)

5. TP Sensor Inspection

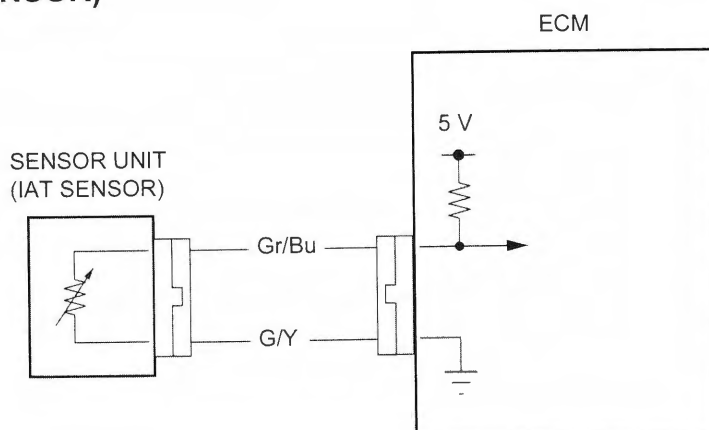
Replace the sensor unit with a known good one (page 4-38).
 Connect the ECM 33P (Black) connector.
 Erase the DTC (page 4-7).
 Check the TP sensor with the MCS.

Is DTC 8-2 indicated?

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

NO – Faulty original sensor unit (TP sensor)

DTC 9 (IAT SENSOR)



Probable cause

- Open or short circuit in Gray/blue wire between the sensor unit and ECM
- Open circuit in Green/yellow wire between the sensor unit and ECM
- Faulty sensor unit (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 System Inspection with Connector Disconnected

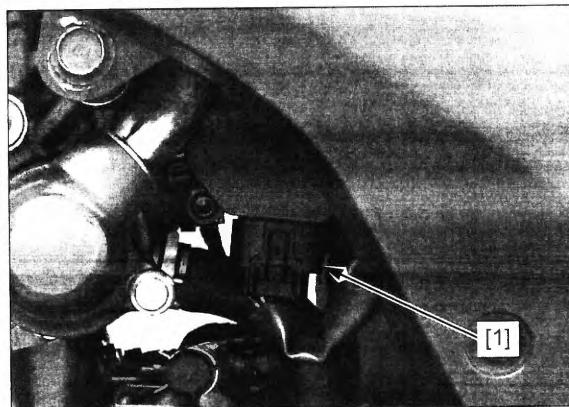
Turn the ignition switch OFF.

Disconnect the sensor unit 5P (Black) connector [1].
Check the IAT sensor with the MCS.

Is about 0 V indicated?

YES – GO TO STEP 3.

NO – Faulty sensor unit (IAT sensor)



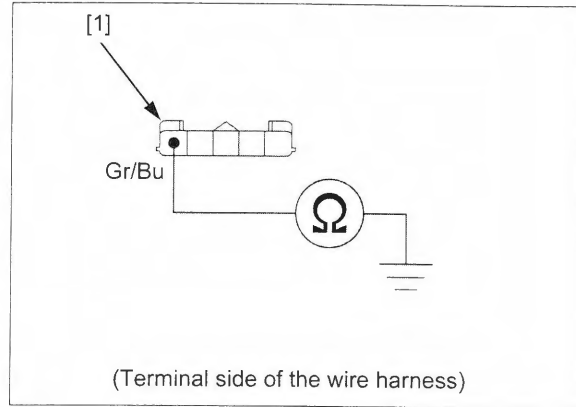
3. IAT Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.
 Disconnect the ECM 33P (Black) connector (page 4-36).
 Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] terminal and ground.

CONNECTION: Gray/blue – Ground

Is there continuity?

- YES** – Short circuit in Gray/blue wire
- NO** – Replace the ECM with a known good one, and recheck.



DTC 9-2 (IAT SENSOR HIGH VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the sensor unit 5P (Black) and ECM 33P (Black) connectors, and recheck the DTC.

1. IAT Sensor System Inspection

Check the IAT sensor with the MCS.

Is about 5 V indicated?

- YES** – GO TO STEP 2.
- NO** – Intermittent failure

2. IAT Sensor System Inspection with Jumper Wire

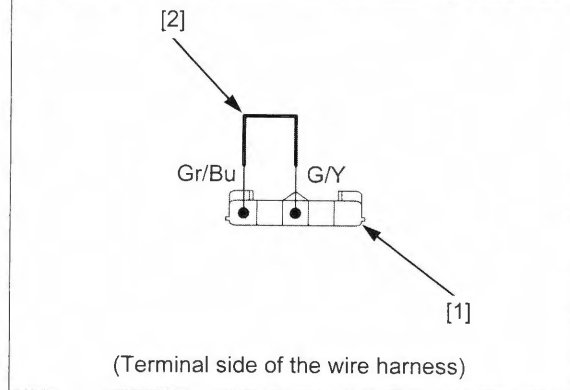
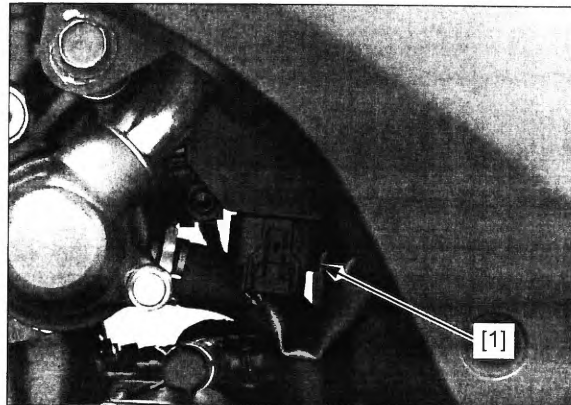
Turn the ignition switch OFF.
 Disconnect the sensor unit 5P (Black) connector [1].
 Connect the wire harness side sensor unit 5P (Black) connector terminals with a jumper wire [2].

CONNECTION: Gray/blue – Green/yellow

Check the IAT sensor with the MCS.

Is about 0 V indicated?

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



3. IAT Sensor Line Open Circuit Inspection

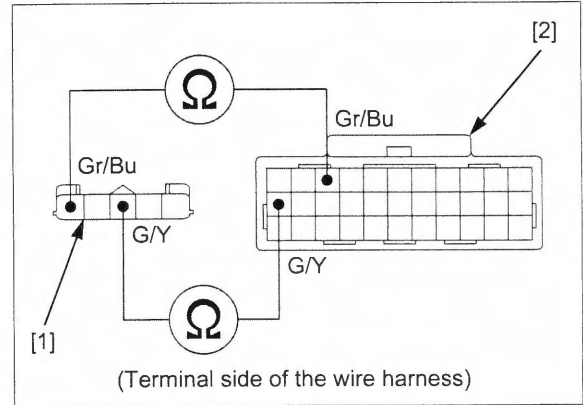
Turn the ignition switch OFF.
 Disconnect the ECM 33P (Black) connector (page 4-36).
 Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] and ECM 33P (Black) connector [2] terminals.

TOOL:
Test probe 07ZAJ-RDJA110

CONNECTION:
 Gray/blue – Gray/blue
 Green/yellow – Green/yellow

Is there continuity?

- YES** – GO TO STEP 4.
NO – • Open circuit in Gray/blue wire
 • Open circuit in Green/yellow wire



4. IAT Sensor Resistance Inspection

Connect the sensor unit 5P (Black) connector.
 Measure the resistance between the wire harness side ECM 33P (Black) connector [1] terminals.

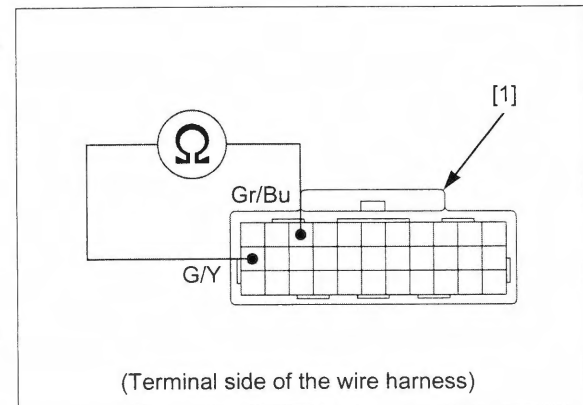
TOOL:
Test probe 07ZAJ-RDJA110

CONNECTION: Gray/blue – Green/yellow

STANDARD: 1 – 4 kΩ (20°C/68°F)

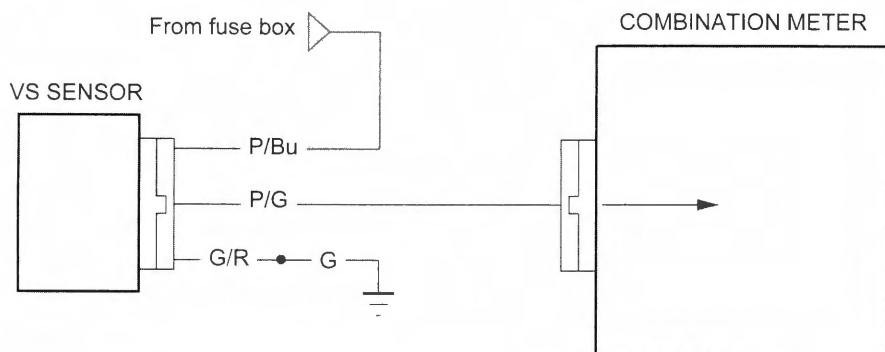
Is the resistance within standard value?

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



DTC 11 (VS SENSOR)

- Before starting the inspection, check for loose or poor contact on the VS sensor 3P (Black), engine sub-wire harness 6P (Black) and combination meter 16P (Gray) connectors, and recheck the DTC.



Probable cause

- Open circuit in Pink/blue wire between the fuse box and VS sensor
- Open circuit in Green/red or Green wire between the VS sensor and ground
- Open or short circuit in Pink/green wire between the VS sensor and combination meter
- Faulty VS sensor
- Faulty combination meter

DTC 11-1 (VS SENSOR)

1. Recheck DTC

Erase the DTC (page 4-7).
 Test-ride the motorcycle above 3,600 rpm.
 Stop the engine.
 Check the VS sensor with the MCS.

Is DTC 11-1 indicated?

- YES** – GO TO STEP 2.
NO – Intermittent failure

2. VS Sensor Input Voltage Inspection

Turn the ignition switch OFF.
 Disconnect the VS sensor 3P (Black) connector (page 4-40).
 Connect the following connectors by temporarily installing the throttle body/air cleaner housing assembly.

- IACV 4P (Black)
- No. 1 and No. 2 fuel injector 2P (Gray)
- sensor unit 5P (Black)

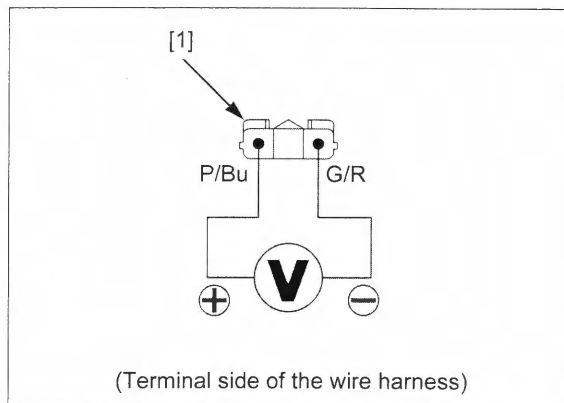
Turn the ignition switch ON with the engine stop switch "O".

Measure the voltage between the wire harness side VS sensor 3P (Black) connector [1] terminals.

CONNECTION: Pink/blue (+) – Green/red (-)

Is there battery voltage?

- YES** – GO TO STEP 3.
NO – • Open circuit in Pink/blue wire
 • Open circuit in Green/red or Green wire



3. VS Sensor Signal Line Short Circuit Inspection

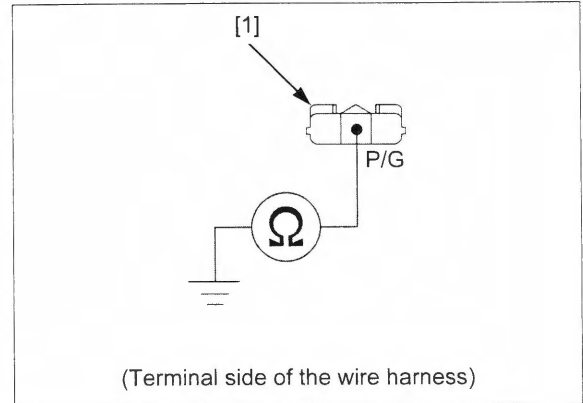
Turn the ignition switch OFF.
 Check for continuity between the wire harness side VS sensor 3P (Black) connector [1] terminal and ground.

CONNECTION: Pink/green – Ground

Is there continuity?

YES – Short circuit in Pink/green wire

NO – GO TO STEP 4.



4. VS Sensor Signal Line Open Circuit Inspection

Disconnect the combination meter 16P (Gray) connector as the combination meter power/ground line inspection (page 21-10).
 Check for continuity between the wire harness side VS sensor 3P (Black) connector [1] and combination meter 16P (Gray) connector [2] terminals.

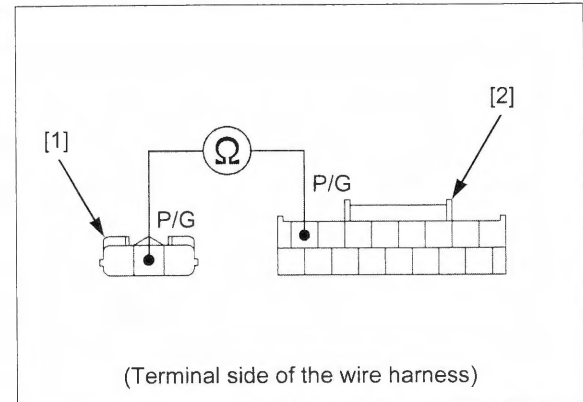
TOOL:
Test probe 07ZAJ-RDJA110

CONNECTION: Pink/green – Pink/green

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in Pink/green wire



5. VS Sensor Inspection

Replace the VS sensor with a known good one (page 4-40).
 Connect the combination meter 16P (Gray) connector.
 Erase the DTC (page 4-7).
 Test-ride the motorcycle above 3,600 rpm.
 Stop the engine.
 Check the DTC with the MCS.

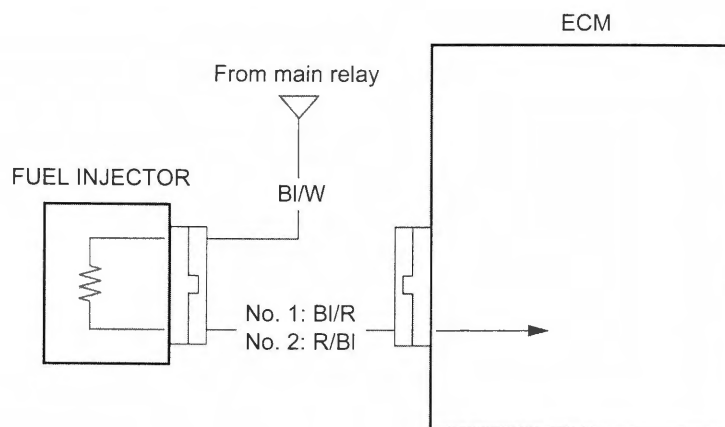
Is DTC 11-1 indicated?

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

NO – Faulty original VS sensor

**DTC 12 (No. 1 [left] FUEL INJECTOR)/
DTC 13 (No. 2 [right] FUEL INJECTOR)**

- Before starting the inspection, check for loose or poor contact on the fuel injector 2P (Gray) and ECM 33P (Black) connectors, and recheck the DTC.



Probable cause

- Open circuit in Black/white wire between the main relay and fuel injector
- Open or short circuit in Black/red (No. 1) or Red/black (No. 2) wire between the fuel injector and ECM
- Faulty fuel injector
- Faulty ECM

**DTC 12-1 (No. 1 [left] FUEL INJECTOR)/
DTC 13-1 (No. 2 [right] FUEL INJECTOR)**

1. Recheck DTC

Erase the DTC (page 4-7).
Start the engine and check the fuel injector with the MCS.

Is the DTC 12-1 or 13-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Fuel Injector Input Voltage Inspection

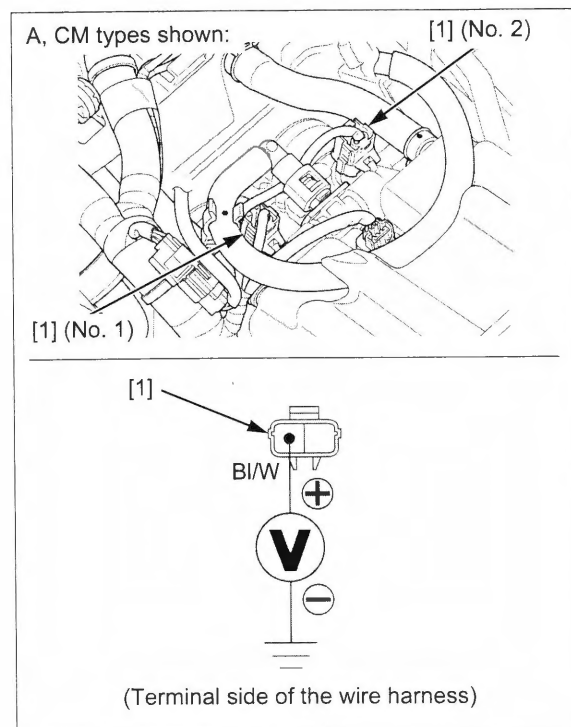
Turn the ignition switch OFF.
 Lift the fuel tank and support it (page 3-4).
 Disconnect the fuel injector 2P (Gray) connector [1].
 Turn the ignition switch ON with the engine stop switch "O".
 Measure the voltage between the wire harness side injector 2P (Gray) connector terminal and ground.

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

Is there battery voltage?

YES – GO TO STEP 3.

NO – Open circuit in Black/white wire



3. Fuel Injector Resistance Inspection

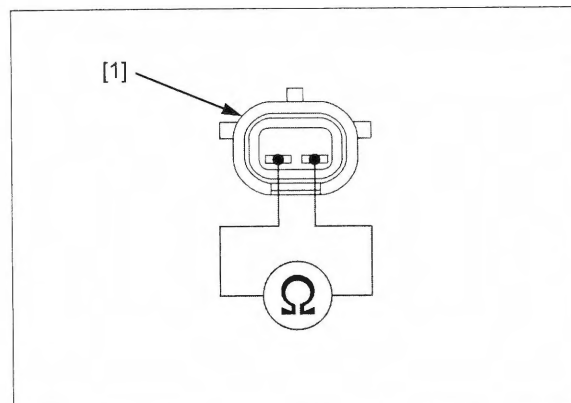
Turn the ignition switch OFF.
 Measure the resistance between the 2P connector terminals of the fuel injector [1].

STANDARD: 11 – 13 Ω (20°C/68°F)

Is the resistance within standard value?

YES – GO TO STEP 4.

NO – Faulty fuel injector



4. Fuel Injector Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-36).
 Check for continuity between the wire harness side fuel injector 2P (Gray) connector [1] and ECM 33P (Black) connector [2] terminals.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION:

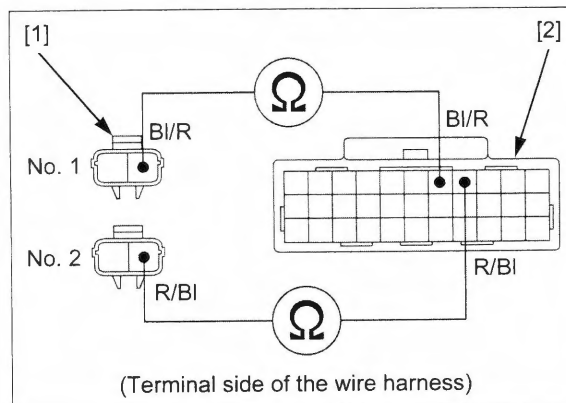
No. 1: Black/red – Black/red

No. 2: Red/black – Red/black

Is there continuity?

YES – GO TO STEP 5.

NO – • Open circuit in Black/red wire
 • Open circuit in Red/black wire



5. Fuel Injector Signal Line Short Circuit Inspection

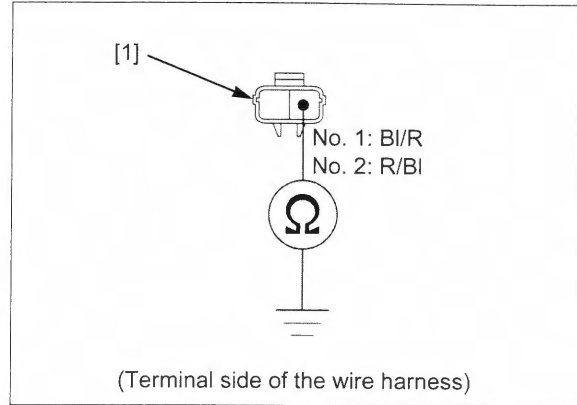
Check for continuity between the wire harness side injector 2P (Gray) connector [1] terminal and ground.

CONNECTION:

- No. 1: Black/red – Ground
- No. 2: Red/black – Ground

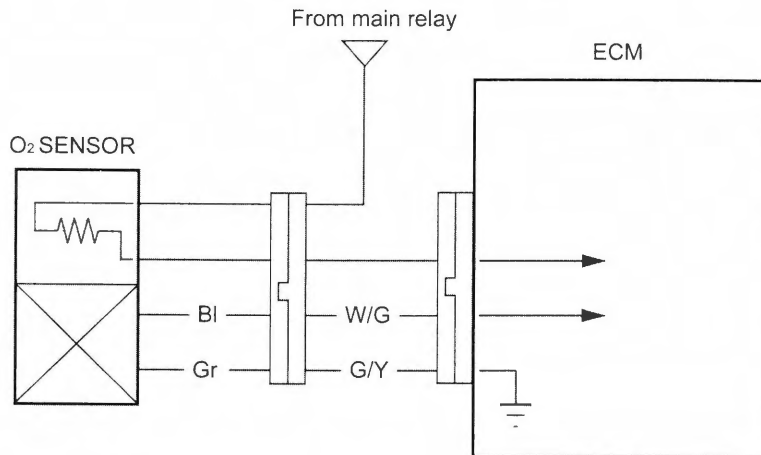
Is there continuity?

- YES** – • Short circuit in Black/red wire
• Short circuit in Red/black wire
- NO** – Replace the ECM with a known good one, and recheck.



DTC 21 (O₂ SENSOR)

- Before starting the inspection, check for loose or poor contact on the O₂ sensor 4P (Black) and ECM 33P (Black) connectors, and recheck the DTC.



Probable cause

- Open or short circuit in White/green wire between the ECM and O₂ sensor
- Open circuit in Green/yellow wire between the O₂ sensor and ECM
- Faulty O₂ sensor
- Faulty ECM

DTC 21-1 (O₂ Sensor)

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 O₂ sensor with the MCS.

Is the DTC 21-1 indicated?

- YES** – GO TO STEP 2.
- NO** – Intermittent failure

2. O₂ Sensor Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the O₂ sensor 4P (Black) connector (page 4-40).

Disconnect the ECM 33P (Black) connector (page 4-36).

Check for continuity between the wire harness side O₂ sensor 4P (Black) connector [1] and ECM 33P (Black) connector [2] terminals.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION:

White/green – White/green

Green/yellow – Green/yellow

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in White/green or Green/yellow wire

3. O₂ Sensor Output Line Short Circuit Inspection

Check the continuity between the wire harness side O₂ sensor 4P (Black) connector [1] terminal and ground.

CONNECTION: White/green – Ground

Is there continuity?

YES – Short circuit in White/green wire

NO – GO TO STEP 4.

4. O₂ Sensor Inspection

Replace the O₂ sensor with a known good one (page 4-40).

Connect the ECM 33P (Black) connector.

Erase the DTC (page 4-7).

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

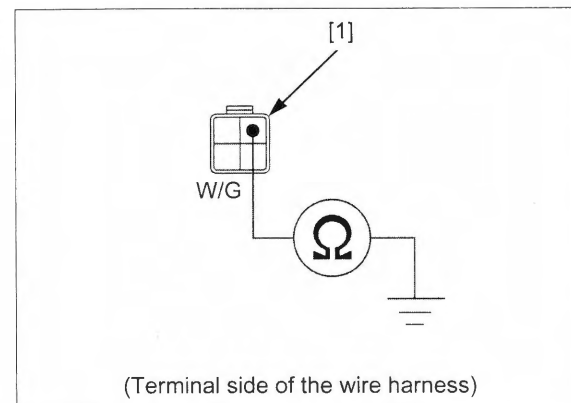
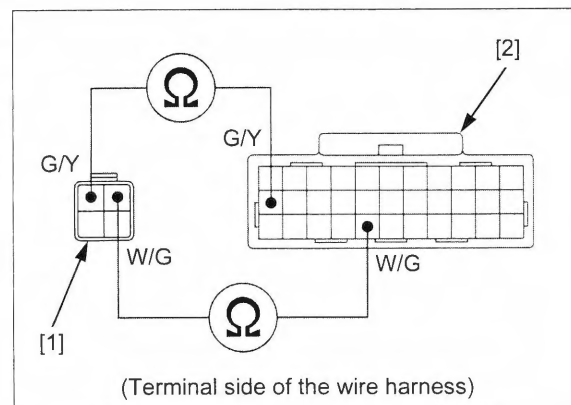
Stop the engine.

Check the O₂ sensor with the MCS.

Is the DTC 21-1 indicated?

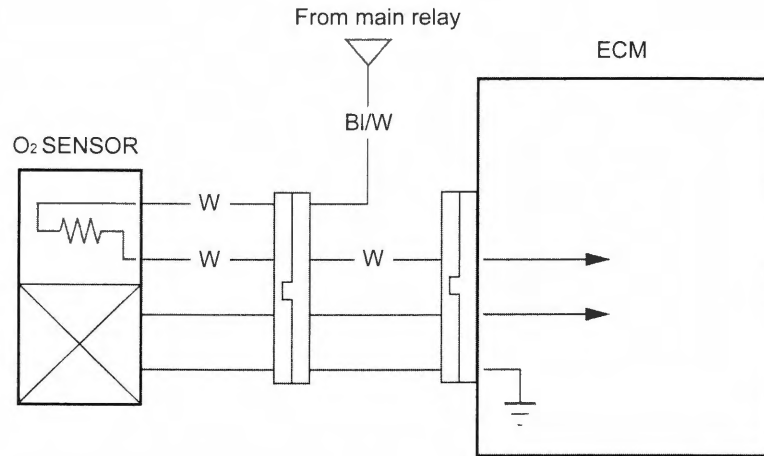
YES – Replace the ECM with a known good one, and recheck.

NO – Faulty original O₂ sensor



DTC 23 (O₂ SENSOR HEATER)

- Before starting the inspection, check for loose or poor contact on the O₂ sensor 4P (Black) and ECM 33P (Black) connectors, and recheck the DTC.



Probable cause

- Open circuit in Black/white wire between the main relay and O₂ sensor
- Open or short circuit in White wire between the O₂ sensor and ECM
- Faulty O₂ sensor
- Faulty ECM

DTC 23-1 (O₂ SENSOR HEATER)

1. Recheck DTC

Erase the DTC (page 4-7).

Start the engine and check the O₂ sensor heater with the MCS.

Is DTC 23-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. O₂ Sensor Heater Resistance Inspection

Turn the ignition switch OFF.

Disconnect the O₂ sensor 4P (Black) connector (page 4-40).

Measure the resistance between the sensor side O₂ sensor 4P (Black) connector [1] terminals.

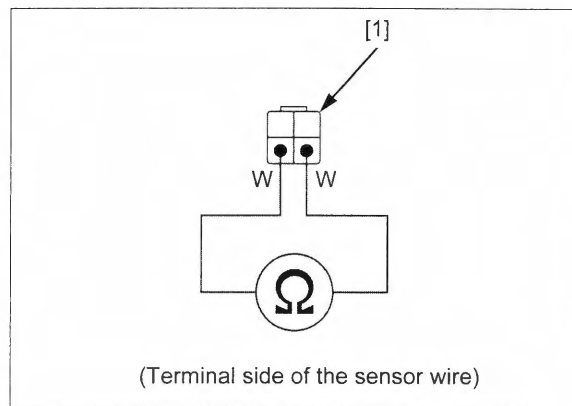
CONNECTION: White – White

STANDARD: 10 – 40 Ω (20°C/68°F)

Is the resistance within standard value?

YES – GO TO STEP 3.

NO – Faulty O₂ sensor



3. O₂ Sensor Heater Input Voltage Inspection

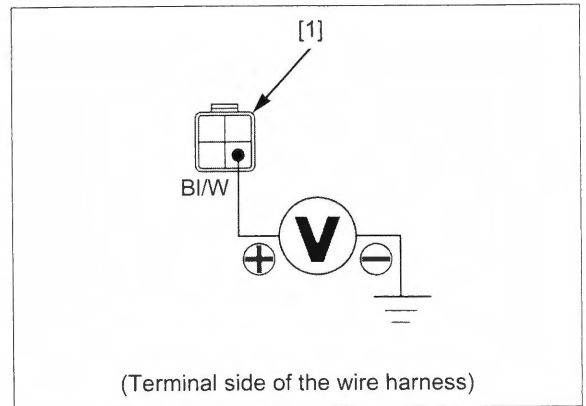
Turn the ignition switch ON with the engine stop switch "O".
 Measure the voltage between the wire harness side O₂ sensor 4P (Black) connector [1] and ground.

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

Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in Black/white wire



4. O₂ Sensor Heater Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-36).
 Check the continuity between the wire harness side O₂ sensor 4P (Black) connector [1] and ECM 33P (Black) connector [2] terminals.

TOOL:

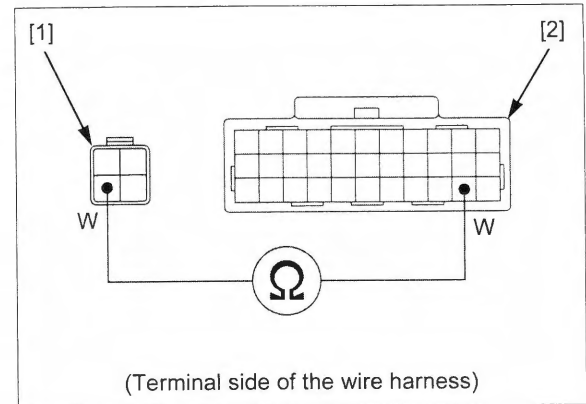
Test probe 07ZAJ-RDJA110

CONNECTION: White – White

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in White wire



5. O₂ Sensor Heater Line Short Circuit Inspection

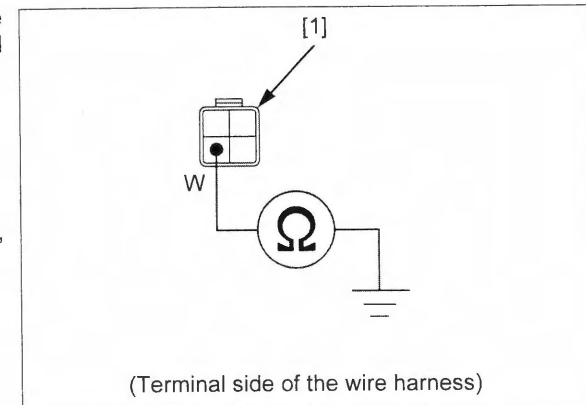
Check the continuity between the wire harness side O₂ sensor 4P (Black) connector [1] terminal and ground.

CONNECTION: White – ground

Is there continuity?

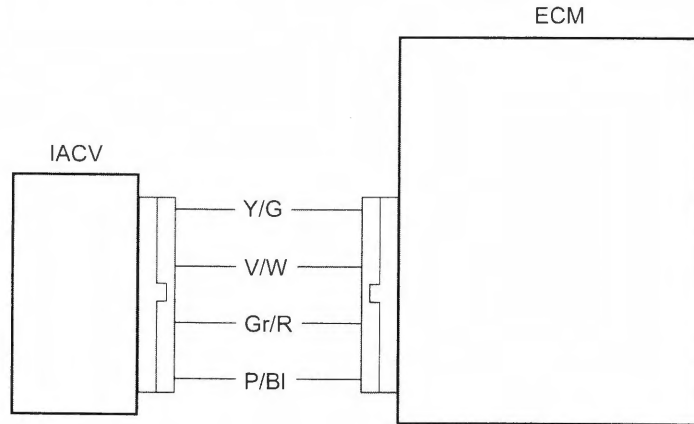
YES – Short circuit in White wire

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



DTC 29 (IACV)

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



Probable cause

- Open or short circuit in Yellow/green, Violet/white, Gray/red or Pink/black wire between the IACV and ECM
- Faulty IACV
- Faulty ECM

DTC 29-1 (IACV)

1. Recheck DTC

Erase the DTC (page 4-7).
Check the IACV with the MCS.

Is the DTC 29-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. IACV Resistance Inspection

Turn the ignition switch OFF.
Lift the fuel tank and support it (page 3-4).
Disconnect the IACV 4P (Black) connector [1].
Measure the resistance between the 4P connector terminals of the IACV [2].

TOOL:

Test probe 07ZAJ-RDJA110

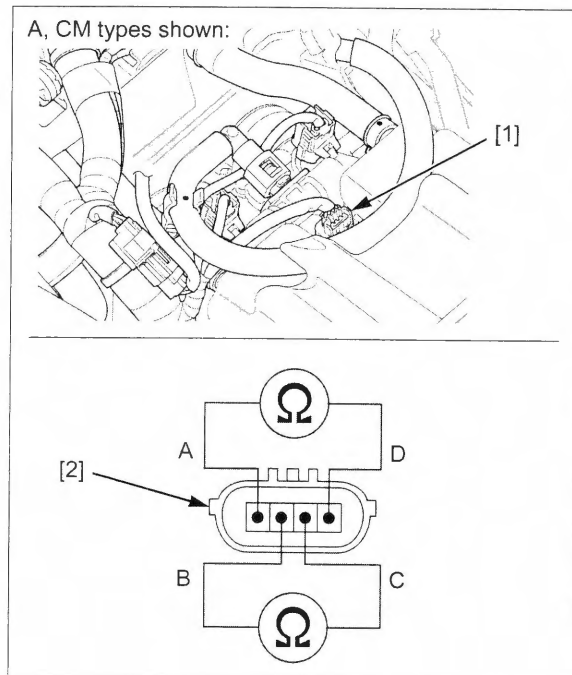
CONNECTION: A – D
B – C

STANDARD: 110 – 150 Ω (25°C/77°F)

Is the resistance within standard value?

YES – GO TO STEP 3.

NO – Faulty IACV



3. IACV Internal Short Circuit Inspection

Check for continuity between the 4P connector terminals of the IACV [1].

TOOL:

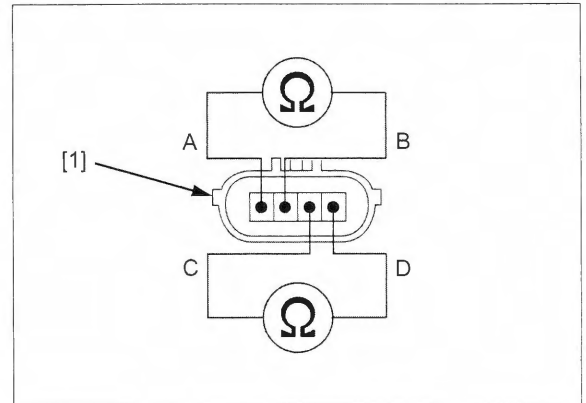
Test probe 07ZAJ-RDJA110

CONNECTION: A – B
C – D

Is there continuity?

YES – Faulty IACV

NO – GO TO STEP 4.



4. IACV Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-36).

Check for continuity between the wire harness side ECM 33P (Black) connector [1] and IACV 4P (Black) connector [2] terminals.

TOOL:

Test probe (2 required) 07ZAJ-RDJA110

CONNECTION:

Yellow/green – Yellow/green

Violet/white – Violet/white

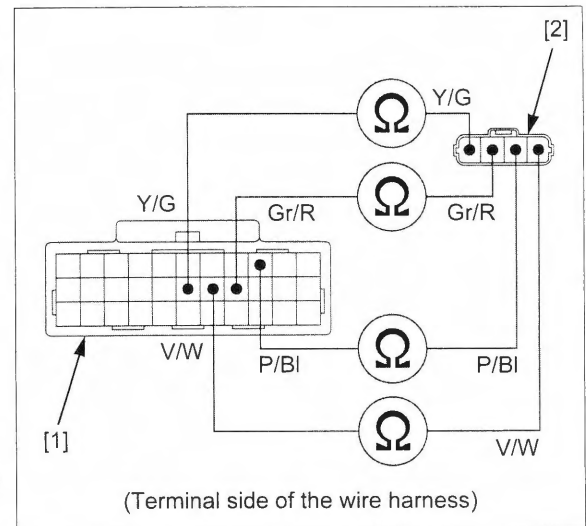
Gray/red – Gray/red

Pink/black – Pink/black

Is there continuity?

YES – GO TO STEP 5.

NO – • Open circuit in Yellow/green or Violet/white wire
• Open circuit in Gray/red or Pink/black wire



5. IACV Line Short Circuit Inspection

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

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION:

Yellow/green – Ground

Violet/white – Ground

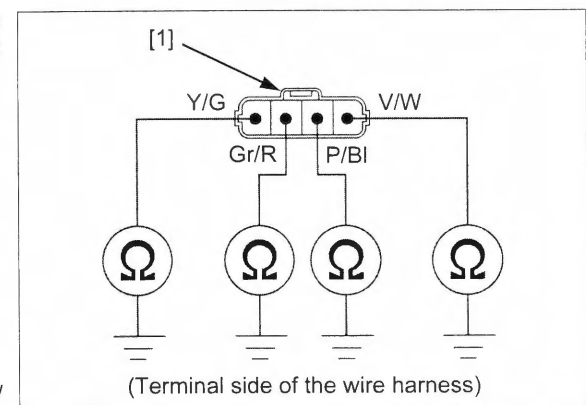
Gray/red – Ground

Pink/black – Ground

Is there continuity?

YES – • Short circuit in Yellow/green or Violet/white wire
• Short circuit in Gray/red or Pink/black wire

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



DTC 33-2 (ECM EEPROM)

1. Recheck DTC

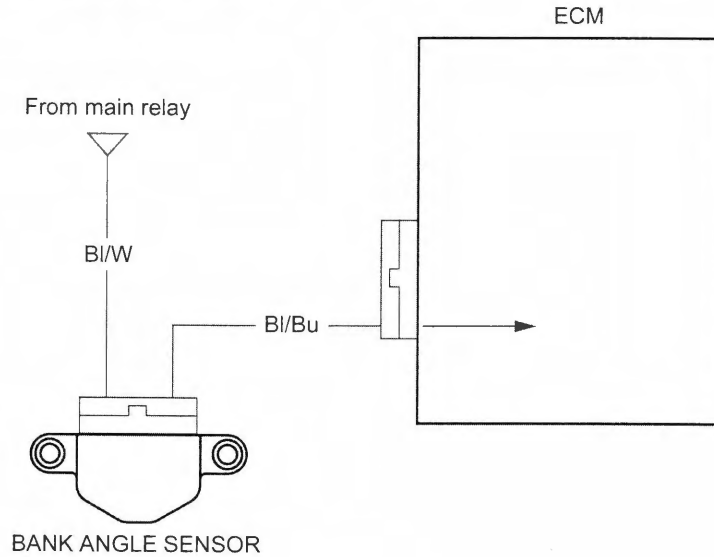
Erase the DTC (page 4-7).
Check the ECM EEPROM with the MCS.

Is the DTC 33-2 indicated?

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

NO – Intermittent failure

DTC 54 (BANK ANGLE SENSOR)



Probable cause

- Open circuit in Black/white wire between the main relay and bank angle sensor
- Open or short circuit in Black/blue wire between the bank angle sensor and ECM
- Faulty bank angle sensor
- Faulty ECM

DTC 54-1 (BANK ANGLE SENSOR LOW VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the bank angle sensor 2P (Black) and ECM 33P (Black) connectors, and recheck the DTC.

1. Bank Angle Sensor System Inspection

Erase the DTC (page 4-7).
Check the bank angle sensor with the MCS.

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

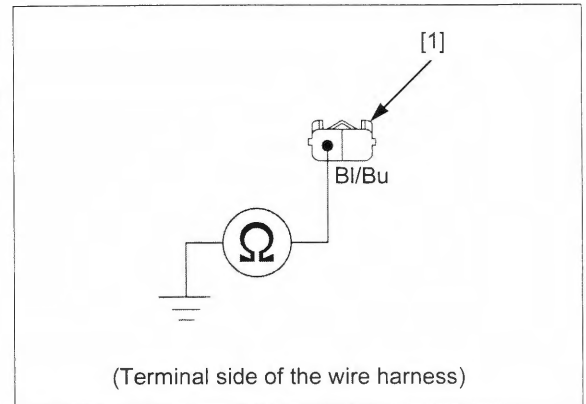
2. Bank Angle Sensor Signal Line Short Circuit Inspection

Turn the ignition switch OFF.
 Disconnect the bank angle sensor 2P (Black) connector (page 4-41).
 Check for continuity between the wire harness side bank angle sensor 2P (Black) connector [1] terminal and ground.

CONNECTION: Black/blue – Ground

Is there continuity?

- YES** – Short circuit in the Black/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 (Black) connector [2] terminals.

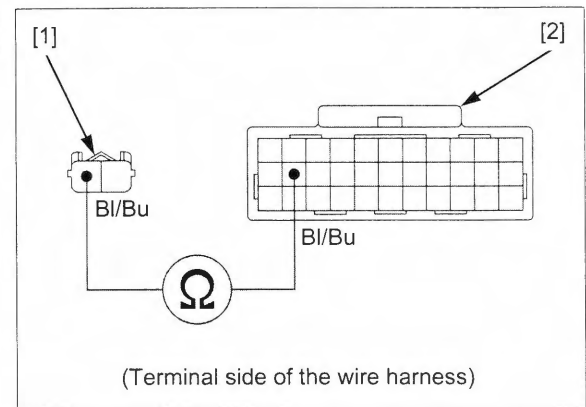
TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION: Black/blue – Black/blue

Is there continuity?

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



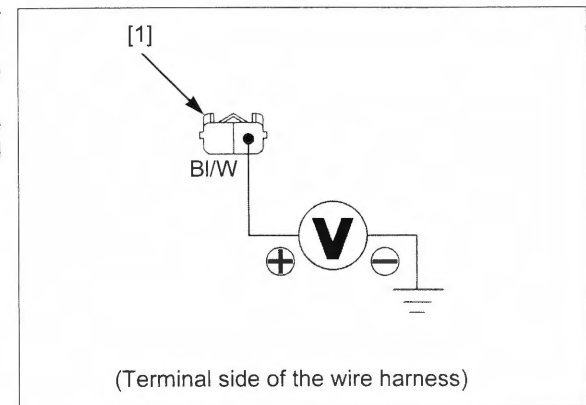
4. Bank Angle Sensor Input Voltage Inspection

Temporarily install the ECM to the wire harness by connecting the 33P (Black) connector.
 Turn the ignition switch ON with the engine stop switch "O".
 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 Black/white wire



5. Bank Angle Sensor Inspection

Check the bank angle sensor (page 4-42).

Is the bank angle sensor normal?

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

DTC 54-2 (BANK ANGLE SENSOR HIGH VOLTAGE)

1. Bank Angle Sensor System Inspection

Erase the DTC (page 4-7).
Check the bank angle sensor with the MCS.

Is about 5 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Bank Angle Sensor Inspection

Replace the bank angle sensor with a known good one (page 4-41).

Erase the DTC (page 4-7).
Check the bank angle sensor with the MCS.

Is DTC 54-2 indicated?

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

NO – Faulty original bank angle sensor

DTC 86 (SERIAL COMMUNICATION MALFUNCTION)

NOTE:

- Refer to Technical Feature for configuration of the serial communication (page 1-83).
- Before starting the inspection, check the following connectors for loose or poor contact and the fuse for blown.
 - front sub-wire harness 12P (Black) and 4P (Black)
 - ECM 33P (Black)
 - combination meter 16P (Gray)
 - CLOCK/TURN fuse (7.5 A)

DTC 86-1 (SERIAL COMMUNICATION)

1. Recheck DTC

Erase the DTC (page 4-7).
Check the serial communication with the MCS.

Is DTC 86-1 indicated?

YES – GO TO STEP 2.

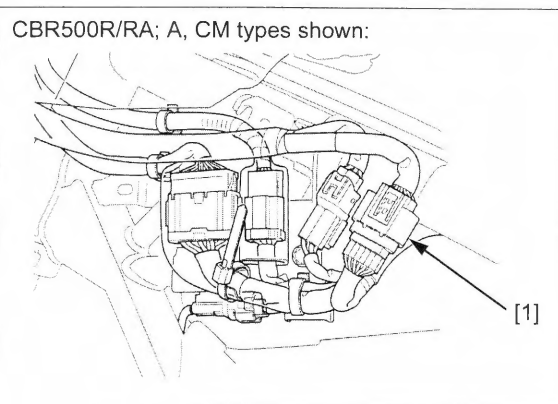
NO – Intermittent failure

2. ECM Serial Communication Output Voltage Inspection

Turn the ignition switch OFF.
Remove the left middle cowl (page 2-8).
Disconnect the front sub-wire harness 12P (Black) connector [1].
Short the DLC terminals using the SCS service connector (page 4-6).
Open the throttle grip fully, hold it and turn the ignition switch ON with the engine stop switch "O".
Wait for more than 10 seconds and release the throttle grip.

NOTE:

- The ECM enters the communication diagnostic output mode. The open circuit in the ECM can be checked in this mode.



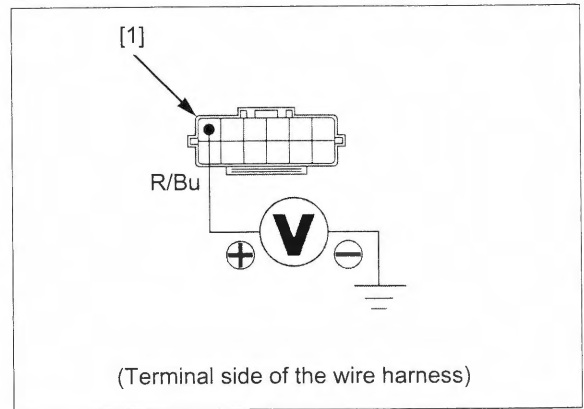
Measure the voltage between the wire harness side 12P (Black) connector [1] terminal and ground.

CONNECTION: Red/blue (+) – Ground (-)

Does the voltage repeat cycling between 0 V to 8 V or more at intervals of 5 seconds?

YES – GO TO STEP 3.

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



3. Combination Meter Serial Communication Output Voltage Inspection

Turn the ignition switch OFF.

Remove the SCS service connector.

Connect the front sub-wire harness 12P (Black) connector.

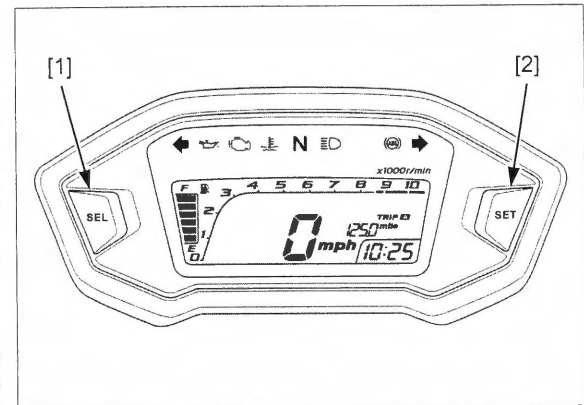
Disconnect the ECM 33P (Black) connector (page 4-36).

Push and hold combination meter buttons SEL [1] and SET [2], and turn the ignition switch ON with the engine stop switch "O".

Wait for more than 10 seconds and release the buttons.

NOTE:

- The combination meter enters the communication diagnostic output mode. The open circuit in the combination meter can be checked in this mode.



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

TOOL:

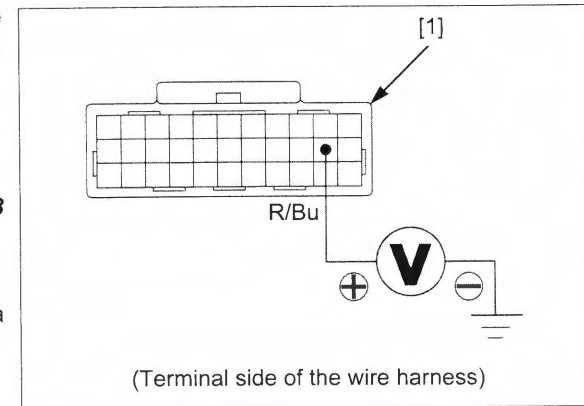
Test probe 07ZAJ-RDJA110

CONNECTION: Red/blue (+) – Ground (-)

Does the voltage repeat cycling between 0 V to 8 V or more at intervals of 5 seconds?

YES – GO TO STEP 4.

NO – Replace the combination meter with a known good one, and recheck.



4. Combination Meter Back-up Voltage Inspection

Turn the ignition switch OFF.

Disconnect the combination meter 16P (Gray) connector (page 21-11).

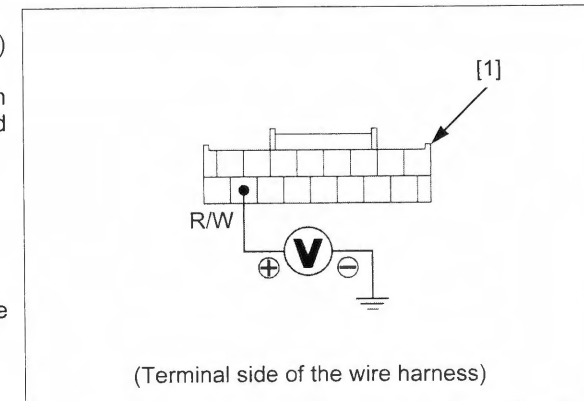
Measure the voltage between the combination meter 16P (Gray) connector [1] terminal and ground.

CONNECTION: Red/white (+) – Ground (-)

Is there battery voltage?

YES – Intermittent failure

NO – Open circuit in Red/white wire between the fuse box 1 and combination meter



MIL CIRCUIT TROUBLESHOOTING

Check that the MIL [1] comes on for 2 seconds and goes off when the ignition switch is turned ON with the engine stop switch "O".

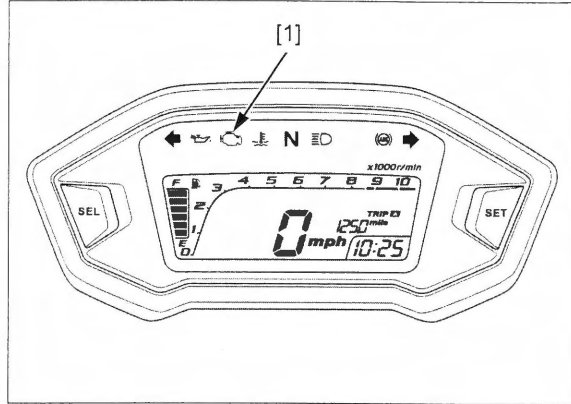
NOTE:

- If the MIL and digital display do not function at all, refer to combination meter initial operation check (page 21-10).

If the engine stop switch is in "O", the MIL will stay on even when the system is normal.

If the MIL stays on and the other indications function normally, check the combination meter indication when the serial communication line is abnormal (page 1-83).

If the indication is not according to above condition, check as follows.



Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector (page 4-36).

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

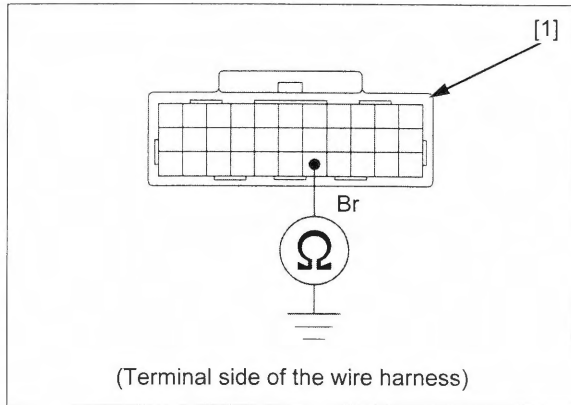
TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION: Brown – Ground

If there is continuity, check for short circuit in the Brown wire between the DLC and ECM.

If there is no continuity, replace the ECM with a known good one, and recheck.



ECM

REMOVAL/ INSTALLATION

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

Turn the ignition switch OFF.

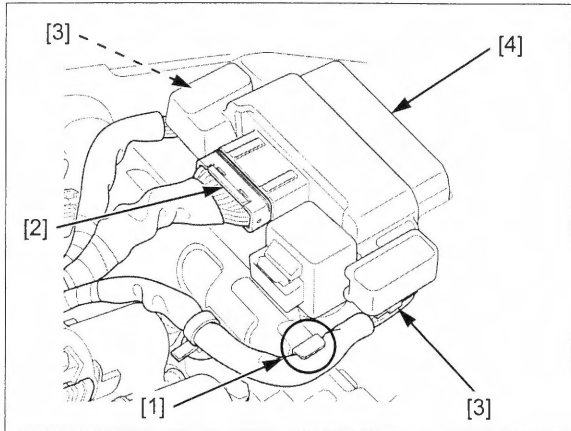
Release the junction wire from the wire guide [1].

Disconnect the ECM 33P (Black) connector [2].

Remove the ECM assembly from the stays and the wire junctions [3] from the rubber holder.

Remove the ECM [4] from the rubber holder.

Installation is in the reverse order of removal.



POWER/GROUND LINE INSPECTION

Disconnect the ECM 33P (Black) connector (page 4-36).

POWER INPUT LINE

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

TOOL:

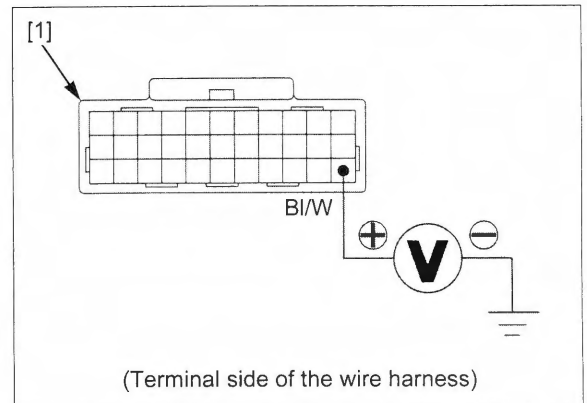
Test probe 07ZAJ-RDJA110

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

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

If there is no voltage, check the following:

- Black/white wire between the ECM and main relay for open circuit
- main relay and its circuit (page 4-42)



GROUND LINE

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

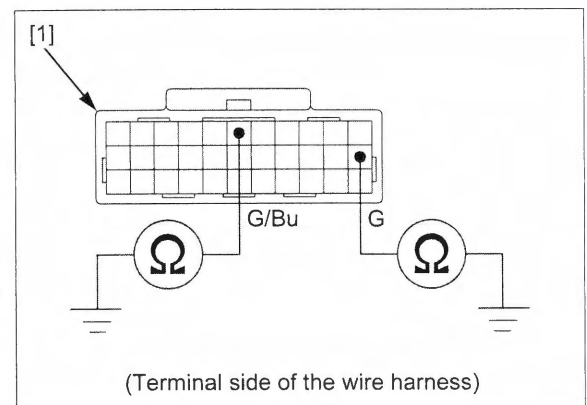
TOOL:

Test probe 07ZAJ-RDJA110

**CONNECTION: Green/blue – Ground
Green – Ground**

There should be continuity at all times.

If there is no continuity, check for open circuit in the Green/blue or Green wire.



SENSOR UNIT LINE

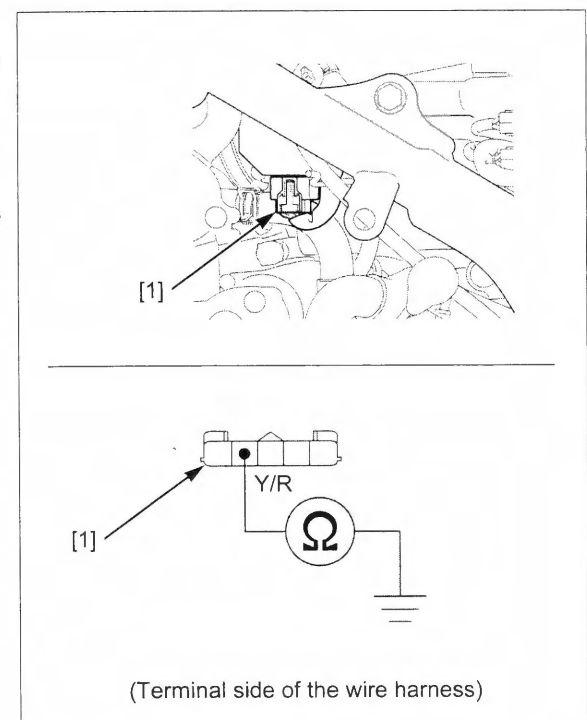
Disconnect the sensor unit 5P (Black) connector [1].

Check for continuity between the wire harness side sensor unit 5P (Black) connector terminal and ground.

CONNECTION: Yellow/red – Ground

There should be no continuity.

If there is continuity, check for short circuit in the Yellow/red wire.



SENSOR UNIT

REMOVAL/INSTALLATION

Remove the throttle body/air cleaner housing assembly (page 7-11).

Remove the following:

- torx screws [1]
- sensor unit [2]
- O-ring A [3]
- setting plate [4]
- O-ring B [5]

Installation is in the reverse order of removal.

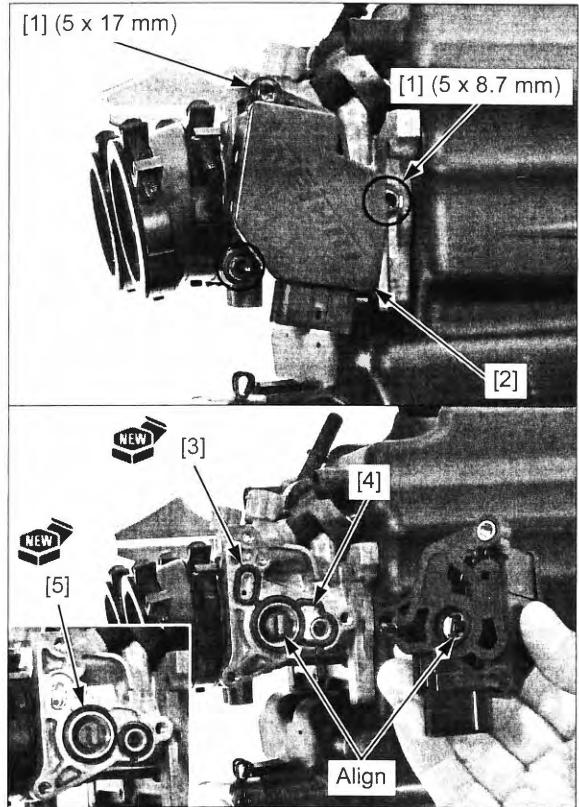
NOTE:

- Replace the O-rings with new ones and install them properly as shown (do not apply oil).
If the O-rings are not installed properly, the idle air will leak and engine idle speed will be unstable.
- Align the clip of the TP sensor and shaft end of the throttle valve.
The light pressure is sufficient to assemble the sensor unit and throttle body in their correct position. If you cannot assemble them easily, the clip may be misaligned. Do not attempt to force them together and make sure that the clip is aligned.

TORQUE:

Sensor unit torx screw:
3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)

Perform the TP sensor reset procedure (page 4-38).

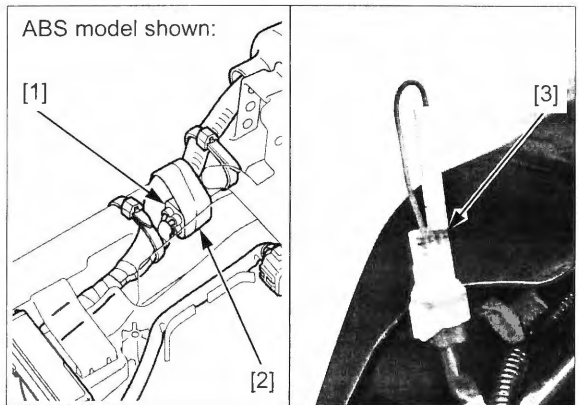


TP SENSOR RESET PROCEDURE

- Make sure that the DTC is not stored in ECM. If the DTC is stored in ECM, TP sensor reset mode won't start by following the procedure below.
1. Remove the following:
 - CBR500R/RA/CB500F/FA: front seat (page 2-6)
 - CB500X/XA: seat (page 2-6)
 2. Turn the ignition switch OFF.
 3. Remove the DLC [1] from the dummy connector [2] and short the DLC terminals using the special tool.

TOOL:

[3] SCS service connector 070PZ-ZY30100



4. Disconnect the ECT sensor 2P (Black) connector [1].

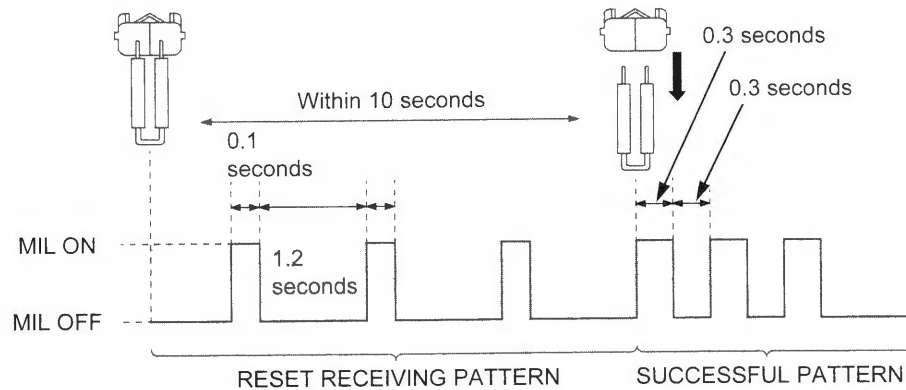
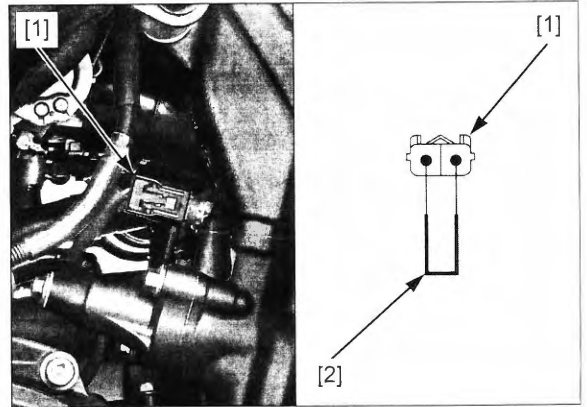
Short the wire harness side ECT sensor 2P (Black) connector terminals with a jumper wire [2].

5. Turn the ignition switch ON with the engine stop switch "O", then disconnect the jumper wire from the ECT sensor 2P (Black) connector within 10 seconds while the MIL is blinking (reset receiving pattern).

6. Check if the MIL blinks.

After disconnection of the jumper wire, the MIL should start blinking. (successful pattern)

If the jumper wire is connected for more than 10 seconds, the MIL will stay on (unsuccessful pattern). Turn the ignition switch OFF and try again from the step 4.



7. Turn the ignition switch OFF. Remove the special tool and install the DLC into the dummy connector.
8. Install the removed parts in the reverse order of removal.
9. Check the engine idle speed (page 3-12).

ECT SENSOR

REMOVAL/INSTALLATION

Drain the coolant (page 8-5).

Disconnect the ECT sensor 2P (Black) connector [1].

Remove the ECT sensor [2] and O-ring [3].

Installation is in the reverse order of removal.

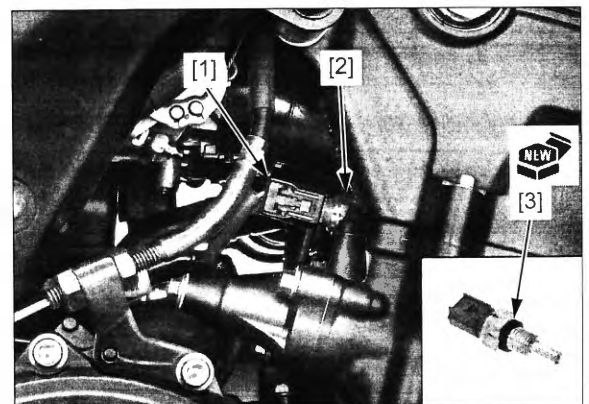
NOTE:

- Replace the O-ring with a new one (do not apply oil).

TORQUE:

ECT sensor: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Fill the and bleed the cooling system (page 8-5).



VS SENSOR

REMOVAL/INSTALLATION

Remove the throttle body/air cleaner housing assembly (page 7-11).

Disconnect the VS sensor 3P (Black) connector [1].

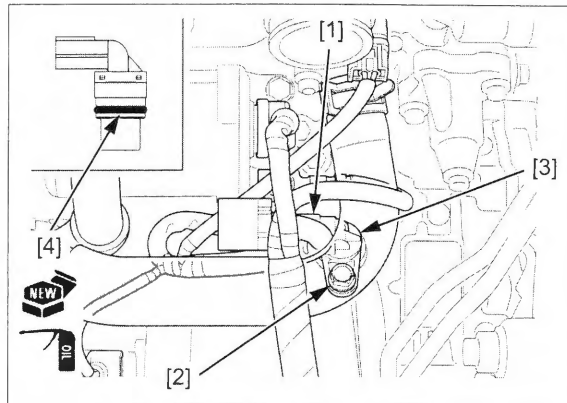
Remove the following:

- bolt [2]
- VS sensor [3] (pull the water hose aside)
- O-ring [4]

Installation is in the reverse order of removal.

NOTE:

- Replace the O-ring with a new and coat it with engine oil.
- Install the O-ring into the groove in the VS sensor.



TORQUE:

VS sensor bolt: 12 N·m (1.2 kgf·m, 9 lbf·ft)

O₂ SENSOR

REMOVAL/INSTALLATION

NOTICE

- Do not get grease, oil or other materials in the O₂ sensor air hole.
- The O₂ sensor may be damaged if dropped. Replace it with a new one, if dropped.

NOTE:

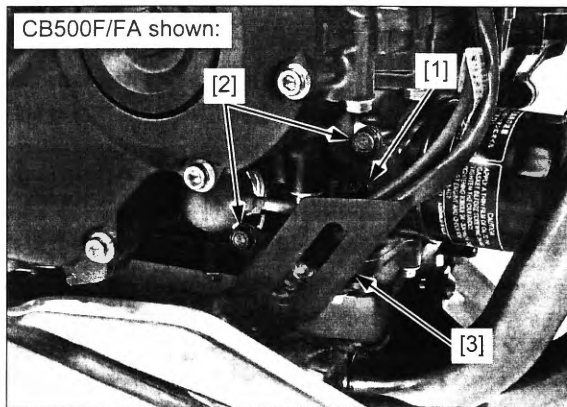
- Do not service the O₂ sensor while it is hot.
- Do not use an impact wrench while removing or installing the O₂ sensor, or it may be damaged.

Remove the following:

- CBR500R/RA/CB500X/XA: under cowl (page 2-22)
- CB500F/FA/X/XA: right middle cowl (page 2-8)

CB500F/FA/X/XA: Release the wire clip [1].

CB500F/FA: Remove the two bolts [2] and the sensor protector [3].

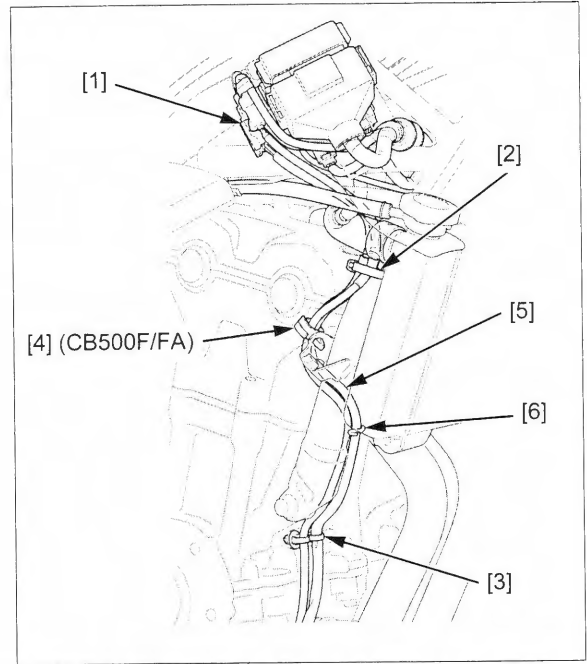


Disconnect the O₂ sensor 4P (Black) connector [1].

Remove the wire band [2] (securing the O₂ sensor and oil pressure switch wires) and the band clip [3] from the stay on the crankcase.

CB500F/FA: Release the wire clip [4].

Release the O₂ sensor wire [5] from the wire guide [6] and remove it out of the frame.



Remove the O₂ sensor [1] using the special tool.

TOOL:

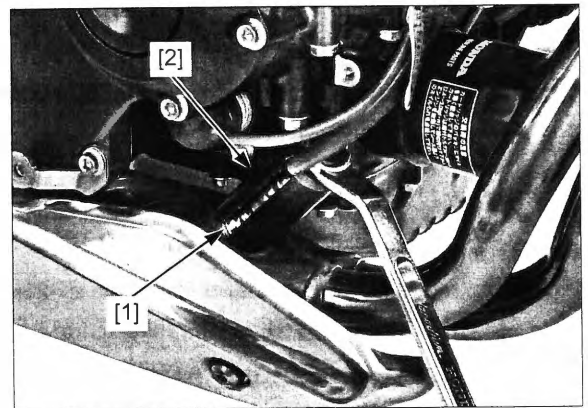
[2] Sensor socket wrench,
22 mm

07LAA-PT50101 or
equivalent
commercially
available in U.S.A.

Installation is in the reverse order of removal.

TORQUE:

O₂ sensor: 44 N·m (4.5 kgf·m, 32 lbf·ft)



BANK ANGLE SENSOR

REMOVAL/INSTALLATION

Remove the fuel tank under tray (page 2-25).

Disconnect the bank angle sensor 2P (Black) connector [1].

Remove the following:

- two nuts [2]
- bank angle sensor [3]
- two bolts [4] and washers [5]
- two collars [6]

Installation is in the reverse order of removal.

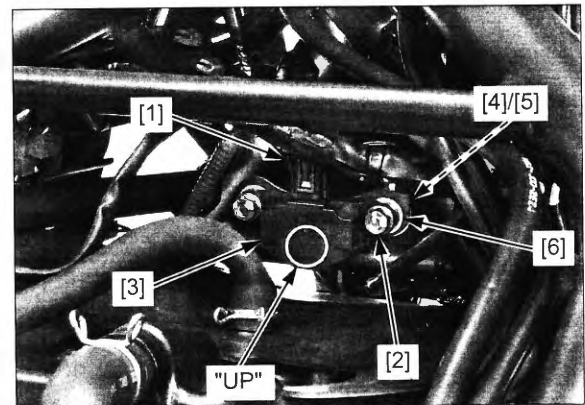
NOTE:

- Install the bank angle sensor with the "UP" mark facing up.

TORQUE:

Bank angle sensor nut:

8.5 N·m (0.9 kgf·m, 6.3 lbf·ft)



INSPECTION

Remove the bank angle sensor without disconnecting its connector (page 4-41).

SYSTEM INSPECTION WITH MCS

Temporarily install the ECM to the wire harness by connecting the 33P (Black) connector.

Connect the MCS to the DLC (page 4-6).

Check the output voltage at each position of the sensor with the MCS.

STANDARD:

Horizontal Position: 7.0 – 8.8 V

Approx. 60°: 0.40 – 0.84 V

FUNCTION CHECK

Temporarily install the following components to the wire harness by connecting each connector (page 5-5).

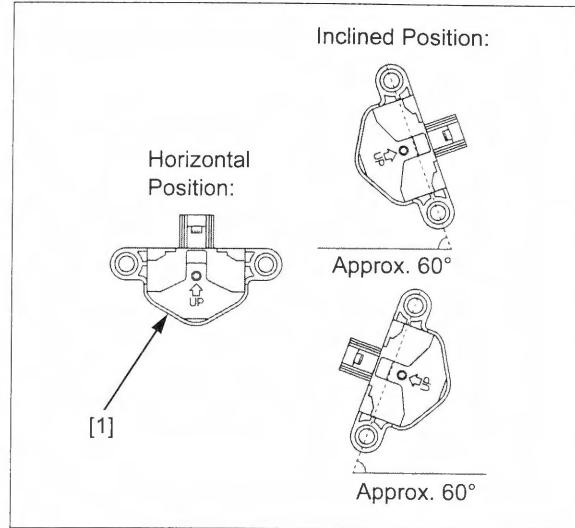
- ECM
- ignition coils

Place the bank angle sensor [1] horizontal.

Start the engine.

Incline the bank angle sensor approximately 60° to the left or right.

The bank angle sensor is normal if the engine stops after a few seconds.



MAIN RELAY

CIRCUIT INSPECTION

For relay inspection (page 21-25).

Remove the main relay (page 21-24).

RELAY COIL POWER INPUT LINE

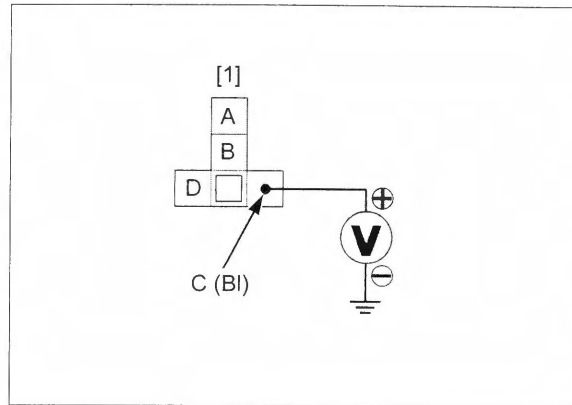
Measure the voltage between the main relay terminal of the relay box [1] and ground.

CONNECTION: C (+) – Ground (-)

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

If there is no voltage, check the following:

- Black wire between the relay box and engine stop switch for open circuit
- engine stop switch (page 21-18)
- White/yellow wire between the engine stop switch and fuse box 1 for open circuit
- ENG STOP (7.5 A) fuse



RELAY SWITCH POWER INPUT LINE

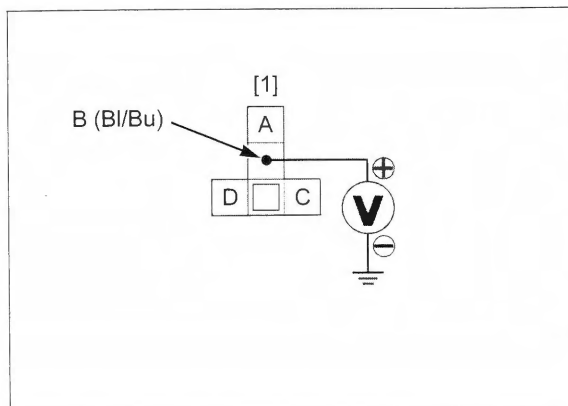
Measure the voltage between the main relay terminal of the relay box [1] and ground.

CONNECTION: B (+) – Ground (-)

There should be battery voltage at all times.

If there is no voltage, check the following:

- Black/blue wire between the main relay and fuse box 2 for open circuit
- FI (15 A) fuse



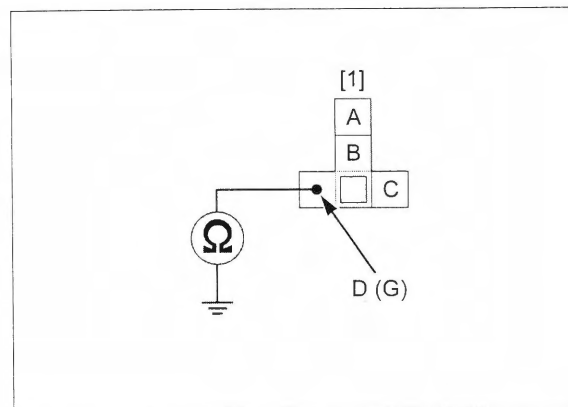
GROUND LINE

Check for continuity between the main relay terminal of the relay box [1] and ground.

CONNECTION: D – Ground

There should be continuity at all times.

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



MEMO

5. IGNITION SYSTEM

SERVICE INFORMATION	5-2	IGNITION SYSTEM INSPECTION	5-5
TROUBLESHOOTING	5-3	IGNITION TIMING	5-7
SYSTEM LOCATION	5-4	IGNITION COIL	5-8
SYSTEM DIAGRAM	5-4		

SERVICE INFORMATION

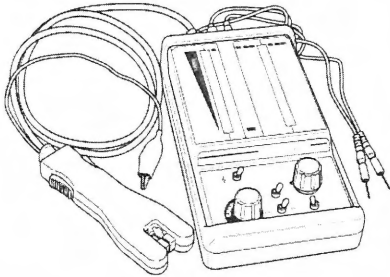
GENERAL

NOTICE

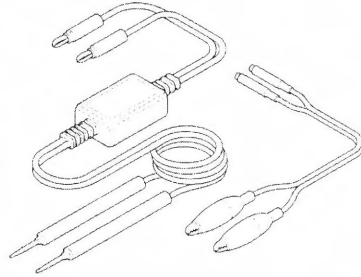
- The ECM may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn off the ignition switch before servicing.
- Use spark plug of the correct heat range. Using a spark plug with an incorrect heat range can damage 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 5-3).
- For following components information, refer to each section.
 - ignition switch (page 21-17)
 - engine stop switch (page 21-18)
 - main relay (page 4-42)
 - bank angle sensor (page 4-41)
 - sidestand switch (page 21-21)
 - neutral switch (page 21-20)
 - neutral diode (page 6-9)

TOOLS

IgnitionMate peak voltage tester
MTP07-0286 (U.S.A. only)

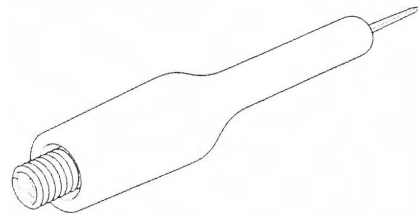


Peak voltage adaptor
07HGJ-0020100



(not available in U.S.A.) with
commercially available digital
multimeter (impedance 10 MΩ/DCV
minimum)

Test probe (2 required)
07ZAJ-RDJA110



TROUBLESHOOTING

- Inspect the following before diagnosing the system.
 - Faulty spark plug
 - Loose spark plug cap or spark plug wire connection
 - Water got into the spark plug cap (Leaking the ignition coil secondary current)
- If there is no spark at cylinder, temporarily exchange the ignition coil with a known good one and perform the spark test. If there is spark, the original ignition coil is faulty.
- "Initial voltage" of the ignition primary coil is the battery voltage with the ignition switch turned ON and engine stop switch turned "O" (The engine is not cranked by the starter motor).

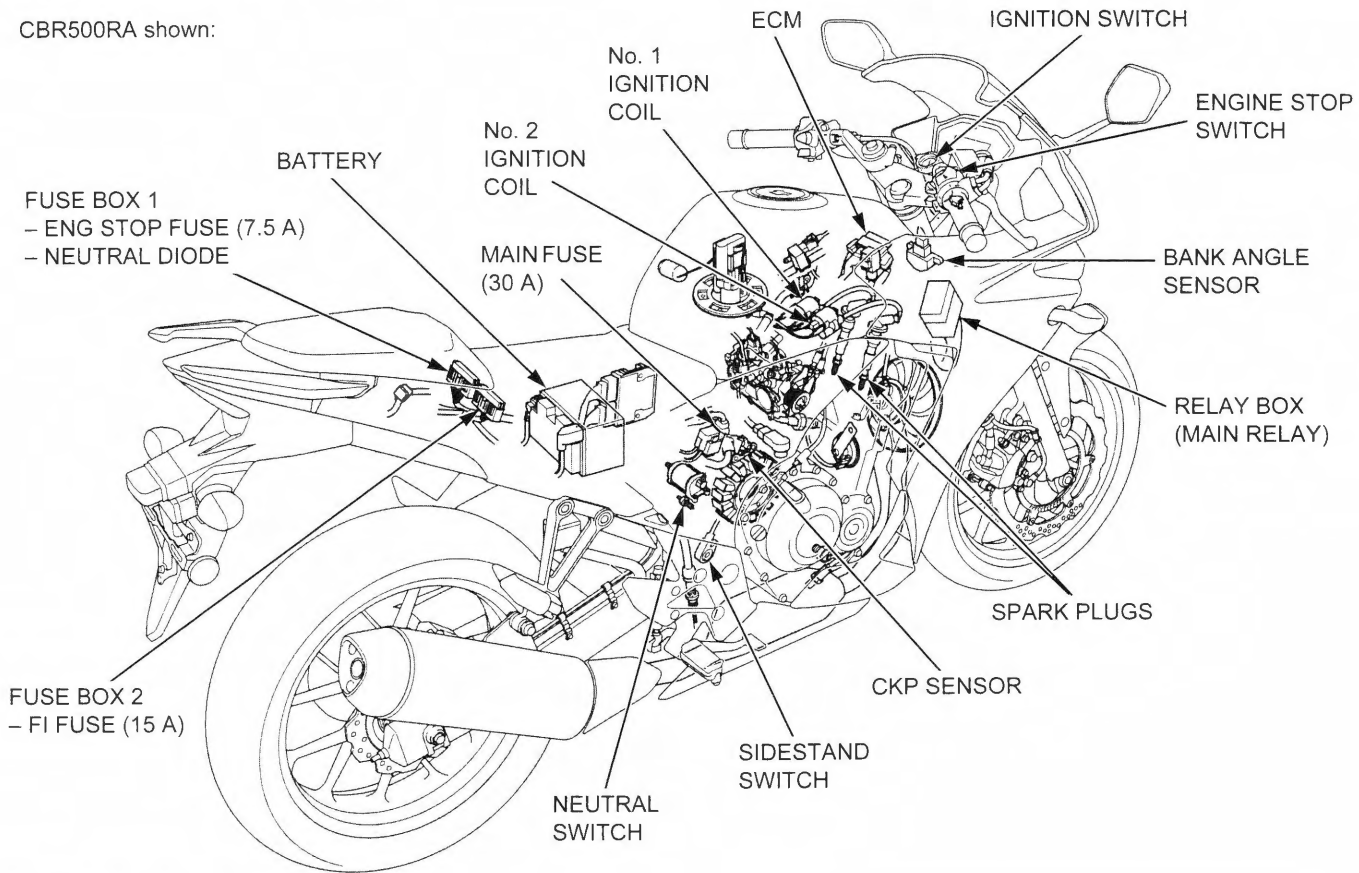
No spark at spark plug

	Unusual condition	Probable cause (Check in numerical order)
Ignition coil primary voltage	No initial voltage with the ignition switch turned ON and engine stop switch turned "O" (Other electrical components are normal).	<ol style="list-style-type: none"> 1. An open circuit in the Black/white wire between the main relay and ignition coil. 2. Faulty main relay or its related circuits. 3. Loose or poor connection of the primary terminal, or an open circuit in the primary coil. 4. Faulty ECM (in case when the initial voltage is normal with the ECM connector disconnected).
	Initial voltage is normal, but it drops by 2 – 4 V while cranking the engine.	<ol style="list-style-type: none"> 1. Incorrect peak voltage adaptor connections (System is normal if measured voltage is over the specifications with reverse connections). 2. Battery is undercharged (Voltage drops largely when the engine is started). 3. No voltage between the Black/blue (+) wire and body ground (–) at the ECM connector or loosen ECM connection. 4. An open circuit or loose connection in the Green or Green/blue wire of the ECM. 5. An open circuit or loose connection in the Blue/yellow or Yellow/blue wire between the ignition coil and ECM. 6. Faulty sidestand switch or neutral switch. 7. Loose or poor connection or an open circuit in No. 6 related wires. <ul style="list-style-type: none"> – Sidestand switch line: Green/white and Green – Neutral switch line: Green/red and Light green 8. Faulty CKP sensor (Measure peak voltage). 9. Faulty ECM (in case when above No. 1 through 8 are normal).
	Initial voltage is normal but there is no peak voltage while cranking the engine.	<ol style="list-style-type: none"> 1. Incorrect peak voltage adaptor connections. 2. Faulty peak voltage adaptor. 3. Faulty CKP sensor. 4. Faulty ECM (in case when above No. 1 through 3 are normal).
	Initial voltage is normal but peak voltage is lower than the standard value.	<ol style="list-style-type: none"> 1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too slow (Battery is undercharged). 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). 4. Faulty ECM (in case when above No. 1 through 3 are normal).
	Initial and peak voltages are normal but no spark jumps.	<ol style="list-style-type: none"> 1. Faulty spark plug or leaking ignition coil secondary current. 2. Faulty ignition coil.
CKP sensor	Peak voltage is lower than standard value.	<ol style="list-style-type: none"> 1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too low (Battery is undercharged). 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). 4. Faulty CKP sensor (in case when above No. 1 through 3 are normal).
	No peak voltage	<ol style="list-style-type: none"> 1. Faulty peak voltage adaptor. 2. Faulty CKP sensor.

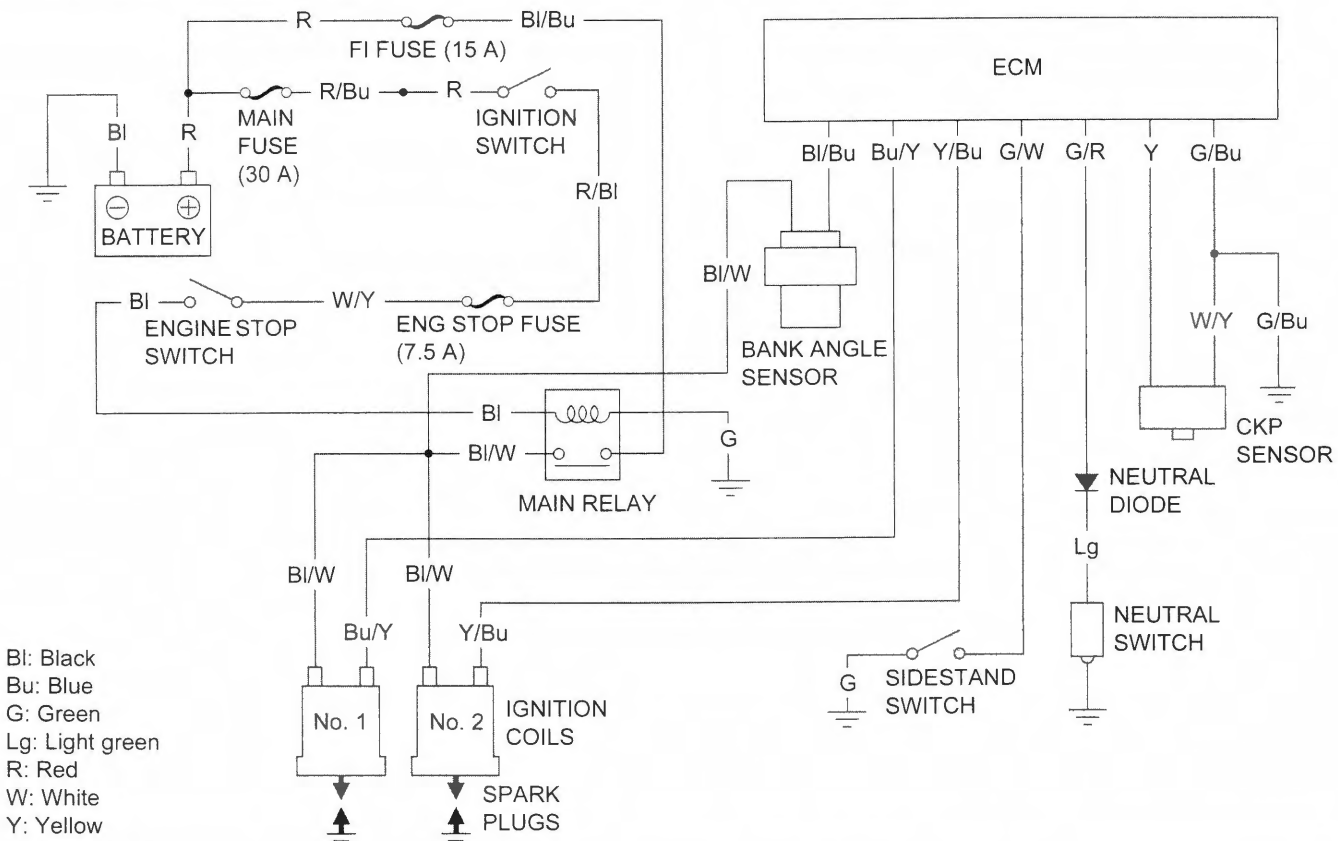
IGNITION SYSTEM

SYSTEM LOCATION

CBR500RA shown:



SYSTEM DIAGRAM



IGNITION SYSTEM INSPECTION

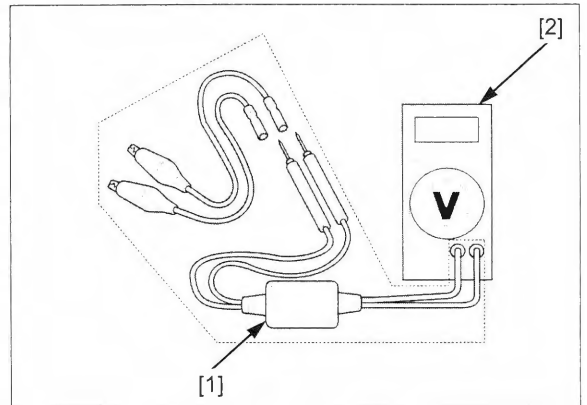
NOTE:

- If there is no spark at the plug, check all connections for loose or poor contact before measuring the 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 07HGJ-0020100 (not available in U.S.A.)
- Peak voltage adaptor with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)**



IGNITION COIL PRIMARY PEAK VOLTAGE

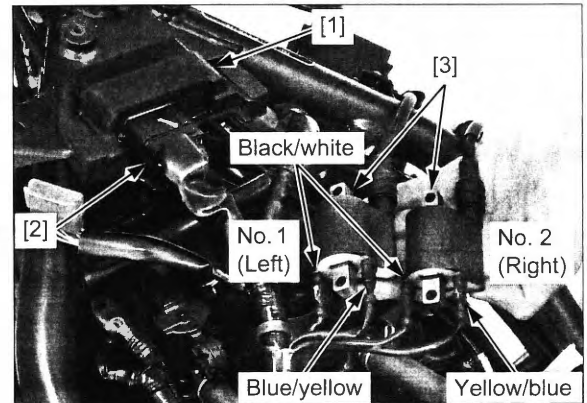
NOTE:

- Check all system connections before performing this inspection. Loose connectors can cause incorrect readings.
- Check the cylinder compression and check that the spark plugs are installed correctly in the cylinder head.

Remove the ignition coils (page 5-8).

Temporarily install the following components to the wire harness by connecting each connector:

- ECM [1]; 33P (Black) [2]
- ignition coils [3]



IGNITION SYSTEM

Connect a known good spark plug [1] to the spark plug cap and ground it to the cylinder head as done in a spark test.

With the connectors connected, connect the peak voltage tester or adaptor [2] probes to the ignition coil primary terminal [3] and ground.

CONNECTION:

No. 1 (left) ignition coil:

Blue/yellow (+) – Ground (–)

No. 2 (Right) ignition coil:

Yellow/blue (+) – Ground (–)

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

Check the initial voltage at this time.

The battery voltage should be measured.

If the initial voltage cannot be measured, follow the checks described in the troubleshooting table (page 5-3).

Shift the transmission into neutral.

Crank the engine with the starter motor and read ignition coil primary peak voltage.

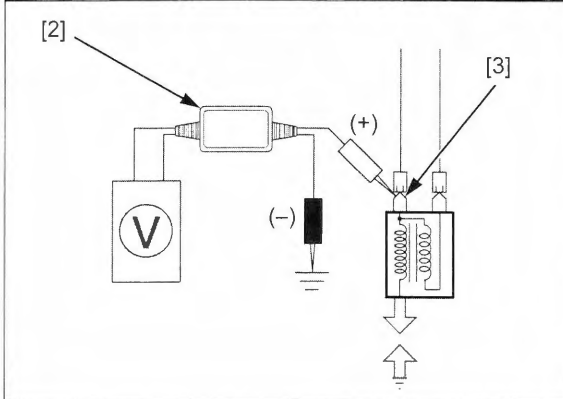
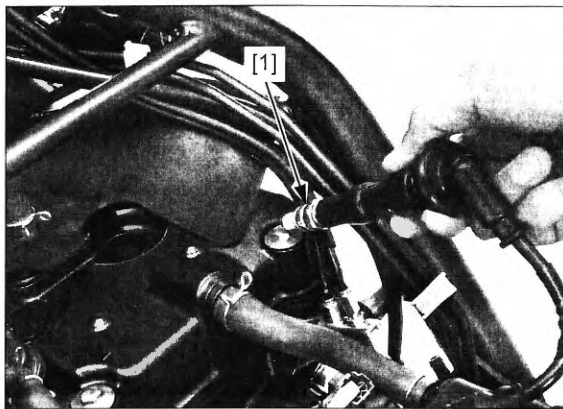
PEAK VOLTAGE: 100 V minimum

NOTE:

- Although measured values are different for each ignition coil, 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 5-3).

Install the removed parts in the reverse order of removal.



Avoid touching the spark plug and tester probes to prevent electric shock.

CKP SENSOR PEAK VOLTAGE

NOTE:

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

Disconnect the ECM 33P (Black) connector (page 4-36).

Connect the peak voltage tester or adaptor [1] probes to the ECM 33P (Black) connector [2] terminals of the wire harness side, using the test probes (page 4-7).

TOOL:

Test probe (2 required) 07ZAJ-RDJA110

CONNECTION: Yellow (+) – Green/blue (–)

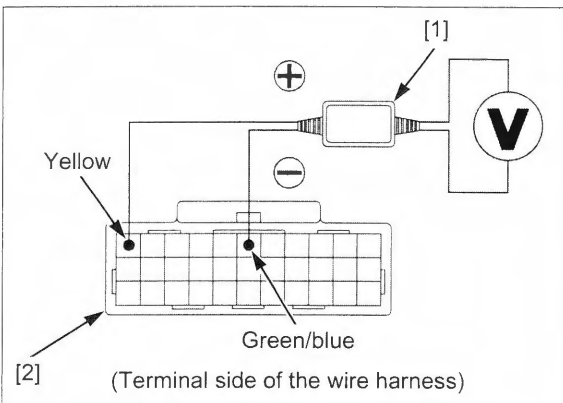
Shift the transmission into neutral.

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

Crank the engine with the starter motor and measure the CKP sensor peak voltage.

PEAK VOLTAGE: 0.7 V minimum

If the peak voltage measured at the ECM 33P (Black) connector is abnormal, measure the peak voltage at the CKP sensor connector.



Turn the ignition switch OFF.

Release the wire clip [1] and disconnect the CKP sensor 2P (Red) connector [2].

Connect the peak voltage tester or adaptor probes to the 2P (Red) connector terminals of the CKP sensor side.

CONNECTION: Yellow (+) – White/yellow (-)

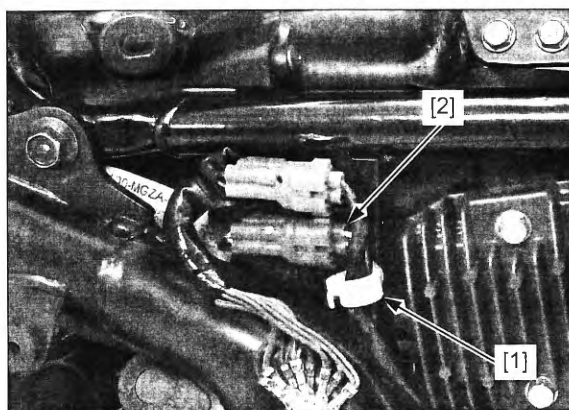
In the same manner as at the ECM 33P (Black) connector, measure the peak voltage and compare it to the voltage measured at the ECM 33P (Black) connector.

NOTE:

- If the peak voltage measured at the ECM is abnormal and the one measured at the CKP sensor is normal, the wire harness has an open or short circuit or loose connection.
- If the peak voltage of the CKP sensor side is lower than standard value, follow the checks described in the troubleshooting table (page 5-3).

For CKP sensor replacement (page 12-4).

Install the removed parts in the reverse order of removal.



IGNITION TIMING

NOTE:

- The ignition timing cannot be adjusted since the ECM is factory preset.
- The fuel tank under tray removal/installation is required to connect the timing light [1] to the spark plug wire (page 2-25).

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

Stop the engine and remove the crankshaft hole cap.

Read the instructions for timing light operation.

Remove the fuel tank under tray from the frame without disconnecting the spark plug caps and connect the timing light.

Temporarily install the fuel tank under tray.

Lower the fuel tank until the fuel pump 3P (Black) connector can be connected and support it. Temporarily connect the fuel pump 3P (Black) connector.

Start the engine and let it idle.

IDLE SPEED: 1,200 ± 100 rpm

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

Coat a new O-ring with engine oil and install it into the groove in the crankshaft hole cap.

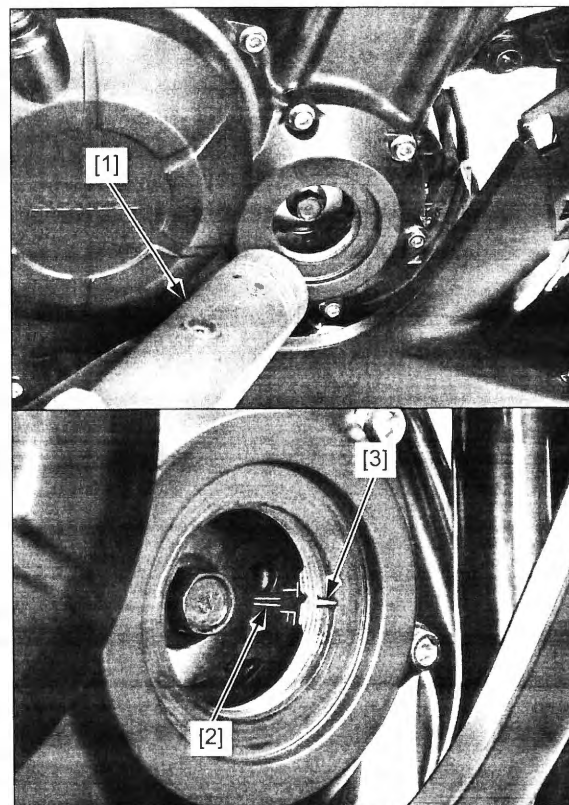
Apply grease to the threads of the crankshaft hole cap and install it.

Tighten the crankshaft hole cap to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Remove the timing light in the reverse order of connection.

Install the fuel tank under tray properly (page 2-25).



IGNITION COIL

REMOVAL/INSTALLATION

Remove the fuel tank under tray (page 2-25).

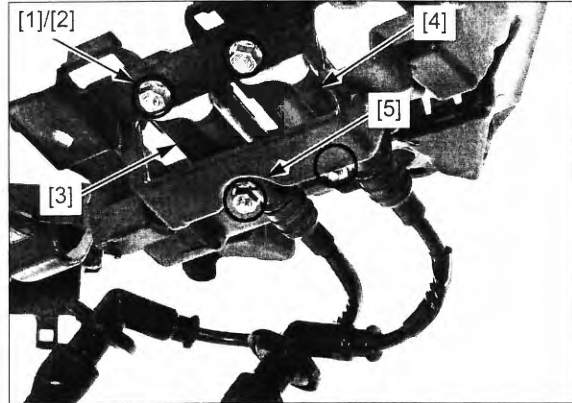
Remove the nuts [1] and bolts [2].

Remove the No. 1 (left) ignition coil [3] first and then the No. 2 (right) ignition coil [4] by slipping the spark plug caps through the semi-circular cutout [5].

Installation is in the reverse order of removal.

NOTE:

- Do not interchange the ignition coils.
 - No. 1 (left) ignition coil; long wire
 - No. 2 (right) ignition coil; short wire



6. ELECTRIC STARTER

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

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 21-17)
 - engine stop switch (page 21-18)
 - starter switch (page 21-18)
 - clutch switch (page 21-19)
 - sidestand switch (page 21-21)
 - neutral switch (page 21-20)

TROUBLESHOOTING

NOTE:

- Make sure the battery is fully charged and in good condition.
- Check for a blown main fuse (30 A) and sub-fuse (ENG STOP; 7.5 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 "O"
 - 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 21-17)
• Faulty engine stop switch (page 21-18)
• Faulty starter switch (page 21-18)
• 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 neutral switch (page 21-20)
• Faulty neutral diode (page 6-9)
• Faulty sidestand switch (page 21-21)
• Faulty clutch switch (page 21-19)
• 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

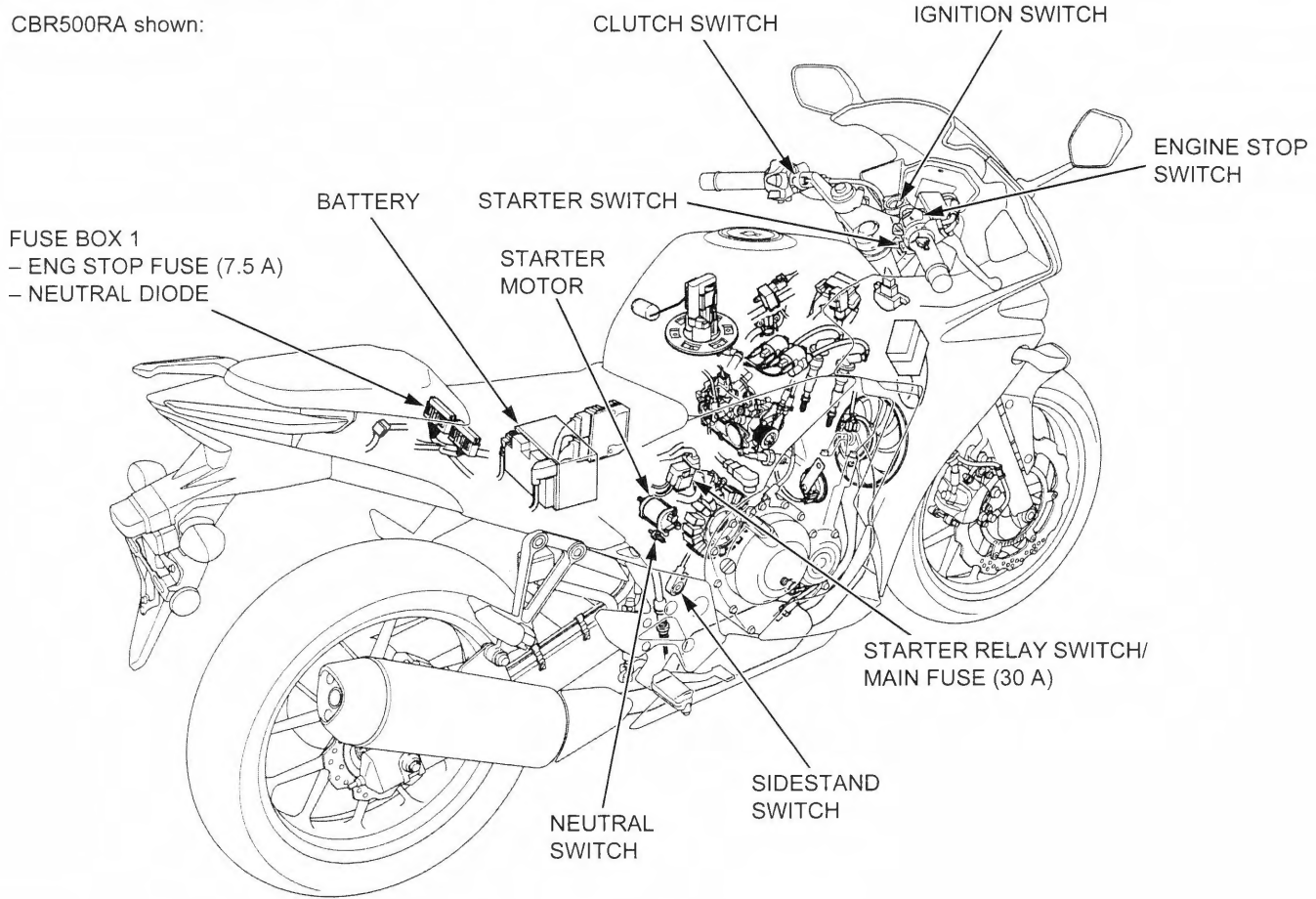
Starter motor turns, but engine does not turn

- Faulty starter clutch or starter gear train (page 12-7)
- Faulty ignition system (page 5-3)

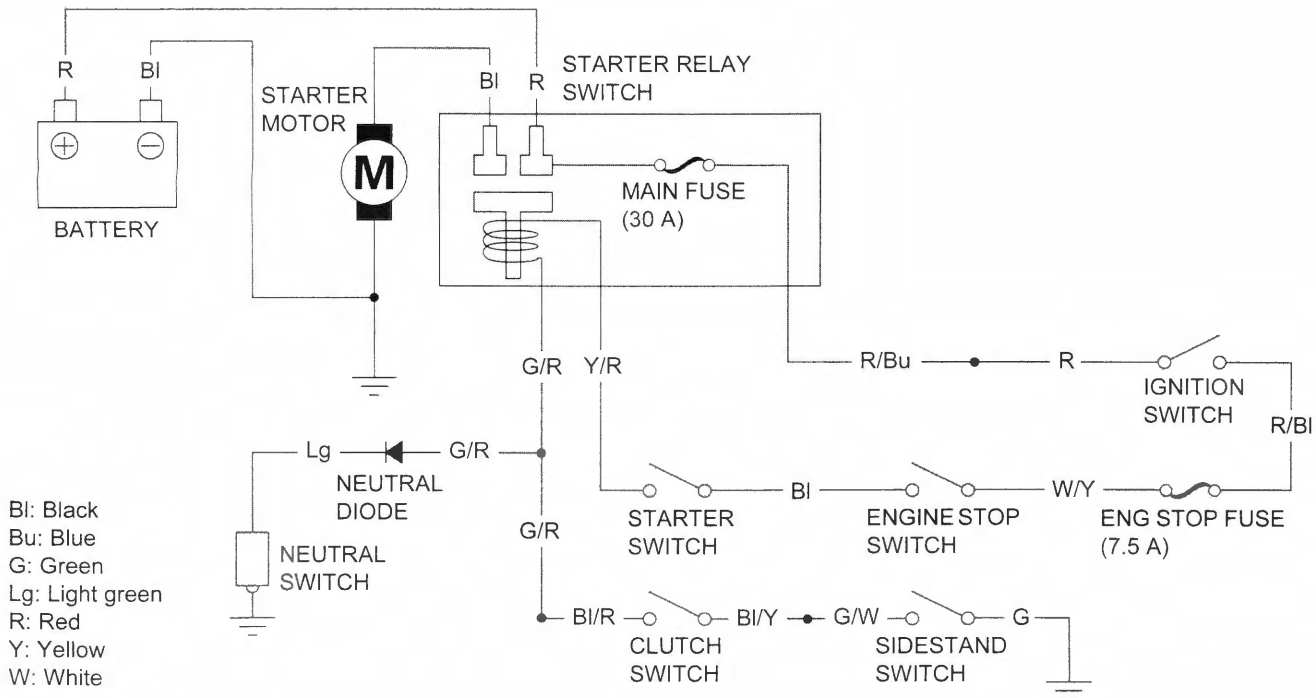
ELECTRIC STARTER

SYSTEM LOCATION

CBR500RA shown:



SYSTEM DIAGRAM



STARTER MOTOR

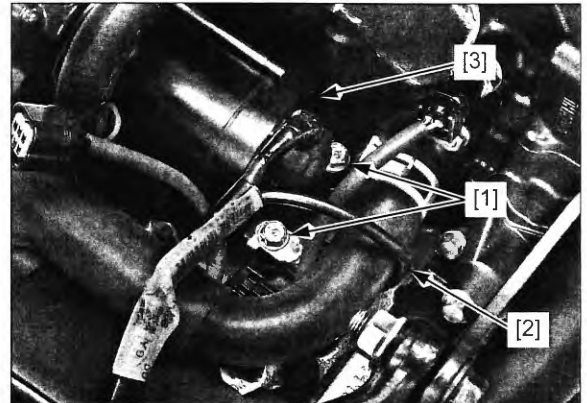
REMOVAL

Disconnect the negative (-) cable from the battery (page 20-5).

Remove the throttle body/air cleaner housing assembly (page 7-11).

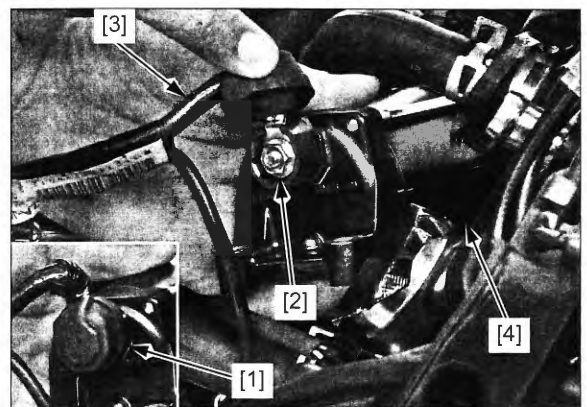
Remove the two mounting bolts [1] and negative (-) cable [2].

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].

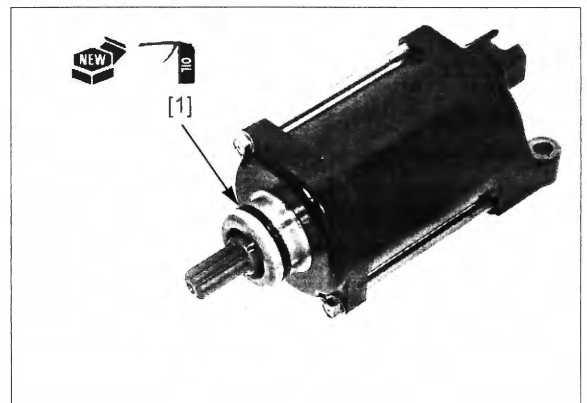


Remove the O-ring [1].

Installation is in the reverse order of removal.

NOTE:

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



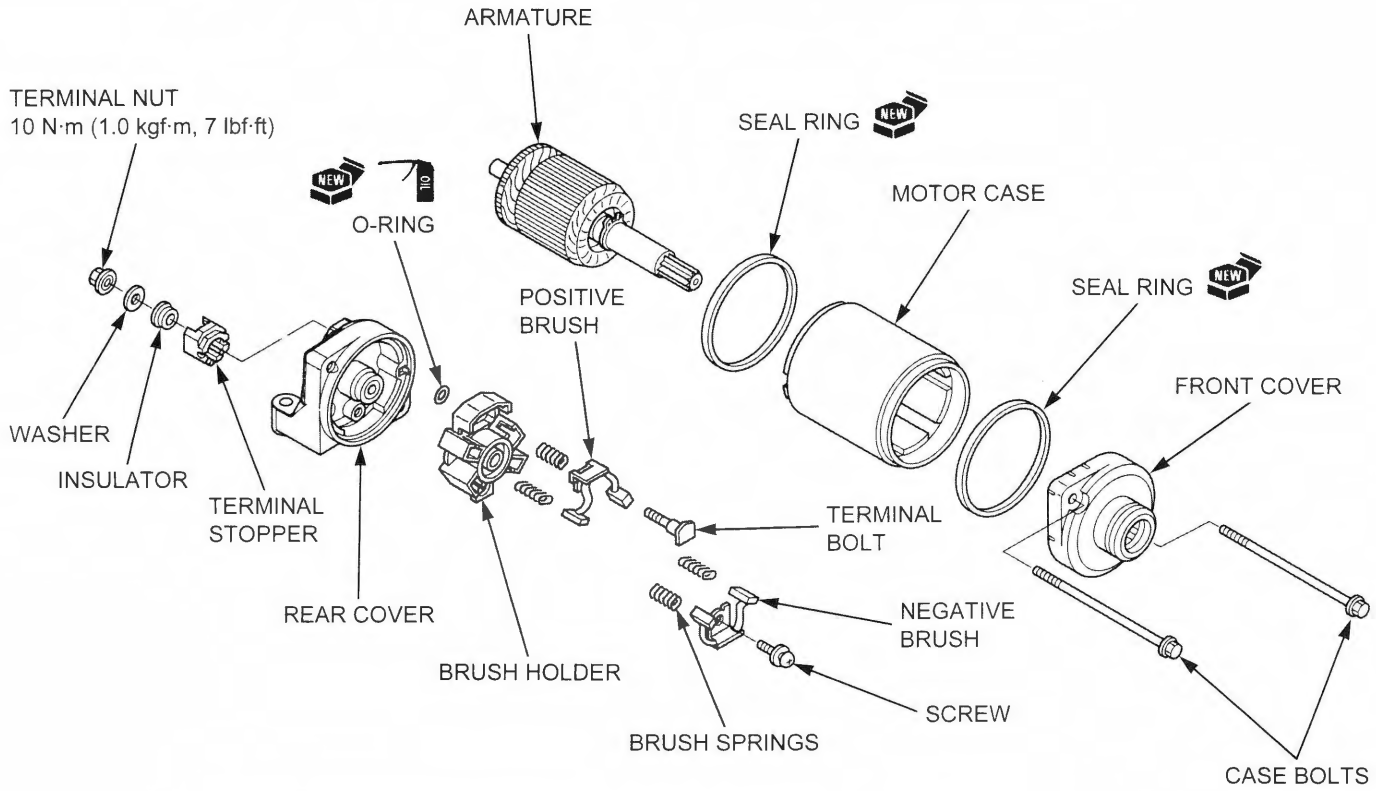
ELECTRIC STARTER

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the starter motor as following illustration.

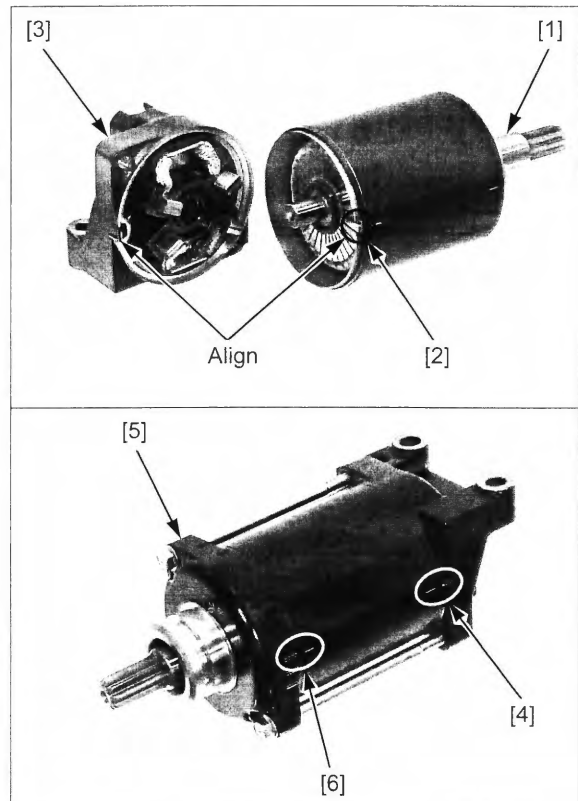
NOTICE

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



NOTE:

- Install the armature [1] into the motor case from the case groove [2] side so the commutator bars facing to the rear side.
- When installing the rear cover [3], align the tab with the groove (the index lines [4] are aligned).
- When installing the front cover [5], take care to prevent damaging the oil seal lip with the armature shaft. Align the index lines [6] on the front cover and motor case.



