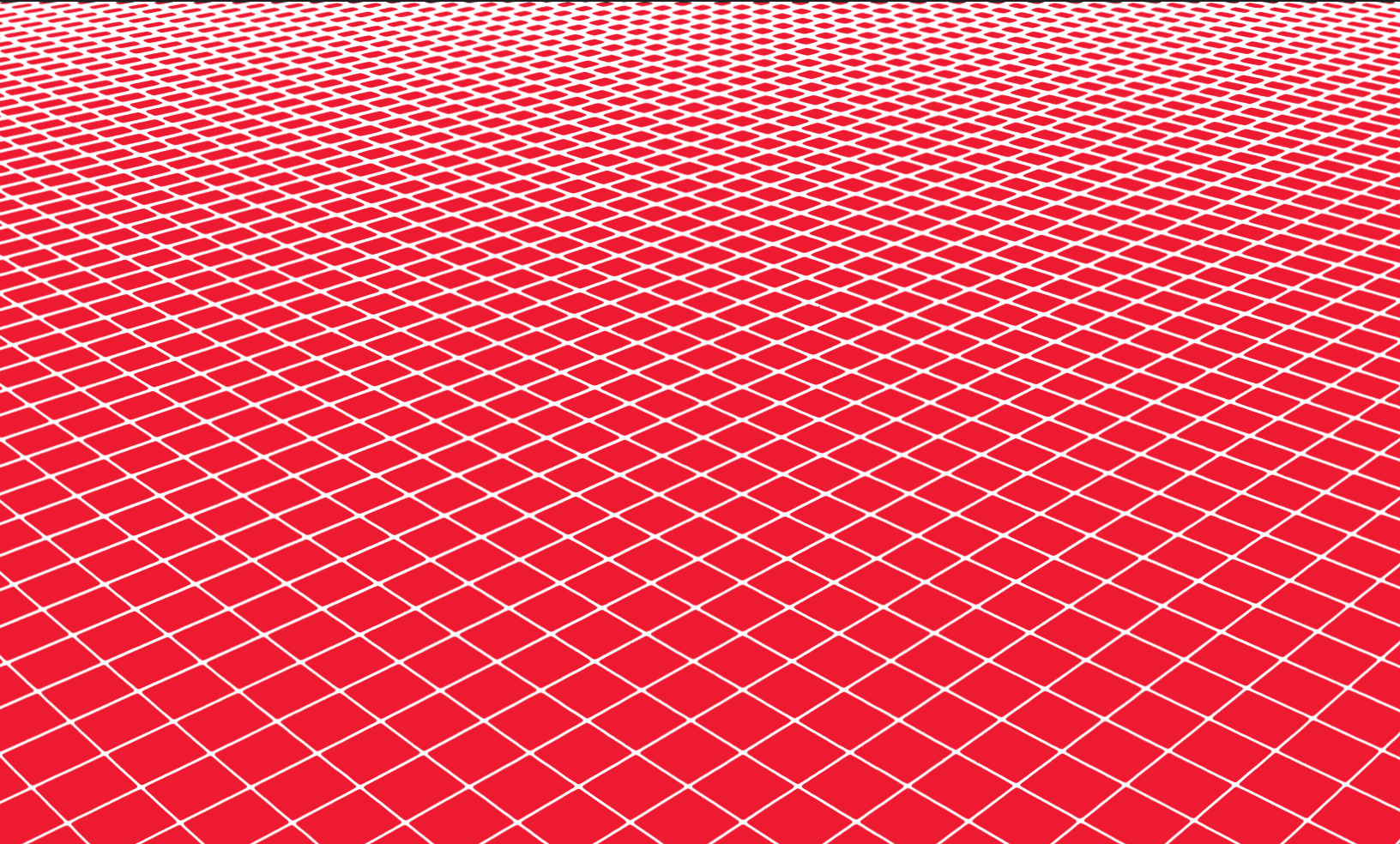




SHOP MANUAL

CBR650RA, CB650RA



CBR650RAM, CB650RAM
CBR650RAN, CB650RAN

HOW TO USE THIS MANUAL

A Few Words About Safety

Service Information

The service and repair information contained in this manual is intended for use by qualified, professional technicians. Attempting service or repairs without the proper training, tools, and equipment could cause injury to you or others. It could also damage the vehicle or create an unsafe condition.

This manual describes the proper methods and procedures for performing service, maintenance and repairs. Some procedures require the use of specially designed tools and dedicated equipment. Any person who intends to use a replacement part, service procedure or a tool that is not recommended by Honda, must determine the risks to their personal safety and the safe operation of the vehicle.

If you need to replace a part, use Honda Genuine parts with the correct part number or an equivalent part. We strongly recommend that you do not use replacement parts of inferior quality.

For Your Customer's Safety

Proper service and maintenance are essential to the customer's safety and the reliability of the vehicle. Any error or oversight while servicing a vehicle can result in faulty operation, damage to the vehicle, or injury to others.

⚠ WARNING

Improper service or repairs can create an unsafe condition that can cause your customer or others to be seriously hurt or killed.

Follow the procedures and precautions in this manual and other service materials carefully.

For Your Safety

Because this manual is intended for the professional service technician, we do not provide warnings about many basic shop safety practices (e.g., Hot parts—wear gloves). If you have not received shop safety training or do not feel confident about your knowledge of safe servicing practice, we recommended that you do not attempt to perform the procedures described in this manual.

Some of the most important general service safety precautions are given below. However, we cannot warn you of every conceivable hazard that can arise in performing service and repair procedures. Only you can decide whether or not you should perform a given task.

⚠ WARNING

Failure to properly follow instructions and precautions can cause you to be seriously hurt or killed.

Follow the procedures and precautions in this manual carefully.

Important Safety Precautions

Make sure you have a clear understanding of all basic shop safety practices and that you are wearing appropriate clothing and using safety equipment. When performing any service task, be especially careful of the following:

- Read all of the instructions before you begin, and make sure you have the tools, the replacement or repair parts, and the skills required to perform the tasks safely and completely.
- Protect your eyes by using proper safety glasses, goggles or face shields any time you hammer, drill, grind, pry or work around pressurized air or liquids, and springs or other stored-energy components. If there is any doubt, put on eye protection.
- Use other protective wear when necessary, for example gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts. Before you grab something that looks like it can hurt you, stop and put on gloves.
- Protect yourself and others whenever you have the vehicle up in the air. Any time you lift the vehicle, either with a hoist or a jack, make sure that it is always securely supported. Use jack stands.

Make sure the engine is off before you begin any servicing procedures, unless the instruction tells you to do otherwise. This will help eliminate several potential hazards:

- Carbon monoxide poisoning from engine exhaust. Be sure there is adequate ventilation whenever you run the engine.
- Burns from hot parts or coolant. Let the engine and exhaust system cool before working in those areas.
- Injury from moving parts. If the instruction tells you to run the engine, be sure your hands, fingers and clothing are out of the way.

Gasoline vapors and hydrogen gases from batteries are explosive. To reduce the possibility of a fire or explosion, be careful when working around gasoline or batteries.

- Use only a nonflammable solvent, not gasoline, to clean parts.
 - Never drain or store gasoline in an open container.
 - Keep all cigarettes, sparks and flames away from the battery and all fuel-related parts.
-

How To Use This Manual

This manual describes the service procedures for the CBR650RA, CB650RA.

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 22 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 recommendations to ensure that the motorcycle is in peak operating condition.

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

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


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

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 judgment.

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

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

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

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

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

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

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

ALL INFORMATION, ILLUSTRATIONS, DIRECTIONS AND SPECIFICATIONS INCLUDED IN THIS PUBLICATION ARE BASED ON THE LATEST PRODUCT INFORMATION AVAILABLE AT THE TIME OF APPROVAL FOR PRINTING. Honda Motor Co., Ltd. RESERVES THE RIGHT TO MAKE CHANGES AT ANY TIME WITHOUT NOTICE AND WITHOUT INCURRING ANY OBLIGATION WHATSOEVER. NO PART OF THIS PUBLICATION MAY BE REPRODUCED WITHOUT WRITTEN PERMISSION. THIS MANUAL IS WRITTEN FOR PERSONS WHO HAVE ACQUIRED BASIC KNOWLEDGE OF MAINTENANCE ON Honda MOTORCYCLES, MOTOR SCOOTERS OR ATVS.












© Honda Motor Co., Ltd.
SERVICE PUBLICATION OFFICE

Date of Issue: October, 2021

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.• Pro Honda M-77 Assembly Paste (Moly) (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.

CONTENTS

	GENERAL INFORMATION	1
	FRAME/BODY PANELS/EXHAUST SYSTEM	2
	MAINTENANCE	3
ENGINE/DRIVE TRAIN ELECTRICAL	PGM-FI SYSTEM	4
	IGNITION SYSTEM	5
	ELECTRIC STARTER	6
	FUEL SYSTEM	7
	COOLING SYSTEM	8
	LUBRICATION SYSTEM	9
	CYLINDER HEAD/VALVES	10
	CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH	11
	ALTERNATOR	12
	CRANKCASE/TRANSMISSION	13
	CRANKSHAFT/PISTON/CYLINDER	14
	ENGINE REMOVAL/INSTALLATION	15
CHASSIS	FRONT WHEEL/SUSPENSION/STEERING	16
	REAR WHEEL/SUSPENSION	17
	HYDRAULIC BRAKE	18
	ANTI-LOCK BRAKE SYSTEM (ABS)	19
FRAME ELECTRICAL	BATTERY/CHARGING SYSTEM	20
	LIGHTS/METERS/SWITCHES	21
	IMMOBILIZER SYSTEM (HISS)	22
	WIRING DIAGRAMS	23
	INDEX	

MEMO

1. GENERAL INFORMATION

SERVICE RULES.....	1-2	SPECIAL TOOL LIST	1-20
MODEL IDENTIFICATION	1-3	CABLE & HARNESS ROUTING	1-22
SPECIFICATIONS.....	1-5	EMISSION CONTROL SYSTEMS	1-48
TORQUE VALUES	1-11	TECHNICAL FEATURE	1-51
LUBRICATION & SEAL POINTS	1-17		

GENERAL INFORMATION

SERVICE RULES

1. Use genuine Honda 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 1-22).
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
A/F sensor	Air/Fuel ratio sensor
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
ESS	Emergency Stop Signal
EVAP	Evaporative Emission
GST	General Scan Tool
HISS	Honda Ignition Security System
HSTC	Honda Selectable Torque Control
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
OBD	On-Board Diagnostic
PAIR	Pulse Secondary Air Injection
PGM-FI	Programmed Fuel Injection
SCS short connector	Service Check Signal short 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
ED, IIED, IIIED, IVED	European direct sales
FO, IIFO	Taiwan
KO, IIKO	Korea
MA, IIMA	Malaysia
TH, II TH	Thailand
IN	Indonesia
U, IIU	Australia, New Zealand
BR, IIBR	Brazil

MODEL IDENTIFICATION

CBR650RA:

ED model shown:



CB650RA:

ED model shown:



This manual covers following models:

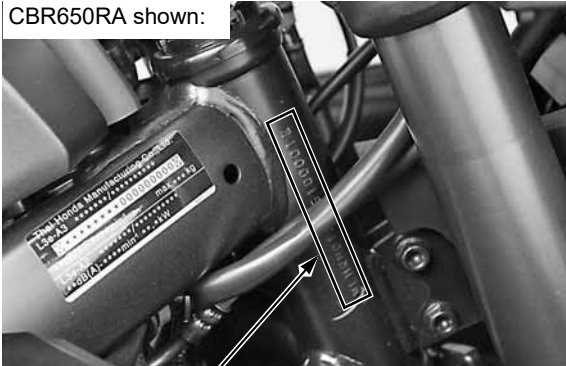
Type	Destination code	Turn signal/ position light	EVAP	Front reflector	Front licence plate stay	USB	A/F sensor/ CKP sensor 3P	O ₂ sensor/ CKP sensor 2P
CBR650RA	ED, IIED, IIIED, IVED	-	O	O	-	O	O	-
	FO, IIFO	-	O	O	-	O	O	-
	KO, IIKO	-	O	O	-	-	O	-
	MA, IIMA	-	-	O	-	O	-	O
	TH, IITH	-	O	-	-	O	-	O
	U, IIU	-	-	-	O	-	-	O
	IIBR	-	O	-	-	-	-	O
CB650RA	ED, IIIED	O	O	O	-	O	O	-
	FO	O	O	O	-	O	O	-
	KO	O	O	O	-	-	O	-
	MA	O	-	O	-	O	-	O
	IN	-	-	-	O	O	-	O
	TH	O	O	-	-	O	-	O
	U	O	-	-	O	-	-	O
BR	O	O	-	-	-	-	O	

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

GENERAL INFORMATION

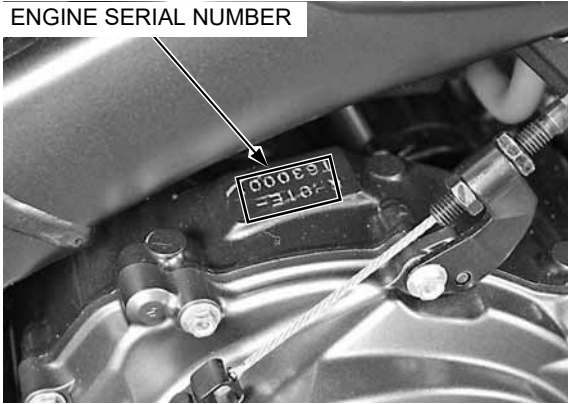
SERIAL NUMBERS/LABELS

CBR650RA shown:

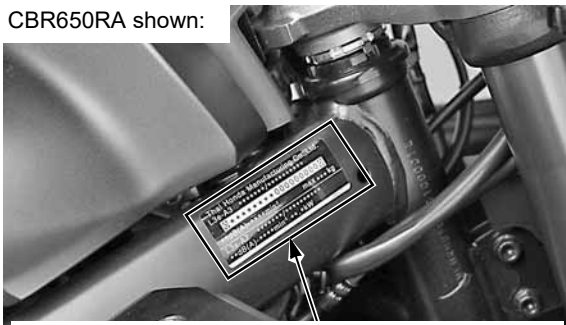


VEHICLE IDENTIFICATION NUMBER (V.I.N)

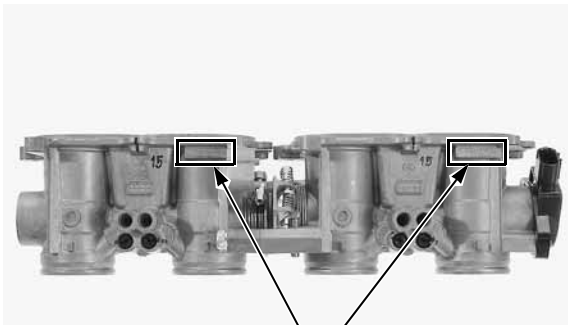
ENGINE SERIAL NUMBER



CBR650RA shown:



ED, IIED, IIIED, IVED, FO, IIFO models:
REGISTERED NUMBER PLATE
KO, IIKO models: SAFETY CERTIFICATION LABEL
U, IIU models: COMPLIANCE PLATE
MA, IIMA models: PRODUCT LABEL

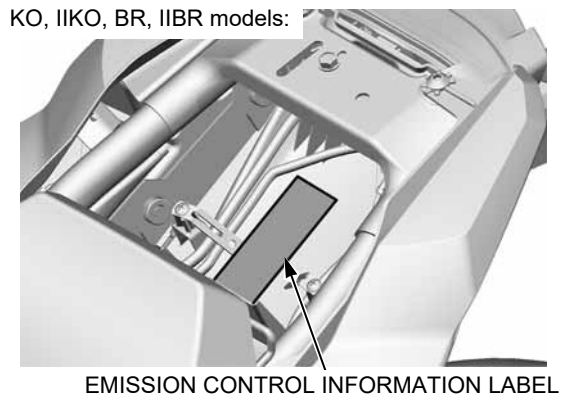


THROTTLE BODY IDENTIFICATION NUMBER



Except TH, IITH, FO, IIFO, MA,
IIMA, IN, BR, IIBR models:

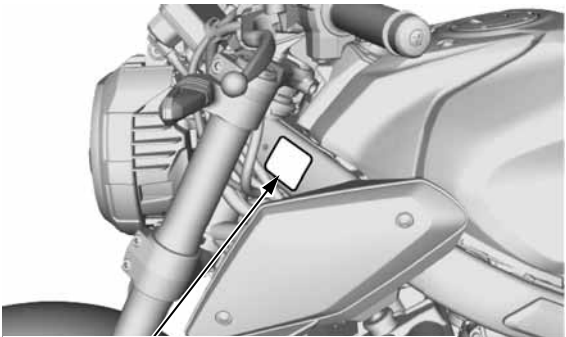
COLOR LABEL



KO, IIKO, BR, IIBR models:

EMISSION CONTROL INFORMATION LABEL

CB650RA shown:



KO, IIKO, BR, IIBR models: NAME PLATE

SPECIFICATIONS

GENERAL SPECIFICATIONS

		ITEM	SPECIFICATION		
DIMENSIONS	Overall length	Except FO, IIFO, TH, IITH, IN, models		2,120 mm (83.5 in)	
		FO, IIFO models		2,130 mm (83.9 in)	
		TH, IITH models		2,145 mm (84.4 in)	
		IN, BR, IIBR models		2,128 mm (83.8 in)	
	Overall width	CBR650RA	Except TH, IITH, KO, IIKO models		750 mm (29.5 in)
			TH, IITH, IIBR models		749 mm (29.5 in)
			KO, IIKO models		740 mm (29.1 in)
		CB650RA	Except TH, IN, KO models		780 mm (30.7 in)
			TH, IN, BR models		784 mm (30.9 in)
			KO model		760 mm (29.9 in)
	Overall height	CBR650RA	Except TH, IITH models		1,150 mm (45.3 in)
			TH, IITH, IIBR models		1,149 mm (45.2 in)
		CB650RA	Except TH, IN models		1,075 mm (42.3 in)
			TH, IN, BR models		1,076 mm (42.4 in)
	Wheelbase	CBR650RA	Except TH, IITH models		1,450 mm (57.1 in)
			TH, IITH, IIBR models		1,449 mm (57.0 in)
		CB650RA	Except TH, IN models		1,450 mm (57.1 in)
			TH, IN, BR models		1,449 mm (57.0 in)
	Seat height			810 mm (31.9 in)	
	Footpeg height			357 mm (14.1 in)	
	Ground clearance	CBR650RA	Except TH, IITH models		130 mm (5.1 in)
			TH, IITH, IIBR models		132 mm (5.2 in)
		CB650RA	Except TH, IN models		150 mm (5.9 in)
TH, IN, BR models			148 mm (5.8 in)		
Curb weight	CBR650RA	ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models		208 kg (459 lbs)	
		TH, IITH, IIBR models		207 kg (456 lbs)	
		MA, IIMA, U, IIU models		205 kg (452 lbs)	
	CB650RA	ED, IIIED, FO, KO models		203 kg (448 lbs)	
		TH, IN, BR model		202 kg (445 lbs)	
		MA, U models		200 kg (441 lbs)	
		Except TH, IITH, KO, IIKO, IN models		168 kg (370 lbs)	
Maximum weight capacity			TH, IITH models	128 kg (282 lbs)	
			KO, IIKO models	148 kg (326 lbs)	
			IN model	138 kg (304 lbs)	
FRAME	Frame type		Diamond		
	Front suspension		Telescopic fork		
	Front axle travel		108 mm (4.3 in)		
	Rear suspension		Swingarm		
	Rear axle travel		128 mm (5.0 in)		
	Front tire size		120/70ZR17M/C (58W)		
	Rear tire size		180/55ZR17M/C (73W)		
	Front tire brand	CBR650RA, CB650RA Include ED, IIIED models		D214F Z (DUNLOP)	
		CB650RA ED, IIIED models		ROADTEC 01 (METZELER)	
	Rear tire brand	CBR650RA, CB650RA Include ED, IIIED models		D214 Q (DUNLOP)	
		CB650RA ED, IIIED models		ROADTEC 01 E (METZELER)	
	Front brake		Hydraulic double disc		
	Rear brake		Hydraulic single disc		
	Caster angle	Except MA, KO models		25° 30'	
		MA, KO models		25.5°	
	Trail length		101 mm (4.0 in)		
Fuel tank capacity		15.4 liters (4.07 US gal, 3.39 Imp gal)			

GENERAL INFORMATION

ITEM				SPECIFICATION	
ENGINE	Cylinder arrangement			4 cylinders in-line, inclined 30° from vertical	
	Bore and stroke	Except TH, IITH, IN, BR, IIBR models		67.0 x 46.0 mm (2.64 x 1.81 in)	
		IN, TH, IITH, BR, IIBR models		67.000 x 46.000 mm (2.6378 x 1.8110 in)	
	Displacement	Except TH, IITH, IN, BR, IIBR models		649 cm ³ (39.6 cu-in)	
		TH, IITH, IN, BR, IIBR models		648.72 cm ³ (39.572 cu-in)	
	Compression ratio			11.6 : 1	
	Valve train			Chain driven DOHC	
	Intake valve	opens	at 1 mm (0.04 in) lift	Except TH, IITH, MA, IIMA, IN, U, IIU, BR, IIBR models	- 2° BTDC
				TH, IITH, MA, IIMA, IN, U, IIU, BR, IIBR models	0° BTDC
		closes	at 1 mm (0.04 in) lift	Except TH, IITH, MA, IIMA, IN, U, IIU, BR, IIBR models	35° ABDC
				TH, IITH, MA, IIMA, IN, U, IIU, BR, IIBR models	33° ABDC
	Exhaust valve	opens	at 1 mm (0.04 in) lift		30° BBDC
		closes	at 1 mm (0.04 in) lift		0° TDC
	Lubrication system			Forced pressure and wet sump	
	Oil pump type			Trochoid	
	Cooling system			Liquid cooled	
	Air filtration			Viscous paper element	
Engine dry weight	Except TH, IITH, MA, IIMA, IN, U, IIU, BR, IIBR models		60.5 kg (133.4 lbs)		
	TH, IITH, MA, IIMA, IN, U, IIU, BR, IIBR models		60.6 kg (133.6 lbs)		
Firing order			1 - 2 - 4 - 3		
FUEL DELIVERY SYSTEM	Type			PGM-FI (Programmed Fuel Injection)	
	Throttle bore			32 mm (1.3 in)	
DRIVE TRAIN	Clutch system			Multi-plate, wet	
	Clutch operation system			Cable operating	
	Transmission			Constant mesh, 6 speeds	
	Primary reduction			1.690 (71/42)	
	Final reduction			2.800 (42/15)	
	Gear ratio	1st		3.071 (43/14)	
		2nd		2.352 (40/17)	
		3rd		1.888 (34/18)	
		4th		1.560 (39/25)	
		5th		1.370 (37/27)	
6th		1.214 (34/28)			
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	1,250 ± 100 min ⁻¹ (rpm)
ECT sensor resistance (40°C/104°F)	1.0 – 1.3 kΩ
IAT sensor resistance (40°C/104°F)	1.0 – 1.3 kΩ
Fuel injector resistance (20°C/68°F)	11 – 13 Ω
A/F sensor heater resistance (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models: 20°C/68°F)	3.6 – 6.0 Ω
O ₂ sensor heater resistance (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models: 20°C/68°F)	13.0 – 18.5 Ω
IACV resistance (25°C/77°F)	99 – 121 Ω

IGNITION SYSTEM SPECIFICATIONS

ITEM	SPECIFICATION	
Spark plug	IMR9E-9HES (NGK), VUH27ES (DENSO)	
Spark plug gap	0.8 – 0.9 mm (0.03 – 0.04 in)	
Ignition coil peak voltage	100 V minimum	
CKP sensor peak voltage	0.7 V minimum	
Ignition timing ("F" mark)	ED, IIED, IIIED, IVED, TH, IITH, IN, BR, IIBR models	5.3° BTDC at idle speed
	Except ED, IIED, IIIED, IVED, TH, IITH, IN, BR, IIBR models	5° BTDC at idle speed

FUEL SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS	
Throttle body identification number	ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models	GQ8LA
	TH, IITH, BR, IIBR models	GQ8KA
	MA, IIMA, IN, U, IIU models	GQ8KB
Throttle grip freeplay	2 – 6 mm (0.1 – 0.2 in)	
Fuel pressure at idle	324 – 367 kPa (3.3 – 3.7 kgf/cm ² , 47 – 53 psi)	
Fuel pump flow (at 12 V)	125 cm ³ (4.23 US oz, 4.40 Imp oz) minimum/10 seconds	
PAIR control solenoid valve resistance (20°C/68°F)	23 – 27 Ω	
CO concentration	BR, IIBR models only	0.5 % maximum
HC concentration	BR, IIBR models only	400 ppm maximum

COOLING SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS	
Coolant capacity	Radiator and engine	2.5 liters (2.6 US qt, 2.2 Imp qt)
	Reserve tank (Upper level)	0.195 liter (0.206 US qt, 0.172 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	ED, IIED, IIIED, IVED, KO, IIKO, U, IIU, BR, IIBR models	High quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors (Mix the distilled water and antifreeze in the ratio of 1:1)
	TH, IITH, IN, FO, IIFO, MA, IIMA, IN models	Honda PRE-MIX COOLANT or equivalent

GENERAL INFORMATION

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	2.3 liters (2.4 US qt, 2.0 Imp qt)	–
	At oil filter change	2.6 liters (2.7 US qt, 2.3 Imp qt)	–
	At disassembly	3.0 liters (3.2 US qt, 2.6 Imp qt)	–
Recommended engine oil		Honda "4-stroke motorcycle oil" or an equivalent motor oil API service classification: SG or higher JASO T903 standard: MA Viscosity: SAE 10W-30	–
Oil pressure at EOP switch		490 kPa (5.0 kgf/cm ² , 71 psi) at 5000 min ⁻¹ (rpm)/80°C (176°F)	–
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)

CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT	
Cylinder compression at 300 min ⁻¹ (rpm)			1,491 kPa (15.2 kgf/cm ² , 216 psi)	–	
Valve clearance		IN	0.20 ± 0.03 (0.008 ± 0.001)	–	
		EX	0.28 ± 0.03 (0.011 ± 0.001)	–	
Camshaft	Cam lobe height	ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models	IN	34.6200 – 34.7800 (1.36299 – 1.36929)	34.59 (1.362)
			EX	34.4000 – 34.5600 (1.35433 – 1.36063)	34.37 (1.353)
		MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models	IN	34.5800 – 34.8200 (1.36141 – 1.37086)	34.55 (1.360)
			EX	34.4000 – 34.5600 (1.35433 – 1.36063)	34.37 (1.353)
	Oil clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)	
	Valve lifter	Valve lifter O.D.		25.978 – 25.993 (1.0228 – 1.0233)	25.97 (1.022)
Valve lifter bore I.D.		26.010 – 26.026 (1.0240 – 1.0246)	26.04 (1.025)		
Valve, valve guide	Valve stem O.D.	IN	4.475 – 4.490 (0.1762 – 0.1768)	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)
	Valve guide height		IN/EX	12.70 – 13.00 (0.500 – 0.512)	–
	Valve seat width		IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length			38.26 (1.506)	37.3 (1.47)	
Cylinder head warpage			–	0.10 (0.004)	

CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch lever freeplay		10 – 20 (0.4 – 0.8)	–
Clutch	Spring free length	43.7 (1.72)	42.7 (1.68)
	Disc thickness	2.92 – 3.08 (0.115 – 0.121)	2.7 (0.11)
	Plate warpage	–	0.30 (0.012)
Clutch outer guide	I.D.	25.000 – 25.021 (0.9843 – 0.9851)	25.031 (0.9855)
	O.D.	34.984 – 35.000 (1.3773 – 1.3780)	34.974 (1.377)
Mainshaft O.D. at clutch outer guide		24.980 – 24.990 (0.9835 – 0.9839)	24.960 (0.9827)
Starter driven gear boss O.D.		45.657 – 45.673 (1.7975 – 1.7981)	45.642 (1.7969)

CRANKCASE/TRANSMISSION SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Transmission	Gear I.D.	M5, M6, C1	28.000 – 28.021 (1.1024 – 1.1032)
		C2, C3, C4	33.000 – 33.025 (1.2992 – 1.3002)
	Bushing O.D.	M5, M6	27.959 – 27.980 (1.1007 – 1.1016)
		C2	32.955 – 32.980 (1.2974 – 1.2984)
		C3, C4	32.950 – 32.975 (1.2972 – 1.2982)
	Bushing I.D.	M5	25.000 – 25.021 (0.9843 – 0.9851)
		C2	29.985 – 30.006 (1.1805 – 1.1813)
Mainshaft O.D.	at M5 bushing	24.967 – 24.980 (0.9830 – 0.9835)	
Countershaft O.D.	at C2 bushing	29.967 – 29.980 (1.1798 – 1.1803)	
Shift fork, fork shaft	Shift fork shaft O.D.		11.957 – 11.968 (0.4707 – 0.4710)
	Shift fork I.D.		12.000 – 12.018 (0.4724 – 0.4731)
	Shift fork claw thickness		5.93 – 6.00 (0.233 – 0.236)
			5.83 (0.230)

CRANKSHAFT/PISTON/CYLINDER SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod big end side clearance		0.05 – 0.20 (0.002 – 0.008)
	Crankpin bearing oil clearance		0.032 – 0.052 (0.0013 – 0.0020)
	Main journal bearing oil clearance		0.017 – 0.035 (0.0007 – 0.0014)
	Runout		–
Cylinder	I.D.		67.000 – 67.015 (2.6378 – 2.6384)
	Out-of-round		–
	Taper		–
	Warpage		–
Piston, piston pin, piston ring	Piston O.D. at 7 mm (0.3 in) from bottom		66.965 – 66.985 (2.6364 – 2.6372)
	Piston pin hole I.D.		16.002 – 16.008 (0.6300 – 0.6302)
	Piston pin O.D.		15.994 – 16.000 (0.6297 – 0.6299)
	Piston ring end gap	Top	0.10 – 0.20 (0.004 – 0.008)
		Second	0.21 – 0.31 (0.008 – 0.012)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)
	Piston ring-to-ring groove clearance	Top	0.030 – 0.060 (0.0012 – 0.0024)
Second		0.015 – 0.050 (0.0006 – 0.0020)	
Connecting rod small end I.D.		16.030 – 16.044 (0.6311 – 0.6317)	
			16.05 (0.632)

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Cold tire pressure	Driver only	250 kPa (2.50 kgf/cm ² , 36 psi)	–
	Driver and passenger	250 kPa (2.50 kgf/cm ² , 36 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel balance weight		–	60 g (2.1 oz) max.
Fork	Recommended fork fluid		Fork fluid (viscosity: 10W)
	Spring free length	Right	364.3 (14.34)
		Left	347.0 (13.66)
	Fluid level	Right	90 (3.5)
		Left	145 (5.7)
	Fluid capacity	Right	465 ± 2.5 cm ³ (15.7 ± 0.08 US oz, 16.3 ± 0.09 Imp oz)
Left		503 ± 2.5 cm ³ (17.0 ± 0.08 US oz, 17.7 ± 0.09 Imp oz)	
			–

GENERAL INFORMATION

REAR WHEEL/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Cold tire pressure	Driver only	290 kPa (2.90 kgf/cm ² , 42 psi)	–
	Driver and passenger	290 kPa (2.90 kgf/cm ² , 42 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel balance weight		–	60 g (2.1 oz) max.
Drive chain	Size/link	DID525V11-118LE/RK525KRW-118LE	–
	Slack	25 – 35 (1.0 – 1.4)	–
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 disc thickness	4.5 (0.18)	3.5 (0.14)	
	Brake disc warpage	–	0.3 (0.01)	
	Master cylinder I.D.	14.000 – 14.043 (0.5512 – 0.5529)	–	
	Master piston O.D.	13.957 – 13.984 (0.5495 – 0.5506)	–	
	Caliper cylinder I.D.	A	30.23 – 30.28 (1.190 – 1.192)	–
		B	27.000 – 27.050 (1.0630 – 1.0650)	–
	Caliper piston O.D.	A	30.148 – 30.198 (1.1869 – 1.1889)	–
B		26.918 – 26.968 (1.0598 – 1.0617)	–	
Rear	Specified brake fluid	DOT 4	–	
	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.	14.000 – 14.043 (0.5512 – 0.5529)	–	
	Master piston O.D.	13.957 – 13.984 (0.5495 – 0.5506)	–	
	Caliper cylinder I.D.	38.18 – 38.23 (1.503 – 1.505)	–	
	Caliper piston O.D.	38.098 – 38.148 (1.4999 – 1.5019)	–	

ANTI-LOCK BRAKE SYSTEM (ABS) SPECIFICATIONS

ITEM		SPECIFICATIONS
Air gap	Front (Between the wheel speed sensor guard and pulser ring)	0.73 – 1.40 mm (0.029 – 0.055 in)
	Rear (Between the caliper bracket and pulser ring)	0.40 – 1.22 mm (0.016 – 0.048 in)

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS	
Battery	Type	FTZ10S, YTZ10	
	Capacity	12 V - 8.6 Ah (10 HR), 12 V - 9.1 Ah (20 HR)	
	Current leakage	2.8 mA max.	
	Voltage (20°C/68°F)	Fully charged	12.8 V minimum
		Needs charging	Below 12.3 V
	Charging current	Normal	0.9 A/5 – 10 h
Quick		4.5 A/1 h	
Alternator	Capacity	370 W/5,000 min ⁻¹ (rpm)	
	Charging coil resistance (20°C/68°F)	0.1 – 1.0 Ω	

LIGHTS/METERS/SWITCHES SPECIFICATIONS

ITEM		SPECIFICATION	
Bulbs	Headlight	Hi	LED
		Lo	LED
	Position light (CBR650RA), (CB650RA: IN model)		LED
	Turn signal/position light (CB650RA: Except IN model)		LED
	Turn signal light (CBR650RA), (CB650RA: IN model)		LED
	Brake/taillight		LED
	License light		LED
	Instrument light		LED
	Turn signal indicator		LED
	High beam indicator		LED
	Neutral indicator		LED
	Engine oil pressure indicator		LED
	Torque control indicator		LED
	Torque control off indicator		LED
	Shift up indicator		LED
	MIL		LED
	HISS indicator		LED
	ABS indicator		LED
Fuse	Main fuse		30 A
	Sub fuse		20 A, 15 A, 10 A, 7.5 A x 5
	ABS motor fuse		30 A
	ABS main fuse		7.5 A
	ABS FSR fuse		30 A
ECT sensor resistance	40°C (104°F)		1.0 – 1.3 kΩ
	100°C (212°F)		0.1 – 0.2 kΩ
Fuel level sensor resistance	FULL		6 – 10 Ω
	EMPTY		384 – 396 Ω

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.

GENERAL INFORMATION

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 (CBR650RA)	4	6	10 (1.0, 7)	
Rearview mirror lock nut (CB650RA)	2	10	20 (2.0, 15)	
Rearview mirror adaptor (CB650RA)	2	10	20 (2.0, 15)	
Front reflector mounting nut (Except TH, IITH, IN, BR, IIBR models)	2	6	1.8 (0.2, 1.3)	Self-lock nut
Windscreen special bolt (CBR650RA)	4	5	0.42 (0.04, 0.3)	
Middle cowl special bolt (CBR650RA)	4	5	0.42 (0.04, 0.3)	
Front cowl stay mounting nut (CBR650RA)	2	8	27 (2.8, 20)	
Shroud A mounting bolt (CB650RA)	4	5	0.42 (0.04, 0.3)	
License light mounting screw	2	4	0.9 (0.1, 0.7)	
Rear reflector mounting nut	1	5	1.8 (0.2, 1.3)	Self-lock nut
Rear turn signal light mounting bolt	2	6	9 (0.9, 7)	
Sidestand pivot bolt	1	10	10 (1.0, 7)	See page 2-16
Sidestand pivot nut	1	10	30 (3.1, 22)	Self-lock nut, See page 2-16
Rider footpeg bracket socket bolt	4	8	27 (2.8, 20)	
Passenger footpeg bracket socket bolt	4	8	27 (2.8, 20)	
Muffler protector mounting bolt	2	6	12 (1.2, 9)	
Exhaust pipe joint nut	8	8	18 (1.8, 13)	
Muffler mounting bolt	2	8	21 (2.1, 15)	
Exhaust pipe stud bolt	8	8	–	See page 2-18

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Throttle cable adjuster lock nut (throttle body side)	1	6	5.5 (0.6, 4.1)	
Throttle cable adjuster lock nut (throttle grip side)	1	7	3.8 (0.4, 2.8)	
Air cleaner element tapping screw	2	5	1.1 (0.1, 0.8)	
Air cleaner lid tapping screw	9	5	1.1 (0.1, 0.8)	
Spark plug	4	10	16 (1.6, 12)	
Timing hole cap	1	45	18 (1.8, 13)	Apply grease to the threads.
Engine oil filter cartridge	1	20	26 (2.7, 19)	Apply engine oil to the threads.
Engine oil drain bolt	1	12	30 (3.1, 22)	
Engine oil filter boss	1	20	–	See page 3-11 Apply locking agent to the threads.
Rear axle nut	1	18	98 (10.0, 72)	Self-lock nut
Drive chain adjuster lock nut	2	8	27 (2.8, 20)	
Drive sprocket bolt	1	10	54 (5.5, 40)	
Driven sprocket nut	5	12	108 (11.0, 80)	Self-lock 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
MAP sensor mounting screw	1	5	3.4 (0.3, 2.5)	
ECT sensor	1	10	12 (1.2, 9)	
IAT sensor screw	2	5	1.2 (0.1, 0.9)	
A/F sensor (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models)	1	12	24.5 (2.5, 18)	
O ₂ sensor (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)	1	12	24.5 (2.5, 18)	
Gear position switch mounting socket bolt	1	6	7 (0.7, 5)	
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
Timing 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)	
Negative brush screw	1	5	3.7 (0.4, 2.7)	
Starter motor case bolt	2	5	4.9 (0.5, 3.6)	
Starter relay switch cable nut	2	6	4.9 (0.5, 3.6)	

FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel tank mounting nut	1	6	12 (1.2, 9)	Self-lock nut
Fuel filler cap mounting socket bolt	3	4	1.8 (0.2, 1.3)	
Fuel pump mounting nut	6	6	12 (1.2, 9)	See page 7-9
Insulator band screw (throttle body side)	4	5	4.5 (0.5, 3.3)	
Throttle cable B lock nut	1	6	5.5 (0.6, 4.1)	
Throttle cable adjuster lock nut	1	6	5.5 (0.6, 4.1)	
IACV body screw	3	5	3.4 (0.3, 2.5)	
IACV setting plate screw	2	4	2.1 (0.2, 1.5)	
IACV hose joint plate screw	1	4	2.1 (0.2, 1.5)	
Insulator band screw (cylinder head side)	4	5	4.5 (0.5, 3.3)	
Fuel injector joint bolt	4	5	5.1 (0.5, 3.8)	
PAIR check valve cover bolt	4	6	12 (1.2, 9)	Apply locking agent to the threads.

COOLING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Water pump drain bolt	1	6	13 (1.3, 10)	
Thermostat cover bolt	2	6	12 (1.2, 9)	
Fan motor shroud bolt	3	6	8.5 (0.9, 6.3)	
Fan motor nut	3	5	5.1 (0.5, 3.8)	
Cooling fan nut	1	5	2.7 (0.3, 2.0)	Apply locking agent to the threads.
Radiator reserve tank mounting bolt	1	6	12 (1.2, 9)	
Water pump mounting bolt	3	6	12 (1.2, 9)	
Water pump cover bolt	1	6	13 (1.3, 10)	

LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil cooler bolt	1	20	59 (6.0, 44)	Apply engine oil to the threads and seating surface.

GENERAL INFORMATION

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head cover bolt	4	6	10 (1.0, 7)	
Camshaft holder bolt	20	6	12 (1.2, 9)	Apply engine oil to the threads and seating surface.
Cam sprocket bolt	4	7	20 (2.0, 15)	Apply locking agent to the threads.
Air bleeding joint	1	8	12 (1.2, 9)	Apply locking agent to the threads.
Cam chain tensioner pivot washer-bolt	1	6	10 (1.0, 7)	Apply locking agent to the threads.
Cylinder head washer-bolt	10	9	47 (4.8, 35)	Apply molybdenum oil to the threads and seating surface.

CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Right crankcase cover bolt	14	6	12 (1.2, 9)	
Oil pump driven sprocket washer-bolt	1	6	15 (1.5, 11)	Apply locking agent to the threads.
Clutch center lock nut	1	22	128 (13.1, 94)	Lock nut; replace with a new one and stake. Apply engine oil to the threads and seating surface.
Clutch set plate bolt	3	6	12 (1.2, 9)	
Starter clutch outer mounting bolt	1	10	83 (8.5, 61)	Apply engine oil to the threads and seating surface.
Shift drum stopper arm pivot socket 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.
Gearshift pedal pivot socket bolt	1	8	27 (2.8, 20)	
Gearshift pedal adjuster lock nut	2	6	10 (1.0, 7)	

ALTERNATOR

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Left crankcase cover bolt	8	6	12 (1.2, 9)	
Alternator stator socket bolt	4	6	12 (1.2, 9)	
Alternator wire clamp bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads.
Flywheel bolt	1	10	113 (11.5, 83)	Apply engine oil to the threads and seating surface.

CRANKCASE/TRANSMISSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Crankcase main journal bolt	10	8	15 (1.5, 11) + 120°	See page 13-5 Replace with a new one.
Crankcase 10 mm bolt	1	10	39 (4.0, 29)	
Crankcase 8 mm bolt	1	8	24 (2.4, 18)	
Crankcase 6 mm bolt	14	6	12 (1.2, 9)	
Mainshaft bearing setting plate bolt	3	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.

GENERAL INFORMATION

CRANKSHAFT/PISTON/CYLINDER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Crankpin bearing cap nut	8	8	35.2 (3.6, 26)	Apply engine oil to the threads and seating surface.
Crankcase main journal bolt	10	8	15 (1.5, 11) + 120°	See page 13-5 Replace with a new one.

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear lower engine hanger nut	1	12	59 (6.0, 44)	See page 15-7
Rear upper engine hanger nut	1	10	40 (4.1, 30)	
Upper engine hanger bracket bolt	4	8	27 (2.8, 20)	
Upper engine hanger bolt	2	10	49 (5.0, 36)	
Front engine hanger bolt	2	12	59 (6.0, 44)	
Drive sprocket bolt	1	10	54 (5.5, 40)	
EOP switch terminal screw	1	4	2.0 (0.2, 1.5)	
Right crankcase cover bolt	1	6	12 (1.2, 9)	

FRONT WHEEL/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Steering stem nut	1	24	103 (10.5, 76)	
Top bridge pinch bolt	2	8	22 (2.2, 16)	
Handlebar pinch bolt (CBR650RA)	2	8	27 (2.8, 20)	
Handlebar switch housing screw	4	5	2.5 (0.3, 1.8)	
Front master cylinder holder bolt	2	6	12 (1.2, 9)	
Handlebar upper holder socket bolt (CB650RA)	4	8	27 (2.8, 20)	
Handlebar lower holder nut (CB650RA)	2	8	27 (2.8, 20)	
Front brake disc bolt	10	8	42 (4.3, 31)	ALOC bolt; replace with a new one.
Air valve nut	1	8	6.5 (0.7, 4.8)	
Front axle bolt	1	14	59 (6.0, 44)	
Front axle pinch bolt	4	8	22 (2.2, 16)	
Front brake caliper mounting bolt	4	10	45 (4.6, 33)	ALOC bolt; replace with a new one.
Fork cap	2	–	35 (3.6, 26)	
Bottom bridge pinch bolt (CBR650RA)	2	10	42 (4.3, 31)	
Bottom bridge pinch bolt (CB650RA)	4	8	27 (2.8, 20)	
Fork rod lock nut	2	9	18 (1.8, 13)	
Steering bearing adjustment nut	1	26	31 (3.2, 23)	See page 16-41 Apply engine oil to the threads.
Steering bearing adjustment lock nut	1	26	–	See page 16-41

REAR WHEEL/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear axle nut	1	18	98 (10.0, 72)	Self-lock nut
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)	Self-lock nut
Driven sprocket stud bolt	5	12	–	See page 17-7
Shock absorber mounting nut	2	10	44 (4.5, 32)	Self-lock nut
Air valve nut	1	8	6.5 (0.7, 4.8)	
Swingarm pivot nut	1	18	103 (10.5, 76)	Self-lock nut, Apply engine oil to the threads and seating surface.
Drive chain slider screw	2	5	4.2 (0.4, 3.1)	

GENERAL INFORMATION

HYDRAULIC BRAKE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake caliper bleed valve	3	8	5.4 (0.6, 4.0)	
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)	
Front brake caliper mounting bolt	4	10	45 (4.6, 33)	ALOC bolt; replace with a new one.
Rear brake caliper bolt	1	8	22 (2.2, 16)	ALOC bolt; replace with a new one.
Rear brake caliper pad pin	1	10	17 (1.7, 13)	
Front master cylinder holder bolt	2	6	12 (1.2, 9)	
Brake hose oil bolt	5	10	34 (3.5, 25)	
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)	
Right rider footpeg bracket socket bolt	2	8	27 (2.8, 20)	
Rear master cylinder mounting socket bolt	2	6	12 (1.2, 9)	
Rear master cylinder hose joint screw	1	4	1.5 (0.2, 1.1)	Apply locking agent to the threads.
Rear master cylinder push rod joint nut	1	8	17 (1.7, 13)	
Front brake caliper assembly torx bolt	6	8	27 (2.8, 20)	Apply locking agent to the threads.
Rear brake caliper pin bolt	1	12	27 (2.8, 20)	

ANTI-LOCK BRAKE SYSTEM (ABS)

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

LIGHTS/METERS/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake/tail light mounting nut	2	6	9 (0.9, 7)	
Combination meter mounting screw	3	5	1.0 (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	27 (2.8, 20)	One-way bolt; replace with a new one.
Sidestand switch mounting bolt	1	6	10 (1.0, 7)	ALOC bolt; replace with a new one.

OTHERS

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rider footpeg bank sensor cap bolt	2	6	11 (1.1, 8)	
Throttle cable holder screw	2	5	3.4 (0.3, 2.5)	
Radiator air bleed bolt	1	12	1.6 (0.2, 1.2)	
Gearshift spindle return spring pin	1	8	23 (2.3, 17)	
Clutch lever pivot bolt	1	6	1.0 (0.1, 0.7)	
Clutch lever pivot nut	1	6	6 (0.6, 4.4)	Self-lock nut
Clutch switch screw	1	3	0.6 (0.1, 0.4)	ALOC bolt; replace with a new one.
Lower crankcase sealing bolt	1	22	59 (6.0, 44)	Apply locking agent to the threads.
Lower crankcase sealing socket bolt	1	8	23 (2.3, 17)	Apply locking agent to the threads.

LUBRICATION & SEAL POINTS

ENGINE

MATERIAL	LOCATION	REMARKS
Sealant (TB1207B manufactured by ThreeBond or an equivalent)	Oil pan mating surface	See page 9-7
	Right crankcase cover mating area (cover side)	See page 11-4
	Crankcase mating area (right side of the case)	See page 11-4
	Left crankcase cover mating area (cover side)	See page 12-3
	Crankcase mating area (left side of the case)	See page 12-3
	Lower crankcase mating surface	See page 13-5
Sealant (TB5211C manufactured by ThreeBond, KE45 manufactured by Shin-Etsu Silicone or an equivalent)	Cylinder head cover packing semi-circular area	See page 10-4
Engine oil (without molybdenum additives)	Fuel injector seal ring	
	Engine oil strainer seal ring	
	Valve stem seal fitting area	
	Cam chain tensioner lifter slit	Apply 0.5 cm ³ minimum
	Clutch disc and plate entire surface	
	Starter one-way clutch contacting surface	
	Shift fork guide area and guide pin	
	Shift fork shaft outer surface	
	Piston ring entire surface	
	Piston ring grooves	
	Piston pin hole inner surface	
	Piston sliding surface	
	Cylinder inner surface	
	Each gear teeth and rotating surface	
	Each bearing rotating area	
Each O-ring	Except IACV and water passage O-rings	
Other rotating and sliding areas		
Multi-purpose grease	Each oil seal lips	
Molybdenum oil solution (a mixture of engine oil and molybdenum disulfide grease in a ratio of 1:1)	Water pump shaft thrust washer sliding area	
	Oil pump drive sprocket sliding surface	
	Valve stem sliding surface	
	Valve lifter sliding surface	
	Camshaft journals, lobes and thrust surfaces	
	Clutch outer guide entire surface	
	Clutch outer gear, friction spring and clutch outer sliding surface	
	Starter reduction gear sliding surface	
	Starter idle gear shaft outer surface	
	Transmission rotating gear inner surface	
	Transmission gear bushing entire surface (M5, C2)	
	Transmission gear spline bushing outer surface (M6, C3, C4)	
	Transmission gear inner spline surface (M3/4, C5, C6)	
	Transmission gear shifter groove (M3/4, C5, C6)	
	Transmission C1 needle bearing rotating area	
	Crankshaft main journal bearing sliding surface	
	Crankshaft thrust surfaces	
	Crankpin bearing sliding surface	
Connecting rod small end inner surface		
Piston pin outer surface		
Heat-resistant locking agent (TB1360 or TB2440B manufactured by ThreeBond, DL-201 manufactured by LOCTITE or equivalent)	Shift drum center socket bolt threads	Coating width: 6.5 mm (0.26 in) from tip

GENERAL INFORMATION

MATERIAL	LOCATION	REMARKS
Medium strength locking agent (TB1322N or TB2415 manufactured by ThreeBond, LOCTITE 648 or DL-200 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
	Engine oil filter boss threads	Coating width: 6.5 mm (0.26 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 sprocket bolt threads	Coating width: 6.5 mm (0.26 in) from tip
	Radiator air bleeding joint threads	Coating width: 6.5 mm (0.26 in) from tip
	Cam chain tensioner pivot washer-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 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
	Alternator wire clamp bolt threads	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
	CKP sensor wire clamp bolt threads (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
	Right mainshaft bearing setting plate bolt threads	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
Shift drum bearing setting washer-bolt threads	Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip	

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	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	
	Driven flange dust seal lips	
	Brake pedal pivot sliding area	
	Gearshift pedal pivot sliding area (grease groove)	
	Gearshift pedal pivot dust seal lips	
	Gearshift pedal tie-rod ball joint	
	Footpeg pivot sliding area	
Molybdenum disulfide grease	Pillion footpeg spring	
	Sidestand pivot sliding area	
	Rear shock absorber dust seal lips	
	Rear shock absorber spherical bearing rotating area	
	Swingarm needle bearing rotating area	
	Swingarm ball bearing rotating area	
Engine oil	Swingarm dust seal lips	
	Steering bearing adjustment nut threads	
	Swingarm pivot nut threads and seating surface	

GENERAL INFORMATION

MATERIAL	LOCATION	REMARKS
Silicone grease	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)
	Rear brake caliper pin bolt sliding area	0.20 – 0.25 g (0.007 – 0.009 oz)
	Rear brake caliper sleeve sliding area	0.4 g (0.01 oz) (inside of boot) minimum
	Brake caliper dust seal	
DOT 4 brake fluid	Brake caliper pad pin stopper ring	
	Brake master piston and cups	
	Rear master cylinder hose joint O-ring	
	Front brake caliper piston seal	
	Rear brake caliper piston seal	
Fork fluid (viscosity: 10W) or equivalent	Brake caliper piston outer surface	
	Fork oil seal lips	
	Fork dust seal lips	
Honda Bond A or equivalent	Fork cap O-ring	
	Left handlebar grip inner surface	
ThreeBond 1521 or an equivalent	Rear brake pad retainer mating surface	
Drive chain lubricant designed specifically for O-ring chains or SAE #80 – 90 gear oil	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

SPECIAL TOOL LIST

TITLE	TOOL No	TOOL NAME
MAINTENANCE	07HAA-PJ70101	Oil filter wrench
	07HMH-MR10103	Drive chain tool set
PGM-FI SYSTEM	070MZ-0010300	SCS short connector
	07ZAJ-RDJA110	Test probe
IGNITION SYSTEM	07HGJ-0020100	Peak voltage adaptor
	07ZAJ-RDJA110	Test probe (2 pack)
FUEL SYSTEM	07406-0040004	Fuel pressure gauge
	070MJ-K260100	Pressure gauge attachment set
	07ZAJ-S5A0130	Hose attachment, 6 mm/9 mm
	07ZAJ-S7C0100	Hose attachment, 8 mm/9 mm
	07ZAJ-S7C0200	Attachment joint, 8 mm/9 mm
	07ZAJ-S5A0150	Attachment joint, 6 mm/9 mm
LUBRICATION SYSTEM	07506-3000001	Oil pressure gauge set
	07406-0030000	Oil pressure gauge attachment
CYLINDER HEAD/VALVES	070MG-0010100	Tensioner stopper
	07HMG-MR70002	Tappet hole protector
	07757-0010000	Valve spring compressor
	07959-KM30101	Valve spring compressor attachment
	07HMD-ML00101	Valve guide driver, 4.5 mm
	07743-0020000	Valve guide adjusting driver
	07HMH-ML00101	Valve guide reamer, 4.5 mm
	07781-0010600	Cutter holder, 4.5 mm
	07780-0010200	Seat cutter, 27.5 mm (IN, 45°)
	07780-0010600	Seat cutter, 24 mm (EX, 45°)
	07780-0012100	Flat cutter, 28 mm (IN, 32°)
	07780-0012500	Flat cutter, 24 mm (EX, 32°)
	07780-0014500	Interior cutter, 26 mm (IN, 60°)
	07780-0014202	Interior cutter, 22 mm (EX, 60°)
	CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH	07724-0050002
07724-0010100		Gear holder, M2.5
ALTERNATOR	07725-0040001	Flywheel holder
	07733-0020001	Rotor puller
CRANKCASE/TRANSMISSION	07936-3710600	Bearing remover set, 20 mm
	07741-0010201	Remover weight
	07936-3710100	Remover handle
	07949-3710001	Driver
	07746-0010300	Attachment, 42 x 47 mm
	07746-0040500	Pilot, 20 mm
FRONT WHEEL/SUSPENSION/STEERING	07746-0050600	Bearing remover head, 20 mm
	07746-0050100	Bearing remover shaft
	07749-0010000	Driver
	07746-0010300	Attachment, 42 x 47 mm
	07746-0040500	Pilot, 20 mm
	070MA-MGP0100	Fork cap wrench
	07RMD-MW40100	Fork seal driver attachment
	07KMD-KZ30100	Fork seal driver, 45.2 mm
	07916-3710101	Steering stem socket
	07953-MJ10000	Ball race remover set
	07953-MJ10100	Remover attachment
	07953-MJ10200	Remover shaft
	07946-3710500	Bearing remover
	07946-MB00000	Steering stem driver
	07746-0010400	Attachment, 52 x 55 mm

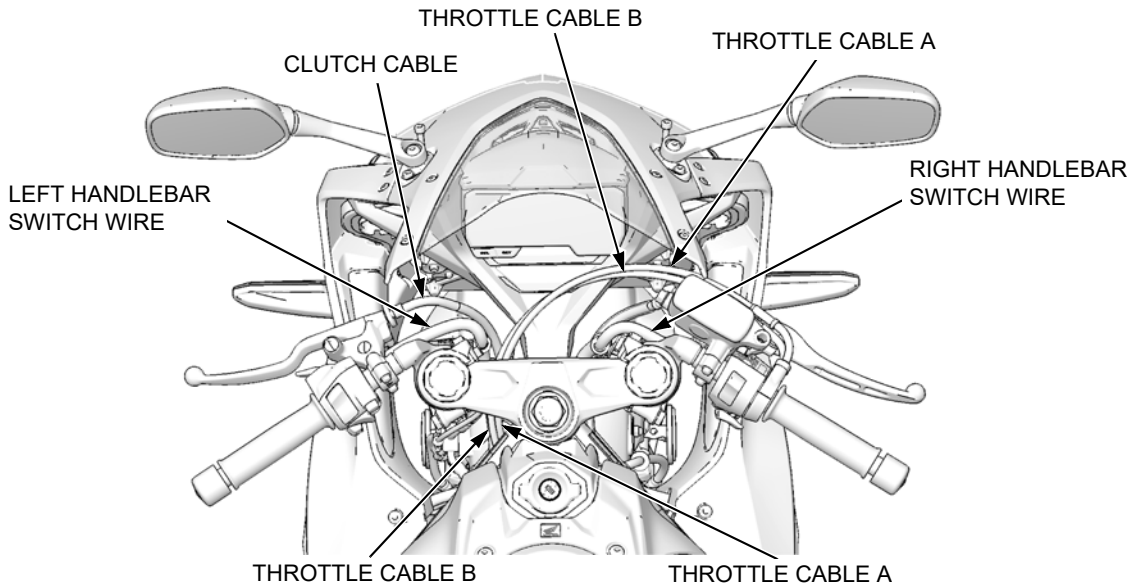
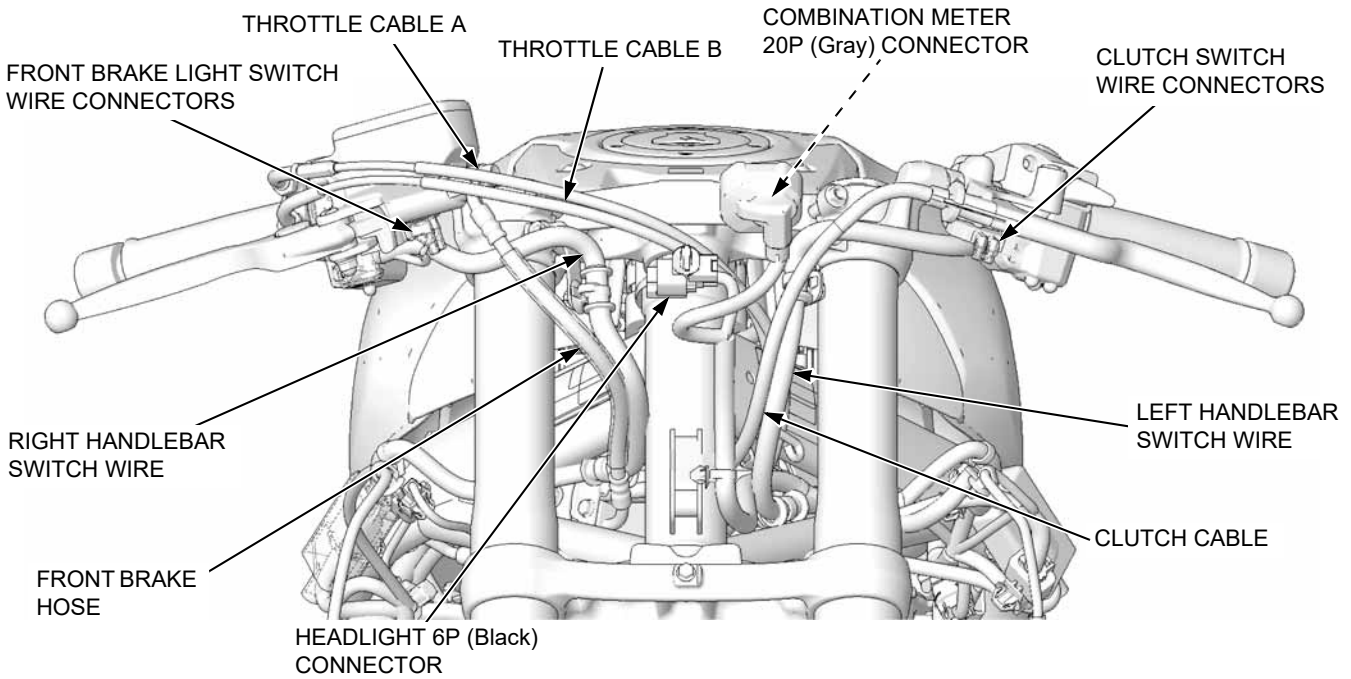
GENERAL INFORMATION

TITLE	TOOL No	TOOL NAME
REAR WHEEL/SUSPENSION	07746-0050600	Bearing remover head, 20 mm
	07GGD-0010100	Bearing remover shaft
	07749-0010000	Driver
	07746-0010300	Attachment, 42 x 47 mm
	07746-0040500	Pilot, 20 mm
	07746-0010800	Attachment, 22 x 24 mm
	07946-1870100	Attachment, 28 x 30 mm
	07746-0010400	Attachment, 52 x 55 mm
	07HMF-HC00100	Spherical Bearing Installer 10 x 19
	07965-GM00100	Crank assembly collar
	07949-3710001	Driver, 15 x 280L
	07746-0010700	Attachment, 24 x 26 mm
	07ZMD-MBW0200	Attachment, 37 mm
	07746-0040700	Pilot 30 mm
	07HMC-MR70100	Remover attachment, 28 mm
	07746-0040400	Pilot 17 mm
	07746-0041100	Pilot, 28 mm
	07JAD-PH80400	Pilot, 28 mm
ANTI-LOCK BRAKE SYSTEM (ABS)	070MZ-0010300	SCS short connector
	07ZAJ-RDJA110	Test probe
LIGHT/METERS/SWITCHES	07ZAJ-RDJA110	Test probe
IMMOBILIZER SYSTEM (HISS)	070MZ-0010300	SCS short connector
	07XMZ-MBW0101	Inspection adaptor
	070MZ-MGE0100	Test harness adaptor
	07ZAJ-RDJA110	Test probe

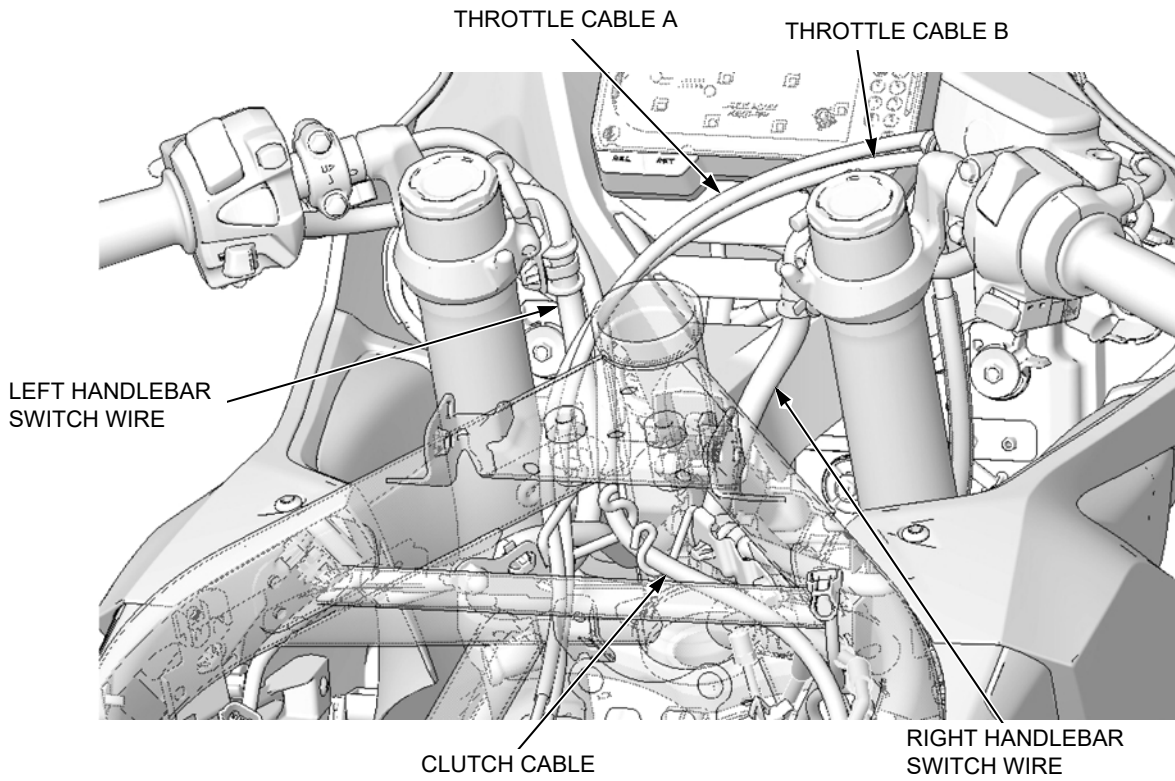
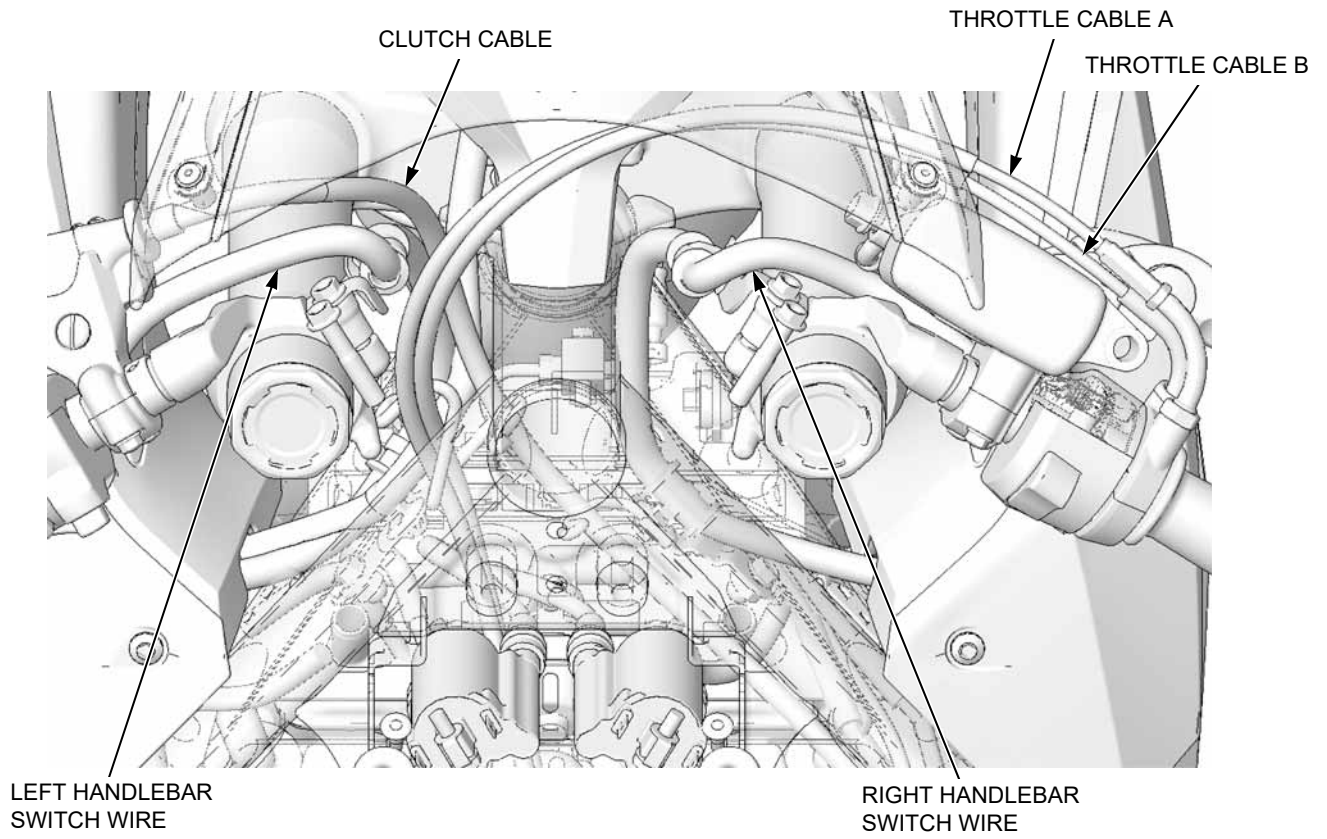
GENERAL INFORMATION

CABLE & HARNESS ROUTING

CBR650RA:



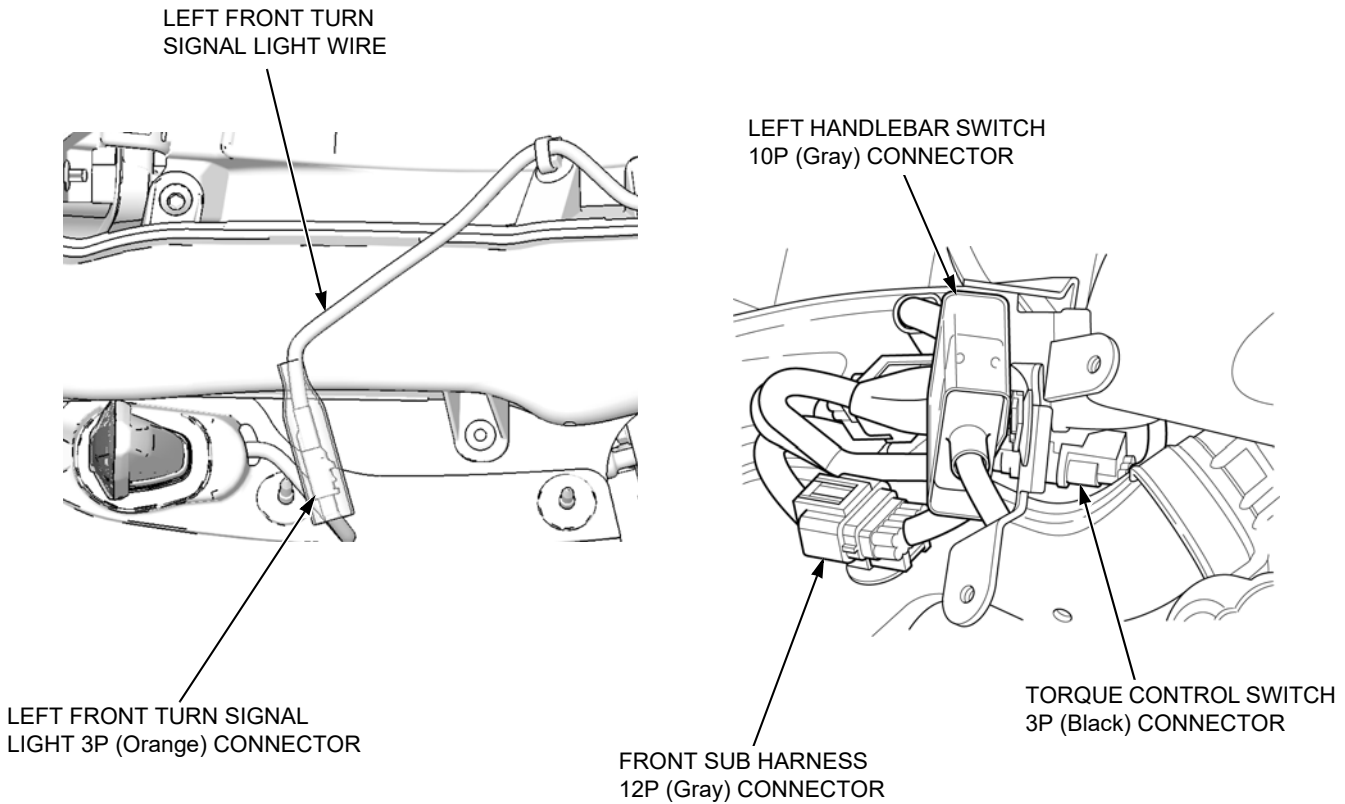
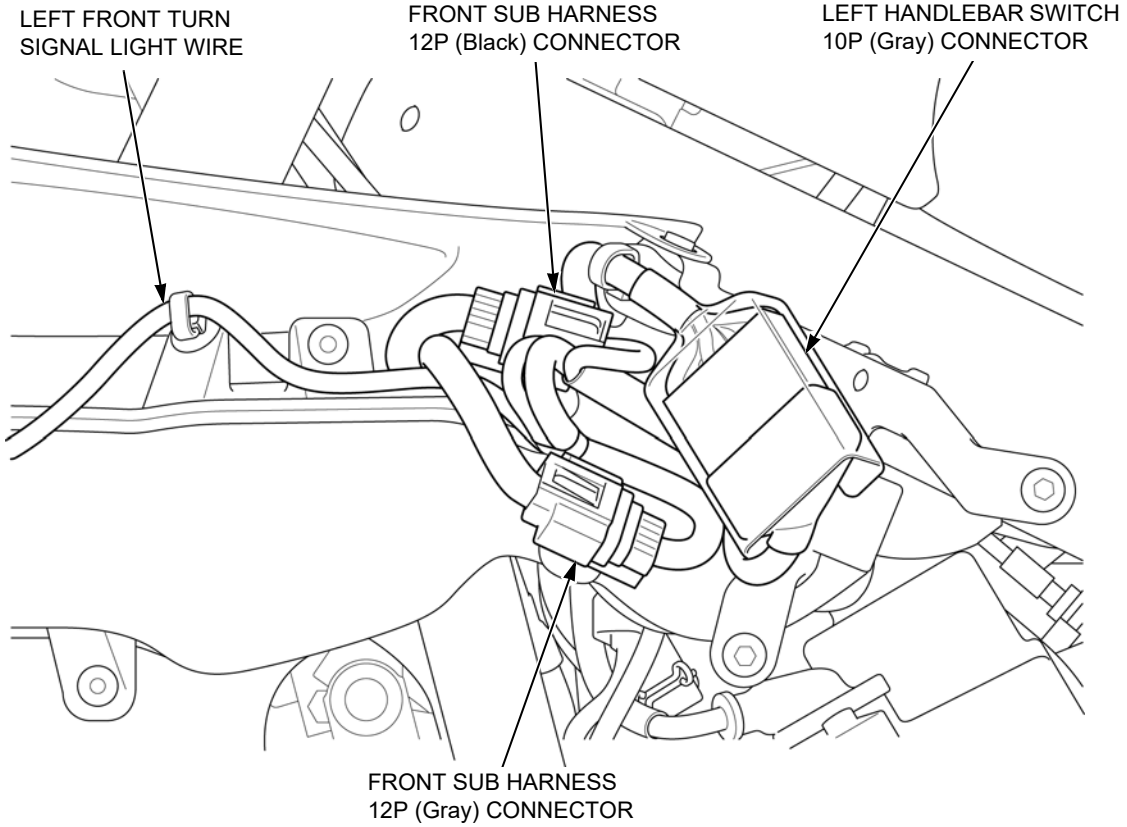
CBR650RA:



GENERAL INFORMATION

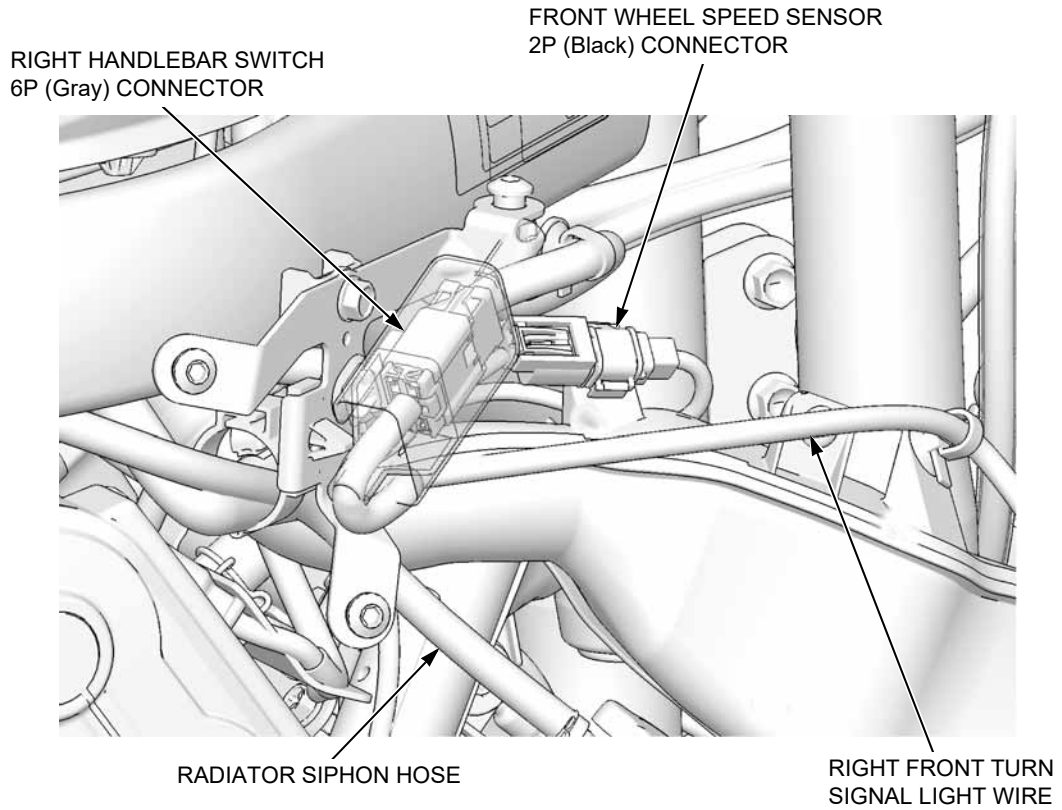
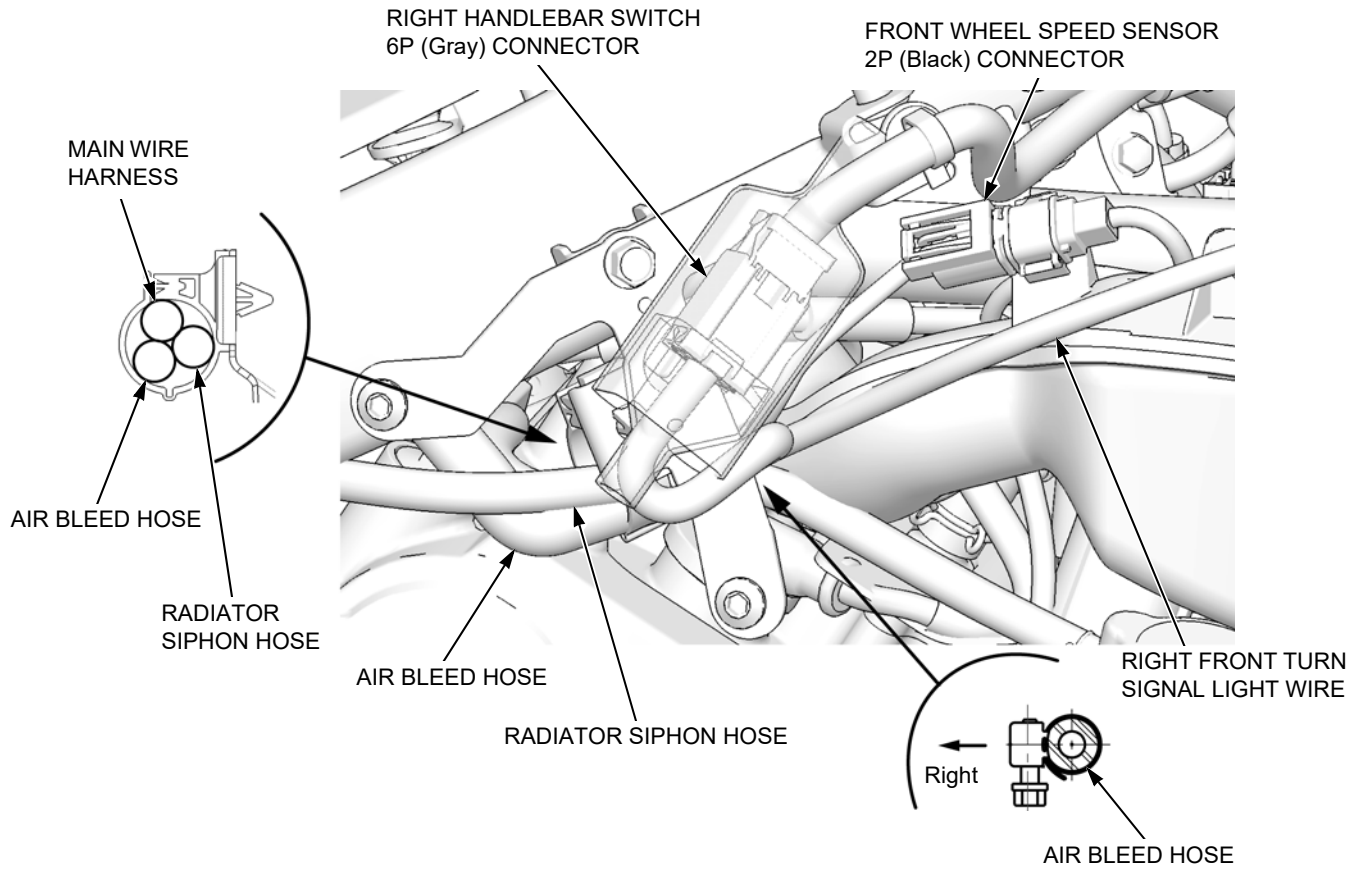
CBR650RA:

LEFT SIDE:



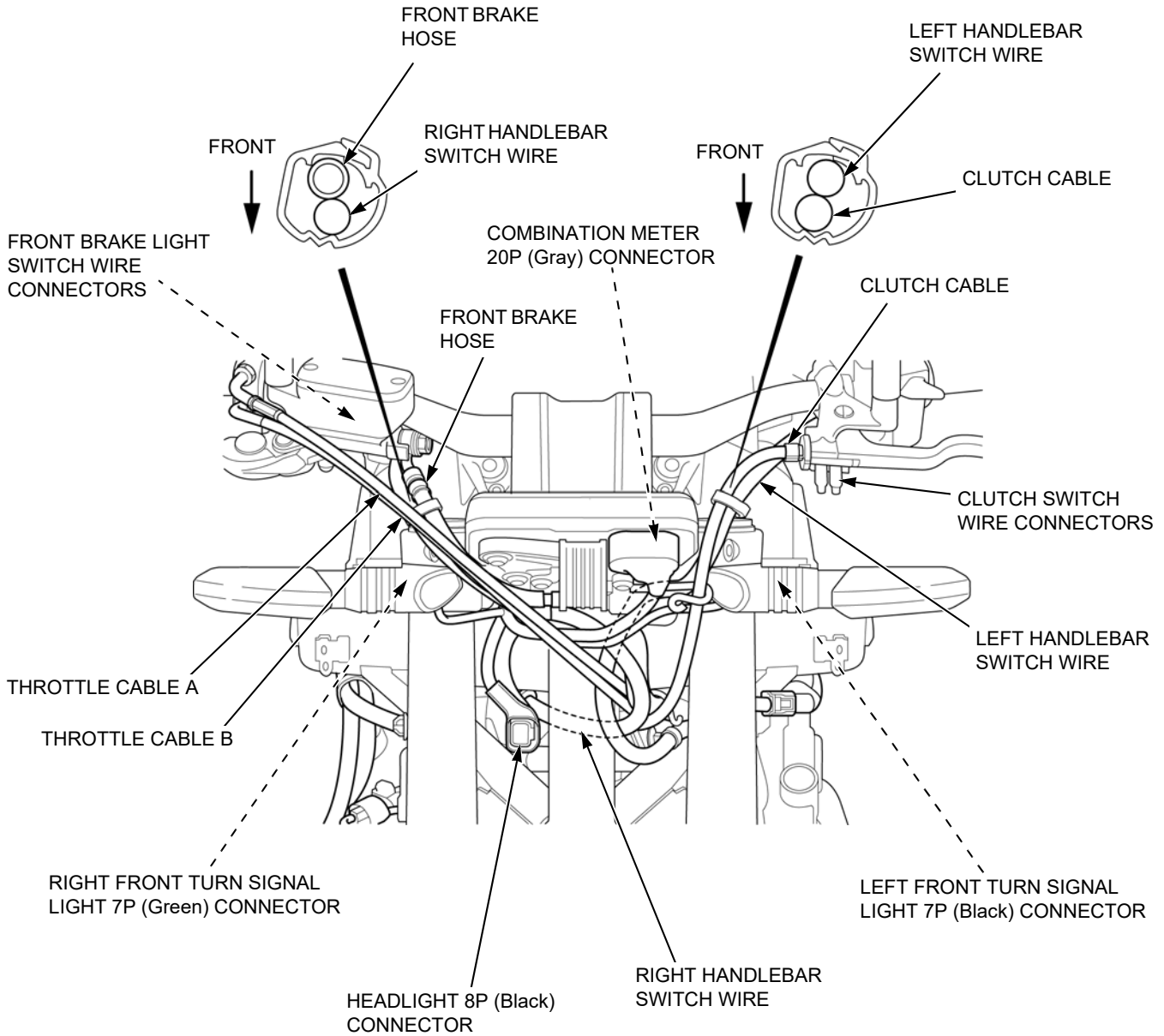
CBR650RA:

RIGHT SIDE:

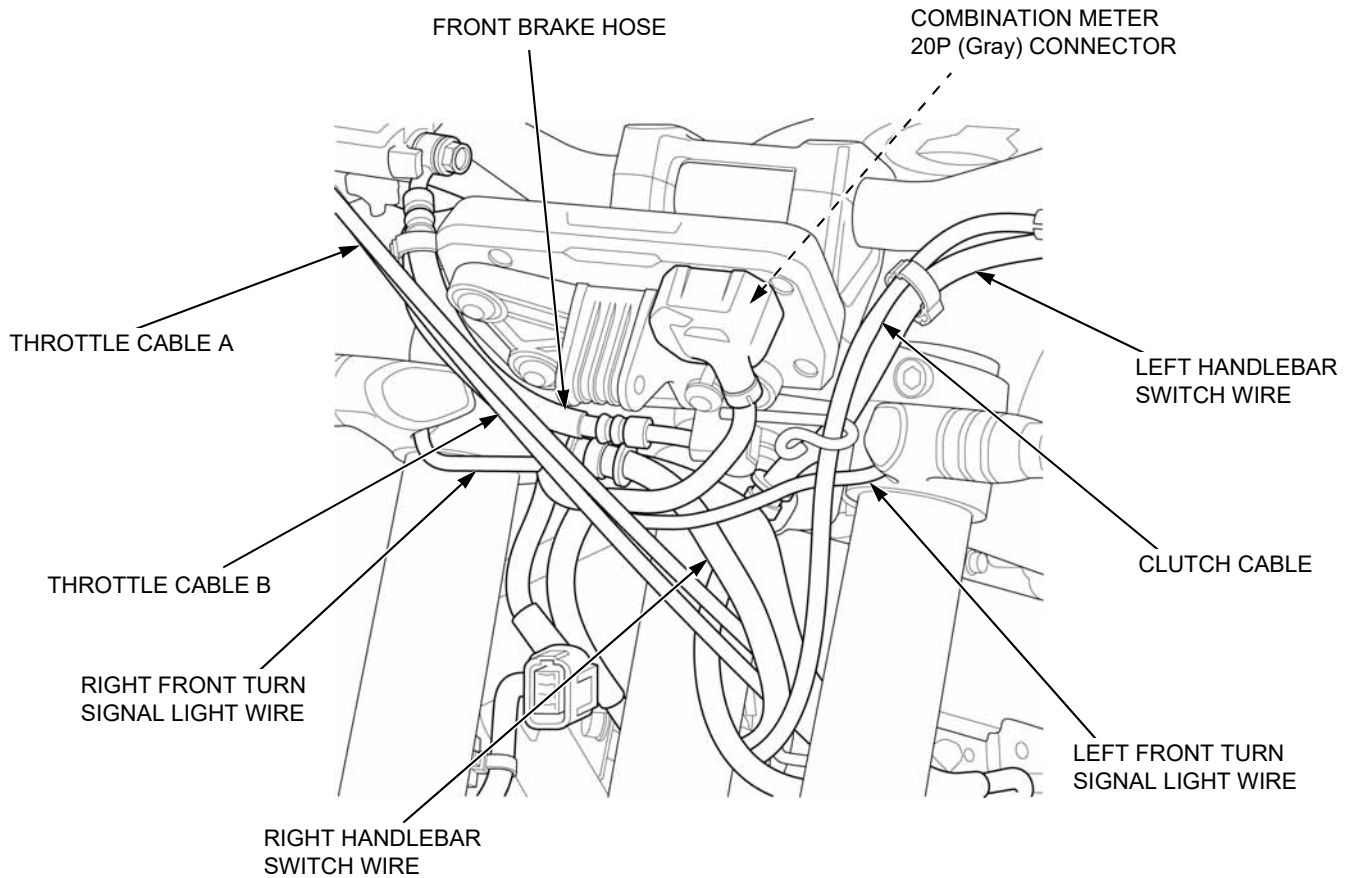
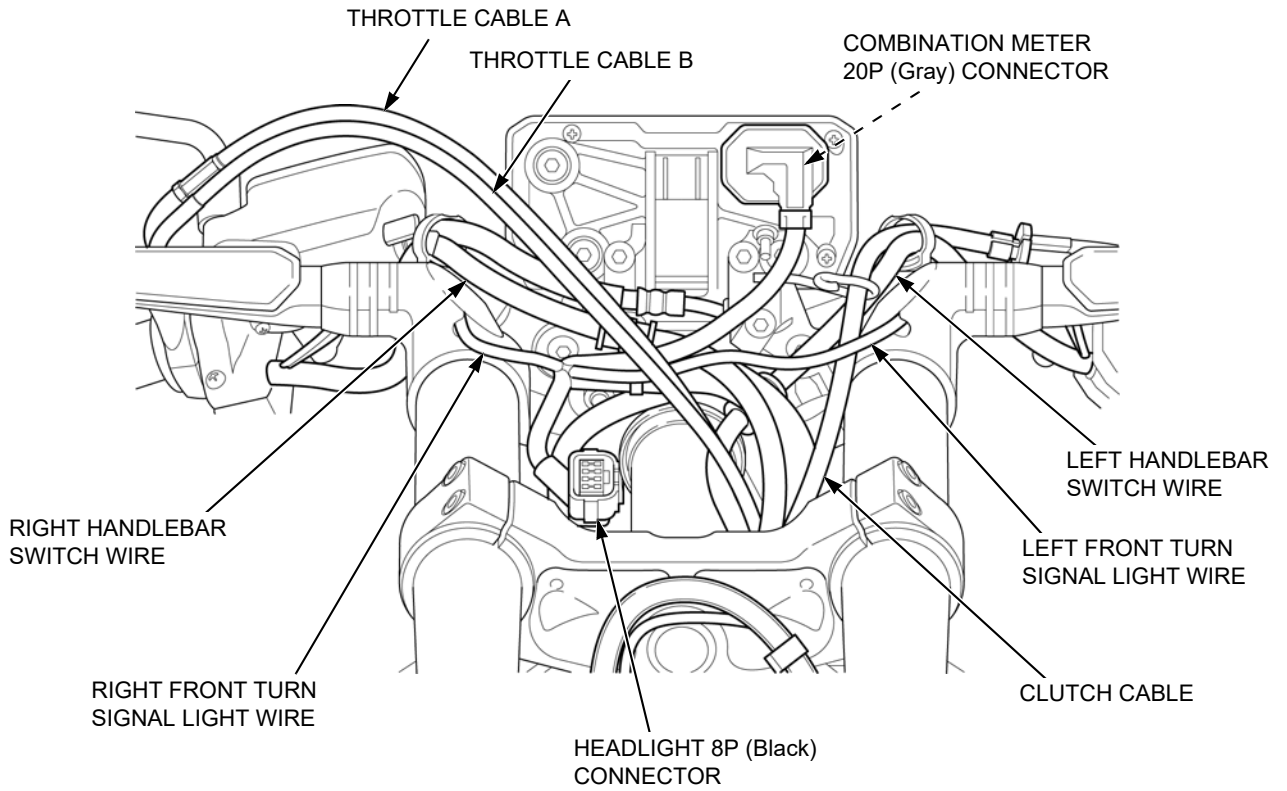


GENERAL INFORMATION

CB650RA:

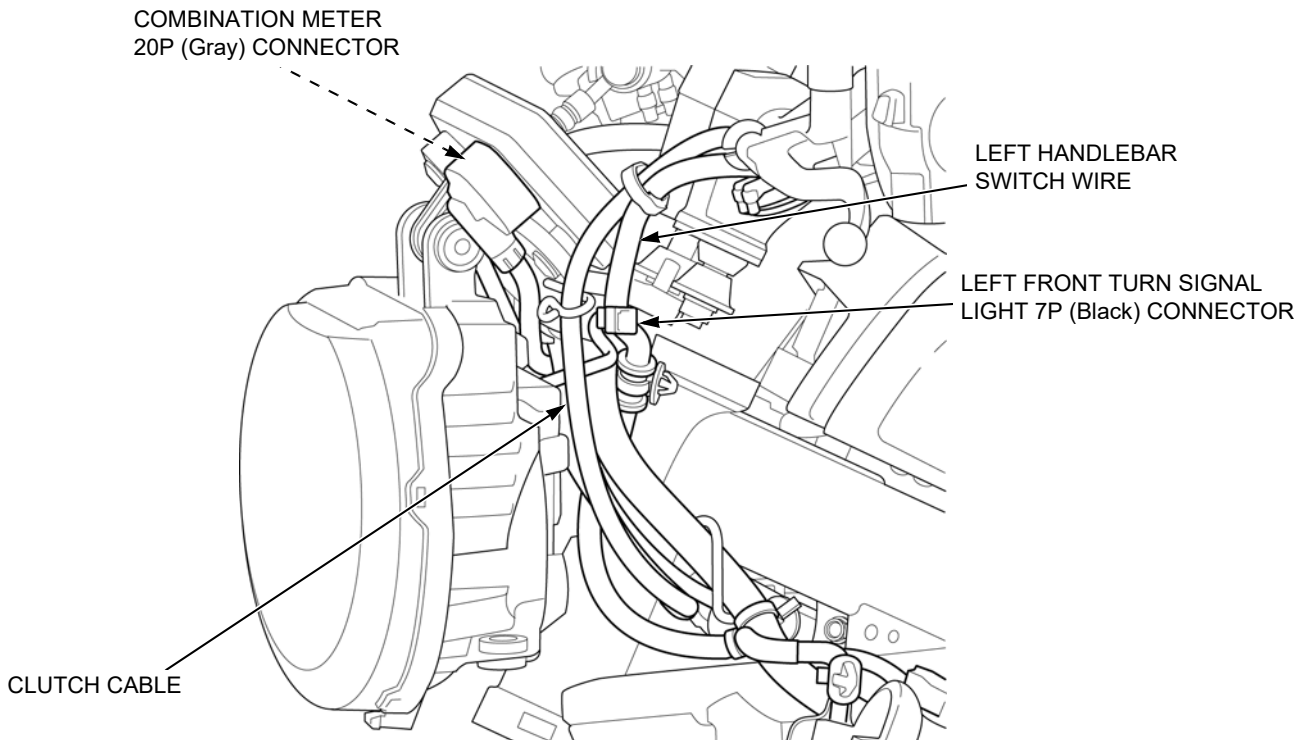
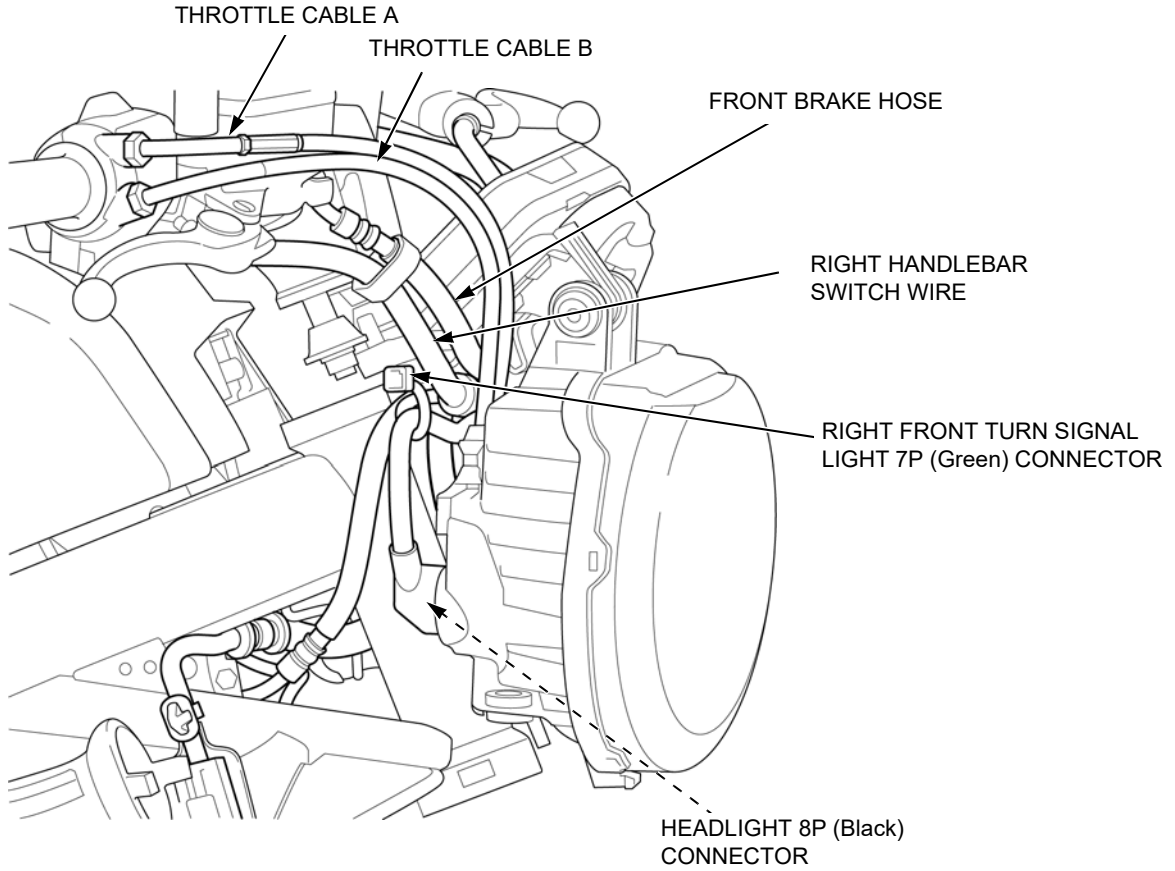


CB650RA:

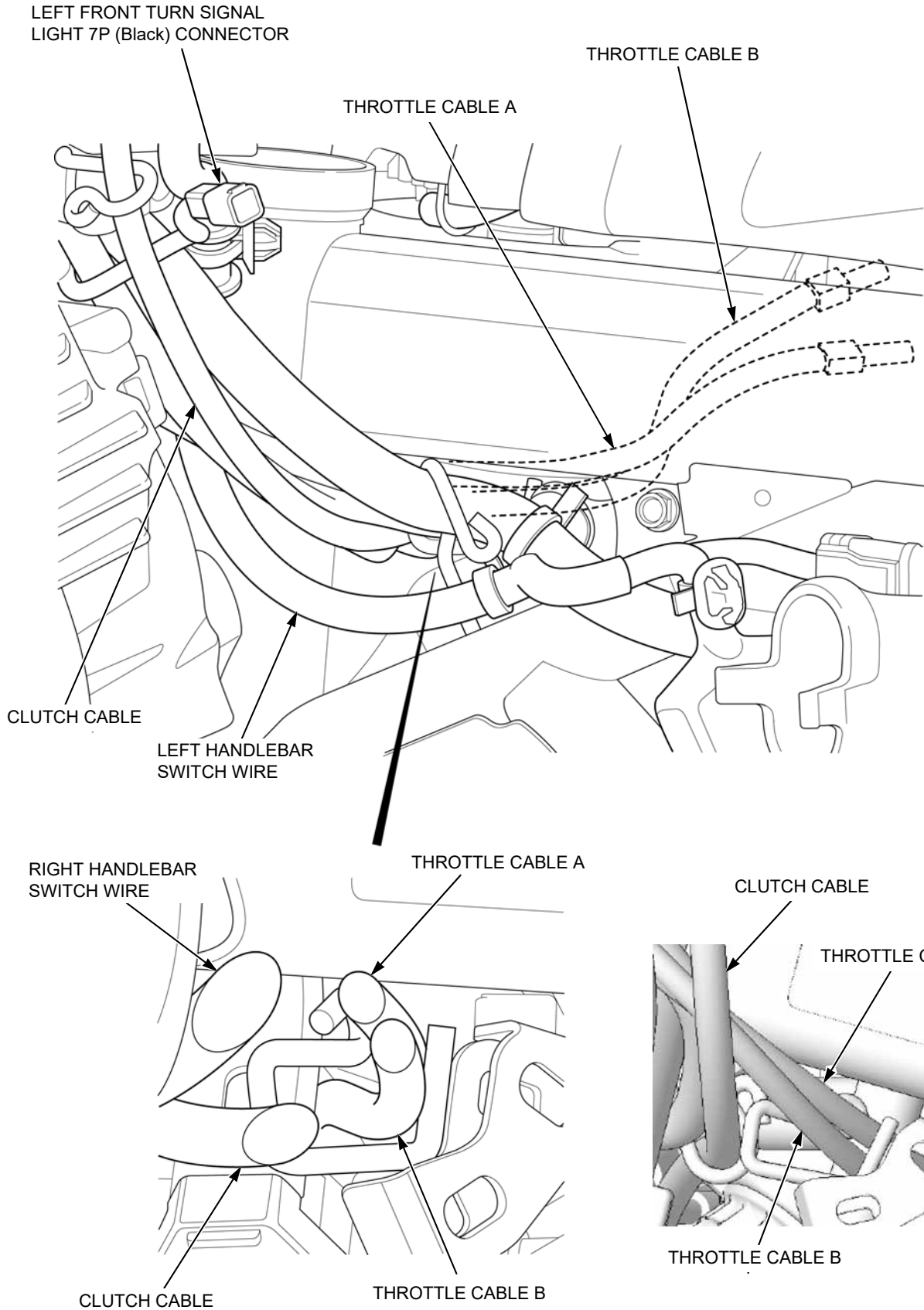


GENERAL INFORMATION

CB650RA:



CB650RA:

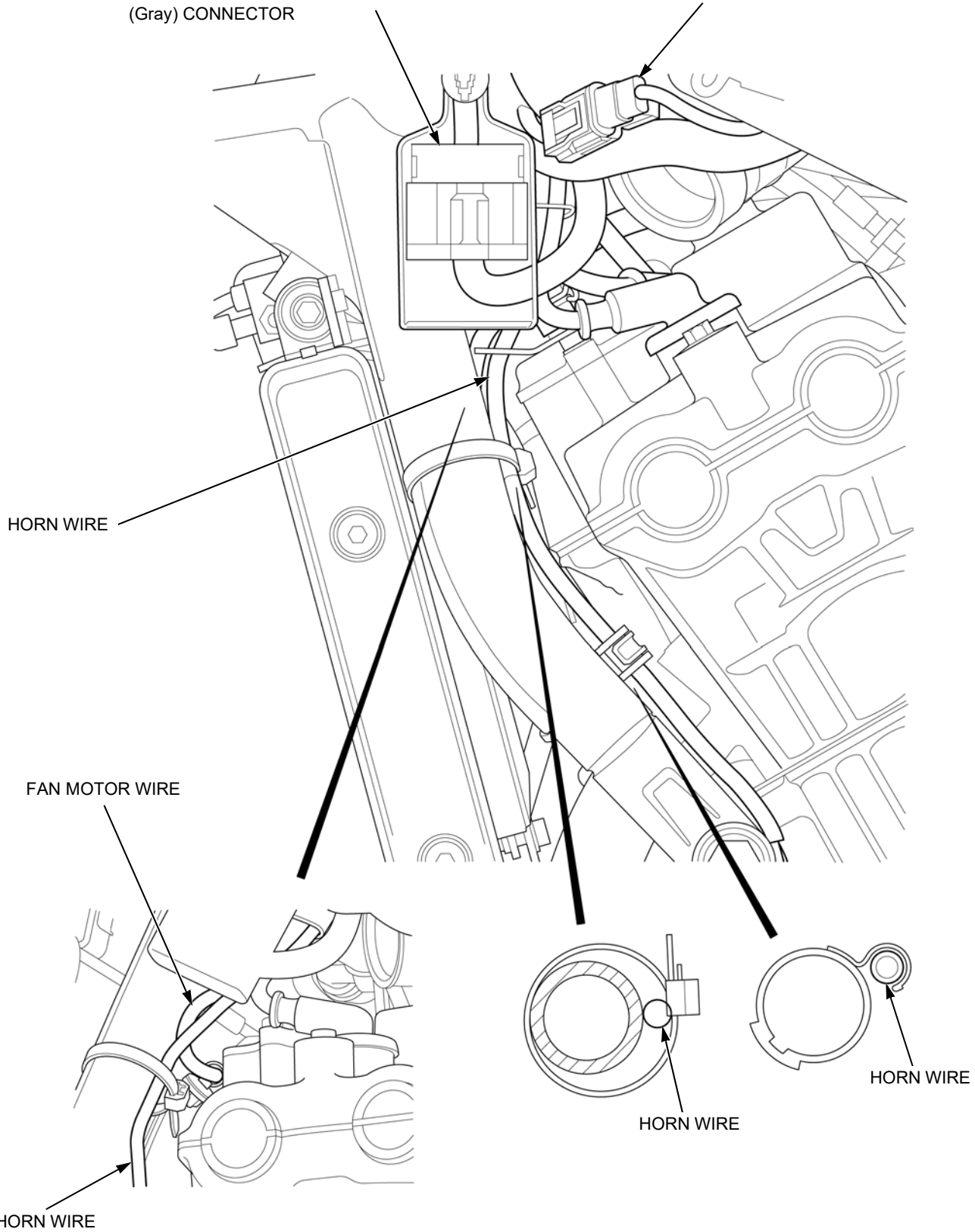


GENERAL INFORMATION

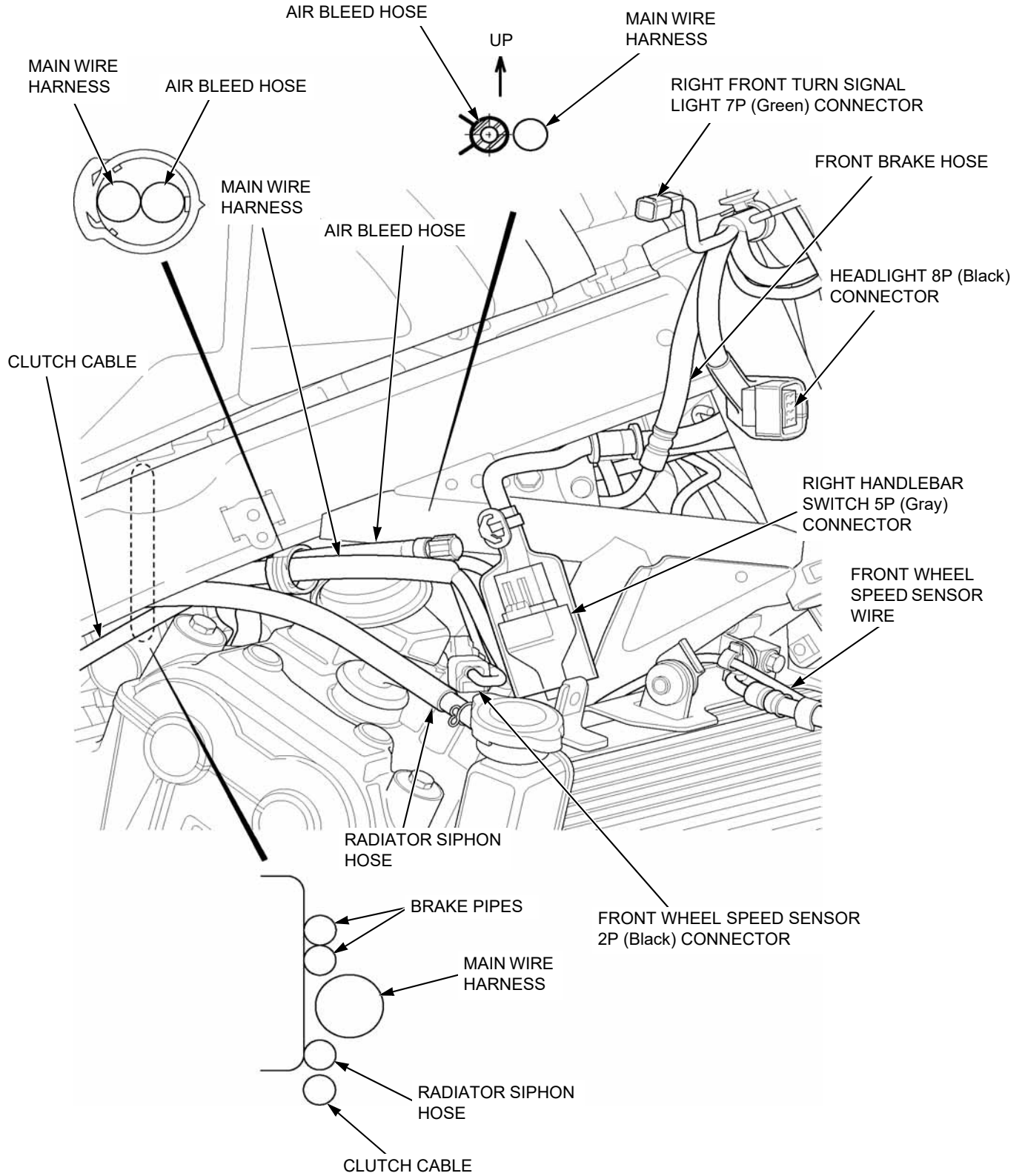
CB650RA:

Except IN model: LEFT HANDLEBAR SWITCH 14P (Gray) CONNECTOR
IN model: LEFT HANDLEBAR SWITCH 10P (Gray) CONNECTOR

TORQUE CONTROL SWITCH 3P (Black) CONNECTOR



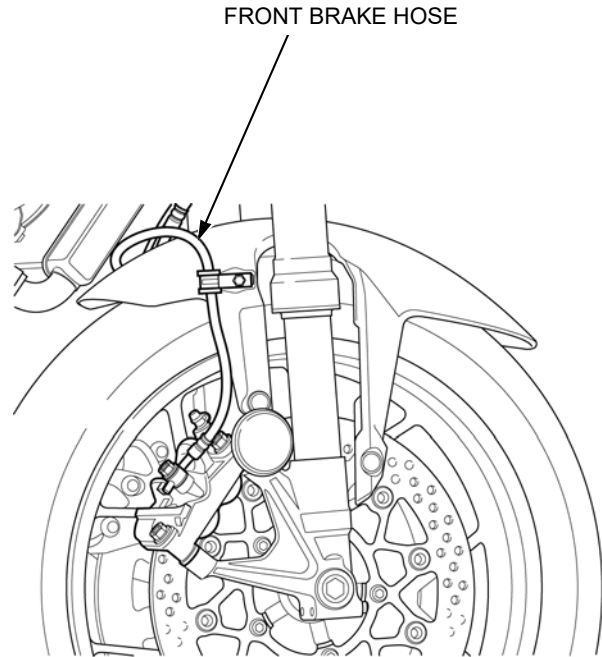
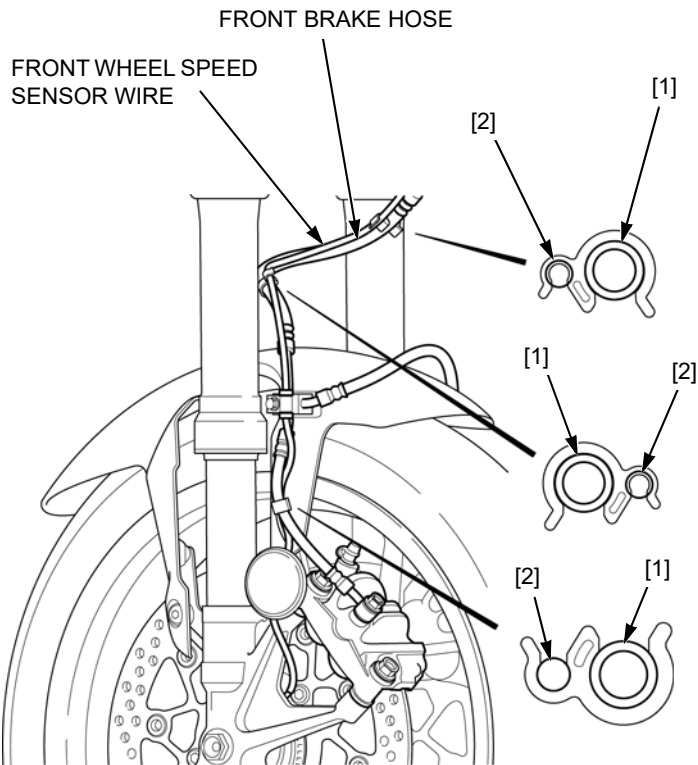
CB650RA:



GENERAL INFORMATION

CBR650RA, CB650RA:

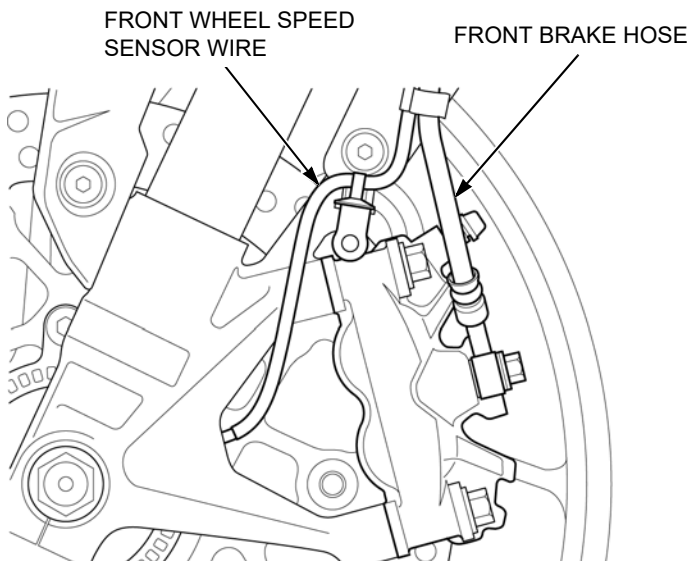
ED model shown:



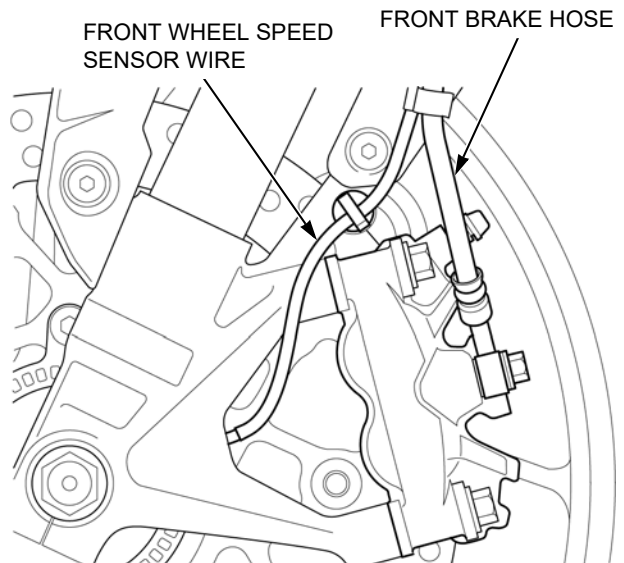
[1]: FRONT BRAKE HOSE

[2]: FRONT WHEEL SPEED SENSOR WIRE

Except TH, IITH, IN, BR, IIBR models:

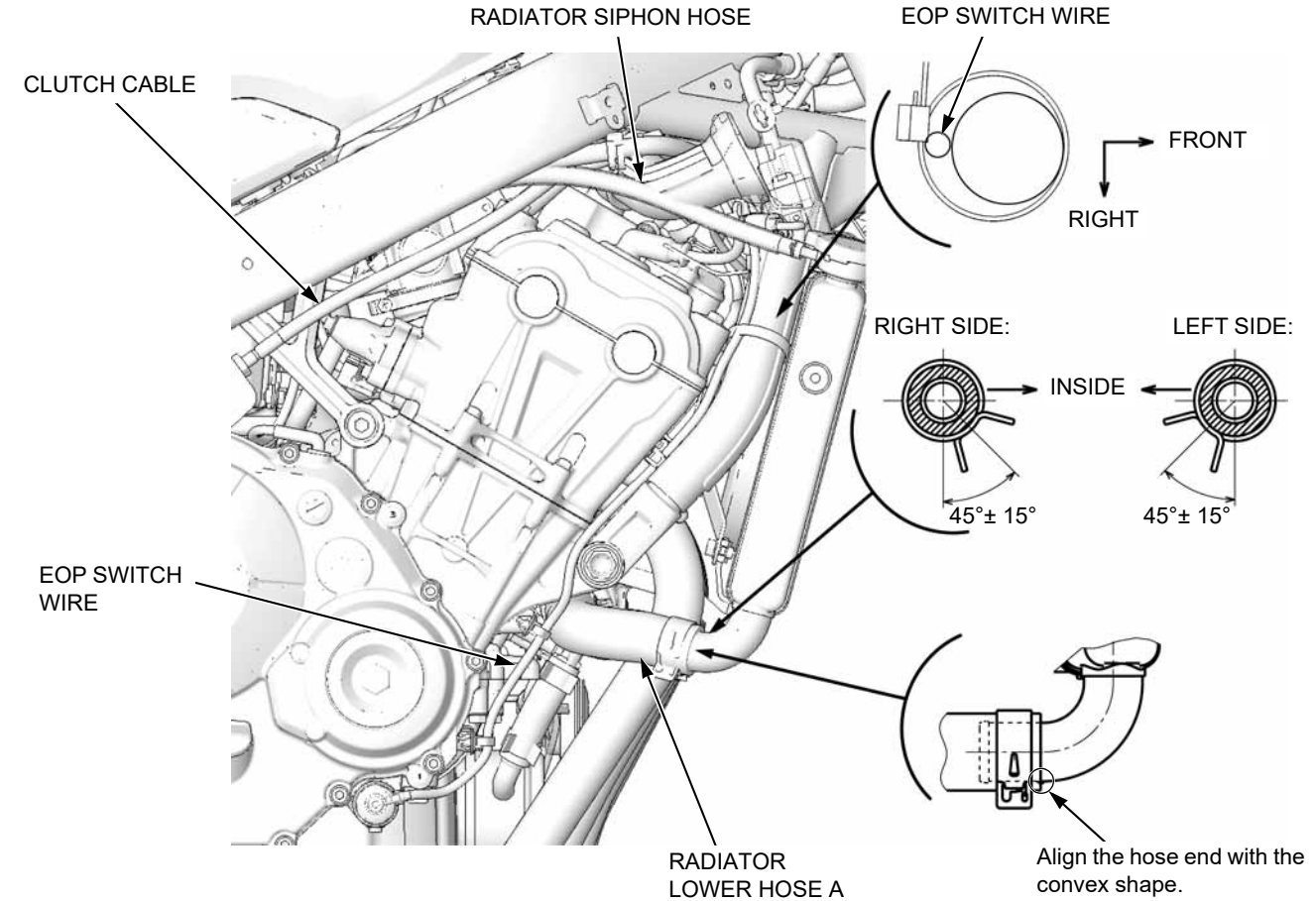
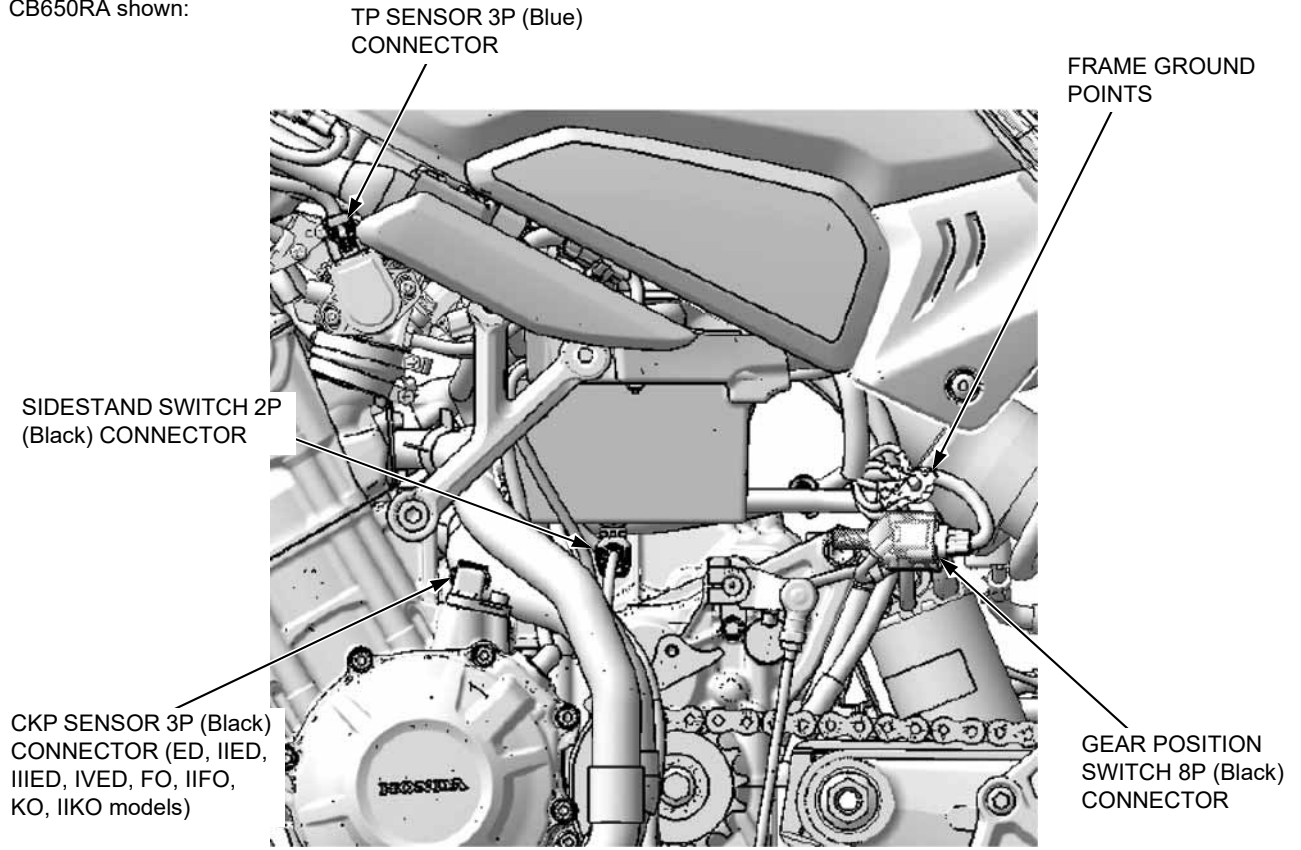


TH, IITH, IN, BR, IIBR models:



CBR650RA, CB650RA:

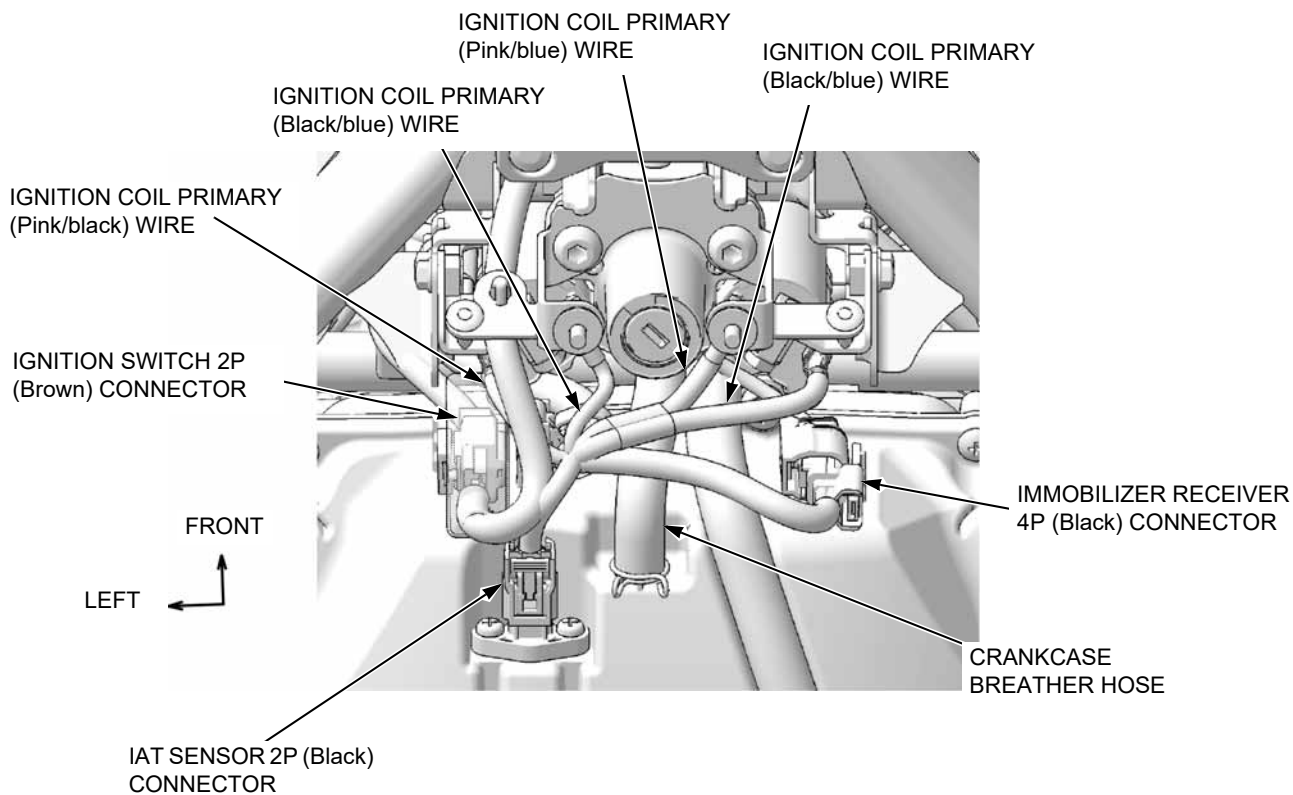
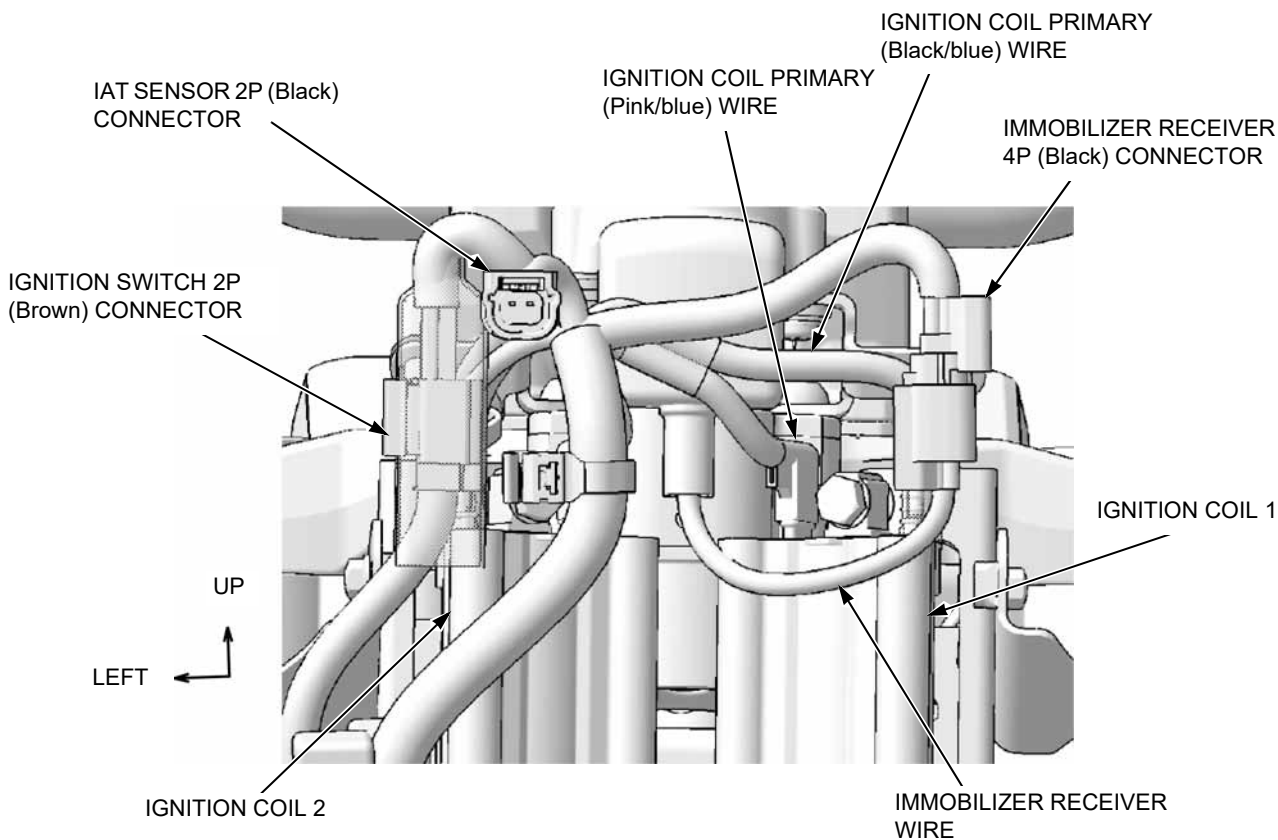
CB650RA shown:



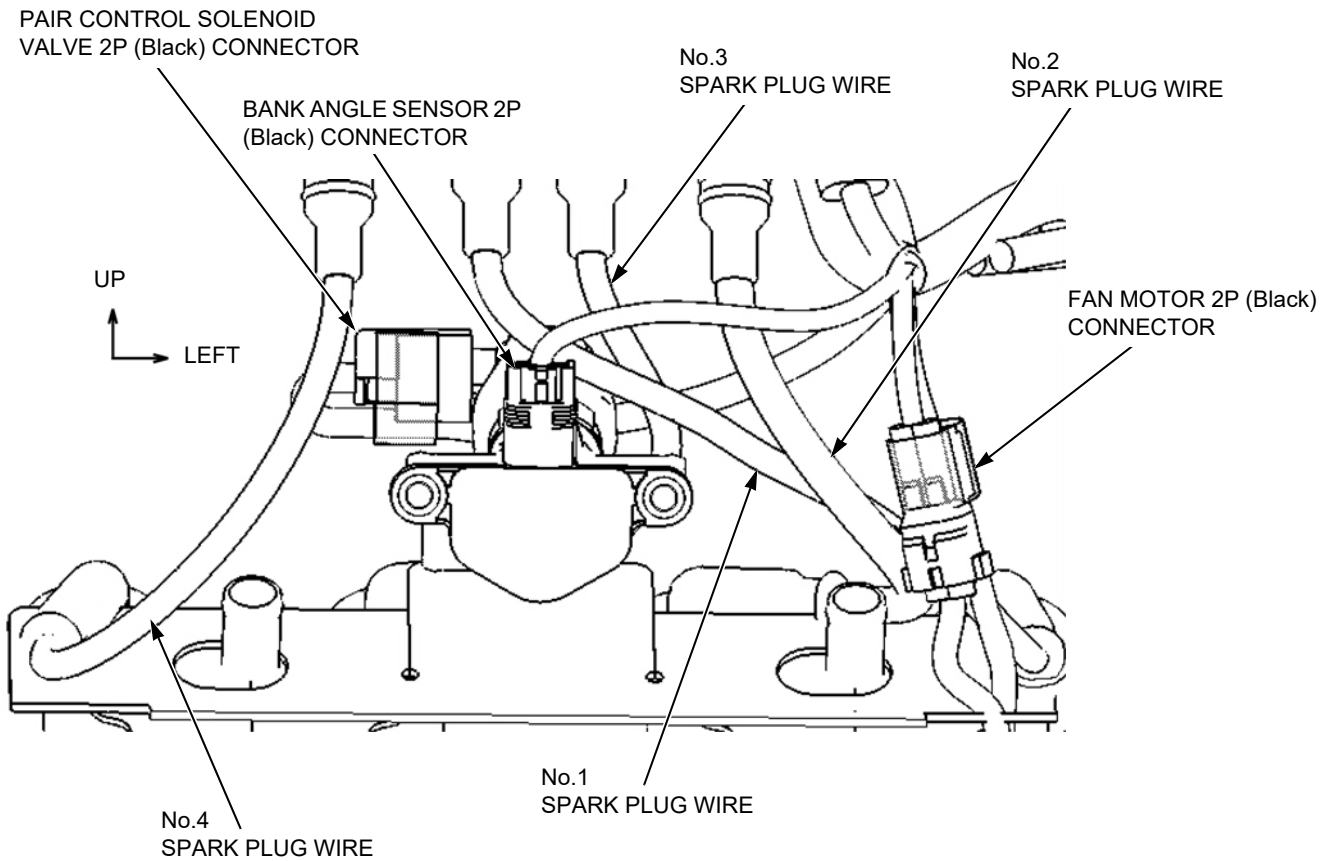
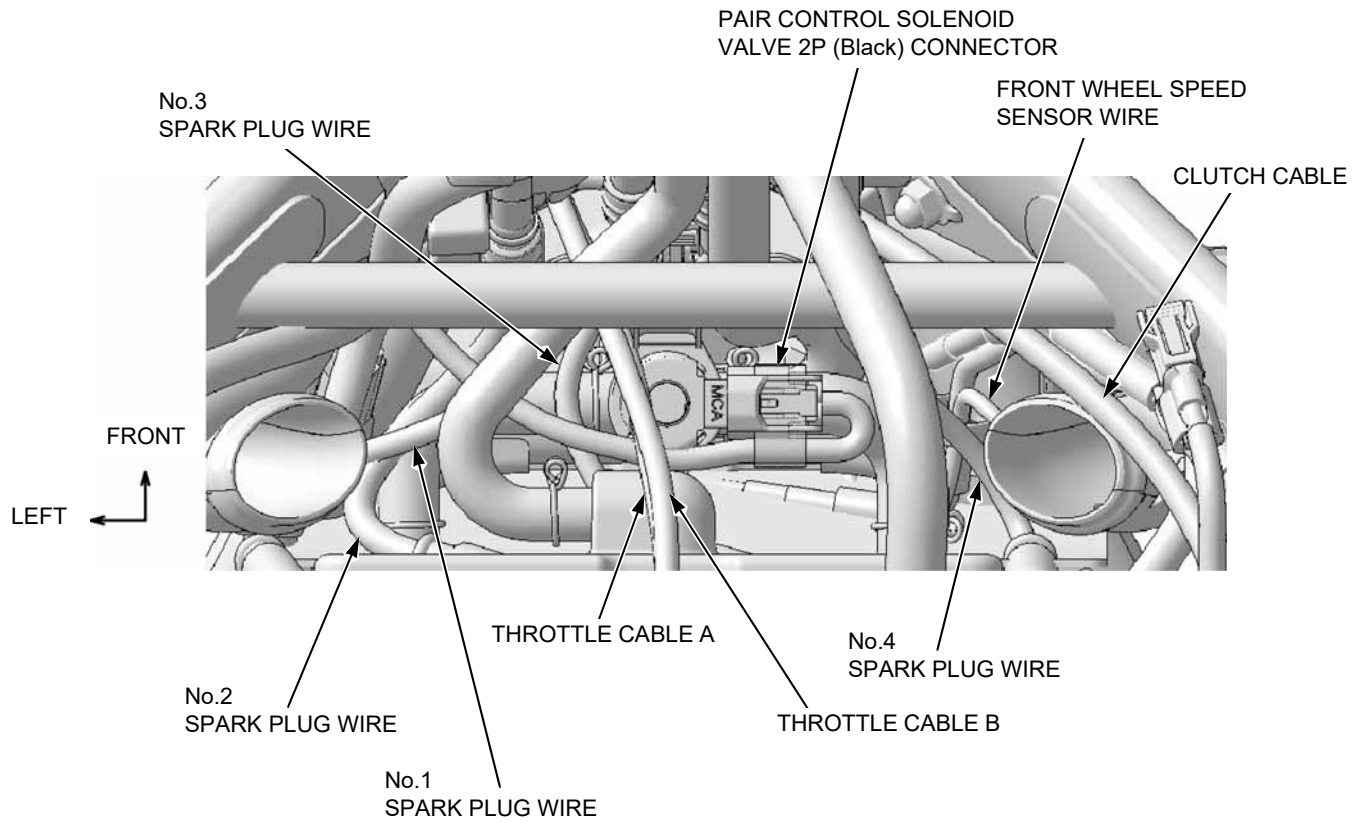
GENERAL INFORMATION

CBR650RA, CB650RA:

CB650RA shown:

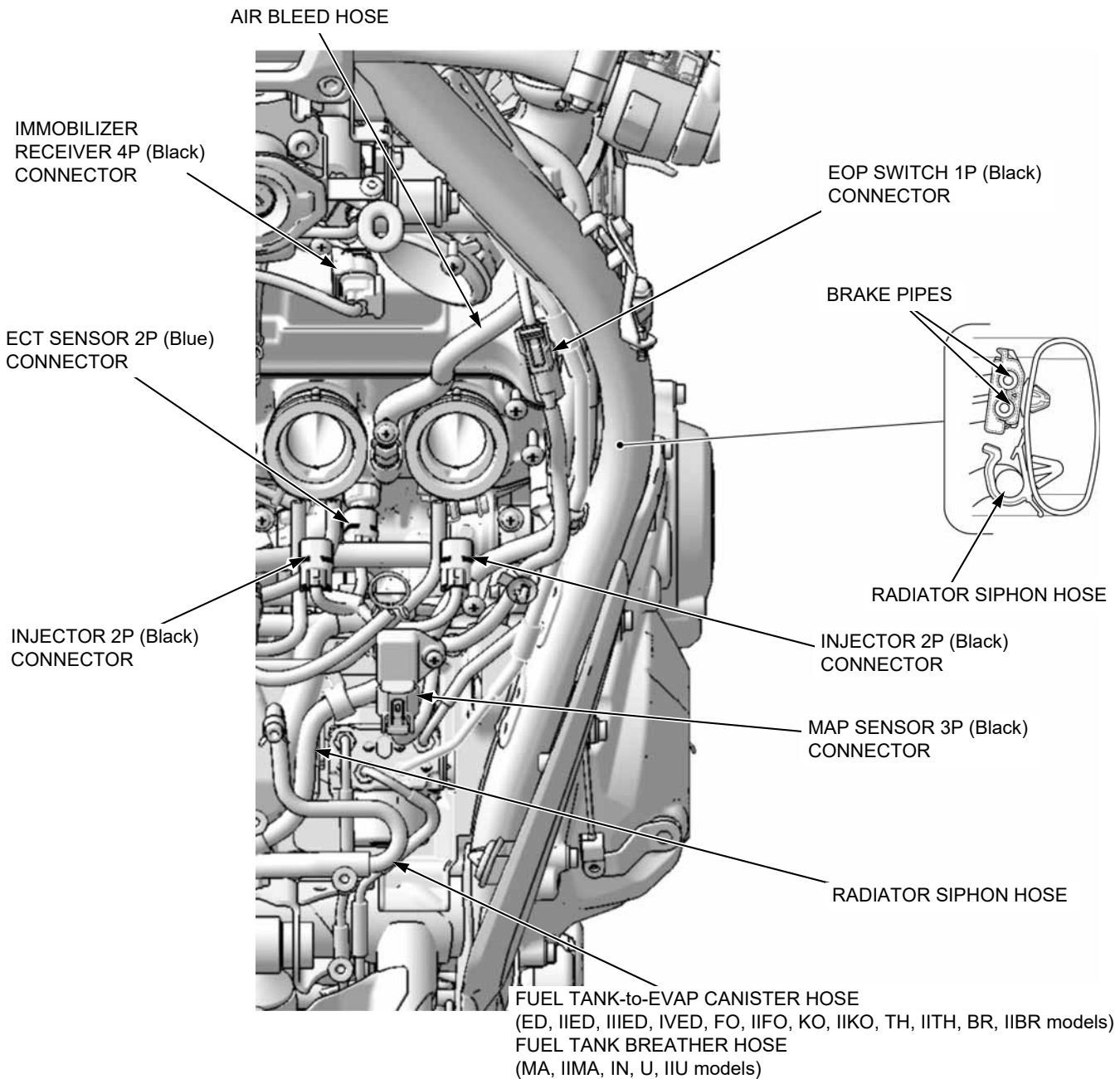
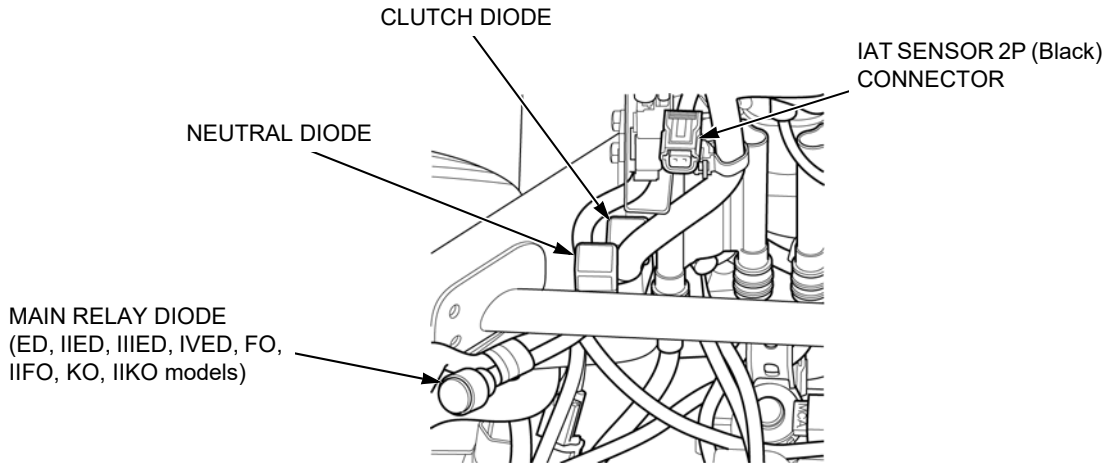


CBR650RA, CB650RA:



GENERAL INFORMATION

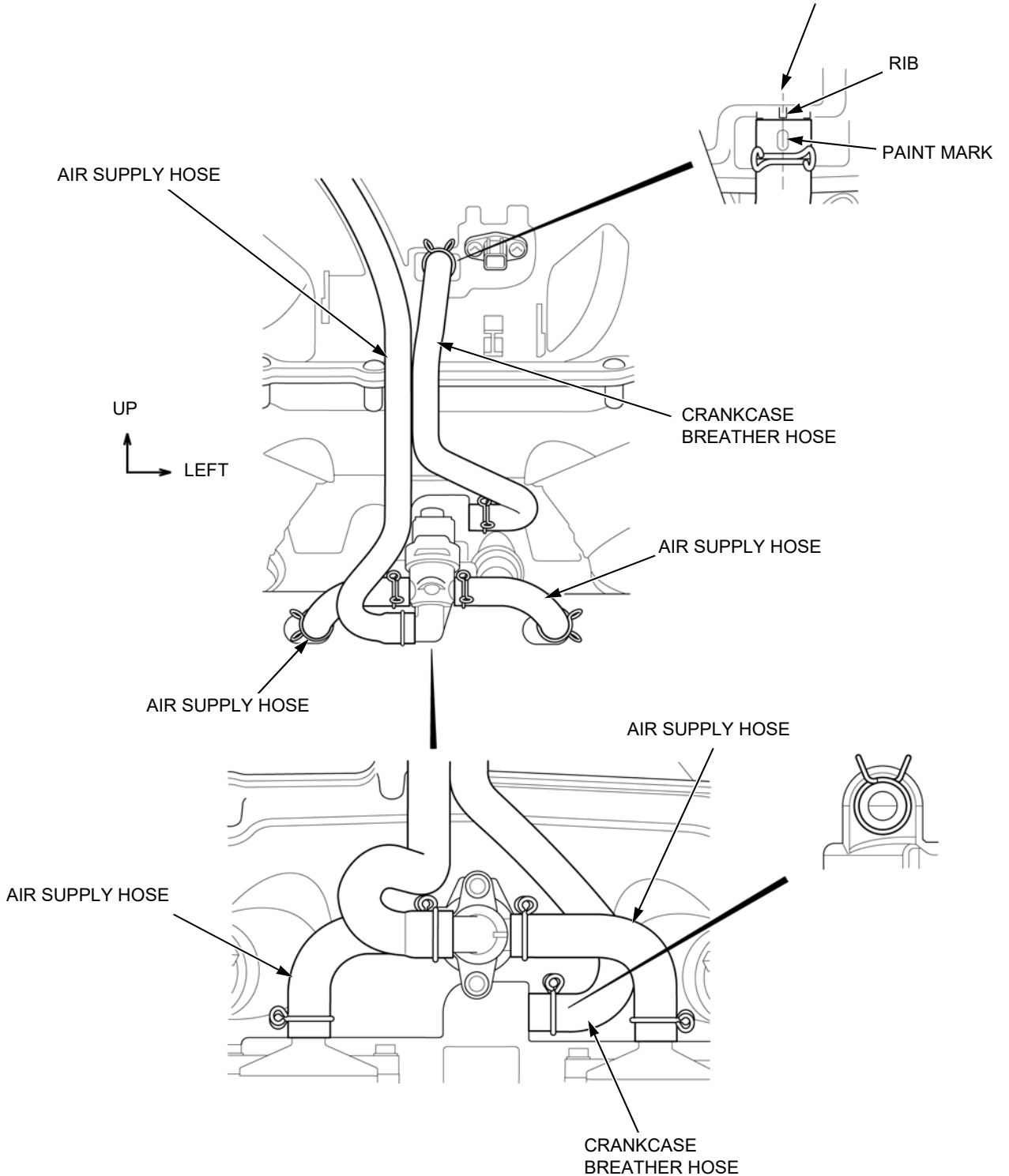
CBR650RA, CB650RA:



CBR650RA, CB650RA:

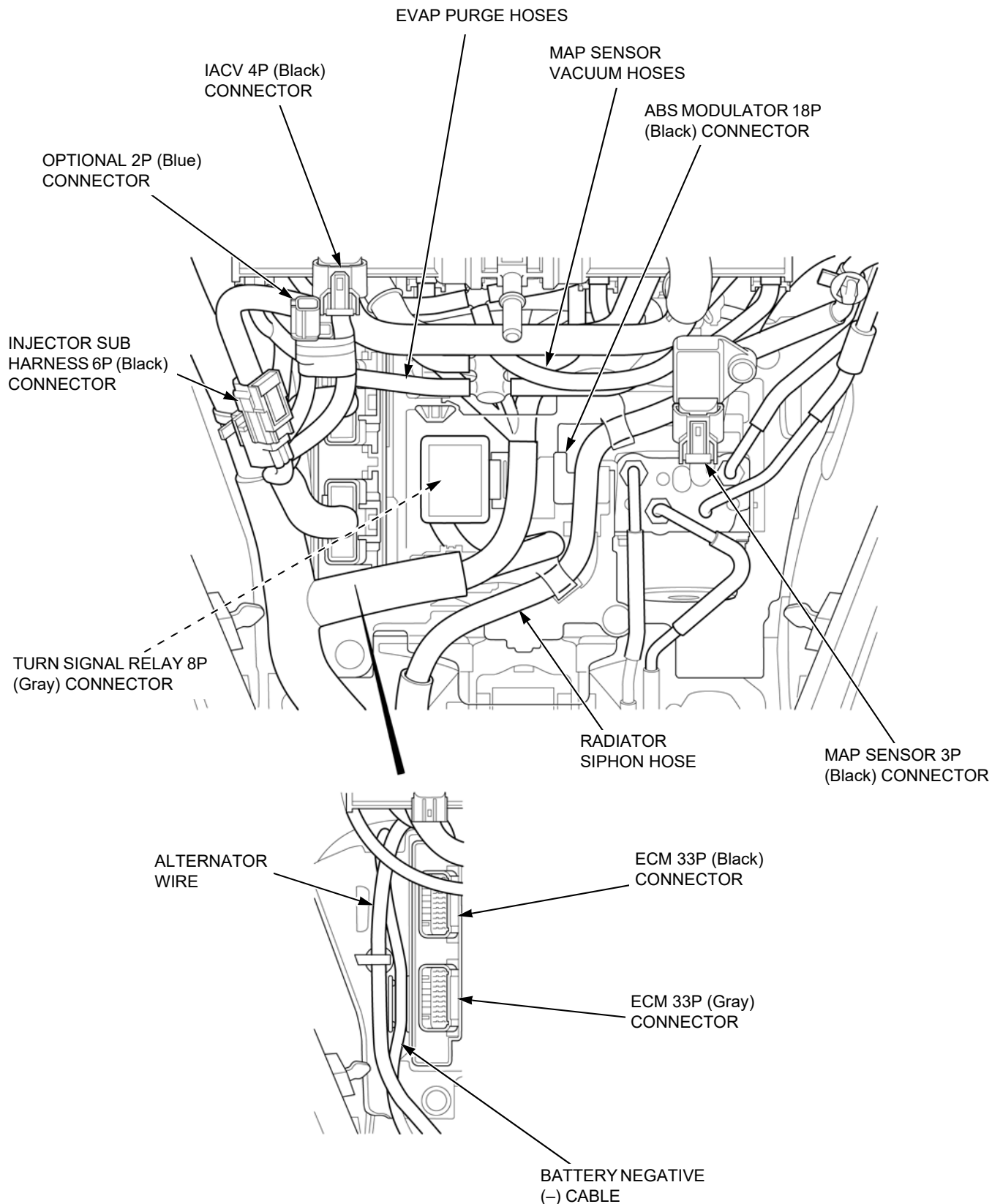
CRANKCASE BREATHER HOSE

- Connect the hose to the air cleaner lid until it is fully seated
- Align the paint mark of the hose with the center of the air cleaner lid rib

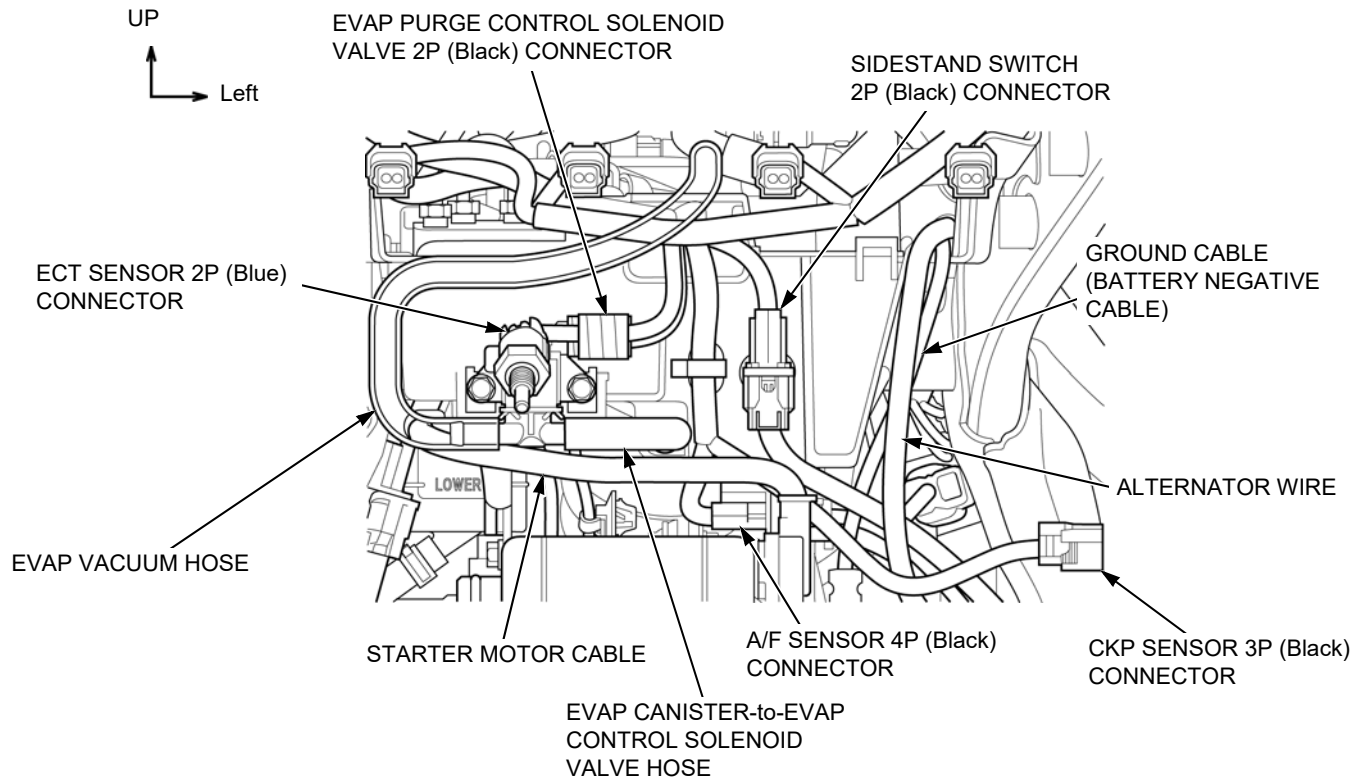


GENERAL INFORMATION

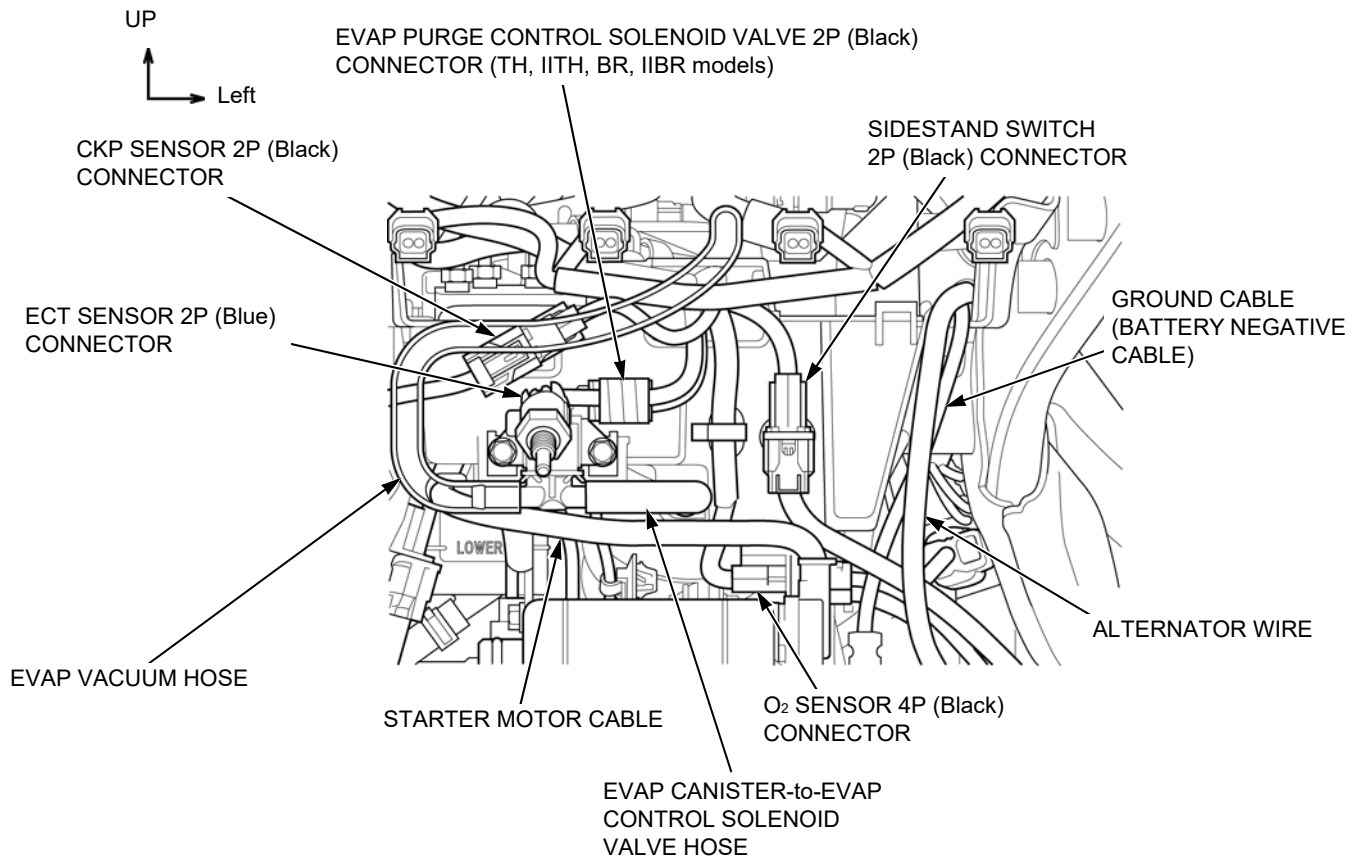
CBR650RA, CB650RA:



CBR650RA, CB650RA (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models):

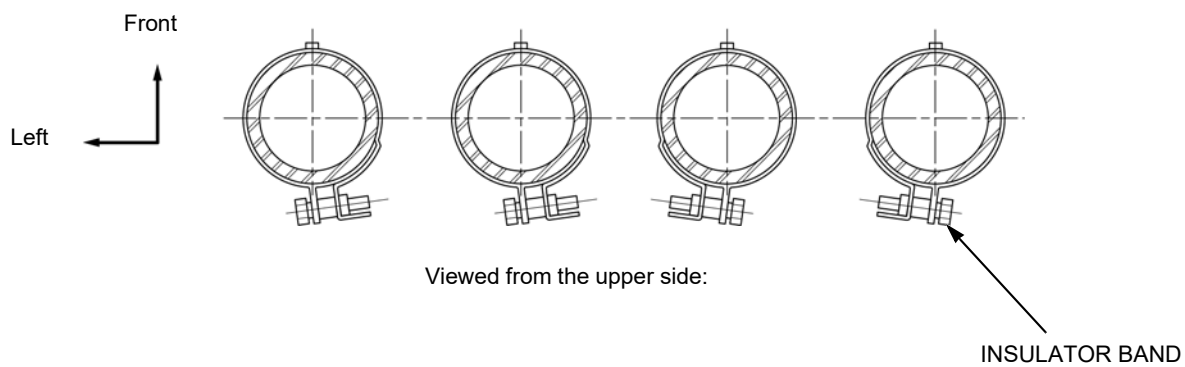
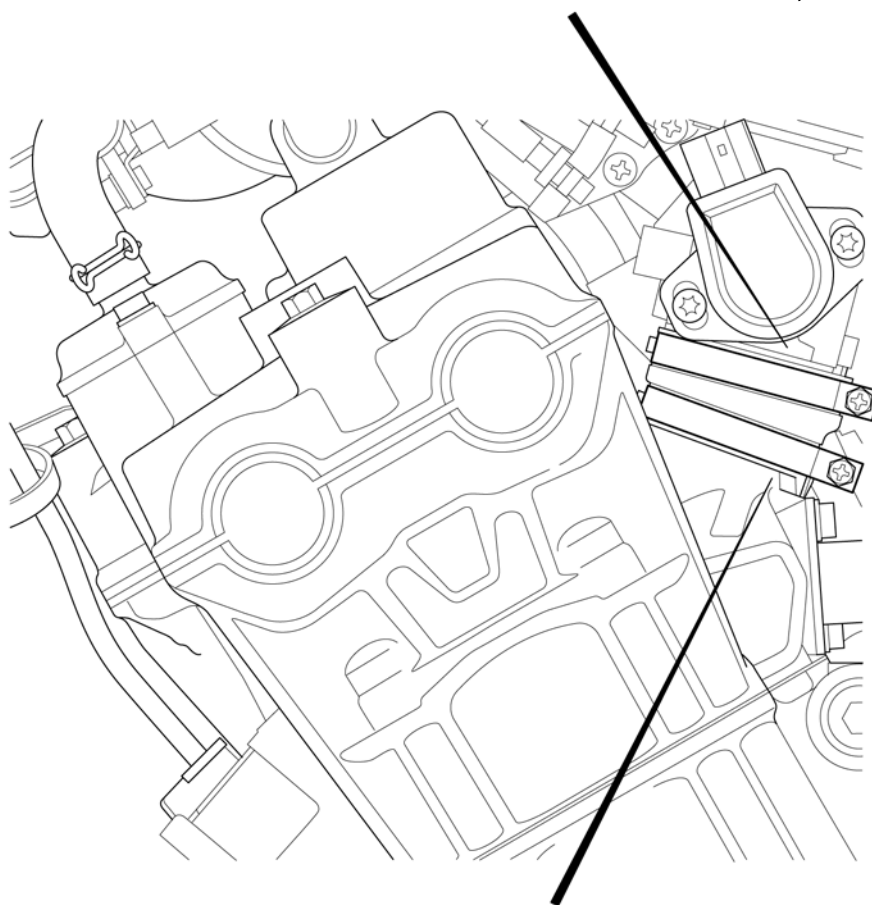
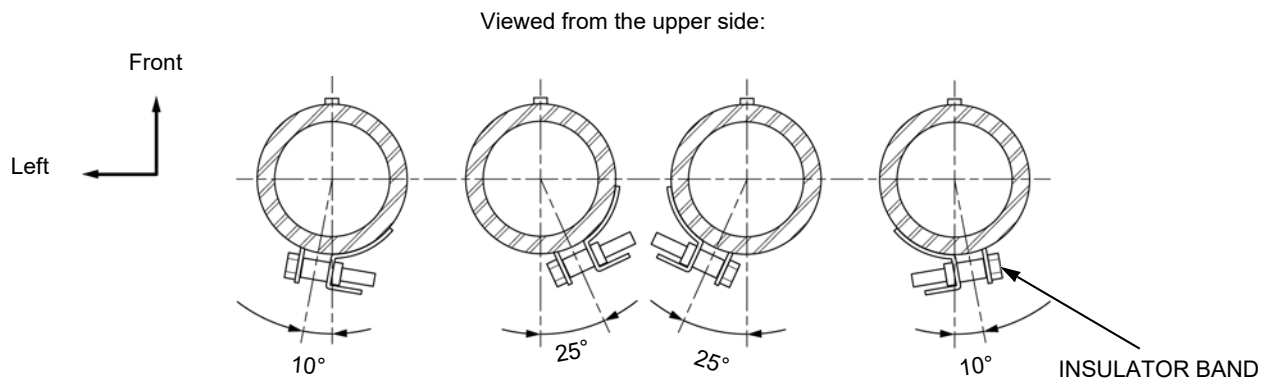


CBR650RA, CB650RA (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models):

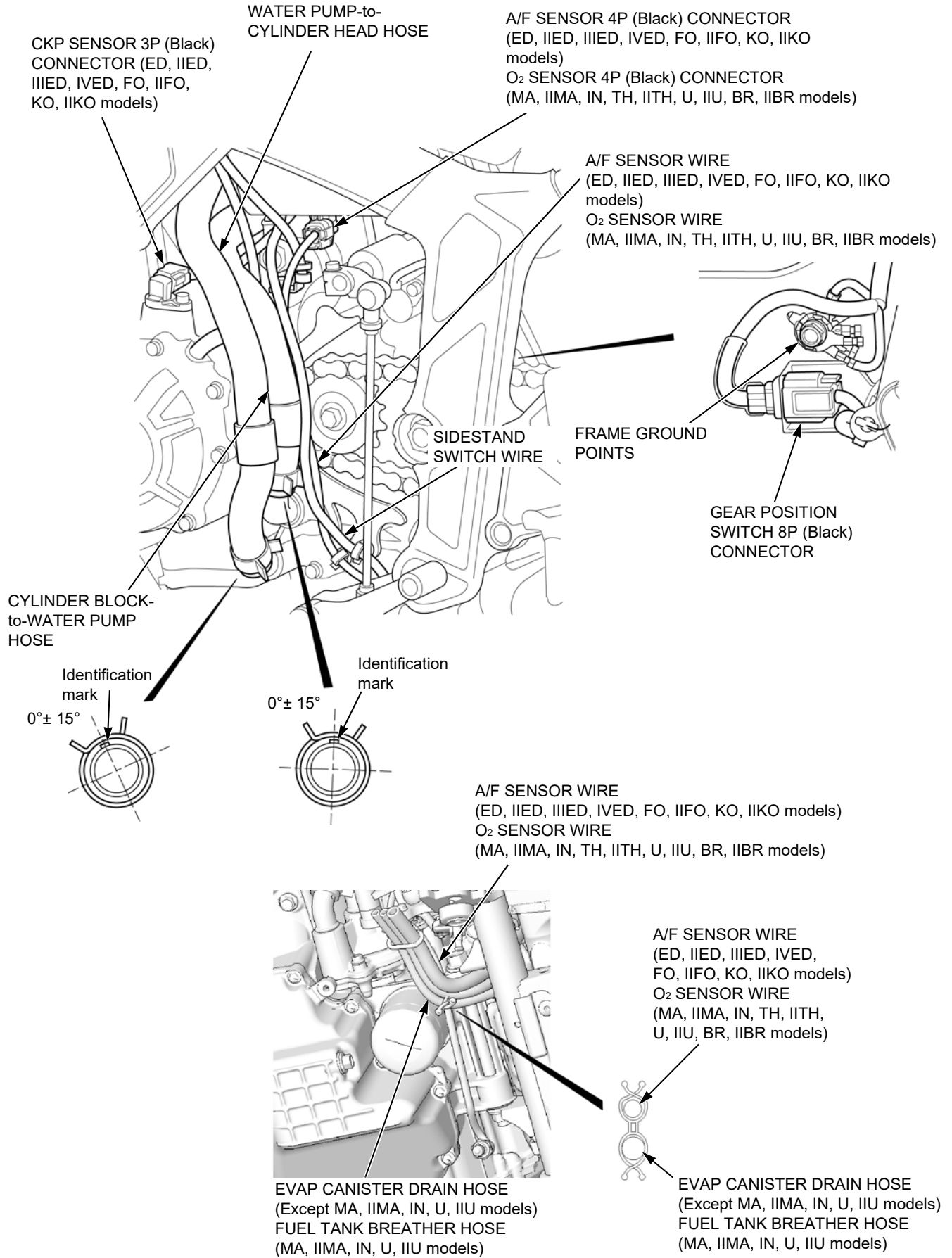


GENERAL INFORMATION

CBR650RA, CB650RA:

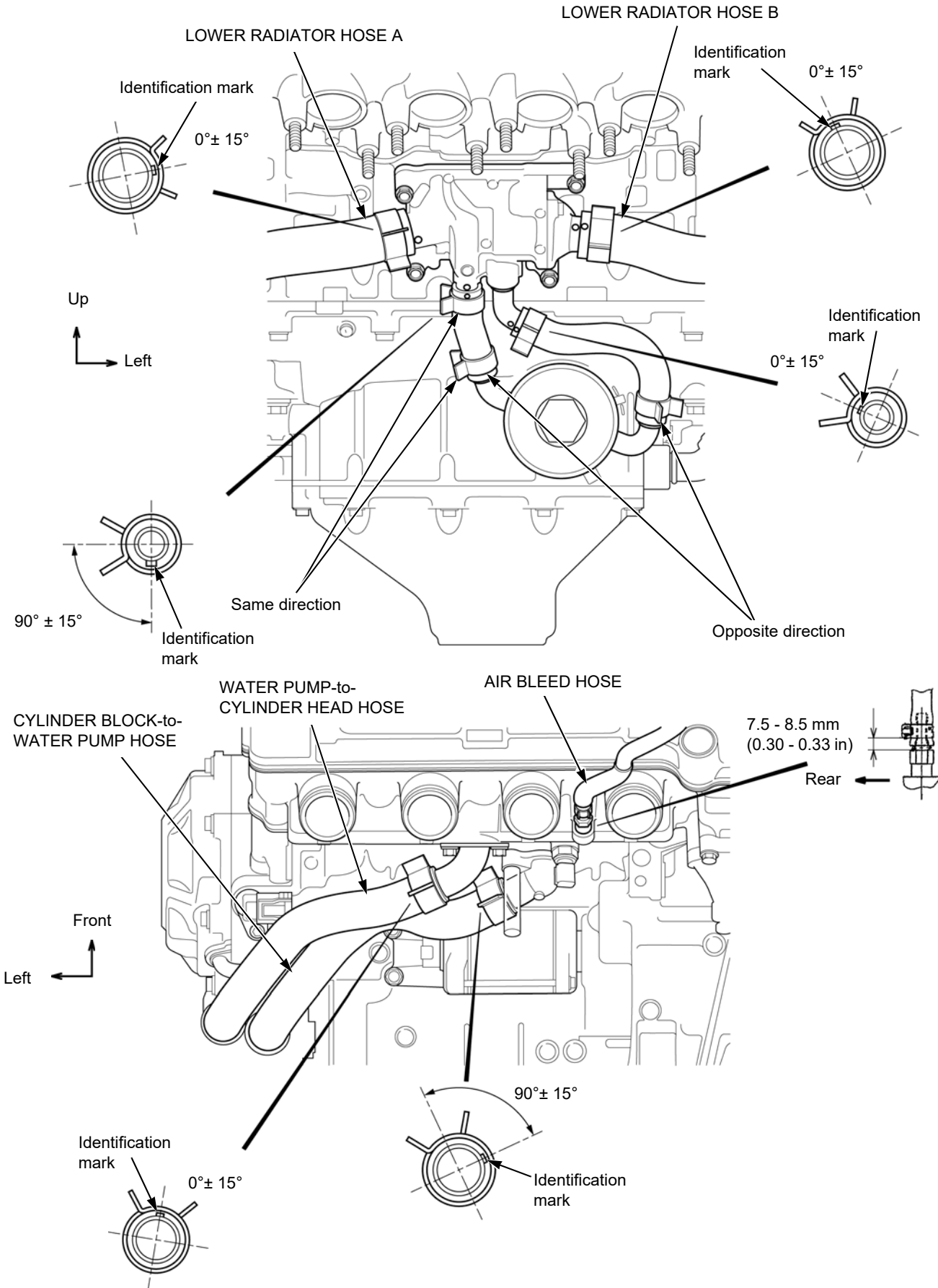


CBR650RA, CB650RA:

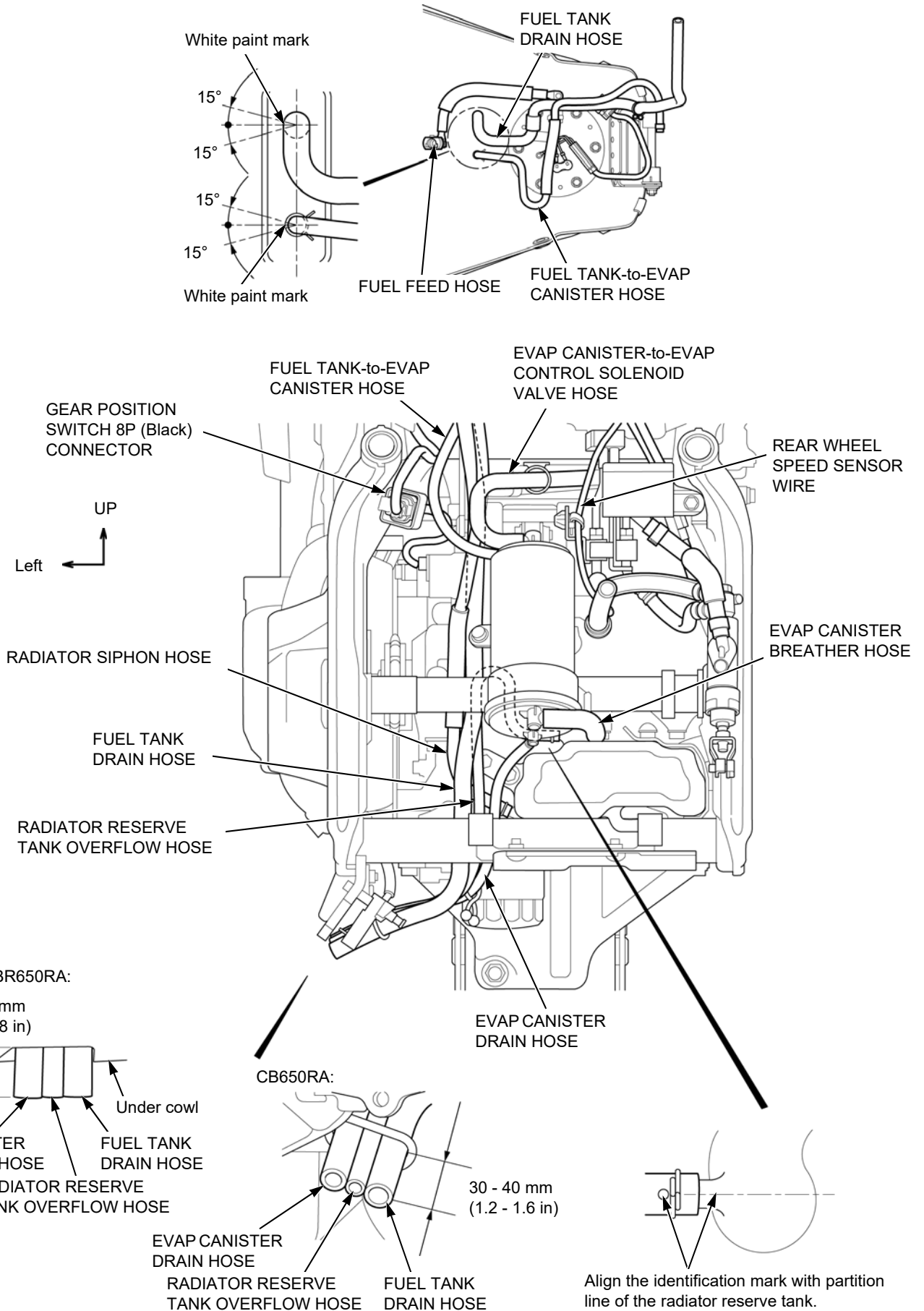


GENERAL INFORMATION

CBR650RA, CB650RA:

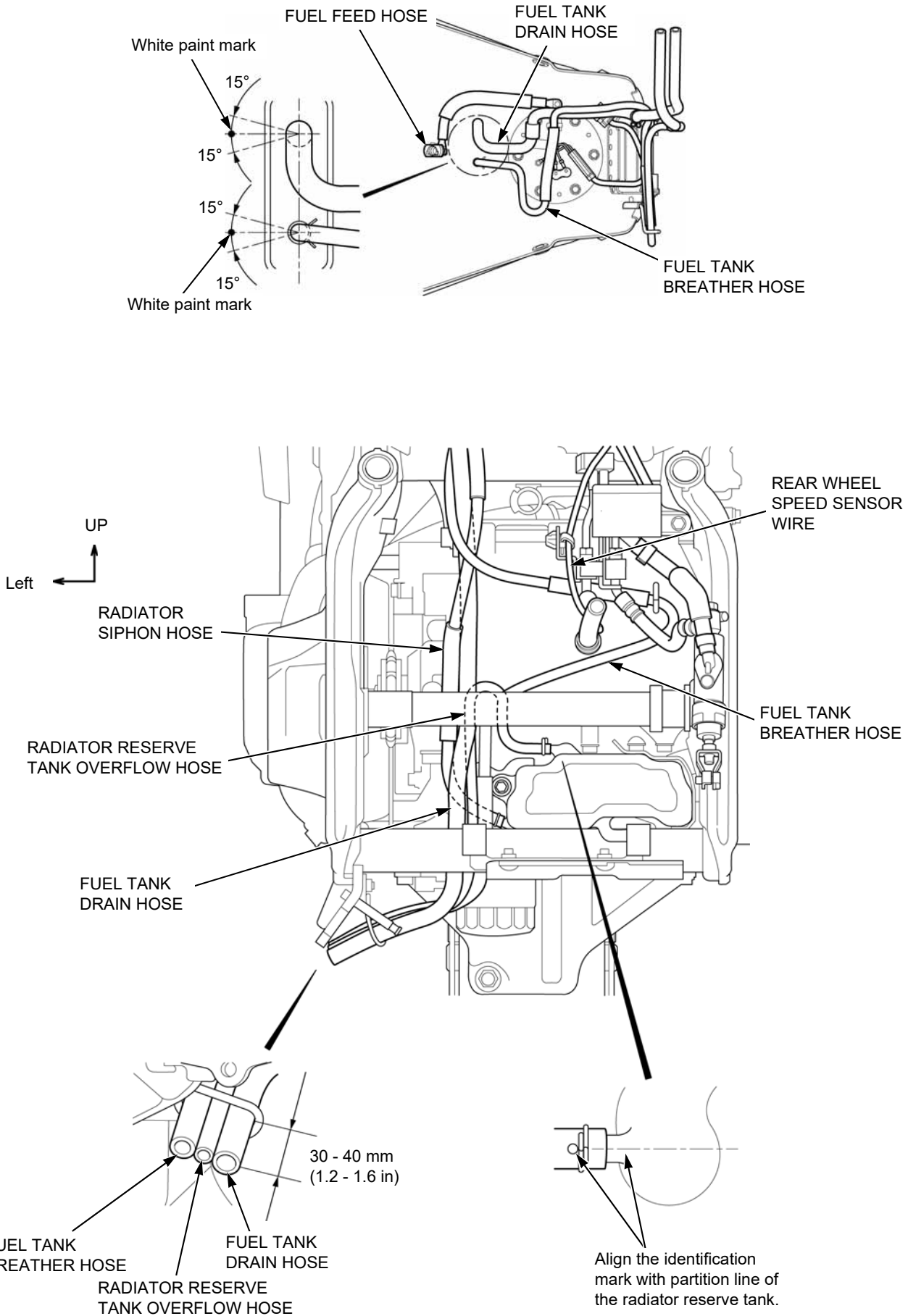


CBR650RA, CB650RA (Except MA, IIMA, IN, U, IIU models):



GENERAL INFORMATION

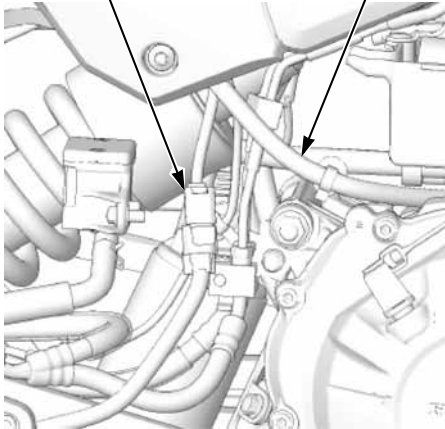
CBR650RA, CB650RA (MA, IIMA, IN, U, IIU models):



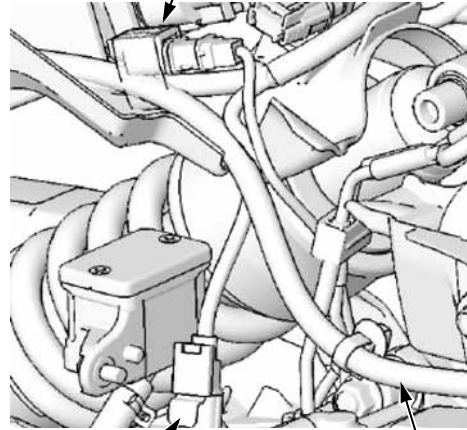
CBR650RA, CB650RA:

REAR BRAKE LIGHT SWITCH 2P (Black) CONNECTOR

STARTER MOTOR CABLE

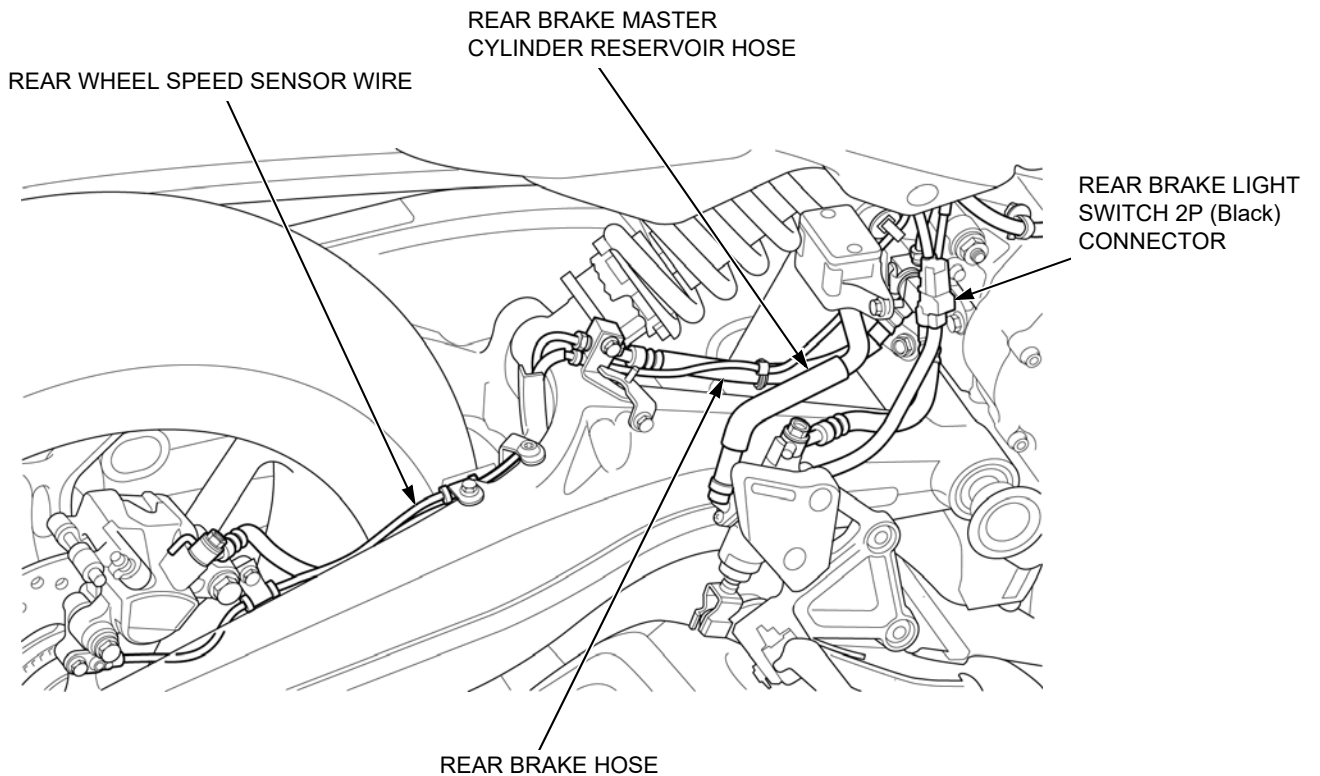


REAR WHEEL SPEED SENSOR 2P (Black) CONNECTOR



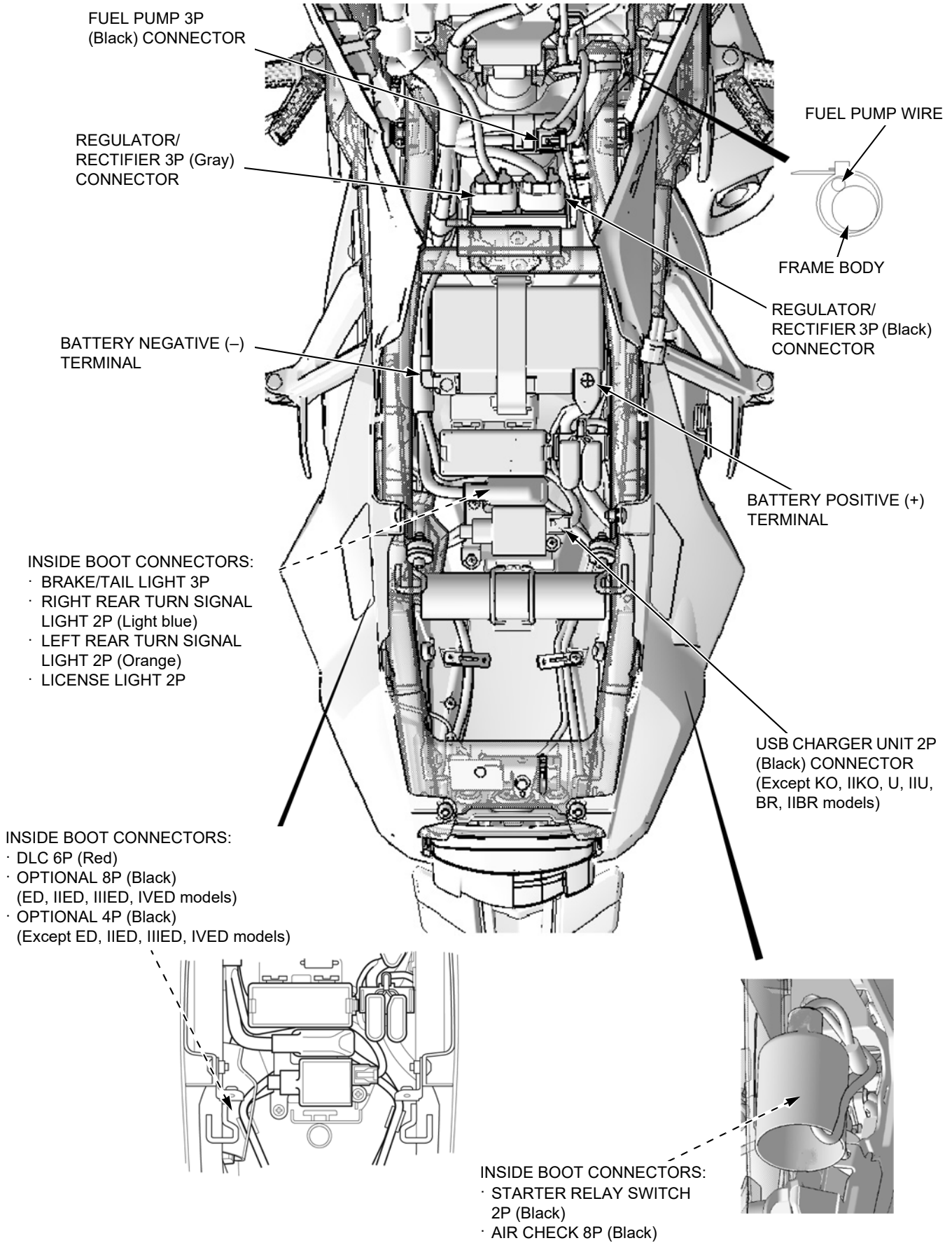
REAR BRAKE LIGHT SWITCH 2P (Black) CONNECTOR

STARTER MOTOR CABLE

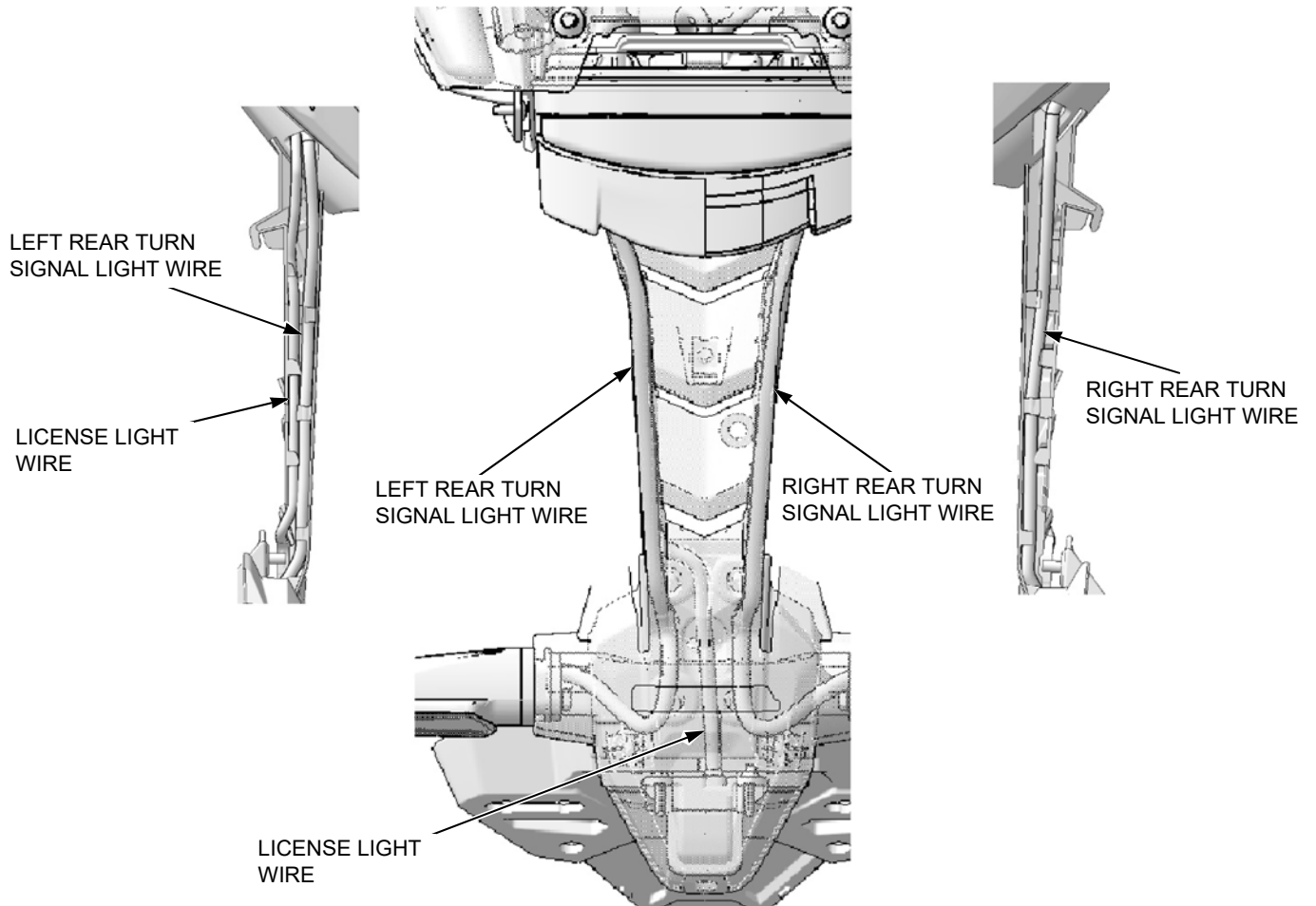
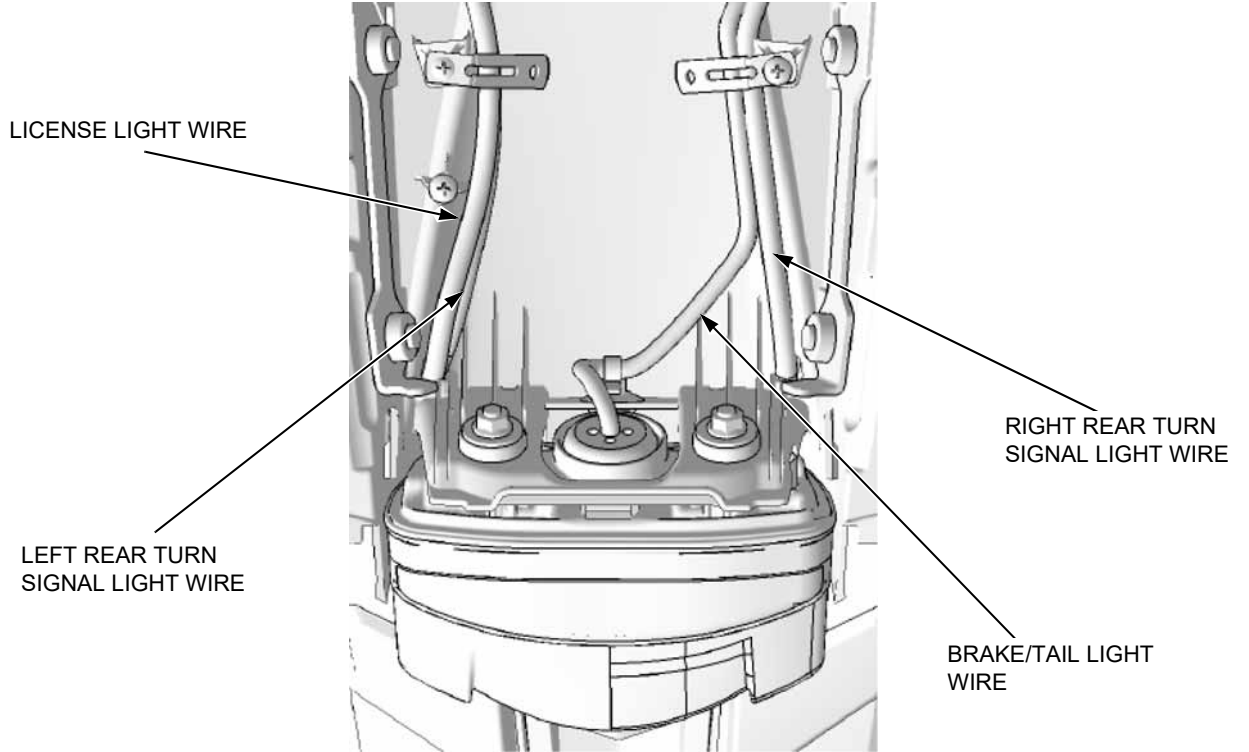


GENERAL INFORMATION

CBR650RA, CB650RA:



CBR650RA, CB650RA



GENERAL INFORMATION

EMISSION CONTROL SYSTEMS

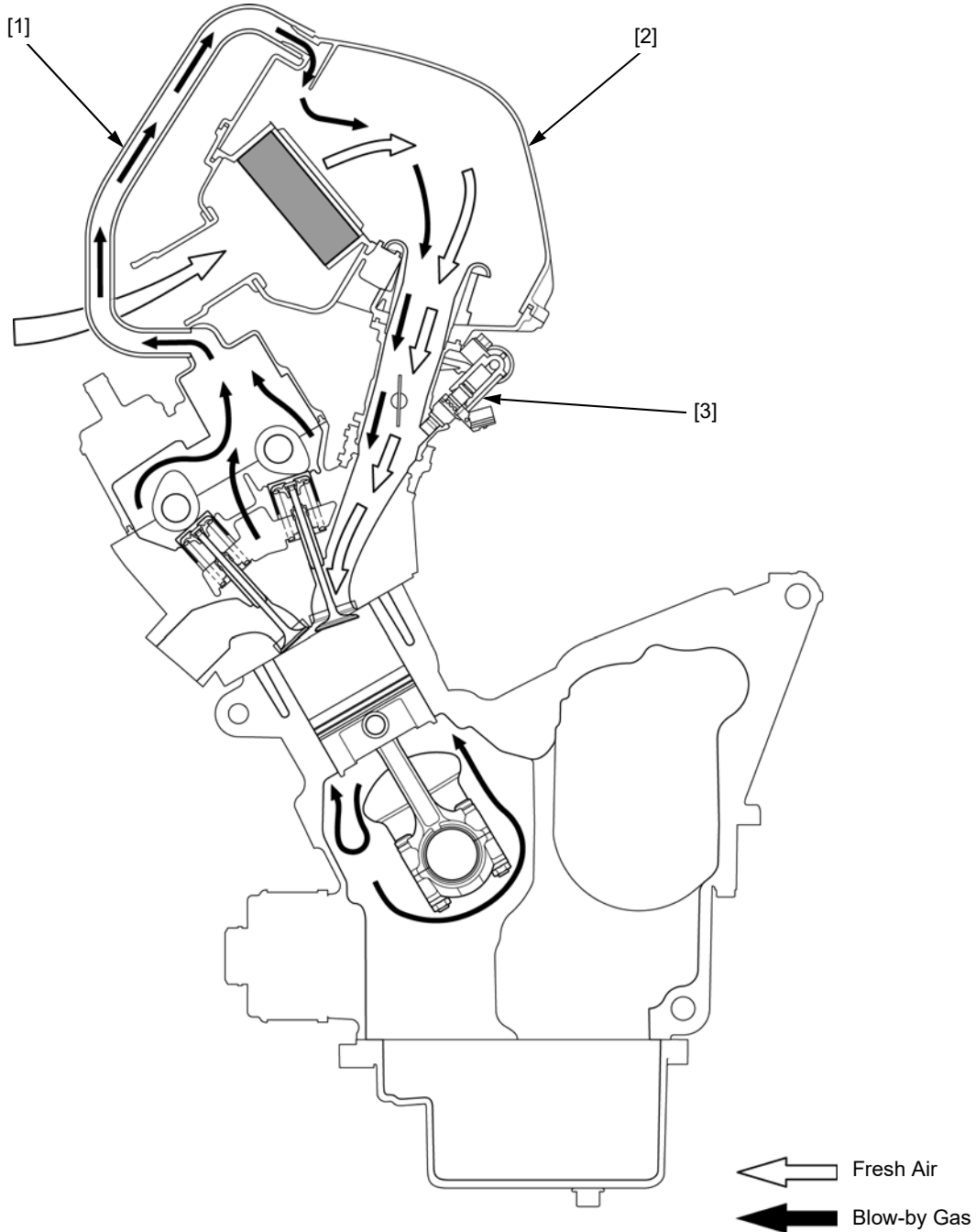
SOURCE OF EMISSIONS

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.

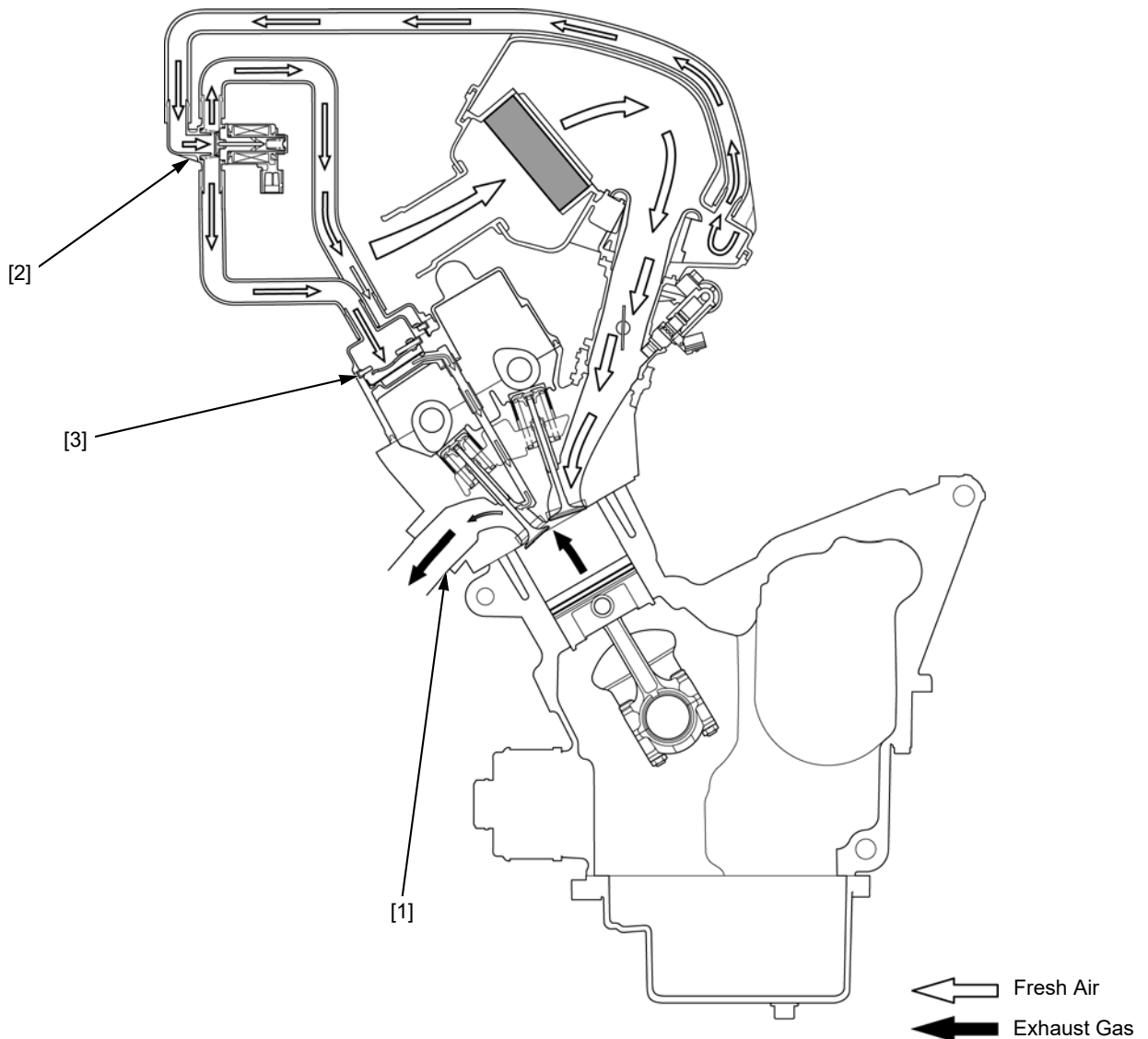
SECONDARY AIR SUPPLY SYSTEM

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.



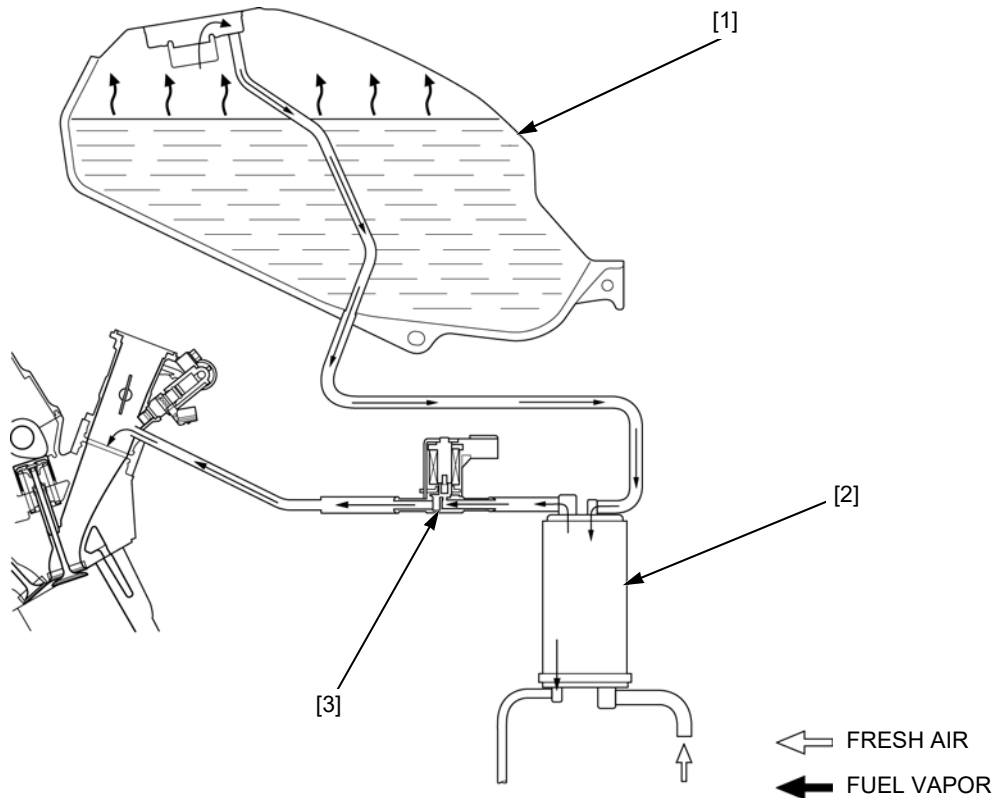
3-WAY CATALYTIC CONVERTER

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), dinitrogen (N₂), and water vapor.

GENERAL INFORMATION

EVAPORATIVE EMISSION CONTROL SYSTEM

Fuel vapor from the fuel tank [1] is routed into the evaporative emission (EVAP) canister [2] where it is absorbed and stored while the engine is stopped. When the engine is running and the evaporative emission (EVAP) purge control solenoid valve [3] is open, fuel vapor in the EVAP canister is drawn into the engine through the intake pipe.



NOISE EMISSION CONTROL SYSTEM

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

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

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

TECHNICAL FEATURE

OBD (On-Board Diagnostic) SYSTEM

This vehicle complies with the emission limits of Euro 4 and OBD stage 1 regulation.

Existing PGM-FI system already equips the self-diagnostic system that detects the PGM-FI system malfunction, and that malfunction data can be read by MCS (Motorcycle Communication System) as the DTCs or freeze data.

Based on existing PGM-FI diagnostic system, for OBD stage 1, following items are equipped with this vehicle.

- Additional self-diagnostic function for the fuel emission control
- MIL indication pattern for malfunction
- GST (General Scan Tool) connection to the vehicle

PGM-FI SELF-DIAGNOSTIC SYSTEM

In addition to existing self-diagnostic system, following function and DTC (Diagnostic Trouble Code) are prepared (page 4-46).

- EVAP purge control solenoid valve circuit
- PAIR control solenoid valve circuit
- Ignition Primary circuit

MIL INDICATION

In the existing PGM-FI system, if the PGM-FI system detects the malfunction at the present, the MIL blinks the number of trouble code with idle engine speed.

But in this PGM-FI system for OBD, when the system detects the malfunction, it turns the MIL ON without blinking unless otherwise the SCS circuit short (reading DTC with DLC connector).

MIL indication

	PGM-FI SYSTEM for OBD			Existing PGM-FI SYSTEM		
	At Idle	Riding	SCS short	At Idle	Riding	SCS short
Current trouble	ON	ON	Blinking	Blinking	ON	Blinking
Past trouble	*ON	*ON	*Blinking	OFF	OFF	Blinking

* This system turn off the MIL if the system does not detect the same trouble again in three driving cycle (three times repeat of ignition-ON, riding and ignition-OFF).

GENERAL INFORMATION

GST (General Scan Tool) CONNECTION

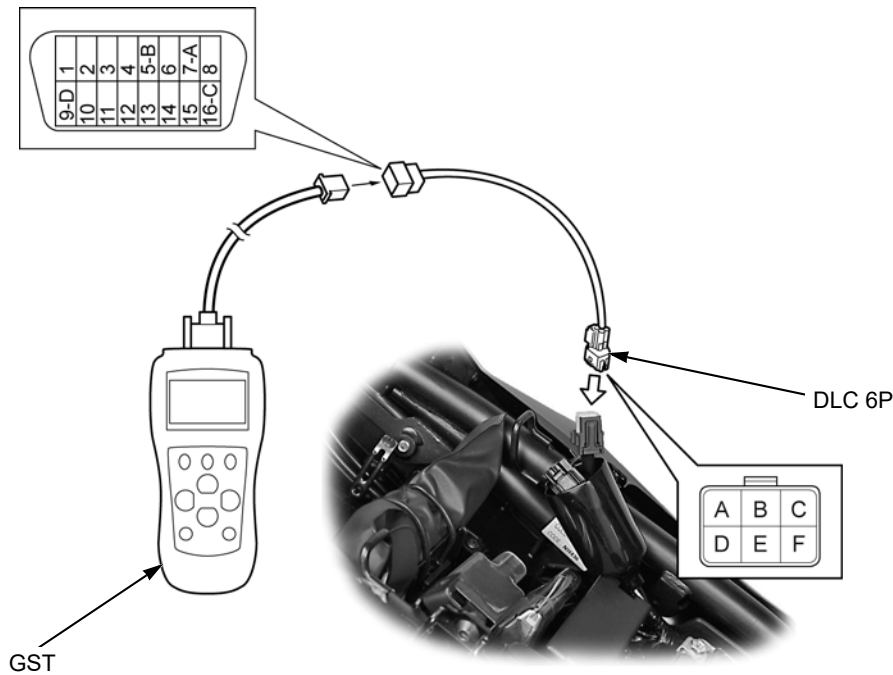
The PGM-FI system of this vehicle supports the connection of the GST that is commercially available as the diagnostic tool for the vehicle. As same as MCS (Motorcycle Communication System; Honda genuine diagnostic tool), the GST can be used for DTC, freeze data and ECM data reading.

The DTCs read by GST are standardized by ISO standard, those are different code system from existing Honda code system read by MCS. Refer to DTC INDEX (page 4-12) for each DTC and troubleshooting detail.

16P connector on GST is also standardized by ISO standard.

To connect the GST to the vehicle, remove the 6P dummy connector and connect the GST.

For using the GST, refer to the instruction manual attached each GST.



OBD harness circuit connection (General allocation in ISO 15031-3)

	DLC 6P	16P
Signal ground	A	5
CAN_H	B	6
Discretionary (SCS line)	C	9
K-line	D	7
CAN_L	E	14
Permanent positive battery	F	16

OBD2 (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models)

This motorcycle complies with OBD2.

Comparison of OBD1 and OBD2:

ITEMS	OBD1	OBD2
Diagnostic method	Function diagnosis	Threshold diagnosis (Diagnosis of deterioration) or Function diagnosis
	Circuit diagnostics	Threshold diagnosis (Diagnosis of deterioration)/ For items that can not be function diagnosed, perform circuit diagnostics
Failure judgment criteria	No stipulation	Specified by emission value
Tool for failure diagnosis	Not specified	Specified in SAE/ISO
Service information	No public regulations	Published regulations
Special tool	SCS short connector (4P) 070PZ-ZY30100	SCS short connector (6P) 070MZ-0010300

Refer to DTC INDEX (page 4-12) for each DTC and troubleshooting detail.

MEMO

2. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION.....	2-2	SHROUD (CB650RA)	2-10
TROUBLESHOOTING	2-2	UNDER COWL (CBR650RA)	2-11
BODY PANEL LOCATIONS/ REMOVAL CHART	2-3	MAIN SEAT	2-11
REARVIEW MIRROR.....	2-5	PILLION SEAT	2-12
FRONT FENDER	2-5	SIDE COVER	2-12
WINDSCREEN (CBR650RA).....	2-6	REAR COWL	2-12
MIDDLE COWL (CBR650RA).....	2-7	REAR FENDER STAY	2-13
TANK COVER	2-7	REAR FENDER B	2-14
INTAKE AIR DUCT (CBR650RA).....	2-8	FRONT LICENSE PLATE STAY	2-15
UPPER INNER PANEL (CBR650RA).....	2-8	DRIVE SPROCKET COVER.....	2-15
METER PANEL (CBR650RA).....	2-8	DRIVE CHAIN COVER/MUD GUARD	2-16
FRONT COWL (CBR650RA).....	2-9	SIDESTAND	2-16
FRONT LOWER COWL (CBR650RA).....	2-9	FOOTPEG BRACKET.....	2-17
FRONT COWL STAY (CBR650RA)	2-9	EXHAUST PIPE/MUFFLER.....	2-17

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

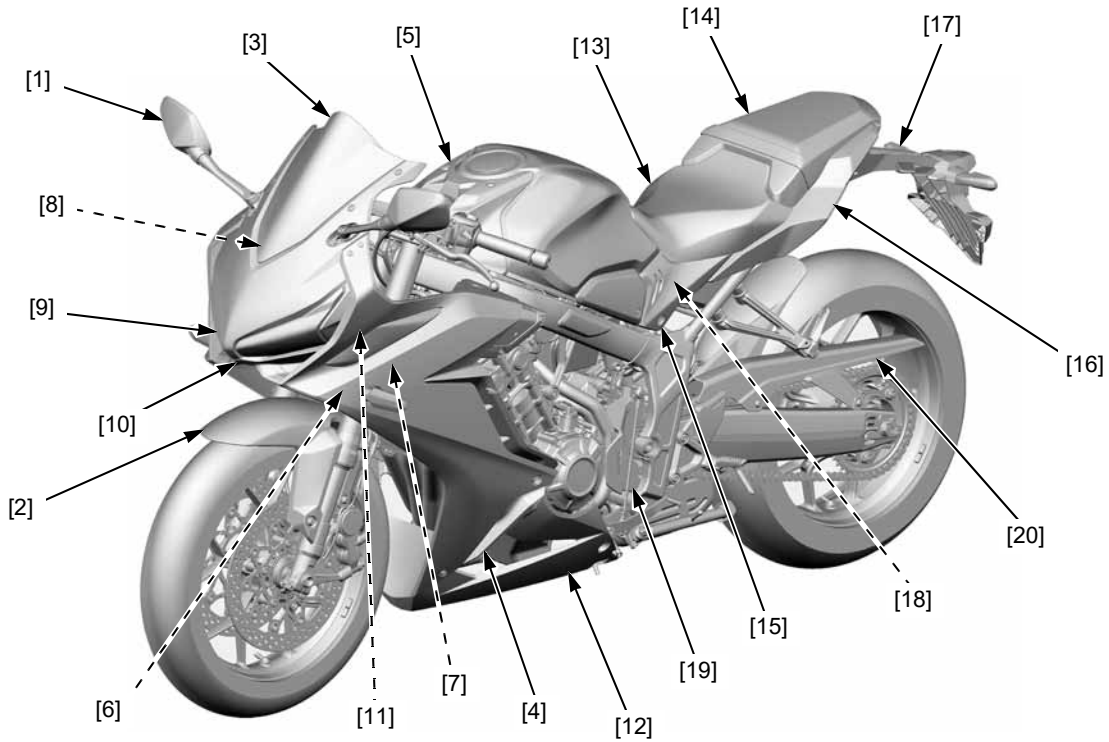
- Broken exhaust system
- Exhaust gas leak

Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

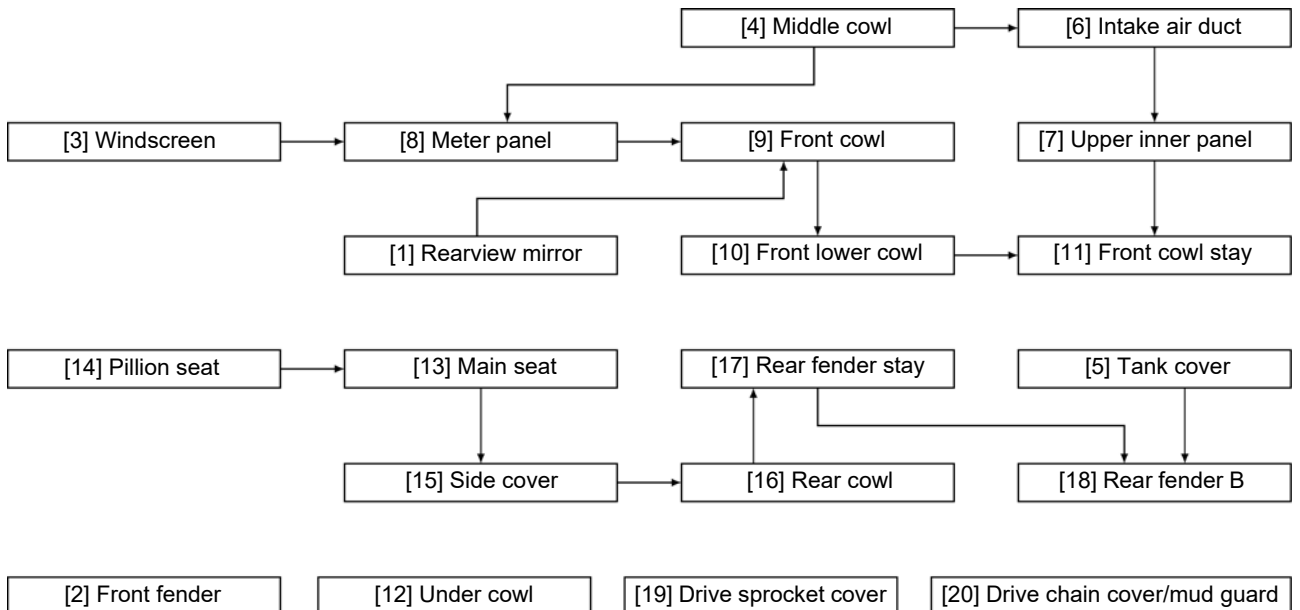
BODY PANEL LOCATIONS/REMOVAL CHART

CBR650RA



- | | | |
|----------------------------------|----------------------------------|--|
| [1] Rearview mirror (page 2-5) | [8] Meter panel (page 2-8) | [15] Side cover (page 2-12) |
| [2] Front fender (page 2-5) | [9] Front cowl (page 2-9) | [16] Rear cowl (page 2-12) |
| [3] Windscreen (page 2-6) | [10] Front lower cowl (page 2-9) | [17] Rear fender stay (page 2-13) |
| [4] Middle cowl (page 2-7) | [11] Front cowl stay (page 2-9) | [18] Rear fender B (page 2-14) |
| [5] Tank cover (page 2-7) | [12] Under cowl (page 2-11) | [19] Drive sprocket cover (page 2-15) |
| [6] Intake air duct (page 2-8) | [13] Main seat (page 2-11) | [20] Drive chain cover/mud guard (page 2-16) |
| [7] Upper inner panel (page 2-8) | [14] Pillion seat (page 2-12) | |

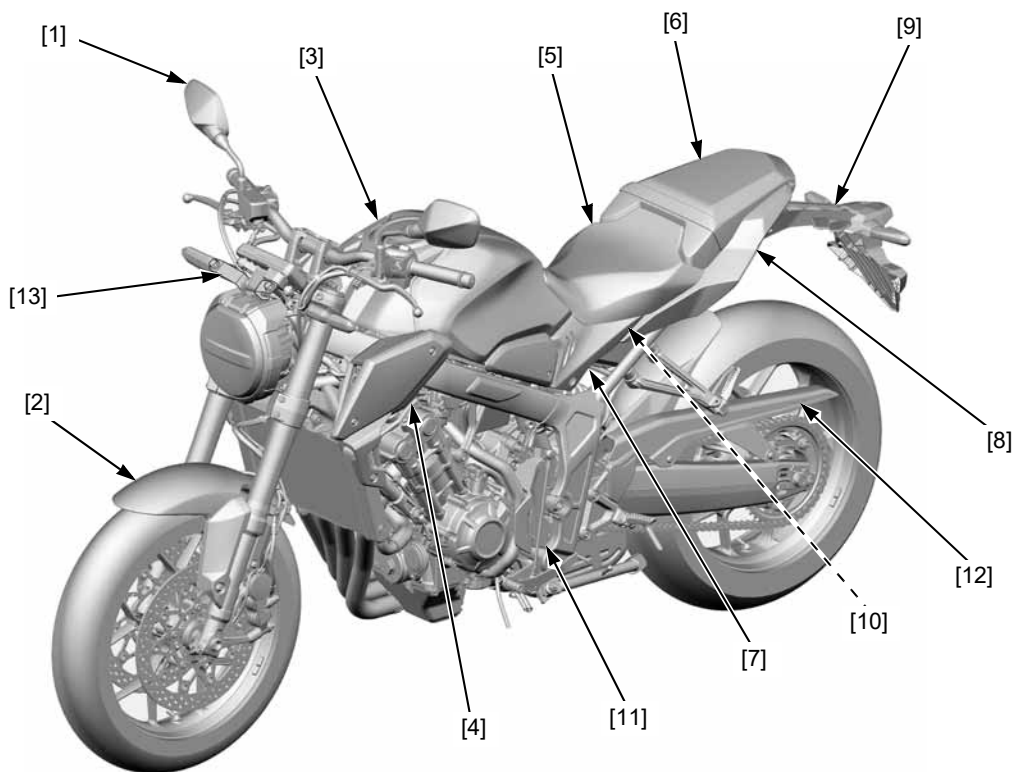
• This chart shows removal order of frame covers by means of arrow.



FRAME/BODY PANELS/EXHAUST SYSTEM

CB650RA

IN model shown:



[1] Rearview mirror (page 2-5)

[2] Front fender (page 2-5)

[3] Tank cover (page 2-7)

[4] Shroud (page 2-10)

[5] Main Seat (page 2-11)

[6] Pillion seat (page 2-12)

[7] Side cover (page 2-12)

[8] Rear cowl (page 2-12)

[9] Rear fender stay (page 2-13)

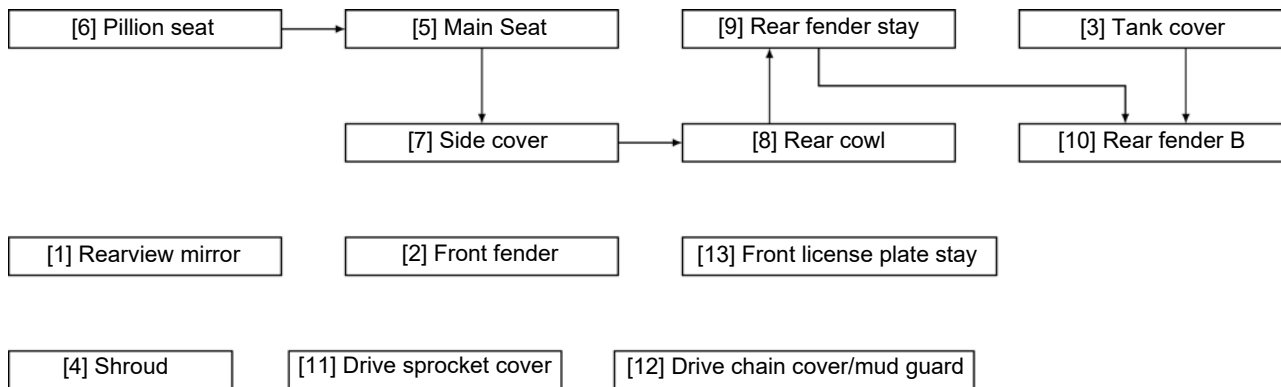
[10] Rear fender B (page 2-14)

[11] Drive sprocket cover (page 2-15)

[12] Drive chain cover/mud guard (page 2-16)

[13] Front license plate stay (page 2-15)

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



REARVIEW MIRROR

REMOVAL/INSTALLATION

CBR650RA

Remove the socket bolts [1] and rearview mirror [2].

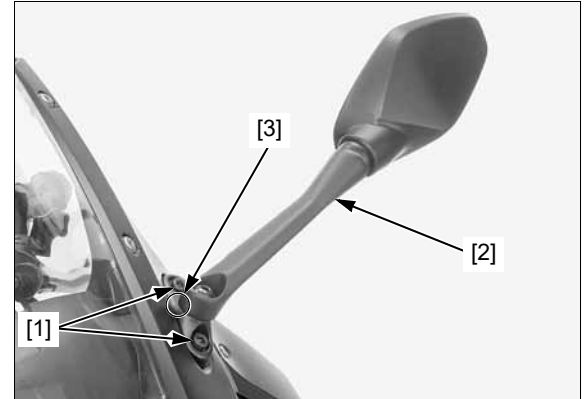
Installation is in the reverse order of removal.

NOTE:

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

TORQUE:

Rearview mirror mounting socket bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)



CB650RA

Slide the boot [1] off from the lock nut [2].

Loosen the lock nut (left-hand threads) and remove the rearview mirror [3].

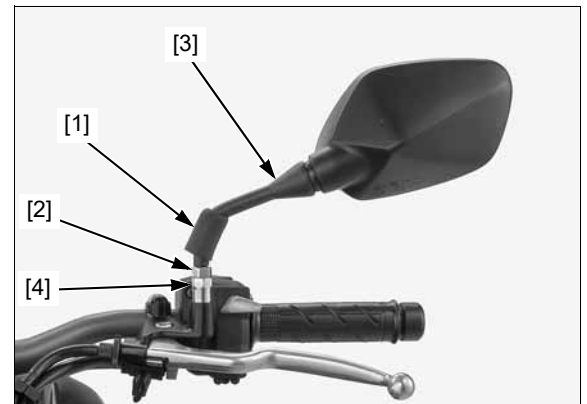
Remove the mirror adaptor [4].

Installation is in the reverse order of removal.

TORQUE:

Rearview mirror lock nut:
20 N·m (2.0 kgf·m, 15 lbf·ft)

Rearview mirror adaptor:
20 N·m (2.0 kgf·m, 15 lbf·ft)



FRONT FENDER

REMOVAL/INSTALLATION

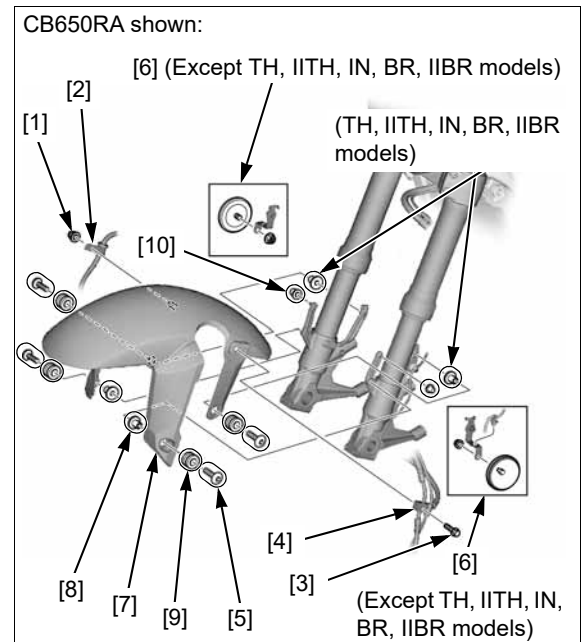
Remove the following:

- Front wheel (page 16-15)
- Cap nut [1] and brake hose clamp [2]
- Bolt [3] and brake hose clamp [4]
- Four socket bolts [5]
- Two reflex reflectors [6]
(Except TH, IITH, IN, BR, IIBR models)
- Front fender [7]
- Four collars (TH, IITH, IN, BR, IIBR models) [8]
- Two collars (Except TH, IITH, IN, BR, IIBR models) [8]
- Four grommets [9]
- Two rubber [10]

Installation is in the reverse order of removal.

TORQUE:

Front reflector mounting nut
(Except TH, IITH, IN, BR, IIBR models):
1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)



WINDSCREEN (CBR650RA)

REMOVAL/INSTALLATION

Remove the following:

- Four special bolts [1]
- Four plastic washers [2]
- Four rubber washers [3]
- Windscreen [4]
- Four well nuts [5]

Installation is in the reverse order of removal.

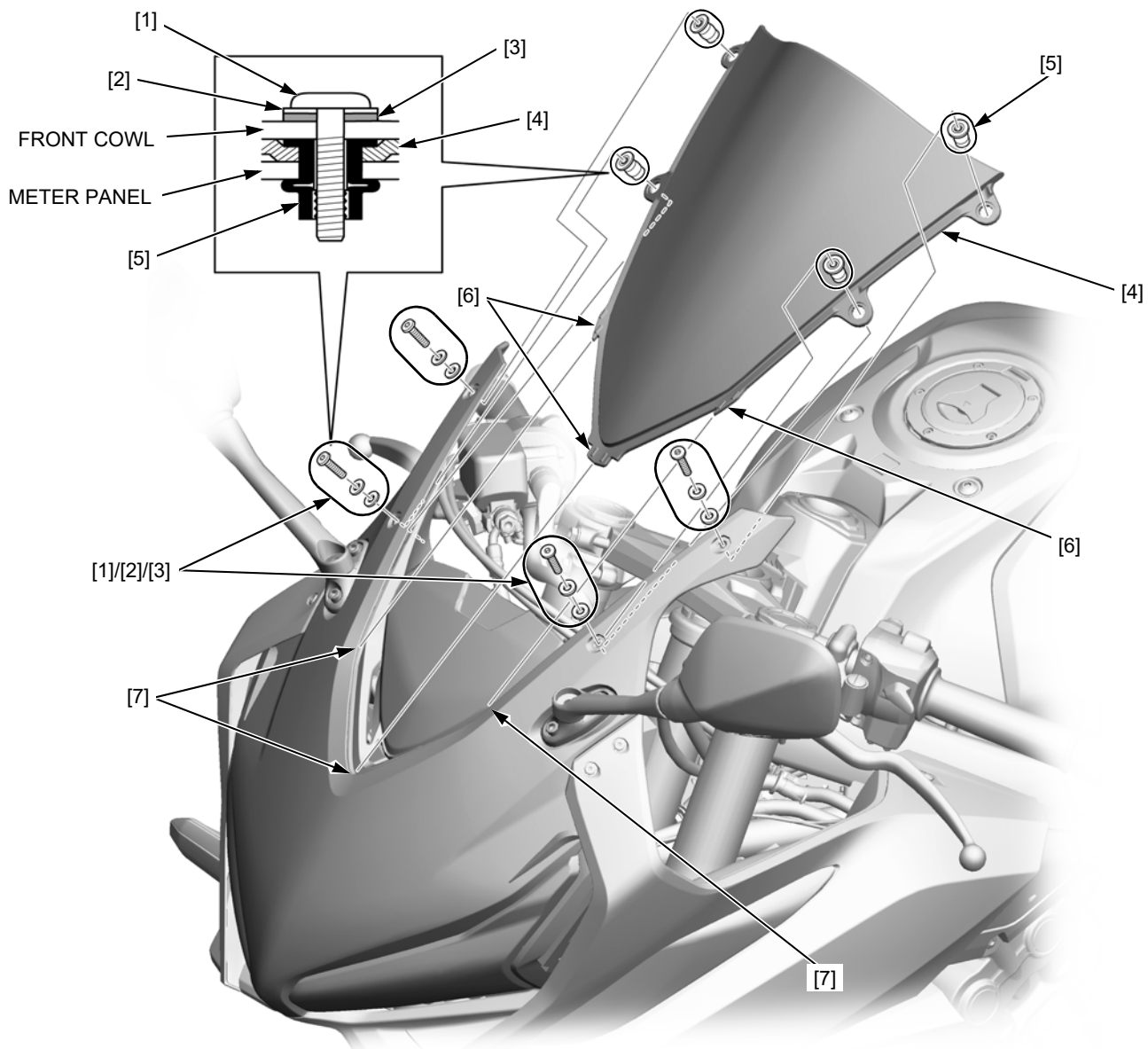
NOTE:

- Be careful not to scratch the windscreen surface.
- Align the windscreen tabs [6] with the slots [7] in the front cowl.

TORQUE:

Windscreen special bolt:

0.42 N·m (0.04 kgf·m, 0.3 lbf·ft)



MIDDLE COWL (CBR650RA)

REMOVAL/INSTALLATION

Remove the following:

- Three trim clips (pin head) [1]
- Three trim clips [2]
- Two special bolts [3]
- Two socket bolts A (Black) [4]
- Two socket bolts A (Silver) [5]
- Socket bolt B [6]

Disconnect the front turn signal light 3P (right: Light blue, left: Orange) connector [7], then remove the middle cowl [8].

Installation is in the reverse order of removal.

TORQUE:

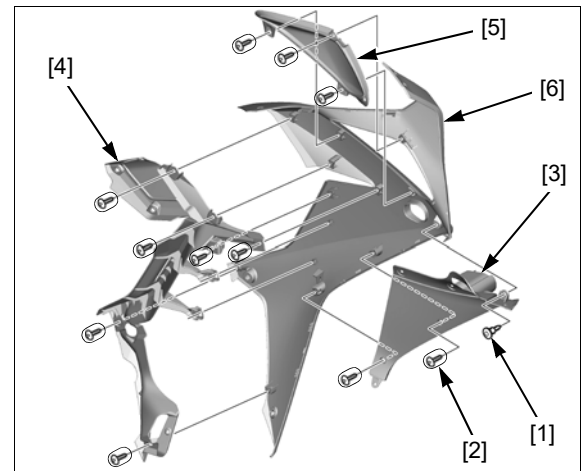
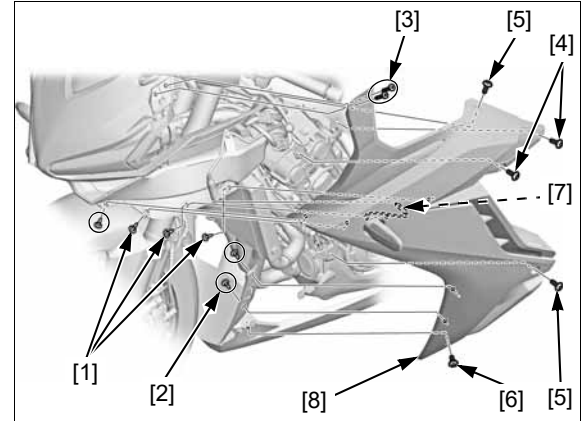
Middle cowl special bolt:
0.42 N·m (0.04 kgf·m, 0.3 lbf·ft)

DISASSEMBLY/ASSEMBLY

Remove the following:

- Front turn signal light (page 21-4)
- Trim clip [1]
- Tapping screws [2]
- Inner panel [3]
- Middle cowl B [4]
- Air duct cover [5]
- Middle cowl A [6]

Assembly is in the reverse order of disassembly.



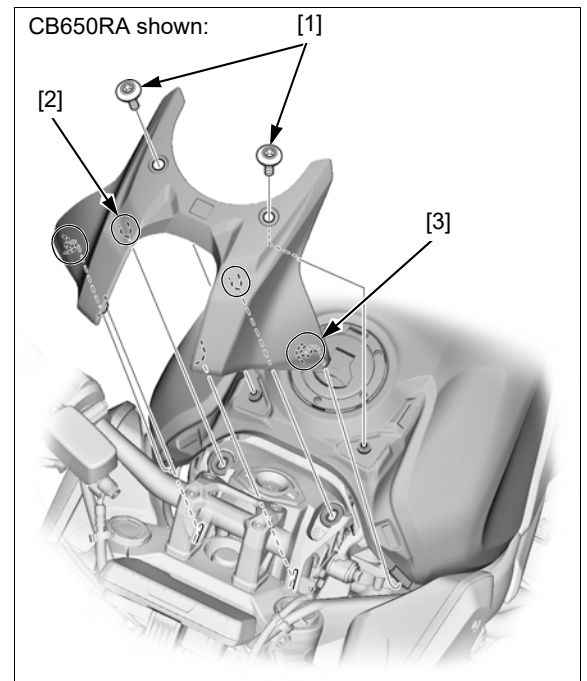
TANK COVER

REMOVAL/INSTALLATION

Remove the two socket bolts [1].

Remove the boss [2] and hook [3], remove the tank cover.

Install the socket bolts with the collars and tighten them.



INTAKE AIR DUCT (CBR650RA)

REMOVAL/INSTALLATION

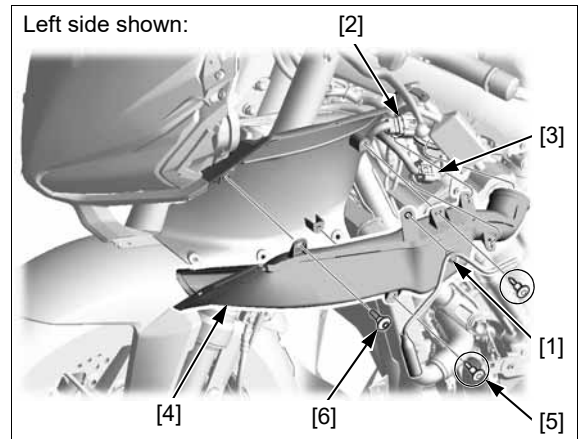
Remove the middle cowl (page 2-7).

Left side: Release the harness clip [1] and front sub harness 12P (Black) [2] and 12P (Gray) [3] connectors from the intake air duct [4].

Right side: Release the harness clip and front wheel speed sensor 2P (Black) connector from the intake air duct.

Remove the two trim clips [5], socket bolt [6] and intake air duct.

Installation is in the reverse order of removal.



UPPER INNER PANEL (CBR650RA)

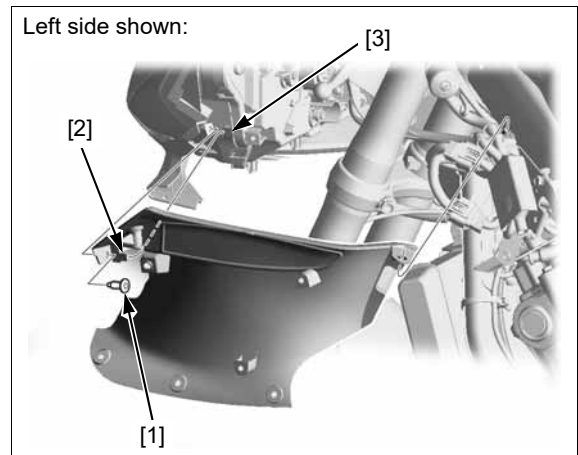
REMOVAL/INSTALLATION

Remove the intake air duct (page 2-8).

Remove the trim clip [1].

Release the tab [2] from the slot [3] of headlight and remove the upper inner panel.

Installation is in the reverse order of removal.



METER PANEL (CBR650RA)

REMOVAL/INSTALLATION

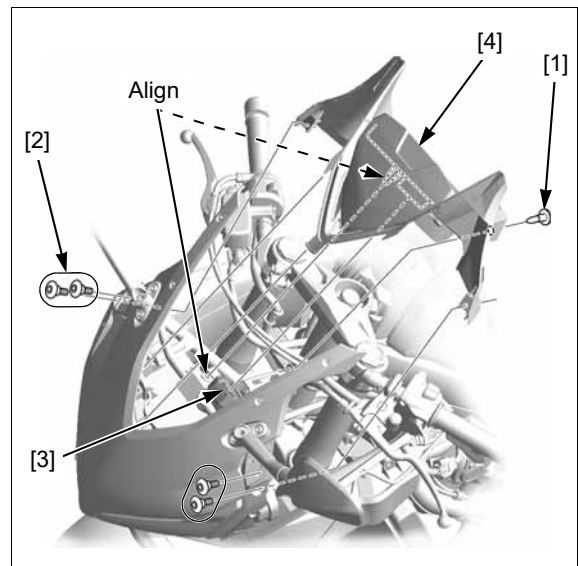
Remove the following:

- Windscreen (page 2-6)
- Middle cowls (page 2-7)
- Trim clip [1]
- Four socket bolts [2]

Disconnect the combination meter 20P (Gray) connector [3], then remove the meter panel [4].

Installation is in the reverse order of removal.

- Align the boss with the hole of the headlight stay.



FRONT COWL (CBR650RA)

REMOVAL/INSTALLATION

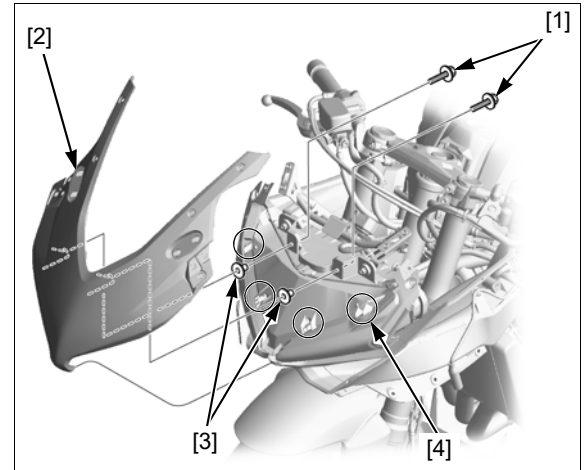
Remove the following:

- Rearview mirrors (page 2-5)
- Meter panel (page 2-8)
- Two bolts [1]
- Front cowl [2]
- Two collars [3]

Installation is in the reverse order of removal.

NOTE:

- Align the lugs [4] of the headlight with the locating ridges on the front cowl.



FRONT LOWER COWL (CBR650RA)

REMOVAL/INSTALLATION

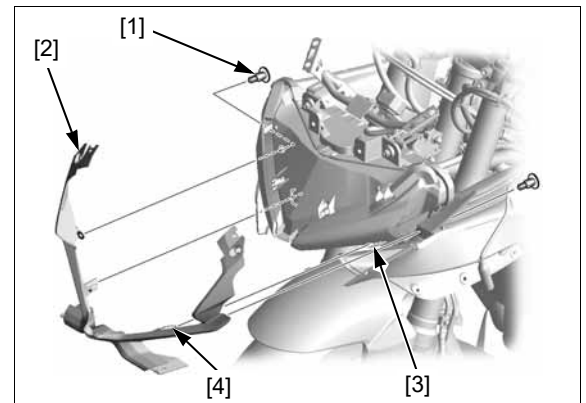
Remove the following:

- Front cowl (page 2-9)
- Two trim clips [1]
- Front lower cowl [2]

Installation is in the reverse order of removal.

NOTE:

- Align the lugs [3] of the headlight with the locating ridges [4] on the front lower cowl.



FRONT COWL STAY (CBR650RA)

REMOVAL/INSTALLATION

Remove the headlight (page 21-3).

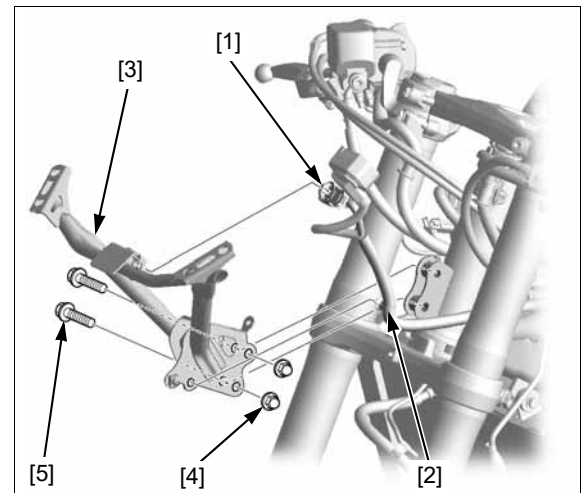
Release the headlight 6P (Black) connector [1] and harness clip [2] from the front cowl stay [3].

Remove the two nuts [4], bolts [5] and front cowl stay.

Installation is in the reverse order of removal.

TORQUE:

Front cowl stay mounting nut:
27 N·m (2.8 kgf·m, 20 lbf·ft)



SHROUD (CB650RA)

REMOVAL/INSTALLATION

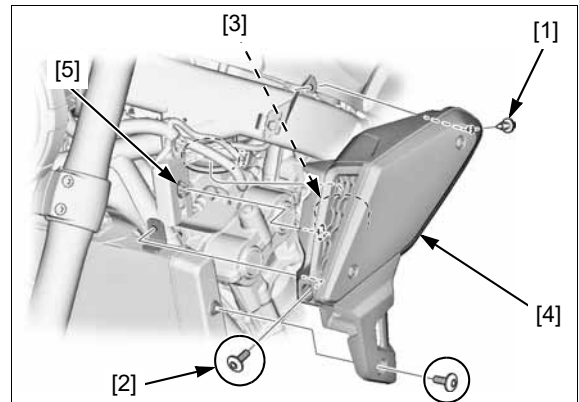
Remove the trim clip [1] and two socket bolts [2].

Release the duct [3] and remove the shroud [4].

Right side: Remove the two connector clips [5] from the shroud.

Left side: Remove the connector clip from the shroud.

Installation is in the reverse order of removal.



DISASSEMBLY/ASSEMBLY

Remove the following:

- Trim clip [1]
- Air duct [2]
- Trim clip (pin head) [3]
- Shroud A mounting bolts [4]
- Collar [5]
- Shroud C [6]
- Shroud A [7]
- Two tapping screws [8]
- Air duct box [9]
- Shroud B [10]

NOTE:

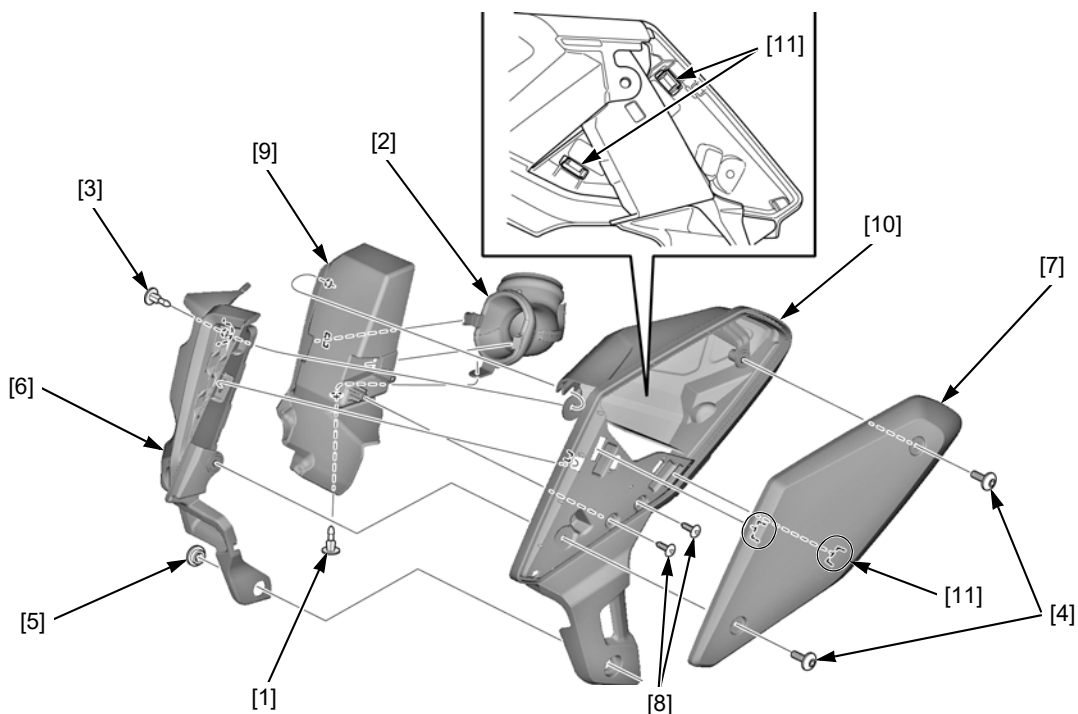
- Release the tabs [11] when removing shroud A.

Assembly is in the reverse order of disassembly.

TORQUE:

Shroud A mounting bolt:

0.42 N·m (0.04 kgf·m, 0.3 lbf·ft)



UNDER COWL (CBR650RA)

REMOVAL/INSTALLATION

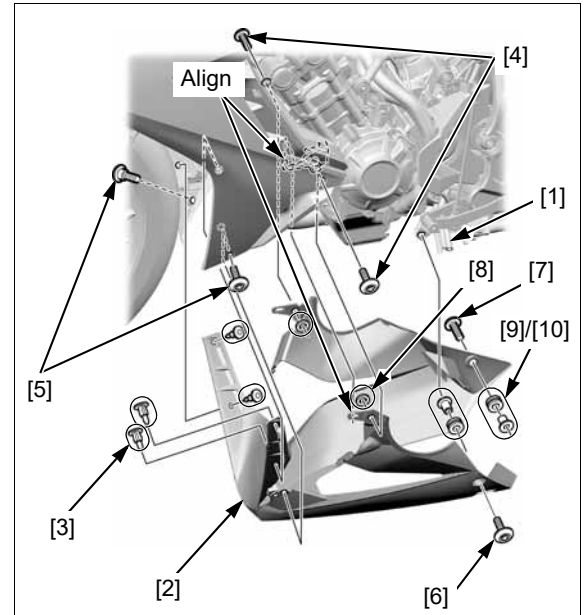
Release the hoses [1] from the under cowl [2].

Remove the following:

- Four trim clips [3]
- Two socket bolts A (Silver) [4]
- Two socket bolts B [5]
- Socket bolt (5mm Black) [6] (left side)
- Socket bolt (6mm Black) [7] (right side)
- Under cowl
- Two rubber washers [8]
- Two collars (left; small I.D./right; large I.D.) [9]
- Two mounting rubbers [10]

Installation is in the reverse order of removal.

- Align the slots with the hook of the stay.



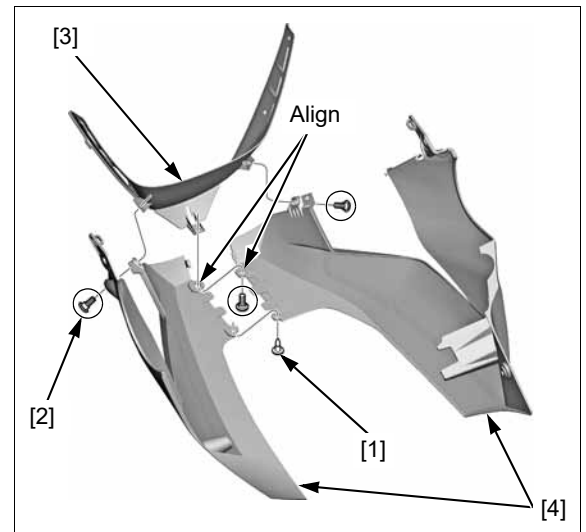
DISASSEMBLY/ASSEMBLY

Remove the following:

- Trim clip [1]
- Three socket bolt [2]
- Lower inner cowl [3]
- Under cowls [4]

Assembly is in the reverse order of disassembly.

- Align the holes with the bosses.



MAIN SEAT

REMOVAL/INSTALLATION

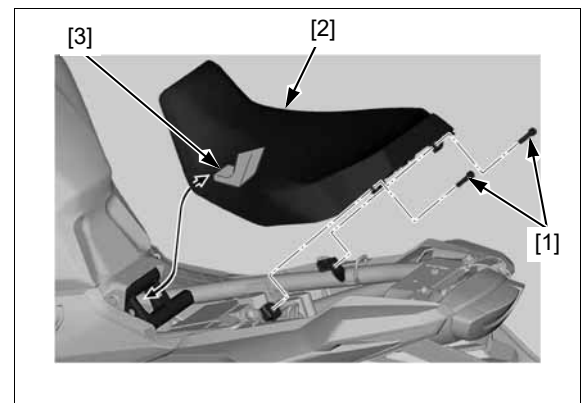
Remove the pillion seat (page 2-12).

Remove the two bolts [1].

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

Install the main seat by inserting its hook [3] into the under the frame.

Install the bolts and tighten them.



PILLION SEAT

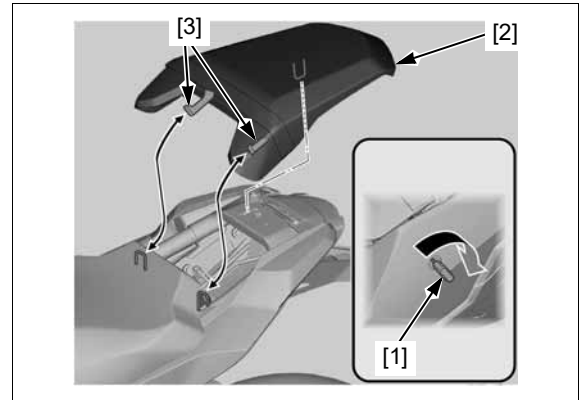
REMOVAL/INSTALLATION

Unhook the seat with the ignition key [1].

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

Install the pillion seat by inserting the prongs [3] under the frame.

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



SIDE COVER

REMOVAL/INSTALLATION

Remove the main seat (page 2-11).

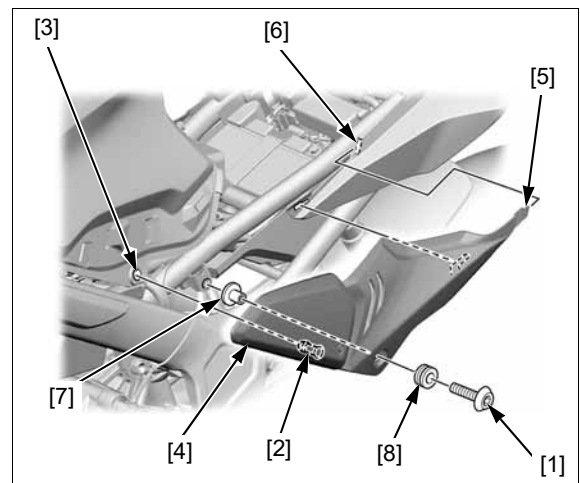
Remove the socket bolts [1].

Release the boss [2] from the grommet [3] of the fuel tank.

Remove the side cover [4] by releasing the tab [5] from the slot [6] of the rear cowl.

Remove the collar [7] and mounting rubber [8].

Installation is in the reverse order of removal.



REAR COWL

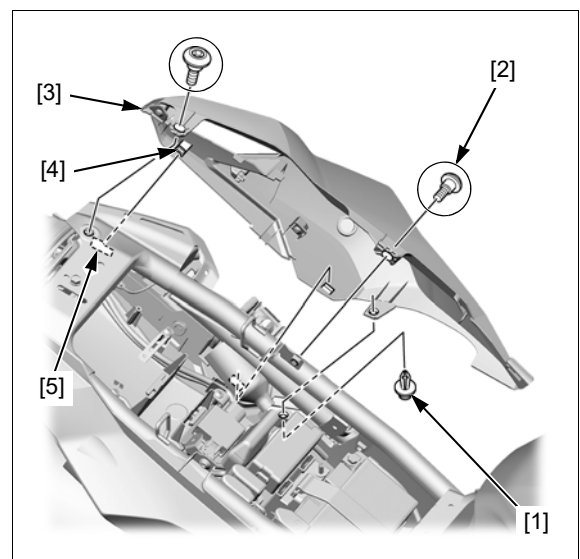
REMOVAL/INSTALLATION

Remove the following:

- Side cover (page 2-12)
- Clip [1]
- Two socket bolts [2]

Remove the rear cowl [3] while releasing its hook [4] from the slot [5] of the rear fender B.

Installation is in the reverse order of removal.



REAR FENDER B

REMOVAL/INSTALLATION

Remove the following:

- Fuel tank (page 7-7)
- Battery (page 20-5)
- Brake/tail light unit (page 21-5)
- Regulator/rectifier (page 20-7)
- USB charger unit (Except KO, IIKO, U, IIU, BR, II BR models) (page 21-25)

Release the following from the rear fender B [1]:

- Junction box cover [2]
- Starter relay switch [3]
- Fuse/relay box [4]
- Fuel pump 3P (Black) connector boss [5]

Release the seat lock cable [6] from the following:

- Setting holder [7]
- Seat lock key cylinder [8]

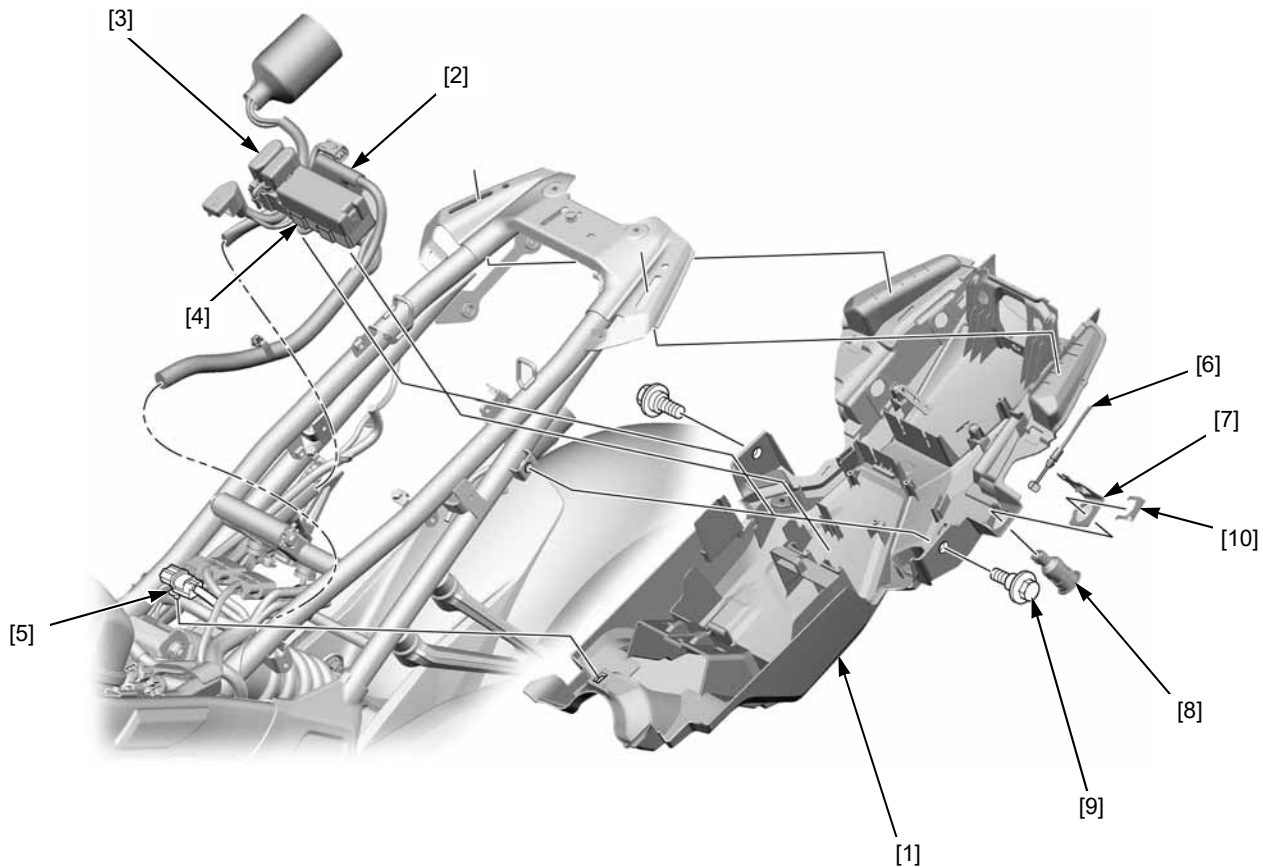
Remove the two bolts [9].