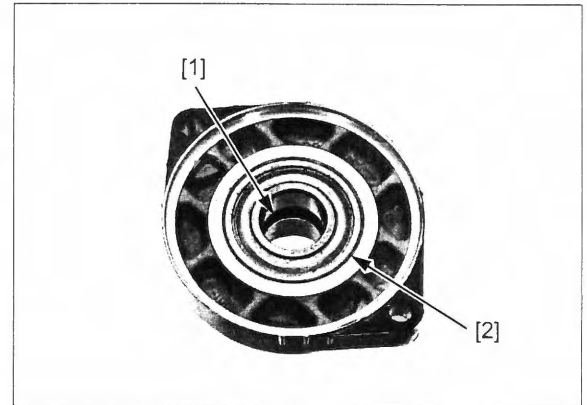
INSPECTION**FRONT COVER**

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**

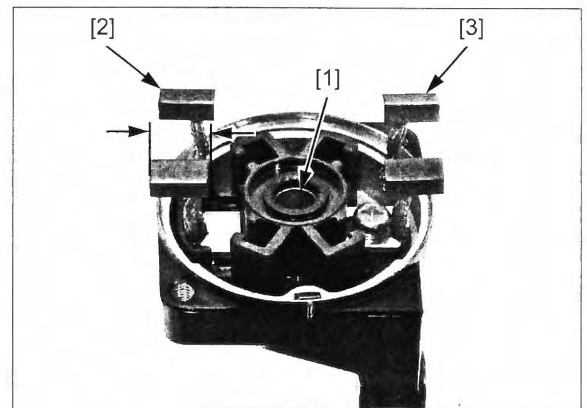
Check the bushing [1] in the rear cover for wear or damage.

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**

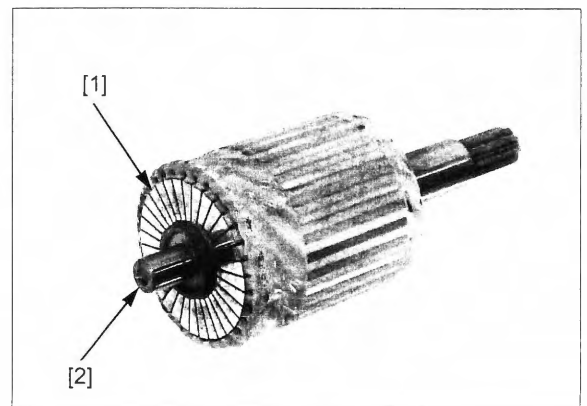
Do not use emery or sand paper on the commutator.

Clean the 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

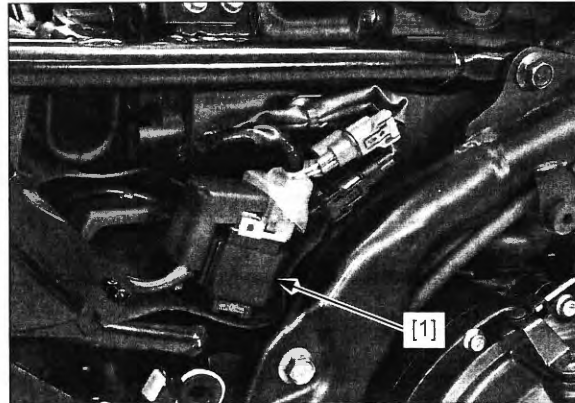
Remove the right side cover (page 2-7).

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 "O". 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

POWER INPUT LINE

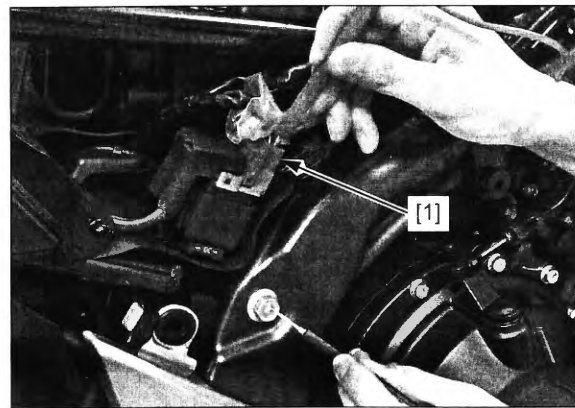
Release the connector boot from the starter relay switch 4P (Red) connector [1].

Turn the ignition switch ON with the engine stop switch turned "O".

Measure the voltage between the 4P (Red) connector terminal and ground.

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

There should be battery voltage when the starter switch is pushed.



GROUND LINE

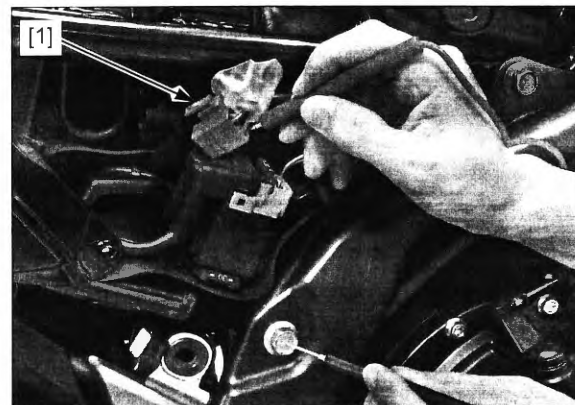
Turn the ignition switch OFF.

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

Check for continuity between the 4P (Red) connector terminal and ground.

CONNECTION: Green/red – Ground

There should be continuity when the transmission is in neutral or when the clutch lever is squeezed with the sidestand retracted (In neutral, there is a slight resistance due to the diode).

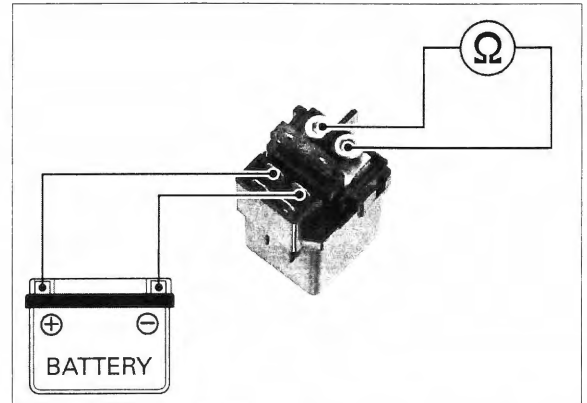


RELAY INSPECTION

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

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 right side cover (page 2-7).

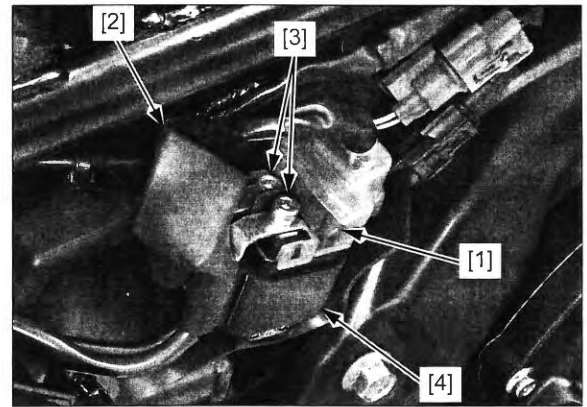
Disconnect the negative (-) cable from the battery (page 20-5).

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

Release the terminal cover [2], and remove the socket bolts [3] to disconnect the cables.

Remove the starter relay switch [4] from the stays.

Installation is in the reverse order of removal.



NEUTRAL DIODE

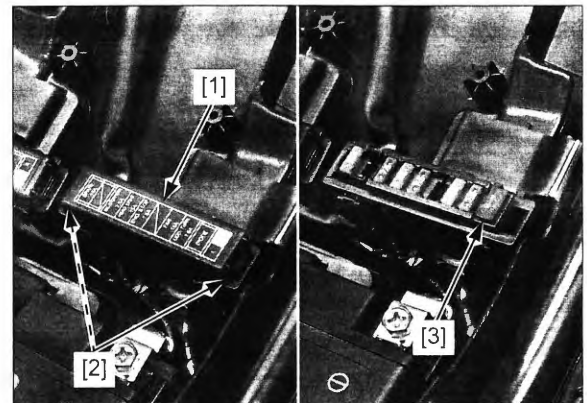
INSPECTION

Remove the following:

- CBR500R/RA/CB500F/FA: front seat (page 2-6)
- CB500X/XA: seat (page 2-6)

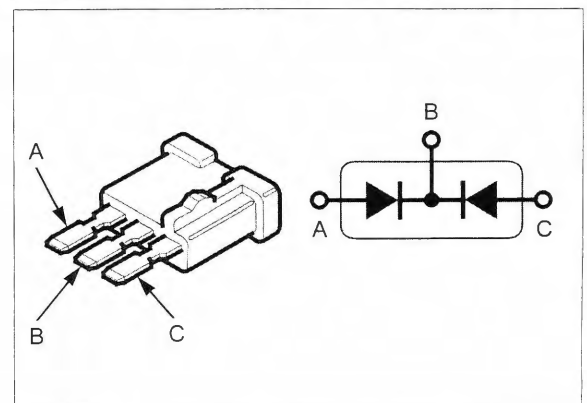
Remove the fuse box cover [1] from the fuse box 1 (left) by releasing the two tabs [2].

Remove the neutral diode [3].



Check for continuity between the diode terminals. When there is continuity, a small resistance value will register.

If there is continuity in direction shown by the arrow, the diode is normal.



MEMO

7. FUEL SYSTEM

SERVICE INFORMATION	7-2	FUEL INJECTOR	7-15
COMPONENT LOCATION	7-4	IACV	7-17
FUEL LINE INSPECTION	7-6	SECONDARY AIR SUPPLY SYSTEM	7-18
FUEL TANK	7-9	EVAP PURGE CONTROL SOLENOID VALVE (AC type)	7-21
FUEL PUMP UNIT	7-10	EVAP CANISTER (AC type)	7-22
THROTTLE BODY/ AIR CLEANER HOUSING	7-11	FUEL PUMP RELAY	7-23

FUEL SYSTEM

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 7-6).
- 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 port with a piece of tape or a clean cloth to keep dirt and debris from entering the engine after the throttle body has been removed.
- Do not damage the throttle body. It may cause incorrect throttle valve operation.
- Prevent dirt and debris from entering the throttle bore and air passages after the throttle body has been removed. Clean them using a compressed air if necessary.
- Do not loosen or tighten the white painted nut and screw of the throttle body. Loosening or tightening them can cause throttle valve and idle control failure.
- Do not apply commercially available carburetor cleaners to the inside of the throttle bore.
- The parts of the throttle body not shown in this manual should not be disassembled.
- For fuel injector and IACV servicing, the throttle body removal/installation is required.
- For fuel level sensor inspection (page 21-17).
- The following color codes are used throughout this section.

Bl = Black
Br = Brown
Bu = Blue

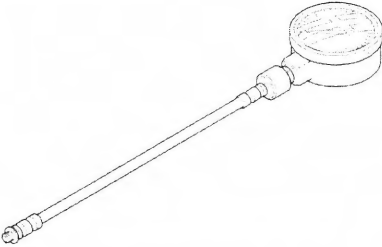
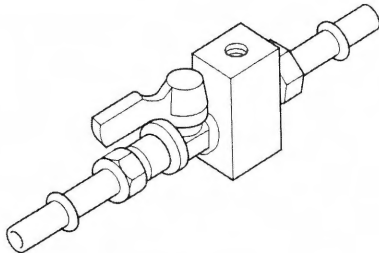
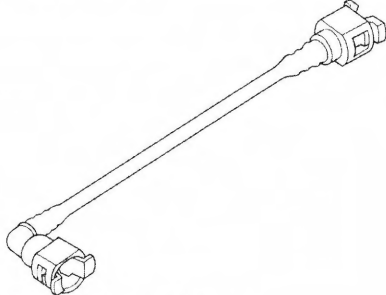
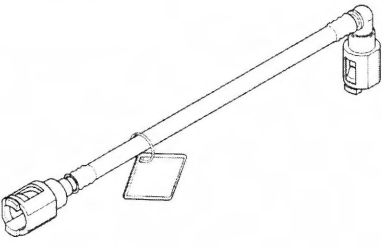

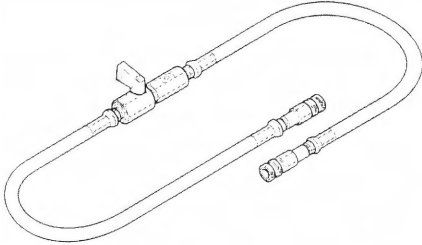
G = Green
Gr = Gray
Lb = Light Blue

Lg = Light Green
O = Orange
P = Pink

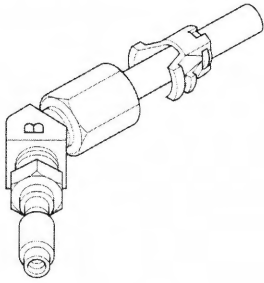
R = Red
V = Violet
W = White

Y = Yellow

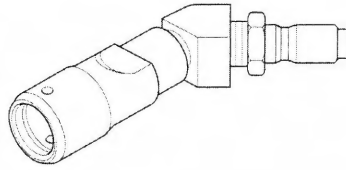
TOOLS

<p>Fuel pressure gauge 07406-0040004</p>  <p>or 07406-004000C (U.S.A. only) or 07406-004000B (U.S.A. only)</p>	<p>Pressure gauge manifold 07ZAJ-S5A0111</p>  <p>(not available in U.S.A.)</p>	<p>Hose attachment, 9 mm/9 mm 07ZAJ-S5A0120</p>  <p>(not available in U.S.A.)</p>
<p>Hose attachment, 8 mm/9 mm 07ZAJ-S7C0100</p>  <p>(not available in U.S.A.)</p>	<p>Attachment joint, 8 mm/9 mm 07ZAJ-S7C0200</p>  <p>(not available in U.S.A.)</p>	<p>Pressure manifold hose 07AMJ-HW3A100 (U.S.A. only)</p> 

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



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



FUEL SYSTEM

COMPONENT LOCATION

A, CM types

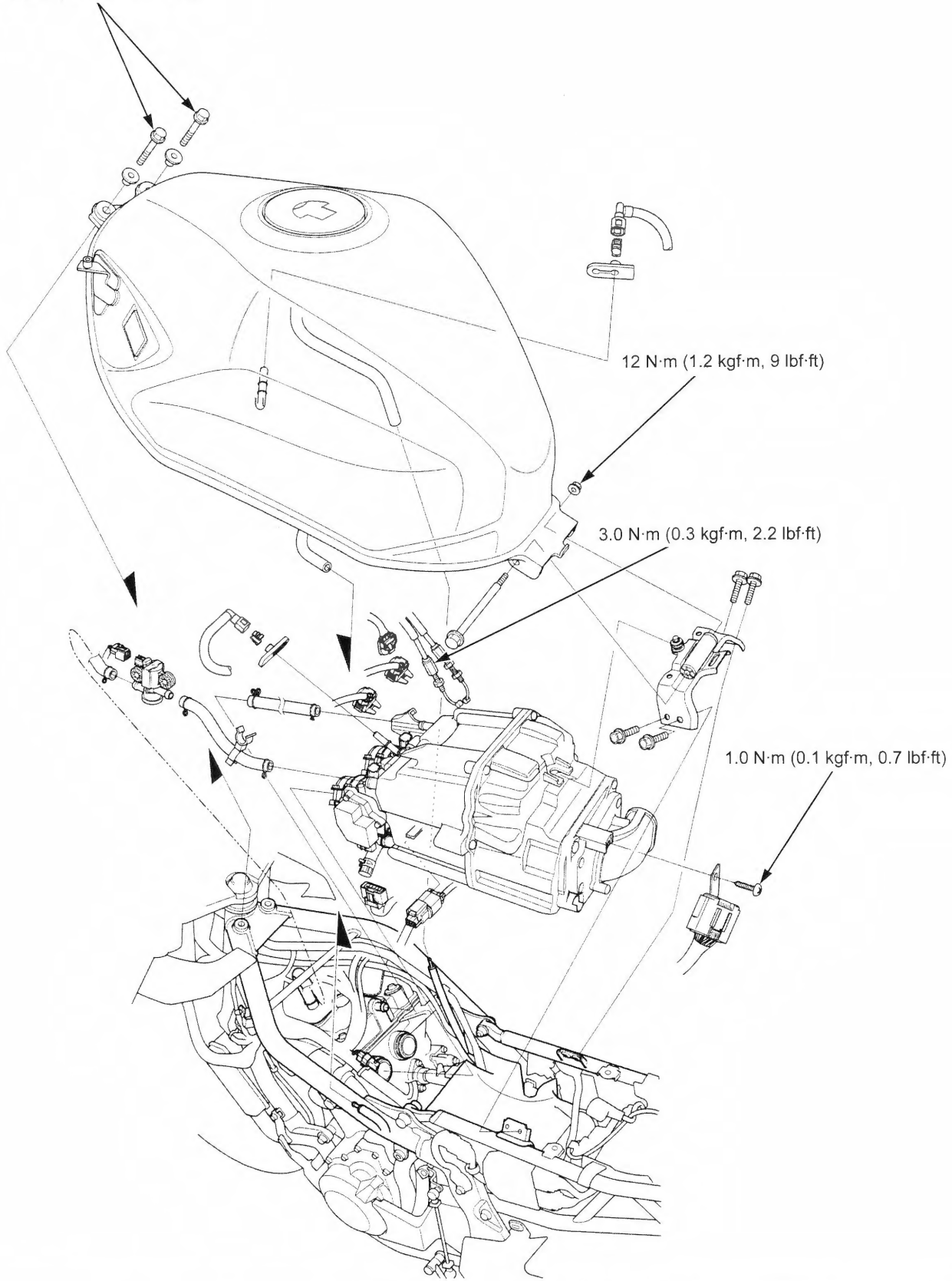
CBR500RA shown:

10 N·m (1.0 kgf·m, 7 lbf·ft)

12 N·m (1.2 kgf·m, 9 lbf·ft)

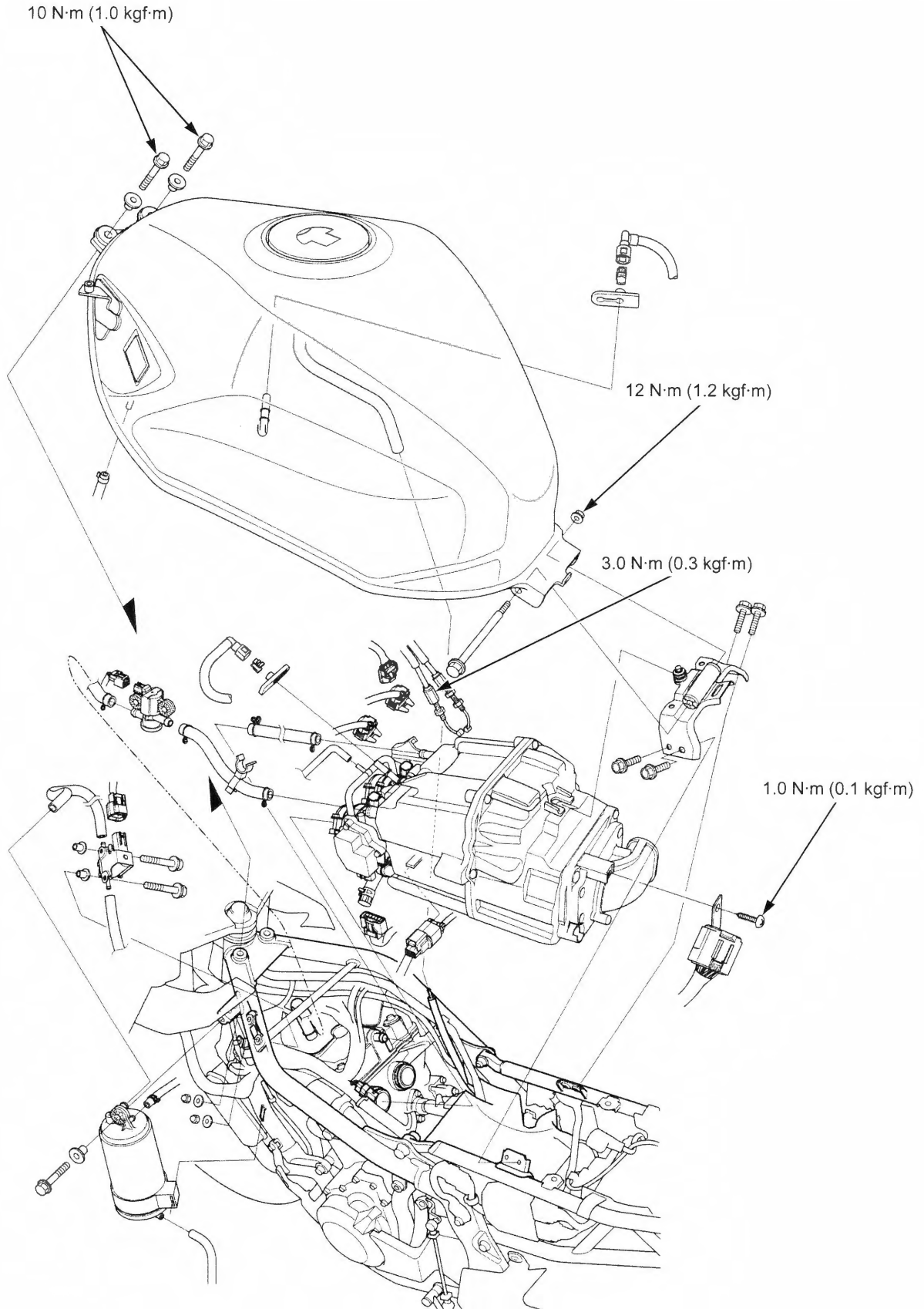
3.0 N·m (0.3 kgf·m, 2.2 lbf·ft)

1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)



AC type

CBR500RA shown:

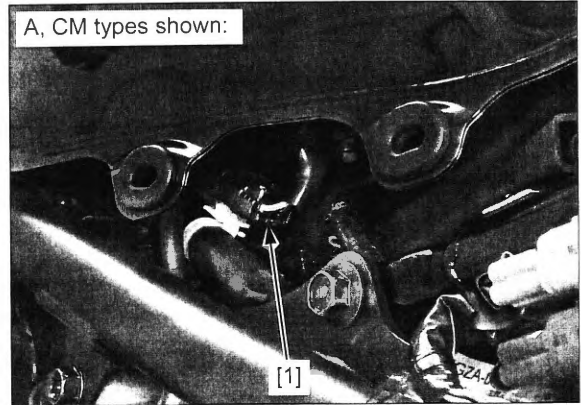


FUEL LINE INSPECTION

FUEL PRESSURE RELIEVING

NOTE:

- Before disconnecting fuel feed hose, relieve pressure from the system as follows.
1. Turn the ignition switch OFF.
 2. Remove the left side cover (page 2-7).
 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.



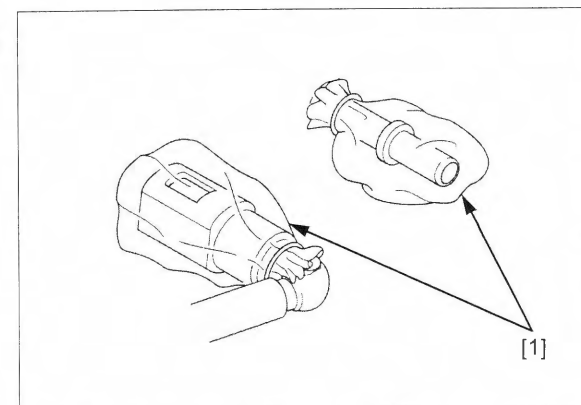
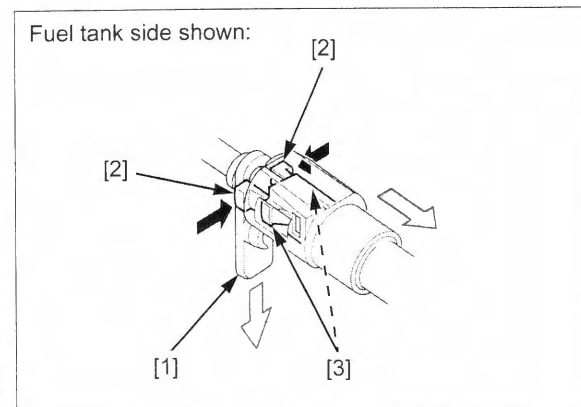
QUICK CONNECT FITTING REMOVAL

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.
1. Relieve the fuel pressure (page 7-6).
 2. Disconnect the negative (-) cable from the battery (page 20-5).
 3. Lift the fuel tank and support it (page 3-4).
 4. Place a shop towel over the quick connect fitting.
Pull and release the joint rubber [1] from the retainer.
 5. Hold the connector with one hand and squeeze the retainer tabs [2] with the other hand to release the locking pawls [3], then pull the connector off the fuel pipe.

NOTE:

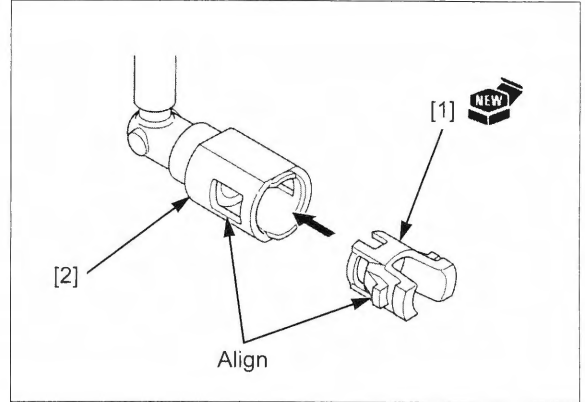
- Be careful not to damage the fuel feed hose, connector and fuel pipe. Do not use tools.
 - Prevent the remaining fuel in the fuel feed hose from flowing out, using a shop towel.
 - If the connector does not move, alternately pull and push the connector until it comes off easily.
6. Remove the retainer and joint rubber from the fuel pipe.
 7. To prevent damage and keep foreign matter out, cover the connector and fuel pipe with plastic bags [1].



QUICK CONNECT FITTING INSTALLATION

NOTE:

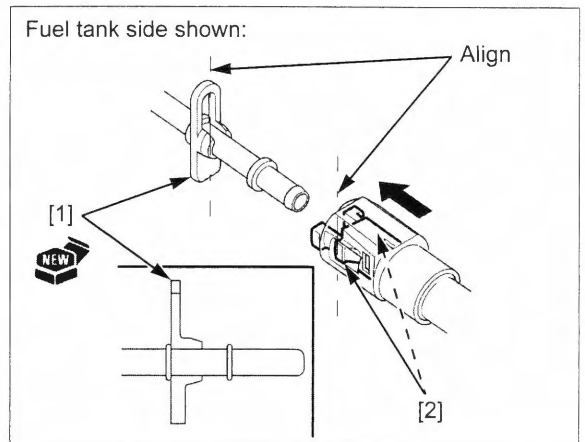
- Always replace the retainer and joint rubber of the quick connect fitting when the fuel feed hose is disconnected.
 - Use the same type of retainer and joint rubber as the removed ones.
 - Do not bent or twist the fuel feed hose.
1. Insert a new retainer [1] into the connector [2] by aligning the locking pawls with the holes.



2. Install a new joint rubber [1] onto the fuel pipe. Install the connector onto the fuel pipe straight and align the retainer groove with the joint rubber tabs as shown. Then press the connector until both locking pawls [2] click.

NOTE:

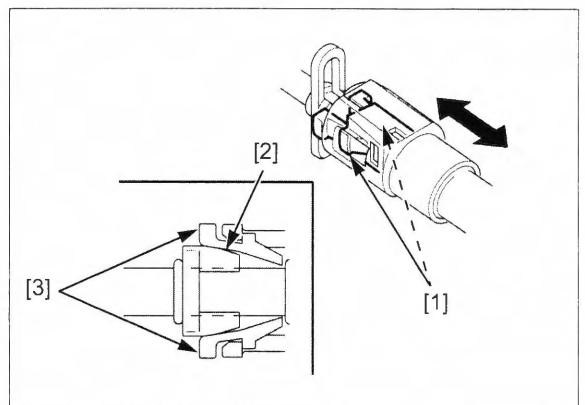
- If it is hard to connect, put a small amount of engine oil on the pipe end.



3. Make sure that the quick connect fitting is connected securely and the locking pawls [1] are locked firmly by pulling the connector.

Make sure the joint rubber boss [2] is placed between the retainer tabs [3] as shown.

4. Temporarily lower the fuel tank (page 3-4).
5. Connect the battery negative (-) cable (page 20-5).
6. Normalize the fuel pressure (page 7-8).



FUEL PRESSURE NORMALIZATION

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

NOTE:

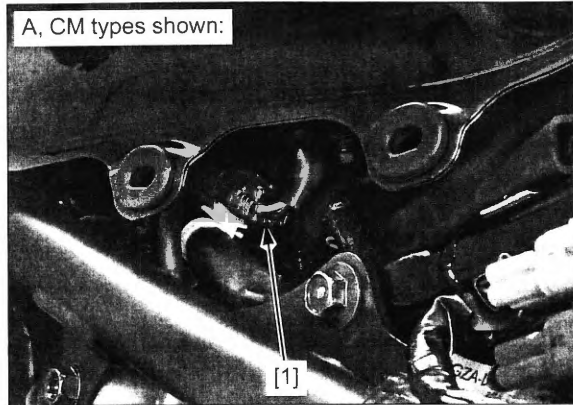
- Do not start the engine.

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 properly (page 3-4).

A, CM types shown:



FUEL PRESSURE TEST

NOTE:

- Check the fuel tank breather hose on the frame (A, CM types) or fuel tank-to-EVAP canister hose (AC type) for pinches or clogs when the fuel tank is lifted.

Disconnect the quick connect fitting from the fuel tank (page 7-6).

Attach the special tools between the fuel feed hose and fuel 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 "C"	07AAJ-S6MA300
Adaptor, female "C"	07AAJ-S6MA500

Lower the fuel tank until the fuel pump 3P (Black) connector [6] can be connected and support it. Temporarily connect the fuel pump 3P (Black) connector, fuel tank breather hose and battery negative (-) cable.

Start the engine and let it idle. Read the fuel pressure.

STANDARD: 343 kPa (3.5 kgf/cm², 50 psi)

If the fuel pressure is higher than specified pressure, replace the fuel pump unit.

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

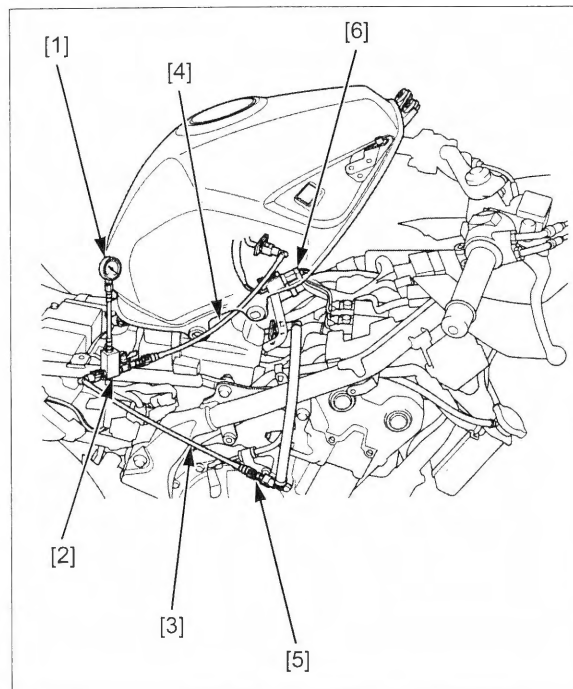
- fuel line for leakage
- fuel tank breather hose (tank side) for pinches or clogs (A, CM types)
- fuel filter for clogs
- fuel pump (page 7-10)

After inspection, relieve the fuel pressure (page 7-6).

Disconnect the negative (-) cable from the battery (page 20-5).

Remove the special tools.

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



FUEL FLOW INSPECTION

NOTE:

- Check the fuel tank breather hose on the frame (A, CM types) or fuel tank-to-EVAP canister hose (AC type) for pinches or clogs when the fuel tank is lifted.

Disconnect the quick connect fitting from the throttle body (page 7-6).

Wipe off spilled out gasoline.

Place the end of the fuel feed hose [1] into an approved gasoline container.

Lower the fuel tank until the fuel pump 3P (Black) [2] connector can be connected and support it. Temporarily connect the fuel pump 3P (Black) connector and battery negative (-) cable.

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

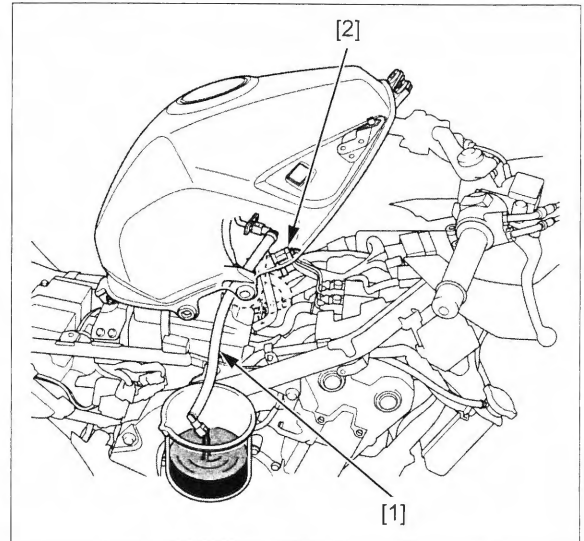
Amount of fuel flow:

**319 cm³ (10.8 US oz, 11.2 Imp oz) minimum/
10 seconds at 12 V**

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

- fuel feed hose for clogs
- fuel tank breather hose (tank side) for pinches or clogs (A, CM types)
- fuel filter for clogs
- fuel pump (page 7-10)

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



FUEL TANK

REMOVAL/INSTALLATION

Disconnect the quick connect fitting from the fuel tank (page 7-6).

Lower the fuel tank, being careful not to pinch the wire and hoses.

Remove the nut [1] and bolt [2], and the fuel tank [3].

Installation is in the reverse order of removal.

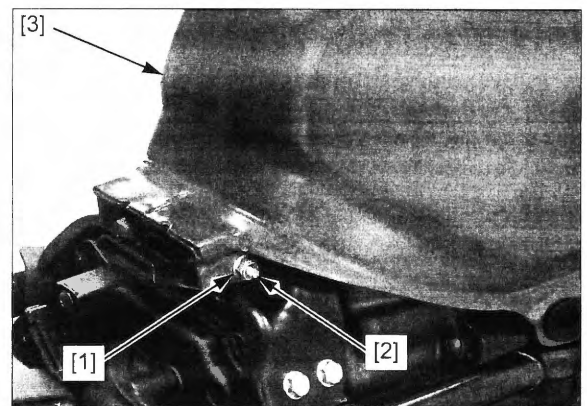
NOTE:

- The mounting bolt is installed from the left side.

TORQUE:

Fuel tank mounting nut: 12 N·m (1.2 kgf·m, 9 lbf·ft)

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



FUEL PUMP UNIT

INSPECTION

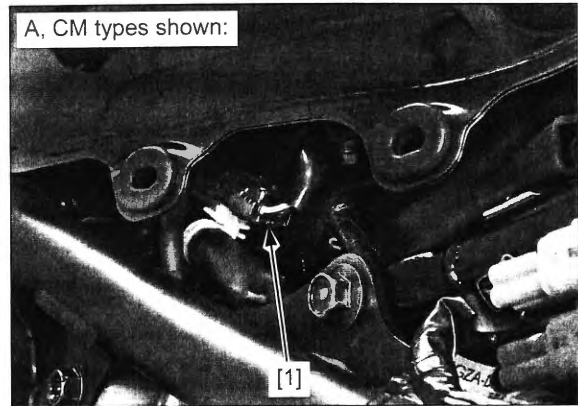
Turn the ignition switch ON with the engine stop switch "O" and confirm that the fuel pump operates for 2 seconds.

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

Turn the ignition switch OFF.

Remove the left side cover (page 2-7).

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



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

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

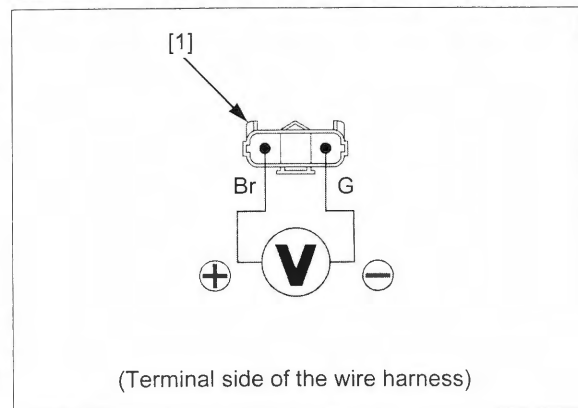
CONNECTION: Brown (+) – Green (-)

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 wire between the fuel pump and ground for open circuit
- Brown wire between the relay box and fuel pump for open circuit
- fuel pump relay and its circuits (page 7-23)
- ECM (page 4-37)



REMOVAL/INSTALLATION

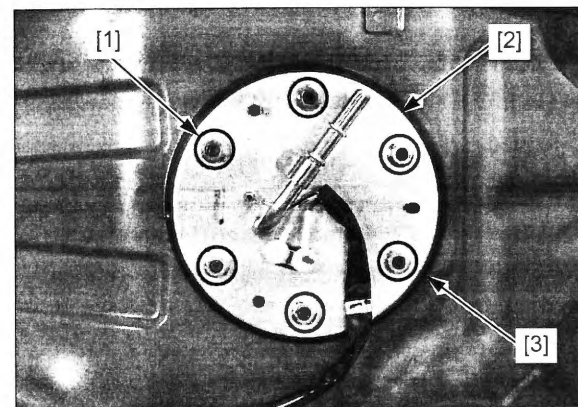
Remove the fuel tank (page 7-9).

Clean around the fuel pump.

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

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

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



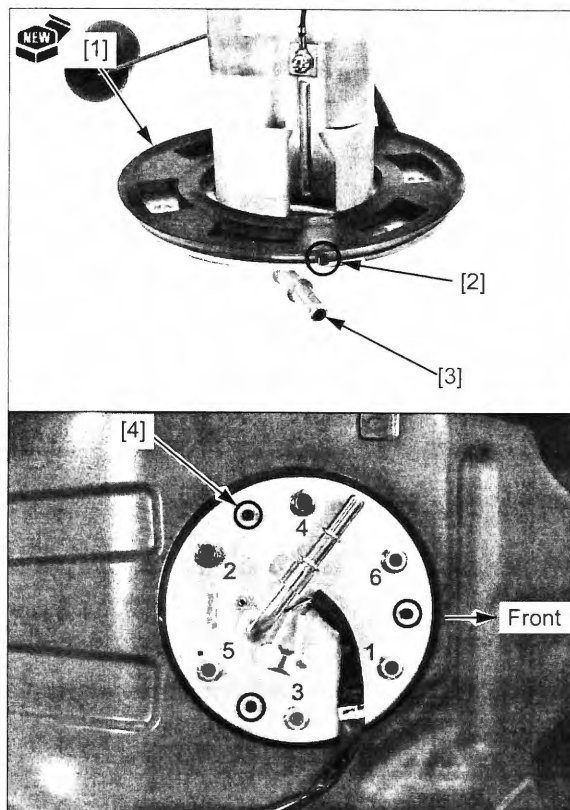
Installation is in the reverse order of removal.

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 are allowed.
- Place the rubber seal with the boss [2] facing toward the fuel pipe [3] and pull the three retaining pins [4] 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)



THROTTLE BODY/AIR CLEANER HOUSING

REMOVAL/INSTALLATION

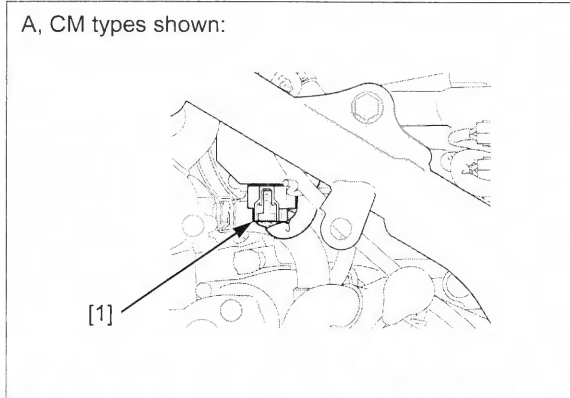
NOTE:

- Always clean around the fuel system parts with compressed air before removing to prevent dirt and debris from entering the air passages in the throttle body.

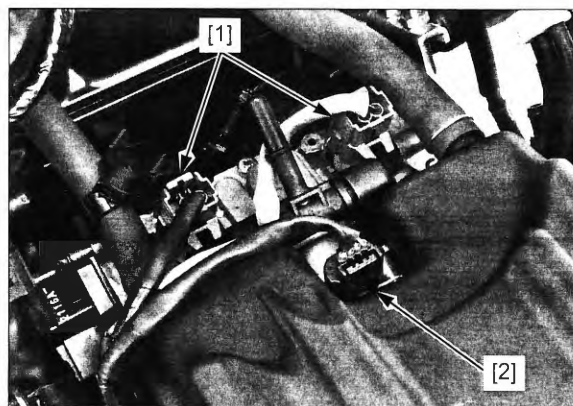
Remove the fuel tank (page 7-9).

Disconnect the following:

- sensor unit 5P (Black) connector [1]

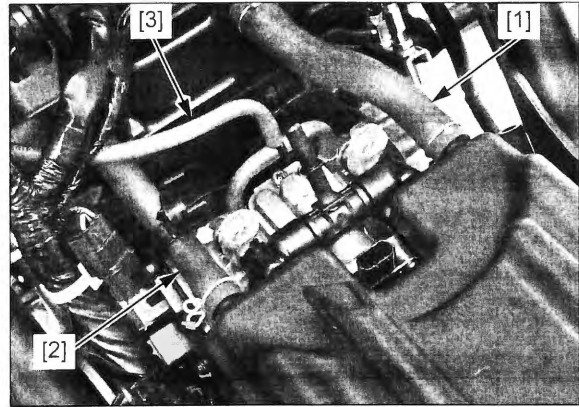


- fuel injector 2P (Gray) connectors [1]
- IACV 4P (Black) connector [2]

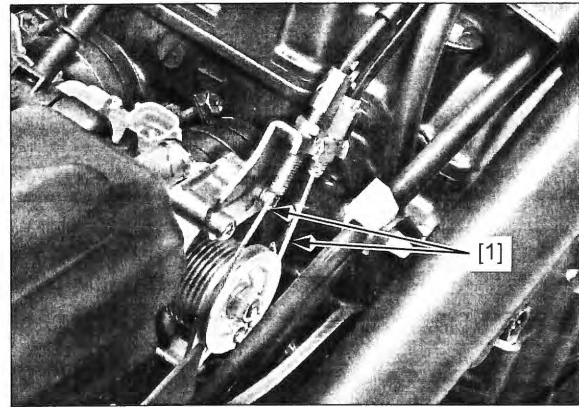


FUEL SYSTEM

- crankcase breather hose [1]
- secondary air supply hose [2]
- AC type: EVAP canister-to-throttle body hose [3] (from the 3-way joint)

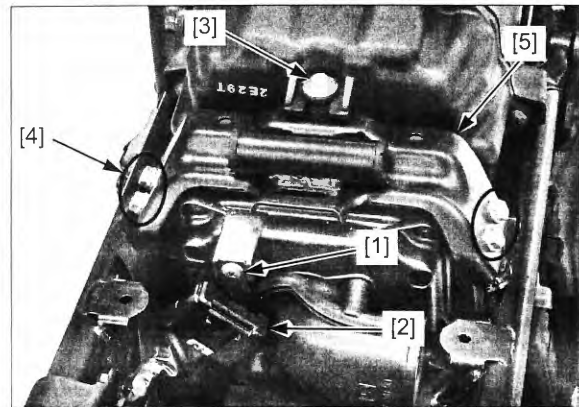


- throttle cables [1] (remove from the cable holder and disconnect from the throttle drum)

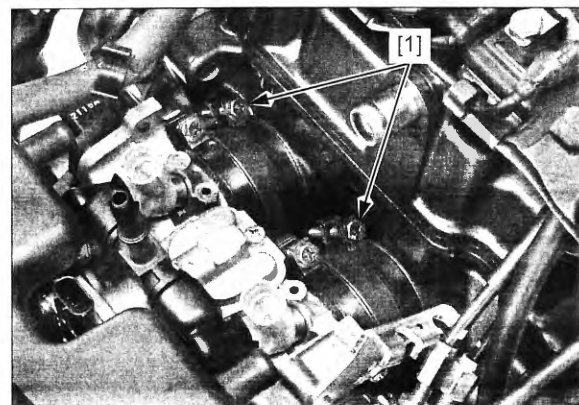


Remove the following:

- tapping screw [1]
- wire junction [2]
- 6 mm bolt [3] (loosen)
- four 8 mm bolts [4]
- fuel tank bracket [5]



Loosen the two insulator band screws (cylinder head side) [1].



Do not apply force to the sensor unit and injectors. Slide the throttle body/air cleaner housing assembly rearward and release the insulators [1] off of the cylinder head.

Raise the front of the assembly and remove the engine sub-wire harness 6P (Black) connector [2] from the stay on the air cleaner housing.

Remove the throttle body/air cleaner housing assembly out of the frame.

Installation is in the reverse order of removal.

NOTE:

- When setting the assembly into the frame, position the crankcase breather tube [3] under the water hose and be sure it is not kinked or deformed.
- Tighten the insulator band screw so the distance [4] between the band ends is 10 ± 1.0 mm (0.4 ± 0.04 in).
- When connecting the injector 2P (Gray) connectors [5], align the groove with the tab of the injector joint.

TORQUE:

Wire junction stay tapping screw:

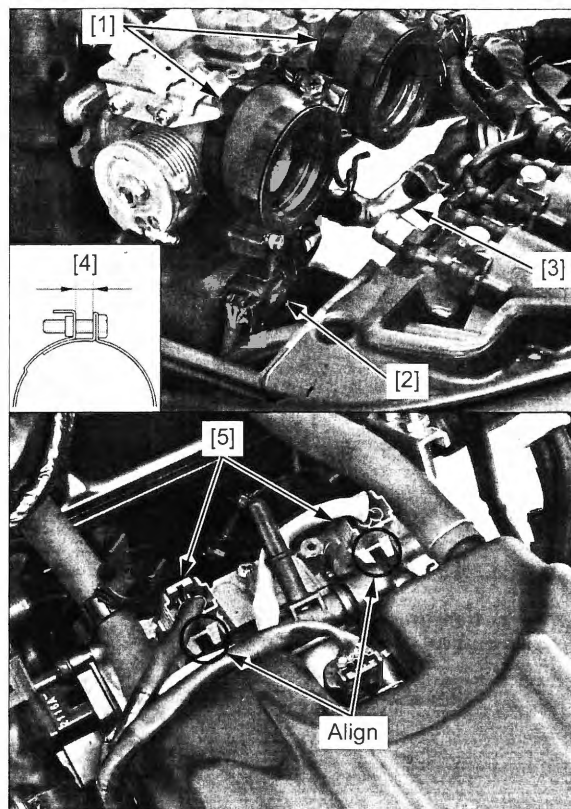
1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)

Throttle cable joint bolt (at throttle body):

3.0 N·m (0.3 kgf·m, 2.2 lbf·ft)

Adjust the throttle grip freeplay (page 3-4).

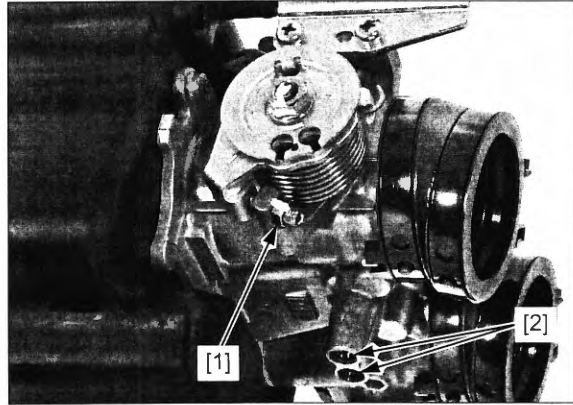
If the sensor unit has been removed, perform the TP sensor reset procedure (page 4-38).



DISASSEMBLY/ASSEMBLY

NOTE:

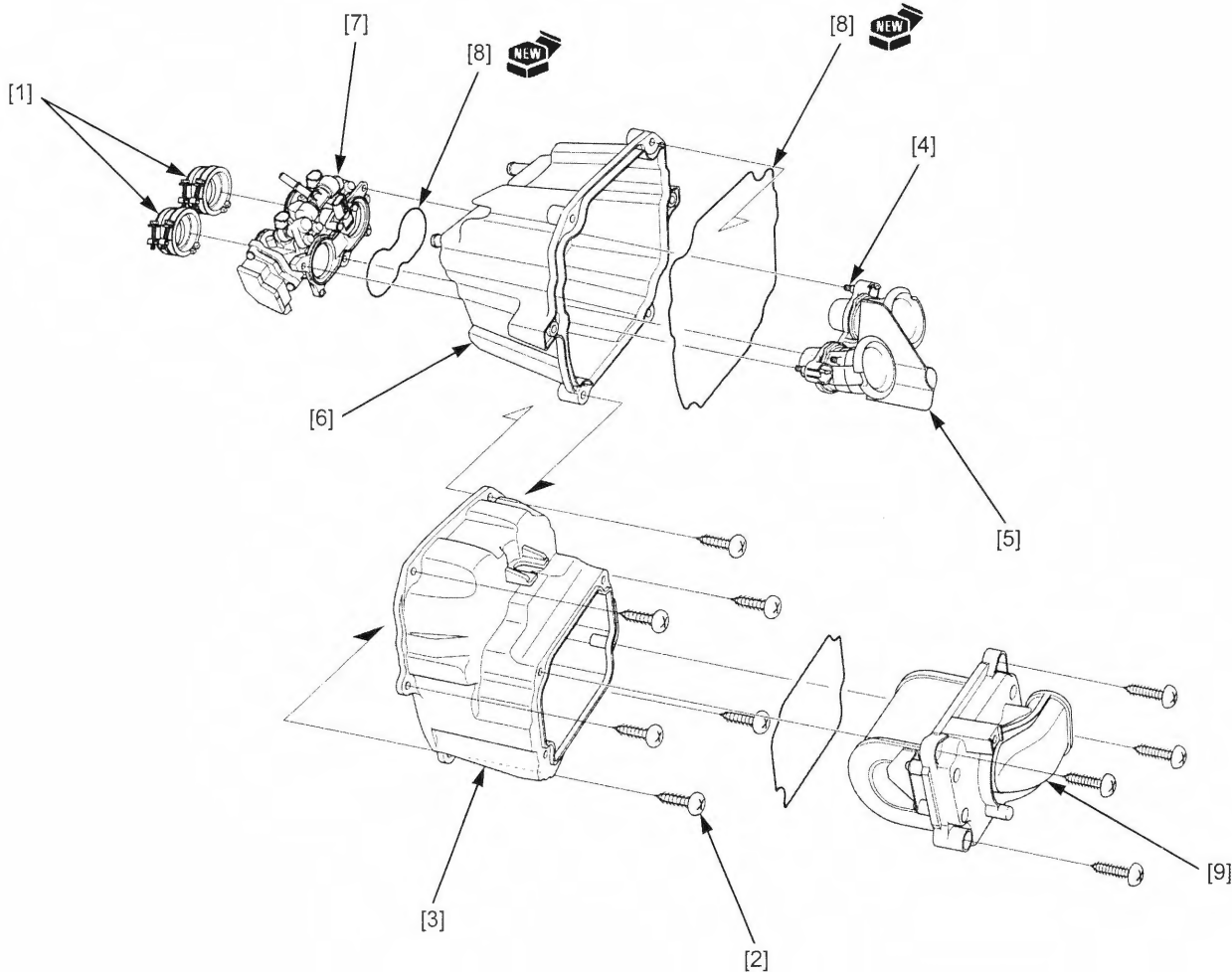
- The throttle body is factory pre-set. Do not disassemble in a way other than shown in this manual.
- Do not snap the throttle valve from full open to full close after the throttle cable has been removed. It may cause incorrect idle operation.
- Do not damage the throttle body. It may cause incorrect throttle valve operation.
- Do not loosen or tighten the white painted nut [1] and air screws [2]. Loosening or tightening them can cause throttle body malfunction.



Remove the following:

- throttle body insulators [1] (loosen the band screws)
- six tapping screws [2]
- rear air cleaner housing [3]
- three screws [4]
- air funnel [5]
- front air cleaner housing [6]
- throttle body [7]
- rubber seals [8]

For air cleaner lid and element [9] removal/installation (page 3-5).



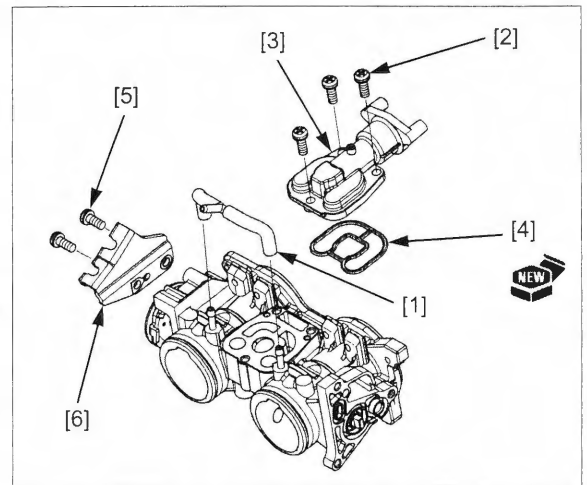
Remove the following:

- sensor unit (page 4-38)
- IACV (page 7-17)
- fuel injectors (page 7-15)
- AC type: EVAP canister-to-throttle body hoses [1]
- three screws [2]
- IACV body [3]
- rubber seal [4]
- two screw [5]
- throttle cable holder [6]

Clean the air passages in the throttle body and IACV body with compressed air.

NOTE:

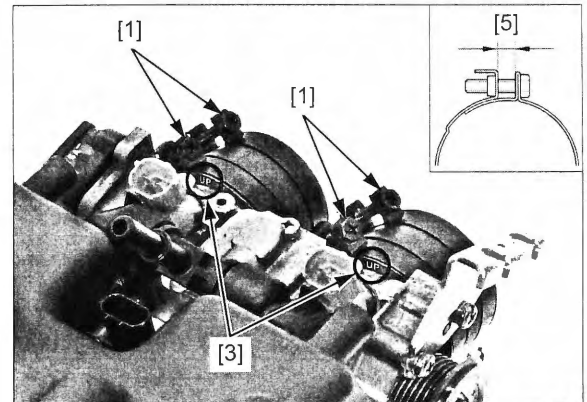
- Cleaning with the a piece of wire will damage the throttle body.



Assembly is in the reverse order of removal.

NOTE:

- Replace the rubber seals with new ones.
- Install each insulator band over the insulator with the screw head [1] facing to the right and align the left band hole [2] with the locating boss.
- Install each insulator with the "UP" mark [3] facing toward the throttle body and align the groove [4] with the lug.
- Tighten the insulator band screw so the distance [5] between the band ends is 10 ± 1.0 mm (0.4 ± 0.04 in).



TORQUE:

Throttle cable holder screw:

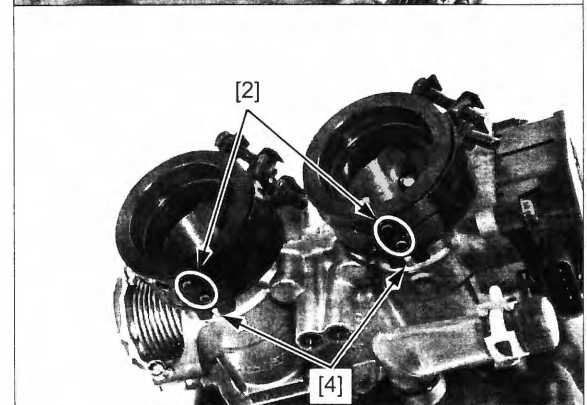
3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)

IACV body screw:

3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)

Air cleaner housing assembly tapping screw:

1.1 N·m (0.1 kgf·m, 0.8 lbf·ft)



FUEL INJECTOR

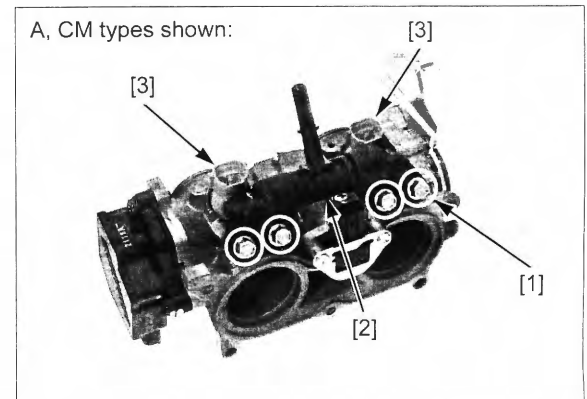
REMOVAL/INSTALLATION

Remove the throttle body from the air cleaner housing (page 7-14).

Remove the following:

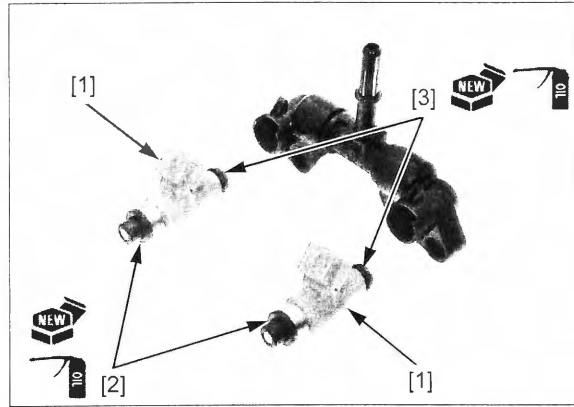
- four bolts [1]
- fuel pipe [2] and fuel injectors [3] (as an assembly)

A, CM types shown:



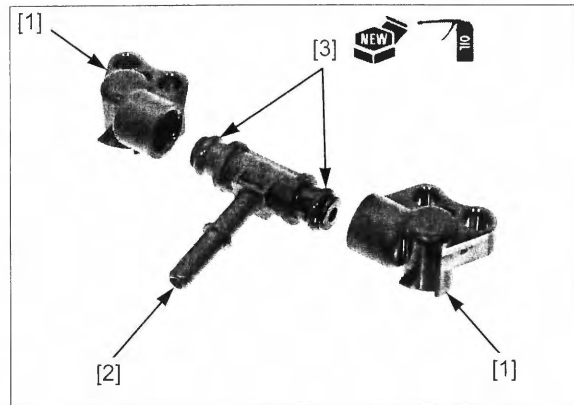
FUEL SYSTEM

- fuel injectors [1]
- seal rings [2]
- O-rings [3]



- injector joints [1]
- fuel pipe [2]
- O-rings [3]

Check each part for wear or damage and replace it if necessary.



Installation is in the reverse order of removal.

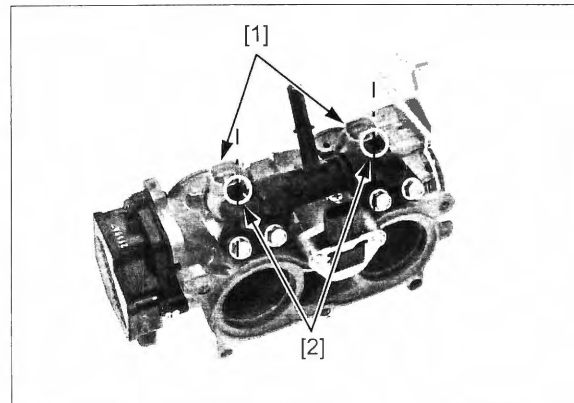
NOTE:

- Replace the O-rings and seal rings with new ones and coat them with engine oil.
- When installing the fuel injector, be careful not to damage the O-ring and seal ring.
- Align the injector connectors [1] with the fuel joint tabs [2] to position them upright.

TORQUE:

Fuel injector joint bolt:

5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)



IACV

INSPECTION

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

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

Turn the ignition switch ON with the engine stop switch "O" and check the IACV.

If the operating (beep) sound is not heard with no MIL blinking, perform the following inspection.

Remove the IACV (page 7-17).

Check the IACV slide valve [1] and IACV air passage in the throttle body for carbon deposits.

Check the O-ring [2] on the IACV for deterioration or damage.

Temporarily install the following components to the wire harness by connecting each connector:

- throttle body; fuel injector 2P (Gray) and sensor unit 5P (Black)
- IACV; 4P (Black) [3]

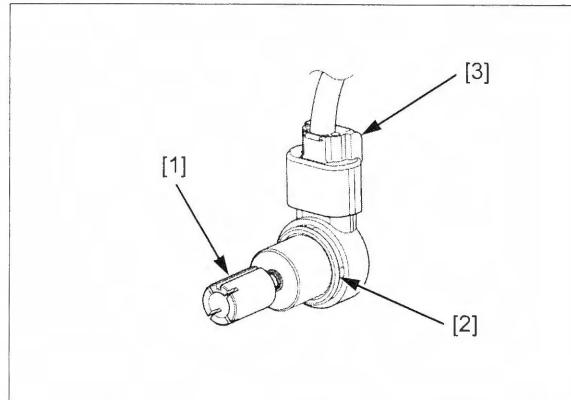
Turn the ignition switch ON with the engine stop switch "O" while holding the slide valve lightly.

The slide valve should move back and forth.

Turn the ignition switch OFF.

Disconnect the connectors to remove the throttle body and IACV from the wire harness.

Install the IACV (page 7-17).

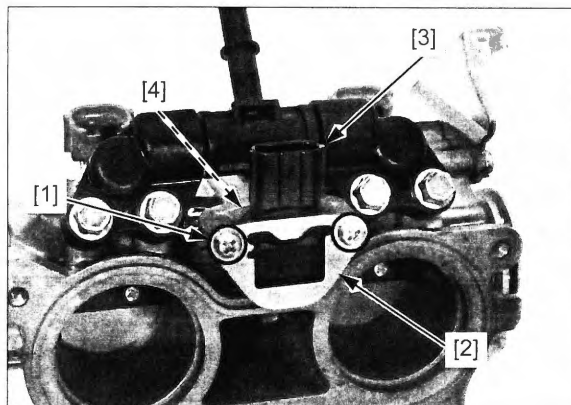


REMOVAL/INSTALLATION

Remove the throttle body from the air cleaner housing (page 7-14).

Remove the following:

- two screws [1]
- setting plate [2]
- IACV [3]
- O-ring [4]



FUEL SYSTEM

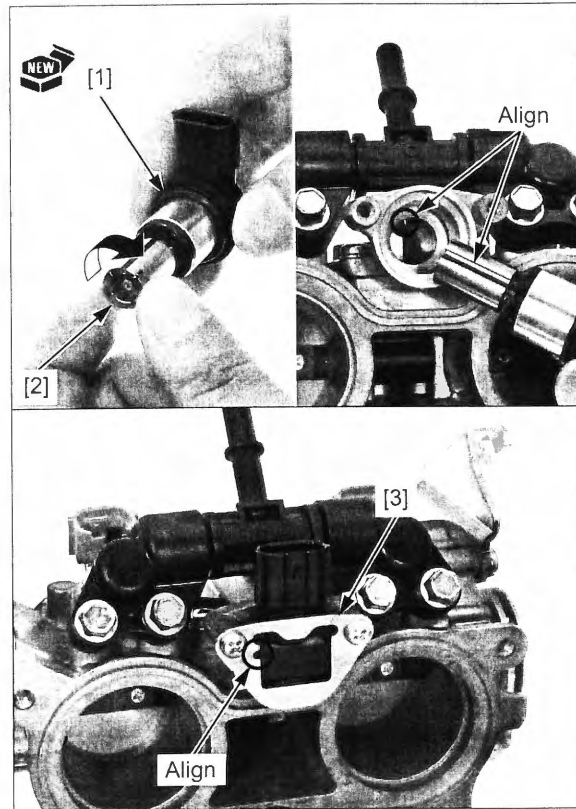
Installation is in the reverse order of removal.

NOTE:

- Replace the O-ring [1] with a new one (do not apply oil).
- Turn the slide valve [2] clockwise until it is seated lightly and install by aligning the long slot with the pin on the throttle body.
- Align the cutout in the setting plate [3] with the lug of the IACV body.

TORQUE:

IACV setting plate torx screw:
2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)



SECONDARY AIR SUPPLY SYSTEM

SYSTEM INSPECTION

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

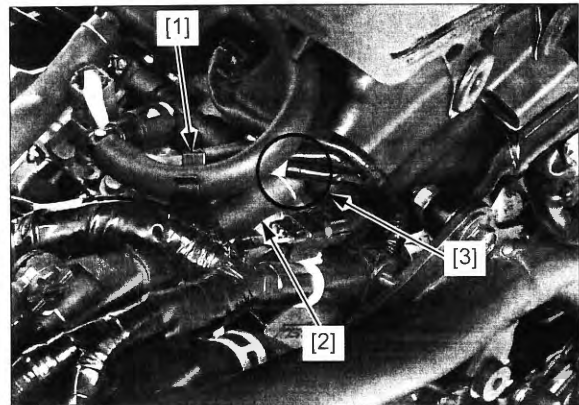
Stop the engine.

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

Remove the hose clip [1] and disconnect the air supply hose [2] from the air cleaner housing.

Check that the hose joint (secondary air intake port) [3] of the air cleaner housing is clean and free of carbon deposits.

Check the PAIR check valve if the port is carbon fouled (page 7-20).

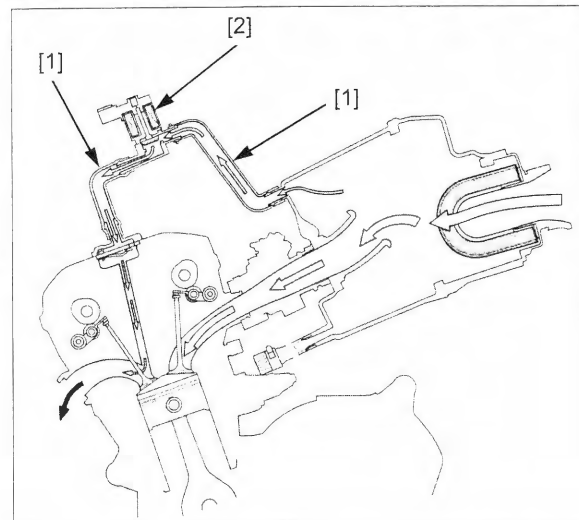


Lower the fuel tank until the fuel pump 3P (Black) connector can be connected and support it.

Temporarily connect the fuel pump 3P (Black) connector.

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

If the air is not drawn in, check the air supply hoses [1] for clogs and PAIR control solenoid valve [2] (page 7-19).



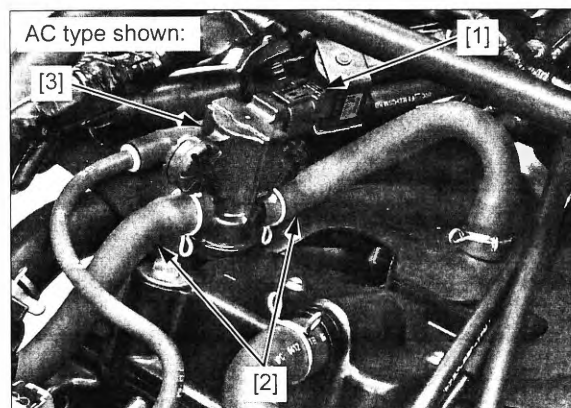
PAIR CONTROL SOLENOID VALVE REMOVAL/INSTALLATION

Remove the fuel tank under tray (page 2-25).

Disconnect the 2P (Black) connector [1].

Disconnect the air supply hoses [2] to remove the PAIR control solenoid valve [3].

Installation is in the reverse order of removal.



PAIR CONTROL SOLENOID VALVE INSPECTION

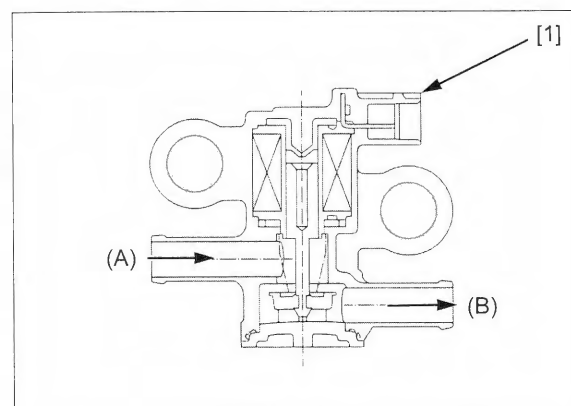
Remove the PAIR control solenoid valve (page 7-19).

Check the air flow through the solenoid valve.

Air should flow from input hose fitting (A) to output hose fitting (B).

Connect a 12 V battery to the 2P connector [1] terminals of the PAIR control solenoid valve.

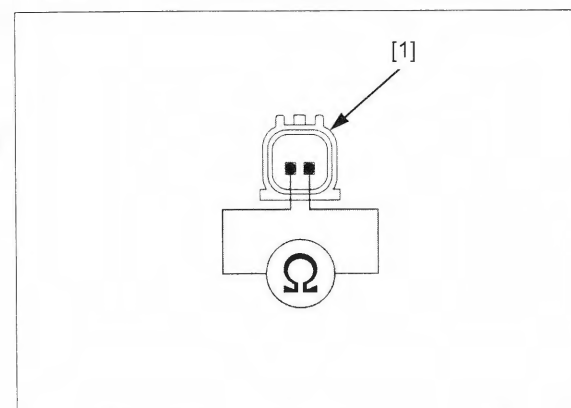
Air should not flow when the battery is connected.



Measure the resistance between the 2P connector [1] terminals of the PAIR control solenoid valve.

STANDARD: 24 – 28 Ω (20°C/68°F)

If the resistance is out of the specification, replace the PAIR control solenoid valve.

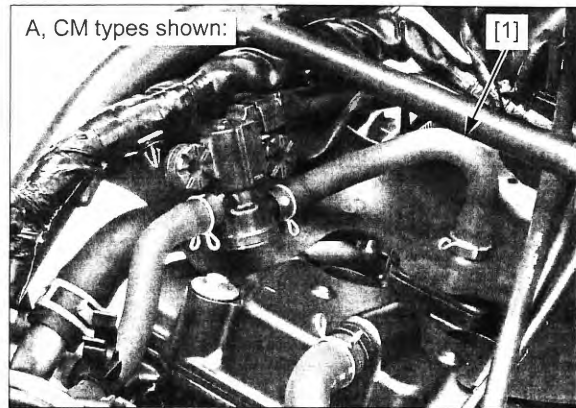


FUEL SYSTEM

PAIR CHECK VALVE REMOVAL/ INSTALLATION

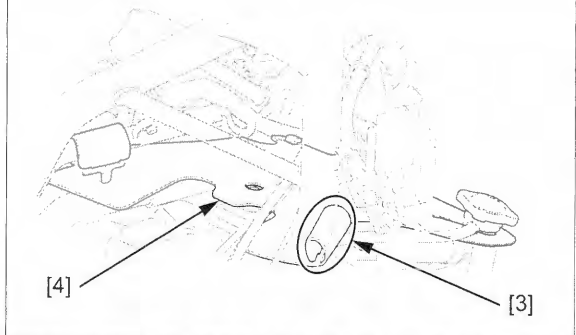
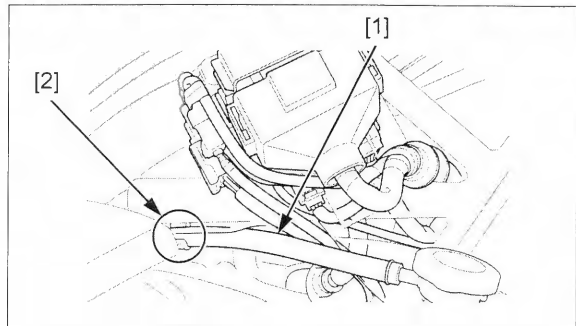
Remove the fuel tank under tray (page 2-25).

Disconnect the air supply hose [1] from the cylinder head cover.

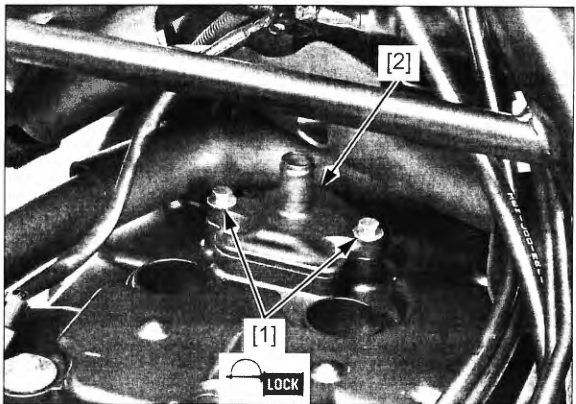


Remove the siphon hose [1] from the clamp [2].

Release the right side flap [3] and remove the heat guard rubber [4] out of the way.



Remove the two bolts [1] and check valve cover [2].



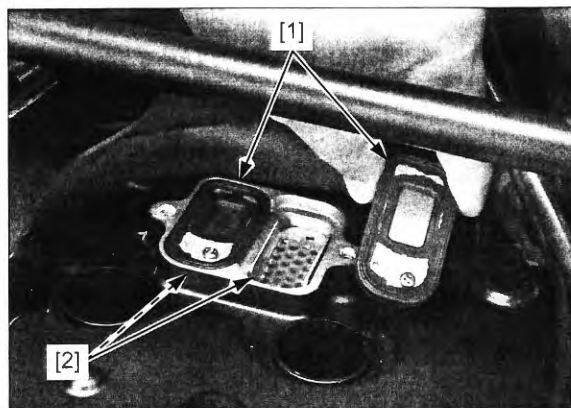
Remove the PAIR check valves [1] and baffle plates [2].
Installation is in the reverse order of removal.

NOTE:

- Apply locking agent to the threads of the PAIR check valve cover bolt (page 1-20).

TORQUE:

PAIR check valve cover bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

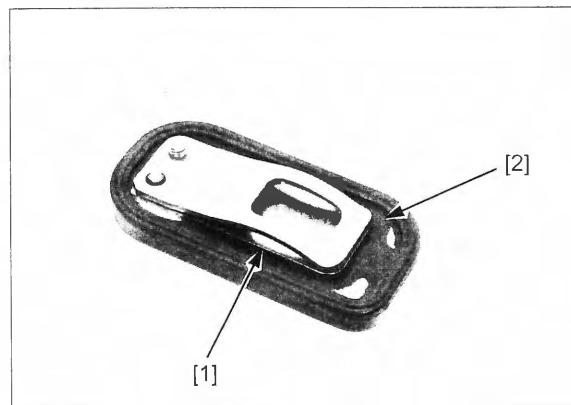


PAIR CHECK VALVE INSPECTION

Remove the PAIR check valves (page 7-20).

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 or damaged, or if there is clearance between the reed and seat.



EVAP PURGE CONTROL SOLENOID VALVE (AC type)

REMOVAL/INSTALLATION

Remove the fuel tank under tray (page 2-25).

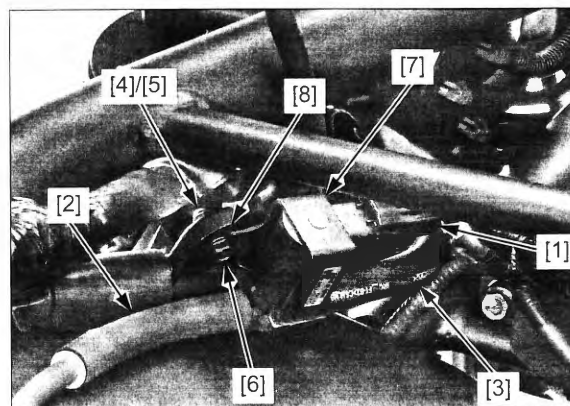
Disconnect the following:

- 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 following:

- two cap nuts [4] and washers [5] (outside)
- two bolts [6] and EVAP purge control solenoid valve [7]
- two collars [8] (inside)

Installation is in the reverse order of removal.



FUEL SYSTEM

INSPECTION

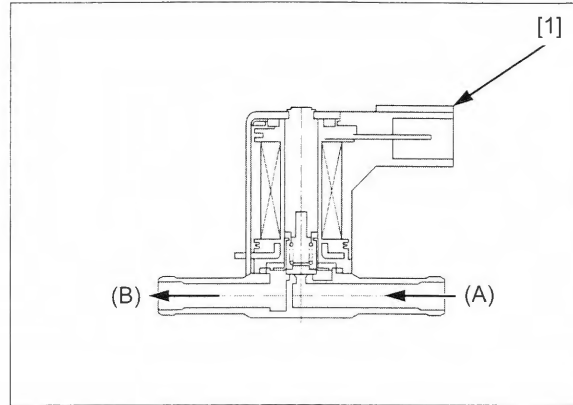
Remove the EVAP purge control solenoid valve (page 7-21).

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.

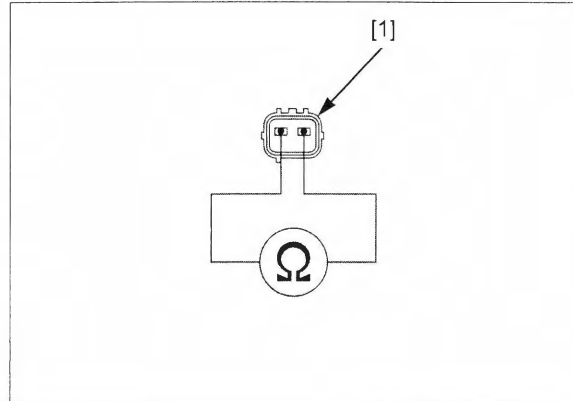
Air should flow when the battery is connected.



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 type)

REMOVAL/INSTALLATION

Remove the left middle cowl (page 2-8).

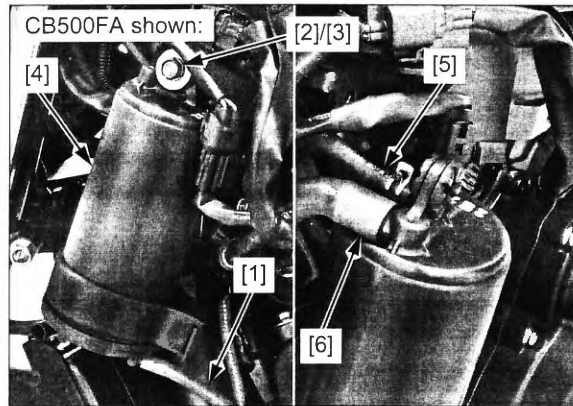
Disconnect the EVAP canister drain hose [1].

Remove the mounting bolt [2] and collar [3], and the EVAP canister [4] from the stay.

Disconnect the following and remove the EVAP canister:

- fuel tank-to-EVAP canister hose [5]
- EVAP canister-to-EVAP purge control solenoid valve hose [6]

Installation is in the reverse order of removal.



FUEL PUMP RELAY

CIRCUIT INSPECTION

For relay inspection (page 21-25).

Remove the fuel pump relay (page 21-24).

RELAY SWITCH/COIL POWER INPUT LINE

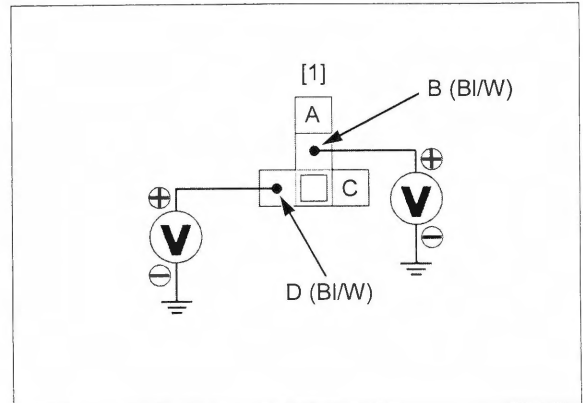
Measure the voltage between each fuel pump relay terminal of the relay box [1] and ground.

CONNECTION: B (+) – Ground (-)
D (+) – Ground (-)

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

If there is no voltage, check the following:

- Black/white wire(s) in the relay box between the main and fuel pump relays
- main relay and its circuit (page 4-42)



SIGNAL LINE

Check for continuity between the fuel pump relay terminal of the relay box [1] and ground.

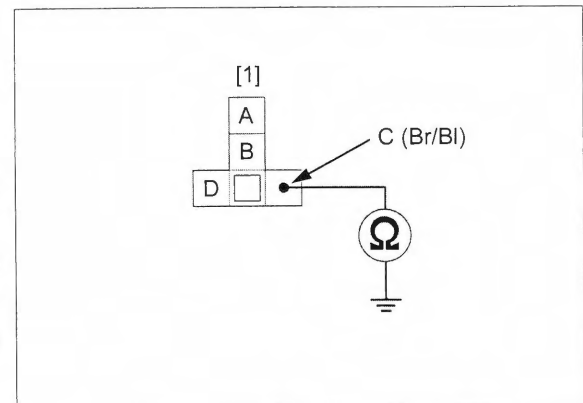
CONNECTION: C – Ground

There should be no continuity with the ignition switch OFF.

If there is continuity, check for short circuit in the Brown/black wire between the relay box and ECM.

There should be continuity for a few seconds when the ignition switch is turned ON with the engine stop switch "O".

If there is no continuity, check for open circuit in the Brown/black wire between the relay box and ECM.



MEMO

8. COOLING SYSTEM

SERVICE INFORMATION	8-2	THERMOSTAT	8-6
TROUBLESHOOTING	8-2	RADIATOR/COOLING FAN	8-7
SYSTEM FLOW PATTERN	8-3	RADIATOR RESERVE TANK	8-9
SYSTEM TESTING	8-4	WATER PUMP	8-10
COOLANT REPLACEMENT	8-5	WATER HOSE JOINT	8-11

COOLING SYSTEM

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 to cooling system at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- For high coolant temperature indicator/ECT sensor inspection (page 21-14).
- For fan control relay inspection (page 21-25).

TROUBLESHOOTING

Engine temperature too high

- Faulty high coolant temperature indicator or ECT sensor (page 21-14)
- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passage blocked in radiator, hoses or water jacket
- Air in system
- Faulty cooling fan motor
- Faulty fan control relay (page 21-25)
- Faulty water pump

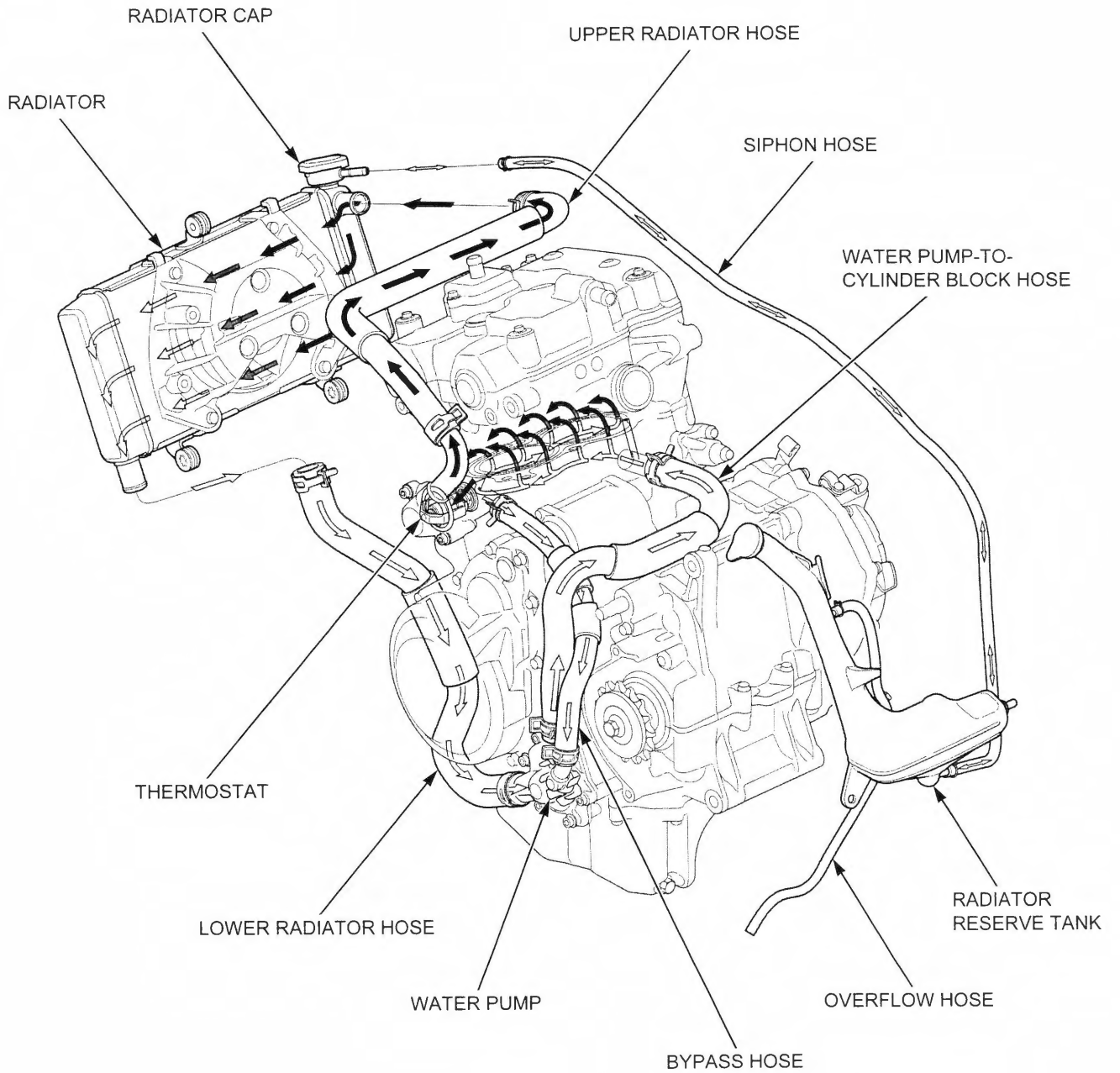
Engine temperature too low

- Faulty high coolant temperature indicator or ECT sensor (page 21-14)
- Thermostat stuck open
- Faulty fan control relay

Coolant leak

- Faulty water pump mechanical seal
- Deteriorated O-rings
- Faulty radiator cap
- Damaged or deteriorated cylinder head gasket
- Loose hose connection or clamp
- Damaged or deteriorated hose
- Damaged radiator

SYSTEM FLOW PATTERN

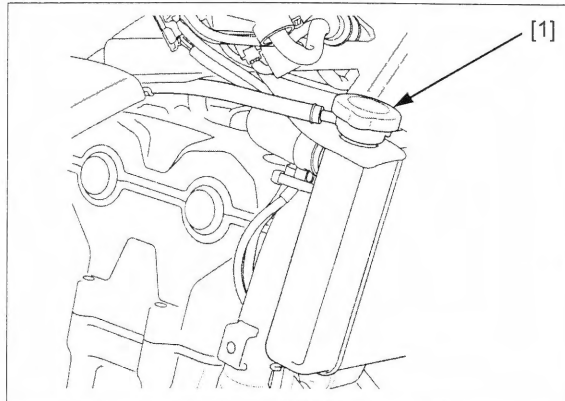


SYSTEM TESTING

RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Remove the right middle cowl (page 2-8).

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.

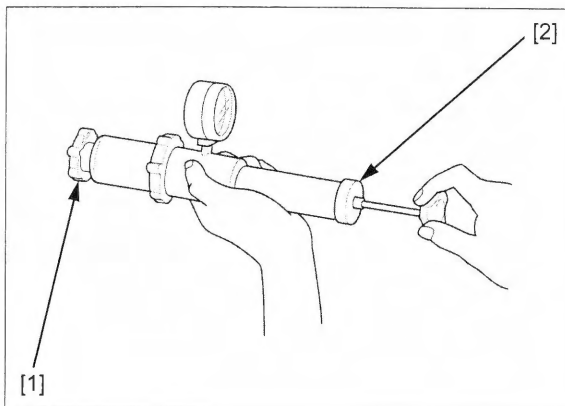
The cap must hold the specified pressure for at least 6 seconds.

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 left middle cowl (page 2-8).

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], 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.

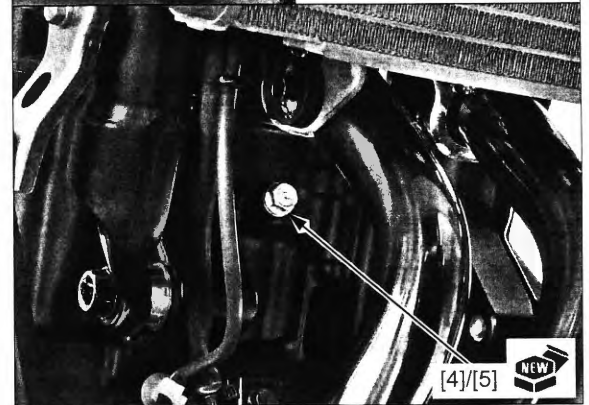
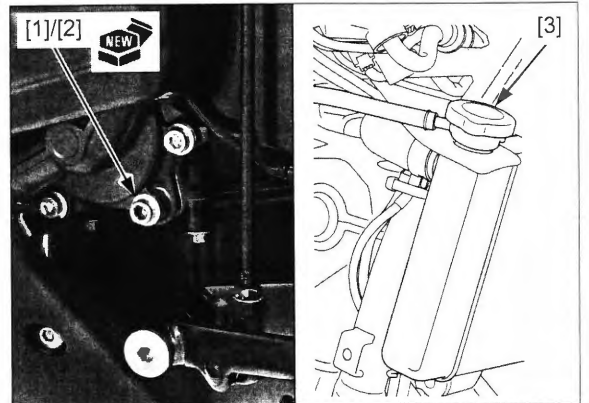
TORQUE:

Water pump drain bolt:

13 N·m (1.3 kgf·m, 10 lbf·ft)

Cylinder drain bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)



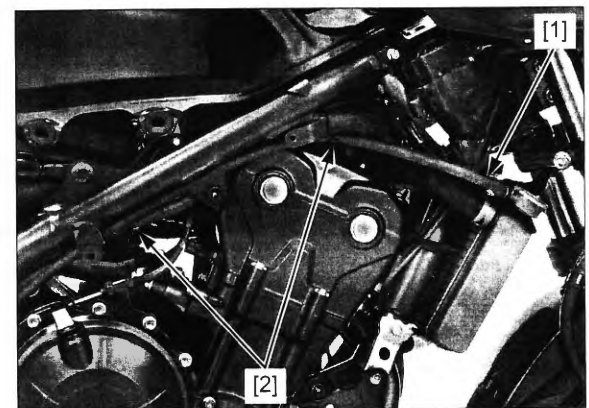
Disconnect the siphon hose [1] from the radiator.

Release the siphon hose from the clamps [2].

Remove the siphon hose out of the frame to the lower side and drain the coolant from the reserve tank.

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

Install the siphon hose into the clamps and connect it to the radiator.



COOLING SYSTEM

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:

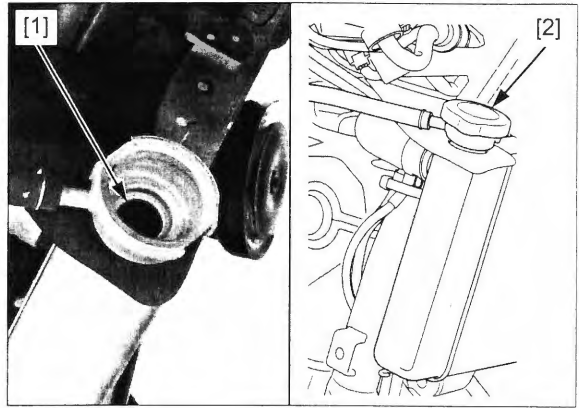
1:1 mixture with distilled water

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 [2].

Fill the reserve tank with the recommended coolant (page 3-12).

Install the left middle cowl (page 2-8).

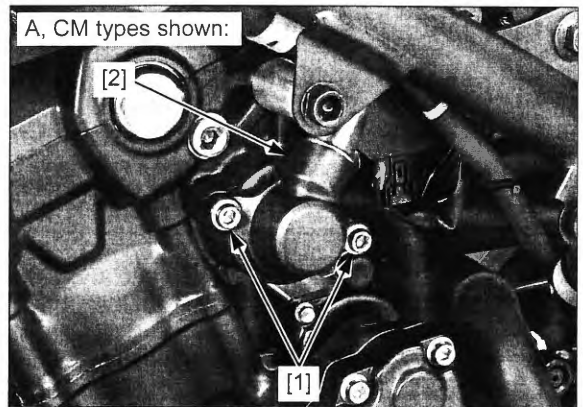


THERMOSTAT

REMOVAL/INSTALLATION

Drain the coolant (page 8-5).

Remove the bolts [1] and thermostat cover [2].



Remove the thermostat [1] from the cylinder head.

Installation is in the reverse order of removal.

TORQUE:

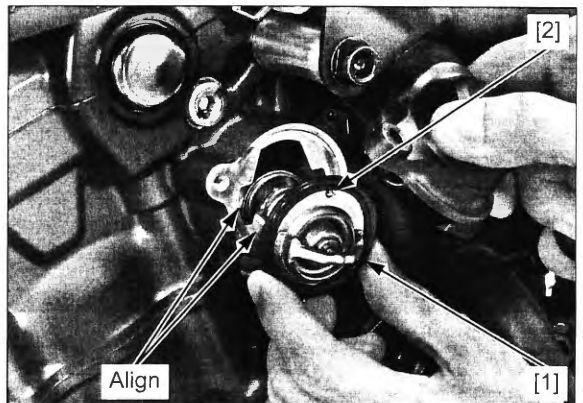
Thermostat cover bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:

- Install the thermostat with the air bleed hole [2] facing up, aligning the body ribs with the grooves of the cylinder head.

Fill and bleed the cooling system (page 8-5).

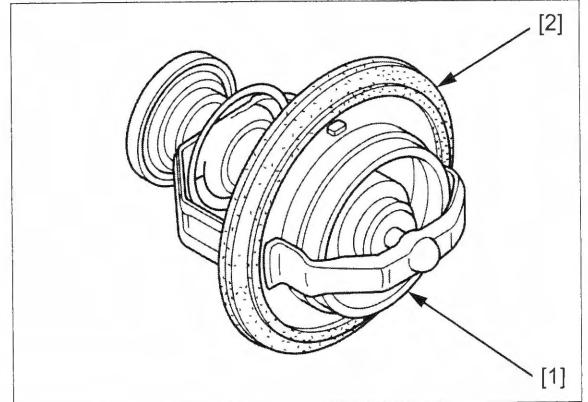


INSPECTION

Visually inspect the thermostat [1] for damage.

Replace the thermostat if the valve stays open at room temperature.

Check the seal ring [2] for damage and replace if necessary.



Wear insulated gloves and adequate eye protection. Keep flammable materials away from the electric heating element. Do not let the thermostat or thermometer [1] touch the pan, or you will get false reading.

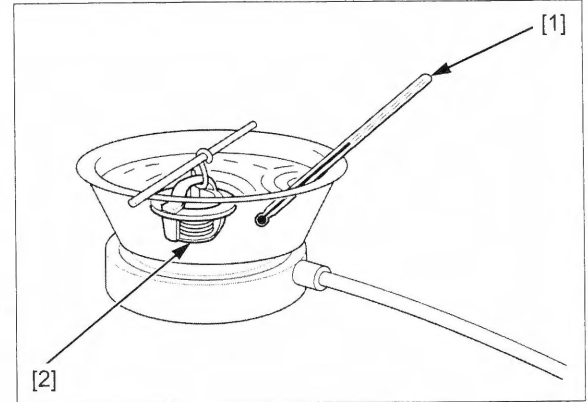
Heat the water with an electric heating element to operating temperature for 5 minutes.

Suspend the thermostat [2] in heated water to check its operation.

THERMOSTAT BEGIN TO OPEN:
80 – 84°C (176 – 183°F)

VALVE LIFT:
8 mm (0.3 in) minimum at 95°C (203°F)

Replace the thermostat if it responds at temperatures other than those specified.



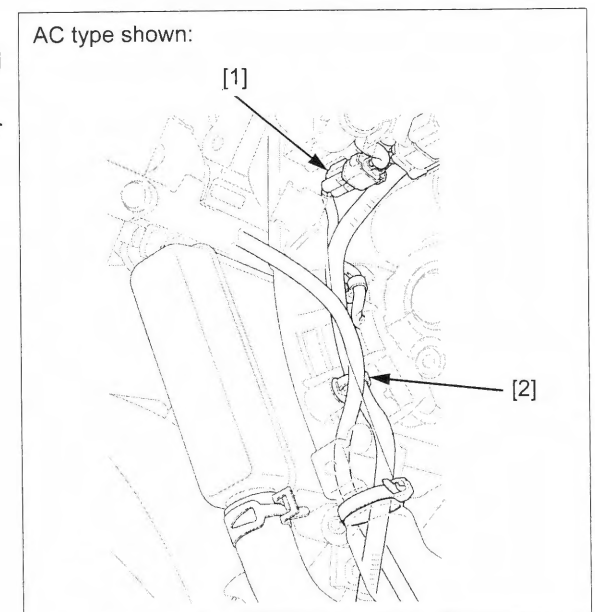
RADIATOR/COOLING FAN

REMOVAL/INSTALLATION

Drain the coolant (page 8-5).

Disconnect the fan motor 2P (Black) connector [1] and remove it from the stay.

Remove the wire band clip [2] from the fan motor shroud.

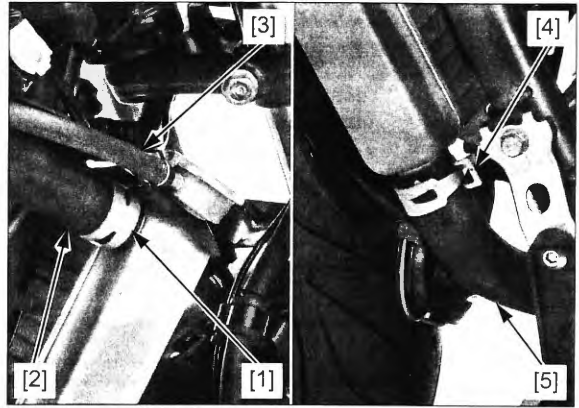


COOLING SYSTEM

Release the hose clip [1] and disconnect upper radiator hose [2].

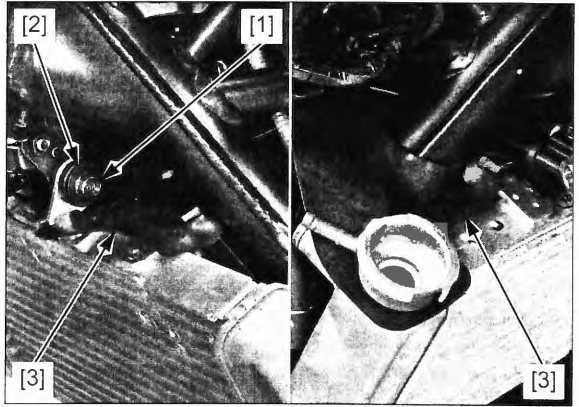
Disconnect the siphon hose [3].

Release the hose clip [4] and disconnect lower radiator hose [5].



Remove the upper mounting bolt [1] and collar [2].

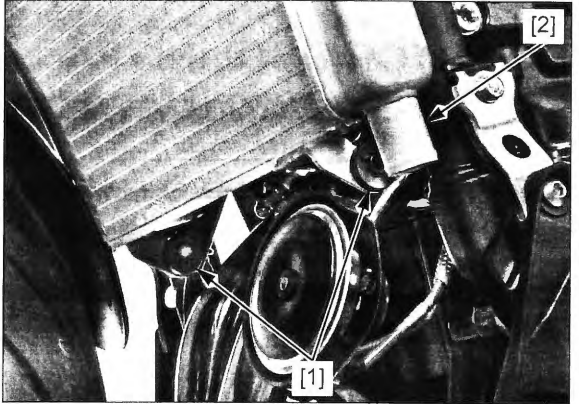
Release the heat guard rubber [3] from the filler neck, hooks and stay.



Be careful not to damage the radiator fins. Release the radiator lower grommets [1] from the frame bosses by moving the radiator to the left to remove the radiator [2].

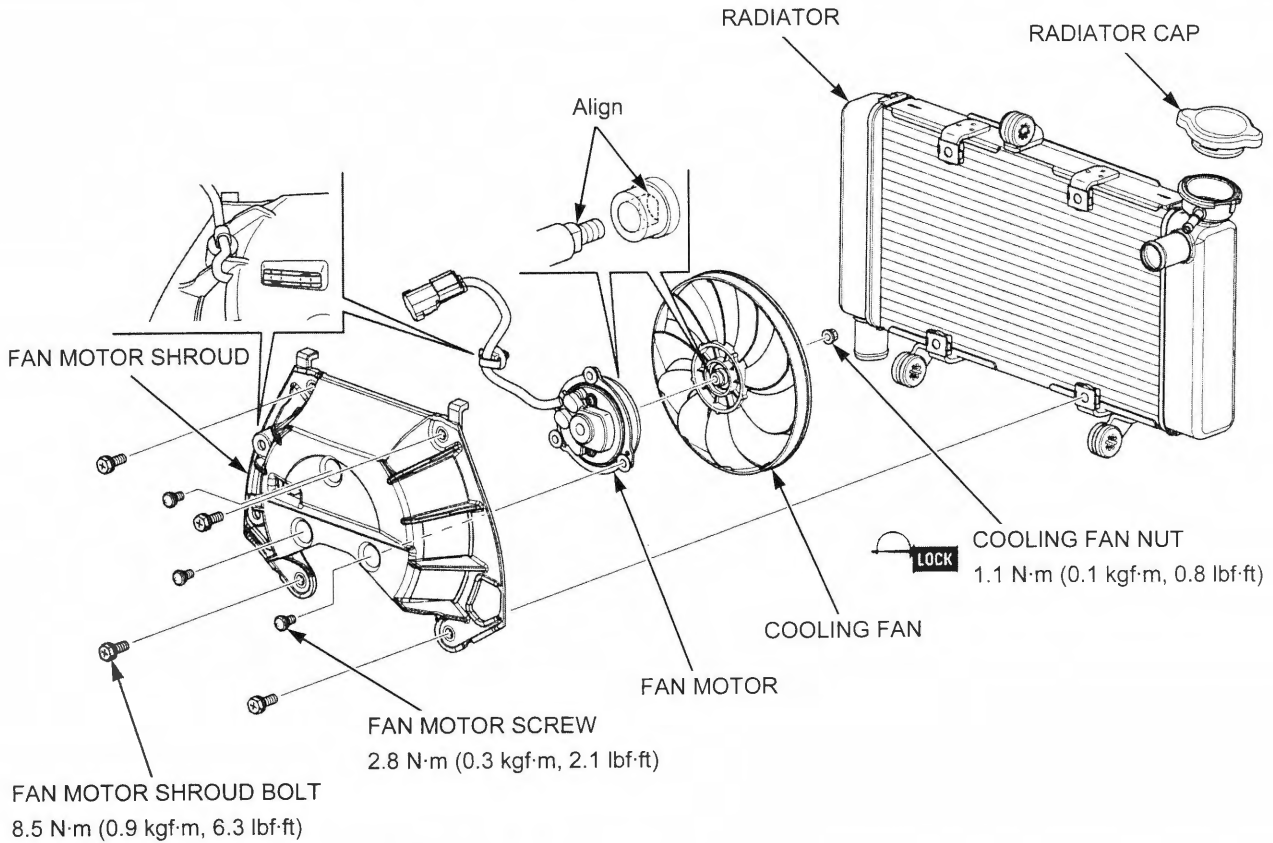
Installation is in the reverse order of removal.

Fill and bleed the cooling system (page 8-5).



DISASSEMBLY/ASSEMBLY

Disassemble and assemble the radiator as following illustration.



RADIATOR RESERVE TANK

REMOVAL/INSTALLATION

Remove the following:

- left side cover (page 2-7)
- swingarm (page 17-13)

Remove the overflow hose [1] from the under cowl.

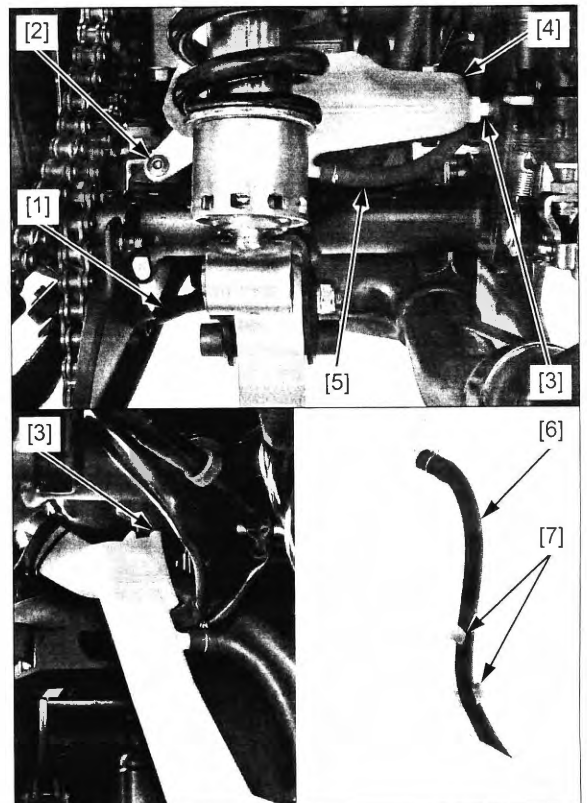
Remove the socket bolt [2], then release the two bosses [3] of the reserve tank [4] from the frame.

Disconnect the siphon hose [5] and drain the coolant to remove the radiator reserve tank.

Disconnect the overflow hose [6] and release it from the guides [7].

Installation is in the reverse order of removal.

Fill the reserve tank with the recommended coolant (page 3-12).



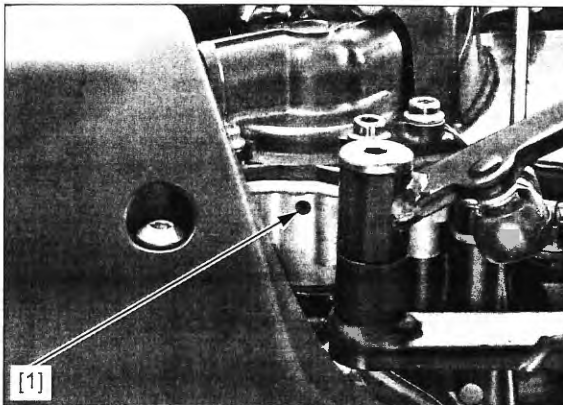
WATER PUMP

MECHANICAL SEAL INSPECTION

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 are no continuous coolant leakage from the bleed hole while operating the engine.

Replace the water pump as an assembly if necessary.



REMOVAL/INSTALLATION

NOTE:

- Place a clean oil pan under the engine because engine oil will flow out when removing the water pump body. Add the recommended engine oil to the specified level after installation (page 3-10).

Drain the coolant (page 8-5).

Remove the drive sprocket cover (page 2-24).

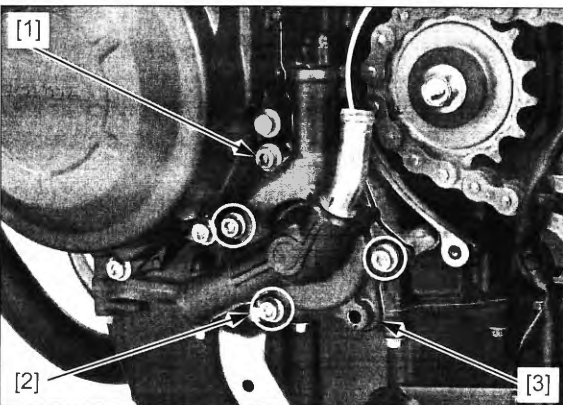
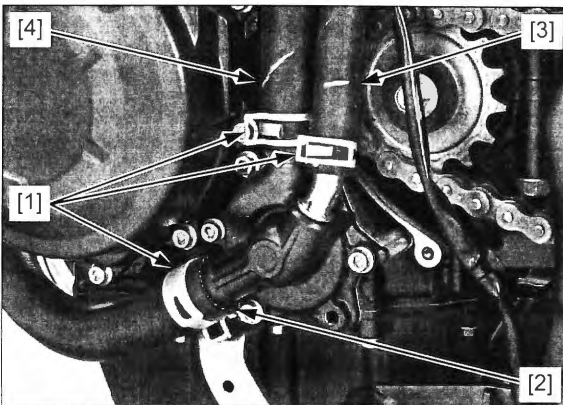
Support the motorcycle in an upright position on a level surface.

Release the hose clips [1] and disconnect the following from the water pump:

- lower radiator hose [2]
- bypass hose [3]
- water pump-to-cylinder block hose [4]

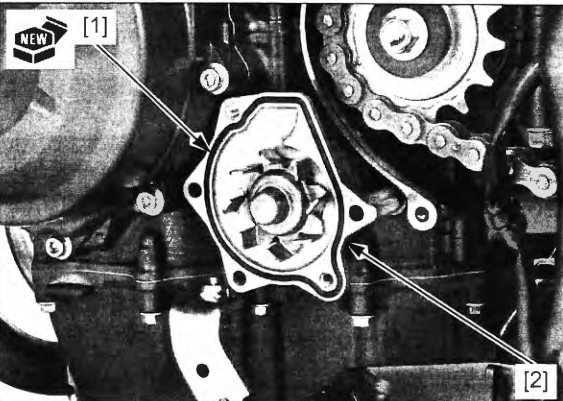
Remove the following:

- cover bolt [1]
- three mounting bolts [2]
- water pump cover [3]



Remove the cover O-ring [1] from the water pump body.

Remove the water pump body [2] from the crankcase.



Remove the water pump body O-ring [1].
Installation is in the reverse order of removal.

TORQUE:

Water pump mounting bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

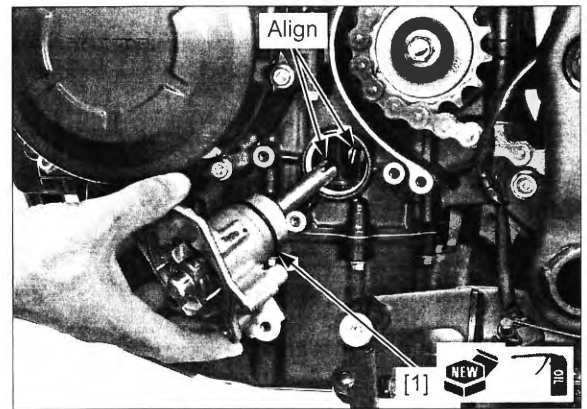
Water pump cover bolt:
13 N·m (1.3 kgf·m, 10 lbf·ft)

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 water pump impeller.

Check the oil level (page 3-10).

Fill and bleed the cooling system (page 8-5).



WATER HOSE JOINT

REMOVAL/INSTALLATION

Drain the coolant (page 8-5).

Remove the throttle body/air cleaner housing assembly (page 7-11).

Release the hose clip [1] and disconnect the water pump-to-cylinder block hose [2].

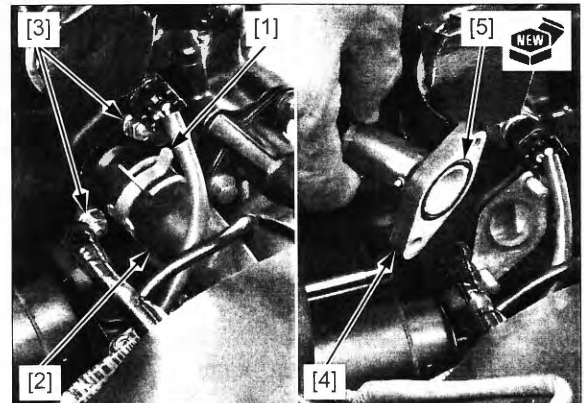
Remove the nuts [3], water hose joint [4] and O-ring [5].

Installation is in the reverse order of removal.

NOTE:

- Replace the O-ring with a new one.

Fill and bleed the cooling system (page 8-5).



STUD BOLT REPLACEMENT

Remove the water hose joint (page 8-11).

Thread two nuts onto the stud and tighten them together, and use a wrench on them to turn the stud bolt out.

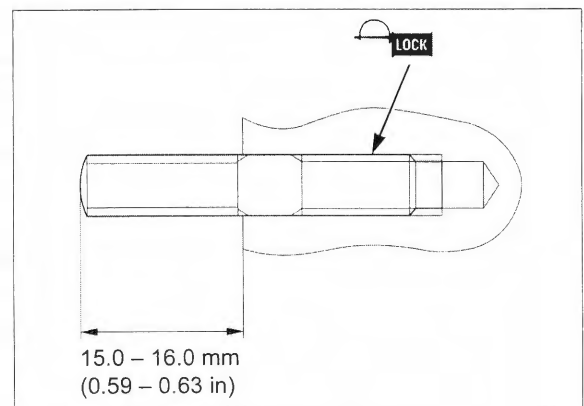
Apply locking agent to new stud bolt threads (page 1-20).

Install the stud bolts into the cylinder block as shown.

After installing the stud bolts, check that the length from the bolt head to the cylinder block surface is within specification.

SPECIFIED LENGTH: 15.0 – 16.0 mm (0.59 – 0.63 in)

Install the water hose joint (page 8-11).



MEMO

9. LUBRICATION SYSTEM

SERVICE INFORMATION	9-2	OIL PUMP	9-5
TROUBLE SHOOTING	9-3	PRESSURE RELIEF VALVE	9-7
LUBRICATION SYSTEM DIAGRAM	9-4	OIL STRAINER	9-8
OIL PRESSURE INSPECTION	9-5		

SERVICE INFORMATION

GENERAL

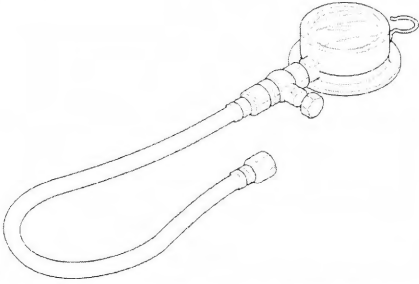
⚠ CAUTION

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

- The oil pump can be serviced with the engine installed in the frame.
- The service procedures in this section must be performed with the engine oil drained.
- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the oil pump has been installed, check that there are no oil leaks and that oil pressure is correct.
- For engine oil pressure indicator/EOP switch inspection (page 21-15).
- For piston oil jet service (page 14-16).

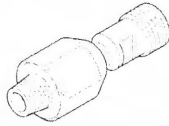
TOOLS

Oil pressure gauge set
07506-3000001



or equivalent commercially available in
U.S.A.

Oil pressure gauge attachment
07406-0030000



or equivalent commercially available in
U.S.A.

TROUBLE SHOOTING

Oil level too low

- Oil consumption
- External oil leak
- Worn piston rings (page 14-14)
- Improperly installed piston rings (page 14-15)
- Worn cylinders (page 14-14)
- Worn stem seals (page 10-17)
- Worn valve guide (page 10-17)

Low oil pressure

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

No oil pressure

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

High oil pressure

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

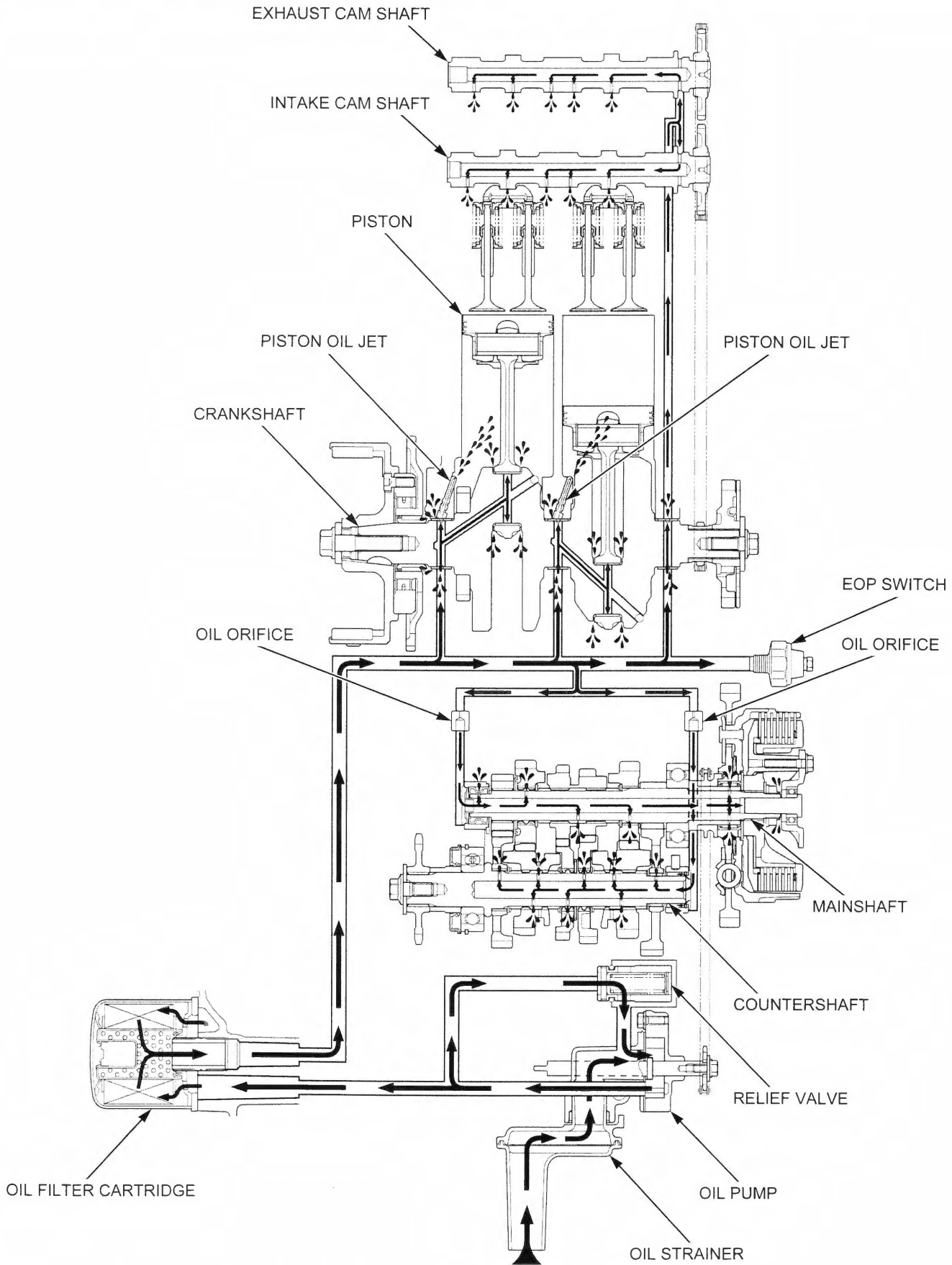
Oil contamination

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

Oil emulsification

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

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 21-15).

Remove the EOP switch (page 21-16).

Install the oil pressure gauge attachment [1] to the switch base.

Connect the oil pressure gauge [2] to the oil pressure gauge attachment.

TOOLS:

Oil pressure gauge set

07506-3000001 or
equivalent
commercially
available in U.S.A.

Oil pressure gauge attachment

07406-0030000 or
equivalent
commercially
available in U.S.A.

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

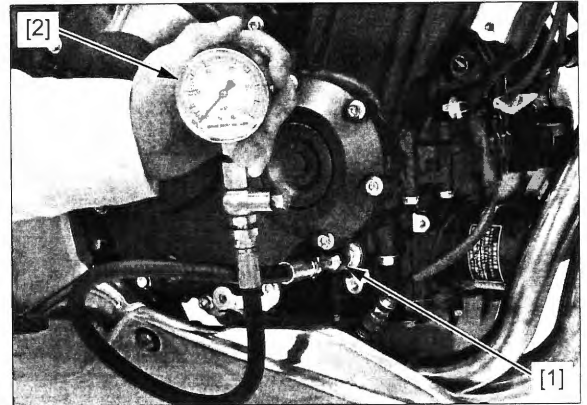
Warm the engine to normal operating temperature (approximately 80°C/176°F) and increase the engine speed to 1,200 rpm and read the oil pressure.

STANDARD:

93 kPa (0.9 kgf/cm², 13 psi) at 1,200 rpm/
80°C (176°F)

Stop the engine and remove the tools.

Install the EOP switch (page 21-16).

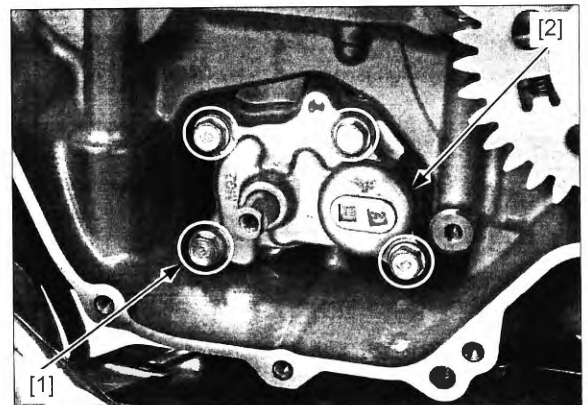


OIL PUMP

REMOVAL/INSTALLATION

Remove the clutch (page 11-7).

Remove the bolts [1] and oil pump [2].

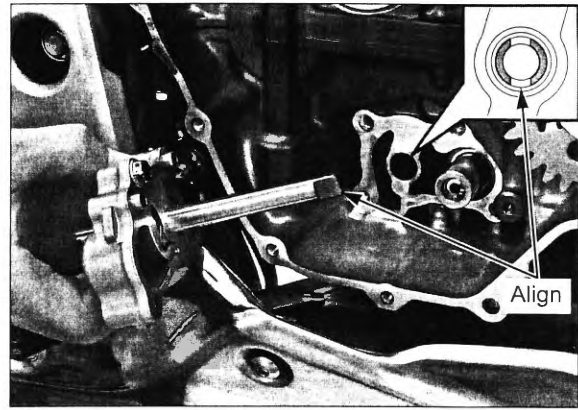


LUBRICATION SYSTEM

Installation is in the reverse order of removal.

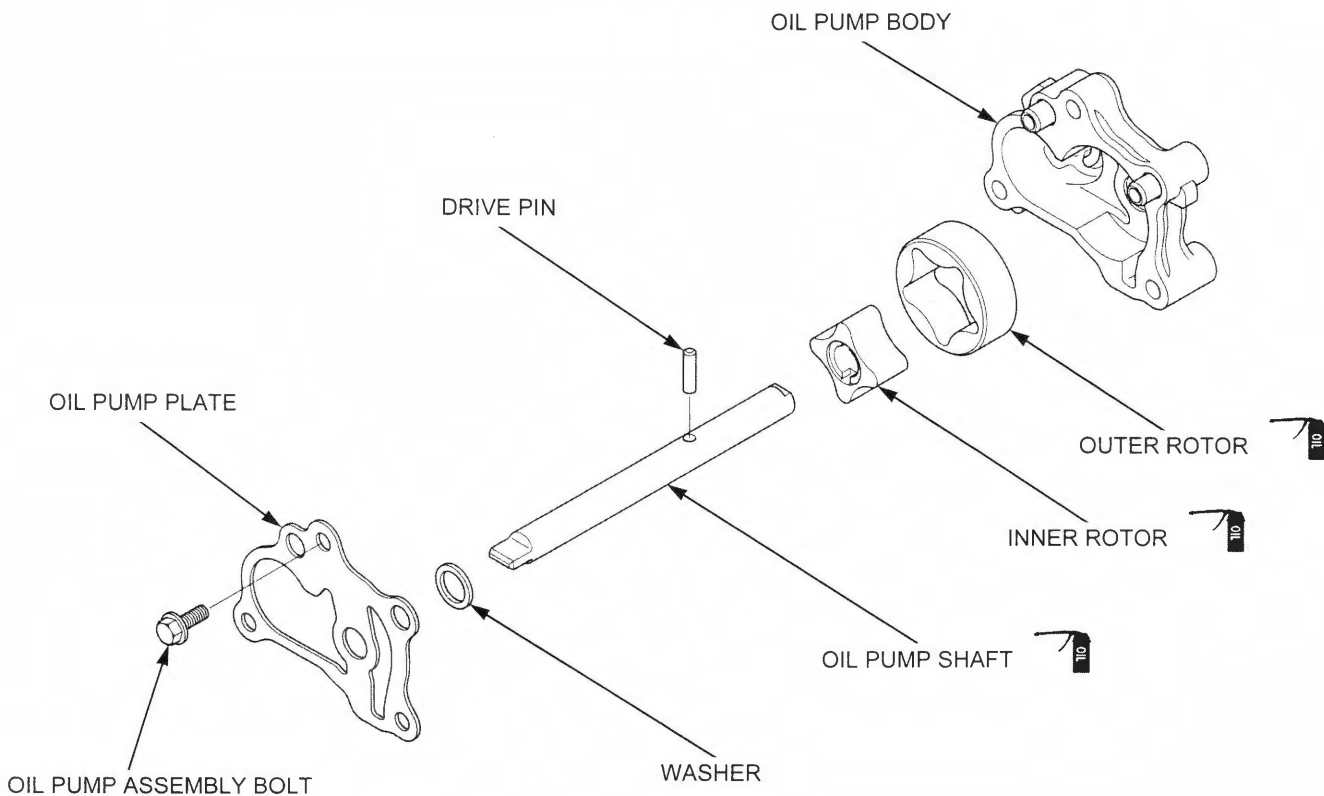
NOTE:

- Align the oil pump shaft end with the water pump shaft groove.



DISASSEMBLY/ASSEMBLY

Disassemble and assemble the oil pump as following illustration.



INSPECTION

- For oil pump drive sprocket, driven sprocket and drive chain inspection (page 11-10).

Inspect the following parts for damage, abnormal wear, deformation or burning.

- oil pump shaft
- drive pin
- inner rotor
- outer rotor
- oil pump body

Measure the oil pump clearances according to LUBRICATION SYSTEM SPECIFICATIONS (page 1-9).

If any of the measurement is out of the service limit, replace the oil pump as an assembly.

PRESSURE RELIEF VALVE

REMOVAL/INSTALLATION

Remove the oil pump (page 9-5).

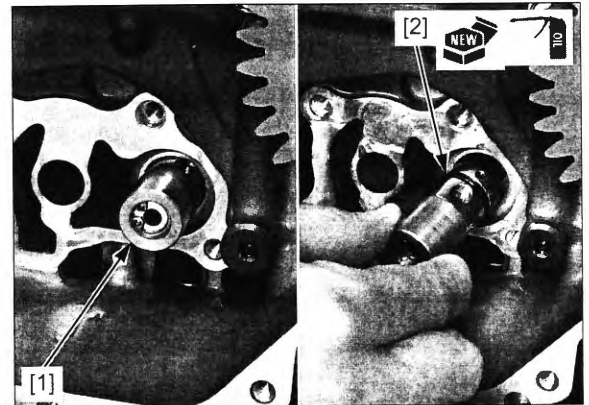
Remove the oil pressure relief valve [1] and O-ring [2].

Apply engine oil to a new O-ring.

Install the O-ring to the oil pressure relief valve groove.

Install the oil pressure relief valve into the crankcase.

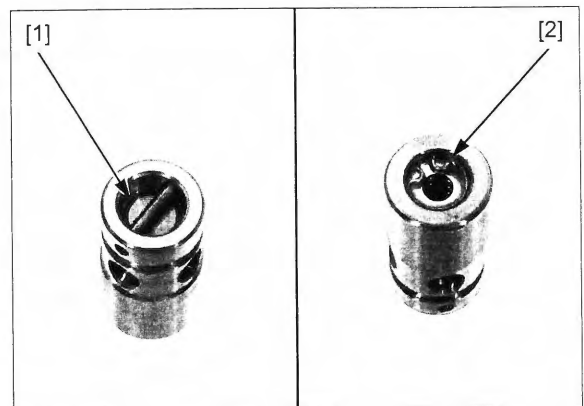
Install the oil pump (page 9-5).



INSPECTION

Check the operation of the pressure relief valve by pushing on the piston [1].

Disassemble the pressure relief valve by removing the snap ring [2].



Remove the washer [1], spring [2] and piston [3].

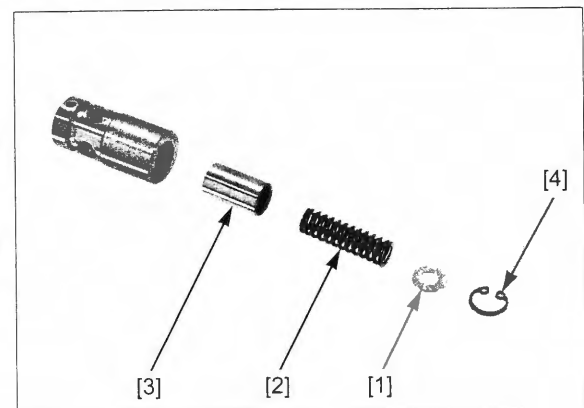
Check the piston for wear, sticking or damage.

Check the spring for fatigue or damage.

Assemble the pressure relief valve in the reverse order of disassembly.

NOTE:

- Install the snap ring [4] with the chamfered edge facing the thrust load side.
- Make sure the snap ring is seated in the groove.



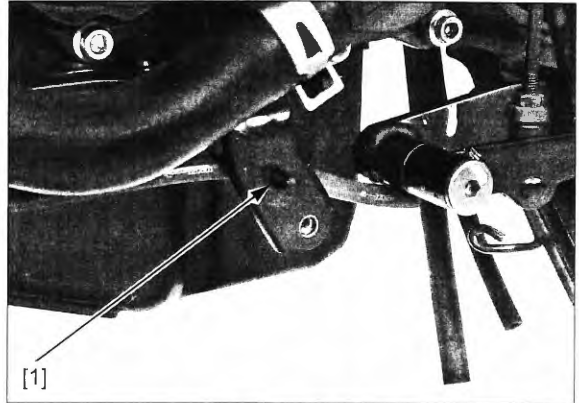
OIL STRAINER

REMOVAL

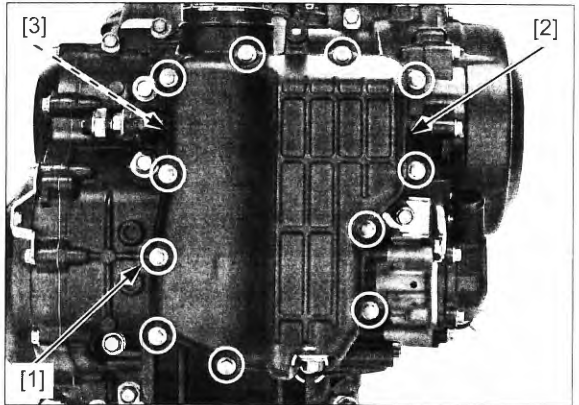
Drain the engine oil (page 3-10).

Remove the exhaust pipe (page 2-29).

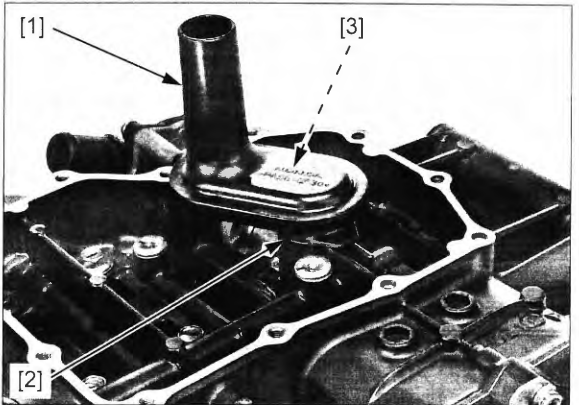
AC type: Remove the EVAP canister drain hose clip [1] from the stay.



Loosen the bolts [1] in a crisscross pattern in 2 or 3 steps, and remove the bolts, oil pan [2] and gasket [3].



Remove the oil strainer [1] and seal ring [2].
Clean the oil strainer screen [3] and check for damage.



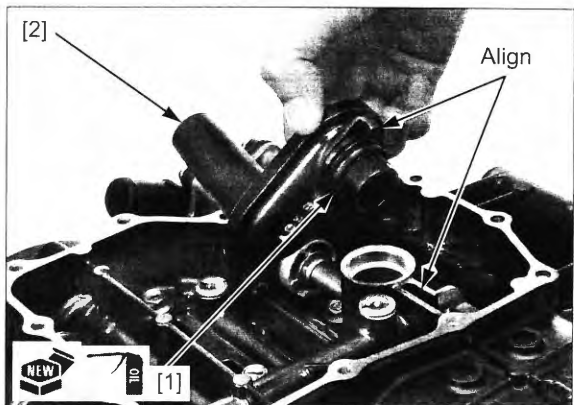
INSTALLATION

Be careful not to damage the mating surfaces.

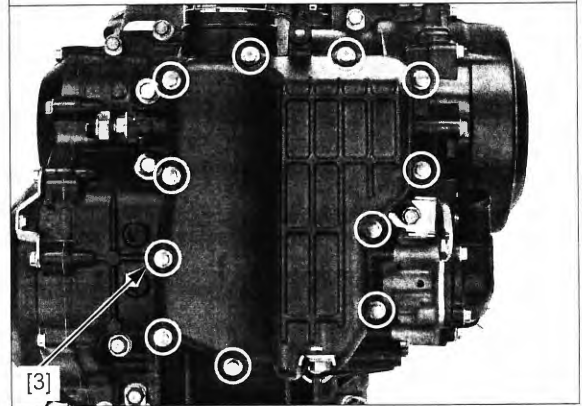
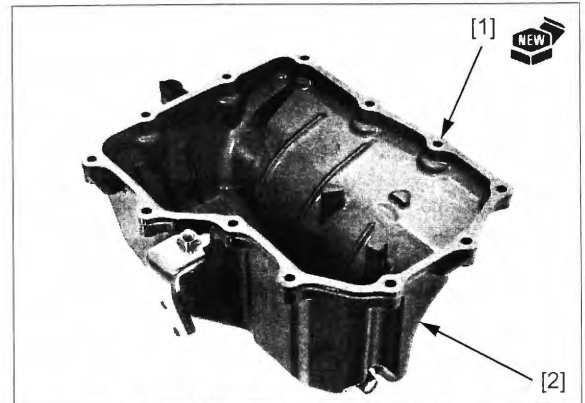
Clean any gasket material from the mating surfaces of the oil pan.

Apply engine oil to a new seal ring [1] and install it onto the oil strainer [2].

Install the oil strainer into the crankcase while aligning the oil strainer boss with the crankcase groove.



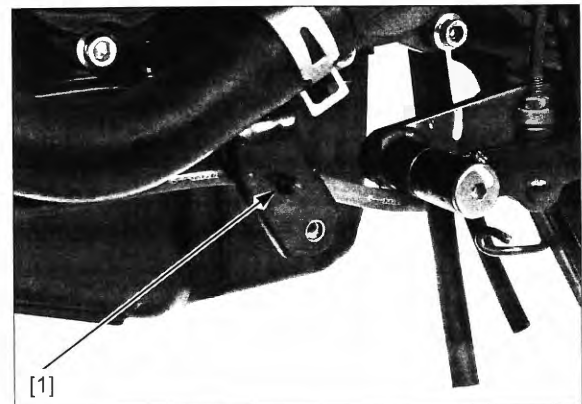
Install a new gasket [1] onto the oil pan [2].
Install the oil pan and bolts [3] to the crankcase.
Tighten the bolts in a crisscross pattern in 2 or 3 steps.



AC type: Install the EVAP canister drain hose clip [1] into the stay.

Install the exhaust pipe (page 2-29).

Fill the engine with the recommended engine oil and check that there are no oil leaks (page 3-10).



MEMO

10. CYLINDER HEAD/VALVES

SERVICE INFORMATION	10-2	CAMSHAFT	10-9
TROUBLESHOOTING	10-4	ROCKER ARM	10-14
COMPONENT LOCATION	10-5	CYLINDER HEAD	10-16
CYLINDER COMPRESSION TEST	10-6	CAM CHAIN TENSIONER LIFTER	10-23
CYLINDER HEAD COVER	10-6	CAM CHAIN/TIMING SPROCKET	10-24

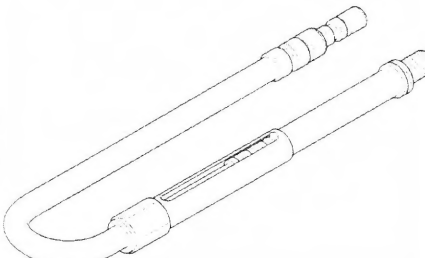
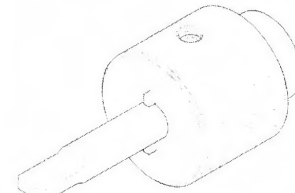
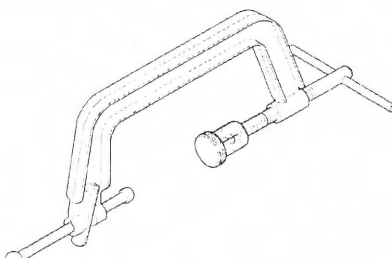
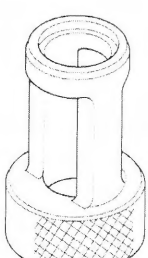
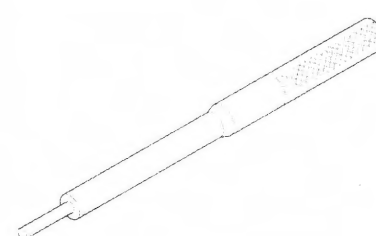
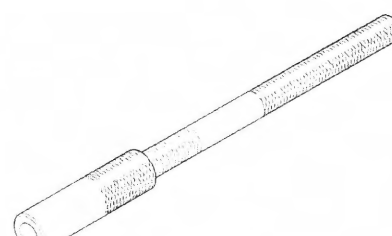
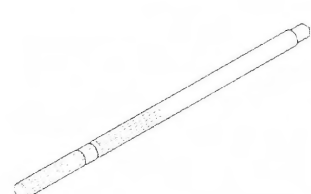
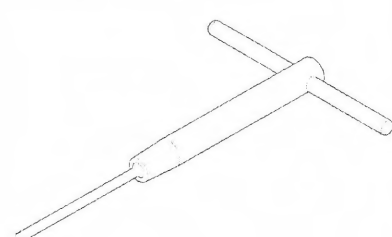

CYLINDER HEAD/VALVES

SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves, rocker arms and camshafts.
- The rocker arms, camshafts and cam chain tensioner lifter services can be done 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.
- Camshafts and rocker arms 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

<p>Compression gauge attachment 07RMJ-MY50100</p>  <p>or equivalent commercially available in U.S.A.</p>	<p>Tensioner holder B 070MG-0010100</p>  <p>or 07AMG-001A100 (U.S.A. only) or 07AMG-MFJA100 (U.S.A. only)</p>	<p>Valve spring compressor 07757-0010000</p> 
<p>Valve spring compressor attachment 07959-KM30101</p> 	<p>Valve guide driver, 4.5 mm 07HMD-ML00101</p> 	<p>Valve guide adjusting driver 07743-0020000</p>  <p>(not available in U.S.A.)</p>
<p>Valve guide reamer, 4.5 mm 07HMH-ML00101</p>  <p>or 07HMH-ML0010B (U.S.A. only)</p>	<p>Cutter holder, 4.5 mm 07781-0010600</p>  <p>or equivalent commercially available in U.S.A.</p>	<p>Seat cutter, 27.5 mm (IN, 45°) 07780-0010200</p>  <p>or equivalent commercially available in U.S.A.</p>

CYLINDER HEAD/VALVES

Seat cutter, 24 mm (EX, 45°)
07780-0010600



or equivalent commercially available in U.S.A.

Flat cutter, 28 mm (IN, 32°)
07780-0012100



or equivalent commercially available in U.S.A.

Flat cutter 24 mm (EX, 32°)
07780-0012500



or equivalent commercially available in U.S.A.

Interior cutter, 26 mm (IN, 60°)
07780-0014500



or equivalent commercially available in U.S.A.

Interior cutter, 22 mm (EX, 60°)
07780-0014202



or equivalent commercially available in U.S.A.

CYLINDER HEAD/VALVES

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problem can be diagnosed by a compression test or by tracing engine noises to the top-end with a sounding rod stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather hose. If the hose is smoky, check for a seized piston ring (page 14-14).

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 14-14)

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 14-14)

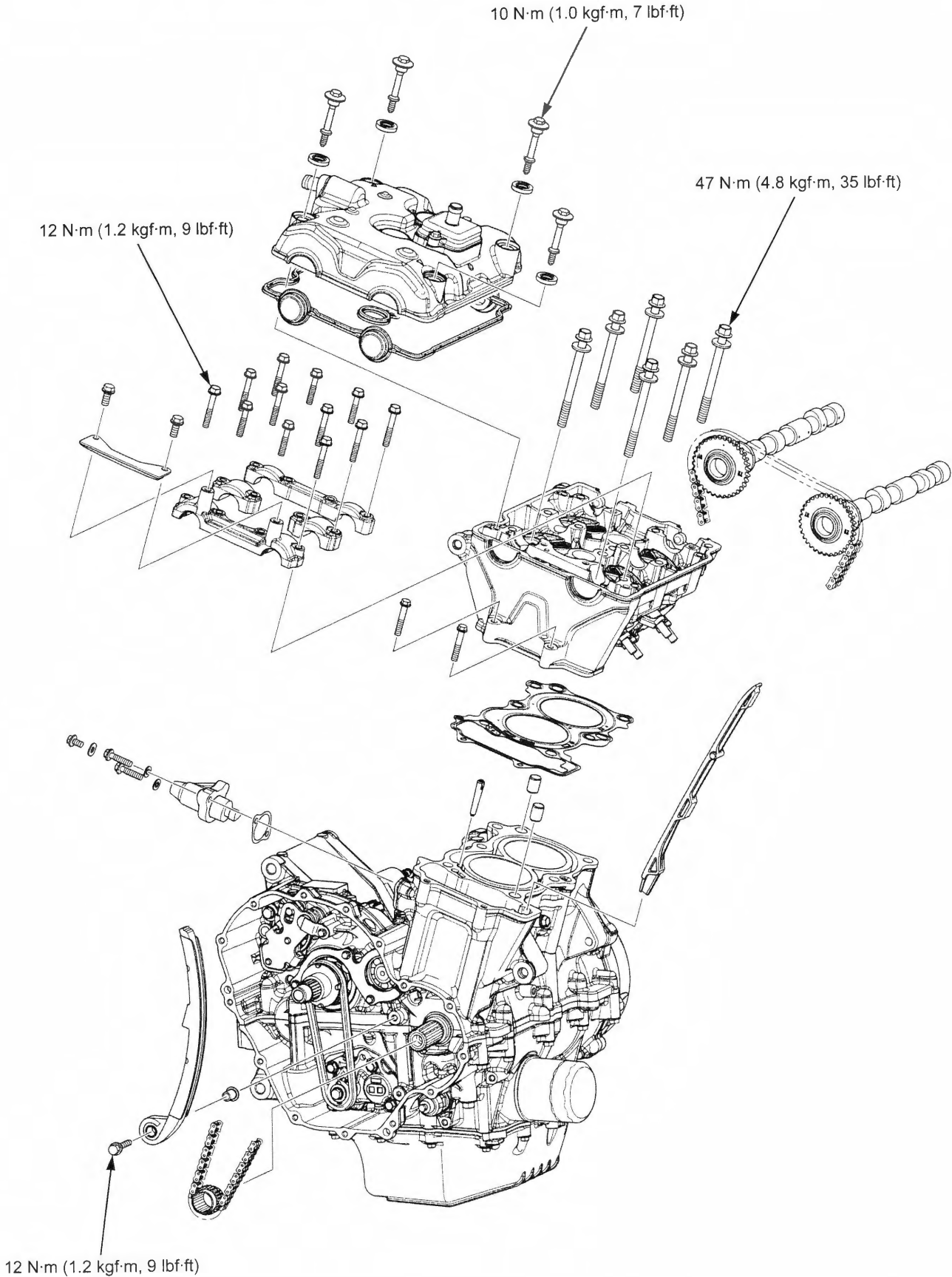
Excessive noise

- Cylinder head:
 - Incorrect valve clearance adjustment
 - Sticking valve or broken valve spring
 - Damaged or worn camshaft
 - Worn rocker arm and/or shaft
 - Worn rocker arm and valve stem end
 - 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 14-14)

Rough idle

- Low cylinder compression

COMPONENT LOCATION



CYLINDER HEAD/VALVES

CYLINDER COMPRESSION TEST

Warm the engine to normal operating temperature.

Stop the engine and remove the all spark plug caps and spark plugs (page 3-6).

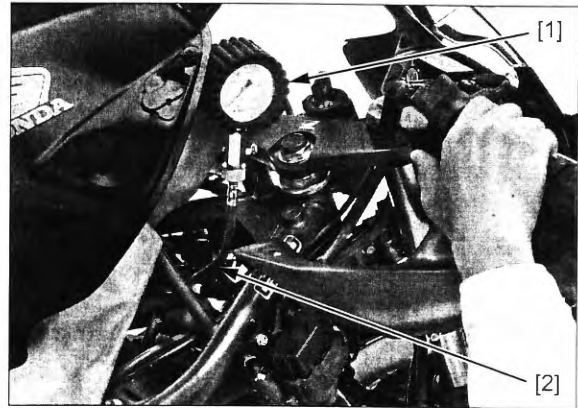
Temporarily install the ECM to the wire harness by connecting the 33P (Black) connector.

Install a compression gauge [1] with the attachment into the spark plug hole.

TOOL:

[2] Compression gauge attachment

07RMJ-MY50100 or equivalent commercially available in U.S.A.



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

Shift the transmission into neutral.

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:

1,372 kPa (14.0 kgf/cm², 119 psi) at 450 rpm

Low compression can be caused by:

- Blown cylinder head gasket
- Improper valve clearance adjustment
- Valve leakage
- Worn piston rings or cylinder

High compression can be caused by:

- Carbon deposits in combustion chamber or on piston head

CYLINDER HEAD COVER

REMOVAL/INSTALLATION

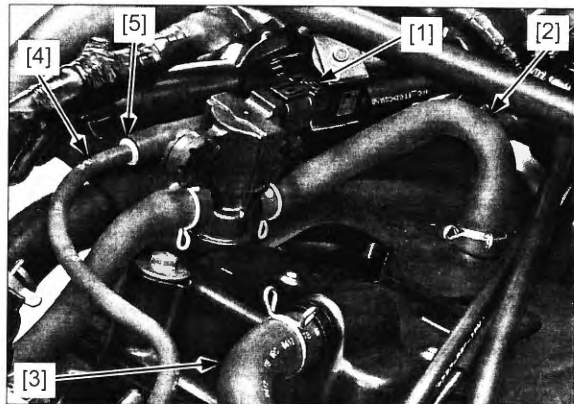
NOTE:

- The cylinder head cover can be serviced with the engine installed in the frame.

Remove the fuel tank under tray (page 2-25).

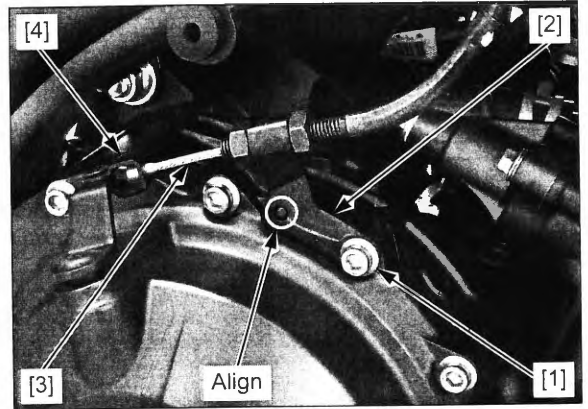
Disconnect the following:

- PAIR control solenoid valve 2P (Black) connector [1]
- PAIR air supply hose [2] from the cylinder head cover
- crankcase breather hose [3] from the cylinder head cover
- AC type: EVAP purge control solenoid valve-to-throttle body hose [4] at the hose joint [5]



Remove the bolt [1] and clutch cable holder [2], then disconnect the clutch cable [3] from the clutch lifter arm [4].

Remove the clutch cable out of the frame.



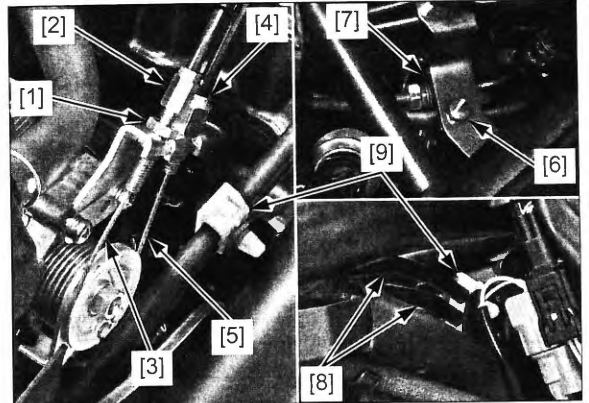
Loosen the throttle cable A adjuster lock nut [1] and adjuster [2] then disconnect the throttle cable A [3] from the throttle drum and cable holder.

Loosen the throttle cable B adjuster [4] then disconnect the throttle cable B [5] from the throttle drum and cable holder.

Remove the throttle cables out of the frame.

Disconnect the upper radiator mounting bolt (page 8-8).

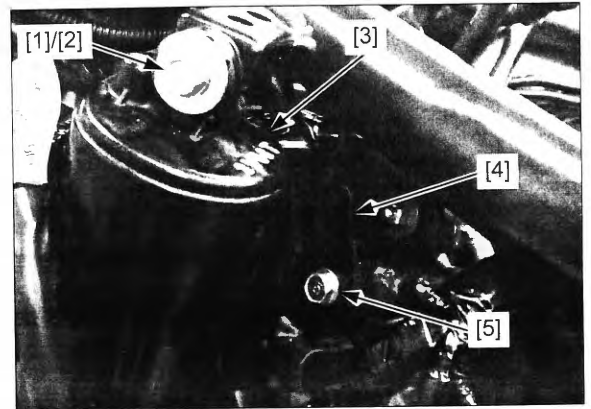
CBR500RA/CB500FA/XA: Remove the bolt [6] and disconnect the brake line joint [7] from its bracket. Remove the brake pipes [8] from the two clips [9] and remove the clips from the frame.



AC type: Remove the canister mounting bolt [1] and collar [2], and move the EVAP canister [3] out of the way.

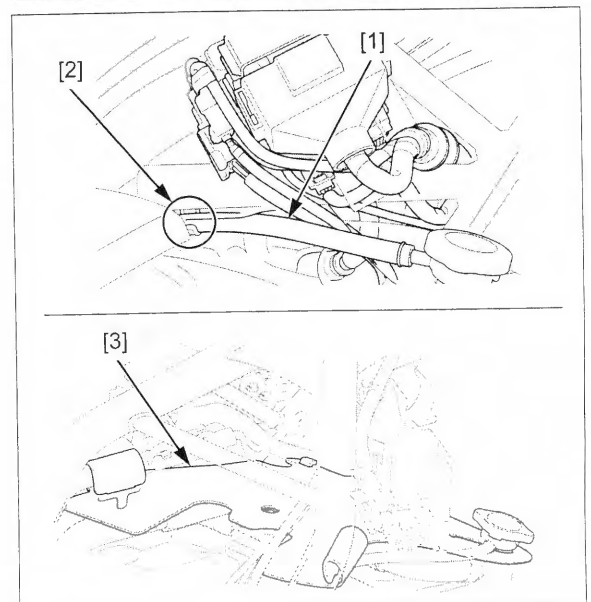
Remove the bolt [4] and connector stay [5].

AC type: Remove the EVAP purge control solenoid valve from the frame (page 7-21).



Release the siphon hose [1] from the clamp [2].

Remove the heat guard rubber [3] from all locations except the siphon hose and move it to the right side of the frame.



CYLINDER HEAD/VALVES

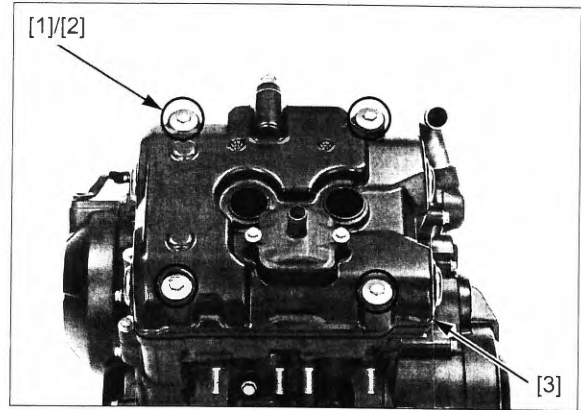
Place tape on the cylinder head cover to protect it upon removal.

Remove the cylinder head cover bolts [1] and mounting rubbers [2].

Remove the cylinder head cover [3] from the cylinder head.

NOTE:

- Do not forcibly remove the dowel pins from the cylinder head cover.



Remove the cylinder head cover packing [1] from the cylinder head cover.

Installation is in the reverse order of removal.

TORQUE:

Cylinder head cover bolt:

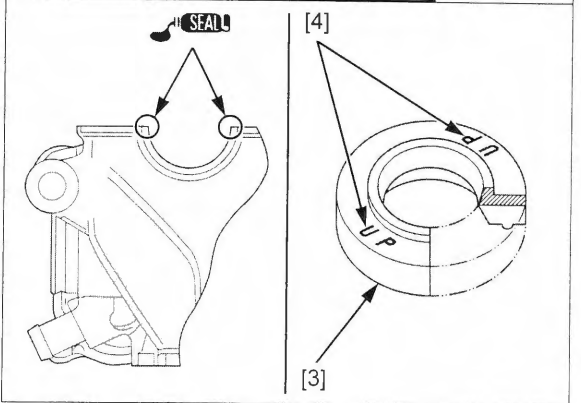
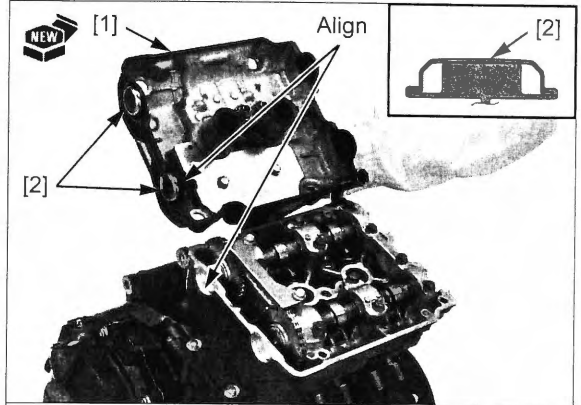
10 N·m (1.0 kgf·m, 7 lbf·ft)

Right crankcase cover bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:

- Replace the cylinder head cover packing with new packing.
- Install the cylinder head cover packing into the groove in the cylinder head cover.
- Make sure the cylinder head cover packing caps [2] are installed in position.
- Apply sealant to the cylinder head semi-circular edges as shown (8 places) (page 1-20).
- Install the cylinder head cover onto the cylinder head while aligning the cylinder head cover packing with the grooves in the cylinder head semi-circular areas.
- Check the mounting rubbers [3] are in good condition, replace them if necessary.
- Install the mounting rubbers with their "UP" mark [4] facing up.
- Align the clutch cable holder hole with the right crankcase cover boss.



Adjust the following:

- throttle grip freeplay (page 3-4)
- clutch lever freeplay (page 3-20)

CAMSHAFT

REMOVAL

NOTE:

- The camshaft can be serviced with the engine installed in the frame.

Remove the cylinder head cover (page 10-6).

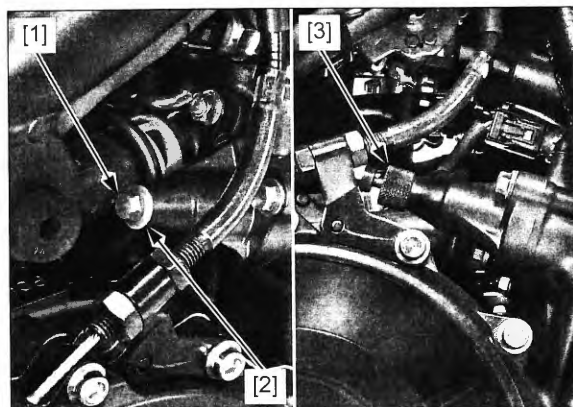
Make sure the No. 1 piston is at TDC (Top Dead Center) on the compression stroke (page 3-7).

Remove the sealing bolt [1] and sealing washer [2].

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

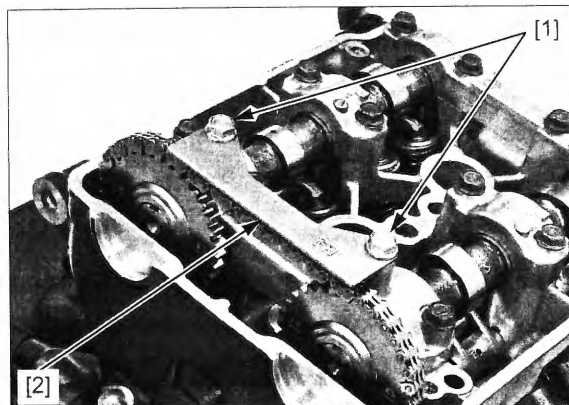
TOOL:

- [3] Tensioner holder B 070MG-0010100 or
 07AMG-001A100
 (U.S.A. only) or
 07AMG-MFJA100
 (U.S.A. only)



Be careful not to let the cam chain guide bolts fall into the crankcase.

Remove the bolts [1] and cam chain guide B [2].



NOTICE

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

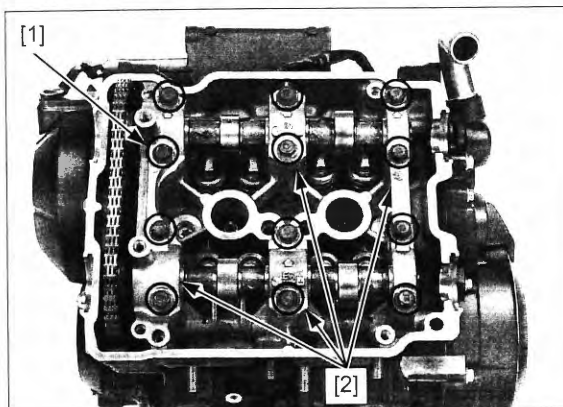
Be careful not to let the camshaft holder bolts fall into the crankcase.

Loosen the camshaft holder bolts [1] gradually in a crisscross pattern in 2 or 3 steps, and remove them.

Remove the camshaft holders [2] with the dowel pins from the cylinder.

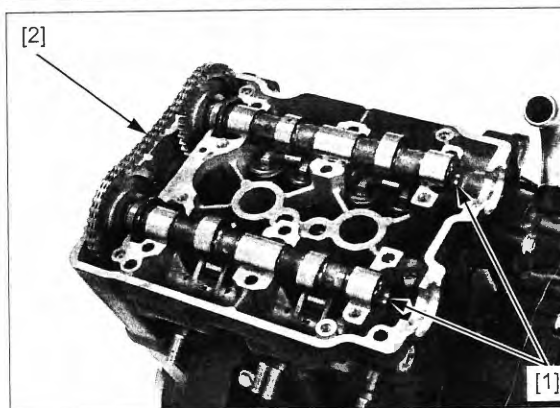
NOTE:

- Do not forcibly remove the dowel pins from the camshaft holders.



Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.

Remove the camshafts [1] by removing the cam chain [2] from the cam sprockets.



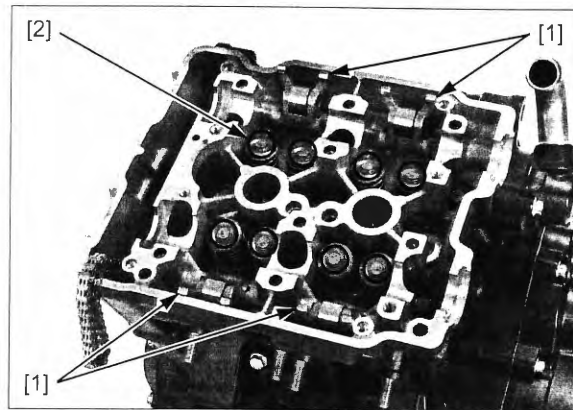
CYLINDER HEAD/VALVES

Lift the rocker arms [1].

Remove the shims [2].

NOTE:

- Do not allow the shims to fall into the crankcase.
- Mark all shims to ensure correct reassembly in their original locations.
- The shims can be easily removed with a tweezers or a 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

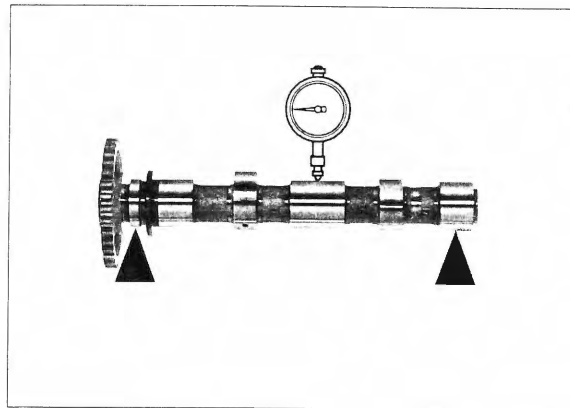
Measure each part according to CYLINDER HEAD/VALVES SPECIFICATIONS (page 1-10).

Replace any part if it is out of service limit.

CAMSHAFT RUNOUT

Support both sides of the camshaft (at journals) with V-blocks and check the camshaft run out with a dial gauge.

SERVICE LIMIT: 0.04 mm (0.002 in)

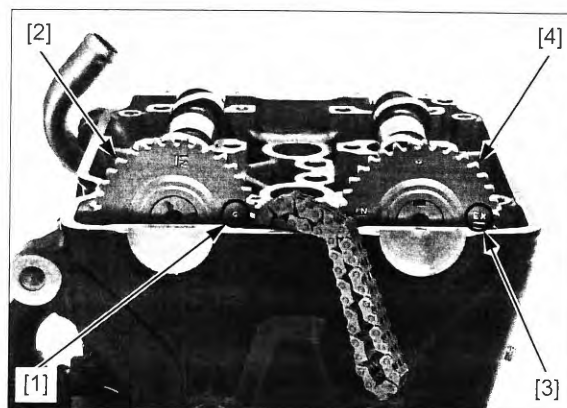


CAMSHAFT OIL CLEARANCE

Wipe any oil from the journals of the camshaft, cylinder head and camshaft holders.

Install the camshafts onto the cylinder head.

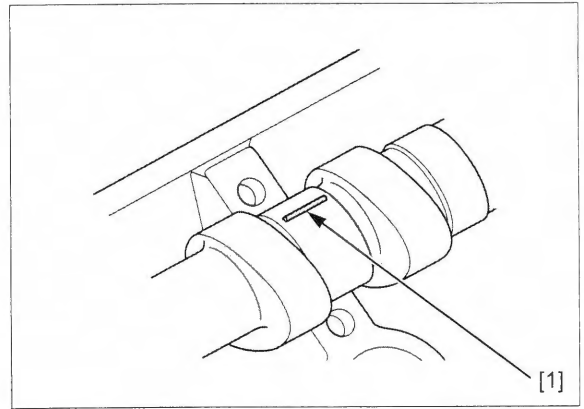
- Align the punch mark [1] on the intake cam sprocket [2] with the cylinder head top surface as shown.
- Align the outside index line ("EX" [3] mark) on the exhaust cam sprocket [4] with the cylinder head top surface as shown.



Lay a strip of plastigauge [1] lengthwise on top of each camshaft journal avoiding the oil hole.

NOTE:

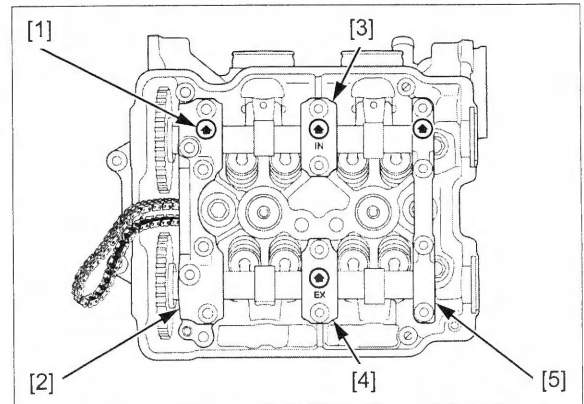
- Do not rotate the camshaft during inspection.



Be sure the dowel pins in the camshaft holder align with the holes in the cylinder head.

Install each camshaft holder with the arrow [1] facing the intake side in the correct locations as shown.

- camshaft holder A [2]
- camshaft holder B [3] ("IN" mark: intake side holder)
- camshaft holder C [4] ("EX" mark: exhaust side holder)
- camshaft holder D [5]



Apply engine oil to the camshaft holder bolt threads and seating surface.

Install the camshaft holder bolts:

- 6 x 39.5 mm bolts [1]
- 6 x 32 mm bolts [2]

NOTICE

Failure to tighten the camshaft holder in a crisscross pattern may cause the camshaft holder to break.

From inside to outside tighten the camshaft holder bolts gradually until the camshaft holders seats on the cylinder head.

Tighten the camshaft holder bolts in a crisscross pattern in 2 or 3 steps to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

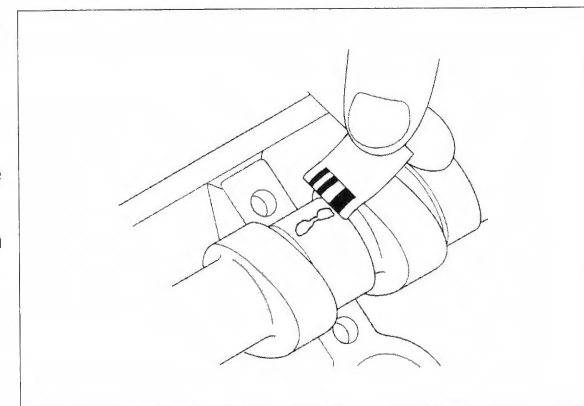
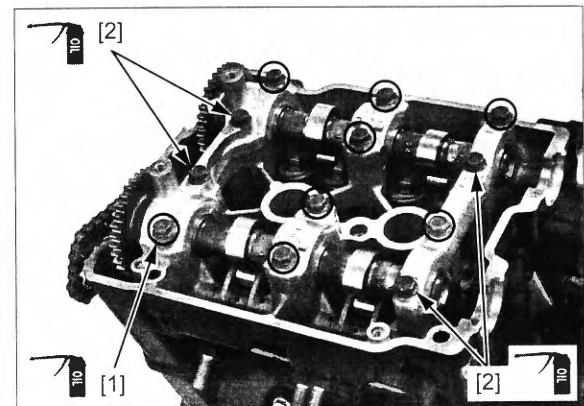
Remove the camshaft holders and measure the width of each plastigauge.

The widest thickness determines the oil clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)

When the service limits are exceeded, replace the camshaft and recheck the oil clearance.

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

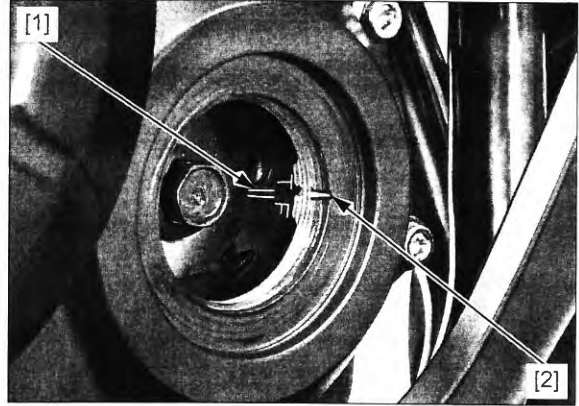


CYLINDER HEAD/VALVES

INSTALLATION

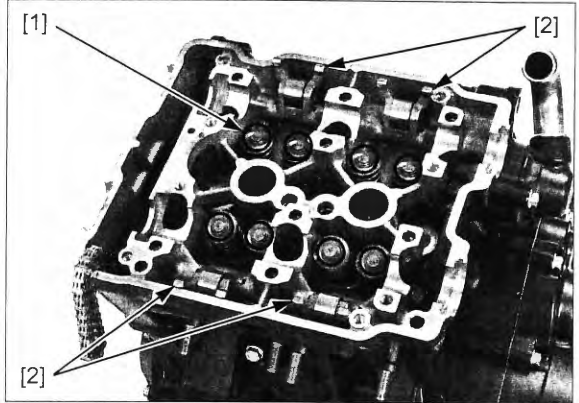
Be careful not to jam the cam chain into the timing sprocket on the crankshaft when rotating the crankshaft.

Rotate the crankshaft clockwise, and align the "T" mark [1] on the primary drive gear with the index notch [2] on the right crankcase cover.



Be careful not to let the shims fall into the crankcase.

Install the shims [1] in their original locations on the valve retainers. Lower the rocker arms [2].



Each camshaft has an identification mark.

- "IN" mark [1]: intake camshaft
- "EX" mark [2]: exhaust camshaft

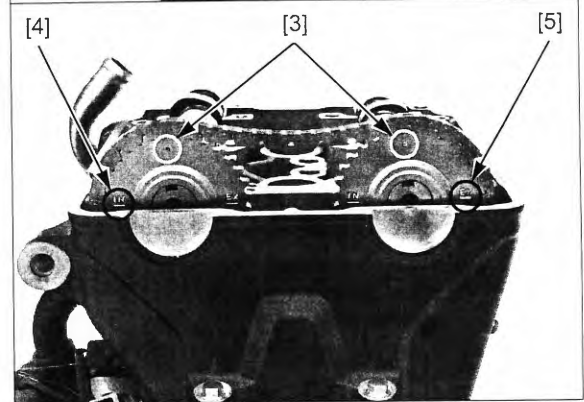
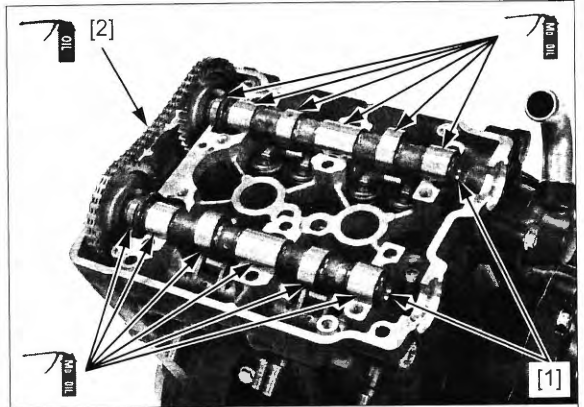


Apply molybdenum oil solution to the camshaft [1] lobes, journal and thrust surfaces.

Apply engine oil to the cam chain [2] whole surface.

Install the camshafts onto the cylinder head while installing cam chain onto the cam sprockets.

Position the punch marks [3] on the cam sprockets facing up, and align the outside index line ("IN" [4] and "EX" [5] marks) with the cylinder head top surface as shown.

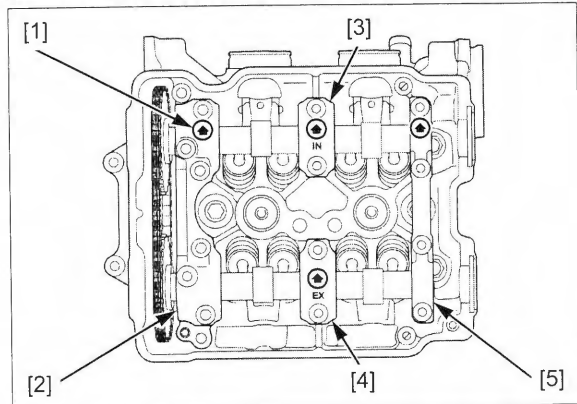


Be sure the dowel pins in the camshaft holder align with the holes in the cylinder head.

All arrows on the camshaft holders should face toward the intake side.

Install each camshaft holder with the arrow [1] facing the intake side in the correct locations as shown.

- camshaft holder A [2]
- camshaft holder B [3] ("IN" mark: intake side holder)
- camshaft holder C [4] ("EX" mark: exhaust side holder)
- camshaft holder D [5]



Apply engine oil to the camshaft holder bolt threads and seating surface.

Install the camshaft holder bolts:

- 6 x 39.5 mm bolts [1]
- 6 x 32 mm bolts [2]

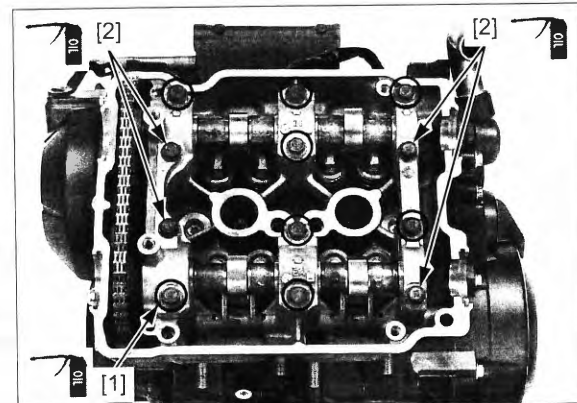
NOTICE

Failure to tighten the camshaft holder in a crisscross pattern may cause the camshaft holder to break.

From inside to outside tighten the camshaft holder bolts gradually until the camshaft holders seats on the cylinder head.

Tighten the camshaft holder bolts in a crisscross pattern in 2 or 3 steps to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

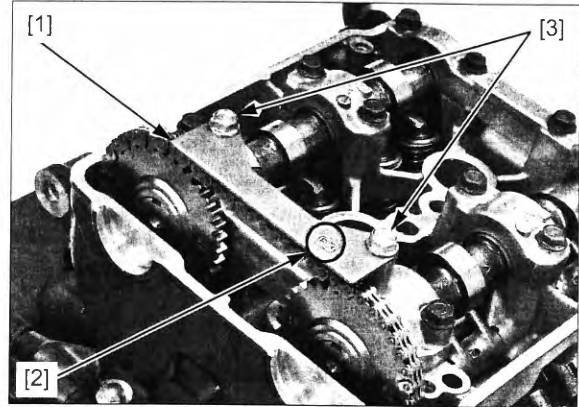


CYLINDER HEAD/VALVES

Install the cam chain guide B [1] with the "EX" mark [2] facing the exhaust side.

Be careful not to let the cam chain guide bolts fall into the crankcase.

Install and tighten the cam chain guide bolts [3] securely.



Remove the tensioner stopper [1] from the cam chain tensioner lifter.

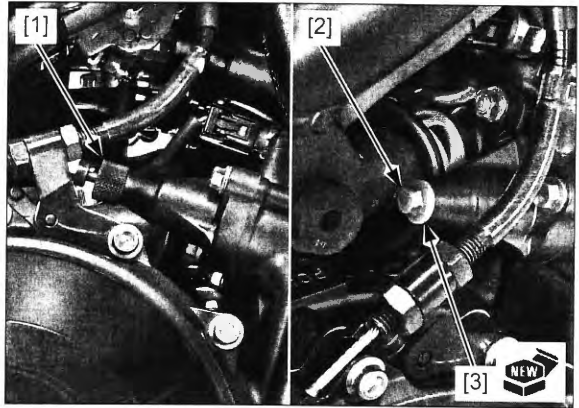
Turn the crankshaft clockwise several times, and align the "T" mark on the primary drive gear with the index notch on the right crankcase cover (page 10-12).

Recheck the valve timing.

Inspect the valve clearance (page 3-7).

Install the sealing bolt [2] with a new sealing washer [3] and tighten it securely.

Install the cylinder head cover (page 10-6).



ROCKER ARM

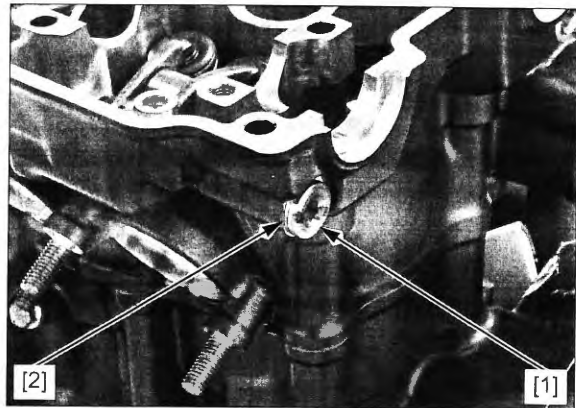
REMOVAL/INSTALLATION

NOTE:

- The rocker arm can be serviced with the engine installed in the frame.
- The intake and exhaust rocker arm services are the same procedures.

Remove the camshafts (page 10-9).

Remove the plug bolt [1] and sealing washer [2].



Remove the rocker arm shaft [1] using a 6 mm bolt [2] while holding the rocker arm [3].

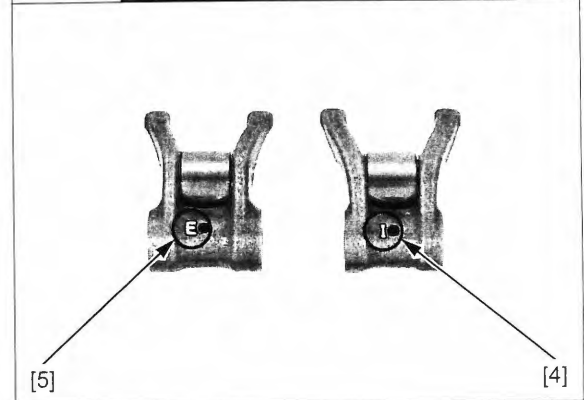
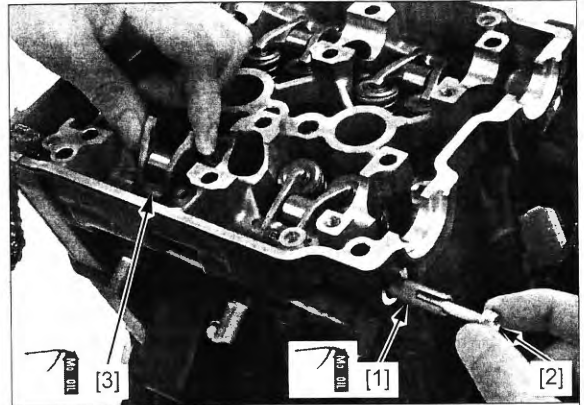
Remove the rocker arms.

Apply molybdenum oil solution to the rocker arm sliding areas, thrust surface and rocker arm shaft outer surface.

Install the rocker arms and rocker arm shaft.

NOTE:

- The rocker arms are identified by the stamped marks:
 - "I" mark [4]: intake rocker arm
 - "E" mark [5]: exhaust rocker arm

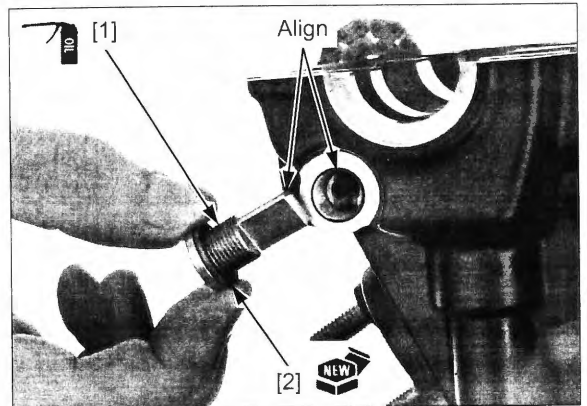


Apply engine oil to the threads of plug bolt [1] and install it with a new sealing washer [2], aligning the blade with the groove.

Tighten the plug bolt to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

Install the camshafts (page 10-12).



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning or clogs in oil passages.

- rocker arms
- rocker arm shafts

Measure each part and clearance according to CYLINDER HEAD/VALVES SPECIFICATIONS (page 1-10).

Replace any part if it is out of service limit.

CYLINDER HEAD

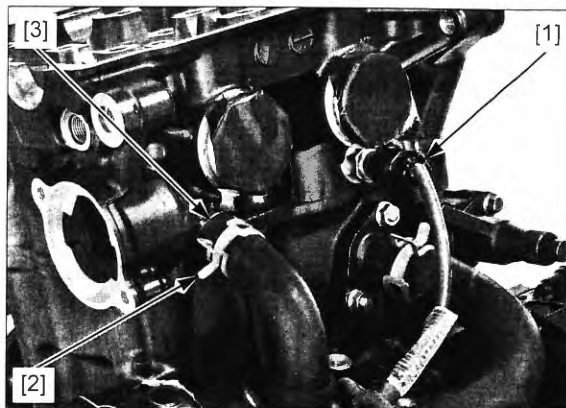
REMOVAL

Remove the following:

- engine (page 15-4)
- rocker arms (page 10-14)
- thermostat (page 8-6)

Disconnect the ECT sensor 2P (Black) connector [1].

Release the hose clip [2] and disconnect the bypass hose [3].



Remove the 6 mm bolts [1].

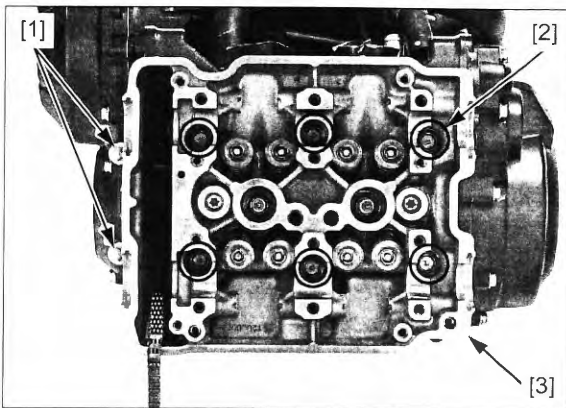
Suck out the oil in the 9 mm washer-bolt cavities before removing the bolts.

Loosen the 9 mm washer-bolts [2] in a crisscross pattern in 2 or 3 steps, then remove them.

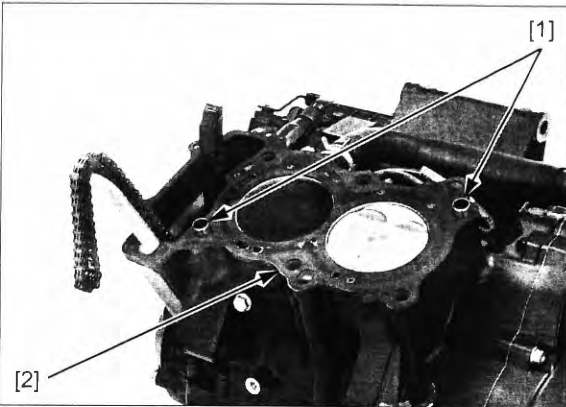
Remove the cylinder head [3].

NOTE:

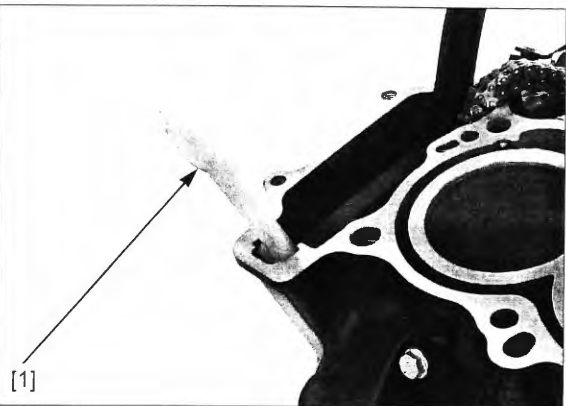
- Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.
- Do not tap the cylinder head too hard and do not damage the mating surface with a screwdriver.



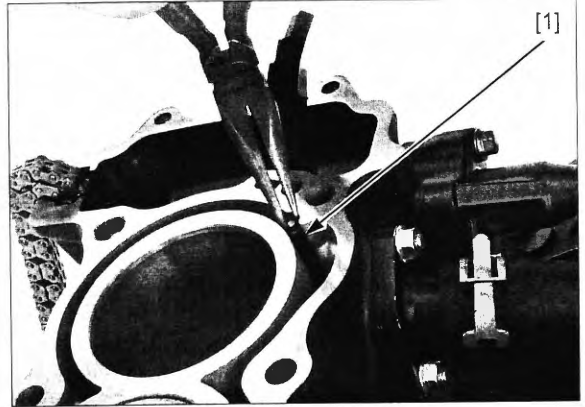
Remove the dowel pins [1] and gasket [2].



Remove the cam chain guide A [1].



Remove the partition pin [1].
Check the partition pin for deterioration or damage.



DISASSEMBLY

Remove the following:

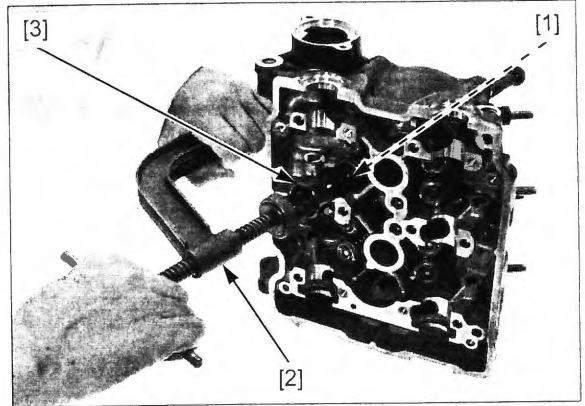
- spark plugs (page 3-6)
- ECT sensor (page 4-39)

To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.

Remove the valve spring cotters [1] using the special tools.

TOOLS:

- [2] Valve spring compressor 07757-0010000
- [3] Valve spring compressor attachment 07959-KM30101



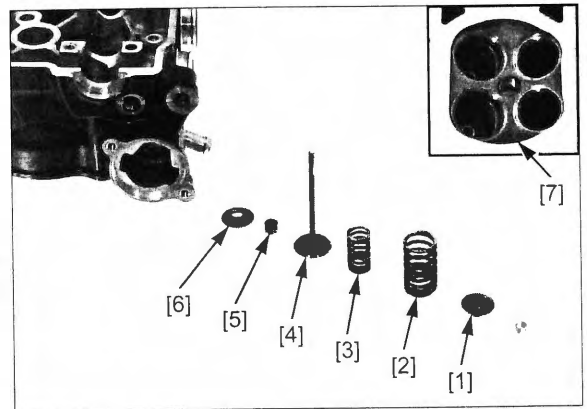
Mark all parts during disassembly so they can be placed back in their original locations.

Remove the valve spring compressor and remove the following:

- valve spring retainers [1]
- outer valve springs [2]
- inner valve springs [3]
- valves [4]
- valve stem seals [5]
- valve spring seats [6]

Avoid damaging the cylinder mating surface and valve seat surfaces.

Remove the carbon deposits from the combustion chamber [7] and clean off the cylinder head gasket surface.



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning or clogs in oil passages.

- cylinder head
- inner/outer valve springs
- valves
- valve guides
- cam chain guide A

Measure each part and clearance according to CYLINDER HEAD/VALVES SPECIFICATIONS (page 1-10).

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 10-18).
- Refer to valve seat inspection (page 10-19).

CYLINDER HEAD/VALVES

VALVE GUIDE REPLACEMENT

Disassemble the cylinder head (page 10-17).

Chill new valve guides in a freezer for about 1 hour.

NOTE:

- Be sure to wear heavy gloves to avoid burns when handling the heated cylinder head.
- Using a torch to heat the cylinder head may cause warpage.

Heat the cylinder head to 130 – 140°C (266 – 284°F) with a hot plate or oven. Do not heat the cylinder head beyond 150°C (302°F). Use temperature indicator sticks, available from welding supply stores, to be sure the cylinder head is heated to the proper temperature.

Support the cylinder head and drive the valve guides [1] out of the cylinder head from the combustion chamber side.

TOOL:

[2] Valve guide driver, 4.5 mm 07HMD-ML00101

Take out new valve guides [1] from the freezer.

While the cylinder head is still heated, drive new valve guides from the camshaft side until the exposed height is specified value.

TOOL:

[2] Valve guide adjusting driver 07743-002000
(not available in U.S.A.)

SPECIFIED HEIGHT:

IN/EX: 14.10 – 14.30 mm (0.555 – 0.563 in)

U.S.A. only installation:

Mark the depth of the valve guide using a marker.
Use the valve guide driver to correct the depth.

Let the cylinder head cool to room temperature.

Ream new valve guides after installation.

NOTE:

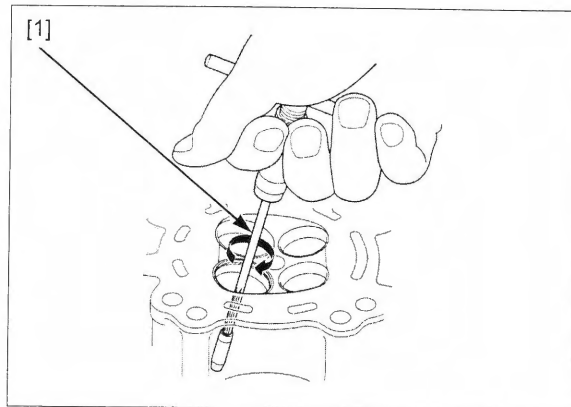
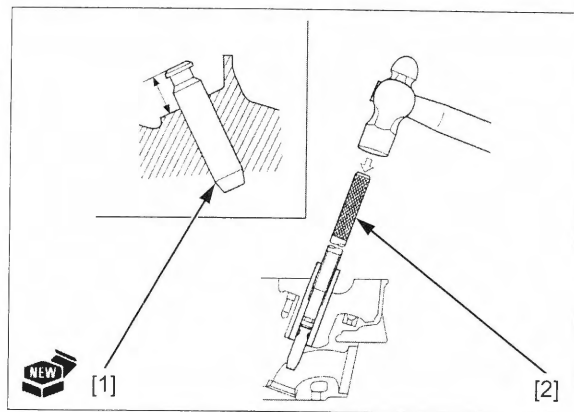
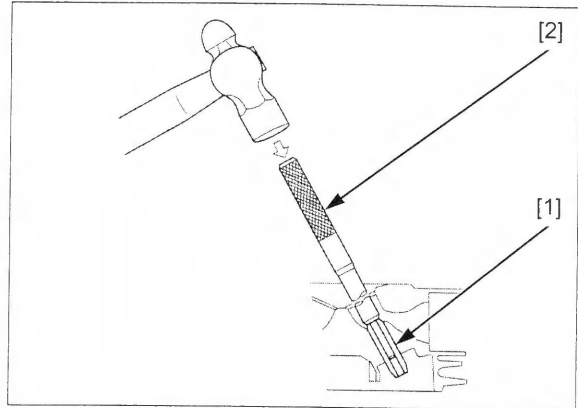
- Take care not to tilt or lean the reamer [1] in the guide while reaming.
- Use cutting oil on the reamer during this operation.

Insert the reamer from the combustion chamber side of the cylinder head and always rotate the reamer clockwise.

TOOL:

Valve guide reamer, 4.5 mm 07HMH-ML00101 or
07HMH-ML0010B
(U.S.A. only)

Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat (page 10-20).



VALVE SEAT INSPECTION/REFACING**INSPECTION**

Disassemble the cylinder head (page 10-17).

Clean the intake and exhaust valves thoroughly to remove carbon deposits.

Apply a light coat of Prussian Blue to the valve seats.

Tap the valve against the valve seat several times using a hand-lapping tool [1], without rotating the valve to make a clear pattern.

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)

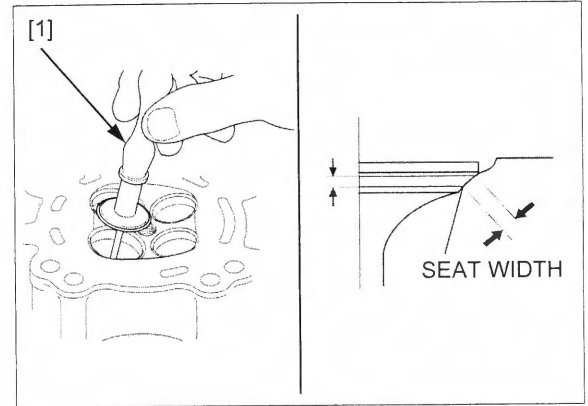
SERVICE LIMIT: 1.5 mm (0.06 in)

If the valve seat width is not within specification, reface the valve seat (page 10-20).

Inspect the valve seat face for:

- Damaged face:
 - Replace the valve and reface the valve seat
- Uneven seat width:
 - Bent or collapsed valve stem; Replace the valve and reface the valve seat
- Contact area (too low or too high):
 - Reface the valve seat

The valves cannot be ground. If the valve face is burned, badly worn or if it contacts the seat unevenly, replace the valve.



CYLINDER HEAD/VALVES

REFACING

Reface the valve seat using the following tools.

TOOLS:

Cutter holder, 4.5 mm	07781-0010600
Seat cutter, 27.5 mm (IN, 45°)	07780-0010200
Seat cutter, 24 mm (EX, 45°)	07780-0010600
Flat cutter, 28 mm (IN, 32°)	07780-0012100
Flat cutter, 24 mm (EX, 32°)	07780-0012500
Interior cutter, 26 mm (IN, 60°)	07780-0014500
Interior cutter, 22 mm (EX, 60°)	07780-0014202

or equivalent commercially available in U.S.A.

VALVE SEAT WIDTH:

0.90 – 1.10 mm (0.035 – 0.043 in)

NOTE:

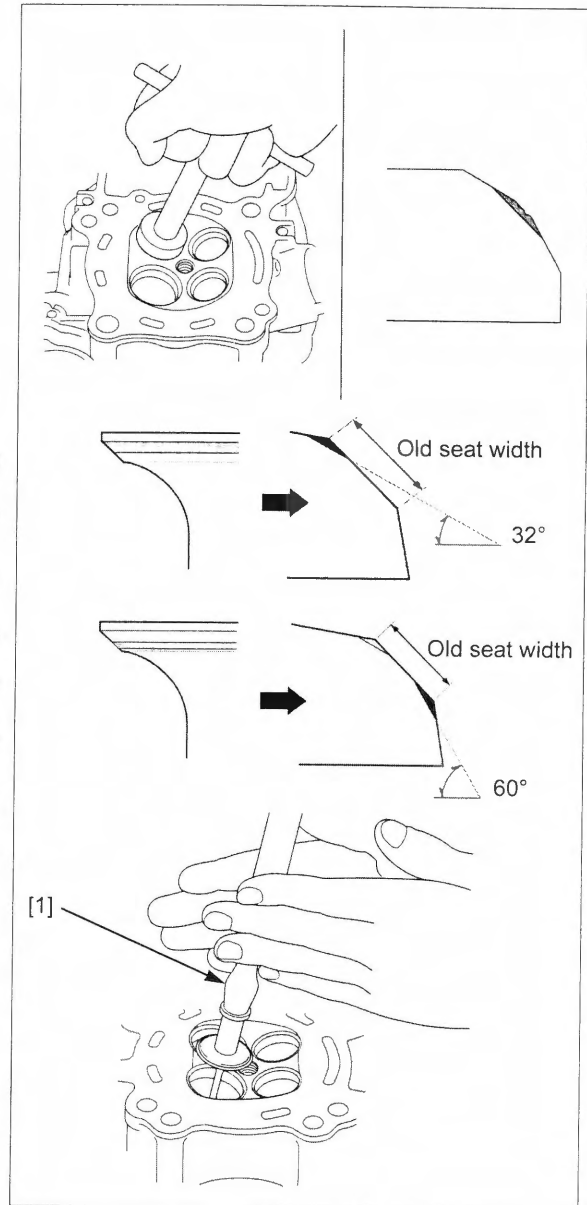
- Follow the refacer manufacturer's operating instructions.
 - Be careful not to grind the seat more than necessary.
1. Use a 45° seat cutter, remove any roughness or irregularities from the seat.
 2. Use a 32° flat cutter, remove the top 1/4 of the existing valve seat material.
 3. Use a 60° interior cutter, remove the bottom 1/4 of the existing valve seat material.
 4. Using a 45° seat cutter, cut the seat to the proper width.
Make sure that all pitting and irregularities are removed.
 5. After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

NOTE:

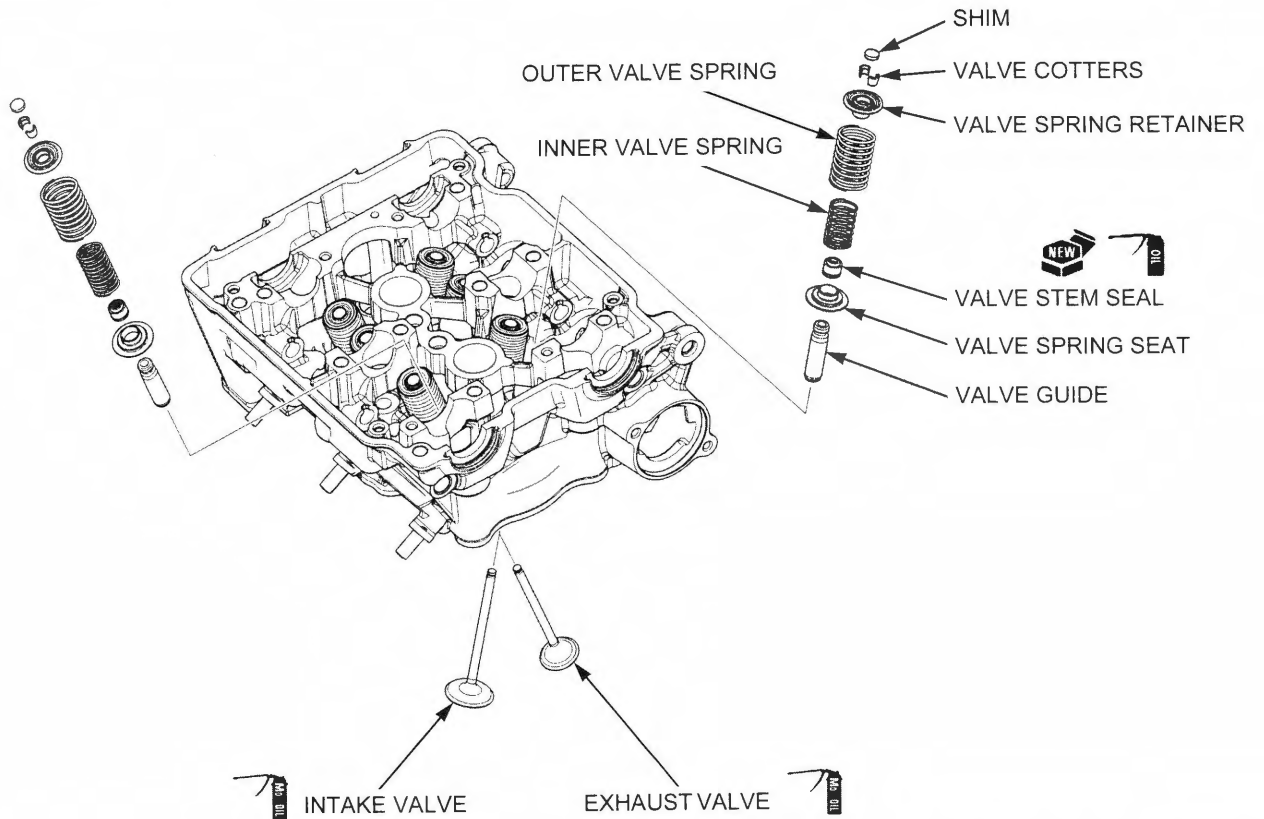
- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool [1] frequently to prevent uneven seat wear.
- Do not allow lapping compound to enter the guides.

After lapping, wash any residual compound off the cylinder head and valve and recheck the seat contact.

Assemble the cylinder head (page 10-21).



ASSEMBLY



Clean the cylinder head assembly with solvent and blow through all oil passages with compressed air.

Apply engine oil to the fitting area of new valve stem seals [1].

Install the valve spring seats [2] and valve stem seals.

Apply molybdenum oil solution to each valve stem end and sliding surface.

Insert the valves [3] into the valve guides while turning them slowly to avoid damage to the valve stem seals.

Install the inner valve spring [4] and outer valve spring [5] with the tightly wound coils should facing the combustion chamber.

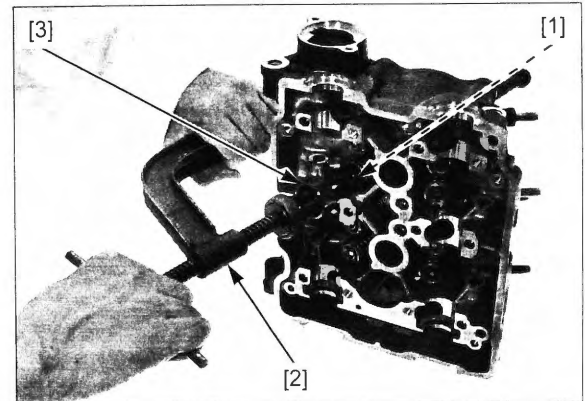
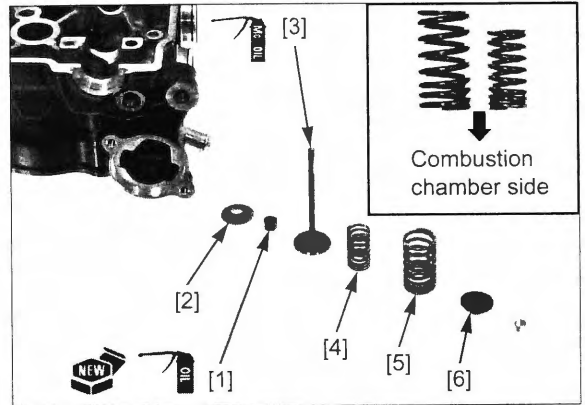
Install the valve spring retainers [6].

Install the valve cotters [1] using the special tool.

Grease the cotters to ease installation. To prevent loss of tension, do not compress the valve spring more than necessary.

TOOLS:

- [2] Valve spring compressor 07757-0010000
- [3] Valve spring compressor attachment 07959-KM30101



CYLINDER HEAD/VALVES

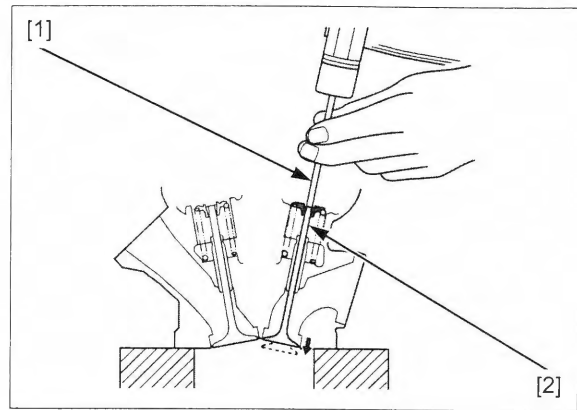
Support the cylinder head above the work bench surface to prevent valve damage.

Place a suitable tool [1] onto the valve stem [2].

Tap the tool gently to seat the valve cotters [3] firmly using a hammer.

Install the following:

- ECT sensor (page 4-39)
- spark plugs (page 3-6)



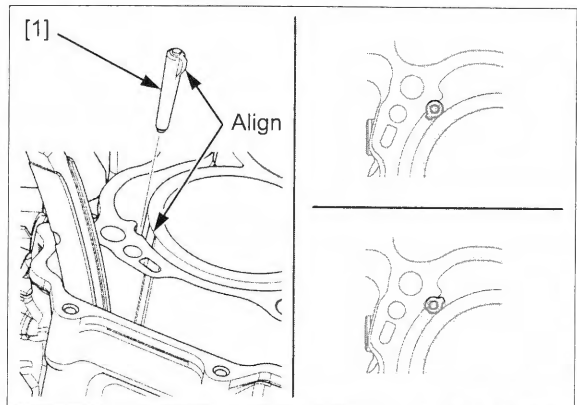
INSTALLATION

Do not allow dust and dirt to enter the crankcase.

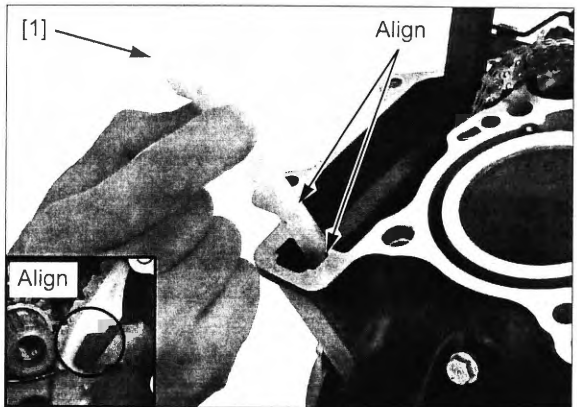
Clean any gasket material from the cylinder mating surfaces.

The lug is positioned in either the right or left.

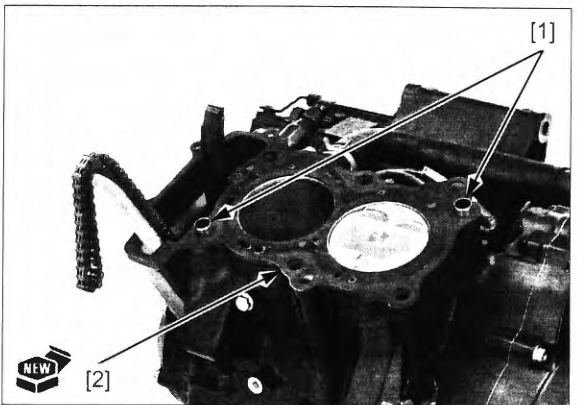
Install the partition pin [1] into the recess of the No. 2 cylinder intake side with the tapered side facing down, aligning its lug with the cylinder water jacket.



Install the cam chain guide A [1] while aligning its pins with the grooves in the cylinder, and its end with the groove in the crankcase.



Install the dowel pins [1] and a new gasket [2].



Route the cam chain through the cylinder head and install the cylinder head [1] onto the cylinder.

Clean the cylinder head 9 mm washer-bolts in solvent, and dry them thoroughly.

Apply engine oil to the 9 mm washer-bolt threads and seating surfaces.

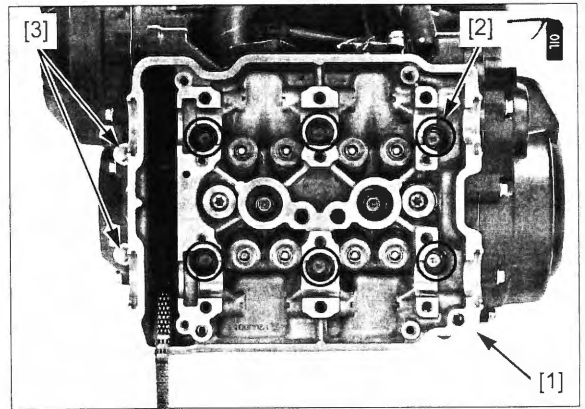
Install and tighten the 9 mm washer-bolt [2] in a crisscross pattern in 2 or 3 steps to the specified torque.

TORQUE: 47 N·m (4.8 kgf·m, 35 lbf·ft)

Install and tighten the 6 mm bolts [3] securely.

Install the following:

- thermostat (page 8-6)
- rocker arms (page 10-14)
- engine (page 15-8)



CAM CHAIN TENSIONER LIFTER

REMOVAL/INSTALLATION

NOTE:

- The cam chain tensioner lifter can be serviced with the engine installed in the frame.

Remove the sealing bolt [1] and sealing washer [2].

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

TOOL:

[3] Tensioner holder B

070MG-0010100 or
07AMG-001A100
(U.S.A. only) or
07AMG-MFJA100
(U.S.A. only)

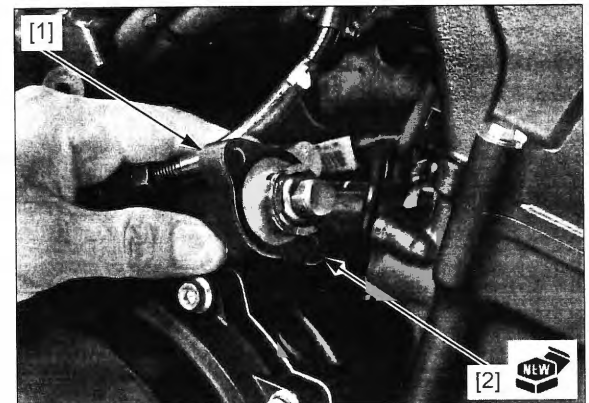
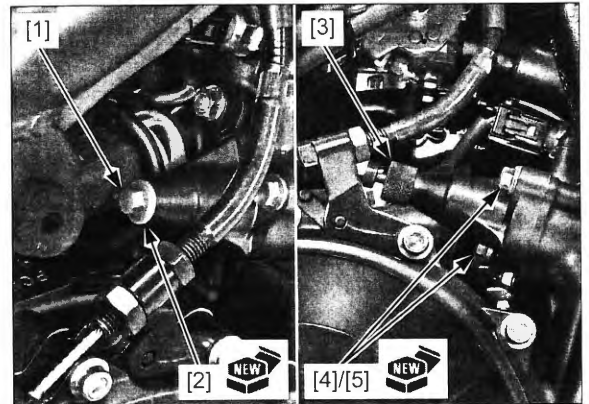
Remove the cam chain tensioner lifter mounting bolts [4] and sealing washers [5].

Remove the cam chain tensioner lifter [1] and gasket [2].

Installation is in the reverse order of removal.

NOTE:

- Replace the gasket and sealing washers with new ones.

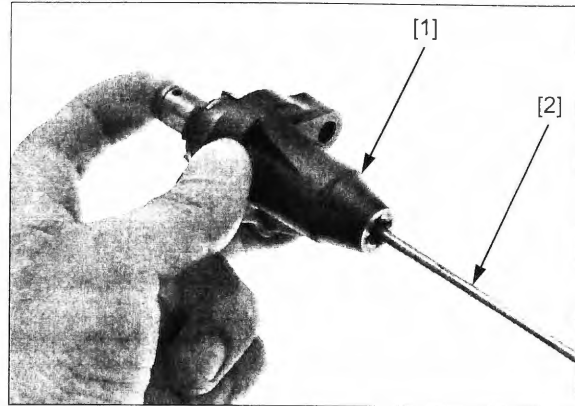


CYLINDER HEAD/VALVES

INSPECTION

Check the cam chain tensioner lifter [1] 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 [2], 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.



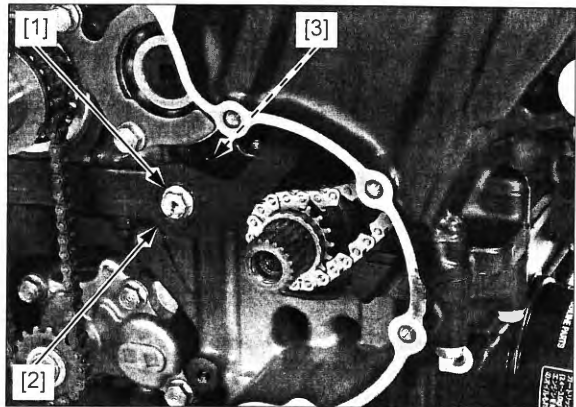
CAM CHAIN/TIMING SPROCKET

REMOVAL

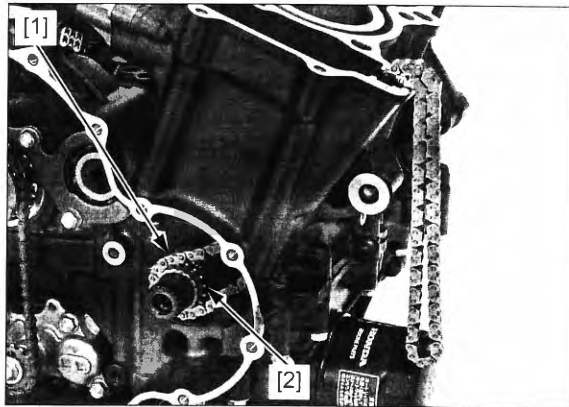
Remove the following:

- cylinder head (page 10-16)
- primary drive gear (page 11-14)
- clutch outer (page 11-7)

Remove the bolt [1], cam chain tensioner [2] and collar [3].



Remove the cam chain [1] and timing sprocket [2] from the crankshaft.



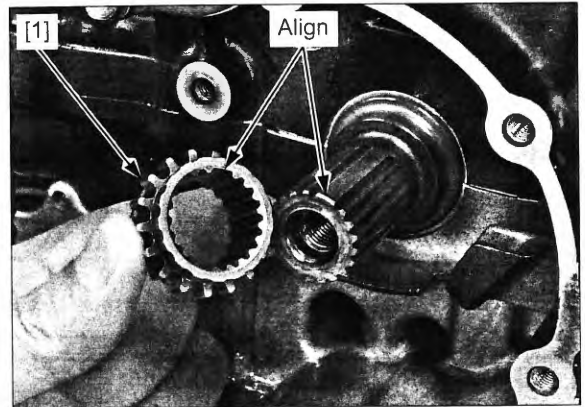
INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

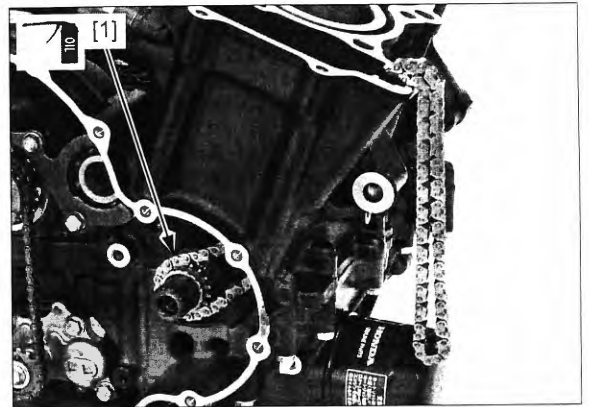
- cam chain
- cam chain tensioner
- timing sprocket

INSTALLATION

Install the timing sprocket [1] by aligning the wide groove with the wide tooth of the crankshaft.



Apply engine oil to the cam chain [1] whole surface and install it to the timing sprocket.



Apply a locking agent to the cam chain tensioner pivot bolt threads (page 1-20).

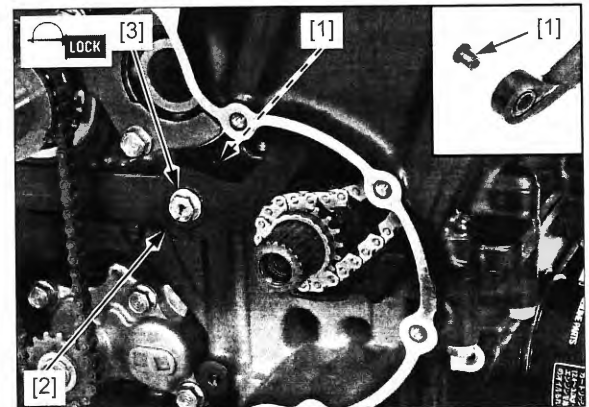
The collar is installed in the direction as shown.

Install the collar [1], cam chain tensioner [2] and bolt [3]. Tighten the cam chain tensioner pivot bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the following:

- clutch outer (page 11-11)
- primary drive gear (page 11-15)
- cylinder head (page 10-22)



MEMO

11. CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION	11-2	CLUTCH	11-7
TROUBLESHOOTING.....	11-3	PRIMARY DRIVE GEAR.....	11-14
COMPONENT LOCATION.....	11-4	GEARSHIFT LINKAGE.....	11-17
RIGHT CRANKCASE COVER	11-5		

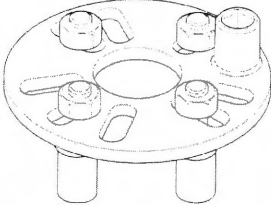
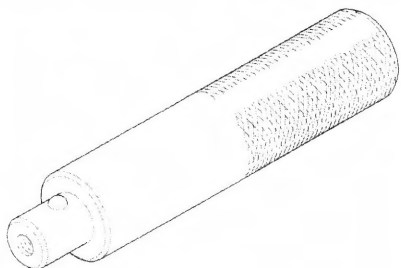
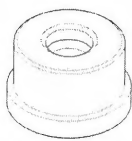


CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION

GENERAL

- This section covers service of the clutch and gearshift linkage. All service can be done with the engine installed in the frame.
- 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

<p>Clutch center holder 07JMB-MN50302</p>  <p>or 07HGB-001010B (plate) and 07HGB-001020B (collar) (U.S.A. only) with 6 x 40 mm bolts</p>	<p>Driver 07749-0010000</p> 	<p>Attachment, 32 x 35 mm 07746-0010100</p> 
<p>Pilot, 28 mm 07746-0041100</p> 	<p>Gear holder, 2.5 07724-0010100</p>  <p>or 07724-001A100 (U.S.A. only)</p>	

TROUBLESHOOTING

Clutch lever is too hard to pull in

- Damaged, kinked or dirty clutch cable
- Improperly routed clutch cable
- Damaged clutch lifter mechanism
- Faulty clutch lifter bearing
- Clutch lifter piece installed improperly

Clutch slips when accelerating

- Clutch lifter sticking
- Worn clutch discs
- Weak clutch springs
- No clutch lever freeplay
- Engine oil mixed with molybdenum or graphite additive

Clutch will not disengage or motorcycle creeps with clutch disengaged

- Excessive clutch lever freeplay (page 3-20)
- Clutch plate warped
- Engine oil level too high, improper engine oil viscosity or additive used
- Loose clutch center lock nut
- Damaged clutch lifter mechanism
- Clutch lifter rod installed improperly
- Worn clutch outer slot and clutch center grooves
- Improper clutch operation

Hard to shift

- Incorrect clutch cable adjustment
- Improper clutch operation
- Improper engine oil viscosity
- Damaged or bent shift forks (page 13-10)
- Bent shift fork shaft (page 13-10)
- Bent shift fork claw (page 13-10)
- Loose shift drum center bolt
- Damaged shift drum center
- Damaged shift drum guide grooves (page 13-10)
- Damaged or bent gearshift spindle

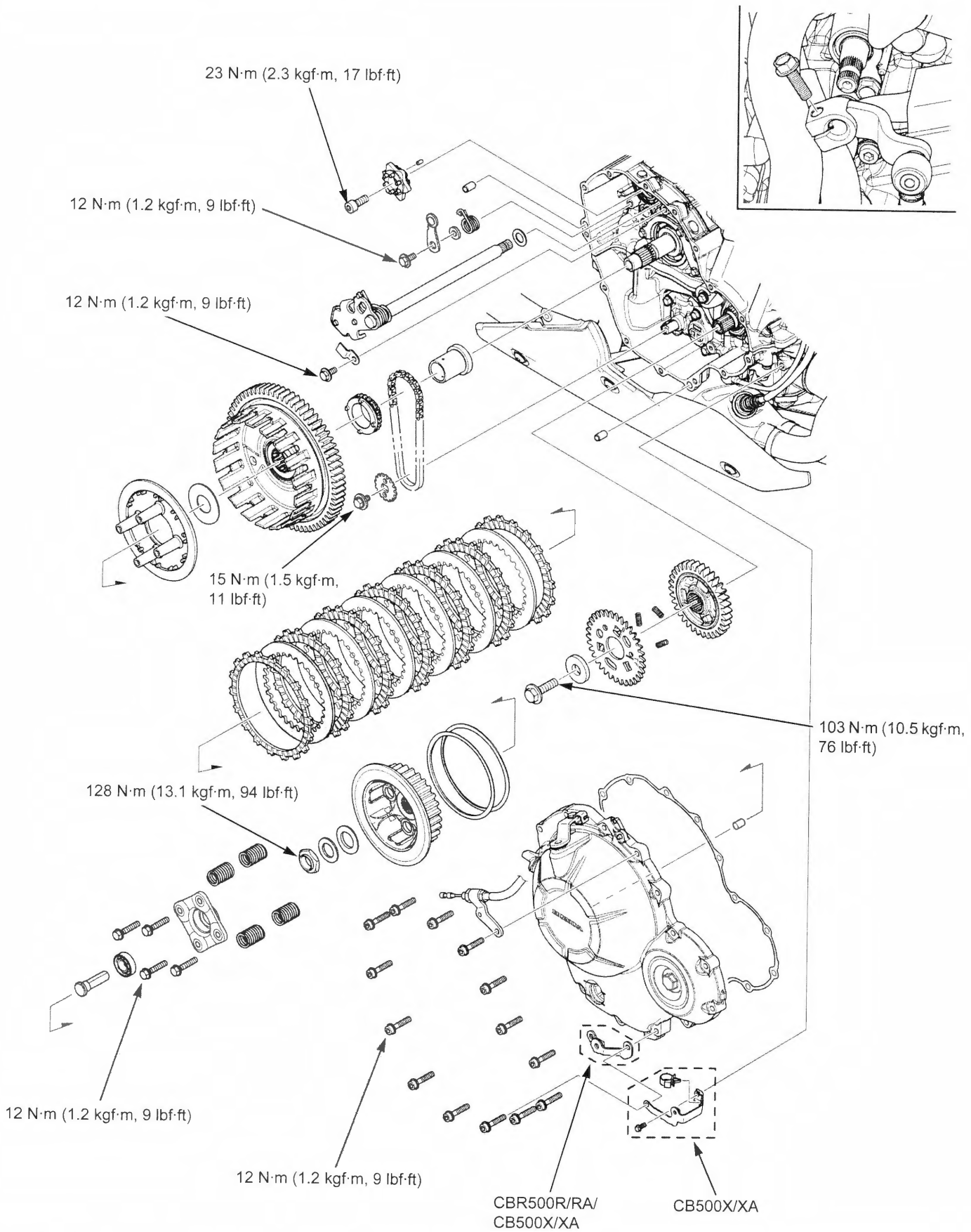
Transmission jumps out of gear

- Worn shift drum stopper arm
- Weak or broken shift drum stopper arm return spring
- Loose shift drum center bolt
- Damaged shift drum center
- Bent shift fork shaft (page 13-10)
- Damaged or bent shift forks (page 13-10)
- Worn gear engagement dogs or slots (page 13-10)

Gearshift pedal will not return

- Weak or broken gearshift spindle return spring
- Damaged or bent gearshift spindle

CLUTCH/GEARSHIFT LINKAGE COMPONENT LOCATION



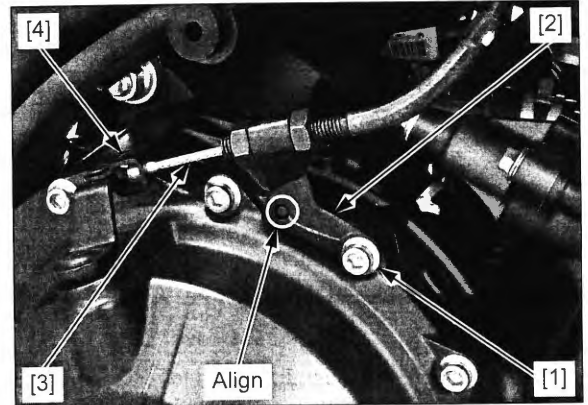
RIGHT CRANKCASE COVER

REMOVAL/INSTALLATION

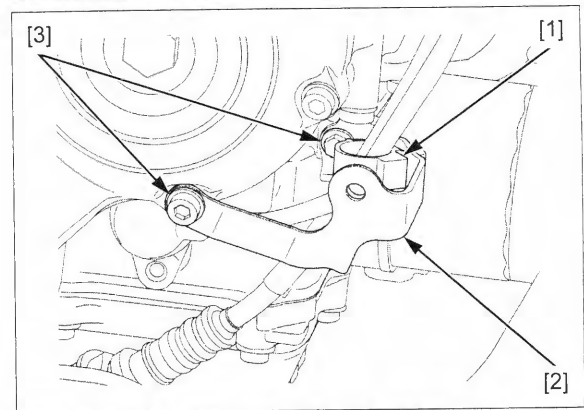
CBR500R/RA: Remove the under cowl (page 2-22).

CB500X/XA: Drain the engine oil (page 3-10).

Remove the bolt [1] and clutch cable holder [2], then disconnect the clutch cable [3] from the clutch lifter arm [4].



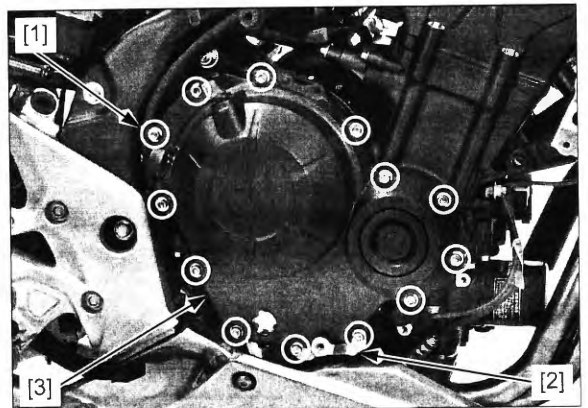
CB500X/XA: Remove the wire clip [1] from the under cowl stay [2].
Remove the bolts [3] and under cowl stay.



Loosen the right crankcase cover bolts [1] in a crisscross pattern in 2 or 3 steps.

Remove the following:

- bolts
- under cowl stay (*CBR500R/RA/**CB500X/XA*) [2]
- right crankcase cover [3]



CLUTCH/GEARSHIFT LINKAGE

Be careful not to damage the mating surfaces.

Remove the dowel pins [1] and gasket [2].

Clean any gasket material from the mating surfaces of the crankcase and cover.

Installation is in the reverse order of removal.

TORQUE:

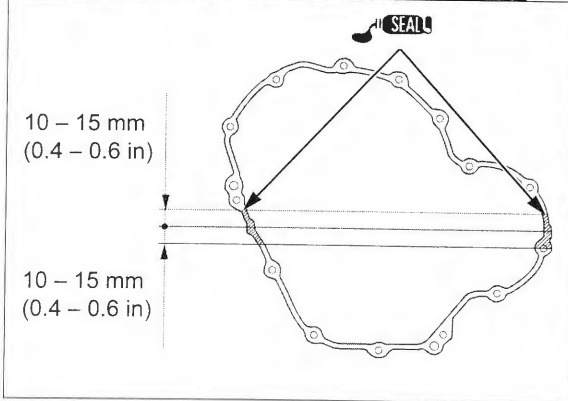
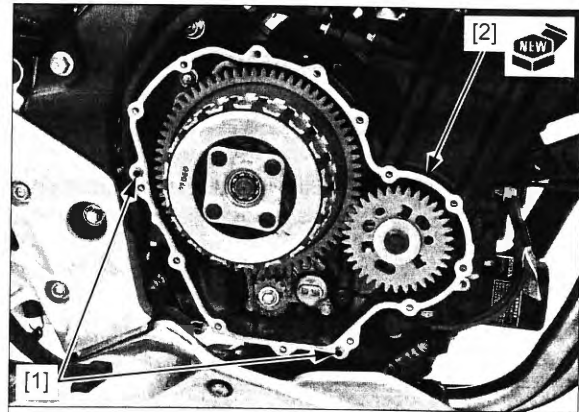
Right crankcase cover bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:

- Apply liquid sealant to the mating areas of crankcase as shown (page 1-20).
- Replace the right crankcase cover gasket with a new one.
- Align the clutch cable holder hole with the right crankcase cover boss.

Adjust the clutch lever freeplay (page 3-20).

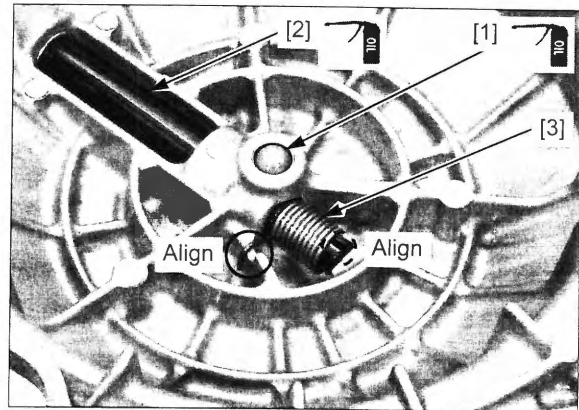
Fill the engine with the recommended engine oil and check that there are no oil leaks (page 3-10).



DISASSEMBLY/ASSEMBLY

Remove the clutch lifter rod A [1] while turning the clutch lifter arm [2].

Remove the clutch lifter arm and return spring [3] from the right crankcase cover.

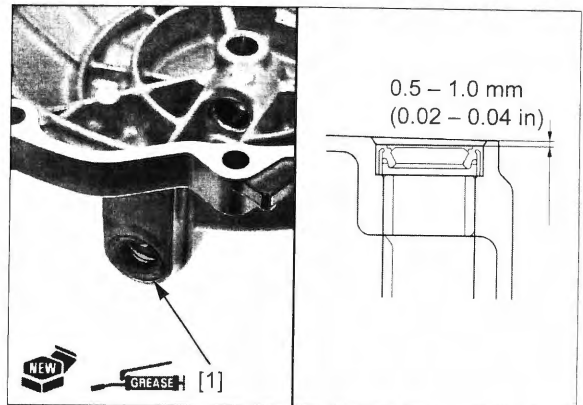


Remove the oil seal [1] from the right crankcase cover.

Assembly is in the reverse order of disassembly.

NOTE:

- Apply grease to a new oil seal lips.
- Install the oil seal to the specified depth as shown.
- Align the return spring hook with right crankcase cover.
- Align the return spring end with clutch lifter arm groove.
- Apply engine oil to the clutch lifter arm and lifter rod A sliding surface.



INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

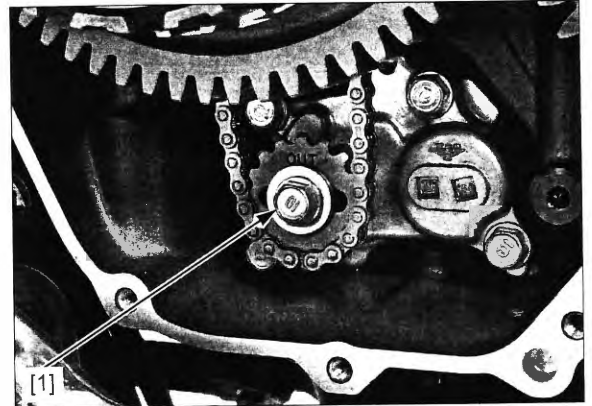
- clutch lifter arm bushing
- clutch lifter arm
- return spring
- clutch lifter rod A

CLUTCH

REMOVAL

Remove the right crankcase cover (page 11-5).

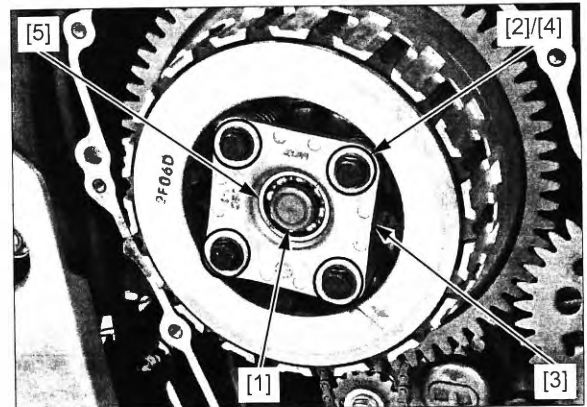
If the clutch outer guide will be removed, loosen the oil pump driven sprocket washer-bolt [1] with the clutch installed.



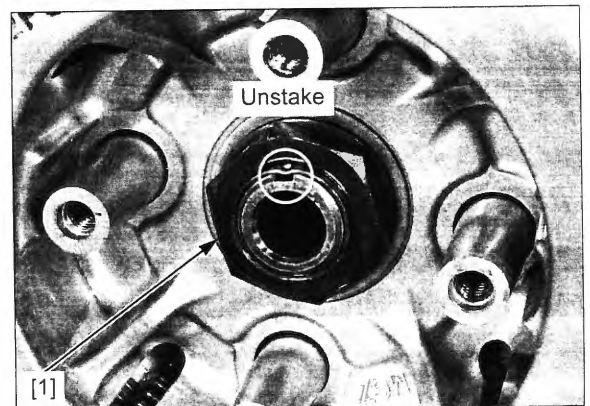
Remove the clutch lifter rod B [1].

Loosen the clutch lifter plate bolts [2] in a crisscross pattern in 2 or 3 steps, and remove the bolts, lifter plate [3] and clutch springs [4].

Remove the lifter plate bearing [5] from the lifter plate.



Be careful not to damage the mainshaft threads. Unstake the clutch center lock nut [1].



CLUTCH/GEARSHIFT LINKAGE

Hold the clutch pressure plate with the special tool and loosen the clutch center lock nut [1].

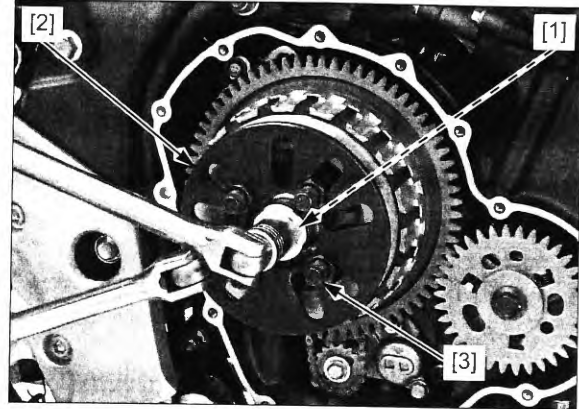
Use with 6 x 40 mm bolts [3].