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

Remove the following:

- Setting plate [10]
- Seat lock key cylinder
- Setting holder

Installation is in the reverse order of removal.



FRONT LICENSE PLATE STAY

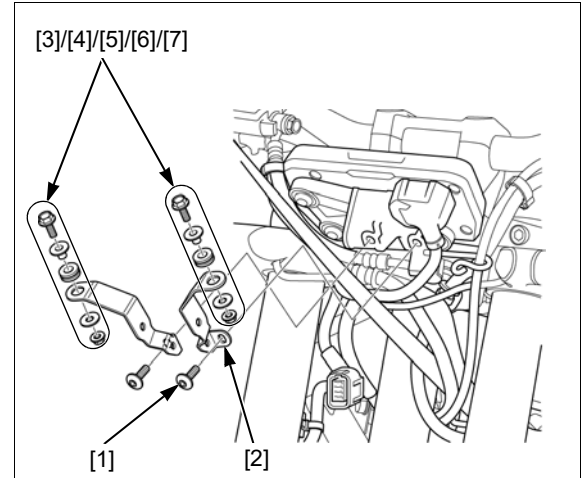
REMOVAL/INSTALLATION

IN model

Remove the following:

- Headlight (page 21-3)
- Socket bolts [1]
- Front license plate stays [2]
- Bolts [3]/nuts [4]/washers [5]
- Collars [6]/mounting rubbers [7]

Installation is in the reverse order of removal.



DRIVE SPROCKET COVER

REMOVAL/INSTALLATION

Remove the following:

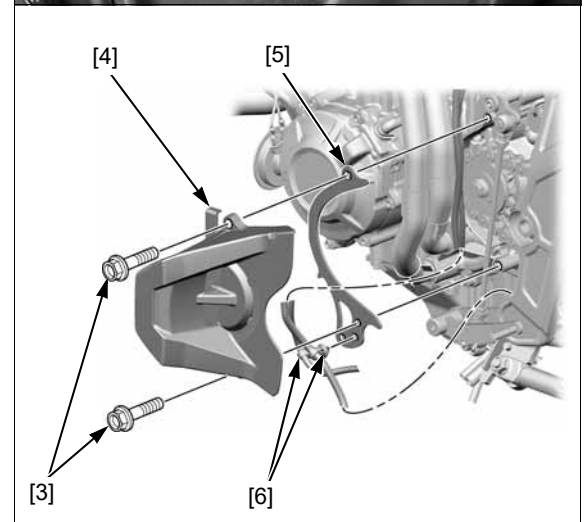
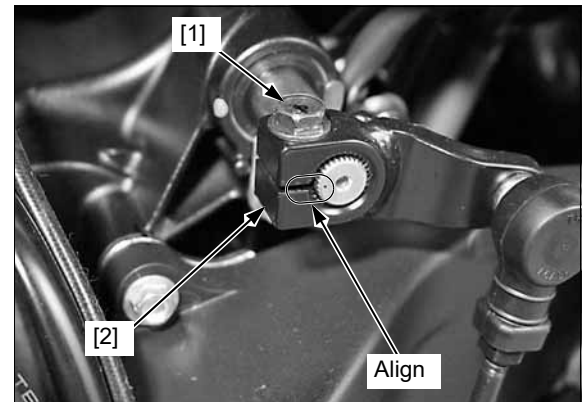
- Pinch bolt [1]
- Gearshift arm [2]
- Two bolts [3]
- Drive sprocket cover [4]

Remove the chain guide [5] by releasing the two wire clips [6].

Installation is in the reverse order of removal.

NOTE:

- Route the wires and hoses into the guide of the sprocket cover (page 1-22).
- Align the slit in the gearshift arm with the punch mark on the spindle.



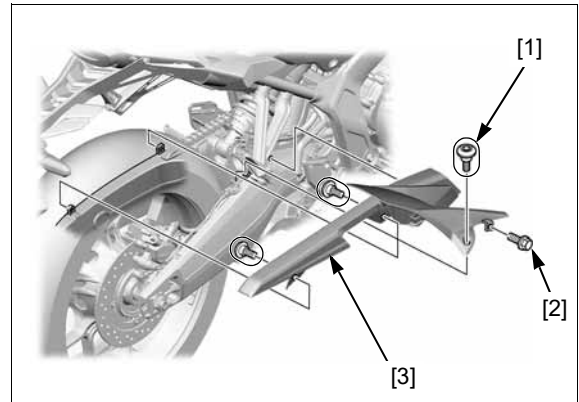
DRIVE CHAIN COVER/MUD GUARD

REMOVAL/INSTALLATION

Remove the following:

- Three socket bolts [1]
- Bolt [2]
- Drive chain cover/mud guard [3]

Installation is in the reverse order of removal.

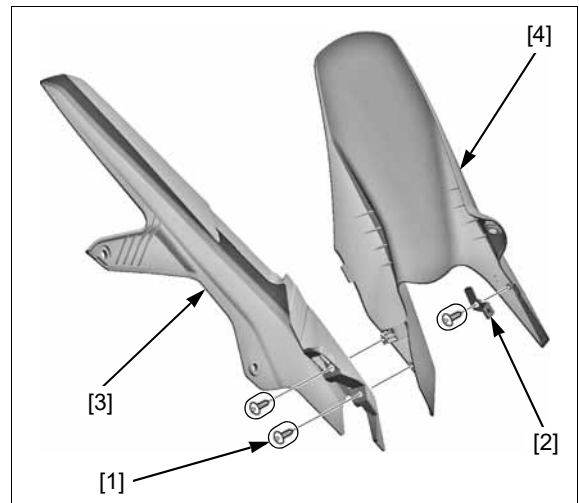


DISASSEMBLY/ASSEMBLY

Remove the following:

- Three tapping screws [1]
- Stay [2]
- Drive chain cover [3]
- Mud guard [4]

Assembly is in the reverse order of disassembly.



SIDESTAND

REMOVAL/INSTALLATION

Remove the sidestand switch from the sidestand pivot (page 21-18).

Remove the following:

- Spring [1]
- Pivot nut [2]
- Pivot bolt [3] and Washer [4]
- Sidestand [5]

Apply molybdenum disulfide grease to the sidestand pivot bolt sliding surface.

Install the sidestand, washer and sidestand pivot bolt.

Tighten the sidestand pivot bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

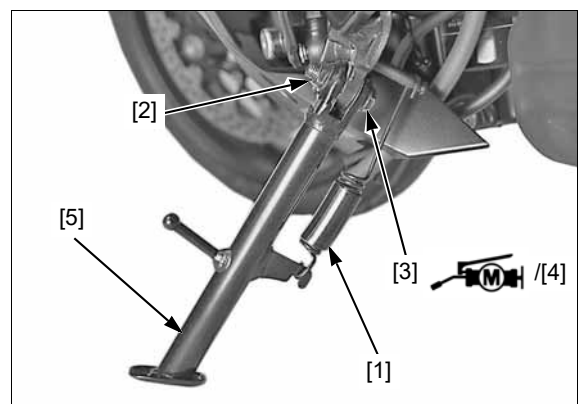
Loosen the sidestand pivot bolt 45 – 90°.

Install and tighten the sidestand pivot nut to the specified torque while holding the pivot bolt.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Install the sidestand spring.

Install the sidestand switch (page 21-18).



FOOTPEG BRACKET

REMOVAL/INSTALLATION

NOTE:

- For right rider footpeg bracket removal/installation, refer to following:
 - Brake pedal (page 18-16)
 - Rear master cylinder (page 18-12)

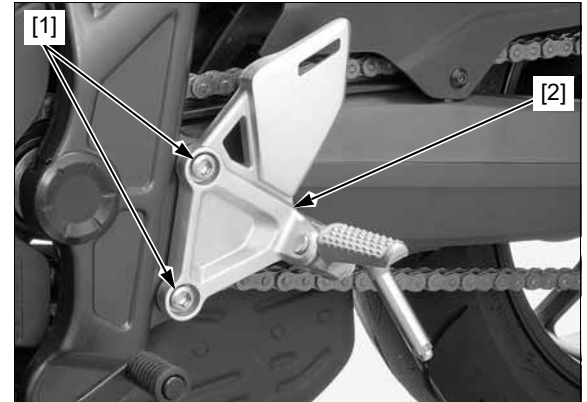
LEFT RIDER FOOTPEG BRACKET

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

Installation is in the reverse order of removal.

TORQUE:

Rider footpeg bracket socket bolt:
 27 N·m (2.8 kgf·m, 20 lbf·ft)



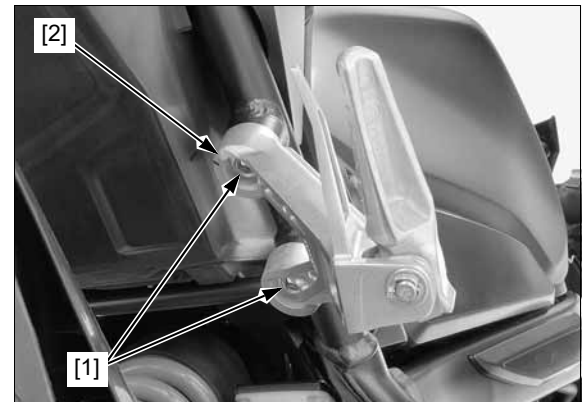
PASSENGER FOOTPEG BRACKET

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

Installation is in the reverse order of removal.

TORQUE:

Passenger footpeg bracket socket bolt:
 27 N·m (2.8 kgf·m, 20 lbf·ft)



EXHAUST PIPE/MUFFLER

MUFFLER PROTECTOR REMOVAL/INSTALLATION

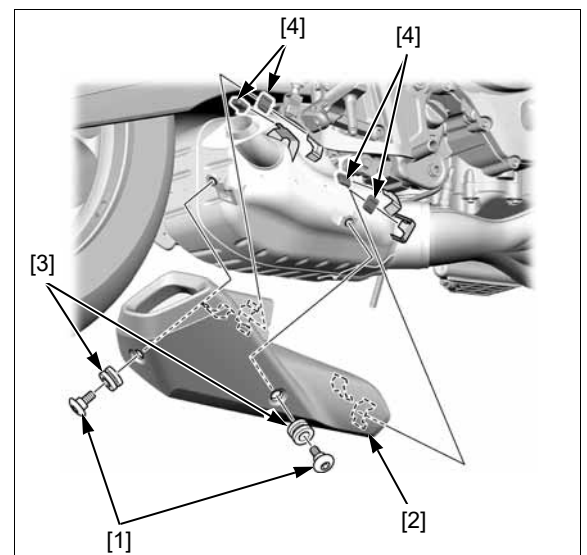
Remove the following:

- Socket bolts [1]
- Muffler protector [2]
- Mounting rubbers [3]
- Protector rubbers [4]

Installation is in the reverse order of removal.

TORQUE:

Muffler protector mounting bolt:
 12 N·m (1.2 kgf·m, 9 lbf·ft)



FRAME/BODY PANELS/EXHAUST SYSTEM

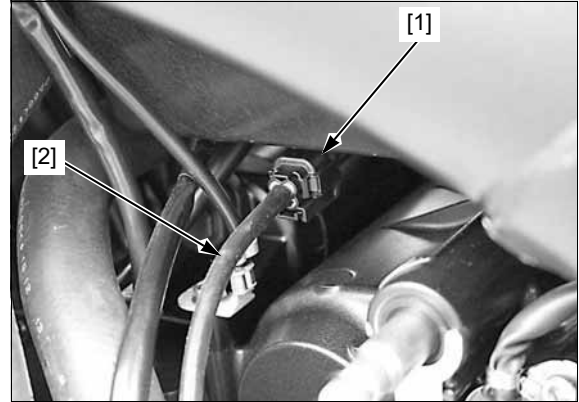
REMOVAL/INSTALLATION

Remove the drive sprocket cover (page 2-15).

Pull down the radiator (page 8-7).

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models

Disconnect the A/F sensor 4P (Black) connector [1] and remove the A/F sensor wire [2] out of the frame.



MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models

Disconnect the O₂ sensor 4P (Black) connector [1] and remove the O₂ sensor wire [2] out of the frame.

Remove the following:

- Joint nuts [1]
- Mounting bolts [2] collars (Right; short/Left; long) [3]
- Exhaust pipe/muffler [4]
- mounting rubbers [5]
- Gaskets [6]

Be sure to verify the length from the stud bolt head to the cylinder head surface (page 2-18).

Install new gaskets and mounting rubbers.

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

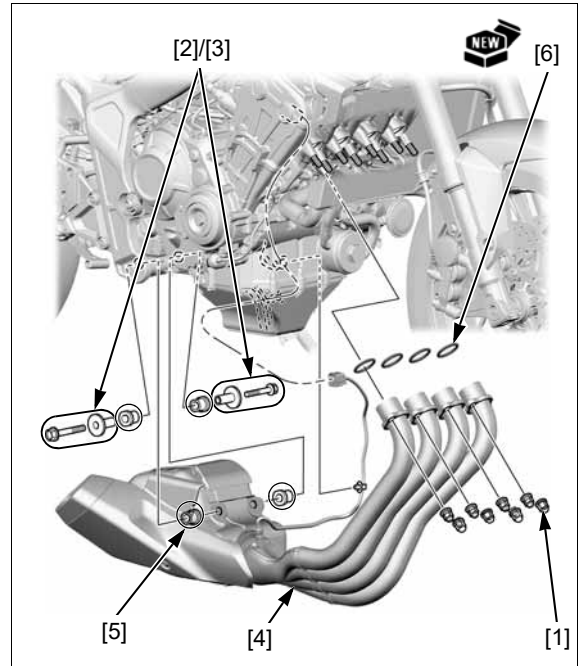
Tighten the joint nuts first to the specified torque, then tighten the mounting bolts.

TORQUE:

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

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

Install the removed parts in the reverse order of removal.



STUD BOLT REPLACEMENT

Remove the exhaust pipe/muffler (page 2-18).

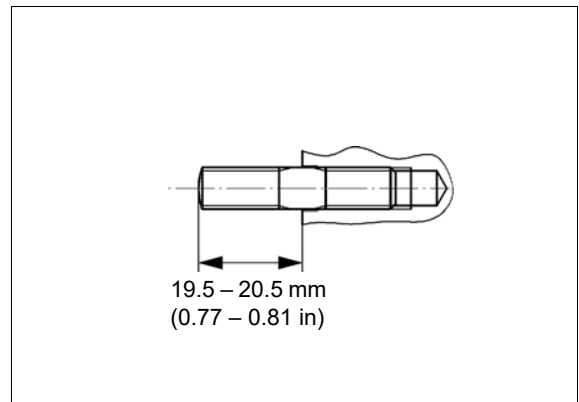
Thread two nuts onto the stud bolt and tighten them together, and use a wrench on them to turn the stud bolt out.

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

Tighten the stud bolt securely.

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

Install the exhaust pipe/muffler (page 2-18).



SERVICE INFORMATION.....	3-2	EVAPORATIVE EMISSION CONTROL SYSTEM (Except MA, IIMA, IN, U, IIU models)	3-14
MAINTENANCE SCHEDULE	3-2	DRIVE CHAIN	3-15
FUEL LINE	3-4	DRIVE CHAIN SLIDER	3-17
THROTTLE OPERATION	3-4	BRAKE FLUID	3-18
AIR CLEANER	3-5	BRAKE PADS WEAR	3-20
SPARK PLUG	3-6	BRAKE SYSTEM	3-21
VALVE CLEARANCE	3-8	BRAKE LIGHT SWITCH.....	3-21
ENGINE OIL/OIL FILTER	3-10	HEADLIGHT AIM.....	3-22
ENGINE IDLE SPEED.....	3-12	CLUTCH SYSTEM	3-23
EXHAUST SYSTEM (BR, IIBR models only)	3-12	SIDESTAND	3-23
RADIATOR COOLANT	3-13	SUSPENSION	3-24
COOLING SYSTEM.....	3-13	NUTS, BOLTS, FASTENERS	3-24
SECONDARY AIR SUPPLY SYSTEM.....	3-14	WHEELS/TIRES	3-25
		STEERING HEAD BEARINGS	3-25

MAINTENANCE

SERVICE INFORMATION

GENERAL

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

MAINTENANCE SCHEDULE

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO, U, IIU models

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

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

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

ITEMS	NOTE	FREQUENCY (NOTE 1)						ANNUAL CHECK	REGULAR REPLACE	REFER TO PAGE
		x 1,000 km	1	12	24	36	48			
		x 1,000 mi	0.6	8	16	24	32			
* FUEL LINE				I	I	I	I	I		3-4
* THROTTLE OPERATION				I	I	I	I	I		3-4
* AIR CLEANER	NOTE 2				R		R			3-5
* SPARK PLUG					I		R			3-6
* VALVE CLEARANCE							I			3-8
ENGINE OIL			R	R	R	R	R	R		3-10
ENGINE OIL FILTER			R		R		R			3-10
* ENGINE IDLE SPEED				I	I	I	I	I		3-12
RADIATOR COOLANT	NOTE 3			I	I	I	I	I	3 YEARS	3-13
* COOLING SYSTEM				I	I	I	I	I		3-13
* SECONDARY AIR SUPPLY SYSTEM					I		I			3-14
* EVAPORATIVE EMISSION CONTROL SYSTEM (Except U, IIU models)					I		I			3-14
DRIVE CHAIN		EVERY 1000 Km (600 mi) I, L								3-15
DRIVE CHAIN SLIDER				I	I	I	I			3-17
BRAKE FLUID	NOTE 3			I	I	I	I	I	2 YEARS	3-18
BRAKE PADS WEAR				I	I	I	I	I		3-20
BRAKE SYSTEM				I	I	I	I	I		3-21
BRAKE LIGHT SWITCH				I	I	I	I	I		3-21
HEADLIGHT AIM				I	I	I	I	I		3-22
CLUTCH SYSTEM				I	I	I	I	I		3-23
SIDESTAND				I	I	I	I	I		3-23
* SUSPENSION				I	I	I	I	I		3-24
* NUTS, BOLTS, FASTENERS				I	I	I	I	I		3-24
** WHEELS/TIRES				I	I	I	I	I		3-25
** STEERING HEAD BEARINGS				I	I	I	I	I		3-25

* 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.

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

NOTES:

- At higher odometer readings, repeat at the frequency interval established here.
- Service more frequently when riding in unusually wet or dusty areas.
- Replacement requires mechanical skill.

TH, IITH, IN, MA, IIMA, BR, IIBR models

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

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

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

ITEMS	NOTE	FREQUENCY (NOTE 1)								ANNUAL CHECK	REGULAR REPLACE	REFER TO PAGE
		x 1,000 km	1	6	12	18	24	30	36			
		x 1,000 mi	0.6	4	8	12	16	20	24			
* FUEL LINE				I		I		I		I		3-4
* THROTTLE OPERATION				I		I		I		I		3-4
* AIR CLEANER	NOTE 2					R				R		3-5
* SPARK PLUG				EVERY 24,000 Km (16,000 mi) I, EVERY 48,000 Km (32,000 mi) R								3-6
* VALVE CLEARANCE										I		3-8
ENGINE OIL			R		R			R		R		3-10
ENGINE OIL FILTER			R					R				3-10
* ENGINE IDLE SPEED					I			I		I		3-12
RADIATOR COOLANT	NOTE 3				I			I		I	3 years	3-13
* COOLING SYSTEM					I			I		I		3-13
* SECONDARY AIR SUPPLY SYSTEM								I				3-14
* EVAPORATIVE EMISSION CONTROL SYSTEM (Except MA, IIMA, IN models)								I				3-14
DRIVE CHAIN			EVERY 1,000 Km (600 mi) I, L								3-15	
DRIVE CHAIN SLIDER					I			I		I		3-17
BRAKE FLUID	NOTE 3			I	I	I	I	I	I	I	2 years	3-18
BRAKE PADS WEAR				I	I	I	I	I	I	I		3-20
BRAKE SYSTEM					I			I		I		3-21
BRAKE LIGHT SWITCH					I			I		I		3-21
HEADLIGHT AIM					I			I		I		3-22
CLUTCH SYSTEM				I	I	I	I	I	I	I		3-23
SIDESTAND					I			I		I		3-23
* SUSPENSION					I			I		I		3-24
* NUTS, BOLTS, FASTENERS					I			I		I		3-24
** WHEELS/TIRES					I			I		I		3-25
** STEERING HEAD BEARINGS					I			I		I		3-25

* 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.

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

NOTES:

1. At higher odometer readings, repeat at the frequency interval established here.
2. Service more frequently when riding in unusually wet or dusty areas.
3. Replacement requires mechanical skill.

FUEL LINE

FUEL TANK LIFTING/LOWERING

Remove the following:

- Ignition switch cover (page 21-14)
- Side cover (page 2-12)

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

Lift the front side of the fuel tank [3] slightly.

Disconnect the following:

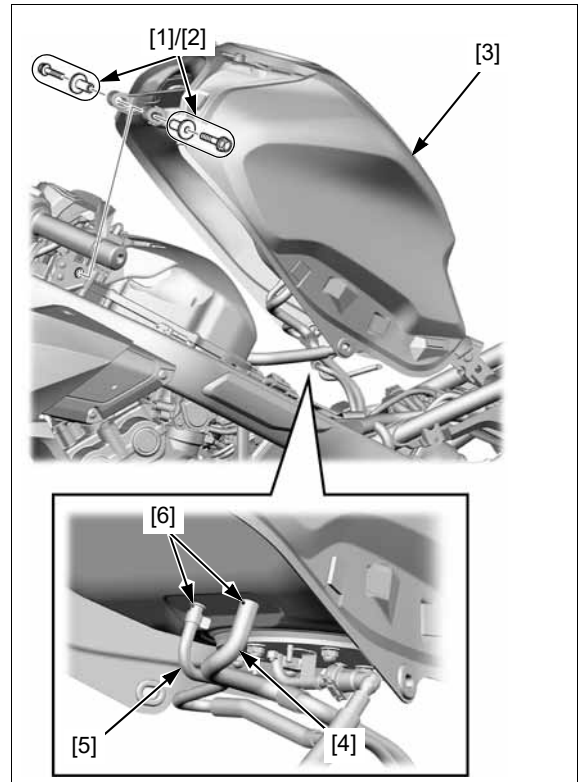
- Fuel tank drain hose [4]
- Fuel tank-to-EVAP canister hose [5]
(Except MA, IIMA, IN, U, IIU models)
- Fuel tank breather hose [5]
(MA, IIMA, IN, U, IIU models)

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

Installation is in the reverse order of removal.

NOTE:

- Install so that the white paint mark [6] faces forward (page 1-22).
- Check that the fuel tank hoses are not bent or pinched.



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.

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.

- CBR650RA: page 16-5
- CB650RA: page 16-9

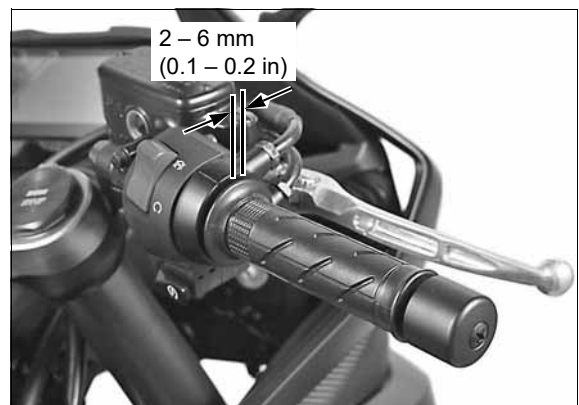
If the throttle grip still do not return properly, replace the throttle cables.

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.

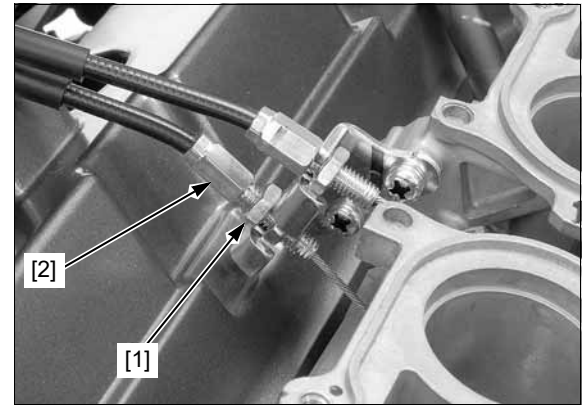
Major adjustment is made with the lower adjuster on the throttle body.

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

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: 5.5 N·m (0.6 kgf·m, 4.1 lbf·ft)



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.

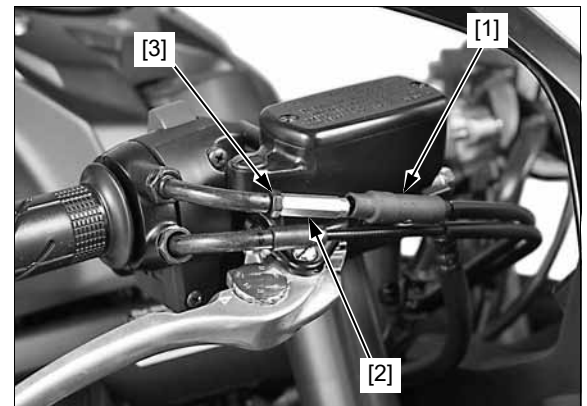
Tighten the lock nut to the specified torque while holding the adjuster.

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

Install the boot over the adjuster properly.

After adjustment, recheck the throttle operation.

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



AIR CLEANER

NOTE:

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

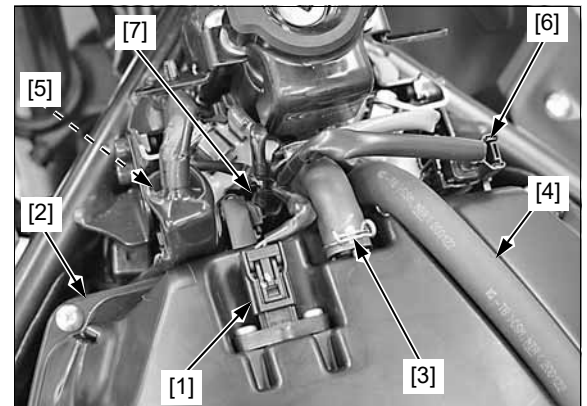
Lift the fuel tank and support it (page 3-4).

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

Disconnect the following from the air cleaner lid [2]:

- Crankcase breather hose [3]
- Air supply hose [4]
- Ignition switch 2P (Brown) connector [5]
- Immobilizer receiver 4P (Black) connector [6]
- Wire clip [7]

Remove the tapping screws [1] and air cleaner lid [2].



MAINTENANCE

Remove the two tapping screws [1] and air cleaner element [2].

Replace the air cleaner element in accordance with the maintenance schedule (page 3-2) or any time it is excessively dirt or damaged.

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

Installation is in the reverse order of removal.

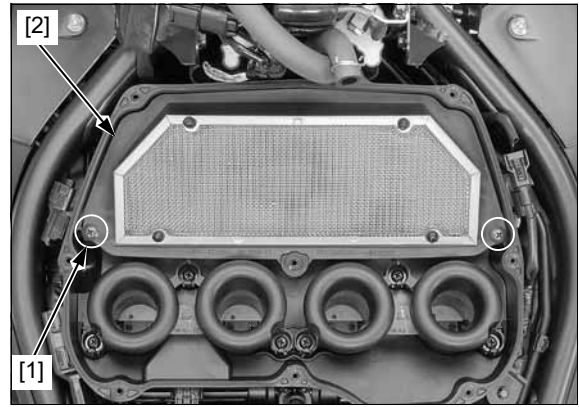
TORQUE:

Air cleaner element tapping screw:

1.1 N·m (0.1 kgf·m, 0.8 lbf·ft)

Air cleaner lid tapping screw:

1.1 N·m (0.1 kgf·m, 0.8 lbf·ft)

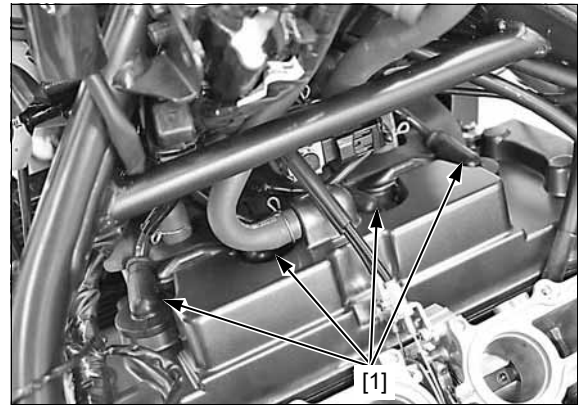


SPARK PLUG

REMOVAL/INSTALLATION

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

Disconnect the spark plug caps [1].



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

Remove the spark plug [1].

Inspect or replace the spark plugs as described in the maintenance schedule (page 3-2).

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 air cleaner housing (page 7-12).



INSPECTION

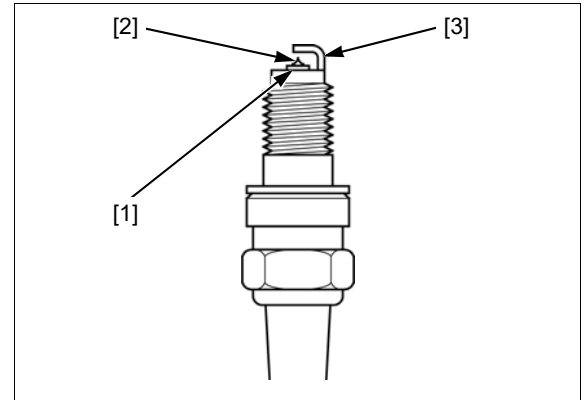
This motorcycle's spark plug is equipped with an iridium center electrode. Do not clean the electrodes.

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

SPECIFIED SPARK PLUG:

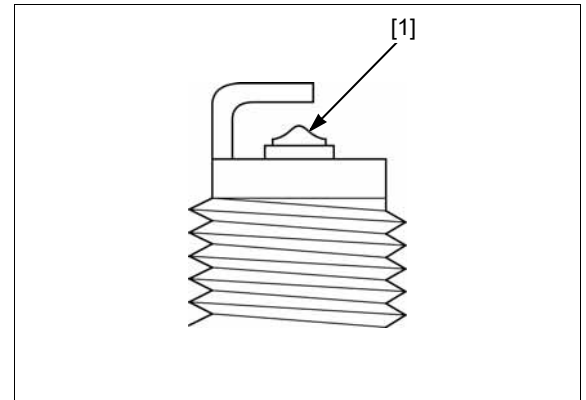
NGK: IMR9E-9HES

DENSO: VUH27ES



Always use specified spark plugs on this motorcycle.

Replace the plug with the specified one if the center electrode [1] is rounded as shown.



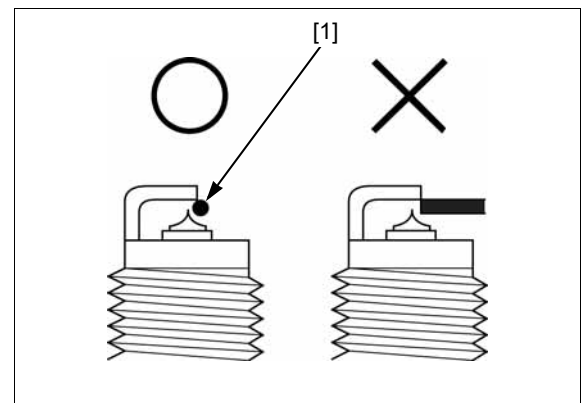
To prevent damaging the iridium center electrode, use a wire type feeler gauge to check the spark plug gap.

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

Make sure that the Φ 1.0 mm (0.04 in) plug gauge does not insert between the gap.

Do not adjust the spark plug gap.

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



VALVE CLEARANCE

INSPECTION

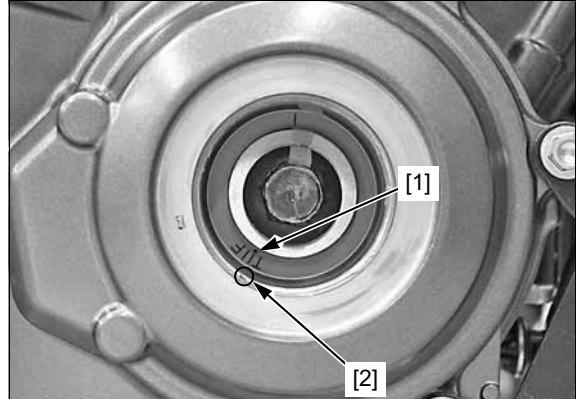
NOTE:

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

Remove the following:

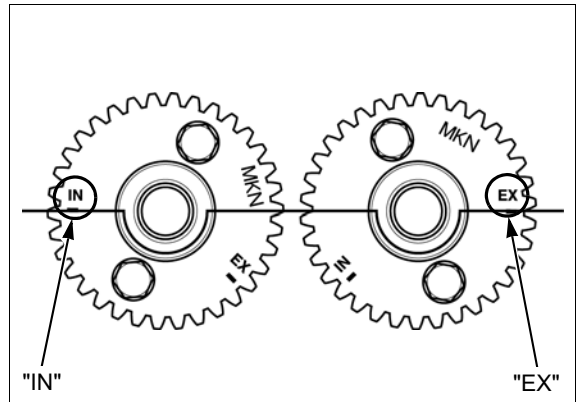
- Cylinder head cover (page 10-4)
- Timing hole cap and O-ring

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 facing outward as shown.

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



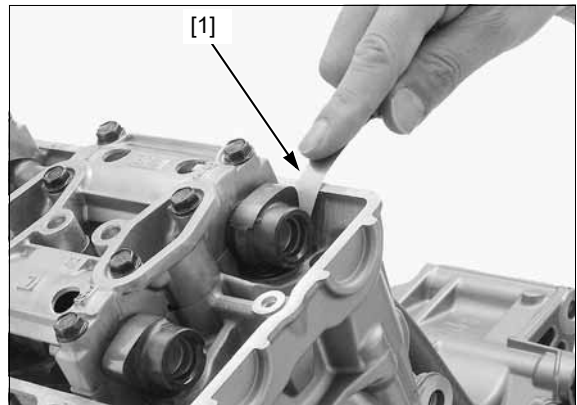
Insert the feeler gauge [1] between the valve lifter and the cam lobe.

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

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

VALVE CLEARANCE:

IN: 0.20 ± 0.03 mm (0.008 ± 0.001 in)



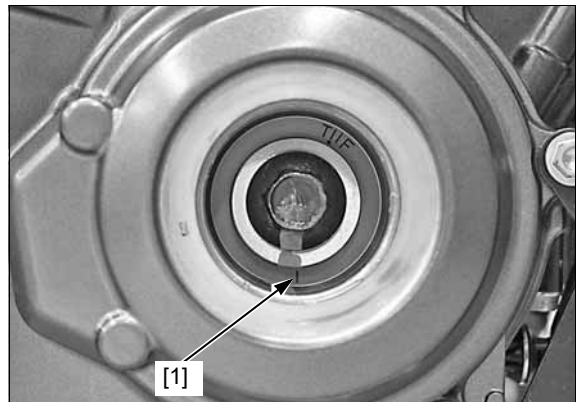
Turn the crankshaft clockwise 1/2 turn (180°), align the index line [1] on the CKP sensor rotor so that it is facing down as shown.

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

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

VALVE CLEARANCE:

EX: 0.28 ± 0.03 mm (0.011 ± 0.001 in)



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

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

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

VALVE CLEARANCE:
IN: 0.20 ± 0.03 mm (0.008 ± 0.001 in)

Turn the crankshaft clockwise 1/2 turn (180°), align the index line on the CKP sensor rotor so that it is facing down as shown.

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

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

VALVE CLEARANCE:
EX: 0.28 ± 0.03 mm (0.011 ± 0.001 in)

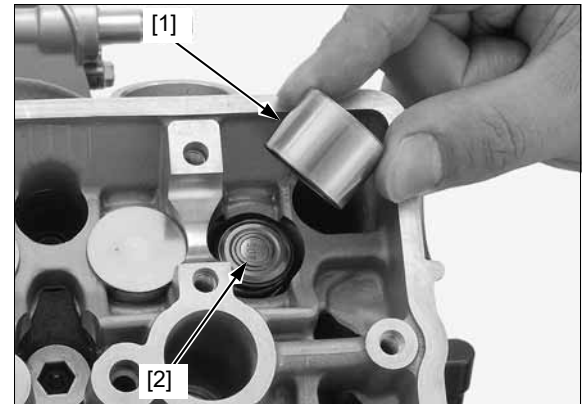
ADJUSTMENT

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

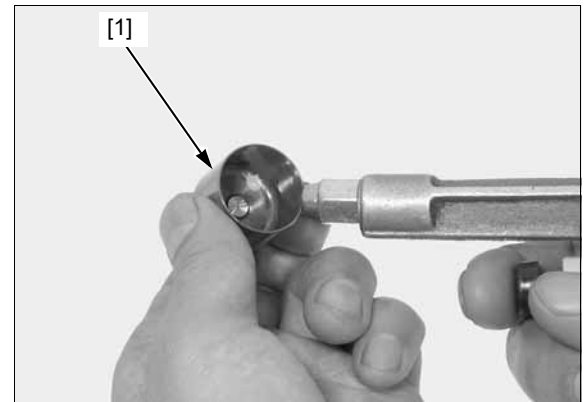
Remove the camshafts (page 10-5).

Remove the valve lifters [1] and shims [2].

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

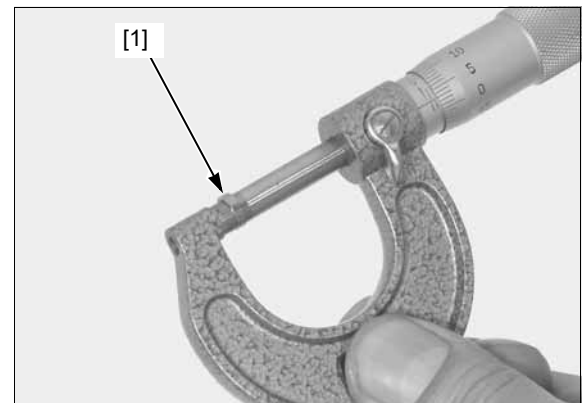


Clean the valve shim contact area in the valve lifter [1] with compressed air.



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

Measure the shim [1] thickness and record it.



MAINTENANCE

Calculate the new shim thickness using the equation below.

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

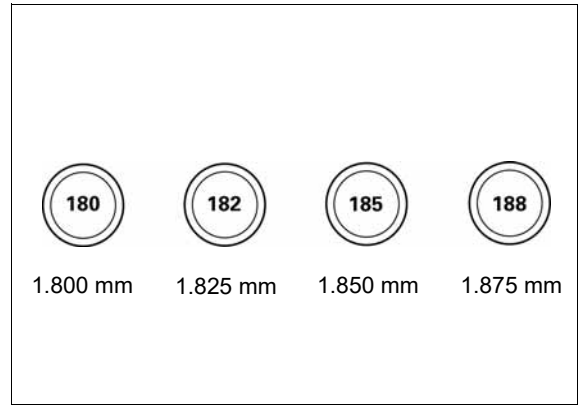
A: New shim thickness

B: Recorded valve clearance

C: Specified valve clearance

D: Old shim thickness

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



Install the shims and valve lifters in their original locations

Install the newly selected shim [1] on the valve retainer.

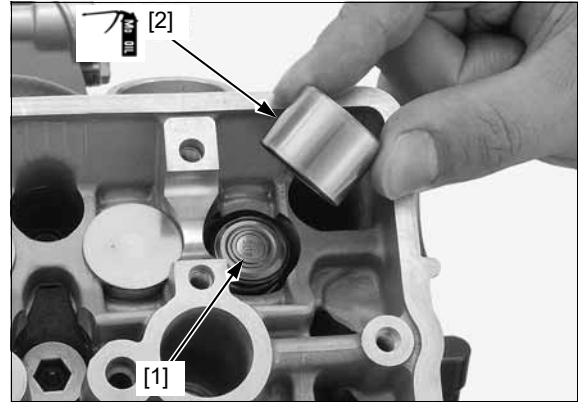
Apply molybdenum disulfide oil to the valve lifter [2] sliding surface.

Install the valve lifters into the valve lifter holes.

Install the camshaft (page 10-8).

Rotate the camshafts by rotating the crankshaft clockwise several times.

Recheck the valve clearance.



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

Apply engine oil to the timing hole cap O-ring.

Apply grease to the timing hole cap threads.

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

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Install the removed parts in the reverse order of removal.

ENGINE OIL/OIL FILTER

OIL LEVEL CHECK

Hold the motorcycle in an upright position.

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

Stop the engine and wait 2 – 3 minutes.

Remove the oil filler cap/dipstick [1] and wipe it clean.

Reinstall the oil filler cap/dipstick, but do not screw it.

Remove the oil filler cap/dipstick and check the oil level.

If the level is below or near the lower level [2] on the dipstick, fill the recommended engine oil to the upper level [3].

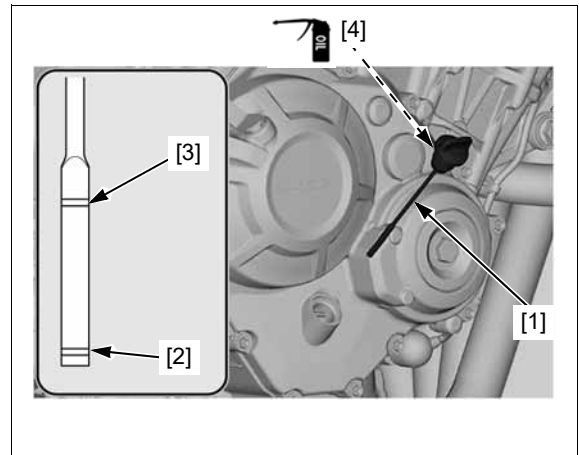
RECOMMENDED ENGINE OIL:

Honda "4-stroke motorcycle oil" or an equivalent

API classification: SG or higher

Viscosity: SAE 10W-30

JASO T 903 standard: MA



Check that the O-ring [4] is in good condition, replace it if necessary.

Apply engine oil to the O-ring.

Install the oil filler cap/dipstick.

ENGINE OIL & FILTER CHANGE

Warm up the engine.

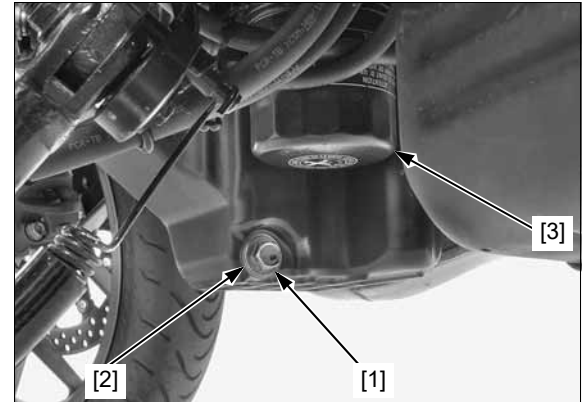
Stop the engine and remove the oil filler cap/dipstick.

Remove the oil drain bolt [1] and sealing washer [2] to drain the engine oil.

Remove the oil filter cartridge [3] using the special tool.

TOOL:

Oil filter wrench **07HAA-PJ70101**

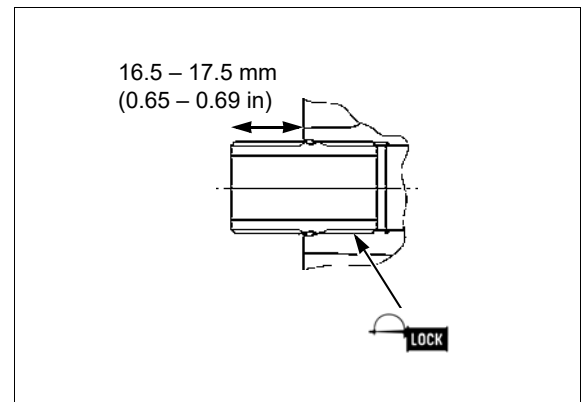


Check that the oil filter boss protrusion from the crankcase is specified length as shown.

SPECIFIED LENGTH: 16.5 - 17.5 mm (0.65 - 0.69 in)

NOTE:

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



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

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

TOOL:

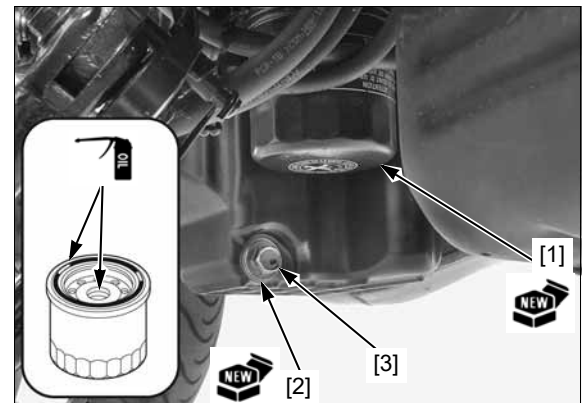
Oil filter wrench **07HAA-PJ70101**

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)

Install a new sealing washer [2] onto the drain bolt [3].

Install and tighten the drain bolt/sealing washer 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:

2.3 liters (2.4 US qt, 2.0 Imp qt) at draining

2.6 liters (2.7 US qt, 2.3 Imp qt) at oil filter change

3.0 liters (3.2 US qt, 2.6 Imp qt) at disassembly

Check the oil level (page 3-10).

Make sure there are no oil leaks.

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
 - 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: $1,250 \pm 100 \text{ min}^{-1}$ (rpm)

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

- Air cleaner element condition (page 3-5)
- Throttle operation and throttle grip freeplay (page 3-4)
- Spark plug condition (page 3-6)
- Intake air leak or engine top-end problem (page 10-4)
- IACV operation (page 7-17)

EXHAUST SYSTEM (BR, IIBR models only)

EXHAUST EMISSION MEASUREMENT AT IDLE

Inspect after checking engine idle speed (page 3-12).

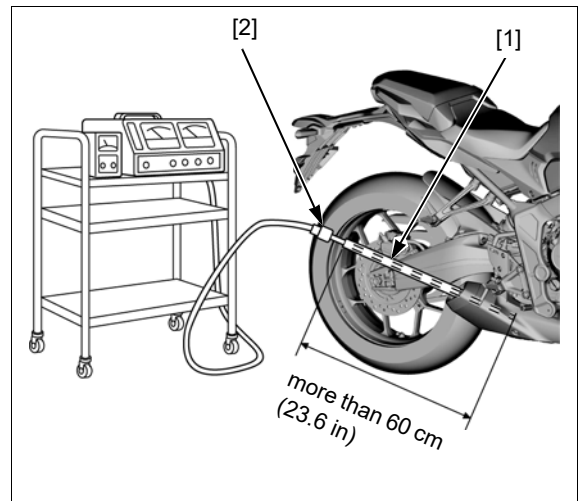
1. Support the motorcycle on its sidestand on a level surface.
2. Connect an appropriate pipe or hose [1] (heat-resistant, chemical-resistant) to the muffler so that the probe [2] can be inserted by more than 60 cm (23.6 in).
3. Start the engine and warm it up until the drain bolt temperature is $65 \pm 5 \text{ }^\circ\text{C}$.
4. Check the engine idle speed.

IDLE SPEED: $1,250 \pm 100 \text{ min}^{-1}$ (rpm)

Insert the probe into the muffler and measure the carbon monoxide (CO,%) and hydrocarbon (HC, ppm) concentration.

CO measurement at idle: Below 0.5 %

HC measurement at idle: Below 400 ppm



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 reserve tank cap [3] and fill the tank to the "UPPER" level line with the recommended coolant.

RECOMMENDED ANTIFREEZE:

ED, IIED, IIIED, IVED, KO, IIKO, U, IIU, BR, IIBR MODELS:

High quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors (Mix the distilled water and antifreeze in the ratio of 1:1)

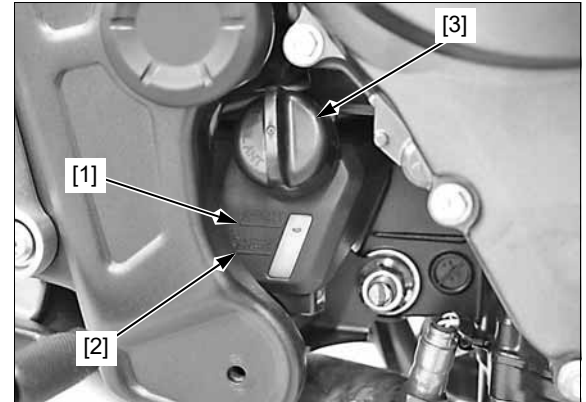
TH, IITH, IN, FO, IIFO, MA, IIMA MODELS:

HONDA PRE-MIX COOLANT or equivalent

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 8-4).

Install the reserve tank cap.



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 following:

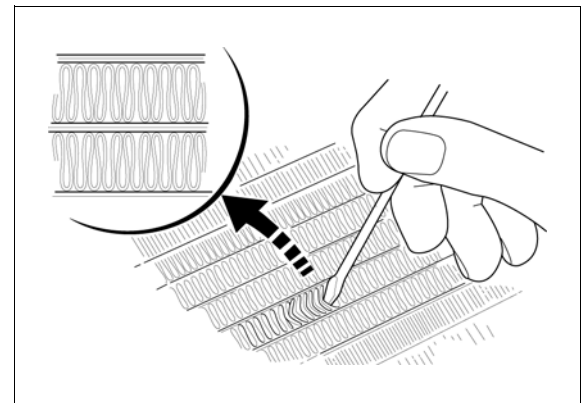
- Middle cowls (page 2-7) (CBR650RA)
- Under cowl (page 2-11) (CBR650RA)
- Shroud (page 2-10) (CB650RA)

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 removed parts in the reverse order of removal.



MAINTENANCE

SECONDARY AIR SUPPLY SYSTEM

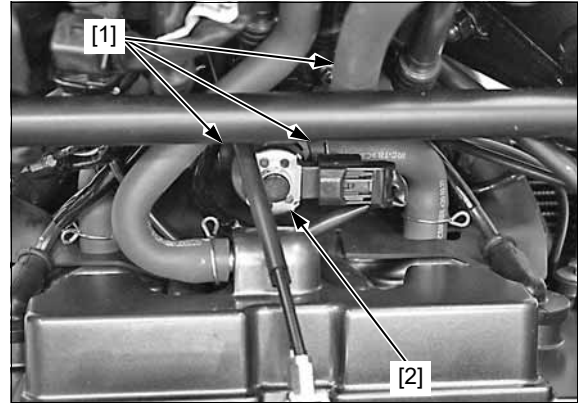
Remove the air cleaner housing (page 7-12).

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 7-22).

For secondary air supply system inspection (page 7-19).



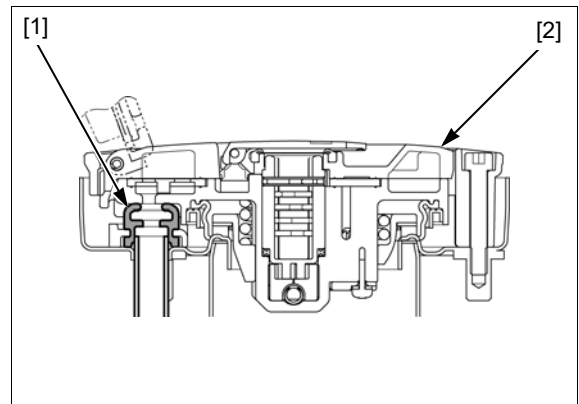
EVAPORATIVE EMISSION CONTROL SYSTEM (Except MA, IIMA, IN, U, IIU models)

Open the fuel fill cap.

Check the breather seal [1] in the fuel fill cap [2] for deterioration, cracks or damage. Replace it if necessary.

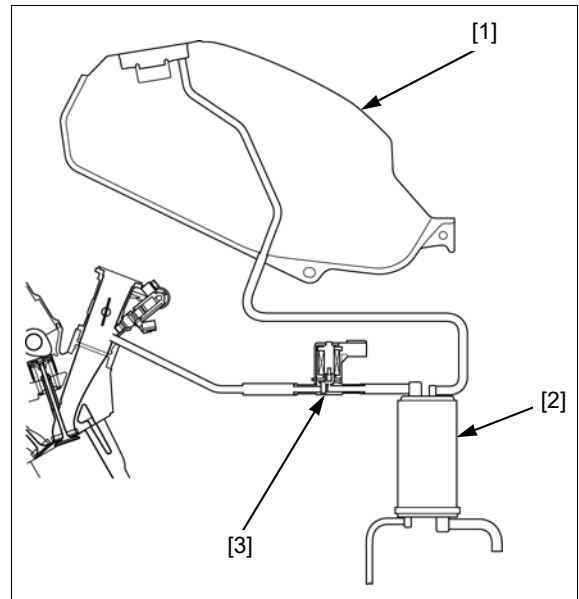
NOTE:

- Always replace the breather seal with a new one when the fuel fill cap is removed for service.



Check the hoses between the fuel tank [1], EVAP canister [2], EVAP purge control solenoid valve [3] for deterioration, damage or loose connection.

Check the EVAP canister for cracks or other damage.



DRIVE CHAIN

DRIVE CHAIN SLACK INSPECTION

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

Turn the ignition switch OFF.

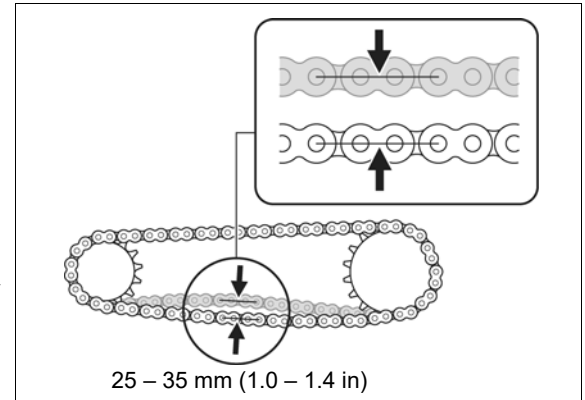
Place the motorcycle on its sidestand and shift the transmission into neutral.

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

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

NOTICE

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



ADJUSTMENT

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

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

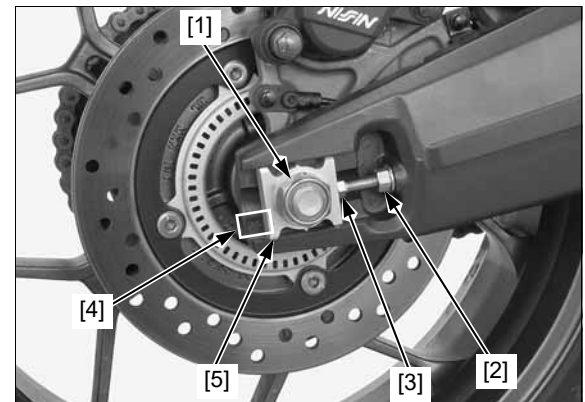
Make sure the scales [4] on both swingarm end are aligned with the end face of the adjusting plates [5].

Tighten the axle nut to the specified torque.

TORQUE: 98 N·m (10.0 kgf·m, 72 lbf·ft)

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

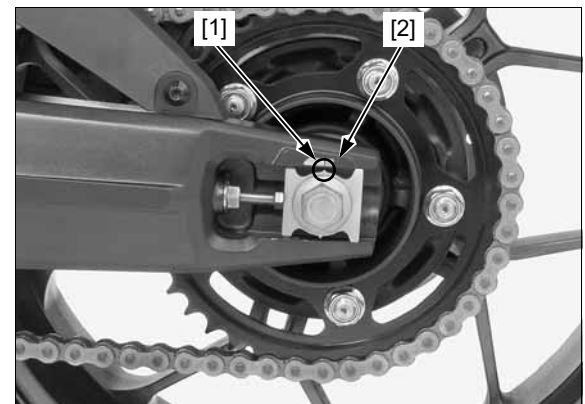
TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



Recheck the drive chain slack and free wheel rotation.

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

If the index notch [1] of the left adjusting plate reaches the red zone [2] 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.

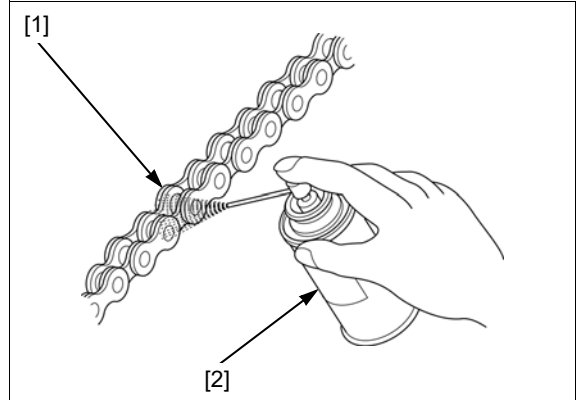
Be sure the drive chain has dried completely before lubricating.

Lubricate the drive chain with drive chain lubricant [2] designed specifically for O-ring chains or SAE #80 – 90 gear oil.

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 2-15).

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.

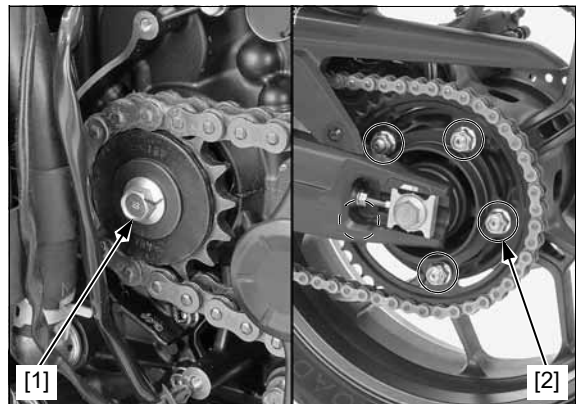
Check the attaching bolt and nuts on the drive and driven sprockets.

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 2-15).

REPLACEMENT

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

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

Remove the drive chain using the special tool.

TOOL:

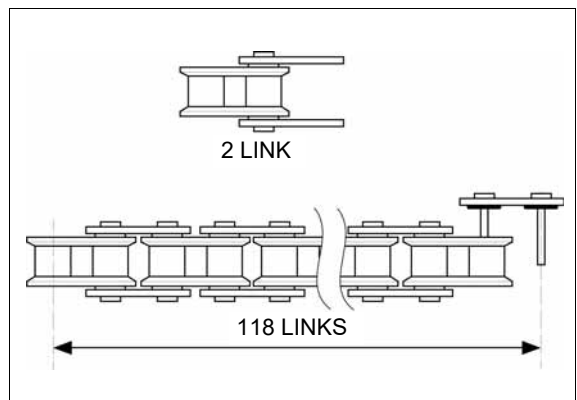
Drive chain tool set 07HMH-MR10103

NOTE:

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

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

SPECIFIED LINKS: 118 LINKS
REPLACEMENT CHAIN: DID525V11-118LE
RK525KRW-118LE



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

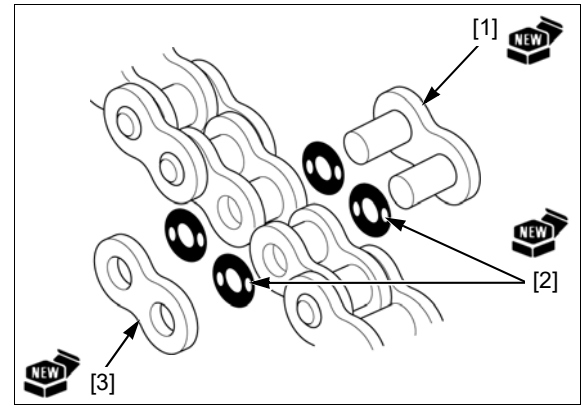
Insert a new master link [1] with new O-rings [2] from the inside of the drive chain, and install a new plate [3] and O-rings with the identification mark facing out.

Assemble the master link, O-rings and plate.

TOOL:

Drive chain tool set

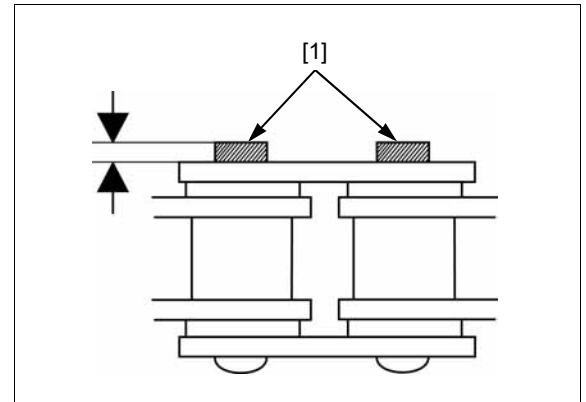
07HMH-MR10103



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.

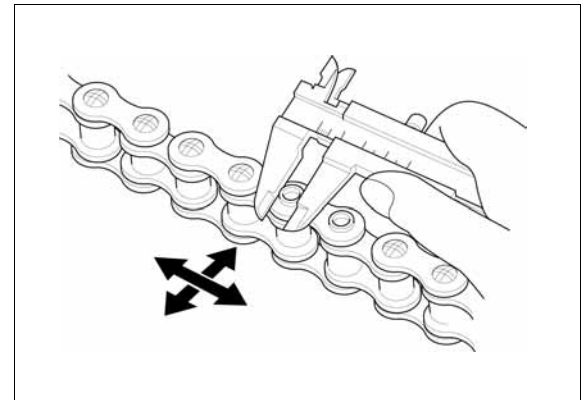
DIAMETER OF STAKED AREA:

DID525V11: 5.50 – 5.80 mm (0.217 – 0.228 in)

RK525KRW: 5.30 – 5.70 mm (0.209 – 0.224 in)

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

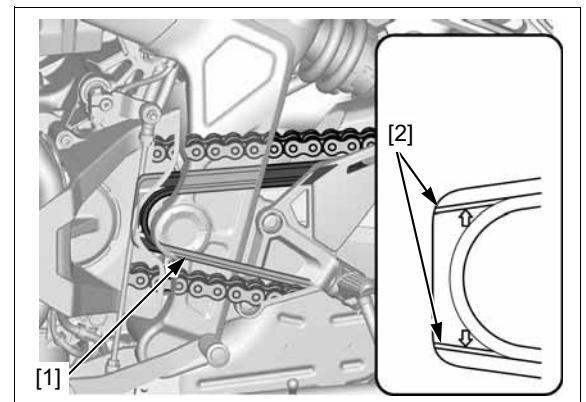
If there is any cracking, replace the master link, O-rings and plate.



DRIVE CHAIN SLIDER

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

The drive chain slider must be replaced if it is worn to the wear limit lines [2] (page 17-11).



BRAKE FLUID

NOTICE

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

NOTE:

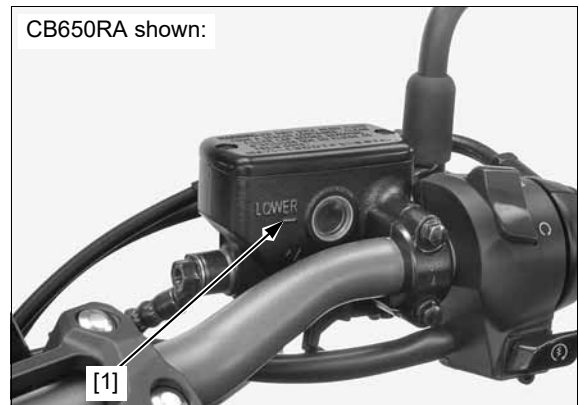
- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.
- When the fluid level is low, check the brake pads for wear (page 3-20).

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 3-21).

FRONT BRAKE

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

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



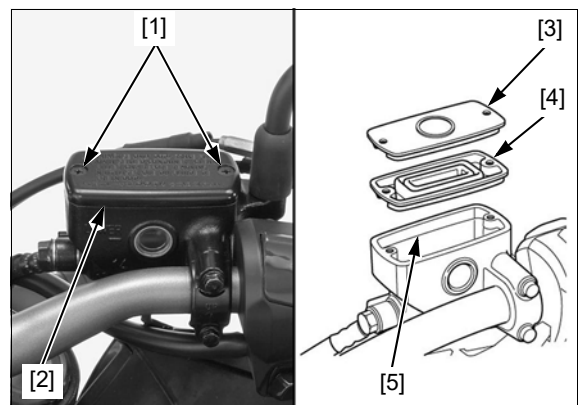
Remove the following:

- Two screws [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 cap, and tighten the screws to the specified torque.

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



REAR BRAKE

Support the motorcycle 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 not to spill the fluid out of the reservoir.

Remove the following:

- Reservoir mounting bolt [1]
- Two screws [2]
- Reservoir cap [3]
- Set plate [4]
- Diaphragm [5]

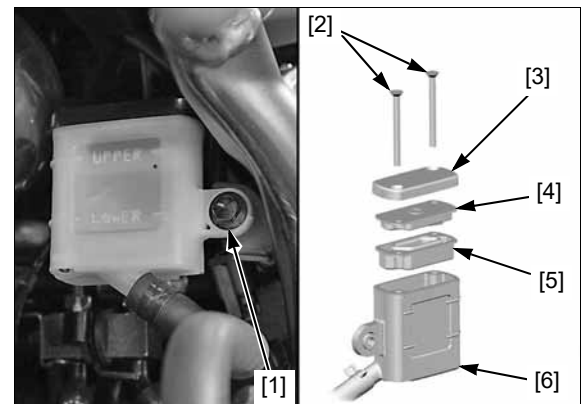
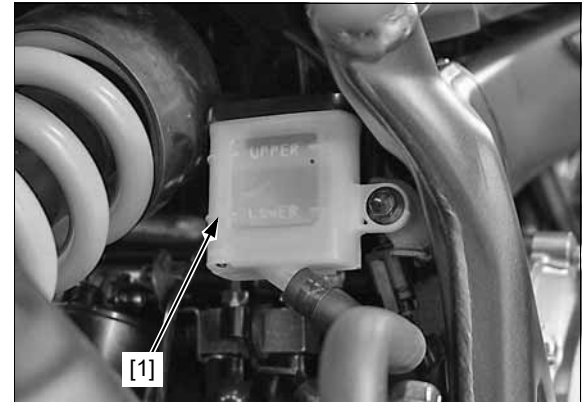
Temporarily install the reservoir [6] onto the reservoir stay with the mounting bolt secure it so the reservoir is level.

Fill the reservoir with DOT 4 brake fluid from a sealed container to the upper level line [7].

Carefully remove the reservoir from the stay by removing the 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)



MAINTENANCE

BRAKE PADS WEAR

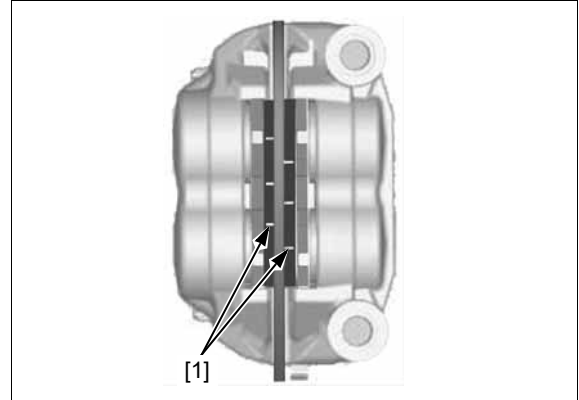
FRONT BRAKE PADS

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 18-8).



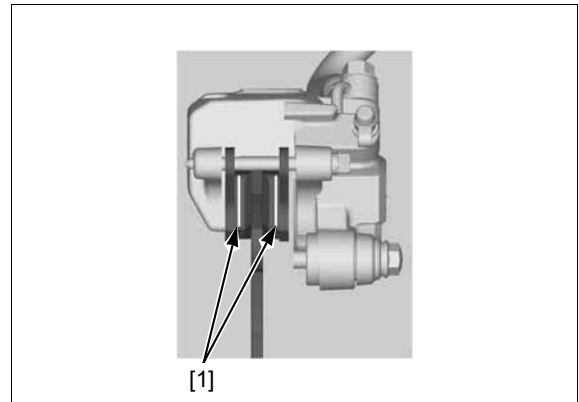
REAR BRAKE PADS

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 18-9).



BRAKE SYSTEM

INSPECTION

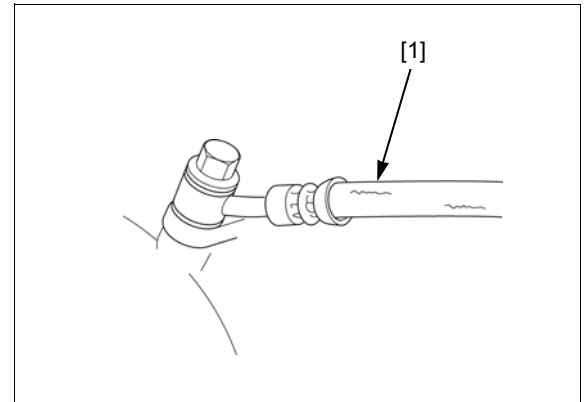
Firmly apply the brake lever or pedal, and check that no air has entered the system.

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.

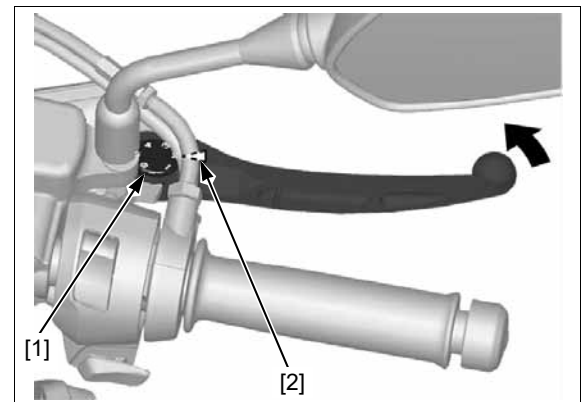
Replace hoses, pipes and fittings as required.



BRAKE LEVER ADJUSTMENT

The distance between the brake lever and the grip can be adjusted by turning the adjuster [1].

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



BRAKE LIGHT SWITCH

NOTE:

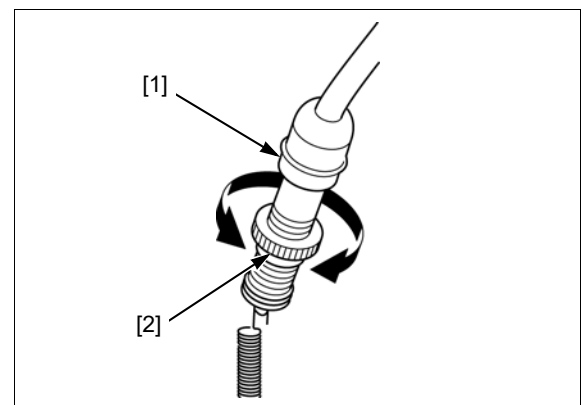
- The brake light switch on the front brake master cylinder cannot be adjusted. If the front brake light switch actuation and brake engagement are not synchronized, either replace the switch unit or the malfunctioning parts of the system.

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.

Do not turn the switch body

Hold the switch body [1] and turn the adjuster [2].



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 the headlight aim vertically by turning the pinion [1].

A counterclockwise rotation moves the beam up and clockwise rotation moves the beam down.

CBR650RA

Right side: Adjust the headlight beams horizontally by turning the horizontal beam adjuster [2].

A counterclockwise rotation moves the beam right and clockwise rotation moves the beam left.

Left side: Adjust the headlight beams horizontally by turning the horizontal beam adjuster [3].

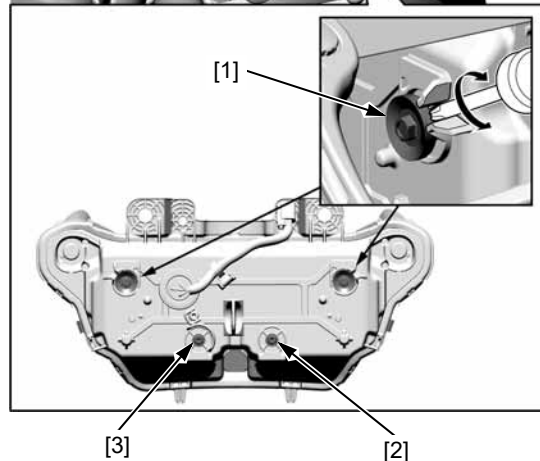
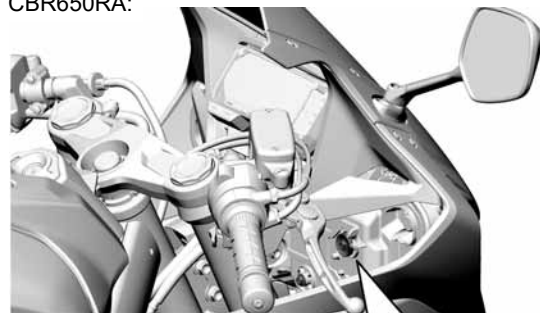
A counterclockwise rotation moves the beam left and clockwise rotation moves the beam right.

CB650RA

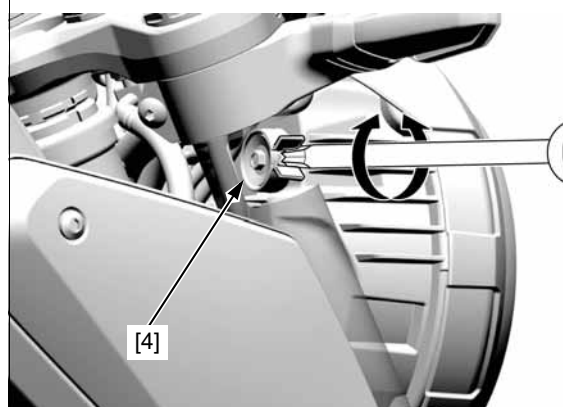
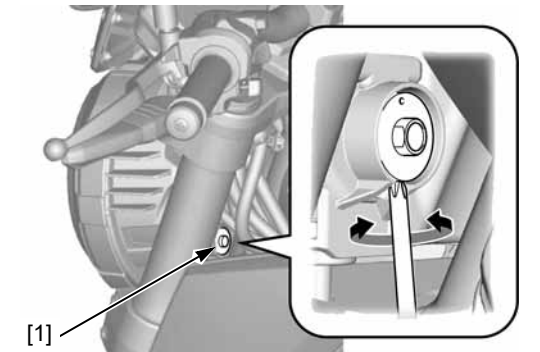
Adjust the headlight beams horizontally by turning the horizontal beam adjuster [4].

A counterclockwise rotation moves the beam left and clockwise rotation moves the beam right.

CBR650RA:



CB650RA:



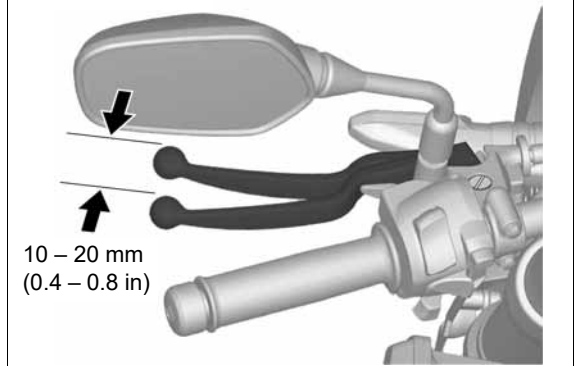
CLUTCH SYSTEM

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)

CB650RA shown:

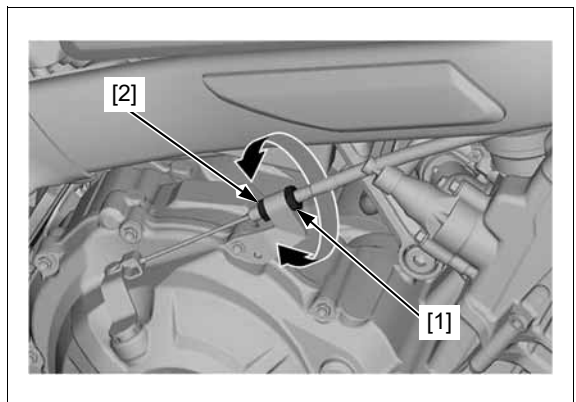


Clutch lever freeplay can be adjusted at either end of the clutch cable.

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.



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

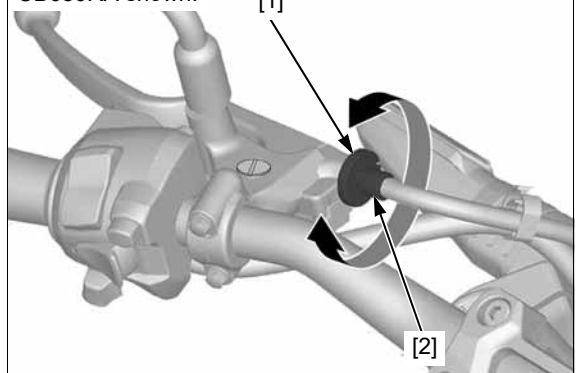
The adjuster may be damaged if it is positioned too far out, leaving minimal thread engagement.

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

Tighten the lock nut while holding the adjuster.

If the proper freeplay cannot be obtained, or the clutch slips during test-ride, disassemble and inspect the clutch (page 11-9).

CB650RA shown:



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.

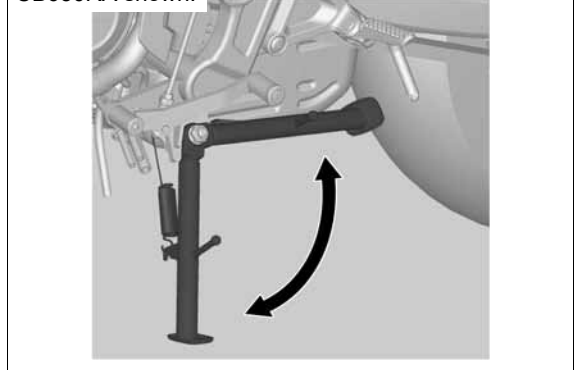
For sidestand removal/installation (page 2-16).

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 21-18).

CB650RA shown:



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 16-21).

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 17-8).

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 17-10).

REAR SUSPENSION ADJUSTMENT

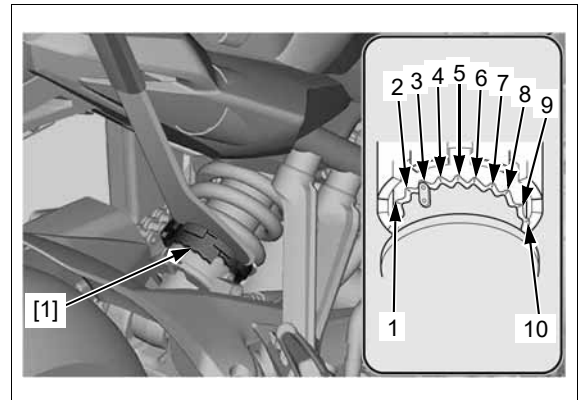
SPRING PRE-LOAD ADJUSTER

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

ADJUSTABLE RANGE: 10 positions

Position 1 and 2 is for a decrease spring preload (soft),
or turn the position 4 to 10 increase spring preload (hard).

The standard position is 3.



NUTS, BOLTS, FASTENERS

Check that all chassis nuts, screws and bolts are tightened to their correct torque values (page 1-11).

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 16-15).

Support the motorcycle using a hoist or equivalent and raise the rear 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 17-4).

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

- Front tire (page 1-9)
- Rear tire (page 1-10)

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

Check the front and rear wheels for trueness.

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 16-38).

MEMO

SERVICE INFORMATION	4-2	ECM	4-76
SYSTEM LOCATION	4-4	MAP SENSOR	4-79
SYSTEM DIAGRAM	4-5	ECT SENSOR	4-79
PGM-FI TROUBLESHOOTING INFORMATION	4-7	IAT SENSOR	4-79
PGM-FI SYMPTOM TROUBLESHOOTING	4-11	A/F SENSOR (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models)	4-80
DTC INDEX (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models)	4-12	O ₂ SENSOR (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)	4-80
DTC TROUBLESHOOTING (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models)	4-14	GEAR POSITION SWITCH	4-81
DTC INDEX (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)	4-46	BANK ANGLE SENSOR	4-81
DTC TROUBLESHOOTING (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)	4-48	CKP SENSOR (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models)	4-82
MIL CIRCUIT TROUBLESHOOTING	4-76	MAIN RELAY	4-85
		MAIN RELAY DIODE	4-87

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 (page 4-7). If the MIL lights or blinks, follow the Self-Diagnostic Procedures to remedy the problem.
- 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.
- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models: If the ECM is replaced, perform the following procedure.
 - Key Registration Procedures (page 22-4)
 - Crank pulse initialize learning procedure (page 4-84)
- MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models: If the ECM is replaced, perform the Key Registration Procedures (page 22-7).
- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models: If the CKP sensor is removed, perform the crank pulse initialize learning procedure (page 4-84).
- The following color codes are used throughout this section.

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

CONVERSION BETWEEN TYPES WITH OR WITHOUT ENGINE OUTPUT LIMITATIONS (ED, IIED, IIIED, IVED models only)

NOTE:

- If the ECM has a DTC, the conversion does not work.
 - When the GST is connected, the conversion does not work.
1. Replace the intake ducts (page 7-12) with corresponding ones.

NOTE:

- Difference in the intake ducts are as follows.
 - Full power: No restriction in the intake duct hole.
 - 35 kw: Restriction wall in the intake duct hole.
2. Connect the MCS (page 4-8), perform the ECM Update for the conversion.

NOTE:

- Refer to the MCS instruction manual for the ECM Update procedure.
- If the ECM update procedure is not complete, the ECM will enter the output restriction mode.
- If the following sensors or actuator faults are detected, the ECM will also enter output restriction mode.
 - TP sensor
 - MAP sensor
 - IAT sensor
 - ECT sensor
 - O₂ sensor
 - Fuel injector
 - PAIR control solenoid valve
 - EVAP purge control solenoid valve
 - IACV
 - Ignition coil
- The output restriction mode is canceled by turning the ignition switch OFF, and then ON again.

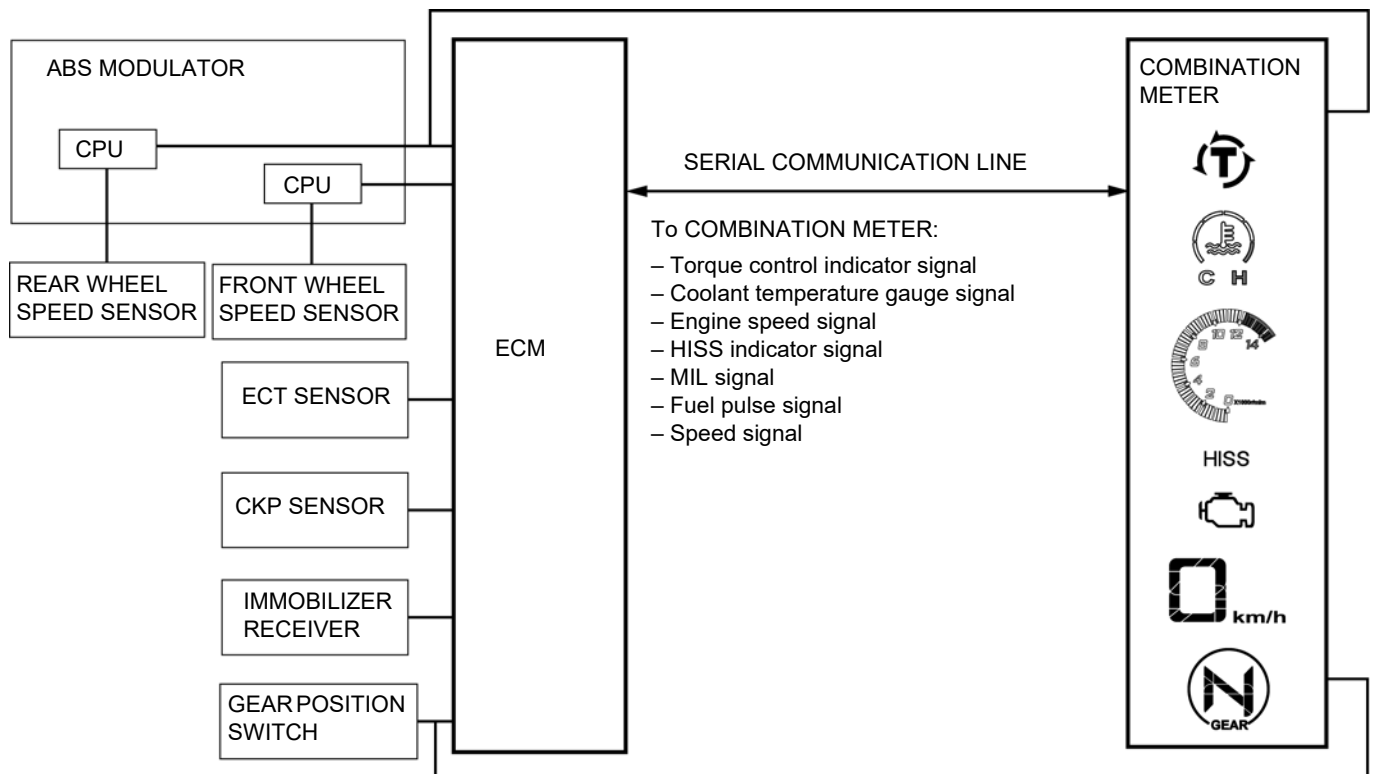
ECM-to-COMBINATION METER TWO-WAY SERIAL COMMUNICATION

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

The ECM sends the following information to the combination meter.

- Torque control indicator signal
- Coolant temperature gauge signal
- Engine speed signal
- HISS indicator signal
- MIL signal
- Fuel pulse signal (for fuel mileage meter)
- Gear position indicator signal
- Speed signal

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

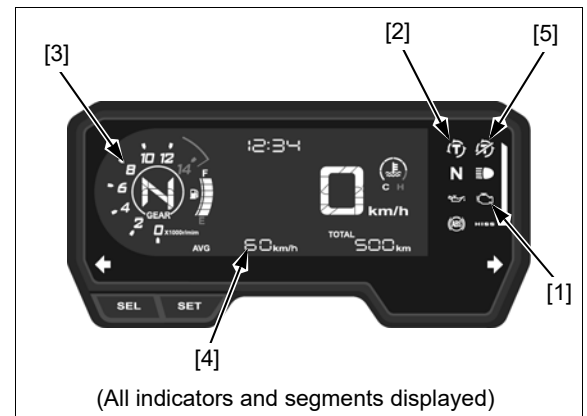
If there is any problem in the serial communication line, the combination meter shows following:

- MIL [1] and torque control indicator [2] stays on
- Tachometer [3] does not operate (though the engine is running)
- Section A display [4] indicates "-"
- Torque control off indicator [5] does not come on

Serial communication line troubleshooting (page 21-7).

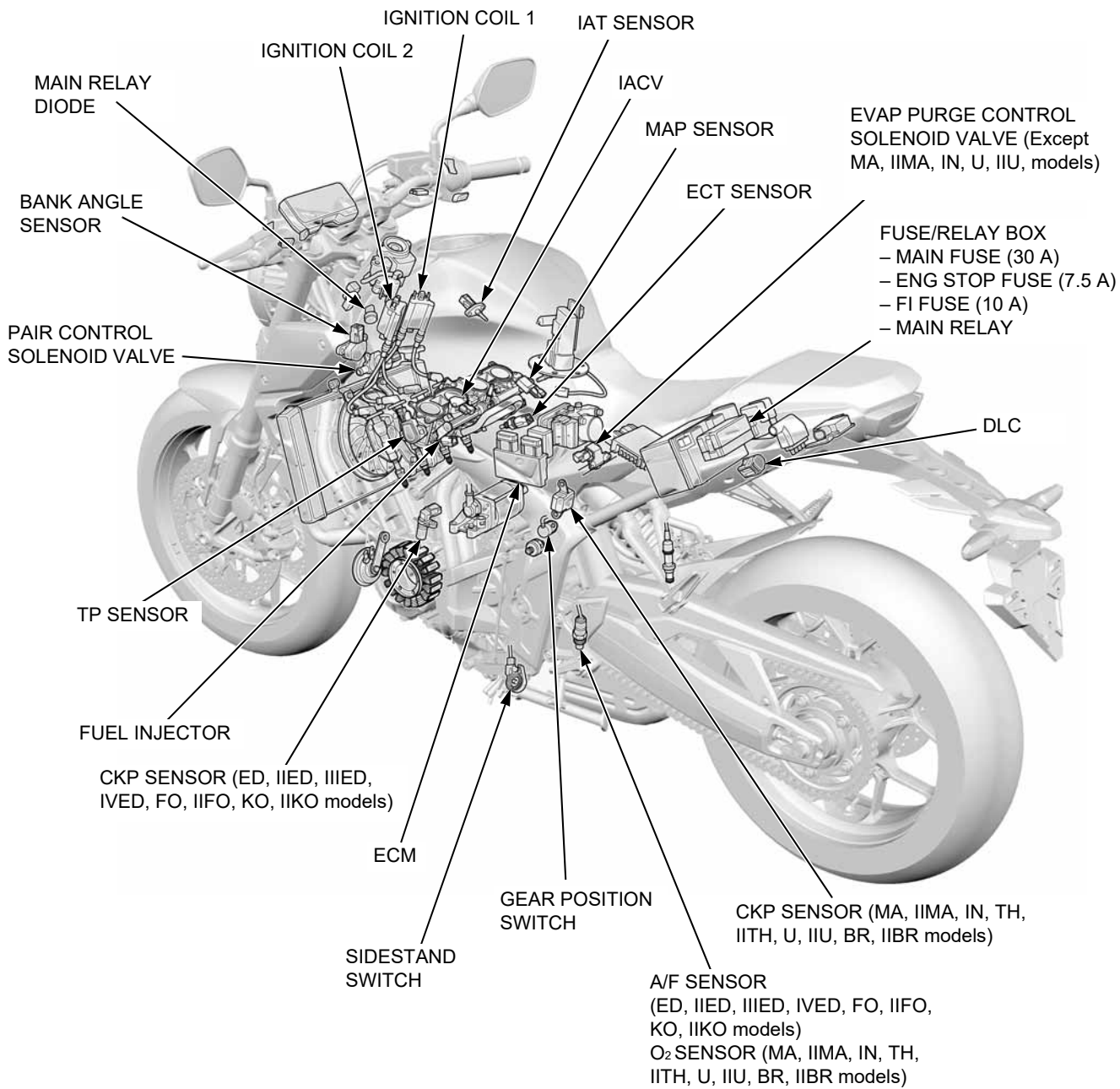
If there is any problem in the serial communication, the ECM stores the DTC P0600.

- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models (page 4-38)
- MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models (page 4-69)



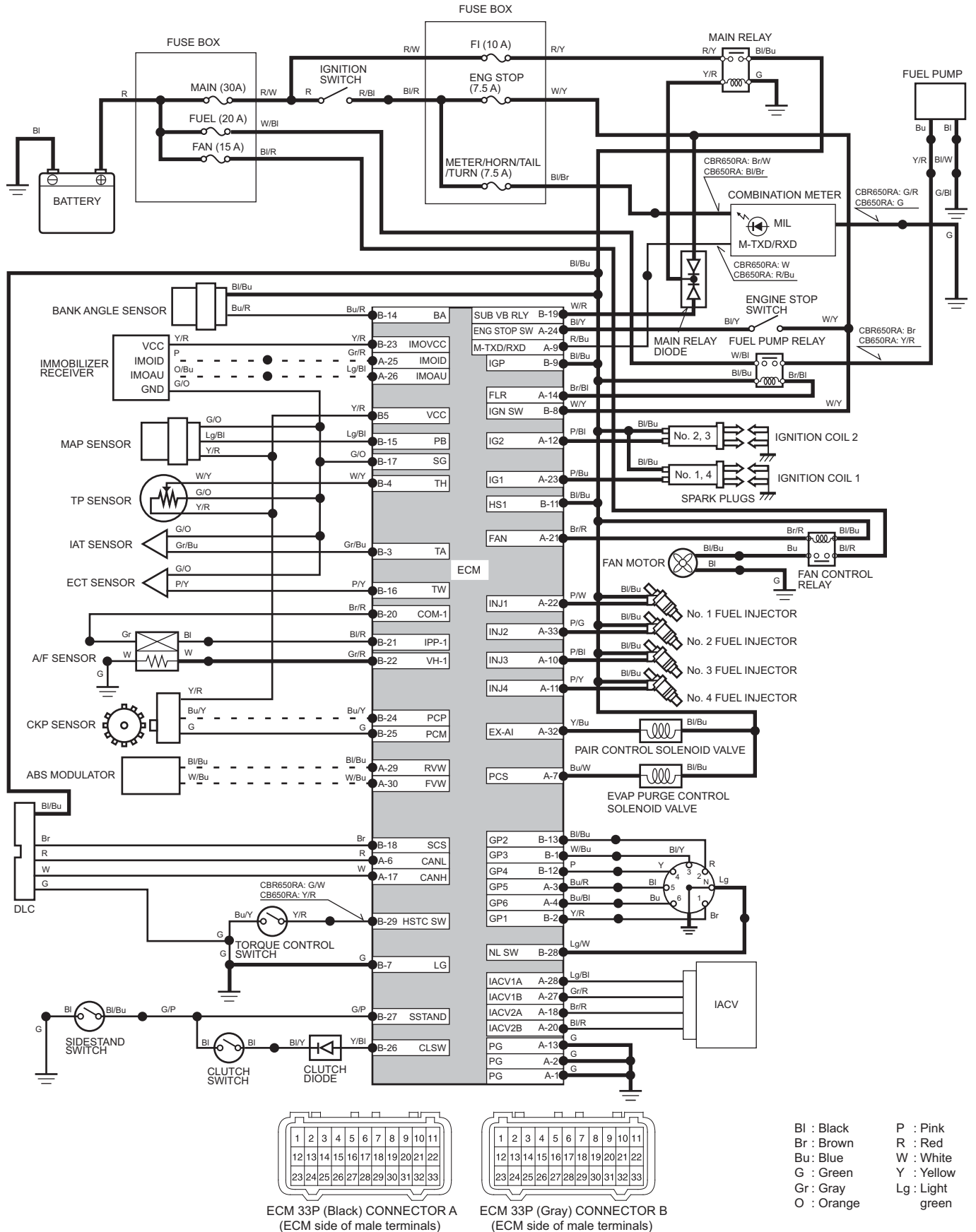
PGM-FI SYSTEM

SYSTEM LOCATION



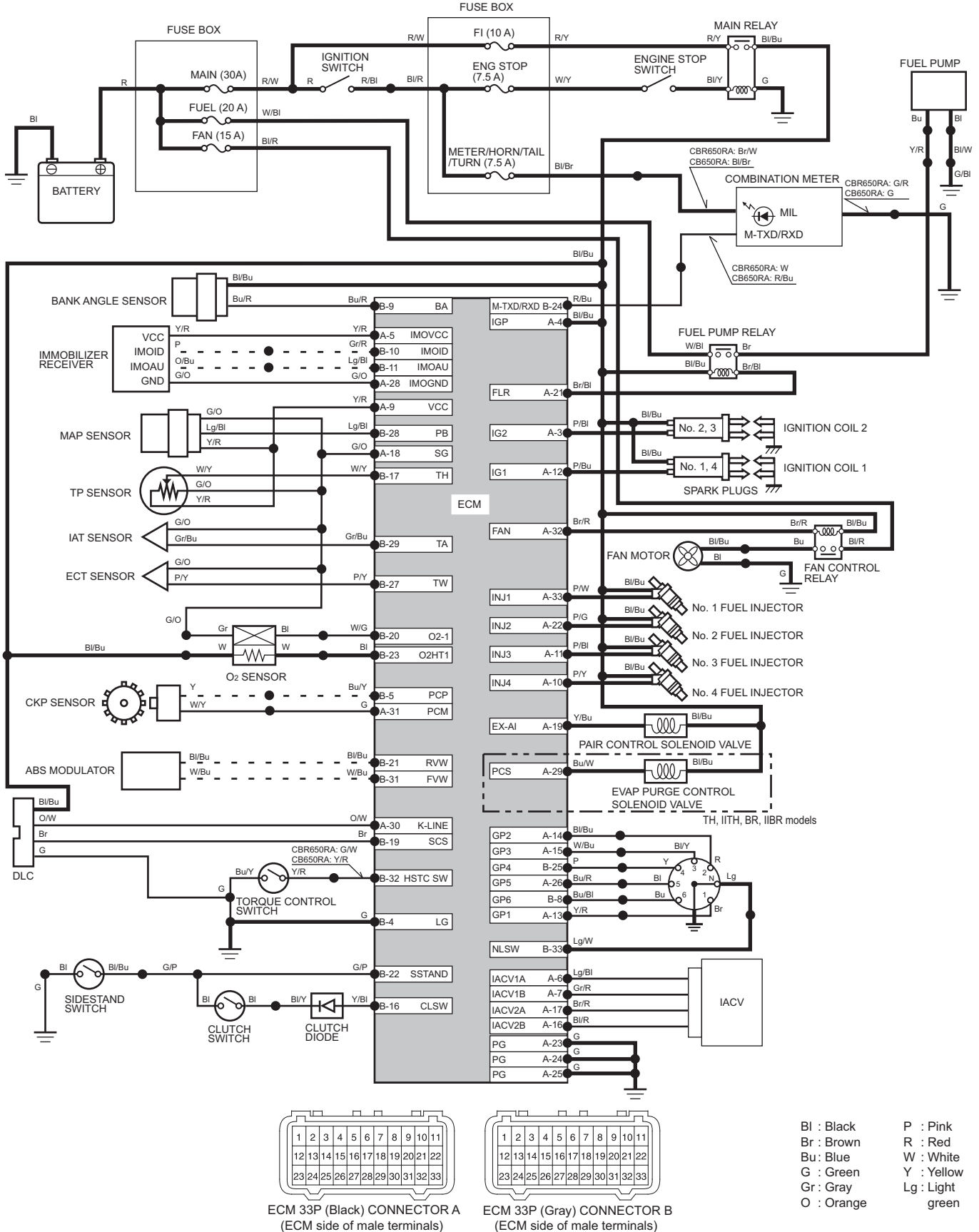
SYSTEM DIAGRAM

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models



PGM-FI SYSTEM

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models



PGM-FI TROUBLESHOOTING INFORMATION

GENERAL TROUBLESHOOTING

Intermittent Failure

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

Opens and Shorts

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

If the MIL has come on

Refer to DTC READOUT (page 4-9).

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 4-11).

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 fuel injector, the fail-safe function stops the engine to protect it from damage.

MIL Check

When the ignition switch is turned ON, the MIL will stay on for a few seconds, then go off. If the MIL does not come on or stay on (No DTC set), inspect the MIL circuit (page 4-76).

MIL Blink Pattern

- If the MCS is not available, DTC can be read from the ECM memory by the MIL blink pattern.
- The MIL will blink the current DTC by shorting SCS circuit (reading DTC with DLC connector).
- 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 three long blinks are followed by six short blinks, the MIL is 36 (three long blinks = 30 blinks, plus six 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.

CURRENT DTC/FREEZE DTC

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

- In case the ECM detects a current problem, the MIL will come on.
- In case the ECM does not detect any problem at present but has a problem stored in its memory, the MIL will not light. If it is necessary to retrieve the past problem, readout the DTC by following the DTC readout procedure (page 4-9).

PGM-FI SYSTEM

GST (General Scan Tool) INFORMATION

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

How to connect the GST

Remove the main seat (page 2-11).

Turn the ignition switch OFF.

Remove the dummy connector [1] from the DLC.

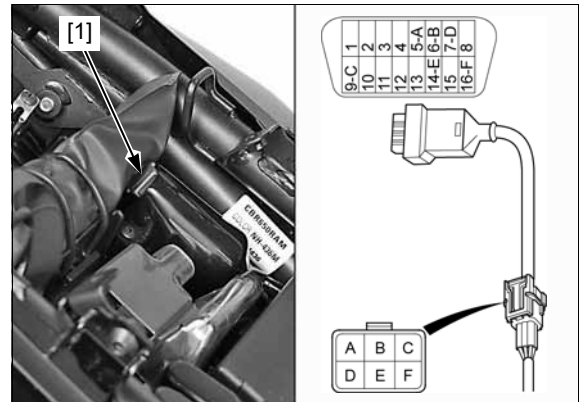
Connect the GST to the DLC.

Turn the ignition switch ON.

Check the DTC and freeze data.

OBID harness circuit connection (General allocation in ISO 15031-3)

	DLC 6P	16P
Signal ground	A	5
CAN_H	B	6
Discretionary (SCS line)	C	9
K-line	D	7
CAN_L	E	14
Permanent positive battery	F	16



MCS INFORMATION

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

How to connect the MCS

Remove the main seat (page 2-11).

Turn the ignition switch OFF.

Remove the dummy connector [1] from the DLC.

Connect the MCS to the DLC.

Turn the ignition switch ON, check the DTC and freeze data.

NOTE:

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



DTC READOUT

Start the engine and check the MIL.

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

If the MIL turns on, connect the MCS or GST to the DLC, read the DTC, freeze data and follow the troubleshooting index.

- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models (page 4-12)
- MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models (page 4-46)

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

Reading DTC with the MIL

Remove the main seat (page 2-11).

Turn the ignition switch OFF.

Remove the dummy connector [1] from the DLC.

Short the DLC terminals using the special tool.

TOOL:

[2] SCS short connector 070MZ-0010300

CONNECTION: Brown – Green

Turn the ignition switch ON, read, note the MIL blinks and refer to the DTC index.

- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models (page 4-12)
- MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models (page 4-46)

ERASING DTC

Connect the following to the DLC:

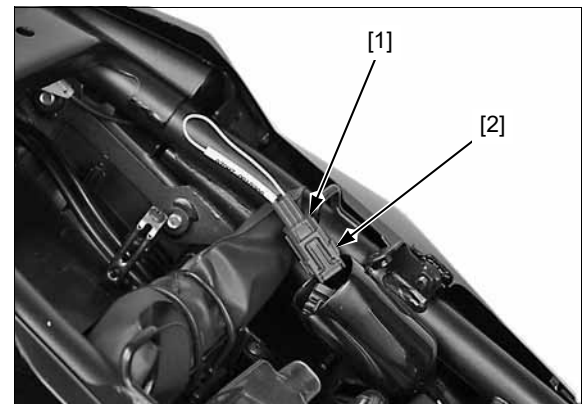
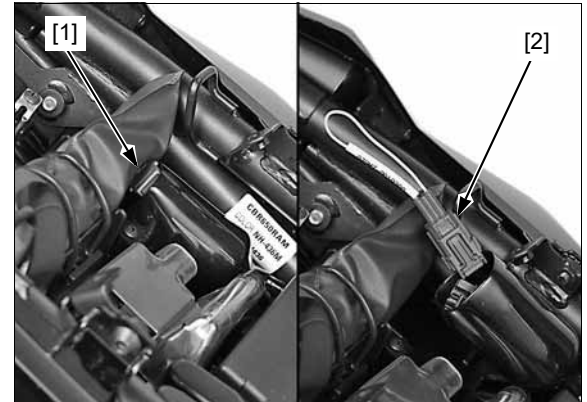
- MCS (page 4-8)
- GST (page 4-8)

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

To erase the DTC without MCS or GST, refer to the following procedure.

How to erase the DTC with SCS short connector

1. Connect the SCS short connector [1] to the DLC [2] (page 4-9).
2. Turn the ignition switch ON.
3. Disconnect the SCS short connector from the DLC.
4. The MIL will light for approximately 5 seconds. While the MIL lights, short the DLC terminals again with the special tool. The self-diagnostic memory is erased if the malfunction indicator goes off and starts blinking.
 - The DLC must be jumped while the MIL lights. If not, the MIL will not start blinking.
 - Note that the self-diagnostic memory cannot be erased if the ignition switch is turned OFF before the MIL starts blinking.



PGM-FI SYSTEM

CIRCUIT INSPECTION

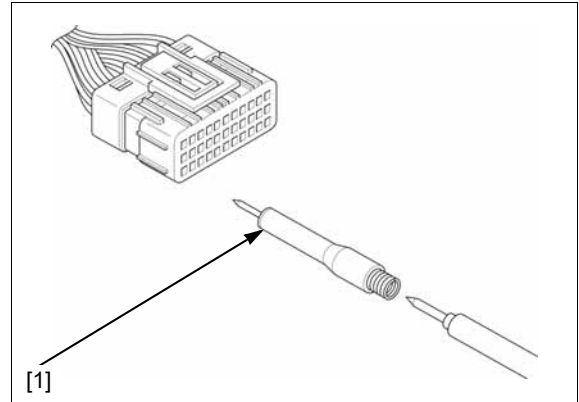
INSPECTION AT ECM CONNECTOR

- Always clean around and keep any foreign material away from the ECM 33P connectors before disconnecting it.
- A faulty PGM-FI system is often related to poorly connected or corroded connections. Check those connections before proceeding.
- In testing at ECM 33P connectors (wire side) terminal, always use the test probe [1]. Insert the test probe into the connector terminal, then attach the digital multimeter probe to the test probe.

TOOL:

Test probe

07ZAJ-RDJA110



PGM-FI SYMPTOM TROUBLESHOOTING

When the motorcycle has one of these symptoms, check the MIL blinking, refer to the DTC index (page 4-46) 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 MIL blinking)	<ol style="list-style-type: none"> 1. Crank the engine for more than ten seconds and check the MIL (page 4-9) and execute the troubleshooting according to the DTC. 2. Inspect the ignition system (page 5-3). 3. Inspect the fuel supply system (page 7-4). 4. Check the spark plug condition (page 3-6). 5. Check the cylinder compression (page 10-4). 	<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 (MA, IIMA, IN, U, IIU models) or fuel tank-to-EVAP canister hose (except MA, IIMA, IN, U, IIU models) – 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 4-77). 2. Inspect the fuel pump system (page 7-8). 	<ul style="list-style-type: none"> • Open circuit in the power input and/or ground line of the ECM • Faulty main relay and related circuit • Faulty fuel pump relay and related circuit • Blown FI fuse (10 A)
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 7-4). 	<ul style="list-style-type: none"> • Restricted fuel feed hose • Contaminated/deteriorated fuel • Intake air leak • Restricted fuel tank breather hose (MA, IIMA, IN, U, IIU models) or fuel tank-to- EVAP canister hose (except MA, IIMA, IN, U, IIU models) • Faulty ignition system
Afterburn when engine braking is used	<ol style="list-style-type: none"> 1. Inspect the secondary air supply system (page 7-19). 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 7-4).	<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 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 MIL blinking)	<ol style="list-style-type: none"> 1. Check the idle speed (page 3-12). 2. Check the throttle operation and freeplay (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 (Engine operates normally and No DTC set)	Inspect the MIL circuit (page 4-76).	

PGM-FI SYSTEM

DTC INDEX (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models)

NOTE:

- When using GST or MCS, check the lighting or blinking state of the MIL, and then refer to DTC index.
- If GST or MCS is not used, perform all of the inspection on the MIL blinks.
- Follow the prior diagnosis notes before performing the troubleshooting, refer to the PRIOR DIAGNOSIS (page 4-14).

DTC	MIL blinks	Detected D/C (Driving Cycle)	DTC name	Refer to page
P0031	38	1	A/F Sensor Heater Circuit Low (A/F Sensor Heater Circuit Low Voltage)	4-15
P0032	38	1	A/F Sensor Heater Circuit High (A/F Sensor Heater Circuit High Voltage)	
P00D1*	38	1	A/F Sensor Heater Control Circuit Performance Problem (A/F Sensor Heater Control Circuit Range/performance)	4-16
P0105	1	2	MAP Sensor Circuit (MAP Sensor Stuck)	4-16
P0106	1	2	MAP Sensor Circuit Range Problem (MAP Sensor Circuit Range/performance)	4-17
P0107	1	1	MAP Sensor Circuit Low (MAP Sensor Circuit Low Voltage)	4-17
P0108	1	1	MAP Sensor Circuit High (MAP Sensor Circuit High Voltage)	
P0111*	9	2	IAT Sensor Circuit High Range Problem (IAT Sensor Circuit Range/performance)	4-18
P0112	9	1	IAT Sensor Circuit Low (IAT Sensor Circuit Low Voltage)	4-19
P0113	9	1	IAT Sensor Circuit High (IAT Sensor Circuit High Voltage)	
P0115*	7	2	ECT Sensor Circuit (ECT Sensor Stuck)	4-20
P0117	7	1	ECT Sensor Circuit Low (ECT Sensor Circuit Low Voltage)	4-20
P0118	7	1	ECT Sensor Circuit High (ECT Sensor Circuit High Voltage)	
P011B*	132	2	ECT Sensor Intake Air Temperature Correlation (Engine Coolant Temperature Correlation)	4-22
P0122	8	1	TP Sensor Circuit Low (TP Sensor Low Voltage)	4-23
P0123	8	1	TP Sensor Circuit High (TP Sensor High Voltage)	
P0125*	7	2	Insufficient Coolant Temperature for Closed Loop Fuel Control	4-24
P0131	36	1	O2/AF Sensor Circuit Low Voltage (A/F Sensor Circuit Low Voltage)	4-25
P0132	36	1	O2/AF Sensor Circuit High Voltage (A/F Sensor Circuit High Voltage)	
P0133*	36	2	O2/AF Sensor Circuit No Activity Detected (A/F Sensor Circuit Slow Response)	4-26
P0134*	36	1	O2/AF Sensor Circuit No Activity Detected (A/F Sensor Circuit No Activity Detected)	
P0201	12	1	Cylinder 1 Injector Circuit (No. 1 Fuel Injector Malfunction)	4-27
P0202	13	1	Cylinder 2 Injector Circuit (No. 2 Fuel Injector Malfunction)	
P0203	14	1	Cylinder 3 Injector Circuit (No. 3 Fuel Injector Malfunction)	
P0204	15	1	Cylinder 4 Injector Circuit (No. 4 Fuel Injector Malfunction)	
P0300*	133	1	Random/multiple Cylinder Misfire Detected (Random/multiple Cylinder Misfire Detected A) (When the MIL is blinking)	4-28
	133	2	Random/multiple Cylinder Misfire Detected (Random/multiple Cylinder Misfire Detected B) (When the MIL is lighting)	

DTC	MIL blinks	Detected D/C (Driving Cycle)	DTC name	Refer to page
P0315*	142	1	CKP Sensor Variation Not Learned (Crankshaft Position System Variation Not Learned)	4-29
P0351	91	1	Ignition Coil 1 Primary Control Circuit Open (No.1, 4 (No.1, No.4 Cylinder) Ignition Coil Circuit Malfunction)	4-30
P0352	92	1	Ignition Coil 2 Primary Control Circuit Open (No.2, 3 (No.2, No.3 Cylinder) Ignition Coil Circuit Malfunction)	
P0412	89	1	AIR System Switching Valve Circuit (PAIR Control Solenoid Valve Malfunction)	4-32
P0443	88	1	EVAP System Purge Control Valve Circuit (EVAP Purge Control Solenoid Valve Malfunction)	4-33
P0500	67	1	VSP sensor 1 Malfunction (Front Wheel Speed Sensor Malfunction)	4-35
P0511	29	1	Idle Air Control Circuit (IACV Malfunction)	4-36
P0519*	29	2	Idle Air Control System Performance Problem (IACV Circuit Range/ Performance)	4-37
P0562	37	1	System Voltage (Main Relay Malfunction)	4-37
P0600	86	1	Serial Communication Link (Meter Circuit Malfunction)	4-38
P062F	33	1	ICM EEPROM Error (ECM EEPROM Malfunction)	4-39
P064D*	131	1	ICM O2 Sensor CPU Performance Problem (A/F Sensor IC Circuit Abnormal)	4-40
P0914	41	1	Gear Position Switch Circuit (Gear Position Switch Malfunction)	4-40
P1000	54	1	Bank Angle Sensor Circuit Low (Bank Angle Sensor Circuit Low Voltage)	4-41
P1001	54	1	Bank Angle Sensor Circuit High (Bank Angle Sensor Circuit High Voltage)	
P1100**	136	1	Intake System Malfunction	4-43
P2158	66	1	VSP Sensor 2 Malfunction (Rear Wheel Speed Sensor Malfunction)	4-44
P2195*	36	2	O2/AF Sensor Signal Biased/stuck Lean (A/F Sensor Signal Biased/stuck Lean)	4-45
P2196*	36	2	O2/AF Sensor Signal Biased/stuck Rich (A/F Sensor Signal Biased/stuck Rich)	
P2A00*	36	2	O2/AF Sensor Circuit Range Problem (A/F Sensor Circuit Range/performance)	4-45

* : ED, IIED, IIIED, IVED, KO, IIKO models only.

** : IIIED, IVED models only.

DTC P0031/DTC P0032

Probable cause:

- Faulty A/F sensor heater or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Fuel consumption deterioration
- Detected value feedback stops

1. A/F Sensor Heater Line Open Circuit Inspection

Disconnect the ECM 33P (Gray) connector (page 4-76).

Disconnect the A/F sensor 4P (Black) connector (page 4-80).

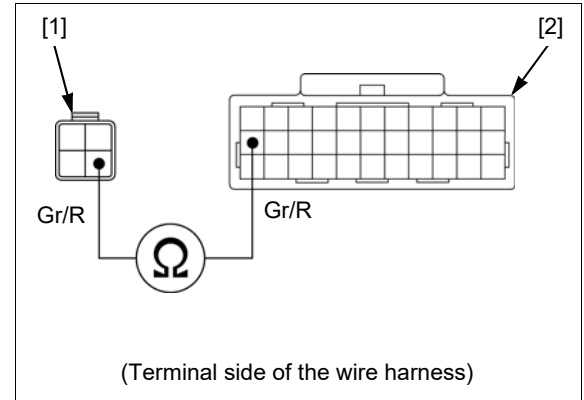
Check for continuity between the wire harness side A/F sensor 4P (Black) connector [1] and ECM 33P (Gray) connector [2].

CONNECTION: Gray/red – Gray/red

Is there continuity?

YES – GO TO STEP 2.

NO – Open circuit in the Gray/red wire



2. A/F Sensor Heater Ground Line Open Circuit Inspection

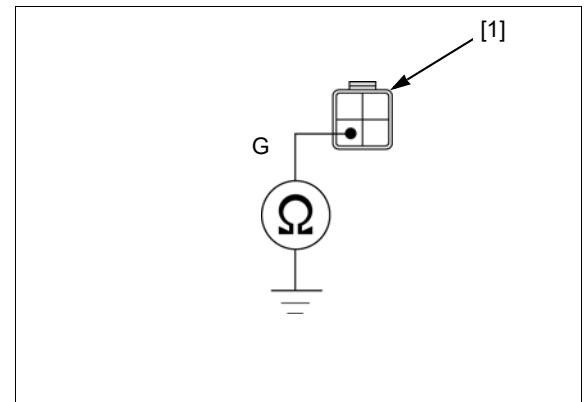
Check for continuity between the wire harness side A/F sensor 4P (Black) connector [1] and ground.

CONNECTION: Green – Ground

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Green wire



3. A/F Sensor Heater Output Line Short Circuit Inspection

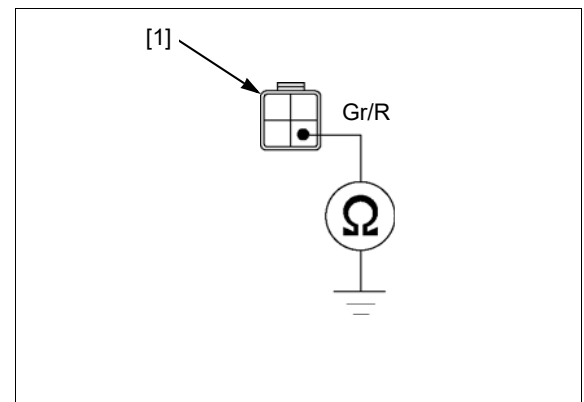
Check for continuity between the wire harness side A/F sensor 4P (Black) connector [1] and ground.

CONNECTION: Gray/red– Ground

Is there continuity?

YES – Short circuit in the Gray/red wire

NO – GO TO STEP 4.



4. A/F Sensor Inspection

Replace the A/F sensor with a new one.
Connect the disconnected connector(s).
Erase the DTC (page 4-9).
Start the engine and wait for a minute.
Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original A/F sensor

DTC P00D1

Probable cause:

- Faulty A/F sensor heater or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Fuel consumption deterioration
- Detected value feedback stops

1. A/F Sensor Inspection

Replace the A/F sensor with a new one.
Erase the DTC (page 4-9).
Start the engine and wait for a minute.
Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original A/F sensor

DTC P0105

Probable cause:

- Faulty MAP sensor or its related circuit
- Loose or poor connection of the MAP sensor 3P (Black) and ECM 33P (Gray) connectors.
- Faulty ECM

Symptom/Fail-safe function:

- Rough idling
- Driveability deterioration

1. MAP Sensor Inspection

Replace the MAP sensor with a new one.
Erase the DTC (page 4-9).
Start the engine and wait for three seconds.
Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original MAP sensor.

DTC P0106

Probable cause:

- Faulty MAP sensor or its related circuit
- Contaminated intake manifold or throttle bore
- Faulty ECM

Symptom/Fail-safe function:

- Rough idling
- Driveability deterioration

1. MAP Sensor Inspection

Replace the MAP sensor with a new one.
Erase the DTC (page 4-9).
Start the engine and wait for three seconds.
Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original MAP sensor.

DTC P0107/DTC P0108

Probable cause:

- Faulty MAP sensor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Rough idling

1. MAP Sensor Input Voltage Inspection

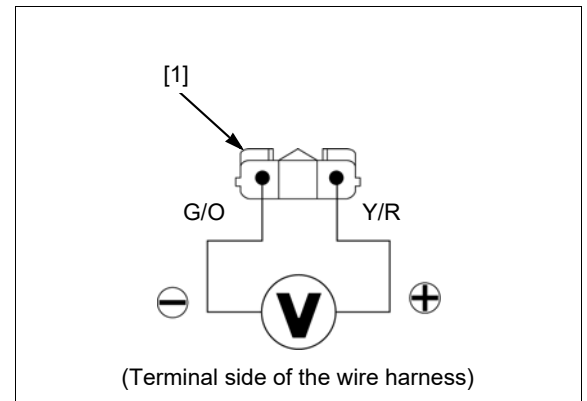
Disconnect the MAP sensor 3P (Black) connector (page 4-79).
Turn the ignition switch ON.
Measure the voltage at the wire harness side MAP sensor 3P (Black) connector [1].

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

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 2.

- NO** –
- Open or short circuit in the Yellow/red wire
 - Open circuit in the Green/orange wire
 - If the wire is OK, replace the ECM with a new one, and recheck.



2. MAP Sensor Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Gray) connector (page 4-76).
Check for continuity between the wire harness side MAP sensor 3P (Black) connector [1] and ECM 33P (Gray) connector [2].

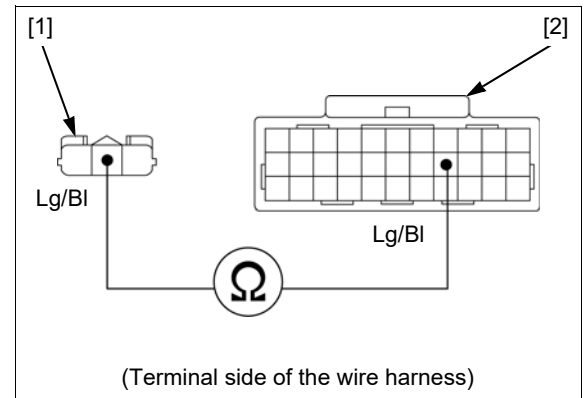
CONNECTION:

Light green/black – Light green/black

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Light green/black wire



3. MAP Sensor Signal Line Short Circuit Inspection

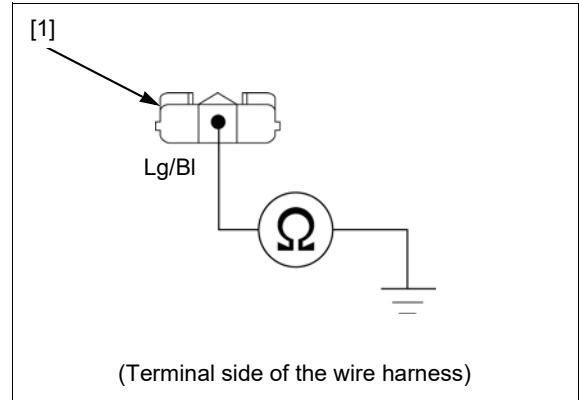
Check for continuity between the wire harness side MAP sensor 3P (Black) connector [1] and ground.

CONNECTION: Light green/black – Ground

Is there continuity?

YES – Short circuit in the Light green/black wire

NO – GO TO STEP 4.



4. MAP Sensor Inspection

Replace the MAP sensor with a known good one (page 4-79).

Connect the ECM 33P (Gray) connector.

Erase the DTC (page 4-9).

Turn the ignition switch ON and wait for 10 seconds.

Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original MAP sensor.

DTC P0111

Probable cause:

- Faulty IAT sensor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

1. IAT Sensor Inspection

Replace the IAT sensor with a new one.

Erase the DTC (page 4-9).

Turn the ignition switch ON and wait for 10 seconds.

Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original IAT sensor.

DTC P0112/DTC P0113

Probable cause:

- Faulty IAT sensor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

1. IAT Sensor Output Line Open Circuit Inspection

Disconnect the ECM 33P (Gray) connector (page 4-76).

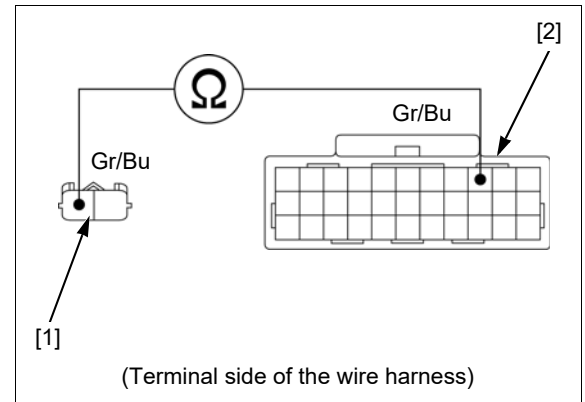
Disconnect the IAT sensor 2P (Black) connector. Check for continuity between the wire harness side IAT sensor 2P (Black) connector [1] and ECM 33P (Gray) connector [2].

CONNECTION: Gray/blue – Gray/blue

Is there continuity?

YES – GO TO STEP 2.

NO – Open circuit in Gray/blue wire

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

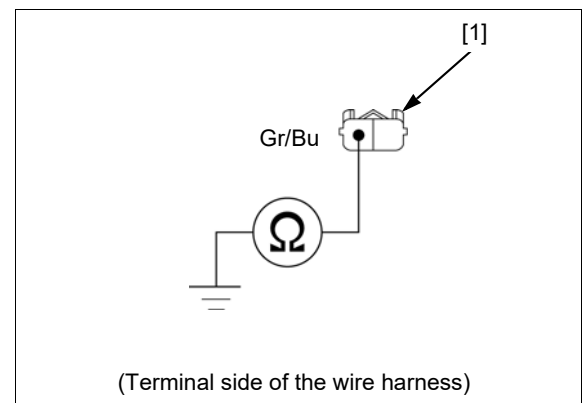
Check for continuity between the wire harness side IAT sensor 2P (Black) connector [1] and ground.

CONNECTION: Gray/blue – Ground

Is there continuity?

YES – Short circuit in the Gray/blue wire

NO – GO TO STEP 3.

**3. IAT Sensor Ground Line Open Circuit Inspection**

Disconnect the ECM 33P (Gray) connector (page 4-76).

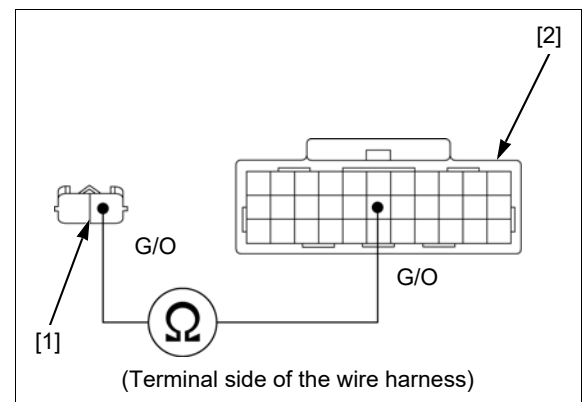
Check for continuity between the wire harness side IAT sensor 2P (Black) connector [1] and ECM 33P (Gray) connector [2].

CONNECTION: Green/orange – Green/orange

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Green/orange wire



4. IAT Sensor Inspection

Replace the IAT sensor with a new one.
Erase the DTC (page 4-9).
Turn the ignition switch ON and wait for 10 seconds.
Check the DTC with GST or MCS.

Is same DTC indicated?

- YES** – Replace the ECM with a new one, and recheck.
NO – Faulty original IAT sensor.

DTC P0115

Probable cause:

- Faulty ECT sensor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Hard to start at a low temperature
- Exhaust gas too lean or too rich
- Fuel consumption deterioration
- Driveability deterioration

1. ECT Sensor Inspection

Replace the ECT sensor with a new one.
Erase the DTC (page 4-9).
Start the engine and wait for 10 minutes.
Stop the engine and wait an hour.
Check the DTC with GST or MCS.

Is same DTC indicated?

- YES** – Replace the ECM with a new one, and recheck.
NO – Faulty original ECT sensor

DTC P0117/DTC P0118

Probable cause:

- Faulty ECT sensor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Hard to start at a low temperature
- Driveability deterioration

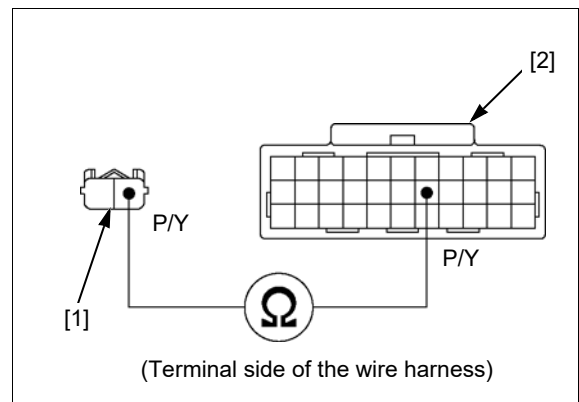
1. ECT Sensor Output Line Open Circuit Inspection

Disconnect the ECM 33P (Gray) connector (page 4-76).
Disconnect the ECT sensor 2P (Blue) connector (page 4-79).
Check for continuity between the wire harness side ECT sensor 2P (Blue) connector [1] and ECM 33P (Gray) connector [2].

CONNECTION: Pink/yellow – Pink/yellow

Is there continuity?

- YES** – GO TO STEP 2.
NO – Open circuit in the Pink/yellow wire



2. ECT Sensor Output Line Short Circuit Inspection

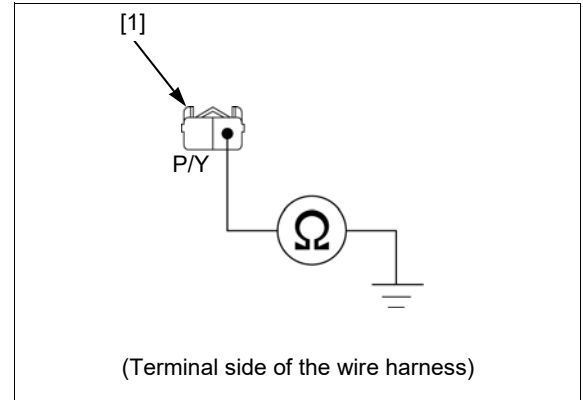
Check for continuity between the wire harness side ECT sensor 2P (Blue) connector [1] and ground.