TOOL:

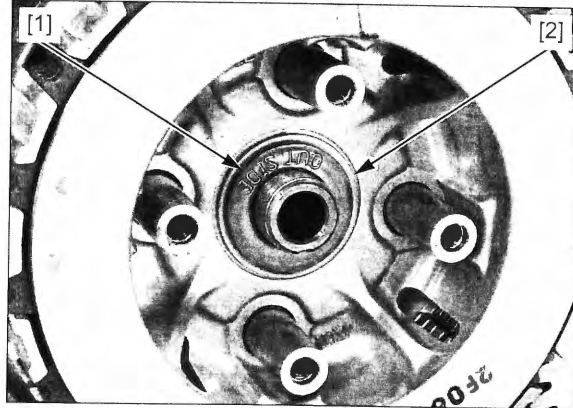
[2] Clutch center holder

07JMB-MN50302 or
07HGB-001010B (plate)
and 07HGB-001020B
(collar) (U.S.A. only)

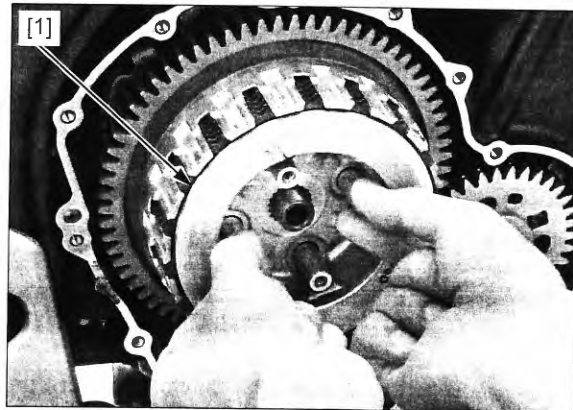
Remove and discard the lock nut.



Remove the lock washer [1] and washer [2].

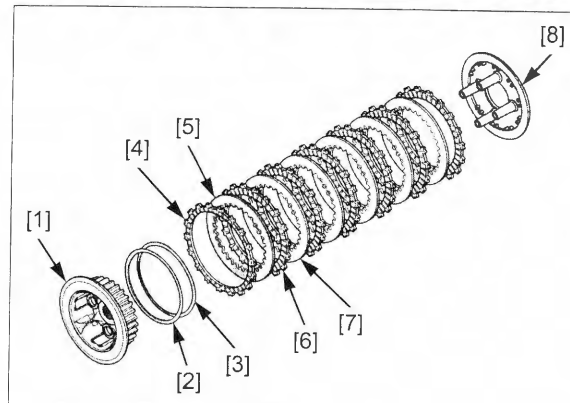


Remove the clutch center assembly [1].

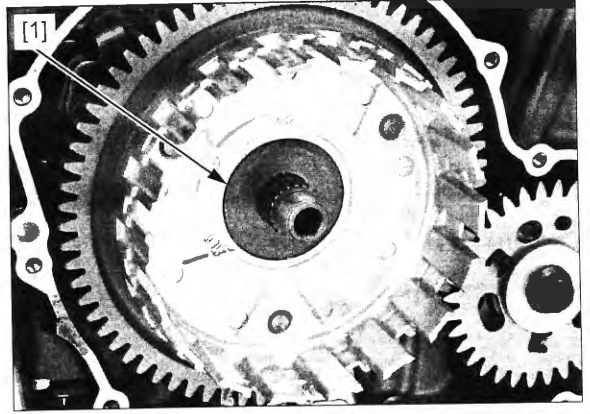


Remove the following:

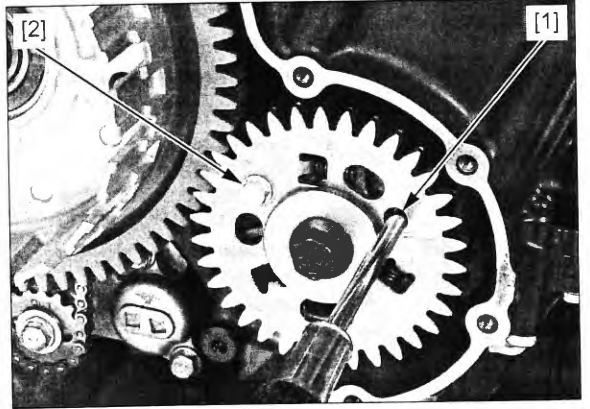
- clutch center [1]
- spring seat [2]
- judder spring [3]
- clutch disc B [4]
- clutch plate B [5]
- six clutch discs A [6]
- five clutch plate A [7]
- pressure plate [8]



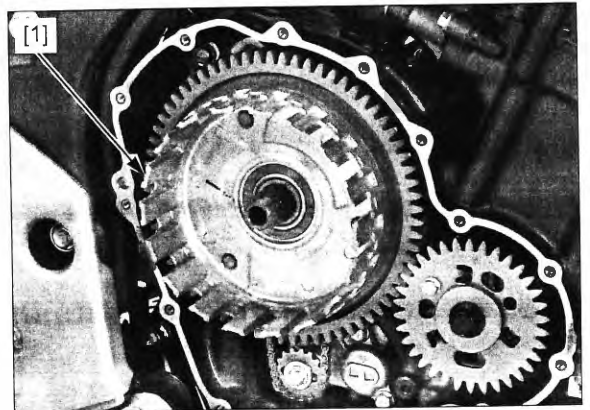
Remove the thrust washer [1].



Align the primary drive (scissors) gear teeth by inserting a screwdriver into the gear slot [1] and prying the gears, and install a 6 x 14 mm bolt [2] into the primary drive gear holes.

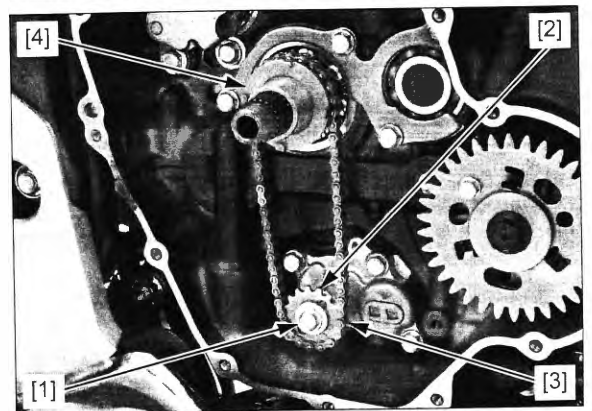


Remove the clutch outer [1].



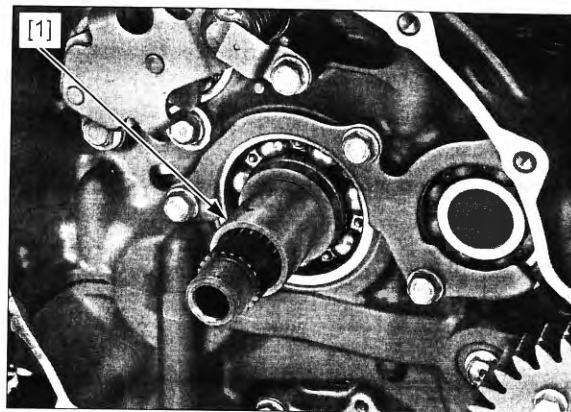
Remove the following:

- washer-bolt [1]
- oil pump driven sprocket [2]
- oil pump drive chain [3]
- oil pump drive sprocket [4]



CLUTCH/GEARSHIFT LINKAGE

Remove the clutch outer guide [1].



INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

- clutch lifter rod B
- clutch lifter bearing
- clutch lifter plate
- clutch springs
- clutch center
- spring seat
- judder spring
- clutch discs/plates
- clutch outer/primary driven gear/needle bearing
- clutch outer guide
- oil pump drive/driven sprockets
- oil pump drive chain
- mainshaft

Measure each part according to CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS (page 1-10).

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.

CLUTCH OUTER NEEDLE BEARING REPLACEMENT

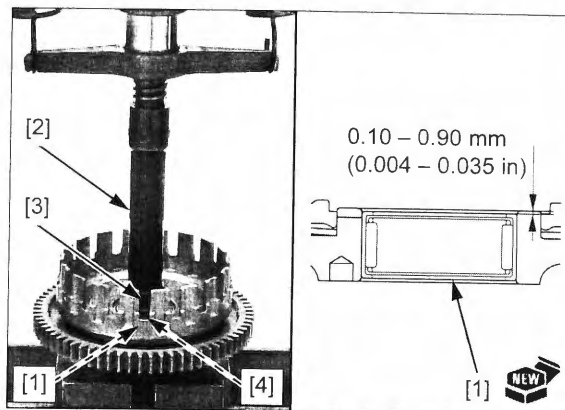
Press the needle bearing [1] out of the clutch outer using the special tools.

TOOLS:

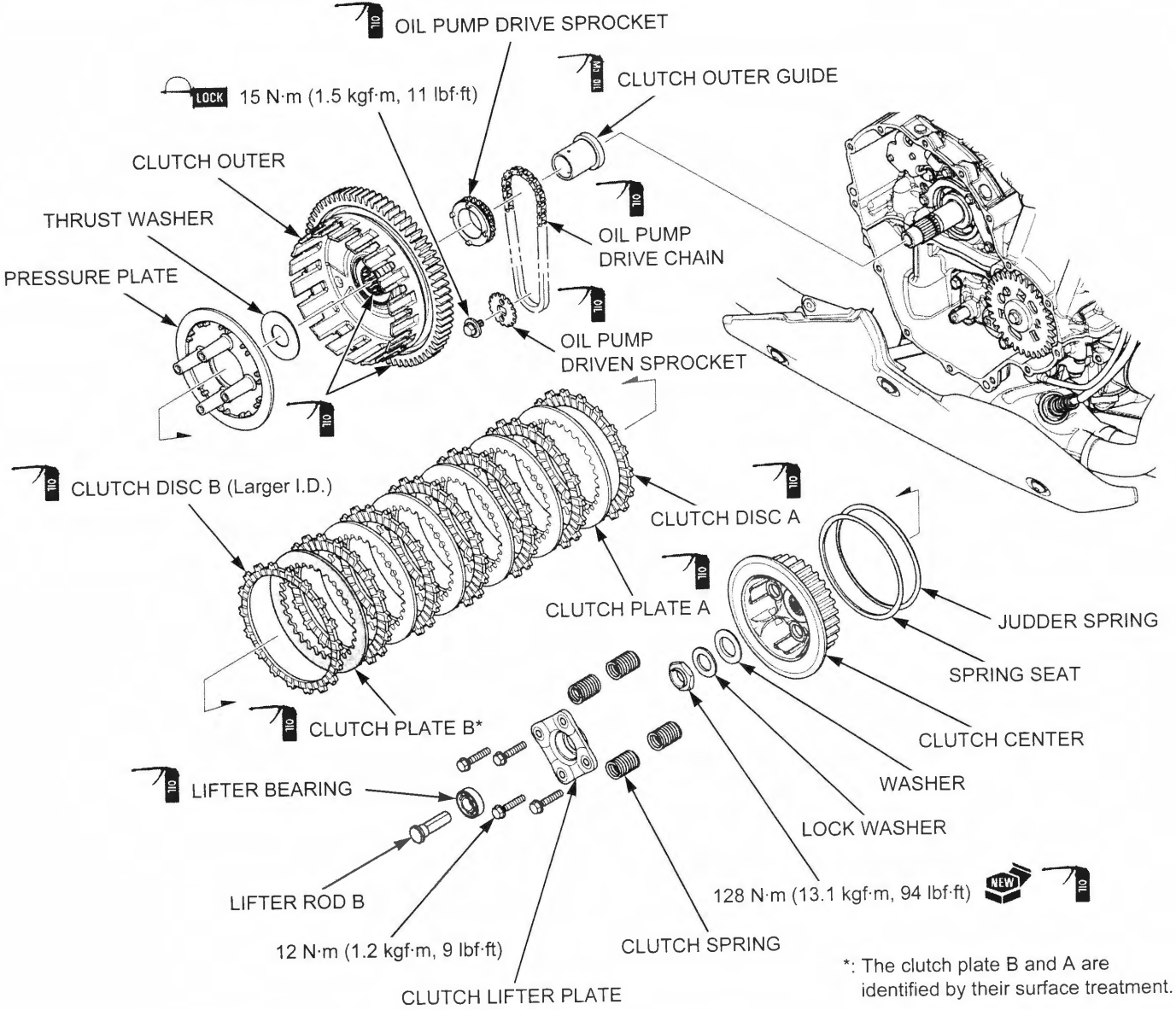
[2] Driver	07749-0010000
[3] Attachment, 32 x 35 mm	07746-0010100
[4] Pilot, 28 mm	07746-0041100

Press in the needle bearing with the marked side facing up.

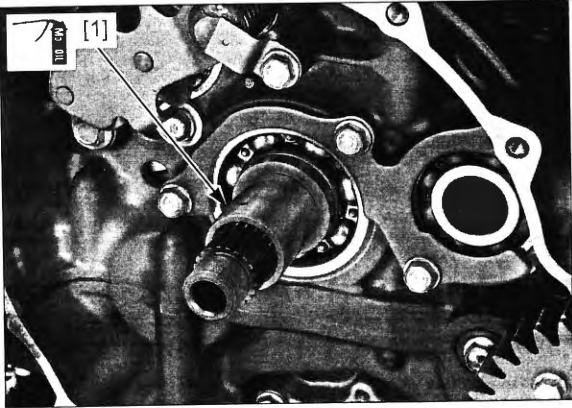
Press a new needle bearing into the clutch outer so that the depth from the clutch outer is 0.10 – 0.90 mm (0.004 – 0.035 in), using the same special tools.



INSTALLATION



Apply molybdenum oil solution to the clutch outer guide [1] entire surface and install it to the mainshaft.



CLUTCH/GEARSHIFT LINKAGE

Apply engine oil to the oil pump drive/driven sprocket teeth and drive chain.

Install the oil pump drive sprocket [1] and drive chain [2] with the drive sprocket "MGZ" mark [3] facing out.

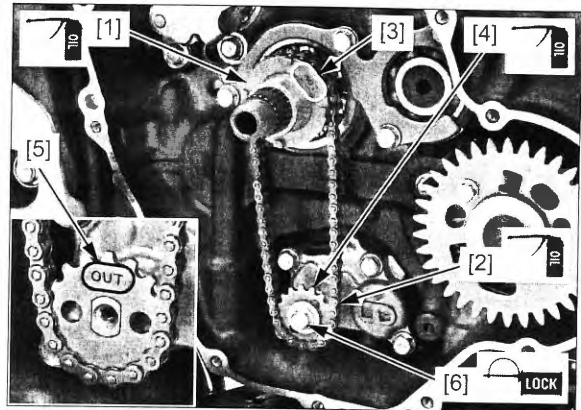
Install the oil pump driven sprocket [4] with its "OUT" mark [5] facing out by aligning the flat surfaces.

Apply a locking agent to the oil pump driven sprocket washer-bolt threads (page 1-20).

Install the oil pump driven sprocket washer-bolt [6].

NOTE:

- Tighten the driven sprocket bolt to the specified torque after installing the clutch.



Apply engine oil to the clutch outer needle bearing, primary drive gear and driven gear teeth.

When installing the clutch outer, turn the oil pump driven sprocket.

Install the clutch outer [1] while aligning the bosses of the oil pump drive sprocket with the holes of the clutch outer.

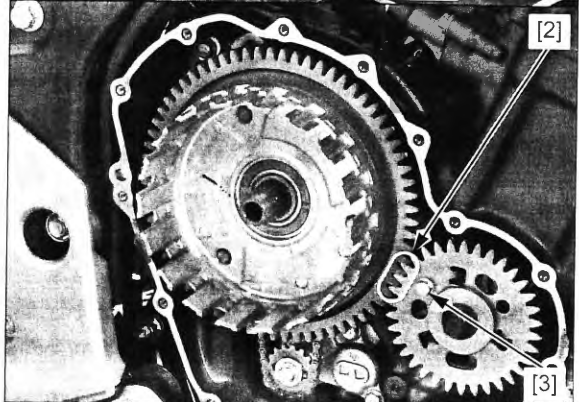
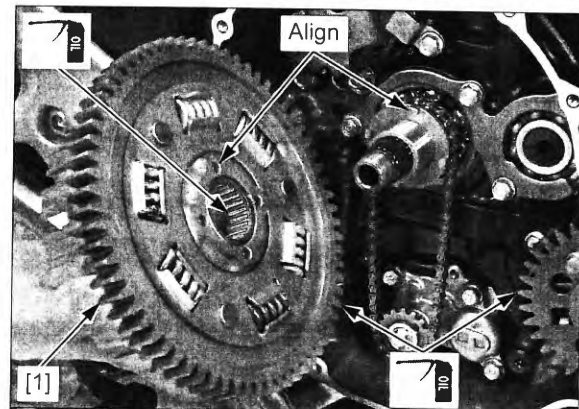
NOTE:

- Make sure the side surfaces [2] of the primary drive and driven gears are flush.

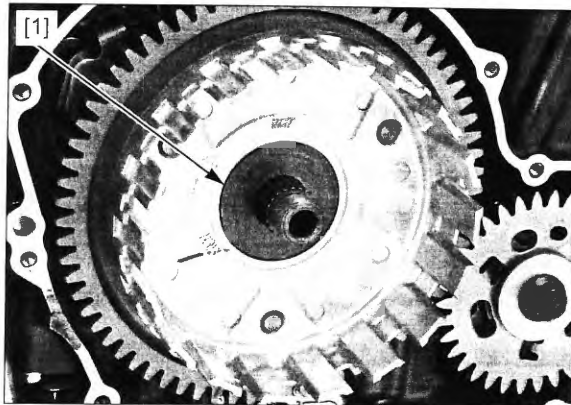
Remove the 6 x 14 mm bolt [3] from the primary drive gear.

NOTE:

- Do not forget to remove the 6 x 14 mm bolt after installing the clutch outer.



Install the thrust washer [1].



CLUTCH/GEARSHIFT LINKAGE

Apply engine oil to the entire surface of clutch discs and plates.

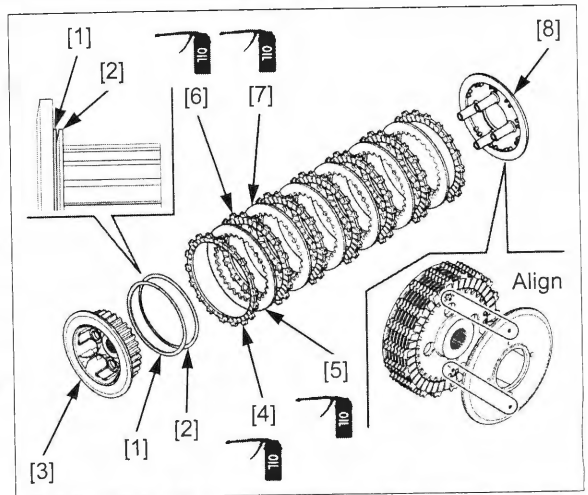
Install the spring seat [1] and judder spring [2] onto the clutch center [3] as shown.

Install the clutch disc B [4] and clutch plate B [5] onto the clutch center.

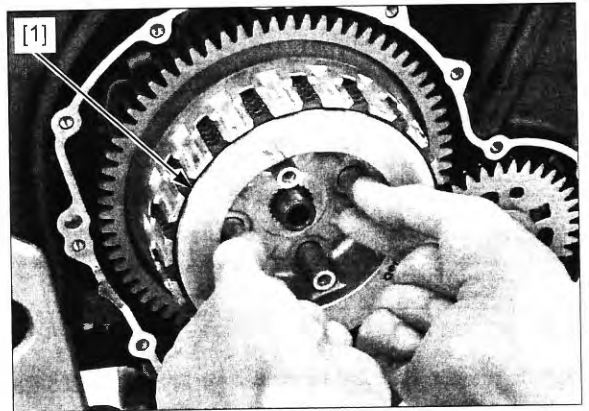
- Clutch disc B: larger I.D.
- Clutch plate B: surface treatment difference from clutch plate A

Install the clutch discs A [6] and plates A [7] alternately, starting with the clutch disc.

Install the pressure plate [8] onto clutch center while aligning "O" mark of clutch center and pressure plate.

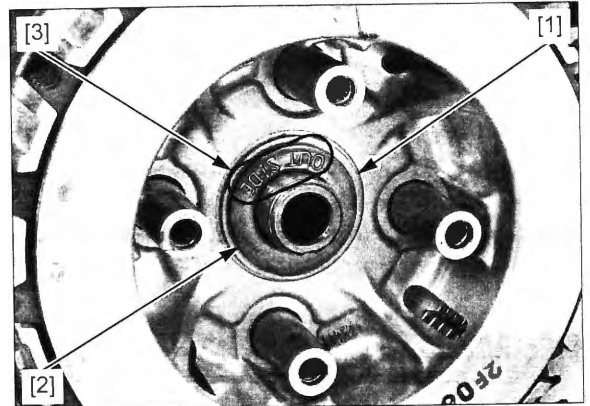


Install the clutch center assembly [1] into the clutch outer by aligning the clutch disc tabs with the grooves of the clutch outer one by one, and the splines of the clutch center and mainshaft.



Install the washer [1].

Install the lock washer [2] with its "OUTSIDE" mark [3] facing out.



Apply engine oil to a new clutch center lock nut threads and seating surface.

Install the clutch center lock nut [1] onto the mainshaft.

Hold the pressure plate with the special tool and tighten the lock nut to the specified torque.

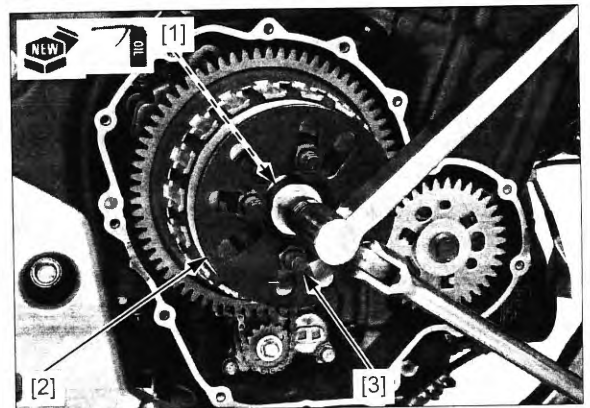
Use with 6 x 40 mm bolts [3].

TOOL:

[2] Clutch center holder

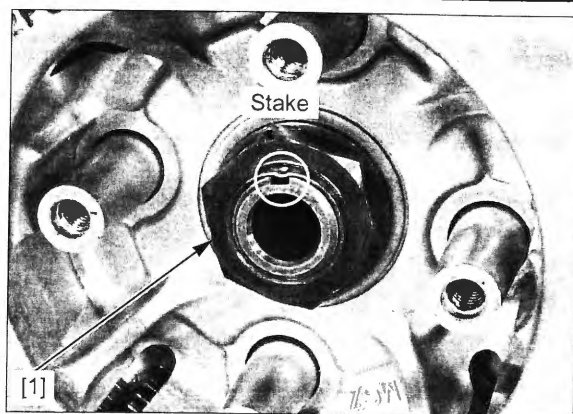
07JMB-MN50302 or
07HGB-001010B (plate)
and 07HGB-001020B
(collar) (U.S.A. only)

TORQUE: 128 N·m (13.1 kgf·m, 94 lbf·ft)



CLUTCH/GEARSHIFT LINKAGE

Be careful not to damage the mainshaft threads. Stake the clutch center lock nut [1] into the mainshaft groove.



Apply engine oil to the lifter plate bearing rotating area.

Install the lifter plate bearing [1] into the lifter plate [2].

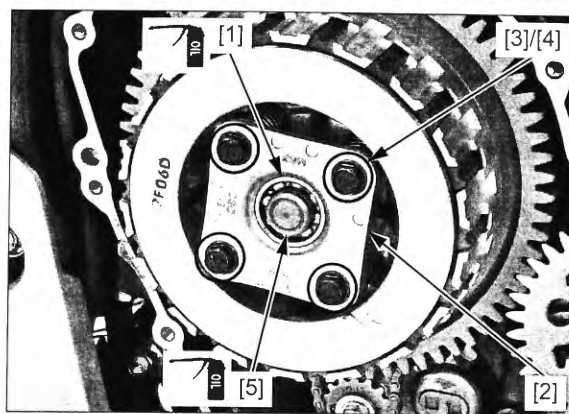
Install the clutch springs [3], lifter plate and clutch lifter plate bolts [4].

Tighten the clutch lifter plate bolts in a crisscross pattern in 2 or 3 steps to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Apply engine oil to the clutch lifter rod B sliding surface.

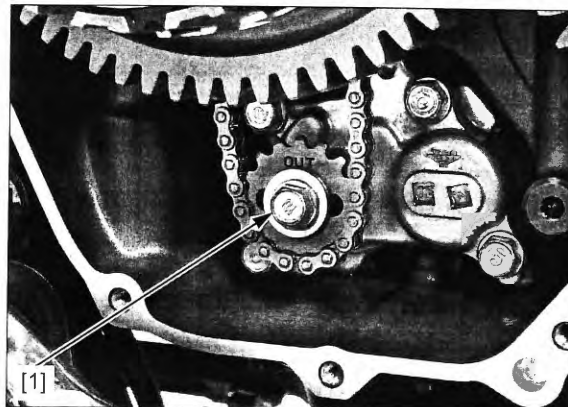
Install the clutch lifter rod B [5].



Tighten the oil pump driven sprocket washer-bolt [1] to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

Install the right crankcase cover (page 11-5).

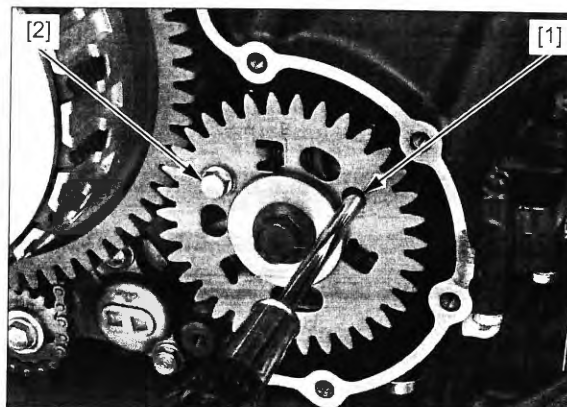


PRIMARY DRIVE GEAR

REMOVAL

Remove the right crankcase cover (page 11-5).

Align the primary drive (scissors) gear teeth by inserting a screwdriver into the gear slot [1] and prying the gears, and install a 6 x 14 mm bolt [2] into the primary drive gear holes.



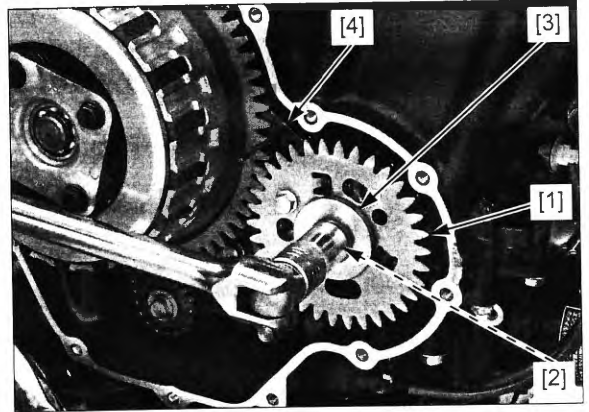
Hold the primary drive gear [1] using a special tool as shown, and remove the primary drive gear bolt [2] and washer [3].

TOOL:

[4] Gear holder, 2.5

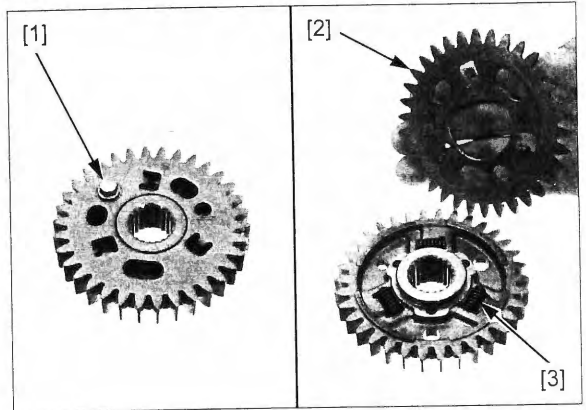
07724-0010100 or
07724-001A100
(U.S.A. only)

Remove the gear holder and primary drive gear.



Remove the 6 x 14 mm bolt [1] and primary drive sub-gear [2].

Remove the springs [3] from the primary drive gear grooves.



INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

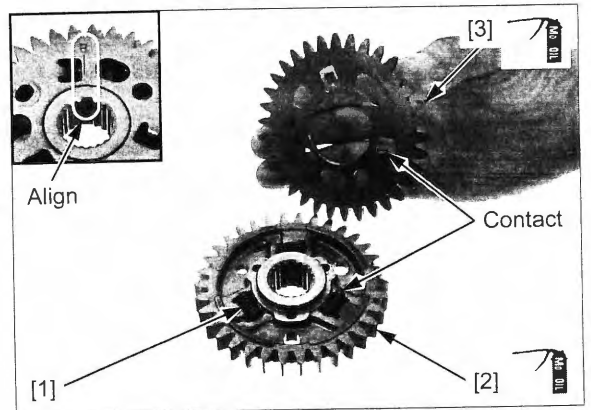
- primary drive gear
- primary drive sub-gear
- springs

INSTALLATION

Apply molybdenum oil solution to the primary drive gear and sub-gear sliding surfaces.

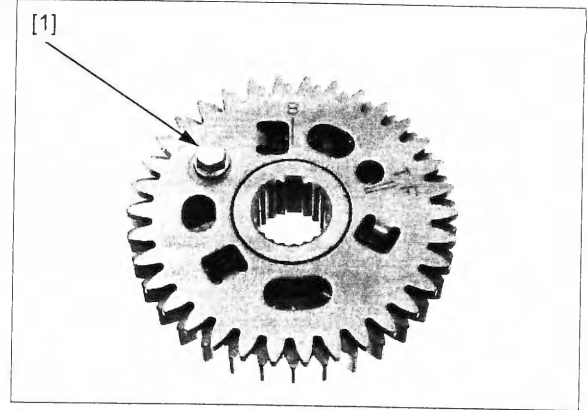
Install the springs [1] into the primary drive gear [2] grooves.

Install the primary drive sub-gear [3] onto the primary drive gear so that the tabs are positioned against the spring ends and the index line of "B" mark aligns with the wide tooth as shown.

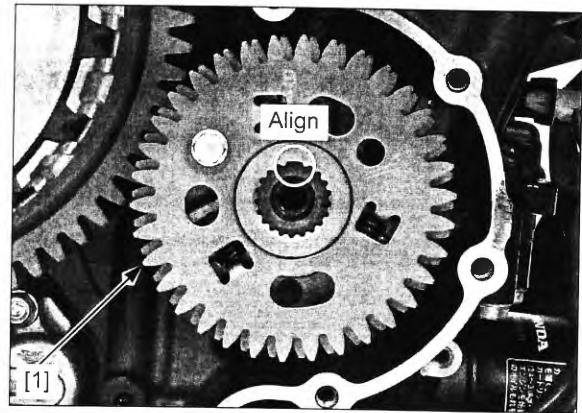


CLUTCH/GEARSHIFT LINKAGE

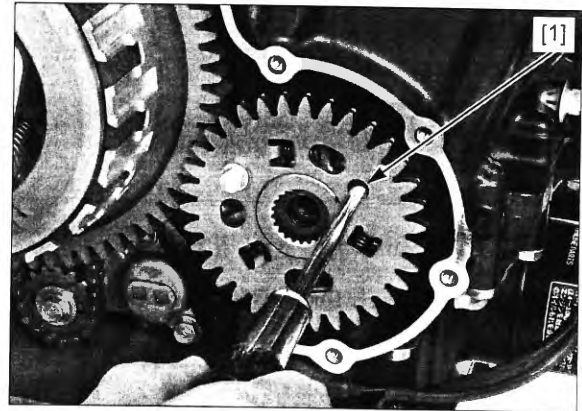
Loosely install a 6 x 14 mm bolt [1] to prevent disengaging the gears.



Install the primary drive gear [1] on the crankshaft by aligning its wide groove with the wide tooth of the crankshaft.



Align the primary drive (scissors) gear teeth by inserting a screwdriver into the gear slot [1] and prying the gears, then engage the sub-gear with the primary driven gear.



Apply engine oil to the primary drive gear bolt threads and seating surface.

Install the washer [1] and primary drive gear bolt [2].

Hold the primary drive gear using a special tool as shown, and tighten the primary drive gear bolt to the specified torque.

TOOL:

[3] Gear holder, 2.5

07724-0010100 or
07724-001A100
(U.S.A. only)

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

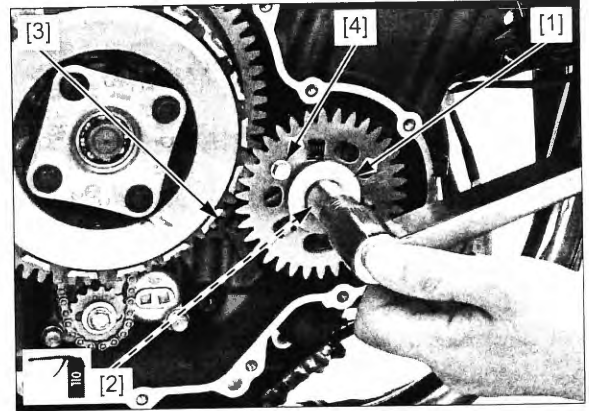
Remove the gear holder.

Remove the 6 x 14 mm bolt [4] from the primary drive gear.

NOTE:

- Do not forget to remove the 6 x 14 mm bolt after installing the primary drive gear.

Install the right crankcase cover (page 11-5).



GEARSHIFT LINKAGE

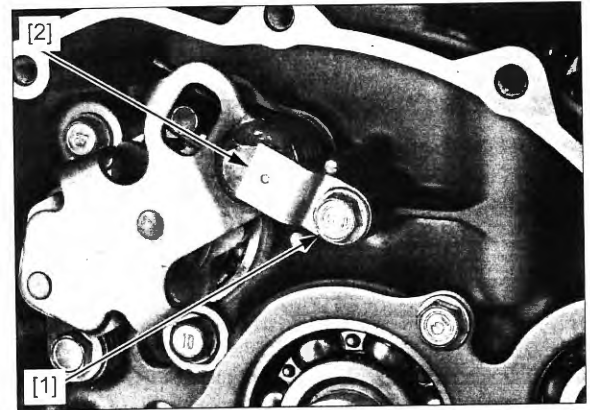
REMOVAL

Remove the following:

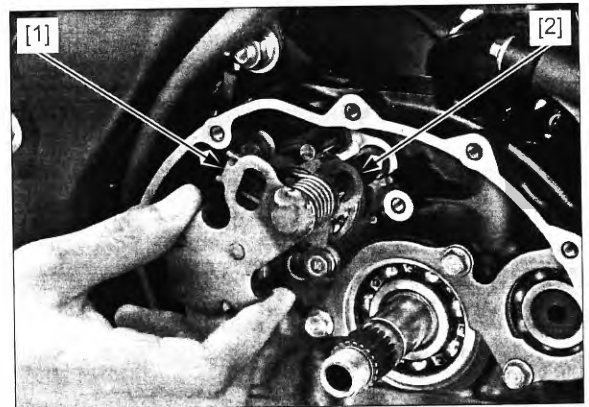
- clutch (page 11-7)
- gearshift arm (page 11-21)

Clean off any dirt from the gearshift spindle serration.

Remove the bolt [1] and setting plate [2].

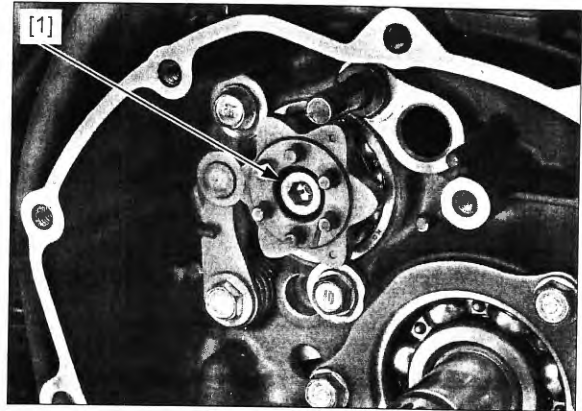


Pull the gearshift spindle assembly [1] and thrust washer [2] out of the crankcase.



CLUTCH/GEARSHIFT LINKAGE

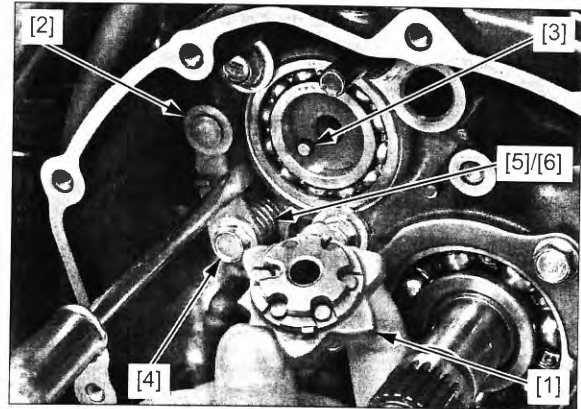
Remove the shift drum center socket bolt [1].



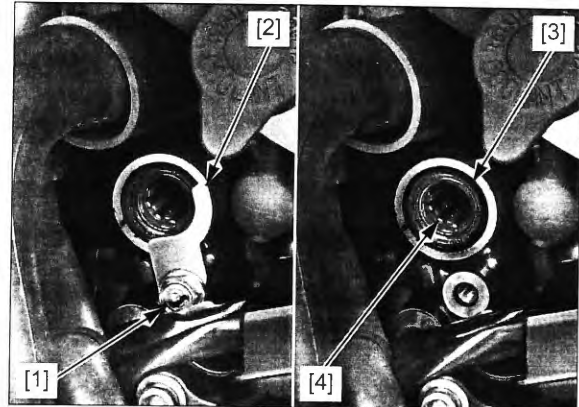
Remove the shift drum center [1] while holding the stopper arm [2] using a screwdriver as shown.

Remove the following:

- dowel pin [3]
- shift drum stopper arm pivot bolt [4]
- shift drum stopper arm
- washer [5]
- return spring [6]



Remove the bolt [1], gearshift spindle oil seal setting plate [2], oil seal [3] and needle bearing [4].



INSPECTION

Inspect the following parts for damage, abnormal wear and deformation. Replace if necessary.

- shift drum center
- shift drum stopper arm
- shift drum stopper arm return spring
- gearshift spindle needle bearing

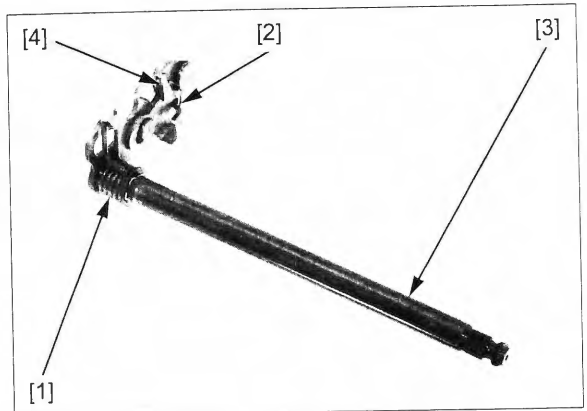
GEARSHIFT SPINDLE

Check the return spring [1] and spindle arm spring [2] for fatigue or damage replace them if necessary.

Check the gearshift spindle [3] for wear or bend.

Check the spindle arm [4] for wear, damage or deformation.

Replace the gearshift spindle as an assembly if necessary.



INSTALLATION

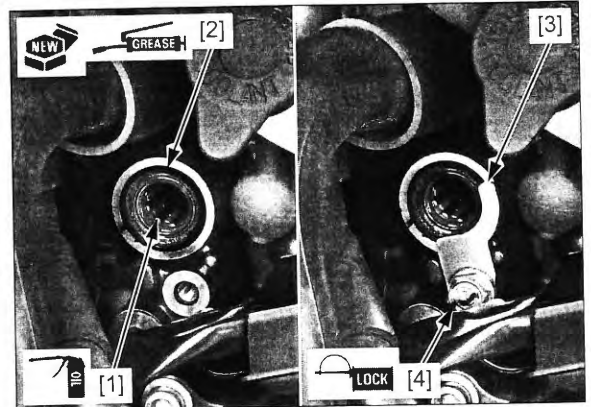
Apply engine oil to the gearshift spindle needle bearing [1], then install it into the crankcase.

Apply grease to a new oil seal [2] lips, then install it into the crankcase until it is flush with the crankcase surface.

Apply locking agent to the gearshift spindle oil seal setting plate bolt threads (page 1-20).

Install the gearshift spindle oil seal setting plate [3] in the direction as shown, and tighten the bolt [4] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



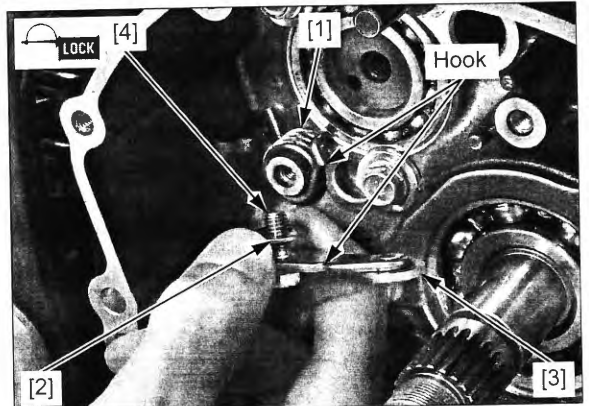
Apply locking agent to the shift drum stopper arm bolt threads (page 1-20).

Install the return spring [1], washer [2] and stopper arm [3] while hooking the return spring at the stopper arm groove.

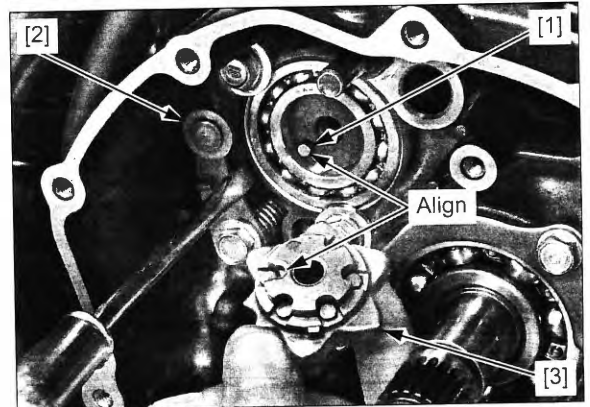
Install and tighten the stopper arm bolt [4] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Check the stopper arm for proper operation.



Install the dowel pin [1] into the hole of the shift drum.
Hold the stopper arm [2] using a screwdriver as shown.
Install the shift drum center [3] while aligning its slot with the dowel pin.

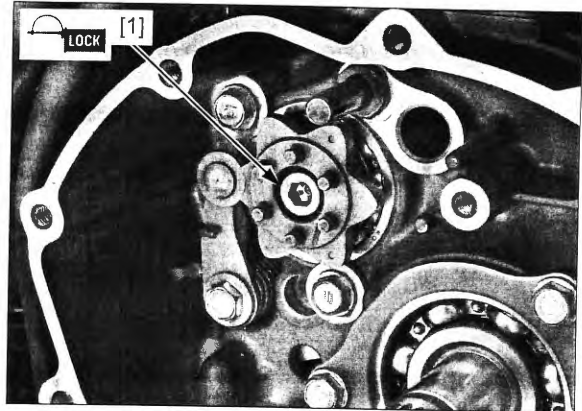


CLUTCH/GEARSHIFT LINKAGE

Apply locking agent to the shift drum center socket bolt threads (page 1-20).

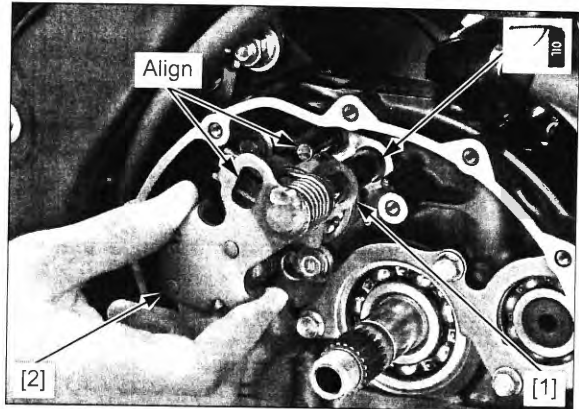
Install and tighten the shift drum center socket bolt [1] to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



Apply engine oil to the gearshift spindle shaft outer surface.

Install the thrust washer [1] and gearshift spindle assembly [2] into the crankcase while aligning the return spring ends with the spring pin.



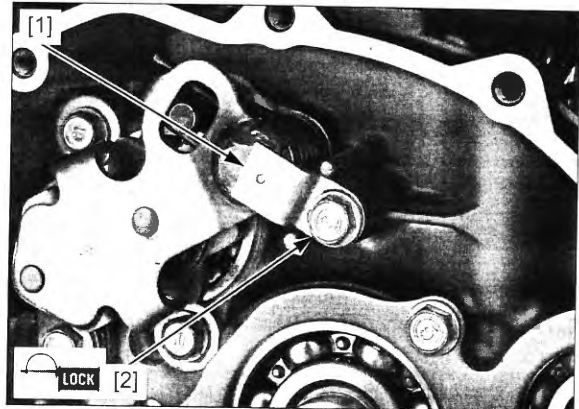
Apply locking agent to the setting plate bolt threads (page 1-20).

Install the setting plate [1], bolt [2] and tighten it to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the following:

- gearshift arm (page 11-21)
- clutch (page 11-11)



GEARSHIFT PEDAL REMOVAL/ INSTALLATION

Remove the pinch bolt [1] and gearshift arm [2] from the gearshift spindle.

Remove the pivot socket bolt [3] and gearshift pedal [4].

Remove the dust seals [5].

Check the dust seals and tie-rod ball joint dust cover [6] for deterioration or damage, replace them if necessary.

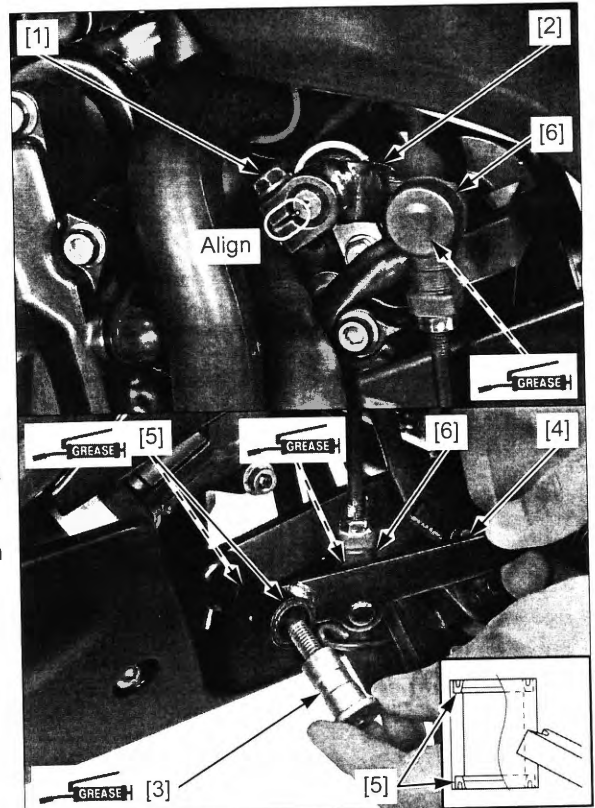
Installation is in the reverse order of removal.

TORQUE:

Gearshift pedal pivot socket bolt:
27 N·m (2.8 kgf·m, 20 lbf·ft)

NOTE:

- Apply grease to the dust seal lips.
- Install the dust seals with the seal lip side facing out.
- Apply grease to the gearshift pedal pivot sliding area (grease groove) of the pivot bolt.
- Apply grease to the gearshift pedal tie-rod ball joint.
- Align the slit of the gearshift arm with the punch mark on the spindle



When adjusting the gearshift pedal height, perform by loosening the lock nuts [1] and it must be noted as follows.

NOTE:

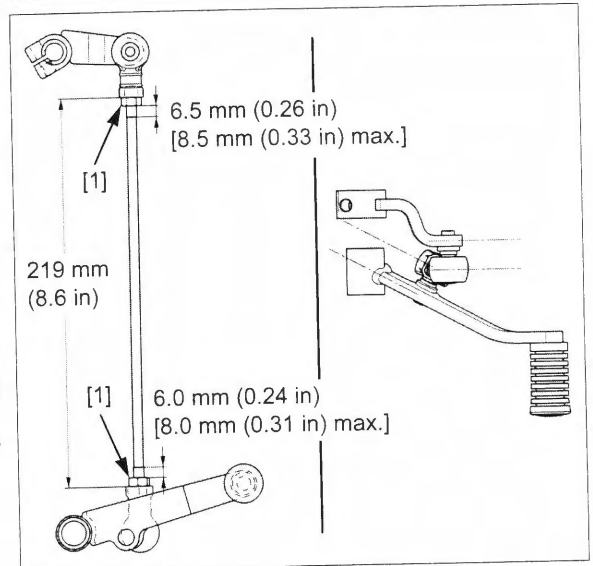
- The gearshift arm side lock nut has left hand threads.

Adjust the tie-rod length so that the distance between the ball joint ends is standard length as shown.

After adjustment tighten the gearshift pedal adjuster lock nuts securely.

NOTE:

- Tighten the lock nuts with the position of each ball joint in parallel to the gearshift arm and gearshift pedal as shown.
- Be sure the thread length from the lock nut is less than the specified value.
 - gearshift arm side: 8.5 mm (0.33 in)
 - gearshift pedal side: 8.0 mm (0.31 in)



MEMO

12. ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION	12-2	STATOR/CKP SENSOR	12-4
TROUBLESHOOTING.....	12-2	FLYWHEEL	12-5
COMPONENT LOCATION	12-2	STARTER CLUTCH	12-7
LEFT CRANKCASE COVER	12-3		

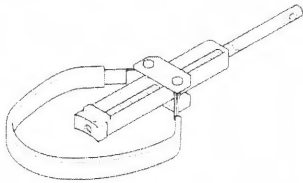
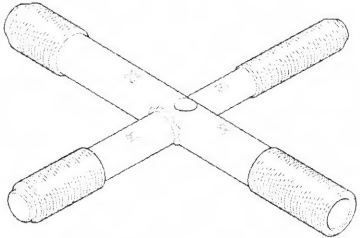
ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION

GENERAL

- This section covers service of the alternator stator and flywheel. All service can be done with the engine installed in the frame.
- For alternator charging coil inspection (page 20-7).
- For CKP sensor inspection (page 5-6).
- For starter motor service (page 6-5).

TOOLS

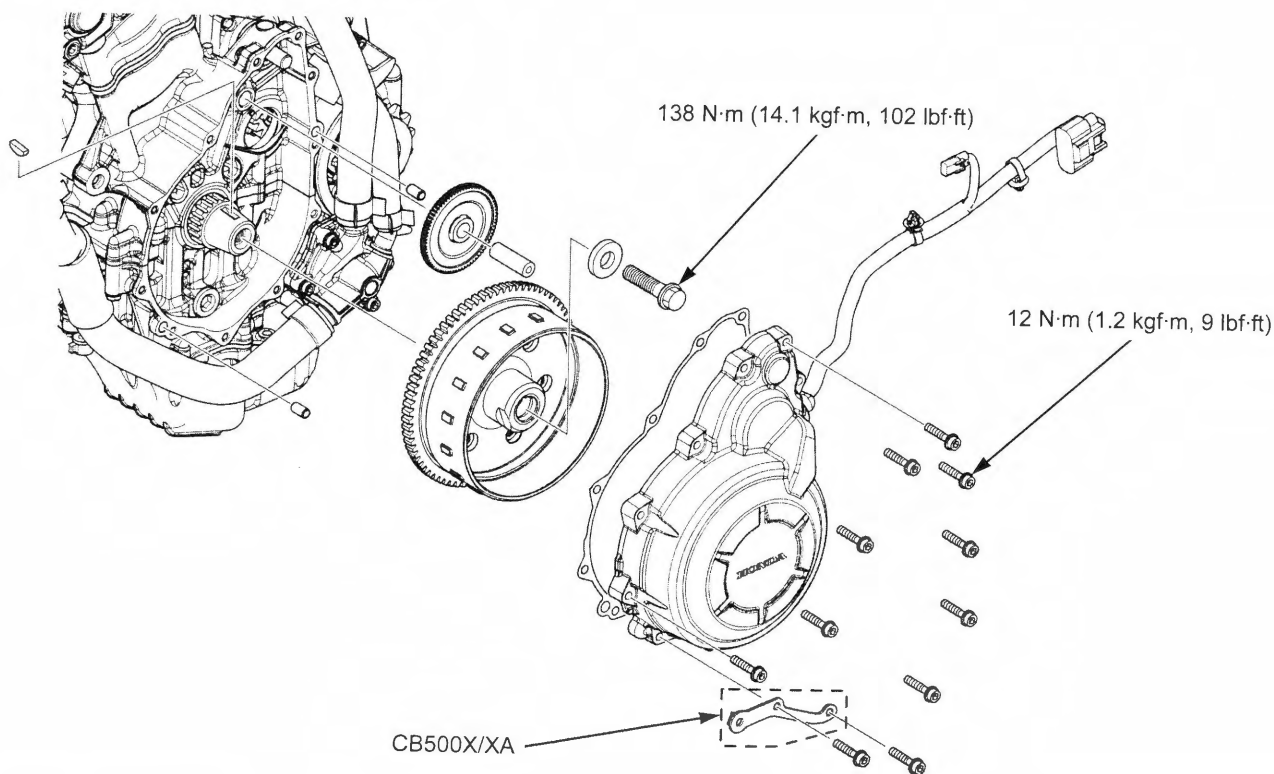
<p>Flywheel holder 07725-0040001</p> 	<p>Rotor puller 07733-0020001</p>  <p>or 07933-3950000 (U.S.A. only)</p>
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TROUBLESHOOTING

Starter motor turns, but engine does not turn

- Faulty starter clutch
- Damaged starter reduction gear/shaft
- Damaged or faulty starter motor pinion gear
- Damaged starter driven gear

COMPONENT LOCATION



LEFT CRANKCASE COVER

REMOVAL/INSTALLATION

NOTE:

- Place a clean oil pan under the engine because engine oil will flow out when removing the left crankcase cover. Add the recommended engine oil to the specified level after installation (page 3-10).

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

Remove the following:

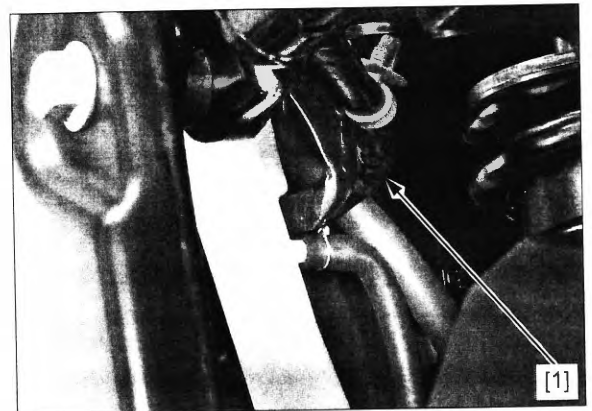
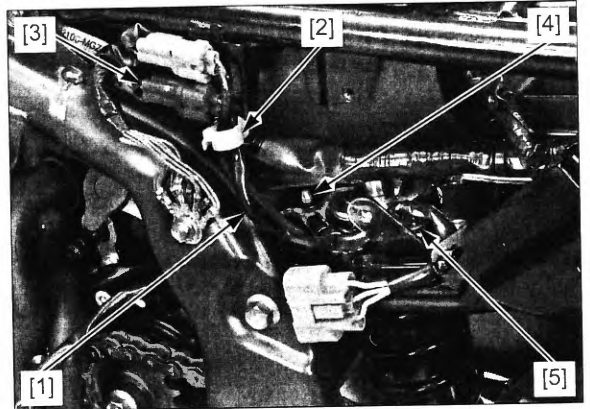
- under cowl (page 2-22)
- drive sprocket cover (page 2-24)
- regulator/rectifier (page 20-7)

Release the CKP sensor wire [1] from the clip [2].

Disconnect the CKP sensor 2P (Red) connector [3].

Remove the stator/CKP sensor wire harness band clips (Brown [4], Black [5]) from the frame.

Remove the stator/CKP sensor wire harness [1] out of the frame.



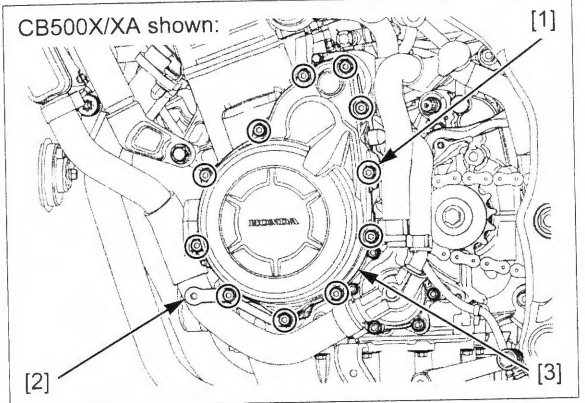
Loosen the left crankcase cover bolts [1] in a crisscross pattern in 2 or 3 steps.

Remove the following:

- bolts
- under cowl stay (CB500X/XA) [2]
- left crankcase cover [3]

NOTE:

- The left crankcase cover (stator) is magnetically attracted to the flywheel, be careful during removal and installation.



ALTERNATOR/STARTER CLUTCH

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.

TORQUE:

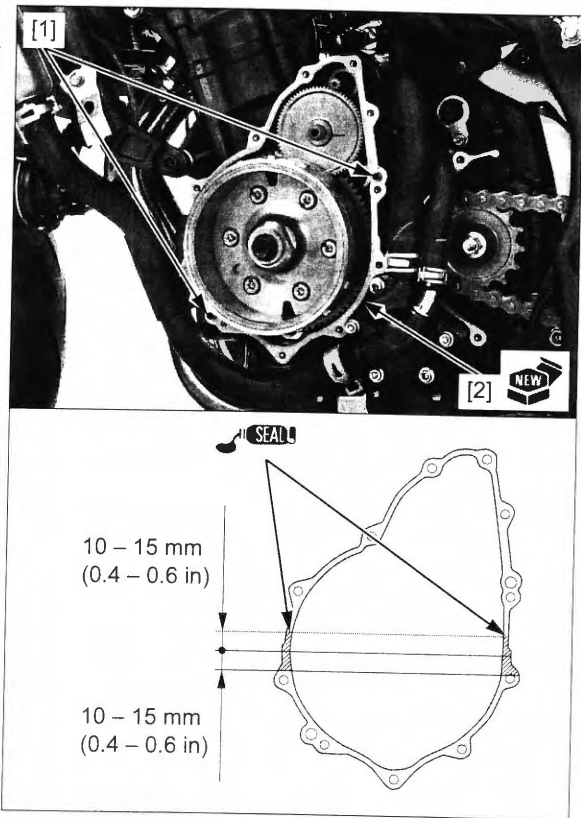
Left crankcase cover bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:

- Apply liquid sealant to the mating areas of crankcase as shown (page 1-20).
- Replace the left crankcase cover gasket with a new one.

Check the oil level (page 3-10).

Make sure there are no oil leaks.



STATOR/CKP SENSOR

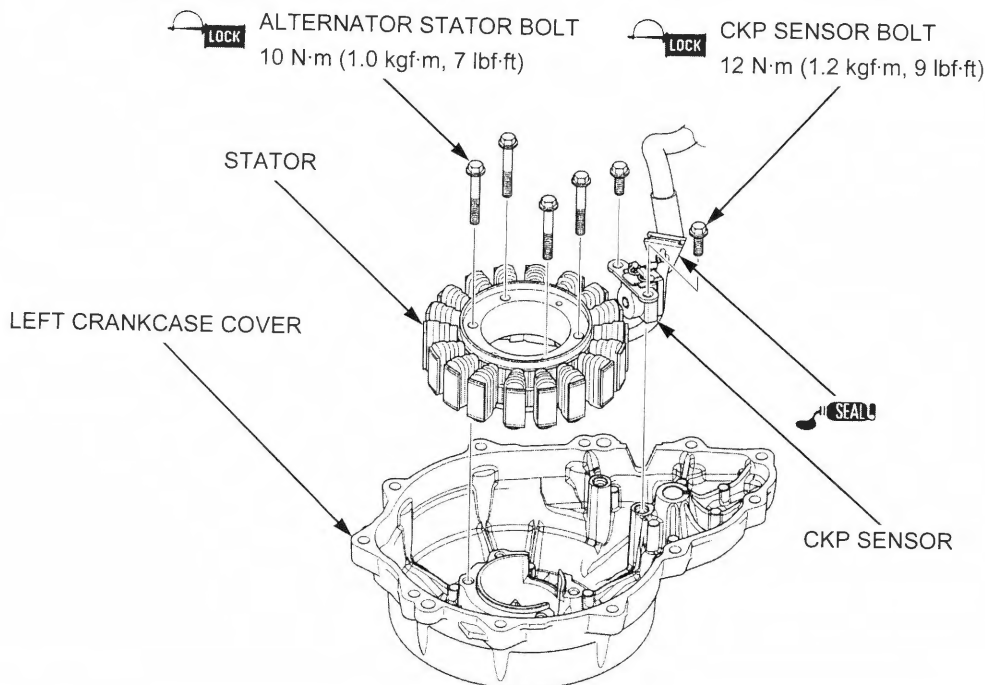
REMOVAL/INSTALLATION

Remove the left crankcase cover (page 12-3).

Remove and install the stator/CKP sensor as following illustration.

- Apply locking agent to the stator and CKP sensor bolt threads (page 1-20).
- Apply sealant to the alternator/CKP sensor wire grommet sealing surface (page 1-20).

Installation is in the reverse order of removal.

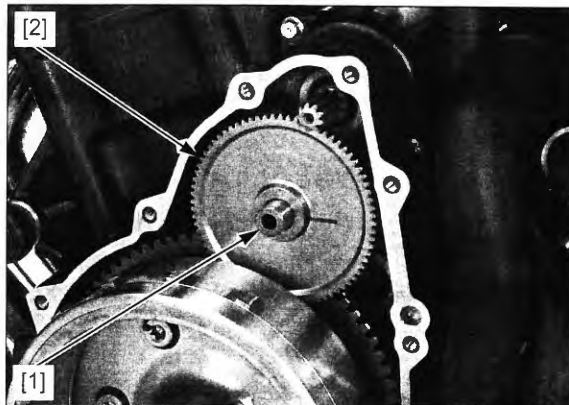


FLYWHEEL

REMOVAL

Remove the left crankcase cover (page 12-3).

Remove the starter reduction gear shaft [1] and starter reduction gear [2].



Hold the flywheel [1] using the special tool and loosen the flywheel bolt [2].

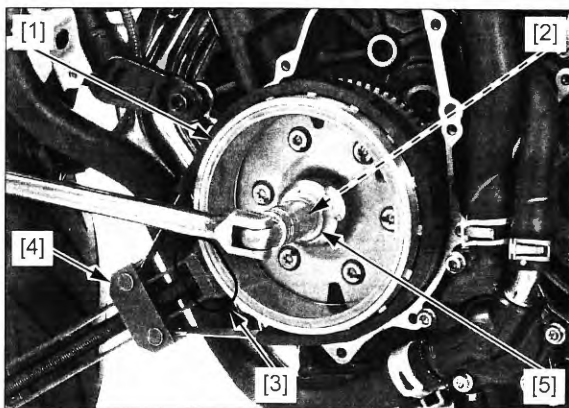
NOTE:

- Set the holding block [3] of the flywheel holder [4] avoiding the flywheel reluctors.

TOOL:

Flywheel holder 07725-0040001

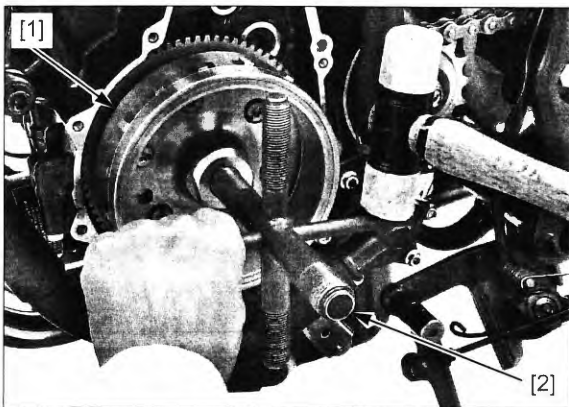
Remove the flywheel bolt and washer [5].



Remove the flywheel [1] using the special tool.

TOOL:

[2] Rotor puller 07733-0020001 or 07933-3950000 (U.S.A. only)



Be careful not to damage the key groove and crankshaft. Remove the woodruff key [1].



ALTERNATOR/STARTER CLUTCH

INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

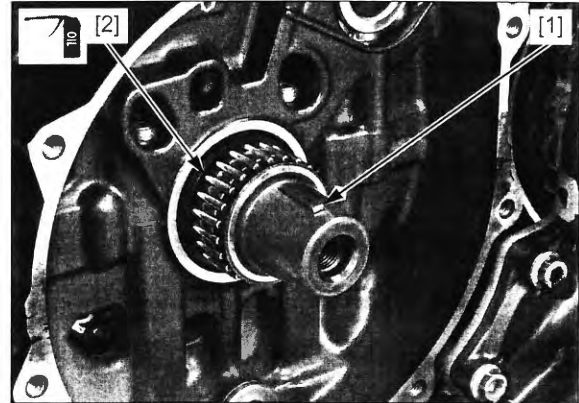
- starter reduction gear shaft
- starter reduction gear
- woodruff key
- needle bearing

INSTALLATION

Be careful not to damage the key groove and crankshaft.

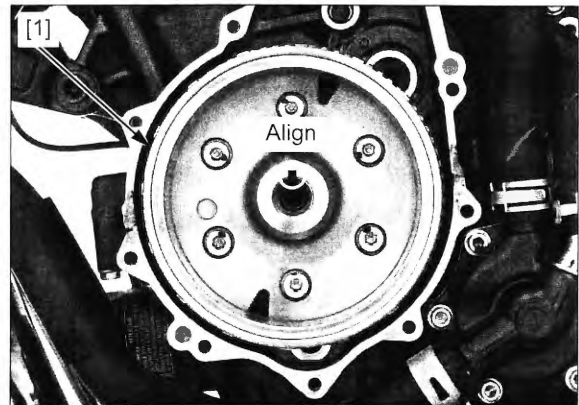
Install the woodruff key [1].

Apply engine oil to the needle bearing [2] rotating area.



Clean any oil from the crankshaft tapered area and flywheel thoroughly.

Install the flywheel [1] while aligning the woodruff key on the crankshaft with flywheel keyway.



Apply engine oil to the flywheel bolt threads and seating surface.

Install the washer [1] and flywheel bolt [2].

Hold the flywheel [3] using the special tool and tighten the flywheel bolt to the specified torque.

NOTE:

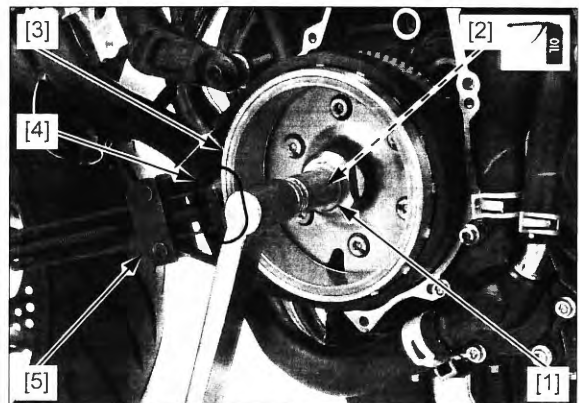
- Set the holding block [4] of the flywheel holder [5] avoiding the flywheel reluctors.

TOOL:

Flywheel holder

07725-0040001

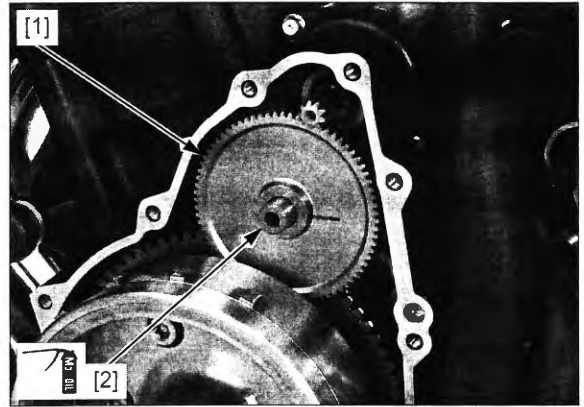
TORQUE: 138 N·m (14.1 kgf·m, 102 lbf·ft)



Apply molybdenum oil solution to the starter reduction gear shaft outer surface.

Install the starter reduction gear [1] and shaft [2].

Install the left crankcase cover (page 12-3).



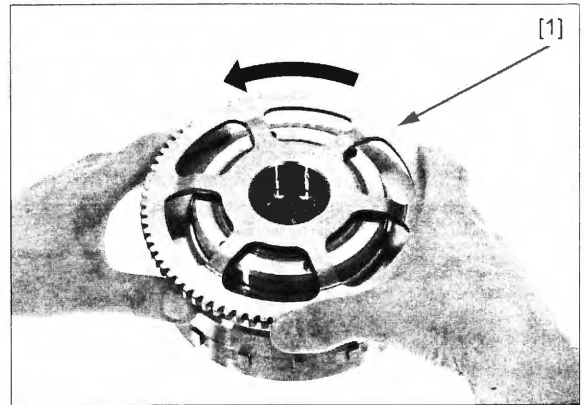
STARTER CLUTCH

ONE-WAY CLUTCH OPERATION INSPECTION

Remove the flywheel (page 12-5).

Check the operation of the one-way clutch by turning the starter driven gear [1].

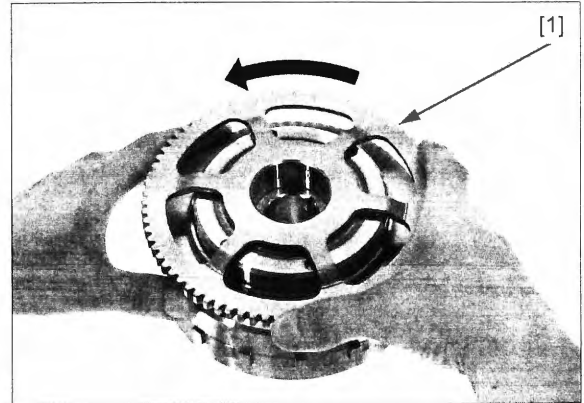
Make sure that the starter driven gear turns counterclockwise smoothly and does not turn clockwise.



REMOVAL

Remove the flywheel (page 12-5).

Remove the starter driven gear [1] while turning the starter driven gear counterclockwise.



Hold the flywheel [1] using the special tool and remove the starter clutch socket bolt [2].

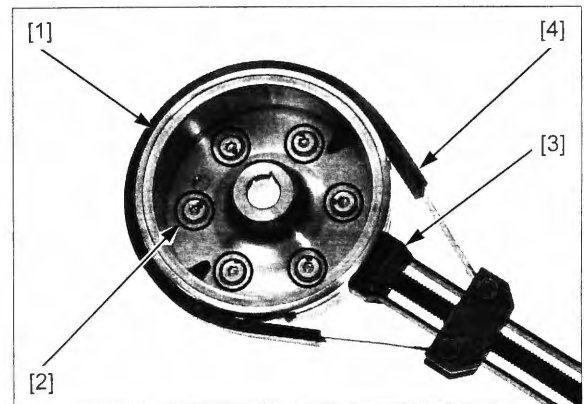
NOTE:

- Set the holding block [3] of the flywheel holder [4] avoiding the flywheel reluctors.

TOOL:

Flywheel holder

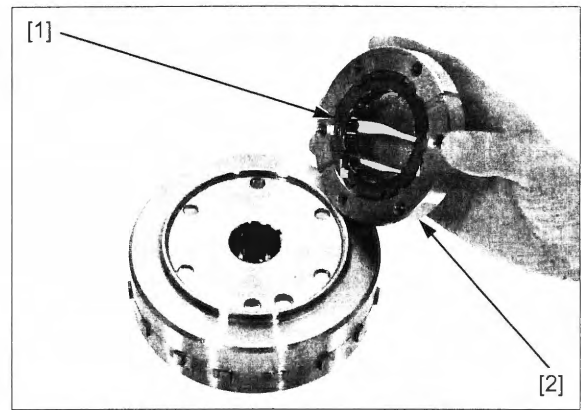
07725-0040001



ALTERNATOR/STARTER CLUTCH

Remove the starter clutch assembly.

Remove the starter one-way clutch [1] from the starter clutch outer [2].



INSPECTION

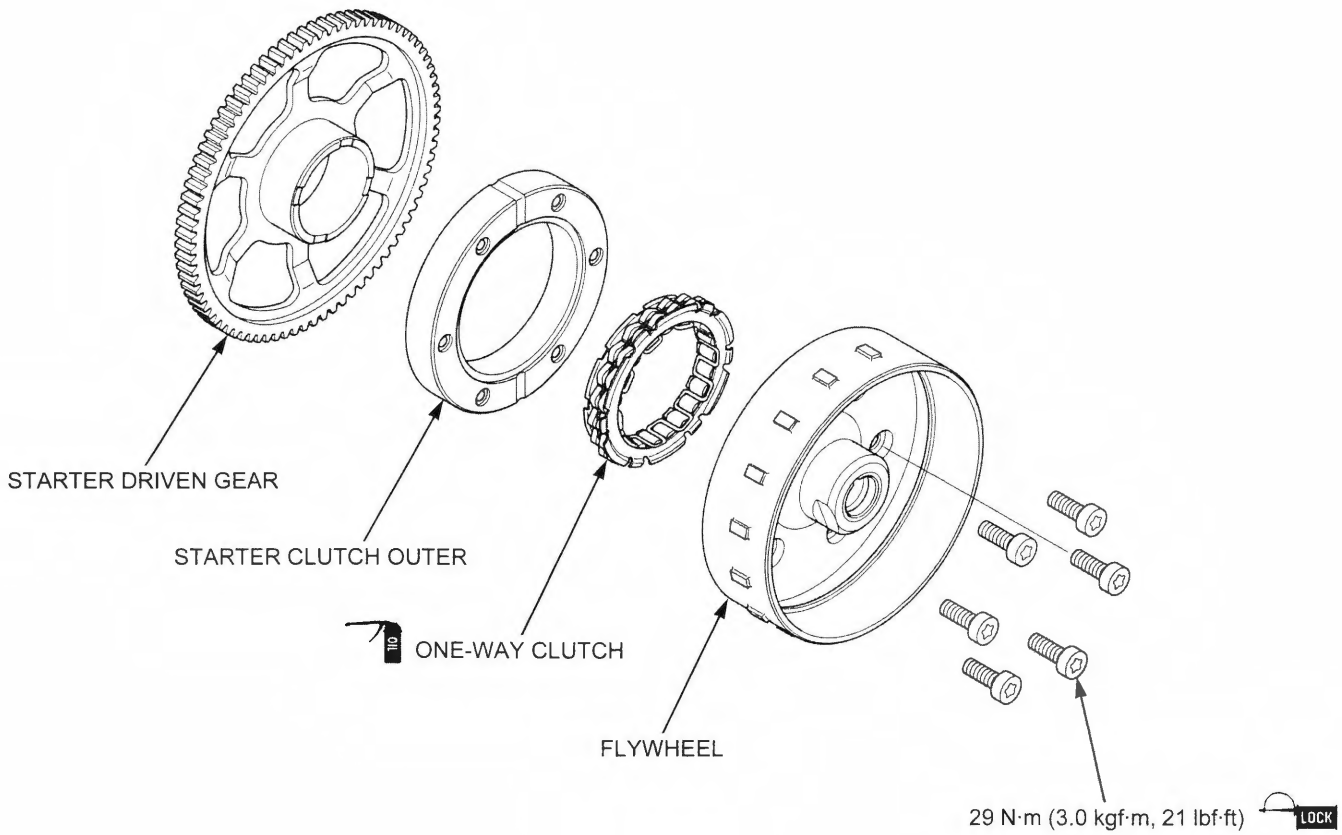
Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

- starter driven gear
- starter clutch outer
- starter one-way clutch

Measure each part according to ALTERNATOR/STARTER CLUTCH SPECIFICATIONS (page 1-10).

Replace any part if it is out of service limit.

INSTALLATION

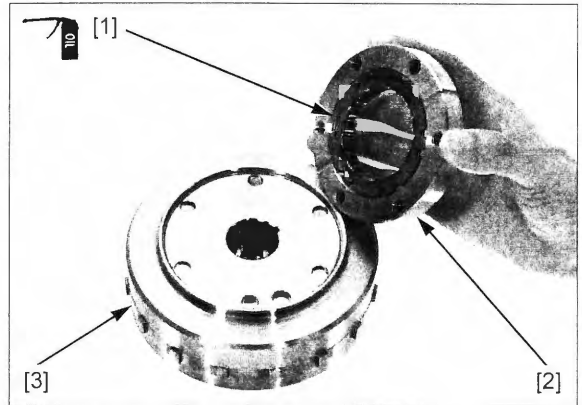


ALTERNATOR/STARTER CLUTCH

Apply engine oil to the starter one-way clutch contacting surface.

Install the starter one-way clutch [1] into the starter clutch outer [2].

Install the starter clutch assembly onto the flywheel [3].



Hold the flywheel [1] using the special tool.

NOTE:

- Set the holding block [2] of the flywheel holder [3] avoiding the flywheel reluctors.

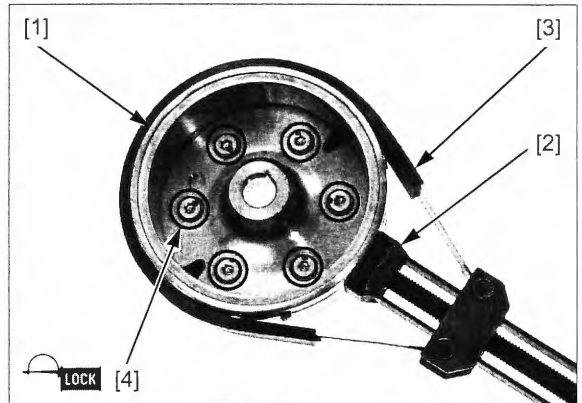
TOOL:

Flywheel holder 07725-0040001

Apply locking agent to the starter clutch socket bolt threads (page 1-20).

Install and tighten the starter clutch socket bolt [4] to the specified torque.

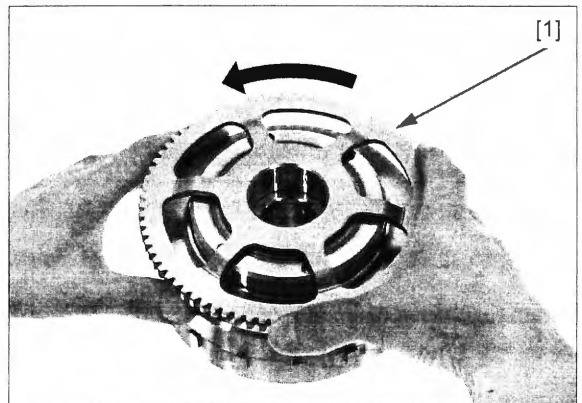
TORQUE: 29 N·m (3.0 kgf·m, 21 lbf·ft)



Install the starter driven gear [1] into the starter clutch outer while turning the starter driven gear counterclockwise.

Check the one-way clutch operation (page 12-7).

Install the flywheel (page 12-6).



MEMO

13. CRANKCASE/TRANSMISSION

SERVICE INFORMATION	13-2	CRANKCASE	13-5
TROUBLESHOOTING	13-3	TRANSMISSION	13-8
COMPONENT LOCATION	13-4		

CRANKCASE/TRANSMISSION

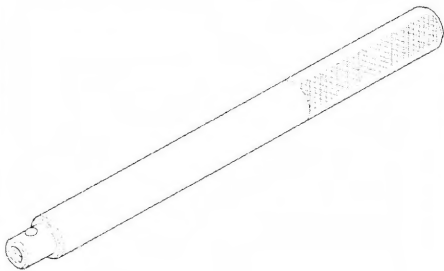
SERVICE INFORMATION

GENERAL

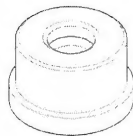
- The crankcase must be separated to service the following:
 - transmission
 - crankshaft (page 14-4)
 - balancer (page 14-17)
 - piston/connecting rod/cylinder (page 14-13)
- The following components must be removed before separating the crankcase:
 - engine (page 15-4)
 - gearshift linkage (page 11-17)
 - flywheel (page 12-5)
 - cylinder head (page 10-16)
 - cam chain tensioner lifter (page 10-23)
 - cam chain/timing sprocket (page 10-24)
 - oil strainer (page 9-8)
 - pressure relief valve (page 9-7)
 - engine oil filter (page 3-10)
 - water pump (page 8-10)
 - water hose joint (page 8-11)
 - EOP switch (page 21-16)
 - VS sensor (page 4-40)
 - neutral switch (page 21-20)
- Be careful not to damage the crankcase mating surfaces when servicing.
- Clean the oil passages before assembling the crankcase halves.
- Prior to assembling the crankcase halves, apply sealant to their mating surfaces. Wipe off excess sealant thoroughly.
- 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.

TOOLS

Driver
07949-3710001



Attachment, 32 x 35 mm
07746-0010100



TROUBLESHOOTING

Hard to shift

- Improper clutch operation
- Improper engine oil viscosity
- Bent shift fork
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum guide groove
- Bent gearshift spindle (page 11-19)

Transmission jumps out of gear

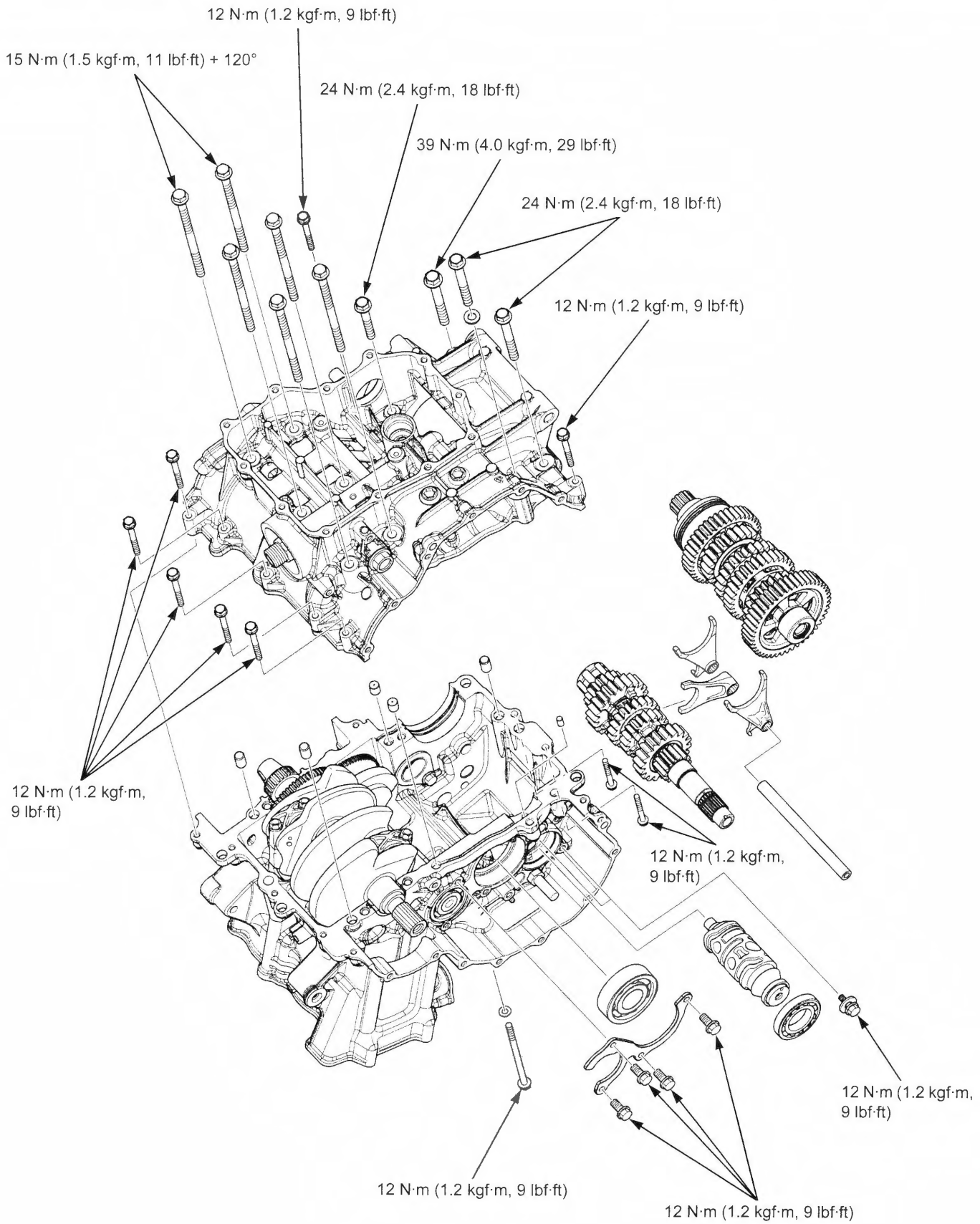
- Worn gear dogs
- Worn gear shifter groove
- Bent shift fork shaft
- Broken shift drum stopper arm (page 11-18)
- Broken shift drum stopper arm return spring (page 11-18)
- Worn or bent shift forks
- Broken gearshift spindle return spring (page 11-19)

Excessive engine noise

- Worn or damaged transmission gear
- Worn or damaged transmission bearings

CRANKCASE/TRANSMISSION

COMPONENT LOCATION

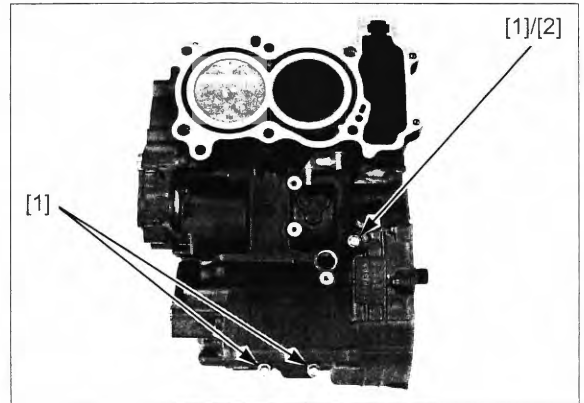


CRANKCASE

SEPARATION

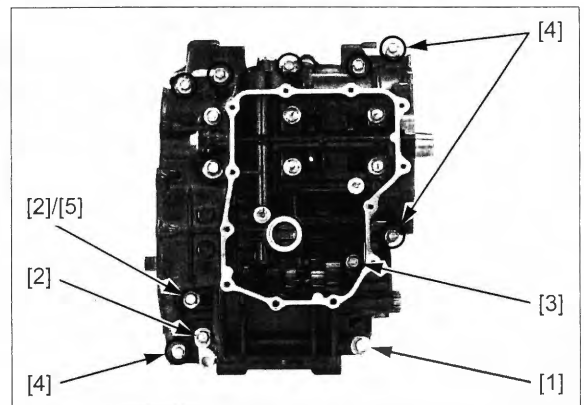
Refer to Service Information for removal of necessary parts before separating the crankcase (page 13-2).

Remove the crankcase 6 mm bolts [1] and sealing washer [2].



Place the engine upside down.

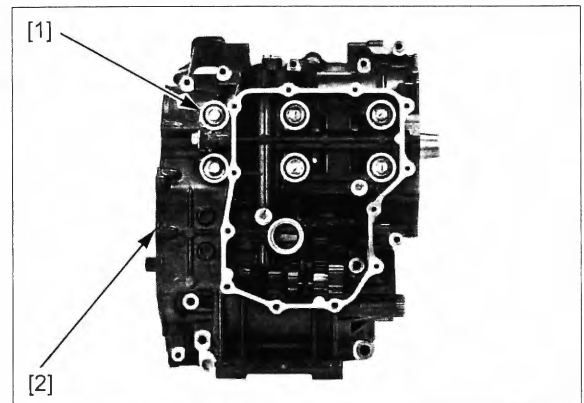
Loosen the crankcase 10 mm bolt [1], 8 x 75 mm bolts [2], 8 x 55 mm bolt [3] and 6 mm bolts [4] in a crisscross pattern in 2 or 3 steps, and remove all the bolts and sealing washer [5].



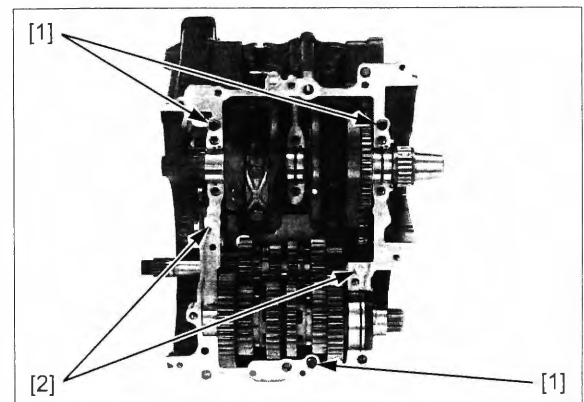
Loosen the crankcase main journal bolt [1] in a crisscross pattern in 2 or 3 steps, and remove them.

Separate the lower crankcase [2] from the upper crankcase.

Do not pry the crankcase halves with a screwdriver.



Remove the dowel pins [1] and oil orifices [2].



CRANKCASE/TRANSMISSION

ASSEMBLY

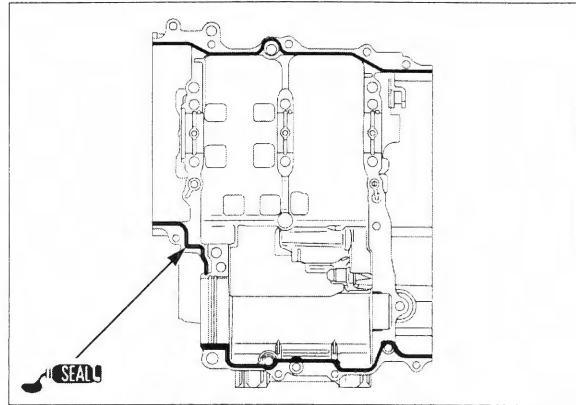
Clean the upper and lower crankcase mating surfaces thoroughly, being careful not to damage them.

Check the crankcase oil passages for clogs, and clean them if necessary.

Apply liquid sealant to the crankcase mating surface as shown (page 1-20).

NOTE:

- Do not apply liquid sealant more than necessary.
- Do not apply liquid sealant to the crankcase main journal bolts area and the oil passage area.

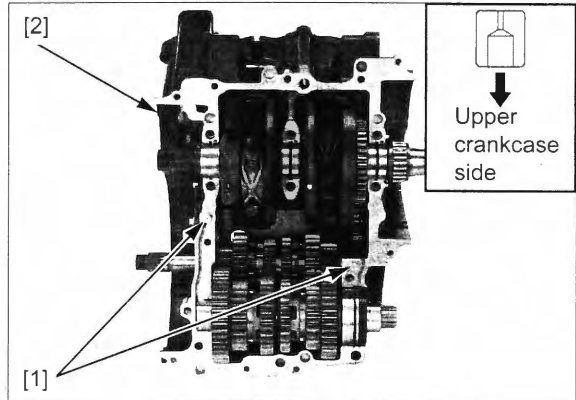


Clean the oil orifices in solvent thoroughly.

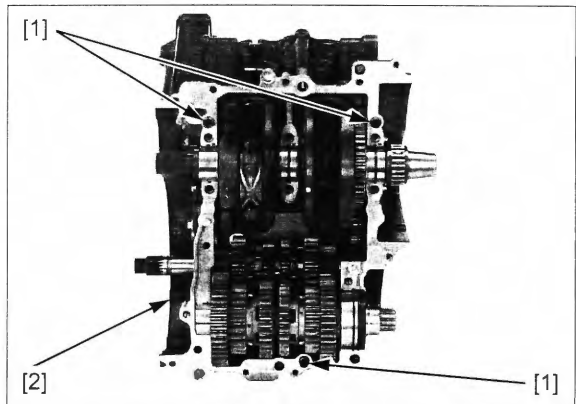
Check the oil orifices for clogs, and replace them if necessary.

Install the oil orifices with its large I.D. side facing the upper crankcase.

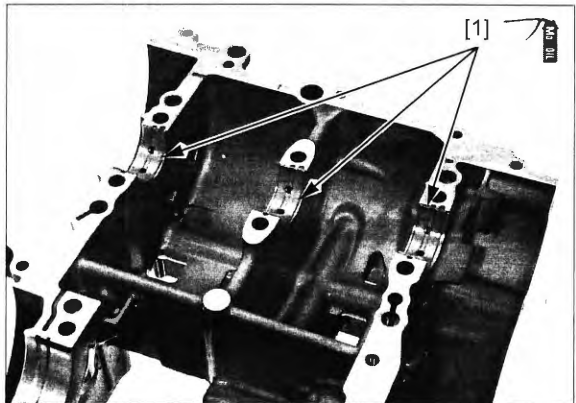
Install the oil orifices [1] into the upper crankcase [2].



Install the dowel pins [1] into the upper crankcase [2].



Apply molybdenum oil solution to the main journal bearing [1] sliding surfaces on the lower crankcase.



Install the lower crankcase [1] onto the upper crankcase.

Install new crankcase main journal bolts [2].

NOTE:

- Tighten the crankcase main journal bolts using the Plastic Region Tightening Method.
- Do not reuse the crankcase main journal bolts, because the correct axial tension will not be obtained.
- The crankcase main journal bolts are pre-coated with an oil additive for axial tension stability. Do not remove the oil additive from the new crankcase main journal bolt surfaces.

Make sure the upper and lower crankcase are seated securely.

Tighten the crankcase main journal bolts in numerical order as shown in a crisscross pattern in 2 or 3 steps to the specified torque.

Further tighten the crankcase main journal bolts 120°.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft) + 120°

Install a new sealing washer [1] and crankcase bolts.

Tighten the crankcase bolts in a crisscross pattern in 2 or 3 steps to the specified torque.

NOTE:

- The sealing washer location is indicated on the lower crankcase by the "△" mark.

TORQUE:

- Crankcase 10 mm bolt [2]:**
39 N·m (4.0 kgf·m, 29 lbf·ft)
- Crankcase 8 x 75 mm bolt [3]:**
24 N·m (2.4 kgf·m, 18 lbf·ft)
- Crankcase 8 x 55 mm bolt [4]:**
24 N·m (2.4 kgf·m, 18 lbf·ft)
- Crankcase 6 mm bolt [5]:**
12 N·m (1.2 kgf·m, 9 lbf·ft)

Place the engine with the lower side down.

Install a new sealing washer [1] and crankcase 6 mm bolts [2].

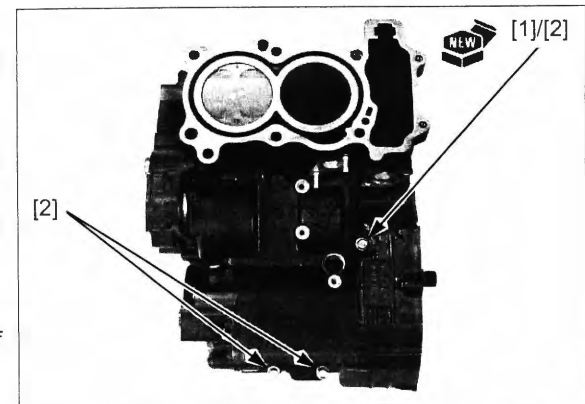
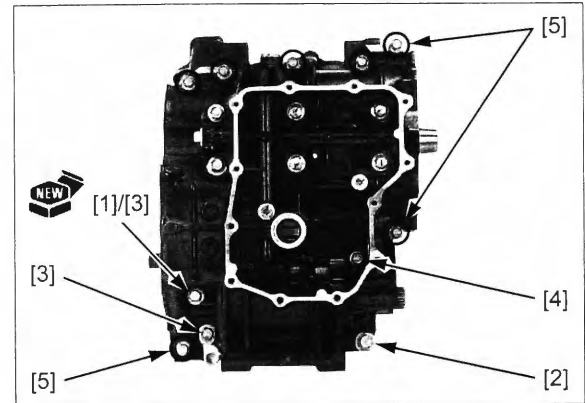
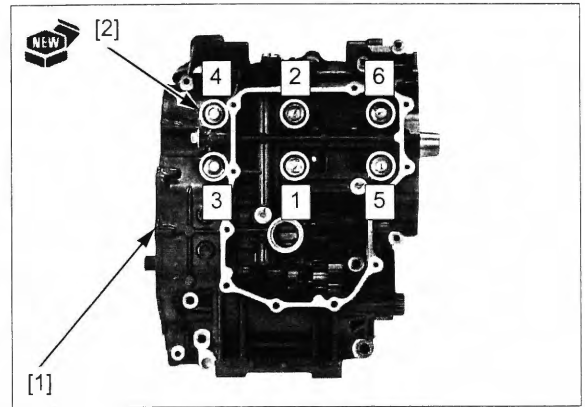
NOTE:

- The sealing washer location is indicated on the upper crankcase by the "△" mark.

Tighten the crankcase 6 mm bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the removed parts in the reverse order of removal (page 13-2).

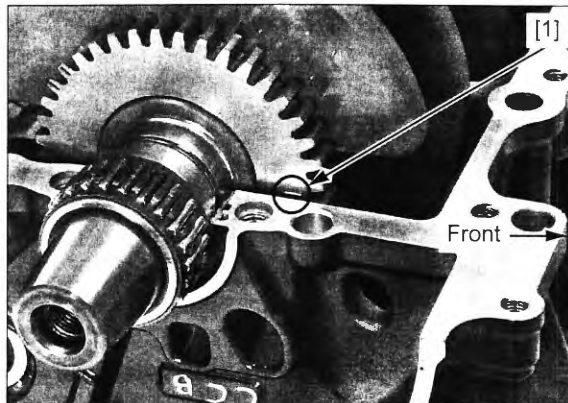


TRANSMISSION

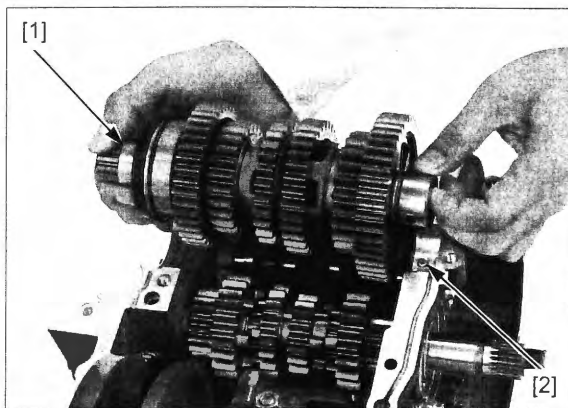
REMOVAL/DISASSEMBLY

Separate the crankcase halves (page 13-5).

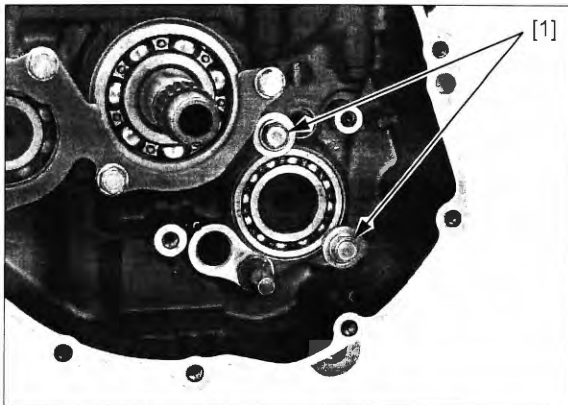
Align the index line [1] on the balancer drive gear with the upper crankcase top surface of the front side.



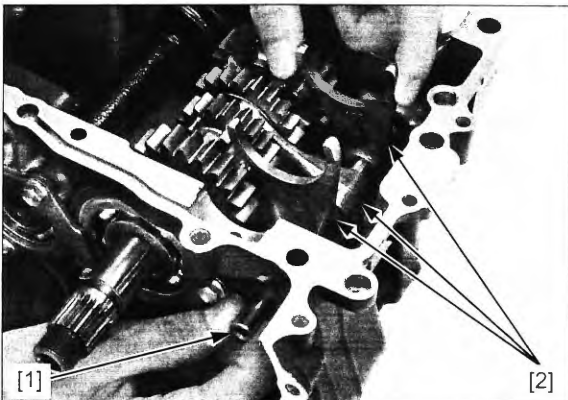
Remove the countershaft assembly [1] and dowel pin [2].



Remove the shift drum bearing setting washer-bolts [1].

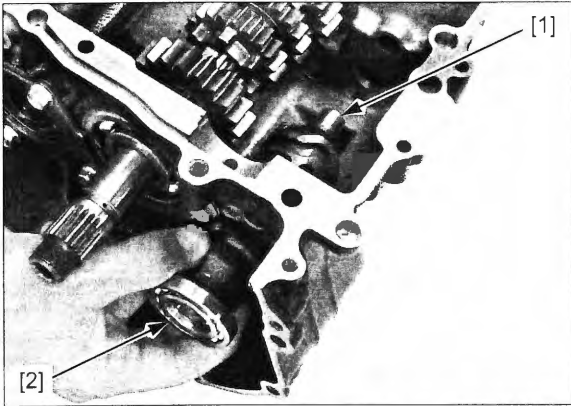


Remove the shift fork shaft [1] and shift forks [2].

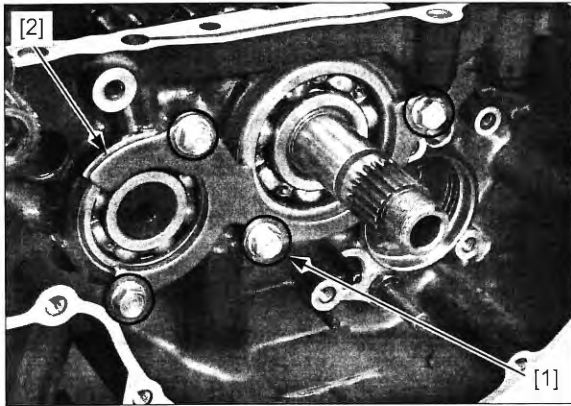


CRANKCASE/TRANSMISSION

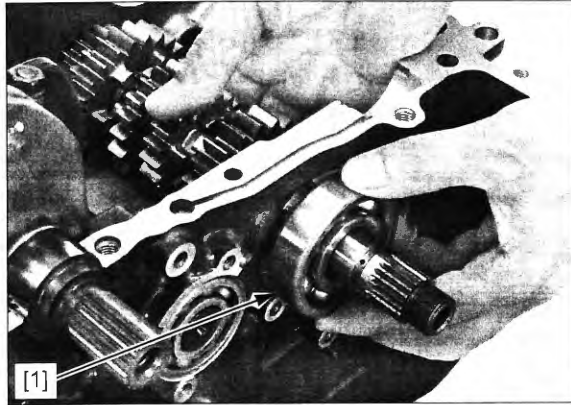
Remove the shift drum [1]/bearing [2] assembly.
Remove the shift drum bearing from the shift drum.



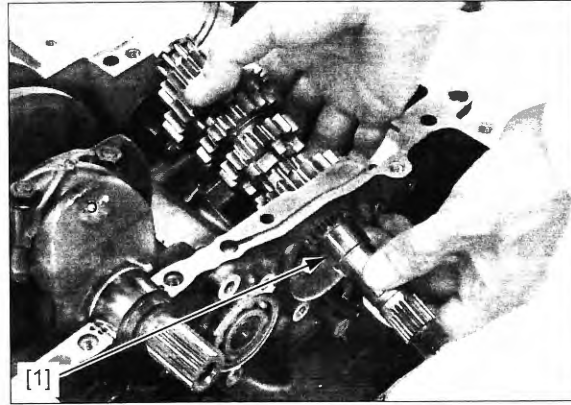
Remove the bolts [1] and balancer/right mainshaft bearing setting plate [2].



Slide the mainshaft assembly off the upper crankcase and remove the right mainshaft bearing [1].



Remove the mainshaft assembly [1].

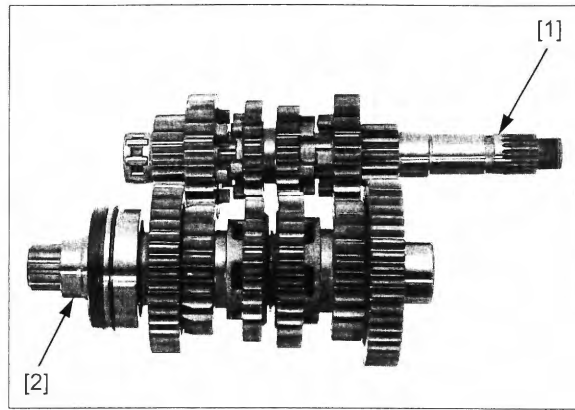


CRANKCASE/TRANSMISSION

Disassemble the mainshaft assembly [1] and countershaft assembly [2].

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.



INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

- transmission gears
- transmission bushings
- transmission bearings
- shift drum/bearing
- shift forks
- shift fork shaft

Measure each part and calculate the clearance according to CRANKCASE/TRANSMISSION SPECIFICATIONS (page 1-10).

Replace any part if it is out of service limit.

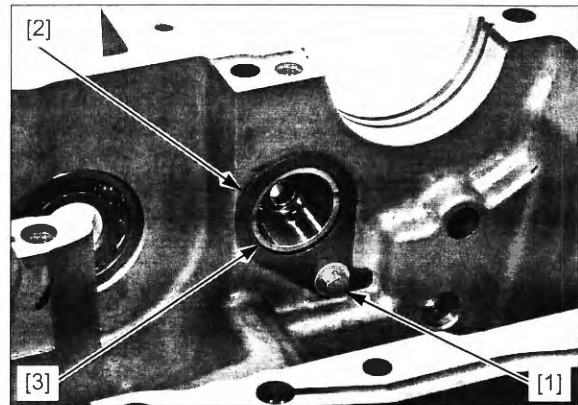
LEFT MAINSHAFT BEARING OUTER RACE REPLACEMENT

Remove the following:

- balancer (page 14-17)
- piston (page 14-13)

Remove the bolt [1] and bearing outer race setting plate [2].

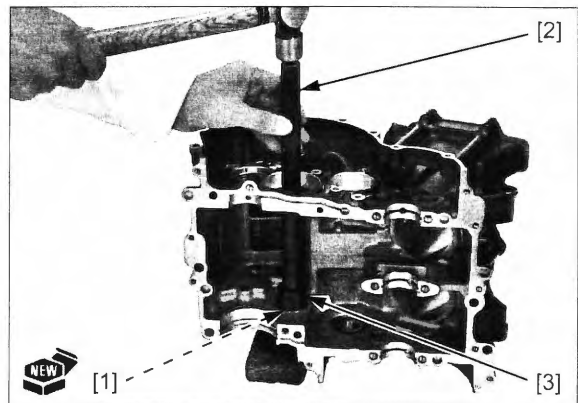
Remove the left mainshaft bearing outer race [3] from the upper crankcase using a suitable tool.



Drive in a new left mainshaft bearing outer race [1] squarely into the upper crankcase until it is fully seated using the special tools.

TOOLS:

- | | |
|----------------------------|---------------|
| [2] Driver | 07949-3710001 |
| [3] Attachment, 32 x 35 mm | 07746-0010100 |

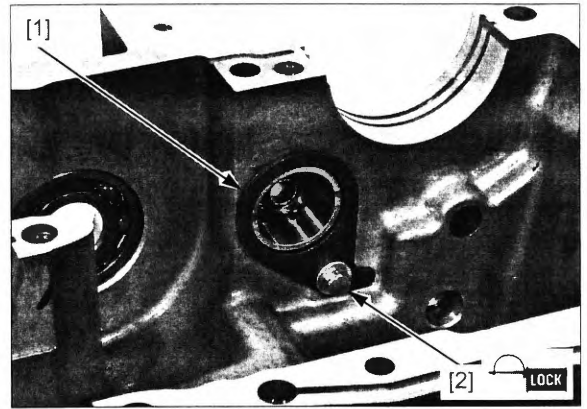


Apply locking agent to the bearing outer race setting plate bolt threads (page 1-20).

Install the bearing outer race setting plate [1], bolt [2] and tighten the bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the removed parts in the reverse order of removal.



ASSEMBLY

Clean all parts in solvent, and dry them thoroughly.

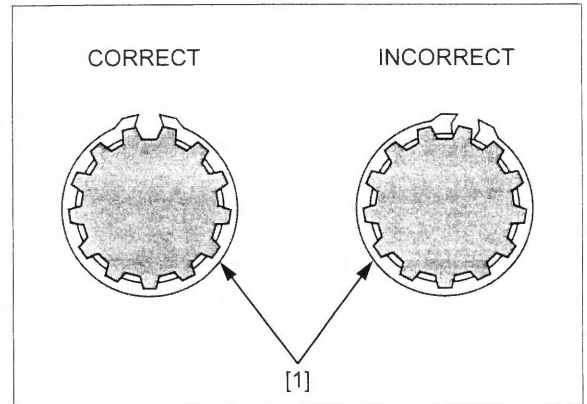
Apply engine oil to the gear teeth, rotating surface and bearing.

Apply molybdenum oil solution to the gear spline bushing outer surface (M6, C3, C4), gear bushing entire surface (M5, C2), needle bearing rotating area (C1) and gear shifter grooves (M3/4, C5, C6).

Assemble the mainshaft and countershaft.

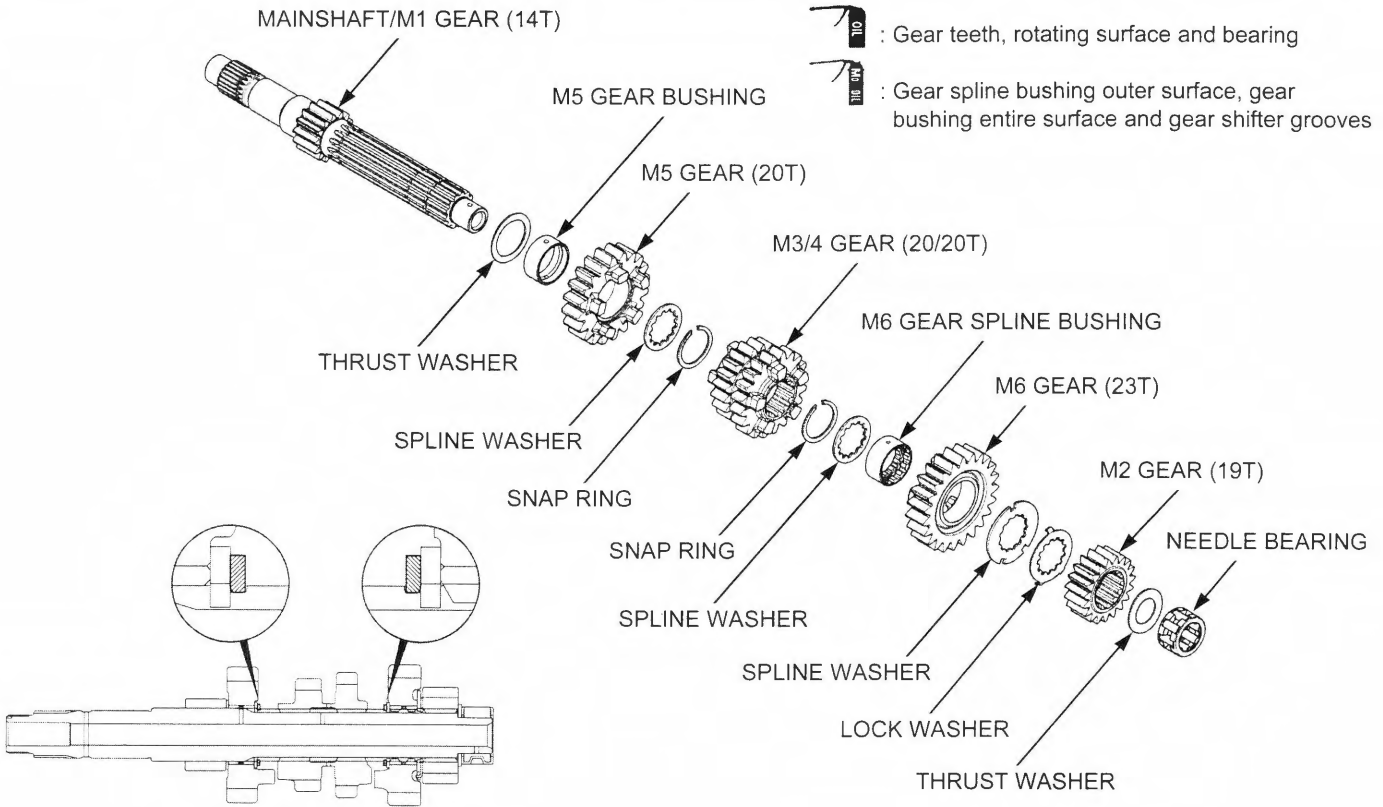
NOTE:

- 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.

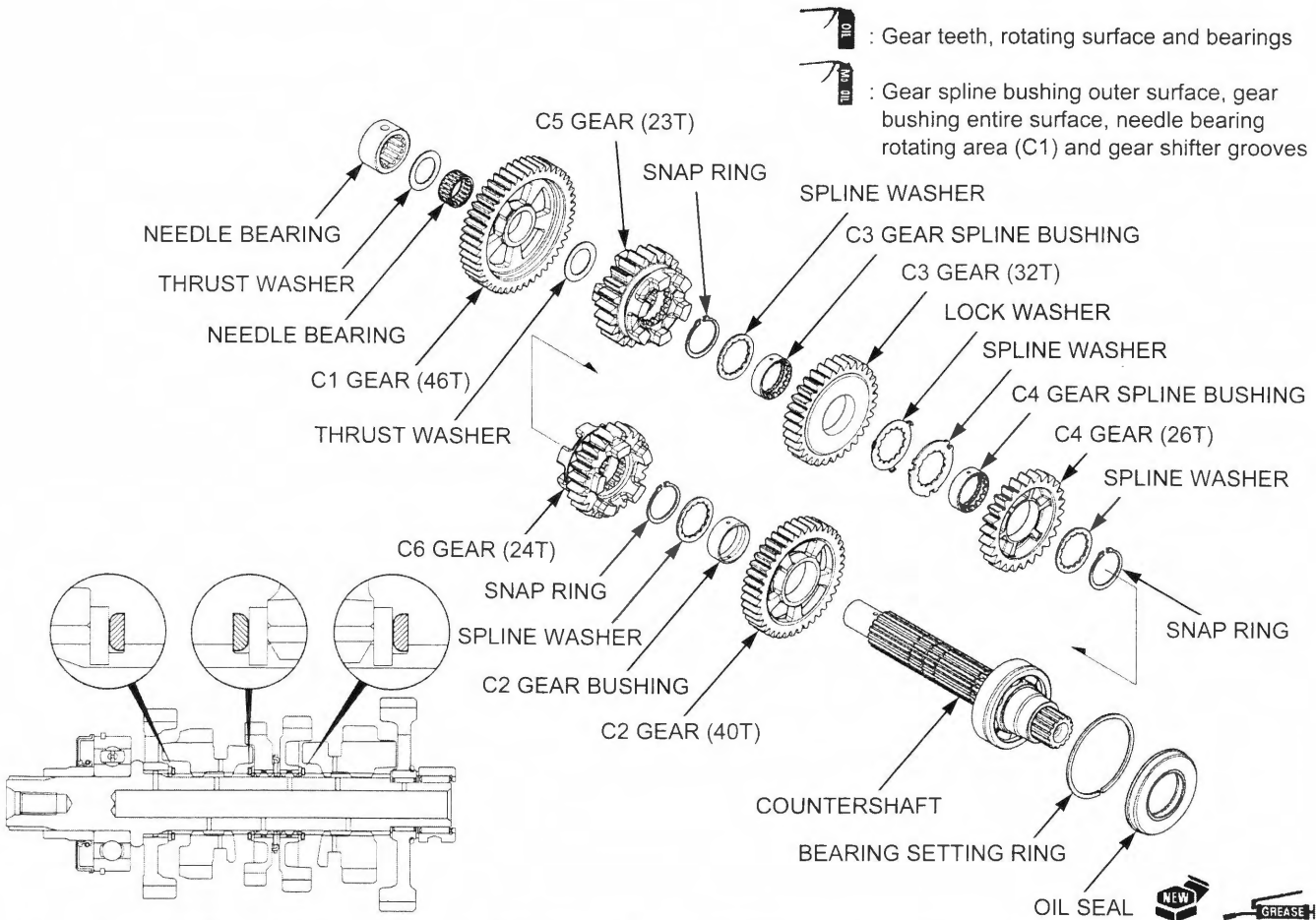


CRANKCASE/TRANSMISSION

MAINSHAFT

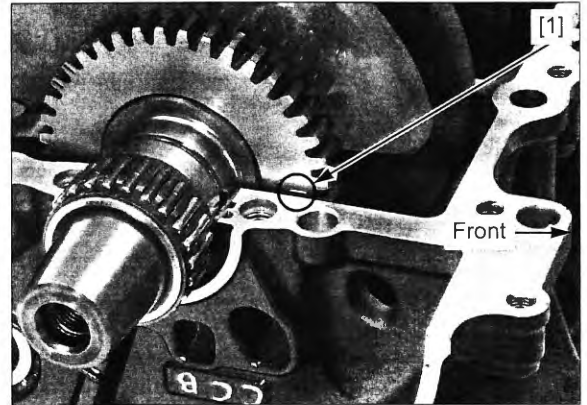


COUNTERSHAFT

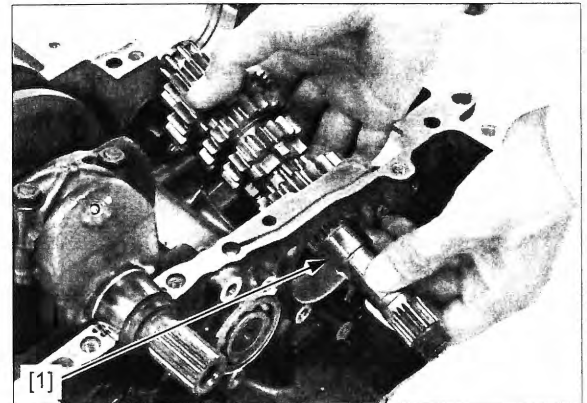


INSTALLATION

Align the index line [1] on the balancer drive gear with the upper crankcase top surface of the front side.