CONNECTION: Pink/yellow – Ground

Is there continuity?

YES – Short circuit in the Pink/yellow wire

NO – GO TO STEP 3.



3. ECT Sensor Ground Line Open Circuit Inspection

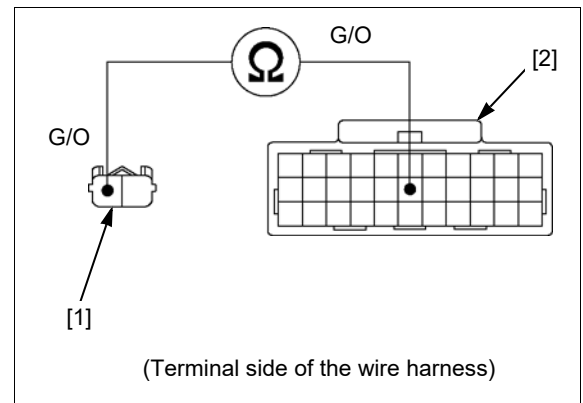
Check for continuity between the wire harness side ECT sensor 2P (Blue) connector [1] and ECM 33P (Gray) connector [2].

CONNECTION: Green/orange – Green/orange

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Green/orange wire



4. ECT Sensor Inspection

Replace the ECT sensor with a new one.
Erase the DTC (page 4-9).
Turn the ignition switch ON and wait for 10 seconds.
Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original ECT sensor

DTC P011B

Probable cause:

- Faulty ECT sensor or its related circuit
- Insufficient coolant
- Faulty thermostat
- Faulty water pump
- Clogged coolant passage
- Faulty IAT sensor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Hard to start at a low temperature
- Exhaust gas too lean or too rich
- Fuel consumption deterioration
- Driveability deterioration
- Before processing the DTC troubleshooting, stop the engine and wait for 6 hours if the motorcycle is running.

NOTE:

- Do not disconnect the battery cable.

1. ECT Sensor Inspection

Replace the ETC sensor with a new one.

Erase the DTC (page 4-9).

Turn the ignition switch OFF and wait for 6 hours.

Check the DTC with GST or MCS.

Is same DTC indicated?

YES – GO TO STEP 2.

NO – Faulty original ECT sensor

2. IAT Sensor Inspection

Replace the IAT sensor with a new one.

Erase the DTC (page 4-9).

Turn the ignition switch OFF and wait for 6 hours.

Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original IAT sensor

DTC P0122/DTC P0123

Probable cause:

- Faulty TP sensor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates at idle speed

1. TP Sensor Input Voltage Inspection

Disconnect the TP sensor 3P (Blue) connector (page 7-13).

Turn the ignition switch ON.

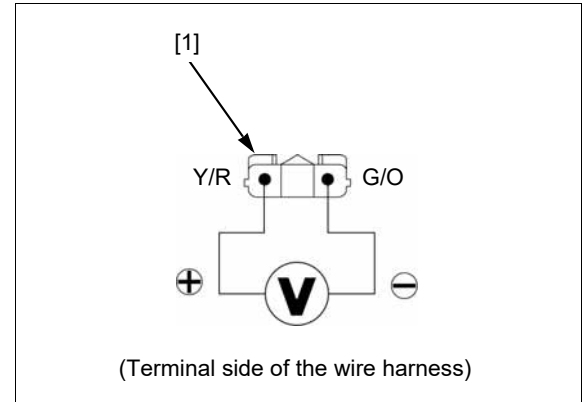
Measure the voltage at the wire harness side TP sensor 3P (Blue) connector [1] terminals.

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

Is about 5 V indicated?

YES – GO TO STEP 2.

- NO** –
- Open or short circuit in the Yellow/red wire
 - Open circuit in the Green/orange wire
 - If the wire is OK, replace the ECM with a new one, and recheck.



2. TP Sensor Output Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Gray) connector (page 4-76).

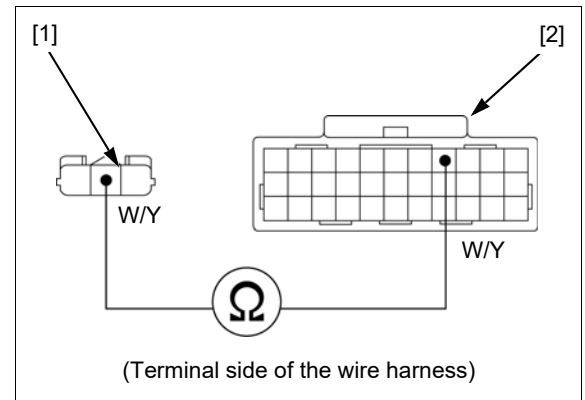
Check for continuity between the wire harness side TP sensor 3P (Blue) connector [1] and ECM 33P (Gray) connector [2].

CONNECTION: White/yellow – White/yellow

Is there continuity?

YES – GO TO STEP 3.

- NO** – Open circuit in the White/yellow wire



3. TP Sensor Output Line Short Circuit Inspection

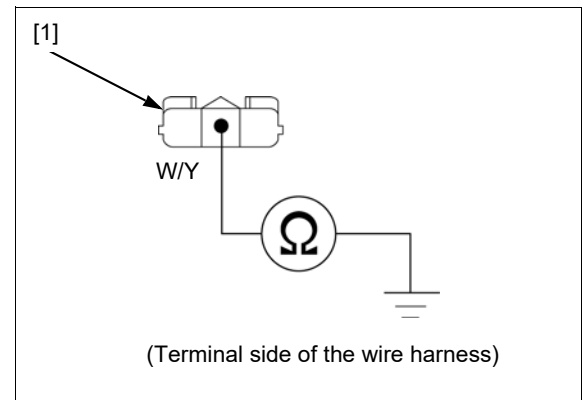
Check for continuity between the wire harness side TP sensor 3P (Blue) connector [1] and ground.

CONNECTION: White/yellow – Ground

Is there continuity?

YES – Short circuit in the White/yellow wire

- NO** – GO TO STEP 4.



4. TP Sensor Inspection

Replace the throttle body (TP sensor) with a known good one (page 7-13).
Connect the disconnected connector(s).
Erase the DTC (page 4-9).
Turn the ignition switch ON and wait for 10 seconds.
Check the DTC with GST or MCS.

Is same DTC indicated?

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

DTC P0125

Probable cause:

- Faulty ECT sensor or its related circuit
- Insufficient coolant
- Faulty thermostat
- Faulty water pump
- Clogged coolant passage
- Faulty ECM

Symptom/Fail-safe function:

- Hard to start at a low temperature
- Exhaust gas too lean or too rich
- Fuel consumption deterioration
- Driveability deterioration

1. ECT Sensor Inspection

Replace the ECT sensor with a new one.
Erase the DTC (page 4-9).
Warm up the engine until the coolant temperature is above 25°C (77°F) and wait for 10 minutes.
Check the DTC with GST or MCS.

Is same DTC indicated?

- YES** – Replace the ECM with a new one, and recheck.
- NO** – Faulty original ECT sensor

DTC P0131/DTC P0132

Probable cause:

- Faulty A/F sensor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Fuel consumption deterioration
- Detected value feedback stops

1. A/F Sensor Output Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the A/F sensor 4P (Black) connector (page 4-80).

Disconnect the ECM 33P (Gray) connector (page 4-76).

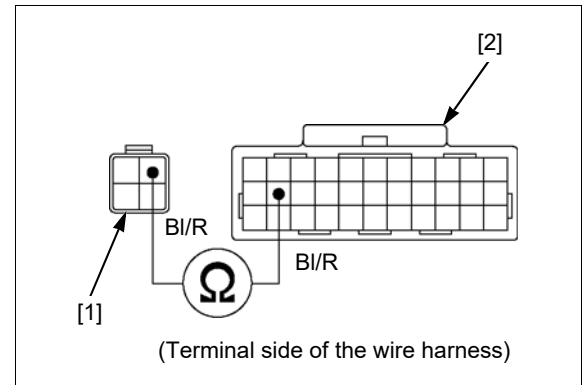
Check for continuity between the wire harness side A/F sensor 4P (Black) connector [1] and ECM 33P (Gray) connector [2] terminals.

CONNECTION: Black/red – Black/red

Is there continuity?

YES – GO TO STEP 2.

NO – Open circuit in the Black/red wire



2. A/F Sensor Output Line Short Circuit Inspection

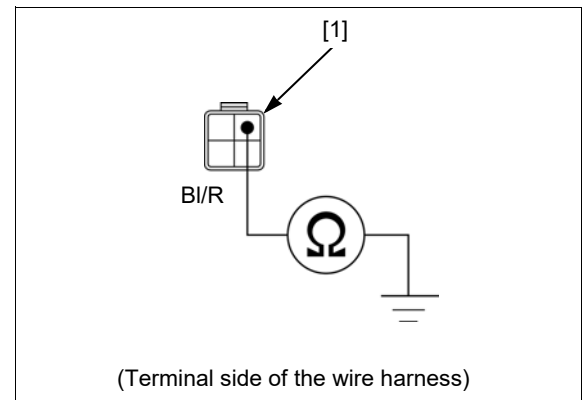
Check for continuity between the wire harness side A/F sensor 4P (Black) connector [1] and ground.

CONNECTION: Black/red – Ground

Is there continuity?

YES – Short circuit in the Black/red wire

NO – GO TO STEP 3.



3. A/F Sensor Ground Line Open Circuit Inspection

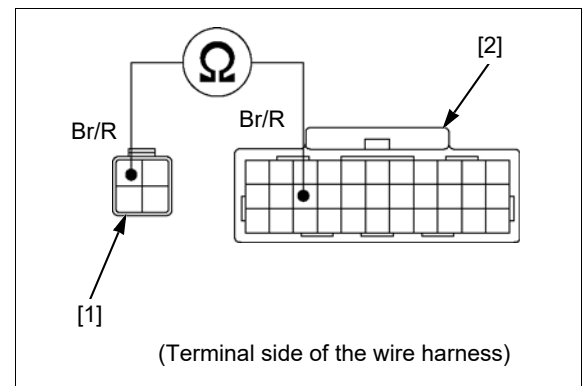
Check for continuity between the wire harness side A/F sensor 4P (Black) connector [1] and ECM 33P (Gray) connector [2].

CONNECTION: Brown/red – Brown/red

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Brown/red wire



4. A/F sensor Inspection

Replace the A/F sensor with a new one.
Connect the disconnected connector(s).
Erase the DTC (page 4-9).
Start the engine and wait for a minute.
Stop the engine.
Check the DTC with GST or MCS.

Is same DTC indicated?

- YES** – Replace the ECM with a new one, and recheck.
- NO** – Faulty original A/F sensor

DTC P0133/DTC P0134

Probable cause:

- Faulty A/F sensor or its related circuit
- Faulty A/F sensor heater or its related circuit
- There is an exhaust leak
- Faulty ECM

Symptom/Fail-safe function:

- Fuel consumption deterioration
- Exhaust gas too lean or too rich
- Driveability deterioration

1. A/F sensor Inspection

Replace the A/F sensor with a new one.
Erase the DTC (page 4-9).
Warm up the engine until the coolant temperature is above 50°C (122°F) and keep the engine revolution at 1,600 – 8,100 r/min with no 100 r/min variation a second.
Stop the engine.
Check the DTC with GST or MCS.

Is same DTC indicated?

- YES** – Replace the ECM with a new one, and recheck.
- NO** – Faulty original A/F sensor

**DTC P0201/DTC P0202/DTC P0203/
DTC P0204**

Probable cause:

- Faulty fuel injector
- Faulty ECM

Symptom/Fail-safe function:

- Engine does not start (Fuel injectors, fuel pump and ignition shut down)

1. Fuel Injector Input Voltage Inspection

Disconnect the fuel injector 2P (Black) connector (page 7-16).

Turn the ignition switch ON.

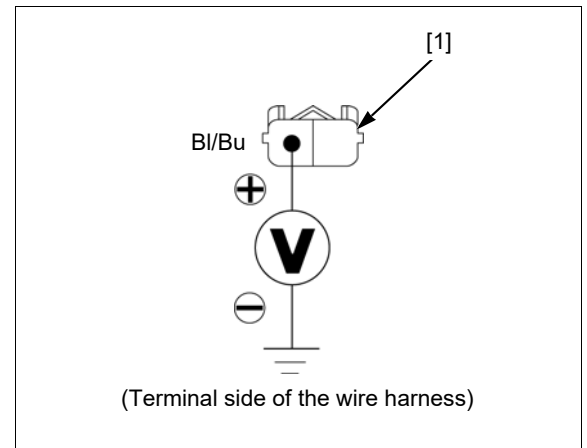
Measure the voltage between the wire harness side fuel injector 2P (Black) connector [1] and ground.

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

Is there battery voltage?

YES – GO TO STEP 2.

NO – Open circuit in the Black/blue wire



2. Fuel Injector Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-76).

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

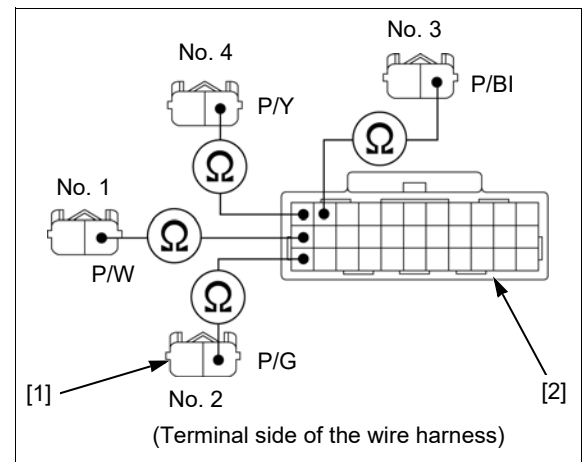
CONNECTION:

- No. 1: Pink/white – Pink/white**
- No. 2: Pink/green – Pink/green**
- No. 3: Pink/black – Pink/black**
- No. 4: Pink/yellow – Pink/yellow**

Is there continuity?

YES – GO TO STEP 3.

- NO** –
- Open circuit in Pink/white wire
 - Open circuit in Pink/green wire
 - Open circuit in Pink/black wire
 - Open circuit in Pink/yellow wire



3. Fuel Injector Signal Line Short Circuit Inspection

Check for continuity between the wire harness side fuel injector connector [1] and ground.

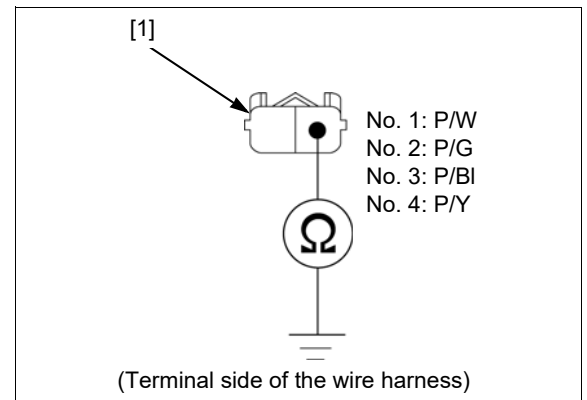
CONNECTION:

- No. 1: Pink/white – Ground**
- No. 2: Pink/green – Ground**
- No. 3: Pink/black – Ground**
- No. 4: Pink/yellow – Ground**

Is there continuity?

- YES** –
- Short circuit in Pink/white wire
 - Short circuit in Pink/green wire
 - Short circuit in Pink/black wire
 - Short circuit in Pink/yellow wire

NO – GO TO STEP 4.



4. Fuel Injector Inspection

Replace the fuel injector with a new one.
Connect the disconnected connector(s).
Erase the DTC (page 4-9).
Turn the ignition switch ON and wait for 10 seconds.
Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original fuel injector

DTC P0300

Probable causes:

- Faulty ignition system
- Faulty fuel supply system
- Faulty air supply system
- Faulty cylinder compression
- Faulty MAP sensor, IAT sensor and TP sensor, CKP sensor and/or A/F sensor

Symptom/Fail-safe function:

- Engine operates at restricted speed
- Driveability deterioration

NOTE:

- When other DTC is displayed, together with P0300, troubleshoot it first.

1. Parts Status Inspection

Check and replace the following:

- Related fuse(s)
- Ignition system
- Fuel line
- Intake air related parts (air cleaner, insulator, throttle body)
- Cylinder compression

Erase the DTC (page 4-9).
Perform the test ride (page 4-14).
Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Checked and replaced parts failure

DTC P0315

Probable cause:

- Faulty CKP sensor
- Faulty crank pulse initialize learning
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

NOTE:

- This DTC is erased at the 1 D/C (driving cycle) after detecting the system normally.

1. CKP Sensor Circuit Inspection

Erase the DTC (page 4-9).

Check for CKP sensor circuit (page 4-82).

Are the CKP sensor or its circuits normally?

YES – GO TO STEP 2.

NO – Open or short circuit in CKP sensor related circuit

2. CKP Sensor Related Parts Inspection

Check the following:

- Iron or other magnetic deposits between the flywheel reluctors and CKP sensor
- Flywheel reluctors for obstruction
- Installation condition of the flywheel or CKP sensor for looseness
- Flywheel reluctors and CKP sensor tip for deformation or damage

Are the flywheel reluctors and CKP sensor in good condition?

YES – GO TO STEP 3.

NO – Replace abnormal parts

3. Crank Pulse Initialize Learning

Perform the crank pulse learning (page 4-84).

Turn the ignition switch ON and wait 10 seconds.

Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – ECM or crank pulse initialization failure

DTC P0351/DTC P0352

Probable cause:

- Faulty Ignition coil or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Fuel injector and ignition coil shut down

1. Ignition Coil Primary Coil Input Voltage Inspection

Disconnect the ignition coil wire connector (page 5-7).

Turn the ignition switch ON.

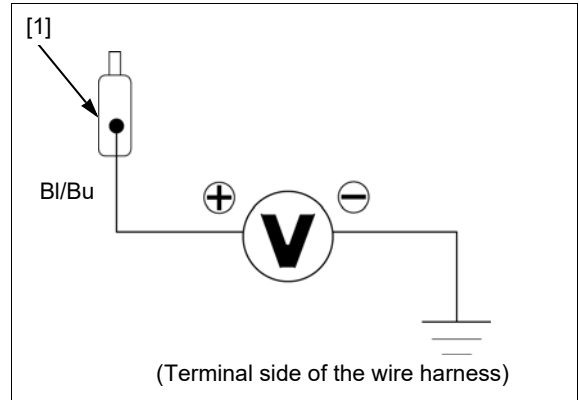
Measure the voltage between the wire harness side ignition coil wire connector [1] and ground.

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

Is there battery voltage?

YES – GO TO STEP 2.

NO – Open circuit in Black/blue wire



2. Ignition Coil Primary Coil Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-76).

Check the continuity between the wire harness side ignition coil wire connector [1] and ECM 33P (Black) connector [2].

CONNECTION:

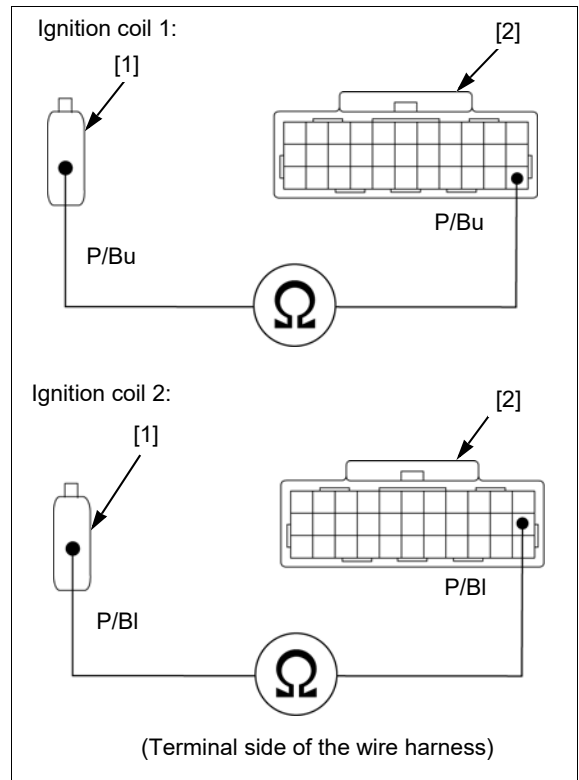
Ignition coil 1: Pink/blue – Pink/blue

Ignition coil 2: Pink/black – Pink/black

Is there continuity?

YES – GO TO STEP 3.

- NO** –
- Open circuit in Pink/blue wire
 - Open circuit in Pink/black wire



3. Ignition Coil Primary Coil Signal Line Short Circuit Inspection

Check for continuity between the wire harness side ignition coil wire connector [1] and ground.

CONNECTION:

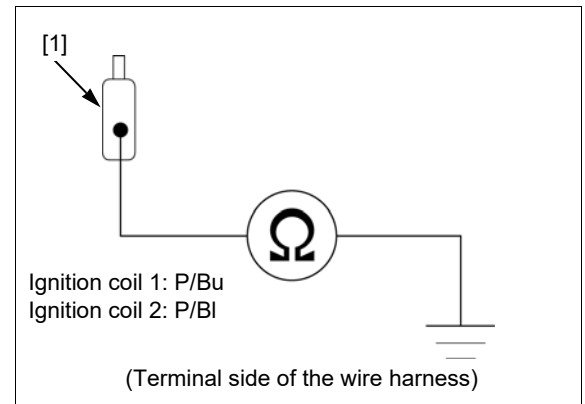
Ignition coil 1: Pink/blue – Ground

Ignition coil 2: Pink/black – Ground

Is there continuity?

YES – • Short circuit in Pink/blue wire
• Short circuit in Pink/black wire

NO – GO TO STEP 4.



4. Ignition Coil Primary Peak Voltage Inspection

Connect the ECM 33P (Black) connector.
Inspect the ignition coil primary peak voltage (page 5-7).

Is the peak voltage normal?

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

NO – GO TO STEP 5.

5. Ignition Coil Inspection

Replace the Ignition coil with a new one.
Connect the disconnected connector(s).
Erase the DTC (page 4-9).
Turn the ignition switch ON and wait for 10 seconds.
Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original ignition coil

DTC P0412

Probable cause:

- Faulty PAIR control solenoid valve or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

1. PAIR Control Solenoid Valve Input Voltage Inspection

Disconnect the PAIR control solenoid valve 2P (Black) connector (page 7-19).

Turn the ignition switch ON.

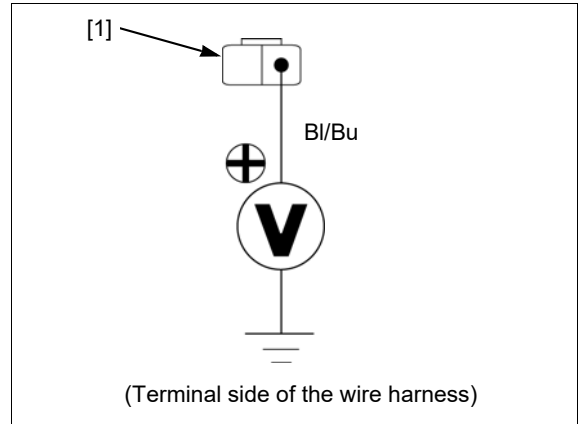
Measure the voltage between the wire harness side PAIR control solenoid valve 2P (Black) connector [1] and ground.

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

Is there battery voltage?

YES – GO TO STEP 2.

NO – Open circuit in the Black/blue wire



2. PAIR Control Solenoid Valve Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-76).

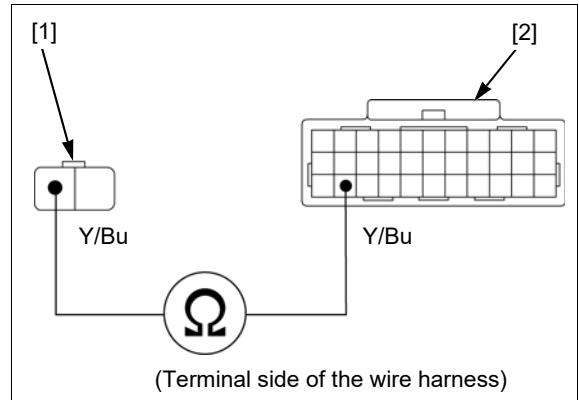
Check for continuity between the wire harness side PAIR control solenoid valve 2P (Black) connector [1] and ECM 33P (Black) connector [2].

CONNECTION: Yellow/blue – Yellow/blue

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Yellow/blue wire



3. PAIR Control Solenoid Valve Signal Line Short Circuit Inspection

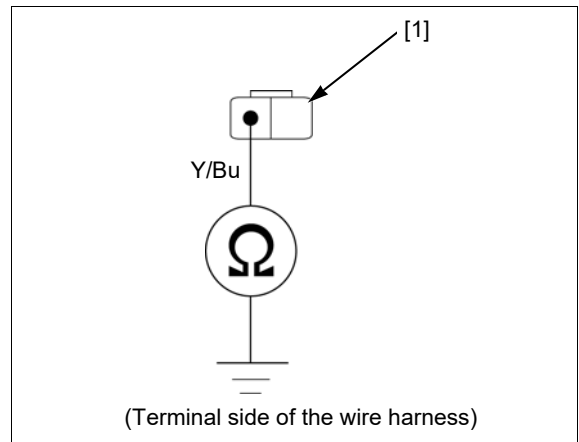
Check for continuity between the wire harness side PAIR control solenoid valve 2P (Black) connector [1] and ground.

CONNECTION: Yellow/blue – Ground

Is there continuity?

YES – Short circuit in the Yellow/blue wire

NO – GO TO STEP 4.



4. PAIR Control Solenoid Valve Inspection

Replace the PAIR control solenoid valve with a new one.
 Connect the disconnected connector(s).
 Erase the DTC (page 4-9).
 Turn the ignition switch ON and wait for 10 seconds.
 Check the DTC with GST or MCS.

Is same DTC indicated?

- YES** – Replace the ECM with a new one, and recheck.
- NO** – Faulty original PAIR control solenoid valve

DTC P0443

Probable cause:

- Faulty EVAP purge control solenoid valve or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

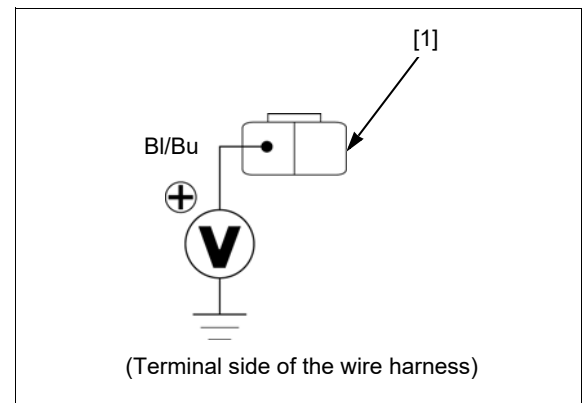
1. EVAP Purge Control Solenoid Valve Input Voltage Inspection

Disconnect the EVAP purge control solenoid valve 2P (Black) connector (page 7-22).
 Turn the ignition switch ON.
 Measure the voltage between the wire harness side EVAP purge control solenoid valve 2P (Black) connector [1] and ground.

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

Is there battery voltage?

- YES** – GO TO STEP 2.
- NO** – Open circuit in the Black/blue wire



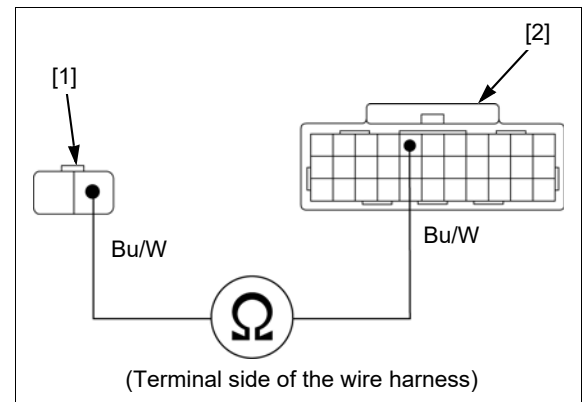
2. EVAP Purge Control Solenoid Valve Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-76).
 Check for continuity between the wire harness side EVAP purge control solenoid valve 2P (Black) connector [1] and ECM 33P (Black) connector [2].

CONNECTION: Blue/white – Blue/white

Is there continuity?

- YES** – GO TO STEP 3.
- NO** – Open circuit in the Blue/white wire



3. EVAP Purge Control Solenoid Valve Signal Line Short Circuit Inspection

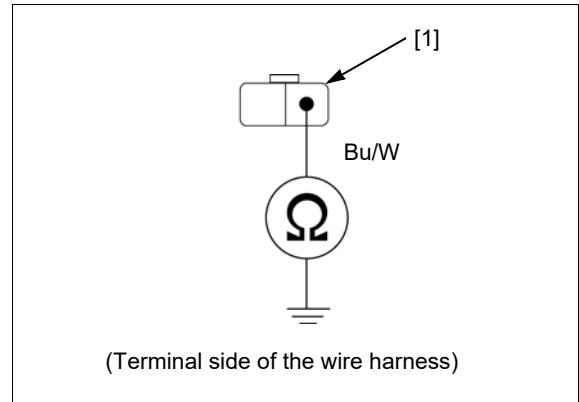
Check for continuity between the wire harness side EVAP purge control solenoid valve 2P (Black) connector [1] and ground.

CONNECTION: Blue/white – Ground

Is there continuity?

YES – Short circuit in the Blue/white wire

NO – GO TO STEP 4.



4. EVAP Purge Control Solenoid Valve Inspection

Replace the EVAP purge control solenoid valve with a new one.

Connect the disconnected connector(s).

Erase the DTC (page 4-9).

Turn the ignition switch ON and wait for 10 seconds.

Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original EVAP purge solenoid valve

DTC P0500

Probable cause:

- Faulty front wheel speed sensor or its related circuit
- ABS modulator has DTC (CAN lines included)
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

NOTE:

- When other DTC is displayed, together with P0500, troubleshoot it first.

1. Front Wheel Speed Sensor Signal Output Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the following:

- ABS modulator 18P (Black) connector (page 19-26)
- ECM 33P (Black) connector (page 4-76)

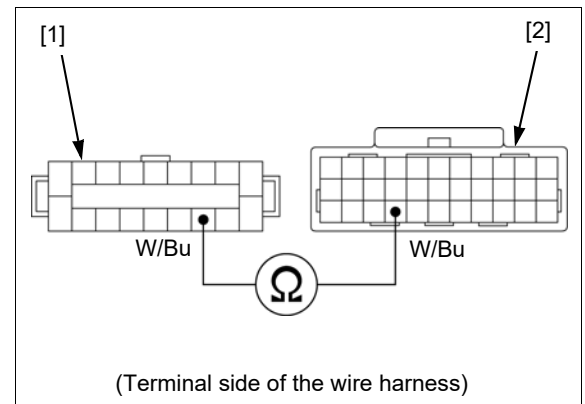
Check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] and ECM 33P (Black) connector [2].

CONNECTION: White/blue – White/blue

Is there continuity?

YES – GO TO STEP 2.

NO – Open circuit in the White/blue wire



2. Front Wheel Speed Sensor Signal Output Line Short Circuit Inspection

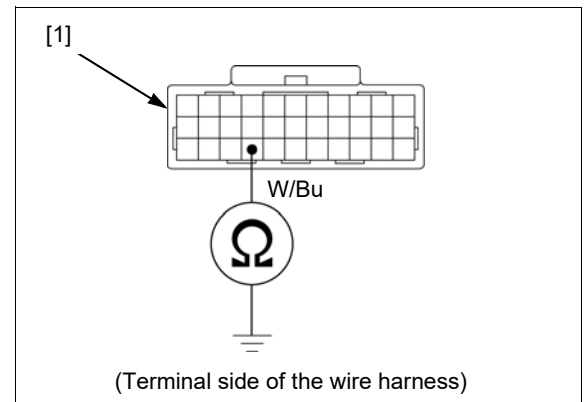
Check for continuity between the wire harness side ECM 33P (Black) connector [1] and ground.

CONNECTION: White/blue – Ground

Is there continuity?

YES – Short circuit in the White/blue wire

NO – GO TO STEP 3.



3. ECM Inspection

Replace the ECM with a new one (page 4-76).

Connect the disconnected connector (s).

Erase the DTC (page 4-9).

Perform the test-ride (page 4-14).

Check the DTC with the GST or MCS.

Is same DTC indicated?

YES – Replace the ABS modulator with a new one and recheck (page 19-26).

NO – Faulty original ECM.

DTC P0511

Probable cause:

- Faulty IACV or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine stalls, hard to start, rough idling

1. IACV Line Open Circuit Inspection

Disconnect the following:

- ECM 33P (Black) connector (page 4-76)
- IACV 4P (Black) connector (page 7-18)

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

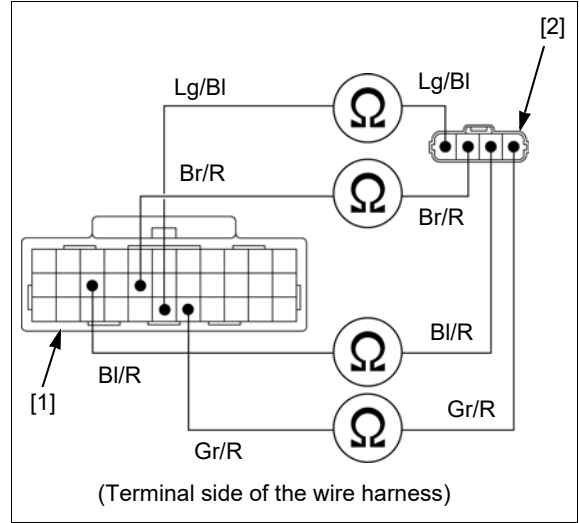
CONNECTION:

- Light green/black – Light green/black**
- Brown/red – Brown/red**
- Black/red – Black/red**
- Gray/red – Gray/red**

Is there continuity?

YES – GO TO STEP 2.

- NO** –
- Open circuit in Light green/black or Brown/red wire
 - Open circuit in Black/red or Gray/red wire



2. IACV Line Short Circuit Inspection

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

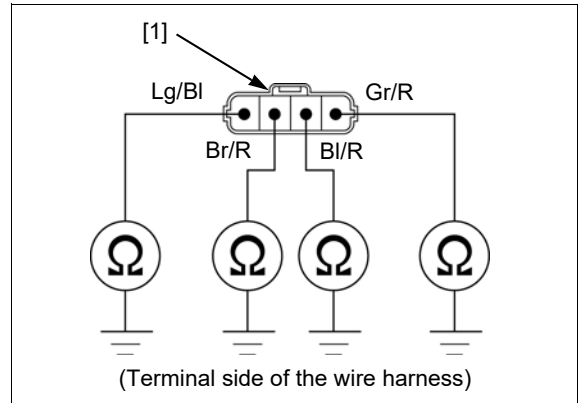
CONNECTION:

- Light green/black – Ground**
- Brown/red – Ground**
- Black/red – Ground**
- Gray/red – Ground**

Is there continuity?

- YES** –
- Short circuit in Light green/black or Brown/red wire
 - Short circuit in Black/red or Gray/red wire

NO – GO TO STEP 3.



3. IACV Inspection

Replace the IACV with a new one.
 Connect the disconnected connector(s).
 Erase the DTC (page 4-9).
 Turn the ignition switch ON and wait for 10 seconds.
 Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original IACV

DTC P0519

Probable cause:

- Faulty IACV or its related parts
- Faulty ECM

Symptom/Fail-safe function:

- Engine stalls, hard to start, rough idling

1. IACV Inspection

Replace the IACV with a new one.
Erase the DTC (page 4-9).
Perform the test ride.
Check the DTC with GST or MCS.

Is same DTC indicated?

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

DTC P0562

Probable cause:

- Faulty main relay circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

1. Main relay Open Circuit Inspection

Turn the ignition switch OFF.
Remove the main relay (page 21-24).
Disconnect the ECM 33P (Gray) connector (page 4-76).
Check for continuity between the main relay terminal of the relay box [1] and ECM 33P (Gray) connector [2] terminals.

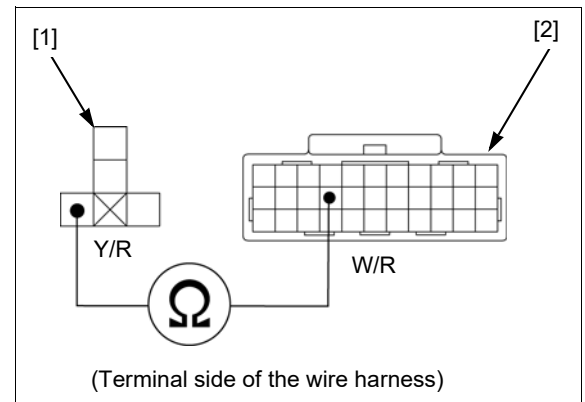
CONNECTION: Yellow/red – White/red

NOTE:

- Since the circuit includes a main relay diode, it is normal if there is continuity (indicating a slight resistance value) in only one direction.

Is there continuity?

- YES** – Replace the ECM with a new one, and recheck.
- NO** –
- Open circuit in White/red wire or Yellow/red wire
 - Faulty fuse/relay box
 - Faulty main relay diode



DTC P0600

Probable cause:

- Faulty combination meter or its related circuit
- Blown CLOCK 7.5 A fuse
- Blown METER/HORN/TAIL/TURN 7.5 A fuse
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

1. Combination Meter Serial Communication Output Voltage Inspection

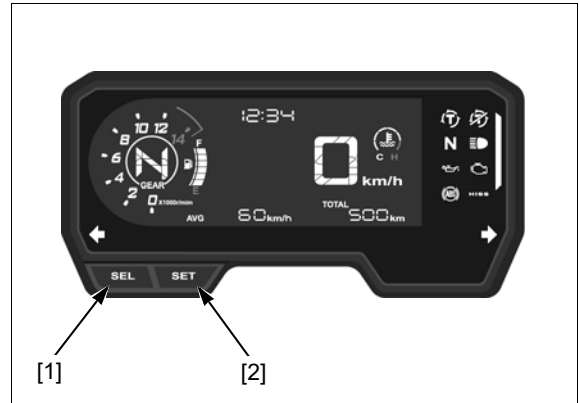
Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) connector (page 4-76).

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 mode.



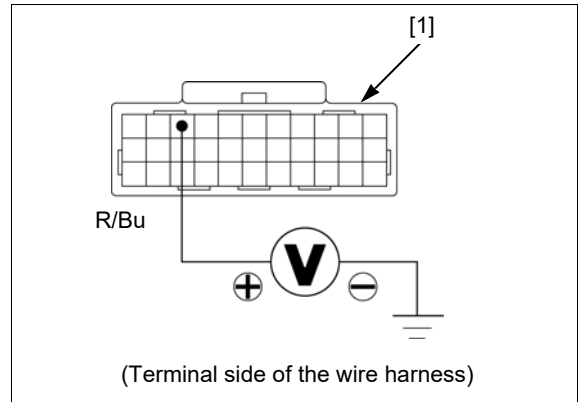
Measure the voltage between the wire harness side ECM 33P (Black) connector [1] terminal and ground.

CONNECTION: Red/Blue (+) – Ground (-)

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

YES – GO TO STEP 2.

NO – Inspect the combination meter (page 21-6).



2. ECM Serial Line Output Voltage Inspection

Turn the ignition switch OFF.
 Disconnect the combination meter 20P (Gray) connector (page 21-5).
 Connect the ECM 33P (Black) connector (page 4-76).
 Short the DLC terminals using the special tool (page 4-9).
 Rotate and hold the throttle grip to the fully open position.
 Turn the ignition switch ON while holding the throttle grip at the fully open position over 10 seconds.

NOTE:

The ECM enters the communication diagnostic mode.

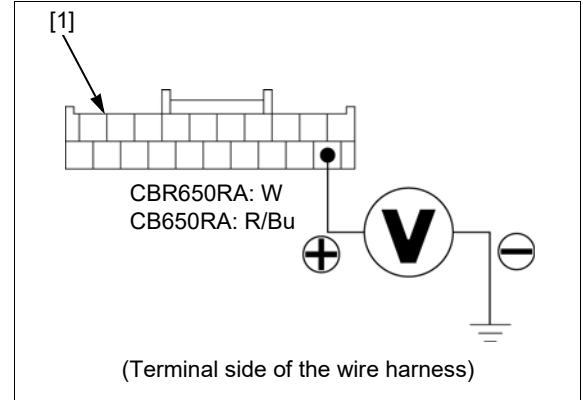
Measure the voltage at the combination meter 20P (Gray) connector [1] of the wire harness side and ground.

CONNECTION:

- CBR650RA: White (+) – Ground (–)**
- CB650RA: Red/blue (+) – Ground (–)**

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

- YES** – Inspect the combination meter (page 21-6).
- NO** – Replace the ECM with a known good one, and recheck.



DTC P062F

Probable cause:

- Faulty ECM

Symptom/Fail-safe function:

- Hard to start
- Does not hold the self-diagnosis data
 - The MIL does not come on (the DTC can be readout and erased only by GST or MCS).

Diagnostic procedure:

1. Replace the ECM with a new one.
2. Erase the DTC (page 4-9).
3. Turn the ignition switch ON and wait for 10 seconds.
4. Check the DTC with GST or MCS.
5. If the same DTC is not indicated, faulty original ECM.

DTC P064D

Probable cause:

- Loose or poor contact of the ECM connector

Symptom/Fail-safe function:

- Engine operates normally

1. A/F Sensor IC Circuit Input Voltage line Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Gray) connector (page 4-76).

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

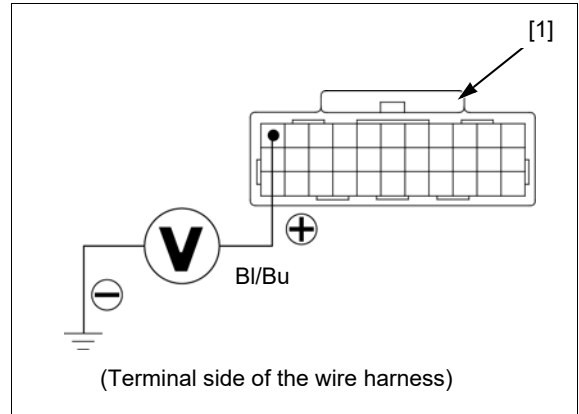
Measure the voltage between the wire harness side ECM 33P (Gray) connector [1] terminal and ground.

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

Is there battery voltage?

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

NO – Open circuit in Black/blue wire.



DTC P0914

Probable cause:

- Faulty gear position switch or its related circuits
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

1. Gear Position Switch Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) [1] and 33P (Gray) connectors [2] (page 4-76).

Check for continuity between the ECM connector terminals at the harness side and ground.

It is normal if there is continuity at each gear position as follows and no continuity at other gear position.

TOOL:

Test probe 07ZAJ-RDJA110

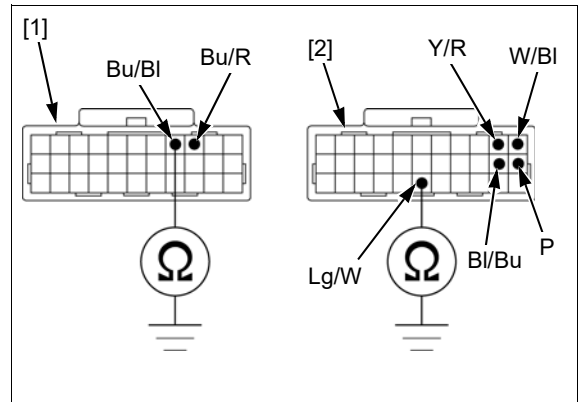
CONNECTION:

- Neutral: Light green/white – Ground**
- 1st gear: Yellow/red – Ground**
- 2nd gear: Black/blue – Ground**
- 3rd gear: White/blue – Ground**
- 4th gear: Pink – Ground**
- 5th gear: Blue/red – Ground**
- 6th gear: Blue/black – Ground**

Is continuity normal?

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

NO – GO TO STEP 2.



2. Gear Position Switch Inspection

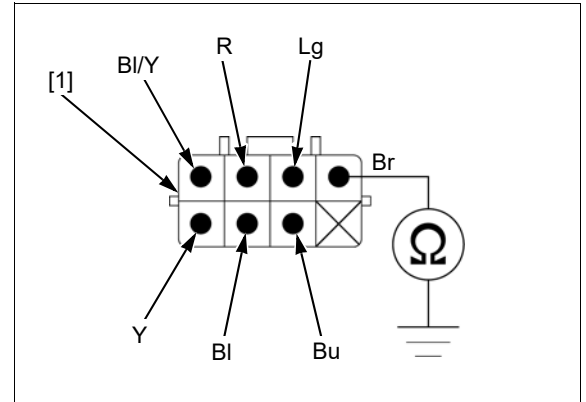
Disconnect the gear position switch 8P (Black) connector (page 4-81).
 Check for continuity between the gear position switch 8P (Black) connector [1] terminals at the switch side and ground.
 It is normal if there is continuity at each gear position as follows and no continuity at other gear position.

CONNECTION:

- Neutral:** Light green – Ground
- 1st gear:** Brown – Ground
- 2nd gear:** Red – Ground
- 3rd gear:** Black/yellow – Ground
- 4th gear:** Yellow – Ground
- 5th gear:** Black – Ground
- 6th gear:** Blue – Ground

Is continuity normal?

- YES** – • Open or short circuit in following wire between the ECM and gear position switch.
- Light green/white
 - Yellow/red
 - Black/blue
 - White/blue
 - Pink
 - Blue/red
 - Blue/black
- NO** – Replace the gear position switch with a known good one, and recheck.



DTC P1000/DTC P1001

Probable cause:

- Faulty bank angle sensor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally
- Engine stop function does not operate

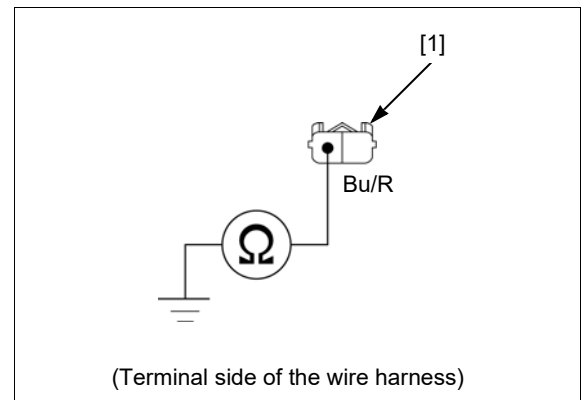
1. Bank Angle Sensor Signal Line Short Circuit Inspection

Turn the ignition switch OFF.
 Disconnect the bank angle sensor 2P (Black) connector (page 4-81).
 Check for continuity between the wire harness side bank angle sensor 2P (Black) connector [1] terminal and ground.

CONNECTION: Blue/red– Ground

Is there continuity?

- YES** – Short circuit in the Blue/red wire
- NO** – GO TO STEP 2.



2. Bank Angle Sensor Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Gray) connector (page 4-76).

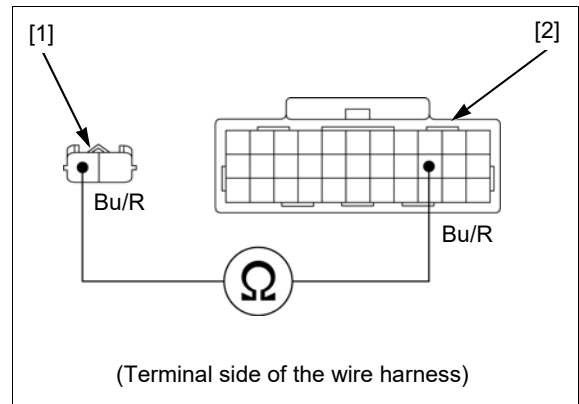
Check for continuity between the wire harness side bank angle sensor 2P (Black) connector [1] and ECM 33P (Gray) connector [2] terminals.

CONNECTION: Blue/red – Blue/red

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Blue/red wire



3. Bank Angle Sensor Input Voltage Inspection

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

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

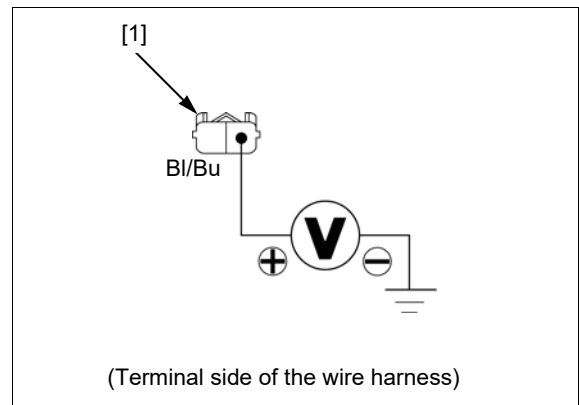
Measure the voltage between the wire harness side bank angle sensor 2P (Black) connector [1] terminal and ground.

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

Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in Black/blue wire



4. Bank Angle Sensor Inspection

Replace the bank angle sensor with a known good one (page 4-81).

Erase the DTC (page 4-9).

Check the DTC with the MCS or GST.

Is same DTC indicated?

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

NO – Faulty bank angle sensor

DTC P1100

Probable causes:

- Faulty fuel pump
- Faulty fuel injector
- Faulty throttle body
- Faulty A/F sensor

Symptom/Fail-safe function:

- Engine operates at restricted speed
- Driveability deterioration

NOTE:

- When other DTC is displayed, together with P0300, troubleshoot it first.

1. 35 kW type Intake Duct Installation inspection

Install the 35 kW type intake duct correctly (page 7-12).

Erase the DTC (page 4-9).

Perform the test ride (page 4-14).

Check the DTC with GST or MCS.

Is same DTC indicated?

YES – GO TO STEP 2.

NO – Faulty installation of the intake duct.

2. Parts Status Inspection

Check and replace the following:

- Fuel pump
- Fuel injector
- Throttle body
- A/F sensor

Erase the DTC (page 4-9).

Perform the test ride (page 4-14).

Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Checked and replaced parts failure

DTC P2158

Probable cause:

- Faulty rear wheel speed sensor or its related circuit
- ABS modulator has DTC (CAN lines included)
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

NOTE:

- When other DTC is displayed, together with P0500, troubleshoot it first.

1. Rear Wheel Speed Sensor Signal Output Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the following:

- ABS modulator 18P (Black) connector (page 19-26)
- ECM 33P (Black) connector (page 4-76)

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

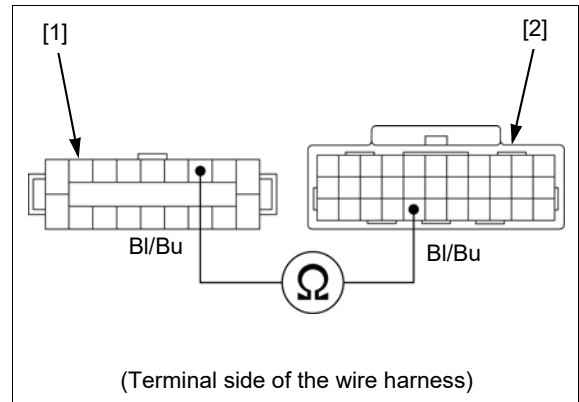
TOOL:

Test probe **07ZAJ-RDJA110**

CONNECTION: Black/blue – Black/blue

Is there continuity?

- YES** – GO TO STEP 2.
- NO** – Open circuit in the Black/blue wire



2. Rear Wheel Speed Sensor Signal Output Line Short Circuit Inspection

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

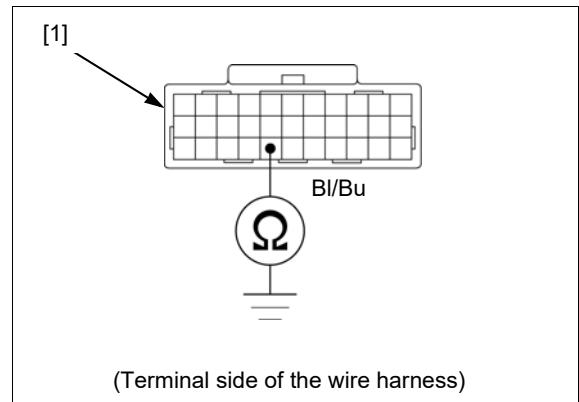
TOOL:

Test probe **07ZAJ-RDJA110**

CONNECTION: Black/blue – Ground

Is there continuity?

- YES** – Short circuit in the Black/blue wire
- NO** – GO TO STEP 3.



3. ECM Inspection

Replace the ECM with a new one (page 4-76).
 Erase the DTC (page 4-9).
 Perform the test-ride the motorcycle (page 4-14).
 Check the DTC with the GST or MCS.

Is same DTC indicated?

- YES** – Replace the ABS modulator with a known good one and recheck (page 19-26).
- NO** – Faulty original ECM.

DTC P2195/DTC P2196

Probable cause:

- Faulty A/F sensor or its related circuit
- Faulty fuel injector or its fuel pressure too low
- Faulty ECT sensor
- Faulty ECM

Symptom/Fail-safe function:

- Hard to start at a low temperature
- Exhaust gas too lean or too rich
- Intake air or engine vacuum leaks
- Fuel consumption deterioration
- Driveability deterioration

1. A/F Sensor Inspection

Replace the A/F sensor with a new one.

Erase the DTC (page 4-9).

Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original A/F sensor

DTC P2A00

Probable cause:

- Faulty A/F sensor or its related circuit
- There is an exhaust leak
- Faulty ECM

Symptom/Fail-safe function:

- Hard to start at a low temperature
- Exhaust gas too lean or too rich
- Intake air or engine vacuum leaks
- Fuel consumption deterioration
- Driveability deterioration

1. A/F sensor Inspection

Replace the A/F sensor with a new one.

Erase the DTC (page 4-9).

Start the engine and wait a minute.

Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original A/F sensor

PGM-FI SYSTEM

DTC INDEX (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)

- NOTE:
- If the MCS or GST 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
P0107 (1-1)	MAP sensor circuit low voltage (less than 0.215 V) • MAP sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 60 kPa (450 mmHg)	4-48
P0108 (1-2)	MAP sensor circuit high voltage (more than 3.809 V) • Loose or poor contact of the MAP sensor connector • MAP sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 60 kPa (450 mmHg) • HSTC does not operate	4-49
P1002 (2-1)	MAP sensor performance problem • Loose or poor connection of the MAP sensor vacuum hose • MAP sensor malfunction	• Engine operates normally • Pre-program value: 60 kPa (450 mmHg) • HSTC does not operate	4-50
P0117 (7-1)	ECT sensor circuit low voltage (less than 0.059 V) • ECT sensor or its circuit malfunction	• Hard start at a low temperature • Pre-program value: 109.9°C (230°F) • HSTC does not operate	4-51
P0118 (7-2)	ECT sensor circuit high voltage (more than 4.922 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: 109.9°C (230°F) • HSTC does not operate	4-51
P0122 (8-1)	TP sensor circuit low voltage (less than 0.313 V) • Loose or poor contact of the TP sensor connector • TP sensor or its circuit malfunction	• Poor engine acceleration • Pre-program value: 0° • HSTC does not operate • Quickshifter does not operate	4-52
P0123 (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° • HSTC does not operate • Quickshifter does not operate	4-54
P0112 (9-1)	IAT sensor circuit low voltage (less than 0.078 V) • IAT sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 34.80°C (95°F) • HSTC does not operate	4-55
P0113 (9-2)	IAT sensor circuit high voltage (more than 4.922 V) • Loose or poor contact of the IAT sensor connector • IAT sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 34.80°C (95°F) • HSTC does not operate	4-55
P0201 (12-1)	No. 1 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	4-56
P0202 (13-1)	No. 2 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	4-56
P0203 (14-1)	No. 3 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	4-56
P0204 (15-1)	No. 4 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	4-56
P0131 (21-1)	O ₂ sensor circuit low voltage • O ₂ sensor or its circuit malfunction	• Engine operates normally	4-58
P0132 (21-2)	O ₂ sensor circuit high voltage • Loose or poor contact of the O ₂ sensor connector • O ₂ sensor or its circuit malfunction	• Engine operates normally	4-59
P0135 (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	4-60
P0511 (29-1)	IACV malfunction • Loose or poor contact of the IACV connector • IACV or its circuit malfunction	• Engine stalls, hard to start, rough idling	4-61
P062F (33-2)	ECM EEPROM malfunction	• Engine operates normally • Does not hold the self-diagnosis data	4-62
P0914 (41-1)	Gear position switch malfunction • Gear position switch or its circuit malfunction	• Engine operates normally • Quickshifter does not operate	4-63

DTC	Function Failure	Symptom/Fail-safe function	Refer to
P1000 (54-1)	Bank angle sensor circuit low voltage (less than 0.020 V) <ul style="list-style-type: none"> Loose or poor contact of the bank angle sensor connector Bank angle sensor or its circuit malfunction 	<ul style="list-style-type: none"> Engine operates normally Engine stop function does not operate 	4-64
P1001 (54-2)	Bank angle sensor circuit high voltage (more than 4.986 V) <ul style="list-style-type: none"> Bank angle sensor or its circuit malfunction 	<ul style="list-style-type: none"> Engine operates normally Engine stop function does not operate 	4-65
P2158 (66-1)	Rear wheel speed sensor malfunction <ul style="list-style-type: none"> Loose or poor contact of the rear wheel speed sensor connector Faulty rear wheel speed sensor or its circuit malfunction 	<ul style="list-style-type: none"> Engine operates normally HSTC does not operate Quickshifter does not operate 	4-66
P1500 (67-1)	Front wheel speed sensor malfunction <ul style="list-style-type: none"> Loose or poor contact of the front wheel speed sensor connector Faulty front wheel speed sensor or its circuit malfunction 	<ul style="list-style-type: none"> Engine operates normally HSTC does not operate 	4-67
P0600 (86-1)	Serial communication malfunction <ul style="list-style-type: none"> Loose or poor contact of the related connector Faulty combination meter or its circuit malfunction Faulty ECM 	<ul style="list-style-type: none"> Engine operates normally 	4-69
P0443 (88-1)	EVAP purge control solenoid valve malfunction <ul style="list-style-type: none"> Loose or poor contact of the EVAP purge control solenoid valve connector EVAP purge control solenoid valve or its circuit malfunction 	<ul style="list-style-type: none"> Engine operates normally 	4-71
P0412 (89-1)	PAIR control solenoid valve malfunction <ul style="list-style-type: none"> Loose or poor contact of the PAIR control solenoid valve connector PAIR control solenoid valve or its circuit malfunction 	<ul style="list-style-type: none"> Engine operates normally 	4-72
P0351 (91-1)	Ignition coil 1 primary circuit malfunction <ul style="list-style-type: none"> Loose or poor contact of the ignition coil connector Ignition coil or its circuit malfunction 	<ul style="list-style-type: none"> Engine stalls, hard to start, rough idling No.1, No.4 Injector, and ignition 1 shut down HSTC does not operate Quickshifter does not operate 	4-74
P0352 (92-1)	Ignition coil 2 primary circuit malfunction <ul style="list-style-type: none"> Loose or poor contact of the ignition coil connector Ignition coil or its circuit malfunction 	<ul style="list-style-type: none"> Engine stalls, hard to start, rough idling No.2, No.3 Injector, and ignition 2 shut down HSTC does not operate Quickshifter does not operate 	4-74

DTC TROUBLESHOOTING (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)

P0107 (MAP SENSOR LOW VOLTAGE)

1. MAP Sensor System Inspection

Check the MAP sensor with the MCS or GST.

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. MAP Sensor Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the MAP sensor 3P (Black) connector (page 4-79).

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

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

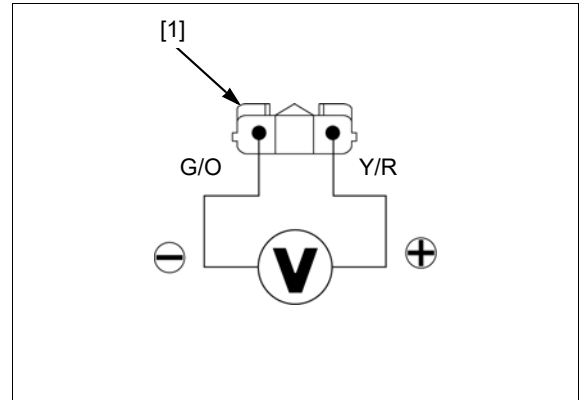
CONNECTION: Yellow/red (+) – Green/orange (-)

STANDARD: 4.75 – 5.25 V

Is the voltage within standard value?

YES – GO TO STEP 4.

NO – GO TO STEP 3.



3. MAP Sensor Input Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Gray) connector (page 4-76).

Check for continuity between the wire harness side MAP sensor 3P (Black) connector [1] and ECM 33P (Black) connector [2] terminals.

TOOL:

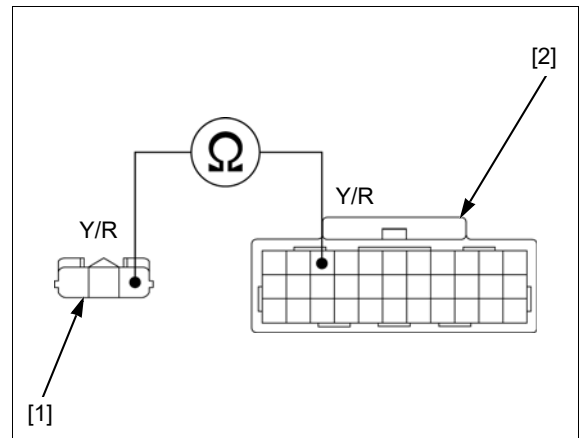
Test probe 07ZAJ-RDJA110

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 (Gray) connector (page 4-76).

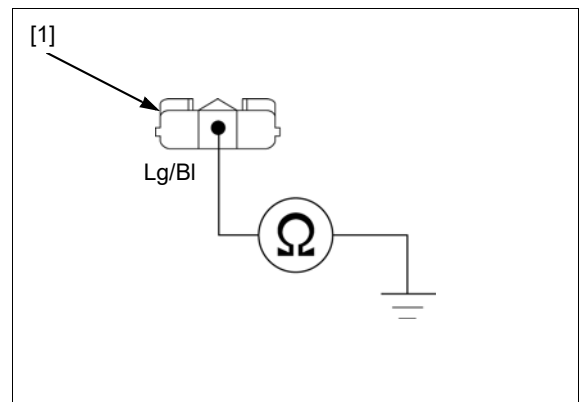
Check for continuity between MAP sensor 3P (Black) connector [1] terminal and ground.

CONNECTION: Light green/black – Ground

Is there continuity?

YES – Short circuit in Light green/black wire

NO – GO TO STEP 5.



5. MAP Sensor Inspection

Replace the MAP sensor with a known good one (page 4-79).
 Connect the ECM 33P connectors.
 Erase the DTC (page 4-9).
 Check the MAP sensor with the MCS or GST.

Is P0107 indicated?

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

P0108 (MAP SENSOR HIGH VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the MAP sensor 3P (Black) and ECM 33P (Gray) connectors, and recheck the DTC.

1. MAP Sensor System Inspection

Check the MAP sensor with the MCS or GST.

Is about 5 V indicated?

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

2. MAP Sensor Input Voltage Inspection

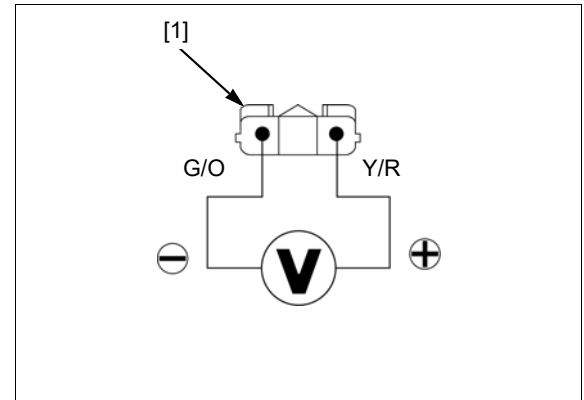
Turn the ignition switch OFF.
 Disconnect the MAP sensor 3P (Black) connector (page 4-79).
 Turn the ignition switch ON with the engine stop switch "O".
 Measure the voltage between the wire harness side MAP sensor 3P (Black) connector [1] terminals.

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

STANDARD: 4.75 – 5.25 V

Is the voltage within standard value?

- YES** – GO TO STEP 3.
- NO** – Open circuit in Green/orange wire



3. MAP Sensor System Inspection with Jumper Wire

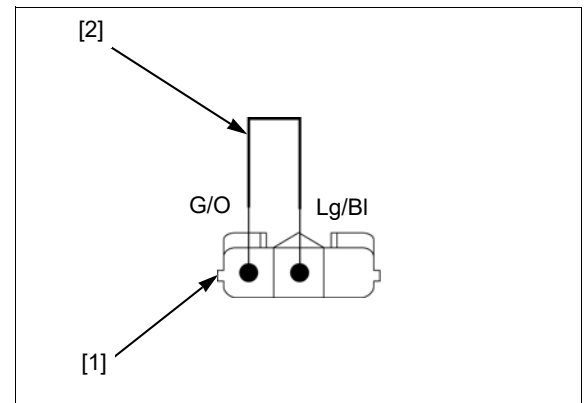
Turn the ignition switch OFF.
 Connect the wire harness side MAP sensor 3P (Black) connector [1] terminals with a jumper wire [2].

CONNECTION: Light green/black – Green/orange

Check the MAP sensor with the MCS or GST.

Is about 0 V indicated?

- YES** – Faulty MAP sensor
- NO** – GO TO STEP 4.



4. MAP Sensor Signal Line Open Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P (Gray) connector (page 4-76).
Check for continuity between the wire harness side MAP sensor 3P (Black) connector [1] and ECM 33P (Gray) connector [2] terminals.

TOOL:

Test probe 07ZAJ-RDJA110

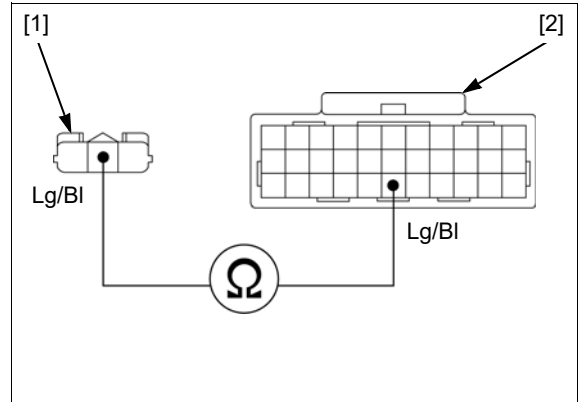
CONNECTION:

Light green/black – Light green/black

Is there continuity?

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

NO – Open circuit in Light green/black wire



P1002 (MAP sensor performance problem)

1. MAP Sensor System Inspection

Start the engine and check the MAP sensor with the MCS or GST at idle speed.

Is the reading changed?

YES – Intermittent failure

NO – GO TO STEP 2.

2. Manifold Absolute Pressure Test

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

Check for connection and installation of the MAP sensor vacuum hose [1].

Is the MAP sensor vacuum hose connection correct?

YES – GO TO STEP 3.

NO – Correct the hose installation.



3. MAP Sensor System Inspection

Replace the MAP sensor with a known good one (page 4-79).
Start the engine.

Check the MAP sensor with the MCS or GST at idle speed.

Is the reading changed?

YES – Faulty original MAP sensor

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

P0117 (ECT SENSOR LOW VOLTAGE)

1. ECT Sensor System Inspection

Check the ECT sensor with the MCS or GST.

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 (Blue) connector (page 4-79).

Check the ECT sensor with the MCS or GST.

Is about 0 V indicated?

YES – GO TO STEP 3.

NO – Faulty ECT sensor

3. ECT Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Gray) connector (page 4-76).

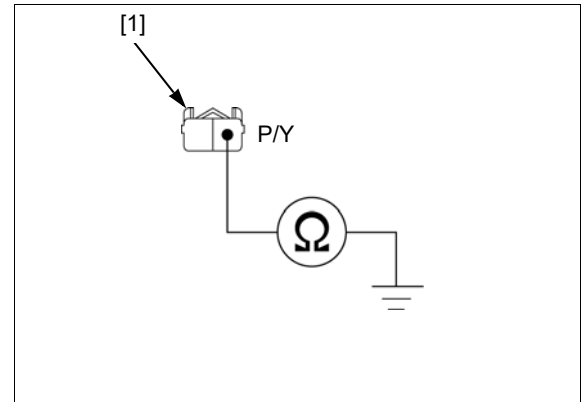
Check for continuity between the wire harness side ECT sensor 2P (Blue) connector [1] terminal and ground.

CONNECTION: Pink/yellow – Ground

Is there continuity?

YES – Short circuit in Pink/yellow wire

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



P0118 (ECT SENSOR HIGH VOLTAGE)

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

1. ECT Sensor System Inspection

Check the ECT sensor with the MCS or GST.

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 (Blue) connector (page 4-79).

Connect the wire harness side ECT sensor 2P (Blue) connector [1] terminals with a jumper wire [2].

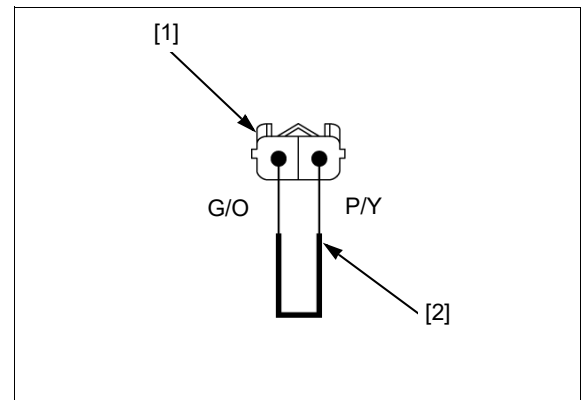
CONNECTION: Pink/yellow – Green/orange

Check the ECT sensor with the MCS or GST.

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) and 33P (Gray) connectors (page 4-76).
 Check for continuity between the wire harness side ECT sensor 2P (Blue) connector [1] and ECM 33P (Black) [2] and 33P (Gray) [3] connector terminals.

TOOL:

Test probe **07ZAJ-RDJA110**

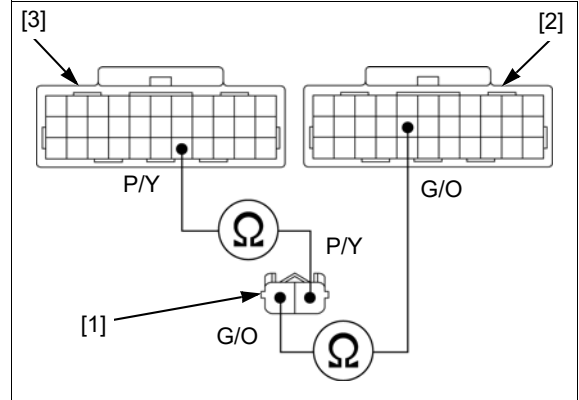
CONNECTION:

Pink/yellow – Pink/yellow
Green/orange – Green/orange

Is there continuity?

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

NO – • Open circuit in Pink/yellow wire
 • Open circuit in Green/orange wire



4. ECT Sensor Resistance Inspection

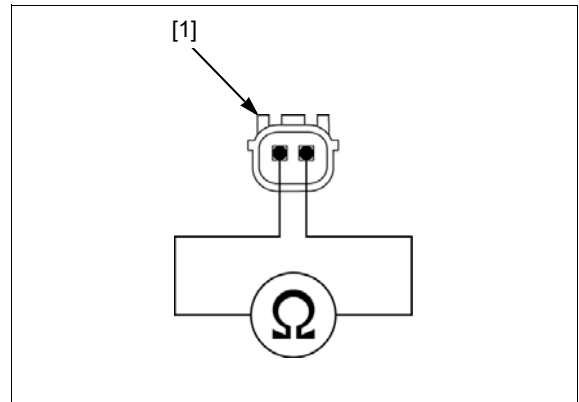
Turn the ignition switch OFF.
 Remove the ECT sensor (page 4-79).
 Measure the resistance between the 2P connector terminals of the ECT sensor [1].

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



P0122 (TP SENSOR LOW VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the TP sensor 3P (Blue), ECM 33P (Black) and 33P (Gray) connectors, and recheck the DTC.

1. TP Sensor System Inspection

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

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. TP Sensor Input Voltage Inspection

Turn the ignition switch OFF.
 Disconnect the TP sensor 3P (Blue) connector [1].
 Turn the ignition switch ON with the engine stop switch "O".
 Measure the voltage between the wire harness side TP sensor 3P (Blue) connector terminals.

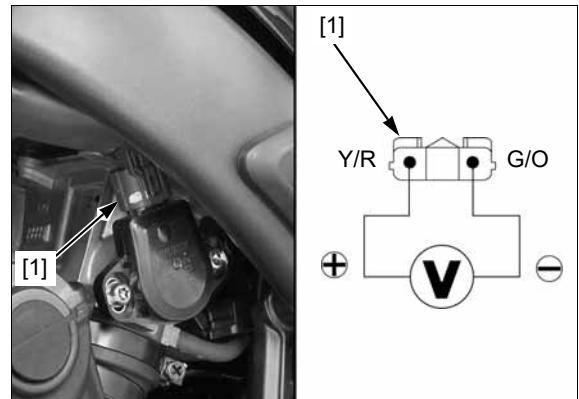
CONNECTION: Yellow/red (+) – Green/orange (-)

STANDARD: 4.75 – 5.25 V

Is the voltage within standard value?

YES – GO TO STEP 4.

NO – GO TO STEP 3.



3. TP Sensor Input Line Open Circuit Inspection

Turn the ignition switch OFF.
 Disconnect the ECM 33P (Black) connector (page 4-76).
 Check for continuity between the wire harness side TP sensor 3P (Blue) connector [1] and ECM 33P (Black) connector [2] terminals.

TOOL:

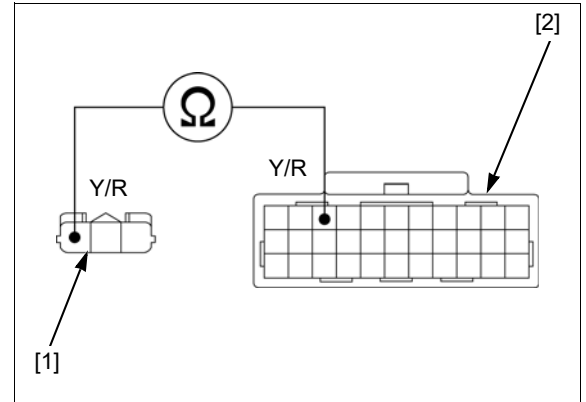
Test probe **07ZAJ-RDJA110**

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 (Gray) connector (page 4-76).
 Check for continuity between the wire harness side TP sensor 3P (Blue) connector [1] and ECM 33P (Gray) connector [2] terminals.

TOOL:

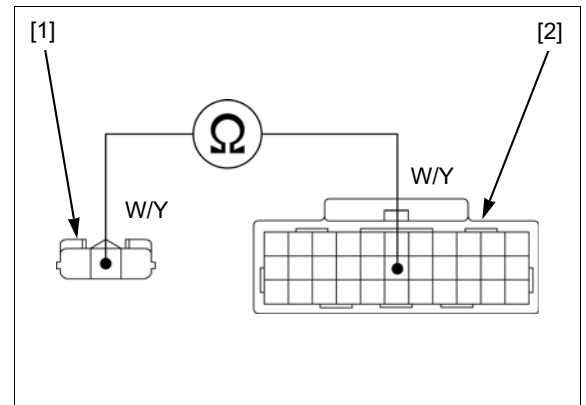
Test probe **07ZAJ-RDJA110**

CONNECTION: White/yellow – White/yellow

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in White/yellow wire



5. TP Sensor Signal Line Short Circuit Inspection

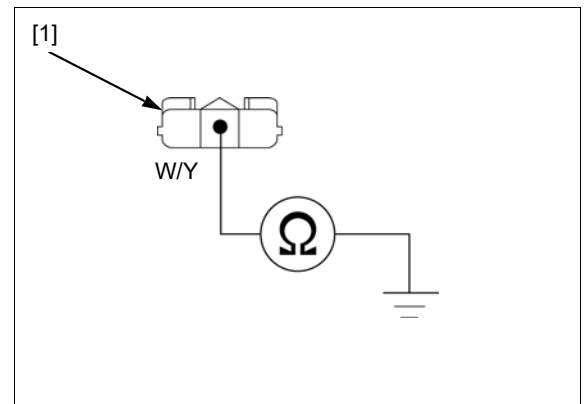
Check for continuity between the wire harness side TP sensor 3P (Blue) connector [1] terminal and ground.

CONNECTION: White/yellow – Ground

Is there continuity?

YES – Short circuit in White/yellow wire

NO – GO TO STEP 6.



6. TP Sensor Inspection

Replace the throttle body (TP sensor) with a known good one (page 7-13).
 Connect the ECM 33P connectors.
 Erase the DTC (page 4-9).
 Check the TP sensor with the MCS or GST.

Is P0122 indicated?

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

NO – Faulty original TP sensor

P0123 (TP SENSOR HIGH VOLTAGE)

1. TP Sensor System Inspection

Check the TP sensor with the MCS or GST.

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 or GST.

Is the voltage increase continuously?

YES – Intermittent failure

NO – Faulty TP sensor

3. TP Sensor Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the TP sensor 3P (Blue) connector [1].

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

Measure the voltage between the wire harness side TP sensor 3P (Blue) connector terminals.

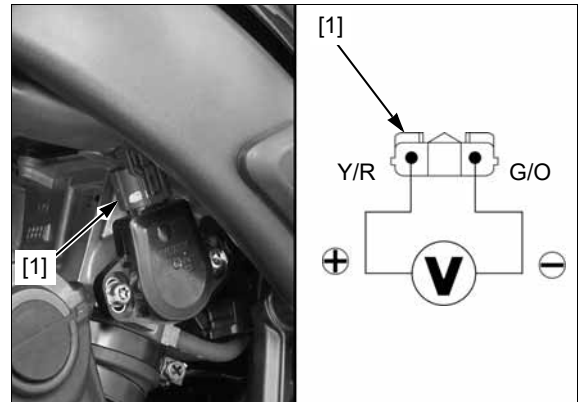
CONNECTION: Yellow/red (+) – Green/orange (-)

STANDARD: 4.75 – 5.25 V

Is the voltage within standard value?

YES – GO TO STEP 4.

NO – Open circuit in Green/orange wire



4. TP Sensor Line Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) and 33P (Gray) connectors (page 4-76).

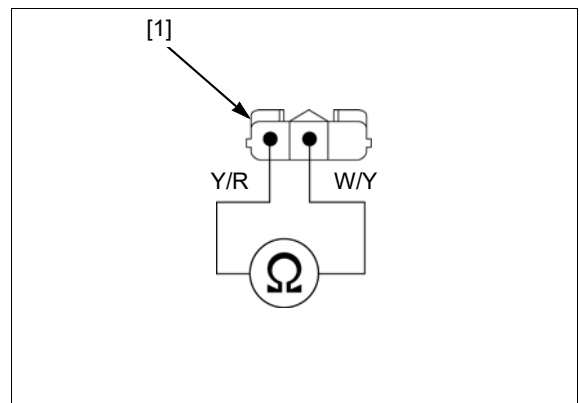
Check for continuity between the wire harness side TP sensor 3P (Blue) connector [1] terminals.

CONNECTION: Yellow/red – White/yellow

Is there continuity?

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

NO – GO TO STEP 5.



5. TP Sensor Inspection

Replace the throttle body (TP sensor) with a known good one (page 7-13).

Connect the ECM 33P connectors.

Erase the DTC (page 4-9).

Check the TP sensor with the MCS or GST.

Is P0123 indicated?

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

NO – Faulty original TP sensor

P0112 (IAT SENSOR LOW VOLTAGE)**1. IAT Sensor System Inspection**

Check the IAT sensor with the MCS or GST.

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 IAT sensor 2P (Black) connector (page 4-79).

Check the IAT sensor with the MCS or GST.

Is about 0 V indicated?

YES – GO TO STEP 3.

NO – Faulty IAT sensor

3. IAT Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Gray) connector (page 4-76).

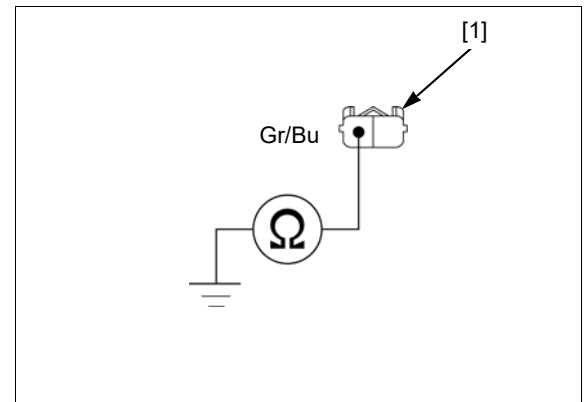
Check for continuity between the wire harness side IAT sensor 2P (Black) connector [1] terminal and ground.

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.

**P0113 (IAT SENSOR HIGH VOLTAGE)**

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

1. IAT Sensor System Inspection

Check the IAT sensor with the MCS or GST.

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 IAT sensor 2P (Black) connector (page 4-79).

Connect the wire harness side IAT sensor 2P (Black) connector [1] terminals with a jumper wire [2].

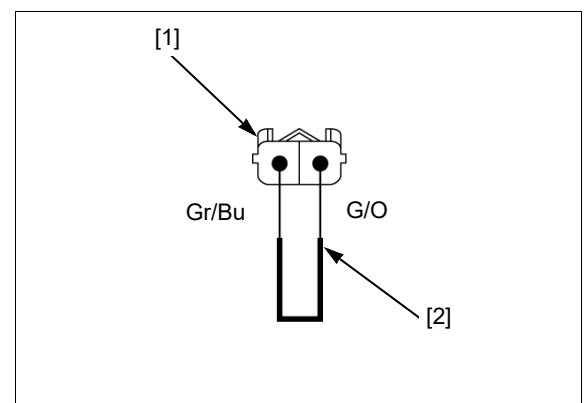
CONNECTION: Gray/blue – Green/orange

Check the IAT sensor with the MCS or GST.

Is about 0 V indicated?

YES – Faulty IAT sensor

NO – GO TO STEP 3.



3. IAT Sensor Line Open Circuit Inspection

Turn the ignition switch OFF.
 Disconnect the ECM 33P (Black) and 33P (Gray) connectors (page 4-76).
 Check for continuity between the wire harness side IAT sensor 2P (Black) connector [1] and ECM 33P (Black) [2]/33P (Gray) [3] connector terminals.

TOOL:

Test probe **07ZAJ-RDJA110**

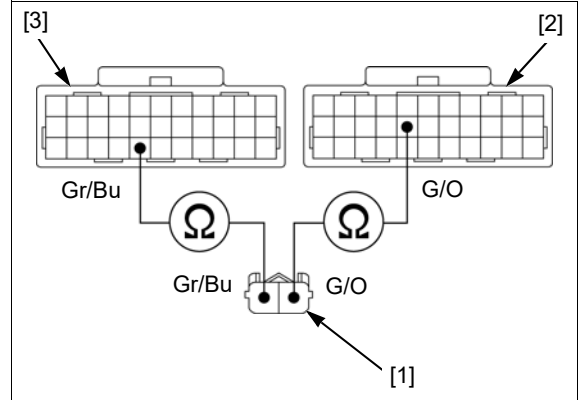
CONNECTION:

Gray/blue – Gray/blue
Green/orange – Green/orange

Is there continuity?

YES – GO TO STEP 4.

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



4. IAT Sensor Resistance Inspection

Connect the IAT sensor 2P (Black) connector.
 Measure the resistance between the wire harness side ECM 33P (Black) [1] and 33P (Gray) [2] connector terminals.

TOOL:

Test probe **07ZAJ-RDJA110**

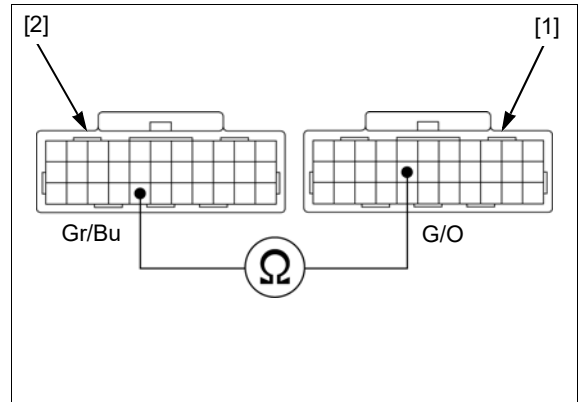
CONNECTION: Gray/blue – Green/orange

STANDARD: 1.0 – 1.3 k Ω (40°C/104°F)

Is the resistance within standard value?

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

NO – Faulty IAT sensor



**P0201 (No. 1 FUEL INJECTOR)/
 P0202 (No. 2 FUEL INJECTOR)/
 P0203 (No. 3 FUEL INJECTOR)/
 P0204 (No. 4 FUEL INJECTOR)**

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

1. Recheck DTC

Erase the DTC (page 4-9).
 Start the engine and check the fuel injector with the MCS or GST.

Is the P0201, P0202, P0203 or P0204 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Fuel Injector Input Voltage Inspection

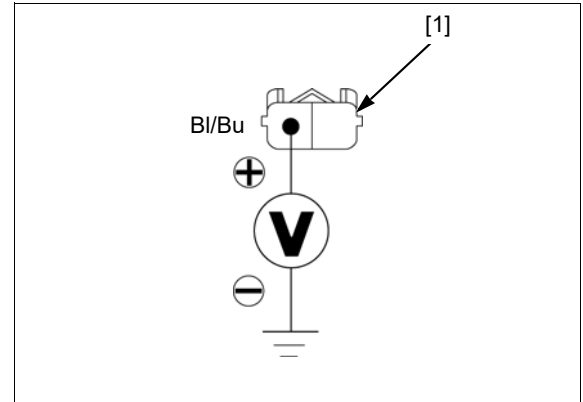
Turn the ignition switch OFF.
 Lift the fuel tank and support it (page 3-4).
 Disconnect the fuel injector 2P (Black) connector.
 Turn the ignition switch ON with the engine stop switch "O".
 Measure the voltage between the wire harness side injector 2P (Black) connector [1] terminal and ground.

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

Is there battery voltage?

YES – GO TO STEP 3.

NO – Open circuit in Black/blue wire



3. Fuel Injector Resistance Inspection

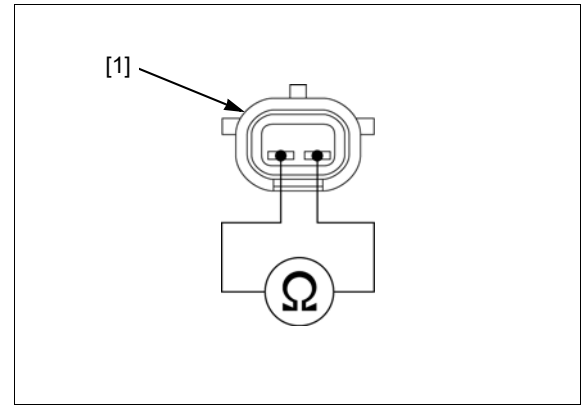
Turn the ignition switch OFF.
 Measure the resistance between the 2P connector terminals of the fuel injector [1].

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 4-76).
 Check for continuity between the wire harness side fuel injector 2P (Black) connectors [1] and ECM 33P (Black) connector [2] terminals.

TOOL:

Test probe 07ZAJ-RDJA110

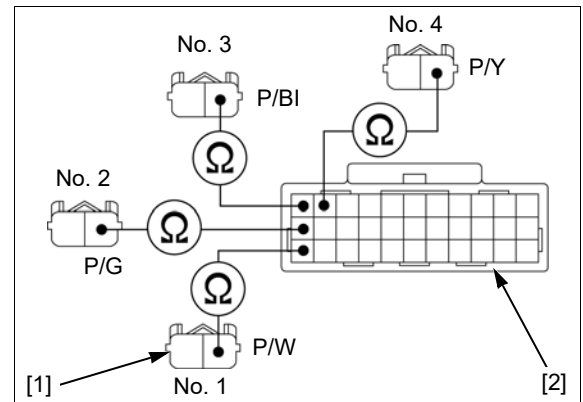
CONNECTION:

- No. 1: Pink/white – Pink/white**
- No. 2: Pink/green – Pink/green**
- No. 3: Pink/black – Pink/black**
- No. 4: Pink/yellow – Pink/yellow**

Is there continuity?

YES – GO TO STEP 5.

- NO** –
- Open circuit in Pink/white wire
 - Open circuit in Pink/green wire
 - Open circuit in Pink/black wire
 - Open circuit in Pink/yellow wire



5. Fuel Injector Signal Line Short Circuit Inspection

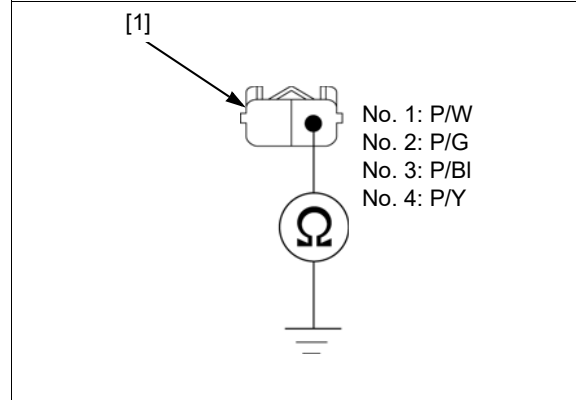
Check for continuity between the wire harness side injector 2P (Black) connectors [1] terminal and ground.

CONNECTION:

- No. 1: Pink/white – Ground
- No. 2: Pink/green – Ground
- No. 3: Pink/black – Ground
- No. 4: Pink/yellow – Ground

Is there continuity?

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



P0131 (O₂ SENSOR LOW VOLTAGE)

1. Recheck DTC

Erase the DTC (page 4-9).
 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 or GST.

Is the P0131 indicated?

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

2. O₂ Sensor Output Line Short Circuit Inspection

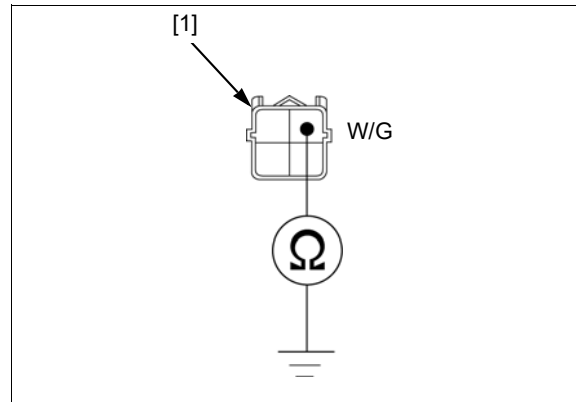
Turn the ignition switch OFF.
 Disconnect the following:
 – O₂ sensor 4P (Black) connector (page 2-18)
 – ECM 33P (Black)/33P (Gray) connectors (page 4-76)

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 3.



3. O₂ Sensor Inspection

Replace the O₂ sensor with a known good one (page 4-80).
 Connect the ECM 33P connectors.
 Erase the DTC (page 4-9).
 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 or GST.

Is the P0131 indicated?

- YES** – Replace the ECM with a known good one, and recheck.
NO – Faulty original O₂ sensor

P0132 (O₂ SENSOR HIGH VOLTAGE)

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

1. Recheck DTC

Erase the DTC (page 4-9).
 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 or GST.

Is the P0132 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. O₂ Sensor Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the following:

- O₂ sensor 4P (Black) connector (page 2-18)
- ECM 33P (Black)/ECM 33P (Gray) connectors (page 4-76)

Check for continuity between the wire harness side O₂ sensor 4P (Black) connector [1] and ECM 33P (Black) [2]/ECM 33P (Gray) [3] connector terminals.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION:

White/green – White/green

Green/orange – Green/orange

Is there continuity?

YES – GO TO STEP 3.

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

3. O₂ Sensor Inspection

Replace the O₂ sensor with a known good one (page 4-80).

Connect the ECM 33P connectors.

Erase the DTC (page 4-9).

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

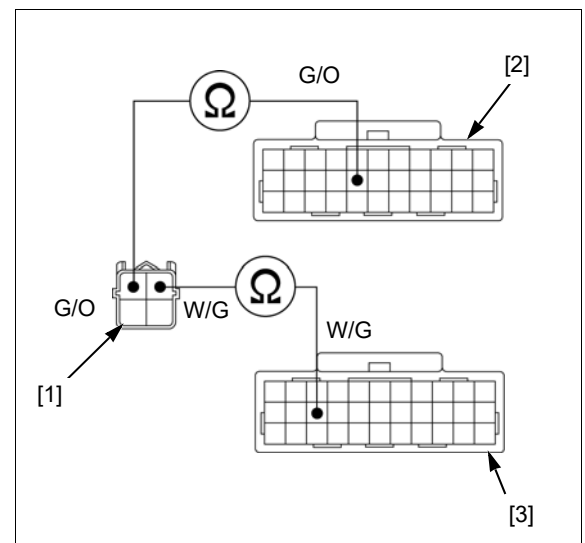
Stop the engine.

Check the O₂ sensor with the MCS or GST.

Is the P0132 indicated?

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

NO – Faulty original O₂ sensor



P0135 (O₂ SENSOR HEATER)

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

1. Recheck DTC

Erase the DTC (page 4-9).
Start the engine and check the O₂ sensor heater with the MCS or GST.

Is P0135 indicated?

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

2. O₂ Sensor Heater Resistance Inspection

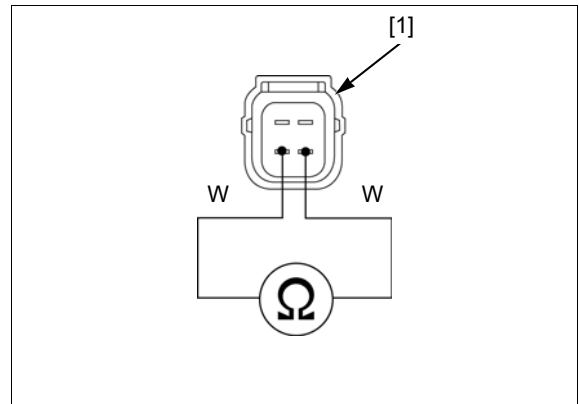
Turn the ignition switch OFF.
Disconnect the O₂ sensor 4P (Black) connector (page 2-18).
Measure the resistance between the sensor side O₂ sensor 4P (Black) connector [1] terminals.

CONNECTION: White – White

STANDARD: 13.0 – 18.5 Ω (20°C/68°F)

Is the resistance within standard value?

- YES** – GO TO STEP 3.
- NO** – Faulty O₂ sensor



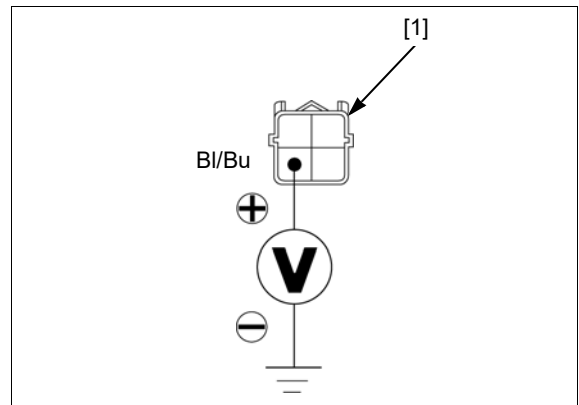
3. O₂ Sensor Heater Input Voltage Inspection

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/blue (+) – Ground (-)

Is there battery voltage?

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



4. O₂ Sensor Heater Line Open Circuit Inspection

Disconnect the ECM 33P (Gray) connector (page 4-76).
Check the continuity between the wire harness side O₂ sensor 4P (Black) connector [1] and ECM 33P (Gray) connector [2] terminals.

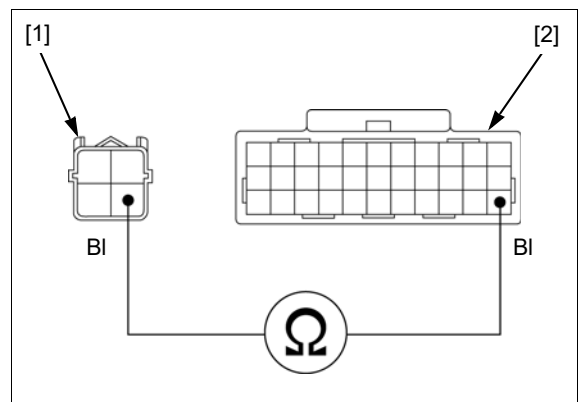
TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION: Black – Black

Is there continuity?

- YES** – GO TO STEP 5.
- NO** – Open circuit in Black wire



5. O₂ Sensor Heater Line Short Circuit Inspection

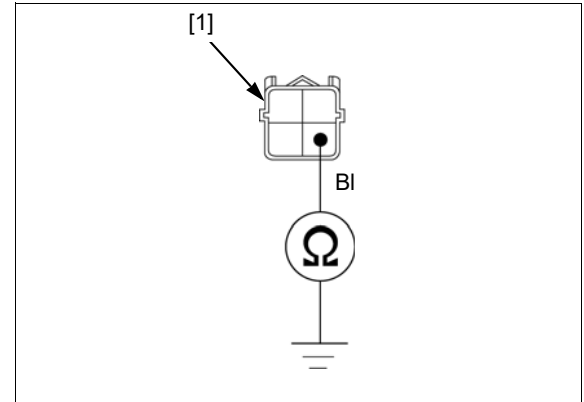
Check the continuity between the wire harness side O₂ sensor 4P (Black) connector [1] terminal and ground.

CONNECTION: Black – ground

Is there continuity?

YES – Short circuit in Black wire

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



P0511 (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.

1. Recheck DTC

Erase the DTC (page 4-9).
Check the IACV with the MCS or GST.

Is the P0511 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 (page 7-18).
Measure the resistance between the 4P connector terminals of the IACV [1].

TOOL:

Test probe **07ZAJ-RDJA110**

CONNECTION: A – D
B – C

STANDARD: 99 – 121 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:

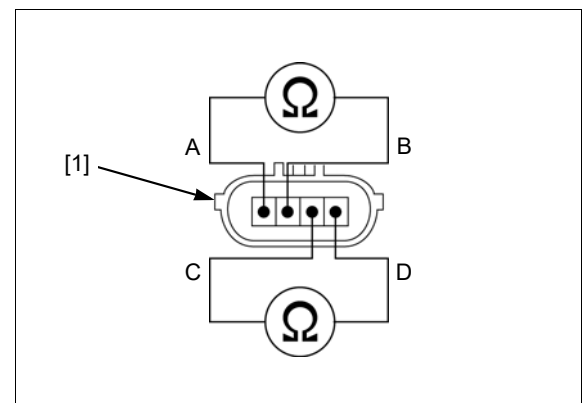
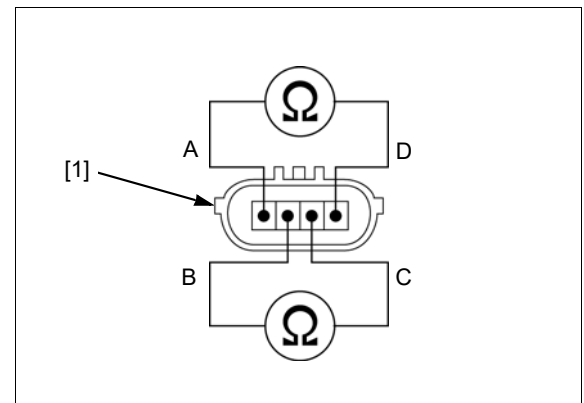
Test probe **07ZAJ-RDJA110**

CONNECTION: A – B
C – D

Is there continuity?

YES – Faulty IACV

NO – GO TO STEP 4.



4. IACV Line Open Circuit Inspection

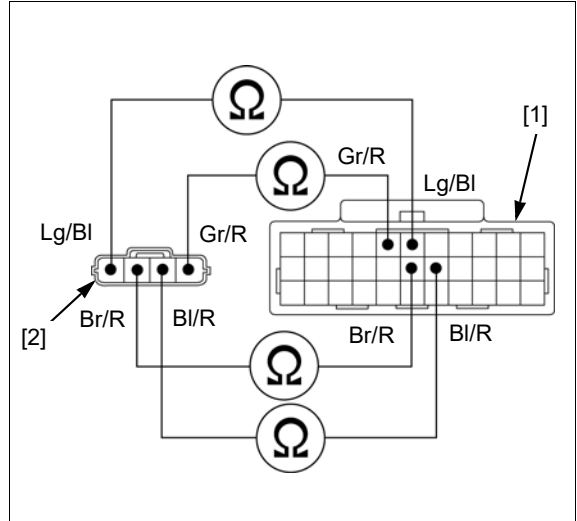
Disconnect the ECM 33P (Black) connector (page 4-76).
 Check for continuity between the wire harness side ECM 33P (Black) connector [1] and IACV 4P (Black) connector [2] terminals.

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

CONNECTION:
Light green/black – Light green/black
Brown/red – Brown/red
Black/red – Black/red
Gray/red – Gray/red

Is there continuity?

- YES** – GO TO STEP 5.
- NO** –
- Open circuit in Light green/black or Brown/red wire
 - Open circuit in Black/red or Gray/red wire



5. IACV Line Short Circuit Inspection

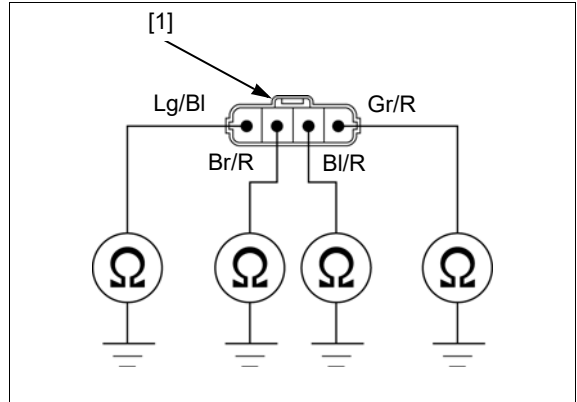
Check for continuity between the wire harness side IACV 4P (Black) connector [1] terminals and ground.

TOOL:
Test probe 07ZAJ-RDJA110

CONNECTION:
Light green/black – Ground
Brown/red – Ground
Black/red – Ground
Gray/red – Ground

Is there continuity?

- YES** –
- Short circuit in Light green/black or Brown/red wire
 - Short circuit in Black/red or Gray/red wire
- NO** – Replace the ECM with a known good one, and recheck.



P062F (EEPROM)

1. Recheck DTC

Erase the DTC (page 4-9).
 Recheck the ECM EEPROM with the MCS or GST.

Is the DTC P062F indicated?

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

P0914 (GEAR POSITION SWITCH)**1. Gear Position Switch System Inspection**

Erase the DTC (page 4-9).

Check the gear position switch with the MCS or GST.

Is the DTC P0914 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Gear Position Switch Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) [1] and 33P (Gray) connectors [2] (page 4-76).

Check for continuity between the ECM connector terminals at the harness side and ground.

It is normal if there is continuity at each gear position as follows and no continuity at other gear position.

TOOL:

Test probe

07ZAJ-RDJA110

CONNECTION:

Neutral: Light green/white – Ground

1st gear: Yellow/red – Ground

2nd gear: Black/blue – Ground

3rd gear: White/blue – Ground

4th gear: Pink – Ground

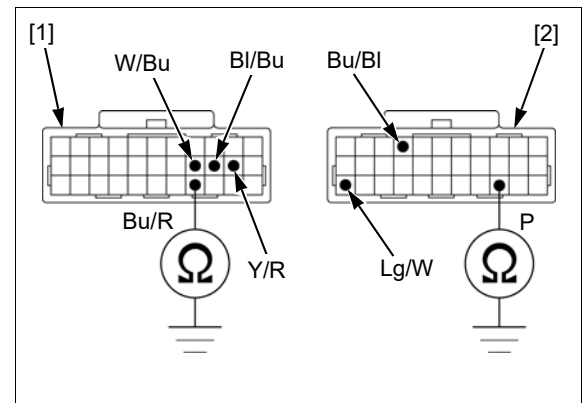
5th gear: Blue/red – Ground

6th gear: Blue/black – Ground

Is continuity normal?

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

NO – GO TO STEP 3.

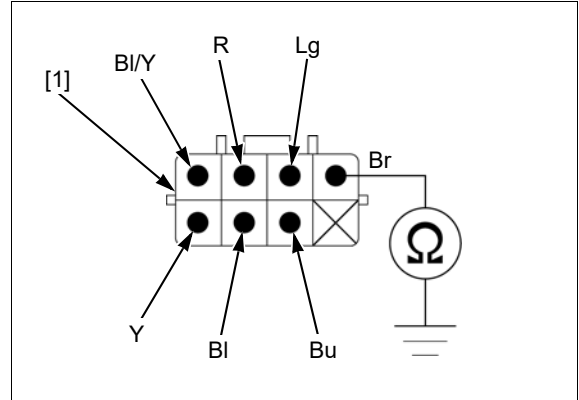


3. Gear Position Switch Inspection

Disconnect the gear position switch 8P (Black) connector (page 4-81).
 Check for continuity between the gear position switch 8P (Black) connector [1] terminals at the switch side and ground.
 It is normal if there is continuity at each gear position as follows and no continuity at other gear position.

CONNECTION:

- Neutral:** Light green – Ground
- 1st gear:** Brown – Ground
- 2nd gear:** Red – Ground
- 3rd gear:** Black/yellow – Ground
- 4th gear:** Yellow – Ground
- 5th gear:** Black – Ground
- 6th gear:** Blue – Ground



Is continuity normal?

- YES** – • Open or short circuit in following wire between the ECM and gear position switch.
- Light green/white
 - Yellow/red
 - Black/blue
 - White/blue
 - Pink
 - Blue/red
 - Blue/black
- NO** – Replace the gear position switch with a known good one, and recheck.

P1000 (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 (Gray) connectors, and recheck the DTC.

1. Bank Angle Sensor System Inspection

Erase the DTC (page 4-9).
 Check the bank angle sensor with the MCS or GST.

Is about 0 V indicated?

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

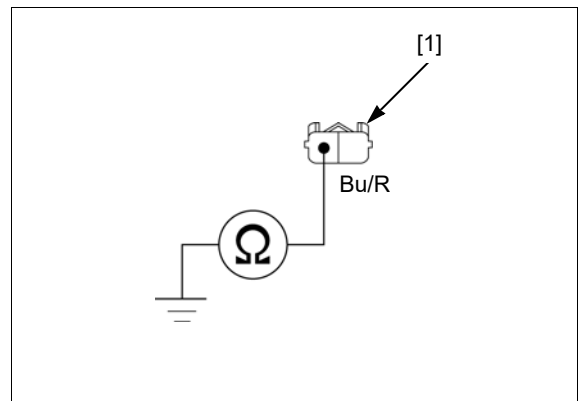
2. Bank Angle Sensor Signal Line Short Circuit Inspection

Turn the ignition switch OFF.
 Disconnect the bank angle sensor 2P (Black) connector (page 4-81).
 Check for continuity between the wire harness side bank angle sensor 2P (Black) connector [1] terminal and ground.

CONNECTION: Blue/red – Ground

Is there continuity?

- YES** – Short circuit in the Blue/red wire
NO – GO TO STEP 3.



3. Bank Angle Sensor Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Gray) connector (page 4-76).
 Check for continuity between the wire harness side bank angle sensor 2P (Black) connector [1] and ECM 33P (Gray) connector [2] terminals.

TOOL:

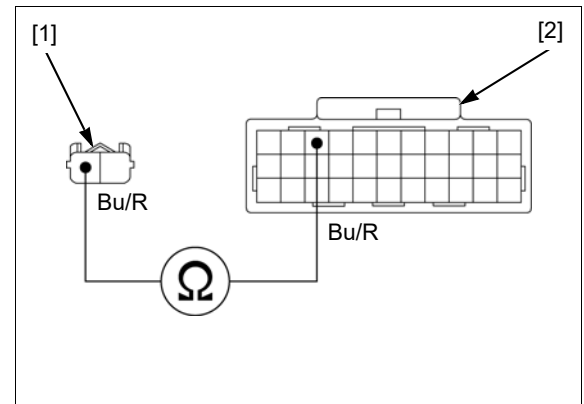
Test probe **07ZAJ-RDJA110**

CONNECTION: Blue/red – Blue/red

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Blue/red wire



4. Bank Angle Sensor Input Voltage Inspection

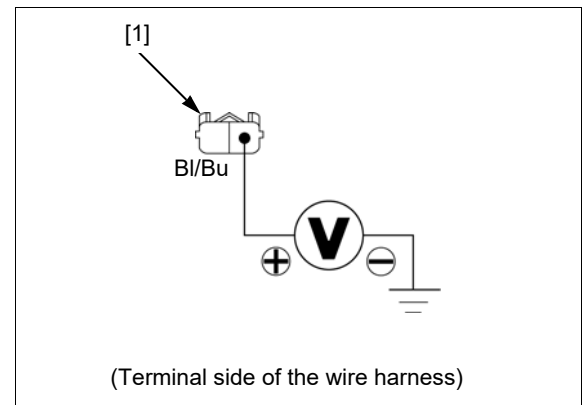
Temporarily install the ECM to the wire harness by connecting the 33P (Gray) connector.
 Turn the ignition switch ON with the engine stop switch "O".
 Measure the voltage between the wire harness side bank angle sensor 2P (Black) connector [1] terminal and ground.

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

Is there battery voltage?

YES – GO TO STEP 5.

NO – Open circuit in Black/blue wire



5. Bank Angle Sensor Inspection

Check the bank angle sensor (page 4-82).

Is the bank angle sensor normal?

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

NO – Faulty bank angle sensor

P1001 (BANK ANGLE SENSOR HIGH VOLTAGE)

1. Bank Angle Sensor System Inspection

Erase the DTC (page 4-9).
 Check the bank angle sensor with the MCS or GST.

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 4-81).
 Erase the DTC (page 4-9).
 Check the bank angle sensor with the MCS or GST.

Is P1001 indicated?

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

NO – Faulty original bank angle sensor

P2158 (REAR WHEEL SPEED SENSOR SIGNAL)

1. DTC Recheck

Erase the DTC (page 4-9).
 Test-ride the motorcycle above 20 km/h (12 mph) for more than 20 seconds.
 Stop the engine.
 Check the DTC with the GST or MCS.

Is P2158 indicated?

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

2. ABS DTC Check

Check the ABS DTC (page 19-6).

Does the ABS modulator have any DTC?

- YES** – Follow the ABS DTC index (page 19-10).
- NO** – GO TO STEP 3.

3. Rear Wheel Speed Sensor Signal Output Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the following:

- ABS modulator 18P (Black) connector (page 19-26)
- ECM 33P (Gray) connector (page 4-76)

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

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. Rear Wheel Speed Sensor Signal Output Line Short Circuit Inspection

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

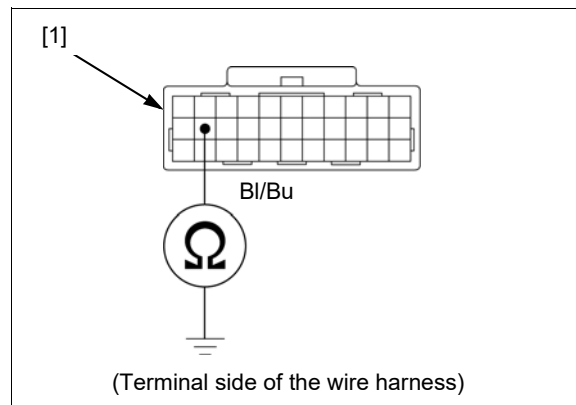
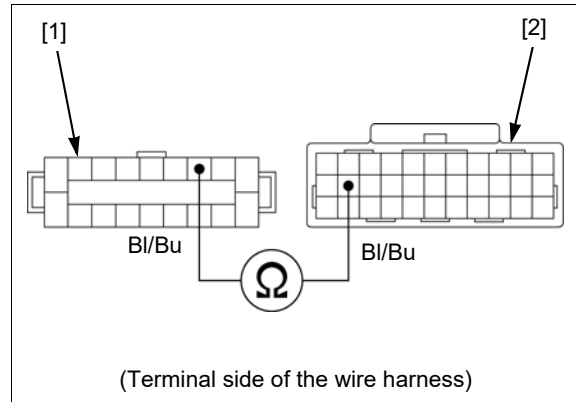
TOOL:

Test probe **07ZAJ-RDJA110**

CONNECTION: Black/blue– Ground

Is there continuity?

- YES** – Short circuit in the Black/blue wire
- NO** – GO TO STEP 5.



5. ECM Inspection

Replace the ECM with a known good one (page 4-76).
 Connect the ABS modulator 18P (Black) connector.
 Erase the DTC (page 19-26).
 Test-ride the motorcycle above 20 km/h (12 mph) for more than 20 seconds.
 Stop the engine.
 Check the DTC with the GST or MCS.

Is P2158 indicated?

- YES** – Replace the ABS modulator with a known good one and recheck (page 19-26).
- NO** – Faulty original ECM.

P1500 (FRONT WHEEL SPEED SENSOR SIGNAL)

1. DTC Recheck

Erase the DTC (page 4-9).
 Test-ride the motorcycle above 20 km/h (12 mph) for more than 30 seconds.
 Stop the engine.
 Check the DTC with the GST or MCS.

Is P1500 indicated?

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

2. ABS DTC Check

Check the ABS DTC (page 19-6).

Does the ABS modulator have any DTC?

- YES** – Follow the ABS DTC index (page 19-10).
- NO** – GO TO STEP 3.

3. Front Wheel Speed Sensor Signal Output Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the following:

- ABS modulator 18P (Black) connector (page 19-26)
- ECM 33P (Gray) connector (page 4-76)

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

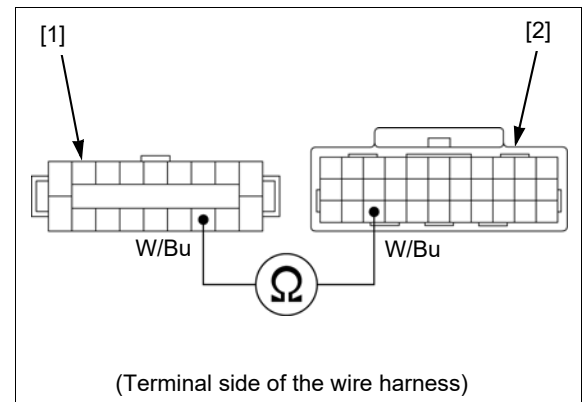
TOOL:

Test probe **07ZAJ-RDJA110**

CONNECTION: White/blue – White/blue

Is there continuity?

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



4. Front Wheel Speed Sensor Signal Output Line Short Circuit Inspection

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

TOOL:

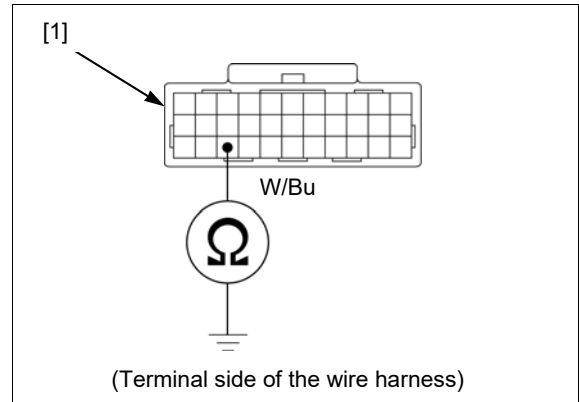
Test probe 07ZAJ-RDJA110

CONNECTION: White/blue – Ground

Is there continuity?

YES – Short circuit in the White/blue wire

NO – GO TO STEP 5.



5. ECM Inspection

Replace the ECM with a known good one (page 4-76).

Connect the ABS modulator 18P (Black) connector.

Erase the DTC (page 4-9).

Test-ride the motorcycle above 20 km/h (12 mph) for more than 30 seconds.

Stop the engine.

Check the DTC with the GST or MCS.

Is P1500 indicated?

YES – Replace the ABS modulator with a known good one and recheck (page 19-26).

NO – Faulty original ECM.

P0600 (SERIAL COMMUNICATION)

NOTE:

- Before starting the inspection, check the following connectors for loose or poor contact.
 - Front sub harness 12P (Black) (CBR650RA)
 - ECM 33P (Gray)
 - Combination meter 20P (Gray)

1. Recheck DTC

Erase the DTC (page 4-9).
Check the serial communication with the MCS or GST.

Is P0600 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Combination Meter Serial Line Output Voltage Inspection

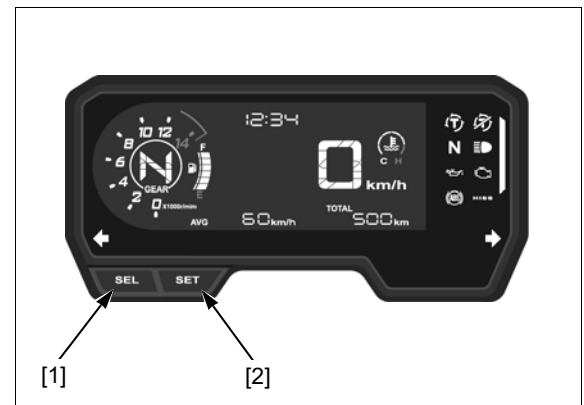
Turn the ignition switch OFF.

Disconnect the ECM 33P (Gray) connector (page 4-76).

Turn the ignition switch ON while pushing and holding combination meter SEL button [1] and SET button [2] over 10 seconds.

NOTE:

The combination meter enters the communication diagnostic mode.



Measure the voltage at the ECM 33P (Gray) connector [1] of the wire harness side and ground.

CONNECTION: Red/blue (+) – Ground (–)
STANDARD: 8 V or more (Every 5 seconds)

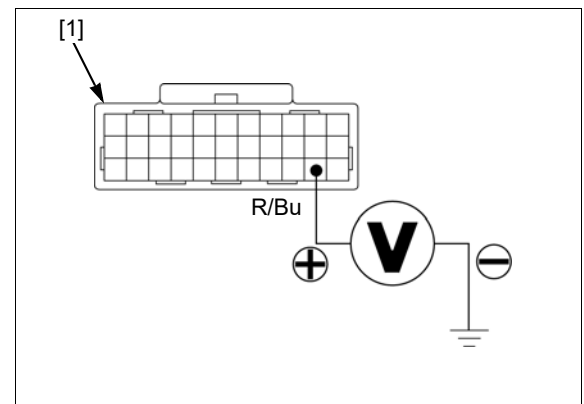
TOOL:

Test probe **07ZAJ-RDJA110**

Does the standard voltage exist?

YES – GO TO STEP 3.

NO – Inspect the combination meter (page 21-6).



3. ECM Serial Line Output Voltage Inspection

Turn the ignition switch OFF.

Disconnect the combination meter 20P (Gray) connector (page 21-6).

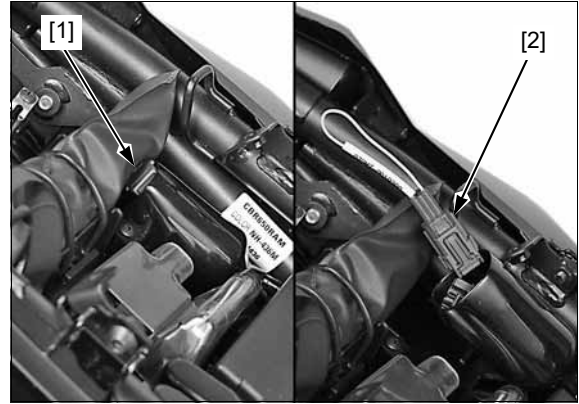
Connect the ECM 33P (Gray) connector (page 4-76).

Remove the dummy connector [1] from the DLC. Short the DLC terminals using the special tool.

CONNECTION: Brown – Green

TOOL:

[2] SCS short connector 070MZ-0010300

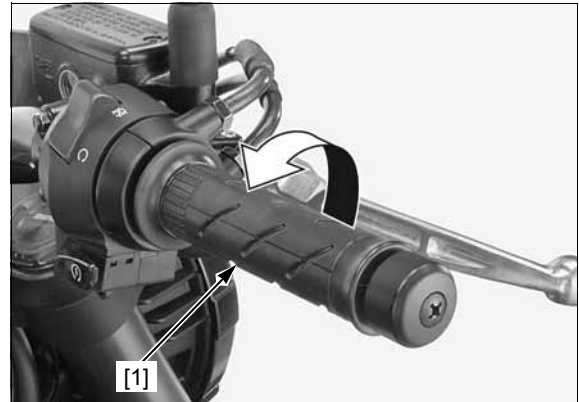


Rotate and hold the throttle grip [1] to the fully open position.

Turn the ignition switch ON while holding the throttle grip at the fully open position over 10 seconds.

NOTE:

The ECM enters the communication diagnostic mode.



Measure the voltage at the combination meter 20P (Gray) connector [1] of the wire harness side and ground.

CONNECTION:

CBR650RA: White (+) – Ground (-)

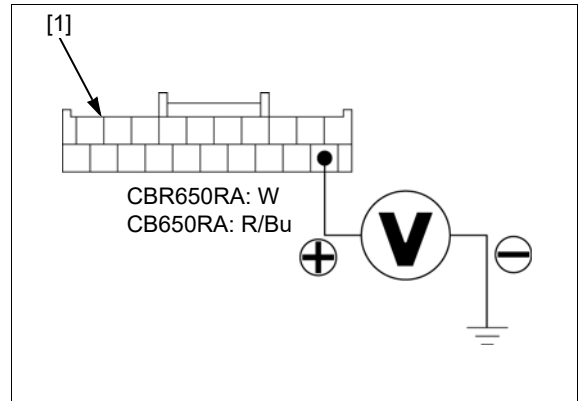
CB650RA: Red/blue (+) – Ground (-)

STANDARD: 8 V or more (Every 5 seconds)

Does the standard voltage exist?

YES – Inspect the combination meter (page 21-6).

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



P0443 (EVAP PURGE CONTROL SOLENOID VALVE)

NOTE:

- Before starting the inspection, check for loose or poor contact on the EVAP purge control solenoid valve 2P (Black) connector and ECM 33P (Black) connector, then recheck the DTC.

1. EVAP Purge Control Solenoid Valve System Inspection

Erase the DTCs (page 4-9).

Start the engine and check the EVAP purge control solenoid valve with the MCS or GST.

Is the P0443 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. EVAP Purge Control Solenoid Valve Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the EVAP purge control solenoid valve 2P (Black) connector [1] (page 7-22).

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

Measure the voltage between the EVAP purge control solenoid valve 2P (Black) connector of the wire harness side and ground.

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

Does the battery voltage exist?

YES – GO TO STEP 3.

NO – Open circuit in Black/blue wire

3. EVAP Purge Control Solenoid Valve Resistance Inspection

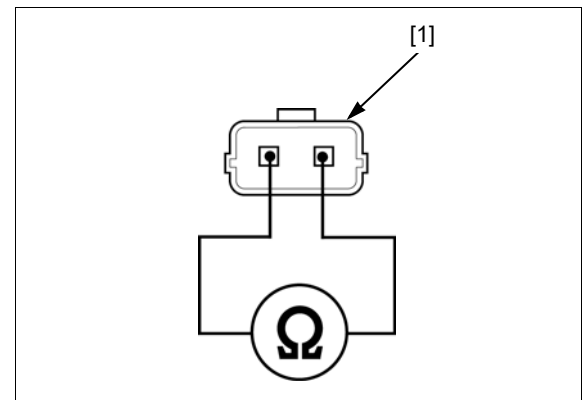
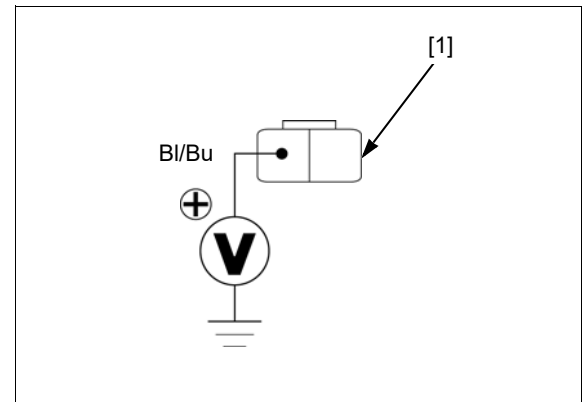
Turn the ignition switch OFF.

Measure the resistance at the EVAP purge control solenoid valve side of the EVAP purge control solenoid valve 2P (Black) connector [1] terminals.

Is the resistance within 30 – 34 Ω (20°C/68°F)?

YES – GO TO STEP 4.

NO – Faulty EVAP purge control solenoid valve



4. EVAP Purge Control Solenoid Valve Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-76).
 Check the continuity between the EVAP purge control solenoid valve 2P (Black) connector [1] and ECM 33P (Black) connector [2] of the wire harness side.

TOOL:

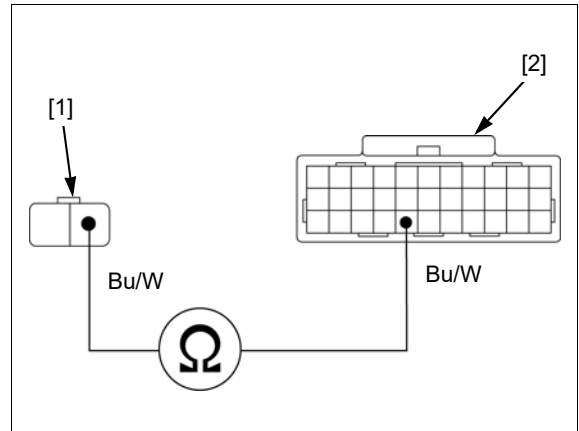
Test probe **07ZAJ-RDJA110**

CONNECTION: Blue/white – Blue/white

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in Blue/white wire



5. EVAP Purge Control Solenoid Valve Signal Line Short Circuit Inspection

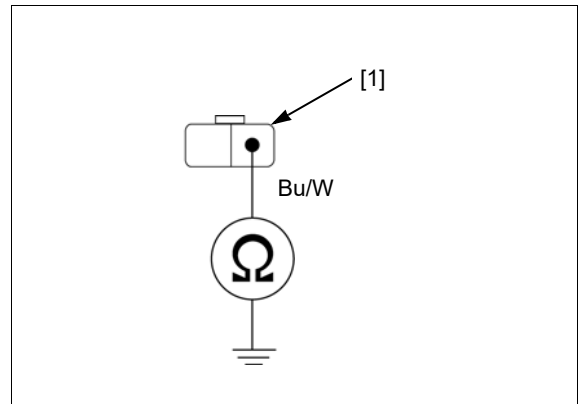
Check for continuity between the EVAP purge control solenoid valve 2P (Black) connector [1] and ground with the ECM 33P (Black) connector disconnected.

CONNECTION: Blue/white – Ground

Is there continuity?

YES – Short circuit in Blue/white wire

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



P0412 (PAIR CONTROL SOLENOID VALVE)

NOTE:

- Before starting the inspection, check for loose or poor contact on the PAIR control solenoid valve 2P (Black) connector and ECM 33P (Black) connector, then recheck the DTC.

1. PAIR Control Solenoid Valve System Inspection

Erase the DTCs (page 4-9).

Start the engine and check the PAIR control solenoid valve with the MCS or GST.

Is the P0412 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. PAIR Control Solenoid Valve Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the PAIR control solenoid valve 2P (Black) connector (page 7-19).

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

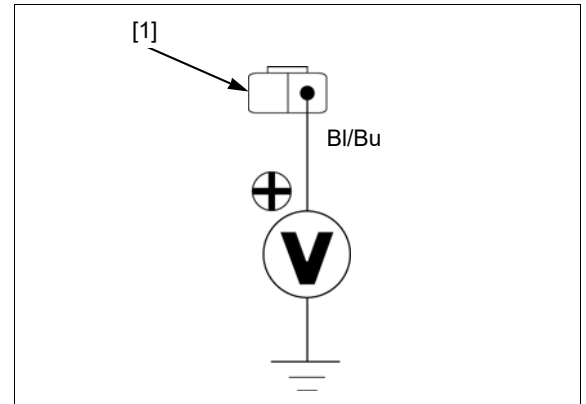
Measure the voltage between the PAIR control solenoid valve 2P (Black) connector [1] of the wire harness side and ground.