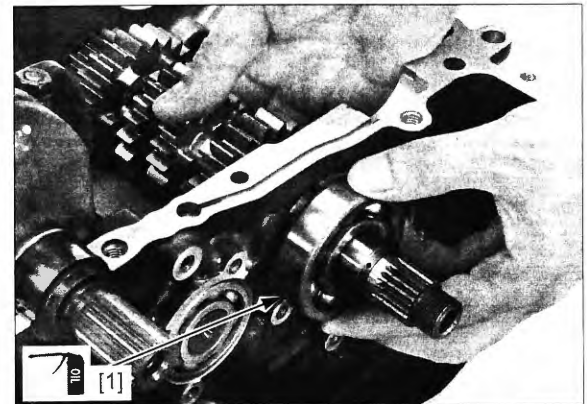
Install the mainshaft assembly [1] into the upper crankcase.



Apply engine oil to the right mainshaft bearing.

Install the bearing into the crankcase with the marked side facing out.

Install the right mainshaft bearing [1] into the upper crankcase.

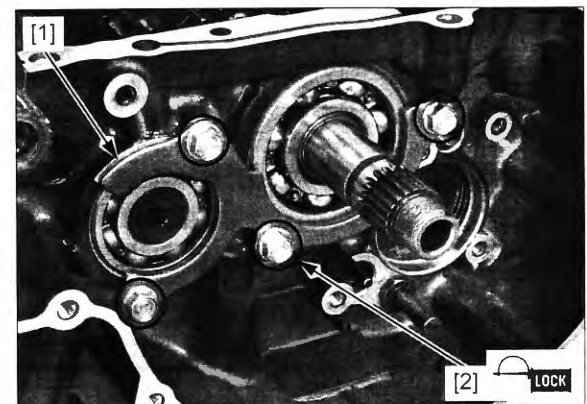


Apply locking agent to the balancer/right mainshaft bearing setting plate bolts threads (page 1-20).

Install the balancer/right mainshaft bearing setting plate [1] and setting plate bolts [2].

Tighten the setting plate bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

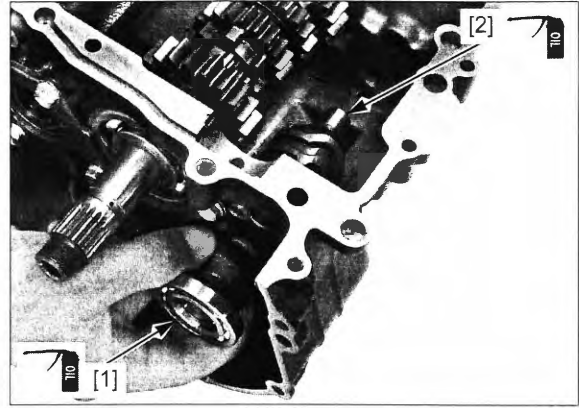


CRANKCASE/TRANSMISSION

Apply engine oil to the shift drum bearing and shift drum journal outer surface.

Install the bearing onto the shift drum with the marked side facing out.

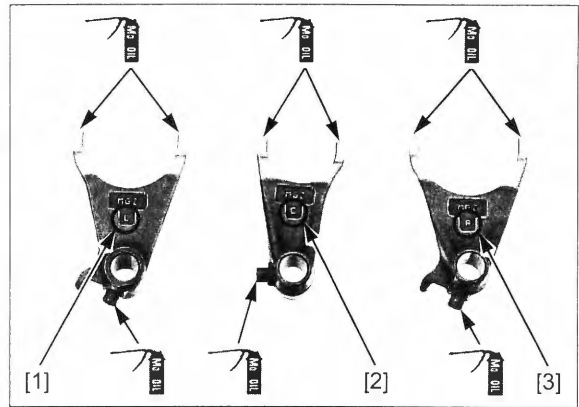
Install the shift drum bearing [1] onto the shift drum [2].
Install the shift drum/bearing assembly into the upper crankcase.



The shift forks have the following identification marks:

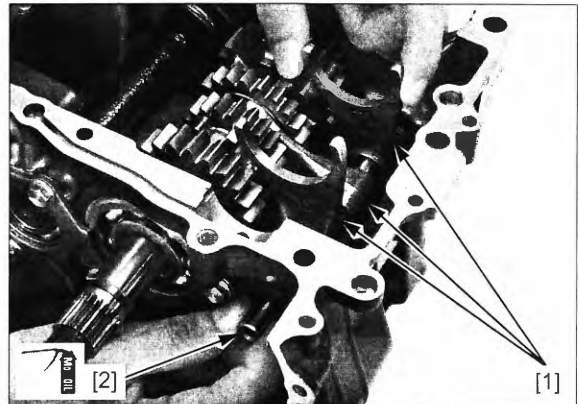
- "L" mark [1]: left shift fork
- "C" mark [2]: center shift fork
- "R" mark [3]: right shift fork

Apply molybdenum oil solution to the shift fork guide area and guide pin.



Apply molybdenum oil solution to the shift fork shaft outer surface.

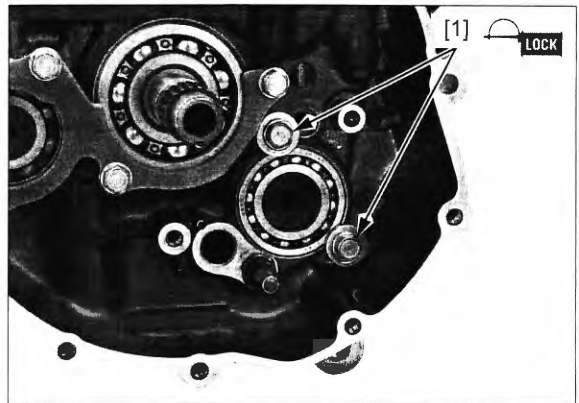
Install the shift forks [1] into the shift drum guide grooves and shifter groove (center shift fork) with the identification marks facing toward the right side of the engine, then insert the fork shaft [2].



Apply locking agent to the shift drum bearing setting washer-bolt threads (page 1-20).

Install and tighten the shift drum bearing setting washer-bolts [1] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



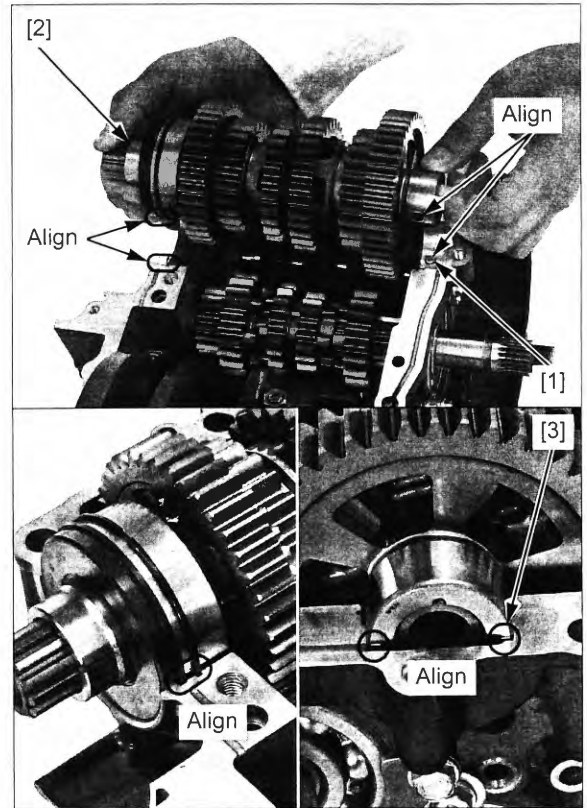
Install the dowel pin [1] onto the upper crankcase hole.

Install the countershaft assembly [2] by aligning the bearing setting ring and oil seal flange with the upper crankcase grooves, and needle bearing cap hole with the dowel pin.

NOTE:

- Make sure the index lines [3] on the bearing cap is aligned with the upper crankcase top surface.

Assemble the crankcase halves (page 13-6).



MEMO

14. CRANKSHAFT/PISTON/CYLINDER/BALANCER

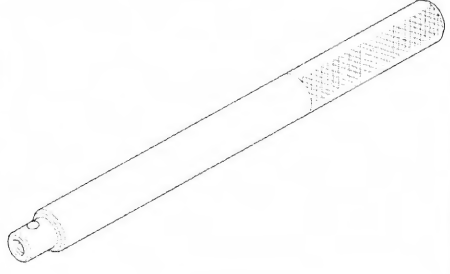
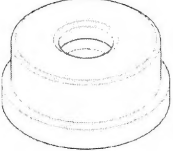
SERVICE INFORMATION	14-2	CRANKPIN BEARING	14-10
TROUBLESHOOTING.....	14-2	PISTON/CYLINDER	14-13
COMPONENT LOCATION	14-3	PISTON OIL JET	14-16
CRANKSHAFT	14-4	BALANCER.....	14-17
MAIN JOURNAL BEARING	14-7		

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the crankshaft, balancer, cylinder, piston/connecting rod and piston oil jet. Refer to procedures for crankcase separation (page 13-5).
- Mark and store the connecting rods, bearing caps and bearing inserts to be sure of their correct locations for reassembly.
- The crankpin and main journal bearing inserts are select fit and are identified by color codes. Select replacement bearings from the code tables. After selecting new bearings, recheck the oil clearance with a plastigauge. Incorrect oil clearance can cause major engine damage.

TOOLS

<p>Driver 07949-3710001</p> 	<p>Attachment, 42 x 47 mm 07746-0010300</p> 	<p>Pilot, 20 mm 07746-0040500</p> 
--	---	---

TROUBLESHOOTING

Cylinder compression is too low, hard to starting or poor performance at low speed

- Leaking cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston

Cylinder compression too high, overheating or knocking

- Excessive carbon built-up on piston head or combustion chamber

Excessive smoke

- Worn cylinder, piston or piston ring
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

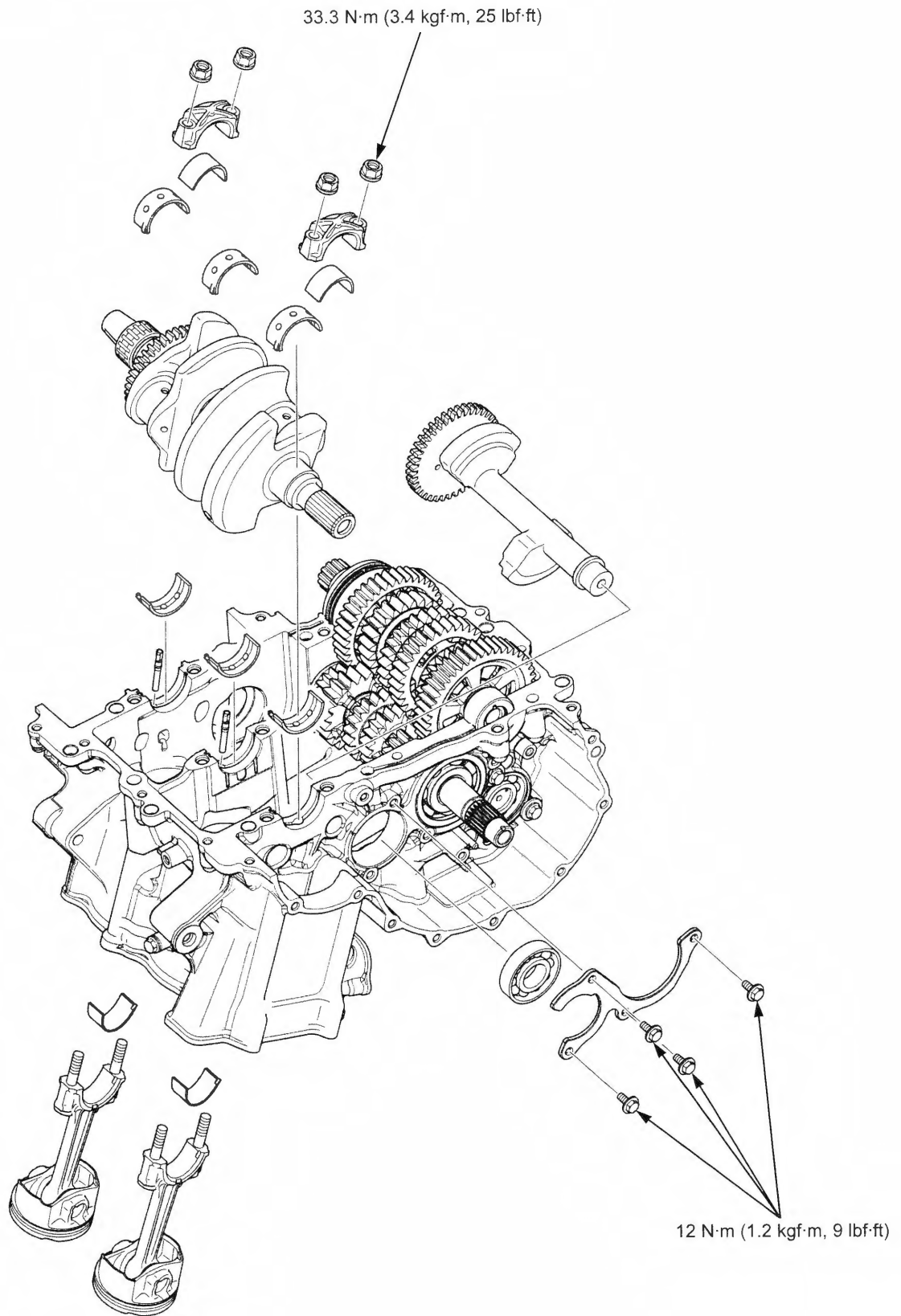
Abnormal noise

- Worn piston pin or piston pin hole
- Worn connecting rod small end
- Worn cylinder, piston or piston rings
- Worn main journal bearings
- Worn crankpin bearings

Engine vibration

- Excessive crankshaft runout

COMPONENT LOCATION



CRANKSHAFT

SIDE CLEARANCE INSPECTION

Separate the crankcase halves (page 13-5).

Measure the connecting rod side clearance.

SERVICE LIMIT: 0.25 mm (0.010 in)

If the clearance exceeds the service limit, replace the connecting rod (page 14-13).

Recheck and if still out of limit, replace the crankshaft (page 14-4).



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 13-5).

Mark the bearing caps and bearings as you remove them to indicate the correct cylinder for reassembly.

Remove the crankpin 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.

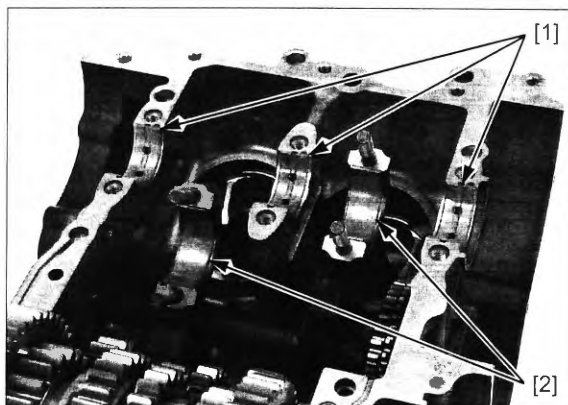
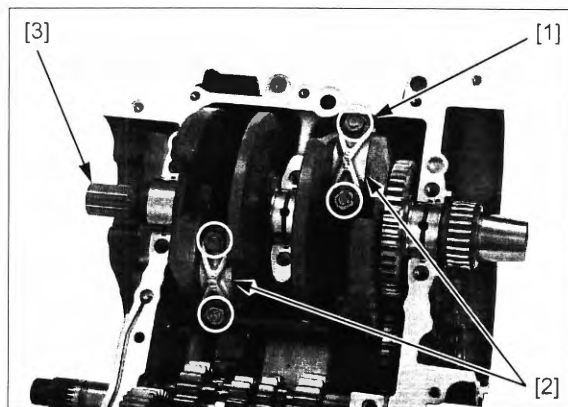
Remove the main journal bearings [1] from both crankcase halves.

Remove the crankpin bearings [2] from the connecting rods and bearing caps.

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.

Be careful not to damage the crankpin, main journal and bearing inserts.



INSPECTION

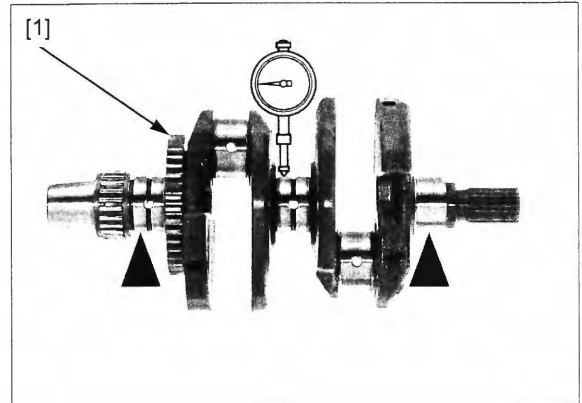
Support the crankshaft on both end journals.

Set a dial gauge on the center main journal of the crankshaft avoiding the oil groove and hole.

Rotate the crankshaft two revolutions (720°) and read the runout.

SERVICE LIMIT: 0.05 mm (0.002 in)

Check the balancer drive gear [1] teeth for abnormal wear or damage.



INSTALLATION

Install the main journal bearings [1] and crankpin bearings [2] in the original locations.

- main journal bearing (page 14-10)
- crankpin bearing (page 14-13)

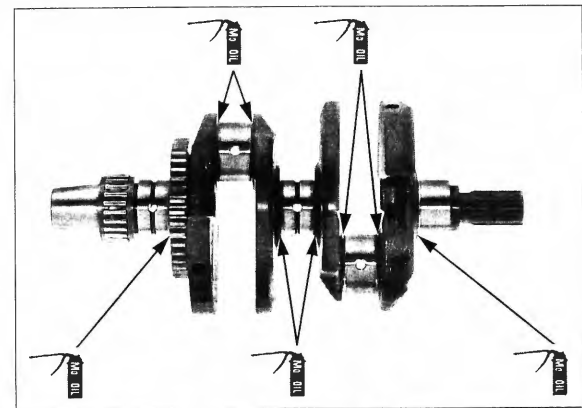
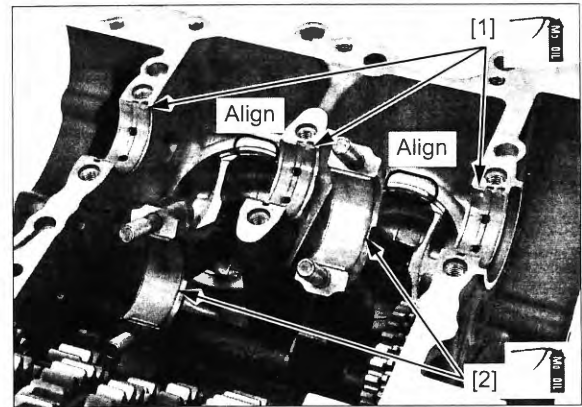
NOTICE

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.

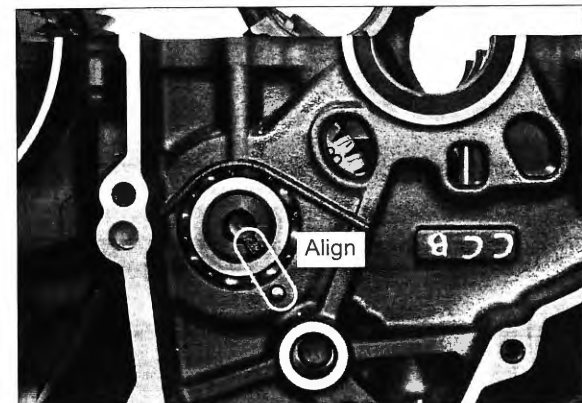
Apply molybdenum oil solution to the main journal bearing sliding surfaces on the upper crankcase and crankpin bearing sliding surfaces on the connecting rods.

Align both the piston skirt ends with the cylinder edges.

Apply molybdenum oil solution to the thrust surfaces of the crankshaft as shown.



Align the balancer shaft end groove with the projection of the upper crankcase.

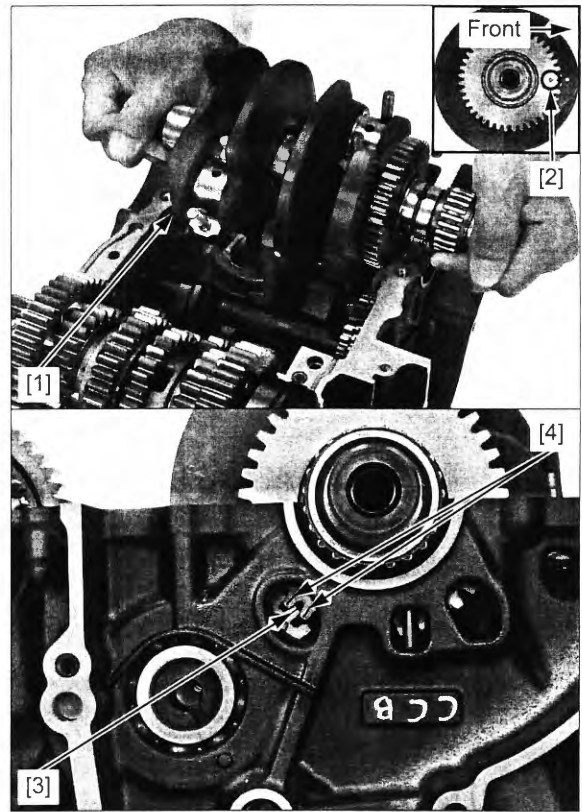


CRANKSHAFT/PISTON/CYLINDER/BALANCER

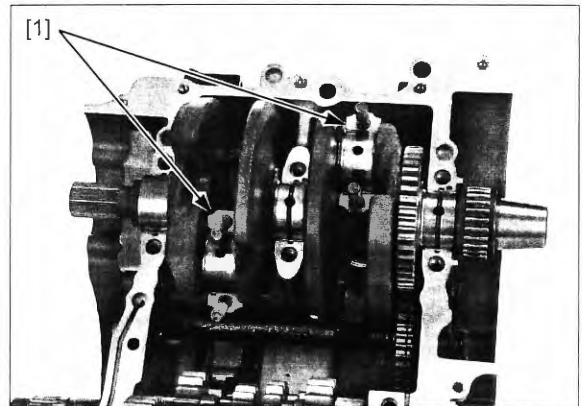
Be careful not to damage the crankpin, main journal and bearing inserts.

Hold the crankshaft [1] over the crankcase securely with "△" mark [2] on the balancer drive gear facing the front side of the engine, and set its crankpins onto the connecting rods.

Install the crankshaft onto the upper crankcase while aligning the balancer driven gear index line [3] between the balancer drive gear index lines [4] as shown.



Set the connecting rods [1] onto the crankpins.



Clean the mating surface of the connecting rods and crankpin bearing caps with solvent and blow them with compressed air.

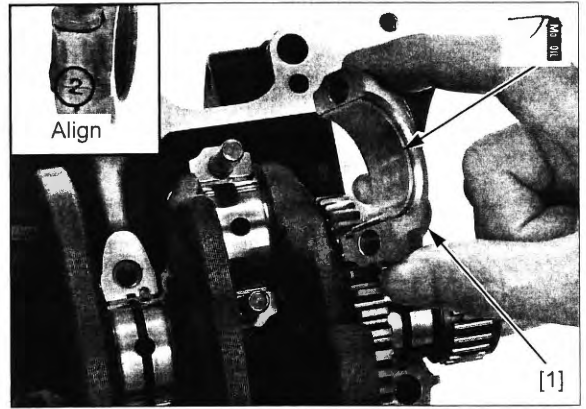


Apply molybdenum oil solution to the crankpin bearing sliding surfaces on the crankpin bearing caps.

Install the crankpin bearing caps [1] by aligning the I.D. code number on the connecting rod and bearing cap.

NOTICE

Be sure to install each part in its original position, as noted during removal.

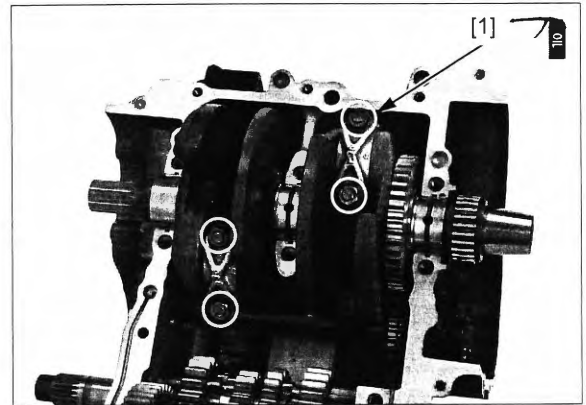


Apply engine oil to the crankpin bearing cap nut threads and seating surfaces.

Install and tighten the crankpin bearing cap nuts [1] in 2 or 3 steps alternately to the specified torque.

TORQUE: 33.3 N·m (3.4 kgf·m, 25 lbf·ft)

Assemble the crankcase halves (page 13-6).



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.

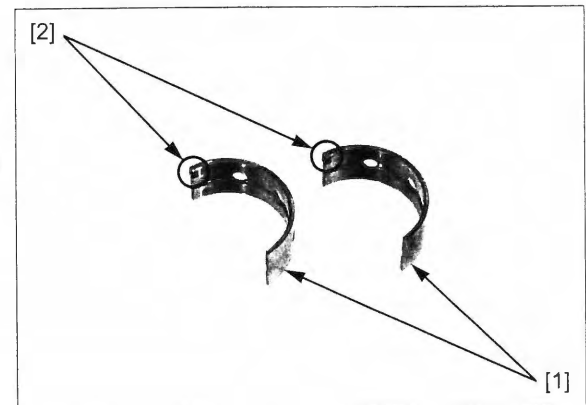
BEARING INSPECTION

Remove the crankshaft (page 14-4).

Check the main journal bearing inserts [1] for unusual wear or peeling.

Check the bearing tabs [2] for damage.

If the main journal bearing damaged, select a replacement bearing (page 14-9).



OIL CLEARANCE INSPECTION

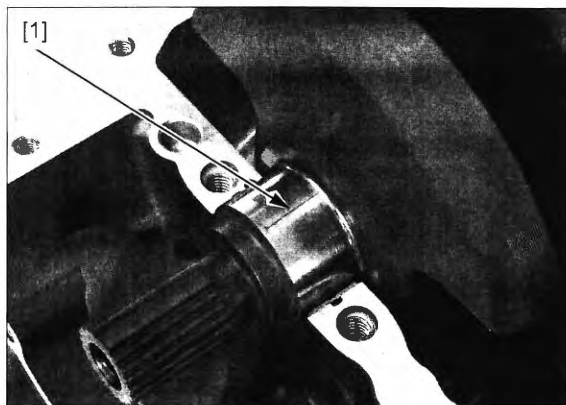
Remove the crankshaft (page 14-4).

Clean off any oil from the bearing inserts and main journals.

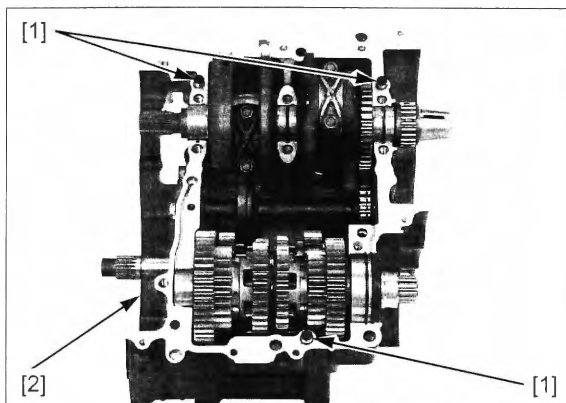
Install the crankshaft onto the upper crankcase (page 14-5).

Do not rotate the crankshaft during inspection.

Put a strip of plastigauge [1] lengthwise on each main journal avoiding the oil hole.



Install the dowel pins [1] onto the upper crankcase [2].



Install the lower crankcase [1] onto the upper crankcase.

Clean the crankcase main journal bolts (reuse) 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 as shown in a crisscross pattern in 2 or 3 steps to the specified torque.

Further tighten the crankcase main journal bolts 120°.

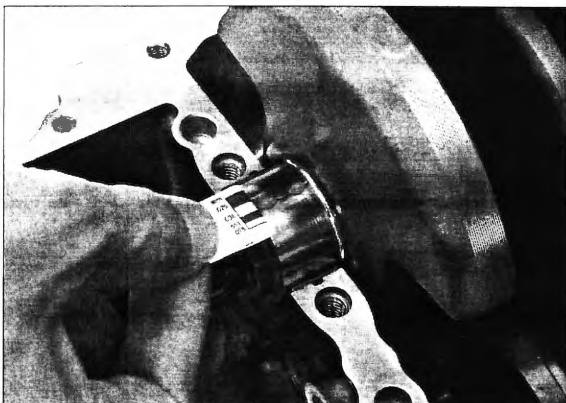
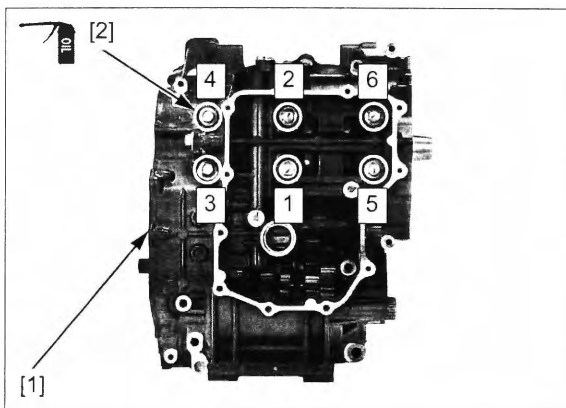
TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft) + 120°

Remove the crankcase main journal bolt and 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 14-9).



BEARING SELECTION

Letters (A, B or C) on the left side of upper crankcase are bearing support I.D. codes from left to right.

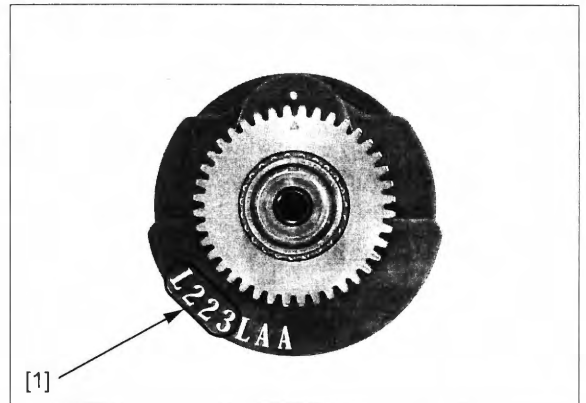
Record the crankcase bearing support I.D. code letters [1] from left side of the upper crankcase as shown.



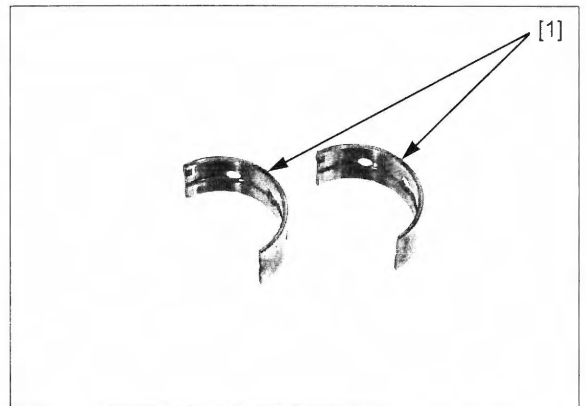
Numbers (1, 2 or 3) on the crank weight are main journal O.D. codes from left to right.

If you are replacing the crankshaft, record the corresponding main journal O.D. code numbers [1] from the crank weight.

If you are reusing the crankshaft, measure the crankpin O.D. with a micrometer.



Cross-reference the main journal and bearing support codes to determine the replacement bearing color code [1].



MAIN JOURNAL BEARING THICKNESS:

- A: Black: Thickest
- B: Brown:
- C: Green: ↑
- D: Yellow: ↓
- E: Pink: 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	34.000 – 34.006 mm (1.3386 – 1.3388 in)	E (Pink)	D (Yellow)	C (Green)
	2	33.994 – 34.000 mm (1.3383 – 1.3386 in)	D (Yellow)	C (Green)	B (Brown)
	3	33.988 – 33.994 mm (1.3381 – 1.3383 in)	C (Green)	B (Brown)	A (Black)

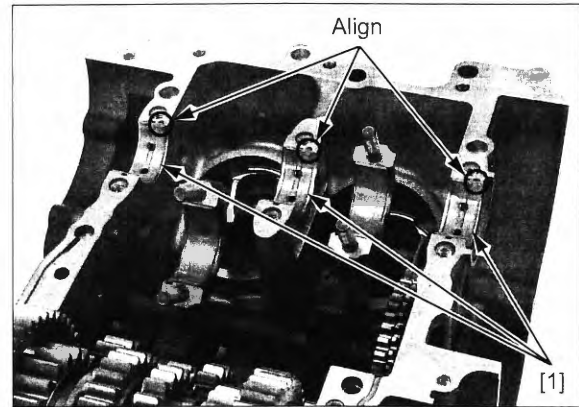
NOTICE

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.

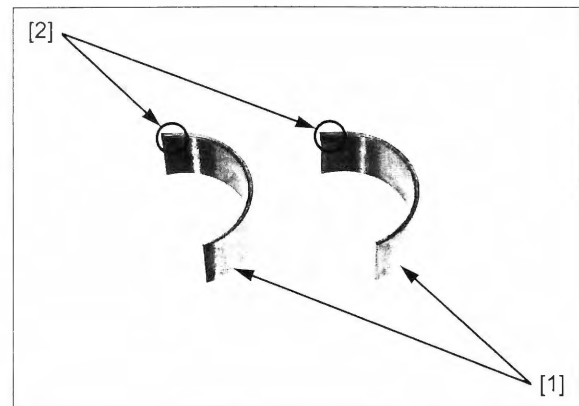
BEARING INSPECTION

Remove the crankshaft (page 14-4).

Check the crankpin bearing inserts [1] for unusual wear or peeling.

Check the bearing tabs [2] for damage.

If the crankpin bearing is damaged, select a replacement bearing (page 14-12).



OIL CLEARANCE INSPECTION

Remove the crankshaft (page 14-4).

Clean the mating surface of the connecting rod and crankpin bearing cap with solvent and blow them with compressed air.



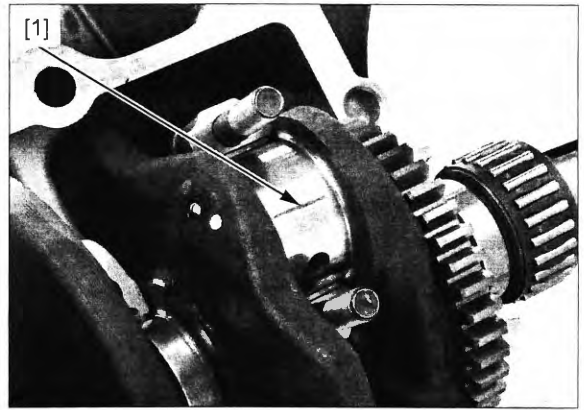
Clean off any oil from the bearing inserts and crankpins.

Install the crankshaft onto the upper crankcase (page 14-5).

Set the connecting rods onto the crankpins.

Do not rotate the crankshaft during inspection.

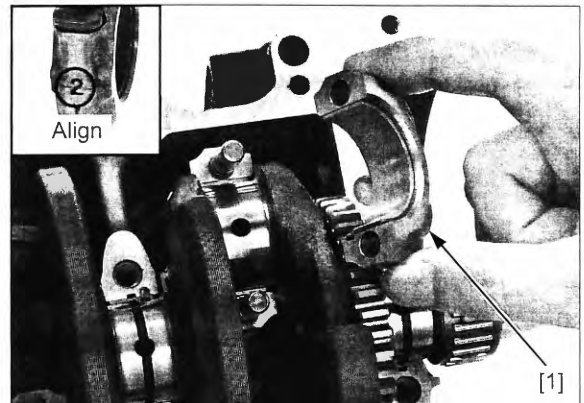
Put a strip of plastigauge [1] lengthwise on each crankpin avoiding the oil hole.



Install the crankpin bearing caps [1] by aligning the I.D. code number on the connecting rod and bearing cap.

NOTICE

Be sure to install each part in its original position, as noted during removal.

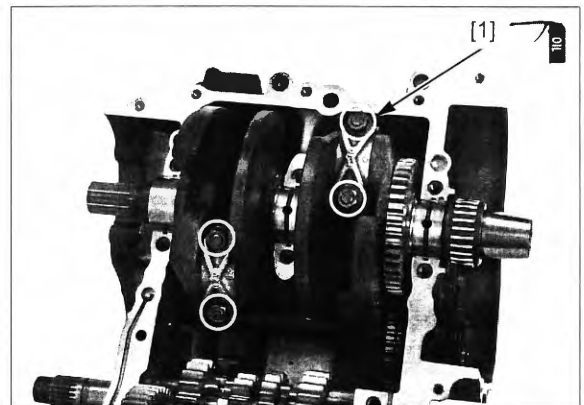


Apply engine oil to the crankpin bearing cap nut threads and seating surfaces.

Install and tighten the crankpin bearing cap nuts [1] in 2 or 3 steps alternately to the specified torque.

TORQUE: 33.3 N·m (3.4 kgf·m, 25 lbf·ft)

Remove the bearing caps.



Measure the compressed plastigauge at its widest point on the crankpin to determine the oil clearance.

SERVICE LIMIT: 0.06 mm (0.002 in)

If the oil clearance exceeds the service limit, select the correct replacement bearings (page 14-12).

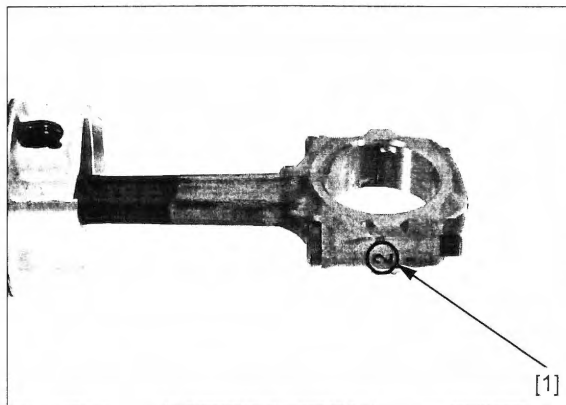


CRANKSHAFT/PISTON/CYLINDER/BALANCER

BEARING SELECTION

Numbers (1, 2 or 3) on the connecting rods are the connecting rod I.D. codes.

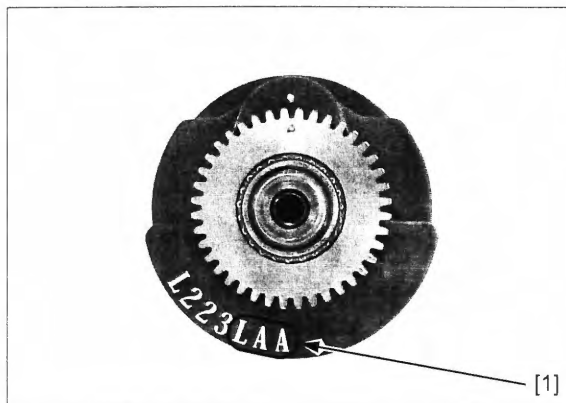
Record the connecting rod I.D. code number [1] or measure the I.D. with the crankpin bearing cap installed without bearing inserts.



Letters (A, B or C) on the crank weight are the crankpin O.D. codes from left to right.

If you are replacing the crankshaft, record the corresponding crankpin O.D. code letter [1].

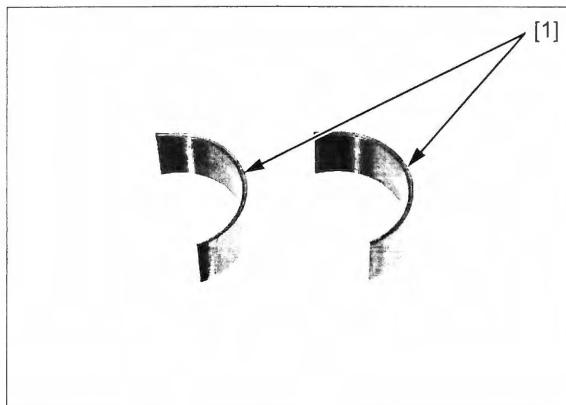
If you are reusing the crankshaft, measure the crankpin O.D. with a micrometer.



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 – 1.5357 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)

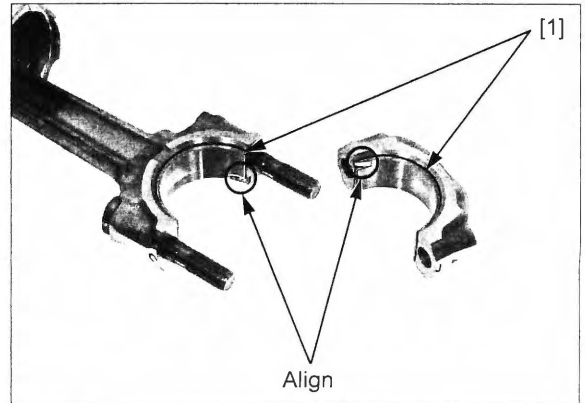
NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

BEARING INSTALLATION

Clean the bearing outer surfaces, crankpin 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

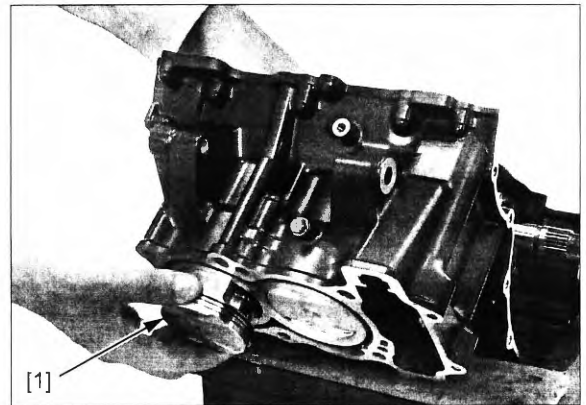
NOTICE

- Before piston removal, place a clean shop towel around the connecting rod to prevent damaging the cylinder sleeve.
- Do not try to remove the piston/connecting rod assembly from bottom of the cylinder; the assembly will get stuck in the gap between the cylinder liner and the upper crankcase.
- Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

Remove the following:

- countershaft (page 13-8)
- crankshaft (page 14-4)

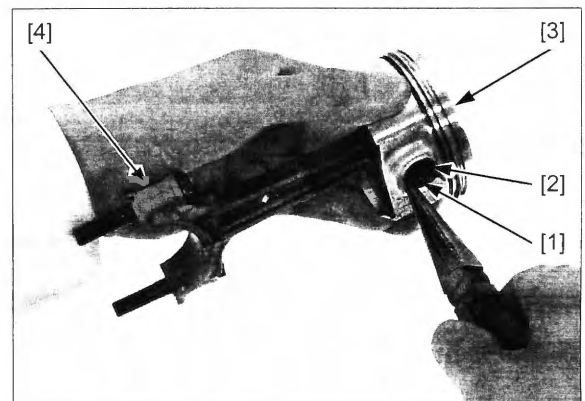
Remove the piston/connecting rod assembly [1] from the top of the cylinder.



PISTON REMOVAL

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.

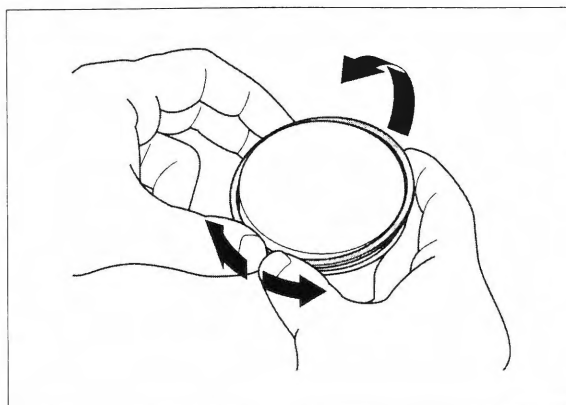


PISTON RING REMOVAL

Spread each piston ring ends and remove them by lifting up at a point opposite the gap.

NOTE:

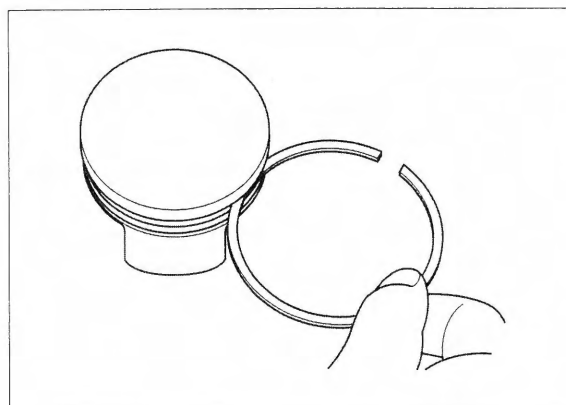
- Do not damage the piston ring by spreading the ends too far.
- Be careful not to damage the piston when removing the piston ring.



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 scratch, 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/BALANCER SPECIFICATIONS (page 1-11).

Replace any part if it is out of service limit.

PISTON RING INSTALLATION

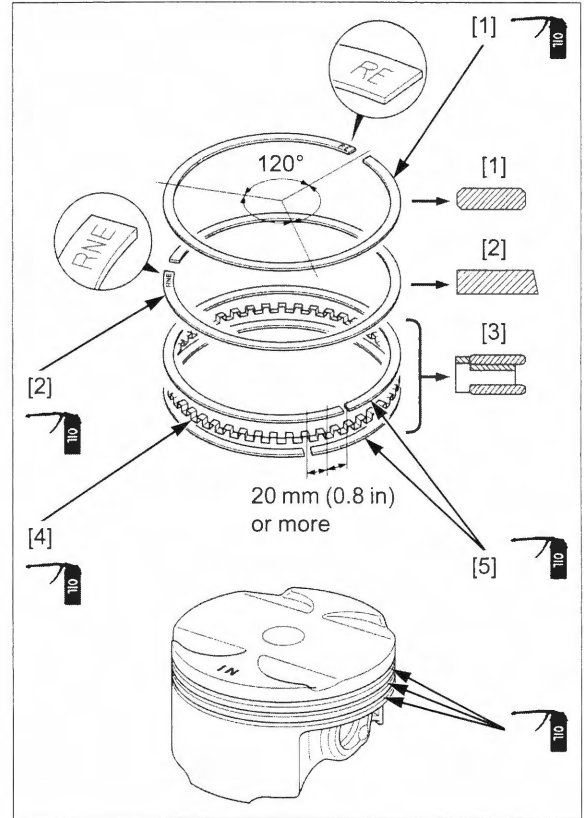
Clean the piston ring grooves thoroughly and install the piston rings.

- Apply engine oil to the piston ring entire surface and piston ring grooves.
- Avoid piston and piston ring damage during installation.
- Install the piston rings with the marked side facing up.
 - "RE" mark: top ring [1]
 - "RNE" mark: 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.



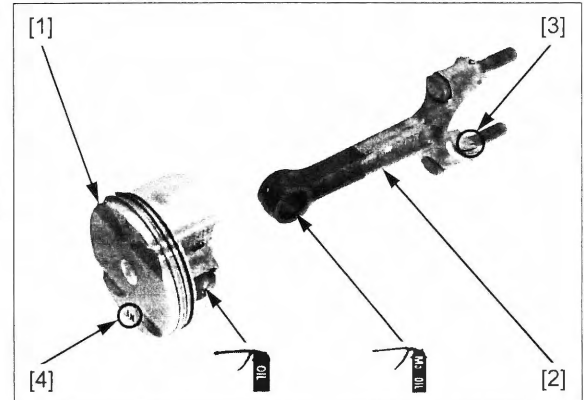
PISTON INSTALLATION

Install the crankpin bearings in the original locations (page 14-13).

Apply engine oil to the piston pin hole inner surface.

Apply molybdenum oil solution to the connecting rod small end inner surface.

Assemble the piston [1] and connecting rod [2] with the crankpin bearing tab [3] facing to the piston "IN" mark [4].

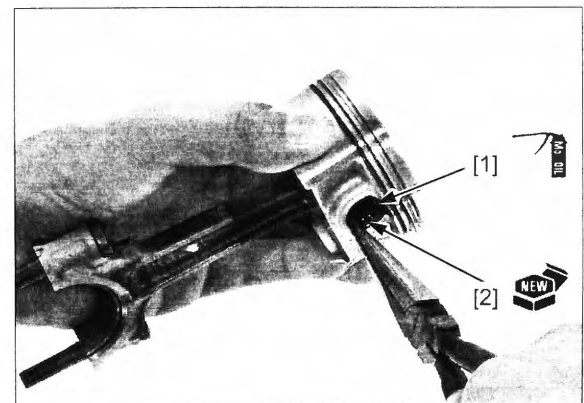


Apply molybdenum oil solution to the piston pin outer surface.

Install the piston pin [1] and secure it using new piston pin clips [2].

NOTE:

- Make sure that the piston pin clips are seated securely.
- Do not align the piston pin clip end gap with the piston cutout.



CRANKSHAFT/PISTON/CYLINDER/BALANCER

Apply engine oil to the cylinder walls and piston sliding surface.

Install the piston/ connecting rod assembly with the piston "IN" mark [3] facing the intake side.

Install the piston/connecting rod assembly [1] into the cylinder using a commercially available piston ring compressor tool [2].

When reusing the connecting rods, they must be installed in their original locations.

NOTICE

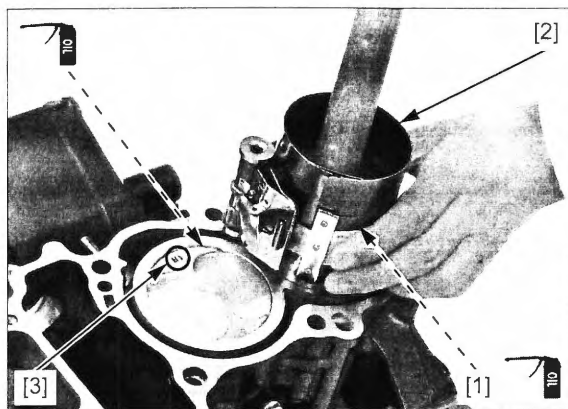
- While installing the piston, be careful not to damage the top surface of the cylinder, especially around the cylinder bore.
- Be careful not to damage the cylinder sleeve and crankpin with the connecting rod.

Make sure the piston ring compressor tool sits flush on the top surface of the cylinder.

Use the handle of a plastic hammer or equivalent tool to tap the piston into the cylinder.

Install the following:

- crankshaft (page 14-5)
- countershaft (page 13-13)



PISTON OIL JET

REMOVAL/INSTALLATION

Remove the piston/connecting rod assembly (page 14-13).

Be careful not to damage the oil jet hole.

Remove the oil jets [1] to the main journal side while pushing the oil jet tip from the cylinder side.

Remove the O-ring [2] from the oil jet.

Clean the oil jets in solvent thoroughly.

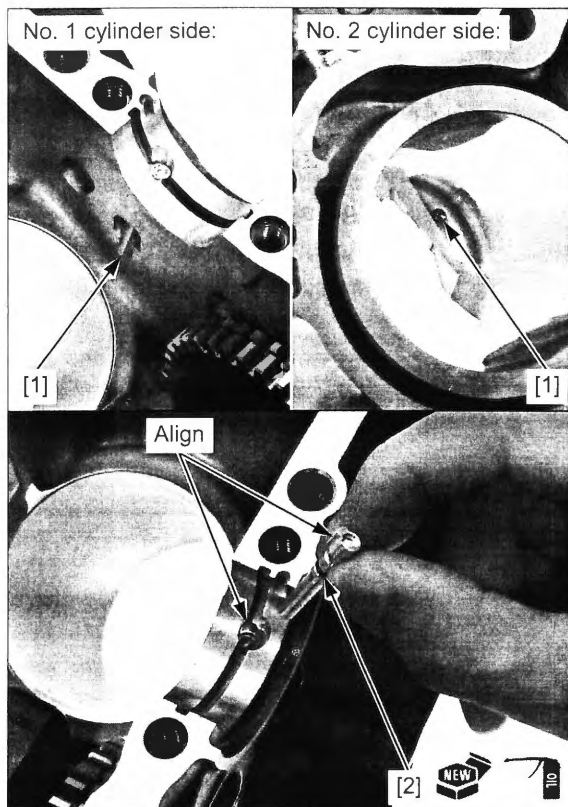
Check the oil jets for clogs, and replace them if necessary.

Blow through the oil passage on the upper crankcase and oil jet with compressed air.

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

Install the oil jets into the upper crankcase until it is fully seated while aligning the lug and groove in the crankcase.

Install the removed parts in the reverse order of removal.



BALANCER

REMOVAL

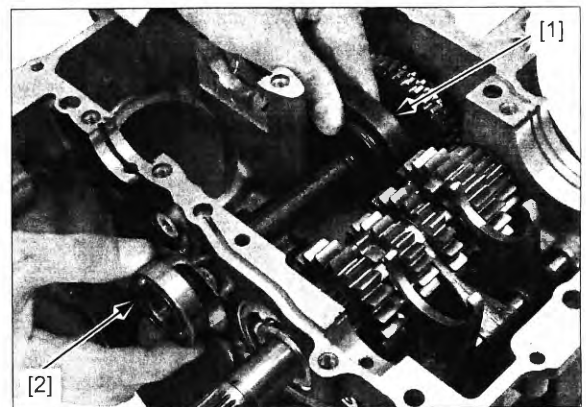
Remove the piston/connecting rod assembly (page 14-13).

Remove the bolts [1] and balancer/right mainshaft bearing setting plate [2].

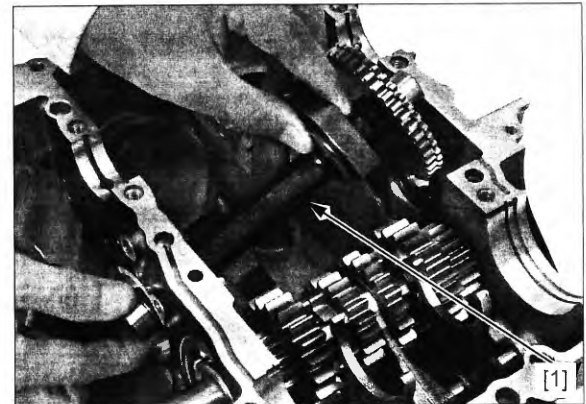


Position the balancer shaft with the left balancer weight [1] facing up.

Slide the balancer shaft off the upper crankcase and remove the right balancer shaft bearing [2].



Remove the balancer shaft [1].



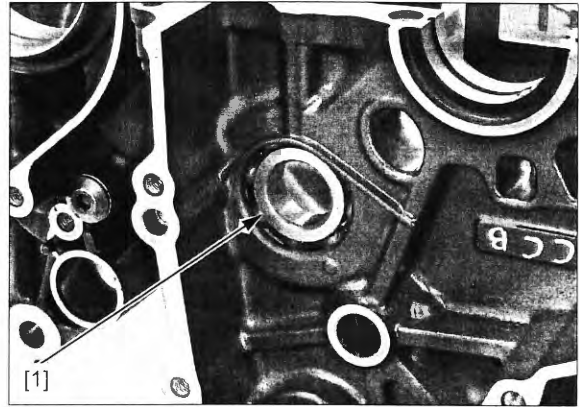
INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

- balancer driven gear
- balancer driven sub-gear
- springs
- balancer shaft
- balancer shaft bearings

LEFT BALANCER SHAFT BEARING REPLACEMENT

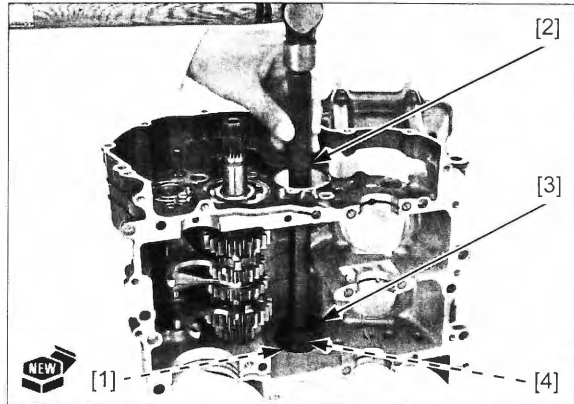
Drive out the left balancer shaft bearing [1] from the upper crankcase.



Drive in squarely with the marked side facing up. Drive in a new left balancer shaft bearing [1] into the upper crankcase until it is fully seated using the special tools.

TOOLS:

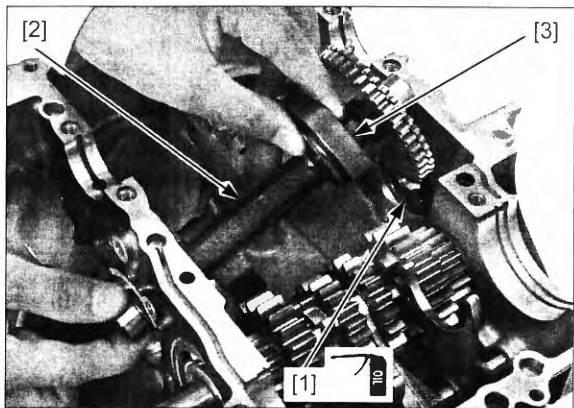
[2] Driver	07949-3710001
[3] Attachment, 42 x 47 mm	07746-0010300
[4] Pilot, 20 mm	07746-0040500



INSTALLATION

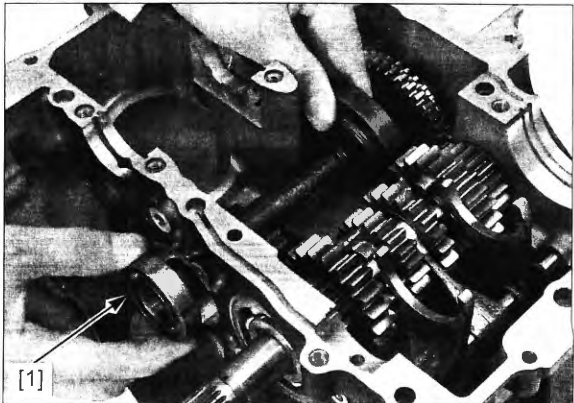
Apply engine oil to the left balancer shaft bearing [1].

Install the balancer shaft [2] into the upper crankcase while the left balancer weight [3] is facing up.



Apply engine oil to the right balancer shaft bearing.

Install with the marked side facing out. Install the right balancer shaft bearing [1] into the upper crankcase.



CRANKSHAFT/PISTON/CYLINDER/BALANCER

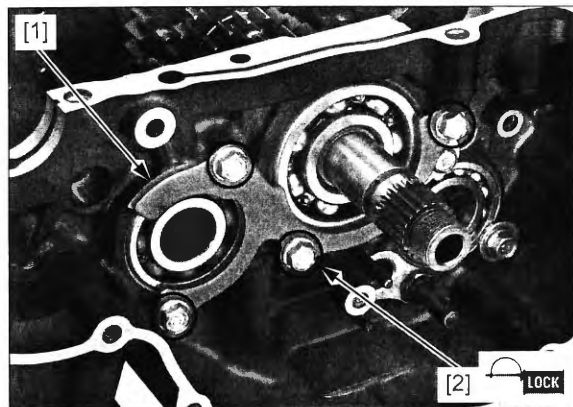
Apply locking agent to the balancer/right mainshaft bearing setting plate bolts threads (page 1-20).

Install the balancer/right mainshaft bearing setting plate [1] and setting plate bolts [2].

Tighten the setting plate bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the piston/connecting rod assembly (page 14-15).



MEMO

15. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION15-2

ENGINE REMOVAL 15-4

COMPONENT LOCATION15-3

ENGINE INSTALLATION..... 15-8

SERVICE INFORMATION

GENERAL

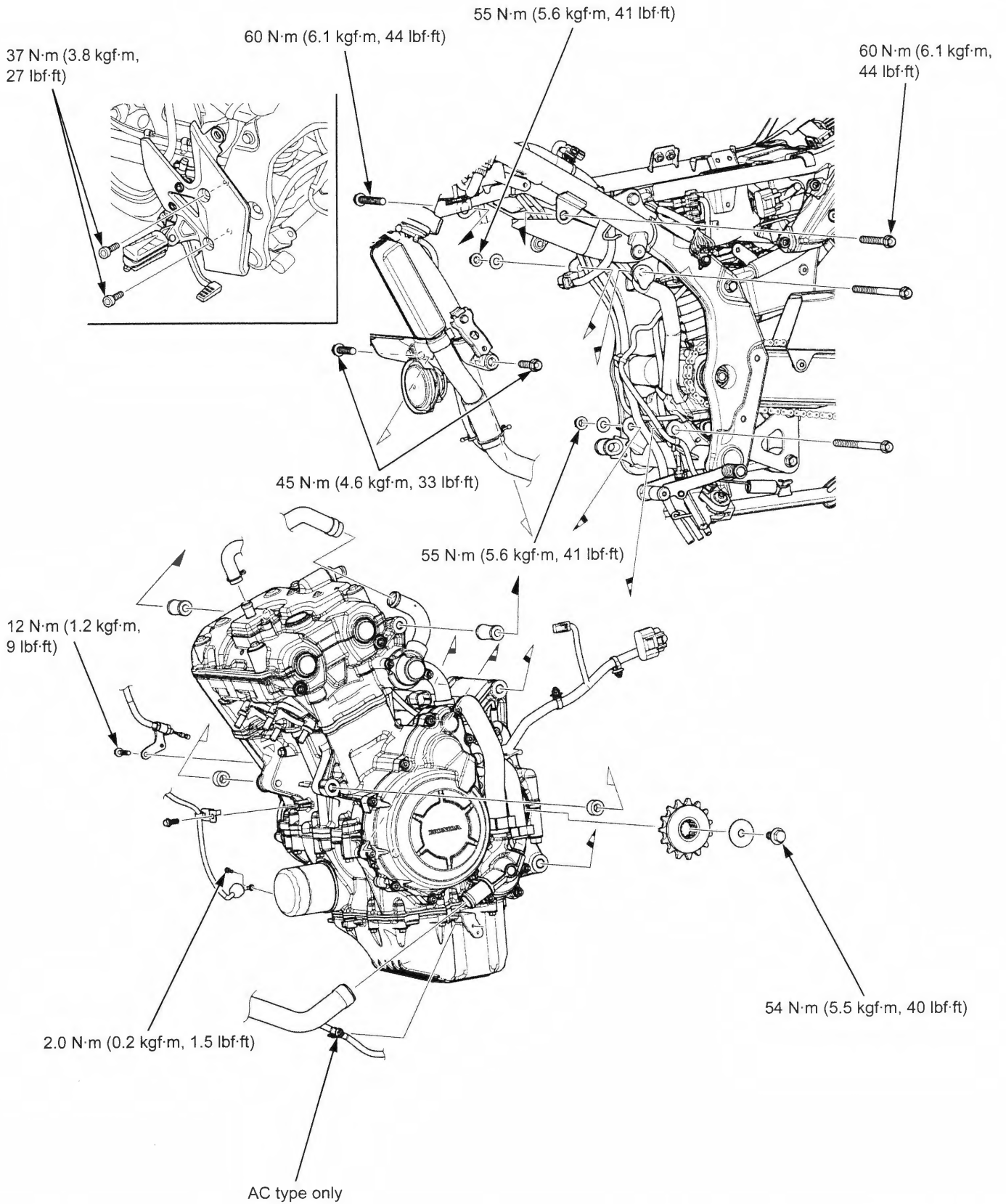
- A hoist or equivalent is required to support the motorcycle when removing and installing the engine.
- A floor jack or other adjustable support is required to support and maneuver the engine.

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/air cleaner housing assembly (page 7-11)
 - Water pump (page 8-10)
 - Oil pump (page 9-5)
 - Oil strainer (page 9-8)
 - Camshaft (page 10-9)
 - Rocker arm (page 10-14)
 - Cam chain tensioner lifter (page 10-23)
 - Clutch (page 11-7)
 - Primary drive gear (page 11-14)
 - Gearshift linkage (page 11-17)
 - Stator/CKP sensor (page 12-4)
 - Flywheel (page 12-5)
 - Starter clutch (page 12-7)
- The following components require engine removal for service.
 - Cylinder head/valves (page 10-16)
 - Transmission (page 13-8)
 - Crankshaft (page 14-4)
 - Piston/cylinder (page 14-13)
 - Balancer (page 14-17)

COMPONENT LOCATION



ENGINE REMOVAL/INSTALLATION

ENGINE REMOVAL

Drain the engine oil (page 3-10).

Drain the coolant (page 8-5).

Fully slacken the drive chain (page 3-14).

Remove the following:

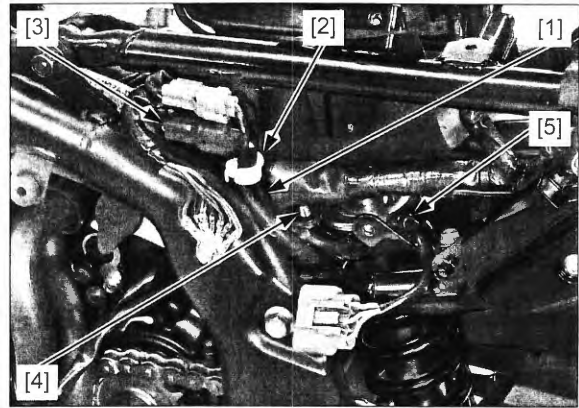
- drive sprocket cover (page 2-24)
- exhaust pipe (page 2-29)
- fuel tank under tray (page 2-25)
- starter motor (page 6-5)
- regulator/rectifier (page 20-7)
- CB500F/FA: under cowl (page 2-23)

Release the CKP sensor wire [1] from the clip [2].

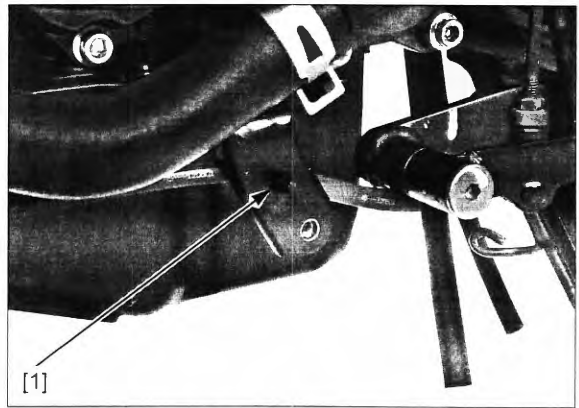
Disconnect the CKP sensor 2P (Red) connector [3].

Remove the stator/CKP sensor wire harness band clips (Brown [4], Black [5]) from the frame.

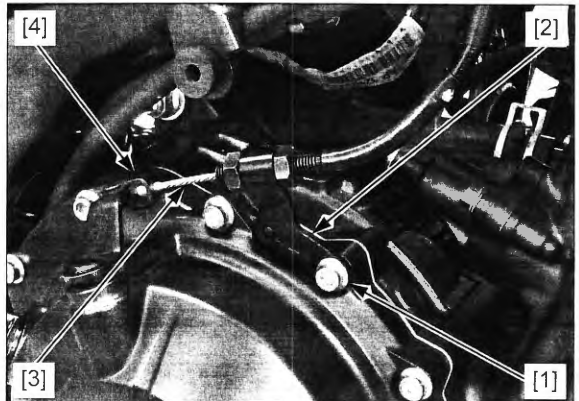
Remove the stator/CKP sensor wire harness [1] out of the frame.



AC type: Remove the EVAP canister drain hose clip [1] from the stay.

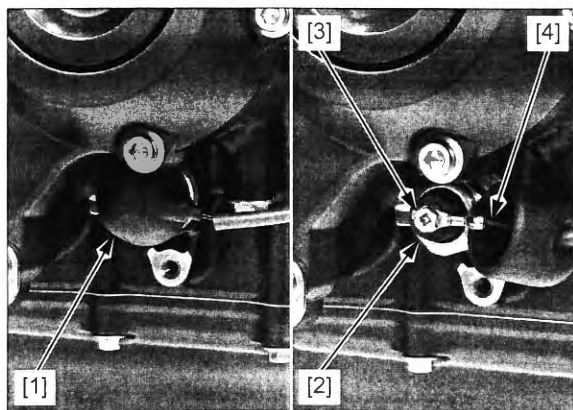


Remove the bolt [1] and clutch cable holder [2], then disconnect the clutch cable [3] from the clutch lifter arm [4].

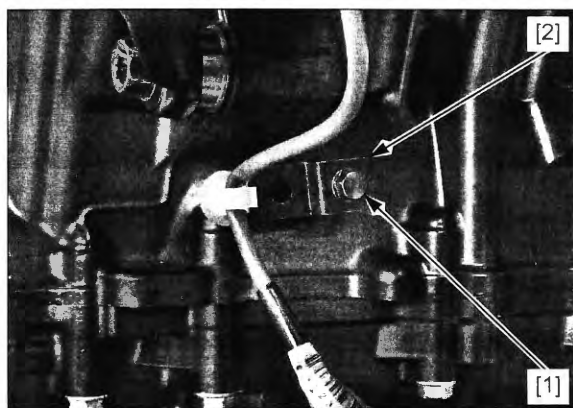


ENGINE REMOVAL/INSTALLATION

Release the rubber cap [1] from the EOP switch [2].
Remove the terminal screw [3] and disconnect the switch wire [4].



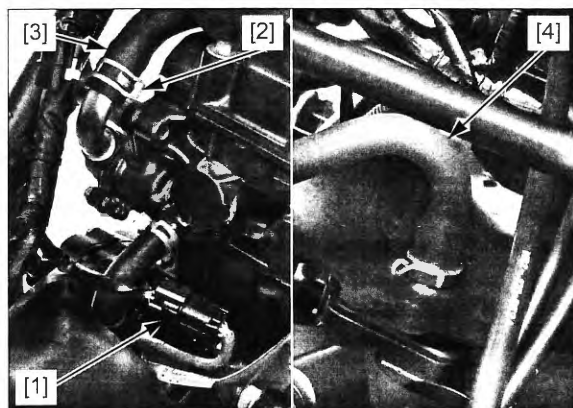
Remove the bolt [1] and wire harness stay [2].



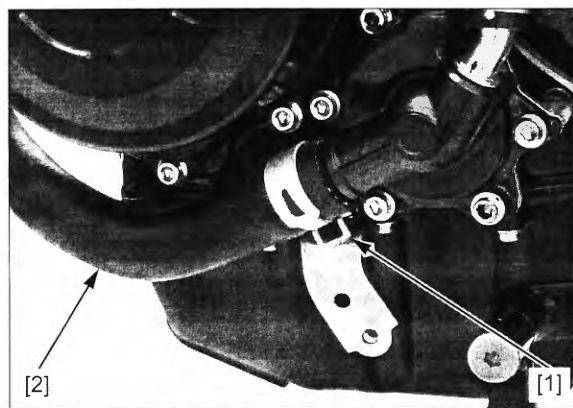
Disconnect the engine sub-wire harness 6P (Black) connector [1].

Release the hose clip [2] and disconnect upper radiator hose [3] from the thermostat cover.

Disconnect the PAIR air supply hose [4] from the cylinder head cover.

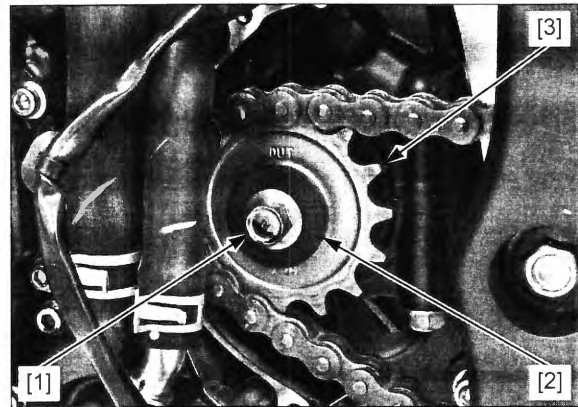


Release the hose clip [1] and disconnect the lower radiator hose [2] from the water pump.



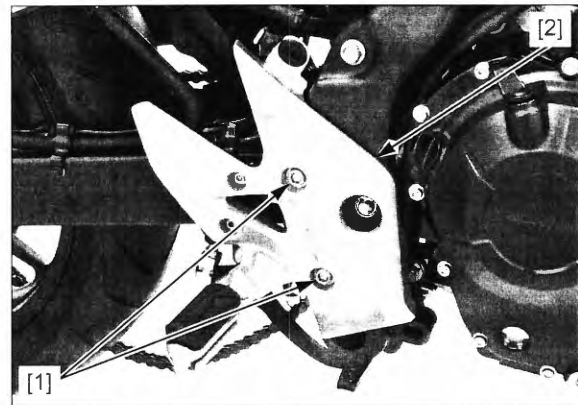
ENGINE REMOVAL/INSTALLATION

Remove the drive sprocket bolt [1], washer [2] and drive sprocket [3].



Support the footpeg bracket so it does not hang from the brake hose. Do not twist the brake hose.

Remove the bolts [1] and right rider footpeg bracket [2].



Support the motorcycle securely with a hoist or equivalent.

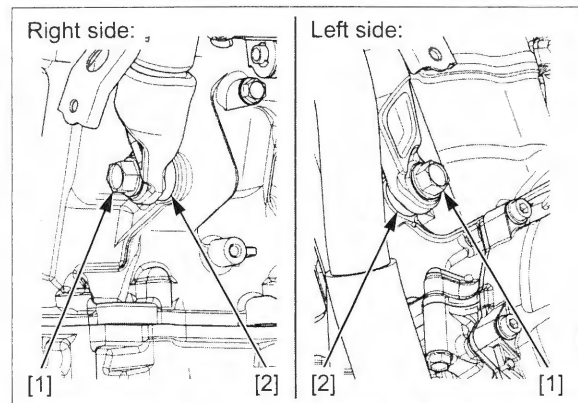
Do not use the oil filter as a jacking point.

Place a floor jack or other adjustable support under the engine.

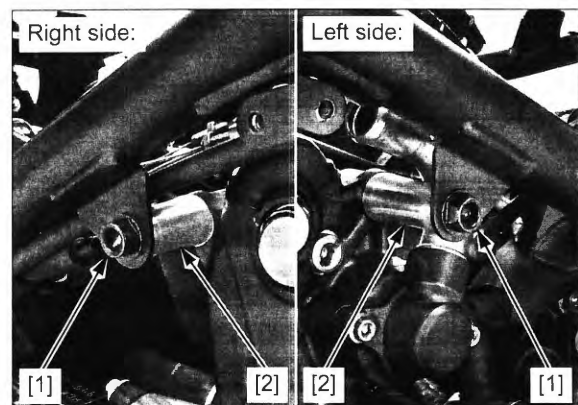
NOTE:

- The jack height must be continually adjusted to relieve stress for ease of bolt removal.

Remove the front engine hanger bolts [1] and collars [2].



Remove the upper engine hanger bolts [1] and collars [2].



ENGINE REMOVAL/INSTALLATION

Thread the 10 x 146 mm rear engine hanger bolts into the left and right upper engine hanger bolt holes and use them as handles to assist in holding the engine.

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

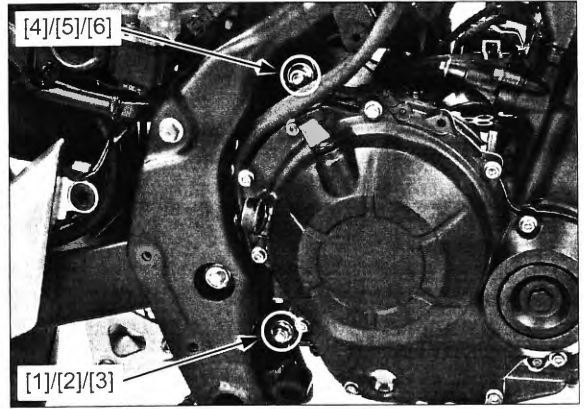
Remove the rear lower engine hanger nut [1], washer [2] and bolt [3].

Remove the rear upper engine hanger nut [4], washer [5] and bolt [6].

NOTE:

- Raising the rear of the motorcycle so the rear wheel is 150 mm (6 in) off the ground can assist in engine removal.

Carefully lower the jack or adjustable support, then remove the engine from the frame.



ENGINE REMOVAL/INSTALLATION

ENGINE INSTALLATION

NOTE:

- Do not use the oil filter as a jacking point.
- The jack height must be continually adjusted to relieve stress for ease bolt installation.
- Carefully align the mounting points with the jack to prevent damage to engine, frame, radiator hoses, wires and cables.

During engine installation, hold the engine securely and be careful not to damage the frame and engine.

Raise the rear of the motorcycle so the rear wheel is 150 mm (6 in) off the ground.

Thread the 10 x 146 mm rear engine hanger bolts into the left and right upper engine hanger bolt holes and use them as handles.

Place the engine under the frame on a jack or other adjustable support.

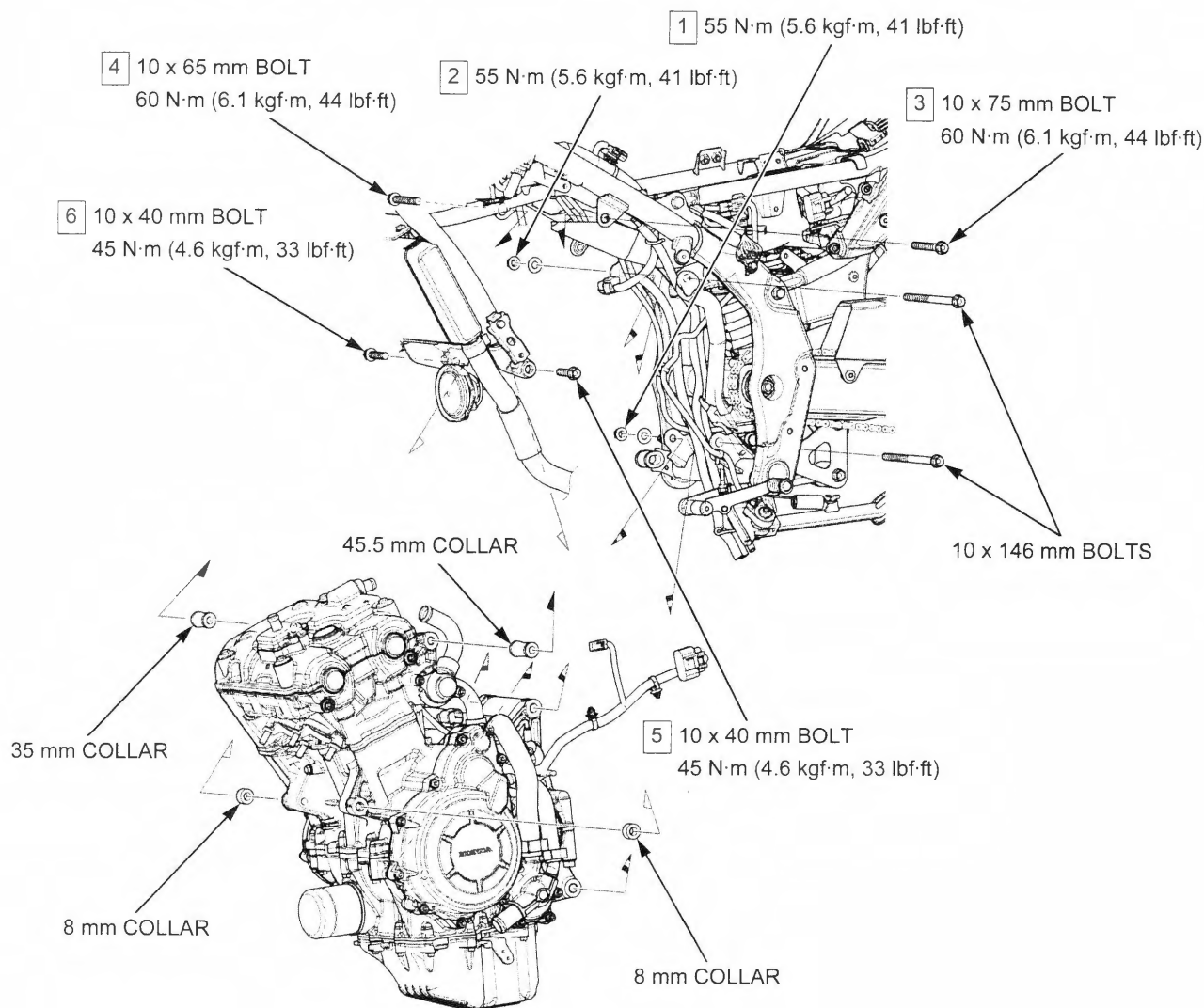
Align the front engine hanger bolt holes with the frame mounts and loosely install the bolts and collars.

Remove the 10 x 146 mm bolts.

Raise the engine while rotating it up in the rear to install the other hanger bolts and collars.

Install the rear engine hanger nuts with the washers.

Tighten the bolts and nuts to the specified torque in the specified sequence as shown.



Install the removed parts in the reverse order of removal.

TORQUE:

Right rider footpeg bracket bolt:

37 N·m (3.8 kgf·m, 27 lbf·ft)

Drive sprocket bolt:

54 N·m (5.5 kgf·m, 40 lbf·ft)

EOP switch terminal screw:

2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)

Right crankcase cover bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:

- Install the drive sprocket [1] with its "OUT" mark [2] facing out.
- Align the clutch cable holder hole with the right crankcase cover boss.

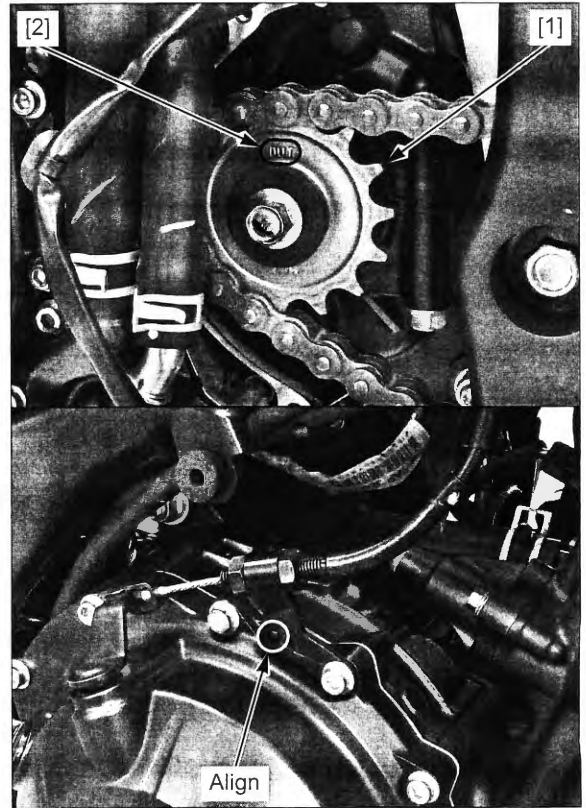
Adjust the following:

- throttle grip freeplay (page 3-4)
- clutch lever freeplay (page 3-20)
- drive chain slack (page 3-14)

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

Fill and bleed the cooling system (page 8-5).

Check the exhaust system and cooling system for leaks.



MEMO

16. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION	16-2	HANDLEBAR (CB500F/FA/X/XA)	16-11
TROUBLESHOOTING	16-4	FRONT WHEEL	16-16
COMPONENT LOCATION	16-5	FORK	16-19
HANDLEBAR (CBR500R/RA)	16-7	STEERING STEM	16-26


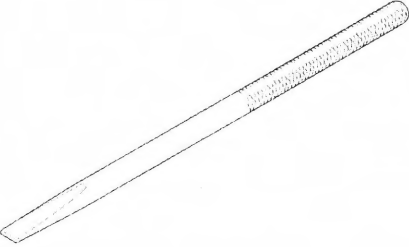
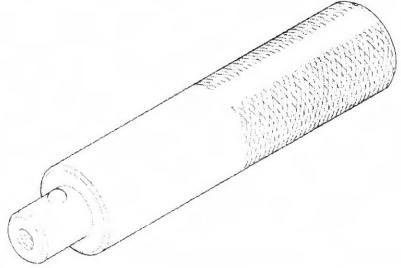
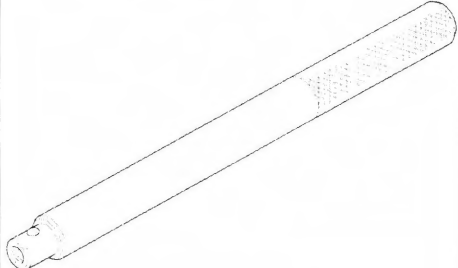
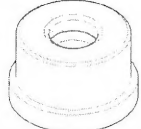
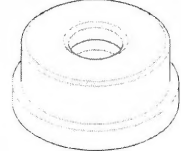
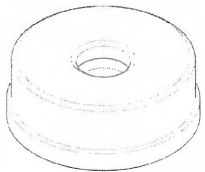

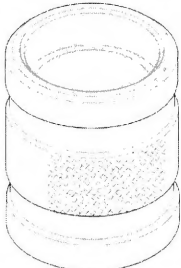
FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION

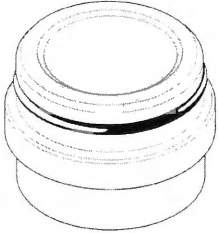
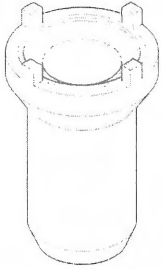
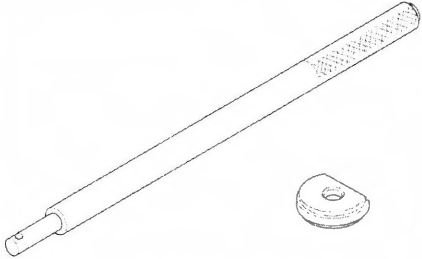
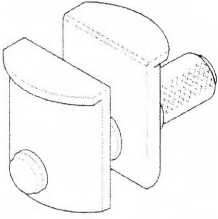
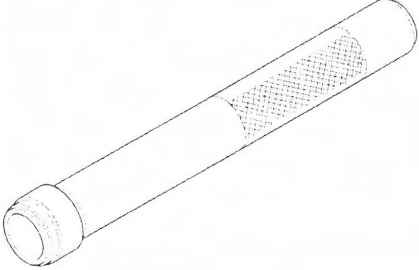
GENERAL

- 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 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.
- CBR500RA/CB500FA/XA: After the front wheel installation, perform the air gap inspection (page 19-22).
- For brake system service (page 18-3).

TOOLS

<p>Bearing remover head, 17 mm 07746-0050500</p> 	<p>Bearing remover shaft 07746-0050100</p> 	<p>Driver 07749-0010000</p> 
<p>Driver 07949-3710001</p> 	<p>Attachment, 32 x 35 mm 07746-0010100</p> 	<p>Attachment, 42 x 47 mm 07746-0010300</p> 
<p>Attachment, 52 x 55 mm 07746-0010400</p> 	<p>Pilot, 17 mm 07746-0040400</p> 	<p>Fork seal driver 07947-KA50100</p> 

FRONT WHEEL/SUSPENSION/STEERING

<p>Fork seal driver attachment, 41 mm 07947-KF00100</p> 	<p>Steering stem socket 07916-3710101</p> 	<p>Ball race remover set 07953-MJ10000</p>  <p>or 07953-MJ1000B (U.S.A. only)</p>
<p>Bearing remover 07946-3710500</p> 	<p>Steering stem driver 07946-MB00000</p> 	

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 18-2)

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

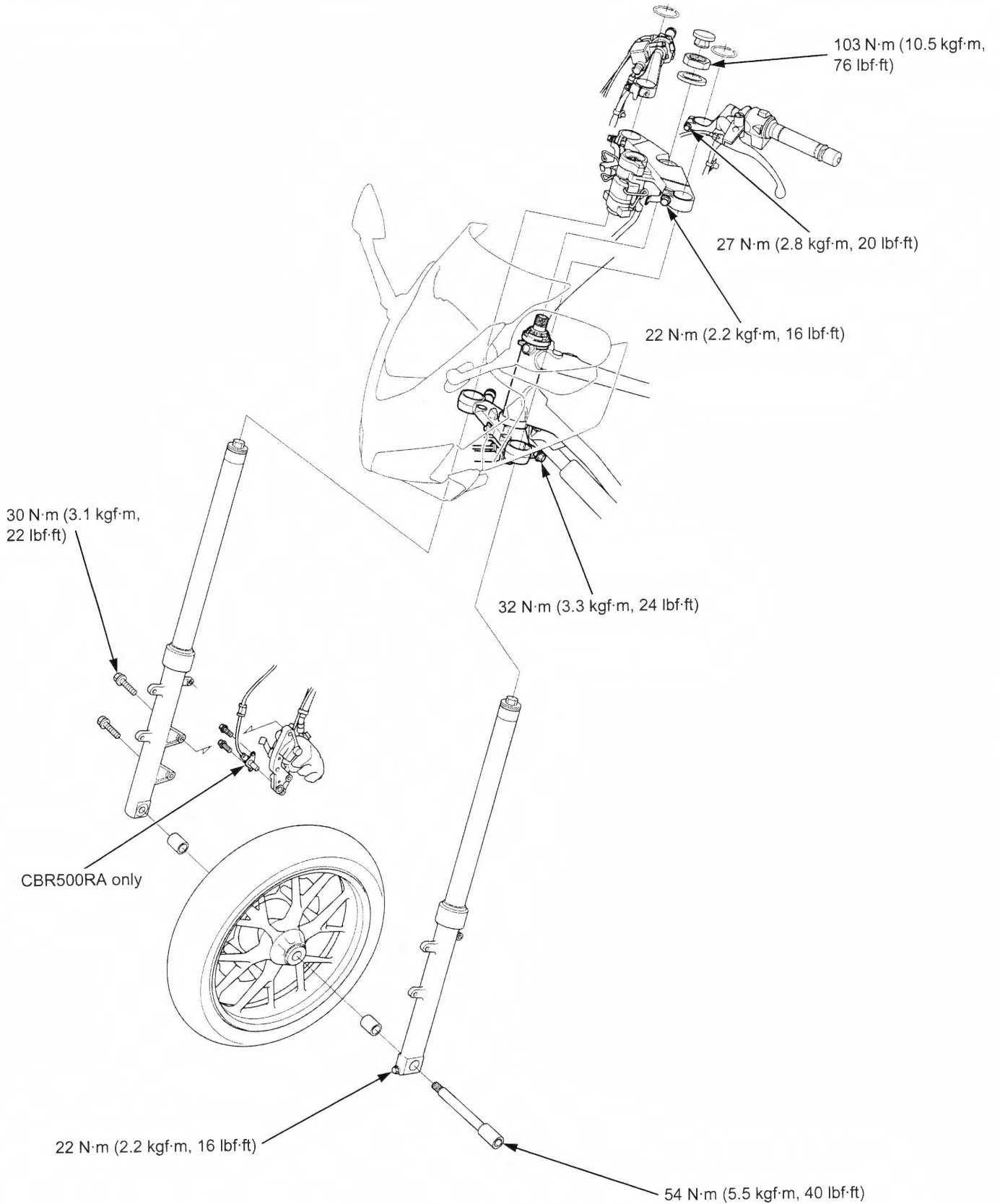
Front suspension noise

- Loose fork fasteners
- Incorrect fork fluid weight (low viscosity)
- Worn slider of fork tube bushing

COMPONENT LOCATION

CBR500R/RA

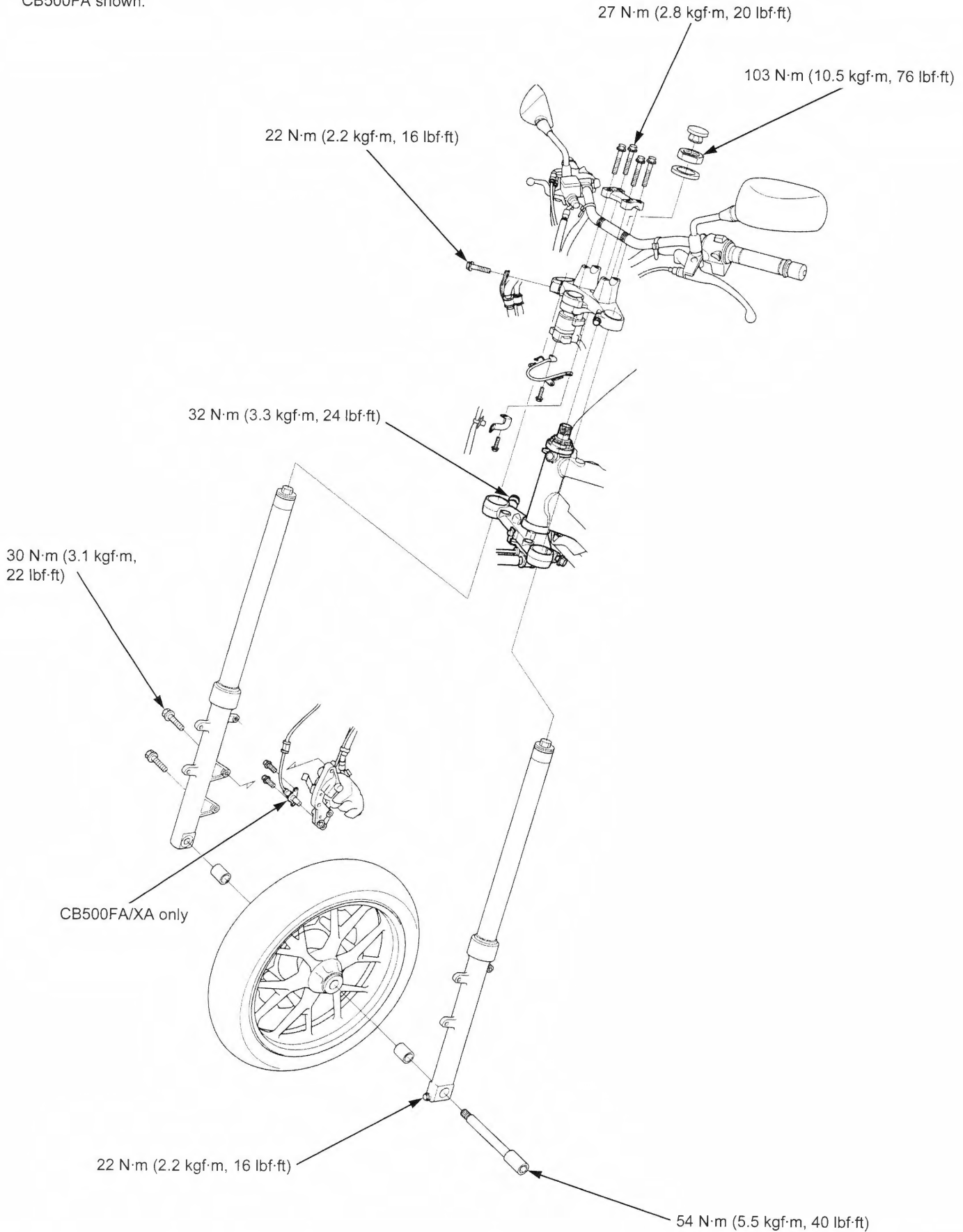
CBR500RA shown:



FRONT WHEEL/SUSPENSION/STEERING

CB500F/FA/X/XA (One-piece handlebar type)

CB500FA shown:



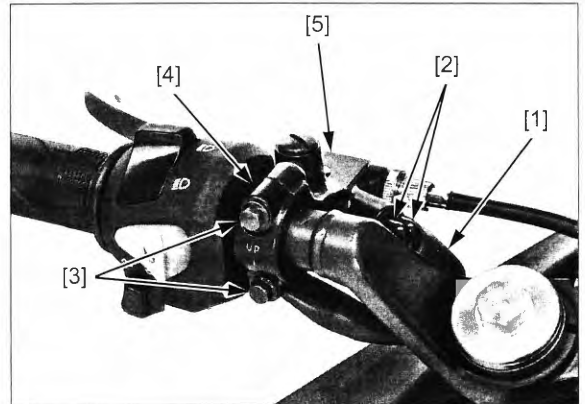
HANDLEBAR (CBR500R/RA)

REMOVAL

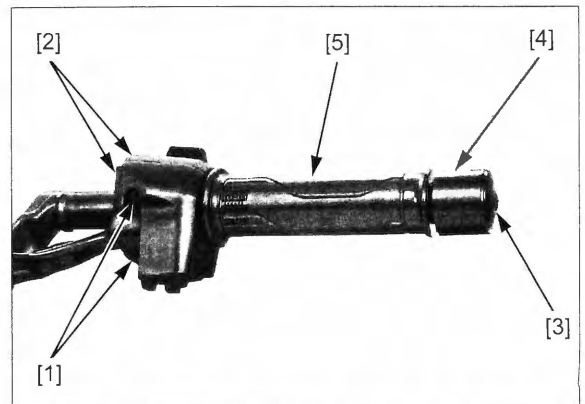
LEFT HANDLEBAR

Remove the following:

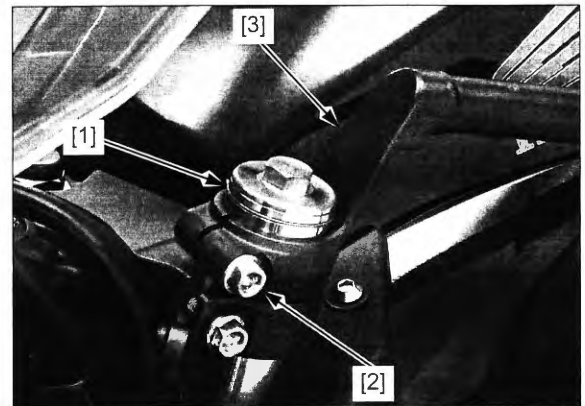
- connector boot [1]
- clutch switch connectors [2]
- two bolts [3]
- bracket holder [4]
- clutch lever bracket [5]



- two screws [1]
- left handlebar switch housings [2]
- screw [3] (while holding the handlebar weight [4] securely)
- handlebar weight
- left handlebar grip [5]

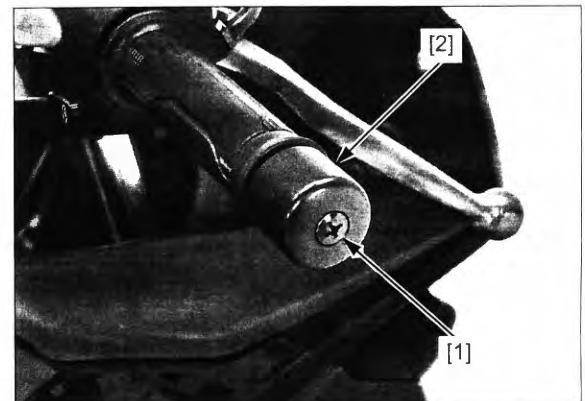


- stopper ring [1]
- pinch bolt [2] (loosen)
- left handlebar [3]



RIGHT HANDLEBAR

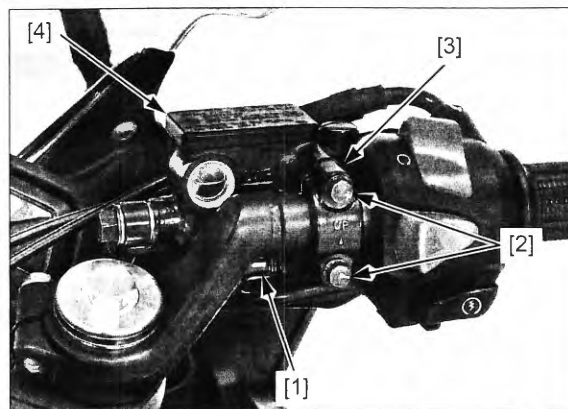
- screw [1] (while holding the handlebar weight [2] securely)
- handlebar weight



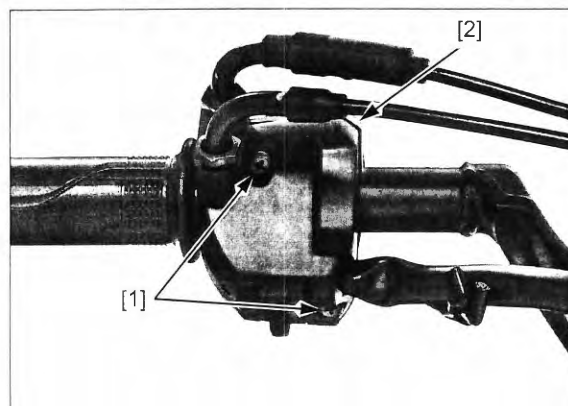
FRONT WHEEL/SUSPENSION/STEERING

Keep the reservoir upright to prevent air from entering the hydraulic system.

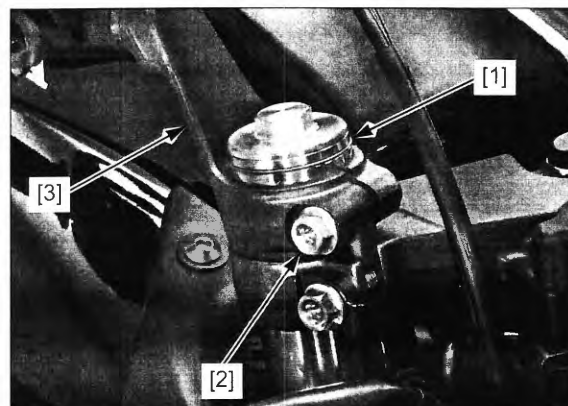
- brake light switch connectors [1]
- two bolts [2]
- master cylinder holder [3]
- front master cylinder [4]



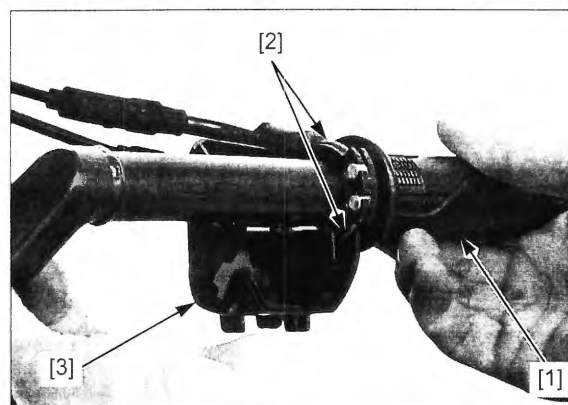
- two screws [1]
- upper right handlebar switch housing [2]



- stopper ring [1]
- pinch bolt [2] (loosen)
- right handlebar [3]



- throttle grip [1] (from the handlebar)
- throttle cables [2]
- lower right handlebar switch housing [3] (from the throttle grip)



INSTALLATION

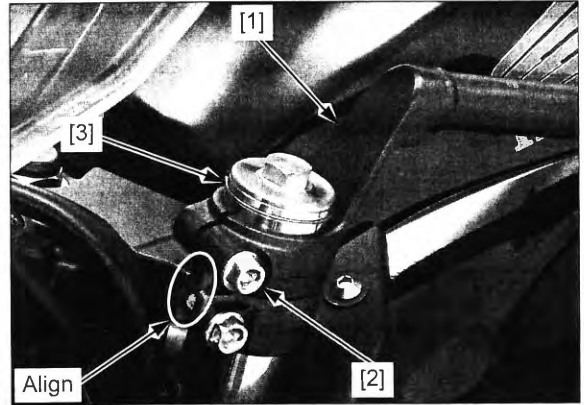
LEFT HANDLEBAR

Install the left handlebar [1] over the fork tube, aligning the boss with the groove in the top bridge.

Be sure the handlebar holder is fully seated on the top bridge. Push the handlebar forward to touch the boss against the inside of the groove, then tighten the pinch bolt [2] to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Install the stopper ring [3] into the groove in the fork tube.



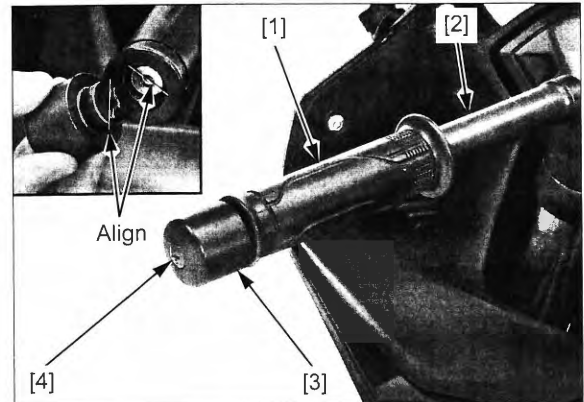
Clean the inside surface of the left handlebar grip [1] and the outside surface of the handlebar [2].

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.

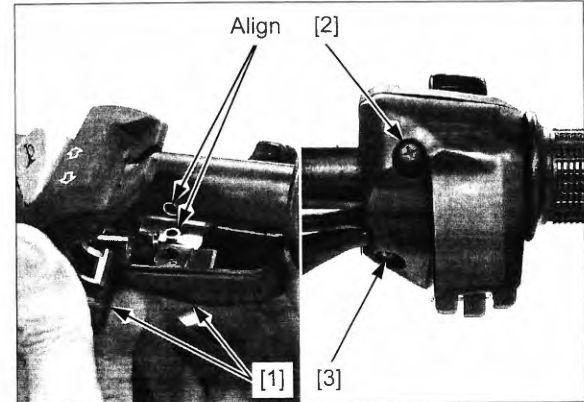
Wait 3 – 5 minutes and install the grip. Rotate the grip for even application of the adhesive.

Install the handlebar weight [3], aligning the flats and tighten the screw [4] while holding the weight securely.



Install the left handlebar switch housings [1] by aligning the locating pin with the hole in the handlebar. Tighten the upper screw first [2], then tighten the lower screw [3] to the specified torque.

TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)



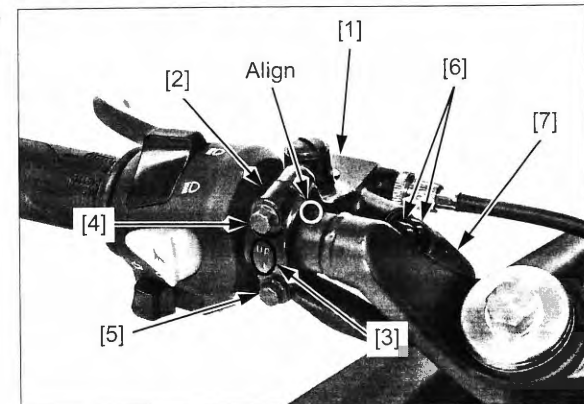
Align the edge of the bracket with the punch mark on the handlebar.

Install the clutch lever bracket [1] and holder [2] with the "UP" mark [3] facing up. Tighten the upper bolt first [4], then the lower bolt [5].

Connect the clutch switch connectors [6].

Install the connector boot [7] over the bracket sleeve.

Check the clutch lever freeplay (page 3-20).



FRONT WHEEL/SUSPENSION/STEERING

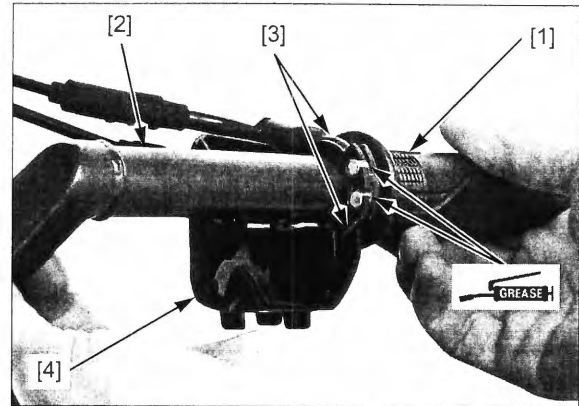
RIGHT HANDLEBAR

Clean the sliding surfaces of the throttle grip [1] and right handlebar [2].

Apply grease to the cable groove and roll-up area of the throttle grip.

Connect the throttle cables [3] to the throttle grip and set the throttle grip into the lower right handlebar switch housing [4].

Install the throttle grip onto the handlebar.

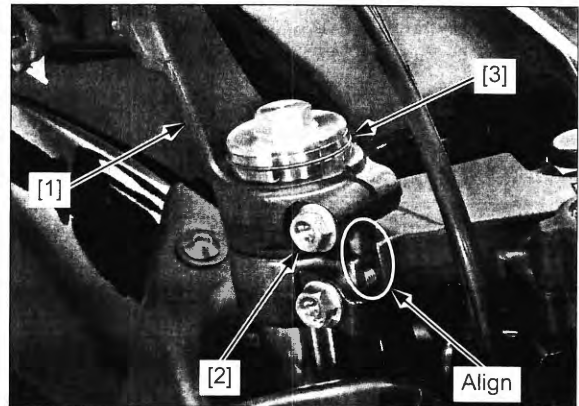


Install the right handlebar [1] over the fork tube, aligning the boss with the groove in the top bridge.

Be sure the handlebar holder is fully seated on the top bridge. Push the handlebar forward to touch the boss against the inside of the groove, then tighten the pinch bolt [2] to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

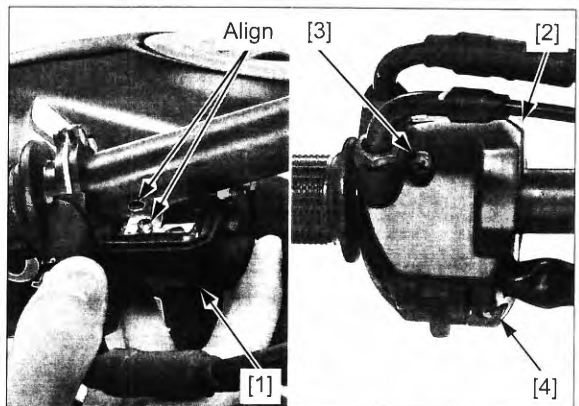
Install the stopper ring [3] into the groove in the fork tube.



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)

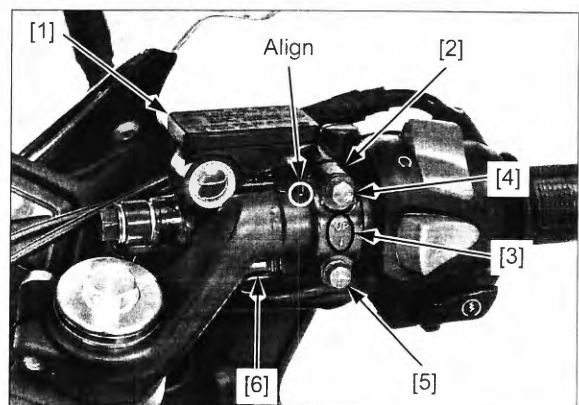


Align the edge of the master cylinder with the punch mark on the handlebar.

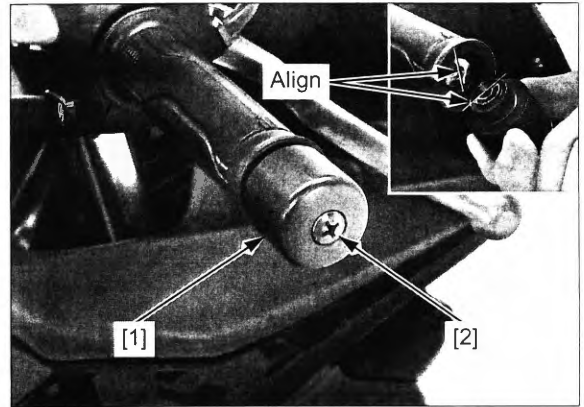
Install the master cylinder [1] and holder [2] with the "UP" mark [3] facing up. Tighten the upper bolt first [4], then the lower bolt [5] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the brake light switch connectors [6].



Install the handlebar weight [1], aligning the flats and tighten the screw [2] while holding the weight securely.
Check the throttle grip freeplay (page 3-4).



HANDLEBAR INNER WEIGHT REPLACEMENT

Remove the left handlebar grip and throttle grip (page 16-7).

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]

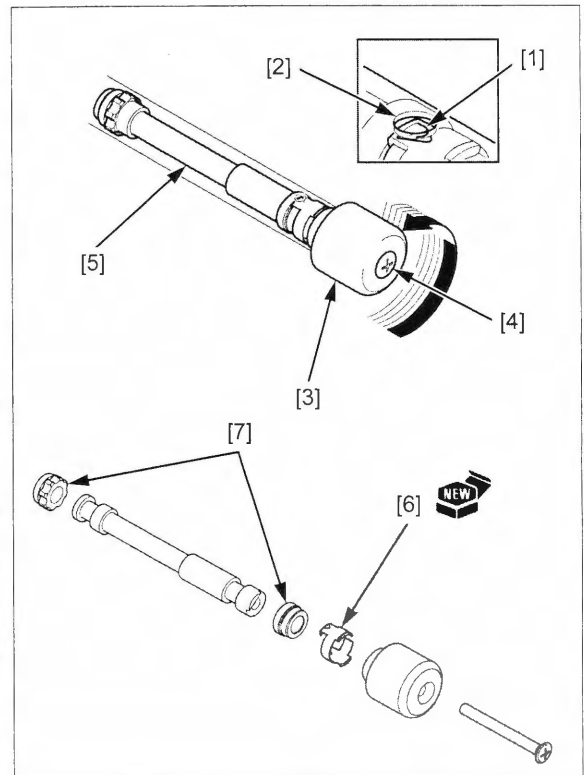
Install the rubber cushions and a new retainer onto the inner weight, aligning the retainer inner tabs with the cushion slit.

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 16-9).



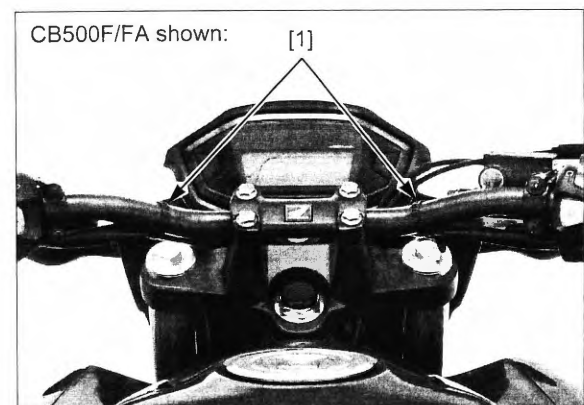
HANDLEBAR (CB500F/FA/X/XA)

REMOVAL

Remove the rearview mirrors (page 2-11).

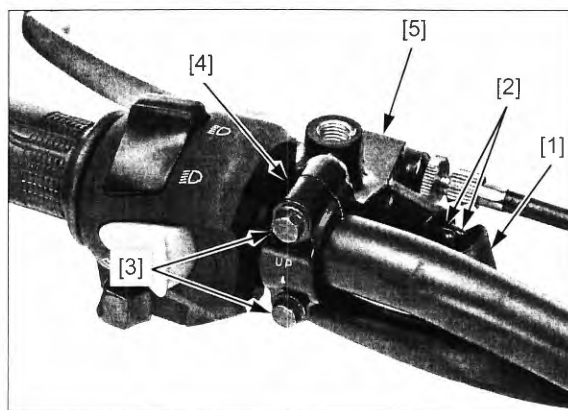
Remove the following:

- wire bands [1]

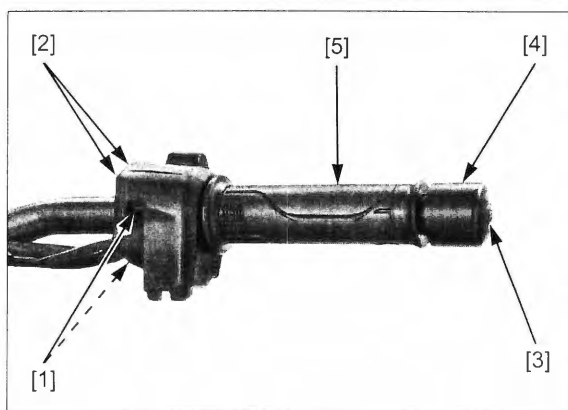


FRONT WHEEL/SUSPENSION/STEERING

- connector boot [1]
- clutch switch connectors [2]
- two bolts [3]
- bracket holder [4]
- clutch lever bracket [5]

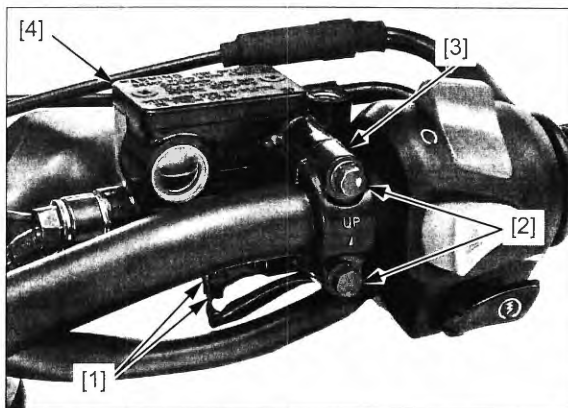


- two screws [1]
- left handlebar switch housings [2]
- screw [3] (while holding the handlebar weight [4] securely)
- handlebar weight (from both sides of the handlebar)
- left handlebar grip [5]

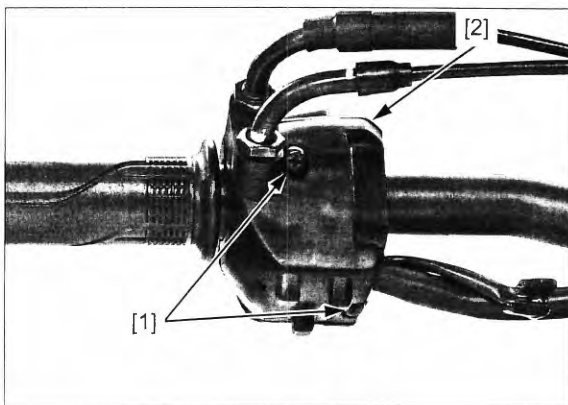


Keep the reservoir upright to prevent air from entering the hydraulic system.

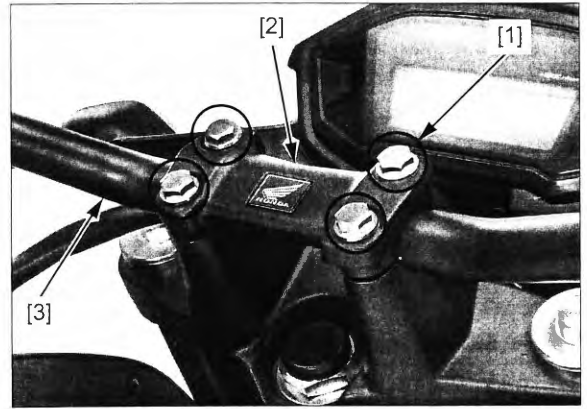
- brake light switch connectors [1]
- two bolts [2]
- master cylinder holder [3]
- front master cylinder [4]



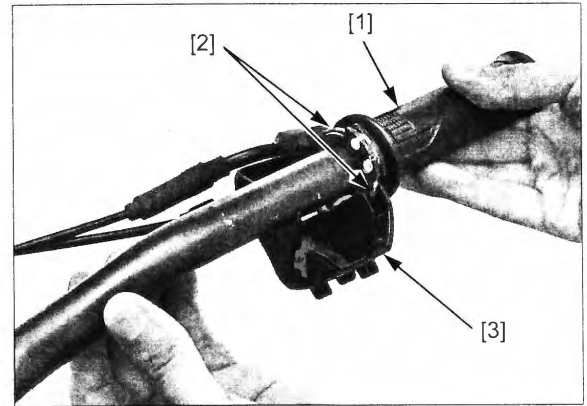
- two screws [1]
- upper right handlebar switch housing [2]



- four bolts [1]
- handlebar holder [2]
- handlebar [3]



- throttle grip [1] (from the handlebar)
- throttle cables [2]
- lower right handlebar switch housing [3] (from the throttle grip)



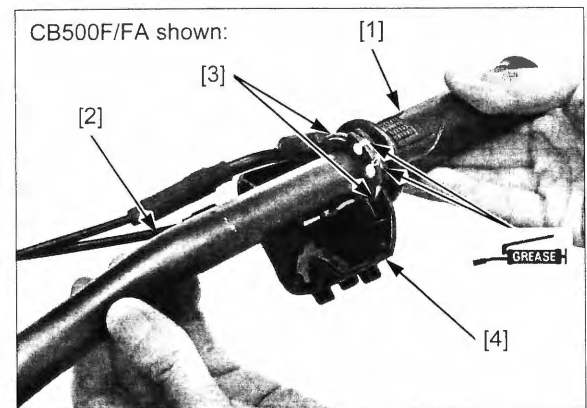
INSTALLATION

Clean the sliding surfaces of the throttle grip [1] and right handlebar [2].

Apply grease to the cable groove and roll-up area of the throttle grip.

Connect the throttle cables [3] to the throttle grip and set the throttle grip into the lower right handlebar switch housing [4].

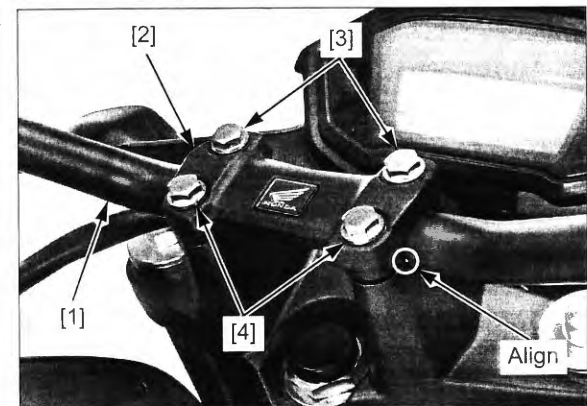
Install the throttle grip onto the handlebar.



Align the punch mark with the edge of the top bridge.

Install the handlebar [1] and holder [2]. Tighten the front bolts [3] first, then tighten the rear bolts [4] to the specified torque.

TORQUE: 27 N·m (2.8 kgf-m, 20 lbf-ft)

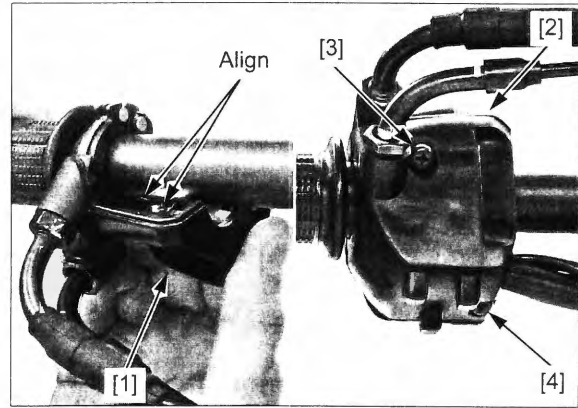


FRONT WHEEL/SUSPENSION/STEERING

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)

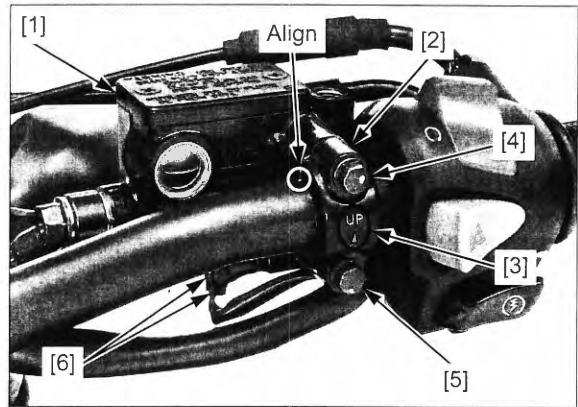


Align the edge of the master cylinder with the punch mark on the handlebar.

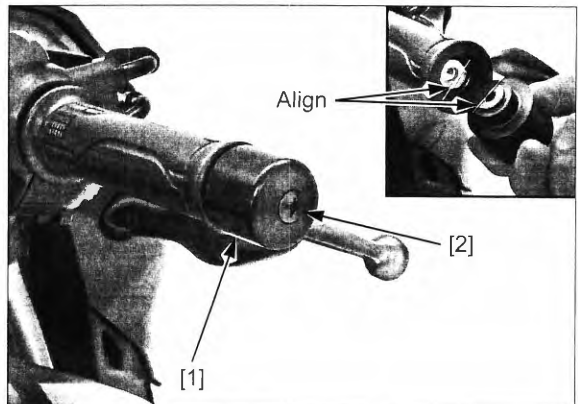
Install the master cylinder [1] and holder [2] with the "UP" mark [3] facing up. Tighten the upper bolt first [4], then the lower bolt [5] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the brake light switch connectors [6].



Install the handlebar weight [1], aligning the flats and tighten the screw [2] while holding the weight securely.



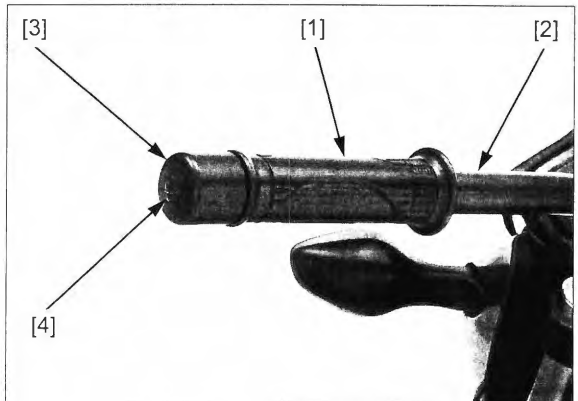
Clean the inside surface of the left handlebar grip [1] and the outside surface of the handlebar [2].

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.

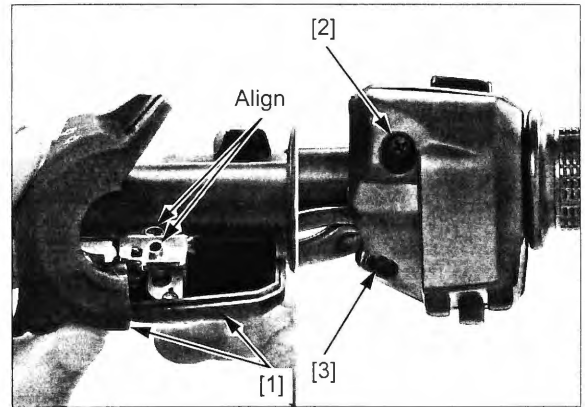
Wait 3 – 5 minutes and install the grip. Rotate the grip for even application of the adhesive.

Install the handlebar weight [3] and tighten the screw [4] as same manner as above.



Install the left handlebar switch housings [1] by aligning the locating pin with the hole in the handlebar. Tighten the upper screw first [2], then tighten the lower screw [3] to the specified torque.

TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)

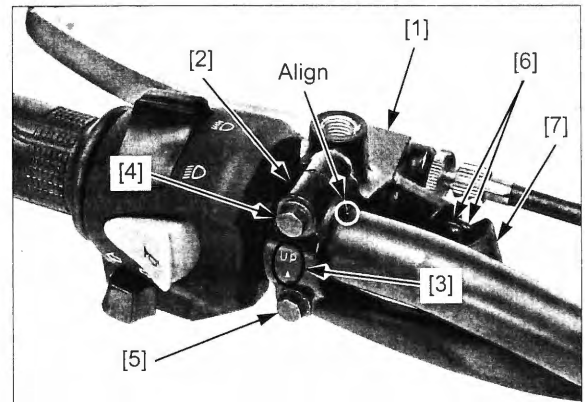


Align the edge of the bracket with the punch mark on the handlebar.

Install the clutch lever bracket [1] and holder [2] with the "UP" mark [3] facing up. Tighten the upper bolt first [4], then the lower bolt [5].

Connect the clutch switch connectors [6].

Install the connector boot [7] over the bracket sleeve.

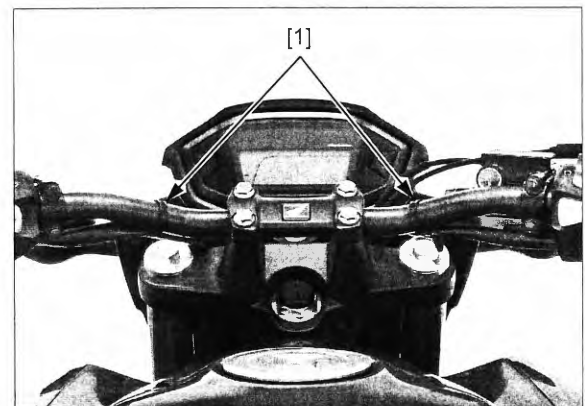


Secure the wires with the wire bands [1].

Install the rearview mirrors (page 2-11).

Check the following:

- clutch lever freeplay (page 3-4)
- throttle grip freeplay (page 3-20)



FRONT WHEEL/SUSPENSION/STEERING

HANDLEBAR INNER WEIGHT REPLACEMENT

Remove the left handlebar grip and throttle grip (page 16-11).

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 inner weight:

- screw
- handlebar weight
- weight retainer [6]
- rubber cushions [7]

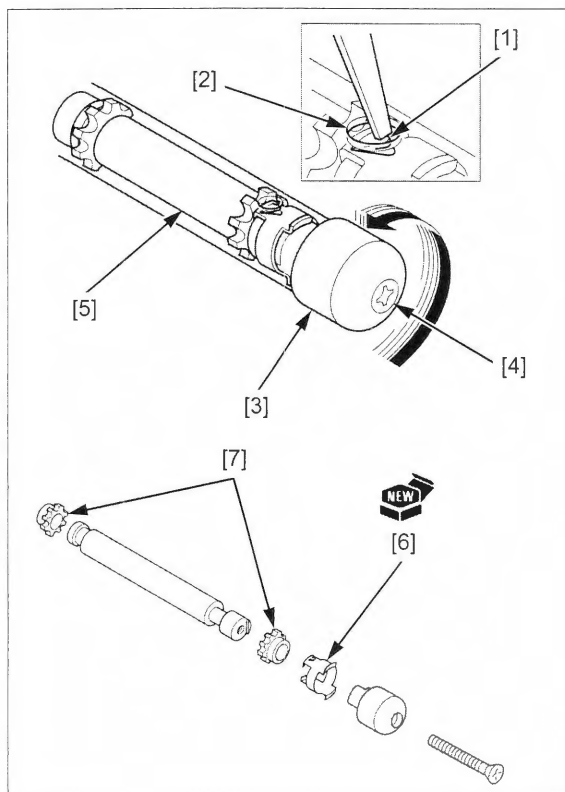
Install the rubber cushions and a new retainer onto the inner weight, aligning the inner retainer tabs with the cushion slit.

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 16-13).



FRONT WHEEL

REMOVAL/INSTALLATION

NOTE:

- Do not operate the brake lever after removing the wheel.
- Be careful not to bend or damage the pulser ring [1] (CBR500RA/CB500FA/XA).

CBR500RA/CB500FA/XA: Remove the two bolts [2] and front wheel speed sensor [3].

Loosen the axle pinch bolt [4] and the front axle [5].

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

Pull the axle out and remove the front wheel.

Remove the side collars [6].

Install the side collars.

Place the wheel between the fork legs. Carefully align the axle holes and insert the axle from the left side.

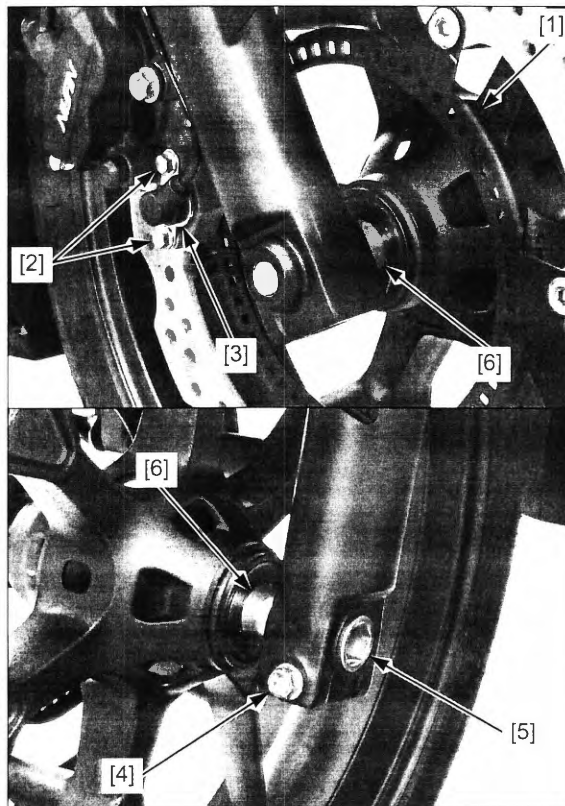
Tighten the axle to the specified torque.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

With the front brake applied, pump the forks up and down several times to seat the axle and check the brake operation.

Tighten the axle pinch bolt to the specified torque.

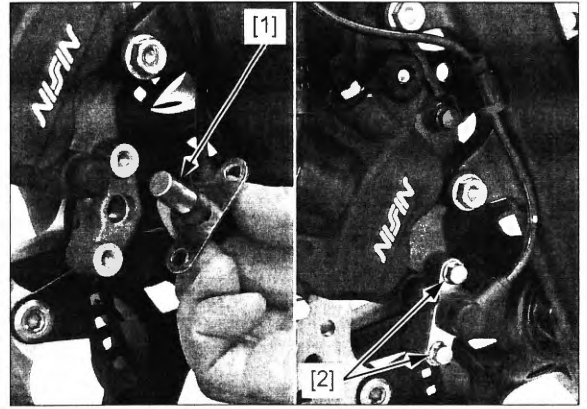
TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



CBR500RA/
CB500FA/XA: 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 19-22).



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.

Replace the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub.

Inspect the following parts for damage, abnormal wear, deformation or bend.

- front axle
- spoke
- wheel rim

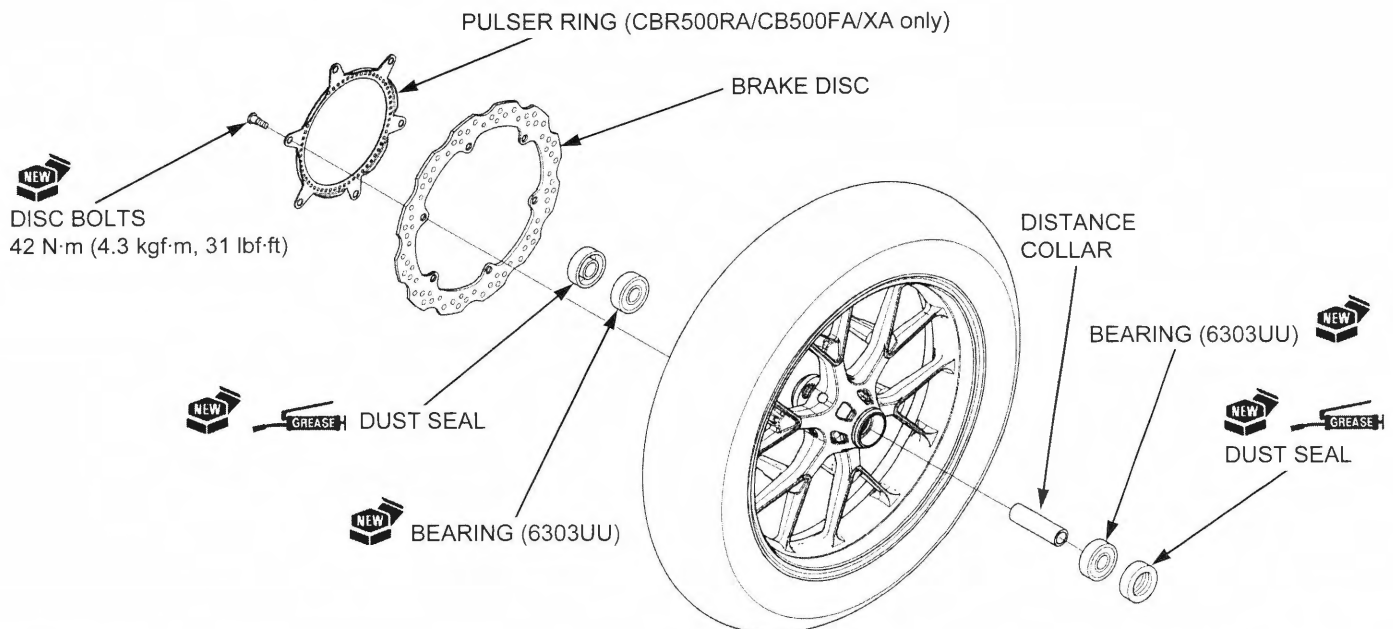
Measure each part according to FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS (page 1-11).

Replace any part if it is out of service limit.

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the front wheel as following illustration.

- 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.



FRONT WHEEL/SUSPENSION/STEERING

BEARING REPLACEMENT

Install the remover head [1] into the bearing.

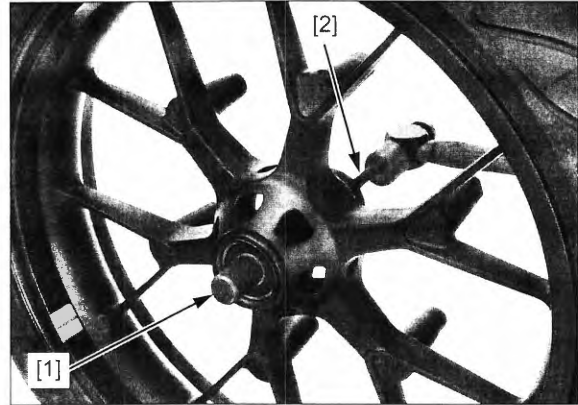
From the opposite side of the wheel, install the bearing remover shaft [2] and drive the bearing out of the wheel hub.

TOOLS:

Bearing remover head, 17 mm 07746-0050500

Bearing remover shaft 07746-0050100

Remove the distance collar and drive out the other bearing.



Drive in a new right side bearing (brake disc side) squarely with the marked side facing up until it is fully seated.

Install the distance collar.

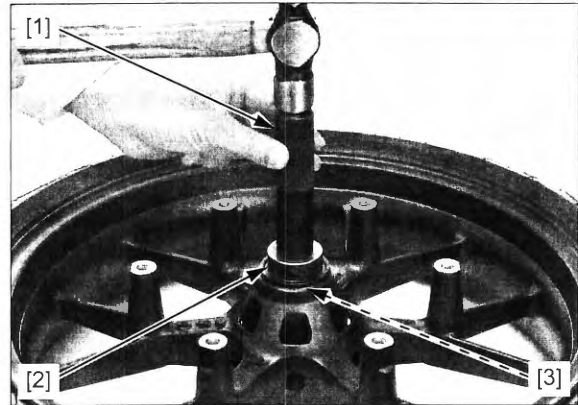
Drive in a new left side bearing squarely with the marked side facing up until it is fully seated.

TOOLS:

[1] Driver 07749-0010000

[2] Attachment, 42 x 47 mm 07746-0010300

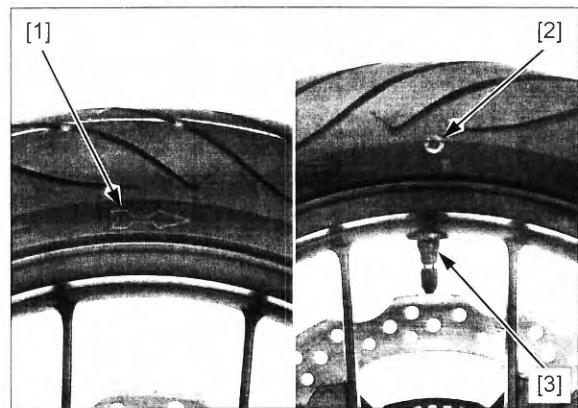
[3] Pilot, 17 mm 07746-0040400



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 front 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.

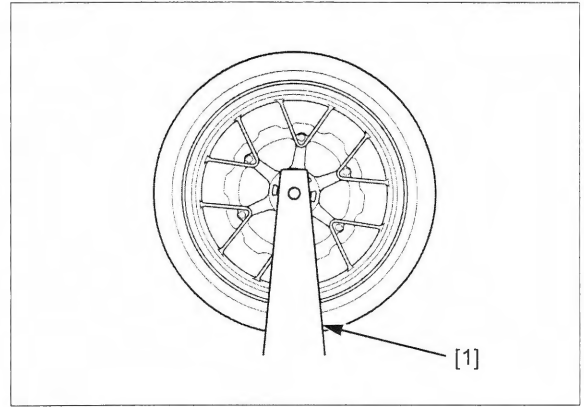


Mount the wheel, tire and brake disc assembly on an inspection stand [1].

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.

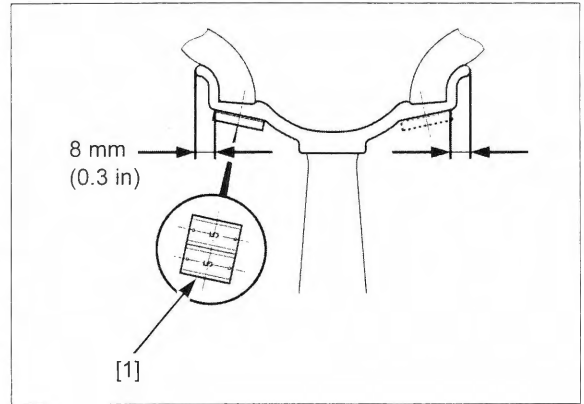


To balance the wheel, install the wheel weights [1] on the highest side of the rim, on the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun. Do not add more than 60 g (2.1 oz) to the wheel.

Press the weights by your hands firmly and make sure they are not come off the rim.

NOTE:

- The weights are attached to the position at 8 mm (0.3 in) from the side surface of the rim in the direction as shown.
- If the weight exceeds 10 g (0.4 oz), install same amount of the balance weights on the right and left symmetrical position.



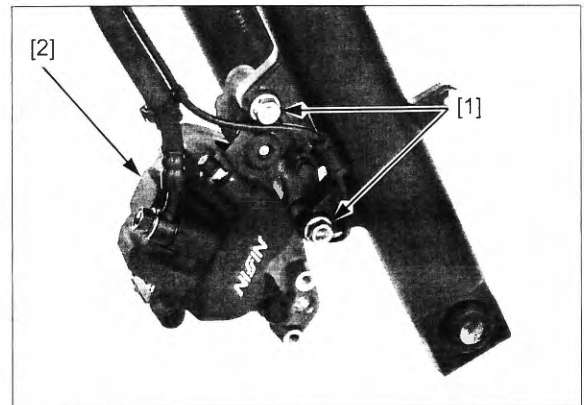
FORK

REMOVAL

Remove the following:

- front wheel (page 16-16)
- front fender (page 2-22)

Remove the two mounting bolts [1] and front brake caliper [2] (right fork only).



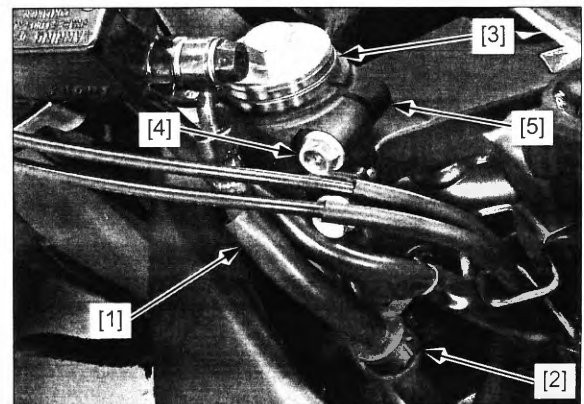
Support the brake caliper so it does not hang from the brake hose. Do not twist the brake hose.

CBR500R/RA: Release the brake hose [1] from the clamp [2] (right fork only).

Remove the stopper ring [3].

Keep the reservoir upright to prevent air from entering the hydraulic system.

Loosen the pinch bolt [4] and remove the handlebar [5] from the fork tube.



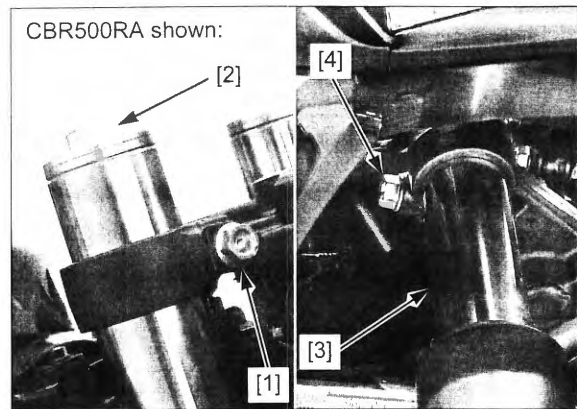
FRONT WHEEL/SUSPENSION/STEERING

Loosen the top bridge pinch bolt [1].

When the fork is ready to be disassembled, loosen the fork cap [2], but do not remove it.

Support the fork leg [3] securely.

Loosen the bottom bridge pinch bolt [4] and pull the fork leg down, then remove it out of the top and bottom bridges.

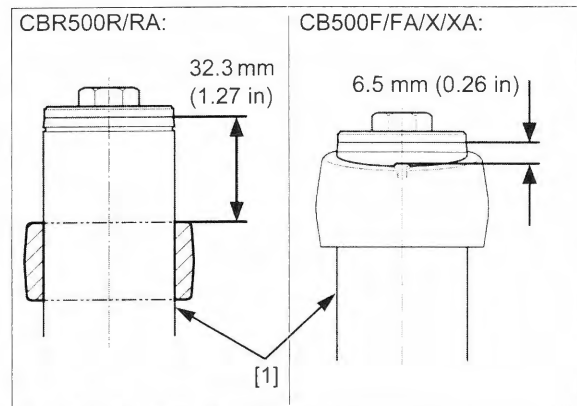


INSTALLATION

Mark the fork tube at the specified height indicated below, 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 pinch bolt.

- CBR500R/RA:
top bridge upper surface-to-fork tube end; 32.3 mm (1.27 in)
- CB500F/FA/X/XA:
top bridge lug-to-fork tube end; 6.5 mm (0.26 in)



Tighten the bottom bridge pinch bolt [1] to the specified torque.

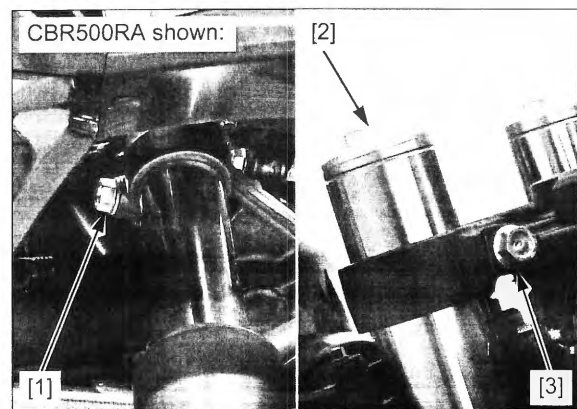
TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

Tighten the fork cap [2] to the specified torque if it was removed.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Tighten the top bridge pinch bolt [3] to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



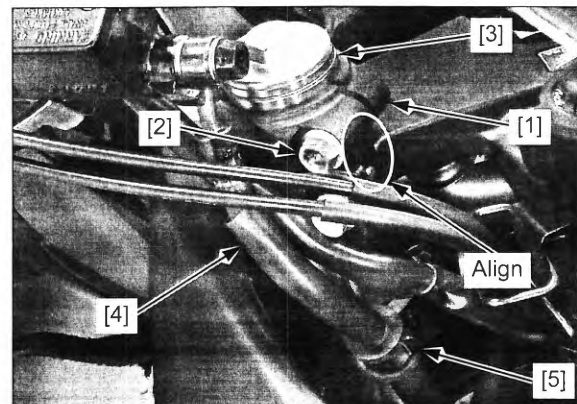
CBR500R/RA: Install the handlebar [1] over the fork tube, aligning the boss with the groove in the top bridge.

Be sure the handlebar holder is fully seated on the top bridge. Push the handlebar forward to touch the boss against the inside of the groove, then tighten the pinch bolt [2] to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Install the stopper ring [3] into the groove in the fork tube.

Install the brake hose [4] into the clamp [5].

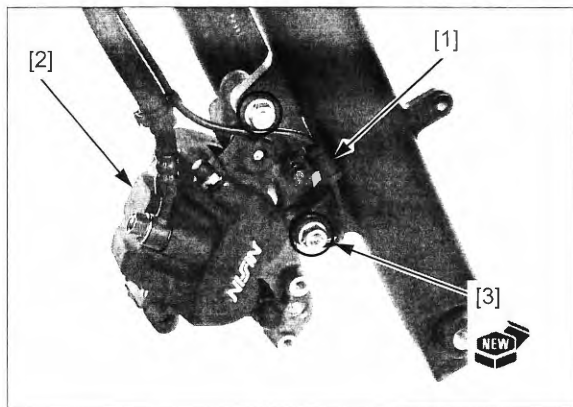


Fit the wire grommet into the clamp [1] (CBR500RA/CB500FA/XA) and install the brake caliper [2] with new mounting bolts [3], and tighten them to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Install the following:

- front fender (page 2-22)
- front wheel (page 16-16)

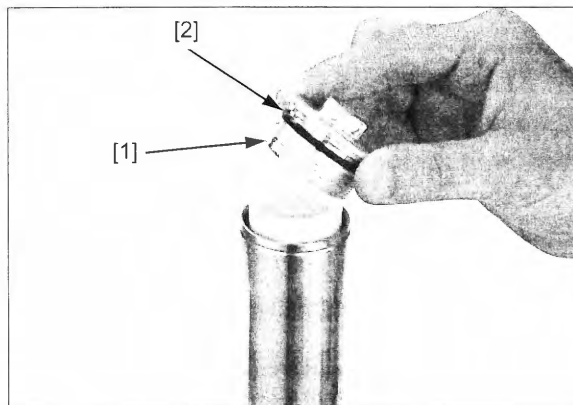


DISASSEMBLY

Fork cap is under spring pressure; use care when losing it.

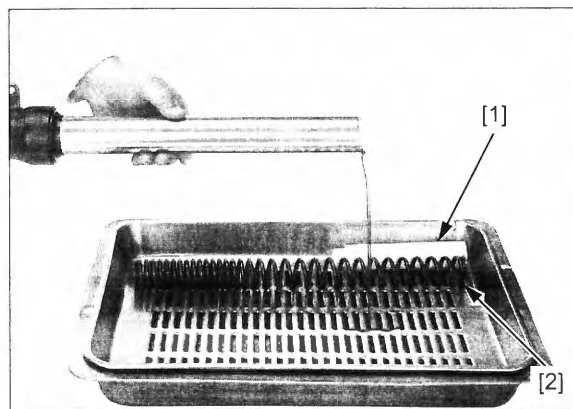
Remove the following:

- fork cap [1]
- O-ring [2]



- spring collar [1]
- fork spring [2]

Pour out the fork fluid by pumping the fork tube up and down several times.

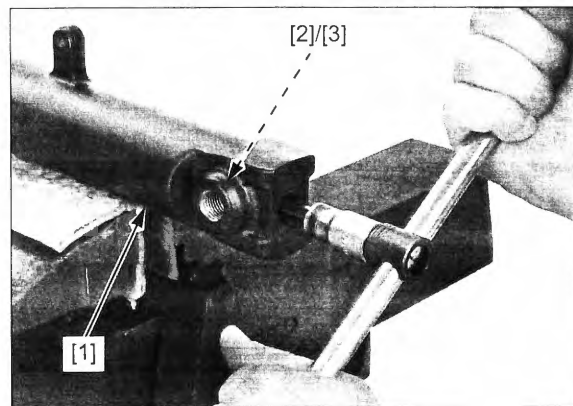


Hold the fork slider [1] in a vise with soft jaws or shop towels.

Remove the following:

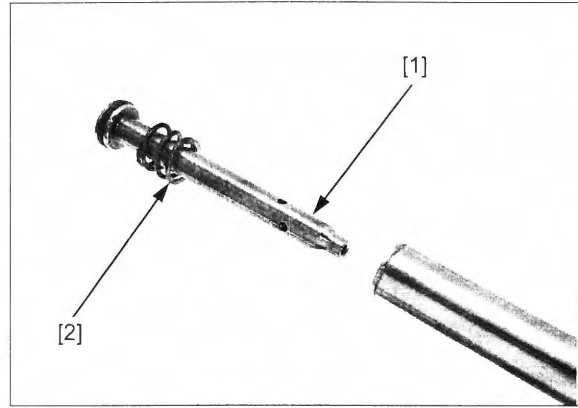
- fork socket bolt [2]
- sealing washer [3]

If the fork piston turns with the socket bolt, temporarily install the above components (spring, spring collar and fork cap).

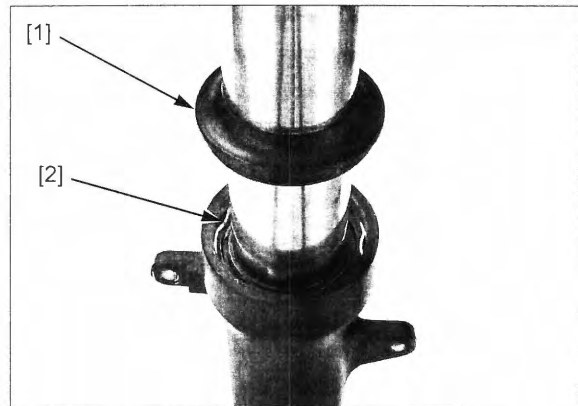


FRONT WHEEL/SUSPENSION/STEERING

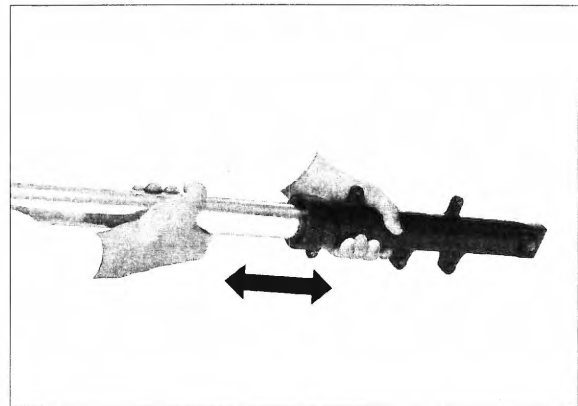
- fork piston [1]
- rebound spring [2]



- 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.

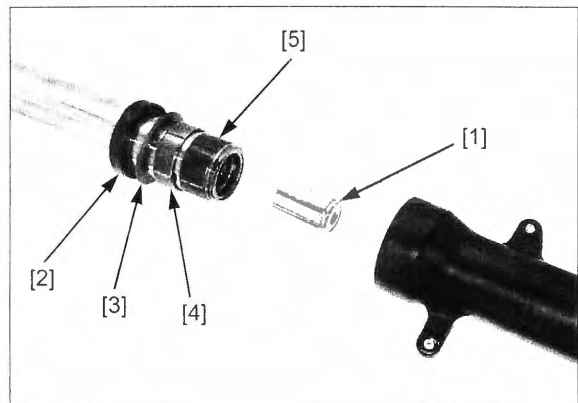


Remove the following:

- oil lock piece [1]
- oil seal [2]
- back-up ring [3]
- guide bushing [4]

Do not remove the fork tube bushing, unless it is necessary to replace with a new one (page 16-23).

Carefully remove the fork tube bushing [5] by prying the slit with a flat blade screwdriver until the bushing can be pulled off by hand.



INSPECTION

Inspect the following parts for damage, abnormal wear, bend, deformation, scoring and teflon coating wear.

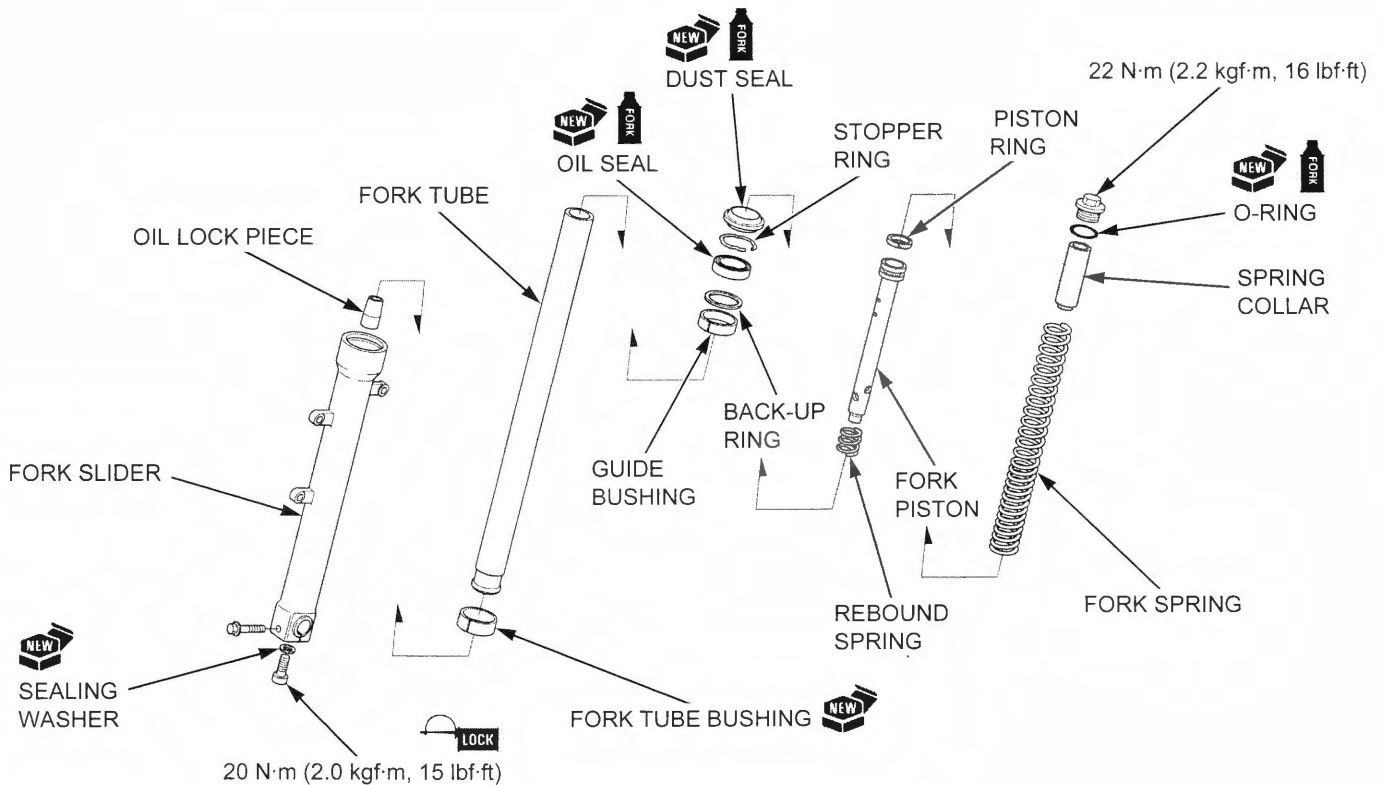
- fork tube
- fork slider
- fork spring
- rebound spring
- piston ring
- fork piston
- oil lock piece
- guide bushing
- fork tube bushing
- buck-up ring

Measure the each part according to FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS (page 1-11).

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.



FRONT WHEEL/SUSPENSION/STEERING

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.

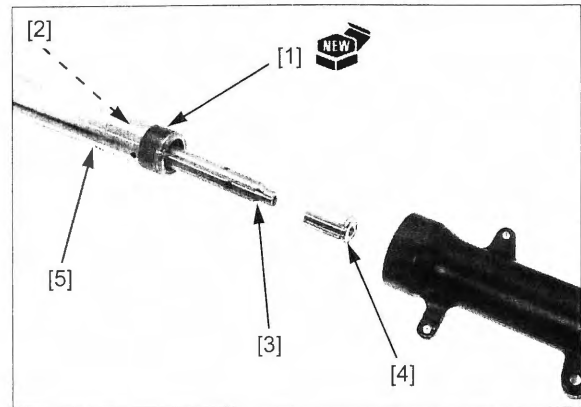
NOTE:

- Remove the burrs from the bushing mating surface, being careful not to peel off the coating.

Install the following:

- rebound spring [2] (onto the fork piston)
- fork piston [3] (into the fork tube)
- oil lock piece [4] (onto the fork piston)

Install the fork tube [5] into the fork slider.

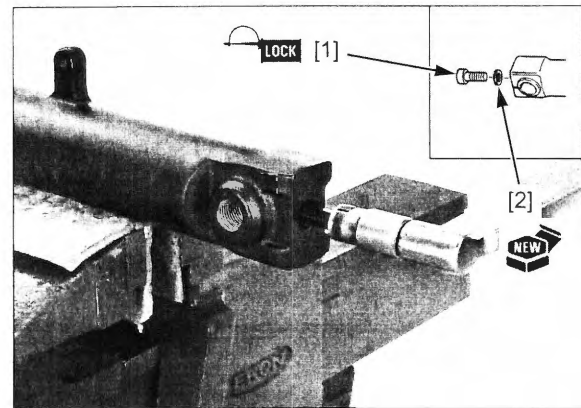


Hold the fork slider in a vise with soft jaws or shop towels.

Apply locking agent to the threads of the fork socket bolt [1].

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)



If the fork piston turns with the socket bolt, temporarily install the fork spring, spring collar and fork cap.

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.

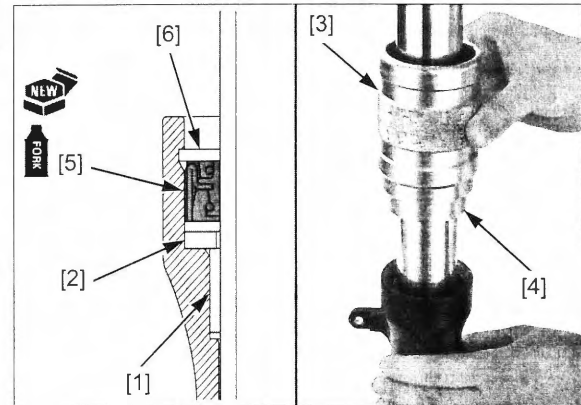
TOOLS:

- [3] Fork seal driver 07947-KA50100
 [4] Fork seal driver attachment, 07947-KF00100
 41 mm

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.

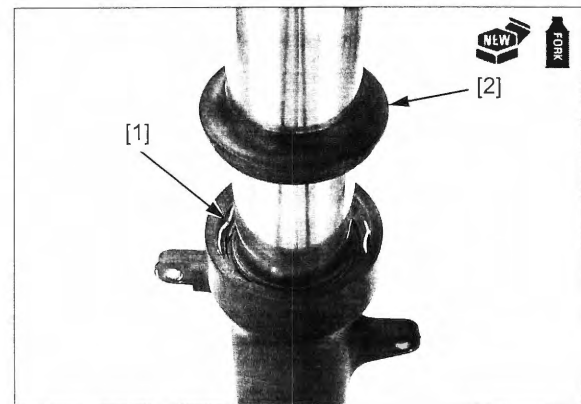
Drive the oil seal until the stopper ring groove [6] is visible using the same tools.



Be careful not to scratch the fork tube.

Install the stopper ring [1] into the groove in the fork slider.

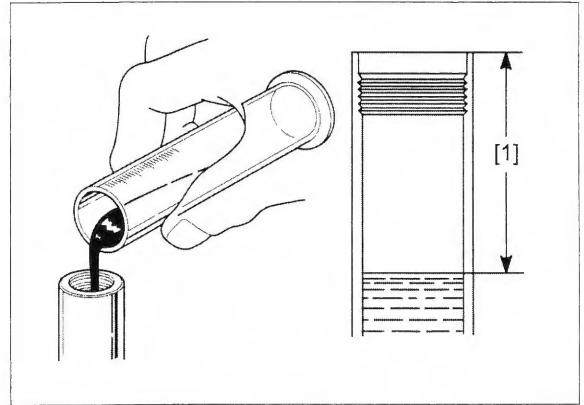
Apply fork fluid to the lips of a new dust seal [2] and install it.



Pour the specified amount of recommended fork fluid into the fork tube.

RECOMMENDED FORK FLUID:
 Pro Honda Suspension Fluid SS-8 (10W)

FORK FLUID CAPACITY:
CBR500R/RA:
 503 ± 2.5 cm³ (17.0 ± 0.08 US oz,
 17.7 ± 0.09 Imp oz)
CB500F/FA:
 480 ± 2.5 cm³ (16.2 ± 0.08 US oz,
 16.9 ± 0.09 Imp oz)
CB500X/XA:
 453 ± 2.5 cm³ (15.3 ± 0.08 US oz,
 15.9 ± 0.09 Imp oz)



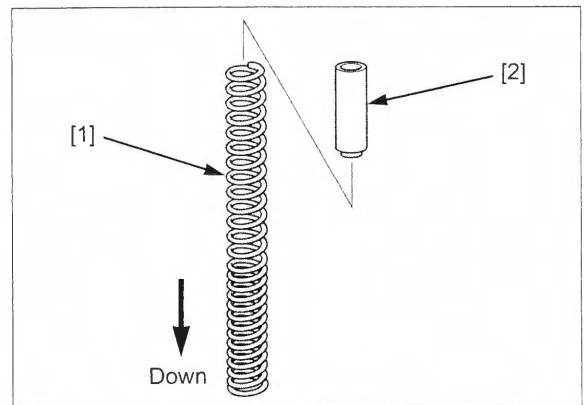
Slowly pump the fork tube several times to remove any trapped air from the lower portion of the fork tube.

Compress the fork tube fully and measure the fluid level from the top end of the fork tube.

[1] FLUID LEVEL:
CBR500R/RA/CB500F/FA: 130 mm (5.1 in)
CB500X/XA: 160 mm (6.3 in)

Pull the fork pipe up and install the fork spring [1] with the tightly wound coil side facing down.

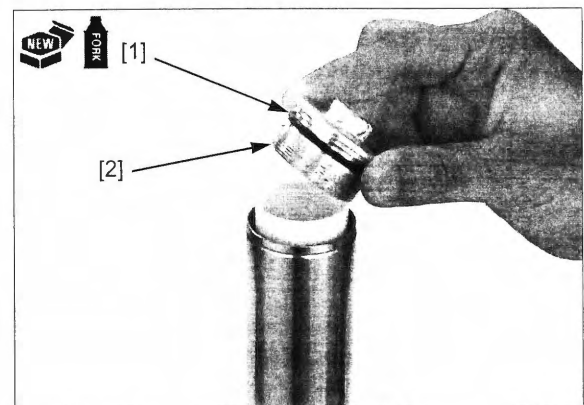
Install the spring collar [2] with the stepped side facing down.



Coat a new O-ring [1] with fork fluid and install it into the groove in the fork cap [2].

Install the fork cap into the fork tube.

Tighten the fork cap after installing the fork tube into the fork bridges.



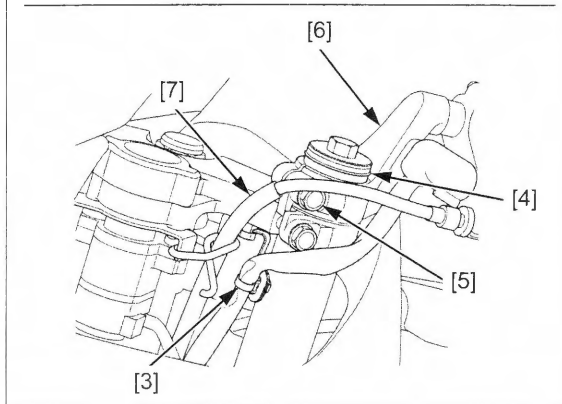
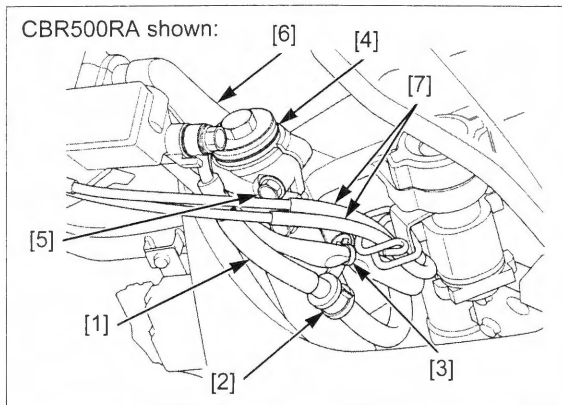
STEERING STEM

REMOVAL

CBR500R/RA: Remove the following:

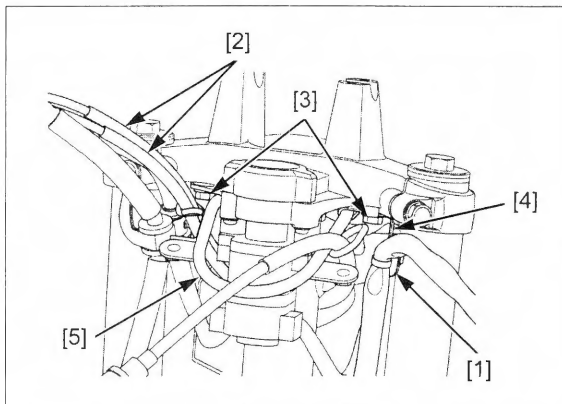
Keep the reservoir upright to prevent air from entering the hydraulic system.

- middle cowls (page 2-8).
- AC type: EVAP canister (page 7-22)
- brake hose [1] (from the clamp [2])
- band clips [3]
- stopper rings [4]
- handlebar pinch bolts [5] (loosen)
- handlebars [6]
- cables [7] (from the cable guides)



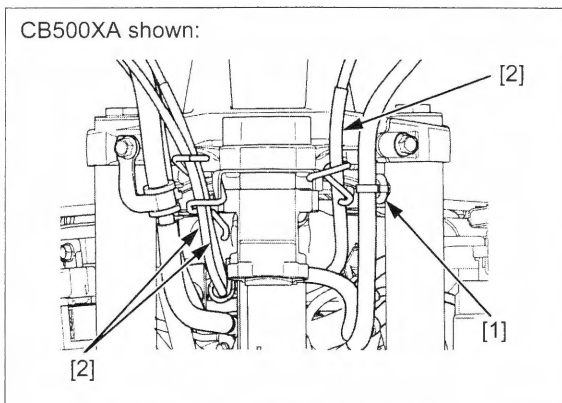
CB500F/FA: Remove the following:

- middle cowls (page 2-9)
- front cowl (page 2-13)
- AC type: EVAP canister (page 7-22)
- handlebar (page 16-11)
- band clip [1]
- throttle cables [2] (from the cable guide)
- two bolts [3]
- band clip stay [4] and front cowl stay [5]



CB500X/XA: Remove the following:

- middle cowls (page 2-9)
- AC type: EVAP canister (page 7-22)
- handlebar (page 16-11)
- band clip [1]
- cables [2] (from the cable guides)

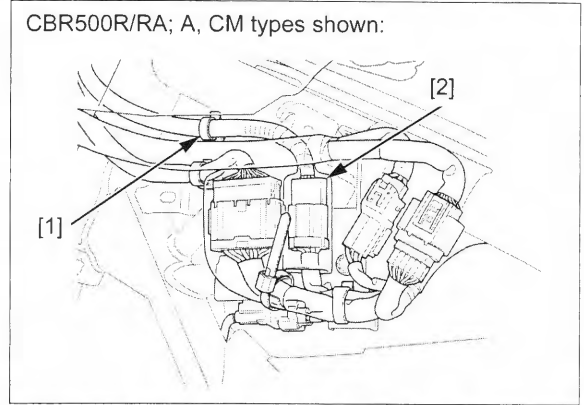


FRONT WHEEL/SUSPENSION/STEERING

Remove the three band clip [1].

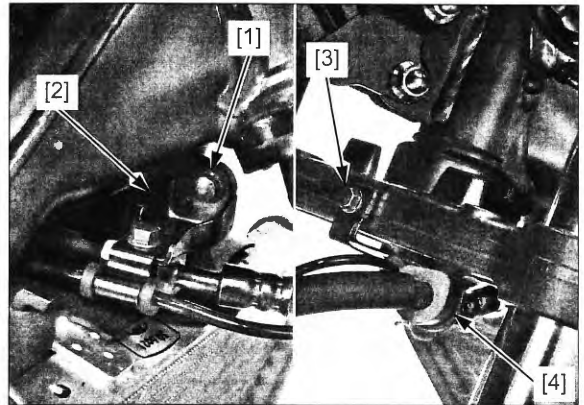
Remove the ignition switch 2P (Brown) connector [2] from the stay and disconnect it.

CBR500R/RA; A, CM types shown:



CBR500RA/CB500FA/XA: Remove the bolt (6 x 10 mm) [1] and hose joint/clamp stay [2].

Remove the bolt (6 x 12 mm) [3] and clamp [4].



Remove the stem cap [1].

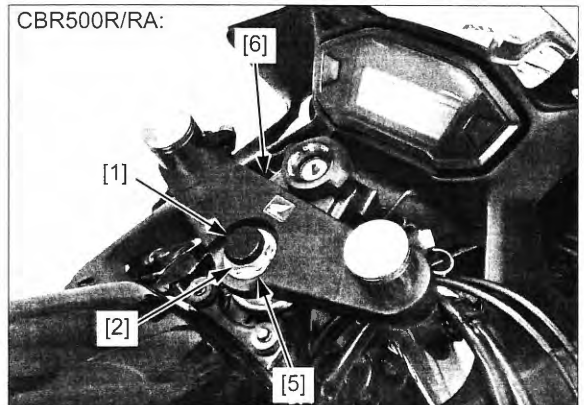
Loosen the steering stem nut [2].

Remove the fork legs (page 16-19).

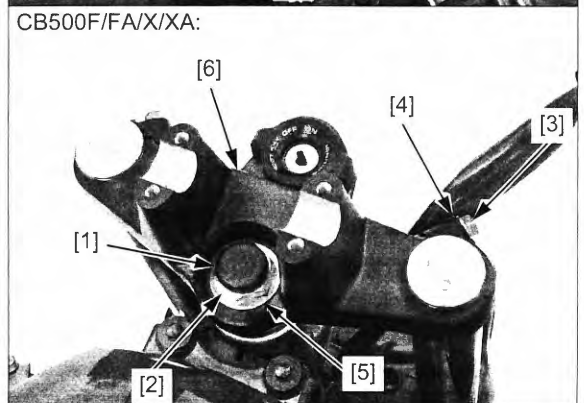
Remove the following:

- CB500F/FA/X/XA: top bridge pinch bolt [3] and clamp [4]
- stem nut
- washer [5]
- top bridge [6]

CBR500R/RA:



CB500F/FA/X/XA:



FRONT WHEEL/SUSPENSION/STEERING

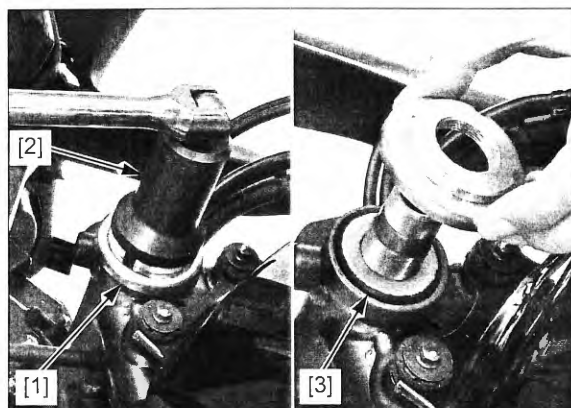
Straighten the lock washer tabs [1].
Remove the lock nut [2] and lock washer.



Loosen the steering bearing adjustment nut [1] using the special tool.

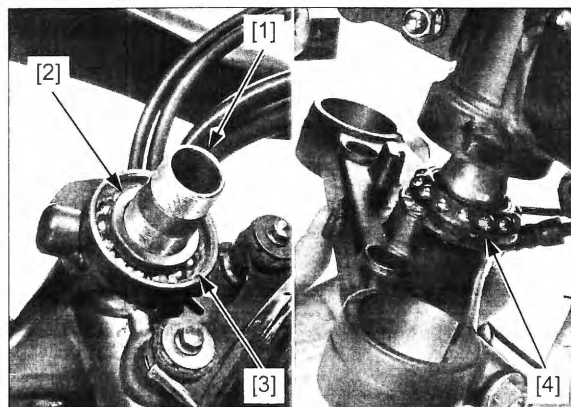
TOOL:
[2] Steering stem socket 07916-3710101

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]



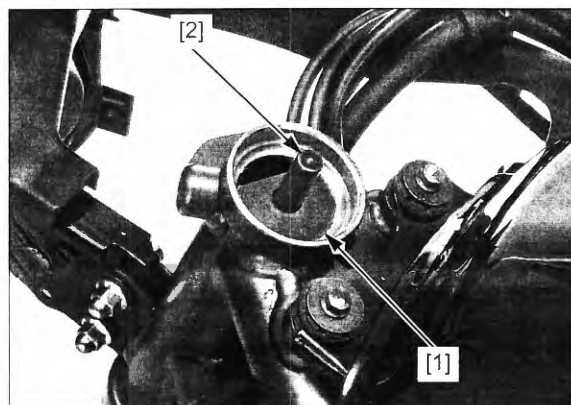
BEARING REPLACEMENT

Always replace the bearing and races as a set.

Remove the upper outer race using the special tools.

TOOLS:
Ball race remover set
- [1] remover attachment 07953-MJ10000
- [2] remover shaft 07953-MJ10100
07953-MJ10200 or
07953-MJ1000B
(U.S.A. only)

For the remover attachment, use side A.

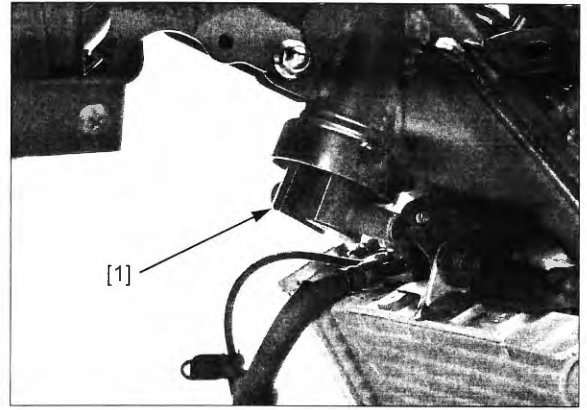


FRONT WHEEL/SUSPENSION/STEERING

Remove the lower outer race using the special tools.

TOOLS:

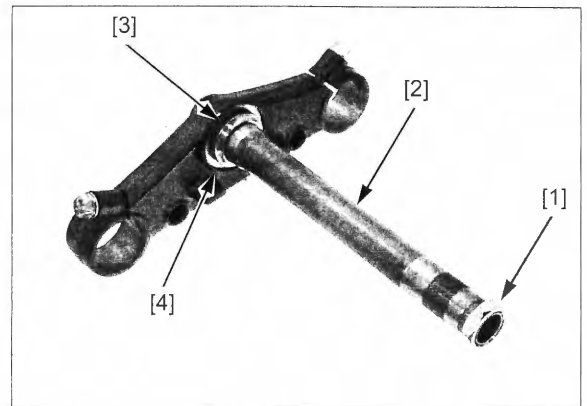
[1] Bearing remover	07946-3710500
Driver	07949-3710001
Attachment, 32 x 35 mm	07746-0010100



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].

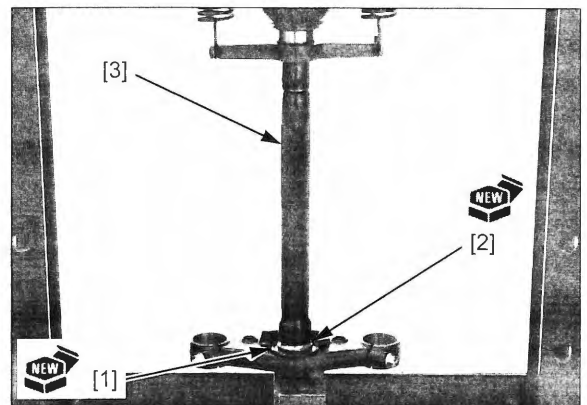


Install a new lower dust seal onto the steering stem [1].

Press a new lower inner race [2] using the special tool.

TOOL:

[3] Steering stem driver	07946-MB00000
--------------------------	---------------



Drive in a new upper outer race [1] into the steering head pipe using the special tool.

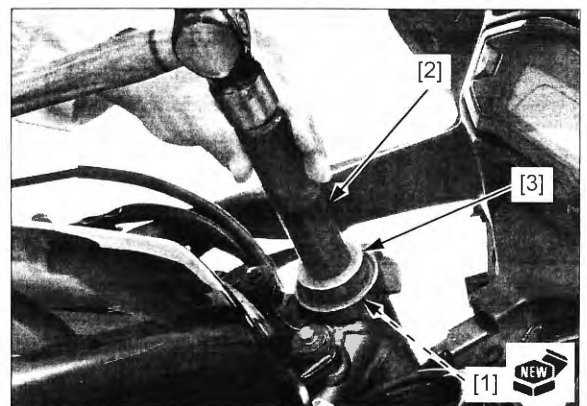
TOOLS:

[2] Driver	07749-0010000
[3] Attachment, 42 x 47 mm	07746-0010300

Drive in a new lower outer race.

TOOLS:

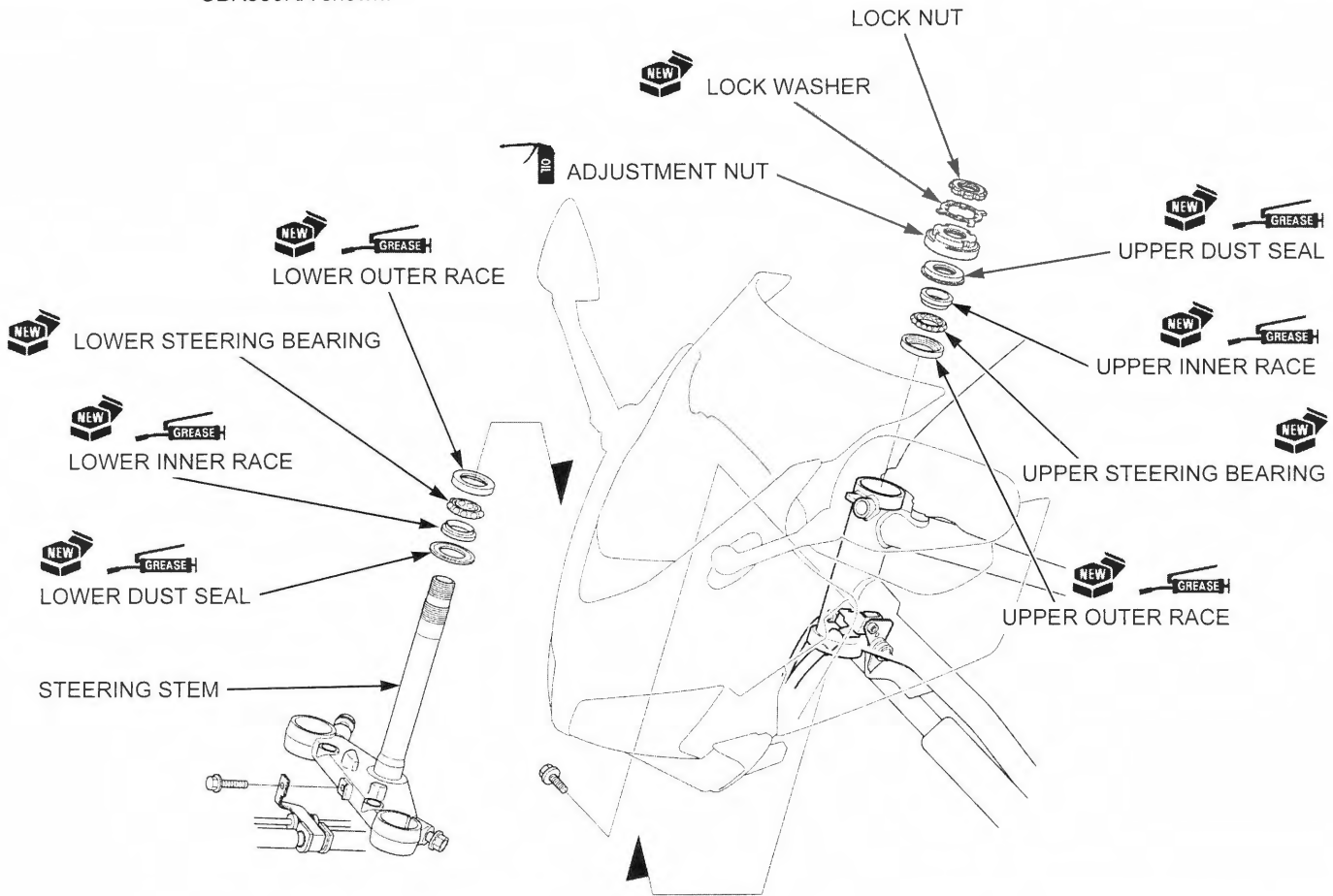
Driver	07749-0010000
Attachment, 52 x 55 mm	07746-0010400



FRONT WHEEL/SUSPENSION/STEERING

INSTALLATION

CBR500RA shown:



NOTE:

- Use urea based multi-purpose extreme pressure grease NLGI #2 (EXCELITE EP2 manufactured by KYODO YUSHI CO., LTD., STAMINA EP2 manufactured by Shell or equivalent) for the bearing race sliding surface and dust seals.

Apply grease to the lip of the lower dust seal [1].

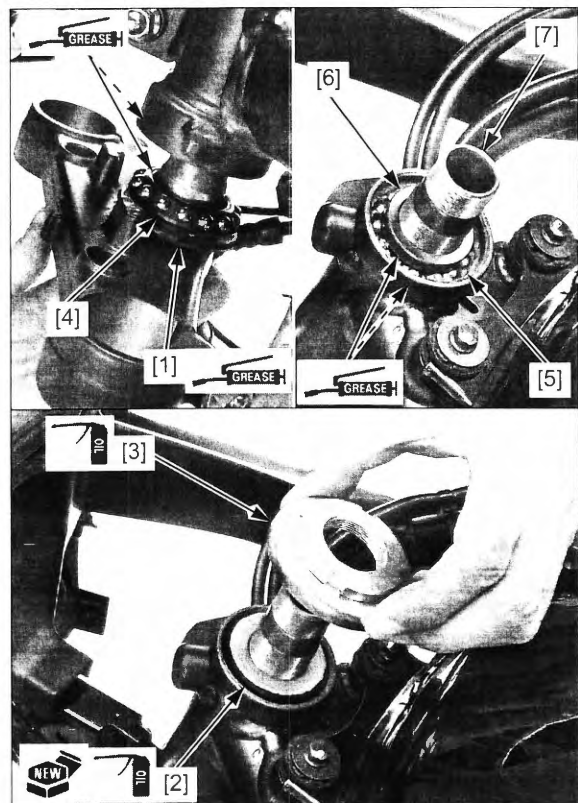
Apply 3 – 5 g (0.1 – 0.2 oz) (per each bearing) of grease to the bearing race sliding surfaces.

Apply grease to the lip of a new upper dust seal [2].

Apply engine oil to the threads of the adjustment nut [3].

Install the following:

- lower steering bearing [4]
- upper steering bearing [5]
- upper inner race [6]
- steering stem [7]
- upper dust seal
- adjustment nut



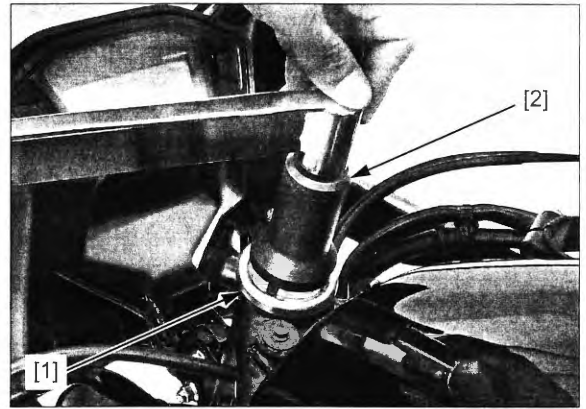
FRONT WHEEL/SUSPENSION/STEERING

1. Tighten the adjustment nut [1] to the specified torque using the special tool.

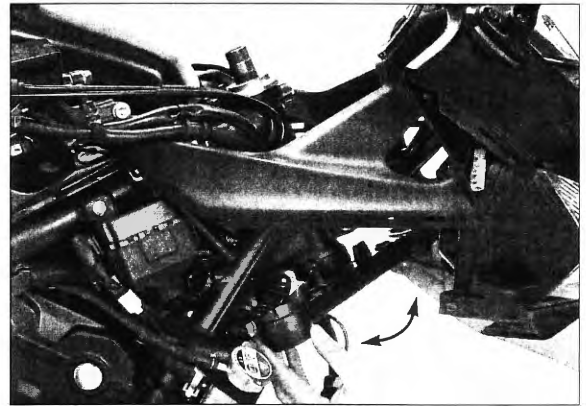
TOOL:

[2] Steering stem socket 07916-3710101

TORQUE: 23 N·m (2.3 kgf·m, 17 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.

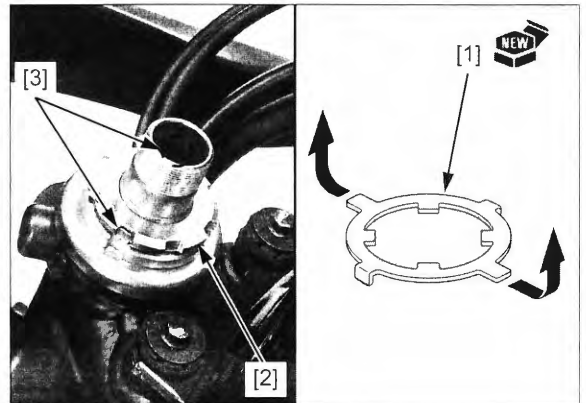


Install a new lock washer [1], aligning its bent tabs with the grooves in the adjustment nut.

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.



FRONT WHEEL/SUSPENSION/STEERING

Clean the threads of the stem with a degreasing agent.

Install the top bridge [1], washer [2] and steering stem nut [3].

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)

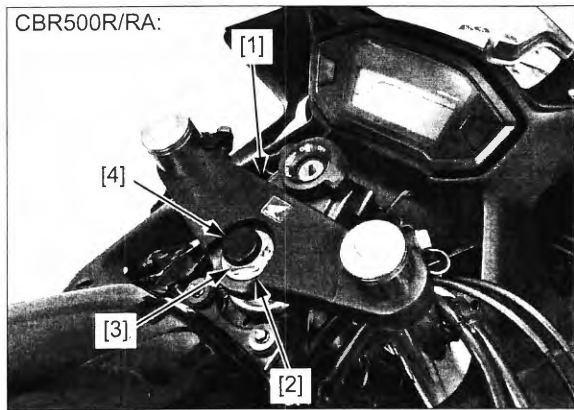
Make sure the steering stem moves smoothly, without play or binding.

Install the stem cap [4].

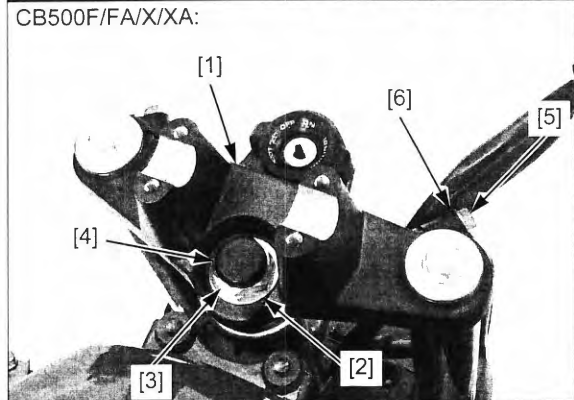
CB500F/FA/X/XA: Install the top bridge pinch bolt [5] with the clamp [6].

Install the fork legs properly (page 16-20).

CBR500R/RA:

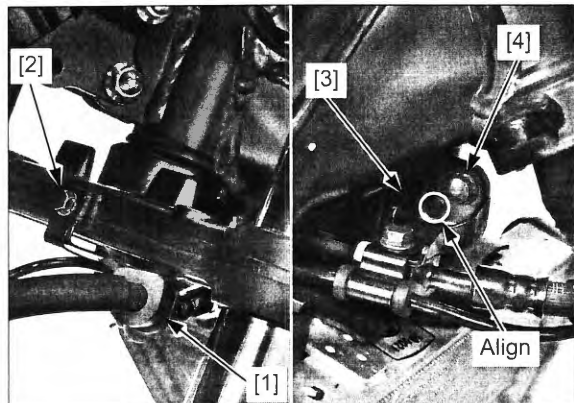


CB500F/FA/X/XA:



Install the clamp [1] onto the bottom bridge and tighten the bolt (6 x 12 mm) [2].

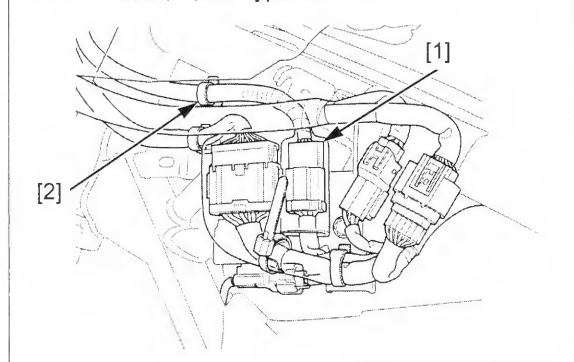
CBR500RA/CB500FA/XA: Install the hose joint/clamp stay [3], aligning the locating pin with the hole and tighten the bolt (6 x 10 mm) [4].



Connect the ignition switch 2P (Brown) connector [1] and install it onto the stay.

Install the band clip [2].

CBR500R/RA; A, CM types shown:



CBR500R/RA: Route the throttle cables [1] and the clutch cable [2] into each cable guide.

Install each handlebar over the fork tube, aligning the boss with the groove in the top bridge.

Be sure the handlebar holder is fully seated on the top bridge. Push the handlebar forward to touch the boss against the inside of the groove, then tighten the pinch bolts [3] to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

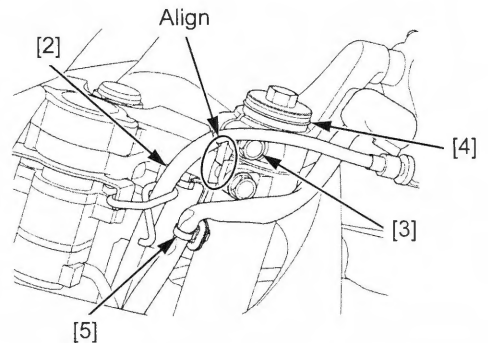
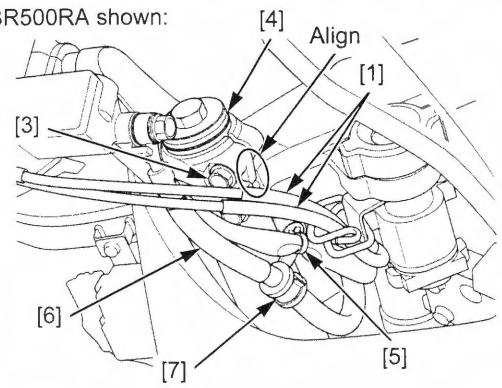
Install the stopper ring [4] into the groove in each fork tube.

Install the two band clips [5] and the brake hose [6] into the clamp [7].

Install the following:

- AC type: EVAP canister (page 7-22)
- middle cowls (page 2-8)

CBR500RA shown:



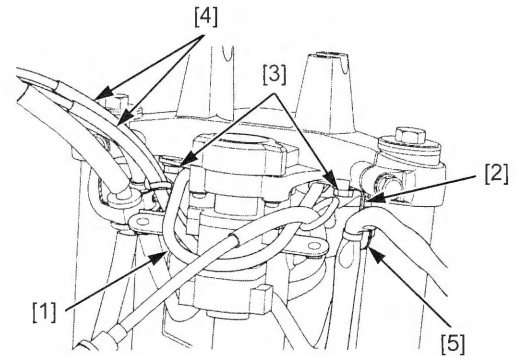
CB500F/FA: Install the front cowl stay [1] and band clip stay [2], and tighten the two bolts [3].

Route the throttle cables [4] into the cable guide.

Install the band clip [5].

Install the following:

- handlebar (page 16-13)
- AC type: EVAP canister (page 7-22)
- front cowl (page 2-13)
- middle cowls (page 2-9)



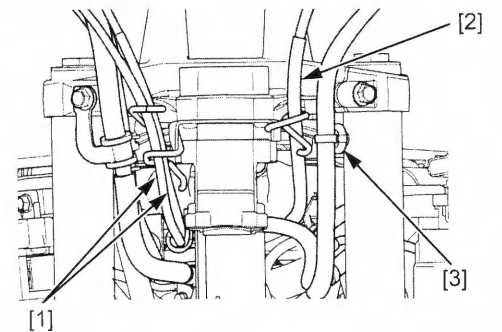
CB500X/XA: Route the throttle cables [1] and the clutch cable [2] into each cable guide.

Install the band clip [3]

Install the following:

- handlebar (page 16-13)
- AC type: EVAP canister (page 7-22)
- middle cowls (page 2-9)

CB500XA shown:



FRONT WHEEL/SUSPENSION/STEERING

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.

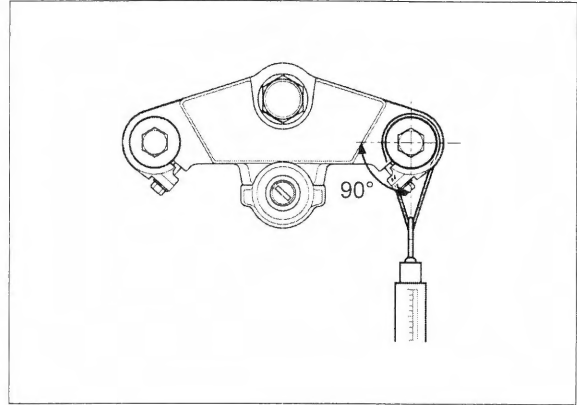
Make sure there is no cable, wire harness or hose interference.

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 16-31).



17. REAR WHEEL/SUSPENSION

SERVICE INFORMATION	17-2	REAR WHEEL	17-6
TROUBLESHOOTING	17-4	SHOCK ABSORBER/LINKAGE	17-10
COMPONENT LOCATION	17-5	SWINGARM	17-13


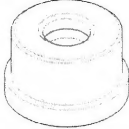
REAR WHEEL/SUSPENSION

SERVICE INFORMATION

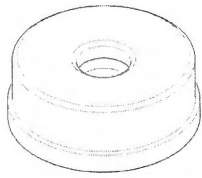




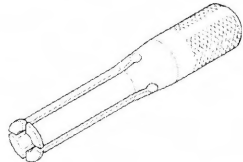
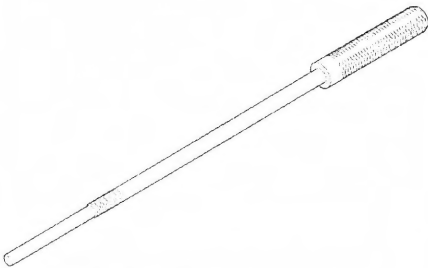
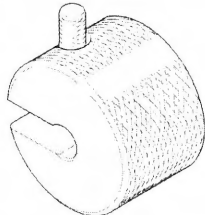
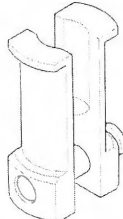
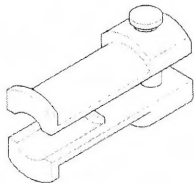
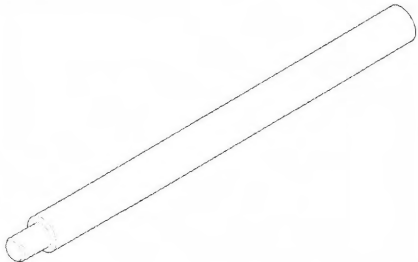
GENERAL

- A hoist or equivalent is required to support the motorcycle when servicing the rear wheel and suspension.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Do not operate the brake pedal after removing the rear wheel.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "FOR TUBELESS".
- After the rear wheel installation, check the brake operation by applying the brake pedal.
- CBR500RA/CB500FA/XA: After the rear wheel installation, perform the air gap inspection (page 19-22).
- Use only genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.
- For brake system service (page 18-3).

TOOLS

<p>Bearing remover head, 17 mm 07746-0050500</p> 	<p>Bearing remover shaft 07746-0050100</p> 	<p>Driver 07749-0010000</p> 
<p>Driver 07949-3710001</p> 	<p>Attachment, 22 x 24 mm 07746-0010800</p> 	<p>Attachment, 24 x 26 mm 07746-0010700</p> 
<p>Attachment, 28 x 30 mm 07946-1870100</p> 	<p>Attachment, 32 x 35 mm 07746-0010100</p> 	<p>Attachment, 42 x 47 mm 07746-0010300</p> 

REAR WHEEL/SUSPENSION

<p>Attachment, 52 x 55 mm 07746-0010400</p> 	<p>Pilot, 15 mm 07746-0040300</p> 	<p>Pilot, 17 mm 07746-0040400</p> 
<p>Pilot, 20 mm 07746-0040500</p> 	<p>Pilot, 25 mm 07746-0040600</p> 	<p>Bearing remover head, 15 mm 07936-KC10200</p>  <p>or 07936-KC10500 (U.S.A. only)</p>
<p>Bearing remover shaft, 15 mm 07936-KC10100</p>  <p>or 07936-KC10500 (U.S.A. only)</p>	<p>Remover weight 07741-0010201</p>  <p>or 07936-3710200 (U.S.A. only) or 07936-371020A (U.S.A. only)</p>	<p>Remover attachment, 24 mm 07LMC-KV30200</p> 
<p>Bearing remover attachment 07GMD-KT70200</p> 	<p>Driver shaft 07946-MJ00100</p> 	

REAR WHEEL/SUSPENSION

TROUBLESHOOTING

Steers to one side or does not track straight

- Drive chain adjusters not adjusted equally
- Bent axle
- Damaged frame
- Worn swingarm pivot components

Rear wheel wobbles

- Bent rim
- Faulty tire
- Worn or damaged wheel 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 wheel bearings
- Bent axle
- Faulty driven flange bearing
- Drive chain too tight (page 3-14)
- Brake drag (page 18-2)

Soft suspension

- Low tire pressure
- Incorrect suspension adjustment
- Weak shock absorber spring
- Oil leakage from damper unit

Stiff suspension

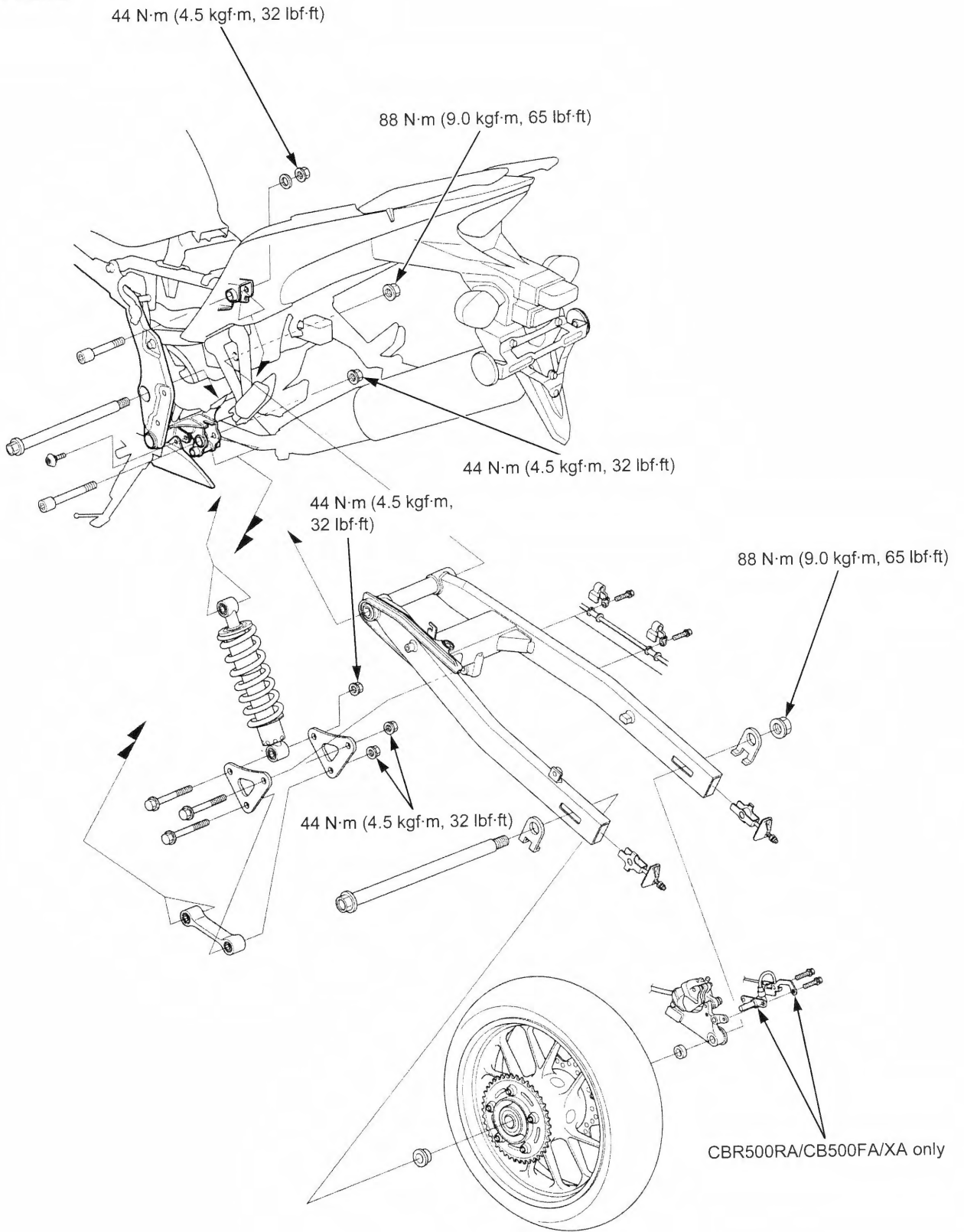
- High tire pressure
- Incorrect suspension adjustment
- Bent shock absorber damper rod
- Damaged suspension or swingarm pivot bearings
- Improperly tightened swingarm pivot

Rear suspension noise

- Loose suspension fasteners
- Worn or damaged suspension pivot bearings
- Faulty shock absorber

COMPONENT LOCATION

CBR500RA shown:



REAR WHEEL/SUSPENSION

REAR WHEEL

REMOVAL/INSTALLATION

CBR500RA/ Remove the following:

CB500FA/XA:

- two bolts [1]
- wire stay [2]
- rear wheel speed sensor [3]

Loosen the axle nut [1].

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

Loosen the chain adjusters by turning the lock nuts [2] and adjusting nuts [3] so the wheel can be moved forward all the way.

Push the rear wheel forward and derail the drive chain [4] from the driven sprocket.

Support the caliper so it does not hang from the brake hose. Do not twist the brake hose

Remove the following:

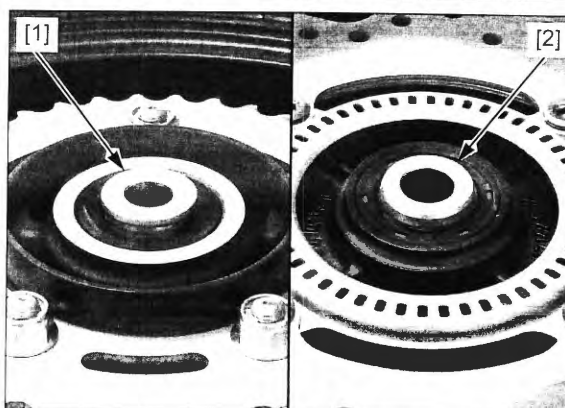
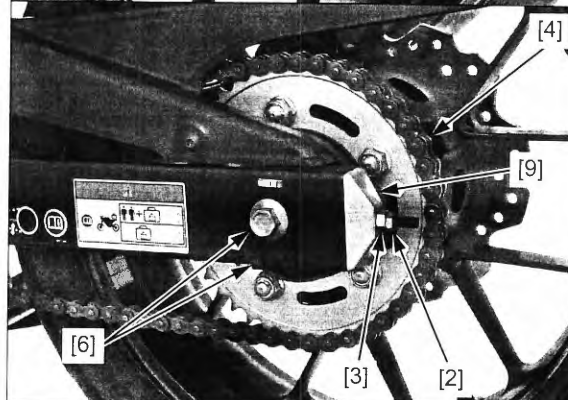
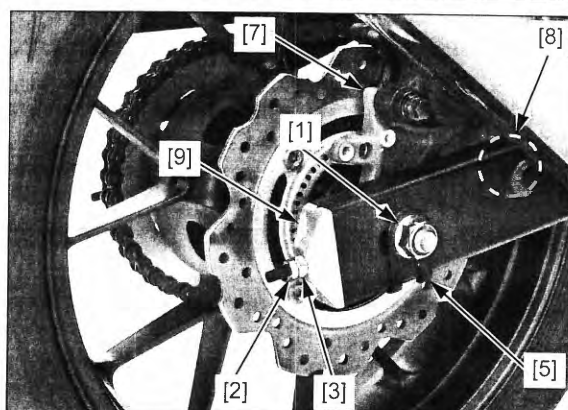
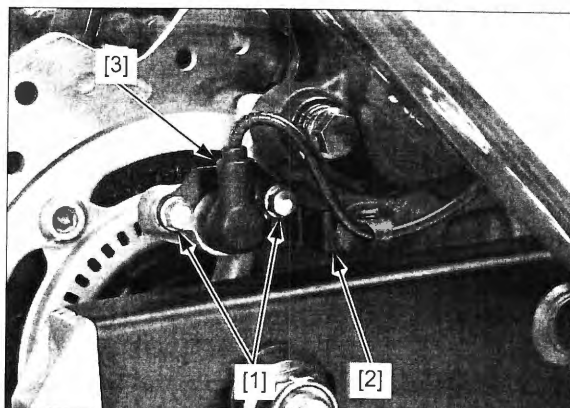
- axle nut
- setting plate [5]
- axle and setting plate [6]
- rear wheel
- rear brake caliper [7] (from the swingarm boss [8])
- chain adjusters [9]

NOTE:

- Do not operate the brake pedal after removing the wheel.

Remove the following:

- left side collar (flange) [1]
- right side collar [2]



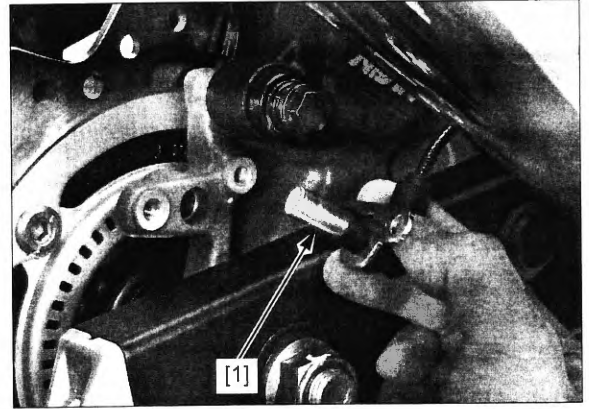
Installation is in the reverse order of removal.

NOTE:

- When installing the wheel, take care not to let the caliper come off the swingarm boss and not to damage the brake pads.
- The axle is installed from the left side.
- CBR500RA/CB500FA/XA: Before installing the rear wheel speed sensor [1], wipe the sensor tip and mounting area to remove any foreign material.

Adjust the drive chain slack (page 3-14).

*CBR500RA/
CB500FA/XA:* Check the air gap between the wheel speed sensor and pulser ring (page 19-22).



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.

Replace the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub.

Inspect the following parts for damage, abnormal wear, deformation or bend.

- rear axle
- spoke
- wheel rim
- driven sprocket (page 3-15)
- damper rubbers (page 17-8)

Measure each part according to REAR WHEEL/SUSPENSION SPECIFICATIONS (page 1-12).

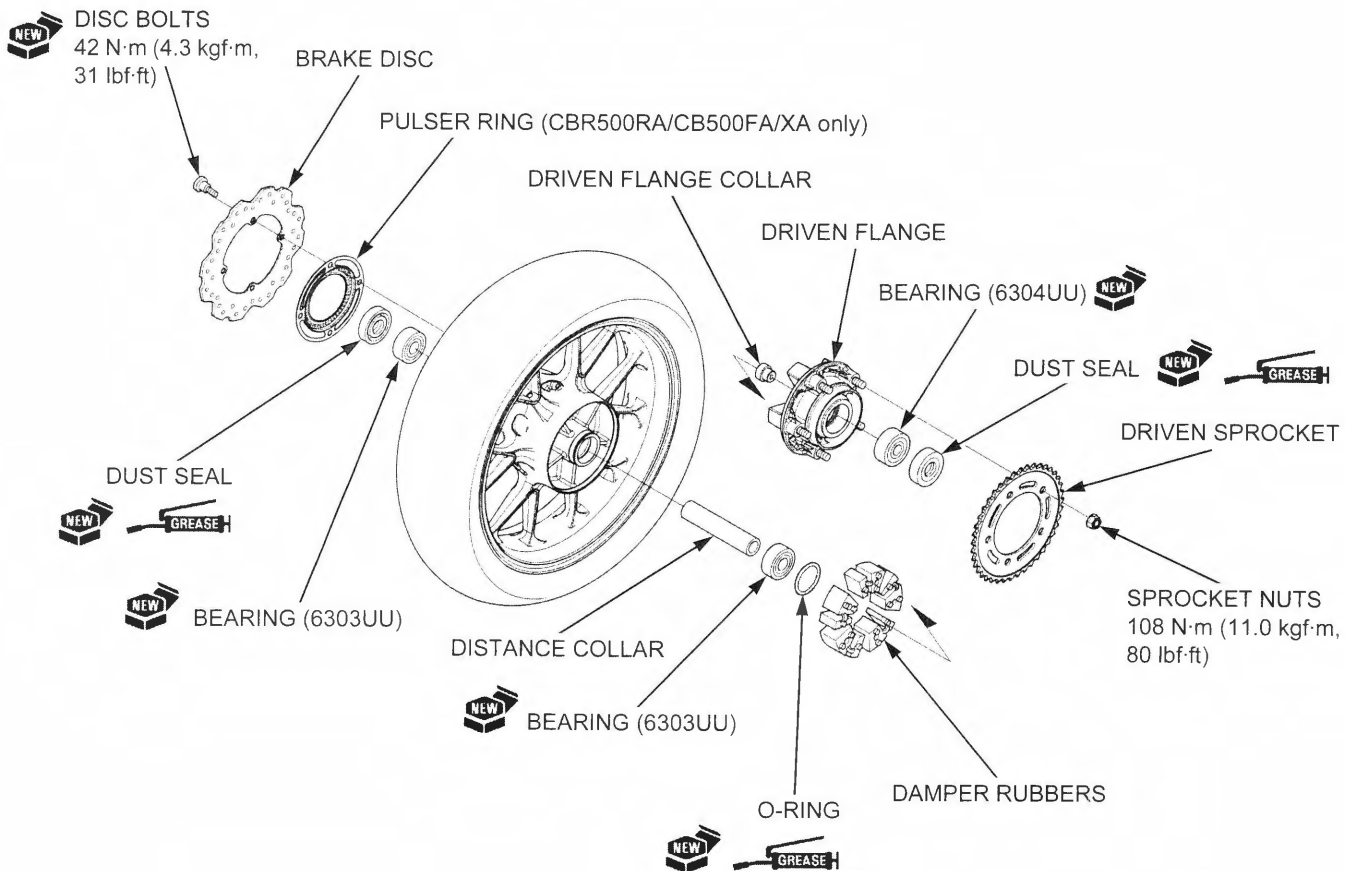
Replace any part if it is out of service limit.

REAR WHEEL/SUSPENSION

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the rear wheel as following illustration.

- For wheel balance service (page 16-18).
- Install each dust seal with the flat side facing out so that it is flush with the hub and driven flange end surfaces.
- Install the brake disc with the rotation mark (arrow) facing out.
- Install the driven sprocket with the stepped surface facing out.



BEARING REPLACEMENT

WHEEL BEARING

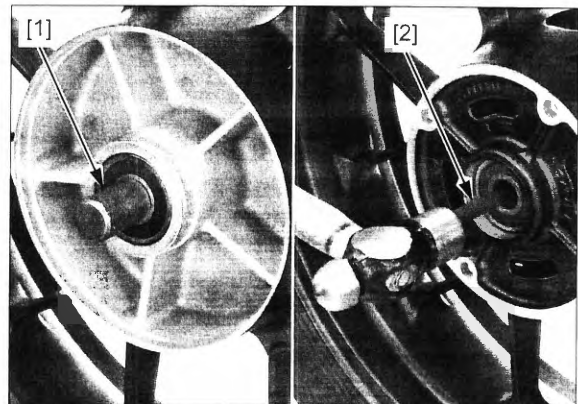
Install the bearing remover head [1] into the bearing.

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, 17 mm 07746-0050500
Bearing remover shaft 07746-0050100

Remove the distance collar and drive out the other bearing.



REAR WHEEL/SUSPENSION

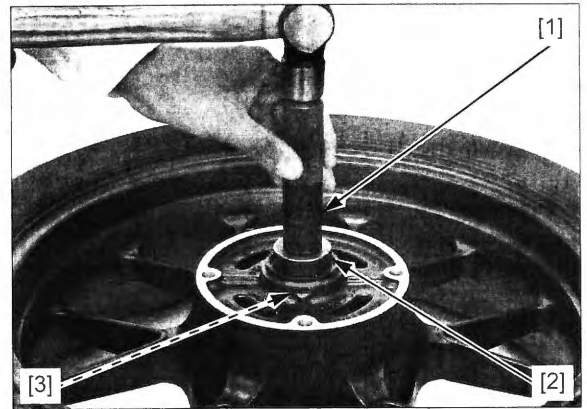
Drive in a new right side bearing (brake disc side) squarely with the marked side facing up until it is fully seated.

Install the distance collar.

Drive in a new left side bearing squarely with the marked side facing up until it is fully seated.

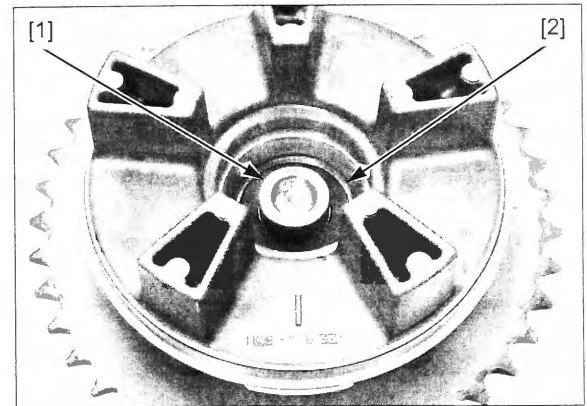
TOOLS:

[1] Driver	07749-0010000
[2] Attachment, 42 x 47 mm	07746-0010300
[3] Pilot, 17 mm	07746-0040400



DRIVEN FLANGE BEARING

Drive out the driven flange collar [1] and the bearing [2].



Place a new bearing [1] with the marked side facing down. Install the driven flange collar [2] into the bearing until it is fully seated.

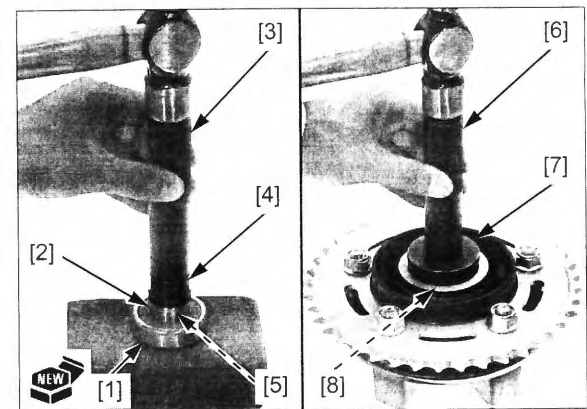
TOOLS:

[3] Driver	07749-0010000
[4] Attachment, 28 x 30 mm	07946-1870100
[5] Pilot, 17 mm	07746-0040400

Drive in the driven flange bearing/collar squarely with the collar side facing down until it is fully seated.

TOOLS:

[6] Driver	07749-0010000
[7] Attachment, 52 x 55 mm	07746-0010400
[8] Pilot, 20 mm	07746-0040500



SHOCK ABSORBER/LINKAGE

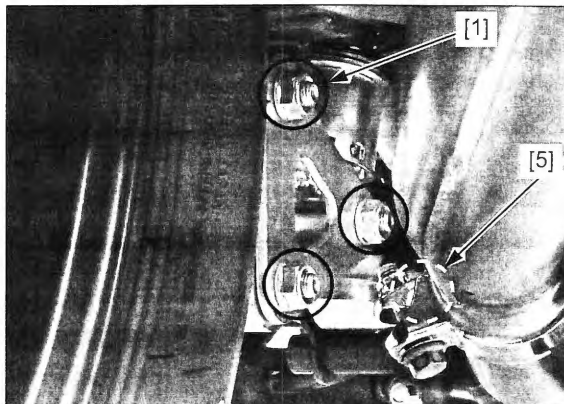
REMOVAL/INSTALLATION

SHOCK LINKAGE

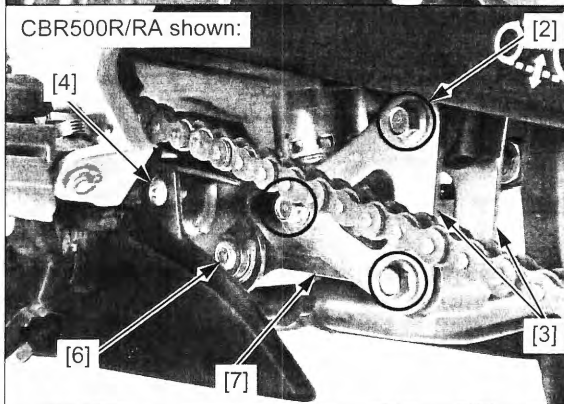
Support the motorcycle using a hoist or equivalent and raise the rear wheel off the ground.

Support the swingarm and remove the following:

- three nuts [1]
- three bolts [2]
- shock arm plates [3]
- under cowl bolt [4]
- nut [5]
- socket bolt [6]
- shock link [7]



CBR500R/RA shown:



Installation is in the reverse order of removal.

NOTE:

- Install the shock link with the dust seals [1] facing the right side.
- Install each shock arm plate so the stamp [2] is facing the left side and its arrow faces forward.
- Install all the bolts from the left side.

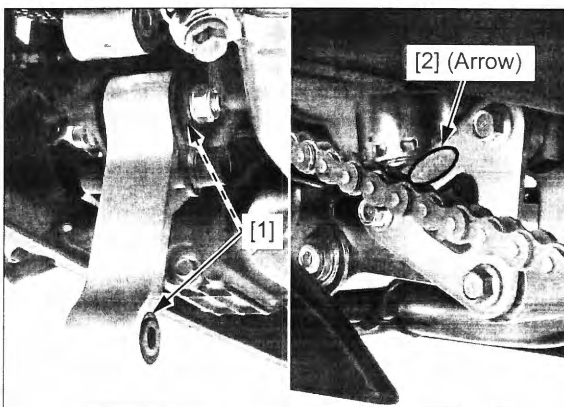
TORQUE:

Shock linkage nut:

44 N·m (4.5 kgf·m, 32 lbf·ft)

Shock absorber mounting nut:

44 N·m (4.5 kgf·m, 32 lbf·ft)



SHOCK ABSORBER

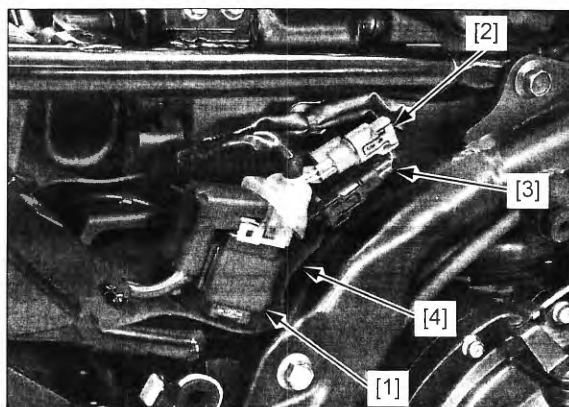
Remove the following:

- side covers (page 2-7)
- regulator/rectifier (page 20-7)
- starter relay switch [1] (page 6-9)

CBR500RA/CB500FA/XA: Disconnect the wheel speed sensor 2P (Gray) connector [2] and remove it from the stay.

Disconnect the brake light switch 2P (Black) connector [3].

Release the heat guard rubber [4] from the relay switch stays and remove the connectors out of the sheet through its slit.



Remove the shock arm plates (page 17-10).

Remove the nut [1] and washer [2].

Remove the bolt [3] while supporting the shock absorber [4] securely.

Remove the shock absorber out of the frame.

Installation is in the reverse order of removal.

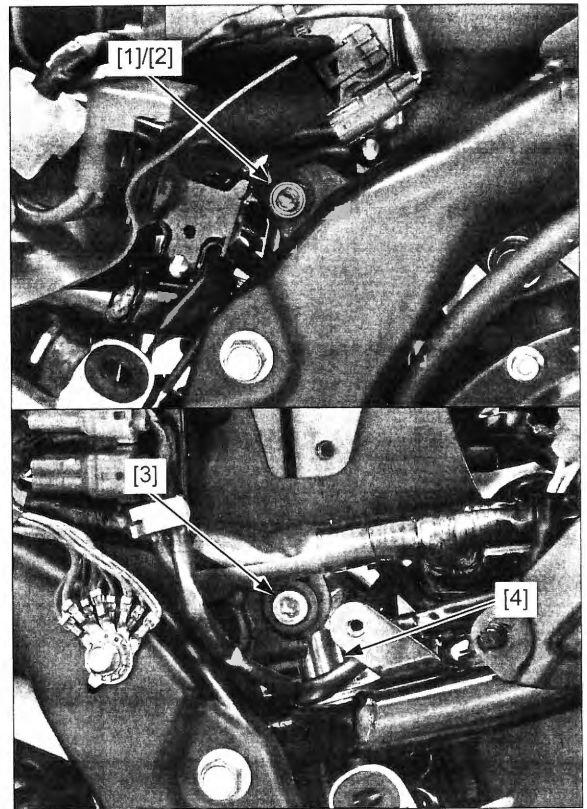
NOTE:

- The mounting bolt is installed from the left side.

TORQUE:

Shock absorber mounting nut:

44 N·m (4.5 kgf·m, 32 lbf·ft)



DISASSEMBLY/ASSEMBLY

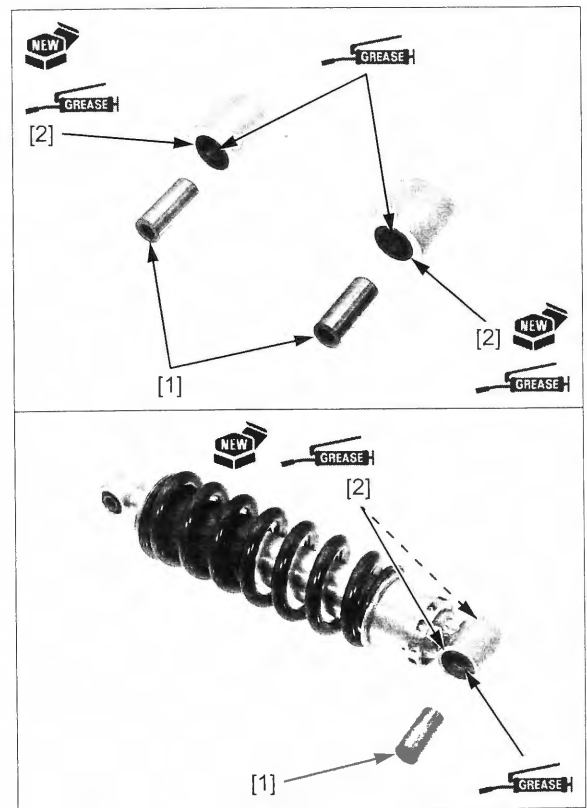
Remove the pivot collars [1] and dust seals [2].

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.



REAR WHEEL/SUSPENSION

INSPECTION

Inspect the following parts of the shock linkage for damage, abnormal wear, deformation or crack.

- shock arm plates
- shock link
- pivot collars
- needle bearings

Inspect the following parts of the shock absorber for damage, abnormal wear, oil leakage or bend.

- damper unit
- pivot bushing
- needle bearing

BEARING REPLACEMENT

NOTE:

- For linkage bearing in the swingarm (page 17-16).

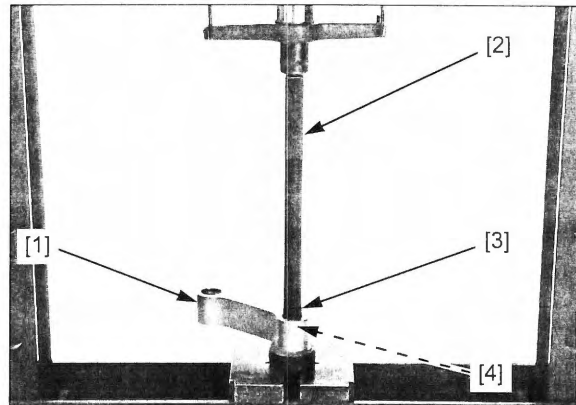
SHOCK LINK

Mark the shock link [1] side surface of the bearing flush side before removing to identify the bearing installation direction.

Press the needle bearings out of the shock link using the special tools.

TOOLS:

[2] Driver	07949-3710001
[3] Attachment, 22 x 24 mm	07746-0010800
[4] Pilot, 17 mm	07746-0040400



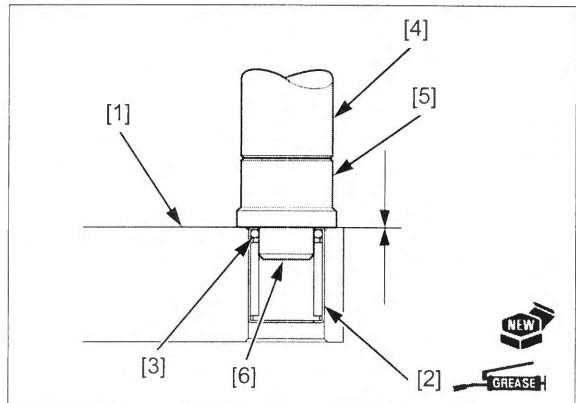
Apply grease to the dust seals lips and rotating areas of new needle bearings.

Place the shock link onto a hydraulic press with the marking side [1] (which is marked in above step) facing up.

Press in each bearing [2] with the dust seal [3] (in the bearing) facing up until the hydraulic press stops so that it is flush with the link surface, using the special tools.

TOOLS:

[4] Driver	07749-0010000
[5] Attachment, 28 x 30 mm	07946-1870100
[6] Pilot, 17 mm	07746-0040400



SHOCK ABSORBER

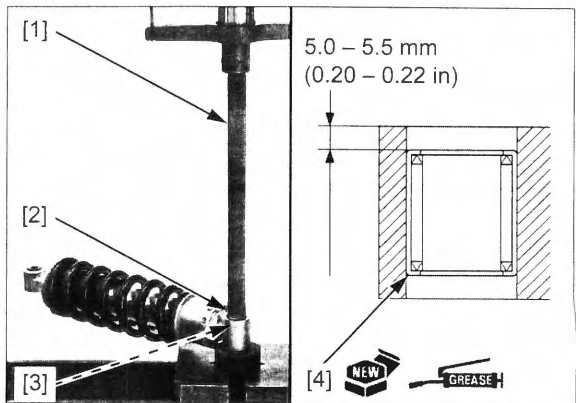
Press the needle bearing out of the shock absorber using the special tools.

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.

Carefully press in the bearing [4] with the marked side facing up until the depth from the pivot end surface is 5.0 – 5.5 mm (0.20 – 0.22 in), using the same tools.