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

Does the battery voltage exist?

YES – GO TO STEP 3.

NO – Open circuit in Black/blue wire



3. PAIR Control Solenoid Valve Resistance Inspection

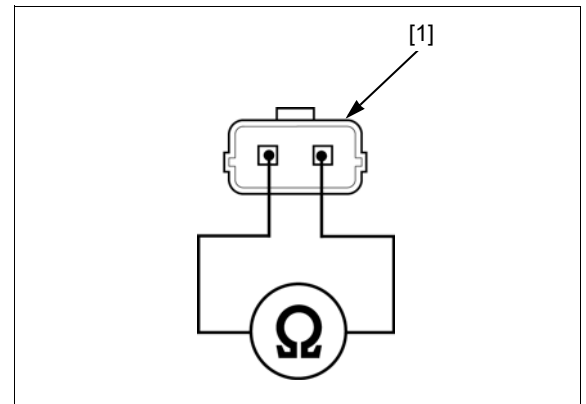
Turn the ignition switch OFF.

Measure the resistance at the PAIR control solenoid valve side of the PAIR control solenoid valve 2P (Black) connector [1] terminals.

Is the resistance within 23 – 27 Ω (20°C/68°F)?

YES – GO TO STEP 4.

NO – Faulty PAIR control solenoid valve



4. PAIR Control Solenoid Valve Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-76).

Check the continuity between the PAIR control solenoid valve 2P (Black) connector [1] and ECM 33P (Black) connector [2] of the wire harness side.

TOOL:

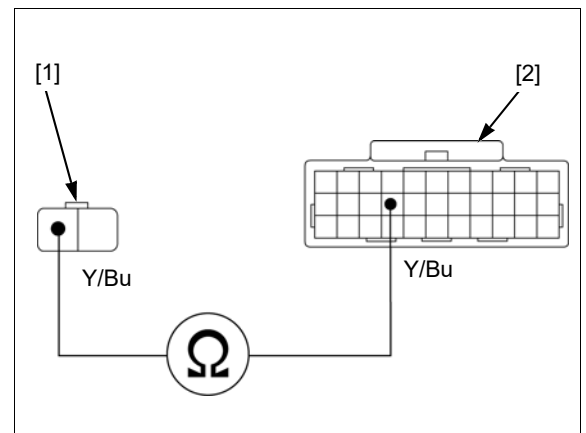
Test probe 07ZAJ-RDJA110

CONNECTION: Yellow/blue – Yellow/blue

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in Yellow/blue wire



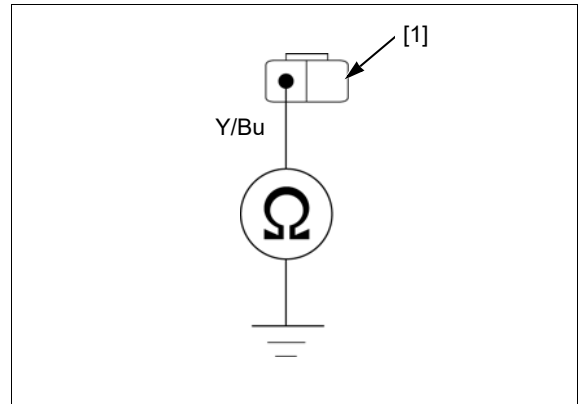
5. PAIR Control Solenoid Valve Signal Line Short Circuit Inspection

Check for continuity between the PAIR control solenoid valve 2P (Black) connector [1] and ground with the ECM 33P (Black) connector disconnected.

CONNECTION: Yellow/blue – Ground

Is there continuity?

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



**P0351 (IGNITION COIL 1 PRIMARY CIRCUIT)/
P0352 (IGNITION COIL 2 PRIMARY CIRCUIT)**

NOTE:

- Before starting the inspection, check for loose or poor contact on the ignition coil wire connectors and ECM 33P (Black) connector, then recheck the DTC.

1. Ignition Coil Primary Circuit System Inspection

Erase the DTCs (page 4-9).

Start the engine and check the ignition coil primary circuit with the MCS or GST.

Is the P0351 or P0352 indicated?

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

2. Ignition Coil Primary Circuit Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the ignition coil wire connector (page 5-11).

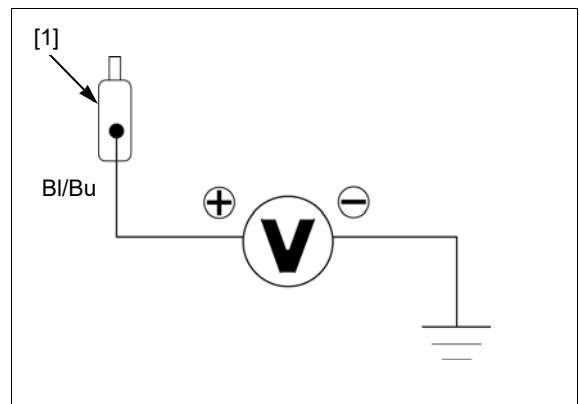
Turn the ignition switch ON and engine stop switch "O".

Measure the voltage between the ignition coil wire connector [1] of the wire harness side and ground.

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

Does the battery voltage exist?

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



3. Ignition Coil Primary Circuit Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-76).
 Check the continuity between the ignition coil wire connector [1] and ECM 33P (Black) connector [2] of the wire harness side.

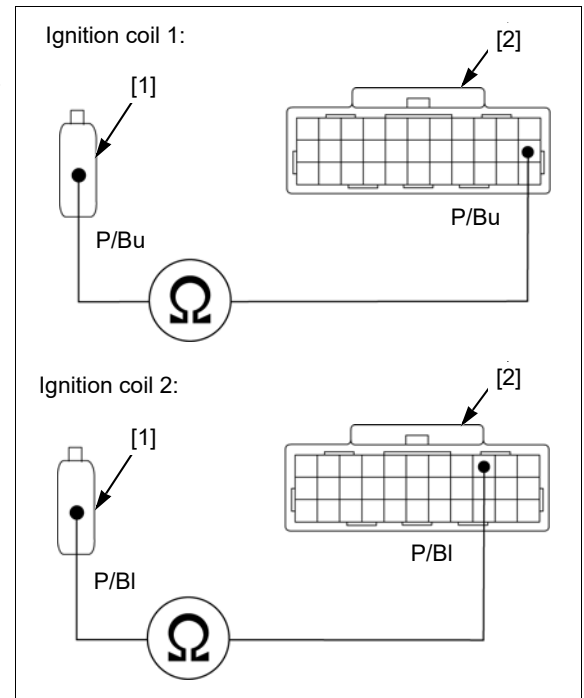
TOOL:
Test probe 07ZAJ-RDJA110

CONNECTION:
Ignition coil 1: Pink/blue – Pink/blue
Ignition coil 2: Pink/black – Pink/black

Is there continuity?

YES – GO TO STEP 4.

NO – • Open circuit in Pink/blue wire
 • Open circuit in Pink/black wire



4. Ignition Coil Primary Circuit Signal Line Short Circuit Inspection

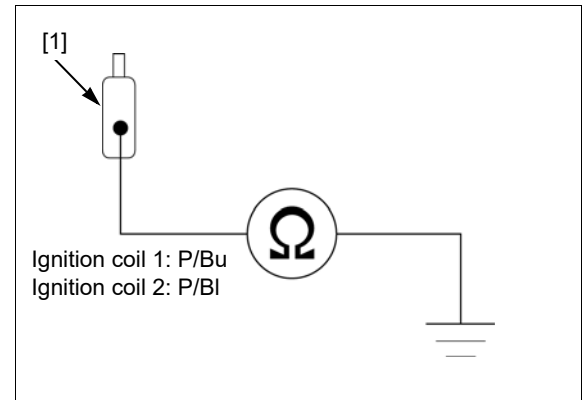
Check for continuity between the ignition coil wire connector [1] and ground with the ECM 33P (Black) connector disconnected.

CONNECTION:
Ignition coil 1: Pink/blue – Ground
Ignition coil 2: Pink/black – Ground

Is there continuity?

YES – • Short circuit in Pink/blue wire
 • Short circuit in Pink/black wire

NO – GO TO STEP 5.



5. Ignition Coil Primary Peak Voltage Inspection

Connect the ECM 33P (Black) connector and ignition coil primary connectors.
 Inspect the ignition coil primary peak voltage (page 5-7).

Is the peak voltage normal?

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

NO – GO TO STEP 6.

6. Ignition Coil Inspection

Replace the ignition coil with a known good one (page 5-11).
 Erase the DTCs (page 4-9).
 Check the ignition coil with the MCS or GST.

Is P0351 or P0352 indicated?

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

NO – Faulty original ignition coil

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 21-6).

If the engine stop switch is in "⊗", 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 21-7).

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



Turn the ignition switch OFF.

Disconnect the ECM 33P (Gray) connector (page 4-76). Check for continuity between the wire harness side ECM 33P (Gray) connector [1] terminal and ground.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION: Brown – Ground

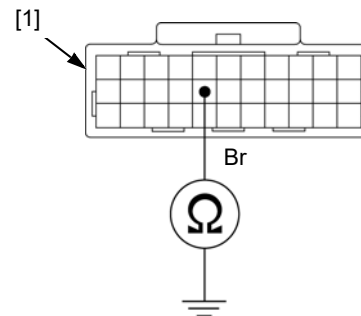
If there is continuity, check for short circuit in the Brown wire between the DLC and ECM.

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

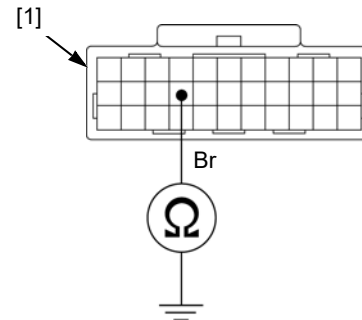
NOTE:

- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models:
If the ECM is replaced, perform the following Procedure:
– Key Registration Procedures (page 22-4)
– Crank pulse initialize learning procedure (page 4-84)
- MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models:
If the ECM is replaced, perform the Key Registration Procedures (page 22-7).

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models:



MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models:



ECM

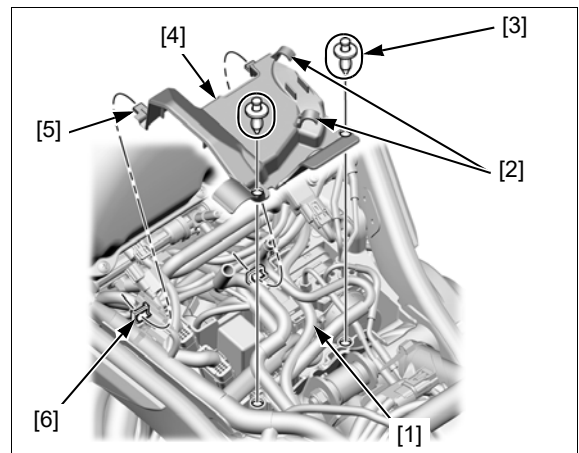
REMOVAL/ INSTALLATION

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

Release the radiator siphon hose [1] from the wire guides [2].

Remove the two clips [3].

Remove the ABS modulator cover [4] by releasing the tab [5] of the ABS modulator tray from the slot [6].



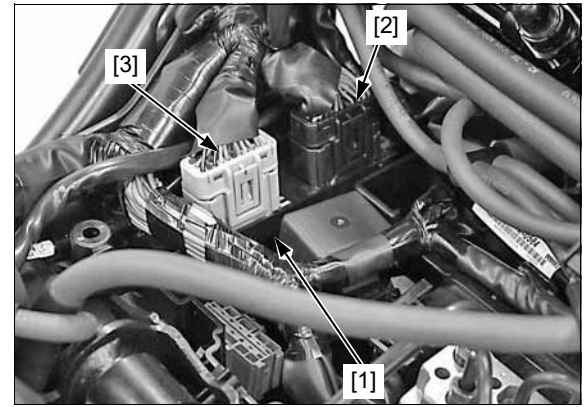
Turn the ignition switch OFF.

Pull out the ECM [1] from the ABS modulator tray, then disconnect the ECM 33P (Black) [2] and 33P (Gray) [3] connectors.

Installation is in the reverse order of removal.

NOTE:

- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models:
If the ECM is replaced, perform the following Procedure:
– Key Registration Procedures (page 22-4)
– Crank pulse initialize learning procedure (page 4-84)
- MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models:
If the ECM is replaced, perform the Key Registration Procedures (page 22-7).



POWER/GROUND LINE INSPECTION

POWER INPUT LINE

Disconnect the ECM 33P (Black) and 33P (Gray) connector (page 4-76).

Measure the voltage between the wire harness side ECM 33P (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models: Gray), (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models: Black) connector [1] terminal and ground.

TOOL:

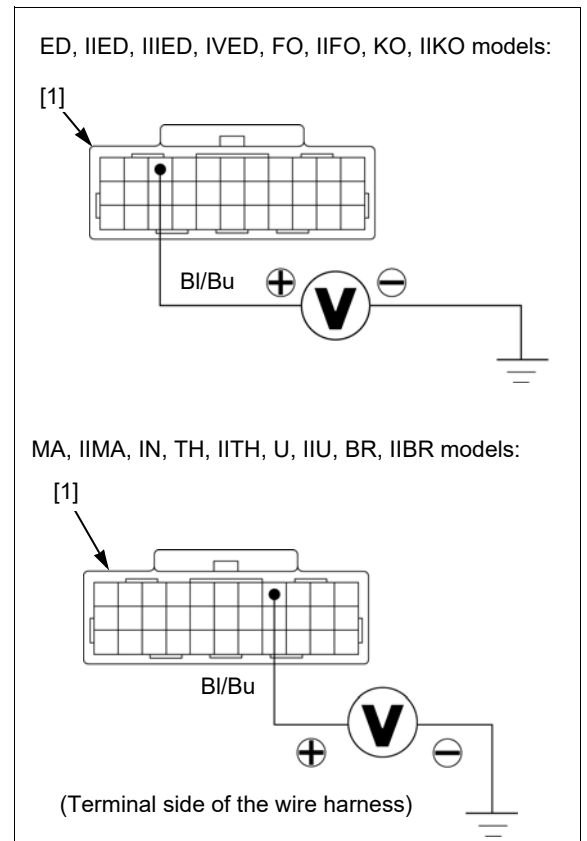
Test probe **07ZAJ-RDJA110**

CONNECTION: Black/blue (+) – 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/blue wire between the ECM and main relay for open circuit
- Main relay (page 4-85)



PGM-FI SYSTEM

GROUND LINE

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

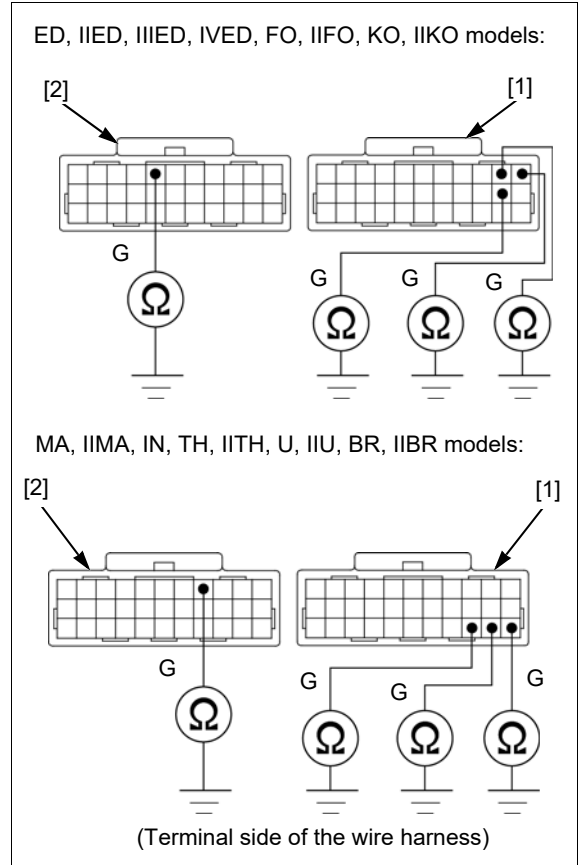
TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION: Green – Ground

There should be continuity at all times.

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



IGN SW (IGNITION SWITCH SIGNAL) LINE (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models)

Disconnect the ECM 33P (Gray) connectors (page 4-76).

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

TOOL:

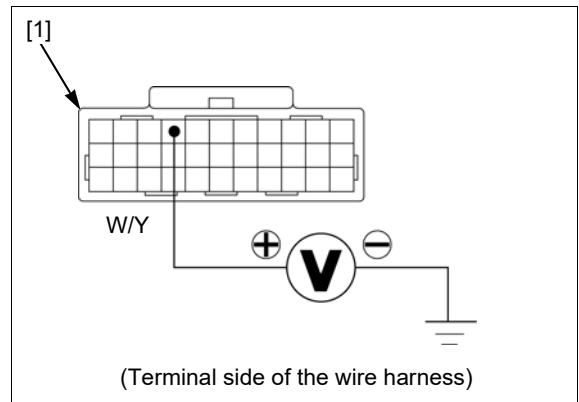
Test probe 07ZAJ-RDJA110

CONNECTION: White/yellow (+) – 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:

- White/yellow wire, Red/black wire and Black/red wire between the ECM and ignition switch for open circuit.
- ENG STOP (7.5 A) fuse
- Ignition switch (page 21-14)



MAP SENSOR

REMOVAL/INSTALLATION

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

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

Remove the screw [2] and MAP sensor [3].

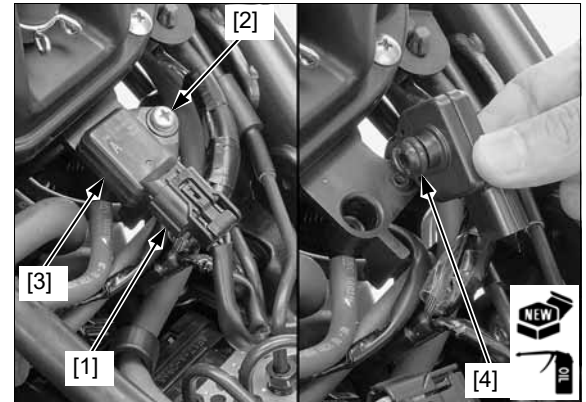
Remove the O-ring [4] from the MAP sensor.

Installation is in the reverse order of removal.

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

TORQUE:

MAP sensor mounting screw:
3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)



ECT SENSOR

REMOVAL/INSTALLATION

Drain the coolant (page 8-4).

Remove the cam chain tensioner lifter (page 10-20).

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

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

Installation is in the reverse order of removal.

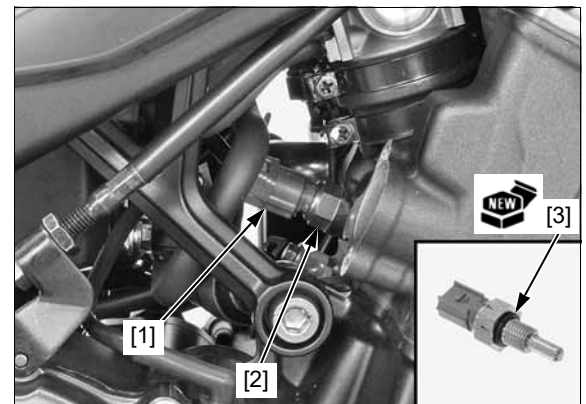
NOTE:

- 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 and bleed the cooling system (page 8-4).



IAT SENSOR

REMOVAL/INSTALLATION

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

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

Remove the screws [2] and IAT sensor [3].

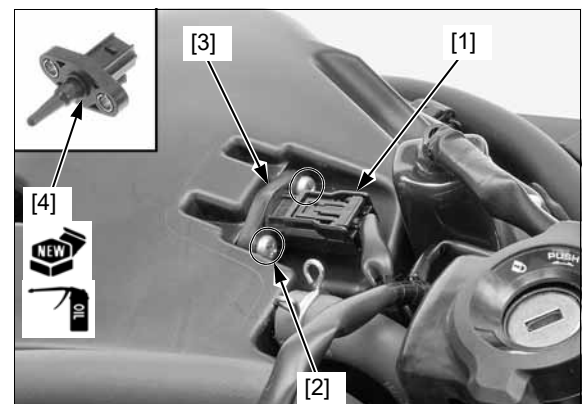
Remove the O-ring [4] from the IAT sensor.

Installation is in the reverse order of removal.

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

TORQUE:

IAT sensor screw: 1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)



A/F SENSOR (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models)

REMOVAL/INSTALLATION

NOTICE

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

NOTE:

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

Remove the exhaust pipe/muffler (page 2-17).

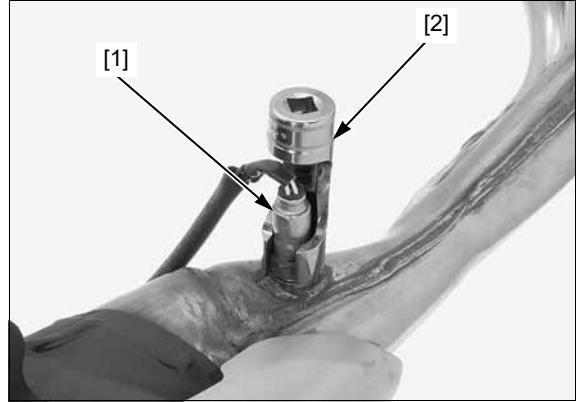
Remove the A/F sensor [1] using the special tool.

TOOL:

[2] FRXM17 (Snap on) or equivalent

Install and tighten the A/F sensor to the specified torque.

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



O₂ SENSOR (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)

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 exhaust pipe/muffler (page 2-17).

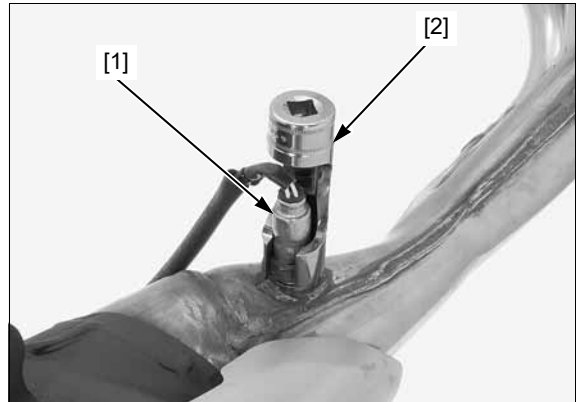
Remove the O₂ sensor [1] using the special tool.

TOOL:

[2] FRXM17 (Snap on) or equivalent

Install and tighten the O₂ sensor to the specified torque.

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



GEAR POSITION SWITCH

REMOVAL/INSTALLATION

Remove the drive sprocket cover (page 2-15).

Disconnect the gear position switch 8P (Black) connector [1] and remove the wire clip [2].

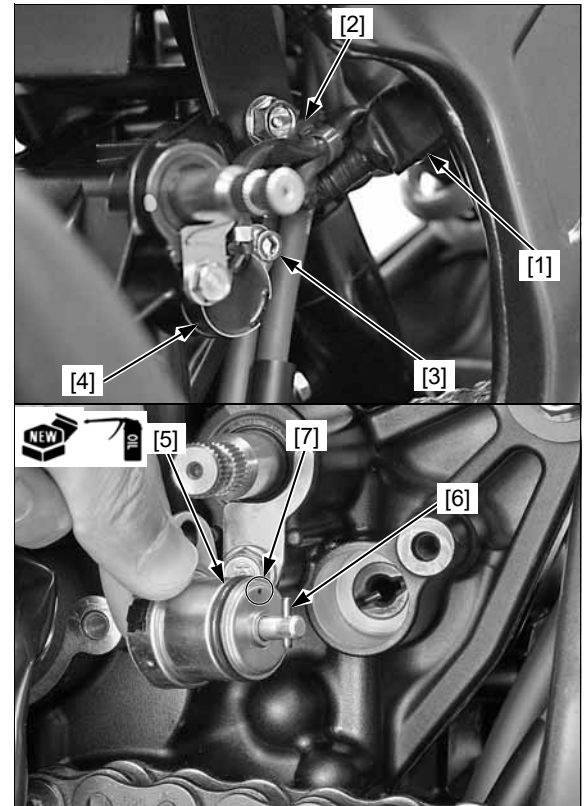
Remove the socket bolt [3] and gear position switch [4].

Remove the O-ring [5] from the gear position switch.

Installation is in the reverse order of removal.

NOTE:

- Apply engine oil to a new O-ring.
- Install the switch with the transmission in neutral.
- Align the long side of the pin [6] with the mark [7] before assembling.



BANK ANGLE SENSOR

REMOVAL/INSTALLATION

Remove the PAIR control solenoid valve (page 7-20).

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

Remove the following:

- Two nuts [1]
- Bank angle sensor [2]
- Two bolts [3] and washers [4]
- Two collars [5]

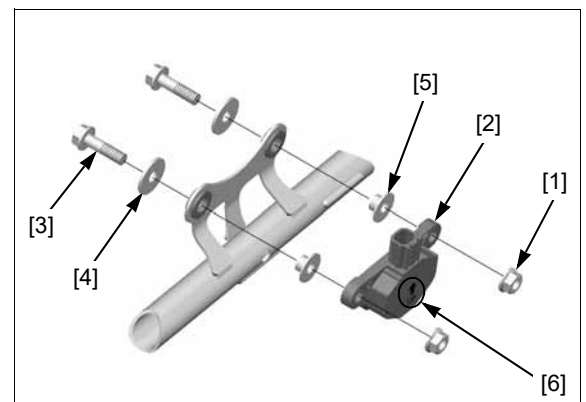
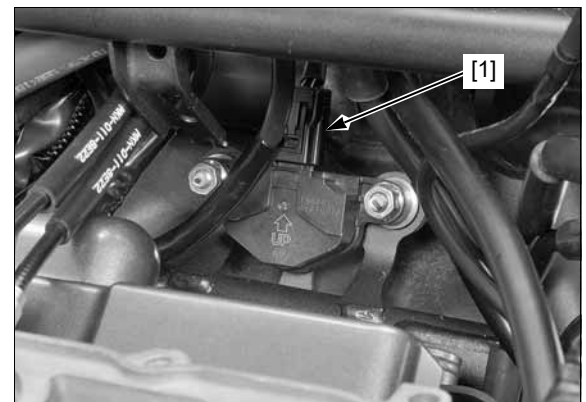
Installation is in the reverse order of removal.

NOTE:

- Install the bank angle sensor with the "UP" mark [6] facing up.

TORQUE:

Bank angle sensor nut:
8.5 N·m (0.9 kgf·m, 6.3 lbf·ft)



INSPECTION

SYSTEM INSPECTION WITH MCS

Remove the bank angle sensor without disconnecting its connector (page 4-81).

Connect the MCS to the DLC (page 4-8).

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

Remove the bank angle sensor without disconnecting its connector (page 4-81).

Pull out the bank angle sensor from the frame.

Temporarily install the following:

- Air cleaner housing (page 7-12)
- Fuel tank (page 7-7)

Place the bank angle sensor [1] horizontal.

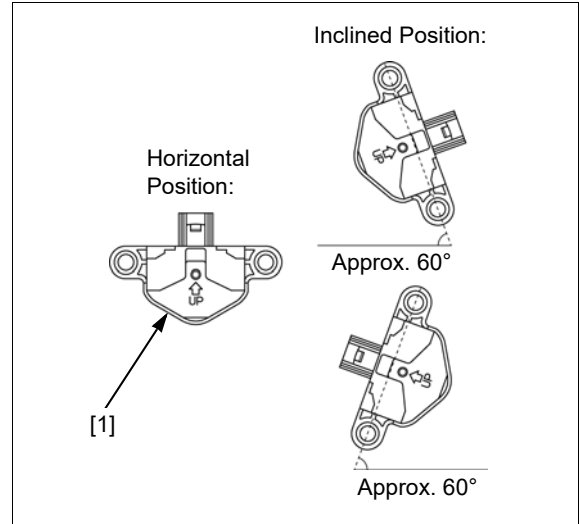
Start the engine.

NOTE:

- Do not crank the engine, when the air cleaner housing is not installed.

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.



CKP SENSOR (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models)

REMOVAL/INSTALLATION

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

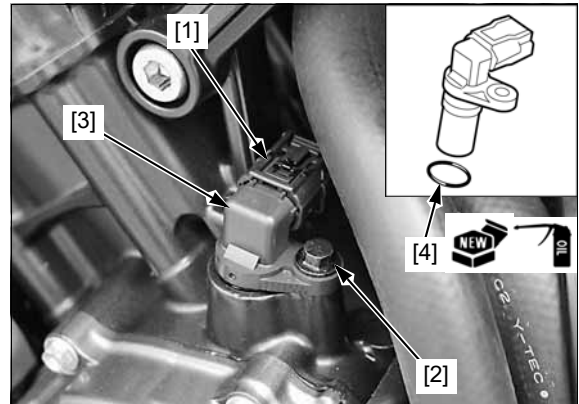
Remove the following:

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

Installation is in the reverse order of removal.

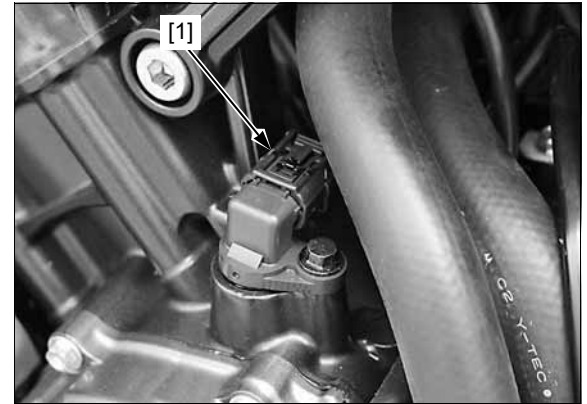
NOTE:

- Replace the O-ring with a new one and coat it with engine oil.
- Install the O-ring into the groove in the CKP sensor.
- After installing, perform the crank pulse initialize learning procedure (page 4-84).



CKP SENSOR LINE INSPECTION

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



POWER INPUT/GROUND LINE INSPECTION

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

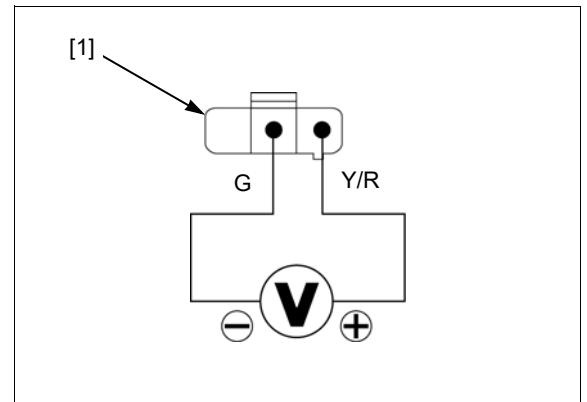
Measure the voltage at the CKP sensor 3P (Black) connector [1] of the wire harness side.

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

STANDARD: 4.75 – 5.25 V

If standard voltage does not appear, the following wire has an open circuit.

- Yellow/red
- Green



SIGNAL LINE INSPECTION

Turn the ignition switch OFF.

Disconnect the ECM 33P (Gray) connector (page 4-76).

Check for continuity between the wire harness side CKP sensor 3P (Black) connector [1] and ECM 33P (Gray) connector [2] terminals.

TOOL:

Test probe 07ZAJ-RDJA110

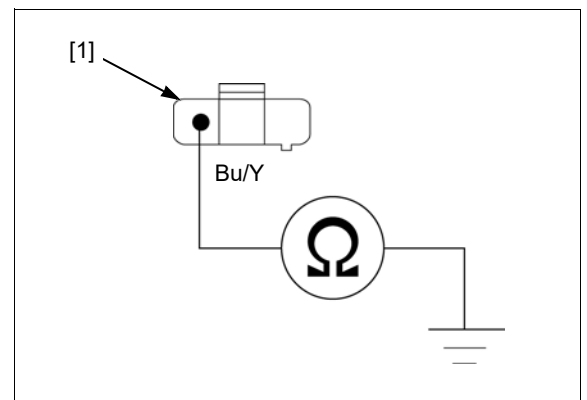
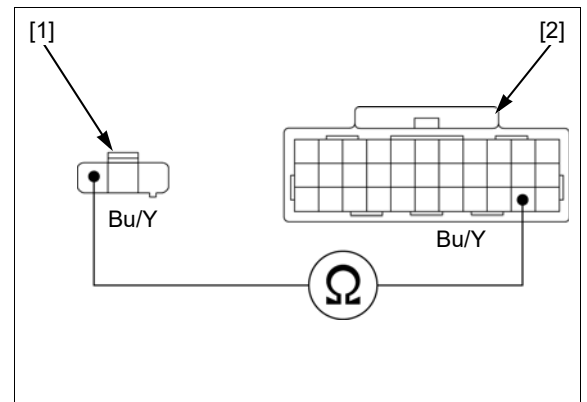
CONNECTION: Blue/yellow – Blue/yellow

If there is no continuity, check for open circuit in Blue/yellow wire and loose contact of the wire harness connectors.

Check for continuity at the CKP sensor 3P (Black) connector terminal [1] of the wire harness side and ground.

CONNECTION: Blue/yellow – Ground

If there is continuity, check for short circuit in Blue/yellow wire.



CRANK PULSE LEARNING

NOTE:

- If you done the following works, perform the crank pulse learning reset procedure and crank pulse initialize learning procedure.
Perform the crank pulse learning reset procedure first, and then the crank pulse initialize learning procedure.
 - CKP sensor removing
 - Alternator cover removing
 - Flywheel removing
 - Stator removing
 - Crankcase separation
 - Crankshaft removing
 - Main journal bearings removing
- If you replace the ECM, perform the crank pulse initialize learning procedure.

CRANK PULSE LEARNING RESET PROCEDURE

1. Connect the SCS short connector to the DLC (page 4-9).
2. Turn the ignition switch ON.
Open the throttle grip fully within 5 seconds.
Close the throttle grip completely within 3 seconds.
Wait for more than 10 seconds.
3. Turn the ignition switch OFF.
Disconnect the SCS short connector from the DLC.
4. Turn the ignition switch ON.
Check the MIL.
If the MIL blinks, crank pulse learning reset procedure is successful.
Turn the ignition switch OFF.

NOTE:

- If the crank pulse learning reset procedure is unsuccessful, perform the reset procedure from step 1 again.

CRANK PULSE INITIALIZE LEARNING PROCEDURE

1. Connect the SCS short connector to the DLC.
2. Turn the ignition switch ON.
Open the throttle grip fully within 5 seconds.
Close the throttle grip completely within 3 seconds.
Start the engine within 5 seconds.
3. Warm up the engine.
Snap the throttle 5 times keeping the engine revolution at more than 4200 r/min.
4. Turn the ignition switch OFF.
Disconnect the SCS short connector from the DLC.
5. Turn the ignition switch ON.
Check the MIL.
If the MIL stays on for a few seconds then go off, crank pulse learning procedure is successful.
Turn the ignition switch OFF.

NOTE:

- If the crank pulse learning procedure is unsuccessful, perform the learning procedure from step 1 again.

MAIN RELAY

CIRCUIT INSPECTION (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models)

For relay inspection (page 21-24).

Remove the main relay (page 21-24).

RELAY COIL POWER INPUT LINE

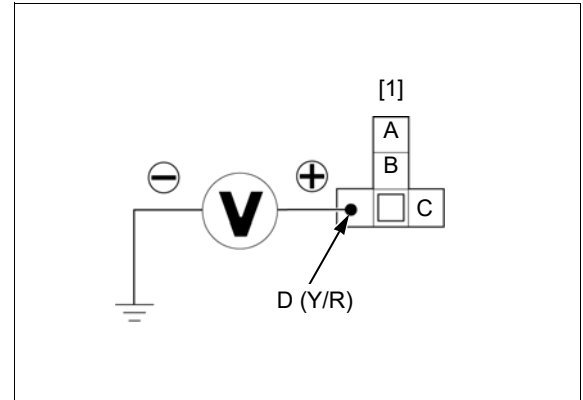
Measure the voltage between the main relay 4P connector [1] terminal and ground.

CONNECTION: D (+) – Ground (-)

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

If there is no voltage, check the following:

- Yellow/red wire between the relay connector and main relay diode
- Main relay diode (page 4-87)
- White/yellow wire between the main relay diode and fuse/relay box
- ENG STOP fuse (7.5 A)



RELAY SWITCH POWER INPUT LINE

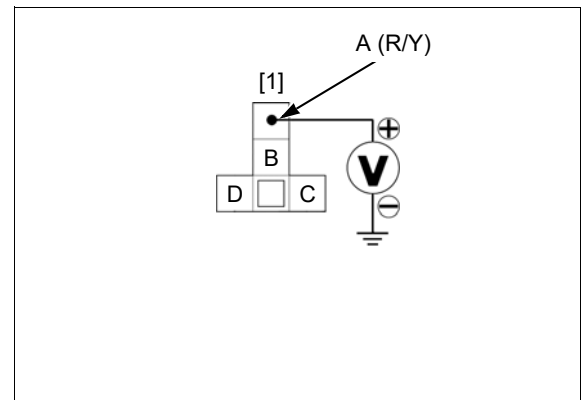
Measure the voltage between the main relay terminal of the relay box [1] and ground.

CONNECTION: A (+) – Ground (-)

There should be battery voltage at all times.

If there is no voltage, check the following:

- Red/yellow wire between the main relay and fuse/relay box for open circuit
- FI fuse (10 A)



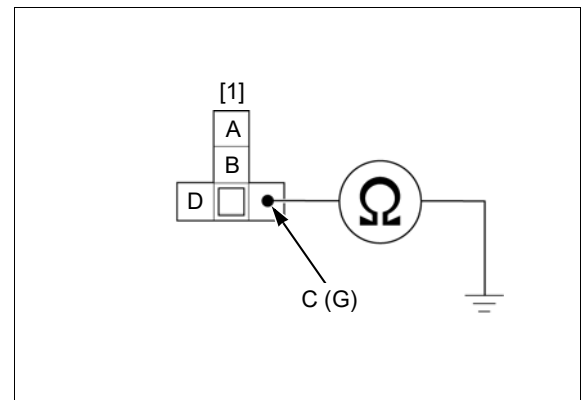
GROUND LINE

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

CONNECTION: C – Ground

There should be continuity at all times.

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



**CIRCUIT INSPECTION
(MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)**

For relay inspection (page 21-24).

Remove the main relay (page 21-24).

RELAY COIL POWER INPUT LINE

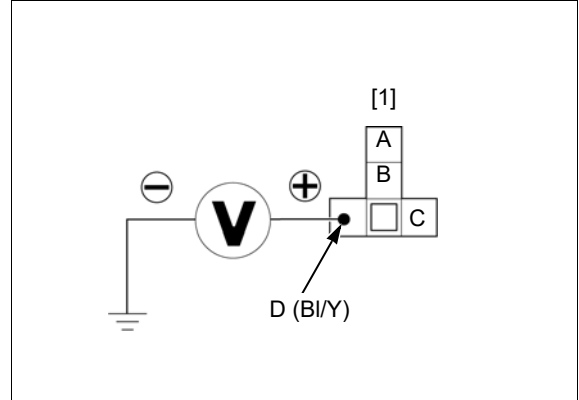
Measure the voltage between the main relay 4P connector [1] terminal and ground.

CONNECTION: 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/yellow wire between the relay connector and engine stop switch for open circuit
- Engine stop switch (page 21-16)
- White/yellow wire between the engine stop switch and fuse/relay box for open circuit
- ENG STOP fuse (7.5 A)



RELAY SWITCH POWER INPUT LINE

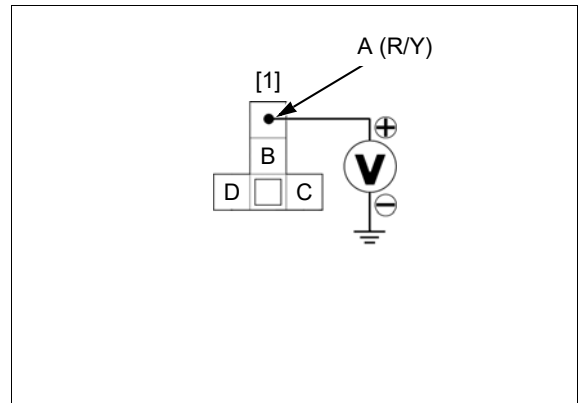
Measure the voltage between the main relay terminal of the relay box [1] and ground.

CONNECTION: A (+) – Ground (-)

There should be battery voltage at all times.

If there is no voltage, check the following:

- Red/yellow wire between the main relay and fuse/relay box for open circuit
- FI fuse (10 A)



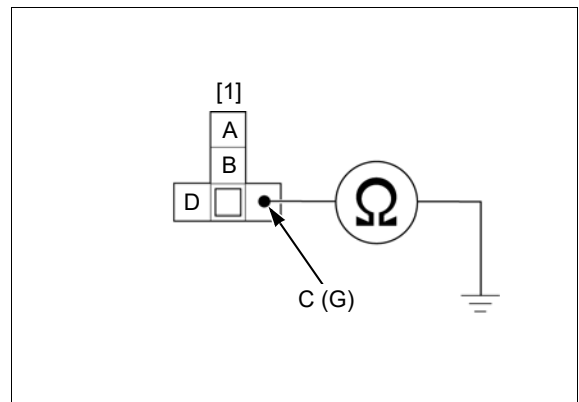
GROUND LINE

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

CONNECTION: C – Ground

There should be continuity at all times.

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



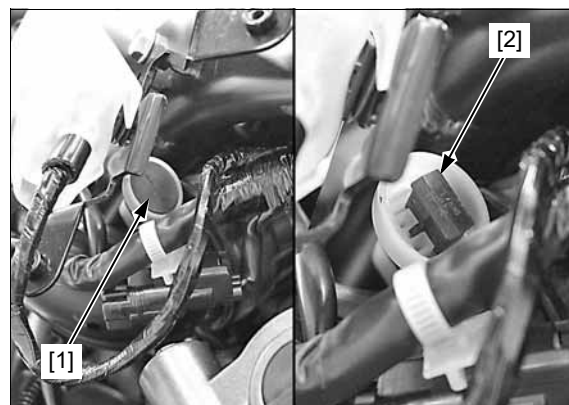
MAIN RELAY DIODE

INSPECTION

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

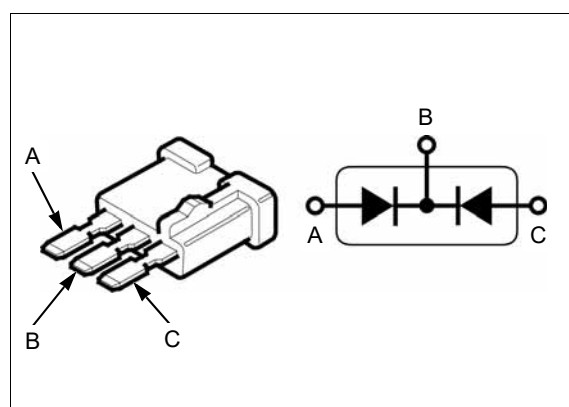
Remove the rubber cap [1] and main relay diode [2].

Installation is in the reverse order of removal.



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

SERVICE INFORMATION.....	5-2	IGNITION SYSTEM INSPECTION	5-7
TROUBLESHOOTING	5-3	IGNITION TIMING	5-10
SYSTEM LOCATION.....	5-5	IGNITION COIL	5-11
SYSTEM DIAGRAM	5-5	CKP SENSOR (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)	5-11

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 terminals. 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 21-14)
 - Engine stop switch (page 21-16)
 - Main relay (page 21-24)
 - ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models: Main relay diode (page 4-87)
 - Bank angle sensor (page 4-81)
 - Sidestand switch (page 21-18)
 - Gear position switch (page 4-81)
 - ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models: CKP sensor (page 4-82)
 - MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models: CKP sensor (page 5-11)
- The following color codes are used throughout this section.

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

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).

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models

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/blue 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 loose ECM connection. 4. An open circuit or loose connection in the Green wires of the ECM. 5. An open circuit or loose connection in the Pink/blue or Pink/black wire between the ignition coil and ECM. 6. Inspect the engine stop switch signal line (page 5-10). 7. Faulty sidestand switch or gear position switch. 8. Loose or poor connection or an open circuit in No. 6 related wires. <ul style="list-style-type: none"> – Sidestand switch line: Green/pink, Black/blue, Black and Green – Gear position switch line: Light green/white, Light green 9. Inspect the CKP sensor (page 4-82). 10. Faulty ECM (in case when above No. 1 through 9 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.

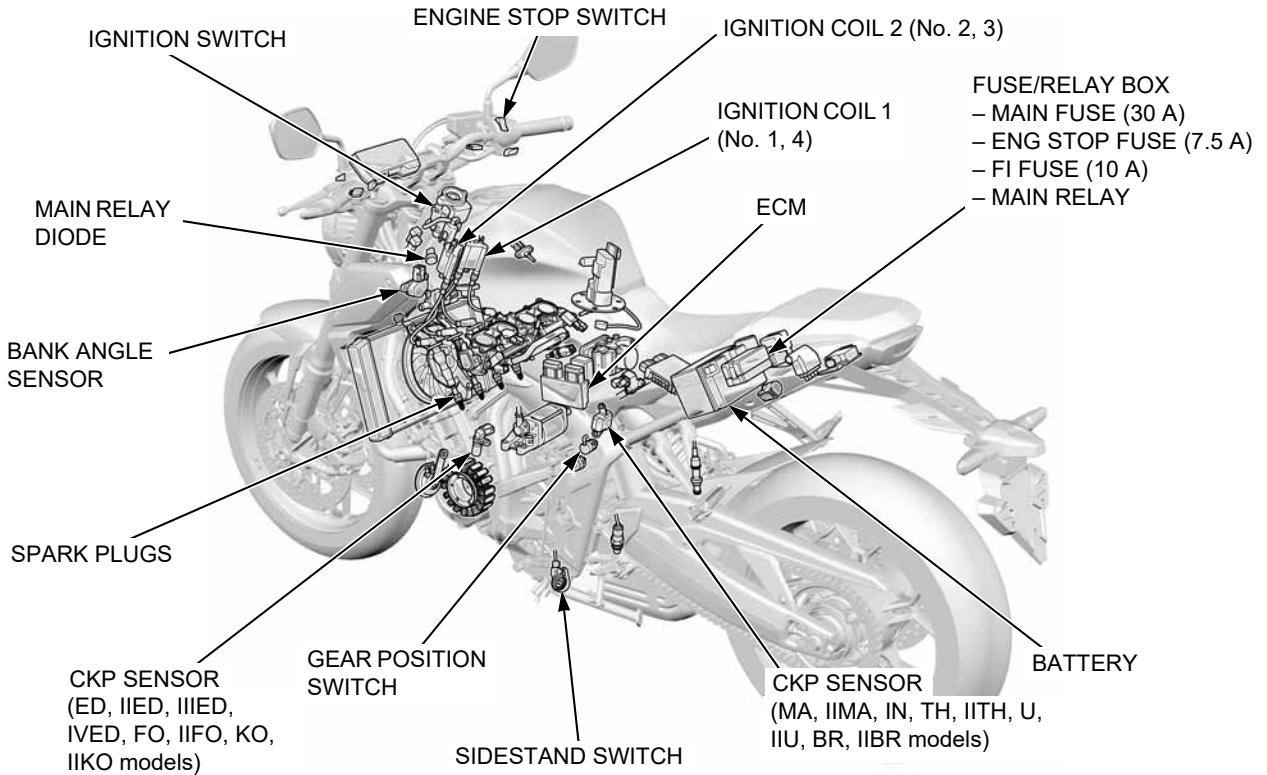
IGNITION SYSTEM

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models

No spark at spark plug

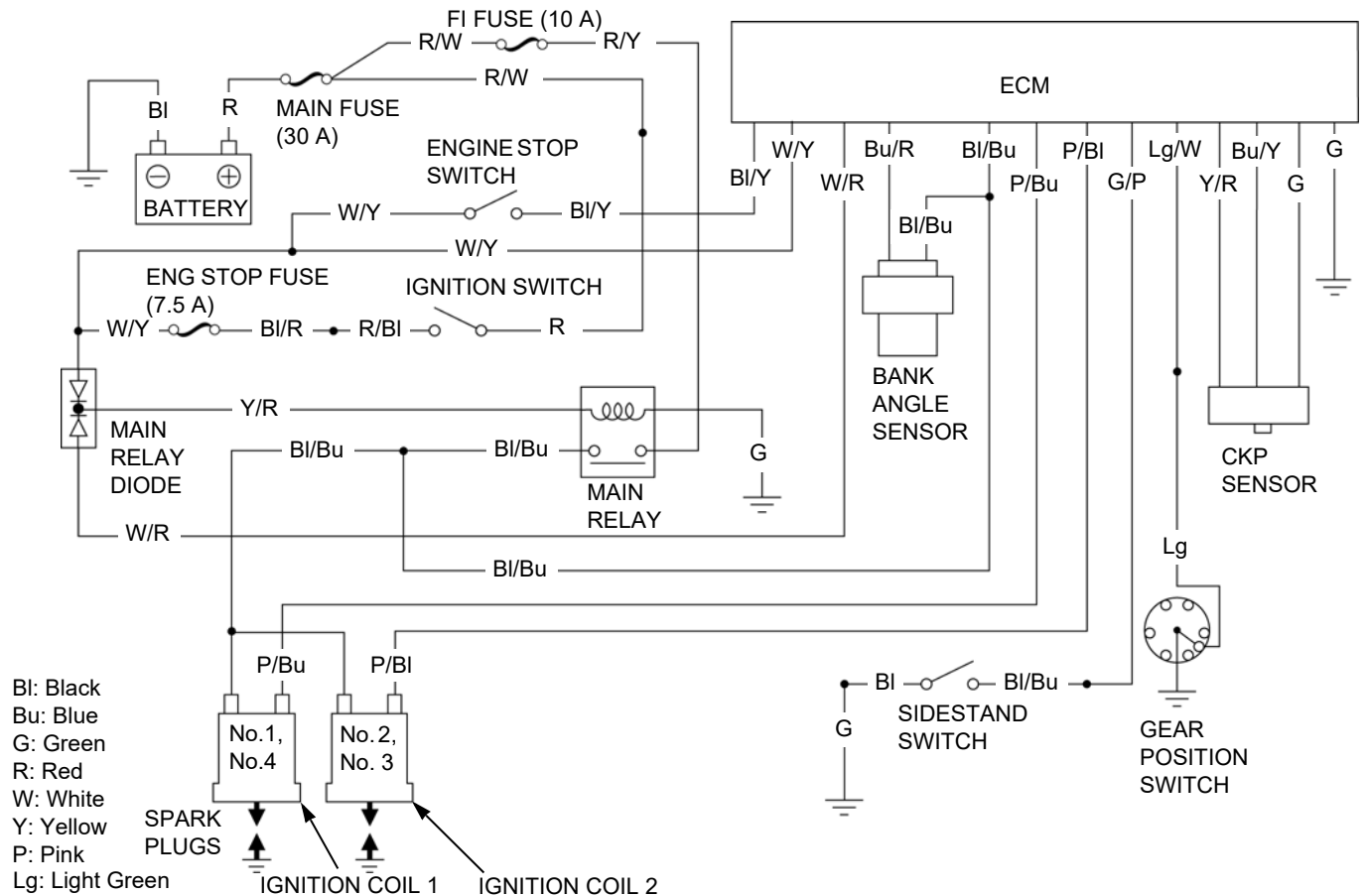
	Unusual condition	Probable cause (Check in numerical order)
Ignition coil primary voltage	No initial voltage with the ignition switch turned ON and engine stop switch turned "O" (Other electrical components are normal).	<ol style="list-style-type: none"> 1. An open circuit in the Black/blue wire between 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 loose ECM connection. 4. An open circuit or loose connection in the Green wires of the ECM. 5. An open circuit or loose connection in the Pink/blue or Pink/black wire between the ignition coil and ECM. 6. Faulty sidestand switch or gear position 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/pink, Black/blue, Black and Green – Gear position switch line: Light green/white, 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.

SYSTEM LOCATION



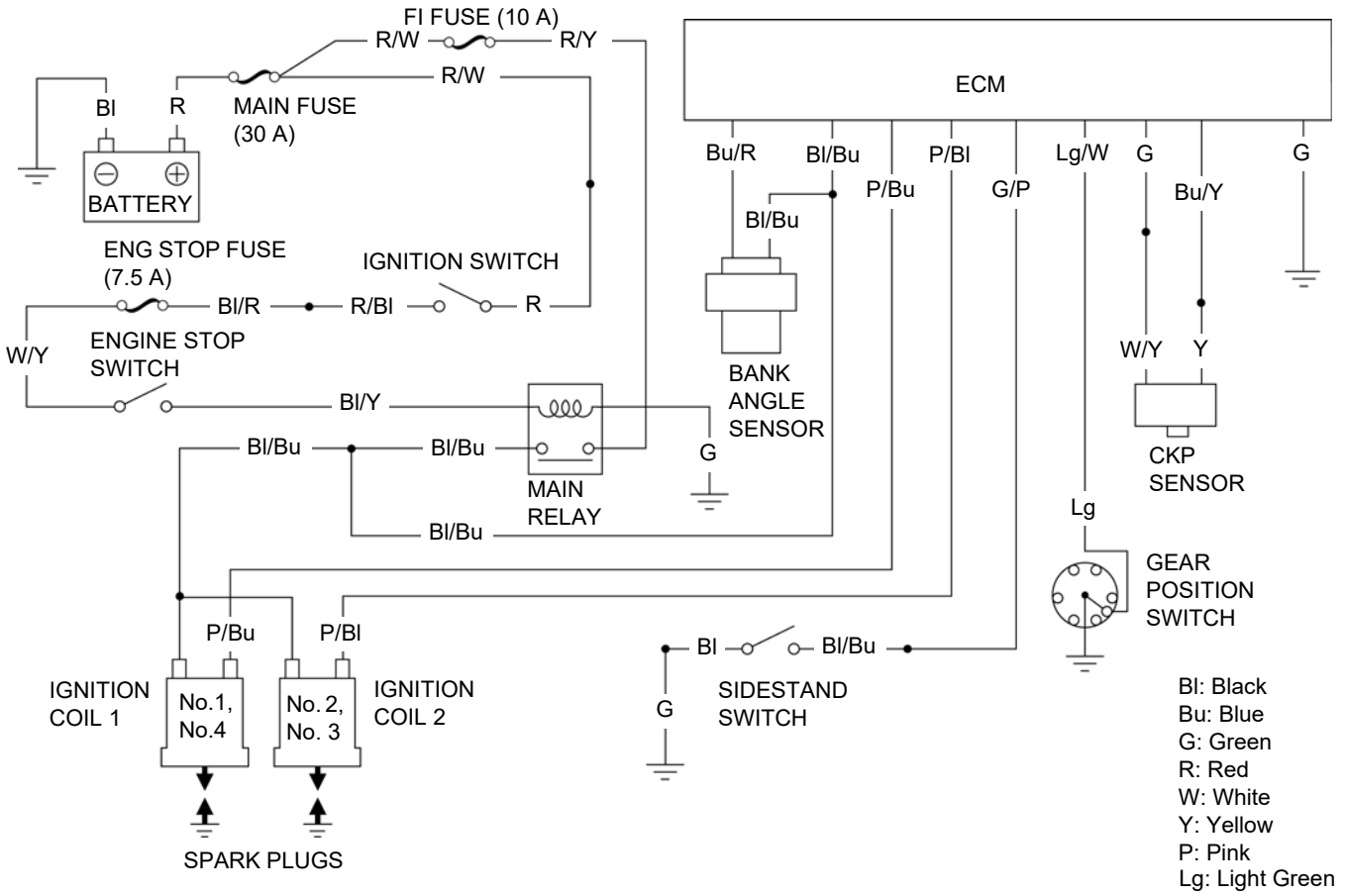
SYSTEM DIAGRAM

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models



IGNITION SYSTEM

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models



IGNITION SYSTEM INSPECTION

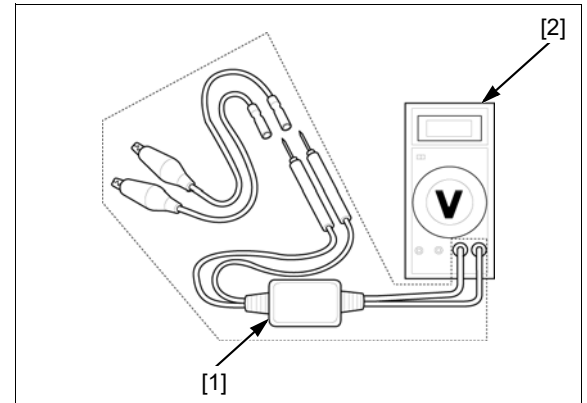
NOTE:

- 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 M Ω /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If using the Imrie diagnostic tester (model 625), follow the manufacturer's instructions.

Connect the peak voltage adaptor [1] to the digital multimeter [2], or use the Imrie diagnostic tester.

TOOL:

**Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum)**



IGNITION COIL PRIMARY PEAK VOLTAGE

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.

Disconnect the spark plug caps from the spark plugs (page 3-6).

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 adaptor or Imrie tester probes to the ignition coil primary terminal [1] and ground.

CONNECTION:

Ignition coil 1 (No.1, 4) [2]:

Pink/blue (+) – Ground (-)

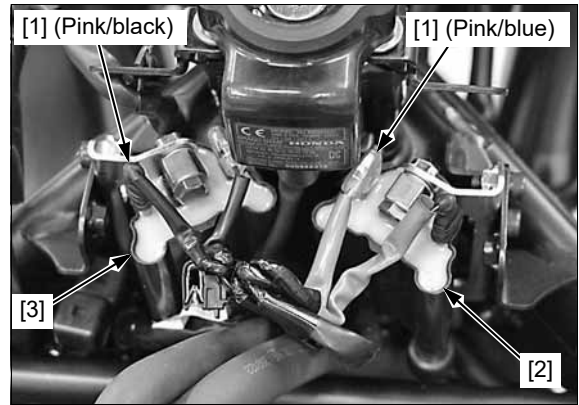
Ignition coil 2 (No.2, 3) [3]:

Pink/black (+) – Ground (-)

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

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

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.

**CKP SENSOR PEAK VOLTAGE
(MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR
models)**

NOTE:

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

Disconnect the ECM 33P (Black) and 33P (Gray) connectors (page 4-76).

Connect the peak voltage adaptor [1] or Imrie tester probes to the ECM 33P (Black) [2] and 33P (Gray) [3] connector terminals of the wire harness side, using the test probes (page 4-10).

TOOL:

Test probe (2 required) 07ZAJ-RDJA110

CONNECTION: Blue/yellow (+) – Green (-)

Shift the transmission into neutral and 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 connectors is abnormal, measure the peak voltage at the CKP sensor connector.

Turn the ignition switch OFF.

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

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

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

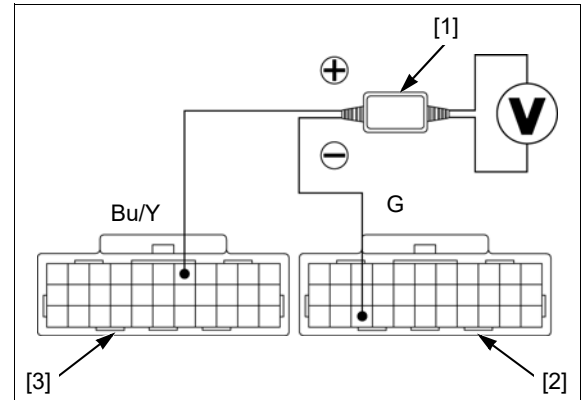
In the same manner as at the ECM 33P connectors, measure the peak voltage and compare it to the voltage measured at the ECM 33P connectors.

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 5-11).

Install the removed parts in the reverse order of removal.



IGNITION SYSTEM

ENGINE STOP SWITCH SIGNAL LINE INSPECTION (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models)

Disconnect the ECM 33P (Black) connector (page 4-76).

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

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

TOOL:

Test probe (2 pack)

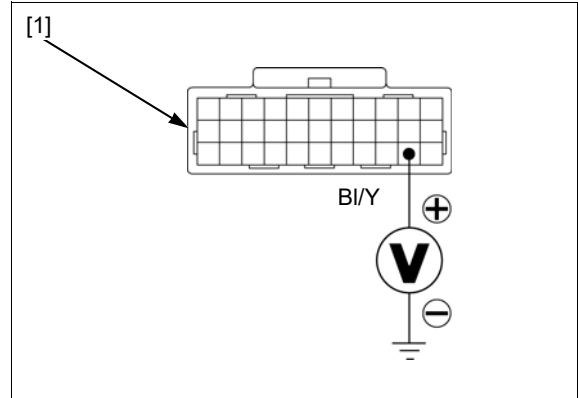
07ZAJ-RDJA110

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

STANDARD: Battery voltage

If there is no voltage, check the following:

- Black/yellow or White/yellow wires between the ECM and ENG STOP fuse (7.5 A) for open circuit.
- Engine stop switch inspection (page 21-16)



IGNITION TIMING

NOTE:

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

Remove the following:

- Left middle cowl (page 2-7) (CBR650RA)
- Left shroud (page 2-10) (CB650RA)

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

Stop the engine and remove the timing hole cap.

Connect the timing light [1] to the No.1 spark plug wire.

Start the engine and let it idle.

IDLE SPEED: 1,250 ± 100 min⁻¹ (rpm)

The ignition timing is correct if the "F" mark [1] on the primary drive gear aligns with the index notch [2] in the right crankcase cover.

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

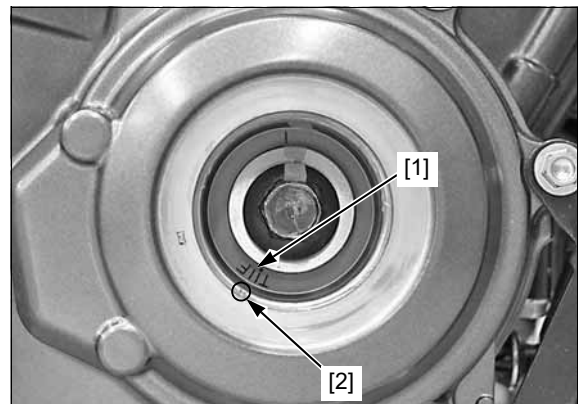
Apply grease to the threads of the timing hole cap and install it.

Tighten the timing hole cap to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Remove the timing light.

Install the removed parts in the reverse order of removal.



IGNITION COIL

REMOVAL/INSTALLATION

Disconnect the spark plug caps (page 3-6).

Disconnect the ignition coil wire connectors [1]

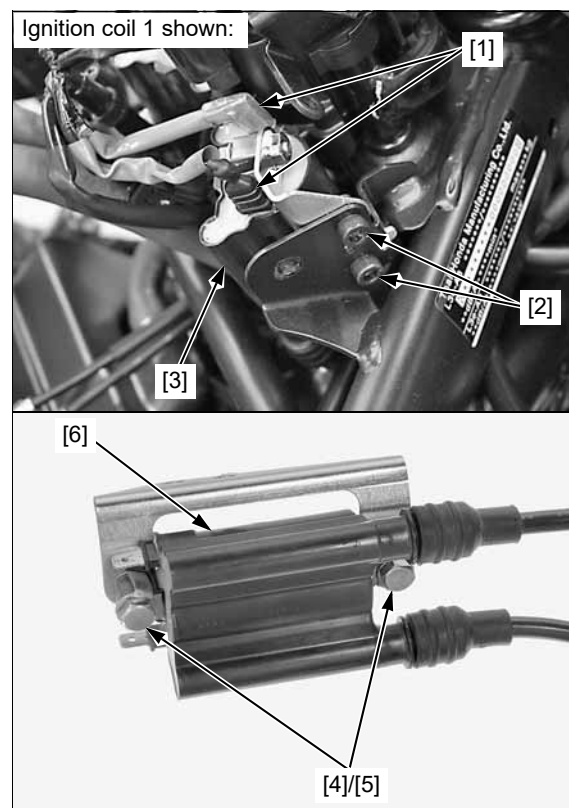
Remove the socket bolts [2] and release the ignition coil stay assembly [3] from the frame.

Remove the bolts [4], spacers [5] and ignition coil [6].

Installation is in the reverse order of removal.

NOTE:

- Do not interchange the ignition coils.



CKP SENSOR (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)

REMOVAL/INSTALLATION

Remove the right crankcase cover (page 11-4).

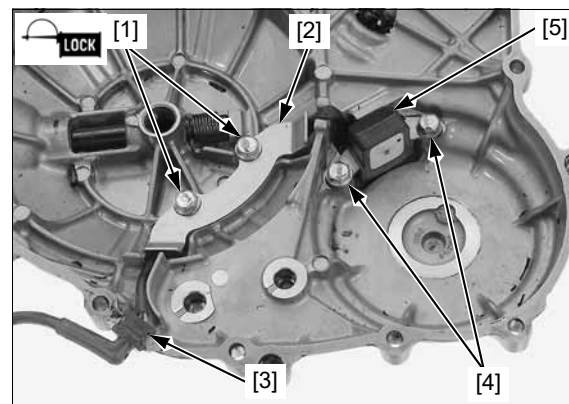
Remove the CKP sensor wire clamp bolts [1] and wire clamp [2].

Remove the wire grommet [3] from the right crankcase cover.

Remove the CKP sensor mounting bolts [4] and CKP sensor [5].

Installation is in the reverse order of removal.

- Apply locking agent to the CKP sensor wire clamp bolt threads (page 1-17).



MEMO

6. ELECTRIC STARTER

SERVICE INFORMATION.....	6-2	STARTER MOTOR.....	6-5
TROUBLESHOOTING	6-3	STARTER RELAY SWITCH.....	6-7
SYSTEM LOCATION.....	6-4	DIODE	6-9
SYSTEM DIAGRAM	6-4		

ELECTRIC STARTER

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 21-14)
 - Engine stop switch (page 21-16)
 - Starter switch (page 21-16)
 - Clutch switch (page 21-18)
 - Sidestand switch (page 21-18)
 - Gear position switch (page 4-81)
- The following color codes are used throughout this section.

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

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 6-7).

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 6-8)

NO – Faulty starter motor

3. Relay Coil Power Input Line Inspection

Check the power input line of the starter relay switch (page 6-7).

Is the input line normal?

YES – GO TO STEP 4.

NO – • Faulty ignition switch (page 21-14)
• Faulty engine stop switch (page 21-16)
• Faulty starter switch (page 21-16)
• 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 gear position switch (page 4-81)
• Faulty neutral diode (page 6-9)
• Faulty sidestand switch (page 21-18)
• Faulty clutch switch (page 21-18)
• Faulty clutch diode (page 6-9)
• Loose or poor contact of the related connector terminal
• Open circuit in wire harness

5. Starter Relay Switch Inspection

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

Is the starter relay switch normal?

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

NO – Faulty starter relay switch

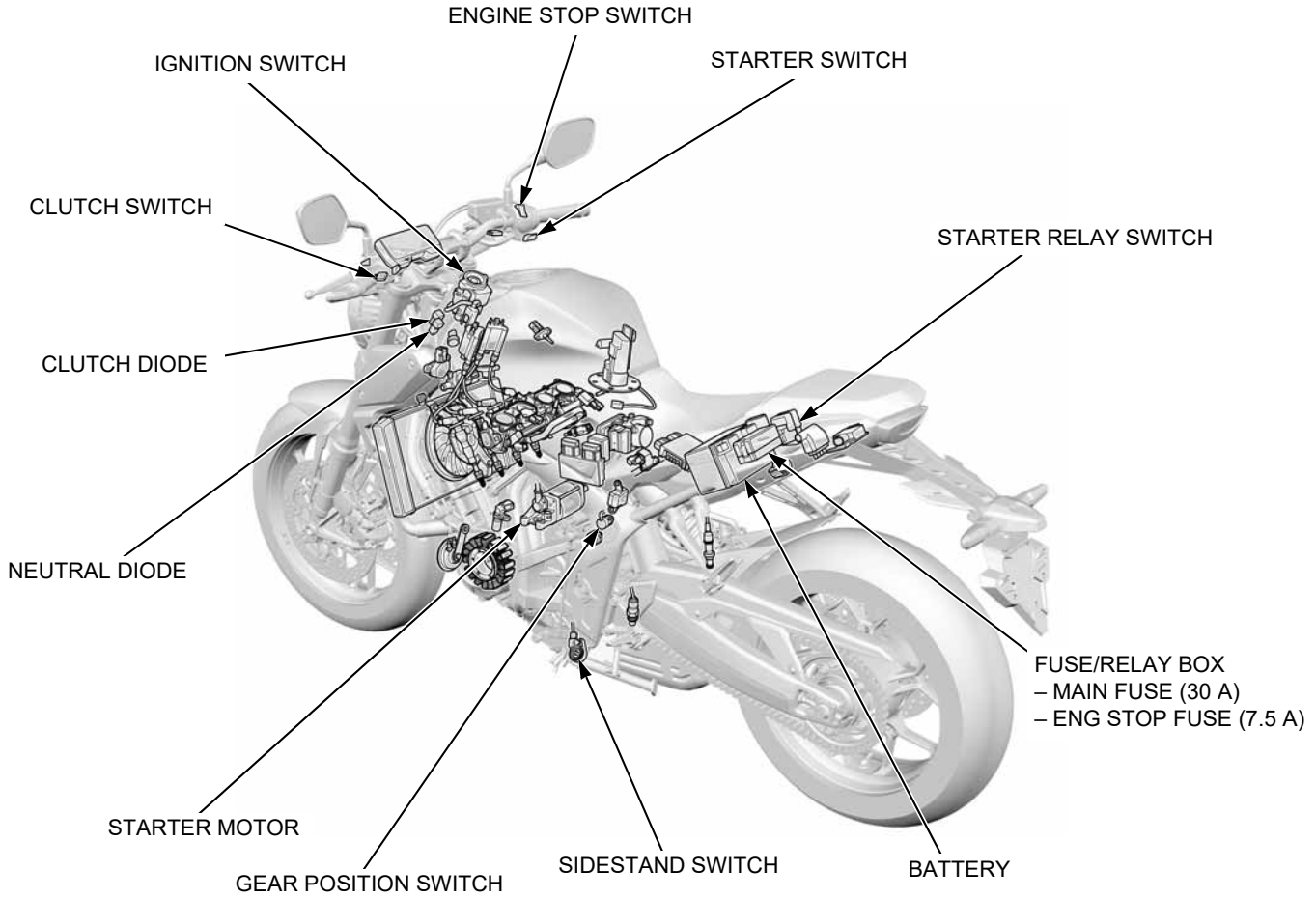
Starter motor turns slowly

- Low battery voltage
- Poorly connected battery cables or starter motor cable
- Faulty starter motor

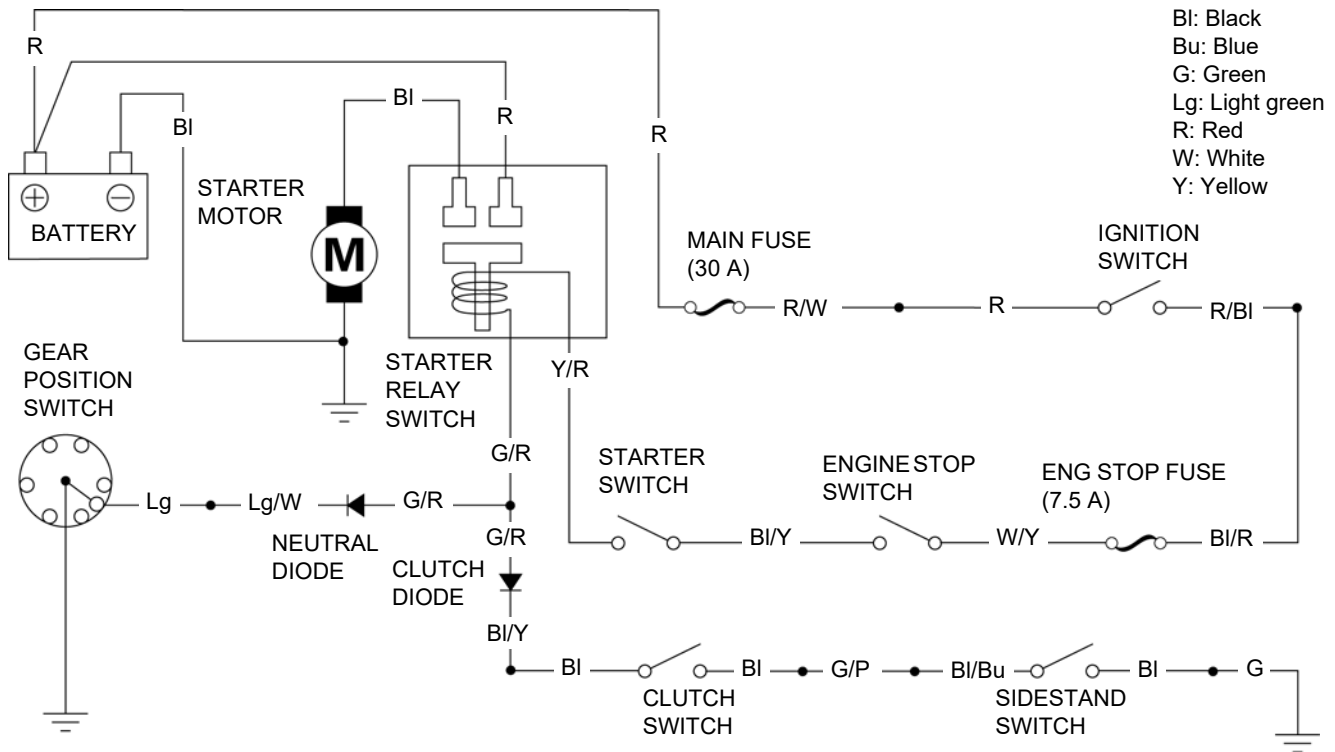
Starter motor turns, but engine does not turn

- Faulty starter clutch or starter gear train (page 11-16)
- Faulty ignition system (page 5-3)

ELECTRIC STARTER SYSTEM LOCATION



SYSTEM DIAGRAM



STARTER MOTOR

REMOVAL/INSTALLATION

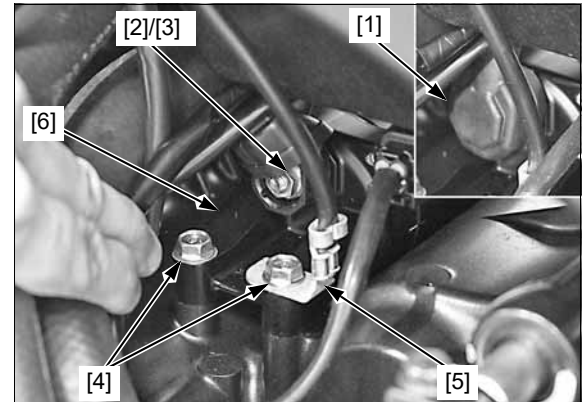
Disconnect the negative (-) cable from the battery (page 20-5).

Release the terminal cap [1].

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

Remove the two mounting bolts [4] and negative (-) cable [5].

Remove the starter motor [6] from the crankcase.

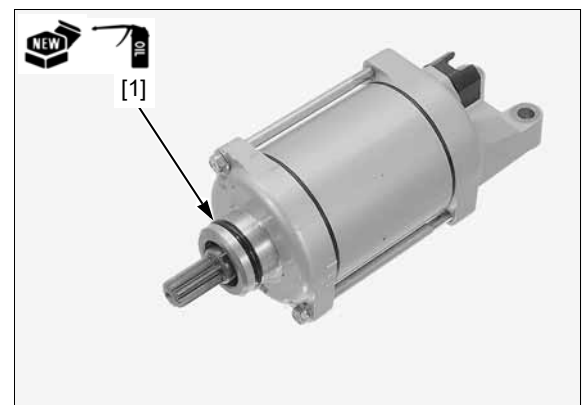


Remove the O-ring [1].

Installation is in the reverse order of removal.

NOTE:

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

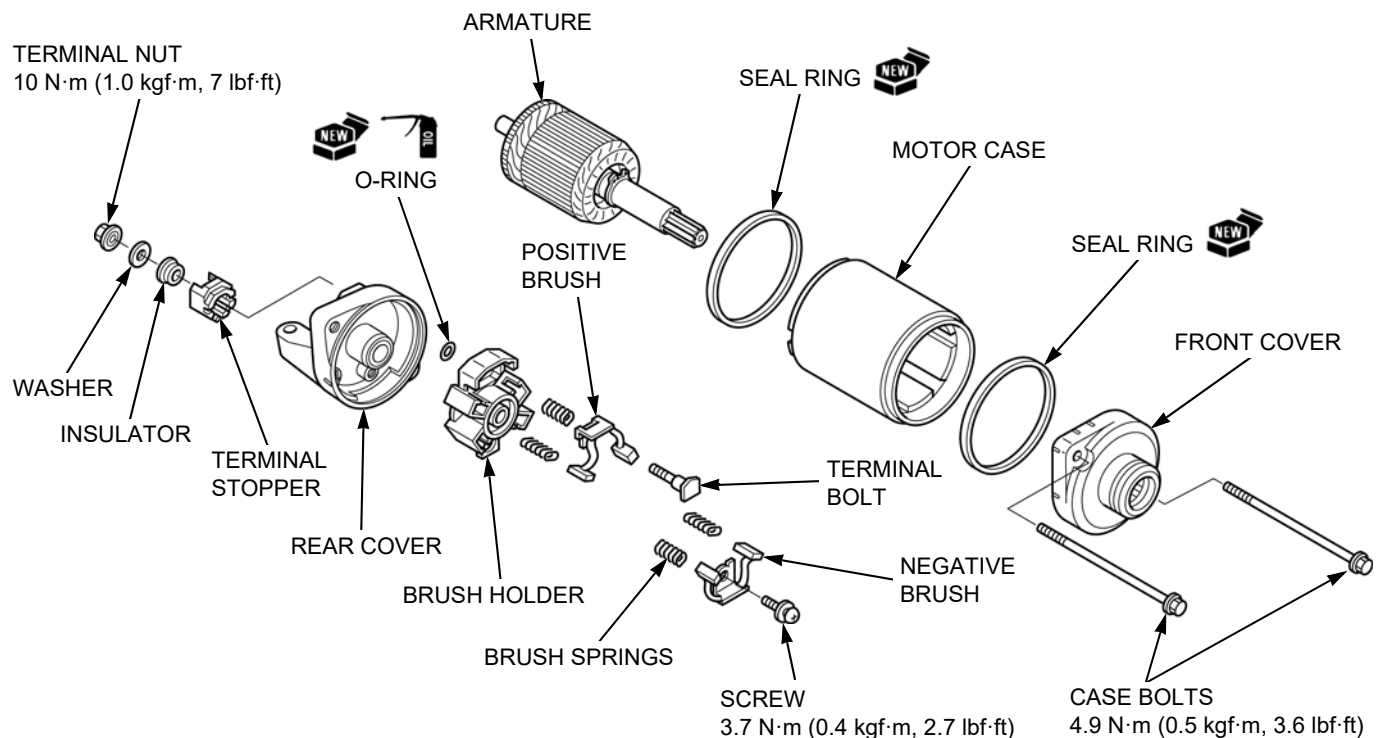


DISASSEMBLY/ASSEMBLY

Disassemble and assemble the starter motor as following illustration.

NOTICE

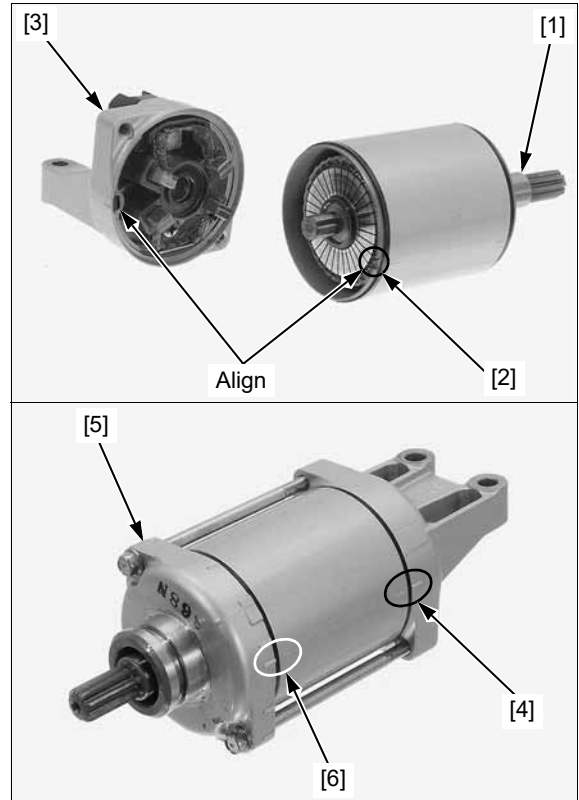
The coil may be damaged if the magnet pulls the armature against the motor case.



ELECTRIC STARTER

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

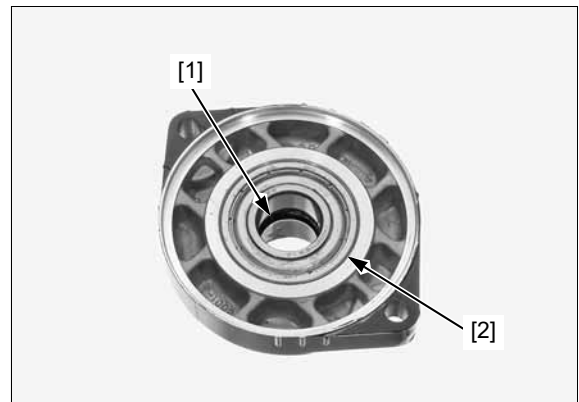
FRONT COVER

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.

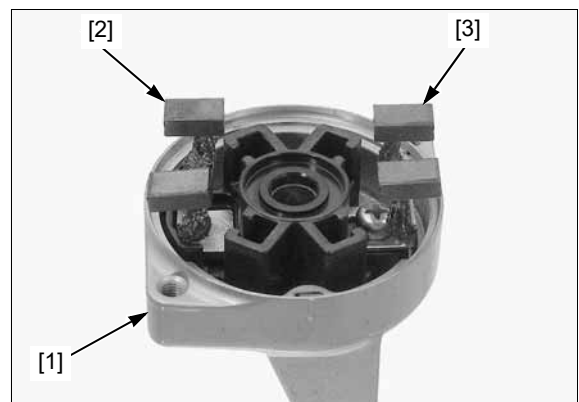


REAR COVER

Check for continuity or no continuity for each part of rear cover [1] as below:

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.
- Between positive brush and negative brush; there should be no continuity.



ARMATURE

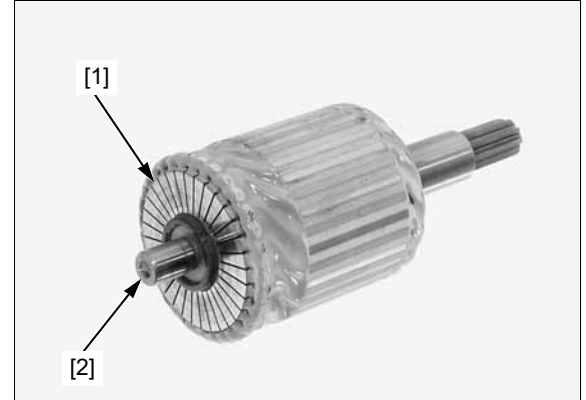
Do not use emery or sand paper on the commutator.

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

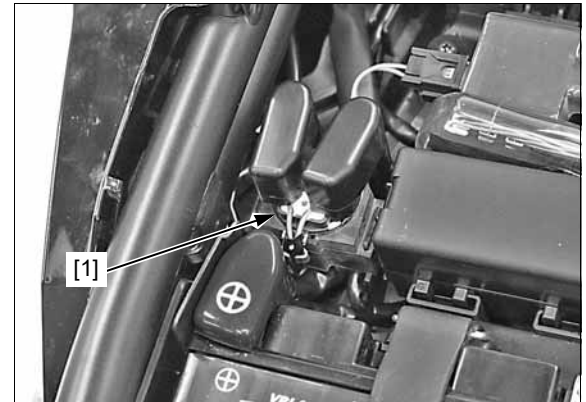
Remove the main seat (page 2-11).

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

Remove the right rear cowl (page 2-12).

POWER INPUT LINE

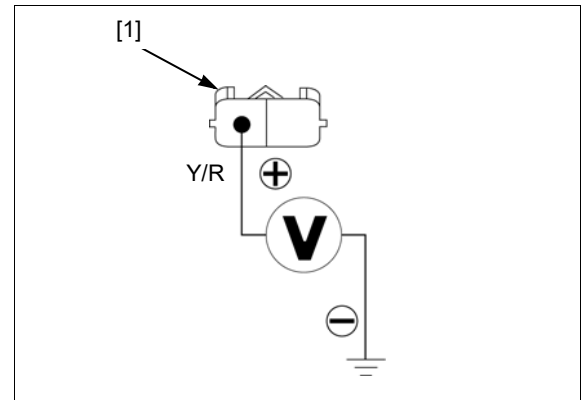
Release the connector boot from the starter relay switch 2P (Black) connector [1].

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

Measure the voltage between the 2P (Black) connector terminal and ground.

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

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



ELECTRIC STARTER

GROUND LINE

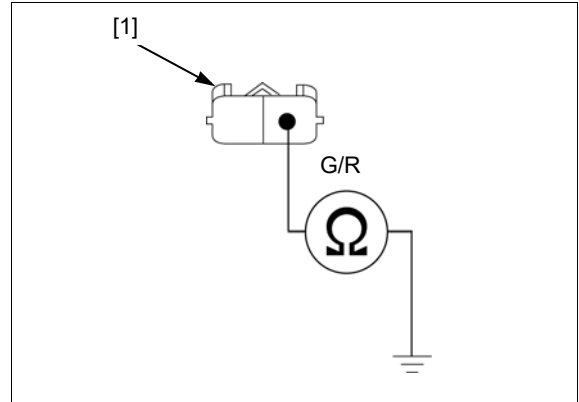
Turn the ignition switch OFF.

Disconnect the starter relay switch 2P (Black) connector [1].

Check for continuity between the 2P (Black) 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 (There is a slight resistance due to the diode).

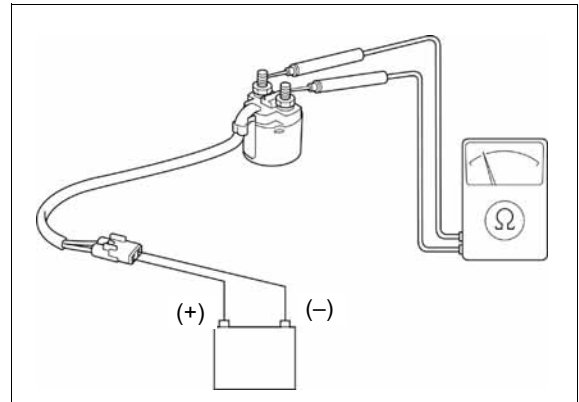


RELAY INSPECTION

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

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

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

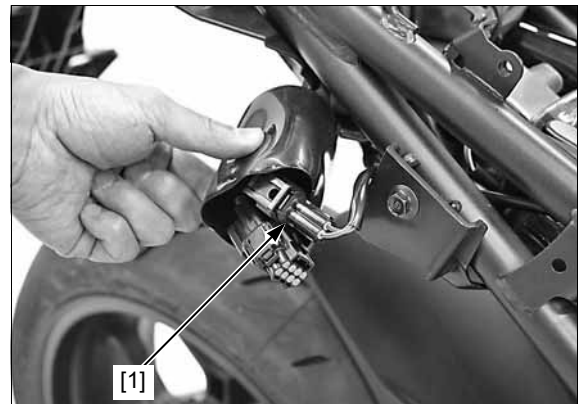


REMOVAL/INSTALLATION

Remove the right rear cowl (page 2-12).

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

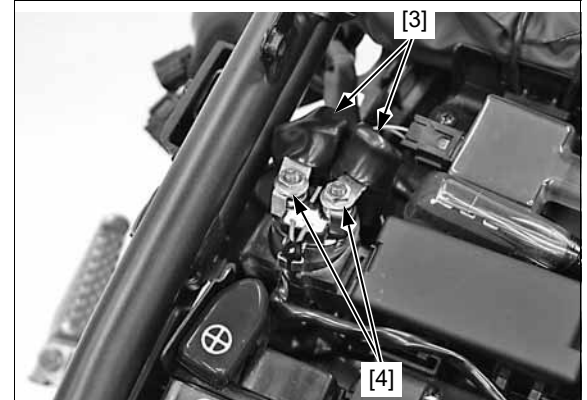
Disconnect the starter relay switch 2P (Black) connector [1].



Remove the starter relay switch [1] from the stays [2].
Release the terminal covers [3], and remove the nuts [4] to disconnect the cables.
Installation is in the reverse order of removal.

TORQUE:

Starter relay switch cable nut:
4.9 N·m (0.5 kgf·m, 3.6 lbf·ft)



DIODE

REMOVAL/INSTALLATION

NEUTRAL DIODE

Remove the air cleaner housing (page 7-12).
Remove the neutral diode [1].
Installation is in the reverse order of removal.



CLUTCH DIODE

Remove the air cleaner housing (page 7-12).
Remove the clutch diode [1].
Installation is in the reverse order of removal.



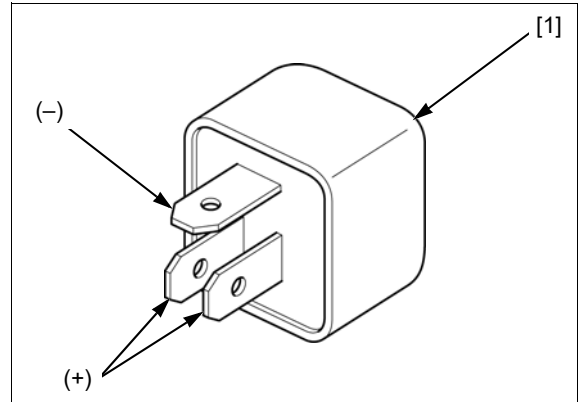
ELECTRIC STARTER

INSPECTION

Check for continuity between the turn signal light diode [1] terminals.

When there is continuity, a small resistance value will register.

If there is continuity in one direction, the turn signal light diode is normal.



SERVICE INFORMATION.....	7-2	INSULATOR	7-16
COMPONENT LOCATION.....	7-3	FUEL INJECTOR.....	7-16
FUEL LINE INSPECTION	7-4	IACV.....	7-17
FUEL TANK.....	7-7	FUEL PUMP RELAY	7-19
FUEL FILLER CAP	7-8	SECONDARY AIR SUPPLY SYSTEM.....	7-19
FUEL PUMP UNIT.....	7-8	EVAP PURGE CONTROL SOLENOID VALVE (Except MA, IIMA, IN, U, IIU models)	7-22
AIR CLEANER HOUSING	7-12	EVAP CANISTER (Except MA, IIMA, IN, U, IIU models)	7-23
THROTTLE BODY	7-13		

SERVICE INFORMATION

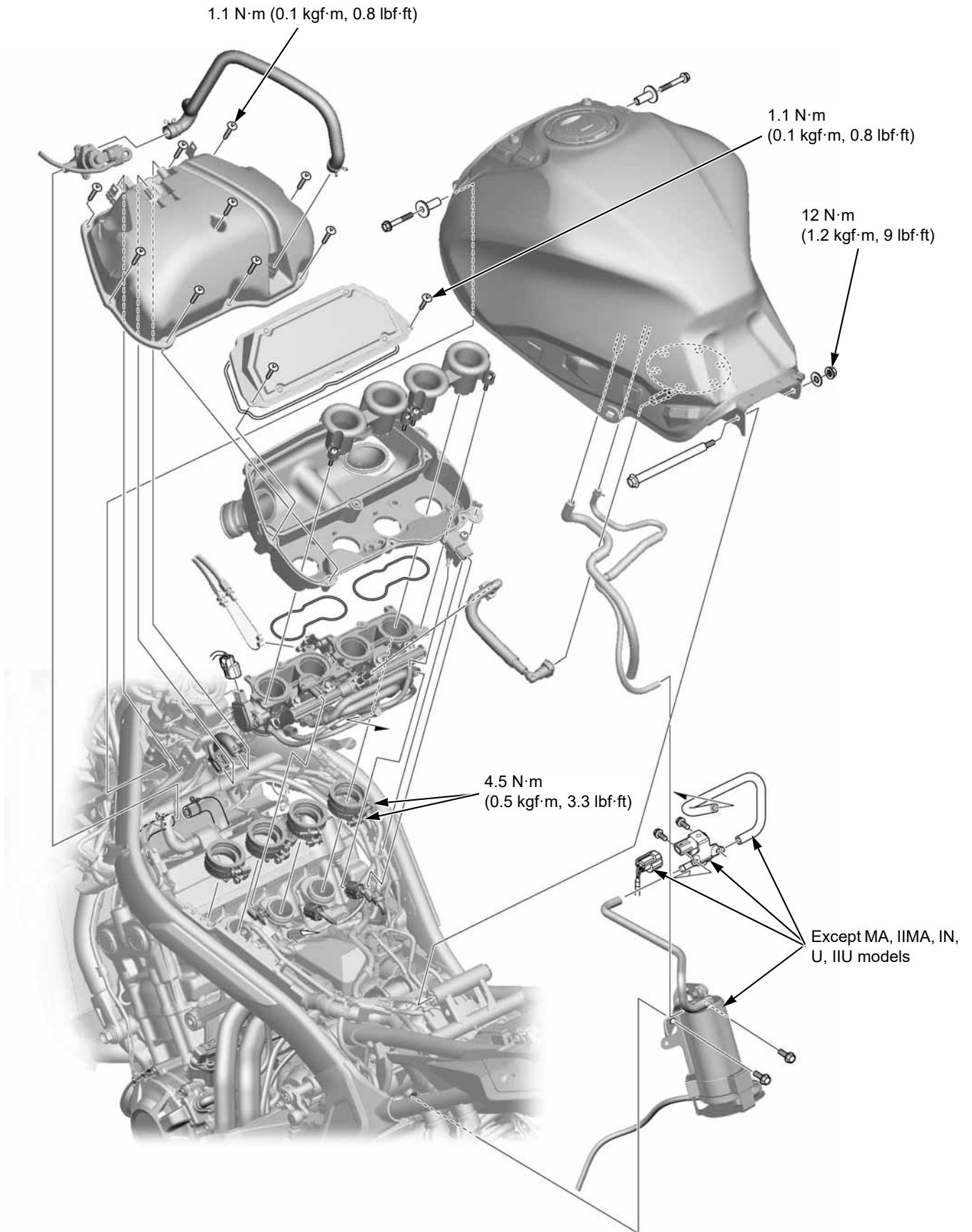
GENERAL

- 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 7-4).
- 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 level sensor inspection (page 21-14).
- The following color codes are used throughout this section.

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

COMPONENT LOCATION

ED model shown:

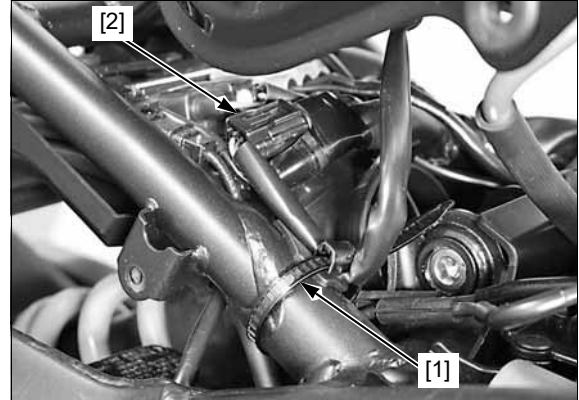


FUEL LINE INSPECTION

FUEL PRESSURE RELIEVING

NOTE:

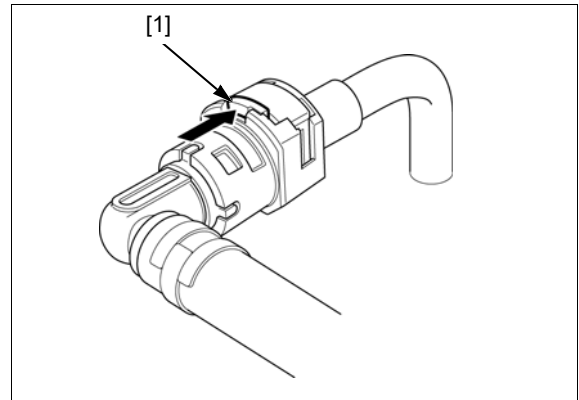
- Before disconnecting fuel feed hose, relieve pressure from the system as follows.
1. Turn the ignition switch OFF.
 2. Lift the fuel tank and support it (page 3-4).
 3. Remove the wire band [1].
 4. Disconnect the fuel pump 3P (Black) connector [2].
 5. Start the engine, and let it idle until the engine stalls.
 6. Turn the ignition switch OFF.



QUICK CONNECT FITTING REMOVAL

NOTE:

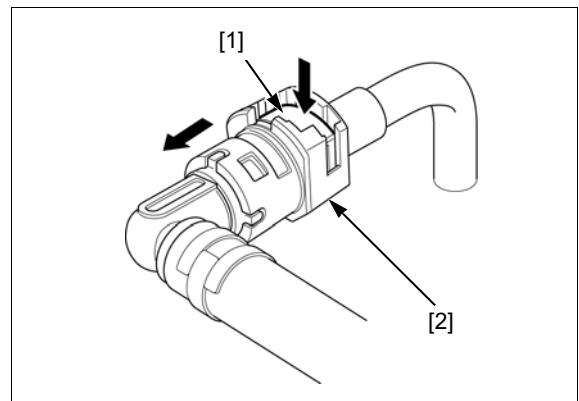
- Clean around the quick connect fitting before disconnecting the fuel feed hose, and be sure that no dirt is allowed to enter into the fuel system.
 - Do not bend or twist the fuel feed hose.
1. Relieve the fuel pressure (page 7-4).
 2. Disconnect the negative (-) cable from the battery (page 20-5).
 3. Lift the fuel tank and support it (page 3-4).
 4. Place a shop towel over the quick connect fitting.
 5. Push the retainer tab [1] forward.



6. Press down the retainer [1] and hold.
Disconnect the connector [2] from the fuel pump joint/fuel injector joint.
Check the retainer condition and replace it if necessary.

NOTE:

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



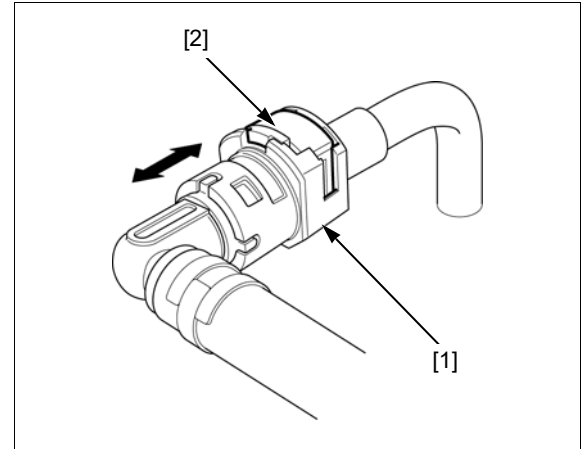
7. To prevent damage and keep foreign matter out, cover the disconnected connector and pipe end with the plastic bags.

QUICK CONNECT FITTING INSTALLATION

NOTE:

- Do not bent or twist the fuel feed hose.
1. Press the connector [1] onto the fuel pump joint/fuel injector joint until the retainer [2] locks with a "CLICK".

If it is hard to connect, put a small amount of engine oil on the pipe end.
 2. Make sure the connection is secure; check visually and by pulling the connector.



FUEL PRESSURE NORMALIZATION

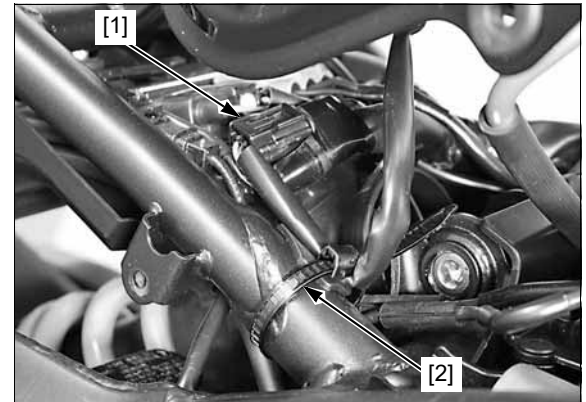
1. Be sure the fuel pump 3P (Black) connector [1] is connected.
2. Install the wire band [2].
3. Turn the ignition switch ON with the engine stop switch "O".

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



FUEL PRESSURE TEST

NOTE:

- Check the fuel tank breather hose on the frame (MA, IIMA, IN, U, IIU models) or fuel tank-to-EVAP canister hose (Except MA, IIMA, IN, U, IIU models) for pinches or clogs when the fuel tank is lifted.

Disconnect the quick connect fitting from the fuel pump (page 7-4).

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

TOOLS:

- [1] Fuel pressure gauge 07406-0040004
- [2] Pressure gauge attachment set 070MJ-K260100
- [3] Hose attachment, 6 mm/9 mm 07ZAJ-S5A0130
- [4] Hose attachment, 8 mm/9 mm 07ZAJ-S7C0100
- [5] Attachment joint, 8 mm/9 mm 07ZAJ-S7C0200
- [6] Attachment joint, 6 mm/9 mm 07ZAJ-S5A0150

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: 324 – 367 kPa
(3.3 – 3.7 kgf/cm², 47 – 53 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:

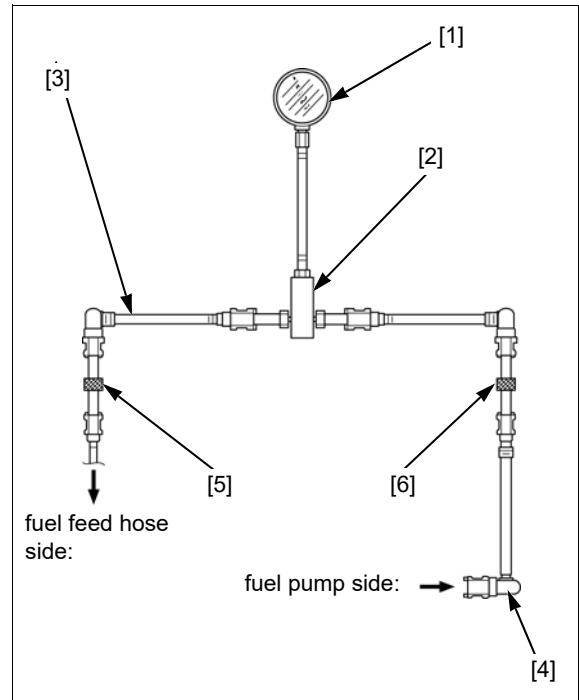
- Fuel line for leakage
- Fuel tank breather hose (tank side) for pinch or clogs
- Fuel filter for clogs
- Fuel pump (page 7-8)

After inspection, relieve the fuel pressure (page 7-4).

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

Remove the special tools.

Connect the quick connect fitting (page 7-5).



FUEL FLOW INSPECTION

NOTE:

- Check the fuel tank breather hose on the frame (MA, IIMA, IN, U, IIU models) or fuel tank-to-EVAP canister hose (Except MA, IIMA, IN, U, IIU models) for pinches or clogs when the fuel tank is lifted.

Disconnect the fuel injector side quick connect fitting (page 7-4).

Wipe off spilled out gasoline.

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

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:

**125 cm³ (4.23 US oz, 4.40 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 pinch or clogs
- Fuel filter for clogs
- Fuel pump (page 7-8)

Connect the quick connect fitting (page 7-5).

FUEL TANK

REMOVAL/INSTALLATION

Disconnect the quick connect fitting from the fuel tank (page 7-4).

Lower the fuel tank, being careful not to pinch the wire and hoses.

Remove the nut [1], washer [2], bolt [3] and fuel tank [4].

Installation is in the reverse order of removal.

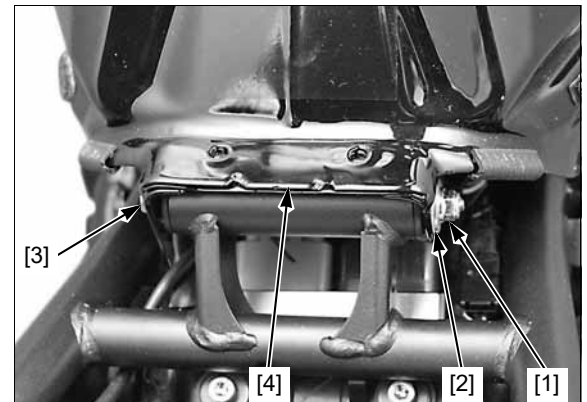
NOTE:

- 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 7-5).



FUEL FILLER CAP

REMOVAL/INSTALLATION

Remove the following:

- Three socket bolts [1]
- Fuel filler cap [2]
- Breathe seal [3]

A pressure release can be heard when opening the fuel cap, but this is not blockage of the passage.

If checking for clog in the passage of the fuel tank side is necessary, apply air pressure to the breather hose end with the fuel filler cap opened.

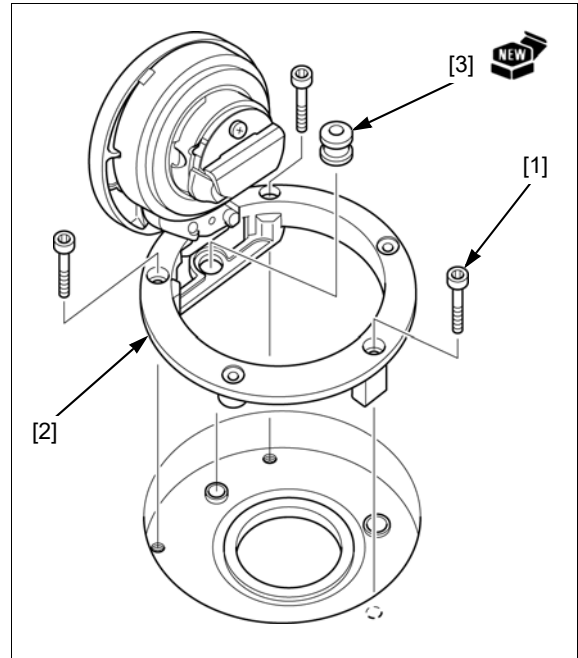
NOTE:

- Replace the breather seal with a new one.

Installation is in the reverse order of removal.

TORQUE:

Fuel filler cap mounting socket bolt:
1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)



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.

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

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



**Except CB650RA
 ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models**

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

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

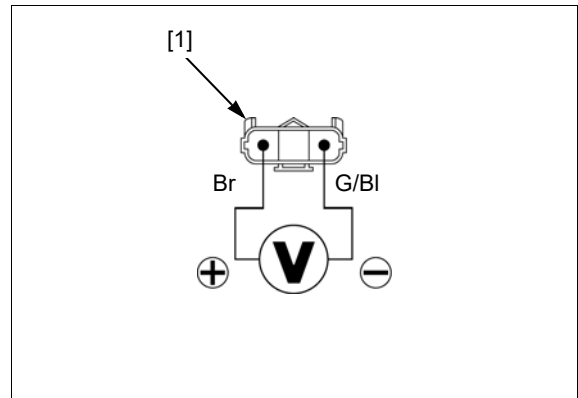
CONNECTION: Brown (+) – Green/black (-)

There should be battery voltage for 2 seconds.

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

If there is no voltage, inspect the following:

- Green/black wire between the fuel pump and ground for open circuit
- Brown wire between the fuel pump relay and fuel pump for open circuit
- Fuel pump relay and its circuits (page 7-19)
- ECM (page 4-76)



**CB650RA
ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models**

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

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

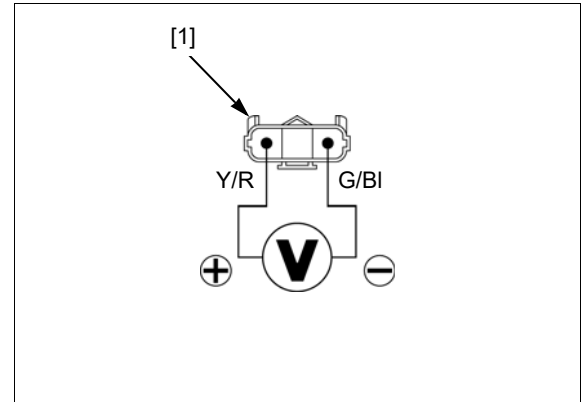
CONNECTION: Yellow/red (+) – Green/black (-)

There should be battery voltage for 2 seconds.

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

If there is no voltage, inspect the following:

- Green/black wire between the fuel pump and ground for open circuit
- Yellow/red wire between the fuel pump relay and fuel pump for open circuit
- Fuel pump relay and its circuits (page 7-19)
- ECM (page 4-77)



REMOVAL/INSTALLATION

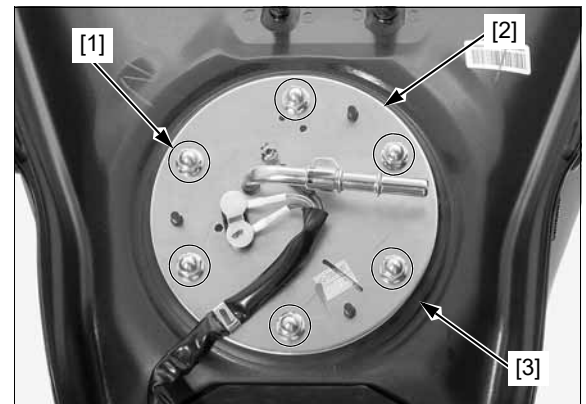
Remove the fuel tank (page 7-7).

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 rubber seal [3].

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



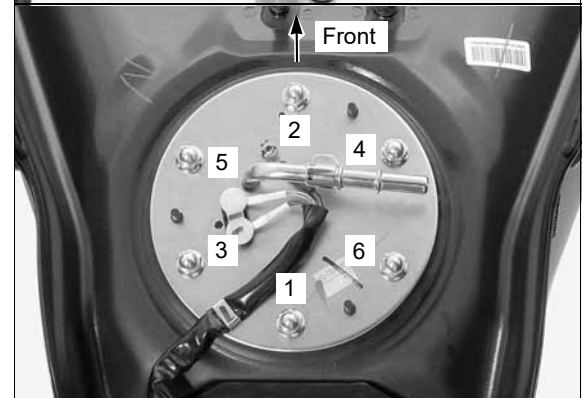
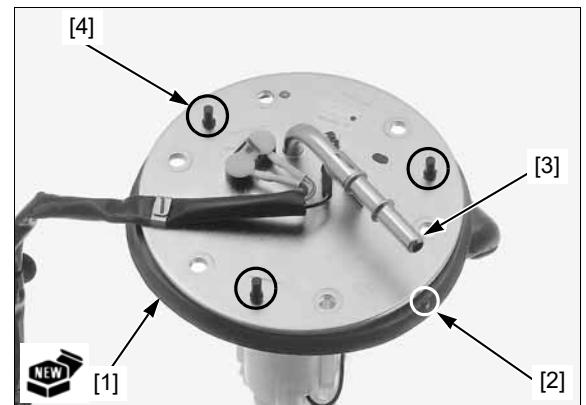
Installation is in the reverse order of removal.

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)**

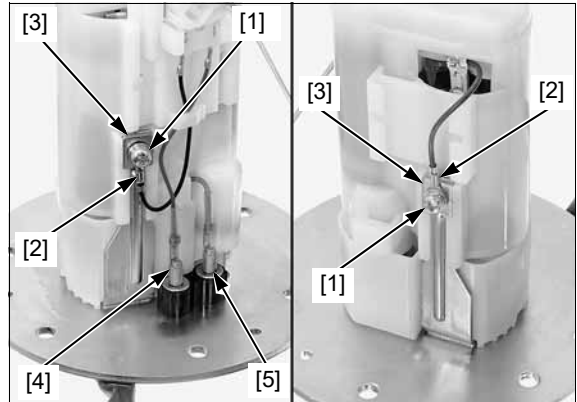


FUEL SYSTEM

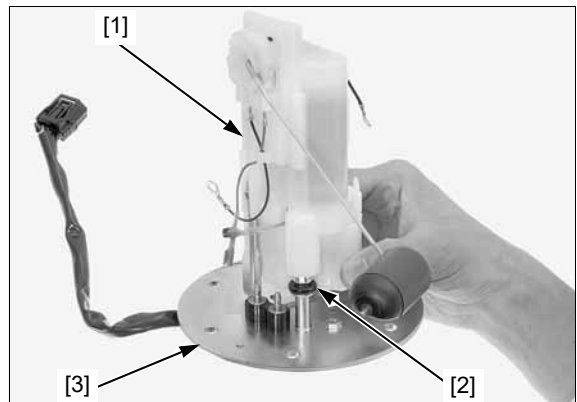
DISASSEMBLY/INSPECTION

Remove the screws [1], Black wire terminals [2] and stoppers [3].

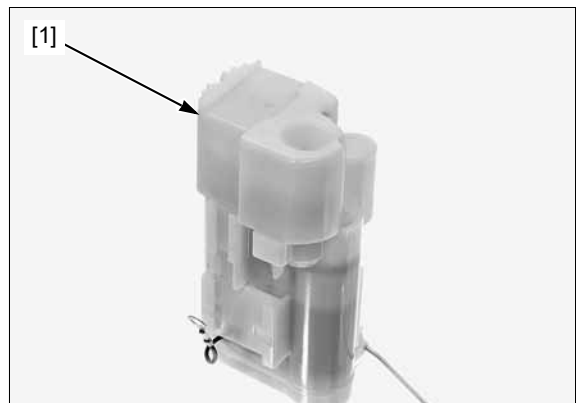
Disconnect the Pink wire connector [4] and Blue wire connector [5].



Remove the fuel pump unit assembly [1] and O-ring [2] from the fuel pump stay [3].



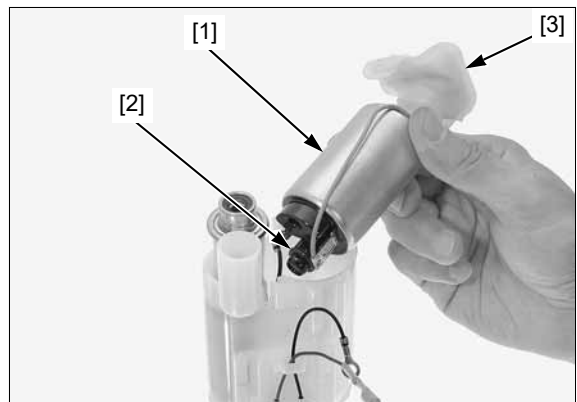
Remove the chamber [1].



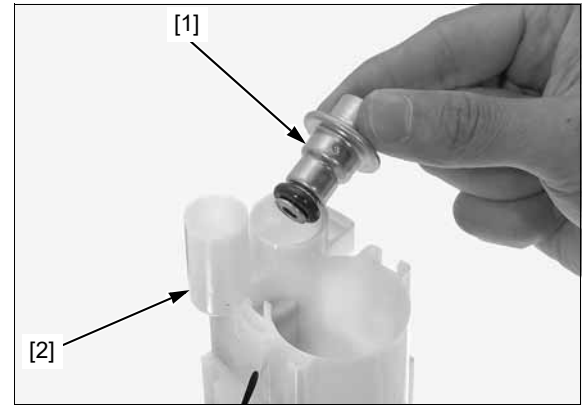
Remove the fuel pump [1] and O-ring [2].

Visually inspect the fuel pump filter [3] for dirt, debris or any clogging.

Replace fuel pump unit as an assembly if necessary.

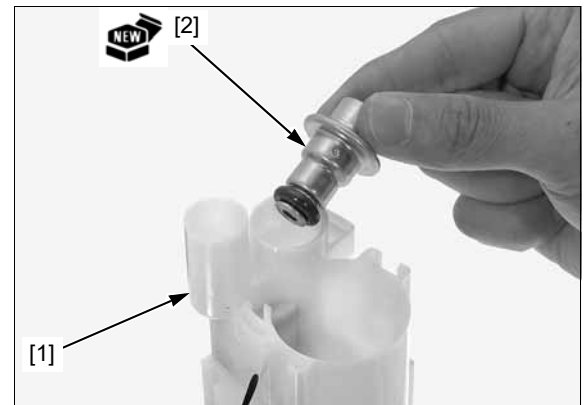


Remove the pressure regulator/O-ring [1] from the fuel filter [2].



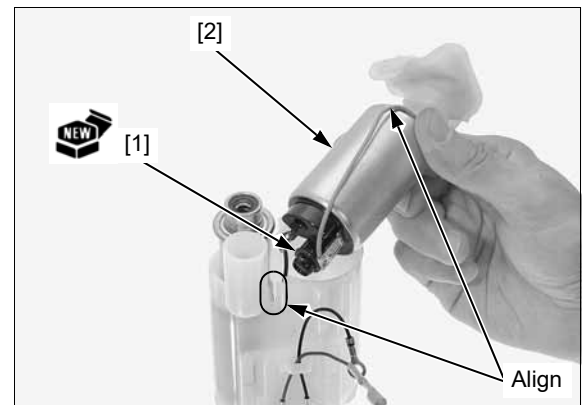
ASSEMBLY

Replace the fuel filter [1] with a new one if necessary.
Install a new pressure regulator/O-ring [2].



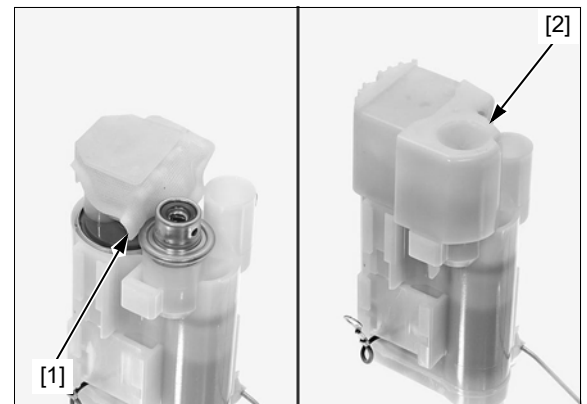
Install a new O-ring [1] to the fuel pump [2].
Install the fuel pump.

- Align the Blue wire with the fuel filter groove.



Insert the fuel pump filter edge [1] between the fuel pump and pressure regulator.

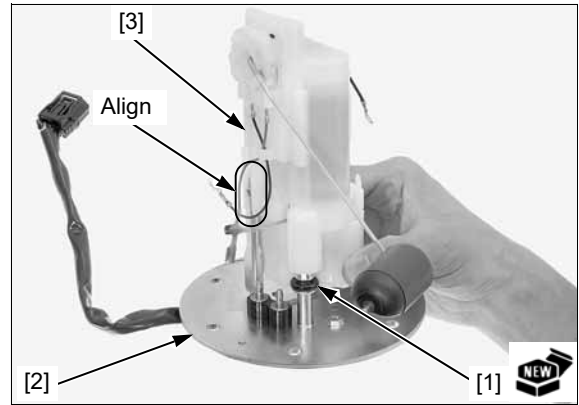
Install the chamber [2].



FUEL SYSTEM

Install a new O-ring [1] to the fuel pump stay [2].

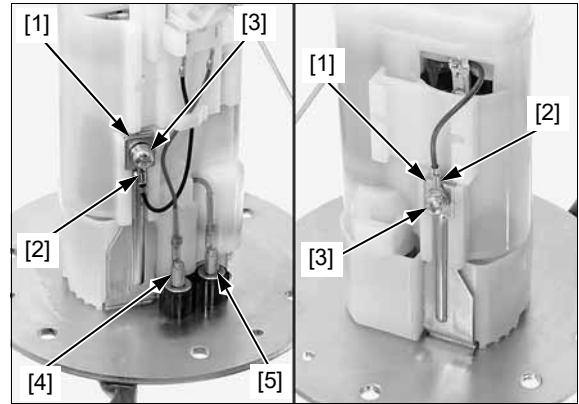
Install the fuel pump unit assembly [3] by aligning the grooves with the fuel pump stay tabs.



Install the stoppers [1], Black wire terminals [2] and screws [3].

Tighten the screws securely.

Connect the Pink wire connector [4] and Blue wire connector [5].



AIR CLEANER HOUSING

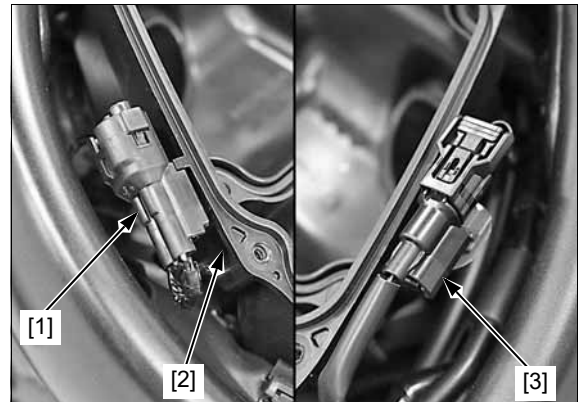
REMOVAL/INSTALLATION

Remove the following:

- Fuel tank (page 7-7)
- Air cleaner lid (page 3-5)
- Intake air duct (page 2-8) (CBR650RA)
- Shroud (page 2-10) (CB650RA)

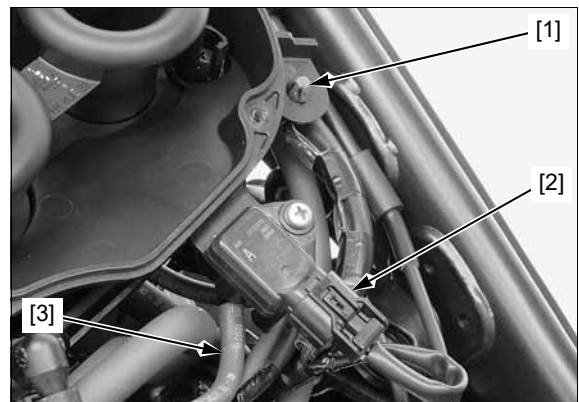
Release the following:

- Optional 2P (Black) connector [1] from the air cleaner housing [2]
- EOP switch 1P (Black) connector [3] from the air cleaner housing



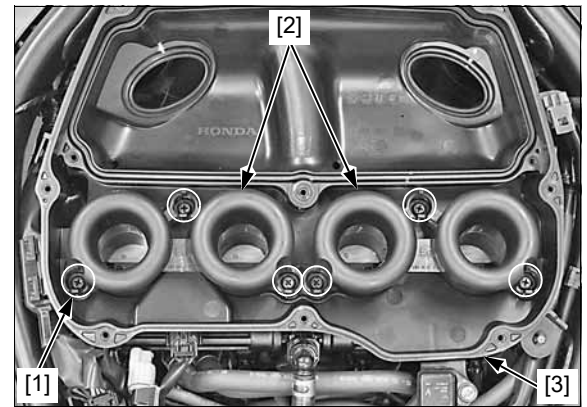
- Wire clip [1]

Disconnect the MAP sensor 3P (Black) connector [2] and vacuum hose [3] from the air cleaner housing.



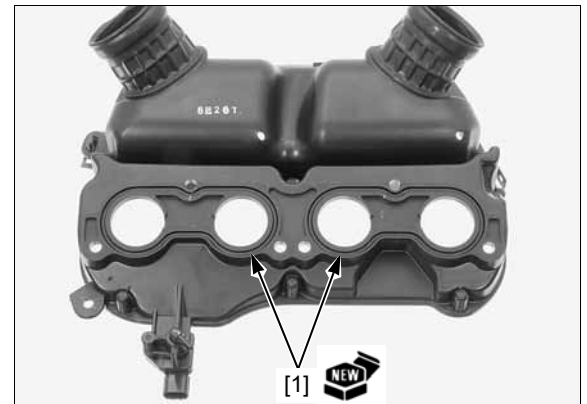
Loosen the six screws [1] fully and remove the intake ducts [2].

Remove the air cleaner housing [3].



Remove the O-rings [1] from the air cleaner housing. Installation is in the reverse order of removal.

- Replace the O-rings with new ones.



THROTTLE BODY

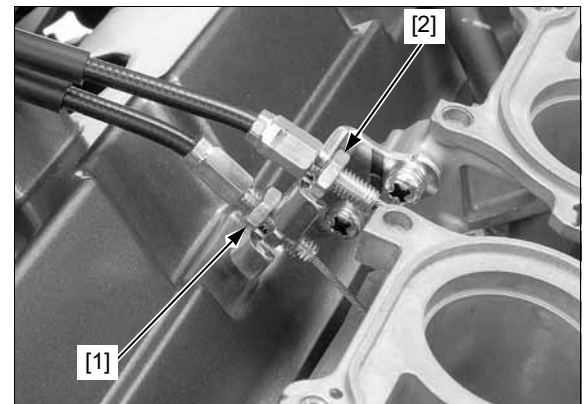
REMOVAL/INSTALLATION

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.

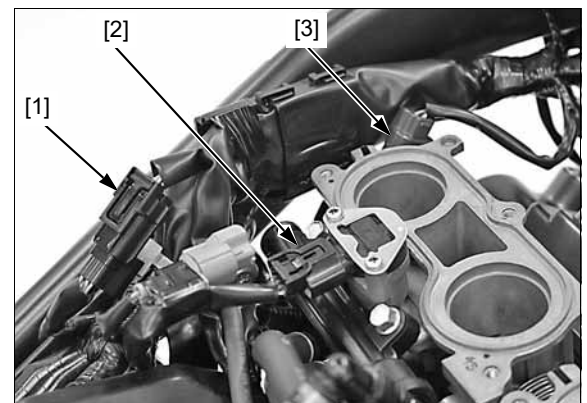
Remove the air cleaner housing (page 7-12).

Loosen the throttle cable A adjuster lock nut [1] and the throttle cable B lock nut [2].



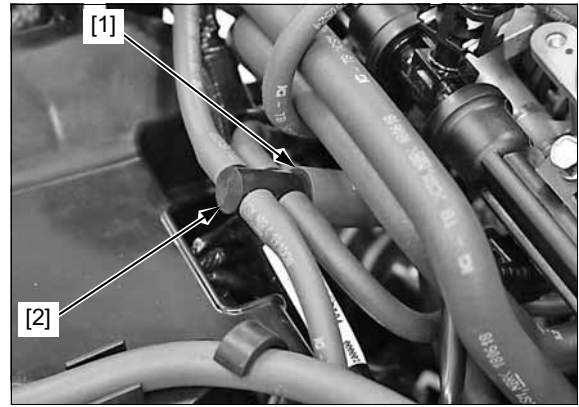
Disconnect the following:

- Fuel injector sub harness 6P (Black) connector [1]
- IACV 4P (Black) connector [2]
- TP sensor 3P (Blue) connector [3]

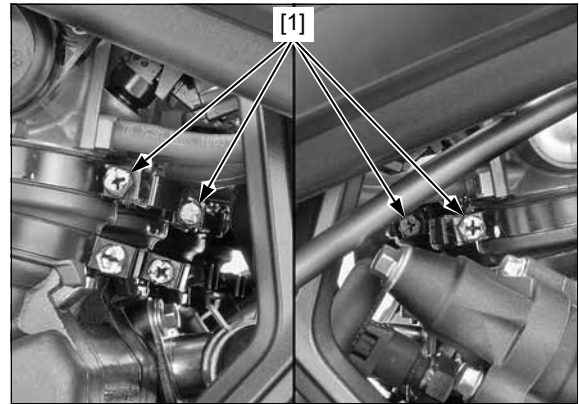


FUEL SYSTEM

Except MA, IIMA, IN, U, IIU models: – EVAP vacuum hose [1] from the hose joint [2]

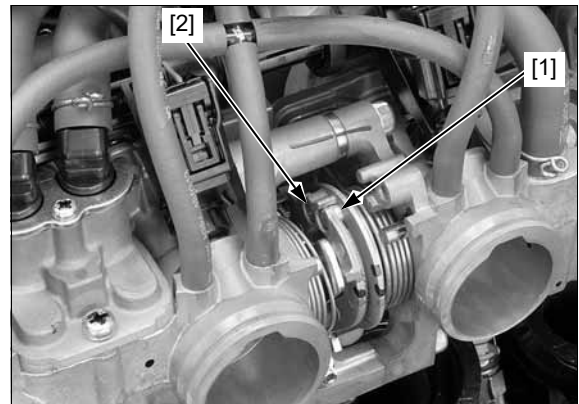


Loosen the four insulator band screws (throttle body side) [1].



Slide the throttle body assembly upward and release it off of the insulators.

Disconnect the throttle cable A [1] and the throttle cable B [2] from the throttle drum and cable stay.



Installation is in the reverse order of removal.

NOTE:

- Tighten the insulator band screw [1] until the band seats on the collar (9 mm) [2].
- Tighten the following to the specified torque.

TORQUE:

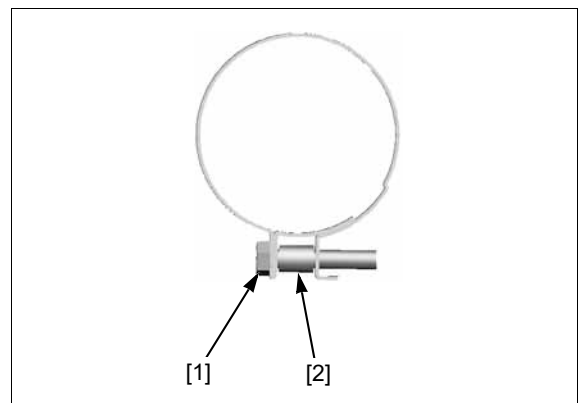
Insulator band screw (throttle body side):

4.5 N·m (0.5 kgf·m, 3.3 lbf·ft)

Throttle cable B lock nut:

5.5 N·m (0.6 kgf·m, 4.1 lbf·ft)

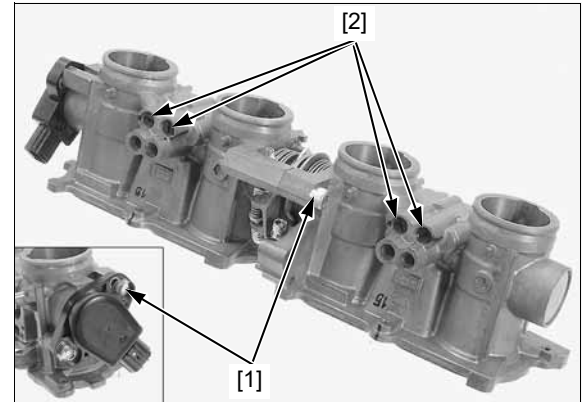
Adjust the throttle grip freeplay (page 3-4).



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 [1] bolts, nuts, screws and air screws [2]. Loosening or tightening them can cause throttle body malfunction.



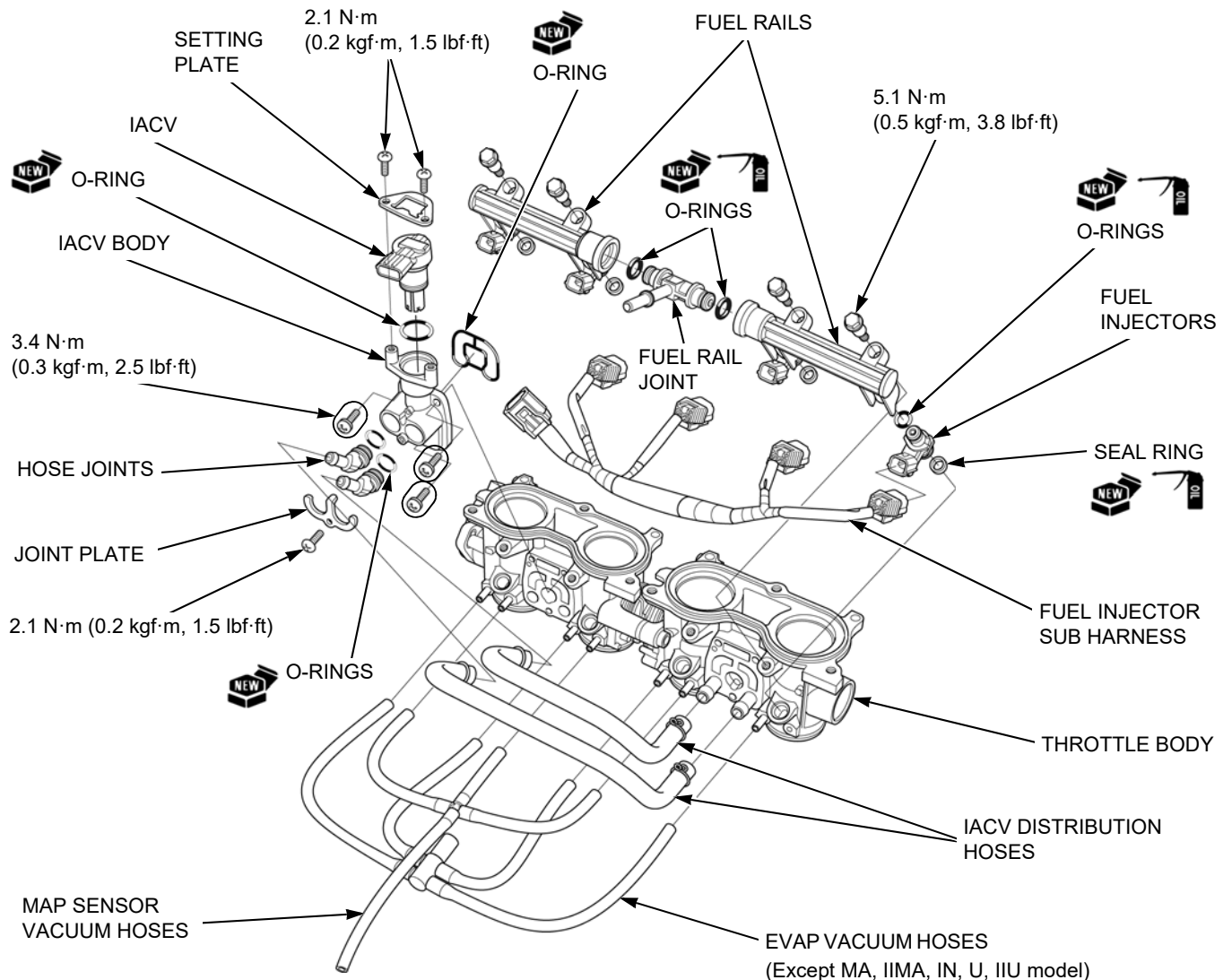
Remove the following:

- IACV (page 7-17)
- Fuel injector (page 7-16)

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.



INSULATOR

REMOVAL/INSTALLATION

Remove the following:

- Throttle body (page 7-13)
- Cam chain tensioner lifter (page 10-20)

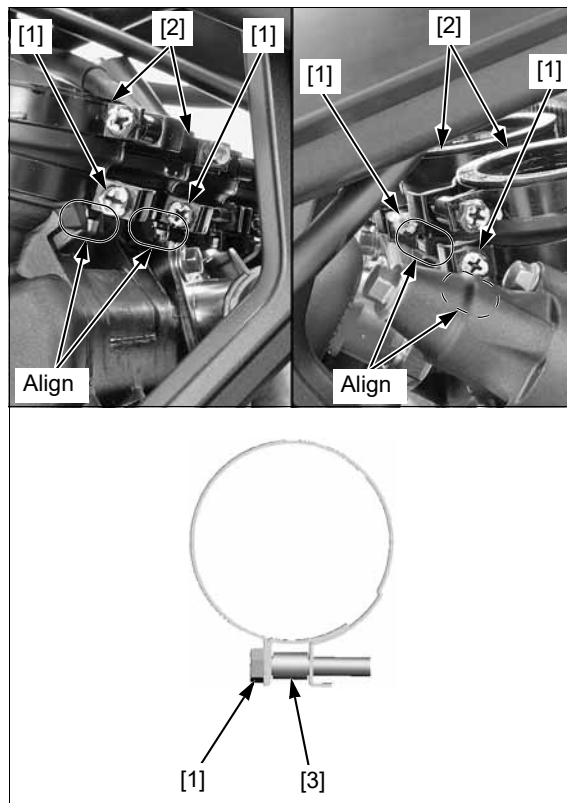
Loosen the band screws [1] and remove the insulators [2].

Installation is in the reverse order of removal.

- Align the insulator grooves with the tabs of the cylinder head.
- Tighten the insulator band screw until the band seat on the collar (7 mm) [3].
- Tighten the insulator band screw to the specified torque.

TORQUE:

Insulator band screw (cylinder head side):
4.5 N·m (0.5 kgf·m, 3.3 lbf·ft)



FUEL INJECTOR

REMOVAL/INSTALLATION

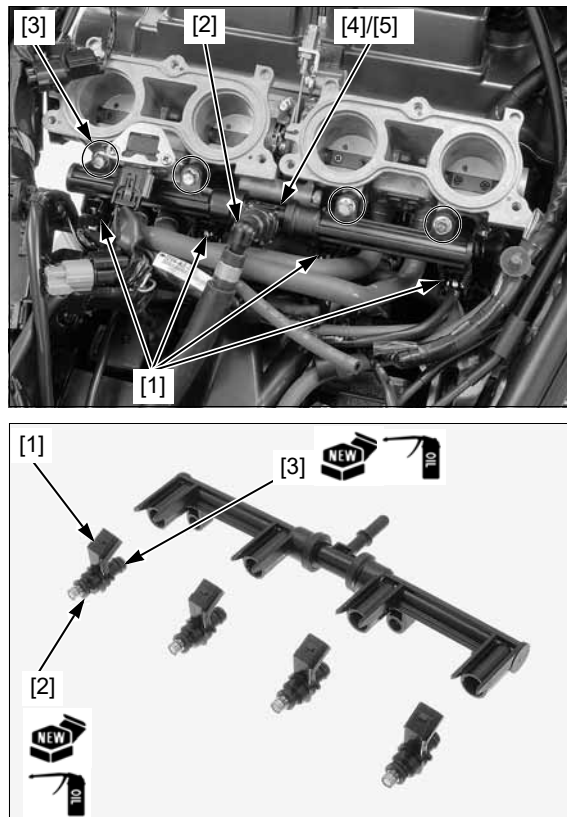
Remove the air cleaner housing (page 7-12).

Disconnect the fuel injector 2P (Black) connectors [1]

Remove the following:

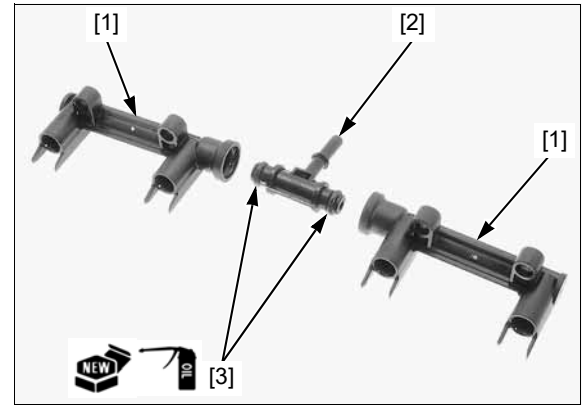
- Fuel feed hose [2]
- Four bolts [3]
- Fuel rails/joint [4] and fuel injectors [5] (as an assembly)

- Fuel injectors [1]
- Seal rings [2]
- O-rings [3]



- Fuel rails [1]
- Fuel rail joint [2]
- O-rings [3]

Check each part for wear or damage and replace it if necessary.



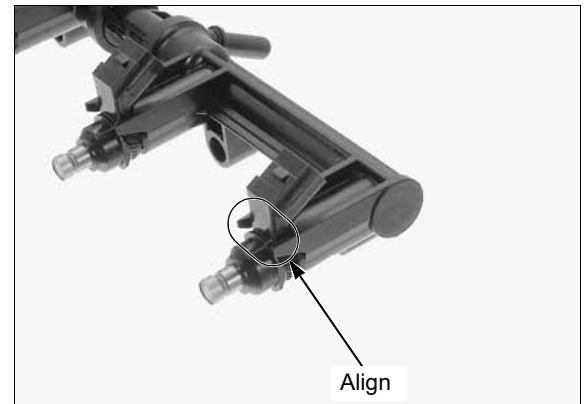
Installation is in the reverse order of removal.

NOTE:

- Replace the O-rings and seal rings with new ones and coat them with engine oil.
- Install the fuel injector by aligning the injector connector with the groove of the fuel rail.
- When installing the fuel injector, be careful not to damage the O-ring and seal ring.

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 stepping motor. When the ignition switch is turned ON, the IACV operates for a few seconds.

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

If the operating sound is not heard with no MIL blinking, perform the following inspection.

Remove the IACV (page 7-18).

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.

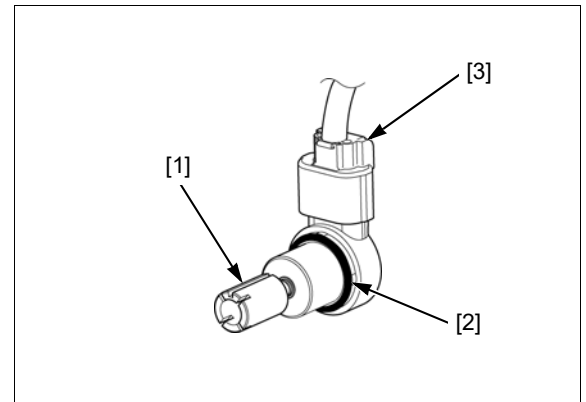
Temporarily connect the IACV 4P (Black) connector [3].

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.

Install the removed parts in the reverse order of removal.



FUEL SYSTEM

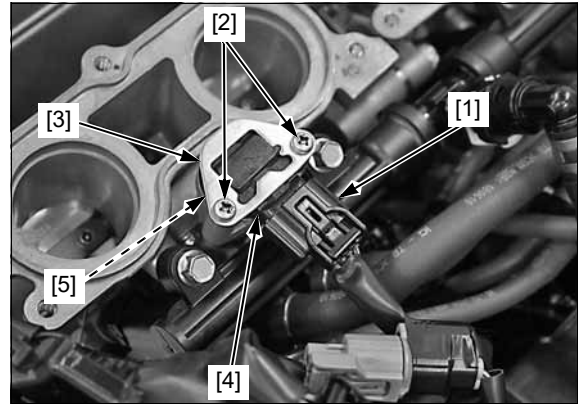
REMOVAL

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

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

Remove the following:

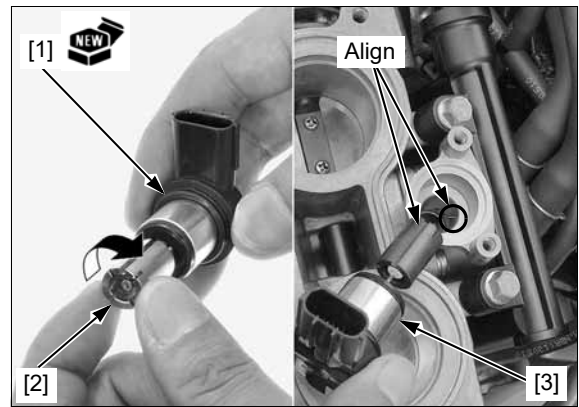
- Two screws [2]
- Setting plate [3]
- IACV [4]
- O-ring [5]



INSTALLATION

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 the IACV [3] by aligning the long slot with the pin on the throttle body.



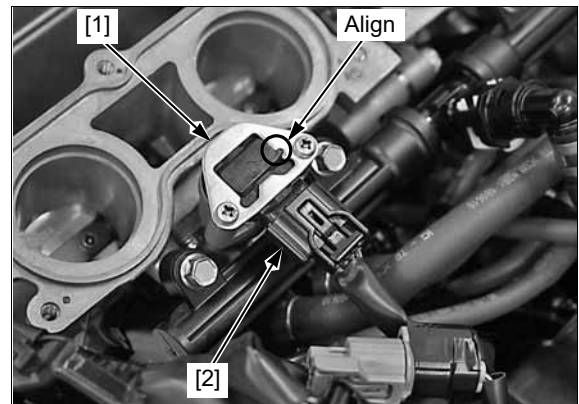
Install the setting plate [1] by aligning the cutout with the lug of the IACV body.

Install and tighten the screws to the specified torque.

TORQUE: 2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)

Connect the IACV 4P (Black) connector [2].

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



FUEL PUMP RELAY

CIRCUIT INSPECTION

For relay inspection (page 21-24).

Remove the fuel pump relay (page 21-24).

RELAY SWITCH/COIL POWER INPUT LINE

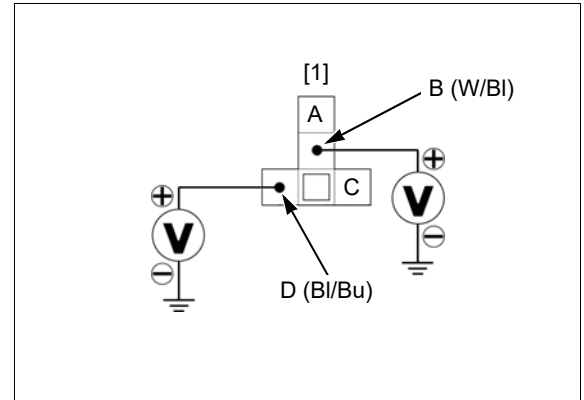
Measure the voltage between each fuel pump relay 4P connector [1] terminal and ground.

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:

- White/black wire between the fuse/relay box and fuel pump relay for open circuit
- FUEL (20 A) fuse
- Black/blue wire between the main relay and fuel pump relay for open circuit
- Main relay and its circuit (page 4-85)



SIGNAL LINE

Check for continuity between the fuel pump relay 4P connector [1] terminal and ground.

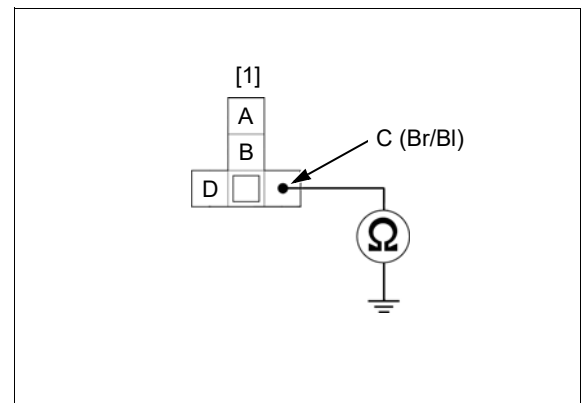
CONNECTION: C – Ground

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 connector 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 connector and ECM.



SECONDARY AIR SUPPLY SYSTEM

SYSTEM INSPECTION

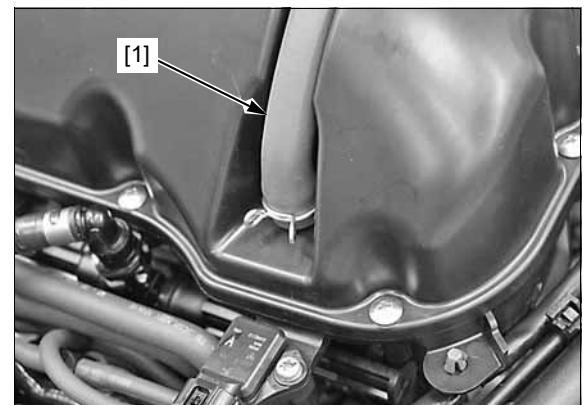
Start the engine and warm it up to normal operating temperature.

Stop the engine.

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

Disconnect the air supply hose [1] from the air cleaner lid.

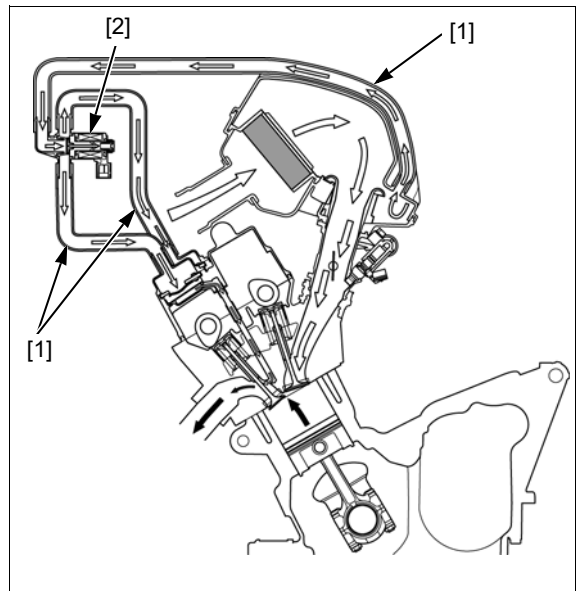
Check that the hose joint (secondary air intake port) of the air cleaner lid is clean and free of carbon deposits. Check the PAIR check valve if the port is carbon fouled (page 7-22).



FUEL SYSTEM

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 7-21).

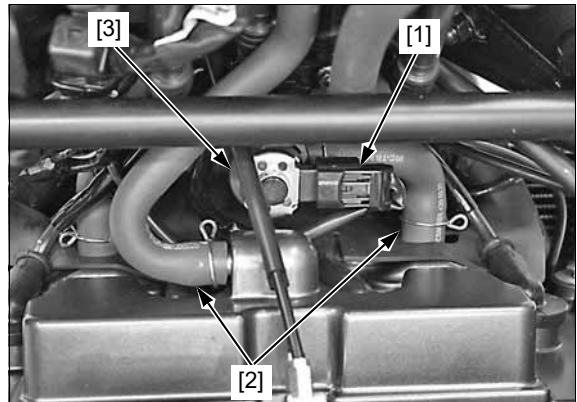


PAIR CONTROL SOLENOID VALVE REMOVAL/INSTALLATION

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

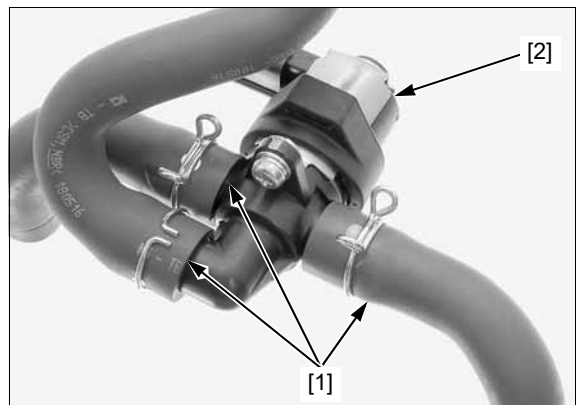
Disconnect the PAIR control solenoid valve 2P (Black) connector [1].

Disconnect the air supply hoses [2] from the cylinder head cover and remove the PAIR control solenoid valve assembly [3].



Disconnect the air supply hoses [1] from the PAIR control solenoid valve [2].

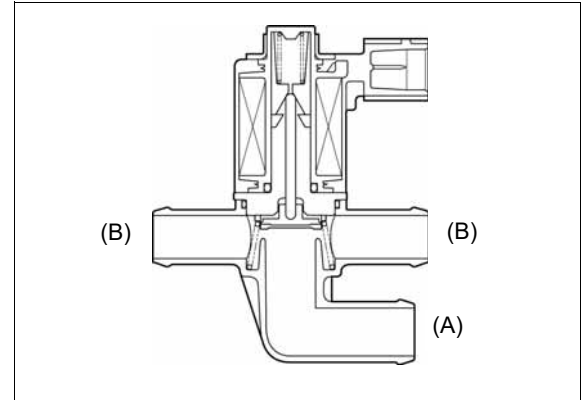
Installation is in the reverse order of removal.



PAIR CONTROL SOLENOID VALVE INSPECTION

Remove the PAIR control solenoid valve (page 7-20).

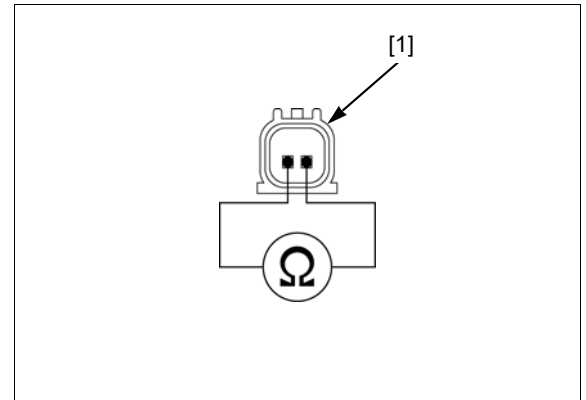
Check that air flows (A) to (B) when the 12 V battery is connected to the PAIR control solenoid valve terminals. Air should not flow (A) to (B) when the battery is disconnected.



Measure the resistance between the 2P connector [1] terminals of the PAIR control solenoid valve.

STANDARD: 23 – 27 Ω (20°C/68°F)

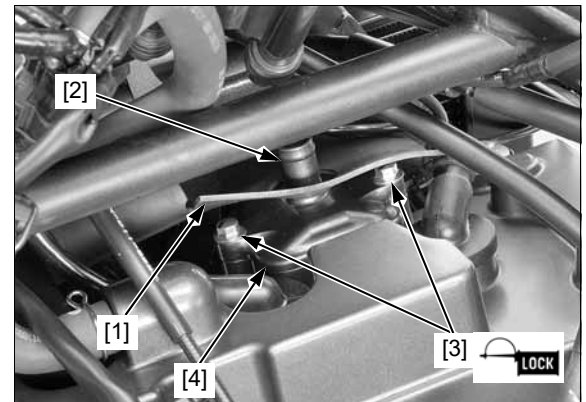
If the resistance is out of the specification, replace the PAIR control solenoid valve.



PAIR CHECK VALVE REMOVAL/ INSTALLATION

Pull off the heat guard rubber [1] from the check valve cover joint [2].

Remove the two bolts [3] and check valve cover [4].



Remove the PAIR check valves [1] and baffle plates [2].

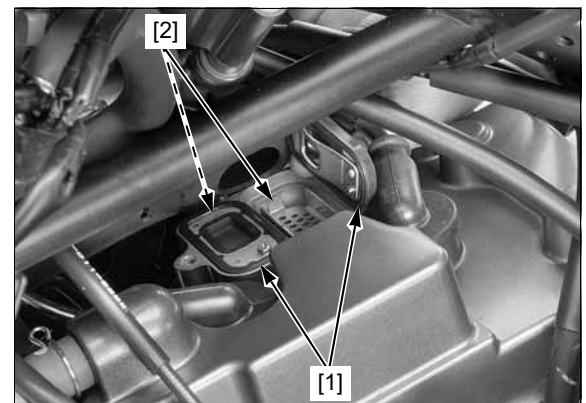
Installation is in the reverse order of removal.

NOTE:

- Apply locking agent to the threads of the PAIR check valve cover bolt (page 1-17).

TORQUE:

PAIR check valve cover bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

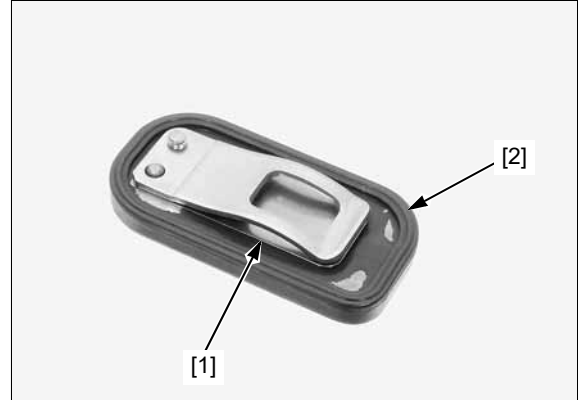


PAIR CHECK VALVE INSPECTION

Remove the PAIR check valves (page 7-21).

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 (Except MA, IIMA, IN, U, IIU models)

REMOVAL/INSTALLATION

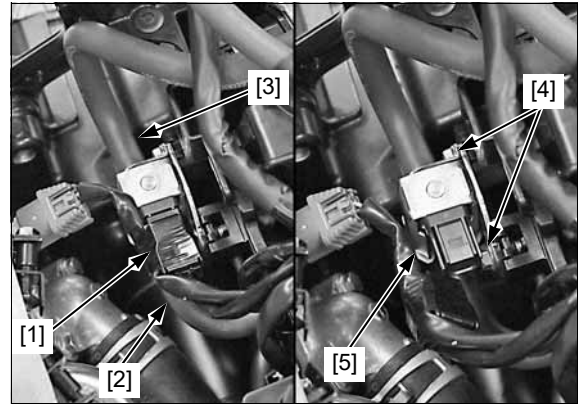
Remove the throttle body (page 7-13).

Disconnect the following:

- EVAP purge control solenoid valve 2P (Black) connector [1]
- Canister-to-EVAP purge control solenoid valve hose [2]
- EVAP vacuum hose [3]

Remove the two bolts [4] and EVAP purge control solenoid valve [5].

Installation is in the reverse order of removal.



INSPECTION

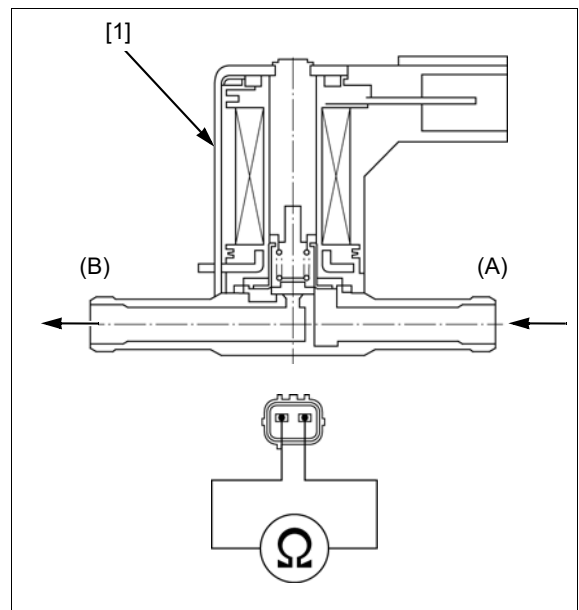
Remove the EVAP purge control solenoid valve [1] (page 7-22).

Check that air flows (A) to (B) when the 12 V battery is connected to the EVAP purge control solenoid valve terminals. Air should not flow (A) to (B) when the battery is disconnected.

Check the resistance between the terminals of the EVAP purge control solenoid valve.

STANDARD: 30 – 34 Ω (20°C/68°F)

If the resistance is out of specification, replace the EVAP purge control solenoid valve.

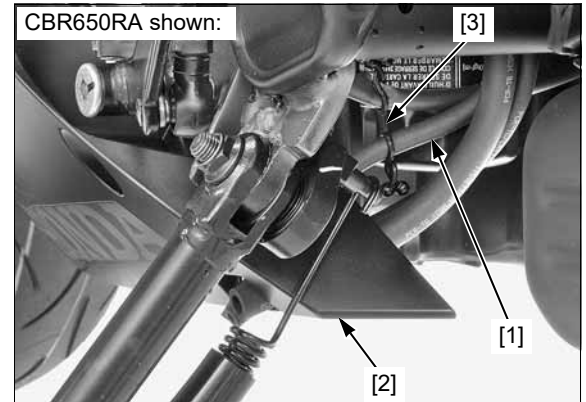


EVAP CANISTER (Except MA, IIMA, IN, U, IIU models)

REMOVAL/INSTALLATION

CBR650RA: Release the EVAP canister drain hose [1] from under cowl [2] and harness clip [3].

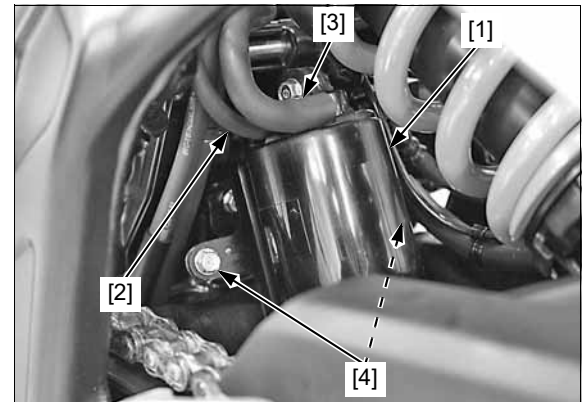
CB650RA: Release the EVAP canister drain hose from hose clamp and harness clip.



Disconnect the following from the EVAP canister [1]:

- Fuel tank-to-EVAP canister hose [2]
- Canister-to-EVAP purge control solenoid valve hose [3]

Remove the two mounting bolts [4] and EVAP canister.



Remove the heat guard [1] by releasing the tabs [2] from the grooves of the rubber mount [3].

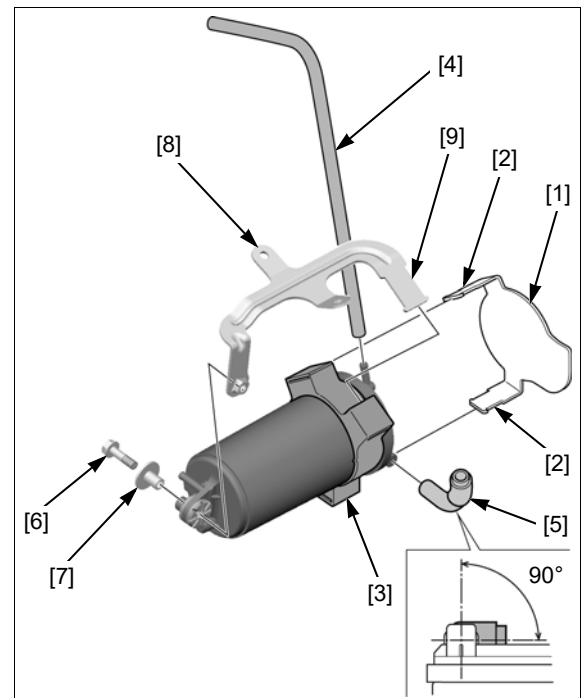
Disconnect the following:

- EVAP canister drain hose [4]
- EVAP canister breather hose [5]

Remove the bolt [6] and collar [7].

Remove the EVAP canister stay [8] by releasing the tab [9] from the groove of the rubber mount.

Installation is in the reverse order of removal.



MEMO

8. COOLING SYSTEM

SERVICE INFORMATION.....	8-2	RADIATOR/COOLING FAN	8-7
TROUBLESHOOTING	8-2	RADIATOR RESERVE TANK.....	8-9
SYSTEM FLOW PATTERN.....	8-3	WATER PUMP	8-10
SYSTEM TESTING.....	8-4	WATER HOSE JOINT B.....	8-11
COOLANT REPLACEMENT	8-4	THERMOSTAT CASE ASSEMBLY	8-12
THERMOSTAT	8-6		

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

ED, IIED, IIIED, IVED, KO, IIKO, U, IIU, BR, IIBR models:

- *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.*

TH, IITH, IN, FO, IIFO, MA, IIMA models:

- *Use only genuine Honda PRE-MIX COOLANT containing corrosion inhibitors, specifically recommended for aluminium engines when adding or replacing the coolant. Genuine Honda PRE-MIX COOLANT is excellent at preventing corrosion and overheating. The effects last for up to 2 years.*
- *The coolant should be inspected and replaced properly by following the maintenance schedule.*
- *Use any genuine Honda PRE-MIX COOLANT without diluting with water.*
- *DO NOT use non-ethylene glycol coolant, tap water, nor mineral water when adding or replacing the coolant. Use of improper coolant may cause damage, such as corrosion in the engine, blockage of the cooling passage or the radiator and premature wear of the water pump seal.*
- Add cooling system at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- For coolant temperature gauge/ECT sensor inspection (page 21-11).
- For fan control relay inspection (page 21-24).

TROUBLESHOOTING

Engine temperature too high

- Faulty coolant temperature gauge or ECT sensor (page 21-11)
- 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 21-24)
- Faulty water pump

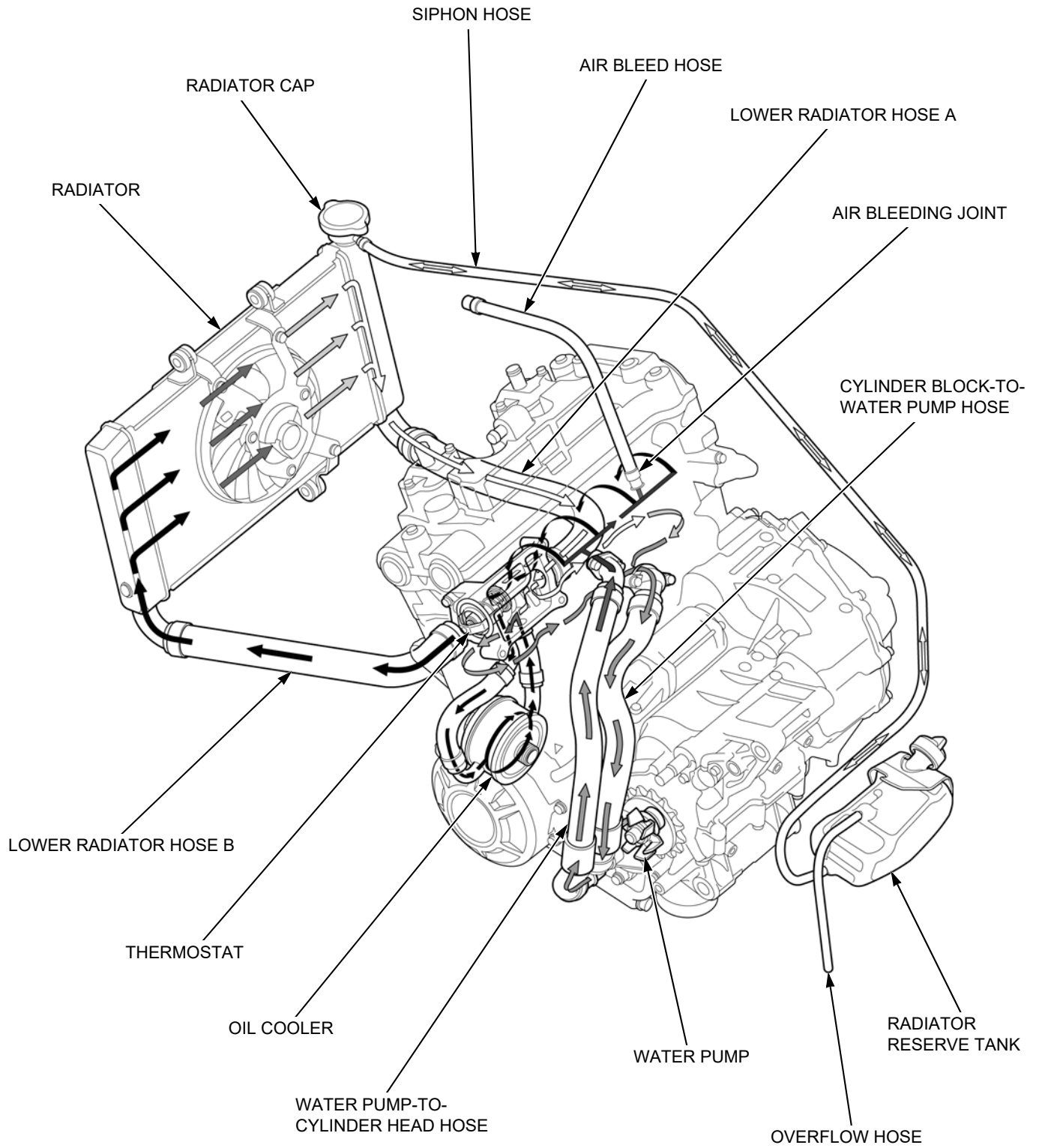
Engine temperature too low

- Faulty coolant temperature gauge or ECT sensor (page 21-11)
- 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

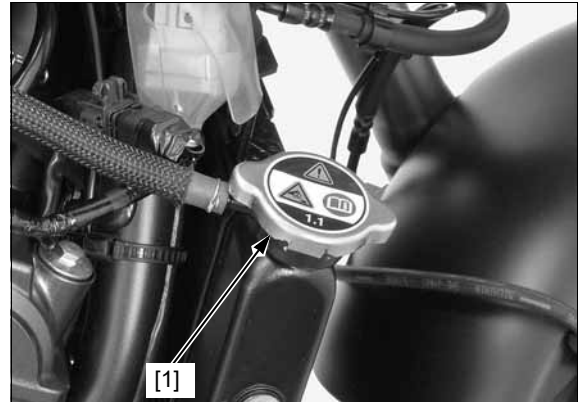


SYSTEM TESTING

RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Remove the following:

- Right middle cowl (page 2-7) (CBR650RA)
- Right shroud (page 2-10) (CB650RA)
- 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.

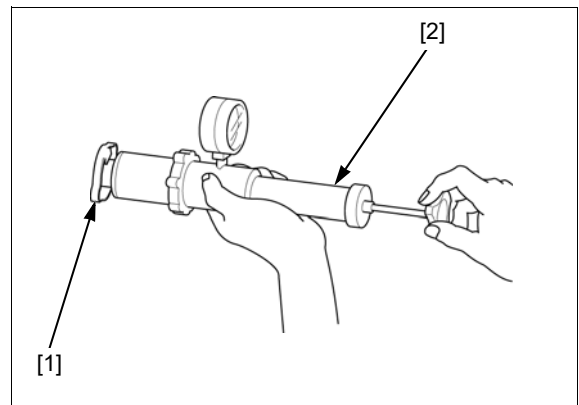
The cap must hold the specified pressure for at least 6 seconds.

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

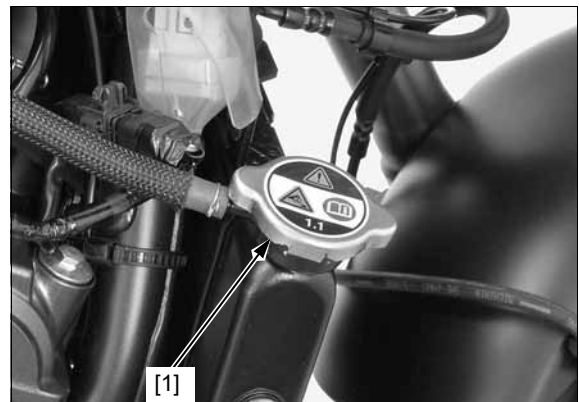
REPLACEMENT/AIR BLEEDING

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 following:

- Under cowl (page 2-11) (CBR650RA)
- Intake air duct (page 2-8) (CBR650RA)
- Shroud (page 2-10) (CB650RA)
- Radiator cap [1]



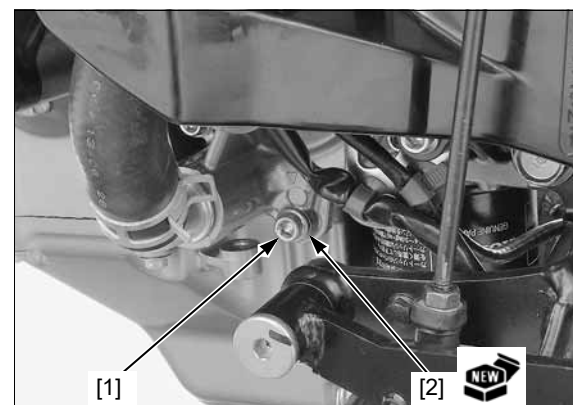
Remove the water pump drain bolt [1] and sealing washer [2], then drain the coolant.

Reinstall the drain bolt with new sealing washer.

Tighten the drain bolt to the specified torque.

TORQUE:

Water pump drain bolt:
13 N·m (1.3 kgf·m, 10 lbf·ft)

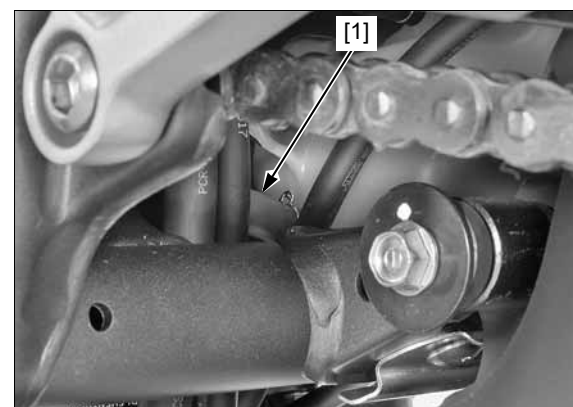


Disconnect the siphon hose [1] from the radiator reserve tank.

Empty the coolant and rinse the inside of the reserve tank with water.

Connect the siphon hose onto the radiator reserve tank.

Fill the reserve tank with the recommended coolant (page 3-13).



COOLING SYSTEM

Remove the air bleed hose plug [1] from the air bleed hose.

Fill the system with the recommended coolant through the filler opening up to the filler neck [2].

RECOMMENDED ANTIFREEZE:

ED, IIED, IIIED, IVED, KO, IIKO, U, IIU, BR, IIBR models:

High quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors (Mix the distilled water and antifreeze in the ratio of 1:1)

TH, IITH, IN, FO, IIFO, MA, IIMA models:

HONDA PRE-MIX COOLANT or equivalent

Bleed air from the system as follow:

1. Shift the transmission into neutral and place the vehicle on the sidestand.
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 recommended coolant up to the filler neck.
4. Install the radiator cap.
Install the air bleed hose plug and tighten the band screw.
5. Check the coolant level in the reserve tank (page 3-13).

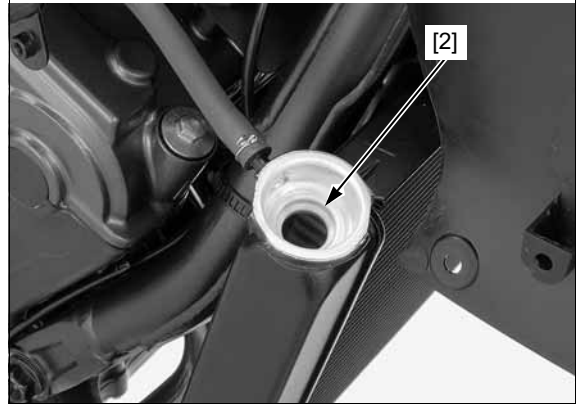
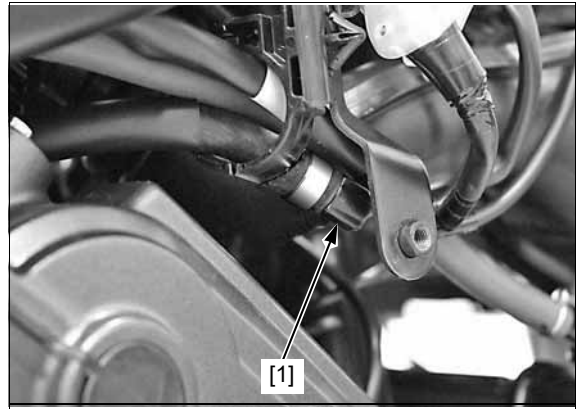
NOTE:

- When air bleeding is insufficient, level of coolant in the reserve tank will decrease.

Check that there are no coolant leaks.

Install the following:

- Under cowl (page 2-11) (CBR650RA)
- Intake air duct (page 2-8) (CBR650RA)
- Shroud (page 2-10) (CB650RA)



THERMOSTAT

REMOVAL/INSTALLATION

Drain the coolant (page 8-4).

Remove the bolts [1] and thermostat cover [2].

Remove the thermostat [3] from the thermostat housing.

Installation is in the reverse order of removal.

TORQUE:

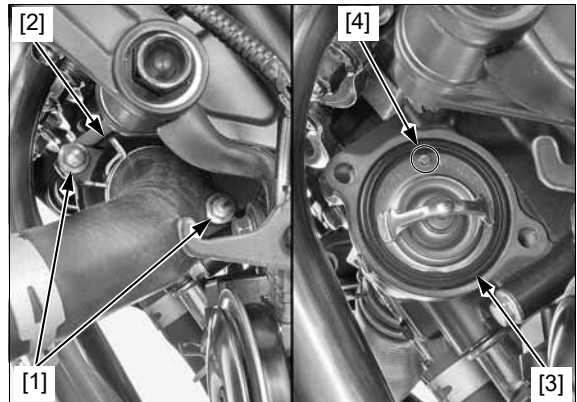
Thermostat cover bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:

- Install the thermostat with the air bleed hole [4] facing up.

Fill and bleed the cooling system (page 8-4).

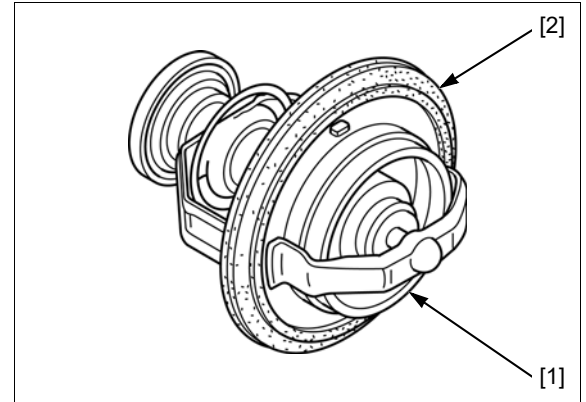


INSPECTION

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.

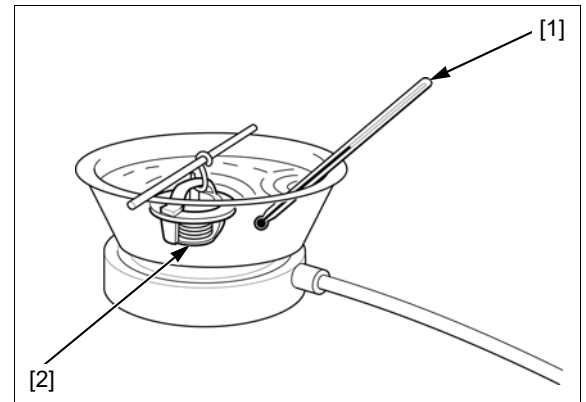
Heat the water with an electric heating element to operating temperature for 5 minutes.

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

PULL DOWN THE RADIATOR

- Perform this procedure, before removing the following:
 - Radiator (page 8-8)
 - Exhaust pipe/muffler (page 2-17)
 - Front wheel speed sensor (page 19-23)

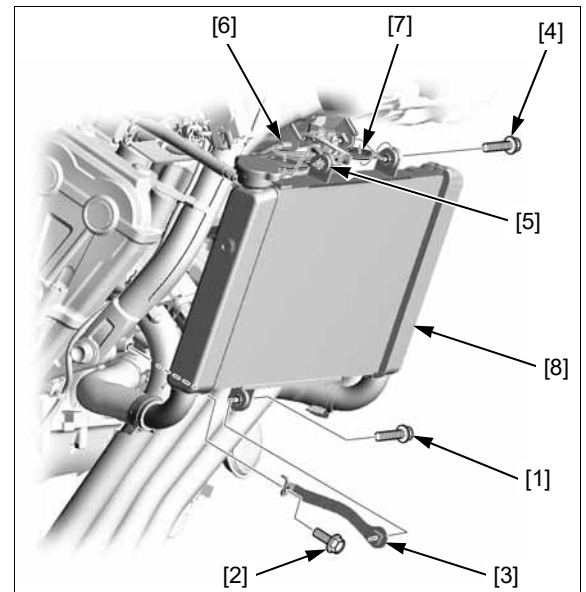
Remove the following:

- Middle cowl (page 2-7) (CBR650RA)
- Under cowl (page 2-11) (CBR650RA)
- Shroud (page 2-10) (CB650RA)
- Radiator lower mounting bolt [1]
- Radiator lower stay mounting bolt [2]
- Radiator lower stay [3]

Remove the radiator upper mounting bolt [4] and release the radiator mounting rubber [5] from the boss [6] of the frame.

Pull off the heat guard rubber [7] and pull down the radiator [8].

Installation is in the reverse order of removal.



COOLING SYSTEM

REMOVAL/INSTALLATION

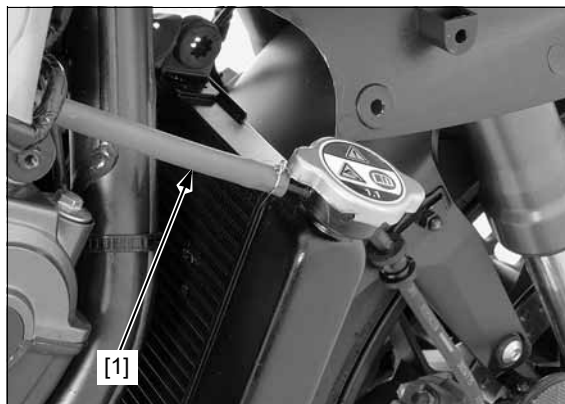
Drain the coolant (page 8-4).

Pull down the radiator (page 8-7).

Disconnect the fan motor 2P (Black) connector [1].



Disconnect the siphon hose [1].



Disconnect lower radiator hose A [1] and lower hose B [2], then remove the radiator.

Installation is in the reverse order of removal.

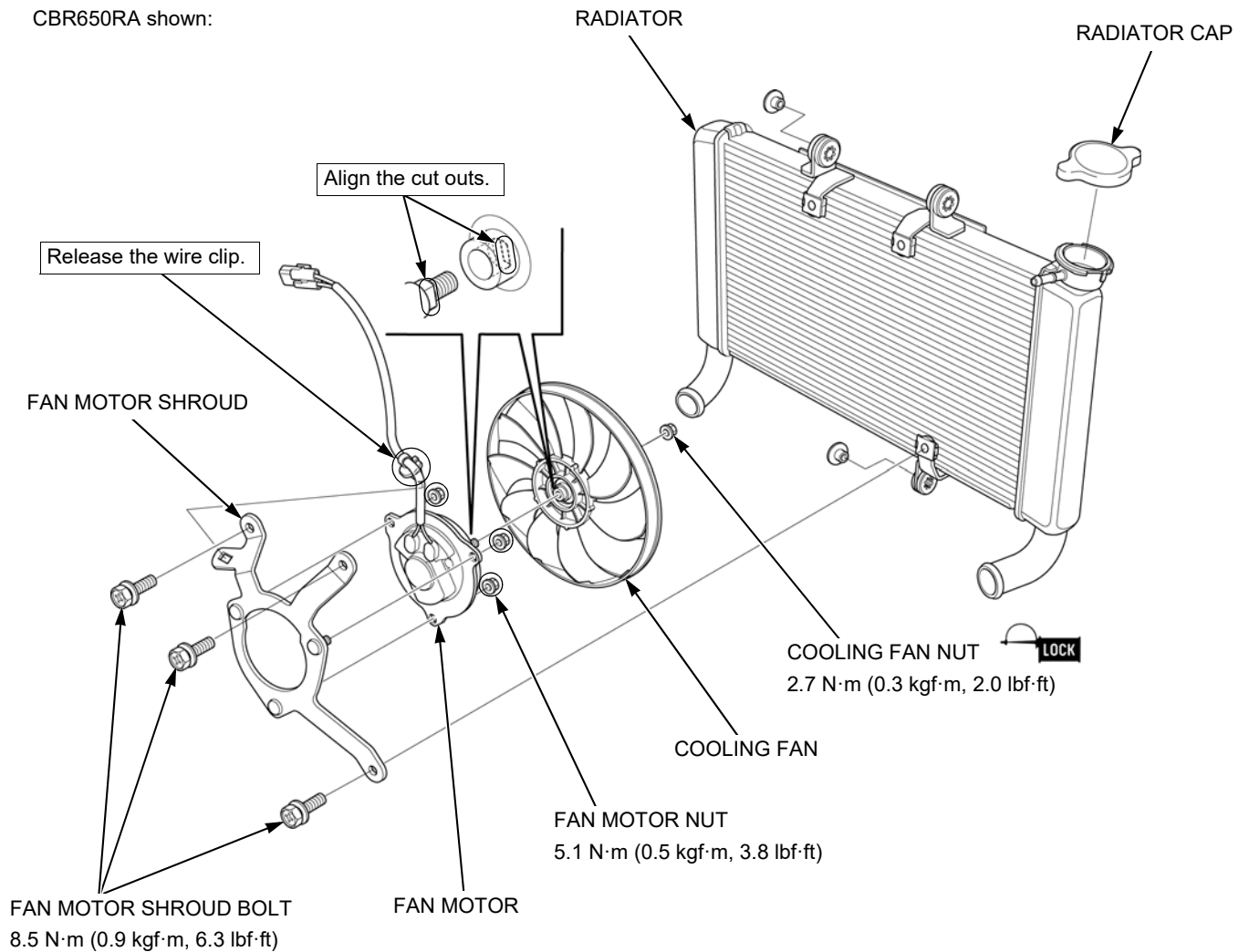
Fill and bleed the cooling system (page 8-4).



DISASSEMBLY/ASSEMBLY

Disassemble and assemble the radiator as following illustration.

CBR650RA shown:



RADIATOR RESERVE TANK

REMOVAL/INSTALLATION

Remove the exhaust pipe/muffler (page 2-17).

Remove the radiator reserve tank cap [1].

Remove the reserve tank stay mounting bolt [2] and release the boss [3] of the reserve tank [4] from the frame.

Disconnect the siphon hose [5] and drain the coolant.

Remove the reserve tank by pulling the overflow hose [6] out from the frame.

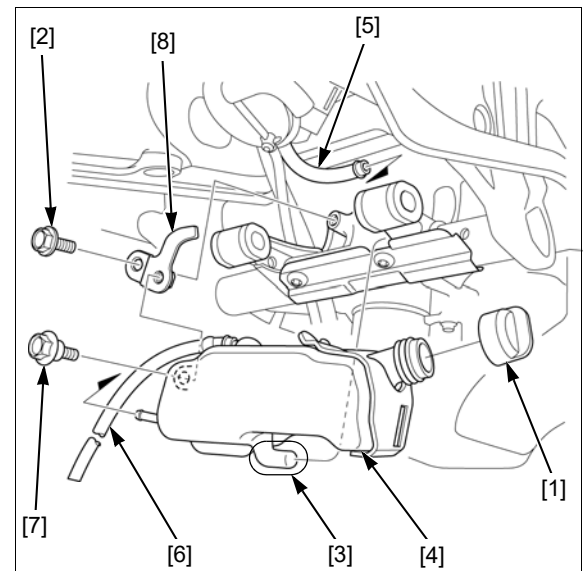
Remove the radiator reserve tank mounting bolt [7] and stay [8].

Installation is in the reverse order of removal.

TORQUE:

**Radiator reserve tank mounting bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)**

Fill the reserve tank with the recommended coolant (page 3-13).



WATER PUMP

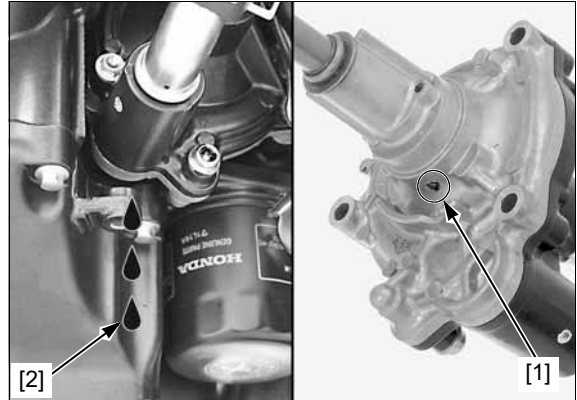
MECHANICAL SEAL INSPECTION

Remove the under cowl (page 2-11) (CBR650RA).

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 [2] from the bleed hole while operating the engine.

Replace the water pump body 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 8-4).

Remove the drive sprocket cover (page 2-15).

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

Disconnect the following from the water pump cover:

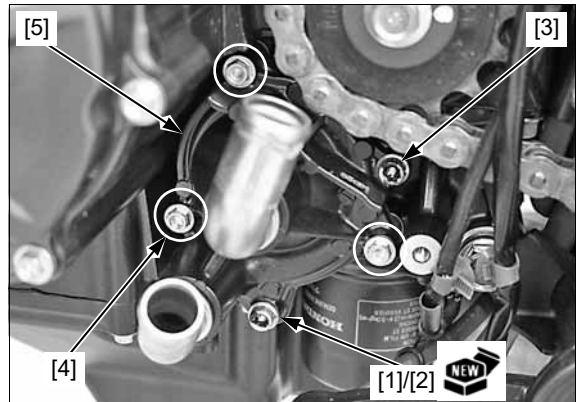
- Cylinder block-to-water pump hose [1]
- Water pump-to-cylinder head hose [2]



Remove the water pump drain bolt [1] and sealing washer [2].

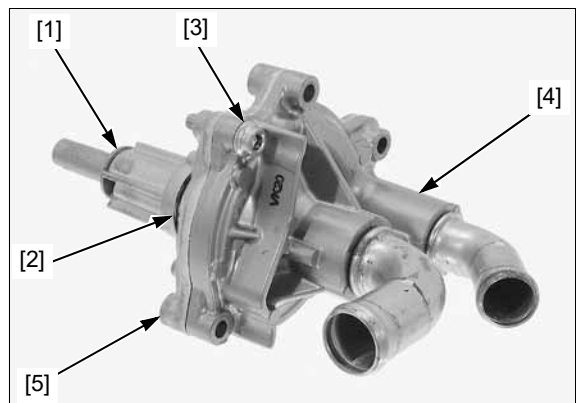
Loosen the cover bolt [3].

Remove the three mounting bolts [4] and water pump assembly [5].



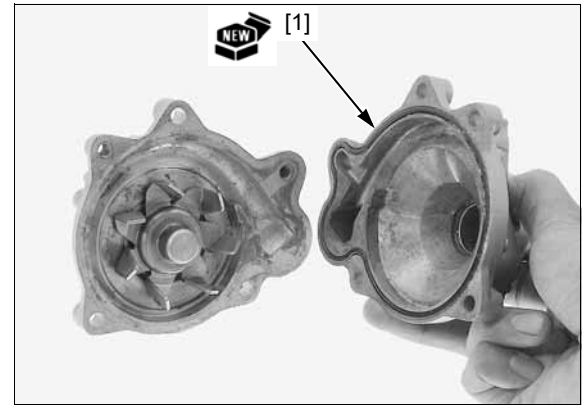
Remove the thrust washer [1] and O-ring [2].

Remove the cover bolt [3], then separate the water pump cover [4] and water pump body [5].



Remove the O-ring [1] from the water pump cover groove and replace it a new one.

- Do not apply engine oil to the cover O-ring.



Installation is in the reverse order of removal.

TORQUE:

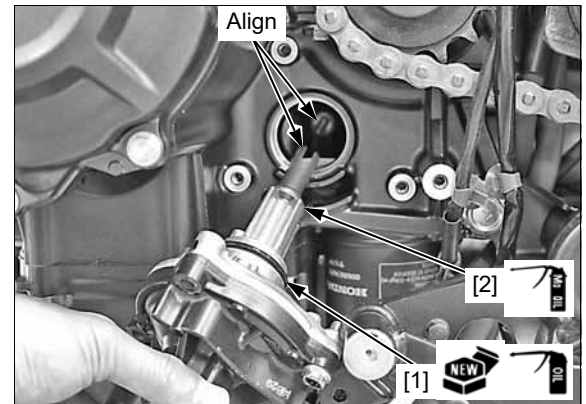
Water pump mounting bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

Water pump cover bolt:
13 N·m (1.3 kgf·m, 10 lbf·ft)

Water pump drain bolt:
13 N·m (1.3 kgf·m, 10 lbf·ft)

NOTE:

- Do not disassemble the water pump body.
- Replace the O-rings and sealing washer with new ones.
- Apply engine oil to the water pump body O-ring [1].
- Apply Molybdenum oil solution to the water pump shaft thrust washer [2] sliding area.
- 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 8-4).

WATER HOSE JOINT B

REMOVAL/INSTALLATION

Drain the coolant (page 8-4).

Remove the throttle body (page 7-13).

Remove the bolts [1].

Remove the water hose joint B [2] from the cylinder block-to-water pump hose [3]

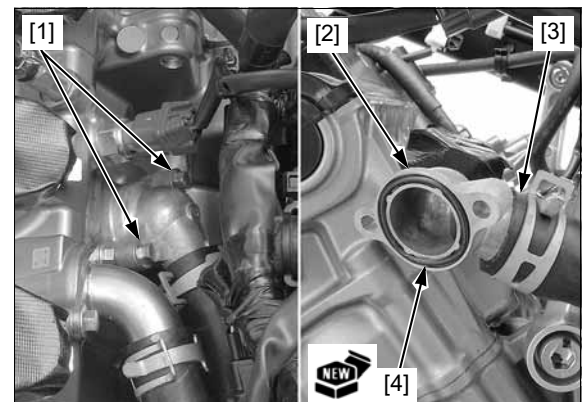
Remove the O-ring [4].

Installation is in the reverse order of removal.

NOTE:

- Replace the O-ring with a new one.
- Do not apply engine oil to the O-ring.

Fill and bleed the cooling system (page 8-4).



THERMOSTAT CASE ASSEMBLY

REMOVAL/INSTALLATION

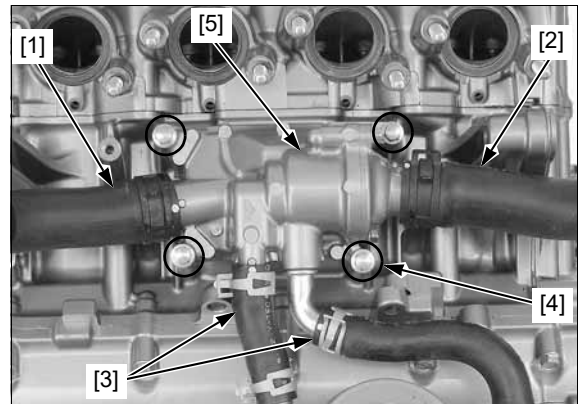
Remove the following:

- Radiator (page 8-8)
- Exhaust pipe/muffler (page 2-18)

Disconnect the following from the thermostat case joint:

- Lower radiator hose A [1]
- Lower radiator hose B [2]
- Oil cooler water hoses [3]

Remove the four bolts [4] and thermostat case assembly [5].



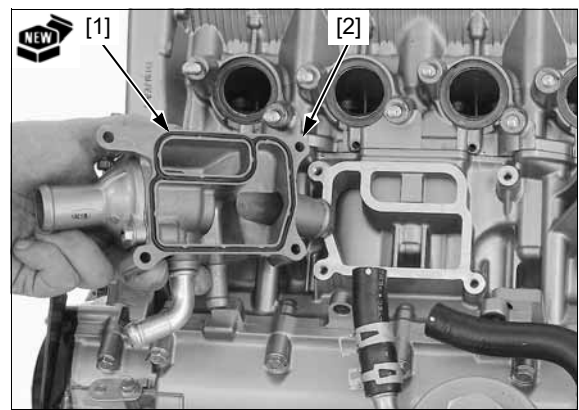
Remove the O-ring [1] from the thermostat case assembly [2].

Installation is in the reverse order of removal.

NOTE:

- Replace the O-ring with a new one.
- Do not apply engine oil to the O-ring.

Fill and bleed the cooling system (page 8-4).



9. LUBRICATION SYSTEM

SERVICE INFORMATION.....	9-2	OIL PUMP	9-4
TROUBLESHOOTING	9-2	PRESSURE RELIEF VALVE	9-6
LUBRICATION SYSTEM DIAGRAM.....	9-3	OIL STRAINER.....	9-6
OIL PRESSURE INSPECTION	9-4	OIL COOLER	9-8

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 21-12).

TROUBLESHOOTING

Oil level too low

- Oil consumption
- External oil leak
- Worn piston rings (page 14-14)
- Improperly installed piston rings (page 14-14)
- Worn cylinders (page 14-14)
- Worn stem seals (page 10-12)
- Worn valve guide (page 10-13)

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

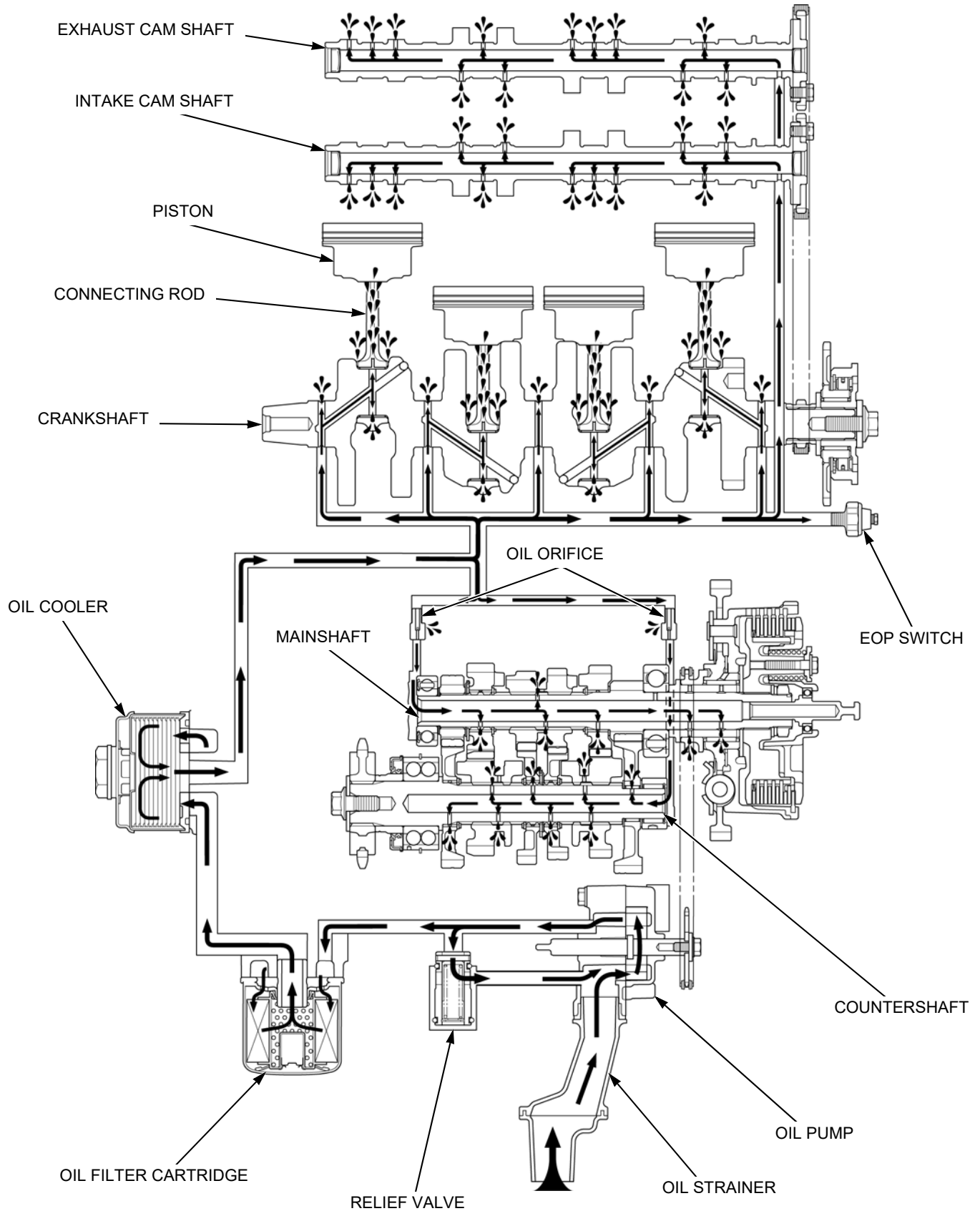
- Oil or filter not changed often enough
- Worn piston rings (page 14-14)

Oil emulsification

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

LUBRICATION SYSTEM DIAGRAM

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models shown:



LUBRICATION SYSTEM

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 21-12).

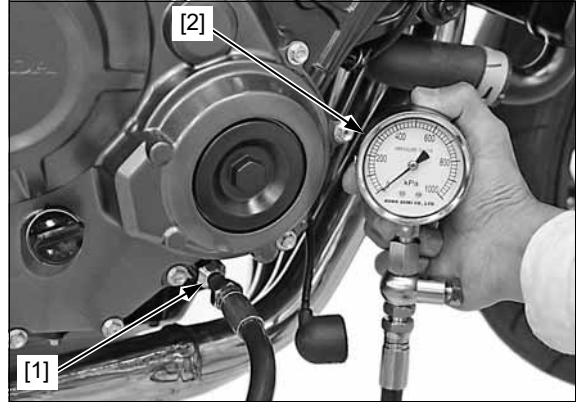
Remove the EOP switch (page 21-13).

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	07506-300001 or equivalent commercially available
Oil pressure gauge attachment	07406-003000 or equivalent commercially available



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).

STANDARD:

**490 kPa (5.0 kgf/cm², 71 psi)
at 5000 min⁻¹ (rpm)/80°C (176°F)**

Stop the engine and remove the tools.

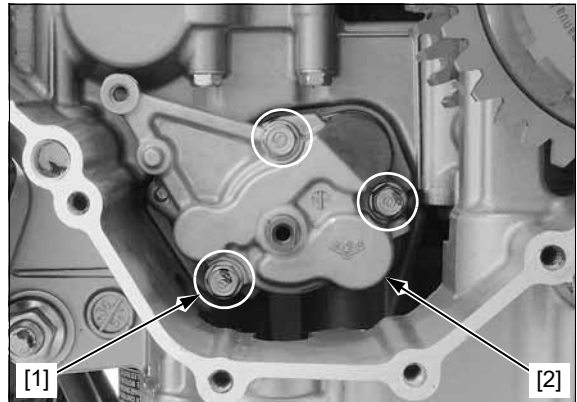
Install the EOP switch (page 21-13).

OIL PUMP

REMOVAL/INSTALLATION

Remove the clutch (page 11-6).

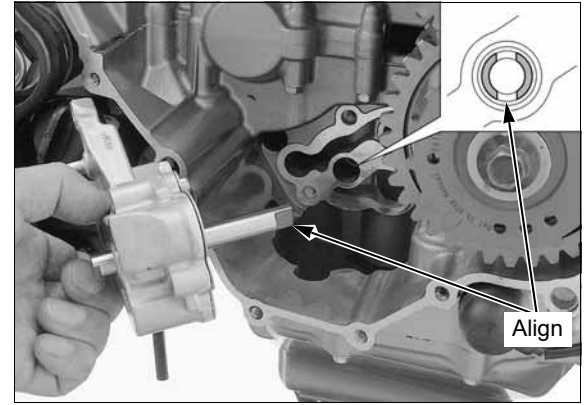
Remove the bolts [1] and oil pump [2].



Installation is in the reverse order of removal.

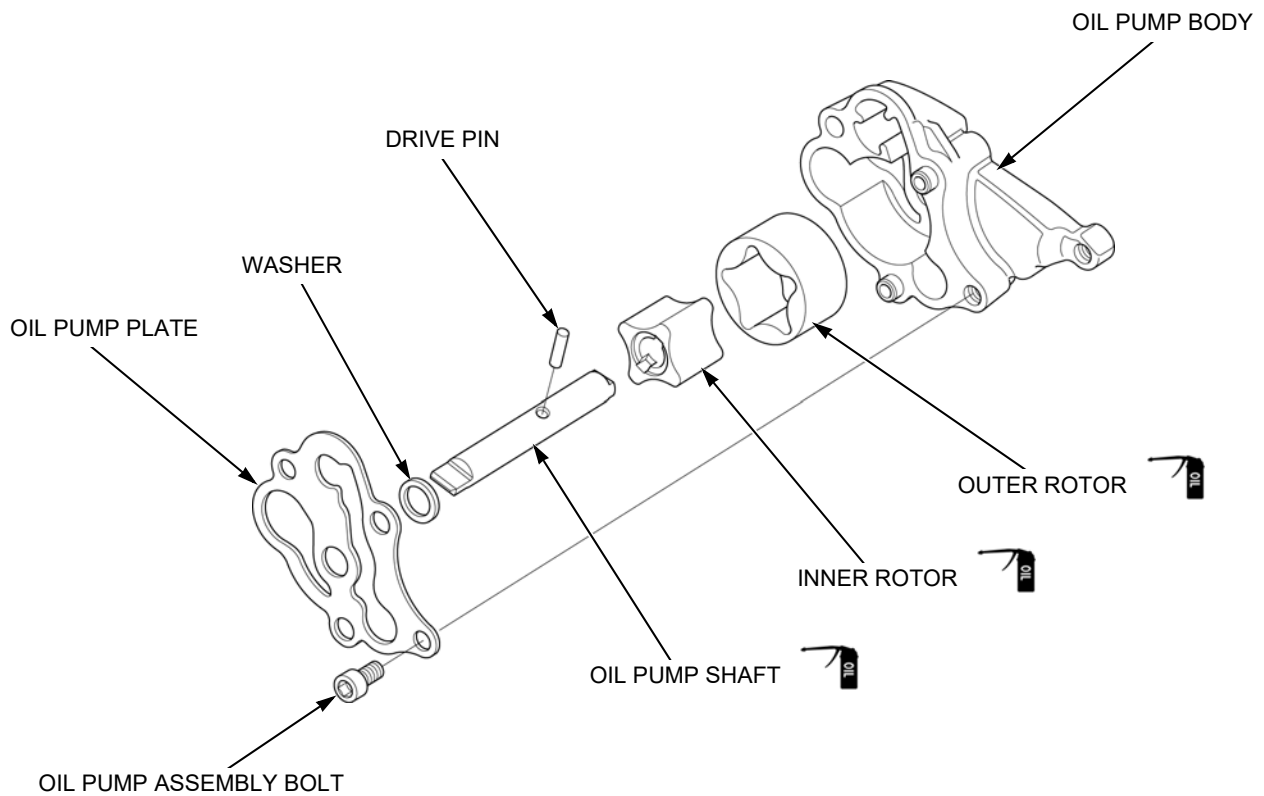
NOTE:

- 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 11-9).

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 1-8).

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 9-4).

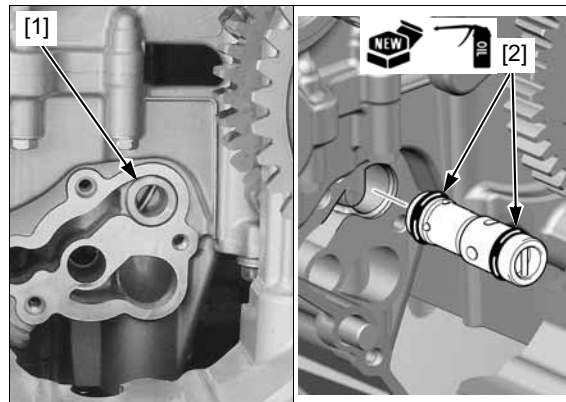
Remove the oil pressure relief valve [1] and O-rings [2].

Apply engine oil to a new O-rings.

Install the O-rings to the oil pressure relief valve grooves.

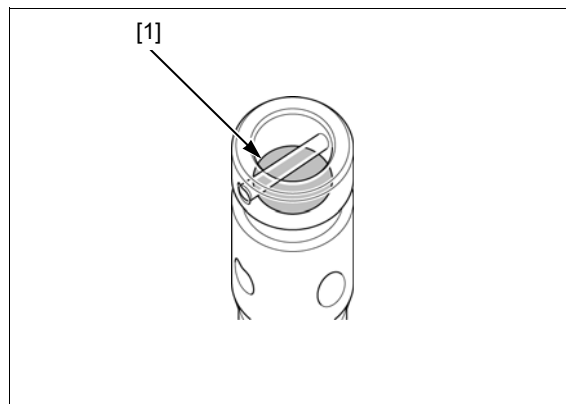
Install the oil pressure relief valve into the crankcase.

Install the oil pump (page 9-4).



INSPECTION

Check the operation of the pressure relief valve by pushing on the piston [1].



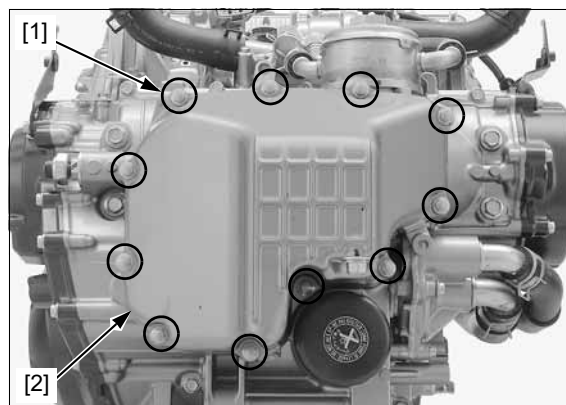
OIL STRAINER

REMOVAL

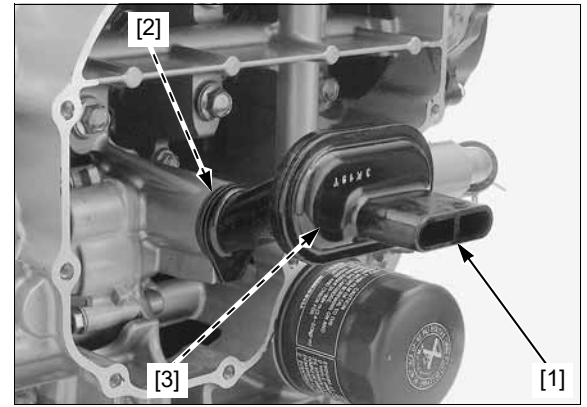
Drain the engine oil (page 3-11).

Remove the exhaust pipe/muffler (page 2-17).

Loosen the bolts [1] in a crisscross pattern in 2 or 3 steps and remove the bolts, oil pan [2].



Remove the oil strainer [1] and seal ring [2].
Clean the oil strainer screen [3] and check for damage.



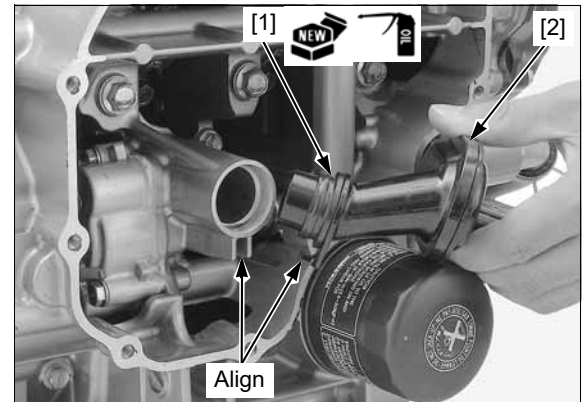
INSTALLATION

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].

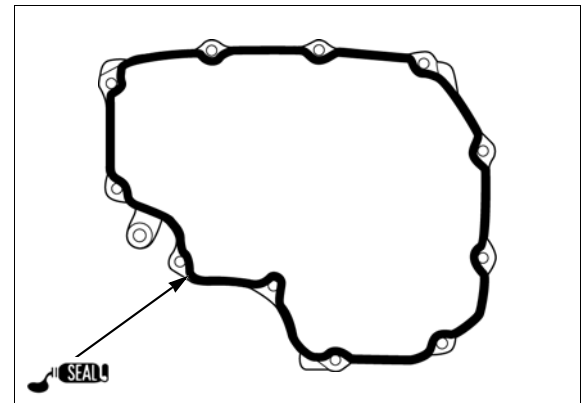
Install the oil strainer into the crankcase while aligning the oil strainer boss with the crankcase groove.



Clean the oil pan mating surface thoroughly.

Apply liquid sealant (TB1207B manufactured by Three Bond or equivalent) to the oil pan mating surface as shown.

- Do not apply more liquid sealant than necessary.

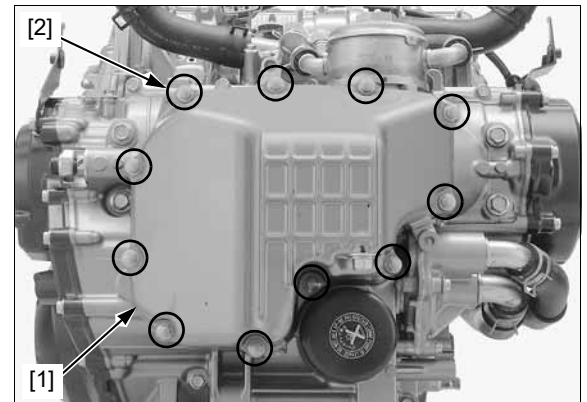


Install the oil pan [1] and bolts [2] to the crankcase.

Tighten the bolts in a crisscross pattern in 2 or 3 steps.

Install the exhaust pipe/muffler (page 2-17).

Fill the engine with the recommended engine oil and check that there are no oil leaks (page 3-10).



OIL COOLER

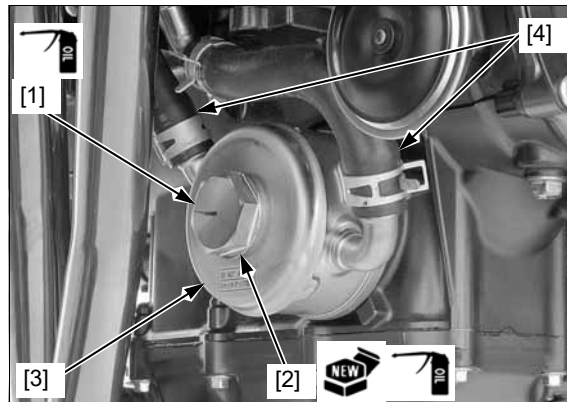
REMOVAL/INSTALLATION

Drain the engine oil (page 3-11).

Drain the coolant from the system (page 8-4).

Remove the bolt [1], sealing washer [2] and oil cooler [3].

Disconnect the oil cooler water hoses [4] from the oil cooler.



Remove the O-ring [1] from the oil cooler.

Installation is in the reverse order of removal.

- Apply engine oil to a new O-ring.
- Align the oil cooler groove with the crankcase boss.
- Apply engine oil to the oil cooler bolt threads and a new sealing washer seating surface.

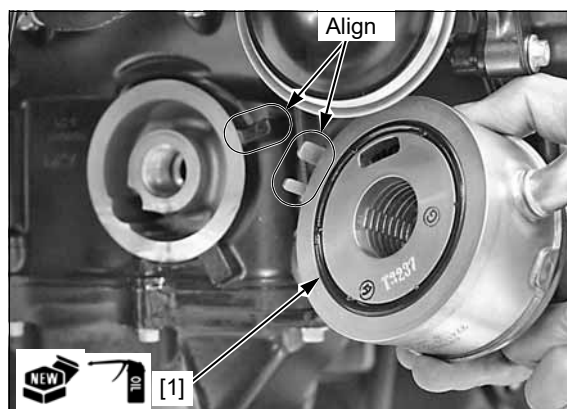
TORQUE:

Oil cooler bolt: 59 N·m (6.0 kgf·m, 44 lbf·ft)

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

Fill the cooling system and bleed any air (page 8-4).

Check that there is no oil leaks.



10. CYLINDER HEAD/VALVES

SERVICE INFORMATION.....	10-2	CYLINDER HEAD COVER.....	10-4
TROUBLESHOOTING	10-2	CAMSHAFT	10-5
COMPONENT LOCATION	10-3	CYLINDER HEAD	10-11
CYLINDER COMPRESSION TEST.....	10-4	CAM CHAIN TENSIONER LIFTER.....	10-20

SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves and camshafts.
- All the services covered in this section can be done with the engine installed in the frame.
- 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 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.

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)

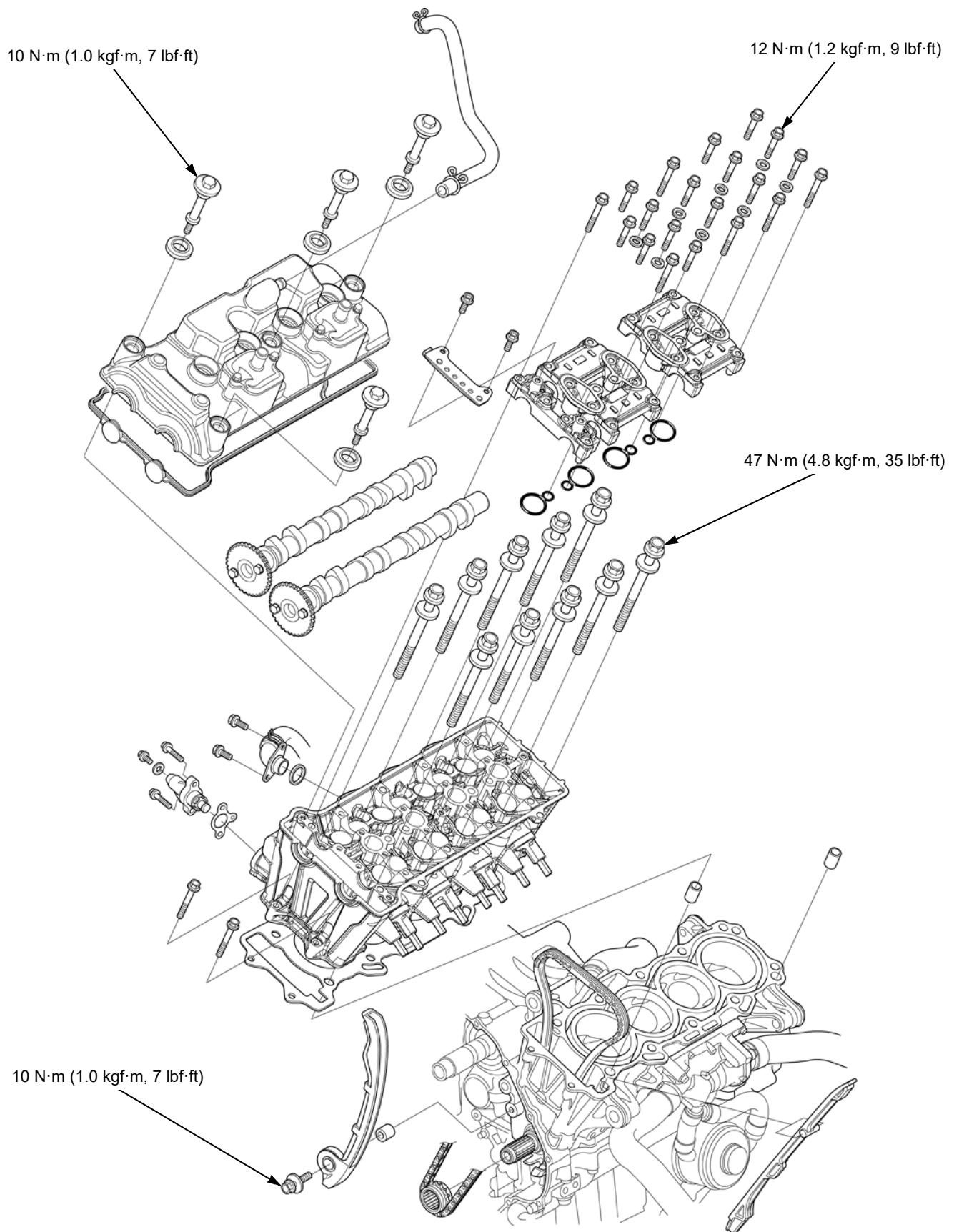
Excessive noise

- Cylinder head:
 - Incorrect valve clearance adjustment
 - Sticking valve or broken valve spring
 - Damaged or worn camshaft
 - 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).

Install a compression gauge [1] into the spark plug hole.

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:

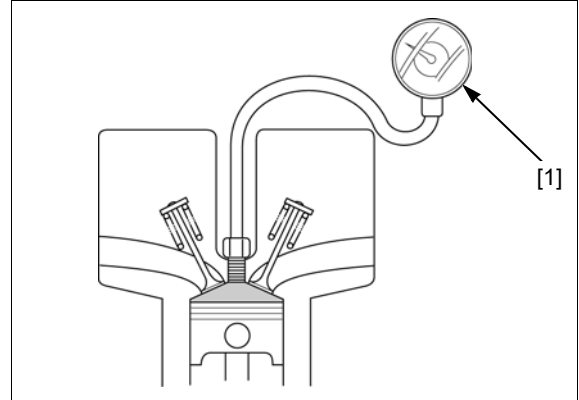
1,491 kPa (15.2 kgf/cm², 216 psi) at 300 min⁻¹ (rpm)

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:

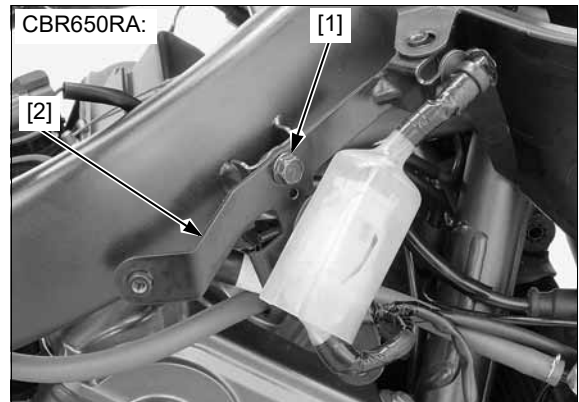
- The cylinder head cover can be serviced with the engine installed in the frame.

Disconnect the spark plug caps from the spark plugs (page 3-6).

Remove the following:

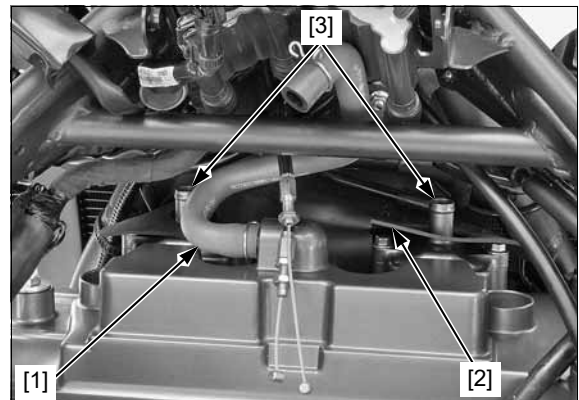
- Throttle body (page 7-13)
- PAIR control solenoid valve assembly (page 7-20)

CBR650RA: Remove the bolt [1] and right middle cowl stay [2].



Disconnect the crankcase breather hose [1] from the cylinder head cover.

Pull off the heat guard rubber [2] from the PAIR check valve cover joints [3].

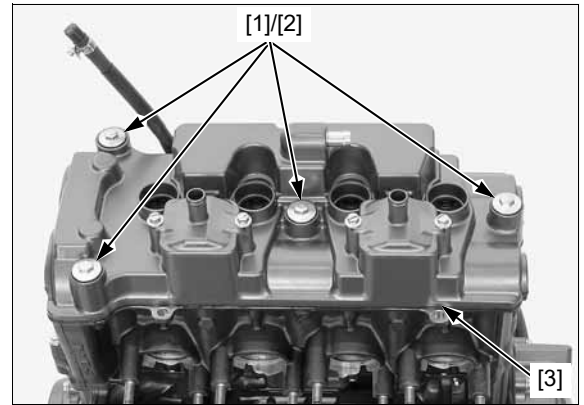


Remove the cylinder head cover bolts [1] and mounting rubbers [2].

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.

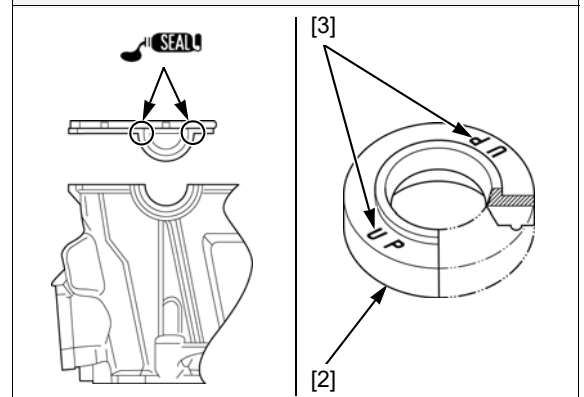
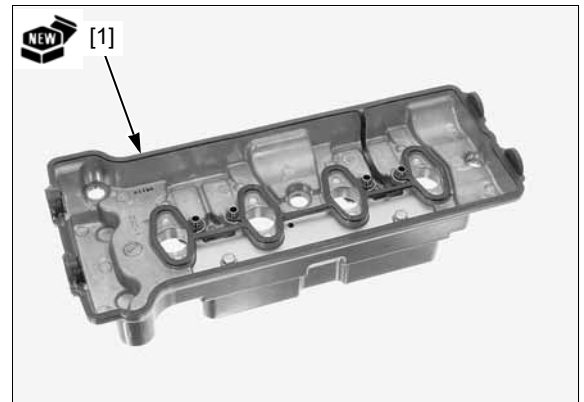
TORQUE:

Cylinder head cover bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)

NOTE:

- Replace the cylinder head cover packing with a new one.
- Install the cylinder head cover packing into the groove in the cylinder head cover.
- Apply sealant (TB5211C manufactured by ThreeBond, KE45 manufactured by Shin-Etsu Silicone or an equivalent) to the cylinder head cover packing semi-circular areas as shown (8 places).
- Check the mounting rubbers [2] are in good condition, replace them if necessary.
- Install the mounting rubbers with their "UP" mark [3] facing up.

Adjust the throttle grip freeplay (page 3-4).



CAMSHAFT

REMOVAL

NOTE:

- The camshaft can be serviced with the engine installed in the frame.

Remove the cylinder head cover (page 10-4).

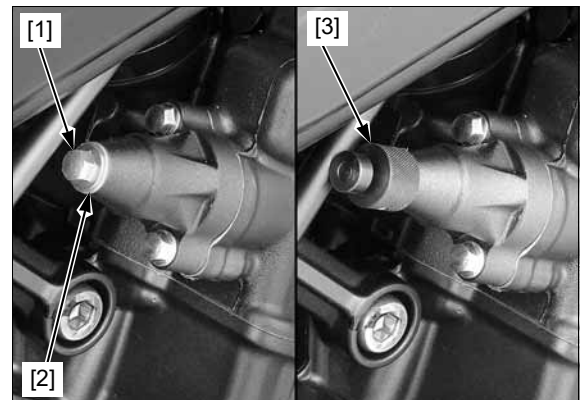
Make sure the No. 1 piston is at TDC (Top Dead Center) on the compression stroke (page 3-8).

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 stopper **070MG-0010100**



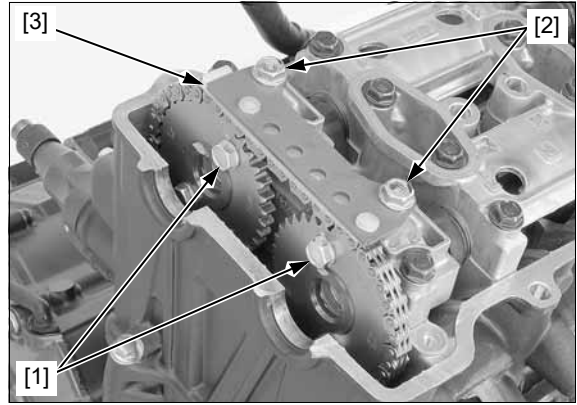
CYLINDER HEAD/VALVES

Be careful not to let the cam chain guide bolts fall into the crankcase.

If you replace the camshaft and/or cam sprocket, loosen the cam sprocket bolts [1].

- Turn the crankshaft clockwise one full turn (360°), loosen the other cam sprocket bolts, then reset the No.1 piston to the TDC (Top Dead Center) on the compression stroke (page 3-8).

Remove the bolts [2] and cam chain guide B [3].



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 and washers [2].

Remove the camshaft holders [3] with the dowel pins from the cylinder head.

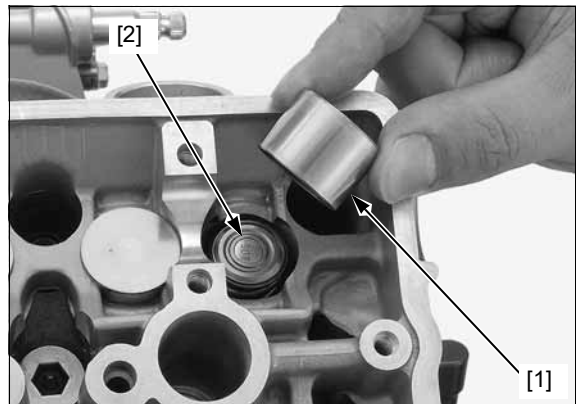
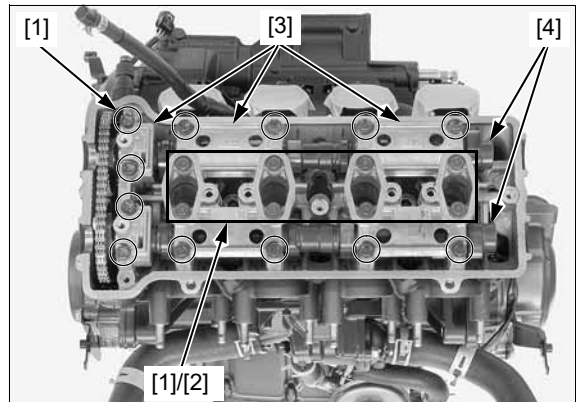
- Do not forcibly remove the dowel pins from the camshaft holders.

Remove the camshafts [4] by removing the cam chain from the cam sprockets.

- Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.

Remove the valve lifters [1] and shims [2].

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



INSPECTION

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 1-8).

Replace any part if it is out of service limit.

CAMSHAFT OIL CLEARANCE

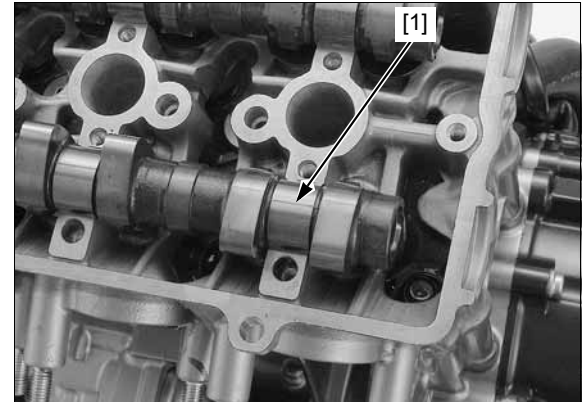
Wipe any oil from the journals of the camshaft, cylinder head and camshaft holders.

Install the camshafts onto the cylinder head.

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 holders are aligned with the holes in the cylinder head.

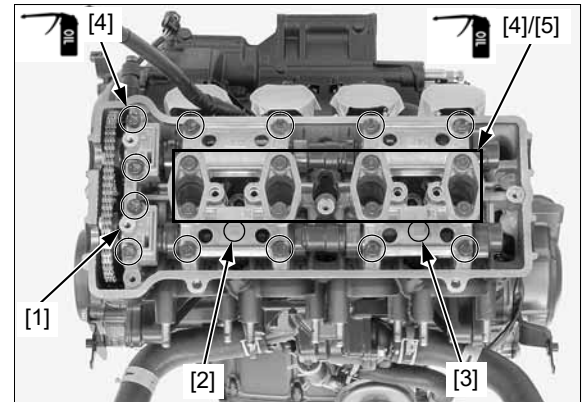
Install each camshaft holder to the correct locations with the identification marks.

- No mark: right camshaft holder [1]
- "R" mark: center camshaft holder [2]
- "L" mark: left camshaft holder [3]

Apply engine oil to the threads and seating surfaces of the camshaft holder bolts [4].

Install the holder bolts and sealing washers [5].

Finger tighten the bolts.



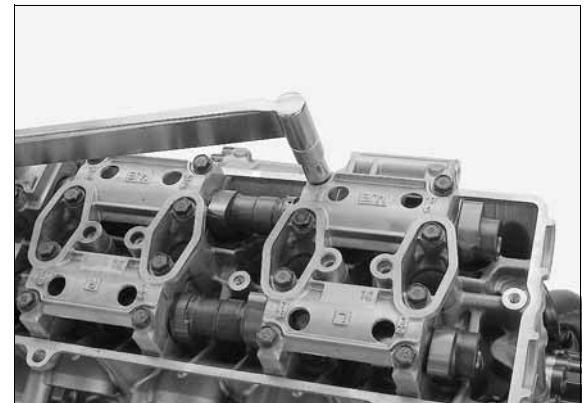
Gradually tighten the camshaft holder bolts until the camshaft holders lightly contact the cylinder head surface.

NOTICE

Failure to tighten the camshaft holder in a criss-cross pattern might cause a camshaft holder to break.

Tighten all camshaft holder bolts in the numerical order cast on the camshaft holders.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



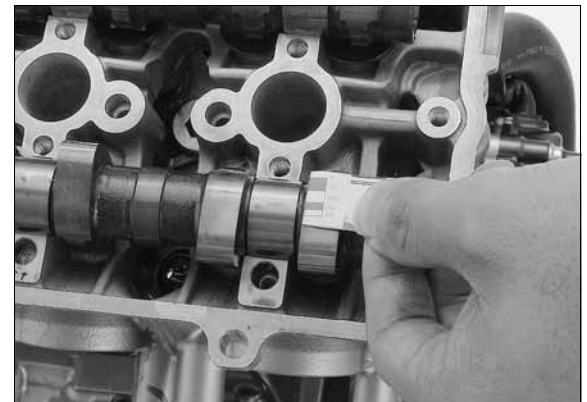
Remove the camshaft holders and measure the width of each plastigauge.

The widest thickness determines the oil clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)

When the service limits are exceeded, replace the camshaft and recheck the oil clearance.

Replace the cylinder head and camshaft holders as a set if the clearance still exceeds the service limit.



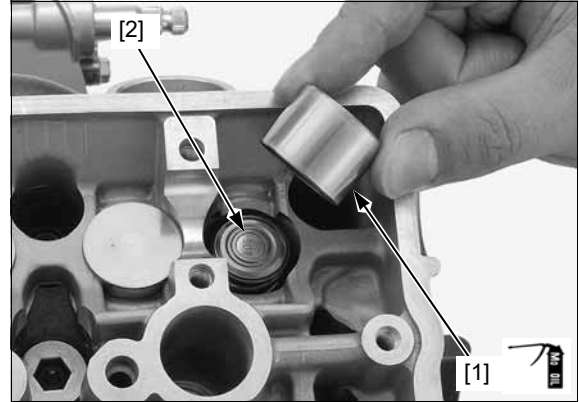
CYLINDER HEAD/VALVES

INSTALLATION

Apply molybdenum oil solution to the outer surface of each valve lifter [1].

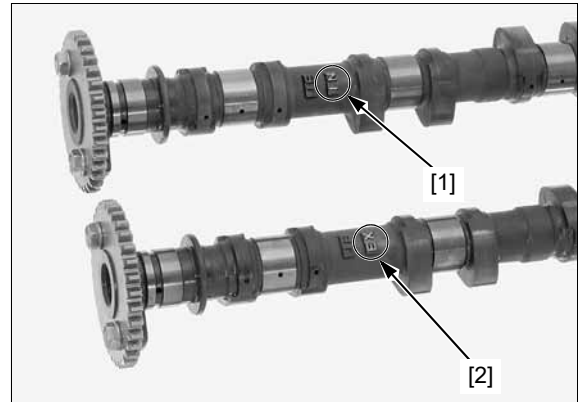
Install the shims and valve lifters in their original locations.

Install the shims [2] on the retainers and valve lifters into the valve lifter bores.



Each camshaft has an identification mark.

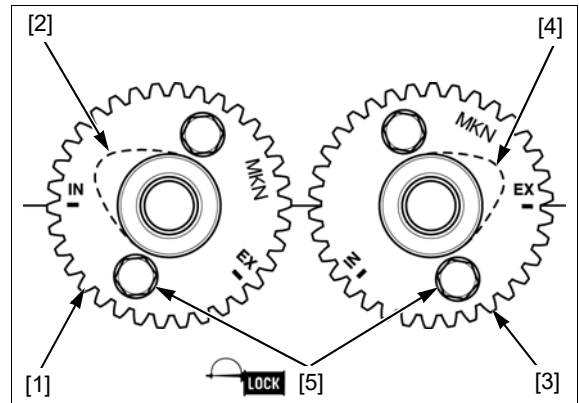
- "IN" mark [1]: Intake camshaft
- "EX" mark [2]: Exhaust camshaft



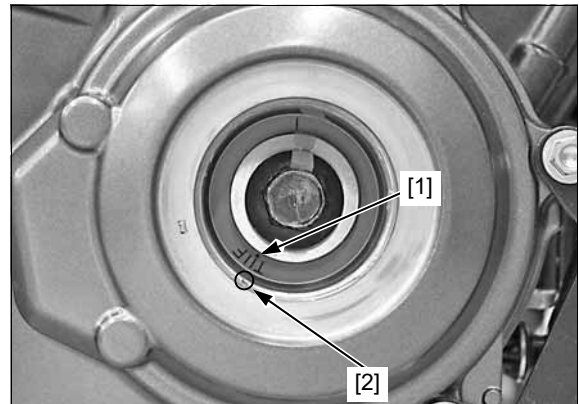
If the cam sprockets are removed, install the cam sprockets onto the camshafts.

- Install the intake cam sprocket [1] with the timing mark (IN) facing outward and the No.1 cam lobes [2] facing up and out as shown.
- Install the exhaust cam sprocket [3] with the timing mark (EX) facing outward and the No.1 cam lobes [4] facing up and out as shown.

Clean and apply a locking agent to the cam sprocket bolt threads (page 1-17).
Install the cam sprocket bolts [5].



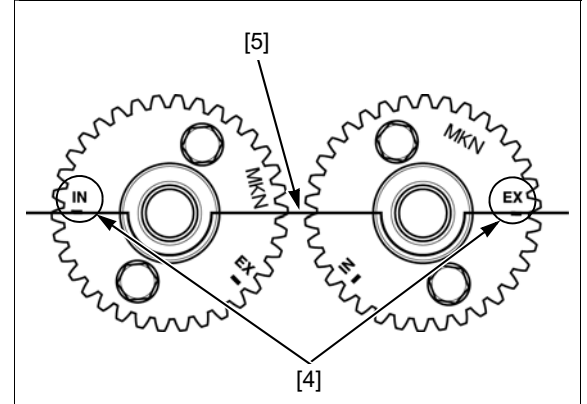
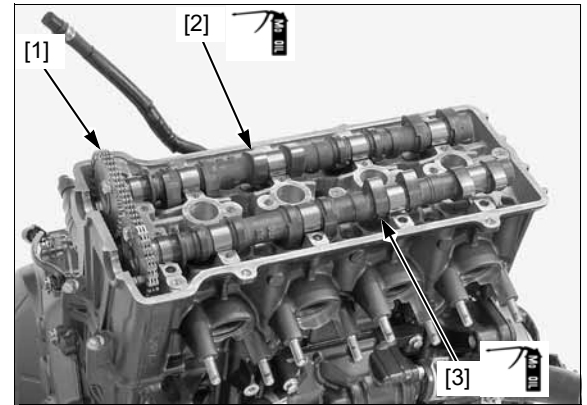
Rotate the crankshaft clockwise slowly and align the "T" mark [1] with the index notch [2] in the crankcase cover.



Apply molybdenum oil solution to the camshaft journals, lobes and thrust surfaces.

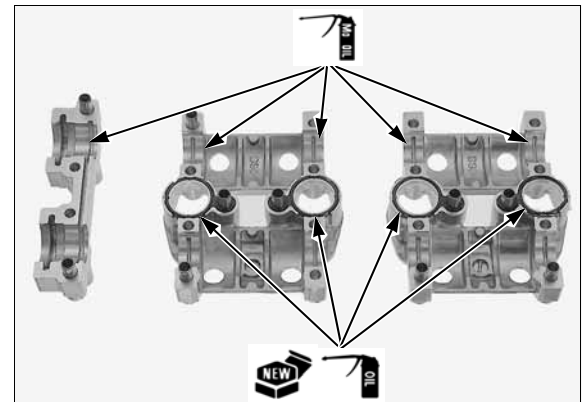
Install the cam chain [1] over the cam sprockets of the intake [2] and exhaust [3] camshafts, making sure that the timing marks [4] on the cam sprockets are flush with the top surface [5] of the cylinder head.

- Install each camshaft to the correct locations with the identification marks (page 10-8).
 "IN" mark: Intake camshaft
 "EX" mark: Exhaust camshaft



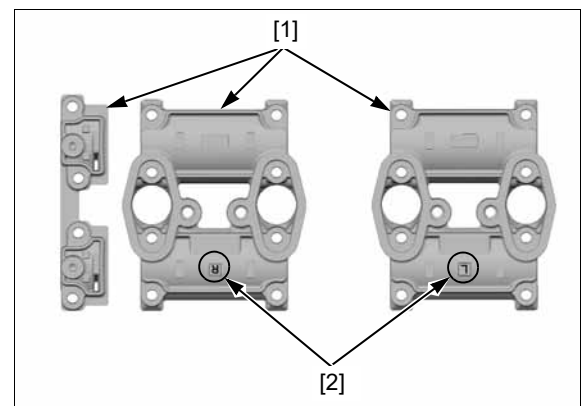
Coat new O-rings with oil and install them into the grooves in the camshaft holders.

Apply molybdenum oil solution to the camshaft journals of the camshaft holders.



Install each camshaft holder [1] to the correct locations with the identification marks [2].

- No mark: right camshaft holder
- "R" mark: center camshaft holder
- "L" mark: left camshaft holder



CYLINDER HEAD/VALVES

Apply engine oil to the camshaft holder bolt [1] threads and seating surface.

Install the camshaft holder bolts with new sealing washers [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)

Install the cam chain guide B [1].

Be careful not to let the cam chain guide bolts fall into the crankcase.

Install and tighten the cam chain guide bolts [2] securely.

If the cam sprocket was removed from the camshaft, apply a locking agent to the cam sprocket bolt [3] threads (page 1-17).

Tighten the cam sprocket bolts to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

Turn the crankshaft clockwise one full turn (360°) and tighten the other cam sprocket bolts.

Remove the tensioner stopper [1] from the cam chain tensioner lifter.

Apply 0.5 cm³ minimum of engine oil into the cam chain tensioner lifter slit.

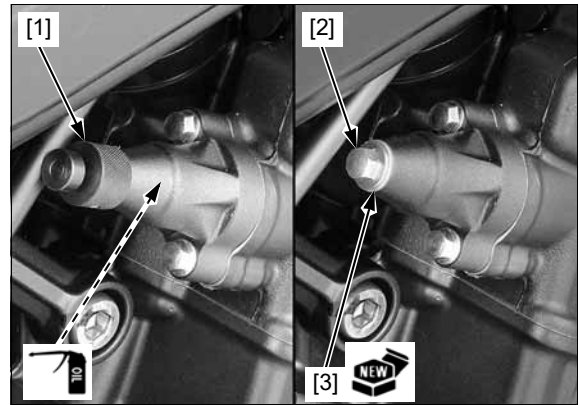
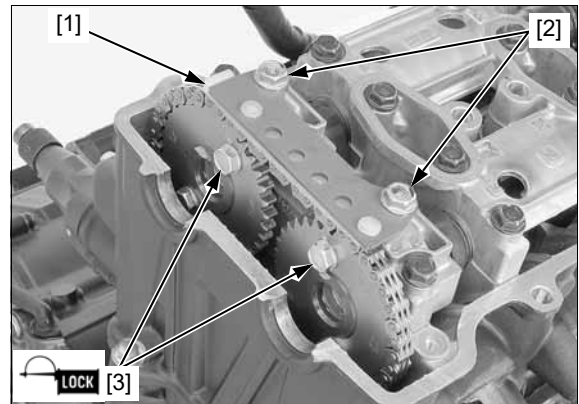
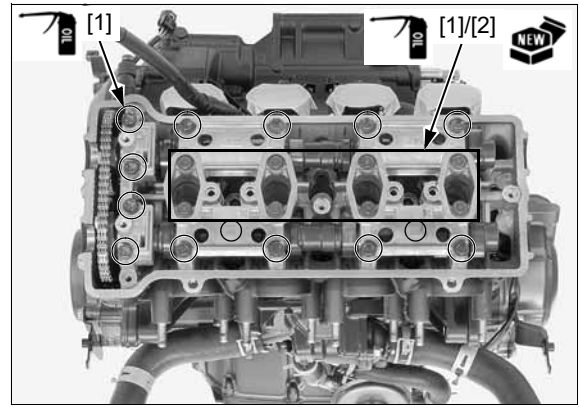
Turn the crankshaft clockwise several times, and align the "T" mark on the primary drive gear with the index notch on the right crankcase cover (page 10-8).

Recheck the valve timing.

Inspect the valve clearance (page 3-8).

Install the sealing bolt [2] with a new sealing washer [3] and tighten it securely.

Install the cylinder head cover (page 10-4).



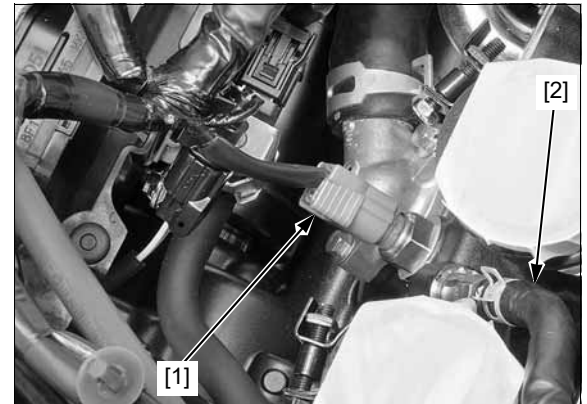
CYLINDER HEAD

REMOVAL

Remove the following:

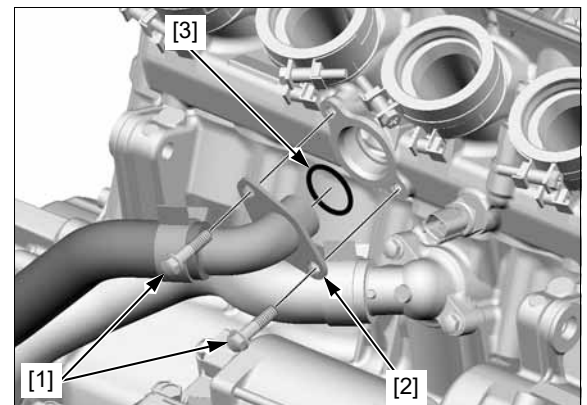
- Exhaust pipe/muffler (page 2-18)
- Throttle body (page 7-13)
- Camshaft (page 10-5)

Disconnect the ECT sensor 2P (Blue) connector [1] and bleeding hose [2].



Remove the bolts [1] and water hose joint A [2] from the cylinder head.

Remove the O-ring [3] from the water hose joint A.



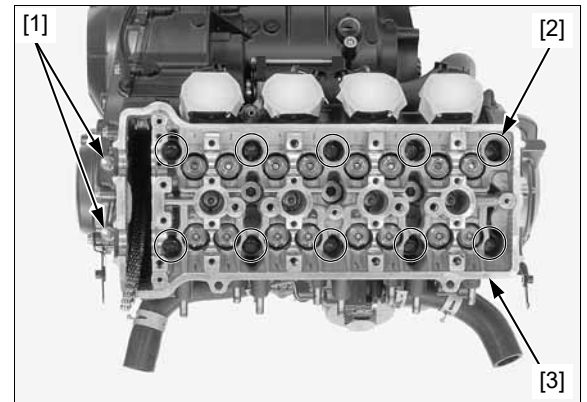
Remove the 6 mm bolts [1].

Loosen the 9 mm washer-bolts [2] in a crisscross pattern in 2 or 3 steps, then remove them.

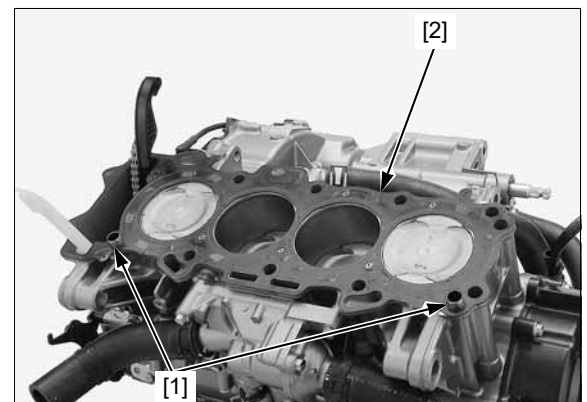
Remove the cylinder head [3].

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].



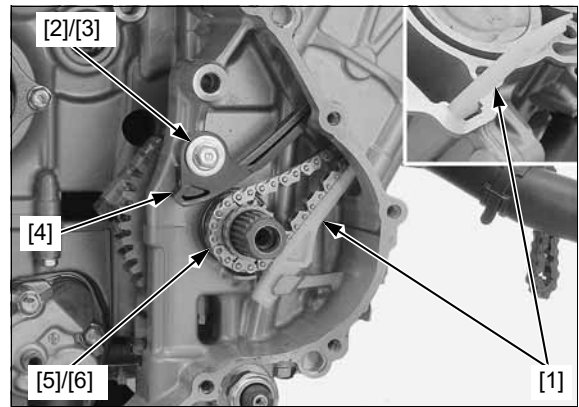
CYLINDER HEAD/VALVES

Remove the starter clutch (page 11-14).

Remove the cam chain guide A [1].

Remove the washer bolt [2], collar [3] and cam chain tensioner [4].

Remove the cam chain [5] and timing sprocket [6] from the crankshaft.

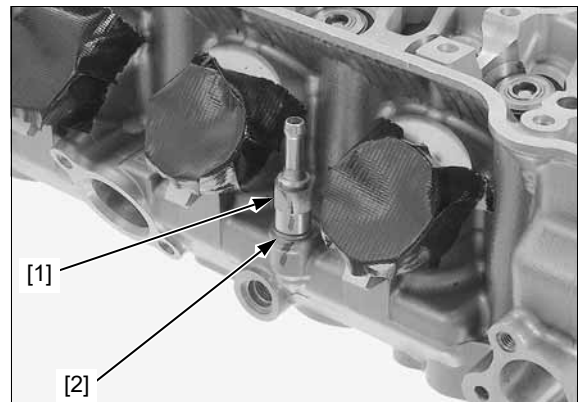


DISASSEMBLY

Remove the following:

- Insulator (page 7-16)
- ECT sensor (page 4-79)
- Spark plugs (page 3-6)

Remove the air bleeding joint [1] and sealing washer [2] from the cylinder head.

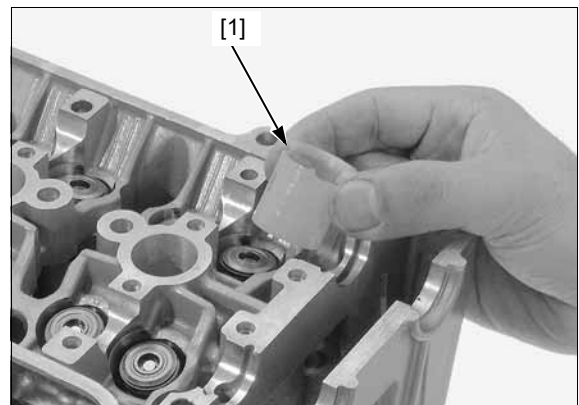


Remove the spark plugs from the cylinder head.

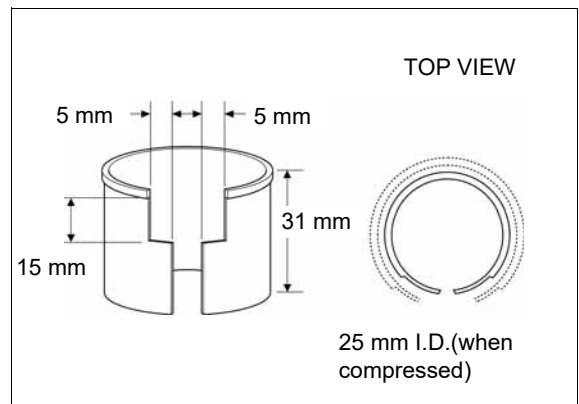
Install the tappet hole protector [1] into the valve lifter bore.

TOOL:

[1] Tappet hole protector 07HMG-MR70002



An equivalent tool can easily be made from a plastic 35 mm film container as shown.

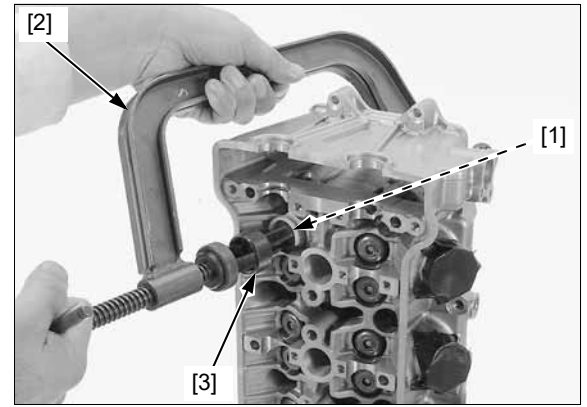


To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.

Remove the valve spring cotters [1] using the special tools as shown.

TOOLS:

- [2] Valve spring compressor** **07757-0010000**
- [3] Valve spring compressor attachment** **07959-KM30101**



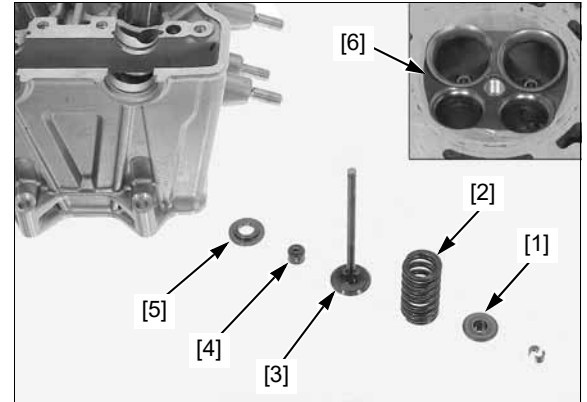
Mark all parts during disassembly so they can be placed back in their original locations.

Remove the valve spring compressor and remove the following:

- Valve spring retainers [1]
- Valve springs [2]
- Valves [3]
- Valve stem seals [4]
- Valve spring seats [5]

Avoid damaging the cylinder mating surface and valve seat surfaces.

Remove the carbon deposits from the combustion chamber [6] 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
- Valve springs
- Valves
- Valve guides
- Cam chain
- Cam chain timing sprocket
- Cam chain guide A
- Cam chain tensioner

Measure each part and clearance according to CYLINDER HEAD/VALVES SPECIFICATIONS (page 1-8).

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 10-14).
- Refer to valve seat inspection (page 10-15).

CYLINDER HEAD/VALVES

VALVE GUIDE REPLACEMENT

Disassemble the cylinder head (page 10-12).

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 07743-0020000

SPECIFIED HEIGHT:

IN/EX: 12.70 – 13.00 mm (0.500 – 0.512 in)

Let the cylinder head cool to room temperature.

Ream new valve guides after installation.

NOTE:

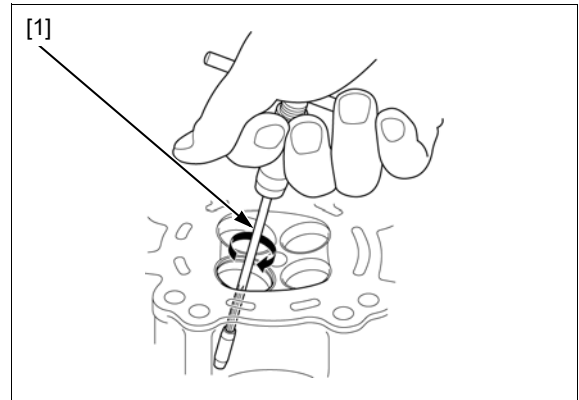
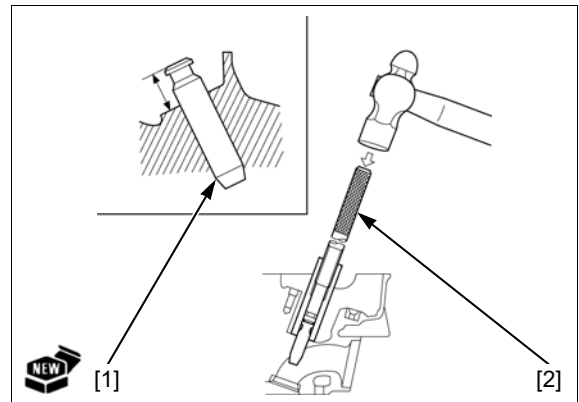
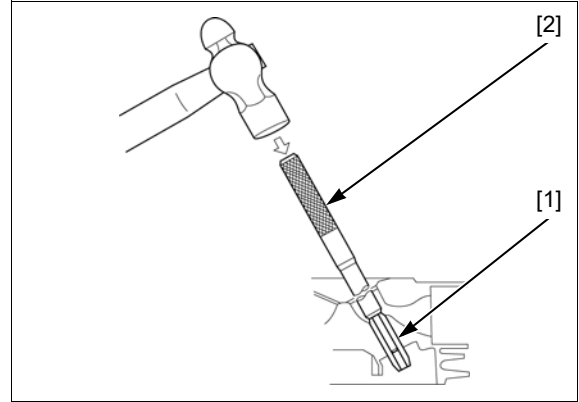
- Take care not to tilt or lean the reamer [1] in the guide while reaming.
- Use cutting oil on the reamer during this operation.