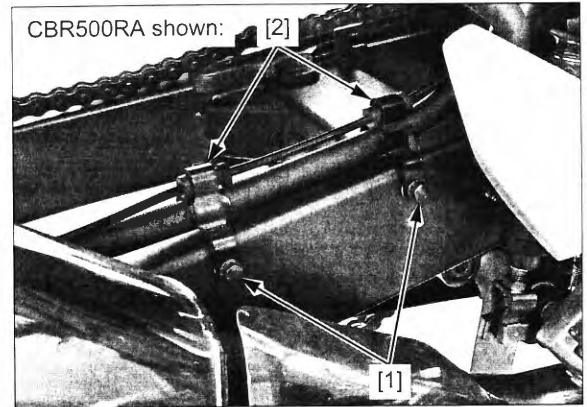
SWINGARM

REMOVAL/INSTALLATION

Remove the following:

- drive chain cover (page 2-24)
- rear wheel (page 17-6)
- shock link plates (page 17-10)

Remove the two bolts [1] and clamps [2].



Remove the pivot nut [1] and the bolt [2].

Support the caliper so it does not hang from the brake hose. Do not twist the brake hose

Move the brake hose, speed sensor wire and drive chain out of the way and remove the swingarm [3] from the frame.

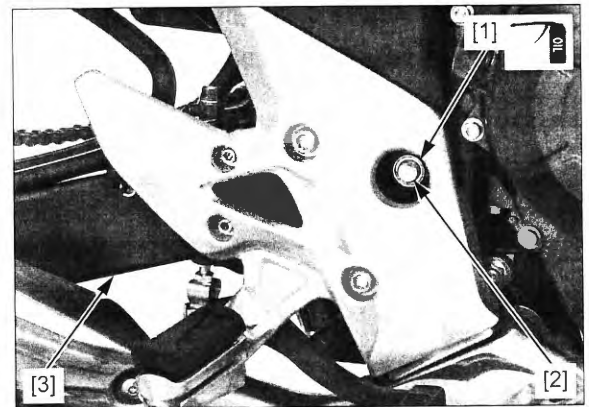
Installation is in the reverse order of removal.

NOTE:

- The pivot bolt is installed from the left side.
- Apply engine oil to the threads and seating surface of the pivot nut.

TORQUE:

Swingarm pivot nut:
88 N·m (9.0 kgf·m, 65 lbf·ft)

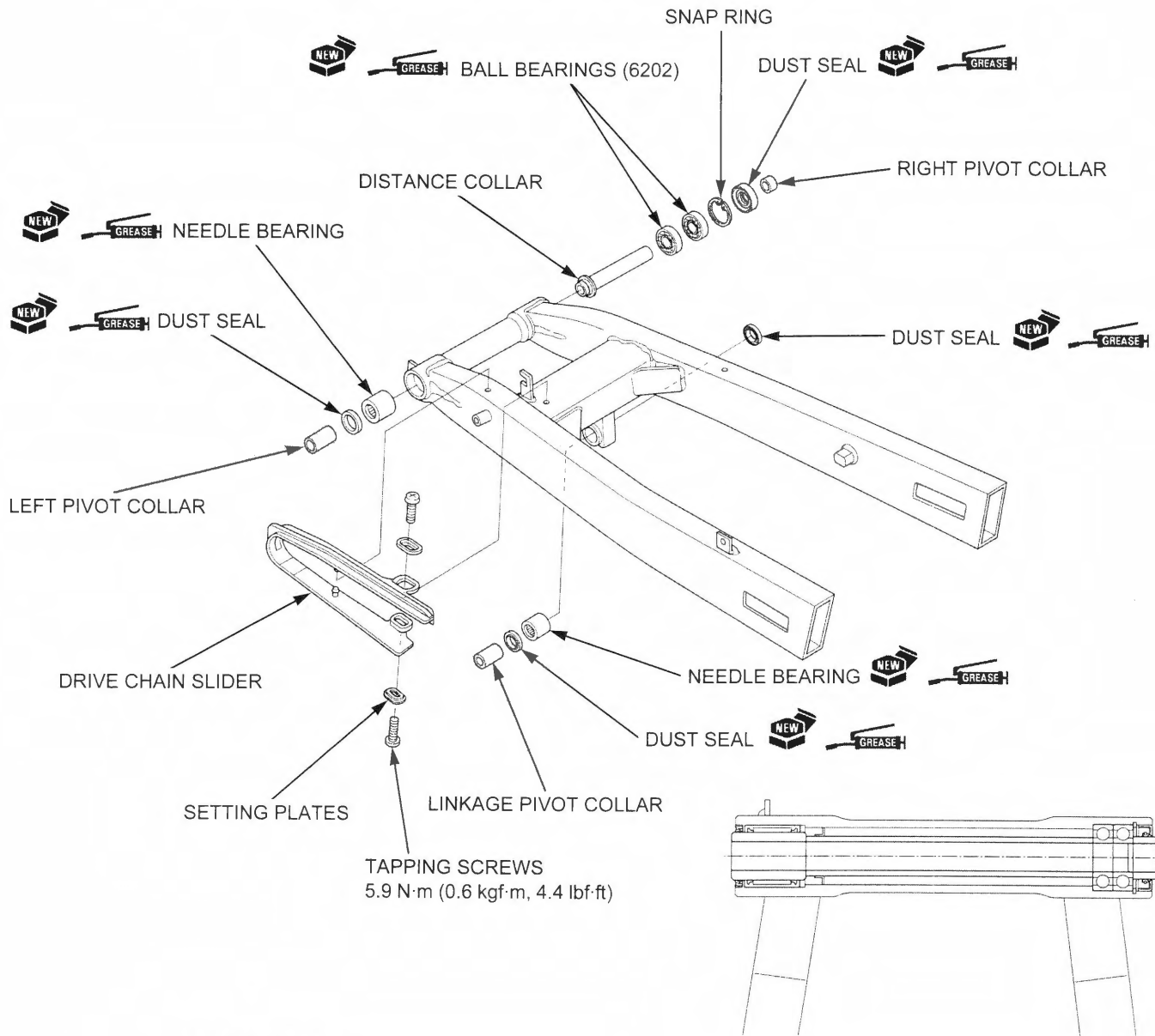


REAR WHEEL/SUSPENSION

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the swingarm as following illustration.

- Install each dust seal with the flat side facing out so that it is flush with the pivot end surface.



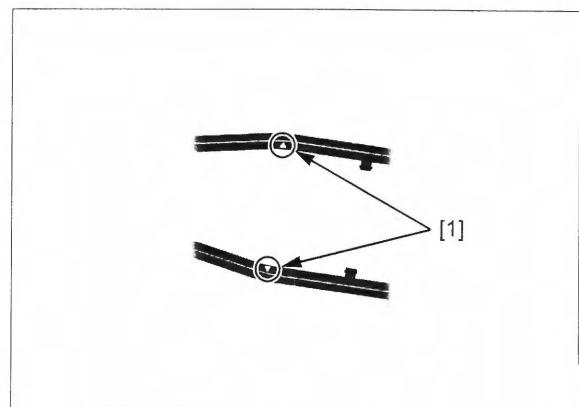
INSPECTION

Check the drive chain slider for wear or damage.

The drive chain slider must be replaced if it is worn to the wear limit indicators [1].

Inspect the following parts for damage, abnormal wear, deformation.

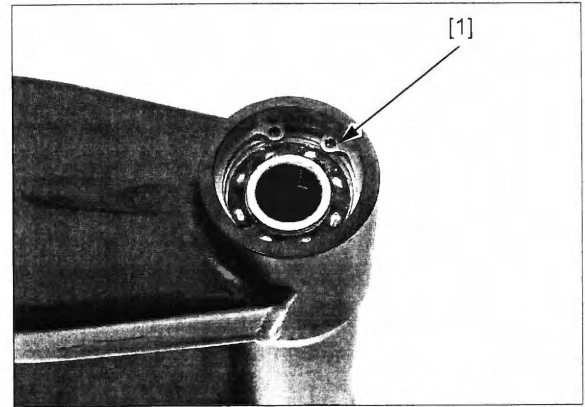
- swingarm
- pivot collars
- bearings



BEARING REPLACEMENT

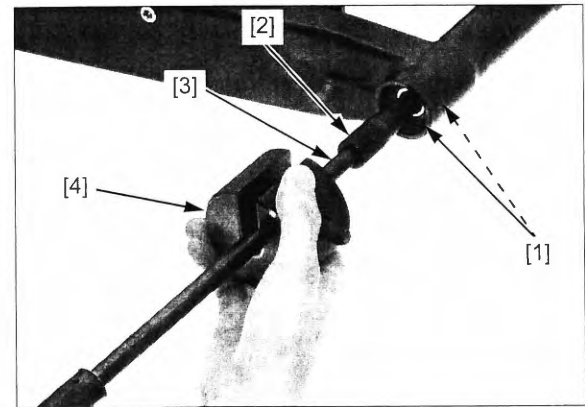
SWINGARM PIVOT BEARING

Remove the snap ring [1].



Remove the ball bearings [1] using the special tools.

- TOOLS:**
- [2] Bearing remover head, 15 mm 07936-KC10200
 - [3] Bearing remover shaft, 15 mm 07936-KC10100 or 07936-KC10500 (U.S.A. only)
 - [4] Remover weight 07741-0010201 or 07936-3710200 (U.S.A. only) or 07936-371020A (U.S.A. only)

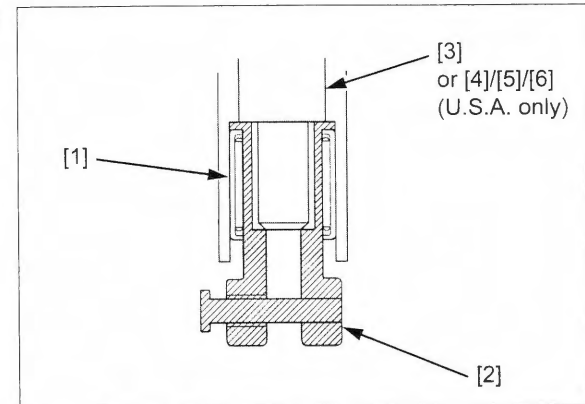


Remove the distance collar.

Press the needle bearing [1] out of the swingarm using the special tools.

- TOOLS:**
- [2] Remover attachment, 24 mm 07LMC-KV30200
 - [3] Driver shaft 07946-MJ00100

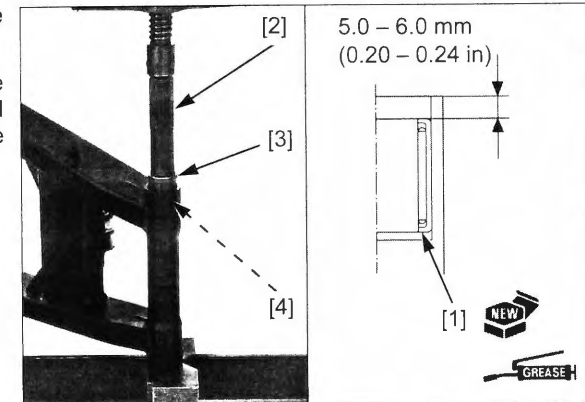
- U.S.A. TOOLS:**
- [2] Bearing remover attachment 07GMD-KT70200
 - [4] Driver 07949-3710001
 - [5] Attachment, 24 x 26 mm 07746-0010700
 - [6] Pilot, 17 mm 07746-0040400



Apply grease to the rotating area of a new needle bearing [1].

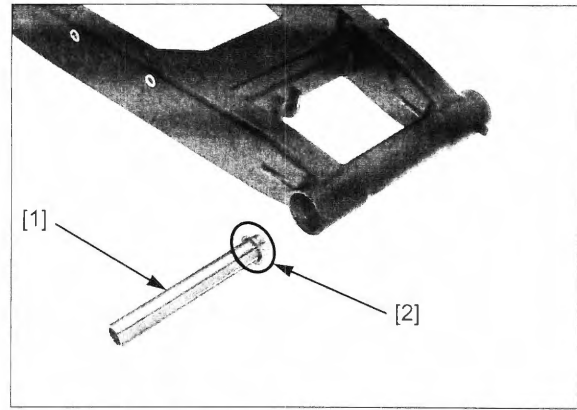
Carefully press the bearing in the left pivot with the marked side facing up until the depth from the pivot end surface is 5.0 – 6.0 mm (0.20 – 0.24 in), using the special tools.

- TOOLS:**
- [2] Driver 07749-0010000
 - [3] Attachment, 32 x 35 mm 07746-0010100
 - [4] Pilot, 25 mm 07746-0040600



REAR WHEEL/SUSPENSION

Install the distance collar [1] with the flange [2] facing the needle bearing (left) side.



Apply grease to the rotating area of new ball bearings [1].

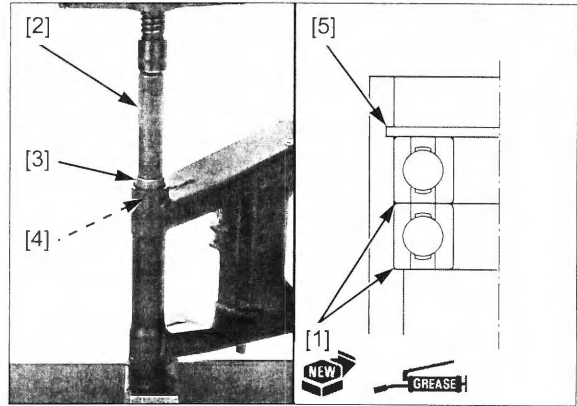
Press the ball bearings in the right pivot with the marked side facing up until they are fully seated, using the special tools.

TOOLS:

- | | |
|----------------------------|---------------|
| [2] Driver | 07749-0010000 |
| [3] Attachment, 32 x 35 mm | 07746-0010100 |
| [4] Pilot, 15 mm | 07746-0040300 |

Be certain the snap ring is firmly seated in the groove. Do not reuse it which could easily spin in the groove.

Install the snap ring [5] into the groove with the chamfered edge facing in.



SHOCK LINKAGE BEARING

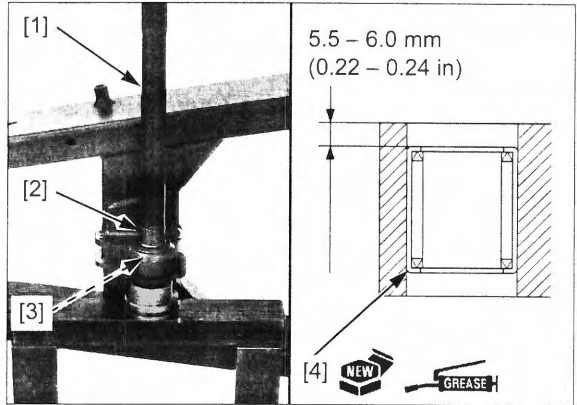
Press the needle bearing out of the swingarm using the special tools.

TOOLS:

- | | |
|----------------------------|---------------|
| [1] Driver | 07949-3710001 |
| [2] Attachment, 22 x 24 mm | 07746-0010800 |
| [3] Pilot, 17 mm | 07746-0040400 |

Apply grease to the rotating area of a new needle bearing [4].

Carefully press in the bearing with the marked side facing up until the depth from the pivot end surface is 5.5 – 6.0 mm (0.22 – 0.24 in), using the same tools.



18. HYDRAULIC BRAKE

SERVICE INFORMATION	18-2	FRONT MASTER CYLINDER	18-8
TROUBLESHOOTING	18-2	REAR MASTER CYLINDER	18-10
COMPONENT LOCATION	18-3	FRONT BRAKE CALIPER	18-12
BRAKE FLUID REPLACEMENT/ AIR BLEEDING	18-5	REAR BRAKE CALIPER	18-14
BRAKE PAD/DISC	18-7	BRAKE PEDAL	18-15

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

Spilling brake fluid will severely damage instrument lenses and painted surface. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cover; make sure the front reservoir is horizontal first.

- This section covers service of the conventional brake components of the brake system. For Anti-lock Brake System (ABS; CBR500RA/CB500FA/XA) service (page 19-2).
- The CBR500RA/CB500FA/XA models are 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 contaminants (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.
- CBR500RA/CB500FA/XA: 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 19-22).

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

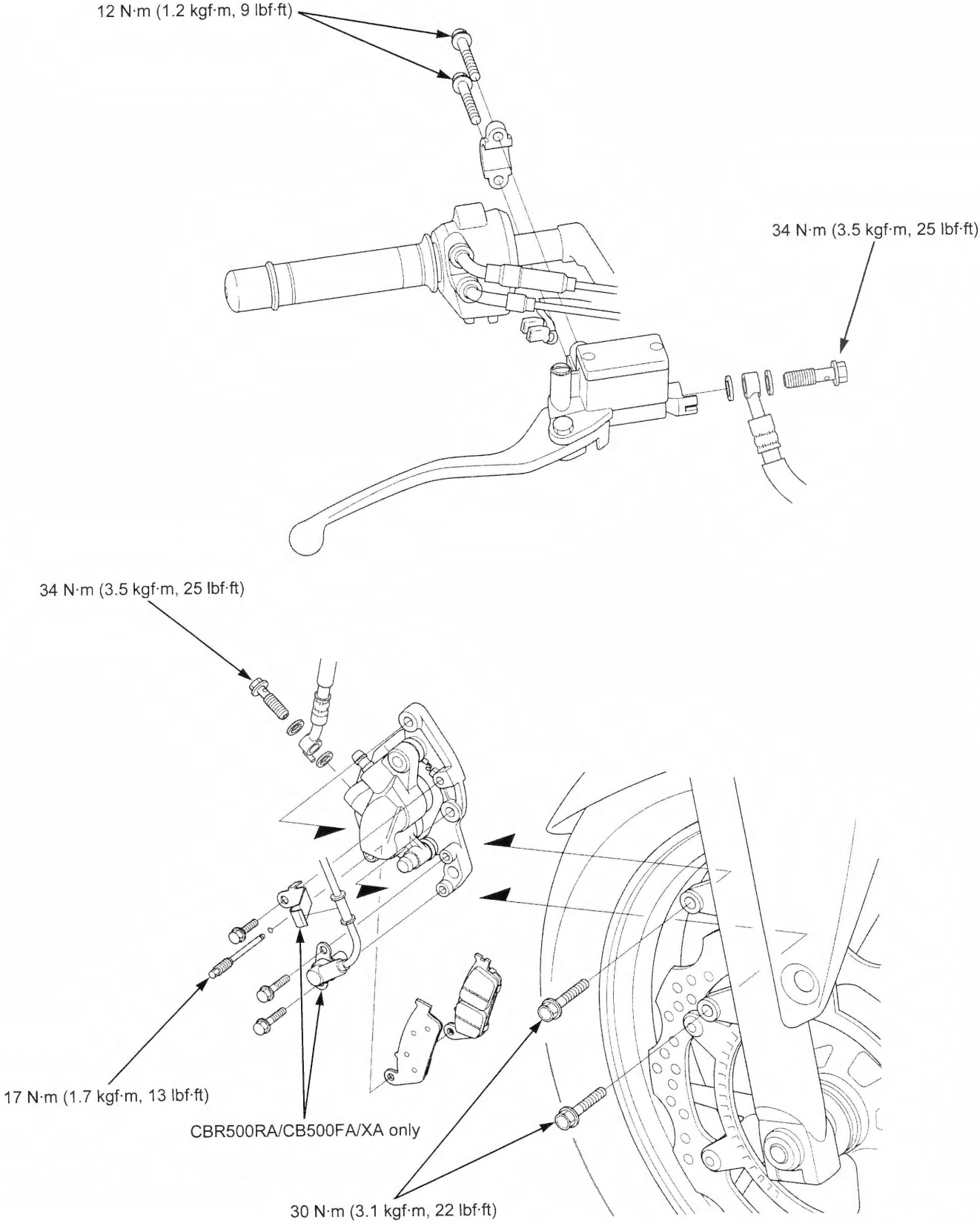
Brake drags

- 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:

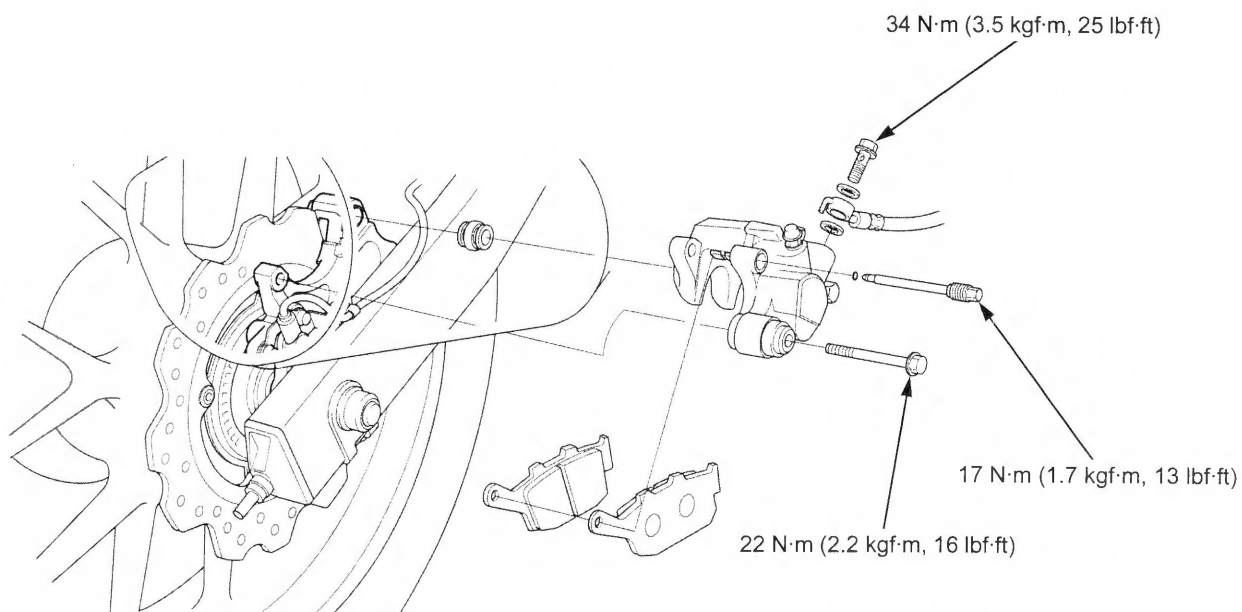
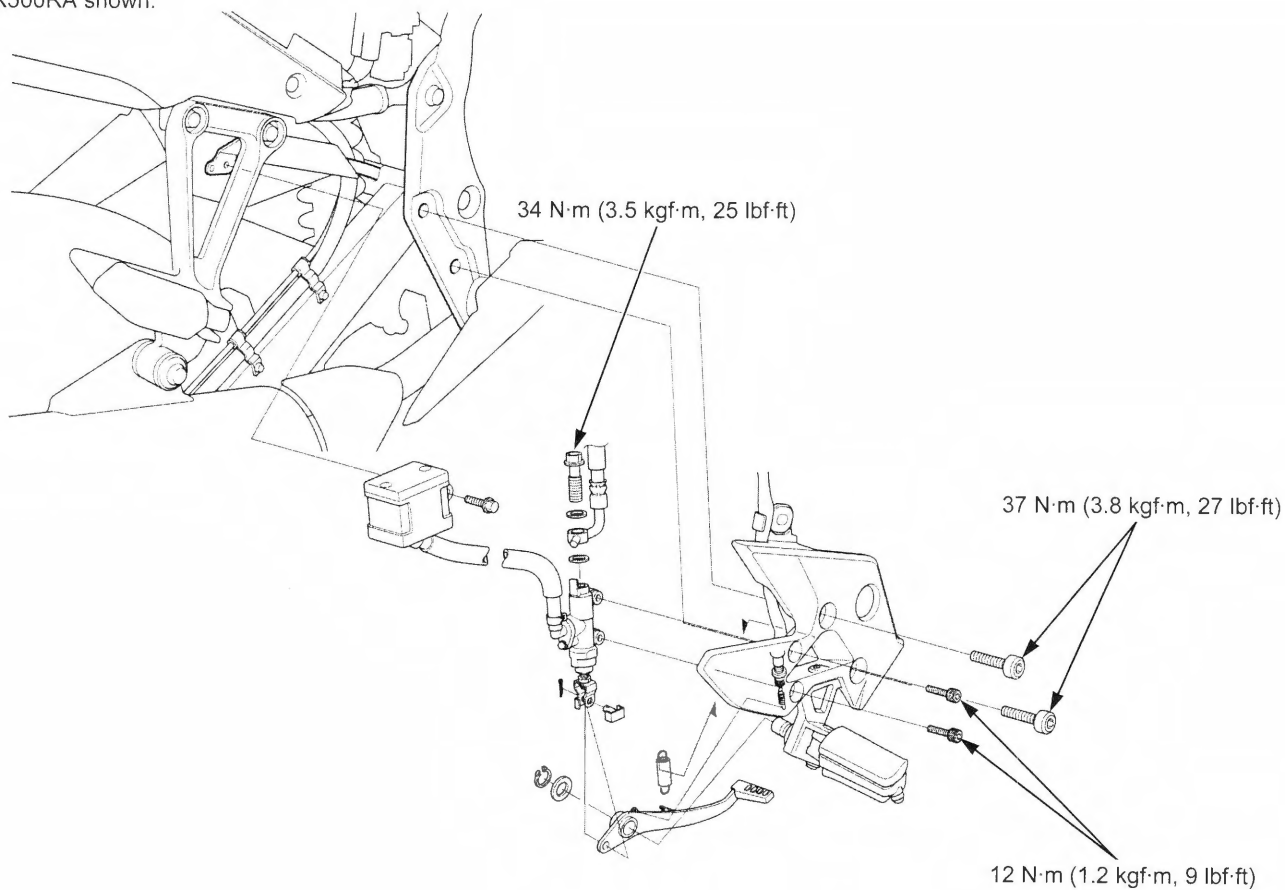
CBR500RA shown:



HYDRAULIC BRAKE

REAR:

CBR500RA shown:



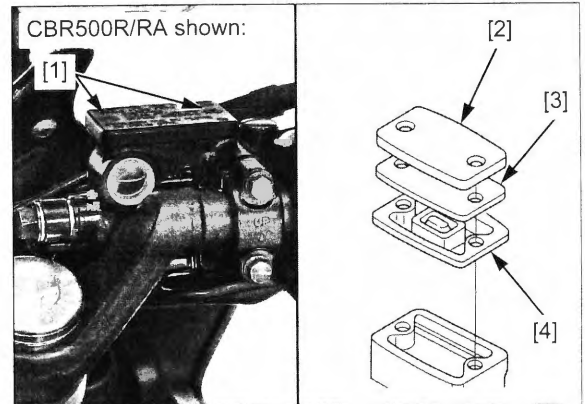
BRAKE FLUID REPLACEMENT/AIR BLEEDING

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 [3]
- diaphragm [4]



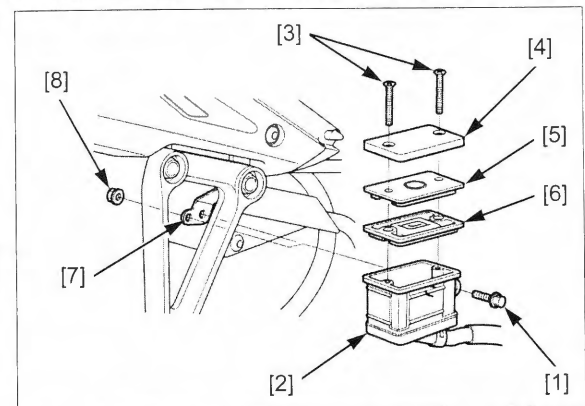
For rear brake: Remove the mounting bolt [1] and reservoir [2] from the stay.

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

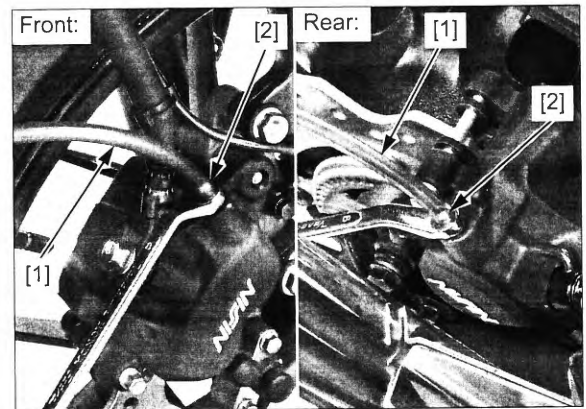
Remove the following:

- two screws [3]
- reservoir cap [4]
- set plate [5]
- diaphragm [6]

Temporarily install the reservoir onto the stay with the mounting bolt through the locating pin hole [7] and secure it using a 6 mm nut [8] so the reservoir is level.



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.

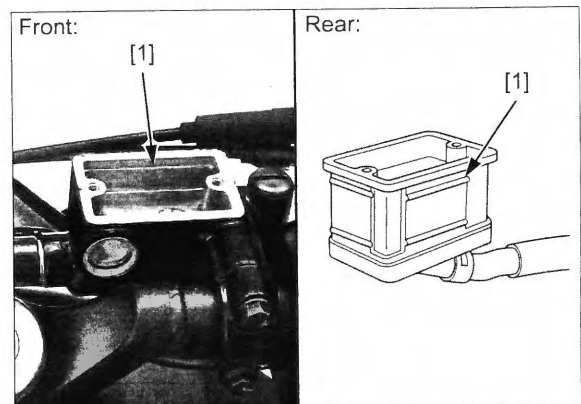
Operate the brake bleeder and loosen the bleed valve.

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.



HYDRAULIC BRAKE

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 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: 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, reservoir cap and tighten the screws to the specified torque.

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

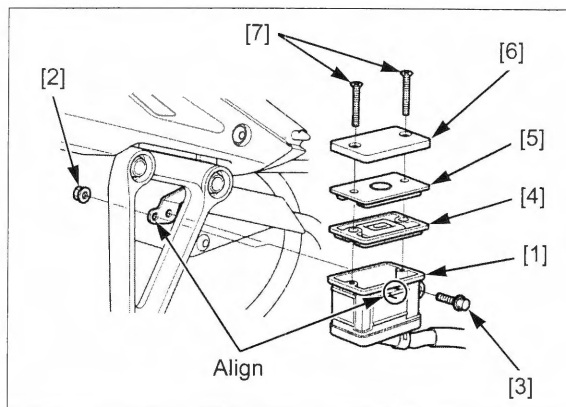
For rear brake: Carefully remove the reservoir [1] from the stay by removing the 6 mm nut [2] and mounting bolt [3].

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

Install the diaphragm [4], set plate [5], reservoir cap [6] and tighten the screws [7] 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 PAD/DISC

BRAKE PAD REMOVAL/ INSTALLATION

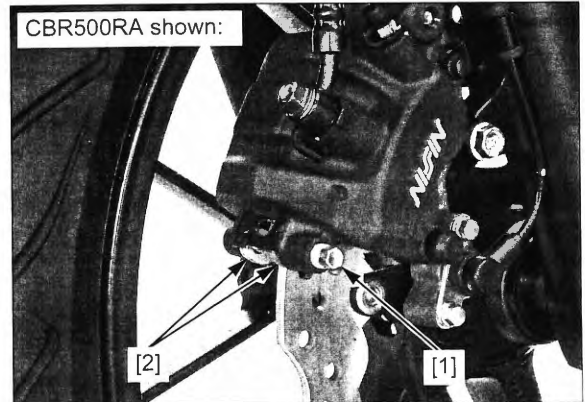
NOTE:

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 before removing the pads. Always replace the brake pads in pairs to ensure even disc pressure.

FRONT

Do not operate the brake lever after removing the pads. Remove the pad pin [1] by pushing the pads against the pad spring, then the brake pads [2] out of the caliper.



Make sure the pad spring [1] is installed in position (page 18-13).

Be sure the stopper ring [2] on the pad pin is in good condition, and replace it with a new one if necessary.

Coat the stopper ring with silicone grease.

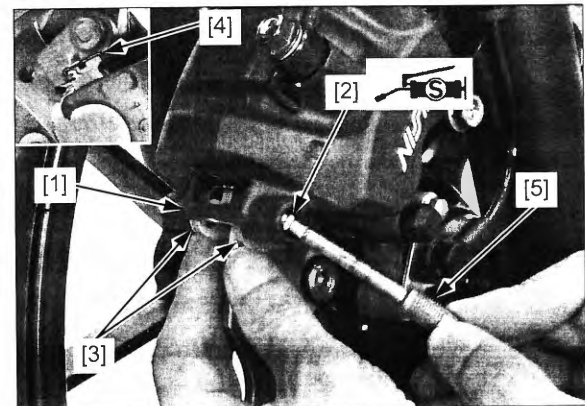
Install the pads [3] so that their ends are set in the retainer [4] properly.

Install the pad pin [5] by pushing the pads against the pad spring to align the pad pin holes in the pads and caliper body.

Tighten the pad pin to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

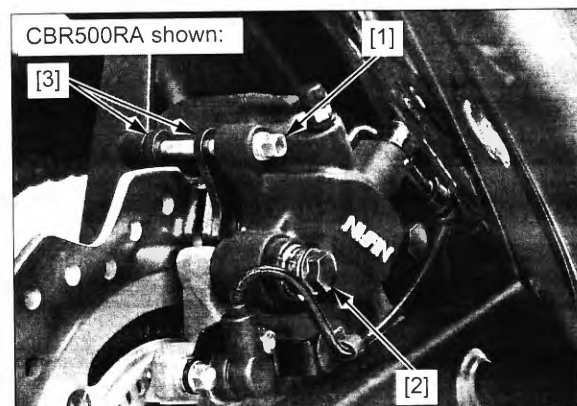
Operate the brake lever to seat the caliper pistons against the pads.



REAR

Loosen the pad pin [1] and remove the caliper bolt [2].

Do not operate the brake pedal after removing the pads. Pivot the caliper body up, and remove the pad pin and brake pads [3].



HYDRAULIC BRAKE

Make sure the pad spring [1] is installed in position (page 18-14).

Be sure the stopper ring [2] 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 [3] so that their ends rest on the pad retainer [4] properly.

Lower the caliper body and loosely install a new caliper bolt [5].

Install the pad pin [6] by pushing the pads against the pad spring to align the pad pin holes in the pads and caliper body.

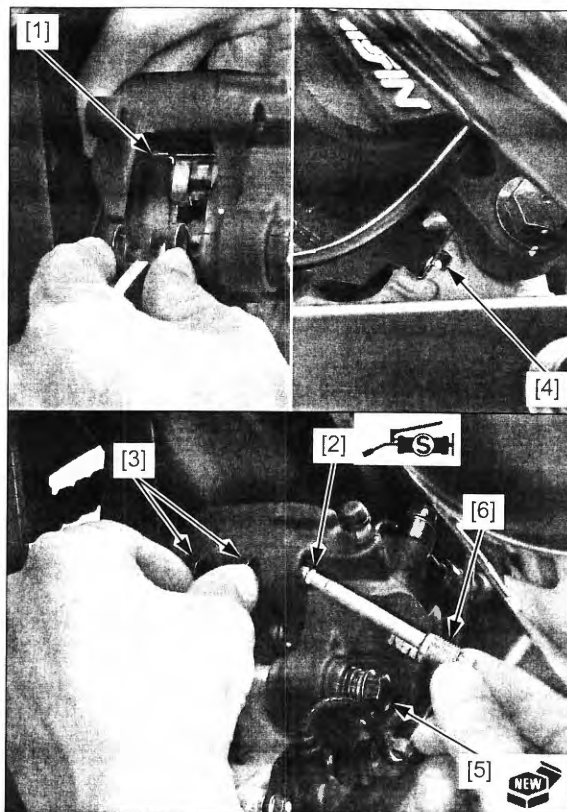
Tighten the caliper bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Tighten the pad pin to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

Operate the brake pedal to seat the caliper piston 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 1-12) and replace if necessary.

FRONT MASTER CYLINDER

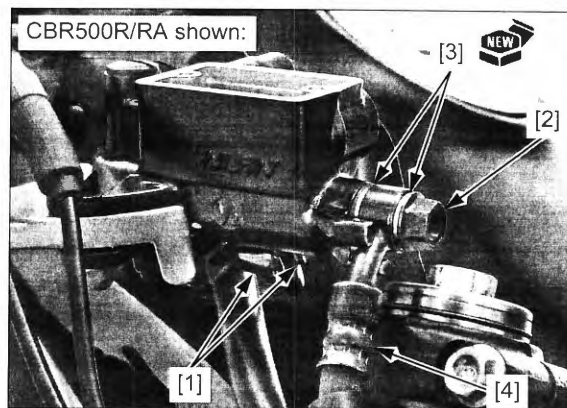
REMOVAL/INSTALLATION

Drain the brake fluid from the front brake hydraulic system (page 18-5).

When removing the oil bolt, cover the end of the brake hose to prevent contamination.

Remove the following:

- right rearview mirror (CB500F/FA/X/XA) (page 2-11)
- brake light switch connectors [1]
- oil bolt [2]
- sealing washers [3]
- brake hose [4]

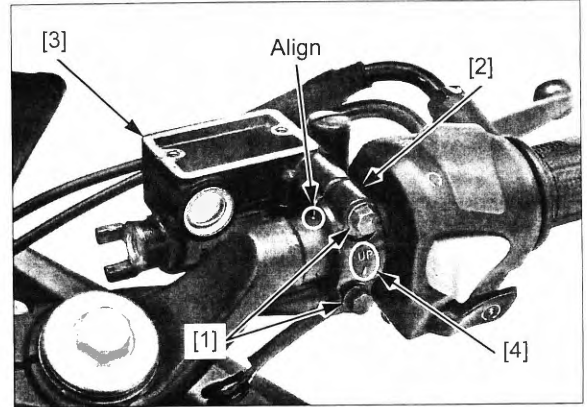


- two bolts [1]
- master cylinder holder [2]
- master cylinder [3]

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 [4] 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 brake hose.



TORQUE:

Front master cylinder holder bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)

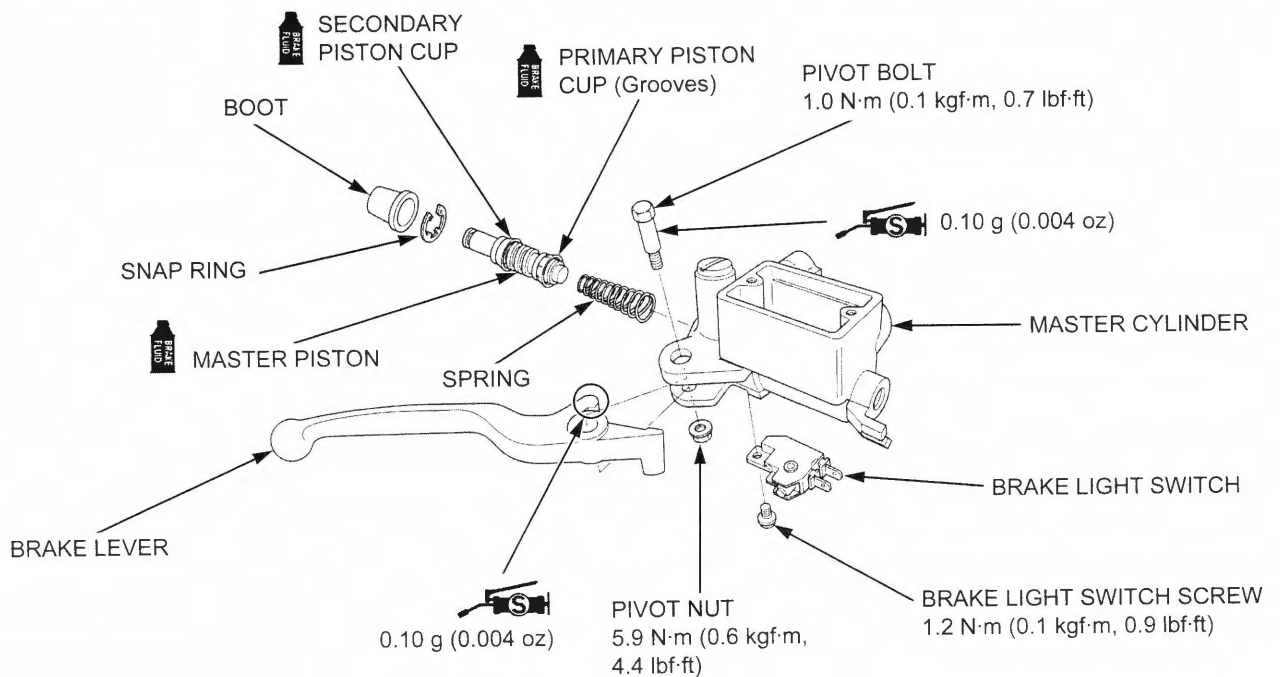
Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the front brake hydraulic system (page 18-5).

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the front master cylinder as following illustration.

- 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.



HYDRAULIC BRAKE

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 1-12) and replace if necessary.

REAR MASTER CYLINDER

REMOVAL/INSTALLATION

Drain the brake fluid from the rear brake hydraulic system (page 18-5).

Remove the following:

- right side cover (page 2-7)
- rear brake reservoir (page 18-6)

When removing the oil bolt, cover the end of the brake hose to prevent contamination.

Disconnect the brake hose [1] by removing the oil bolt [2] and sealing washers [3].

Loosen the master cylinder mounting bolts [4].

Support the right rider footpeg bracket [5] securely and remove the bracket bolts [6].



Remove the following.

- cotter pin [1]
- joint pin [2]
- mounting bolts [3]
- master cylinder [4]

Installation is in the reverse order of removal.

NOTE:

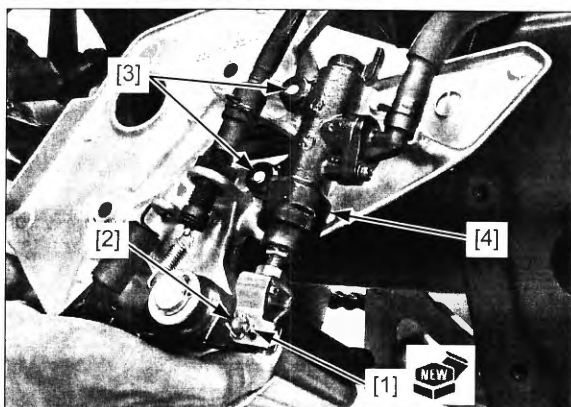
- Replace the sealing washers and cotter pin with new ones.
- Be sure to rest the eyelet stopper pin against the stopper when tightening the oil bolt.

TORQUE:

Rider footpeg bracket bolt:
37 N·m (3.8 kgf·m, 27 lbf·ft)

Rear master cylinder mounting bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

Oil bolt:
34 N·m (3.5 kgf·m, 25 lbf·ft)

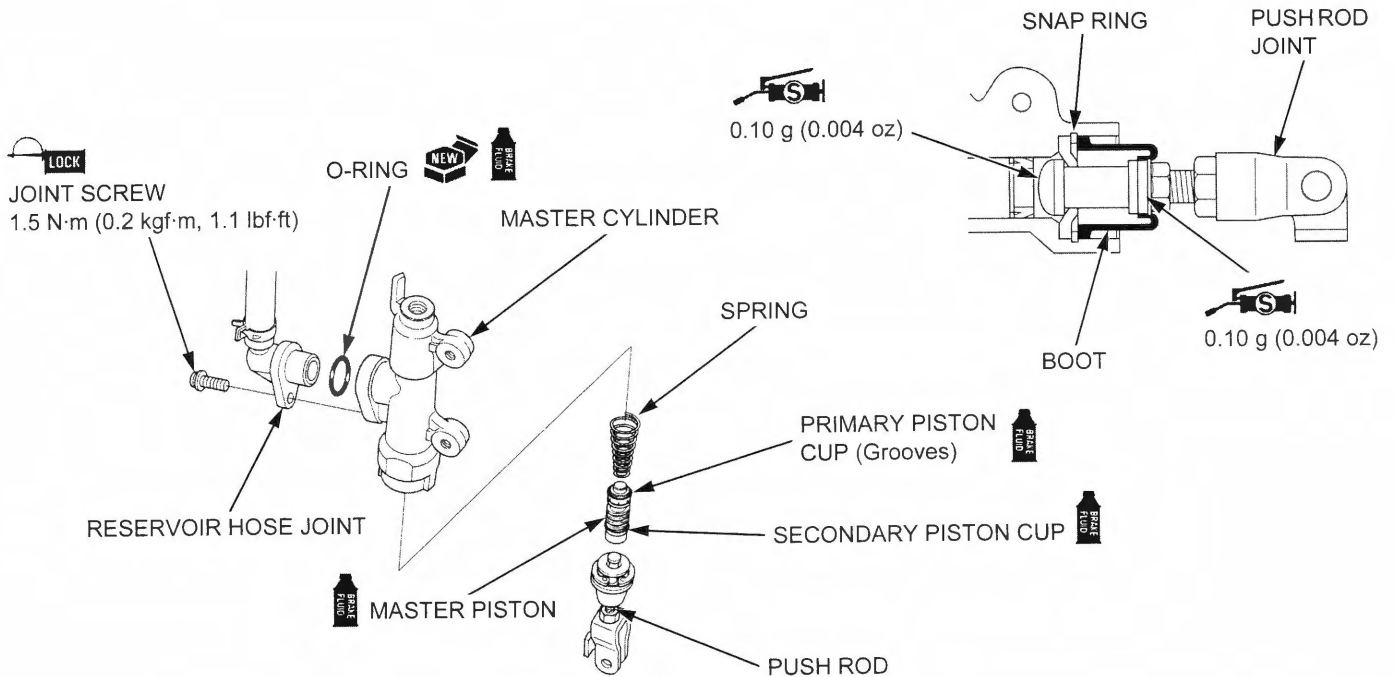


Fill and bleed the rear brake hydraulic system (page 18-5).

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the rear master cylinder as following illustration.

- 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.



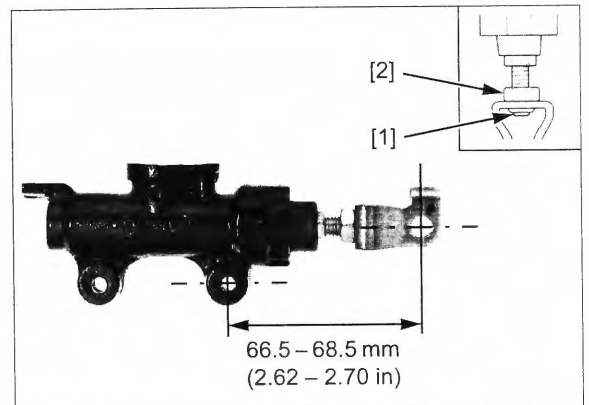
When the push rod has been disassembled, adjust the push rod length so that the distance from the center of the master cylinder lower mounting bolt hole to the center of the joint pin hole is standard length as shown.

If the length is adjusted to the 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:
17 N·m (1.7 kgf·m, 13 lbf·ft)**



HYDRAULIC BRAKE

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 1-12) and replace if necessary.

FRONT BRAKE CALIPER

REMOVAL/INSTALLATION

Drain the brake fluid from the front brake hydraulic system (page 18-5).

CBR500RA/ Remove the following:

CB500FA/XA:

- bolt [1] and wire clamp [2]
- two bolts [3] and front wheel speed sensor [4]

When removing the oil bolt, cover the end of brake hose to prevent contamination.

- brake pads [1] (page 18-7)
- oil bolt [2]
- sealing washers [3]
- brake hose [4]
- mounting bolts [5]
- brake caliper [6]

Installation is in the reverse order of removal.

NOTE:

- Replace the brake caliper mounting bolts and sealing washers with new ones.
- Be sure to rest the eyelet stopper pin against the caliper body when tightening the oil bolt.
- *CBR500RA/**CB500FA/XA:* Before installing the wheel speed sensor, wipe the sensor tip and mounting area to remove any foreign material.

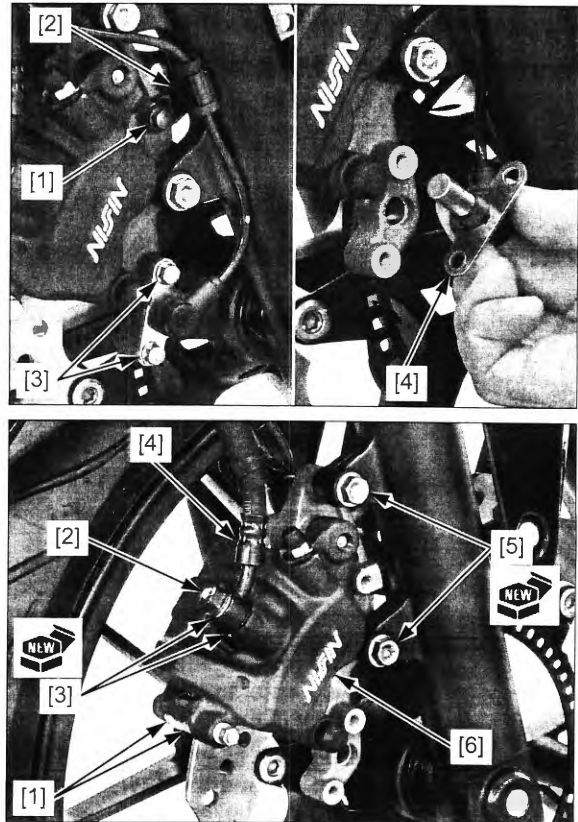
TORQUE:

Front brake caliper mounting bolt:

30 N·m (3.1 kgf·m, 22 lbf·ft)

Oil bolt:

34 N·m (3.5 kgf·m, 25 lbf·ft)

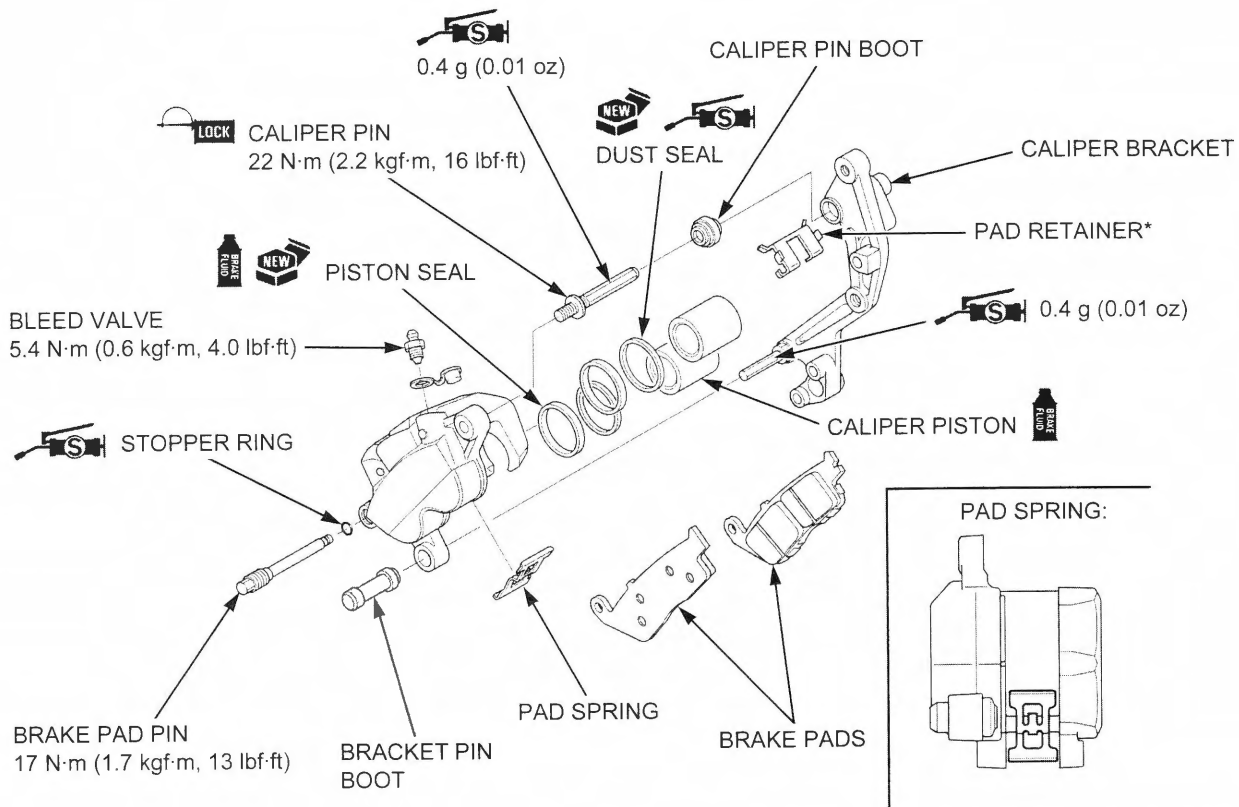


DISASSEMBLY/ASSEMBLY

Disassemble and assemble the front brake caliper as following illustration.

For brake pad removal/installation (page 18-7).

- 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.



*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 1-12) and replace if necessary.

REAR BRAKE CALIPER

REMOVAL/INSTALLATION

Drain the brake fluid from the rear brake hydraulic system (page 18-5).

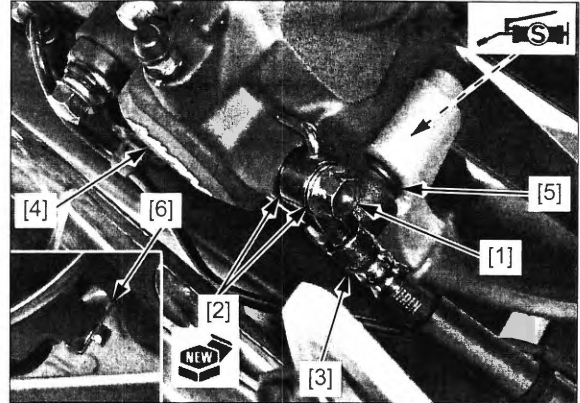
When removing the oil bolt, cover the end of brake hose to prevent contamination.

- oil bolt [1]
- sealing washers [2]
- brake hose [3]
- brake pads (page 18-7)
- brake caliper [4]
- caliper pin boot [5]

Installation is in the reverse order of removal.

NOTE:

- Replace the and sealing washers with new ones.
- If the pad retainer [6] was removed, apply Honda Bond A or Honda Hand Grip Cement (U.S.A. only) to the retainer seating surface.
- Apply 0.4 g (0.01oz) of silicone grease to the sliding area of the caliper pin bolt.
- Be sure to rest the eyelet stopper pin against the caliper body when tightening the oil bolt.



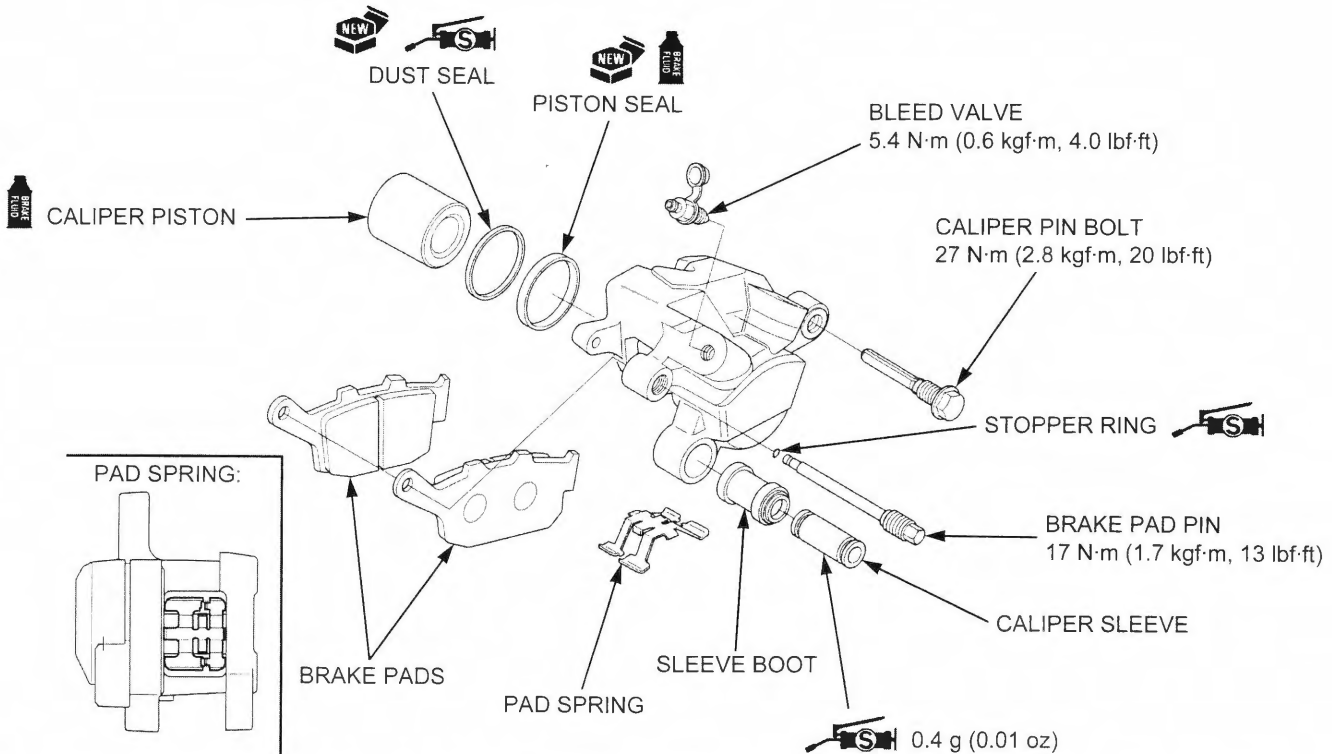
TORQUE: Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the rear brake hydraulic system (page 18-5).

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the rear brake caliper as following illustration.

- 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 piston with the opening toward the pads.



INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

- caliper cylinder
- caliper piston

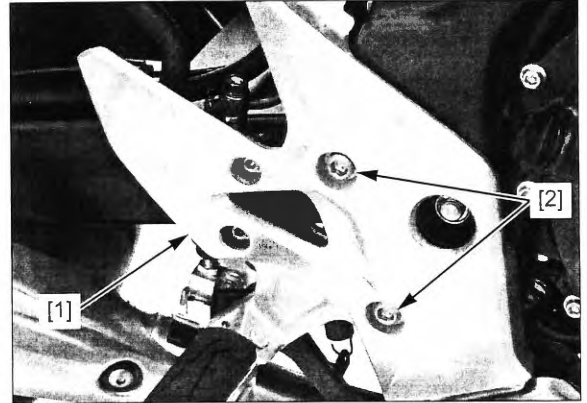
Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-12) and replace if necessary.

BRAKE PEDAL

REMOVAL/INSTALLATION

Remove the right side cover (page 2-7).

Support the right rider footpeg bracket [1] securely and remove the bracket bolts [2].



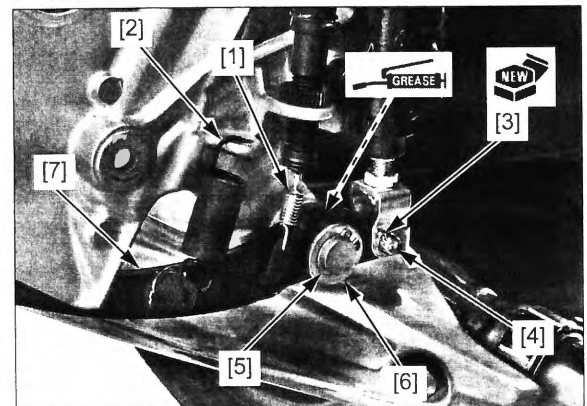
Remove the following:

- switch spring [1]
- return spring [2]
- cotter pin [3]
- joint pin [4]
- snap ring [5]
- washer [6]
- brake pedal [7]

Installation is in the reverse order of removal.

NOTE:

- Apply grease to the pedal pivot sliding area (grease groove).
- 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.
- Replace the cotter pin with a new one.
- Install the each spring in the direction as shown.



TORQUE:

Rider footpeg bracket bolt:
37 N·m (3.8 kgf·m, 27 lbf·ft)

MEMO

19. ANTI-LOCK BRAKE SYSTEM (ABS; CBR500RA/CB500FA/XA)

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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 18-2).
- 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 19-5).
- 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 19-22).
- The following color codes are used throughout this section.

Bl = Black
Br = Brown
Bu = Blue

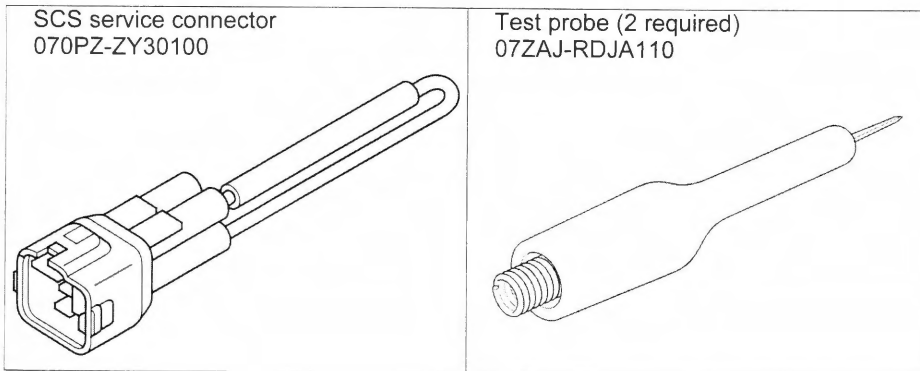
G = Green
Gr = Gray
Lb = Light Blue

Lg = Light Green
O = Orange
P = Pink

R = Red
V = Violet
W = White

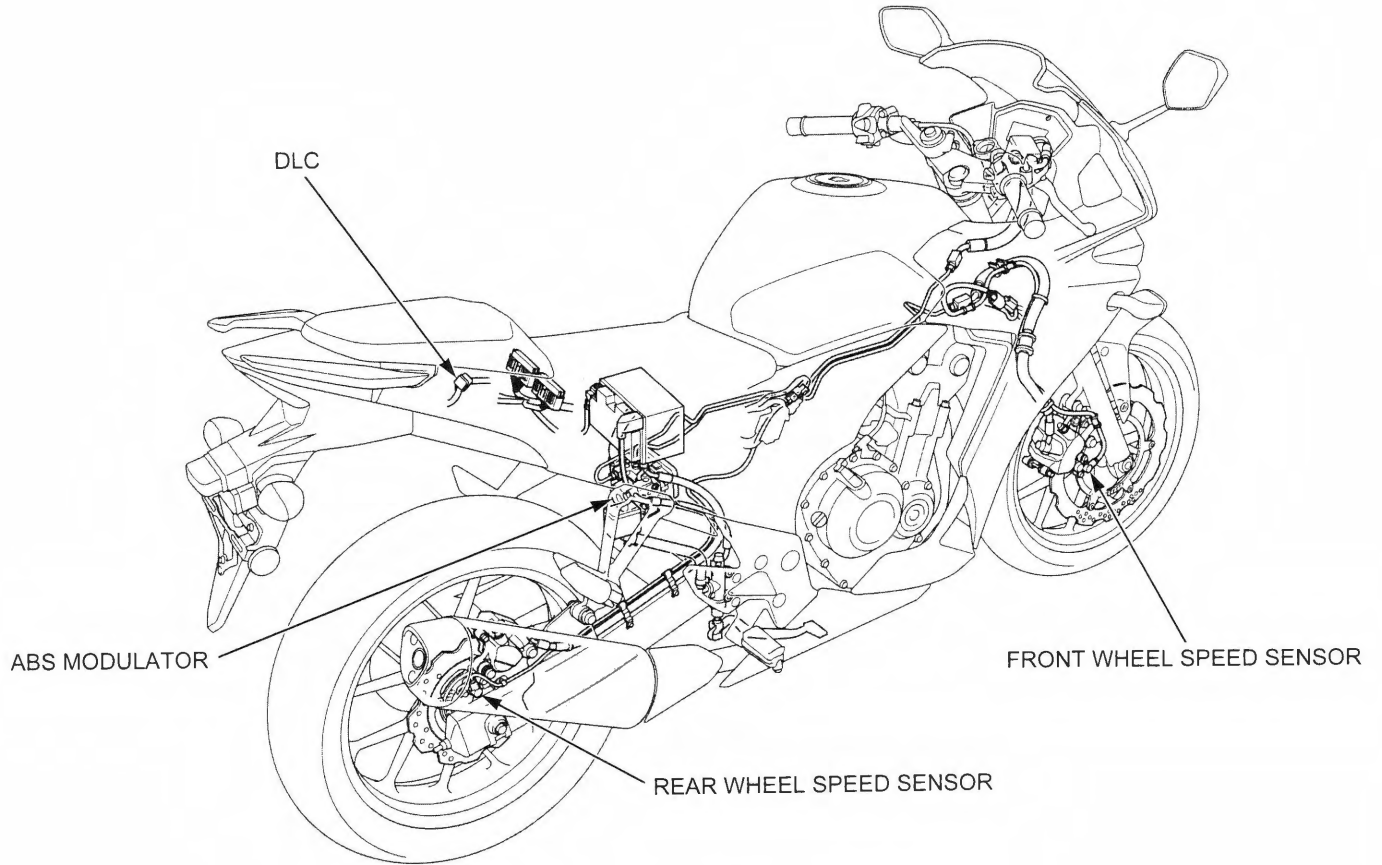
Y = Yellow

TOOLS



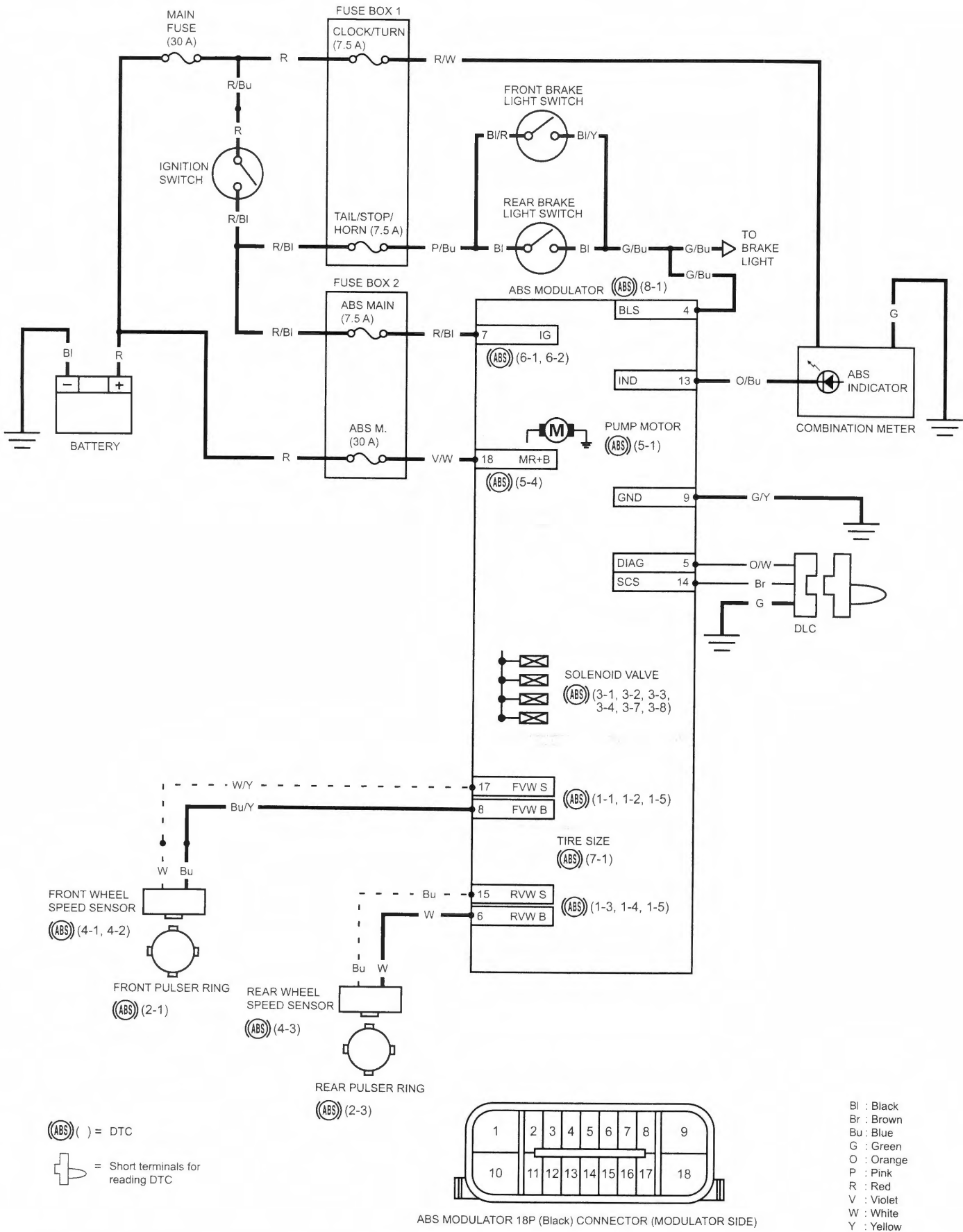
SYSTEM LOCATION

CBR500RA shown:



ANTI-LOCK BRAKE SYSTEM (ABS; CBR500RA/CB500FA/XA)

SYSTEM DIAGRAM



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.

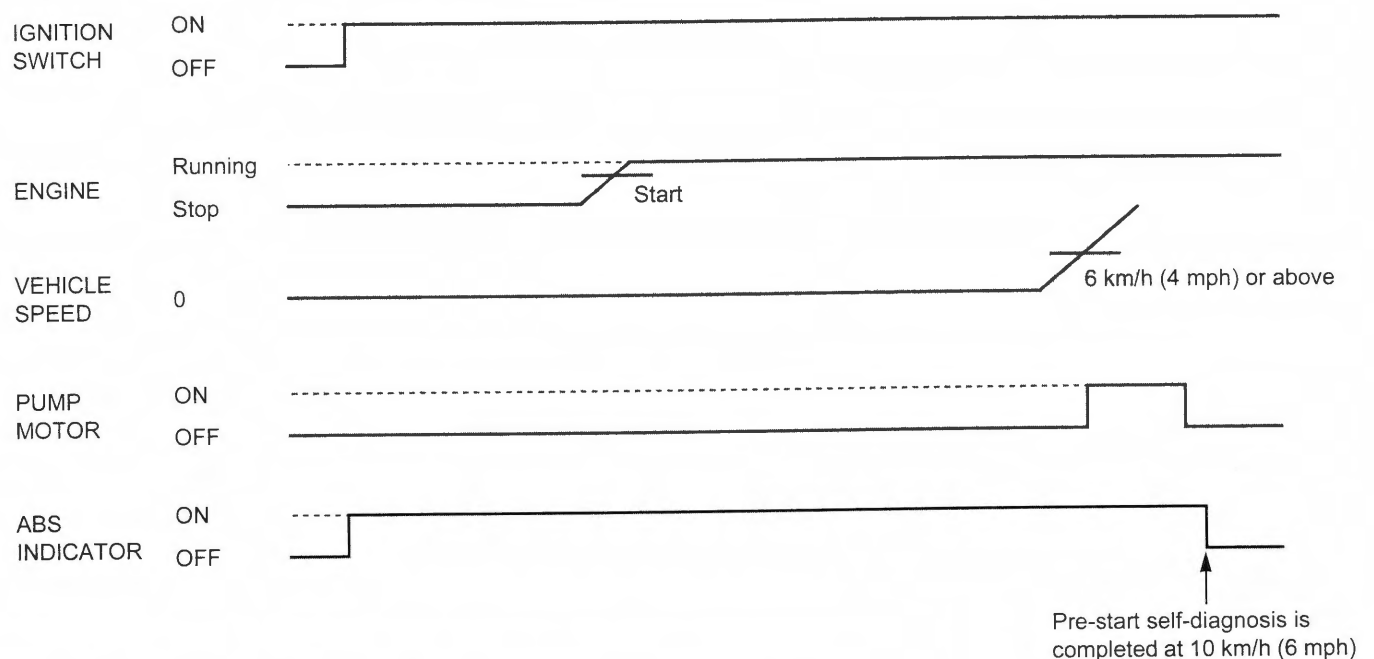
When the motorcycle is running, pulse signals generated at the front and rear wheel speed sensors are sent to the ABS control unit. When the vehicle speed reaches approximately 6 km/h (4 mph), the ABS control unit operates the pump motor to check it. When the vehicle speed reaches 10 km/h (6 mph), the 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 19-6).

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 19-11).

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 "O".
2. Make sure the ABS indicator comes on.
3. Start the engine.
4. Ride the motorcycle and increase the vehicle speed to approximately 10 km/h (6 mph).
5. The ABS is normal if the ABS indicator goes off.

ANTI-LOCK BRAKE SYSTEM (ABS; CBR500RA/CB500FA/XA)

MCS INFORMATION

- The MCS can read out and erase the DTC.

How to connect the MCS

Remove the following:

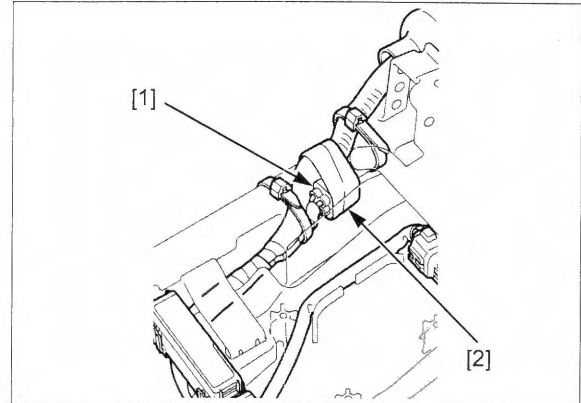
- CBR500RA/CB500FA: front seat (page 2-6)
- CB500XA: seat (page 2-6)

Turn the ignition switch OFF.

Remove the DLC [1] from the dummy connector [2].

Connect the MCS to the DLC.

Turn the ignition switch ON with the engine stop switch "O" 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 19-5).
- Do not apply the brake during DTC readout.

Connect the MCS to the DLC (page 19-6).

Read the DTC and follow the DTC index (page 19-9).

- If the MCS is not available, perform the following.

Reading DTC with the ABS indicator

Remove the following:

- CBR500RA/CB500FA: front seat (page 2-6)
- CB500XA: seat (page 2-6)

Turn the ignition switch OFF.

Remove the DLC [1] from the dummy connector [2] and short the DLC terminals using the special tool.

TOOL:

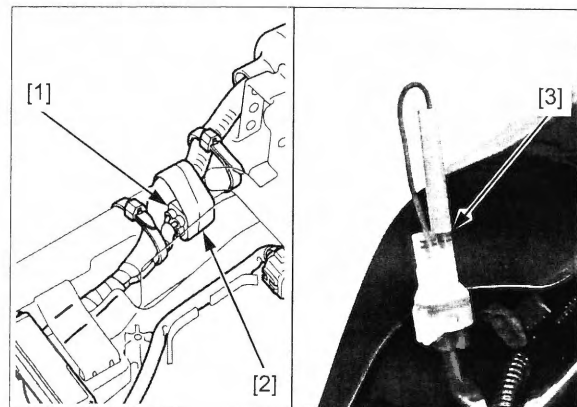
[3] SCS service connector 070PZ-ZY30100

CONNECTION: Brown – Green

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

The ABS indicator should come on 2 seconds (start signal) (then goes off 3.6 seconds) and starts DTC indication.

The DTC is indicated by the number of the times of the ABS indicator blinking.
If the DTC is not stored, the ABS indicator stays on.

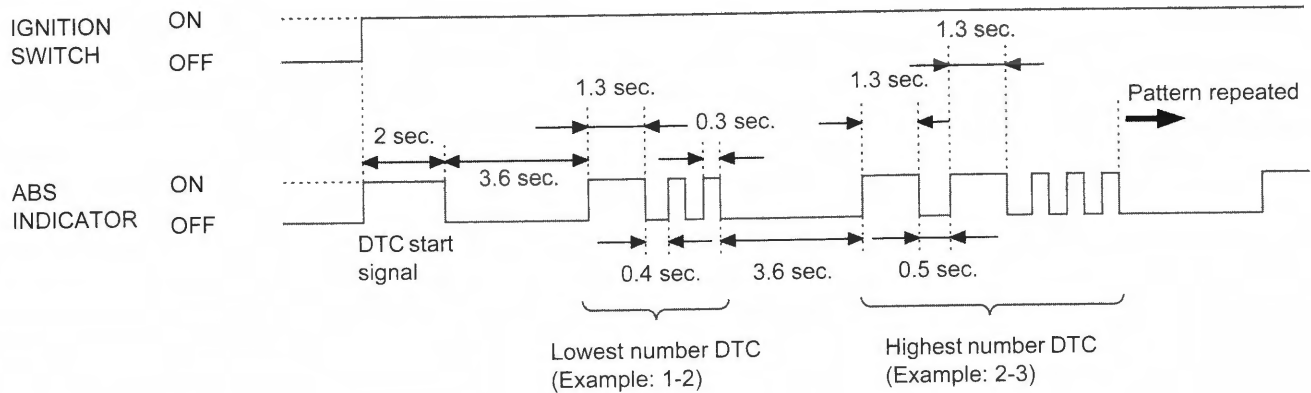


ANTI-LOCK BRAKE SYSTEM (ABS; CBR500RA/CB500FA/XA)

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

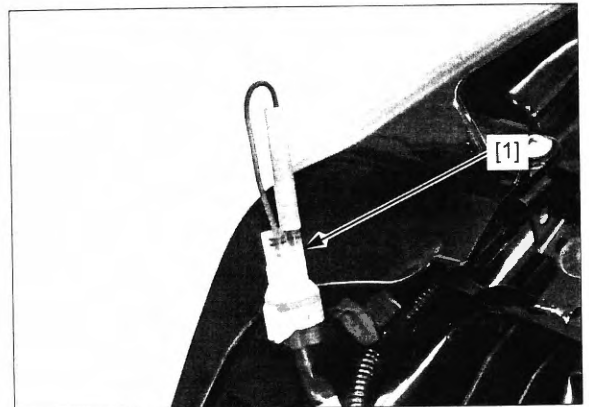
1. Connect the SCS service connector [1] to the DLC (page 19-6).
2. While squeezing the brake lever, turn the ignition switch ON with the engine stop switch to "O". The ABS indicator should come on for 2 seconds and go off.
3. Release the brake lever immediately after the ABS indicator goes off. The 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 following:

- CBR500RA/CB500FA: front seat (page 2-6)
- CB500XA: seat (page 2-6)



ANTI-LOCK BRAKE SYSTEM (ABS; CBR500RA/CB500FA/XA)

CIRCUIT INSPECTION

INSPECTION AT ABS MODULATOR CONNECTOR

Remove the ABS modulator cover (page 2-25).

Turn the ignition switch OFF.

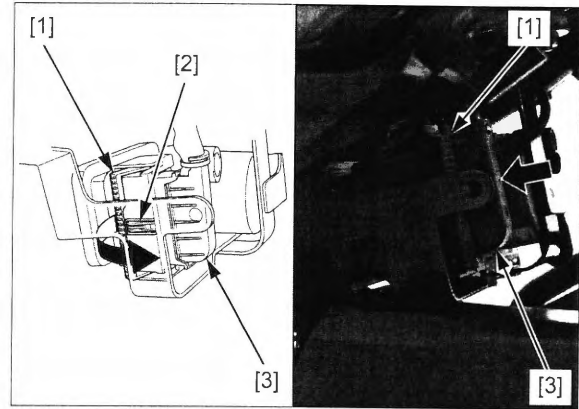
Disconnecting procedure:

Turn the lock lever [1] to this side 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 seat the lock lever against the wire side of the connector fully. 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.

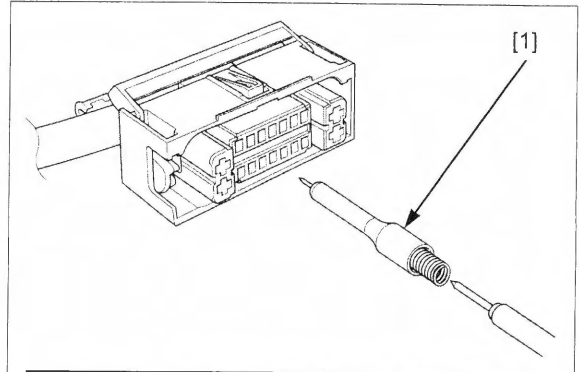


- Always clean around and keep any foreign material away from the connector before disconnecting it.
- A faulty ABS is often related to poorly connected or corroded connections. Check those connections before proceeding.
- In testing at ABS modulator 18P (Black) connector terminals (wire harness side; 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.

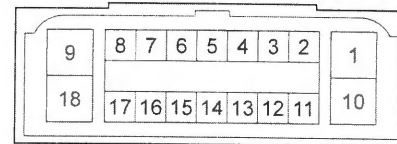
TOOL:

Test probe

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 19-7). Then, test-ride the motorcycle above 30 km/h (19 mph) and check the DTC (page 19-6). 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 (7.5 A)			• ABS indicator never comes ON at all	19-11
				• ABS indicator stays ON at all	19-11
1-1	Front wheel speed sensor circuit malfunction (open circuit) • Wheel speed sensor or related wires	○	○	• Stops ABS operation	19-13
1-2	Front wheel speed sensor malfunction • Wheel speed sensor, pulser ring or related wires • Electromagnetic interference		○	• Stops ABS operation	19-13
1-3	Rear wheel speed sensor circuit malfunction • Wheel speed sensor or related wires	○	○	• Stops ABS operation	19-15
1-4	Rear wheel speed sensor malfunction • Wheel speed sensor, pulser ring or related wires • Electromagnetic interference		○	• Stops ABS operation	19-15
1-5	Front or rear wheel speed sensor circuit malfunction (short circuit) • Wheel speed sensor or related wires	○	○	• Stops ABS operation	19-17
2-1	Front pulser ring • Pulser ring or related wires		○	• Stops ABS operation	19-13
2-3	Rear pulser ring • Pulser ring or related wires		○	• Stops ABS operation	19-15
3-1	Solenoid valve malfunction (ABS modulator)			• Stops ABS operation	19-19
3-2					
3-3					
3-4					
3-7		○	○		
3-8					
4-1	Front wheel lock • Riding condition		○	• Stops ABS operation	19-13
4-2	Front wheel lock (Wheelie) • Riding condition		○		
4-3	Rear wheel lock • Riding condition		○	• Stops ABS operation	19-15
5-1	Pump motor lock • Pump motor (ABS modulator) or related wires • ABS M. fuse (30 A)	○	○	• Stops ABS operation	19-19
5-4	Power supply relay malfunction • Power supply relay (ABS modulator) or related wires • ABS M. fuse (30 A)	○	○	• Stops ABS operation	19-19

ANTI-LOCK BRAKE SYSTEM (ABS; CBR500RA/CB500FA/XA)

DTC	Function failure	Detection		Symptom/Fail-safe function	Refer to
		A	B		
6-1	Power circuit under voltage <ul style="list-style-type: none">• Input voltage (too low)• ABS MAIN fuse (7.5 A)	○	○	• Stops ABS operation	19-20
6-2	Power circuit over voltage <ul style="list-style-type: none">• Input voltage (too high)	○	○	• Stops ABS operation	
7-1	Tire malfunction <ul style="list-style-type: none">• Tire size		○	• Stops ABS operation	19-21
8-1	ABS control unit <ul style="list-style-type: none">• ABS control unit malfunction (ABS modulator)	○	○	• Stops ABS operation	19-21

(A) Pre-start self-diagnosis (page 19-5)

(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 21-10).

1. Indicator Operation Inspection

Turn the ignition switch OFF.
 Disconnect the ABS modulator 18P (Black) connector (page 19-8).
 Turn the ignition switch ON with the engine stop switch "O".
 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:

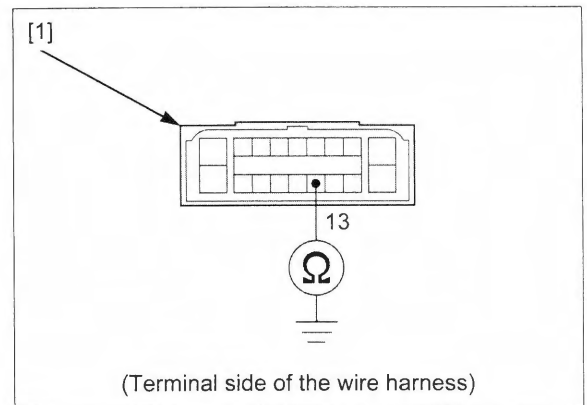
Test probe **07ZAJ-RDJA110**

CONNECTION: 13 – Ground

Is there continuity?

YES – Short circuit in the Orange/blue 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 19-8).
 Check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

TOOL:

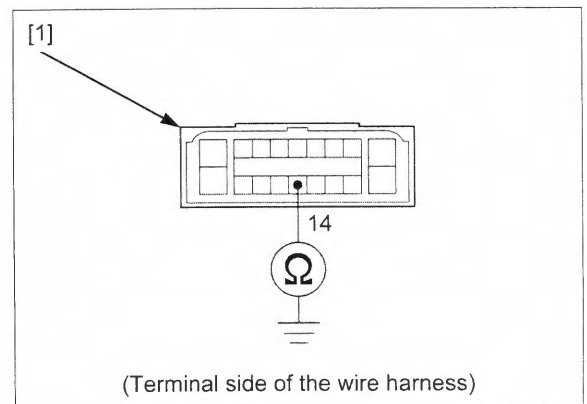
Test probe **07ZAJ-RDJA110**

CONNECTION: 14 – Ground

Is there continuity?

YES – Short circuit in the Brown wire

NO – GO TO STEP 2.



ANTI-LOCK BRAKE SYSTEM (ABS; CBR500RA/CB500FA/XA)

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 07ZAJ-RDJA110

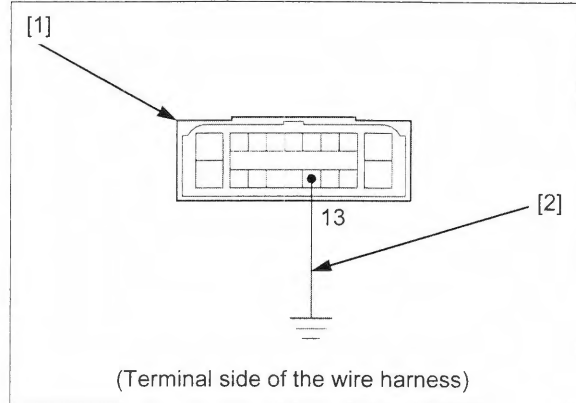
CONNECTION: 13 – Ground

Turn the ignition switch ON with the engine stop switch "O".
Check the ABS indicator.

Does it go off?

YES – GO TO STEP 3.

NO – • Open circuit in the Orange/blue wire
• Faulty combination meter (if the Orange/blue wire is OK)



3. Modulator Ground Line Open Circuit Inspection

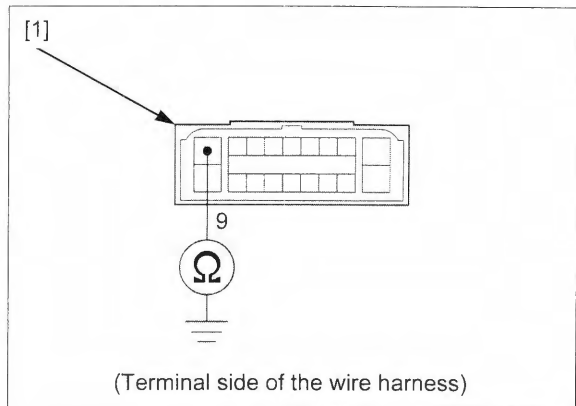
Turn the ignition switch OFF.
Check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

CONNECTION: 9 – Ground

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Green/yellow wire



4. Fuse Inspection

Remove the following:

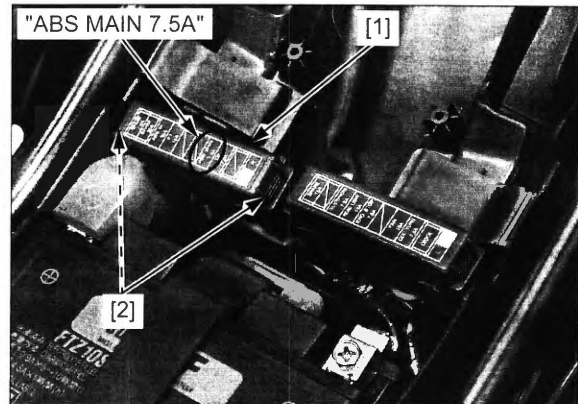
- CBR500RA/CB500FA: front seat (page 2-6)
- CB500XA: seat (page 2-6)

Remove the fuse box cover [1] from the fuse box 2 (right) by releasing the two tabs [2].
Check the ABS MAIN fuse (7.5 A) for blown.

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 (7.5 A) removed, check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] and ground.

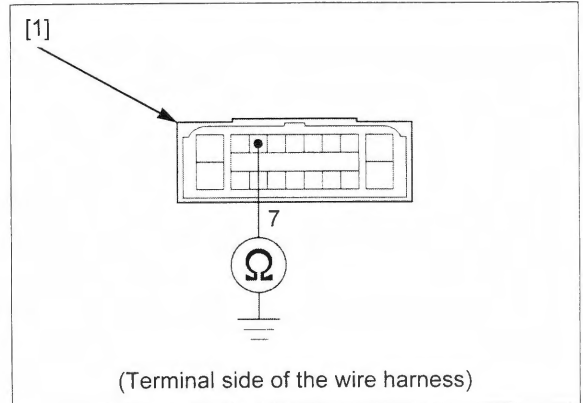
TOOL:

Test probe **07ZAJ-RDJA110**

CONNECTION: 7 – Ground

Is there continuity?

- YES** – Short circuit in Red/black wire
NO – Intermittent failure. Replace the ABS MAIN fuse (7.5 A) with a new one, and recheck.



6. Power Input Line Open Circuit Inspection

Install the ABS MAIN fuse (7.5 A).
 Turn the ignition switch ON with the engine stop switch "O".
 Measure the voltage between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

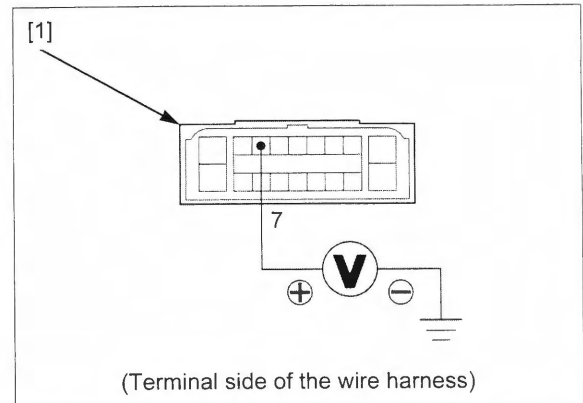
TOOL:

Test probe **07ZAJ-RDJA110**

CONNECTION: 7 (+) – Ground (-)

Is there battery voltage?

- YES** – Faulty ABS modulator
NO – Open circuit in Red/black 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 19-7) and test-ride the motorcycle to check that the ABS indicator operates normally during pre-start self-diagnosis (page 19-5).

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 19-9). This is temporary failure. Erase the DTC (page 19-7) then test-ride the motorcycle above 30 km/h (19 mph) check that the ABS indicator operates normally (page 19-5).
- 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 19-22).

Is the air gap correct?

YES – GO TO STEP 2.

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

2. Speed Sensor Condition Inspection

Inspect the area around the front wheel speed sensor:

Check that there is iron or other magnetic deposits between the pulser ring [1] and wheel speed sensor [2], and the pulser ring slots for obstructions.

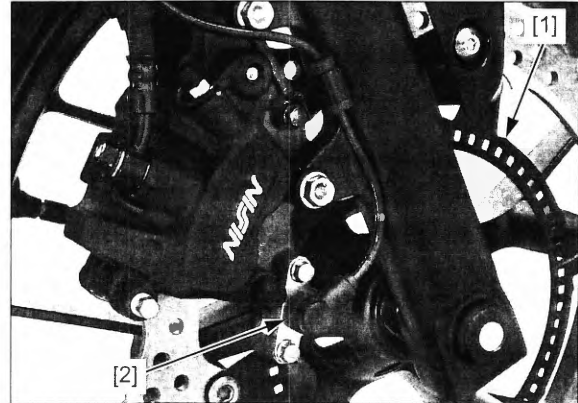
Check the installation condition of the pulser ring or wheel speed sensor for looseness.

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 5.

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 (Blue) connector (page 19-22).

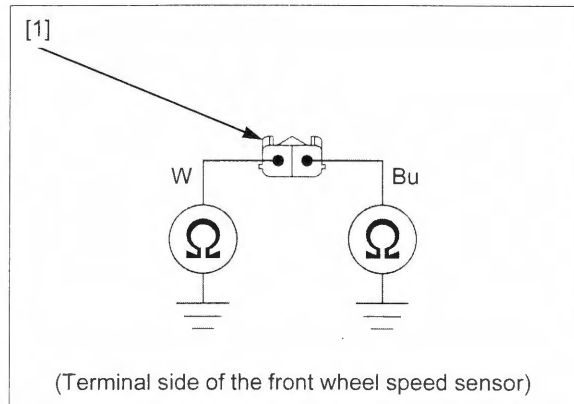
Check for continuity between each terminal of the sensor side front wheel speed sensor 2P (Blue) connector [1] and ground.

**CONNECTION: White – Ground
Blue – 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 19-8).

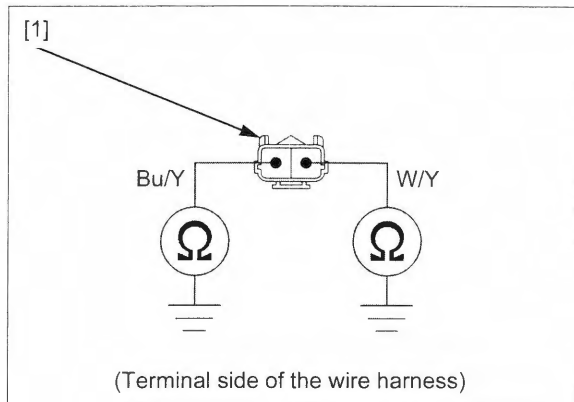
Check for continuity between each terminal of the wire harness side front wheel speed sensor 2P (Blue) connector [1] and ground.

**CONNECTION: Blue/yellow – Ground
White/yellow – Ground**

Is there continuity?

YES – • Short circuit in the Blue/yellow wire
• Short circuit in the White/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

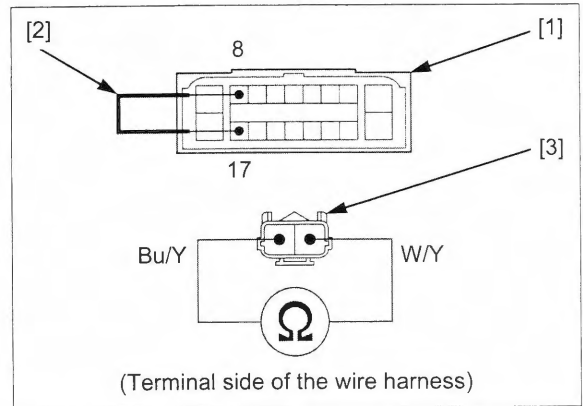
Check for continuity between the wire harness side front wheel speed sensor 2P (Blue) connector [3] terminals.

CONNECTION: Blue/yellow – White/yellow

Is there continuity?

YES – GO TO STEP 6.

NO – Open circuit in the Blue/yellow or White/yellow wire



6. Failure Reproduction with a New Speed Sensor

Replace the front wheel speed sensor with a new one (page 19-22).

Connect the ABS modulator 18P (Black) and front wheel speed sensor 2P (Blue) connectors.

Erase the DTC (page 19-7).

Test-ride the motorcycle above 30 km/h (19 mph).

Recheck the DTC (page 19-6).

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 19-9). This is temporary failure. Erase the DTC (page 19-7) then test-ride the motorcycle above 30 km/h (19 mph) check that the ABS indicator operates normally (page 19-5).
- 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 19-22).

Is the air gap correct?

YES – GO TO STEP 2.

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

ANTI-LOCK BRAKE SYSTEM (ABS; CBR500RA/CB500FA/XA)

2. Speed Sensor Condition Inspection

Inspect the area around the rear wheel speed sensor:

Check that there is iron or other magnetic deposits between the pulser ring [1] and wheel speed sensor [2], and the pulser ring slots for obstructions.

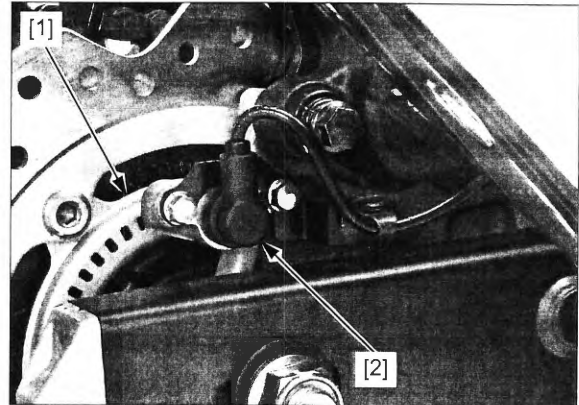
Check the installation condition of the pulser ring or wheel speed sensor for looseness.

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 5.

NO – Remove any deposits. Install properly or replace faulty part.

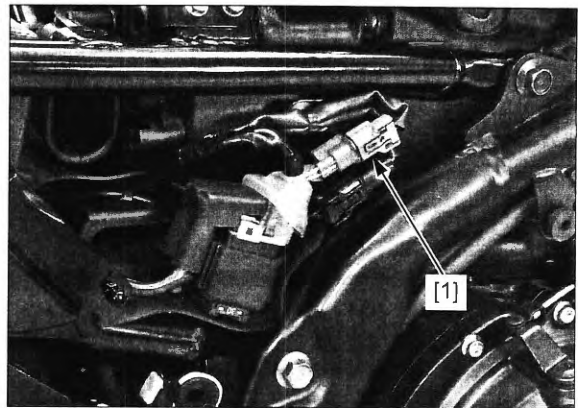


3. Rear Wheel Speed Sensor Line Short Circuit Inspection (at sensor side)

Turn the ignition switch OFF.

Remove the right side cover (page 2-7).

Disconnect the rear wheel speed sensor 2P (Gray) connector [1].



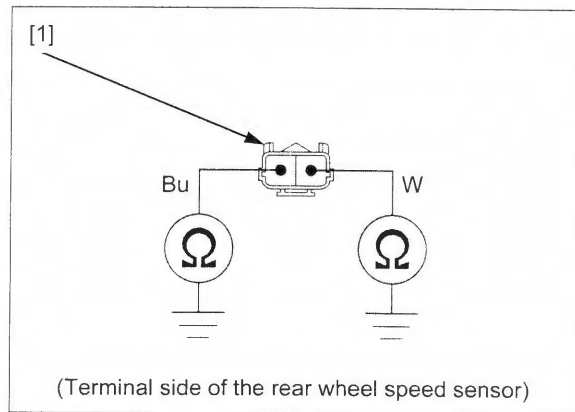
Check for continuity between each terminal of the sensor side rear wheel speed sensor 2P (Gray) connector [1] and ground.

**CONNECTION: Blue – Ground
White – 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 19-8).

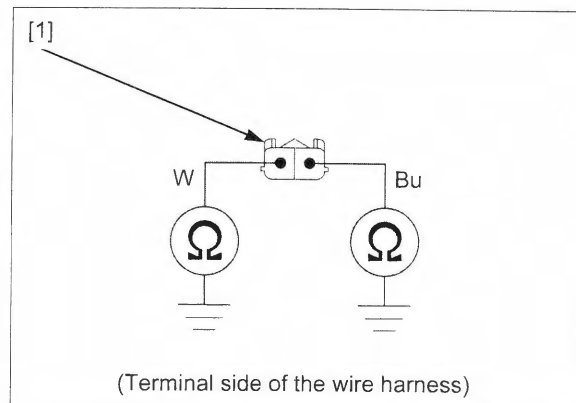
Check for continuity between each terminal of the wire harness side rear wheel speed sensor 2P (Gray) connector [1] and ground.

**CONNECTION: White – Ground
Blue – Ground**

Is there continuity?

YES – • Short circuit in the White wire
• Short circuit in the 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

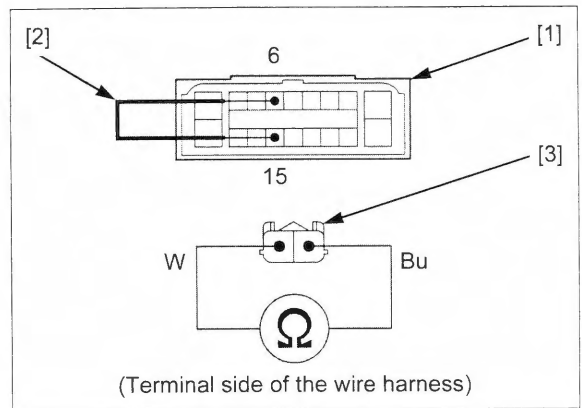
Check for continuity between the wire harness side rear wheel speed sensor 2P (Gray) connector [3] terminals.

CONNECTION: White – Blue

Is there continuity?

YES – GO TO STEP 6.

NO – Open circuit in the White or Blue wire



6. Failure Reproduction with a New Speed Sensor

Replace the rear wheel speed sensor with a new one (page 19-23).

Connect the ABS modulator 18P (Black) and rear wheel speed sensor 2P (Gray) connectors.

Erase the DTC (page 19-7).

Test-ride the motorcycle above 30 km/h (19 mph).

Recheck the DTC (page 19-6).

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 (Blue) connector (page 19-22).

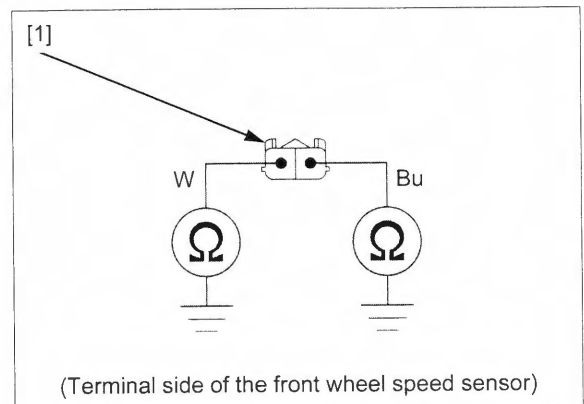
Check for continuity between each terminal of the sensor side front wheel speed sensor 2P (Blue) connector [1] and ground.

**CONNECTION: White – Ground
Blue – Ground**

Is there continuity?

YES – Faulty front wheel speed sensor

NO – GO TO STEP 2.



ANTI-LOCK BRAKE SYSTEM (ABS; CBR500RA/CB500FA/XA)

2. Front Wheel Speed Sensor Line Short Circuit Inspection

Disconnect the ABS modulator 18P (Black) connector (page 19-8).

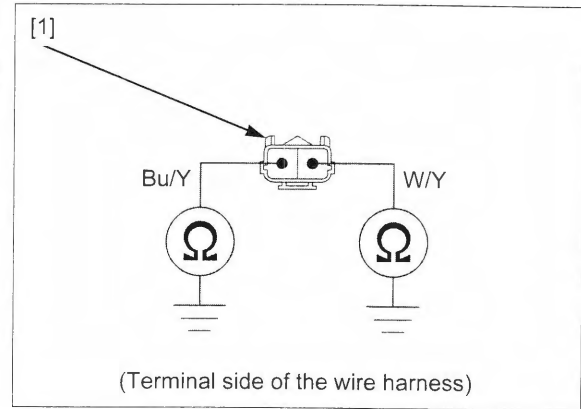
Check for continuity between each terminal of the wire harness side front wheel speed sensor 2P (Blue) connector [1] and ground.

CONNECTION: Blue/yellow – Ground
White/yellow – Ground

Is there continuity?

YES – • Short circuit in the Blue/yellow wire
• Short circuit in the White/yellow wire

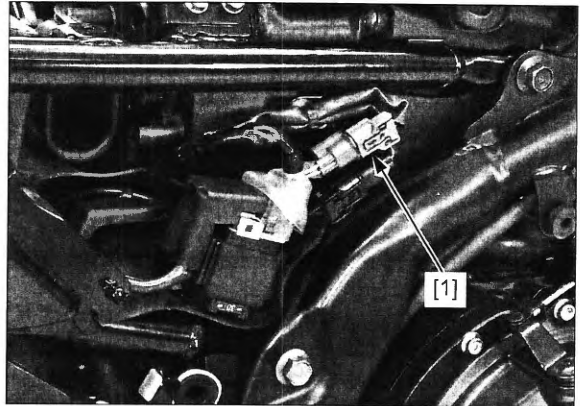
NO – GO TO STEP 3.



3. Rear Wheel Speed Sensor Line Short Circuit Inspection (at sensor side)

Remove the right side cover (page 2-7).

Disconnect the rear wheel speed sensor 2P (Gray) connector [1].



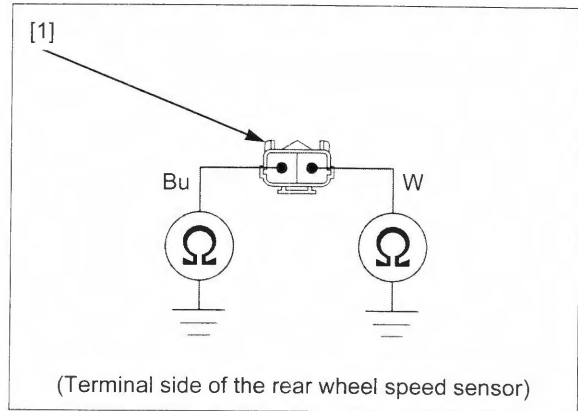
Check for continuity between each terminal of the sensor side rear wheel speed sensor 2P (Gray) connector [1] and ground.

CONNECTION: Blue – Ground
White – Ground

Is there continuity?

YES – Faulty rear wheel speed sensor

NO – GO TO STEP 4.



4. Rear Wheel Speed Sensor Line Short Circuit Inspection

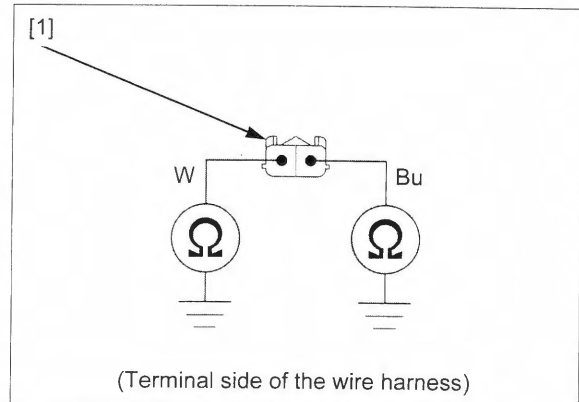
Check for continuity between each terminal of the wire harness side rear wheel speed sensor 2P (Gray) connector [1] and ground.

CONNECTION: White – Ground
Blue – Ground

Is there continuity?

YES – • Short circuit in the White wire
• Short circuit in the Blue wire

NO – Faulty ABS modulator



**DTC 3-1, 3-2, 3-3, 3-4, 3-7 or 3-8
(Solenoid Valve)**

1. Failure Reproduction

Erase the DTC (page 19-7).
 Test-ride the motorcycle above 30 km/h (19 mph).
 Recheck the DTC (page 19-6).

Is the DTC 3-1, 3-2, 3-3, 3-4, 3-7 or 3-8 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

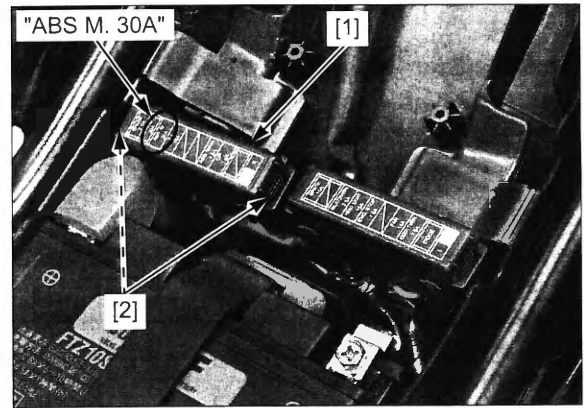
Turn the ignition switch OFF.
 Remove the following:

- CBR500RA/CB500FA: front seat (page 2-6)
- CB500XA: seat (page 2-6)

Remove the fuse box cover [1] from the fuse box 2 (right) by releasing the two tabs [2].
 Check the ABS M. fuse (30 A) for blown.

Is the fuse blown?

- YES** – GO TO STEP 2.
- NO** – GO TO STEP 3.



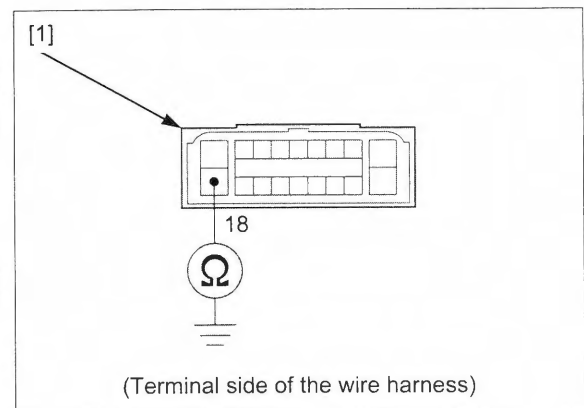
2. Motor Power Input Line Short Circuit Inspection

Disconnect the ABS modulator 18P (Black) connector (page 19-8).
 With the ABS M. 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 Violet/white wire between the fuse box 2 and ABS modulator 18P (Black) connector
- NO** – Intermittent failure. Replace the ABS M. fuse (30 A) with a new one, and recheck.



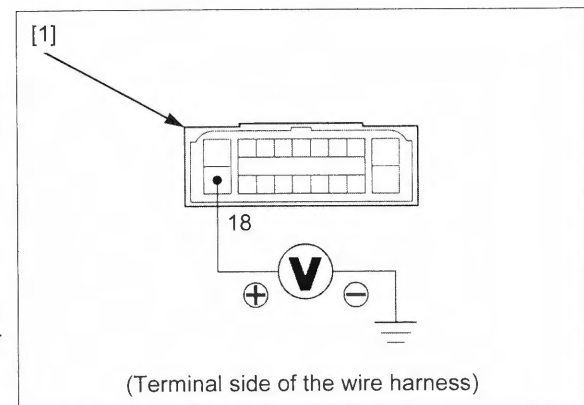
3. Motor Power Input Line Open Circuit Inspection

Install the ABS M. fuse (30 A).
 Disconnect the ABS modulator 18P (Black) connector (page 19-8).
 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 Violet/white wire between the battery and ABS modulator 18P (Black) connector



ANTI-LOCK BRAKE SYSTEM (ABS; CBR500RA/CB500FA/XA)

4. Failure Reproduction

Turn the ignition switch OFF.
Connect the ABS modulator 18P (Black) connector.
Erase the DTC (page 19-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-6).

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 following:

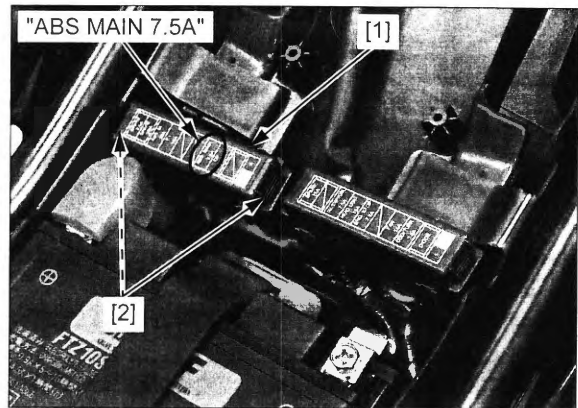
- CBR500RA/CB500FA: front seat (page 2-6)
- CB500XA: seat (page 2-6)

Remove the fuse box cover [1] from the fuse box 2 (right) by releasing the two tabs [2].

Check the ABS MAIN fuse (7.5 A) for blown.

Is the fuse blown?

- YES** – GO TO STEP 2.
NO – GO TO STEP 3.



2. Power Input Line Short Circuit Inspection

Disconnect the ABS modulator 18P (Black) connector (page 19-8).

With the ABS MAIN fuse (7.5 A) removed, check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] and ground.

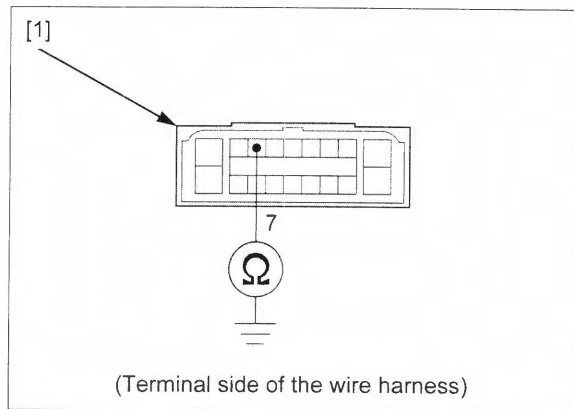
TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION: 7 – Ground

Is there continuity?

- YES** – Short circuit in Red/black wire
NO – Intermittent failure. Replace the ABS MAIN fuse (7.5 A) with a new one, and recheck.



(Terminal side of the wire harness)

3. Power Input Line Open Circuit Inspection

Install the ABS MAIN fuse (7.5 A).

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

Measure the voltage between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

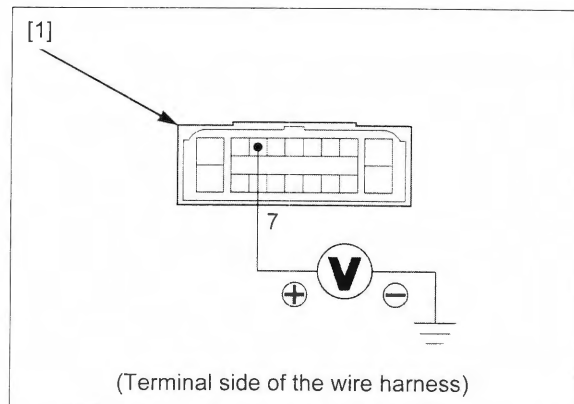
TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION: 7 (+) – Ground (-)

Is there battery voltage?

- YES** – GO TO STEP 4.
NO – Open circuit in Red/black wire



(Terminal side of the wire harness)

4. Failure Reproduction

Turn the ignition switch OFF.
Connect the ABS modulator 18P (Black) connector.
Erase the DTC (page 19-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-6).

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 19-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-6).

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 19-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-6).

Is the DTC 8-1 indicated?

- YES** – Faulty ABS modulator
NO – ABS control unit is normal (intermittent failure)

WHEEL SPEED SENSOR

AIR GAP INSPECTION

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

Measure the clearance (air gap) between the sensor and pulser ring at several points by turning the wheel slowly.

It must be within specification.

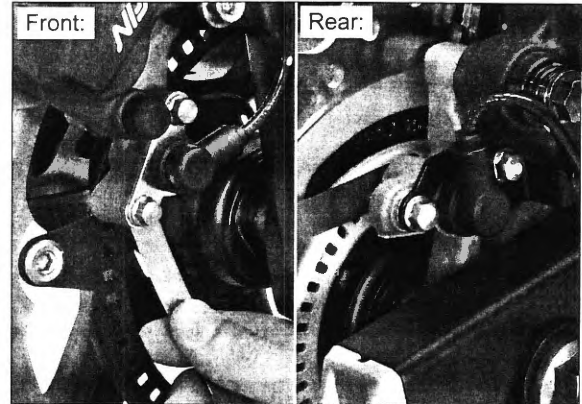
STANDARD: 0.4 – 1.2 mm (0.02 – 0.05 in)

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 16-17)
- Rear pulser ring (page 17-8)



REMOVAL/INSTALLATION

FRONT WHEEL SPEED SENSOR

Remove the right middle cowl (page 2-8).

Remove the front wheel speed sensor 2P (Blue) connector [1] from the stay and disconnect it.