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

Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat (page 10-15).



VALVE SEAT INSPECTION/REFACING

INSPECTION

Disassemble the cylinder head (page 10-12).

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)

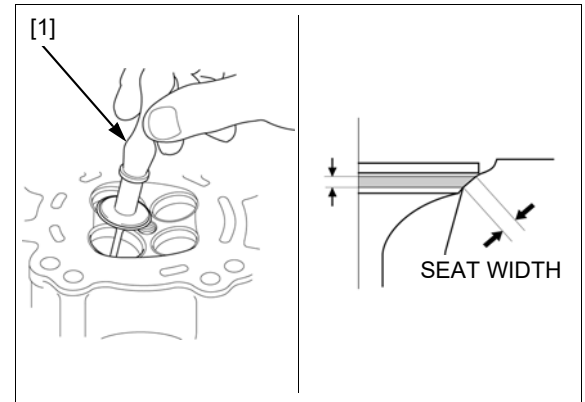
SERVICE LIMIT: 1.5 mm (0.06 in)

If the valve seat width is not within specification, reface the valve seat (page 10-15).

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

VALVE SEAT WIDTH:

0.90 – 1.10 mm (0.035 – 0.043 in)

NOTE:

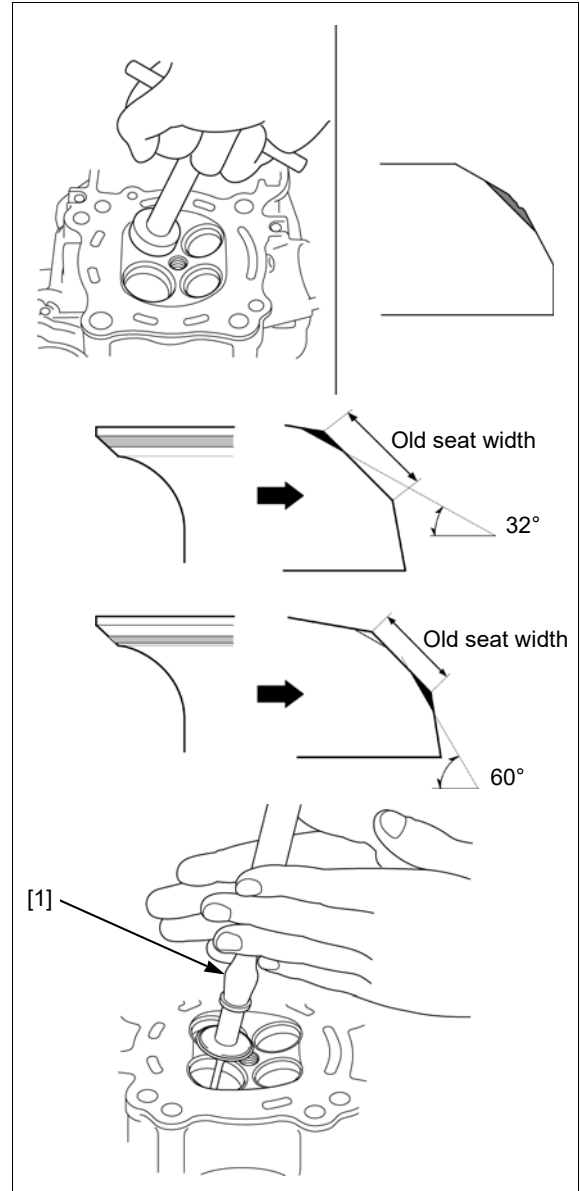
- Follow the refacer manufacturer's operating instructions.
 - Be careful not to grind the seat more than necessary.
1. Use a 45° seat cutter, remove any roughness or irregularities from the seat.
 2. Use a 32° flat cutter, remove the top 1/4 of the existing valve seat material.
 3. Use a 60° interior 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:

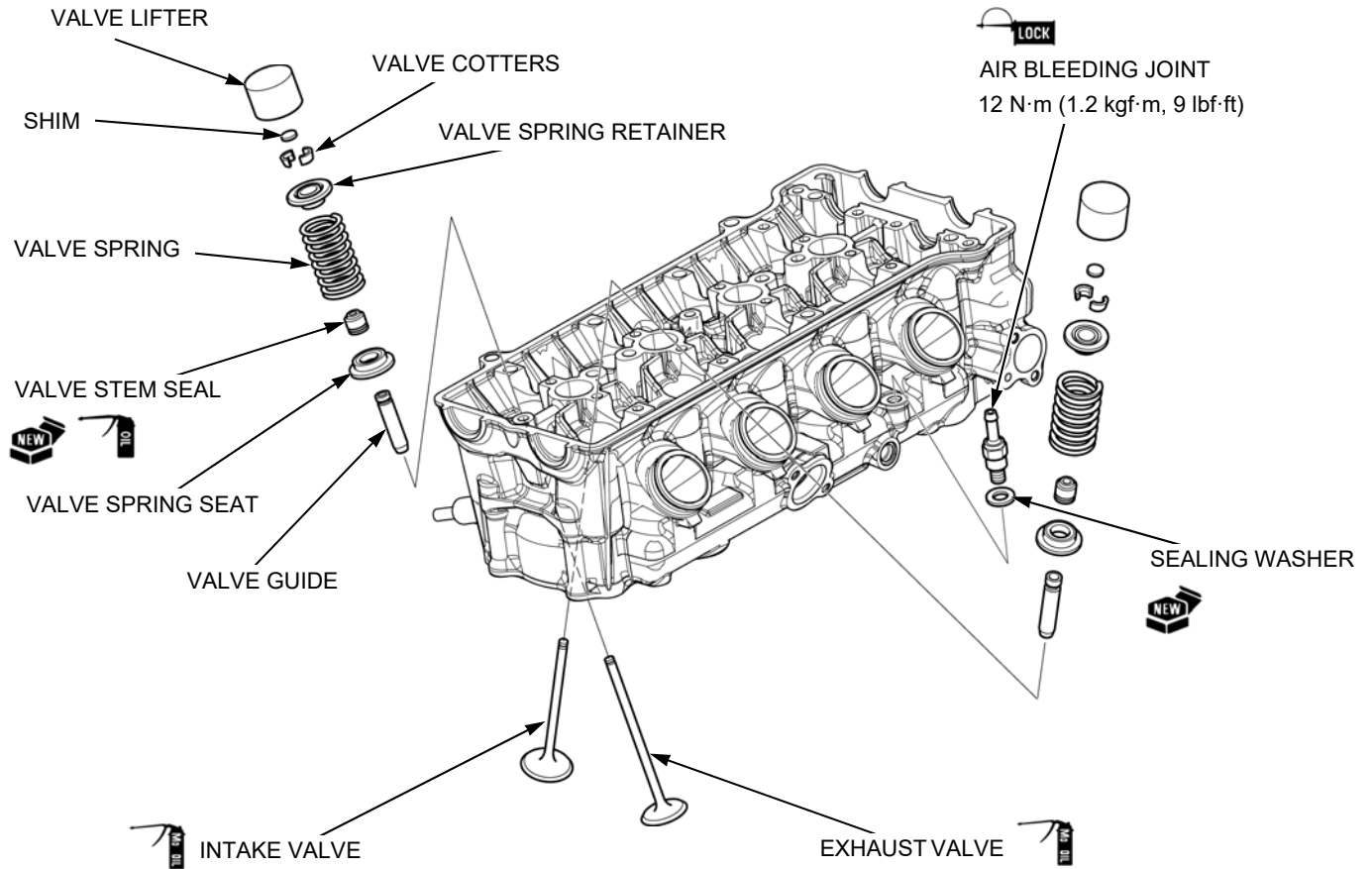
- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool [1] frequently to prevent uneven seat wear.
- Do not allow lapping compound to enter the guides.

After lapping, wash any residual compound off the cylinder head and valve and recheck the seat contact.

Assemble the cylinder head (page 10-17).



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 valve spring [4] with the tightly wound coils facing the combustion chamber.

Install the valve spring retainers [5].

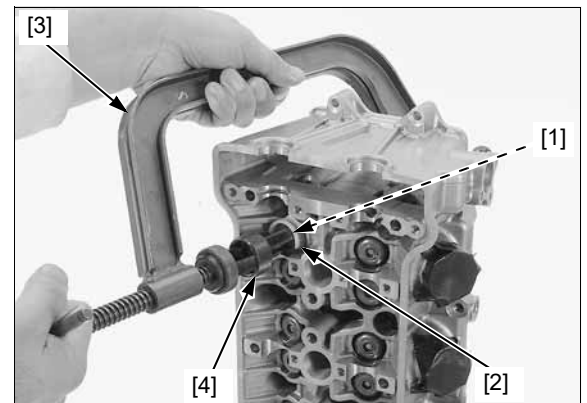
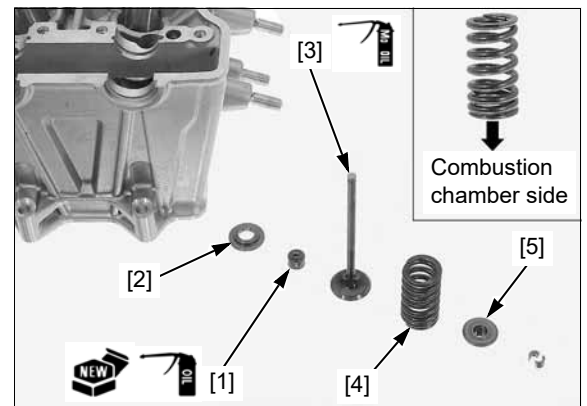
Install the valve cotters [1] using the special tool.

Grease the cotters to ease installation. To prevent loss of tension, do not compress the valve spring more than necessary.

TOOLS:

- [2] Tappet hole protector
- [3] Valve spring compressor
- [4] Valve spring compressor attachment

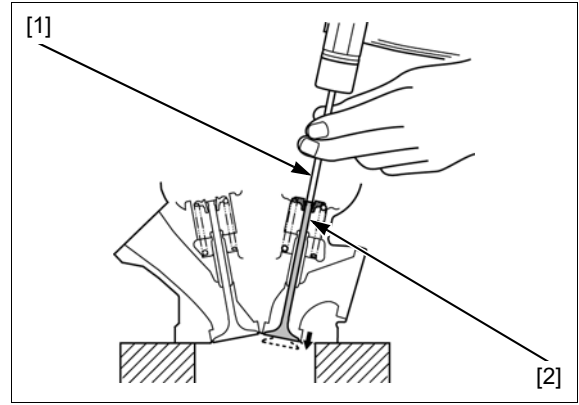
07HMG-MR70002
07757-001000
07959-KM30101



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 cotteners firmly using a hammer.



Apply a locking agent to the air bleeding joint [1] threads (page 1-17).

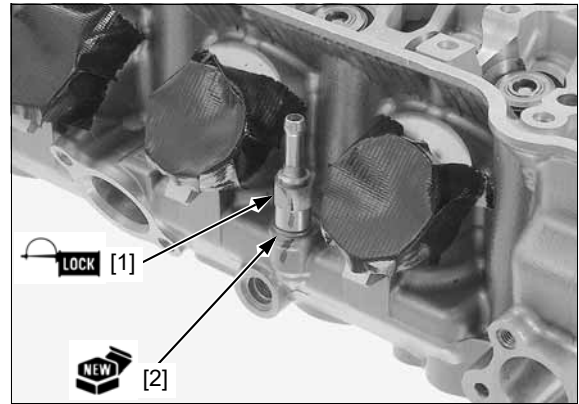
Install the air bleeding joint with a new sealing washer [2] to the cylinder head.

Tighten the air bleeding joint to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the following:

- Insulator (page 7-16)
- ECT sensor (page 4-79)
- Spark plugs (page 3-6)



INSTALLATION

Install the timing sprocket [1] by aligning the wide teeth between the crankshaft and sprocket.

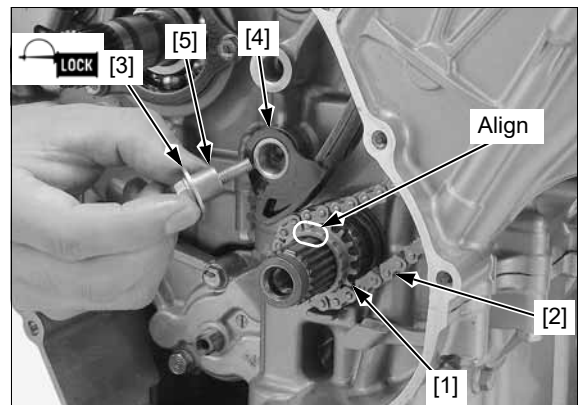
Install the cam chain [2].

Apply locking agent to the cam chain tensioner pivot bolt [3] threads (page 1-17).

Install the cam chain tensioner [4], collar [5] and pivot bolt.

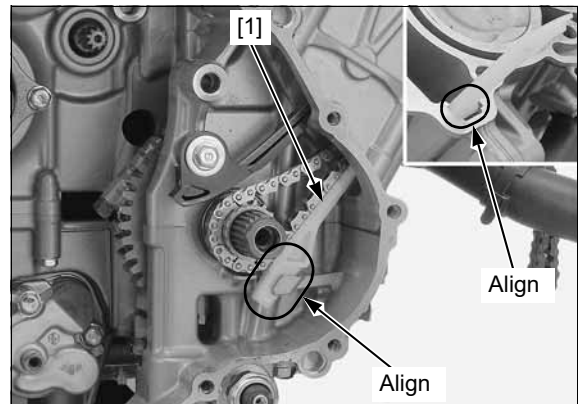
Tighten the cam chain tensioner pivot bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

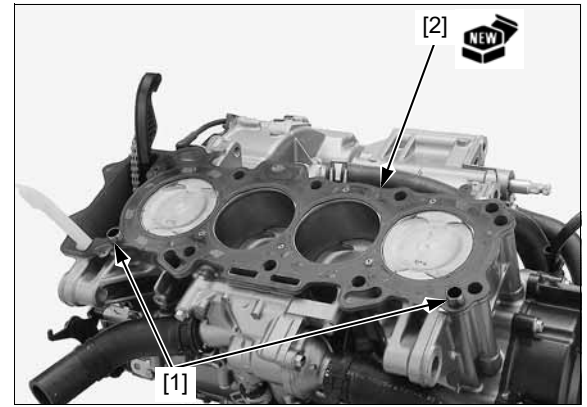


Install the cam chain guide A [1] while aligning its pins with the grooves in the cylinder and its end with the groove in the crankcase.

Install the starter clutch (page 11-17).



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.

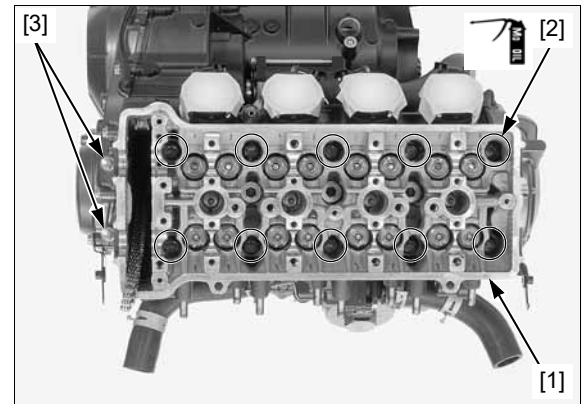
Clean the cylinder head 9 mm washer-bolts [2] in solvent, and dry them thoroughly.

Apply molybdenum oil to the 9 mm washer-bolt threads and seating surfaces.

Install and tighten the 9 mm washer-bolt in a crisscross pattern in 2 or 3 steps to the specified torque.

TORQUE: 47 N·m (4.8 kgf·m, 35 lbf·ft)

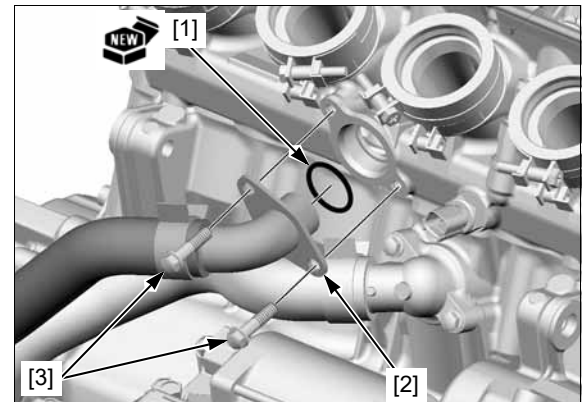
Install and tighten the 6 mm bolts [3] securely.



Install a new O-ring [1] to the water hose joint A [2].

- Do not apply engine oil to the O-ring.

Install the water hose joint A into the cylinder head and tighten the bolts [3].



Connect the ECT sensor 2P (Blue) connector [1] and bleeding hose [2].

Install the following:

- Camshaft (page 10-8)
- Throttle body (page 7-13)
- Exhaust pipe/muffler (page 2-18)



CAM CHAIN TENSIONER LIFTER

REMOVAL/INSTALLATION

NOTE:

- The cam chain tensioner lifter can be serviced with the engine installed in the frame.

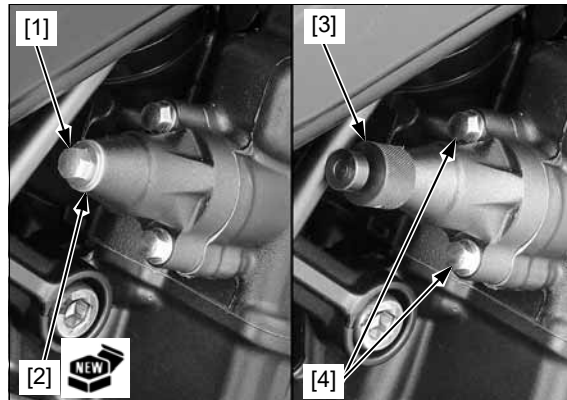
Remove the sealing bolt [1] and sealing washer [2].

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

TOOL:

[3] Tensioner stopper 070MG-0010100

Remove the cam chain tensioner lifter mounting bolts [4].

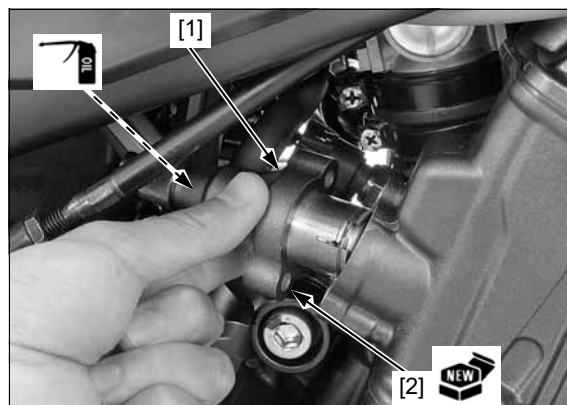


Remove the cam chain tensioner lifter [1] and gasket [2].

Installation is in the reverse order of removal.

NOTE:

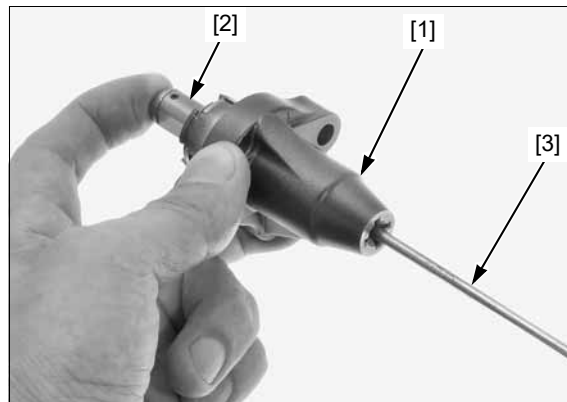
- Replace the gasket and sealing washer with new ones.
- Apply 0.5 cm³ minimum of engine oil into the cam chain tensioner lifter slit after removing the tensioner stopper.



INSPECTION

Check the cam chain tensioner lifter [1] operation:

- The cam chain tensioner lifter shaft [2] 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 [3], 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.



11. CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

SERVICE INFORMATION.....	11-2	CLUTCH	11-6
TROUBLESHOOTING	11-2	STARTER CLUTCH	11-14
COMPONENT LOCATION	11-3	GEARSHIFT LINKAGE	11-19
RIGHT CRANKCASE COVER	11-4		

CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

SERVICE INFORMATION

GENERAL

- This section covers service of the clutch, gearshift linkage and starter clutch. 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.
- For starter motor service (page 6-5).

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 pin 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 3-23)
- 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 pin 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 13-8)
- Bent shift fork shaft (page 13-8)
- Bent shift fork claw (page 13-8)
- Loose shift drum center bolt
- Damaged shift drum center
- Damaged shift drum guide grooves (page 13-8)
- 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 13-8)
- Damaged or bent shift forks (page 13-8)
- Worn gear engagement dogs or slots (page 13-8)

Gearshift pedal will not return

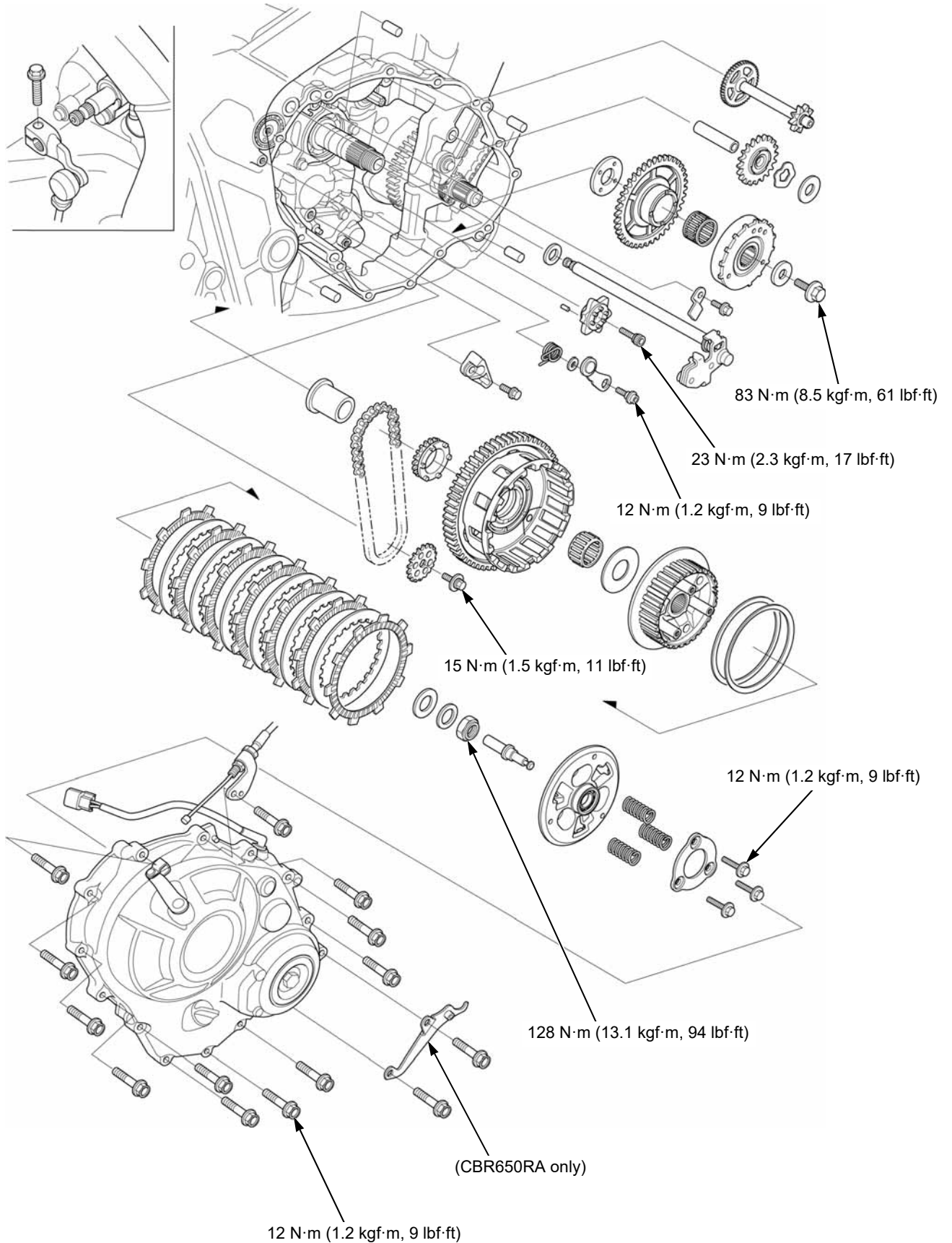
- Weak or broken gearshift spindle return spring
- Damaged or bent gearshift spindle

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

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models shown:



RIGHT CRANKCASE COVER

REMOVAL/INSTALLATION

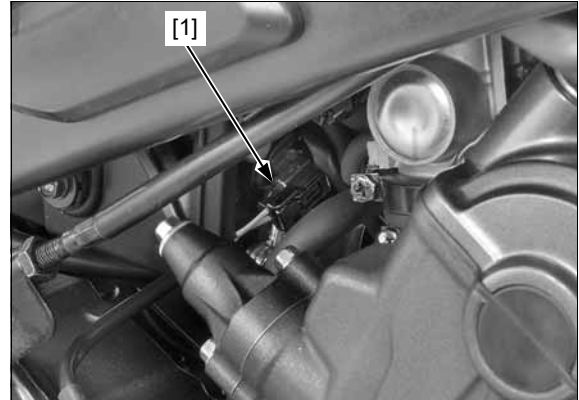
Remove the following (CBR650RA only):

- Under cowl (page 2-11)
- Right middle cowl (page 2-7)

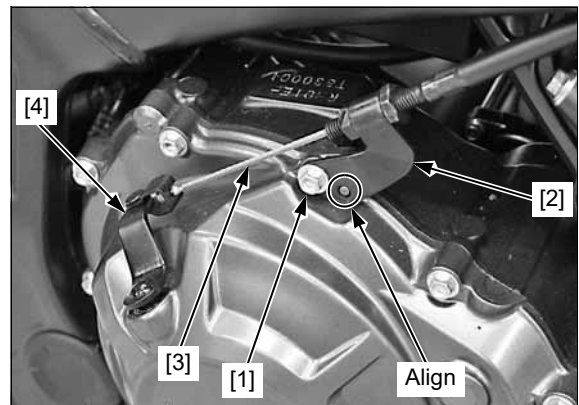
Drain the engine oil (page 3-11).

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

*MA, IIMA, IN, TH,
IITH, U, IIU, BR,
IIBR models*



Remove the bolt [1] and clutch cable holder [2], then disconnect the clutch cable [3] from the clutch lifter arm [4].



Remove the following:

- Right crankcase cover bolts [1]
- Under cowl stay (CBR650RA only) [2]
- Right crankcase cover [3]



Remove the dowel pins [1].

Be careful not to damage the mating surfaces.

Clean any sealant off from the right crankcase cover mating surfaces.

Installation is in the reverse order of removal.

TORQUE:

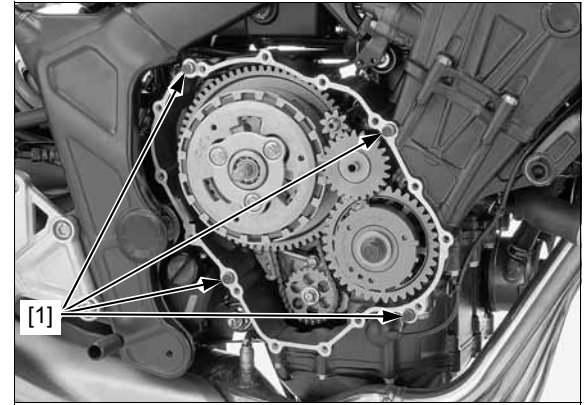
**Right crankcase cover bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)**

NOTE:

- Apply sealant (TB1207B manufactured by ThreeBond or an equivalent) to the mating areas of crankcase cover and crankcase as shown.
- Align the clutch cable holder hole with the right crankcase cover boss.

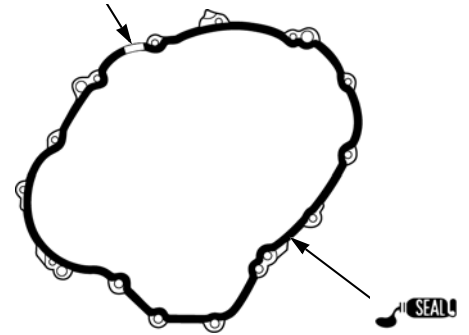
Adjust the clutch lever freeplay (page 3-23).

Fill the engine with the recommended engine oil and check that there are no oil leaks (page 3-10).



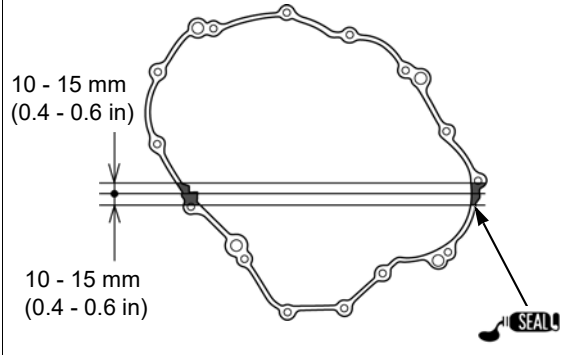
Cover side:

Do not apply liquid sealant to the grommet area



Crankcase side:

10 - 15 mm
(0.4 - 0.6 in)

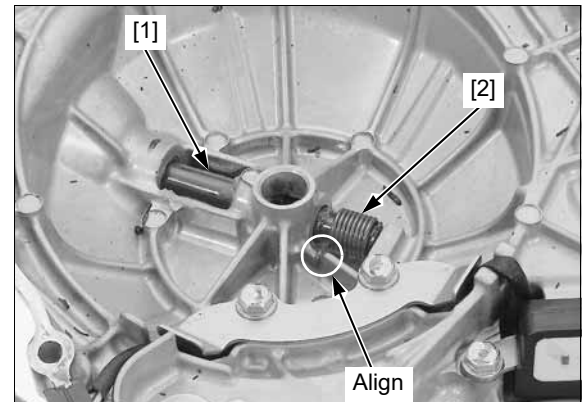


DISASSEMBLY/ASSEMBLY

Remove the clutch lifter arm [1] and return spring [2] from the right crankcase cover.

Check the clutch lifter arm and return spring for scratch, damage, abnormal wear and deformation.

Replace if necessary.



CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

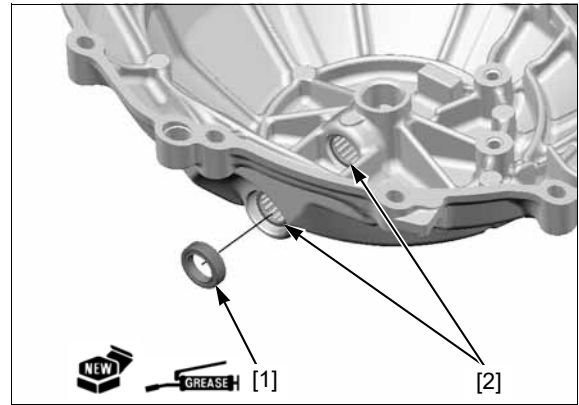
Remove the oil seal [1] from the right crankcase cover.

Check the needle bearings [2] for wear or damage, replace them if necessary.

Assembly is in the reverse order of disassembly.

NOTE:

- Apply grease to a new oil seal lips.
- Align the return spring hook with right crankcase cover.



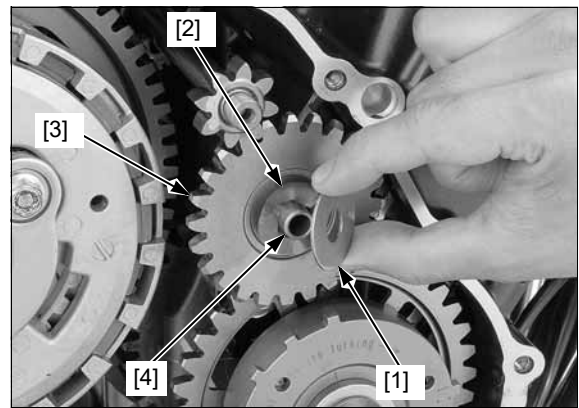
CLUTCH

REMOVAL

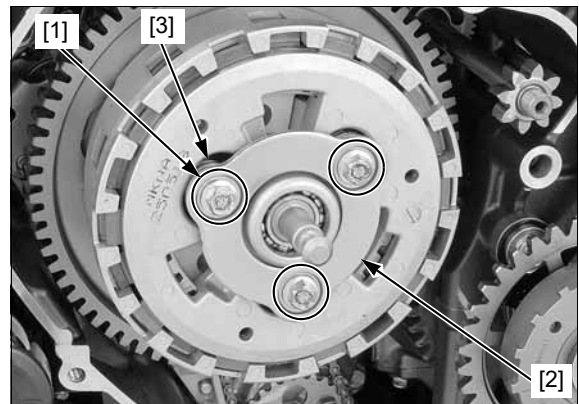
Remove the right crankcase cover (page 11-4).

Remove the following:

- Thrust washer [1]
- Wave washer [2]
- Starter idle gear [3]
- Shaft [4]



Loosen the set plate bolts [1] in a crisscross pattern in two or three steps, and remove the bolts, set plate [2], and clutch springs [3].



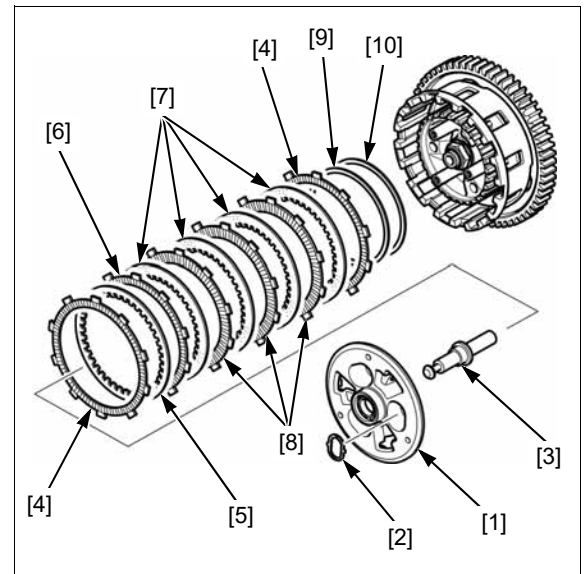
CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

Remove the following:

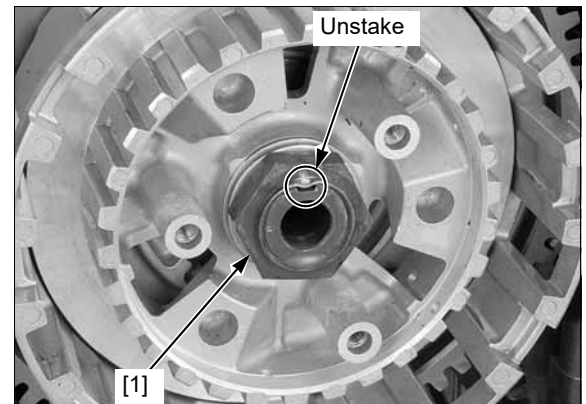
- Clutch pressure plate [1]
- Clutch spring seats [2]
- Clutch lifter pin [3]
- Clutch discs B [4] (2 pcs)
- Clutch plate B [5]
- Clutch disc C [6]
- Clutch plates A [7] (4 pcs)
- Clutch discs A [8] (3 pcs)
- Judder spring [9]
- Judder spring seat [10]

NOTE:

- When removing the clutch discs and plates, note the number of the clutch discs and plates.



Unstake the clutch center lock nut [1].

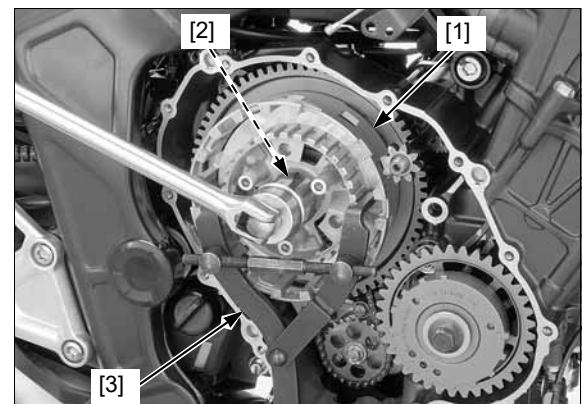


Hold the clutch center [1] with the special tool and remove the clutch center lock nut [2].

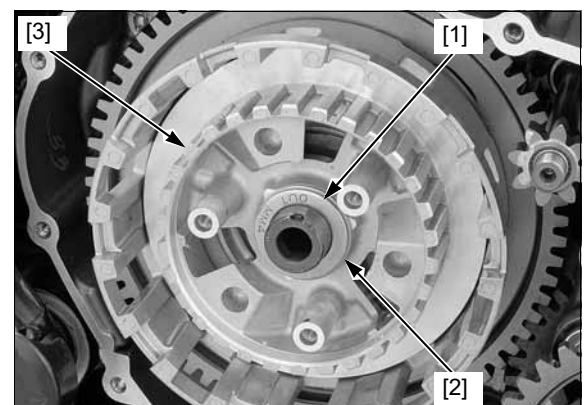
TOOL:

[3] Clutch center holder 07724-0050002 or equivalent commercially available

Discard the lock nut.



Remove the lock washer [1], thrust washer [2] and clutch center [3].



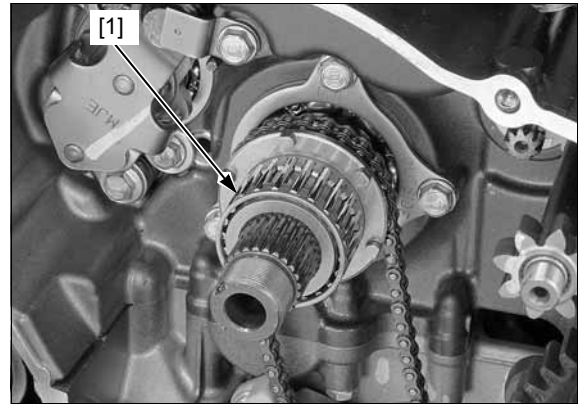
CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

Loosen the oil pump driven sprocket washer-bolt [1], but do not remove it yet.

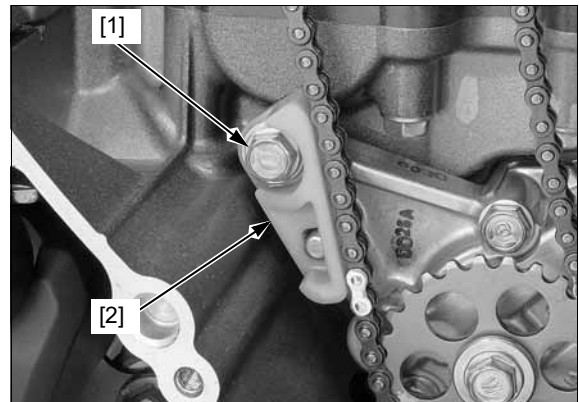
Remove the thrust washer [2] and clutch outer [3].



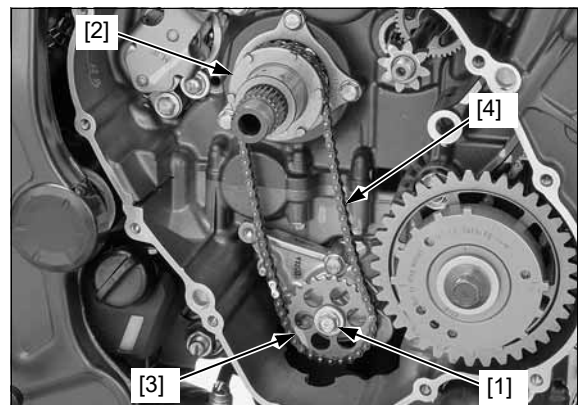
Remove the needle bearing [1].



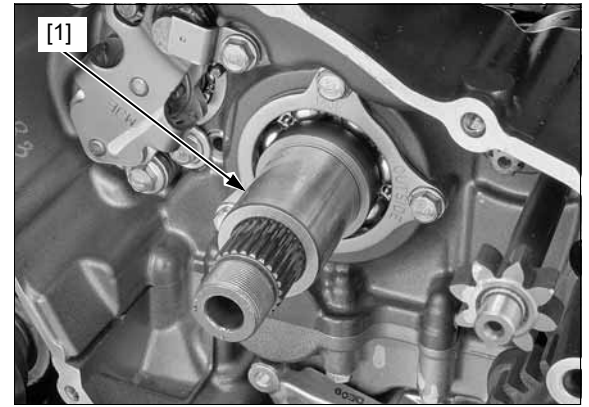
Remove the bolt [1] and oil pump drive chain guide [2].



Remove the oil pump driven sprocket washer-bolt [1].
Remove the oil pump drive sprocket [2], driven sprocket [3] and drive chain [4] as an assembly.



Remove the clutch outer guide [1].

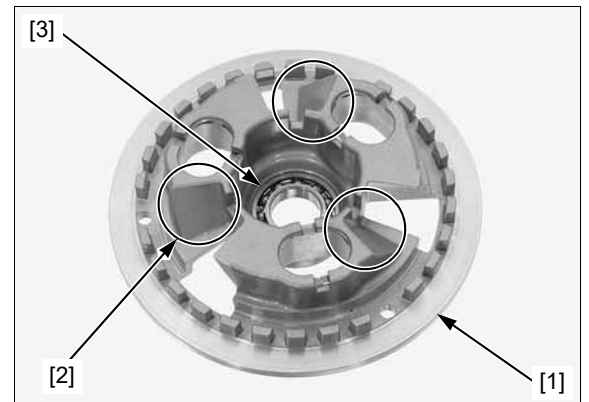


INSPECTION

Check the following of the clutch pressure plate [1] for scratches, damage, abnormal wear and deformation.

- Cam areas [2]
- Grooves
- Disc sliding surface
- Bearing [3]

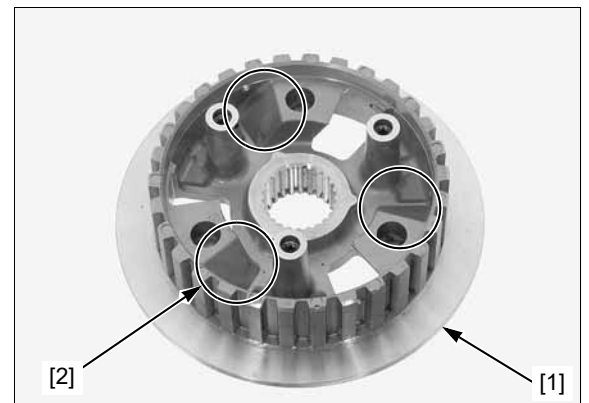
Replace the clutch pressure plate if necessary.



Check the following of the clutch center [1] for scratches, damage, abnormal wear and deformation.

- Cam areas [2]
- Grooves
- Disc sliding surface

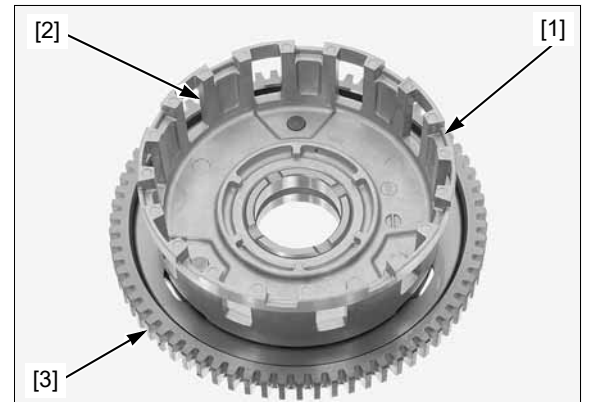
Replace the clutch center if necessary.



Check the following of the clutch outer [1] for scratches, damage, abnormal wear and deformation.

- Slots [2]
- Primary driven gear [3]

Replace the clutch outer if necessary.



CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

Inspect the following parts for scratch, damage, abnormal wear and deformation.

- Clutch lifter bearing
- Clutch lifter pin
- Clutch springs
- Spring seats
- Judder spring
- Clutch discs/plates
- needle bearing
- Clutch outer guide
- Oil pump drive/driven sprocket
- Oil pump drive chain
- Mainshaft

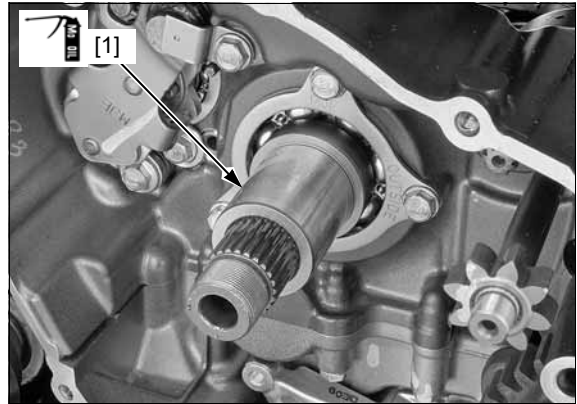
Measure each part according to CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH SPECIFICATIONS (page 1-8).

Replace any if it is out of service limit.

- Replace the clutch springs as a set.
- Replace the clutch discs and plates as a set.

INSTALLATION

Apply molybdenum oil solution to the clutch outer guide [1] sliding surface and install it to the mainshaft.



Apply oil to the oil pump drive sprocket [1] and driven sprocket [2] teeth.

Apply molybdenum oil solution to the oil pump drive sprocket sliding surface.

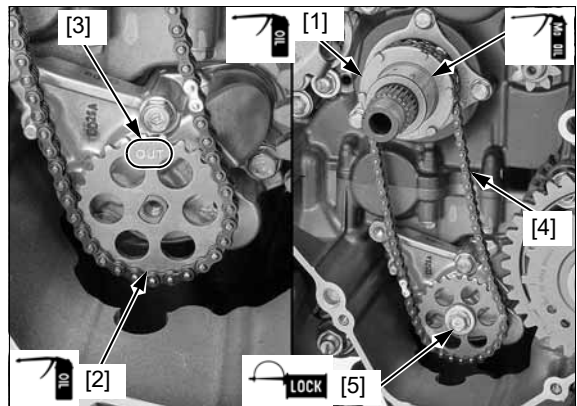
Install the oil pump driven sprocket with its "OUT" mark [3] facing out.

Install the oil pump drive/driven sprocket and drive chain [4] as an assembly.

Apply a locking agent to the oil pump driven sprocket washer-bolt [5] threads (page 1-17).

Be careful not to drop the parts into the oil pan.

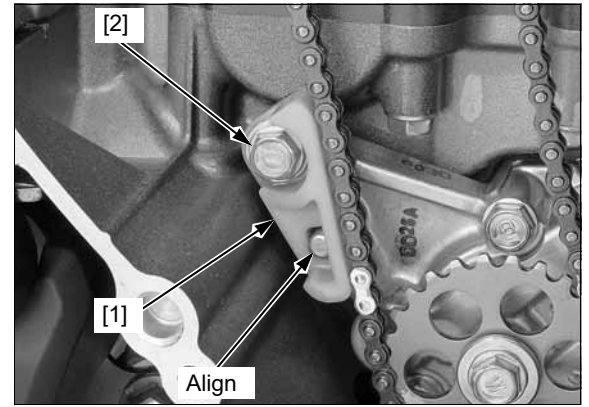
Temporarily install the oil pump driven sprocket washer-bolt.



CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

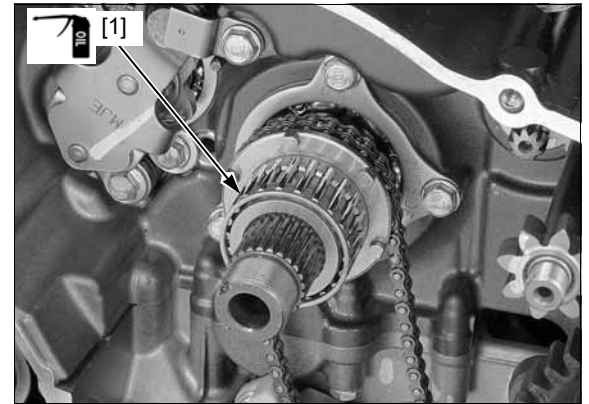
Be careful not to drop the parts into the oil pan.

Install the oil pump drive chain guide [1] by aligning the hole with boss of crankcase. Tighten the bolt [2] securely.



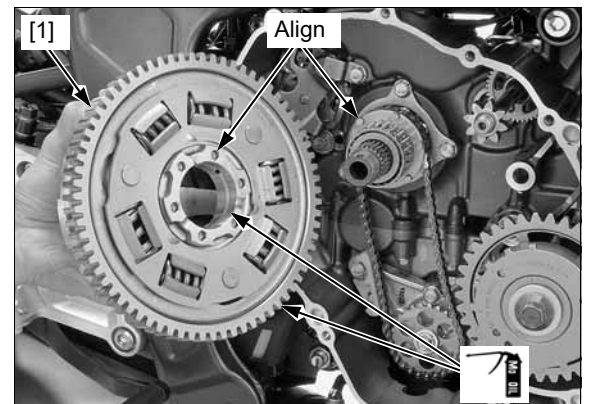
Apply engine oil to the rotating area of the needle bearing [1].

Install the needle bearing onto the mainshaft.



Apply molybdenum oil solution to the clutch outer [1] gear and sliding surface.

Install the clutch outer by aligning the holes with the tabs of the oil pump drive sprocket.



Tighten the oil pump driven sprocket washer-bolt [1] to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

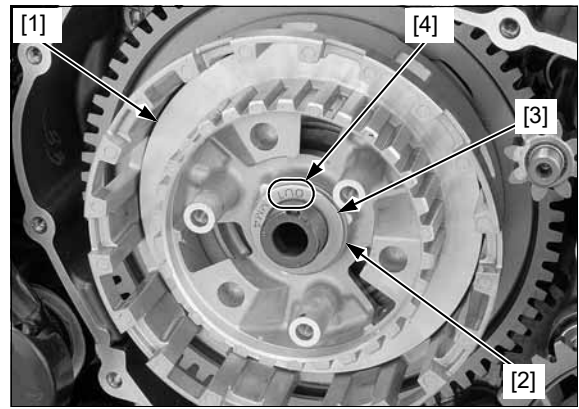
Install the thrust washer [2].



CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

Install the clutch center [1] and thrust washer [2].

Install the lock washer [3] with its "OUT" mark [4] facing out.



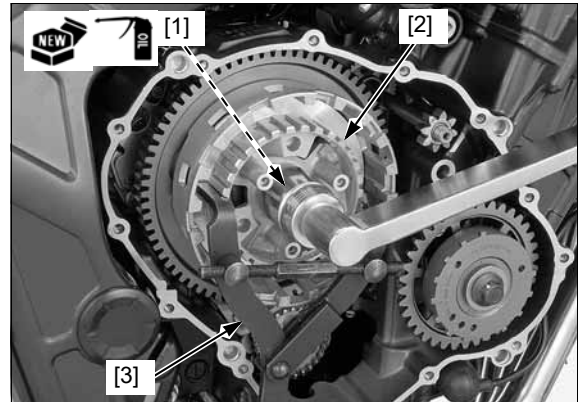
Apply engine oil to the threads and seating surface of a new clutch center lock nut [1], then install it onto the mainshaft.

Hold the clutch center [2] with the special tool and tighten the lock nut to the specified torque.

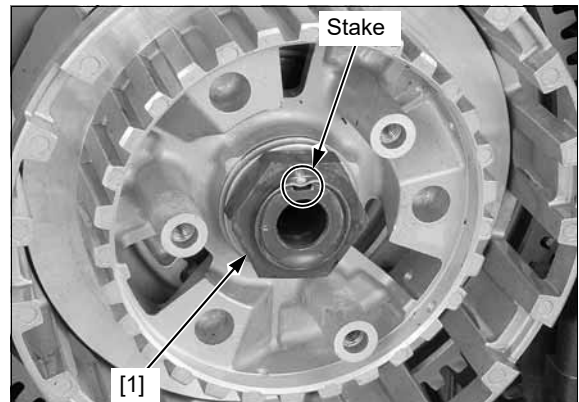
TOOL:

[3] Clutch center holder 07724-0050002 or equivalent commercially available

TORQUE: 128 N·m (13.1 kgf·m, 94 lbf·ft)



Be careful not to damage the mainshaft threads. Stake the lock nut [1] into the mainshaft groove with a punch.



CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

Install the judder spring seat [1] and judder spring [2] onto the clutch center [3] as shown.

Apply engine oil to the entire surface of clutch discs.

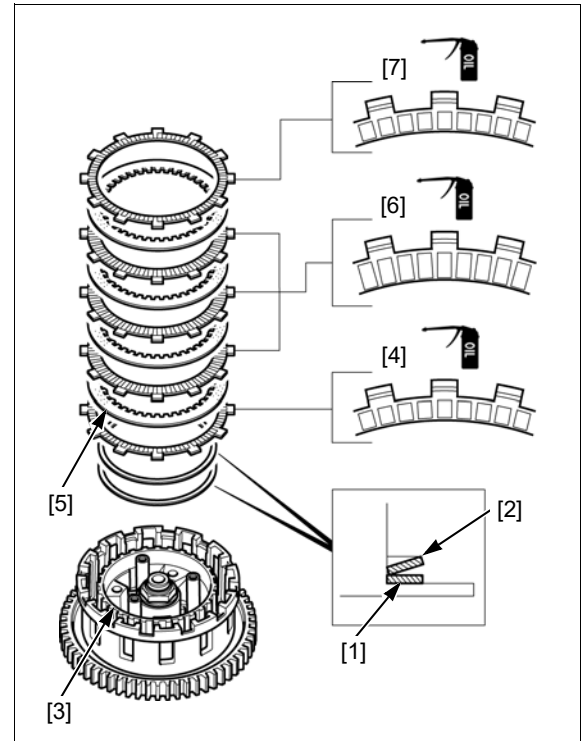
Install the clutch disc B [4] onto the clutch center.

Install the clutch plates A [5] (4 pcs) and discs A [6] (3 pcs) alternately, starting with the plate A.

Install the clutch disc C [7].

NOTE:

- Clutch disc B: lining color is black
- Clutch plate A: Small I.D.



Install the clutch lifter pin [1].

Install the spring seats [2] onto the clutch pressure plate [3] grooves.

NOTE:

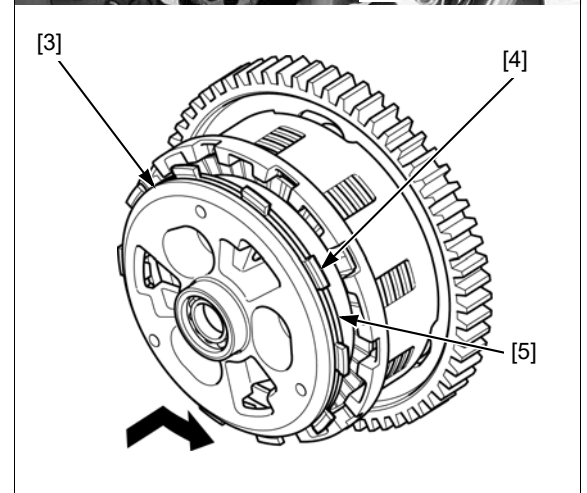
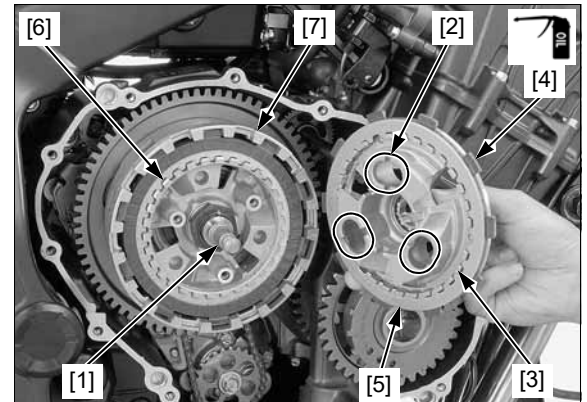
- Make sure that the spring seats are fully seated in the pressure plate grooves.

Apply engine oil to the entire surface of clutch disc B. Install the clutch disc B [4] onto the clutch pressure plate.

Install the clutch plate B [5] by aligning its tabs with the pressure plate grooves.

Put the clutch pressure plate assembly onto the clutch center [6] by aligning each cam area and insert them by rotating counterclockwise.

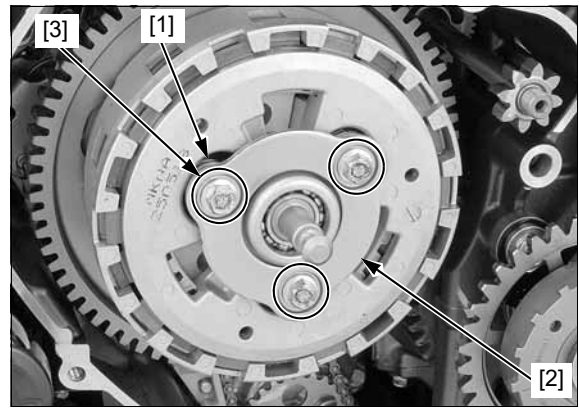
Install the clutch disc B tabs into the shallow slots of the clutch outer [7].



CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

Install the clutch springs [1], set plate [2] and set plate bolts [3].
Tighten the set plate bolts in a crisscross pattern in two or three steps.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

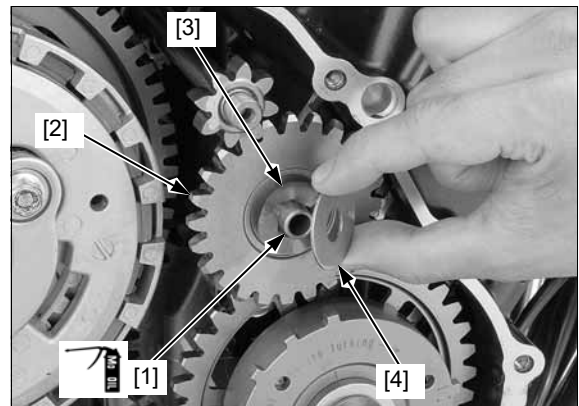


Apply molybdenum oil solution to the starter idle gear shaft [1] outer surface.

Install the starter idle gear [2] and shaft.

Install the wave washer [3] and thrust washer [4] onto the starter idle gear.

Install the right crankcase cover (page 11-4).

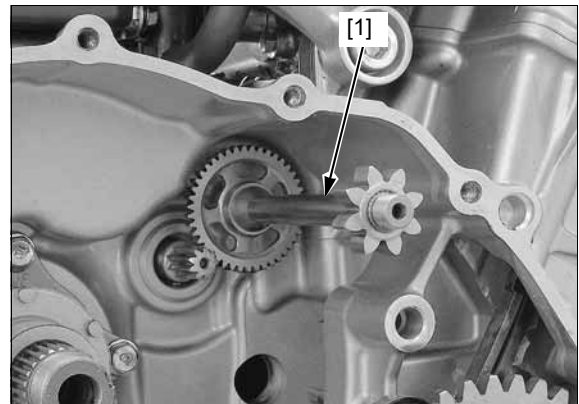


STARTER CLUTCH

REMOVAL

Remove the clutch (page 11-6).

Remove the starter reduction gear [1] from the crankcase.



Temporarily install the following:

- Starter idle gear [1]
- Starter idle gear shaft [2]

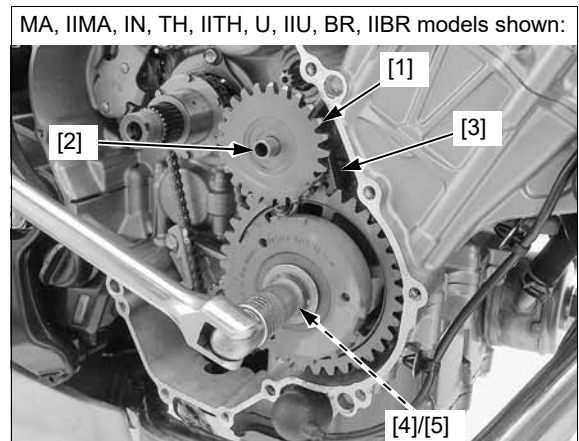
Insert the special tool between the starter idle gear and driven gear as shown.

TOOL:

[3] Gear holder, M2.5 07724-0010100

Remove the starter clutch mounting bolt [4] and washer [5].

Remove the temporarily installed parts.

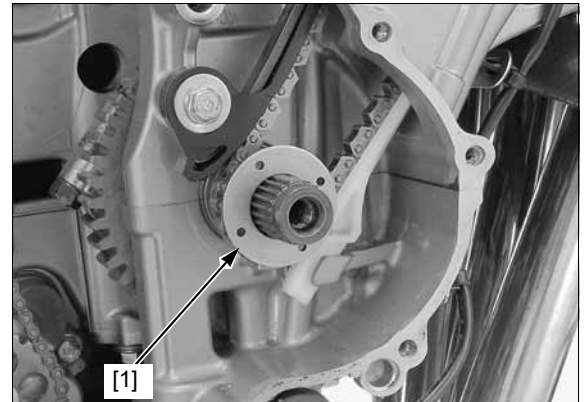


Remove the starter clutch outer assembly [1].

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models shown:



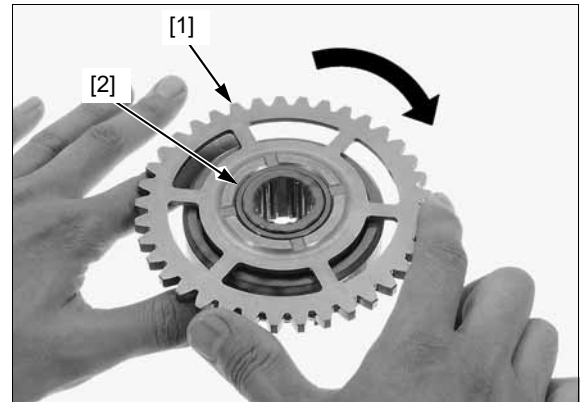
Remove the thrust washer [1].



DISASSEMBLY

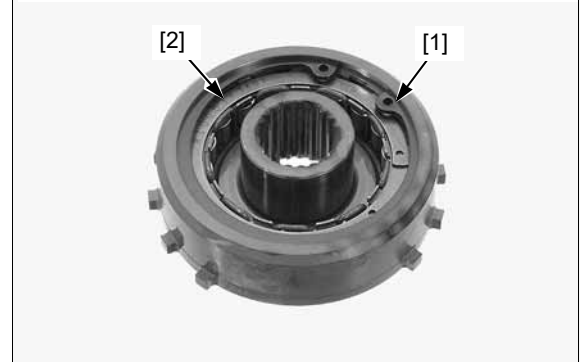
Check the operation of the one-way clutch by turning the driven gear [1]. You should be able to turn the driven gear clockwise smoothly, but the gear should not turn counterclockwise.

Remove the starter driven gear by turning it clockwise.
Remove the needle bearing [2].



Remove the snap ring [1] and one-way clutch [2].

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models shown:



CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation.

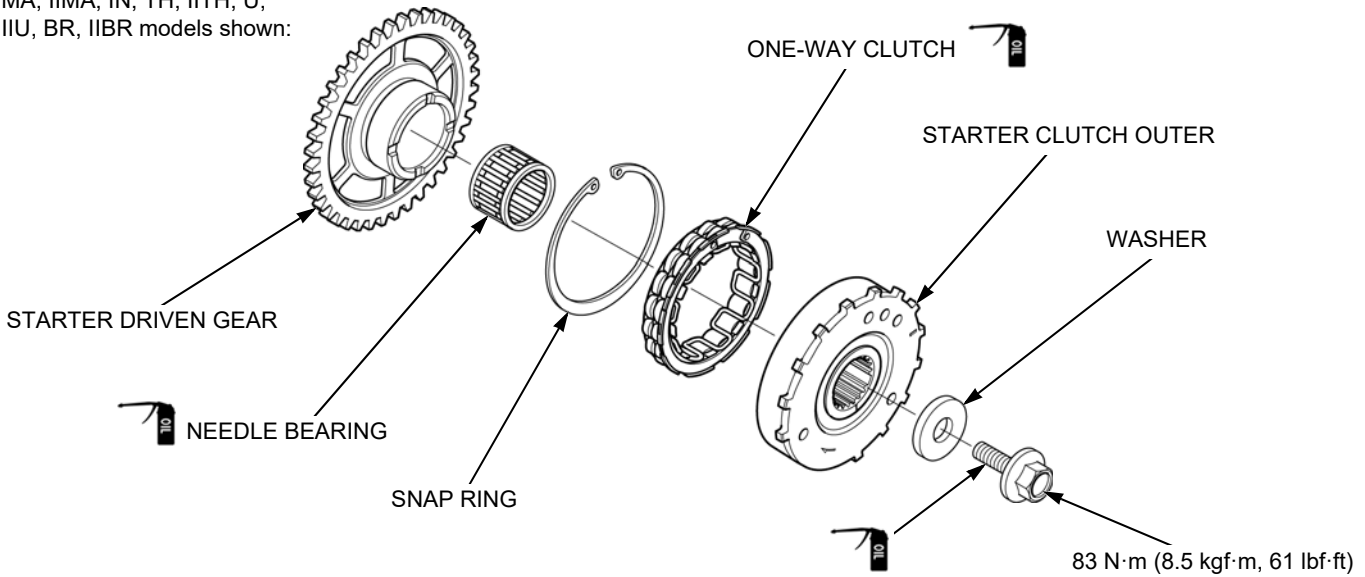
- Starter driven gear
- Starter reduction gear
- Starter clutch outer
- Starter one-way clutch

Measure each part according to CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH SPECIFICATIONS (page 1-8).

Replace any part if it is out of service limit.

ASSEMBLY

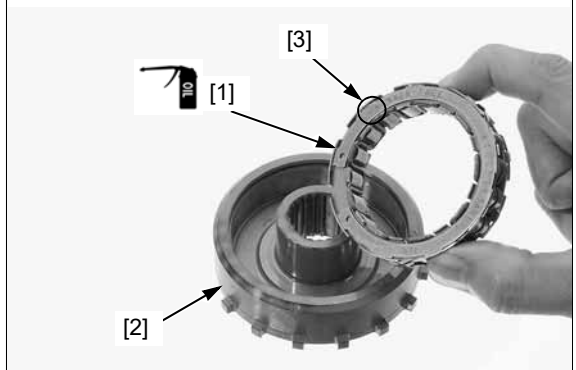
MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models shown:



Apply engine oil to the one-way clutch [1] contacting surface.

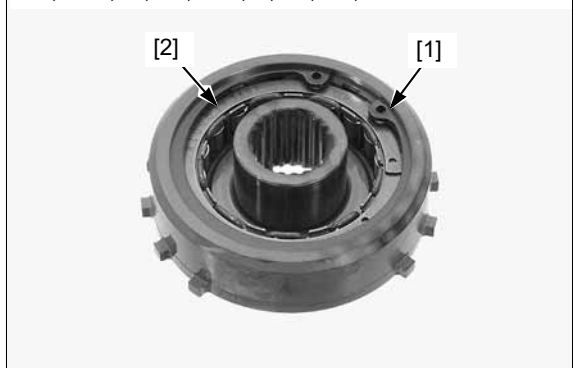
Install the one-way clutch into the starter clutch outer [2] with its arrow mark [3] facing out.

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models shown:

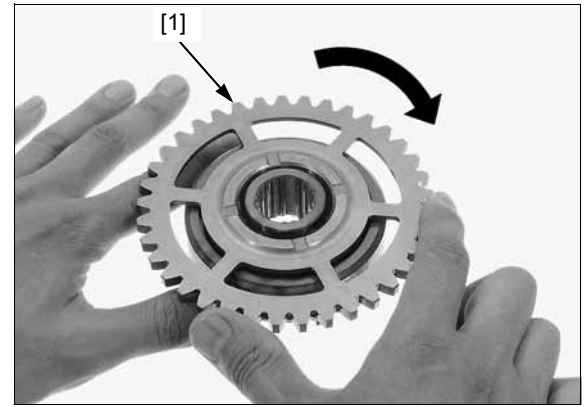


Install the snap ring [1] into the starter clutch outer [2] groove securely.

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models shown:



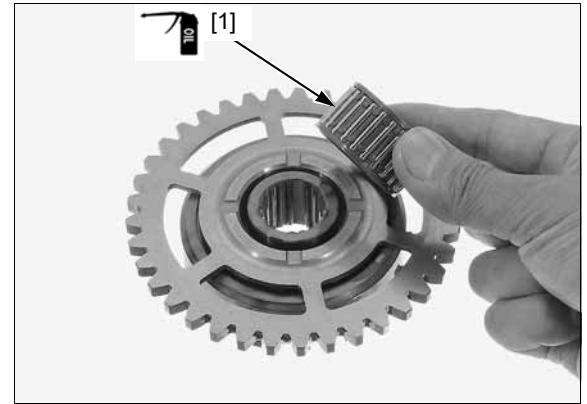
Install the starter driven gear [1] into the starter clutch outer while turning the starter driven gear clockwise.



Apply engine oil to the rotating area of the needle bearing [1].

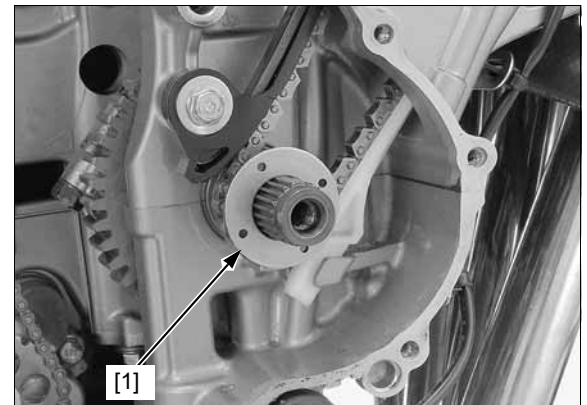
Install the needle bearing into the starter clutch outer.

Recheck the one-way clutch operation (page 11-15).



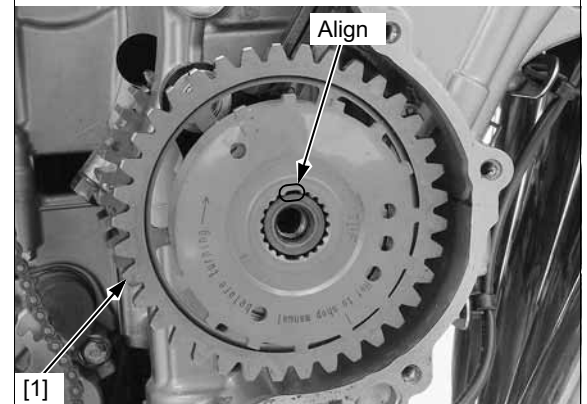
INSTALLATION

Install the thrust washer [1] to the crankshaft.



Install the starter clutch outer assembly [1] to the crankshaft while aligning the tab of the crankshaft with the wide groove of the starter clutch outer assembly.

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models shown:

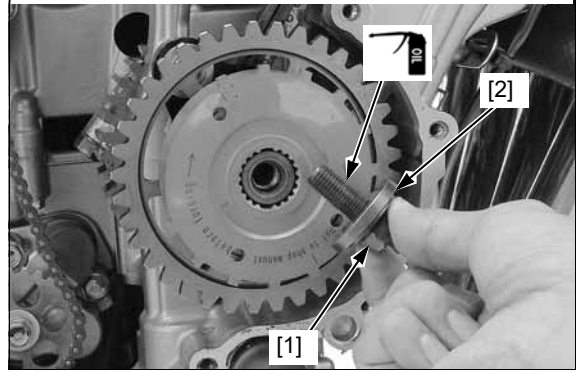


CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

Apply engine oil to the starter clutch outer mounting bolt [1] threads and seating surface.

Install the washer [2] and starter clutch mounting bolt.

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models shown:



Temporarily install the following:

- Oil pump drive sprocket guide
- Oil pump drive sprocket
- Clutch outer guide
- Clutch outer [1]
- Clutch outer needle bearing

Be careful not to drop the gear holder into the crankcase.

Attach the special tool between the primary drive gear and driven gear.

TOOL:

[2] Gear holder, M2.5 07724-0010100

Tighten the starter clutch outer mounting bolt [3] to the specified torque.

TORQUE: 83 N·m (8.5 kgf·m, 61 lbf·ft)

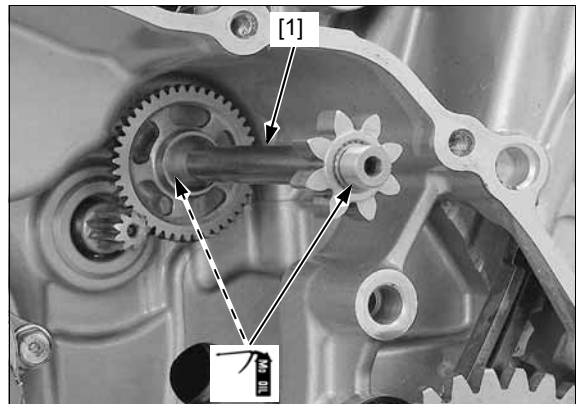
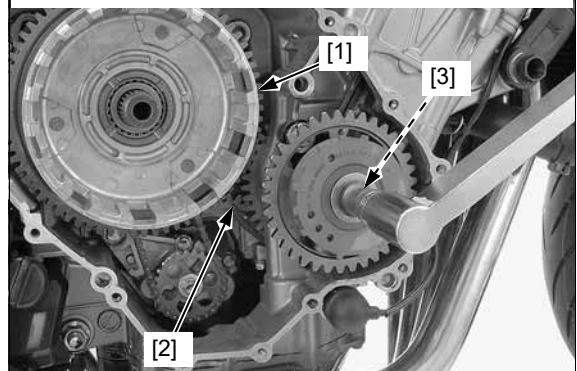
Remove the temporarily installed parts.

Apply molybdenum oil solution to the starter reduction gear [1] sliding surface.

Install the starter reduction gear into the crankcase.

Install the clutch (page 11-10).

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models shown:

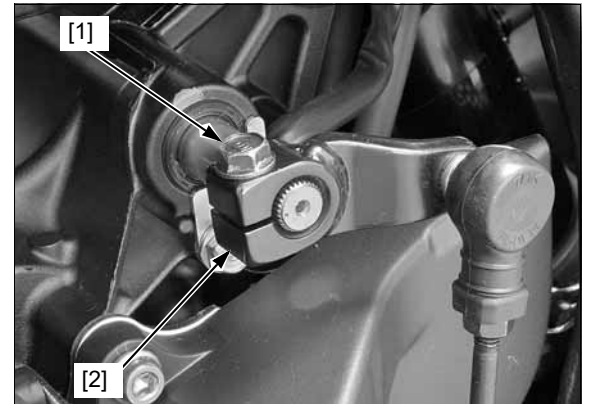


GEARSHIFT LINKAGE

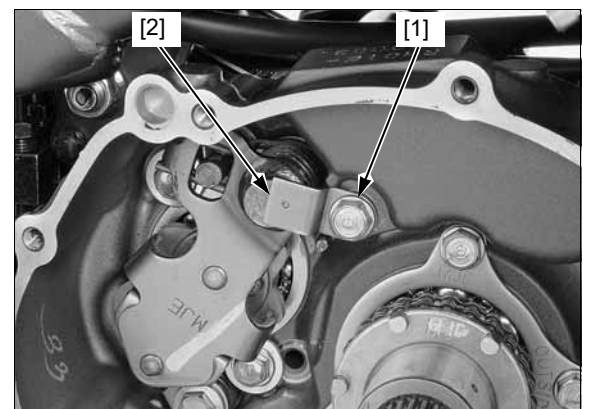
REMOVAL

Remove the clutch (page 11-6).

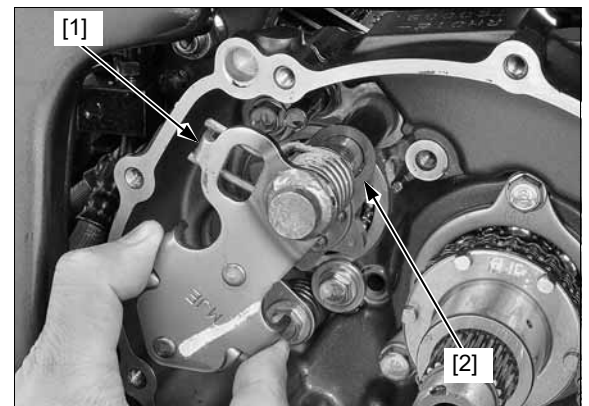
Remove the pinch bolt [1] and disconnect the gearshift arm [2] from the gearshift spindle.



Remove the bolt [1] and setting plate [2].

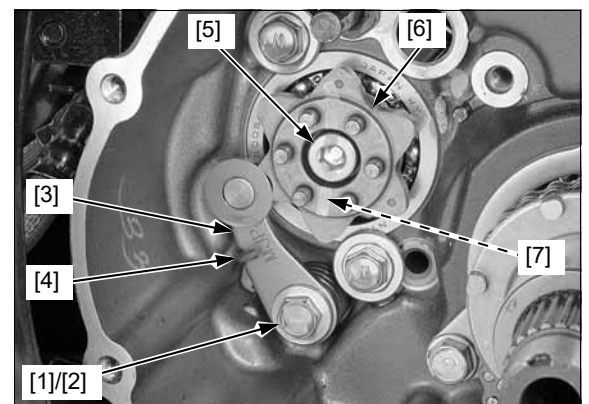


Pull the gearshift spindle assembly [1] and thrust washer [2] out of the crankcase.



Remove the following:

- Stopper arm pivot bolt [1]
- Washer [2]
- Stopper arm [3]
- Return spring [4]
- Shift drum center socket bolt [5]
- Gearshift cam [6]
- Dowel pin [7]



CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

INSPECTION

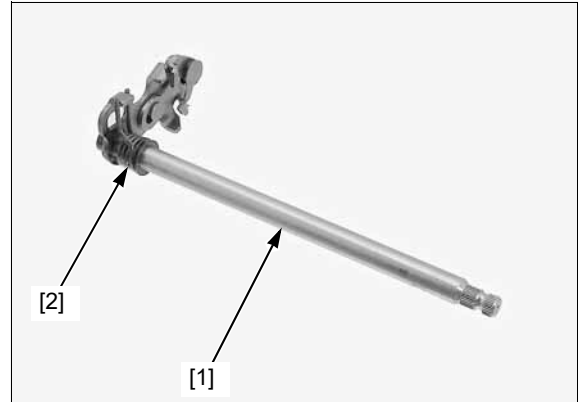
Inspect the following parts for scratch, damage, abnormal wear and deformation.

- Shift drum stopper plate
- Shift drum stopper arm
- Shift drum stopper arm return spring

Replace if necessary.

Check the gearshift spindle [1] for wear, damage or bending.

Check the return spring [2] for fatigue or damage.



GEARSHIFT SPINDLE NEEDLE BEARING REPLACEMENT

Remove the gearshift spindle (page 11-19).

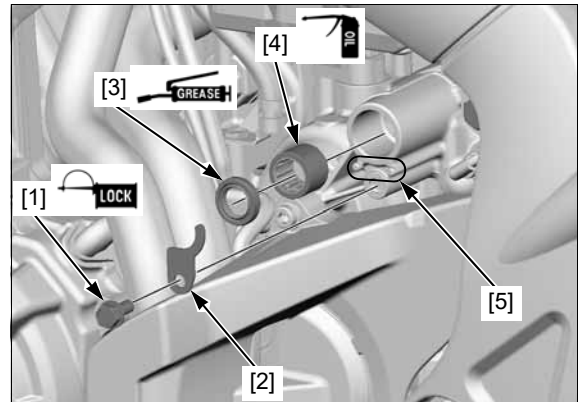
Remove the bolt [1], gearshift spindle oil seal setting plate [2], oil seal [3] and needle bearing [4].

Apply engine oil to a new gearshift spindle needle bearing, then install it into the crankcase.

Apply grease to a new oil seal 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 1-17).

Install the gearshift spindle oil seal setting plate between the crankcase tabs [5], then tighten the bolt.



INSTALLATION

Apply a locking agent to the stopper arm pivot bolt [1] threads (page 1-17).

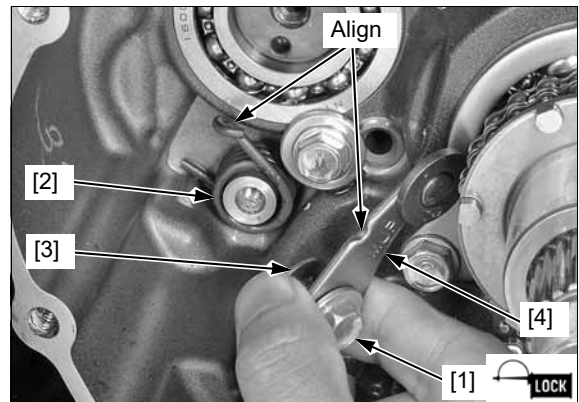
Install the following:

- Return spring [2]
- Washer [3]
- Stopper arm [4]
- Pivot bolt

- Align the stopper arm groove with the spring end.

Tighten the stopper arm pivot bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



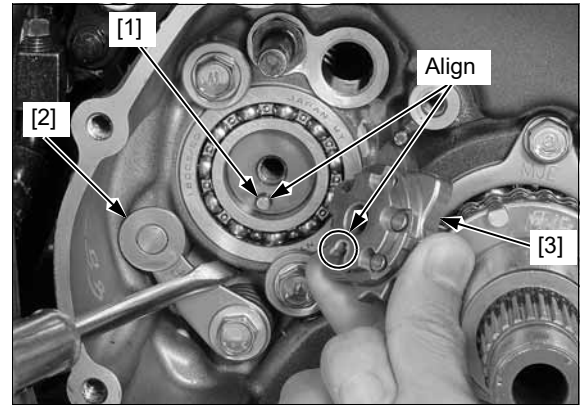
CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

Install the dowel pin [1] onto the shift drum.

Align the dowel pin on the shift drum with the wide groove on the gearshift cam.

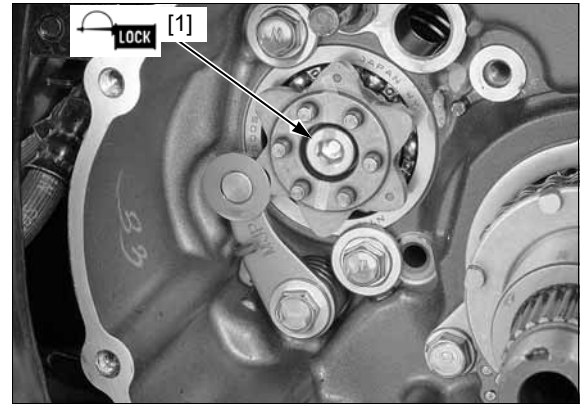
Hold the stopper arm [2] using a screwdriver as shown.

Install the gearshift cam [3] while aligning its slot with the dowel pin.

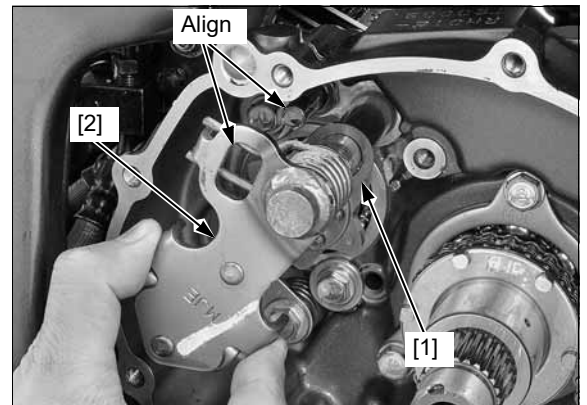


Apply a locking agent to the shift drum center socket bolt [1] threads (page 1-17).
Tighten the socket bolt to the specified torque.

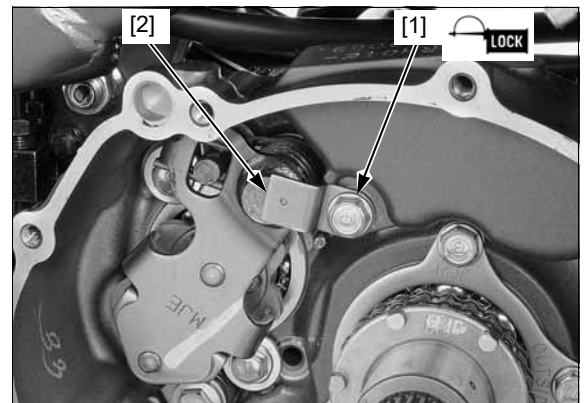
TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



Install the thrust washer [1] and gearshift spindle assembly [2] into the crankcase while aligning the return spring ends with the crankcase stopper pin.



Apply a locking agent to the setting plate bolt [1] threads (page 1-17).
Install the setting plate [2] and tighten the bolt securely.

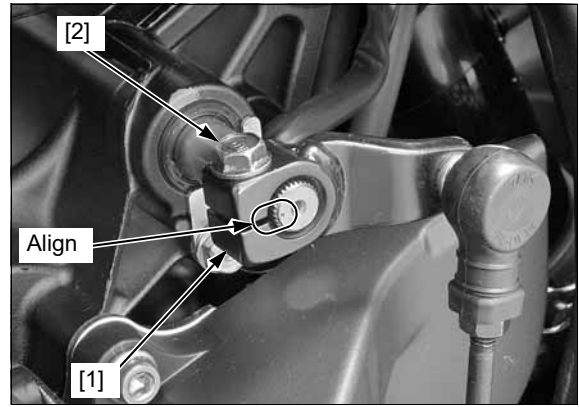


CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH

Install the gearshift arm [1] to the gearshift spindle by aligning the arm slit with the punch mark on the gearshift spindle.

Install and tighten the pinch bolt [2].

Install the clutch (page 11-10).



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.

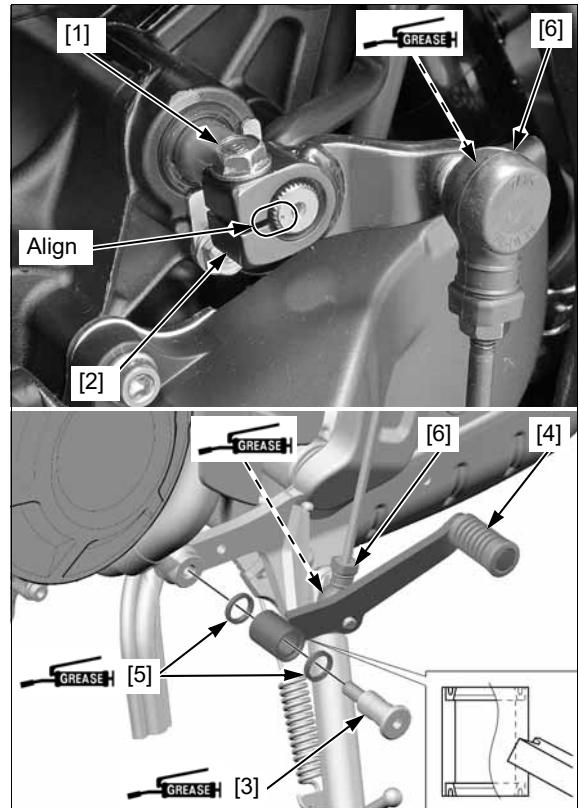
Installation is in the reverse order of removal.

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.

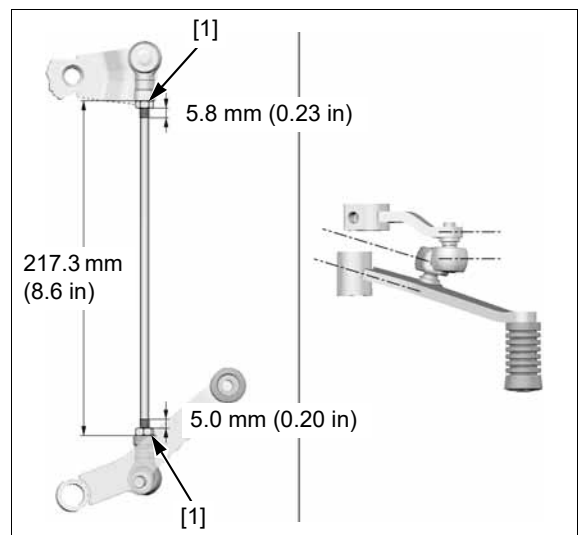
Adjust the tie-rod length so that the distance between the ball joint ends is standard length as shown.

After adjustment tighten the gearshift pedal adjuster lock nuts to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

NOTE:

- Tighten the lock nuts with the position of each ball joint in parallel to the gearshift arm and gearshift pedal as shown.



SERVICE INFORMATION.....	12-2	STATOR	12-4
COMPONENT LOCATION.....	12-2	FLYWHEEL	12-5
LEFT CRANKCASE COVER.....	12-3		

ALTERNATOR

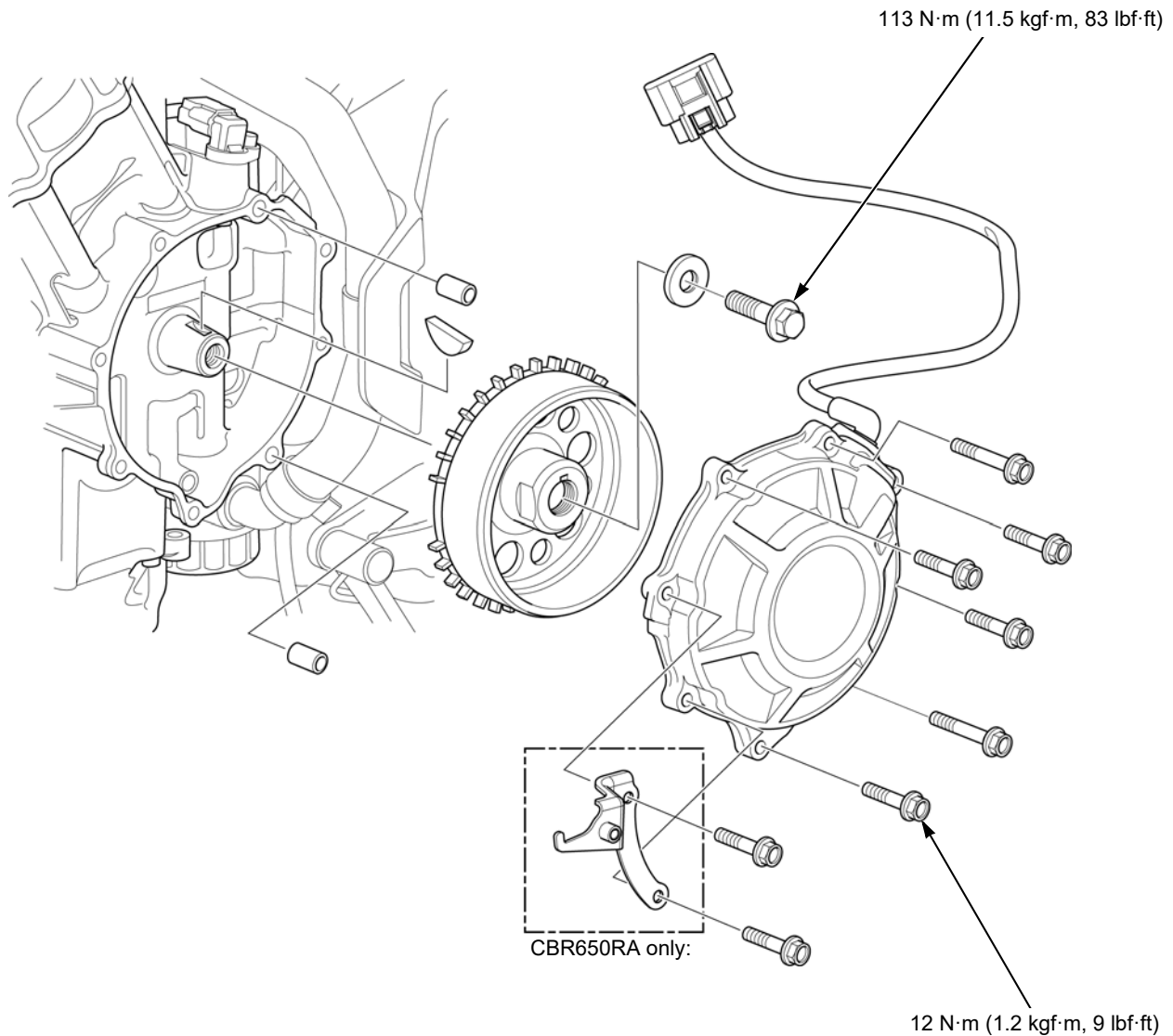
SERVICE INFORMATION

GENERAL

- This section covers service of the alternator stator and flywheel. All service can be done with the engine installed in the frame.
- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models: If the following parts are removed, perform the crank pulse initialize learning procedure (page 4-84):
 - Alternator cover
 - Stator
 - Flywheel
- For alternator charging coil inspection (page 20-7).
- For CKP sensor inspection.
 - ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models (page 4-83)
 - MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models (page 5-9)

COMPONENT LOCATION

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models shown:



LEFT CRANKCASE COVER

REMOVAL/INSTALLATION

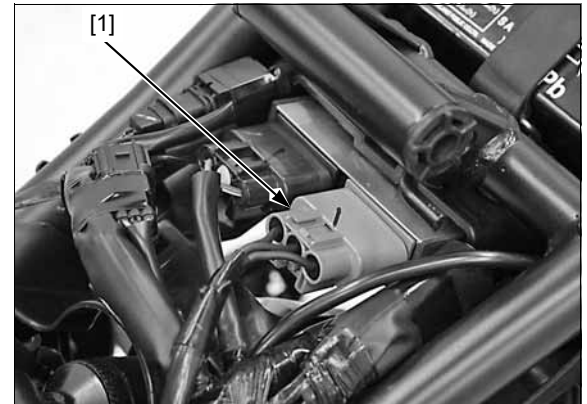
Support the motorcycle in an upright position on a level surface.

Remove the following:

- Left middle cowl (page 2-7) (CBR650RA)
- Under cowl (page 2-11) (CBR650RA)

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

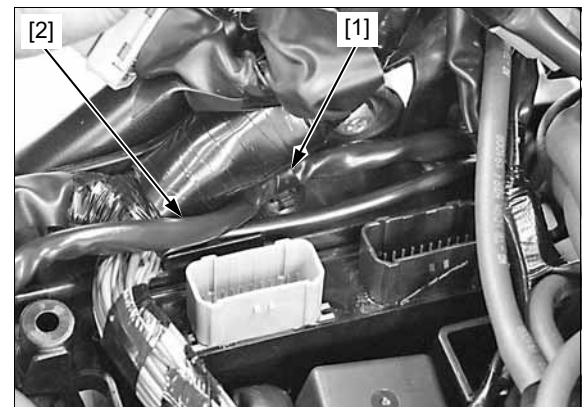
Disconnect the alternator 3P (Gray) connector [1].



Disconnect the ECM 33P connectors (page 4-76).

Release the alternator wire clip [1].

Remove the alternator wire [2] out of the frame.

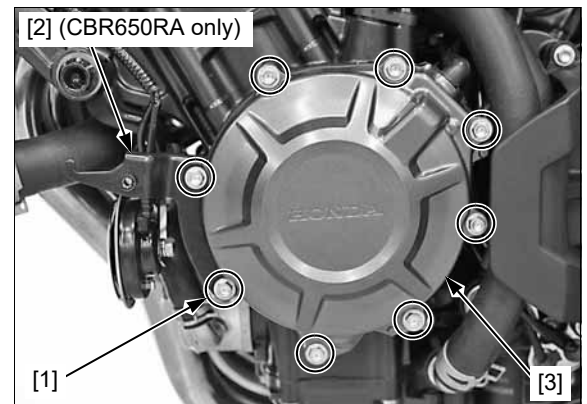


NOTE:

- 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).

Remove the following:

- Left crankcase cover bolts [1]
- Under cowl stay (CBR650RA only) [2]
- Left crankcase cover [3]



NOTE:

- The left crankcase cover (stator) is magnetically attracted to the flywheel, be careful during removal and installation.

Remove the dowel pins [1].

Be careful not to damage the mating surfaces.

Clean any sealant off from the alternator cover mating surfaces.

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models shown:



ALTERNATOR

Installation is in the reverse order of removal.

TORQUE:

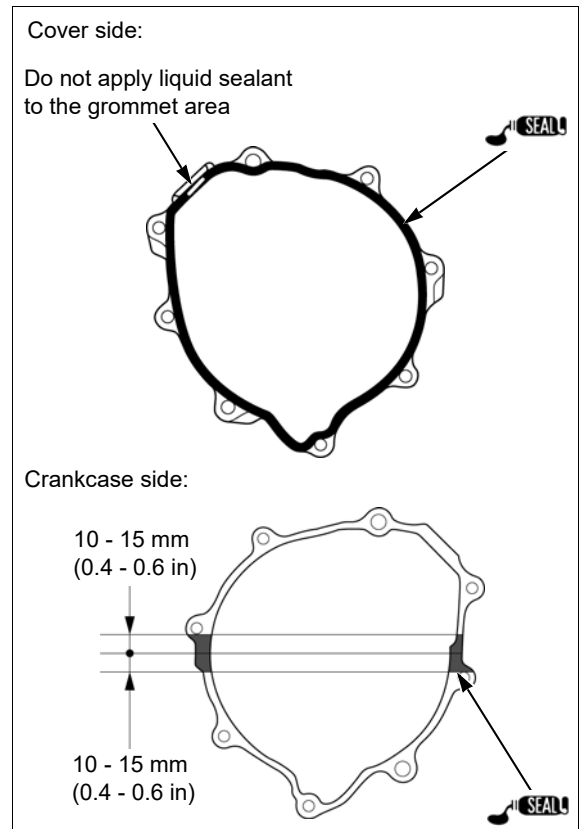
Left crankcase cover bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:

- Apply sealant (TB1207B manufactured by ThreeBond or an equivalent) to the mating areas of crankcase cover and crankcase as shown.
- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models: Perform the crank pulse initialize learning procedure (page 4-84).

Check the oil level (page 3-10).

Make sure there are no oil leaks.



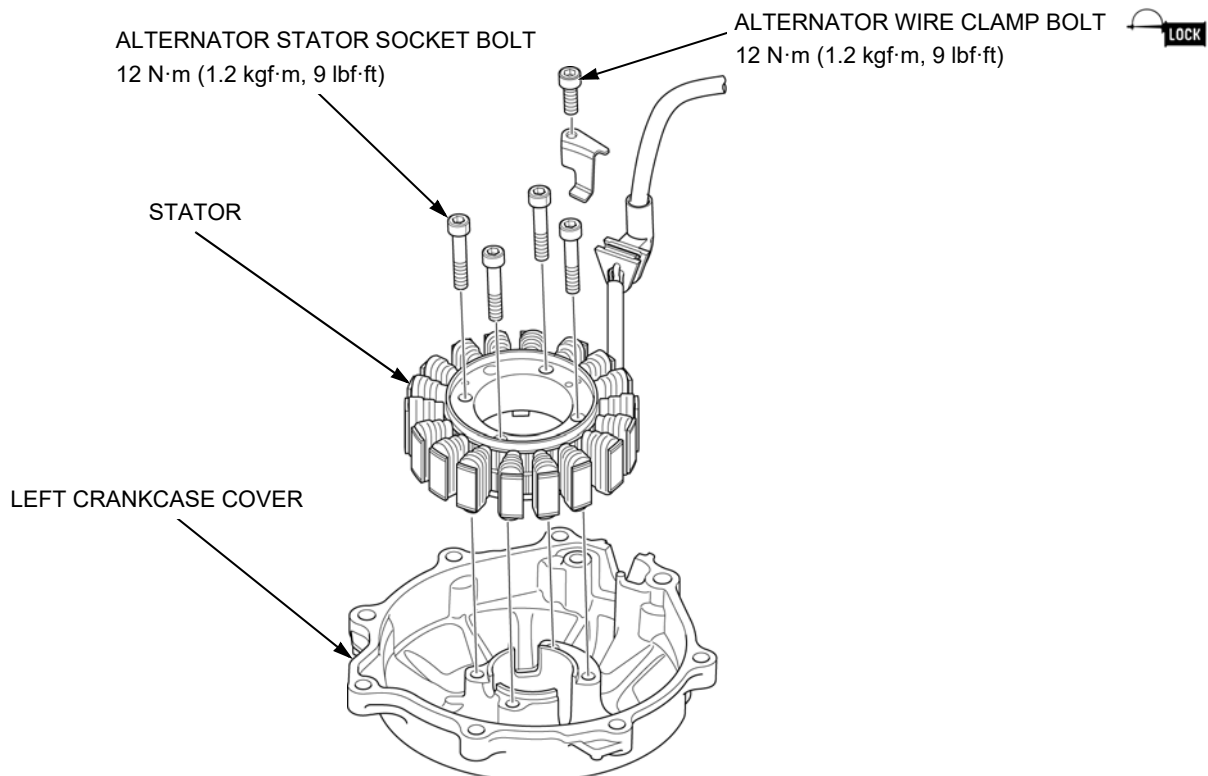
STATOR

REMOVAL/INSTALLATION

Remove the left crankcase cover (page 12-3).

Remove and install the stator as following illustration.

Installation is in the reverse order of removal.



FLYWHEEL

REMOVAL

Remove the left crankcase cover (page 12-3).

Hold the flywheel [1] using the special tool and loosen the flywheel bolt [2].

NOTE:

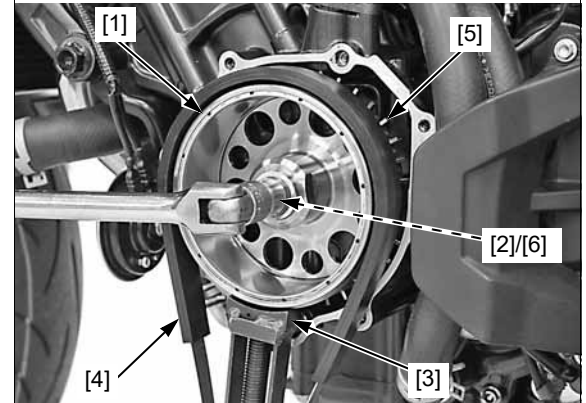
- Set the holding block [3] of the flywheel holder [4] avoiding the flywheel reluctors [5].
- Do not damage the flywheel reluctors.

TOOL:

Flywheel holder 07725-0040001

Remove the flywheel bolt and washer [6].

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models shown:

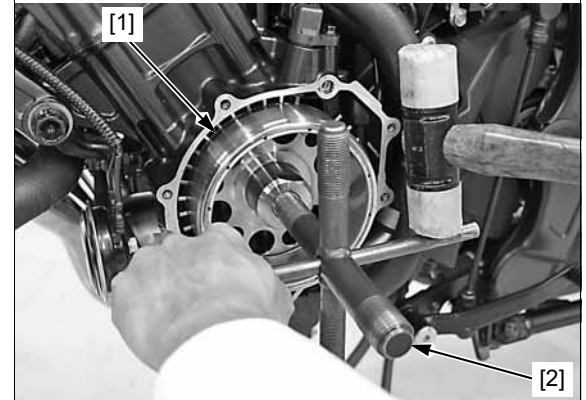


Remove the flywheel [1] using the special tool.

TOOL:

[2] Rotor puller 07733-0020001

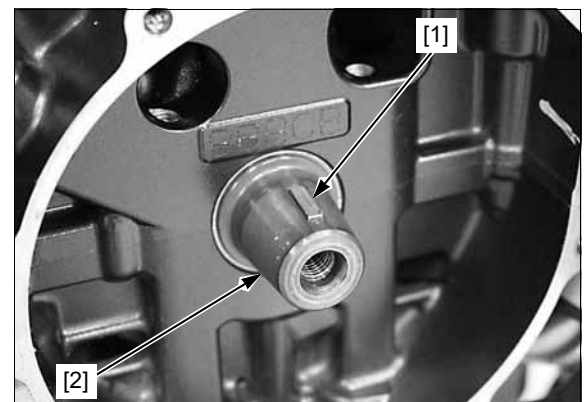
ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models shown:



INSTALLATION

Inspect the woodruff key [1] for scratch, damage, abnormal wear and deformation. Replace if necessary.

Clean any oil off from the crankshaft taper area [2].



ALTERNATOR

Install the flywheel [1] while aligning the woodruff key on the crankshaft with flywheel keyway.

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models shown:



Apply engine oil to the flywheel bolt [1] threads and seating surface.

Install the washer [2] and flywheel bolt.

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 [6].
- Do not damage the flywheel reluctors.

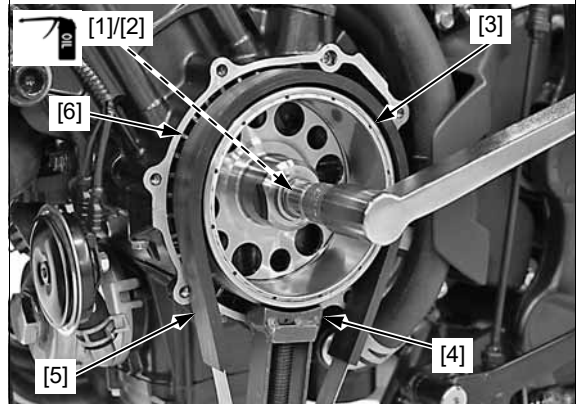
TOOL:

Flywheel holder 07725-0040001

TORQUE: 113 N·m (11.5 kgf·m, 83 lbf·ft)

Install the left crankcase cover (page 12-3).

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models shown:



13. CRANKCASE/TRANSMISSION

SERVICE INFORMATION..... 13-2 CRANKCASE..... 13-4
TROUBLESHOOTING 13-2 TRANSMISSION..... 13-7
COMPONENT LOCATION..... 13-3

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the following:
 - Transmission
 - Crankshaft (page 14-4)
 - Piston/connecting rod/cylinder (page 14-13)
- The following components must be removed before separating the crankcase:
 - Engine (page 15-4)
 - Clutch (page 11-6)
 - Gearshift linkage (page 11-19)
 - Starter clutch (page 11-14)
 - Flywheel (page 12-5)
 - Cylinder head (page 10-11)
 - Oil pan (page 9-6)
 - Oil pump (page 9-4)
 - Oil cooler (page 9-8)
 - Starter motor (page 6-5)
 - Water pump (page 8-10)
 - EOP switch (page 21-13)
 - Gear position switch (page 4-81)
- Be careful not to damage the crankcase mating surfaces when servicing.
- Prior to assembling the crankcase halves, apply sealant to their mating surfaces. Wipe off excess sealant thoroughly.

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 11-20)

Transmission jumps out of gear

- Worn gear dogs
- Worn gear shifter groove
- Bent shift fork shaft
- Broken shift drum stopper arm (page 11-20)
- Broken shift drum stopper arm return spring (page 11-20)
- Worn or bent shift forks
- Broken gearshift spindle return spring (page 11-20)

Excessive engine noise

- Worn or damaged transmission gear
- Worn or damaged transmission bearings

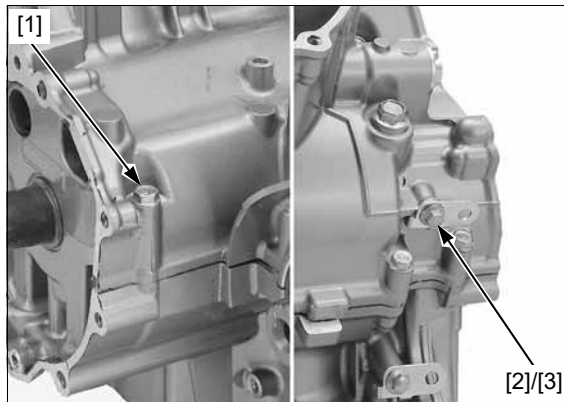
CRANKCASE

SEPARATION

Refer to Service Information for removal of necessary parts before separating the crankcase (page 13-2).

Remove the crankcase 6 x 50 mm bolt [1] on the upper side of the crankcase.

Remove the bolt [2] and wire stay [3] on the lower side of the crankcase.

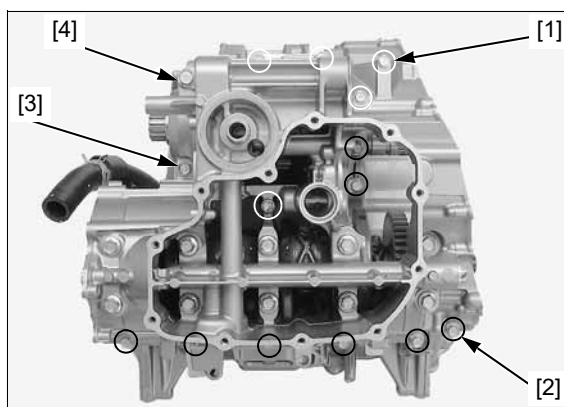


Place the engine upside down.

Loosen the following in a crisscross pattern in 2 or 3 steps:

- Five 6 x 50 mm bolts [1]
- Eight 6 x 35 mm bolts [2]
- 8 mm bolt [3]
- 10 mm bolt [4]

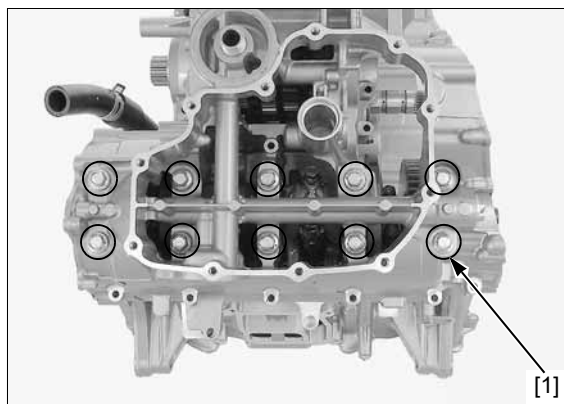
Remove the all bolts.



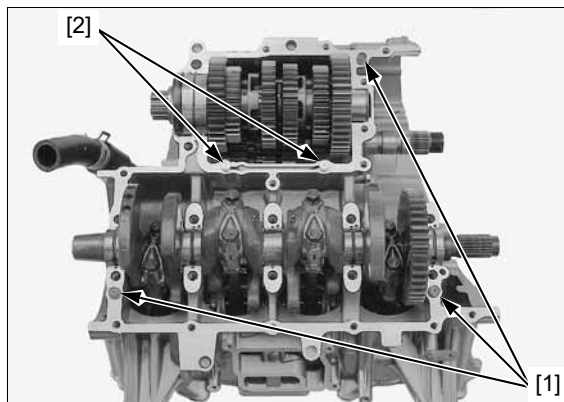
Loosen the crankcase main journal bolt [1] in a crisscross pattern in 2 or 3 steps, and remove them.

Do not pry the crankcase halves with a screwdriver.

Separate the lower crankcase from the upper crankcase.



Remove the dowel pins [1] and oil orifices [2].



ASSEMBLY

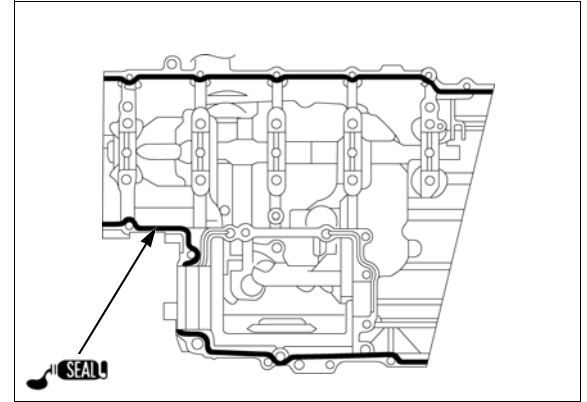
Clean the upper and lower crankcase mating surfaces thoroughly, being careful not to damage them.

Check the crankcase oil passages for clogs, and clean them if necessary.

Apply sealant (TB1207B manufactured by ThreeBond or an equivalent) to the crankcase mating surface as shown.

NOTE:

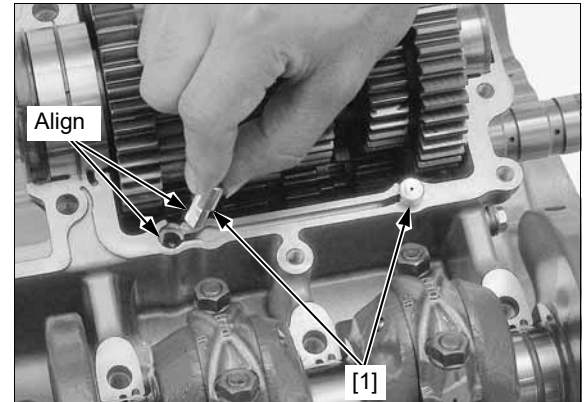
- Do not apply liquid sealant more than necessary.
- Do not apply liquid sealant to the crankcase main journal bolts area and the oil passage area.



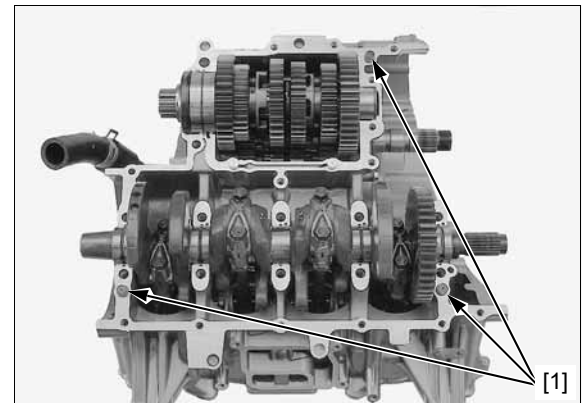
Clean the oil orifices in solvent thoroughly.

Check the oil orifices for clogs, and replace them if necessary.

Install the oil orifices [1] by aligning its cut-out with the groove of upper crankcase.



Install the dowel pins [1] into the upper crankcase.



CRANKCASE/TRANSMISSION

Apply molybdenum oil solution to the main journal bearing sliding surfaces on the lower crankcase.

Install the lower crankcase onto the upper crankcase.

Install new crankcase main journal bolts [1].

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 the all crankcase bolts.

Tighten the crankcase bolts in a crisscross pattern in 2 or 3 steps to the specified torque.

TORQUE:

Crankcase 10 mm bolt [1]:

39 N·m (4.0 kgf·m, 29 lbf·ft)

Crankcase 8 mm bolt [2]:

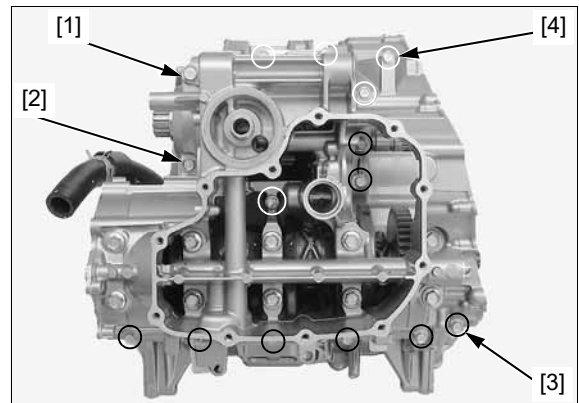
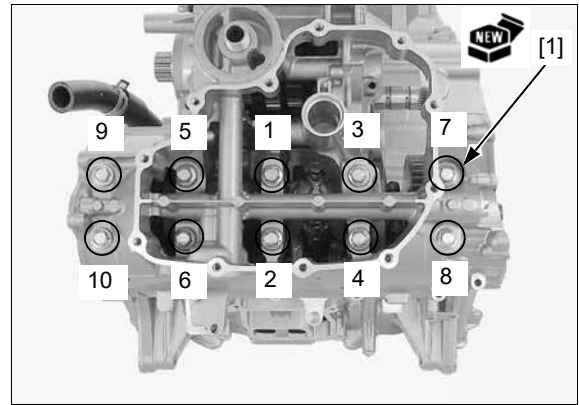
24 N·m (2.4 kgf·m, 18 lbf·ft)

Crankcase 6 x 35 mm bolt [3]

12 N·m (1.2 kgf·m, 9 lbf·ft)

Crankcase 6 x 50 mm bolt [4]:

12 N·m (1.2 kgf·m, 9 lbf·ft)

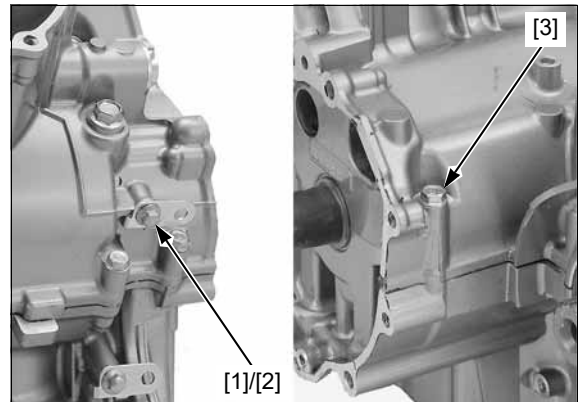


Install the wire stay [1] and bolt [2], then tighten the bolt.

Tighten the crankcase 6 x 50 mm bolt [3] 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).

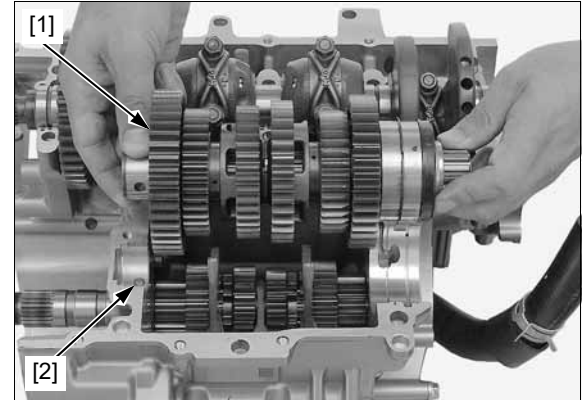


TRANSMISSION

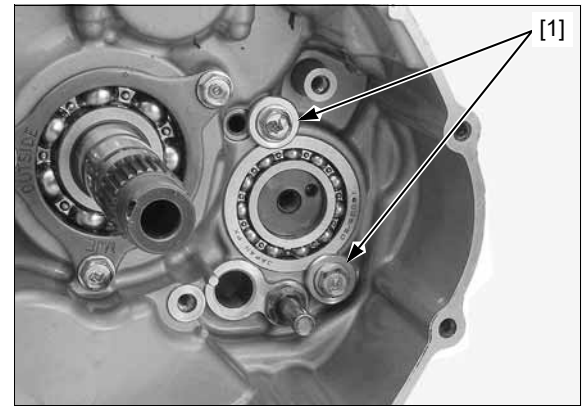
REMOVAL

Separate the crankcase halves (page 13-4).

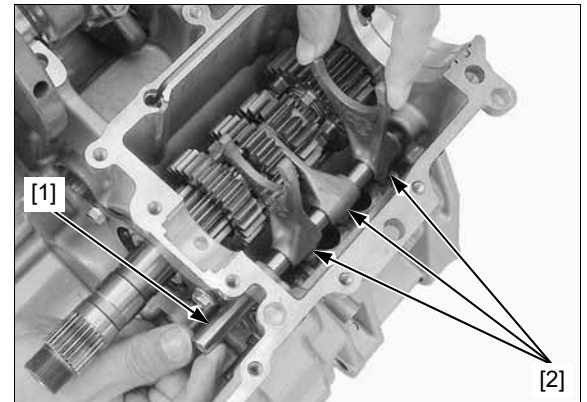
Remove the countershaft assembly [1] and dowel pin [2].



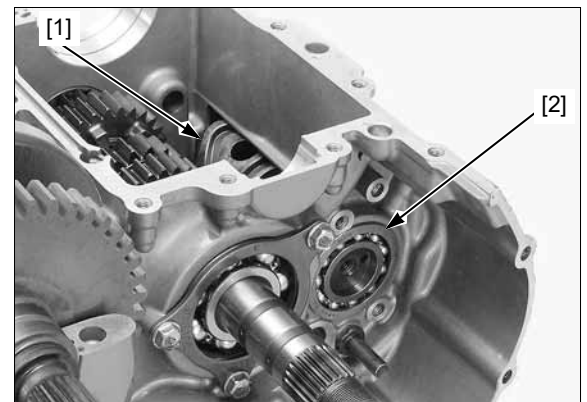
Remove the shift drum bearing setting washer-bolts [1].



Remove the shift fork shaft [1] and shift forks [2].

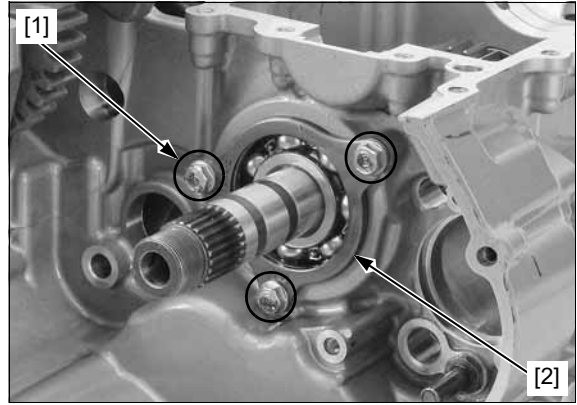


Remove the shift drum [1]/bearing [2] assembly.
Remove the shift drum bearing from the shift drum.



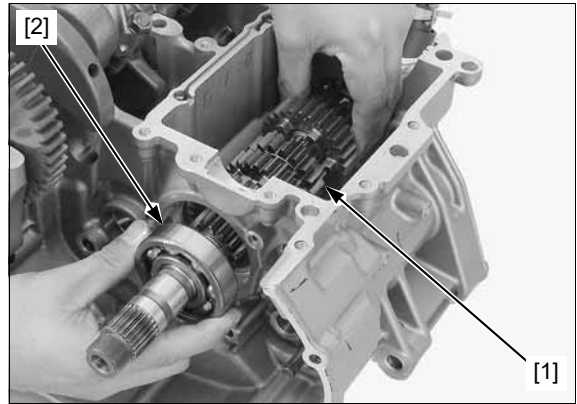
CRANKCASE/TRANSMISSION

Remove the bolts [1] and mainshaft bearing setting plate [2].



Slide the mainshaft assembly [1] off the upper crankcase and remove the right mainshaft bearing [2].

Remove the mainshaft assembly.



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 1-9).

Replace any part if it is out of service limit.

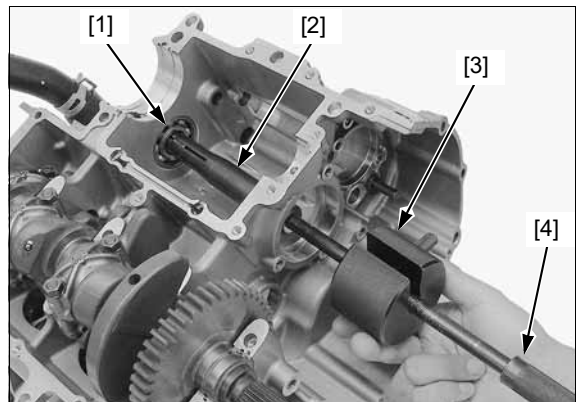
MAINSHAFT BEARING REPLACEMENT

Remove the transmission (page 13-7).

Remove the mainshaft bearing [1] using the special tools as shown.

TOOLS:

- | | |
|--------------------------------|---------------|
| [2] Bearing remover set, 20 mm | 07936-3710600 |
| [3] Remover weight | 07741-0010201 |
| [4] Remover handle | 07936-3710100 |

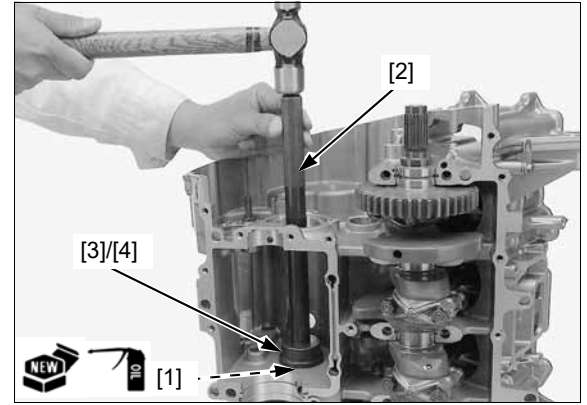


Drive in a new bearing squarely with the marking side facing down.

Apply engine oil to a new main shaft bearing [1].
Drive a new bearing into the 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

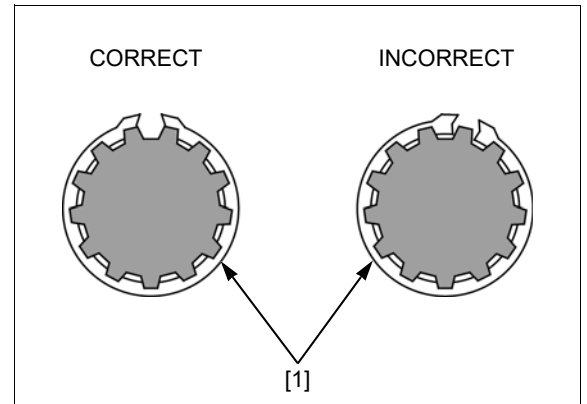
Install the transmission (page 13-10).