Remove the following:

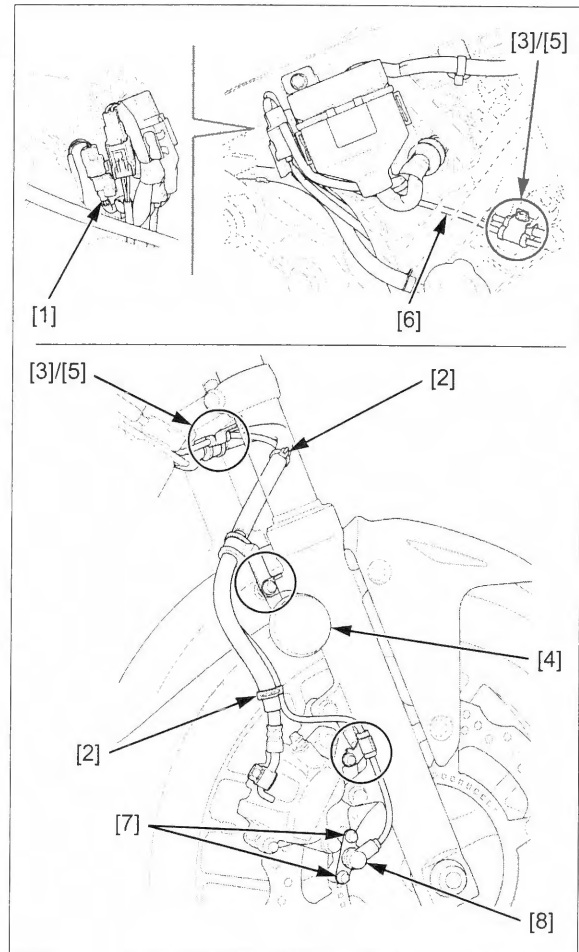
- two wire clips [2]
- four bolts [3]
- reflex reflector [4]
- clamps [5]
- sensor wire [6] (out of the frame)
- two bolts [7] and front wheel speed sensor [8]

Installation is in the reverse order of removal.

NOTE:

- Clean the sensor tip and sensor installation area (caliper bracket) thoroughly, and be sure that no foreign materials are allowed.

After installation, check the air gap (page 19-22).

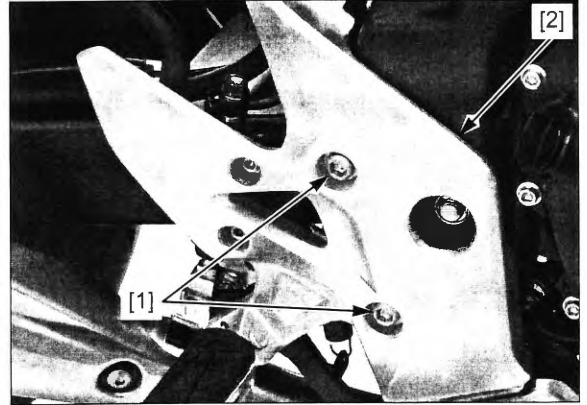


ANTI-LOCK BRAKE SYSTEM (ABS; CBR500RA/CB500FA/XA)

REAR WHEEL SPEED SENSOR

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

Remove the two bolts [1] and right rider footpeg bracket [2] from the frame, and then secure it with a strap.

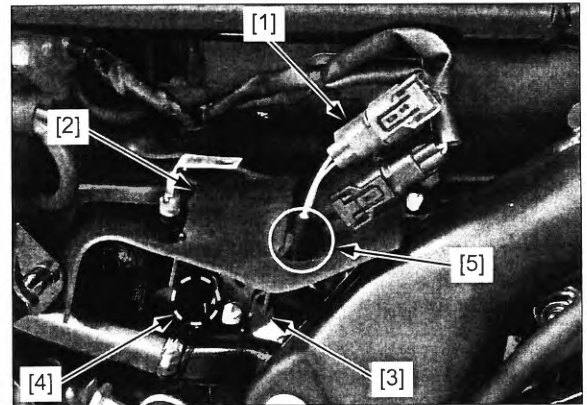


Remove the rear wheel speed sensor 2P (Gray) connector [1] from the stay and disconnect it.

Release the heat guard rubber [2] from the stays of the starter relay switch.

Release the wire clip [3] and remove the band clip [4] from the modulator stay.

Remove the sensor wire out of the frame through the slit [5] in the heat guard rubber.



Remove the following:

- wire clip [1]
- two bolts [2] and clamps [3]
- band clip [4]
- two bolts [5]
- wire stay [6]
- rear wheel speed sensor [7]

Installation is in the reverse order of removal.

NOTE:

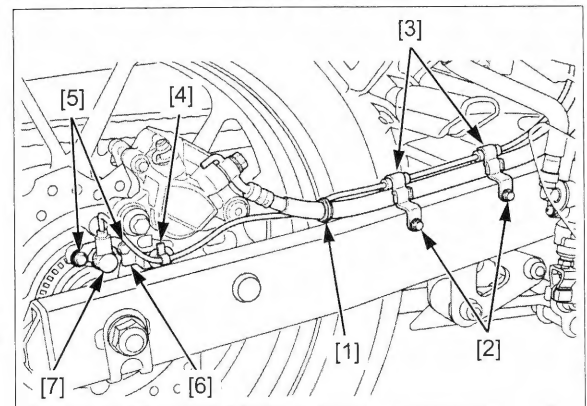
- Clean the sensor tip and sensor installation area (caliper bracket) thoroughly, and be sure that no foreign materials are allowed.

TORQUE:

Rider footpeg bracket bolt:

37 N·m (3.8 kgf·m, 27 lbf·ft)

After installation, check the air gap (page 19-22).



ABS MODULATOR

REMOVAL/INSTALLATION

Drain the brake fluid from the rear brake hydraulic systems (page 18-5).

Remove the following:

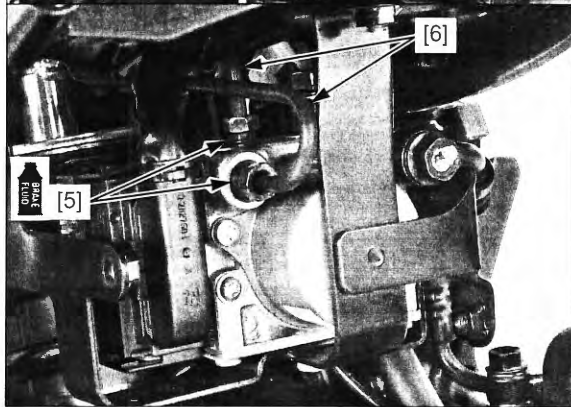
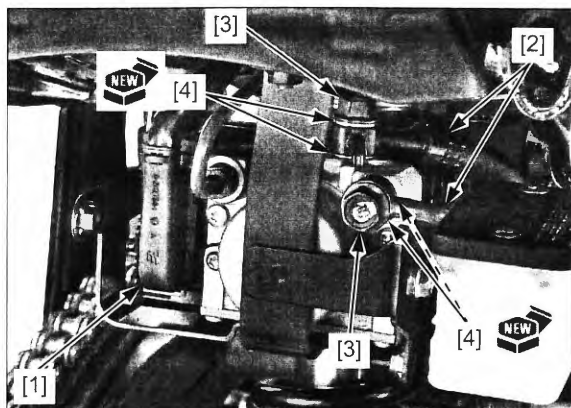
- battery (page 20-5)
- right side cover (page 2-7)
- regulator/rectifier (page 20-7)
- drive chain cover (page 2-24)
- ABS modulator cover (page 2-25)

Disconnect the ABS modulator 18P (Black) connector [1] (page 19-8).

When disconnecting, cover the end of the brake hoses and pipes to prevent contamination.

Disconnect the brake hoses [2] by removing the oil bolts [3] and sealing washers [4].

Loosen the brake pipe joint nuts [5] to disconnect the brake pipes [6].

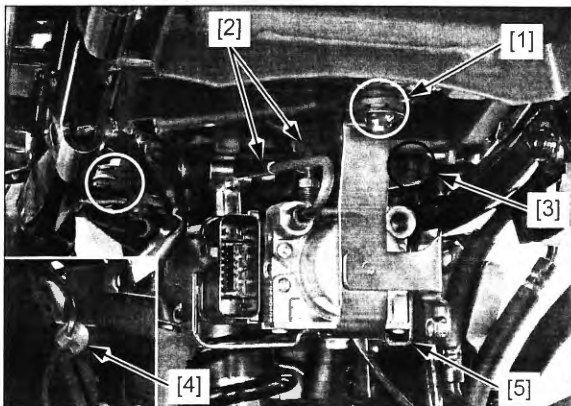


Support the bottom of the modulator stay with a suitable wooden block.

Remove the two stay bolts [1].

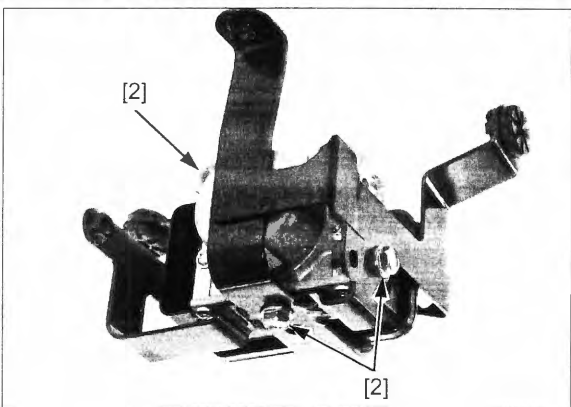
Be careful not to bend or damage the brake pipes.

Disengage the brake pipes [2] off of the pipe fitting areas and release the modulator stay from the frame boss [3].



Remove the band clip [4] located on the front side of the stay and the ABS modulator assembly [5] out of the frame.

Remove the two mounting bolts [1] and the ABS modulator [2] from the stay.



ANTI-LOCK BRAKE SYSTEM (ABS; CBR500RA/CB500FA/XA)

Installation is in the reverse order of removal.

NOTE:

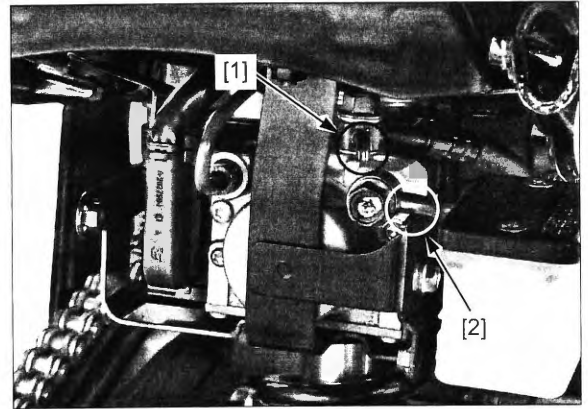
- Replace the sealing washers with new ones.
- Apply brake fluid to the threads of the brake pipe joint nuts.
- When connecting the upper brake hose (that goes to the caliper), set the eyelet stopper pin [1] into the hole properly.
- When tightening the oil bolt of the lower brake hose, rest the eyelet joint [2] against the modulator stay.

TORQUE:

Brake pipe joint nut: 14 N·m (1.4 kgf·m, 10 lbf·ft)

Brake hose oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the front and rear brake hydraulic systems (page 18-5).



MEMO

20. BATTERY/CHARGING SYSTEM

SERVICE INFORMATION	20-2	BATTERY	20-5
TROUBLESHOOTING	20-3	CHARGING SYSTEM INSPECTION	20-6
SYSTEM LOCATION	20-4	ALTERNATOR CHARGING COIL	20-7
SYSTEM DIAGRAM	20-4	REGULATOR/RECTIFIER	20-7

BATTERY/CHARGING SYSTEM

SERVICE INFORMATION

GENERAL

▲ WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
 - If electrolyte gets on your skin, flush with water.
 - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
 - If swallowed, drink large quantities of water or milk and call your local Poison Control Center or 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.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 20-3).
- For alternator service (page 12-2).

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.

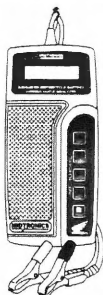
BATTERY TESTING

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), BM-210 or equivalent

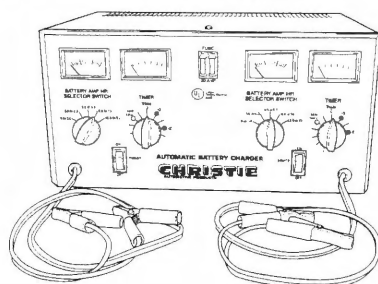
TOOLS

Motorcycle battery analyzer
Micro 404XL (U.S.A. only)



or BM-210 or equivalent

Christie battery charger
MC1012/2T (U.S.A. only)



TROUBLESHOOTING

Battery is damaged or weak

1. Battery Test

Remove the battery (page 20-5).

Check the battery condition using the recommended battery tester.

RECOMMENDED BATTERY TESTER: Micro 404XL (U.S.A. only), BM-210 or equivalent

Is the battery in good condition?

YES – GO TO STEP 2.

NO – Faulty battery

2. Current Leakage Test

Install the battery (page 20-5).

Check the battery current leakage using a digital multimeter (page 20-6).

Is the current leakage below 0.3 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 20-7).

Recheck the battery current leakage.

Is the current leakage below 0.3 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 20-5).

Start the engine.

Measure the charging voltage (page 20-6).

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. Alternator Charging Coil Inspection

Check the alternator charging coil (page 20-7).

Is the alternator charging coil resistance within 0.1 – 1.0 Ω (20°C/68°F)?

YES – GO TO STEP 6.

NO – Faulty charging coil

6. Regulator/rectifier Wire Harness Inspection

Check the regulator/rectifier wire harness (page 20-7).

Are the results of checked voltage and continuity correct?

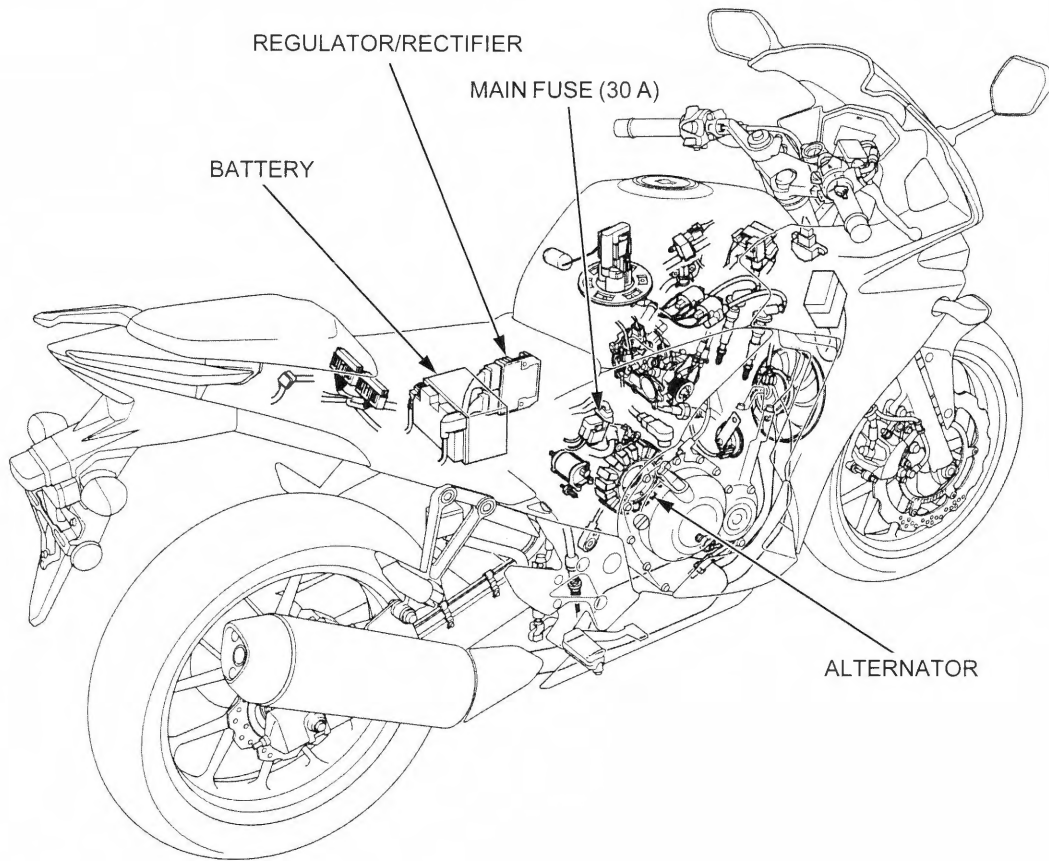
YES – Faulty regulator/rectifier

NO – • Open circuit in related wire
• Loose or poor contacts of related terminal
• Shorted wire harness

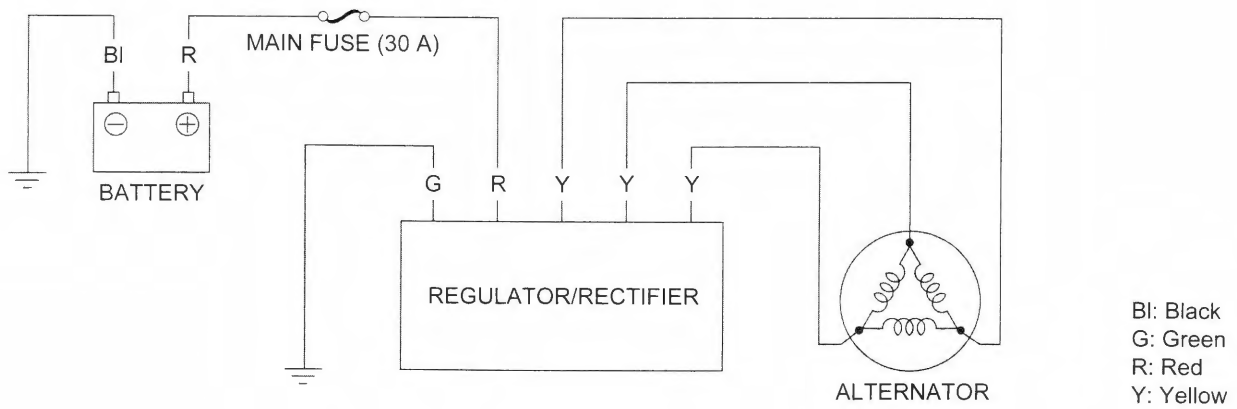
BATTERY/CHARGING SYSTEM

SYSTEM LOCATION

CBR500RA shown:



SYSTEM DIAGRAM



BATTERY

REMOVAL/INSTALLATION

Remove the following:

- CBR500R/RA/CB500F/FA: front seat (page 2-6)
- CB500X/XA: seat (page 2-6)

Turn the ignition switch OFF.

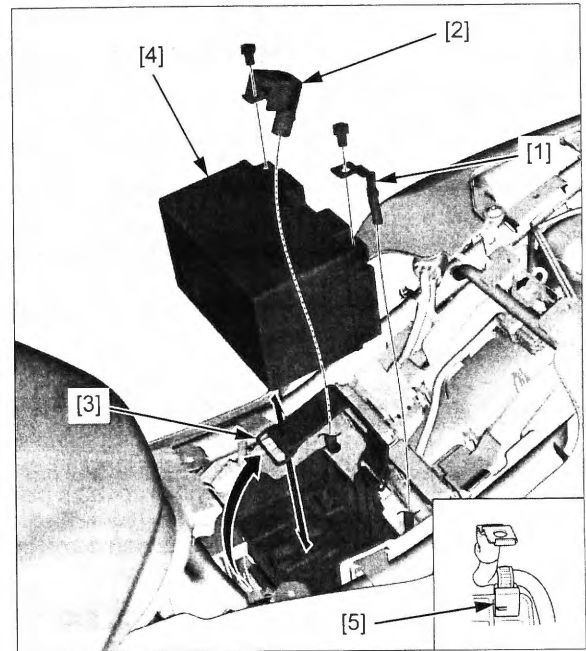
Disconnect the negative (-) cable [1] first and then disconnect the positive (+) cable [2] by removing the terminal bolts.

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.
- Be sure to install the cable clip [5] on the battery (-) cable to the battery housing.
- For digital clock setting procedure (page 21-14).



VOLTAGE INSPECTION

Remove the following:

- CBR500R/RA/CB500F/FA: front seat (page 2-6)
- CB500X/XA: seat (page 2-6)

Measure the battery voltage using a digital multimeter.

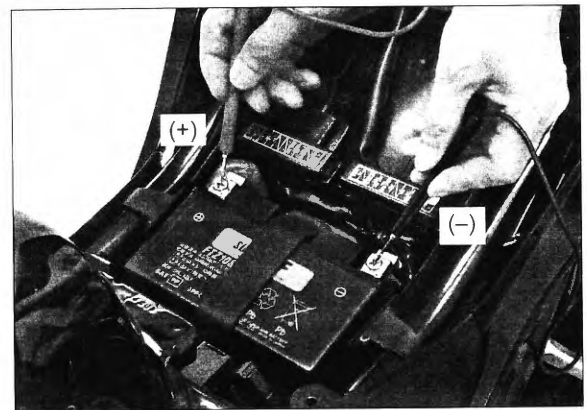
VOLTAGE (20°C/68°F):

Fully charged: 13.0 – 13.2 V

Needs charging: Below 12.4 V

NOTE:

- When measuring the battery voltage after charging, leave it for least 30 minutes, or the accurate results cannot be obtained because the battery voltage fluctuates just after charging.



BATTERY TESTING

Remove the battery (page 20-5).

Refer to the instructions that are appropriate to the battery testing equipment available to you.

TOOL:

Battery tester **Micro 404XL (U.S.A. only),
BM-210 or equivalent**

BATTERY CHARGING (U.S.A. only)

Remove the battery (page 20-5).

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)

CHARGING SYSTEM INSPECTION

CURRENT LEAKAGE TEST

Remove the following:

- CBR500R/RA/CB500F/FA: front seat (page 2-6)
- CB500X/XA: seat (page 2-6)

Turn the ignition switch OFF.

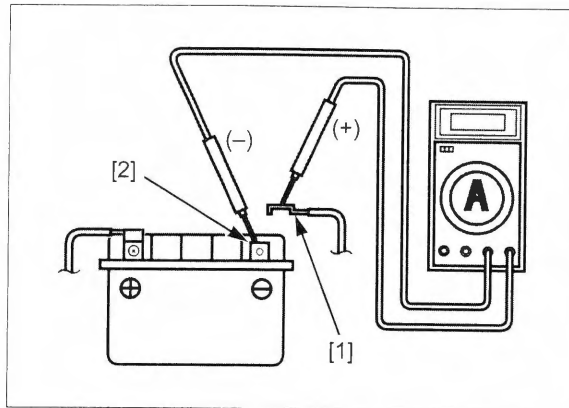
Remove the terminal bolt and disconnect the negative (-) cable [1] from the battery.

Connect the ammeter (+) probe to the negative (-) cable and 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: 0.3 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.

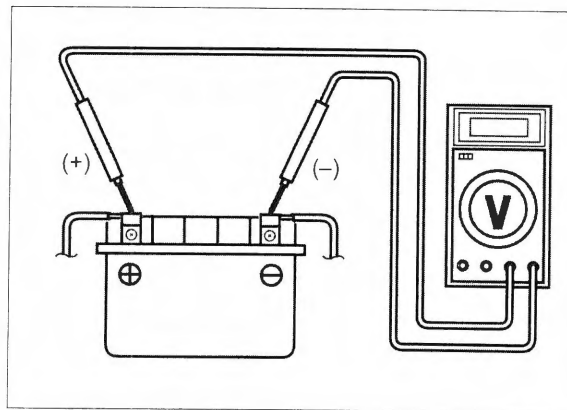
Warm up the engine to normal operating temperature. Stop the engine.

Remove the following:

- CBR500R/RA/CB500F/FA: front seat (page 2-6)
- CB500X/XA: seat (page 2-6)

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.



To prevent a short, make absolutely certain which are the positive (+) and negative (-) terminals or cables.

STANDARD:

Measured BV < Measured CV < 15.5 V

- BV = Battery Voltage (page 20-5)
- CV = Charging Voltage

ALTERNATOR CHARGING COIL

INSPECTION

Remove the left side cover (page 2-7).

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 – 1.0 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 12-4).



REGULATOR/RECTIFIER

WIRE HARNESS INSPECTION

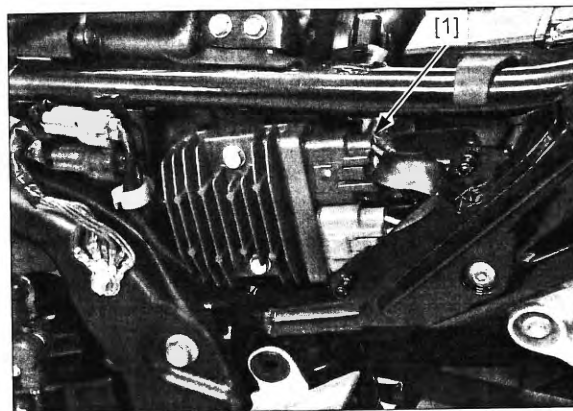
Remove the left side cover (page 2-7).

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.



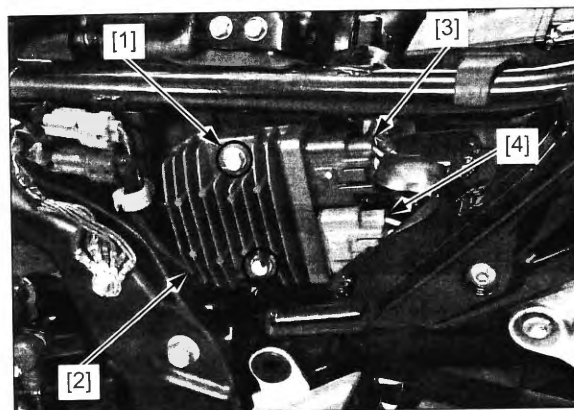
REMOVAL/INSTALLATION

Remove the left side cover (page 2-7).

Remove the two bolts [1] and regulator/rectifier [2] from the frame.

Disconnect the regulator/rectifier 3P (Black) [3] and alternator 3P (Gray) [4] connectors to remove the regulator/rectifier.

Installation is in the reverse order of removal.



MEMO

21. LIGHTS/METERS/SWITCHES

SERVICE INFORMATION	21-2	FUEL GAUGE/FUEL LEVEL SENSOR	21-17
SYSTEM LOCATION	21-3	IGNITION SWITCH	21-17
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LIGHTS/METERS/SWITCHES

SERVICE INFORMATION

GENERAL

NOTICE

- Note the following when replacing the halogen headlight bulb.
 - Wear clean gloves while replacing the bulb. Do not put fingerprints on the headlight bulb, as they may create hot spots on the bulb and cause it to fail.
 - If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
- A halogen headlight bulb becomes very hot while the headlight is ON, and remains hot for a while after it is turned OFF. Be sure to let it cool down before servicing.
- Be sure to install the dust cover after replacing the headlight bulb.
- 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.
- After the TAIL/STOP/HORN fuse (7.5 A) is replaced, check the DTC and erase it (page 4-6).
- 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

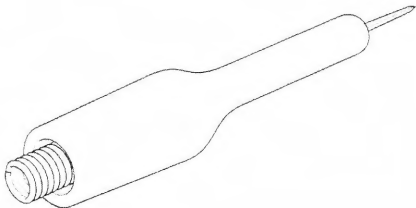
Lb = Light Blue

P = Pink

W = White

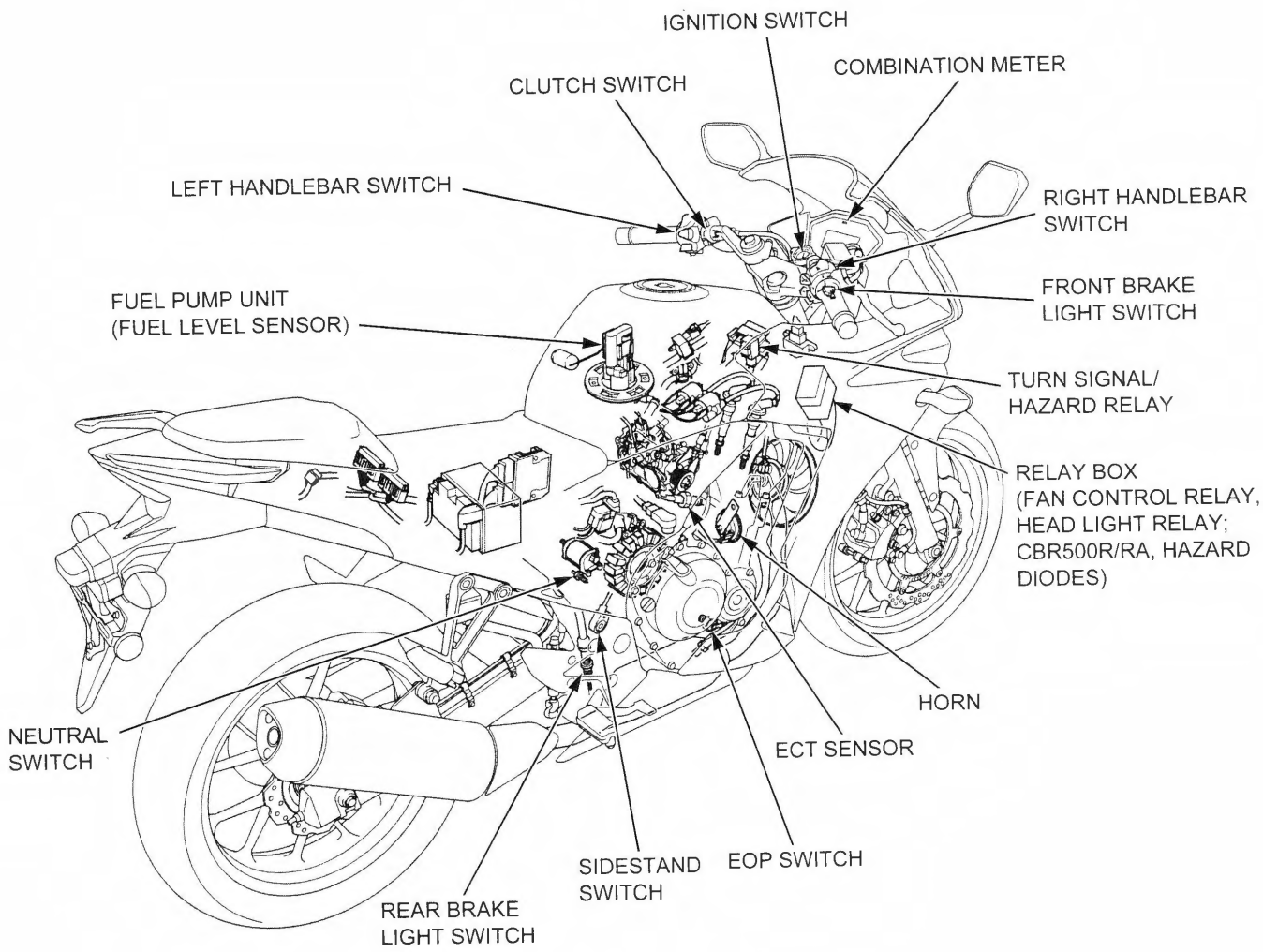
TOOL

Test probe (2 required)
07ZAJ-RDJA110



SYSTEM LOCATION

CBR500RA shown:



HEADLIGHT

BULB REMOVAL/INSTALLATION

NOTICE

Avoid touching the halogen bulb. Finger prints can create hot spots that cause a bulb to break.

CBR500R/RA

Remove the bulb cap [1] by turning it counterclockwise.

Disconnect the headlight 2P (Black) connector [2].

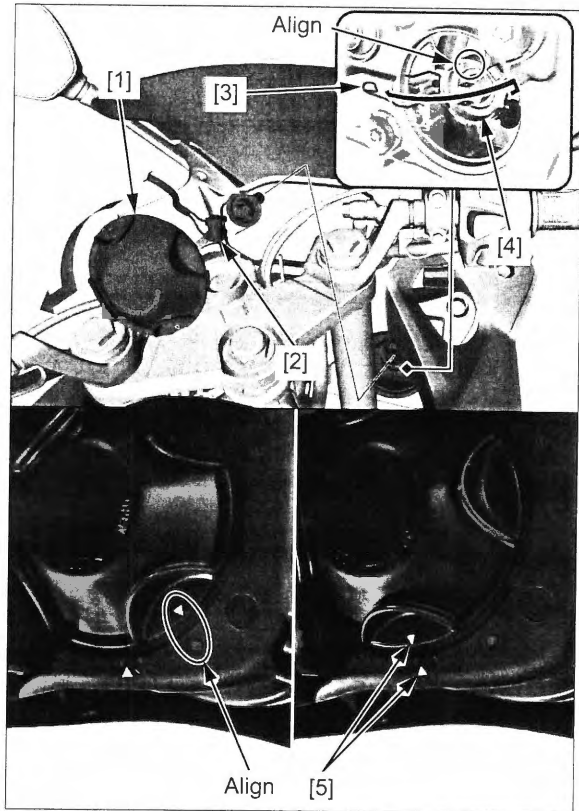
Unhook the bulb retainer [3] and remove the headlight bulb [4].

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

Installation is in the reverse order of removal.

NOTE:

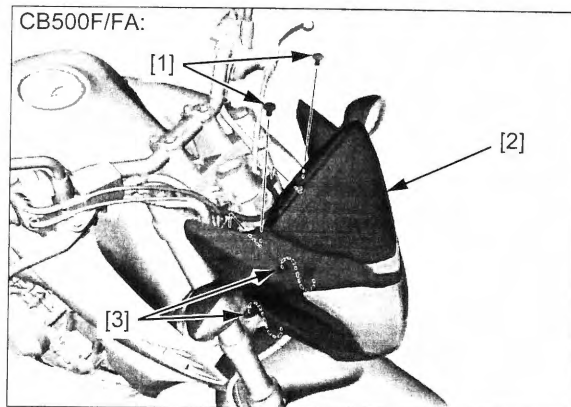
- Align the bulb tab with the groove properly.
- When installing the bulb cap, align the triangular mark with the circular mark on the headlight housing and turn the cap clockwise. Be sure the triangular marks [5] are aligned.



CB500F/FA/X/XA

CB500F/FA: Remove the two socket bolts [1] and release the front cowl assembly [2] and mounting grommets [3] from the bottom bridge, and support it securely, being careful not to damage the front sub-wire harness.

CB500X/XA: Remove the bulb maintenance lid (page 2-10).



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

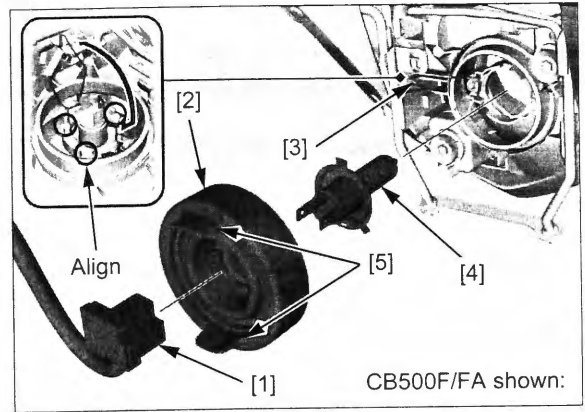
Remove the dust cover [2].

Unhook the bulb retainer [3] and remove the headlight bulb [4].

Installation is in the reverse order of removal.

NOTE:

- Align the bulb tabs with the grooves properly.
- When installing the dust cover, the tabs [5] are facing the vertical direction and set it tightly against the headlight housing.



HEADLIGHT REMOVAL/INSTALLATION

CBR500R/RA

Remove the front cowl/windscreen assembly (page 2-16).

Remove the position/headlight 4P (Black) connector [1] from the stay and disconnect it.

Remove the following fasteners and remove the headlight assembly [2].

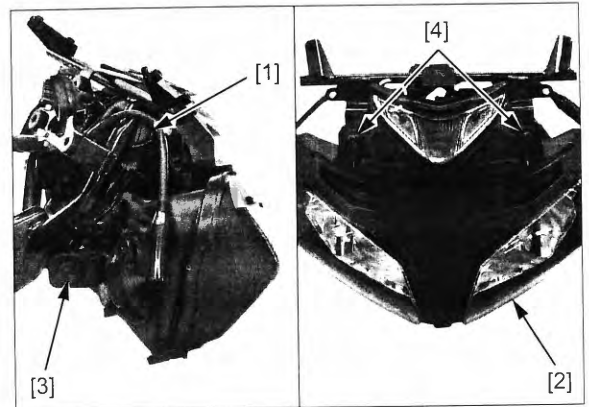
- 6 mm washer-bolt (lower) [3]
- two 5 mm washer-bolts (upper) [4]

Installation is in the reverse order of removal.

TORQUE:

Headlight mounting bolt:

8.5 N·m (0.9 kgf·m, 6.3 lbf·ft)



CB500F/FA

Remove the front cowl (page 2-15).

Remove the option 2P (Black) connector [1].

Disconnect the following connectors:

- headlight 3P (Black) [2]
- position light 2P (Black) [3]

Remove the following fasteners and remove the headlight assembly [4].

- two bolts and washers (lower side) [5]
- two screws and washers (upper side) [6]

Installation is in the reverse order of removal.

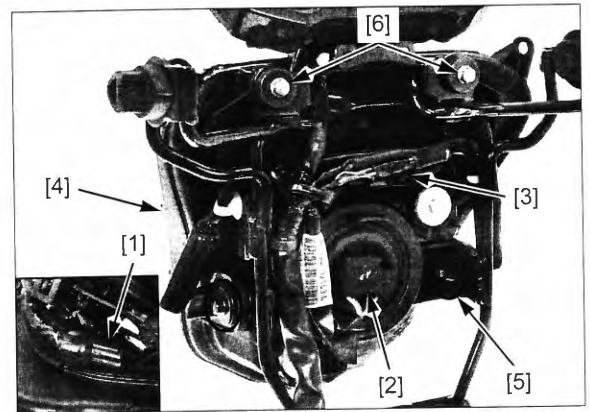
TORQUE:

Headlight mounting bolt:

8.5 N·m (0.9 kgf·m, 6.3 lbf·ft)

Headlight mounting screw:

4.5 N·m (0.5 kgf·m, 3.3 lbf·ft)



LIGHTS/METERS/SWITCHES

CB500X/XA

Remove the front cowl assembly (page 2-13).

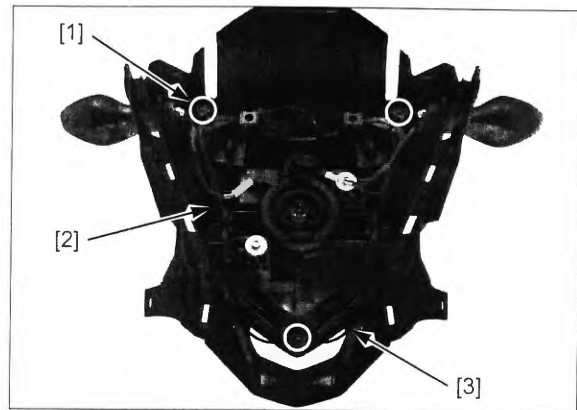
Remove the three tapping screws [1].

Release the upper ends of the headlight housing off of the screw hole studs and remove the headlight assembly [2].

Installation is in the reverse order of removal.

NOTE:

- Align the tabs with the grooves properly (set the two lower tabs [3] first).



POSITION LIGHT

BULB REMOVAL/INSTALLATION

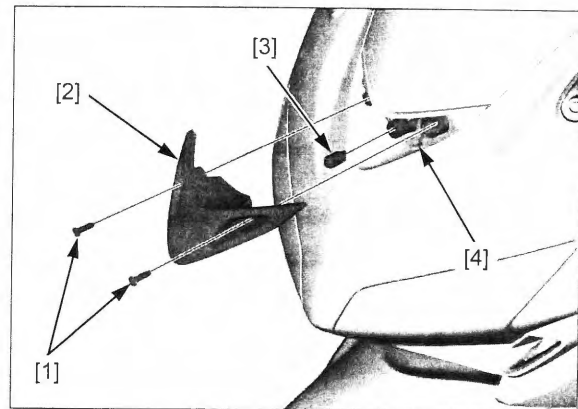
CBR500R/RA

Remove the two tapping screws [1] and position light lens [2].

Pull the bulb [3] out of the socket without turning it.

Make sure the rubber seal [4] on the headlight housing is installed in position and is in good condition, and replace it with a new one if necessary.

Installation is in the reverse order of removal.



CB500F/FA/X/XA

CB500F/FA: Remove the front cowl assembly from the bottom bridge (page 21-4).

CB500X/XA: Remove the bulb maintenance lid (page 2-10).

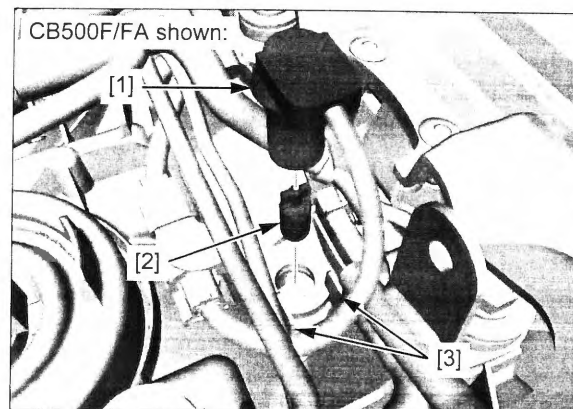
Remove the bulb socket [1] from the light housing by pulling it.

Pull the bulb [2] out of the socket without turning it.

Installation is in the reverse order of removal.

NOTE:

- Install the bulb socket with the wire facing to the right and position it between the guides [3] to fit it.



TURN SIGNAL LIGHT

BULB REMOVAL/INSTALLATION

Remove the screw [1] and collar [2].

Remove the turn signal light lens [3] by releasing the tab [4].

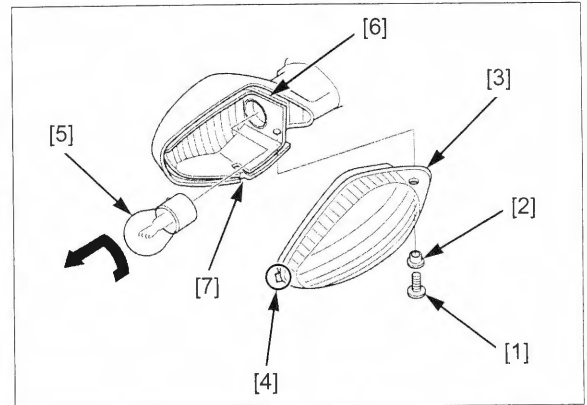
While pushing the bulb [5] in, turn it counterclockwise to remove it.

Make sure the rubber seal [6] in the light housing is installed in position and is in good condition, and replace it with a new one if necessary.

Installation is in the reverse order of removal.

NOTE:

- When installing the rubber seal, align the seal ends with the groove [7] in the housing.



FRONT TURN SIGNAL/POSITION LIGHT REMOVAL/INSTALLATION

CBR500R/RA

Remove the middle cowl (page 2-8).

Release the rubber cap [1] from the turn signal/position light base and its sleeve [2] from the cowl.

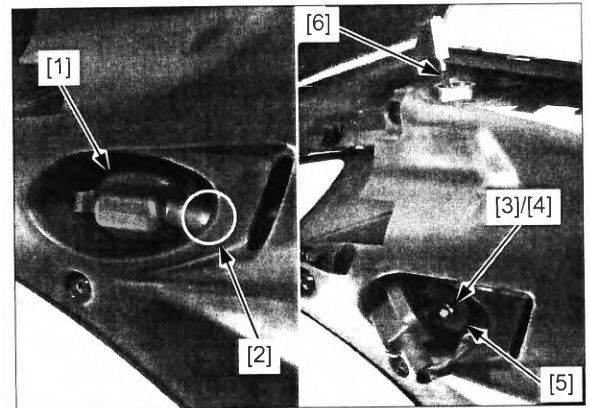
Remove the following:

- nut [3] and washer [4]
- settling plate [5]
- wire [6] (out of the cowl and rubber cap)
- turn signal/position light assembly

Installation is in the reverse order of removal.

TORQUE:

Front turn signal/position light mounting nut:
10 N·m (1.0 kgf·m, 7 lbf·ft)



CB500F/FA

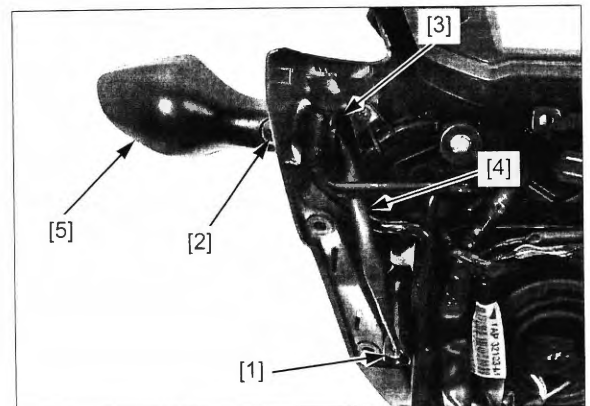
Remove the meter cover (page 2-14).

Disconnect the turn signal/position light 3P connector (left; Orange/right; Light blue) [1].

Remove the following:

- screw [2]
- settling plate [3]
- wire [4] (out of the cowl)
- turn signal/position light assembly [5]

Installation is in the reverse order of removal.



LIGHTS/METERS/SWITCHES

CB500X/XA

Remove the meter panel (page 2-12).

Disconnect the turn signal/position light 3P connector (left; Orange/right; Light blue) [1].

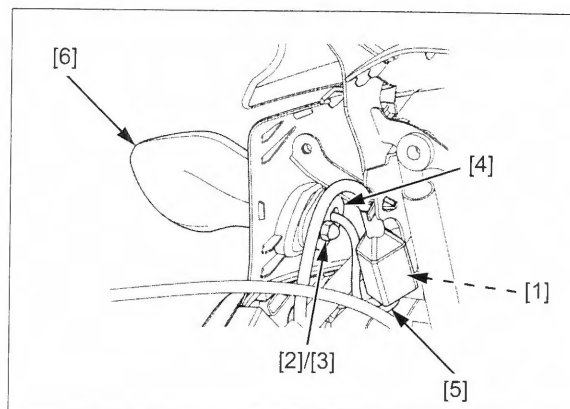
Remove the following:

- nut [2] and washer [3]
- setting plate [4]
- wire [5] (out of the cowl)
- turn signal/position light assembly [6]

Installation is in the reverse order of removal.

TORQUE:

Front turn signal/position light mounting nut:
10 N·m (1.0 kgf·m, 7 lbf·ft)



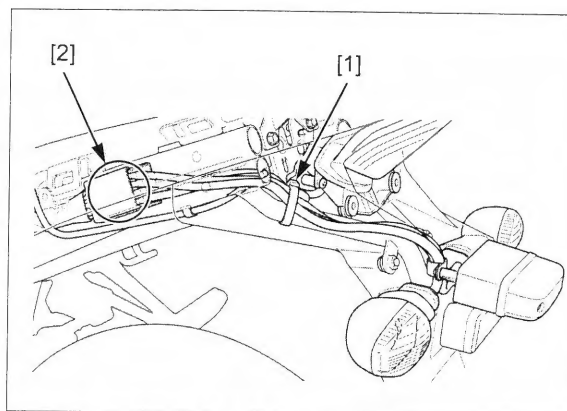
REAR TURN SIGNAL LIGHT REMOVAL/INSTALLATION

Remove the following:

- rear fender cover (page 2-20)
- CBR500R/RA/CB500F/FA: rear seat (page 2-6)
- CB500X/XA: seat (page 2-6)

Remove the wire band [1].

Disconnect the turn signal light 2P connector (left; Orange/right; Light blue) [2].



Remove the following:

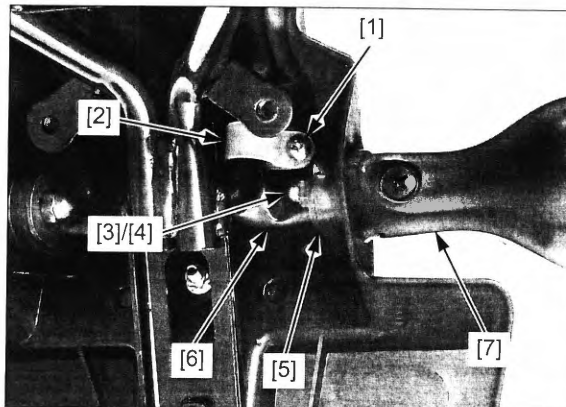
- tapping screw [1]
- clamp [2]
- nut [3] and washer [4]
- setting plate [5]
- wire [6] (out of the fender)
- turn signal light assembly [7]

Installation is in the reverse order of removal.

TORQUE:

Rear turn signal light mounting nut:
10 N·m (1.0 kgf·m, 7 lbf·ft)

Wire clamp tapping screw:
0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)



BRAKE/TAILLIGHT

BULB REMOVAL/INSTALLATION

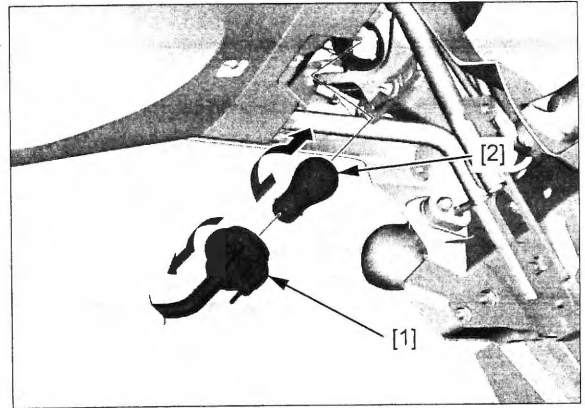
Remove the rear fender cover (page 2-20).

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.

Make sure the rubber seal on the socket is installed in position and is in good condition, and replace it with a new one if necessary.

Installation is in the reverse order of removal.



BRAKE/TAILLIGHT REMOVAL/INSTALLATION

Remove the rear fender A (page 2-20).

Remove the following:

- two tapping screws [1] and washers [2]
- two bolts [3] and collars [4]
- brake/taillight assembly [5]

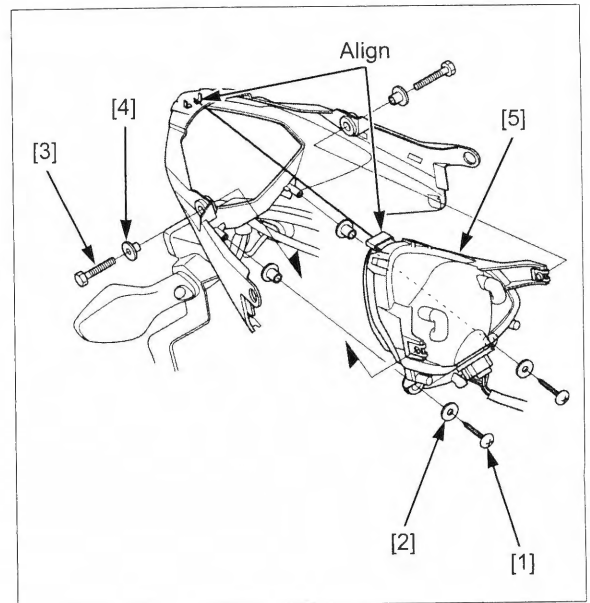
Installation is in the reverse order of removal.

NOTE:

- Align the tab with the groove in the rear fender A properly.

TORQUE:

Brake/taillight mounting screw:
0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)



LICENSE LIGHT

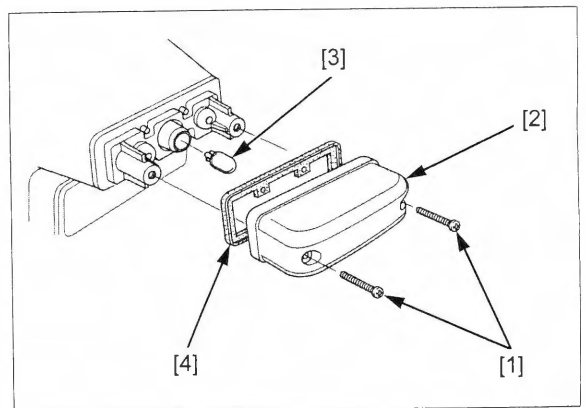
BULB REMOVAL/INSTALLATION

Remove the two tapping screws [1] and license light lens [2].

Pull the bulb [3] out of the socket without turning it.

Make sure the rubber seal [4] on the license light base is installed in position and is in good condition, and replace it with a new one if necessary.

Installation is in the reverse order of removal.



LIGHTS/METERS/SWITCHES

LICENSE LIGHT REMOVAL/ INSTALLATION

Remove the rear fender A (page 2-20).

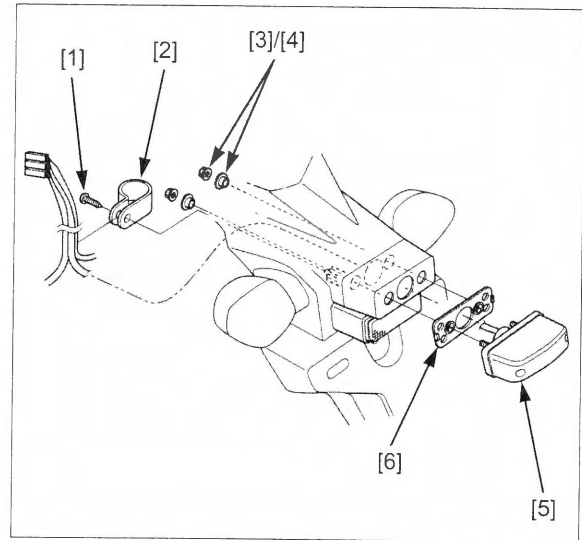
Remove the following:

- tapping screw [1]
- clamp [2]
- two nuts [3] and collars [4]
- license light assembly [5]
- seat rubber [6]

Installation is in the reverse order of removal.

TORQUE:

Wire clamp tapping screw:
0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)



COMBINATION METER

INITIAL OPERATION CHECK

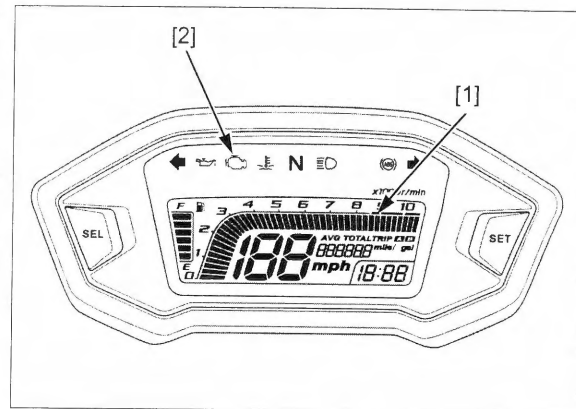
When the ignition switch is turned ON with the engine stop switch "O", the combination meter will show the entire digital display and the tachometer segments [1] will reduce from full scale to zero.

NOTE:

- If the MIL [2] stays on and it does not go off, refer to MIL circuit troubleshooting (page 4-36).

If the digital display does not function at all, inspect the combination meter power/ground line (page 21-10).

If the power and ground lines are OK, replace the combination meter (page 21-13).



POWER/GROUND LINE INSPECTION

NOTE:

- The DTC 86-1 (serial communication malfunction) 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).

**CBR500R/RA/
CB500X/XA:** Remove the meter panel to disconnect the combination meter 16P (Gray) connector (page 2-11).

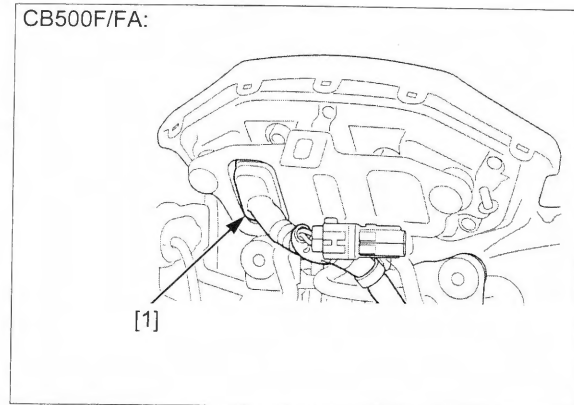
CB500F/FA: Remove the meter visor (page 2-15).

Disconnect the combination meter 16P (Gray) connector [1].

Connect the front sub-wire harness 4P (Black) and 12P (Black) connectors.

Support the front cowl assembly securely to avoid damaging the wire harness.

CB500F/FA:



POWER INPUT LINE

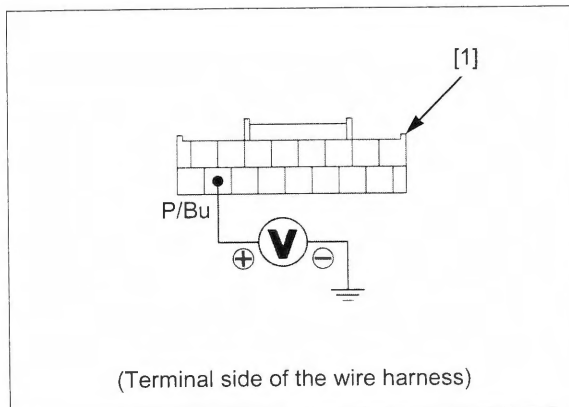
Measure the voltage between the combination meter 16P (Gray) connector [1] terminal and ground.

CONNECTION: Pink/blue (+) – Ground (-)

There should be battery voltage with the ignition switch turned ON.

If there is no battery voltage, check the following:

- Pink/blue wire between the fuse box 1 and combination meter for open circuit
- TAIL/STOP/HORN fuse (7.5 A)



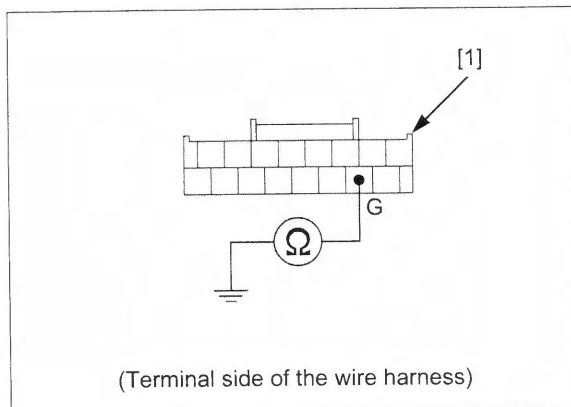
GROUND LINE

Check for continuity between the combination meter 16P (Gray) connector [1] terminal and ground.

CONNECTION: Green – Ground

There should be continuity at all times.

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



SERIAL COMMUNICATION LINE INSPECTION

Disconnect the ECM 33P (Black) connector (page 4-36).

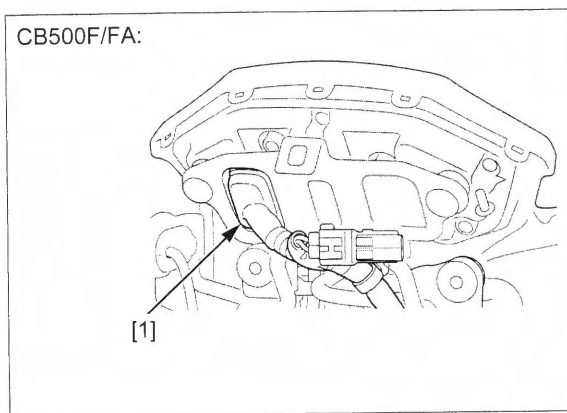
CBR500R/RA/ Remove the meter panel to disconnect the combination
CB500X/XA: meter 16P (Gray) connector (page 2-11).

CB500F/FA: Remove the meter visor (page 2-15).

Disconnect the combination meter 16P (Gray) connector [1].

Support the front cowl assembly securely to avoid damaging the wire harness. Connect the front sub-wire harness 12P (Black) and 4P (Black) connectors.

CB500F/FA:



LIGHTS/METERS/SWITCHES

1. Serial Communication Line Short Circuit Inspection

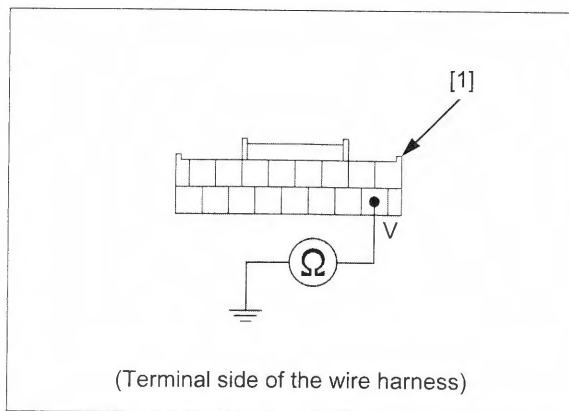
Check for continuity between the wire harness side 16P (Gray) connector [1] terminal and ground.

CONNECTION: Violet – Ground

Is there continuity?

YES – Short circuit in the Violet or Red/blue 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 16P (Gray) connector [1] and ECM 33P (Black) connector [2] terminals.

TOOL:

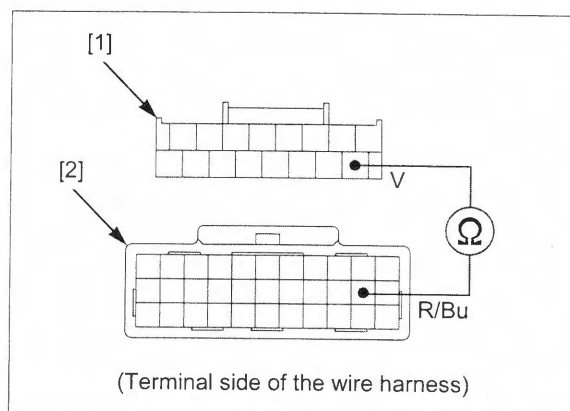
Test probe 07ZAJ-RDJA110

CONNECTION: Violet – Red/blue

Is there continuity?

YES – Loose or poor contact on the related connectors.

NO – Open circuit in the Violet or Red/blue wire between the combination meter and ECM



REMOVAL/INSTALLATION

CBR500R/RA/CB500X/XA

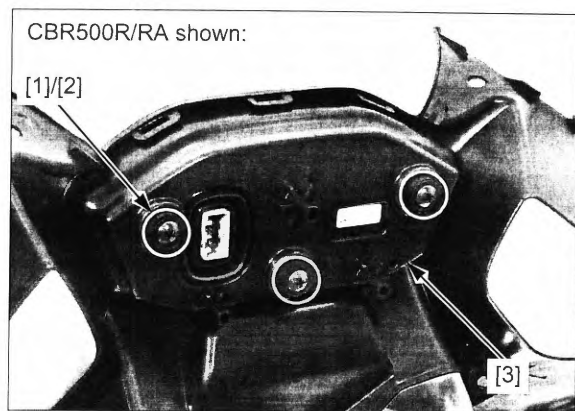
Remove the meter panel (page 2-11).

Remove the three tapping screws [1], washers [2] and combination meter assembly [3] from the meter panel.

Installation is in the reverse order of removal

TORQUE:

Combination meter mounting screw:
1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)



CB500F/FA

Remove the headlight (page 21-5).

Disconnect the combination meter 16P (Gray) connector [1].

Remove the three tapping screws [2], washers [3] and combination meter assembly [4] from the headlight stay.

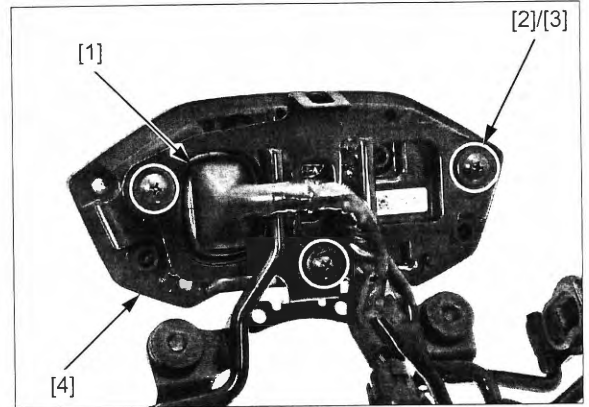
Installation is in the reverse order of removal

NOTE:

- When connecting the 16P (Gray) connector, install the connector boot into the groove in the combination meter properly.

TORQUE:

- **Combination meter mounting screw:**
1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)



DISASSEMBLY/ASSEMBLY

Remove the combination meter assembly (page 21-12).

Remove the six tapping screws [1].

Place the combination meter assembly with the lower case down and remove the following:

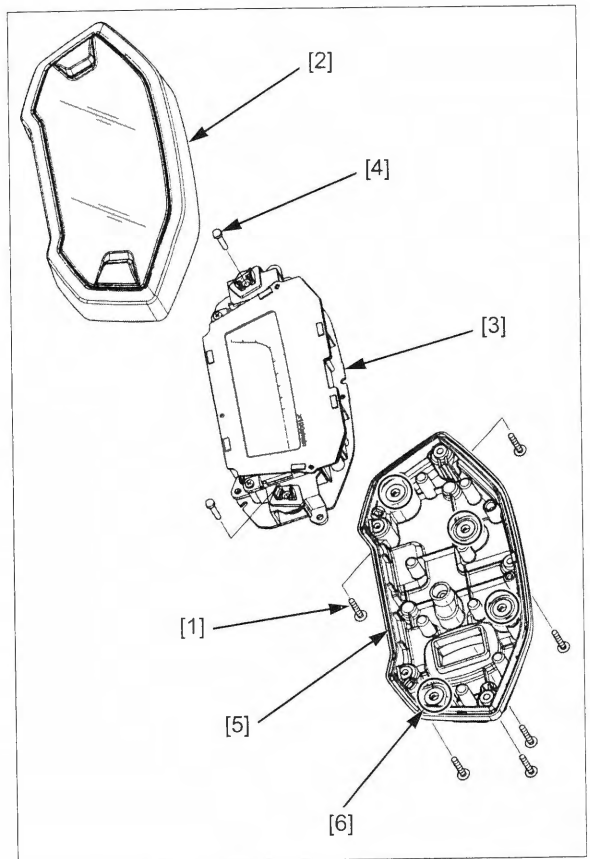
- upper case (lens) [2]
- combination meter [3]
- two extension rods [4]

Make sure the rubber seal [5] and waterproof gaskets [6] of the lower case 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 groove properly.



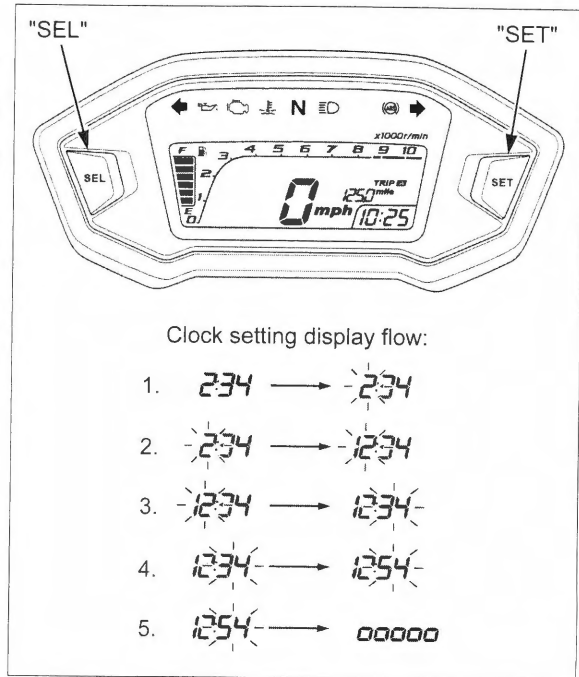
LIGHTS/METERS/SWITCHES

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 SEL and SET buttons until the hour digits starts flashing.
2. Press the SEL button until the desired hour is displayed (press and hold to advance the hour fast).
3. Press the SET button. The minute digits start flashing.
4. Press the SEL button until the desired minute is displayed (press and hold to advance the minute fast).
5. Press the SET button. The clock is set, and then the display moves to the backlight brightness adjustment ("o" – "oooo" is indicated).
Turn the ignition switch OFF.



SPEEDOMETER

SYSTEM INSPECTION

If the speedometer does not operate, check the following:

- combination meter initial operation (page 21-10)
- MIL blinking: If the MIL blinks 11 (DTC 11-1), check the VS sensor system (page 4-9)

If the above items are OK, replace the combination meter (page 21-12).

TACHOMETER

SYSTEM INSPECTION

If the tachometer does not operate, check the following:

- combination meter initial operation (page 21-10)
- combination meter indication when the serial communication line is abnormal (page 1-83)
- CKP sensor (page 5-6)

If the above items are OK, replace the combination meter (page 21-13).

HIGH COOLANT TEMPERATURE INDICATOR/ECT SENSOR

SYSTEM INSPECTION

NOTE:

- If the high coolant temperature indicator and digital display do not function at all, refer to combination meter initial operation check (page 21-10).

If the high coolant temperature indicator does not operate properly, check the following:

- MIL blinking: If the blinks 7 (DTC 7-1, 7-2), check the ECT sensor system (page 4-9)
- combination meter indication when the serial communication line is abnormal (page 1-83)
- ECT sensor (page 21-15)

If the above items are OK, replace the combination meter (page 21-13).

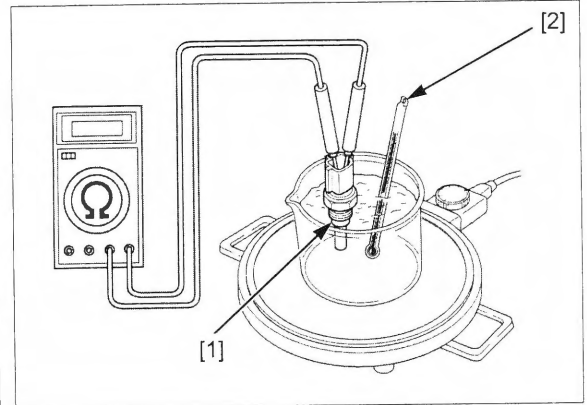
ECT SENSOR INSPECTION

Remove the ECT sensor (page 4-39).

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 sensor terminals as the coolant heats up.

- Soak the ECT sensor in coolant up to its threads with at least 40 mm (1.6 in) from the bottom of the pan to the bottom of the sensor.
- Keep the temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect readings. Do not let the thermometer [2] or ECT sensor touch the pan.

TEMPERATURE	40°C (104°F)	100°C (212°F)
RESISTANCE	1.0 – 1.3 kΩ	0.1 – 0.2 kΩ



Replace the ECT sensor if it is out of specification by more than 10% at any temperature listed.

Install the ECT sensor (page 4-39).

ENGINE OIL PRESSURE INDICATOR/ EOP SWITCH

SYSTEM INSPECTION

When the system is normal, the engine oil pressure indicator [1] comes on when the ignition switch is turned ON with the engine stop switch "O", and then goes off when the engine is started.

NOTE:

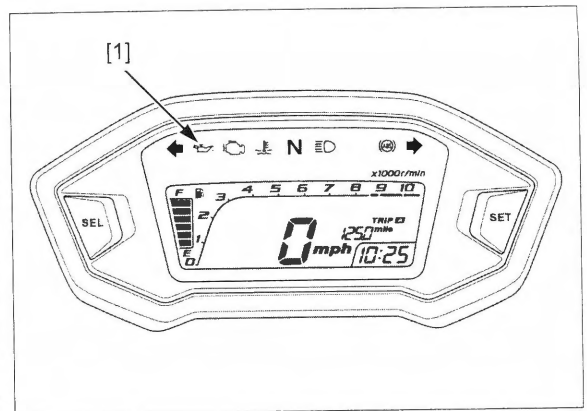
- If the oil pressure indicator and digital display do not function at all, refer to combination meter initial operation check (page 21-10).

If the engine 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 open circuit (page 21-16).

If the engine oil pressure indicator stays on after the engine is started, stop the engine immediately and confirm the indication conditions:

- The combination meter indication when the serial communication line is abnormal (page 1-83).
- The engine oil pressure indicator stays on and the other indications function normally, check the following:
 - engine oil level (page 3-10)
 - EOP switch line for short circuit (page 21-16)
 - engine oil pressure (page 9-5)

If the above items are OK, replace the combination meter (page 21-13).



EOP SWITCH LINE INSPECTION

Turn the ignition switch OFF.

Disconnect the EOP switch wire (page 21-16).

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 21-16).

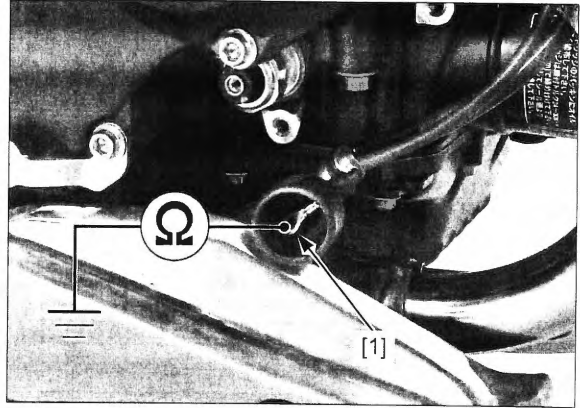
Short Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-36).

Check for continuity between the wire terminal and ground as same manner as above.

There should be no continuity.

- If there is continuity, the EOP switch wire (Black or Light green) has a short circuit.
- If there is no continuity, replace the EOP switch (page 21-16).



EOP SWITCH REMOVAL/INSTALLATION

CBR500R/RA/CB500X/XA: Remove the under cowl (page 2-22).

Place the motorcycle on its sidestand on a level surface.

Release the rubber cap [1] from the EOP switch [2].

Remove the terminal screw [3] and disconnect the switch wire [4].

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.

TORQUE:

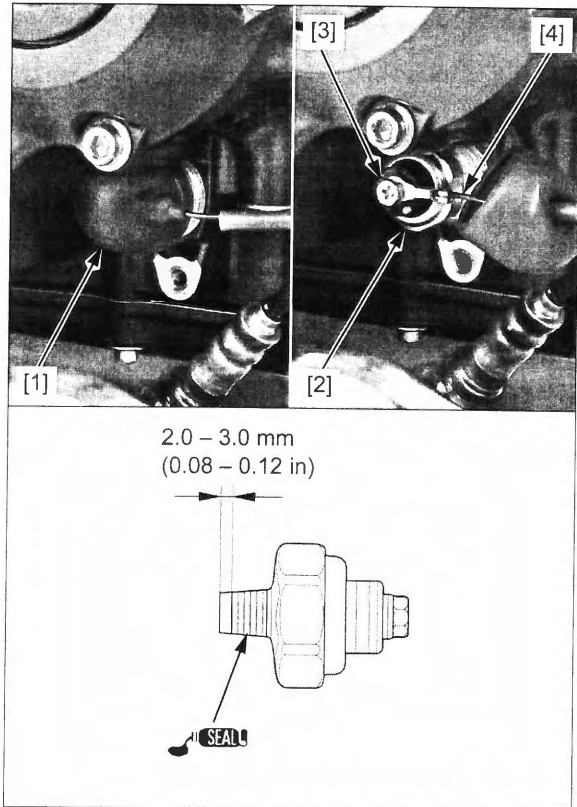
EOP switch:

12 N·m (1.2 kgf·m, 9 lbf·ft)

EOP switch terminal screw:

2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)

Check the engine oil level (page 3-10).



FUEL GAUGE/FUEL LEVEL SENSOR

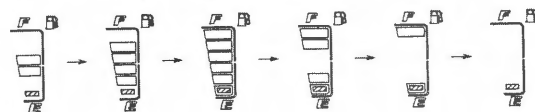
FUEL GAUGE INSPECTION

When the circuit malfunction occurs, the combination meter displays the flow pattern in the fuel gauge. If it is indicated, check for open or short circuit in the Black/green wire between the combination meter and fuel pump unit.

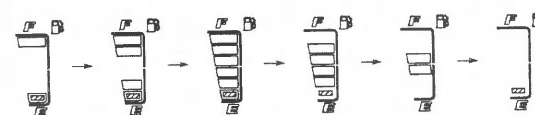
If the Black/green wire is OK, check the fuel level sensor (page 21-17).

If the fuel level sensor is OK, replace the combination meter (page 21-13).

Open circuit (flowing to outside):



Short circuit (flowing to inside):



FUEL LEVEL SENSOR INSPECTION

Remove the fuel pump unit (page 7-10).

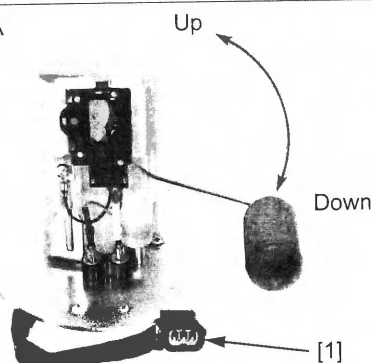
Measure the resistance between the fuel pump unit 3P (Black) connector [1] terminals.

CONNECTION: Red/black – Black/white

FLOAT POSITION	Up (Full)	Down (Empty)
RESISTANCE (20°C/68°F)	9 – 13 Ω	222 – 228 Ω

If the resistance is out of specification, replace the fuel pump unit as an assembly (page 7-10).

CBR500R/RA
shown:



IGNITION SWITCH

INSPECTION

A, CM types: Remove the left middle cowl (page 2-8).

AC type: Remove the EVAP canister (page 7-22).

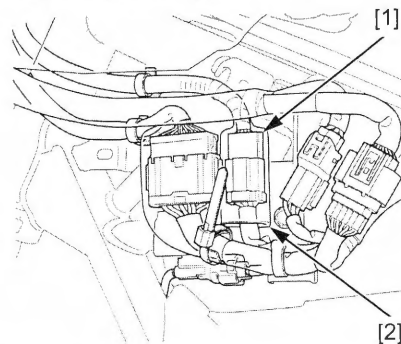
Remove the ignition switch 2P (Brown) connector [1] from the stay.

Release the connector boot [2] and disconnect the connector.

Check for continuity between the switch side 2P (Brown) connector terminals in each switch position according to the continuity chart.

- CBR500R/RA (page 22-2)
- CB500F/FA (page 22-3)
- CB500X/XA (page 22-4)

CBR500R/RA; A, CM types shown:



LIGHTS/METERS/SWITCHES

REMOVAL/INSTALLATION

Remove the following:

- left middle cowl (page 2-8)
- top bridge (page 16-26)

Remove the two bolts [1] and ignition switch [2].

NOTE:

- Use a drill or an equivalent tool when removing the ignition switch mounting bolts.

Installation is in the reverse order of removal.

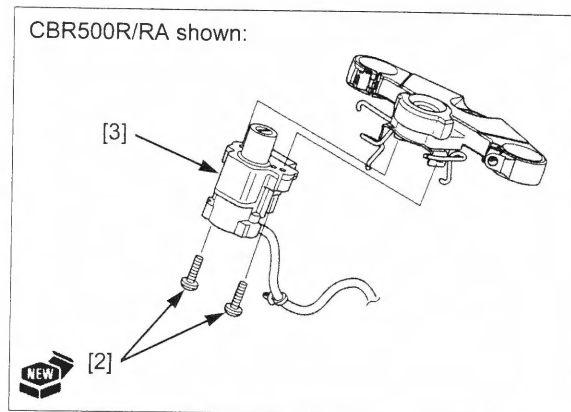
NOTE:

- Replace the switch bolts with new ones.

TORQUE:

Ignition switch mounting bolt:
24 N·m (2.4kgf·m, 18 lbf·ft)

Install the top bridge (page 16-32).



HANDLEBAR SWITCH

LEFT HANDLEBAR SWITCH

A, CM types: Remove the left middle cowl (page 2-8).

AC type: Remove the EVAP canister (page 7-22).

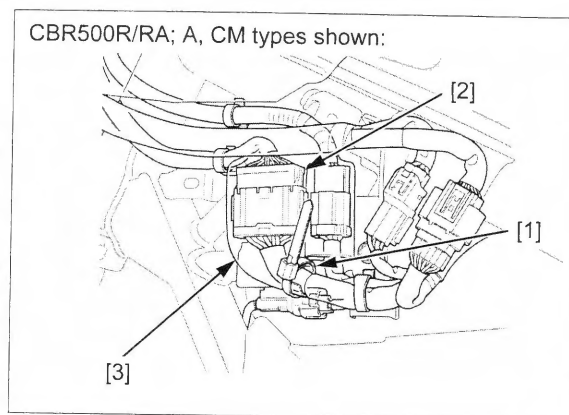
A, CM types: Remove the boot band [1].

Remove the left handlebar switch 14P (Green) connector [2] from the stay.

Release the connector boot [3] and disconnect the connector.

Check for continuity between the switch side 14P (Green) connector terminals in each switch position according to the continuity chart.

- CBR500R/RA (page 22-2)
- CB500F/FA (page 22-3)
- CB500X/XA (page 22-4)



RIGHT HANDLEBAR SWITCH

Remove the right middle cowl (page 2-8).

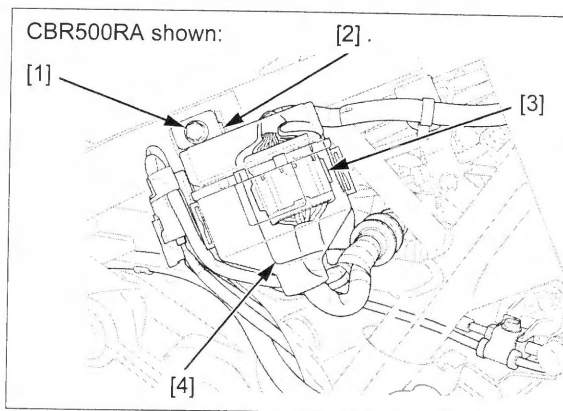
Remove the bolt [1] and relay box stay [2] from the frame.

Remove the right handlebar switch 10P (Gray) connector [3] from the relay box stay by releasing the retaining clip.

Release the connector boot [4] and disconnect the connector.

Check for continuity between the switch side 10P connector terminals in each switch position according to the continuity chart.

- CBR500R/RA (page 22-2)
- CB500F/FA (page 22-3)
- CB500X/XA (page 22-4)

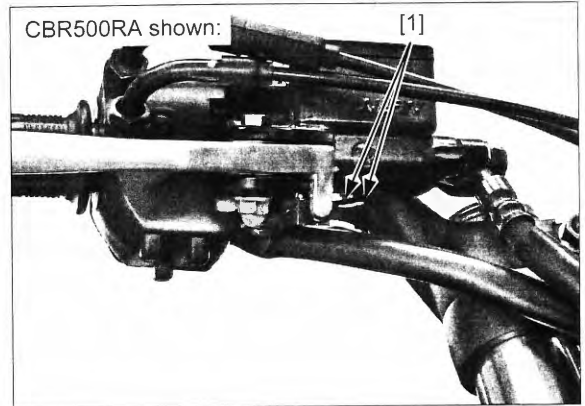


BRAKE LIGHT SWITCH

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.



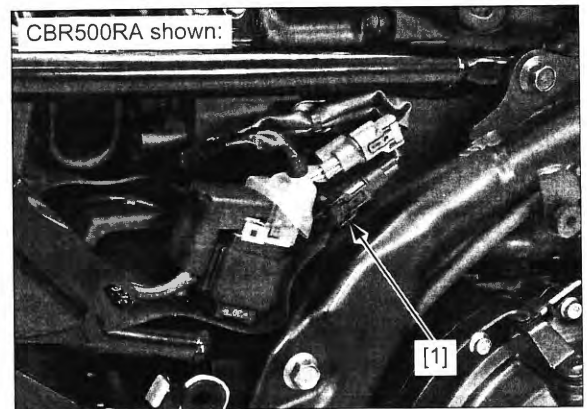
REAR

Remove the right side cover (page 2-7).

Disconnect the rear brake light switch 2P (Black) connector [1].

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.

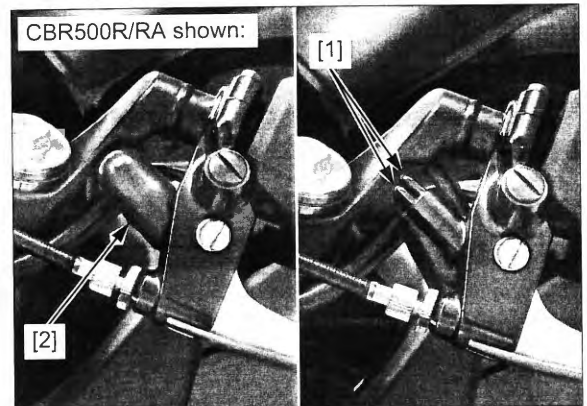


CLUTCH SWITCH

Remove the connector boot [1] from the bracket sleeve.

Disconnect the clutch switch connectors [2] 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.



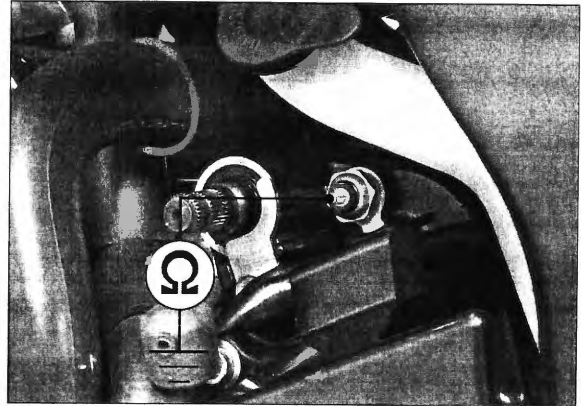
NEUTRAL SWITCH

INSPECTION

Disconnect the neutral switch wire (page 21-20).

Check for continuity between the switch terminal and engine ground.

There should be continuity with the transmission in neutral, and no continuity when the transmission is in gear except neutral.



REMOVAL/INSTALLATION

Remove the left side cover (page 2-7).

Remove the following:

- pinch bolt [1]
- gearshift arm [2]
- terminal cap [3]
- terminal nut [4]
- wire terminal [5]
- neutral switch [6]
- sealing washer [7]

Installation is in the reverse order of removal.

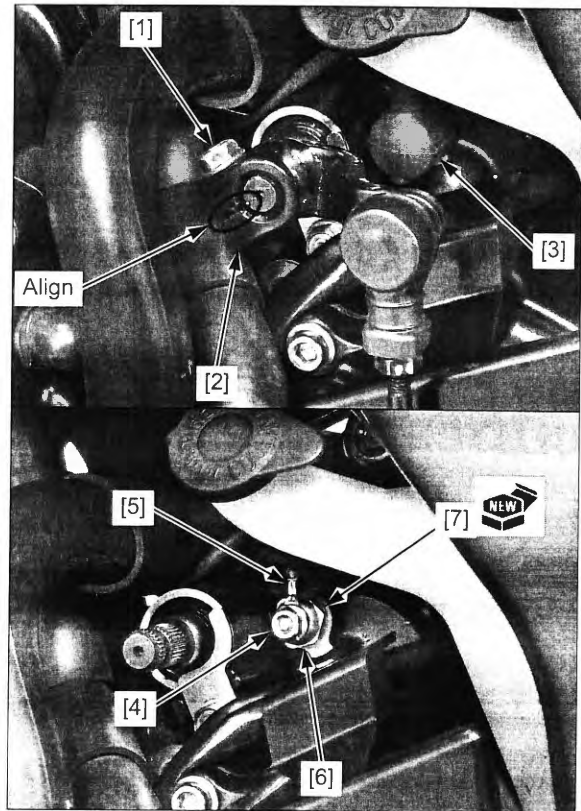
NOTE:

- Replace the sealing washer with a new one.
- When tightening the terminal nut, the wire terminal is facing up vertically.
- Align the slit in the gearshift arm with the punch mark on the spindle.

TORQUE:

Neutral switch: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Terminal nut: 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)



SIDESTAND SWITCH

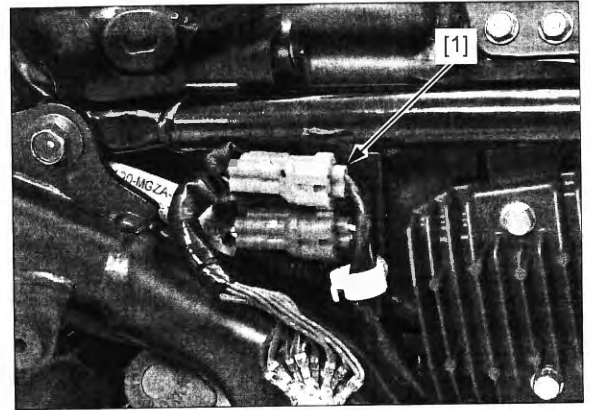
INSPECTION

Remove the left side cover (page 2-7).

Disconnect the sidestand switch 2P (Green) connector [1].

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

Remove the following:

- left side cover (page 2-7)
- drive sprocket cover (page 2-24)

Release the wire clip [1].

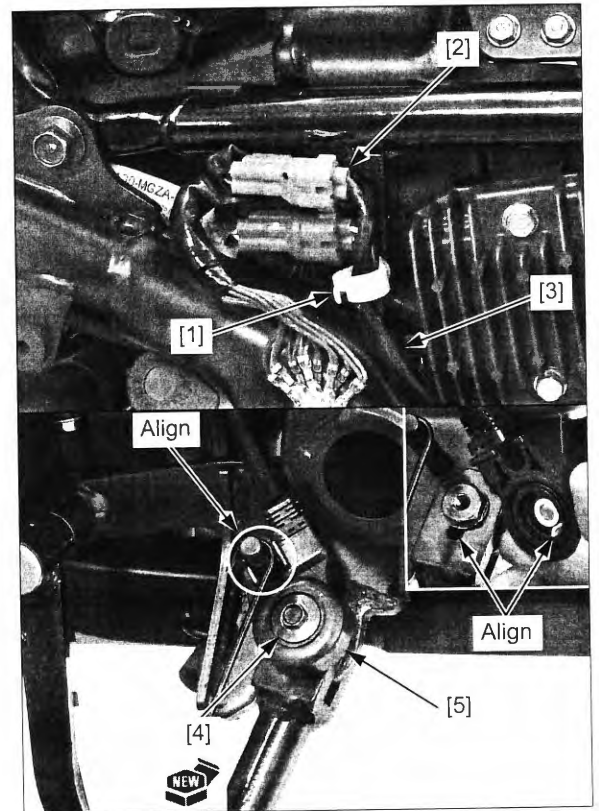
Disconnect the sidestand switch 2P (Green) connector [2] and remove the sidestand switch wire [3] out of the frame.

Remove the bolt [4] and sidestand switch [5].

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 return spring pin.
- Replace the switch bolt with a new one.



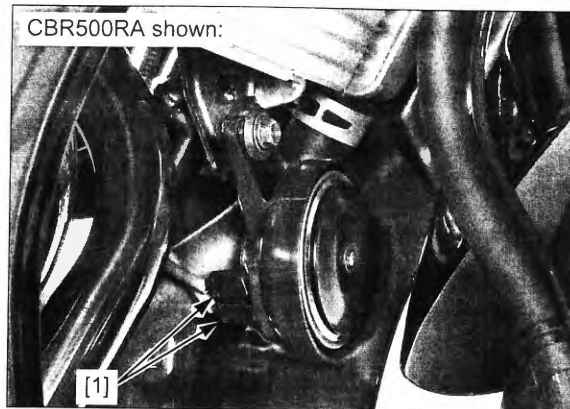
HORN

INSPECTION

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

Disconnect the connectors [1].

Loosen the mounting bolt [2] and remove the horn assembly [3].

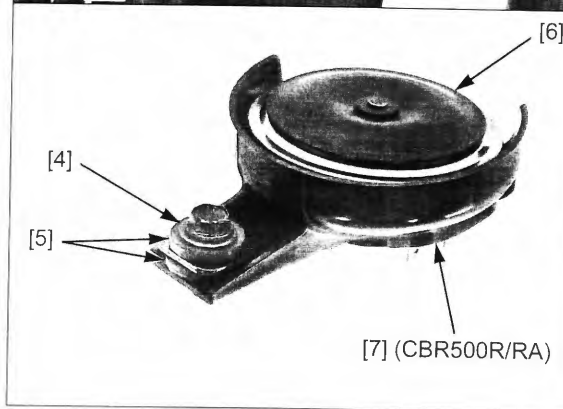
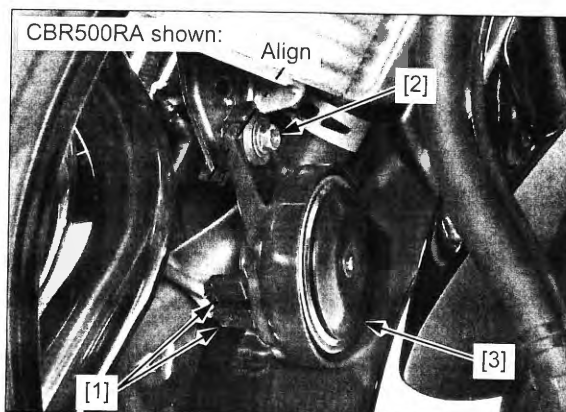
Remove the following:

- mounting bolt
- collar [4]
- two rubber mounts [5]
- horn [6]
- heat guard cover (CBR500R/RA) [7]

Installation in the reverse order of removal.

NOTE:

- When tightening the mounting bolt, align the stay end of the horn with the tab of the frame.



TURN SIGNAL/HAZARD RELAY

NOTE:

- The hazard flasher system can be operated with the ignition switch turned ON.
When the ignition switch is turned OFF with the hazard flasher system operating, the system continue operating.

REMOVAL/INSTALLATION

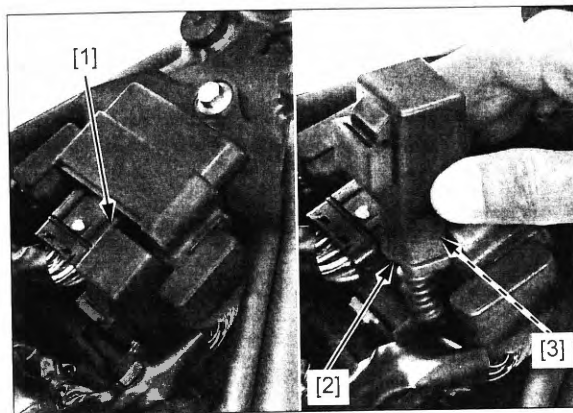
Lift the fuel tank and support it (page 3-4).

Turn the ignition switch OFF.

Remove the turn signal/hazard relay [1] from the stay.

Release the dust cover [2] and disconnect the 4P (White) connector [3] to remove the turn signal/hazard relay.

Installation is in the reverse order of removal.



RELAY CIRCUIT INSPECTION

Remove the turn signal/hazard relay (page 21-23).

Check the following at the wire harness side 4P (White) connector.

1. Battery Power Source Line Open Circuit Inspection

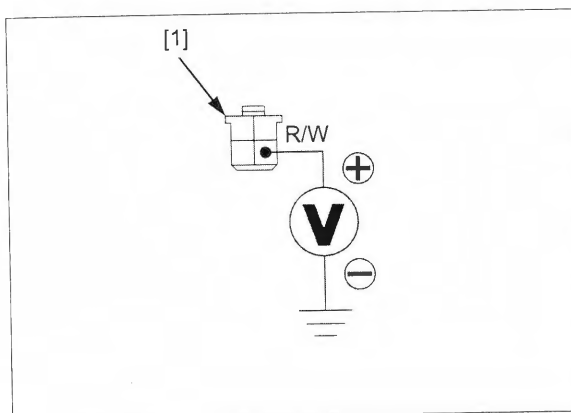
Measure the voltage between the 4P (White) connector [1] terminal and ground.

CONNECTION: Red/white (+) – Ground (-)

Is there battery voltage?

YES – GO TO STEP 2.

NO – Open circuit in the Red/white wire



2. Ground Line Open Circuit Inspection

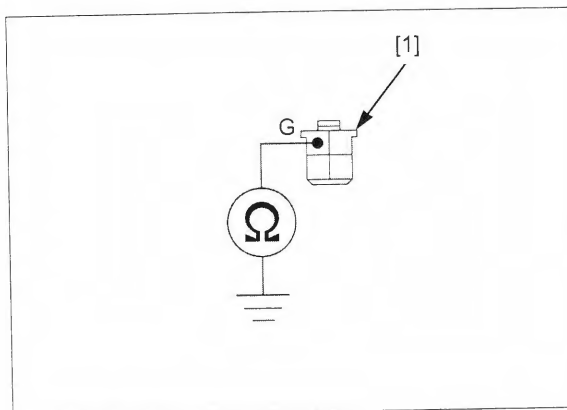
Check for continuity between the 4P (White) connector [1] terminal and ground.

CONNECTION: Green – Ground

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Green wire



LIGHTS/METERS/SWITCHES

3. Turn Signal/hazard Switch Line Open Circuit Inspection

Connect the 4P (White) connector [1] terminals with a jumper wire.

CONNECTION: Red/white – Gray

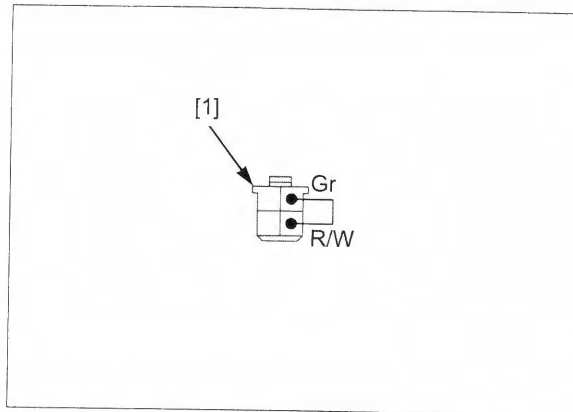
Operate the turn signal switch or push the hazard switch.

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
- Faulty hazard diode (page 21-27)



4. Ignition Switch Power Source Line Open Circuit Inspection

Turn the ignition switch ON.

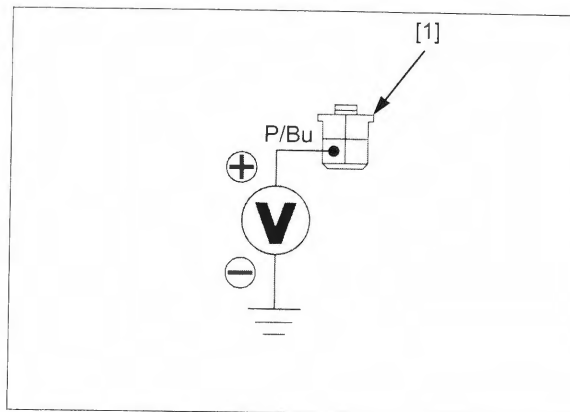
Measure the voltage between the 4P (White) connector [1] terminal and ground.

CONNECTION: Pink/blue (+) – Ground (-)

Is there battery voltage?

YES – System is normal, replace the turn signal/hazard relay.

NO – Open circuit in the Pink/blue wire



RELAY BOX

RELAY REMOVAL/INSTALLATION

Remove the right middle cowl (page 2-8).

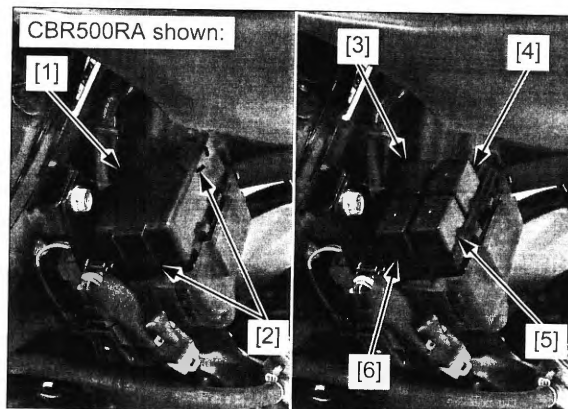
Turn the ignition switch OFF.

Remove the relay box cover [1] by releasing the two tabs [2].

Remove the following by pulling it up.

- main relay [3]
- fan control relay [4]
- fuel pump relay [5]
- headlight relay (CBR500R/RA) [6]

Installation is in the reverse order of removal.



RELAY INSPECTION

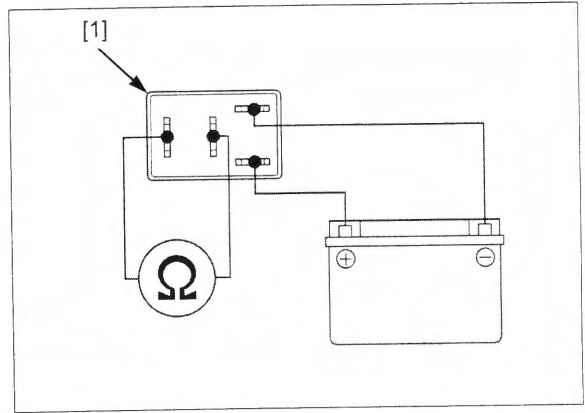
NOTE:

- All the relays in the relay box are same parts. The relay function can be checked by exchanging it with a known good one (except main relay) temporarily.

Remove the relay (page 21-24).

Connect an ohmmeter and a 12 V battery to the headlight relay [1] terminals as shown.

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



FAN CONTROL RELAY

CIRCUIT INSPECTION

For relay inspection (page 21-25).

Remove the fuel pump relay (page 21-24).

RELAY SWITCH/COIL POWER INPUT LINE

Measure the voltage between the relay terminal (switch power input line) of the relay box [1] and ground.

CONNECTION: B (+) – Ground (-)

There should be battery voltage at all times.

If there is no voltage, check the following:

- Red/green wire between the relay box and fuse box 1 for open circuit
- FAN (15 A) fuse

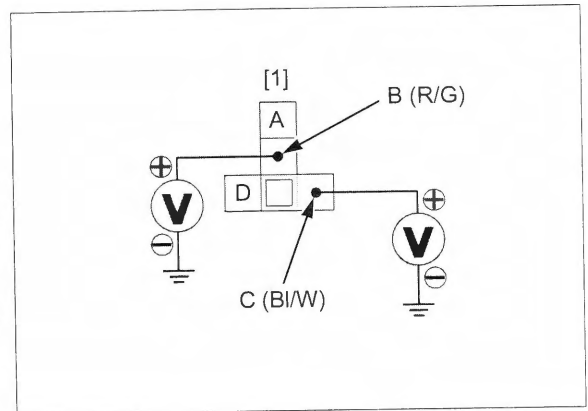
Measure the voltage between the relay terminal (coil power input line) of the relay box [1] and ground.

CONNECTION: C (+) – Ground (-)

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

If there is no voltage, check the following:

- Black/white wire in the relay box between the main and fuel fan control relays for open circuit
- main relay and its circuit (page 4-42)



LIGHTS/METERS/SWITCHES

SIGNAL LINE

Disconnect the ECM 33P (Black) connector (page 4-36).

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

TOOL:

Test probe

07ZAJ-RDJA110

CONNECTION: D – Green/yellow

There should be continuity.

If there is continuity, check for open circuit in the Green/yellow wire between the relay box and ECM.

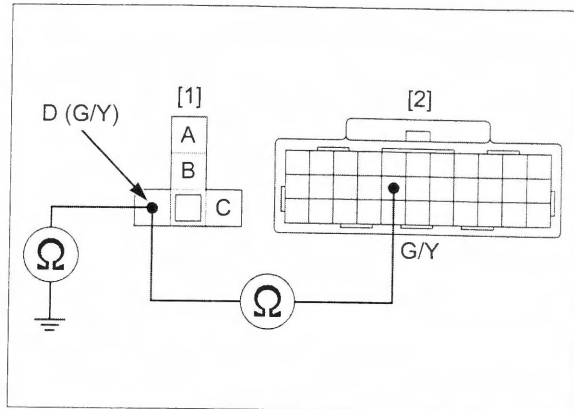
Check for continuity between the fuel pump relay terminal of the relay box [1] and ground.

CONNECTION: D – Ground

There should be no continuity.

If there is continuity, check for short circuit in the Green/yellow wire between the relay box and ECM.

If all of above inspections are normal, check for open circuit in the Black/blue (A) wire between the relay box and fan motor.



HEADLIGHT RELAY (CBR500R/RA)

CIRCUIT INSPECTION

For relay inspection (page 21-25).

Remove the headlight relay (page 21-24).

RELAY SWITCH/COIL POWER INPUT LINE

Measure the voltage between each headlight relay terminal of the relay box [1] and ground.

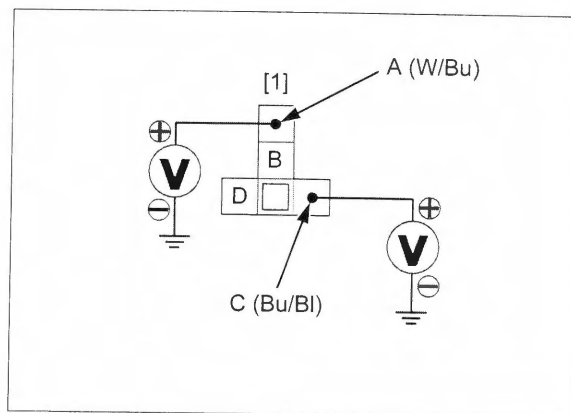
CONNECTION: A (+) – Ground (-)

C (+) – Ground (-)

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

If there is no voltage, check the following:

- White/blue wire between the relay box and fuse box 1 for open circuit
- Blue/black wire between the relay box and dimmer switch for open circuit
- H/L (15 A) fuse



GROUND LINE

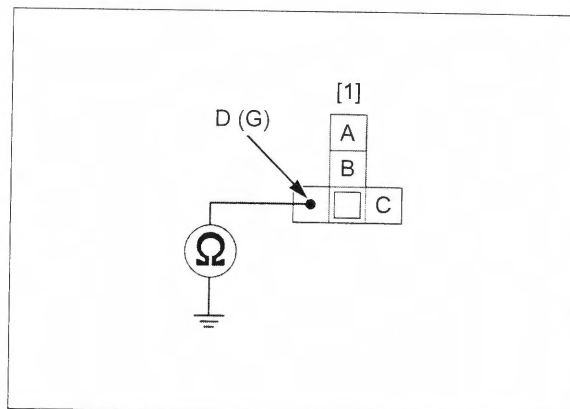
Check for continuity between the fuel headlight relay terminal of the relay box [1] and ground.

CONNECTION: D – Ground

There should be continuity at all times.

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

If all of above inspections are normal, check for open circuit in the Blue (B) wire between the relay box and headlight.



HAZARD DIODE

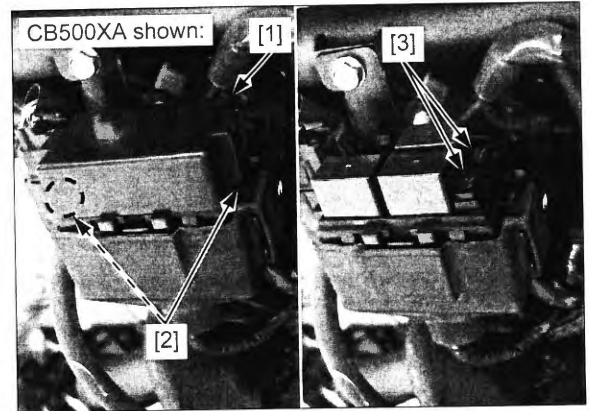
INSPECTION

Remove the right middle cowl (page 2-8).

Turn the ignition switch OFF.

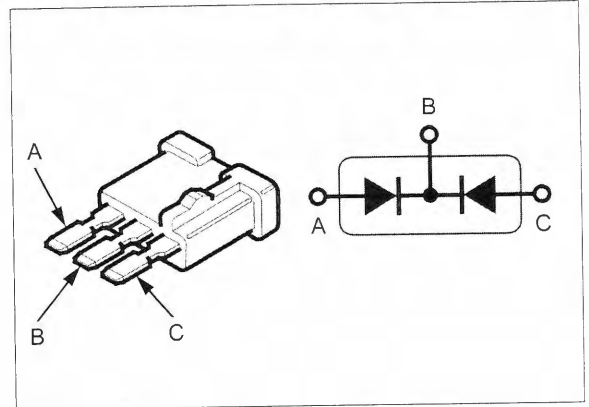
Remove the relay box cover [1] by releasing the two tabs [2].

Remove the hazard diodes [3].



Check for continuity between the diode terminals.
When there is continuity, a small resistance value will register.

If there is continuity in direction shown by the arrow, the diode is normal.



MEMO

MEMO

MEMO

22. WIRING DIAGRAMS

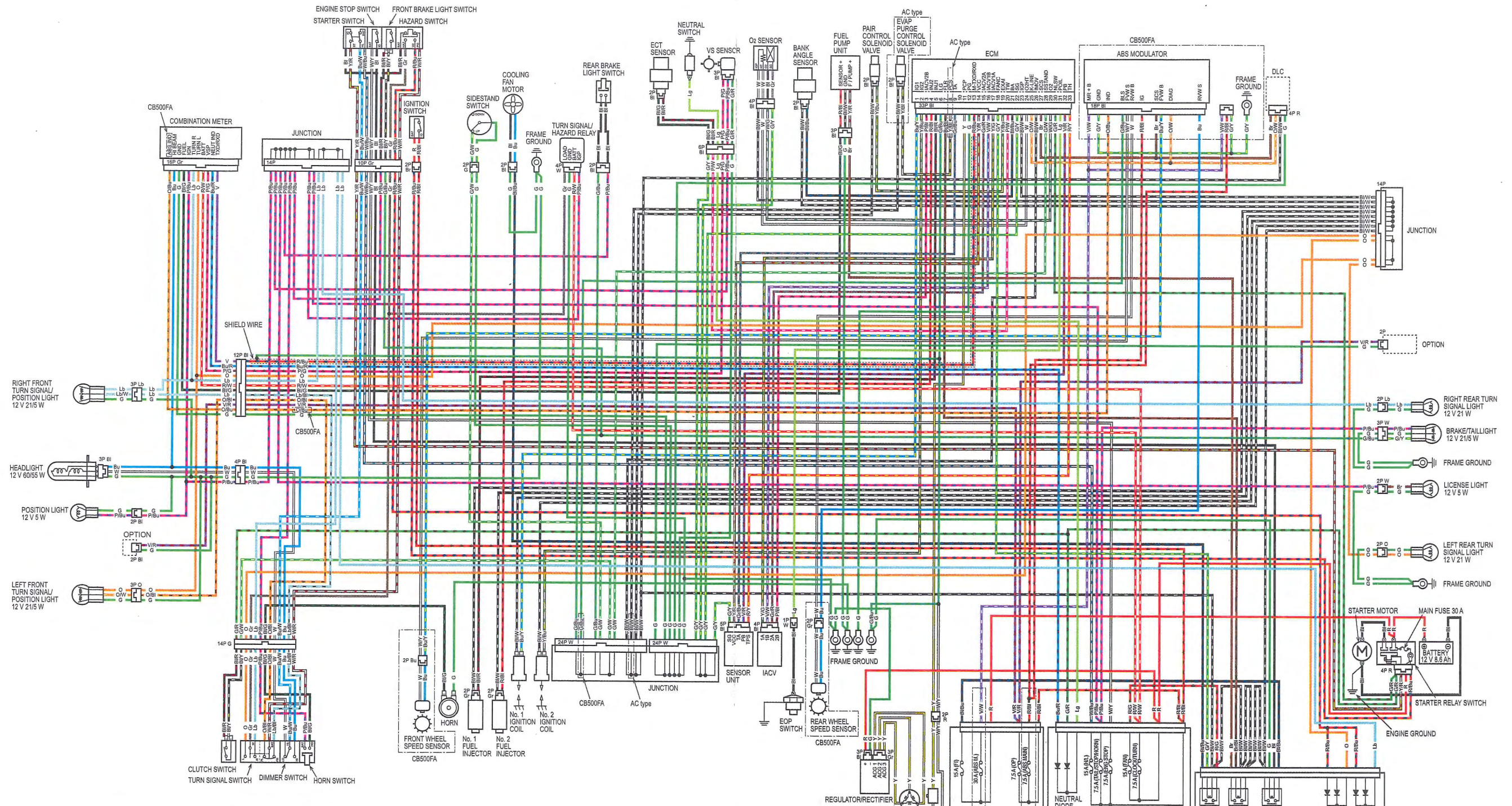
CBR500R/RA.....22-2

CB500X/XA 22-4

CB500F/FA.....22-3

WIRING DIAGRAMS

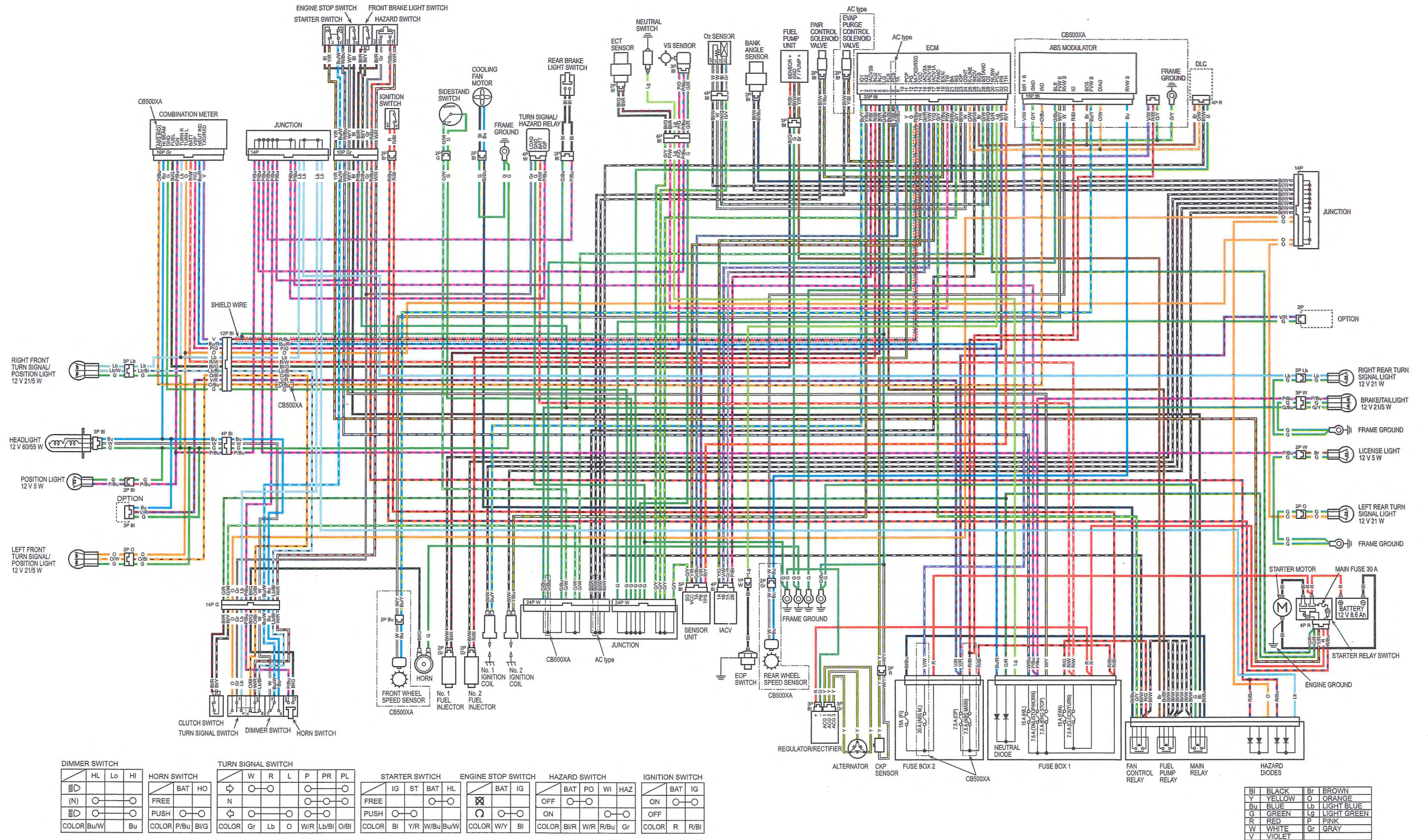
CB500F/FA



DIMMER SWITCH			HORN SWITCH		TURN SIGNAL SWITCH						STARTER SWITCH				ENGINE STOP SWITCH		HAZARD SWITCH			IGNITION SWITCH		
HL	Lo	HI	BAT	HO	W	R	L	P	PR	PL	IG	ST	BAT	HL	BAT	IG	BAT	PO	WI	HAZ	BAT	IG
(N)			FREE		N												OFF				ON	
COLOR Bu/W		Bu	COLOR P/Bu	Bl/G	COLOR Gr	Lb	O	W/R	Lb/Bl	O/Bl	COLOR Bl	Y/R	W/Bu	Bu/W	COLOR W/Y	Bl	COLOR Bl/R	W/R	R/Bu	Gr	COLOR R	P/Bl

Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY
V	VIOLET		

CB500X/XA



DIMMER SWITCH			
HL	Lo	HI	
(N)			
COLOR	Bu/W	Bu	

HORN SWITCH	
BAT	HO
FREE	
PUSH	
COLOR	P/Bu / Bl/G

TURN SIGNAL SWITCH					
W	R	L	P	PR	PL
↔	○	○	○	○	○
N					
↔	○	○	○	○	○
COLOR	Gr	Lb	O	W/R	Lb/Bl / O/Bl

STARTER SWITCH			
IG	ST	BAT	HL
FREE			
PUSH			
COLOR	Bl	Y/R	W/Bu / Bu/W

ENGINE STOP SWITCH	
BAT	IG
⊗	
○	
COLOR	W/Y / Bl

HAZARD SWITCH			
BAT	PO	WI	HAZ
OFF			
ON			
COLOR	B/R	W/R	R/Bu / Gr

IGNITION SWITCH	
BAT	IG
ON	
OFF	
COLOR	R / R/Bl

Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY
V	VIOLET		

MEMO

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