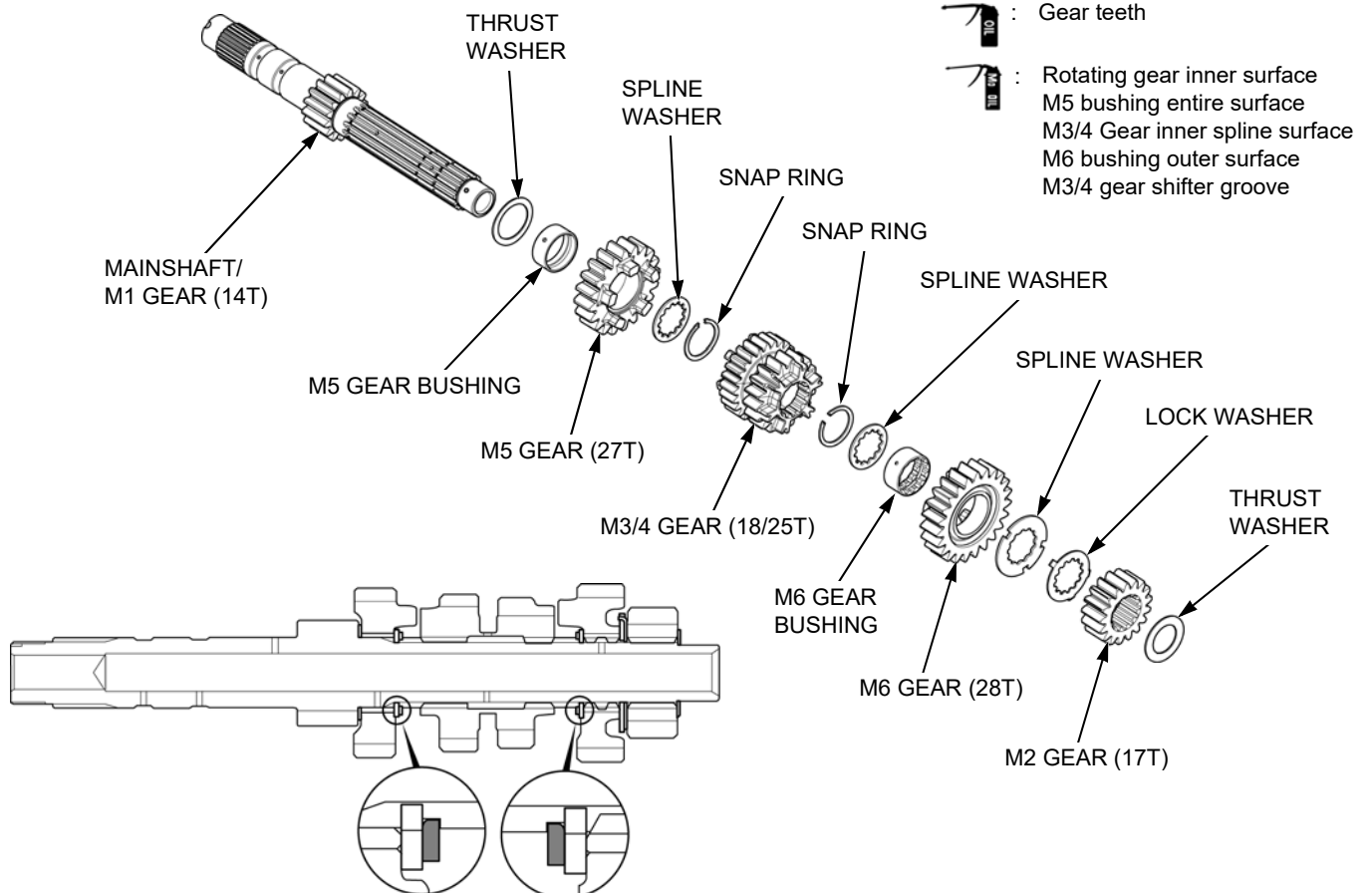
DISASSEMBLY/ASSEMBLY

NOTE:

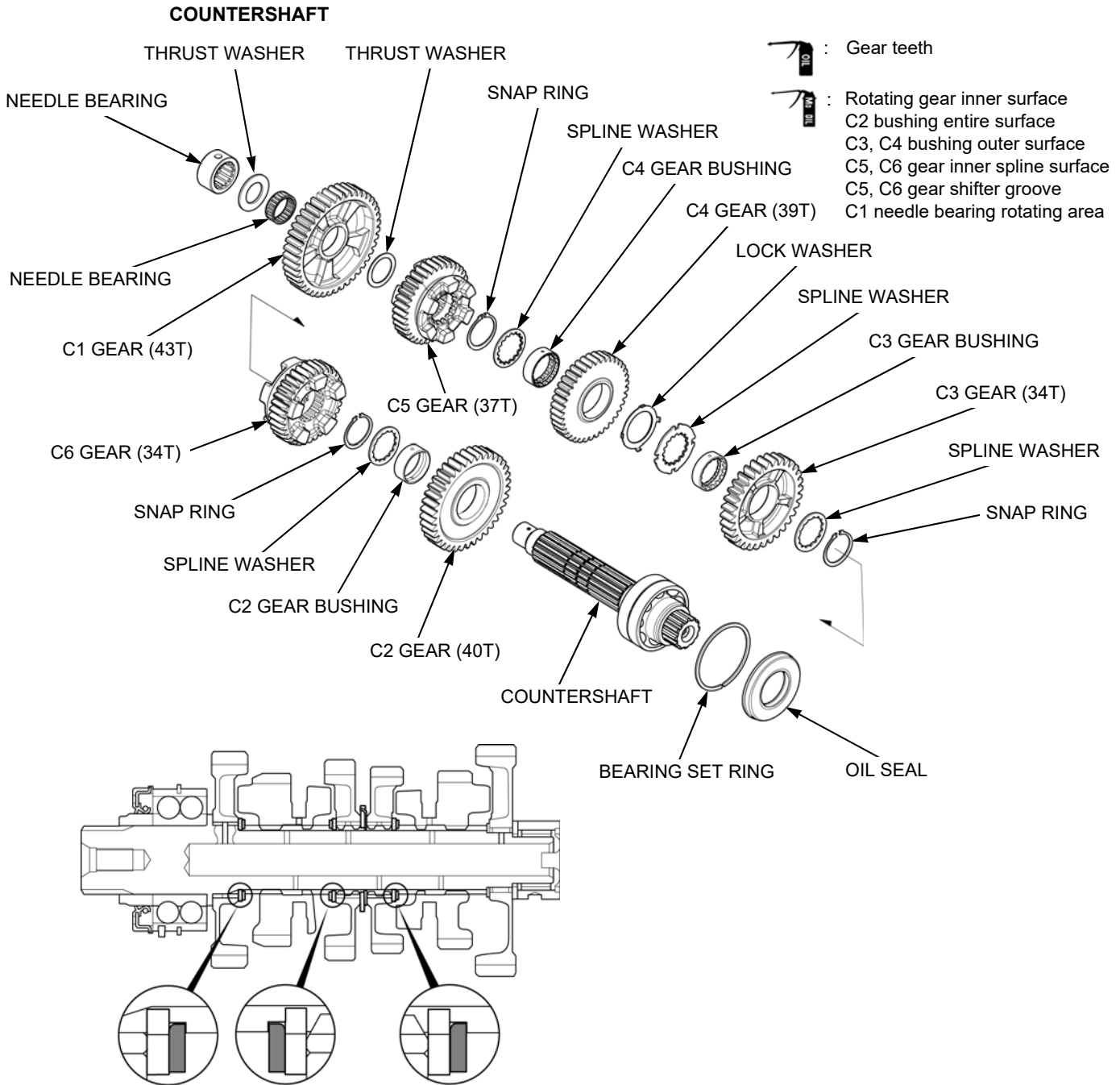
- Coat each gear with clean engine oil and check for smooth movement.
- Align the lock washer tabs with the spline washer grooves.
- Always install the thrust washers and snap rings with the chamfered (rolled) edge facing away from the thrust load.
- Install the snap rings [1] so that the end gap aligns with the groove of the splines.
- Make sure that the snap rings are fully seated in the shaft groove after installing them.



MAINSHAFT



CRANKCASE/TRANSMISSION



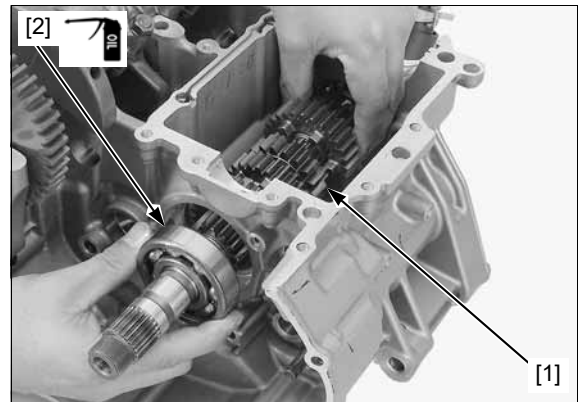
INSTALLATION

Install the mainshaft assembly [1] into the upper crankcase.

Apply engine oil to the mainshaft bearing.

Install the bearing into the crankcase with the marked side facing out.

Install the mainshaft bearing [2] into the upper crankcase.

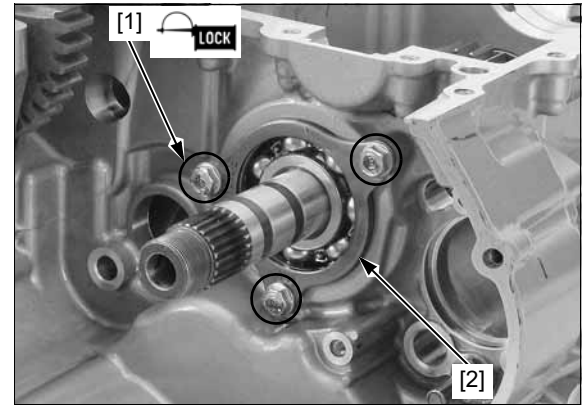


Apply locking agent to the mainshaft bearing setting plate bolts [1] threads (page 1-17).

Install the mainshaft bearing setting plate [2] and setting plate bolts.

Tighten the setting plate bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

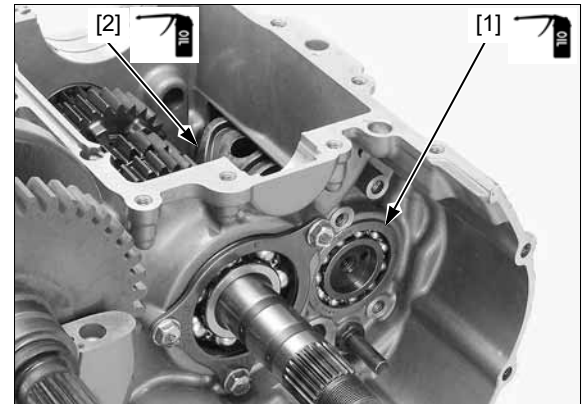


Apply engine oil to the shift drum bearing [1] and shift drum [2] journal outer surface.

Install the bearing onto the shift drum with the marked side facing out.

Install the shift drum bearing onto the shift drum.

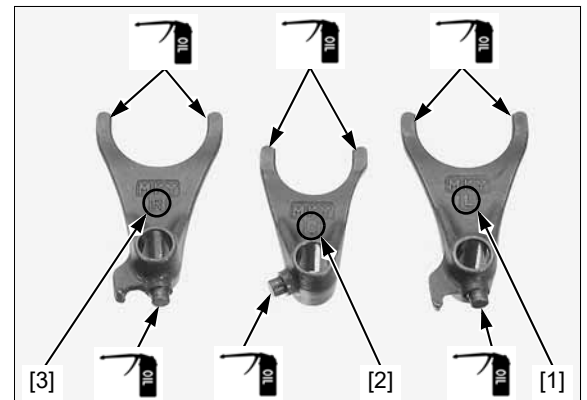
Install the shift drum/bearing assembly into the upper crankcase.



The shift forks have the following identification marks:

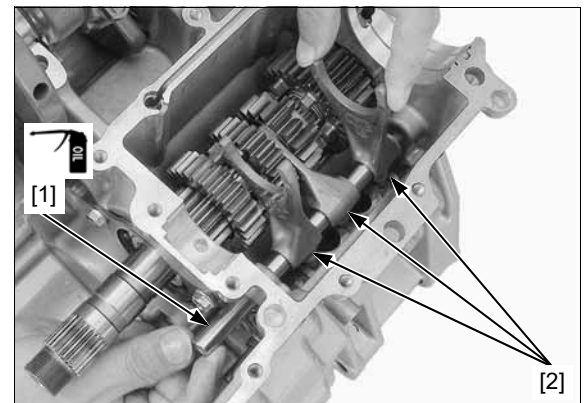
- "L" mark [1]: left shift fork
- "C" mark [2]: center shift fork
- "R" mark [3]: right shift fork

Apply engine oil to the shift fork guide area and guide pin.



Apply engine oil to the shift fork shaft [1] outer surface.

Install the shift forks [2] 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.

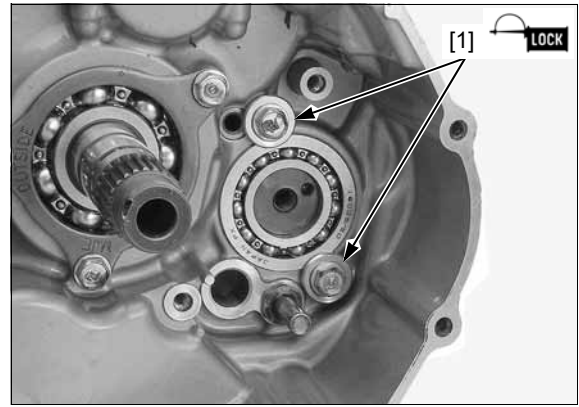


CRANKCASE/TRANSMISSION

Apply locking agent to the shift drum bearing setting washer-bolt [1] threads (page 1-17).

Install and tighten the shift drum bearing setting washer-bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

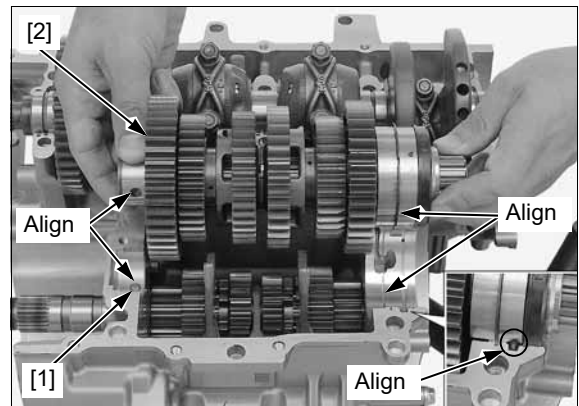


Install the dowel pin [1] onto the upper crankcase hole.

Install the countershaft [2] by aligning the following:

- Set ring with the groove of the upper crankcase
- Bearing cap hole with the dowel pin
- Countershaft bearing stopper pin with the groove of the upper crankcase

Assemble the crankcase halves (page 13-5).



14. CRANKSHAFT/PISTON/CYLINDER

SERVICE INFORMATION.....	14-2	MAIN JOURNAL BEARING	14-7
TROUBLESHOOTING	14-2	CRANKPIN BEARING	14-10
COMPONENT LOCATION	14-3	PISTON/CYLINDER	14-13
CRANKSHAFT	14-4		

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the crankshaft, cylinder, piston/connecting rod and piston oil jet. Refer to procedures for crankcase separation (page 13-4).
- 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.

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

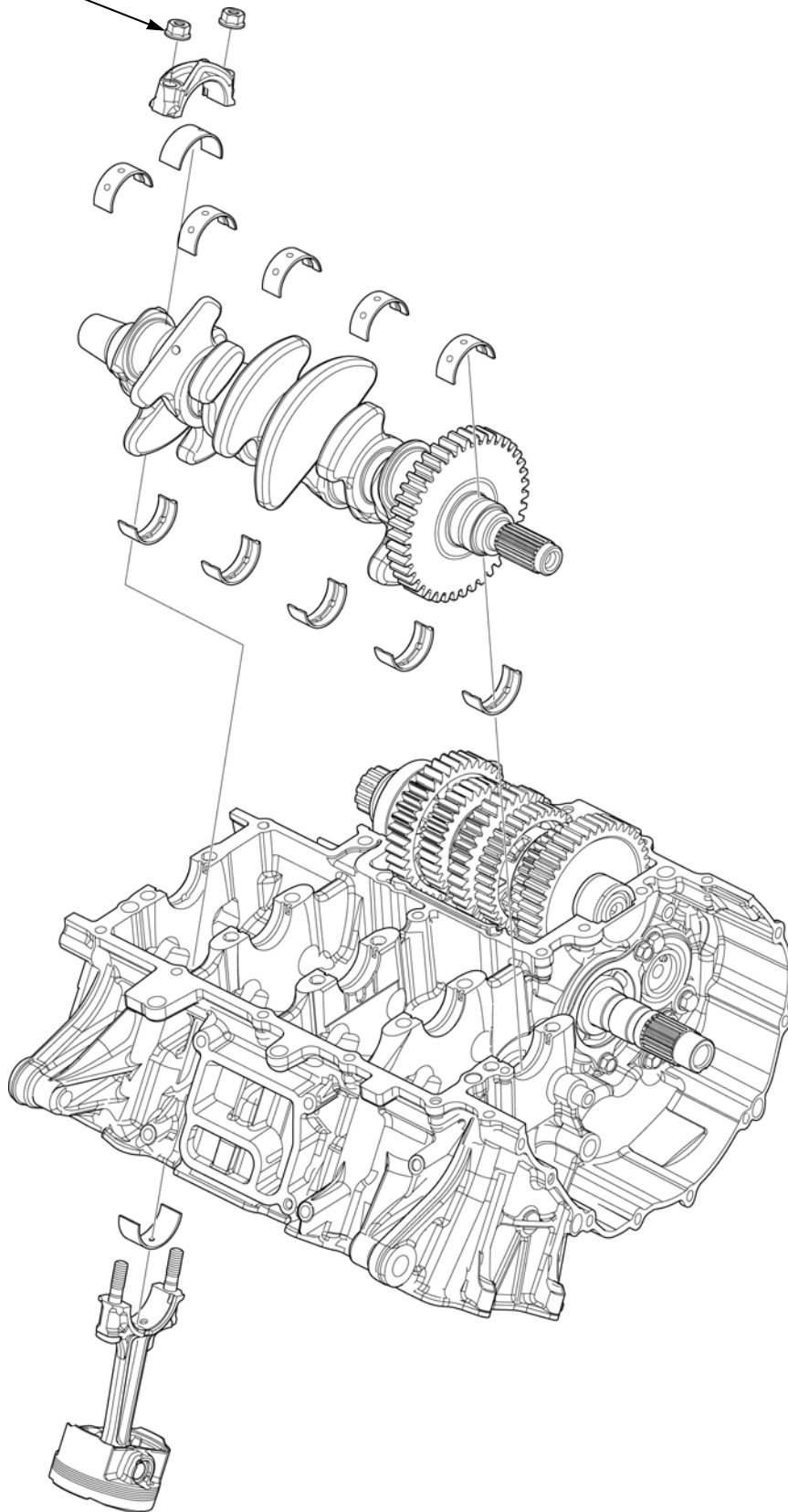
- Worn piston pin or piston pin hole
- Worn connecting rod small end
- Worn cylinder, piston or piston rings
- Worn main journal bearings
- Worn crankpin bearings

Engine vibration

- Excessive crankshaft runout

COMPONENT LOCATION

35.2 N·m (3.6 kgf·m, 26 lbf·ft)



CRANKSHAFT

SIDE CLEARANCE INSPECTION

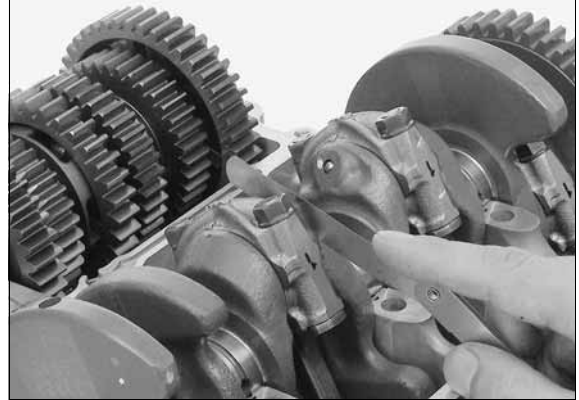
Separate the crankcase halves (page 13-4).

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 14-4).

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 13-4).

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

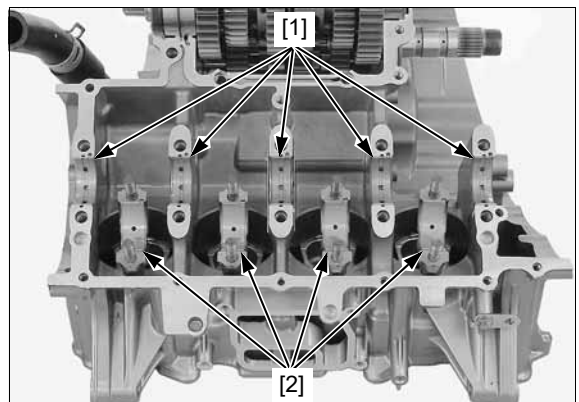
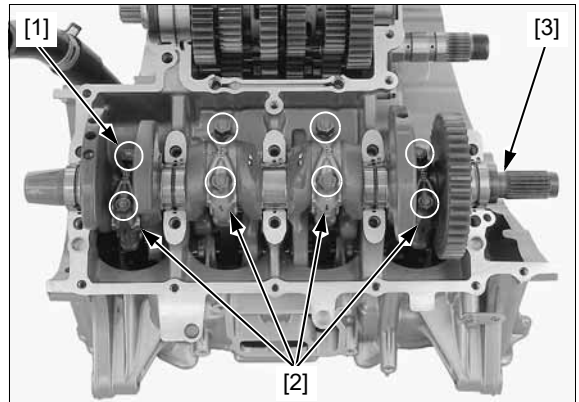
Before removal, position all the pistons at TDC (Top Dead Center) to prevent damaging the crankpin with the connecting rod.

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.

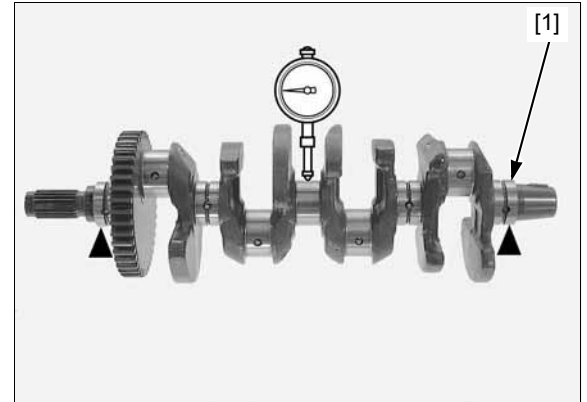
INSPECTION

Support the crankshaft [1] 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)



INSTALLATION

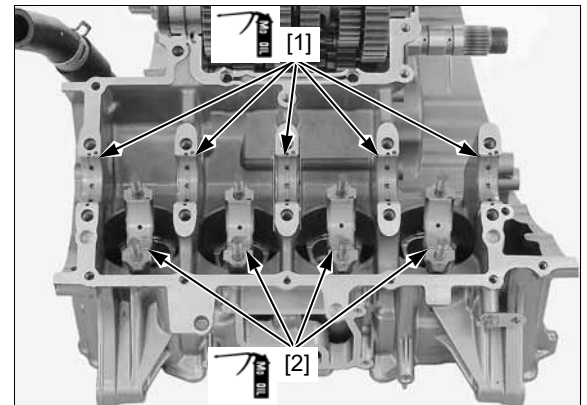
Apply molybdenum oil solution to the main journal bearing [1] sliding surfaces on the upper crankcase and crankpin bearing [2] sliding surfaces on the connecting rods.

The bearing tabs should be aligned with the grooves in the crankcase.

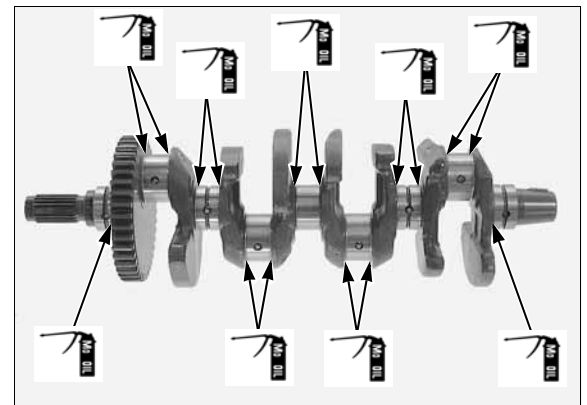
Install the main journal bearings and crankpin bearings in the original locations.

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.



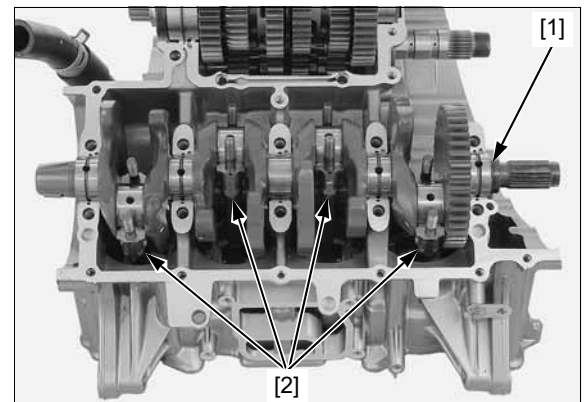
Apply molybdenum oil solution to the thrust surfaces of the crankshaft as shown.



NOTICE

Position all the pistons at TDC (Top Dead Center) to prevent damaging the crankpin with the connecting rod.

Install the crankshaft [1] onto the upper crankcase. Set the connecting rods [2] onto the crankpins.



CRANKSHAFT/PISTON/CYLINDER

Clean the mating surface of the connecting rods and crankpin bearing caps with solvent and blow them with compressed air.

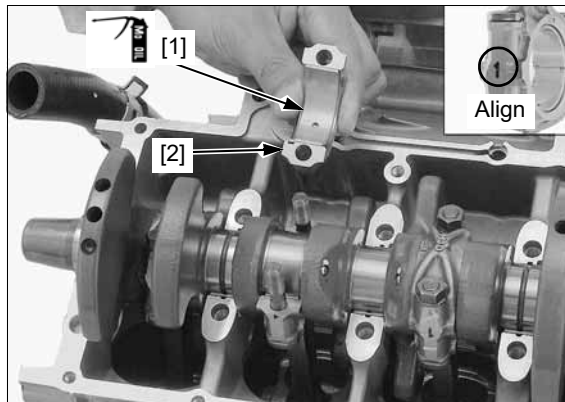


Apply molybdenum oil solution to the crankpin bearing [1] sliding surfaces on the crankpin bearing caps [2].

Install the crankpin bearing caps 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.

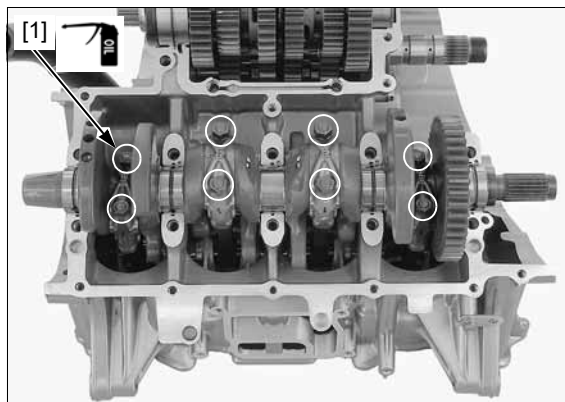


Apply engine oil to the crankpin bearing cap nut [1] threads and seating surfaces.

Install and tighten the crankpin bearing cap nuts in 2 or 3 steps alternately to the specified torque.

TORQUE: 35.2 N·m (3.6 kgf·m, 26 lbf·ft)

Assemble the crankcase halves (page 13-5).



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.

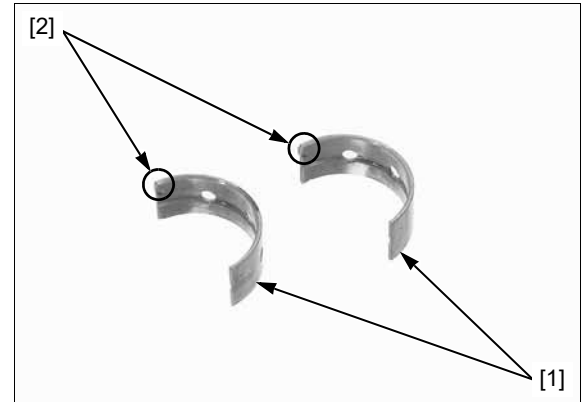
BEARING INSPECTION

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 is damaged, select a replacement bearing (page 14-8).



OIL CLEARANCE INSPECTION

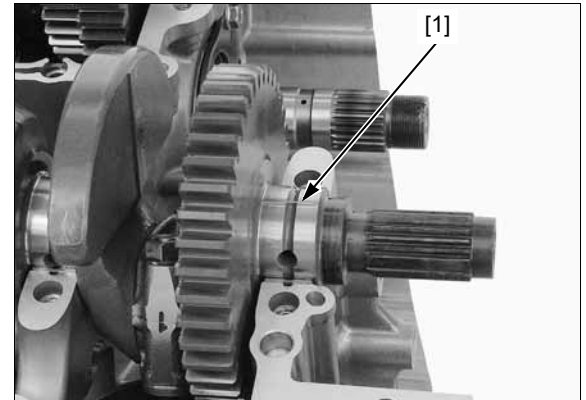
Remove the crankshaft (page 14-4).

Clean off any oil from the bearing inserts and main journals.

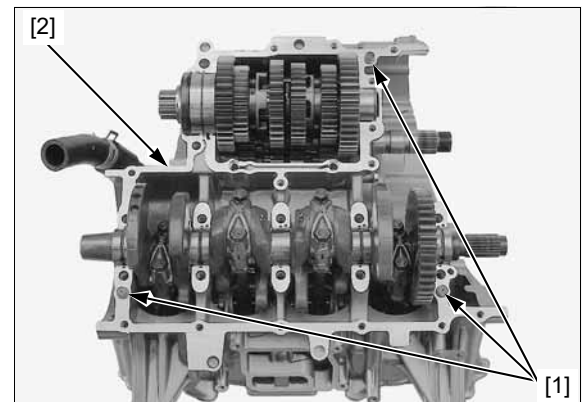
Install the crankshaft onto the upper crankcase (page 14-5).

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].



CRANKSHAFT/PISTON/CYLINDER

Install the lower crankcase 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 [1].

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°.

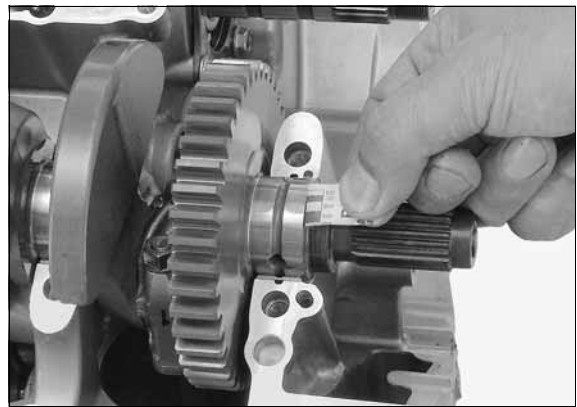
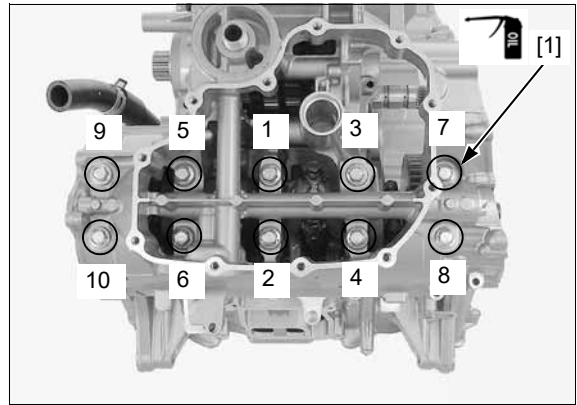
TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft) + 120°

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)

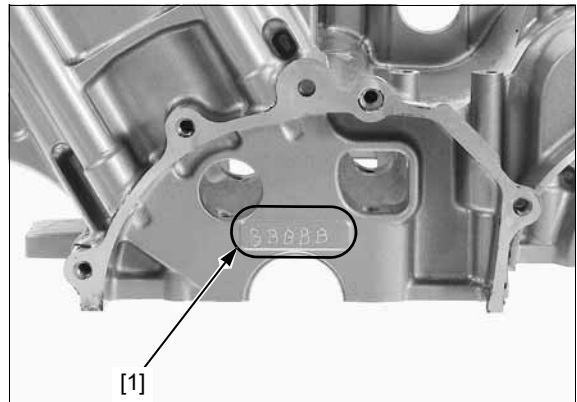
If the oil clearance exceeds the service limit, select a replacement bearing (page 14-8).



BEARING SELECTION

Letters (A, B or C) on the left side of upper crankcase are bearing support I.D. codes from left to right.

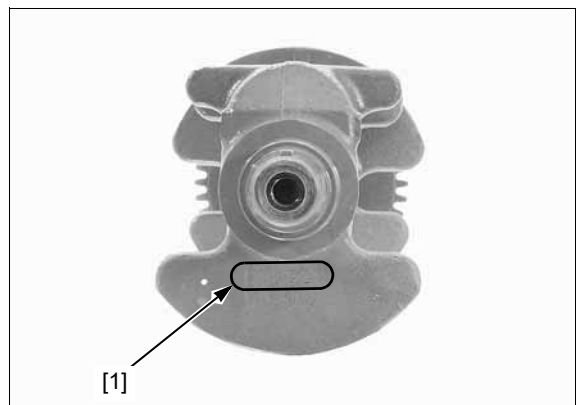
Record the crankcase bearing support I.D. code letters [1] from left side of the upper crankcase as shown.



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.

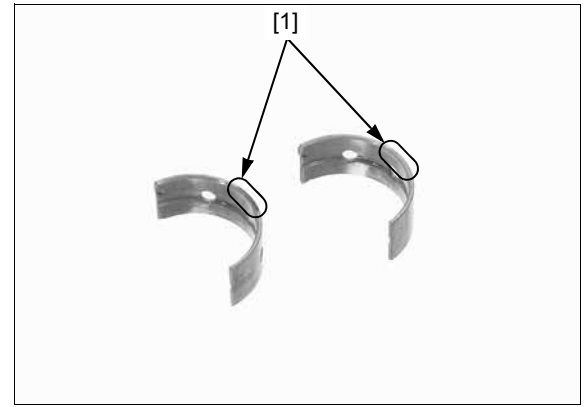
If you are reusing the crankshaft, measure the crankpin O.D. with a micrometer.



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)

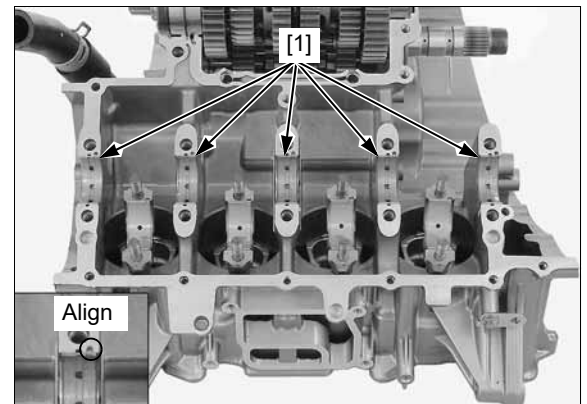
NOTICE

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.

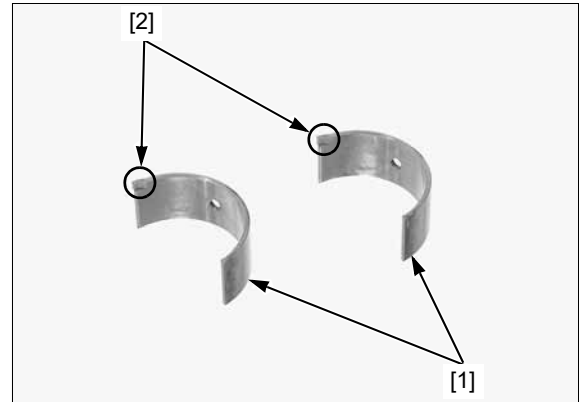
BEARING INSPECTION

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 14-11).



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.

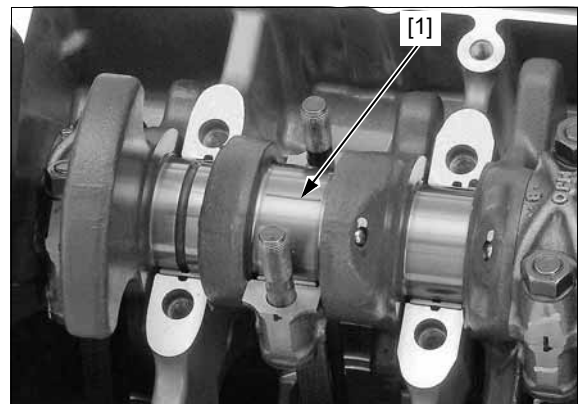


Clean off any oil from the bearing inserts and crankpins. Install the crankshaft onto the upper crankcase (page 14-5).

Set the connecting rods onto the crankpins.

Do not rotate the crankshaft during inspection.

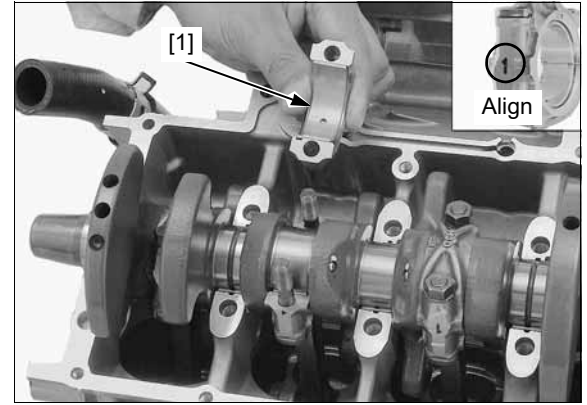
Put a strip of plastigauge [1] lengthwise on each crankpin avoiding the oil hole.



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.

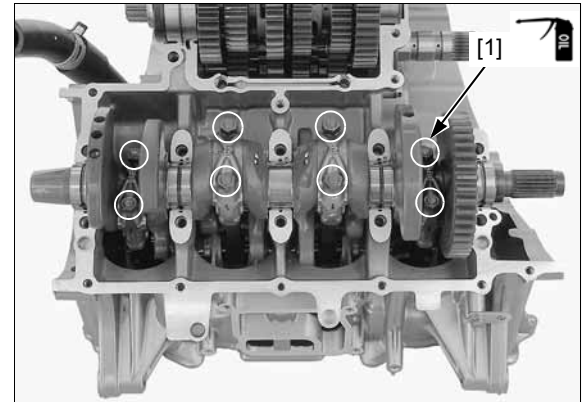


Apply engine oil to the crankpin bearing cap nut [1] threads and seating surfaces.

Install and tighten the crankpin bearing cap nuts in 2 or 3 steps alternately to the specified torque.

TORQUE: 35.2 N·m (3.6 kgf·m, 26 lbf·ft)

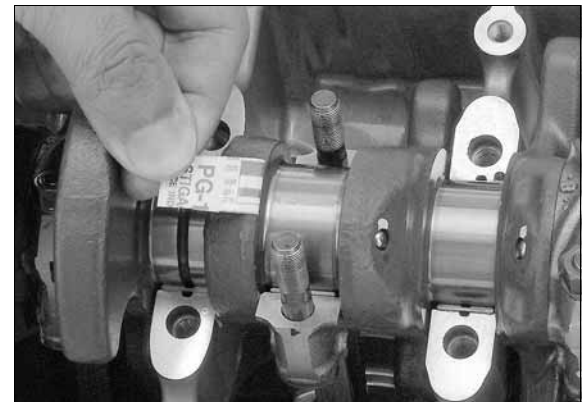
Remove the bearing caps.



Measure the compressed plastigauge at its widest point on the crankpin to determine the oil clearance.

SERVICE LIMIT: 0.06 mm (0.002 in)

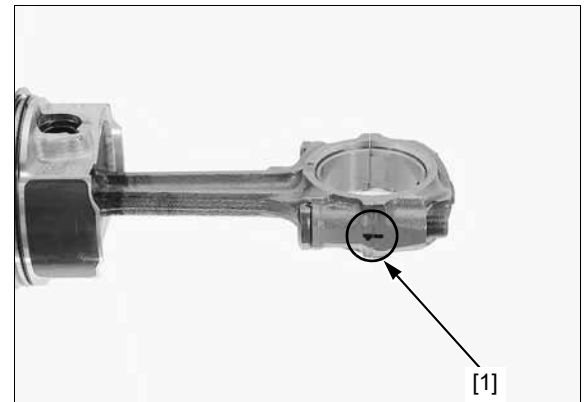
If the oil clearance exceeds the service limit, select the correct replacement bearings (page 14-11).



BEARING SELECTION

Numbers on the connecting rods are the codes for the connecting rod I.D.

Record the connecting rod I.D. code number [1] or measure the I.D. with the crankpin bearing cap installed without bearing inserts.

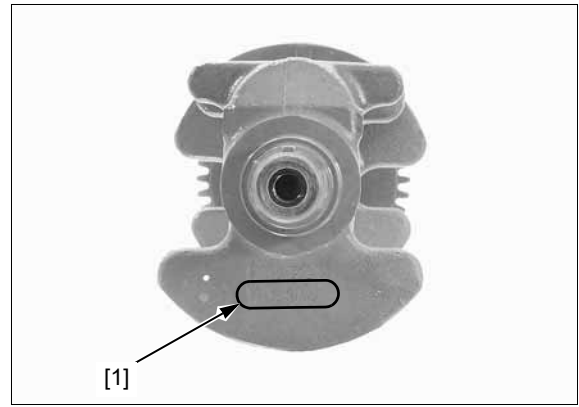


CRANKSHAFT/PISTON/CYLINDER

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].

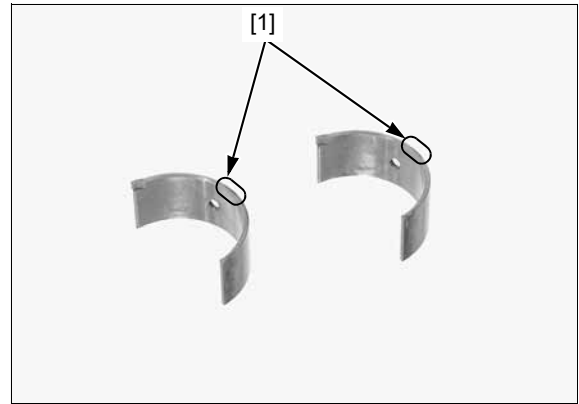
If you are reusing the crankshaft, measure the crankpin O.D. with a micrometer.



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)
	B	35.988 – 35.994 mm (1.4168 – 1.4171 in)	D (Green)	C (Brown)
	C	35.982 – 35.988 mm (1.4166 – 1.4168 in)	C (Brown)	B (Black)
				A (Blue)

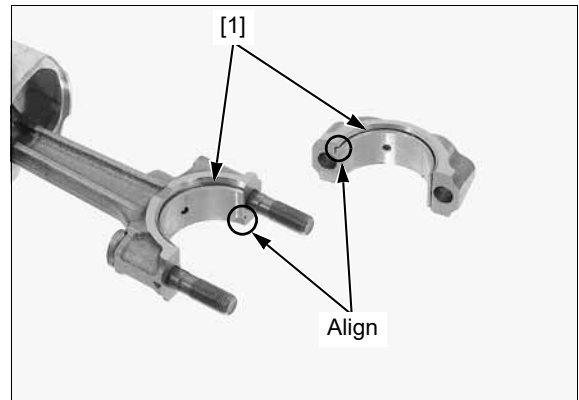
NOTICE

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

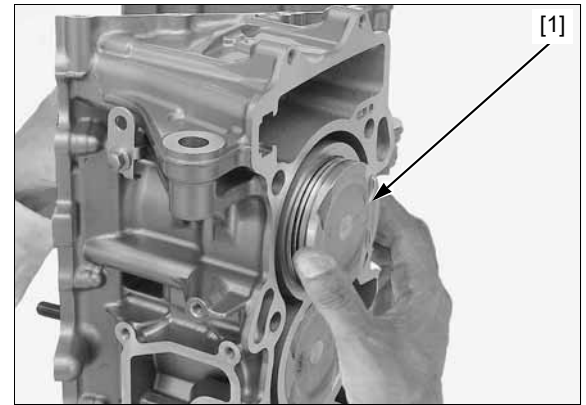
NOTICE

- 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:

- Transmission (page 13-7)
- Crankshaft (page 14-4)

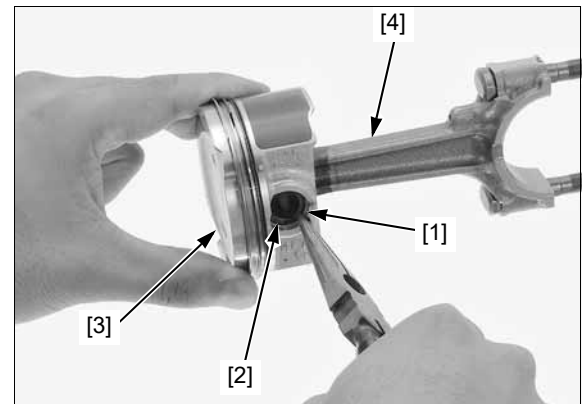
Remove the piston/connecting rod assembly [1] from the top of the cylinder.



PISTON REMOVAL

Remove the piston pin clips [1] with pliers.

Push the piston pin [2] out of the piston [3] and connecting rod [4], then remove the piston.

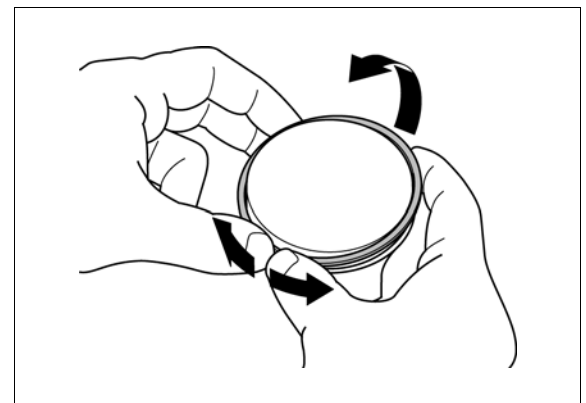


PISTON RING REMOVAL

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.

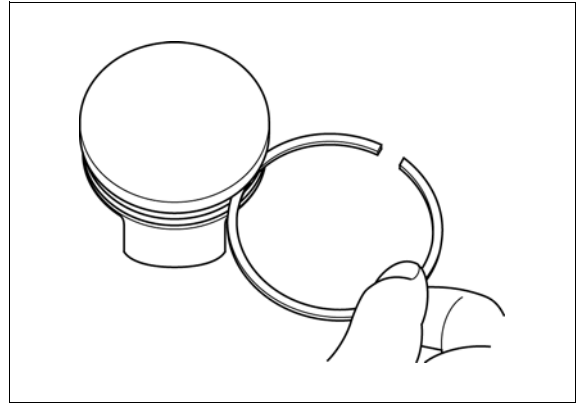


CRANKSHAFT/PISTON/CYLINDER

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 SPECIFICATIONS (page 1-9).

Replace any part if it is out of service limit.

PISTON RING INSTALLATION

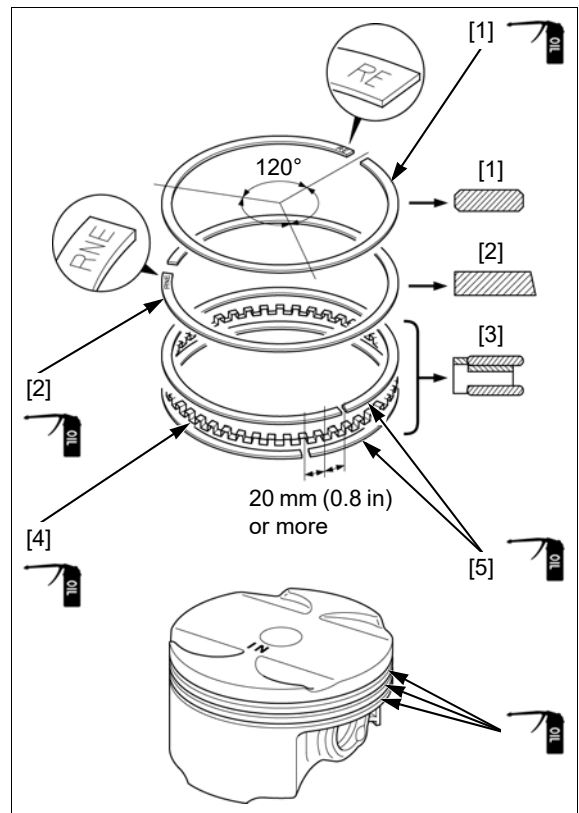
Clean the piston ring grooves thoroughly and install the piston rings.

- 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.



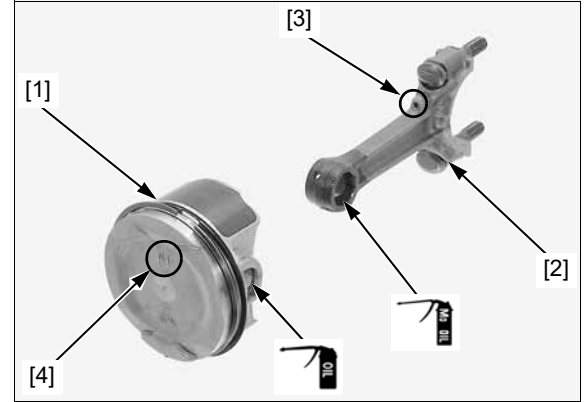
PISTON INSTALLATION

Install the crankpin bearings in the original locations (page 14-5).

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 oil passage hole [3] facing to the piston "IN" mark [4].

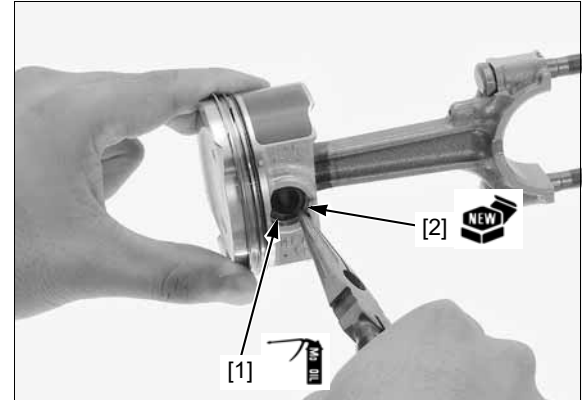


Apply molybdenum oil solution to the piston pin [1] outer surface.

Install the piston pin 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.



Apply engine oil to the cylinder inner surface and piston sliding surface.

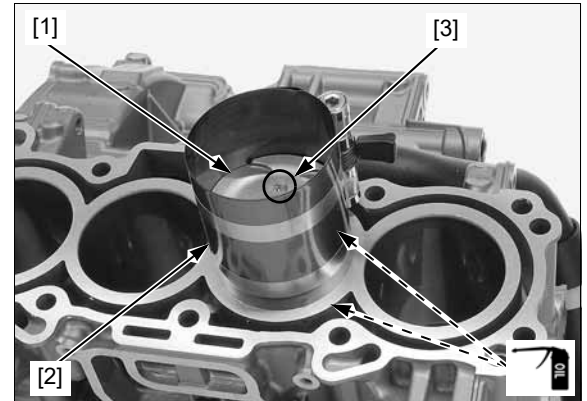
Install the piston/ connecting rod assembly with the piston "IN" mark [3] facing the intake side.

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)
- Transmission (page 13-10)

MEMO

15. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION.....	15-2	ENGINE REMOVAL	15-4
COMPONENT LOCATION.....	15-3	ENGINE INSTALLATION	15-7

SERVICE INFORMATION

GENERAL

- A hoist or equivalent is required to support the motorcycle when removing and installing the engine.
- A floor jack or other adjustable support is required to support and maneuver the engine.

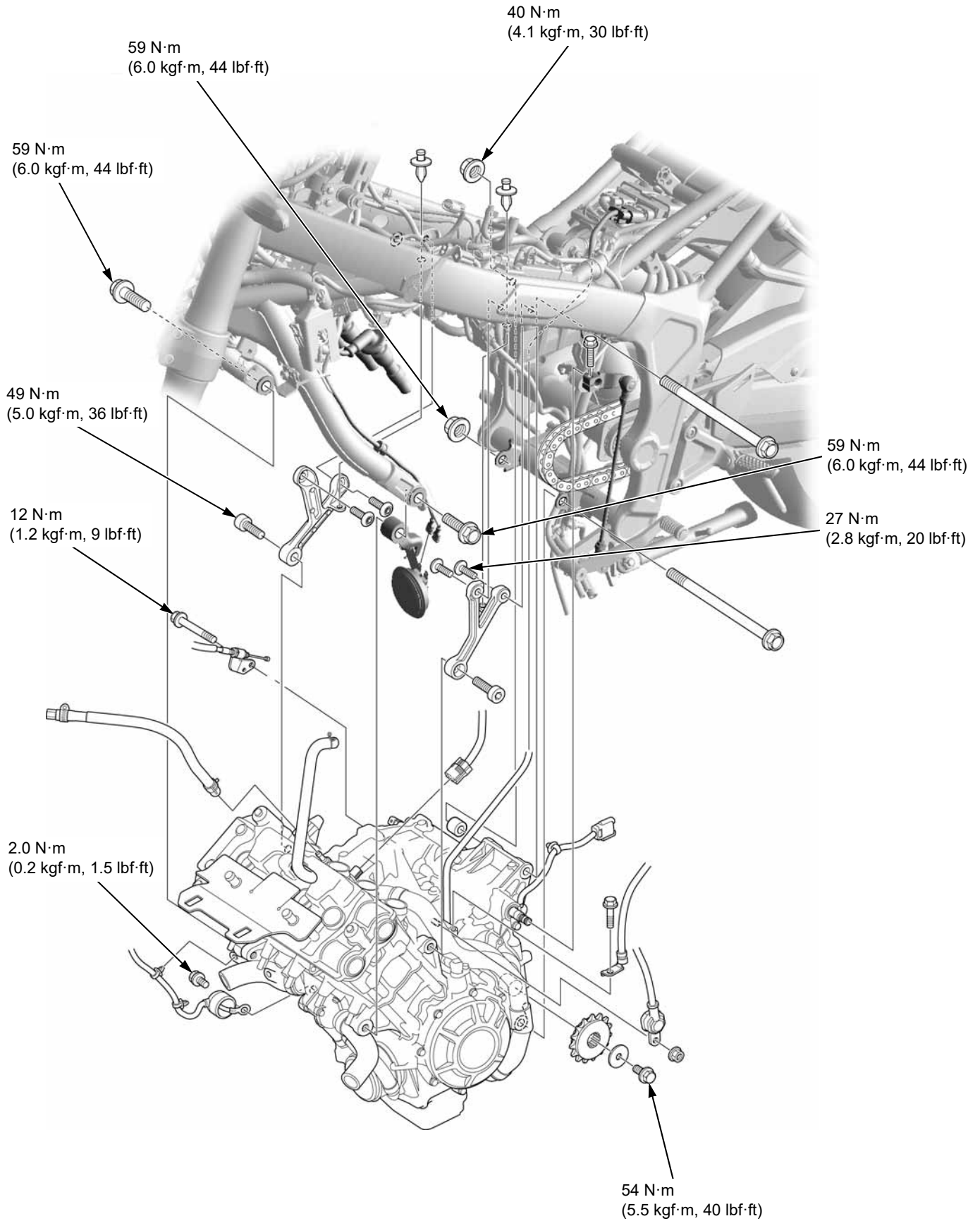
NOTICE

Do not use the oil filter as a jacking point.

- When removing/installing the engine, tape the frame around the engine beforehand for frame protection.
- When installing the engine, be sure to tighten the engine mounting fasteners to the specified torque in the specified sequence. If you mistake the torque or sequence, loosen all mounting fasteners, then tighten them again to the specified torque in the correct sequence.
- The following components can be serviced with the engine installed in the frame.
 - Starter motor (page 6-5)
 - Throttle body (page 7-13)
 - Air cleaner housing (page 7-12)
 - Water pump (page 8-10)
 - Oil pump (page 9-4)
 - Oil strainer (page 9-6)
 - Camshaft (page 10-5)
 - Cam chain tensioner lifter (page 10-20)
 - Clutch (page 11-6)
 - Gearshift linkage (page 11-19)
 - Stator (page 12-4)
 - Flywheel (page 12-5)
 - Starter clutch (page 11-14)
 - Cylinder head/valves (page 10-11)
- The following components require engine removal for service.
 - Transmission (page 13-7)
 - Crankshaft (page 14-4)
 - Piston/cylinder (page 14-13)

COMPONENT LOCATION

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models shown:



ENGINE REMOVAL/INSTALLATION

ENGINE REMOVAL

Drain the engine oil (page 3-11).
Drain the coolant (page 8-4).

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

Remove the following:

- Drive sprocket cover (page 2-15)
- Radiator (page 8-8)
- Exhaust pipe/muffler (page 2-18)
- Throttle body (page 7-13)
- Radiator reserve tank (page 8-9)
- ABS modulator cover (page 4-76)
- EVAP canister
(Except MA, IIMA, IN, U, IIU models) (page 7-23)
- PAIR control solenoid valve assembly (page 7-20)
- Spark plug caps (page 3-6)

Disconnect the following:

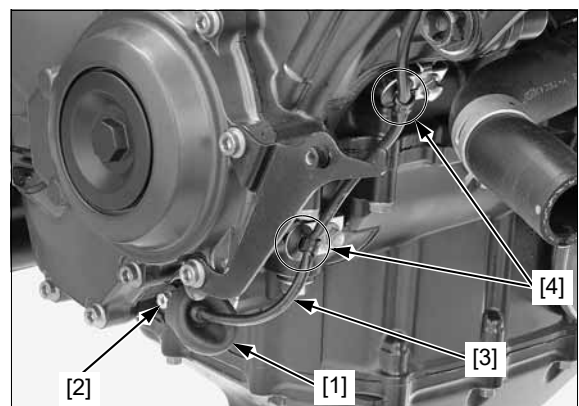
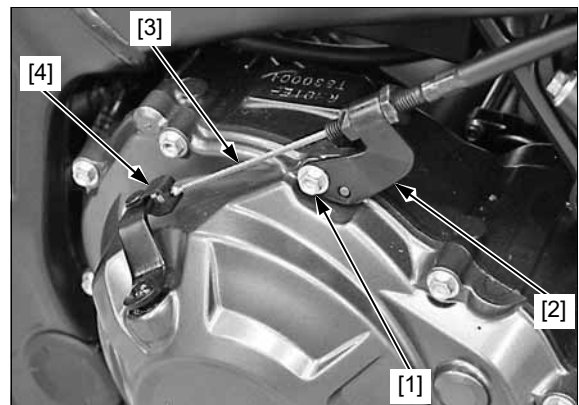
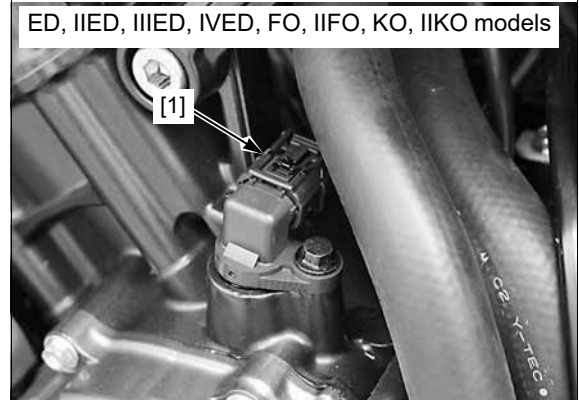
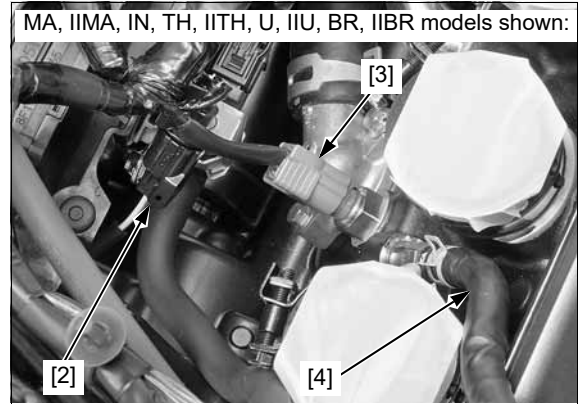
- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models:
CKP sensor 3P (Black) connector [1]
- MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models:
CKP sensor 2P (Black) connector [2]
- ECT sensor 2P (Blue) connector [3]
- Water bleeding hose [4]
- ECM 33P connectors (page 4-76).

Remove the bolt [1] and clutch cable holder [2], then disconnect the clutch cable [3] from the clutch lifter arm [4].

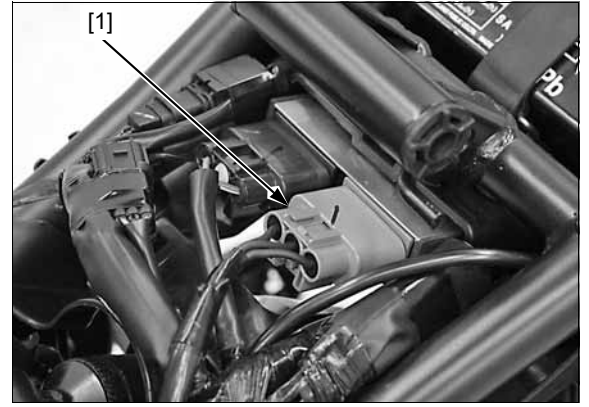
Release the rubber cap [1] from the EOP switch.

Remove the terminal screw [2] and disconnect the switch wire [3].

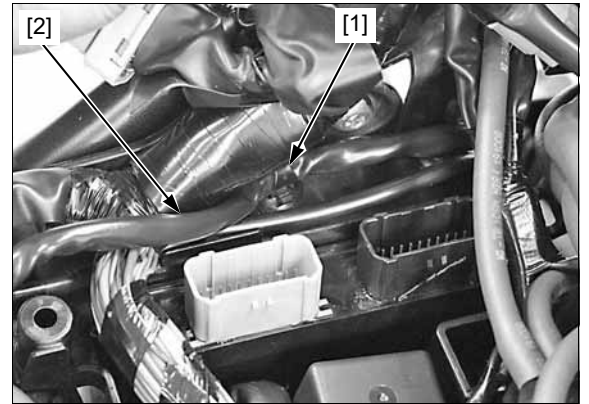
Release the wire clips [4].



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



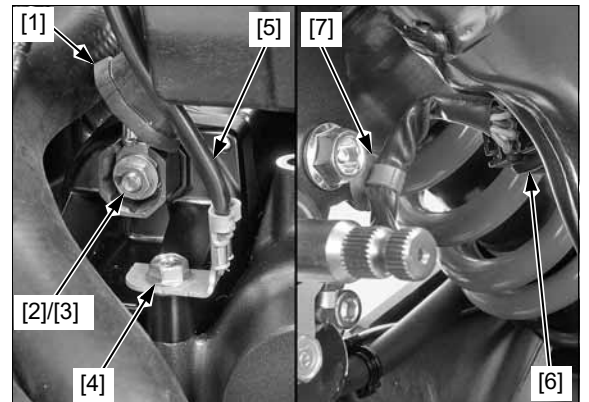
Release the alternator wire clip [1].
Remove the alternator wire [2] out of the frame.



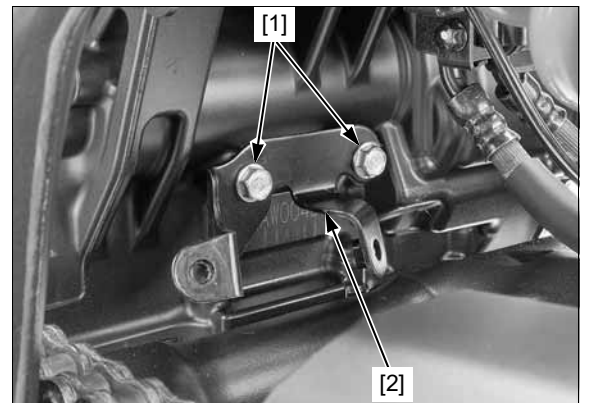
Release the terminal cap [1].
Remove the terminal nut [2] and disconnect the starter motor cable [3].

Remove the starter motor mounting bolt [4] and negative (-) cable [5].

Disconnect the gear position switch 8P (Black) connector [6] and remove the wire clip [7].

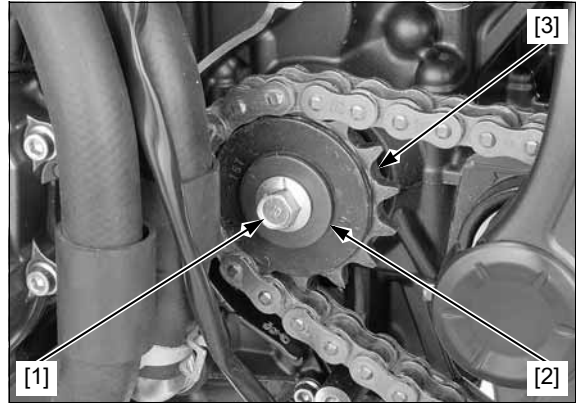


Except MA, IIMA, IN, U, IIU models: Remove the bolts [1] and EVAP canister stay A [2].



ENGINE REMOVAL/INSTALLATION

Remove the drive sprocket bolt [1], washer [2] and drive sprocket [3].



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.

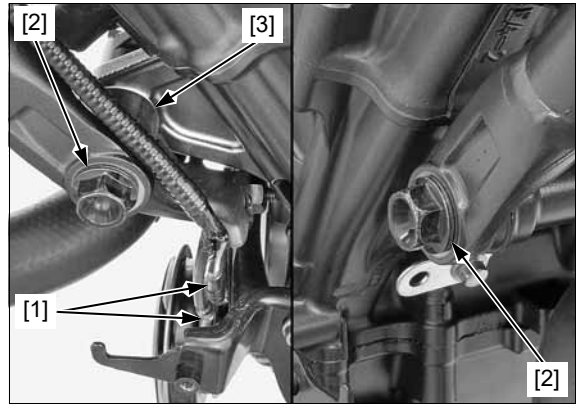
NOTE:

- The jack height must be continually adjusted to relieve stress for ease of bolt removal.

Disconnect the horn connectors [1] from the horn.

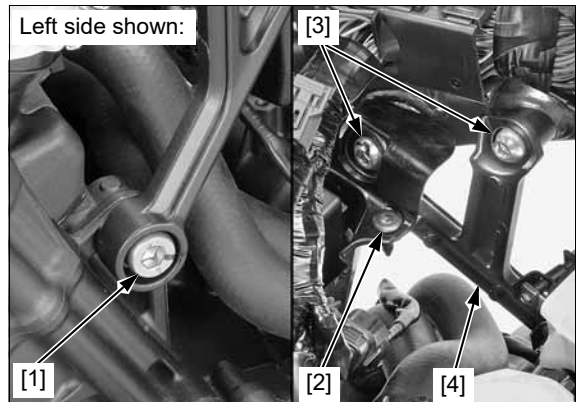
Remove the following:

- Front engine hanger bolts [2]
- Collar [3] (left side only)



Remove the following:

- Upper engine hanger bolts [1]
- Clips [2]
- Engine hanger bracket bolts [3]
- Both engine hangers [4]



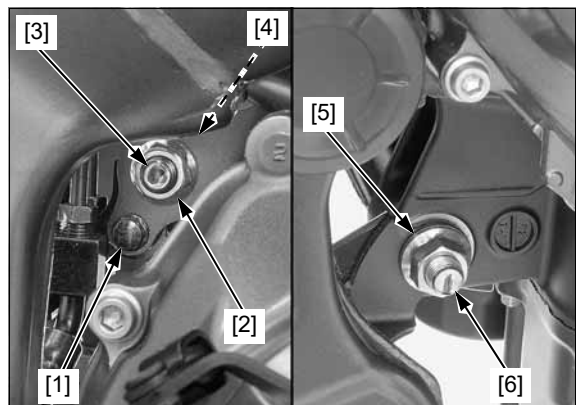
Loosen the rear brake pipe stay bolt [1].

Remove the rear upper engine hanger nut [2], bolt [3] and collar [4].

Remove the rear lower engine hanger nut [5] and bolt [6].

During engine removal, hold the engine securely and be careful not to damage the frame and engine.

Carefully lower the jack or adjustable support, then remove the engine from the frame.



ENGINE INSTALLATION

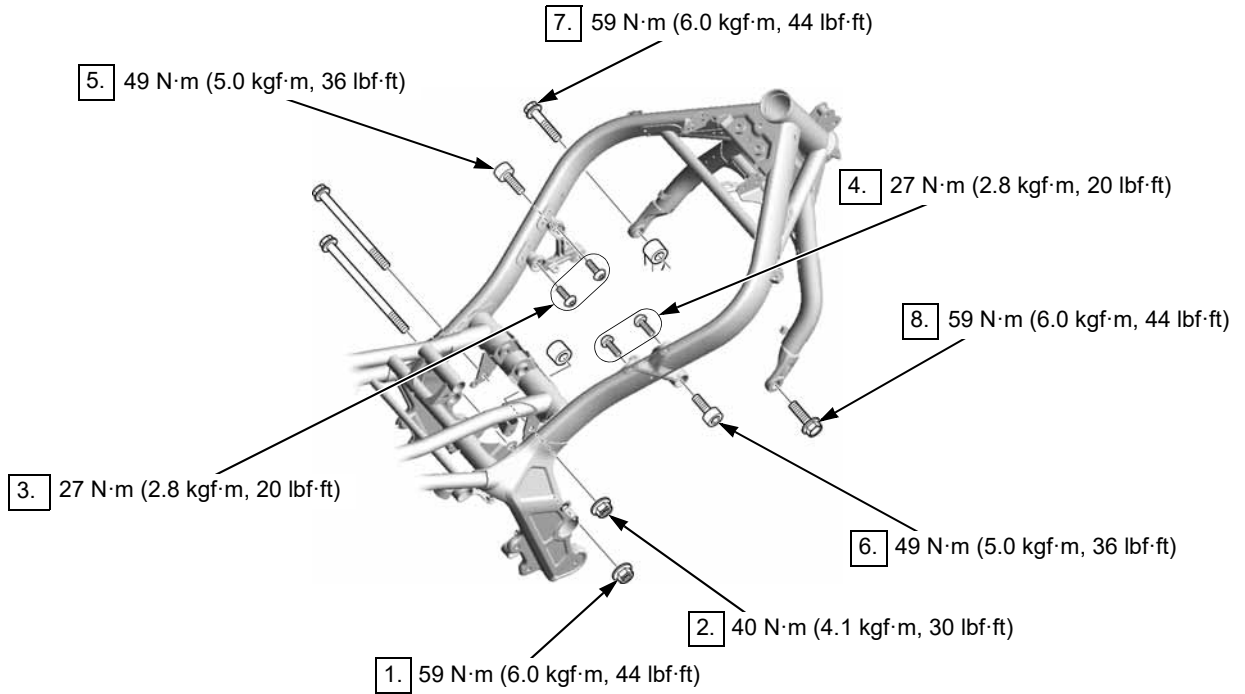
During engine installation, hold the engine securely and be careful not to damage the frame and engine.

Place the engine in the frame, then loosely install all the bolts, collars and nuts.

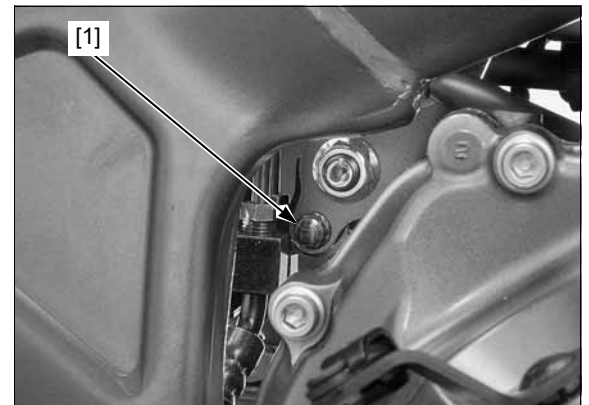
NOTE:

- Place the jack or other adjustable support under the engine.
- 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.

Tighten the bolts and nuts to the specified torque in the specified sequence as shown.



Tighten the rear brake pipe stay bolt [1] securely.



ENGINE REMOVAL/INSTALLATION

Install the removed parts in the reverse order of removal.

NOTE:

- Install the drive sprocket [1] with its marked [2] side facing out.
- Align the clutch cable holder hole with the right crankcase cover boss.

TORQUE:

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)

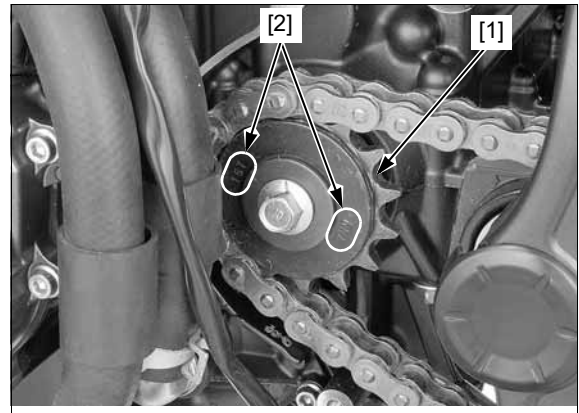
Adjust the following:

- Throttle grip freeplay (page 3-4)
- Clutch lever freeplay (page 3-23)
- Drive chain slack (page 3-15)

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

Fill and bleed the cooling system (page 8-4).

Check the exhaust system and cooling system for leaks.



16. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION.....	16-2	FRONT WHEEL.....	16-15
TROUBLESHOOTING	16-2	FORK	16-21
COMPONENT LOCATION.....	16-3	STEERING STEM	16-38
HANDLEBAR.....	16-5		

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.
- After the front wheel installation, check the brake operation by applying the brake lever.
- For brake system service (page 18-2).

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

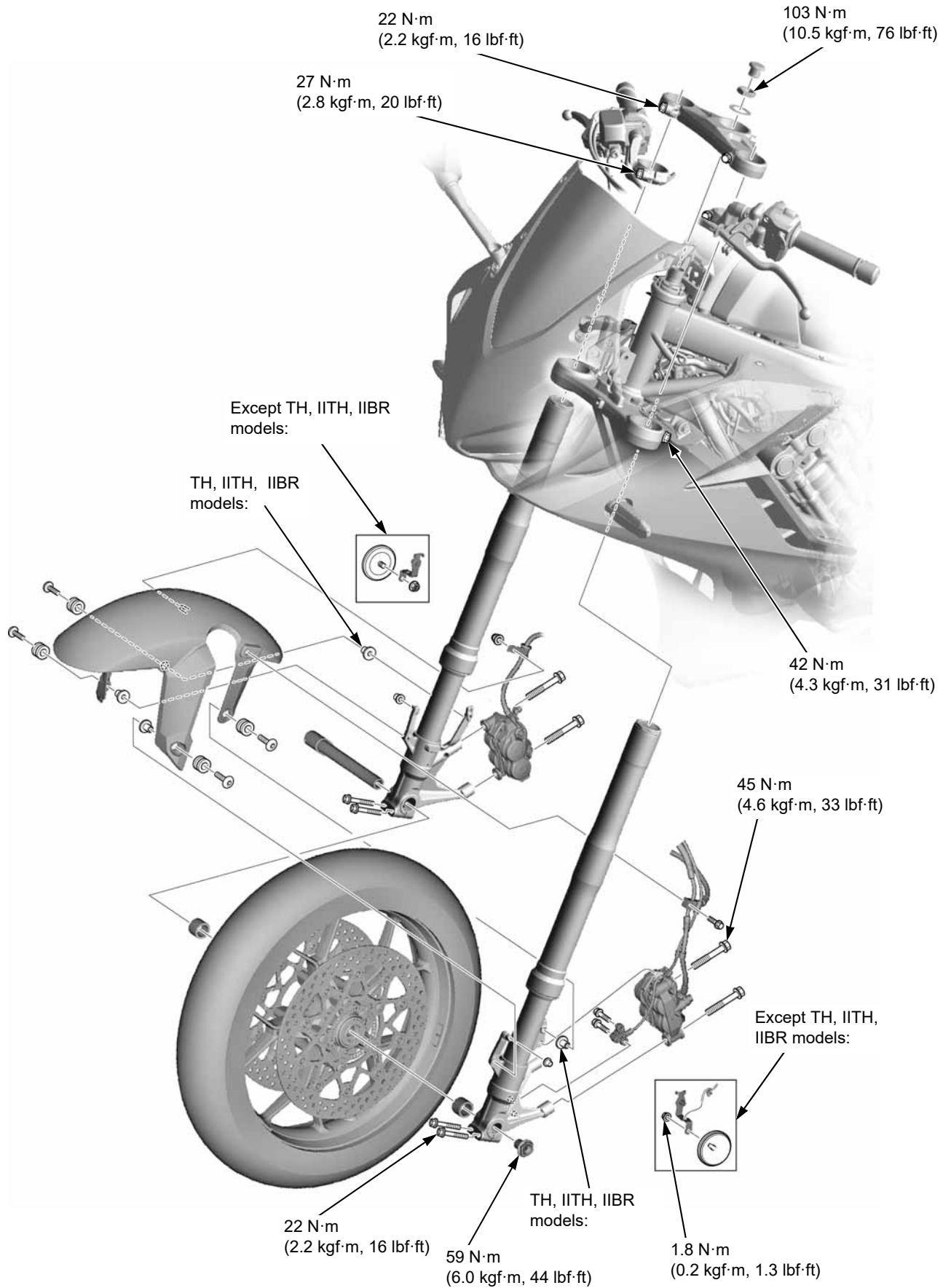
- High tire pressure
- Bent fork tube
- Fork slider binds
- High fluid level in fork
- Incorrect fork fluid weight (high viscosity)
- Clogged fork fluid passage

Front suspension noise

- Loose fork fasteners
- Incorrect fork fluid weight (low viscosity)
- Worn slider of fork tube bushing

COMPONENT LOCATION

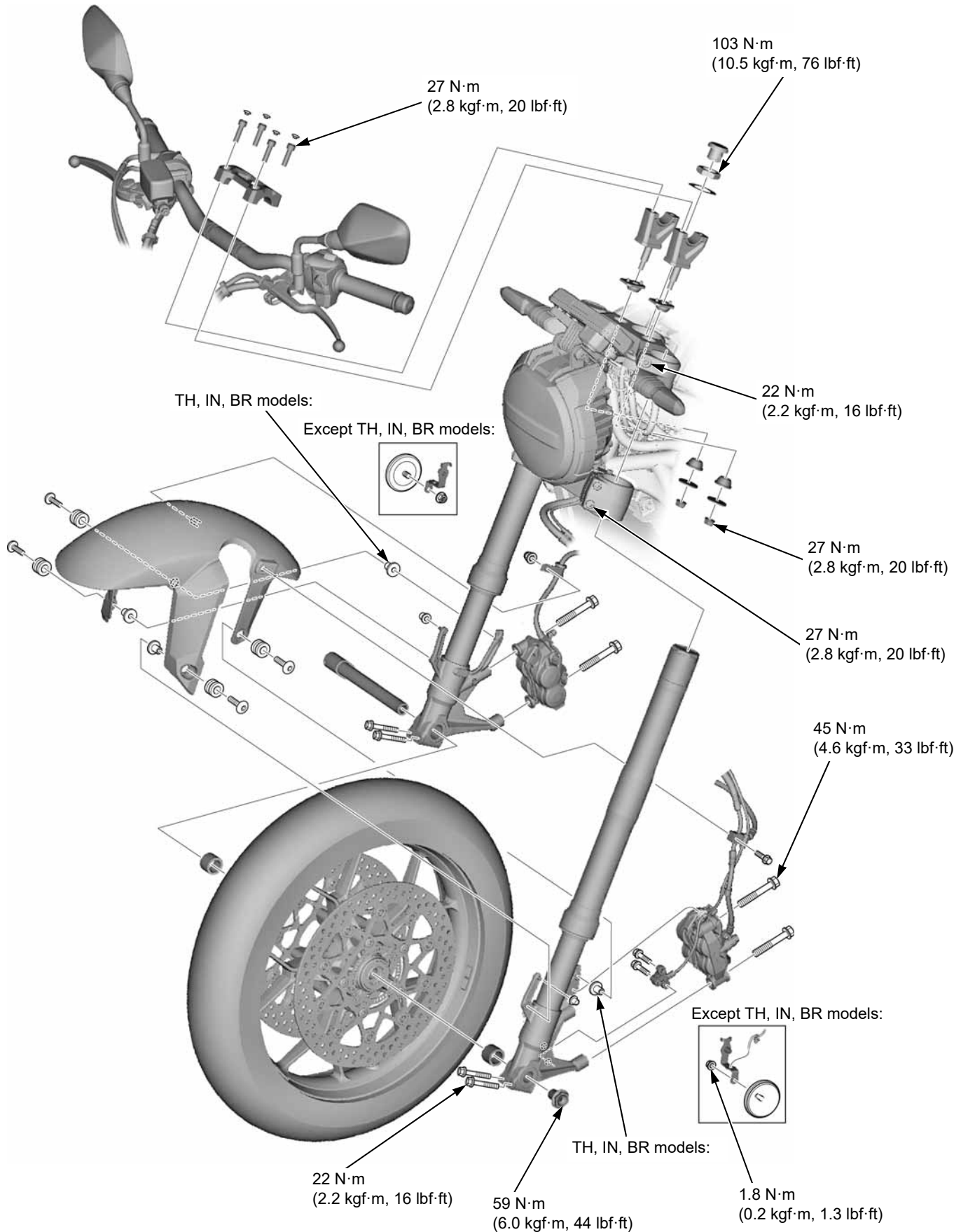
CBR650RA



FRONT WHEEL/SUSPENSION/STEERING

CB650RA

Except IN model shown:

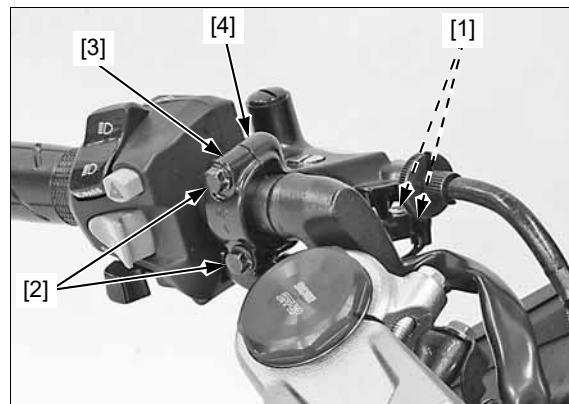


HANDLEBAR

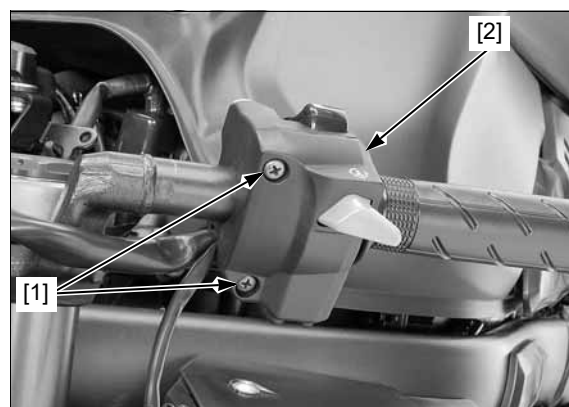
REMOVAL (CBR650RA)

Remove the following:

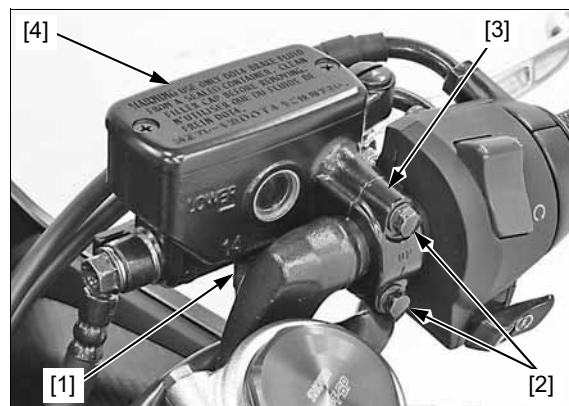
- Ignition switch cover (page 21-14)
- Clutch switch connectors [1]
- Two bolts [2]
- Bracket holder [3]
- Clutch lever bracket [4]



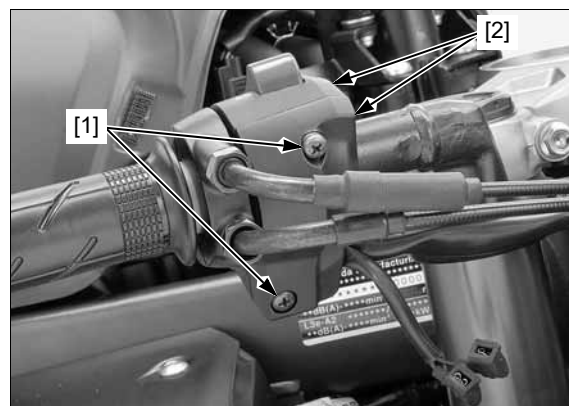
- Two screws [1]
- Left handlebar switch housings [2]



- Keep the reservoir upright to prevent air from entering the hydraulic system.*
- Right handlebar weight (page 16-13)
 - Brake light switch connectors [1]
 - Two bolts [2]
 - Master cylinder holder [3]
 - Front master cylinder [4]

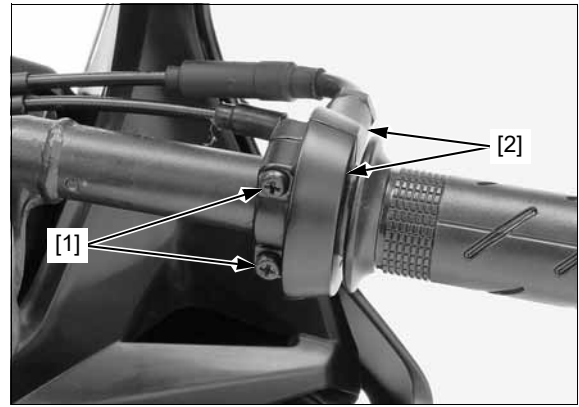


- Two screws [1]
- Right handlebar switch housing [2]



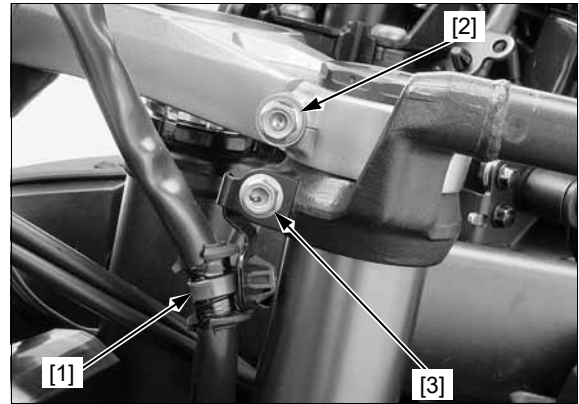
FRONT WHEEL/SUSPENSION/STEERING

- Two screws [1]
- Throttle housing [2]



Release the wire clip [1] from the stay.

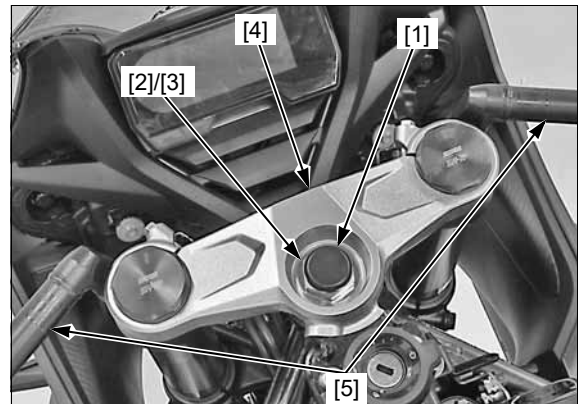
Loosen the top bridge pinch bolt [2] and handlebar pinch bolt [3].



Remove the following:

- Cap [1]
- Steering stem nut [2]
- Washer [3]
- Top bridge [4]

Remove the handlebars [5] from the fork sliders.



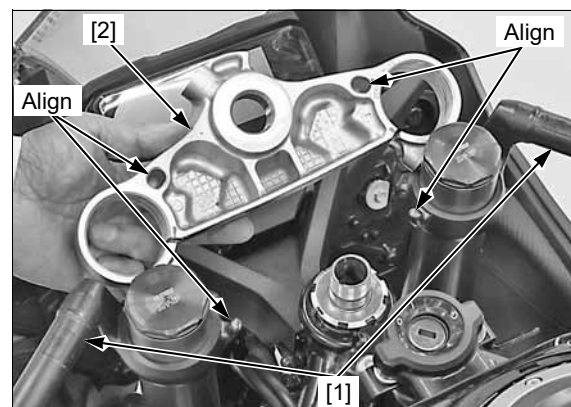
INSTALLATION (CBR650RA)

Make sure the stopper ring [1] is installed in position.

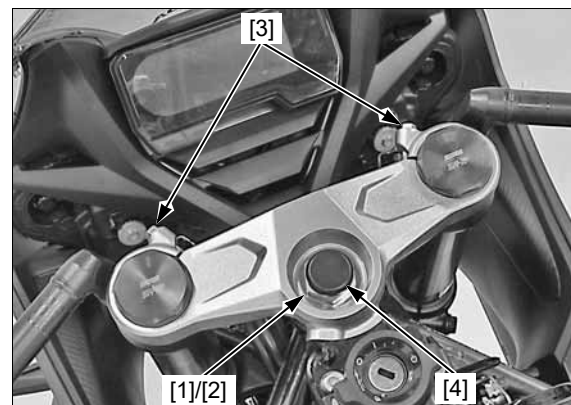


FRONT WHEEL/SUSPENSION/STEERING

Install the handlebars [1] onto the fork sliders.
Install the top bridge [2] while aligning its holes with the handlebar stopper pins.



Install the washer [1] and steering stem nut [2].
Do not fully tighten the top bridge pinch bolts.
Temporarily tighten the top bridge pinch bolts [3] until the seating surfaces contact with each other.
Tighten the steering stem nut to the specified torque.
TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)
Install the cap [4].



Tighten the top bridge pinch bolts [1] to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Tighten the handlebar pinch bolts [2] to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Install the wire clip [3] onto the stay.

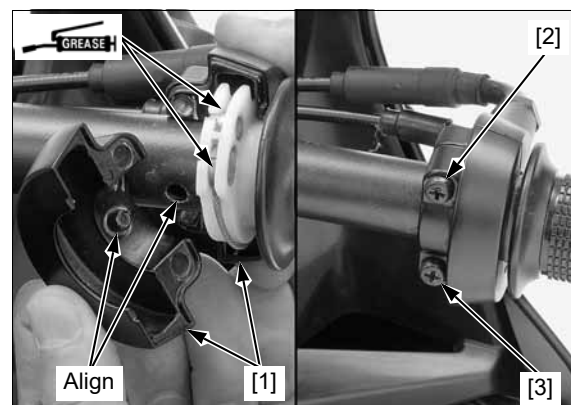


Apply grease to the cable groove and roll-up area of the throttle grip.

Install the throttle housing assembly onto the right handlebar.

Install the throttle housing [1] by aligning the locating pin with the hole in the handlebar.

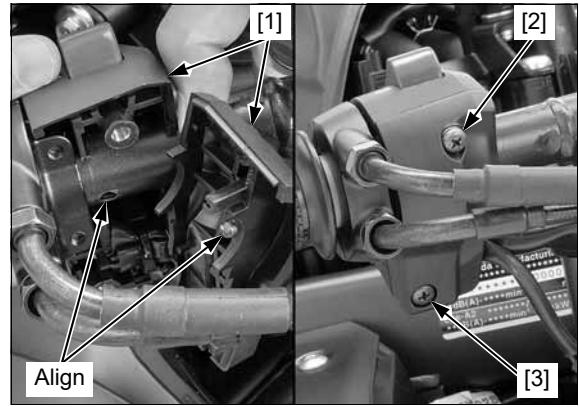
Tighten the upper screw first [2], then tighten the lower screw [3] securely.



FRONT WHEEL/SUSPENSION/STEERING

Install the right 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 master cylinder with the punch mark on the handlebar.

Install the master cylinder [1] and holder [2] with the "UP" mark [3] facing up.

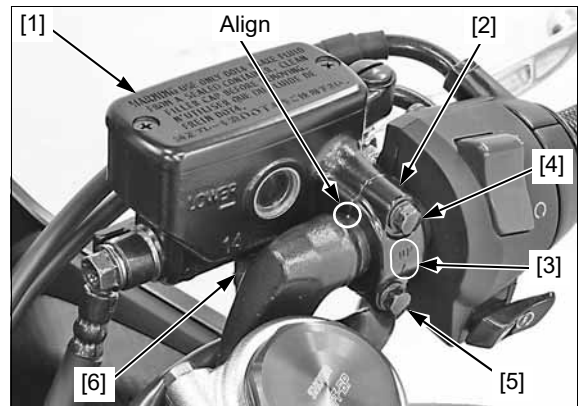
Tighten the upper bolt [4] first, then the lower bolt [5] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the brake light switch connectors [6].

Install the right handlebar weight (page 16-13).

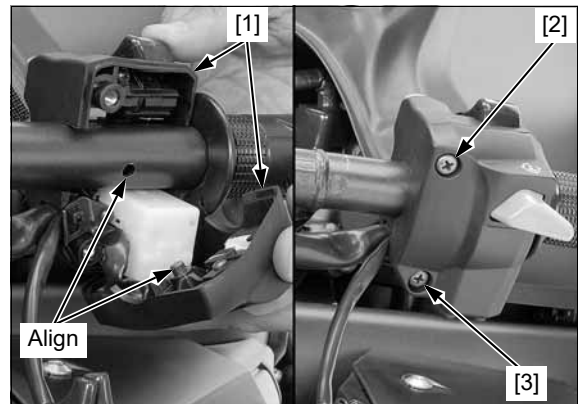
Check the throttle grip freeplay (page 3-4).



Install the left handlebar switch housings [1] by aligning the locating pin with the hole in the handlebar.

Tighten the upper screw [2] first, then tighten the lower screw [3] to the specified torque.

TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)



Align the edge of the bracket with the punch mark on the handlebar.

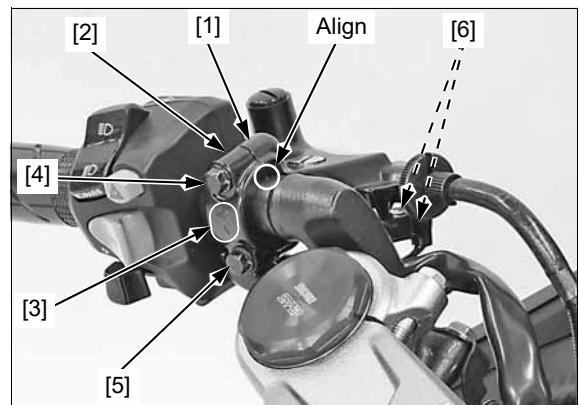
Install the clutch lever bracket [1] and holder [2] with the "UP" mark [3] facing up.

Tighten the upper bolt first [4], then the lower bolt [5].

Connect the clutch switch connectors [6].

Check the clutch lever freeplay (page 3-23).

Install the ignition switch cover (page 21-14).



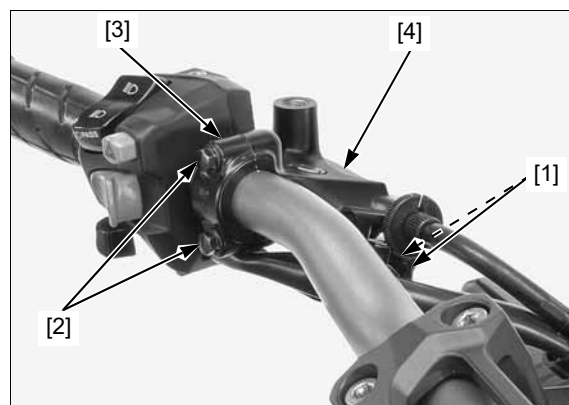
REMOVAL (CB650RA)

Remove the following:

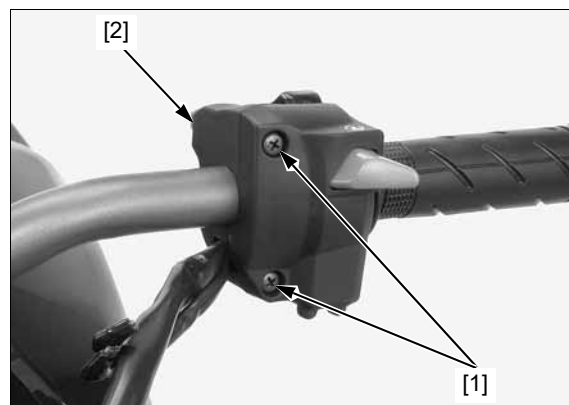
- Rearview mirrors (page 2-5)
- Handlebar weights (page 16-13)
- Bolt caps [1]



- Clutch switch connectors [1]
- Two bolts [2]
- Bracket holder [3]
- Clutch lever bracket [4]

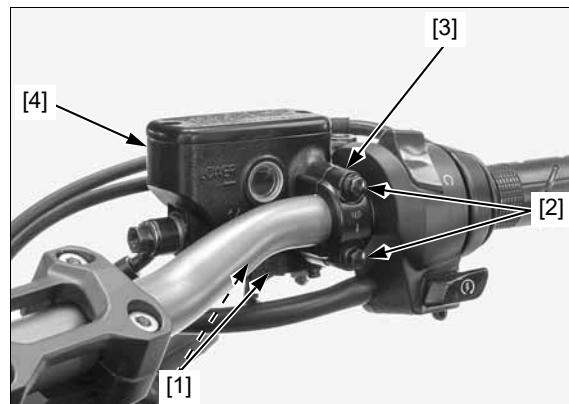


- Two screws [1]
- Left handlebar switch housing [2]



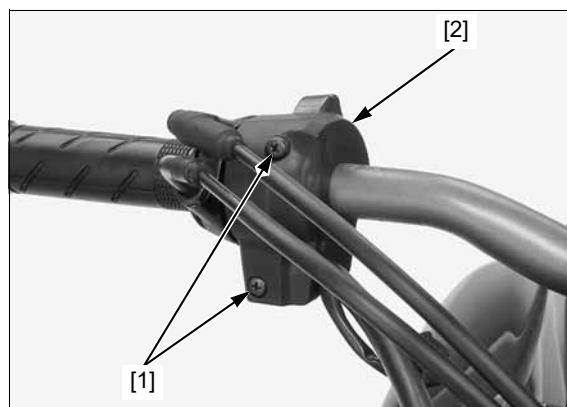
Keep the reservoir upright to prevent air from entering the hydraulic system.

- Brake light switch connectors [1]
- Two bolts [2]
- Master cylinder holder [3]
- Front master cylinder [4]

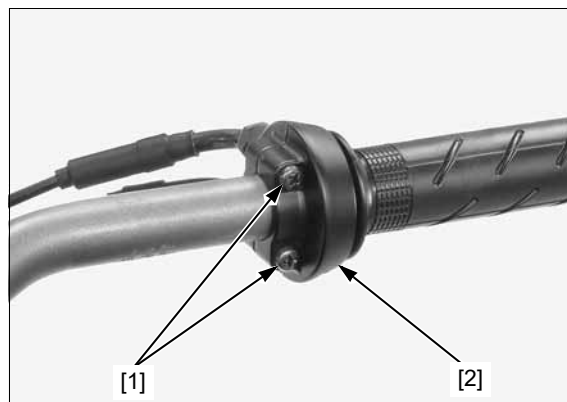


FRONT WHEEL/SUSPENSION/STEERING

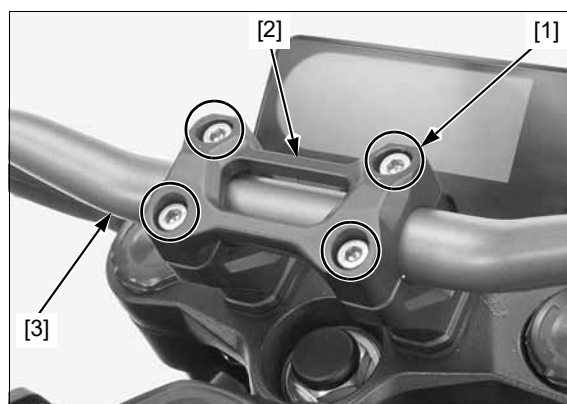
- Two screws [1]
- Right handlebar switch housing [2]



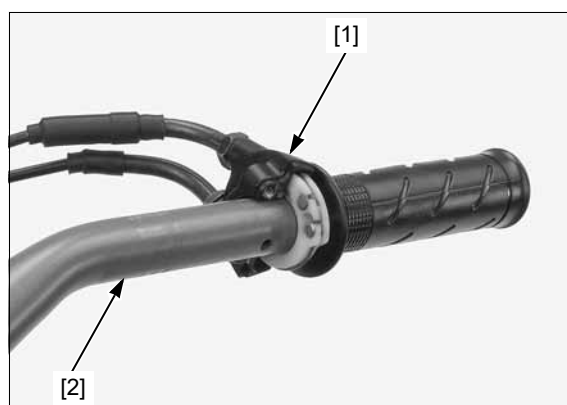
- Two screws [1]
- Rear throttle housing [2]



- Four socket bolts [1]
- Handlebar upper holder [2]
- Handlebar [3]



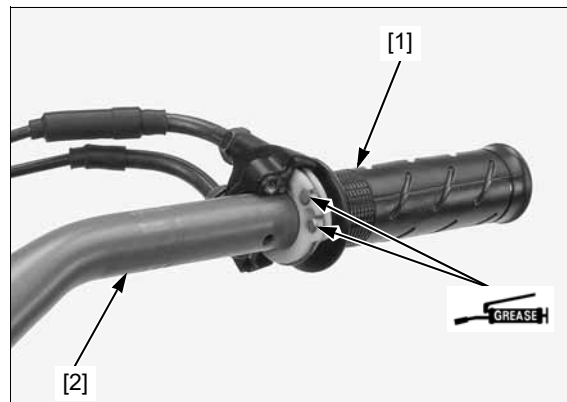
- Throttle grip/housing assembly [1] (from the handlebar [2])



INSTALLATION (CB650RA)

Apply grease to the cable groove and roll-up area of the throttle grip [1].

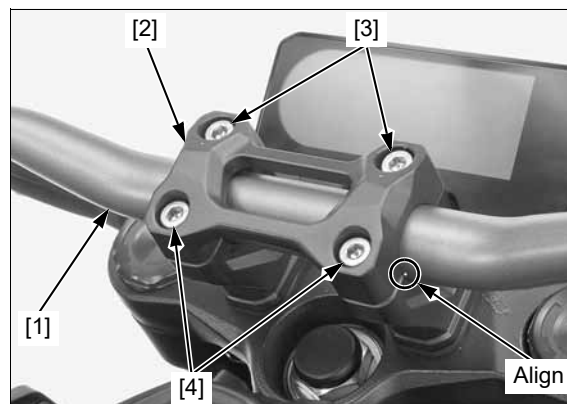
Install the throttle grip/housing assembly onto the handlebar [2].



Align the punch mark with the edge of the top bridge.

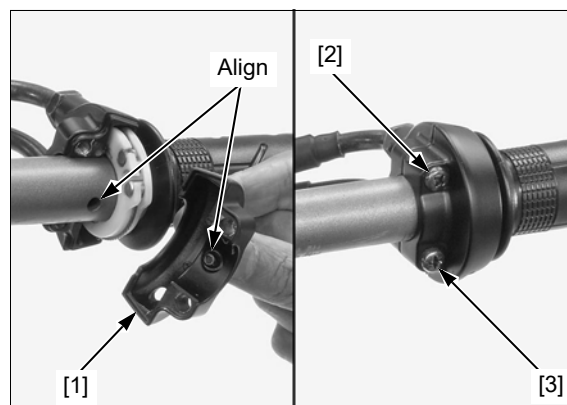
Install the handlebar [1] and upper holder [2]. Tighten the front socket bolts [3] first, then tighten the rear socket bolts [4] to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



Install the rear throttle housing [1] by aligning the locating pin with the hole in the handlebar.

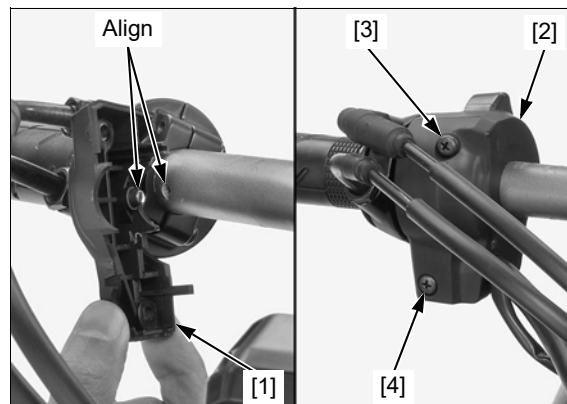
Tighten the upper screw [2] first, then tighten the lower screw [3] securely.



Install the front right handlebar switch housing [1] by aligning the locating pin with the hole in the handlebar.

Install the rear right handlebar switch housing [2]. Tighten the upper screw [3] first, then tighten the lower screw [4] to the specified torque.

TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)



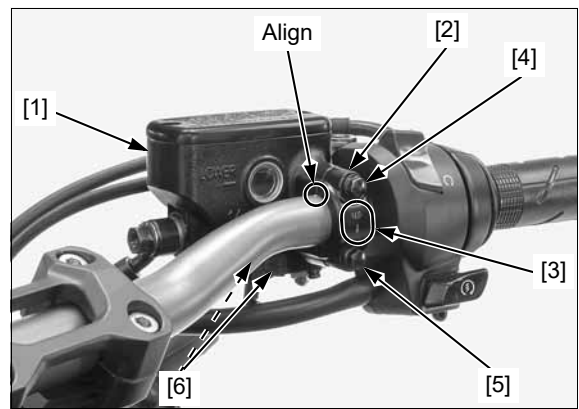
FRONT WHEEL/SUSPENSION/STEERING

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 [4] first, then the lower bolt [5] to the specified torque.

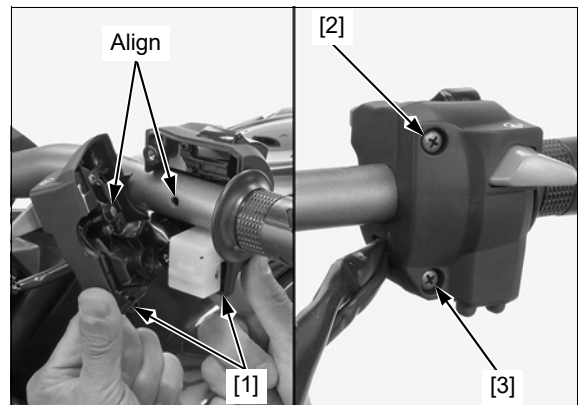
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the brake light switch connectors [6].



Install the left handlebar switch housings [1] by aligning the locating pin with the hole in the handlebar. Tighten the upper screw [2] first, then tighten the lower screw [3] to the specified torque.

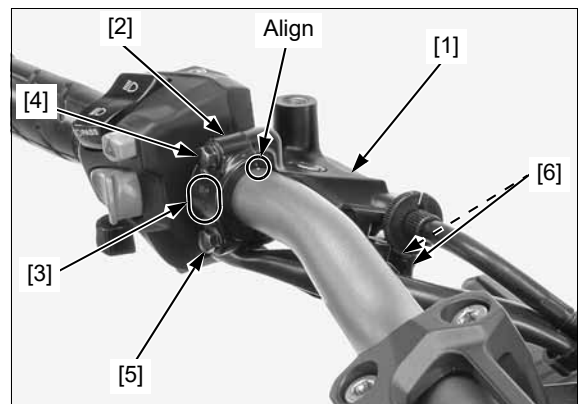
TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)



Align the edge of the 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 [4] first, then the lower bolt [5].

Connect the clutch switch connectors [6].



Install the following:

- Bolt caps [1]
- Handlebar weights (page 16-13)
- Rearview mirrors (page 2-5)

Check the following:

- Clutch lever freeplay (page 3-23)
- Throttle grip freeplay (page 3-4)



HANDLEBAR LOWER HOLDER REMOVAL/INSTALLATION (CB650RA)

Loosen the handlebar lower holder nuts [1].

Remove the Bolt caps [2], handlebar mounting socket bolts [3], handlebar upper holder [4] and handlebar [5] (page 16-9).

Remove the lower holder nuts, washers [6], handlebar lower holders [7] and lower mount rubbers [8].

Remove the upper mount rubbers [9] from lower holders.

Install the upper mount rubbers onto the lower holders.

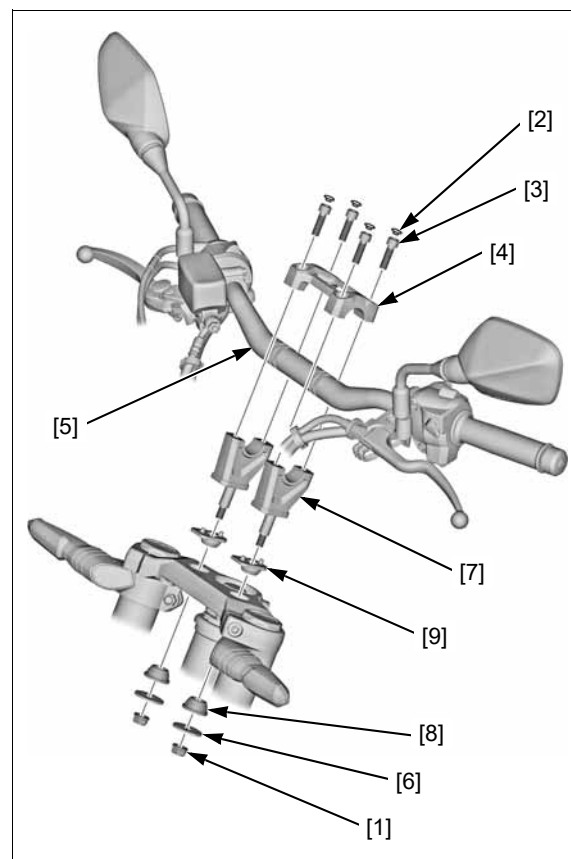
Install the handlebar lower holders, lower mount rubbers, washers and lower holder nuts.

Temporarily install the handlebar, handlebar upper holders and mounting bolts (page 16-11).

Tighten the lower holder nut to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Install the removed parts in the reverse order of removal.



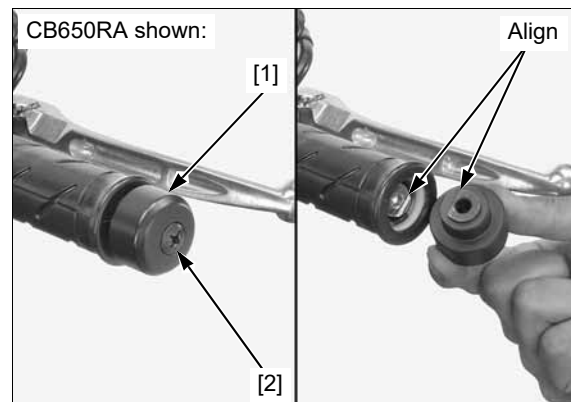
HANDLEBAR WEIGHT REMOVAL/ INSTALLATION

Hold the handlebar weight [1] and remove the handlebar weight mounting screw [2], then remove both handlebar weights.

Install the handlebar weight to the handlebar by aligning each cutout.

Hold the handlebar weight.

Install and tighten the handlebar weight mounting screw securely.



HANDLEBAR INNER WEIGHT REPLACEMENT

CBR650RA

Remove the left handlebar grip and throttle grip (page 16-15).

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 cushion (with MB6 mark) [7]
- Rubber cushion [8]

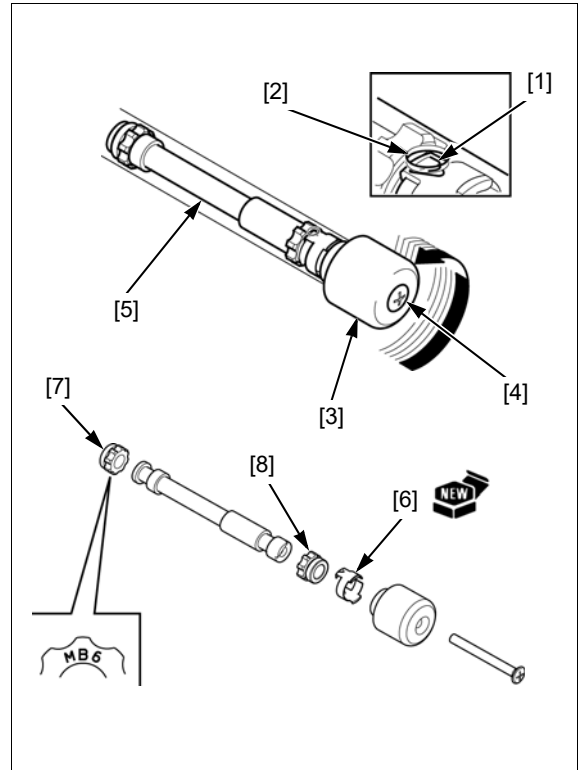
Install the rubber cushions and a new retainer onto the inner weight, aligning the retainer inner tabs with the cushion slit.

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 16-15).



CB650RA

Remove the left handlebar grip and throttle grip (page 16-15).

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]

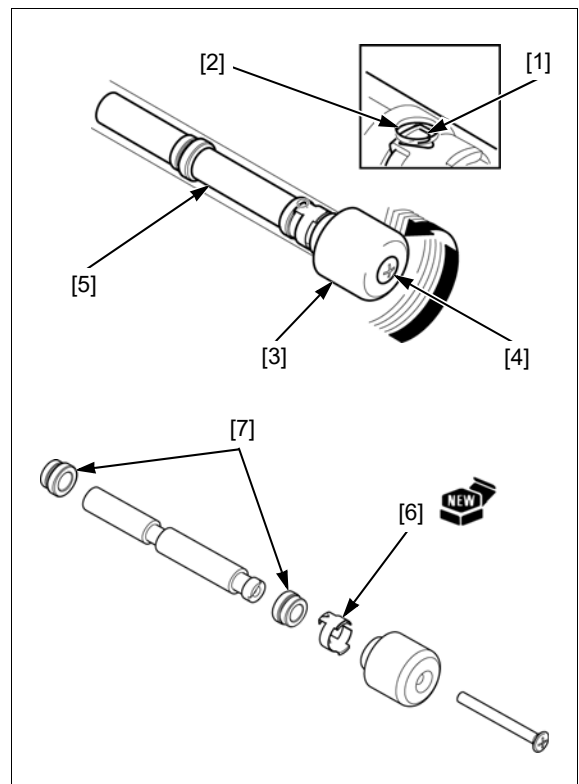
Install the rubber cushions and a new retainer onto the inner weight, aligning the retainer inner tabs with the cushion slit.

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 16-15).



HANDLEBAR GRIP REPLACEMENT

Remove the handlebar weight (page 16-13).

Remove the handlebar grip [1].

Clean the inside surface of the handlebar grip and outside surface of the handlebar and throttle pipe.

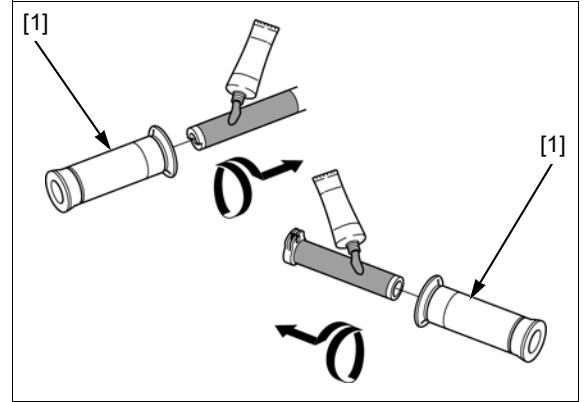
Apply Honda bond A or equivalent to the inside surface of the grips and to the clean surface of the left handlebar and throttle pipe.

Allow the adhesive to dry for 1 hour before using.

Wait 3 – 5 minutes and install the grip.

Rotate the grips for even application of the adhesive.

Install the handlebar weight (page 16-13).



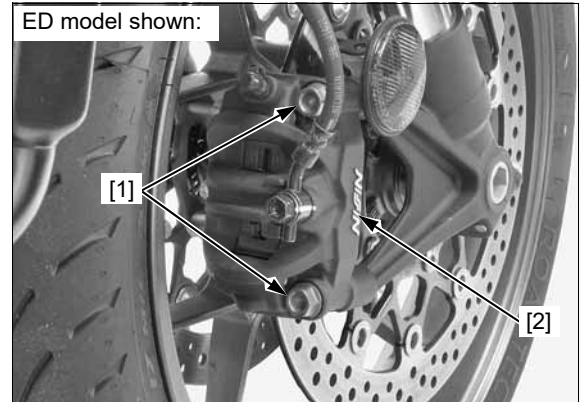
FRONT WHEEL

REMOVAL

Remove the bolts [1] and brake calipers [2].

Do not operate the brake lever after the brake caliper is removed.

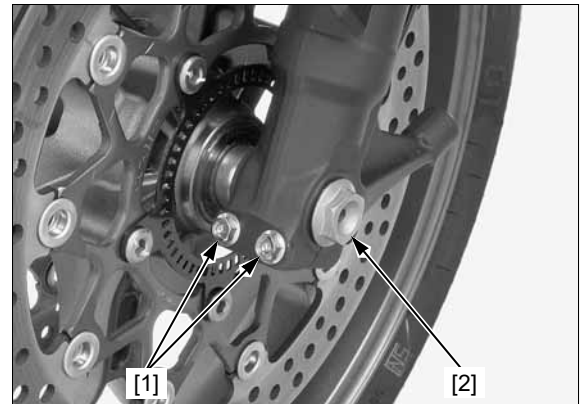
Support the brake caliper with a piece of wire so that it does not hang from the brake hose. Do not twist the brake hose.



Loosen the left axle holder bolts [1].

Remove the axle bolt [2].

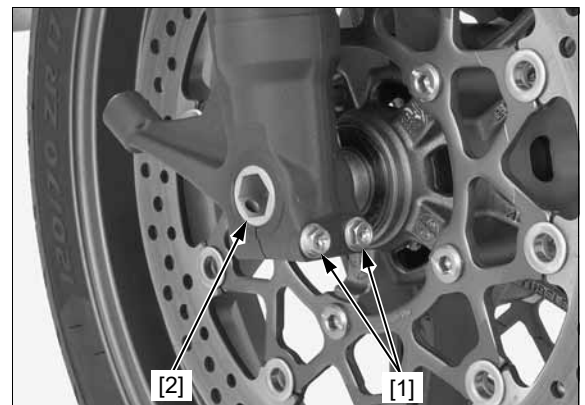
Support the motorcycle securely and raise the front wheel off the ground using a safety stand or a hoist.



Loosen the right axle holder bolts [1].

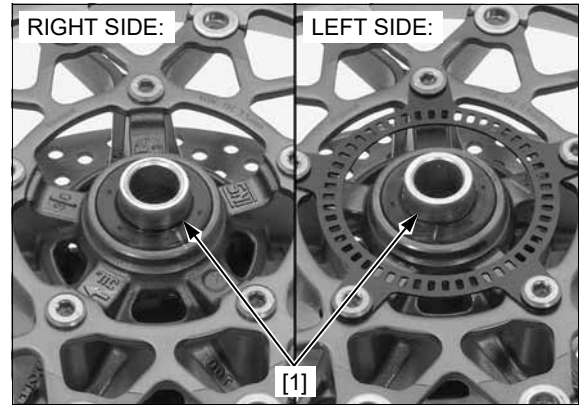
Be careful not to damage the pulser ring.

Remove the axle [2] and front wheel.



FRONT WHEEL/SUSPENSION/STEERING

Remove the right and left side collars [1].



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
- Front wheel

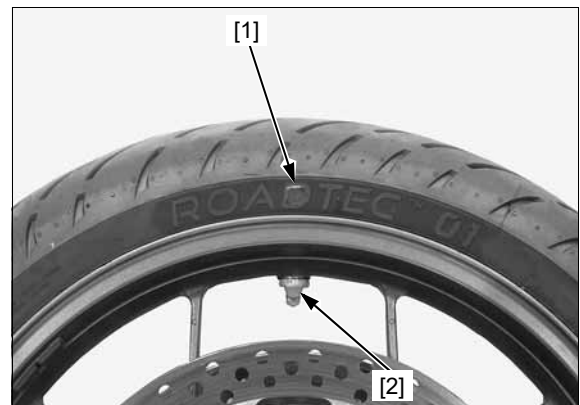
Measure each part according to FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS (page 1-9).

Replace any part if it is out of service limit.

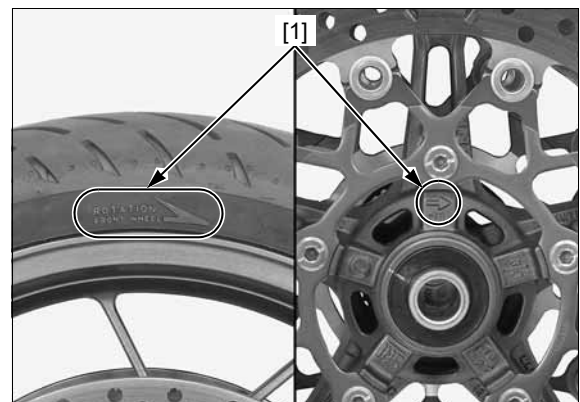
WHEEL BALANCE

NOTE:

- Wheel balance directly affects the stability, handling and overall safety of the motorcycle. Always check balance whenever the tire has been removed from the rim.
- For optimum balance, the tire balance mark [1] (a paint dot on the side wall) must be located next to the valve stem [2]. Remount the tire if necessary.



Note the rotating direction (arrow) marks [1] on the tire and wheel upon tire mounting. Always mount the tire onto the wheel with the marks facing in the same direction.

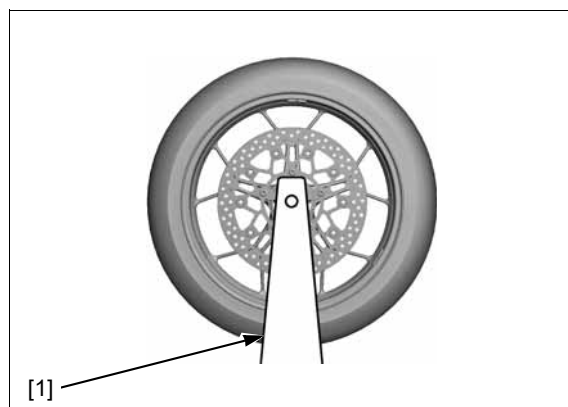


Mount the wheel, tire and brake discs assembly in an inspection stand [1].

Spin the wheel, allow it to stop, and mark the lowest (heaviest) point of the wheel with a 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.



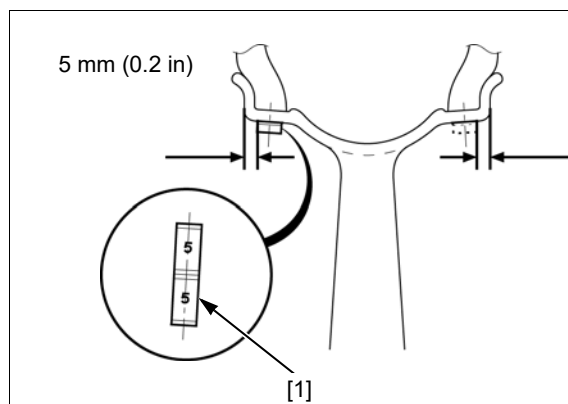
To balance the wheel, install the balance weights [1] on the highest side of the rim, on the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun.

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:

- 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.
- The weights are attached to the position at 5 mm (0.2 in) from the side surface of the rim in the direction as shown.
- If the weight exceeds 10 g, install same amount of the balance weights on the right and left symmetrical position.

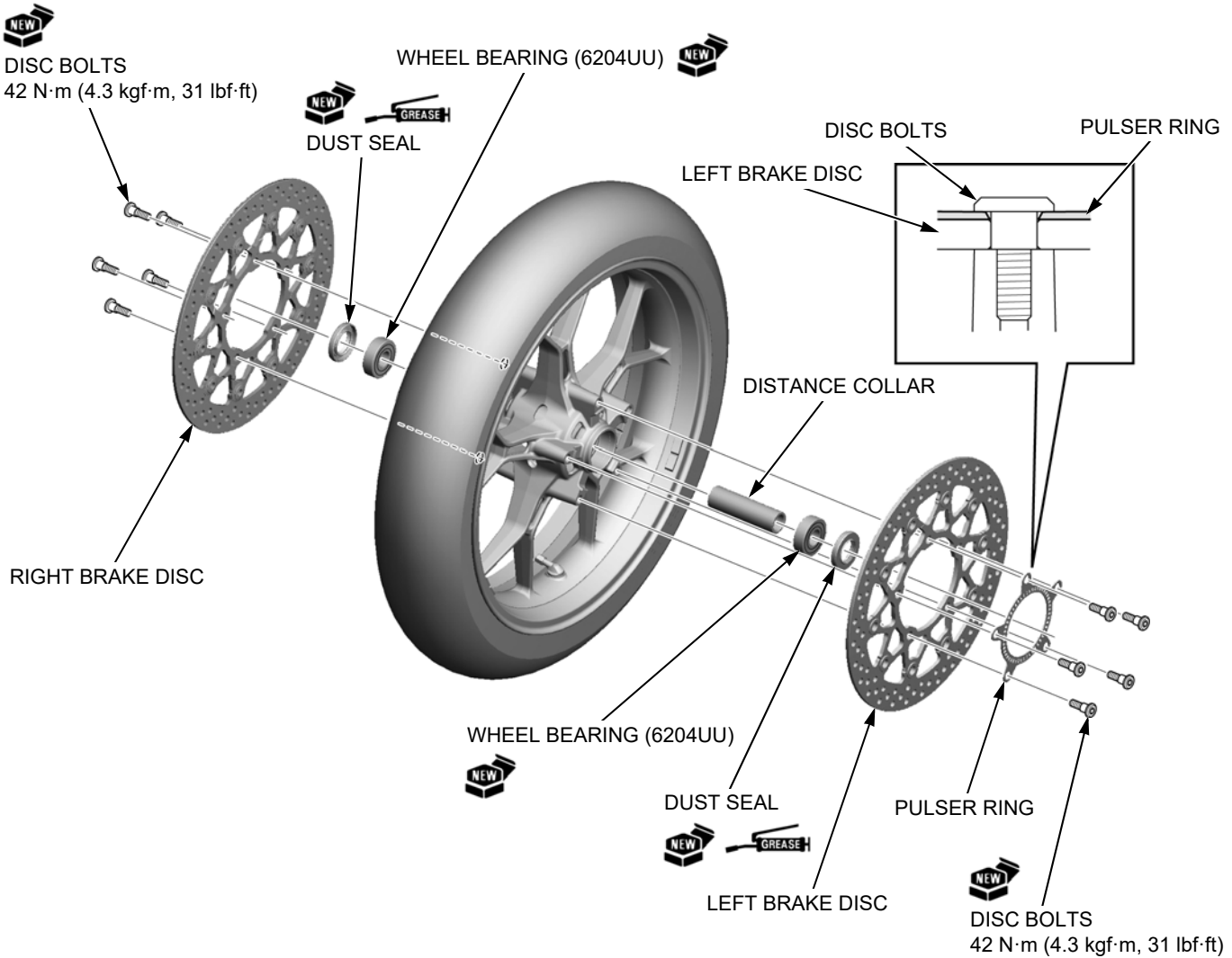


FRONT WHEEL/SUSPENSION/STEERING

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.
- Install the pulsar ring with the tapered surface of the bolt hole facing out.



WHEEL BEARING REPLACEMENT

Install the remover head [1] into the bearing.

From the opposite side of the wheel, install the bearing remover shaft [2] and drive the bearing out of the wheel hub.

TOOLS:

Bearing remover head, 20 mm 07746-0050600
Bearing remover shaft 07746-0050100

Remove the distance collar and drive out the other bearing.



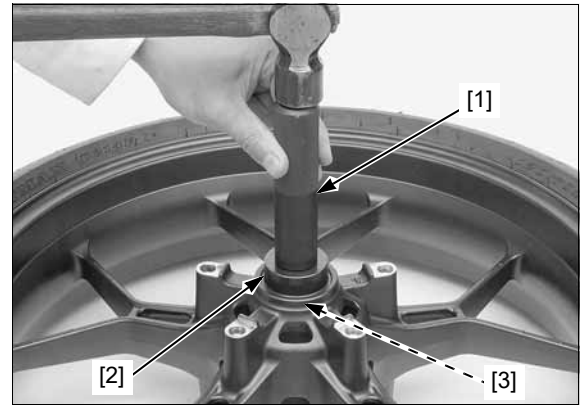
Drive in a new left side bearing squarely with the marked side facing up until it is fully seated.

Install the distance collar.

Drive in a new right side bearing squarely with the marked side facing up until it is fully seated.

TOOLS:

- [1] Driver 07749-0010000
- [2] Attachment, 42 x 47 mm 07746-0010300
- [3] Pilot, 20 mm 07746-0040500



TIRE VALVE REMOVAL/INSTALLATION

Remove the tire.

Remove the nut [1], tire valve [2] and O-ring [3].

If a puncture repair product was used, thoroughly clean the inside of the wheel rim.

Clean the valve installation area of the rim with a degreasing agent.

Do not apply grease to the O-ring.

Install a new O-ring onto the tire valve.

Gradually screw in the tire valve and position it with the valve neck facing the right of the motorcycle and parallel with the axle.

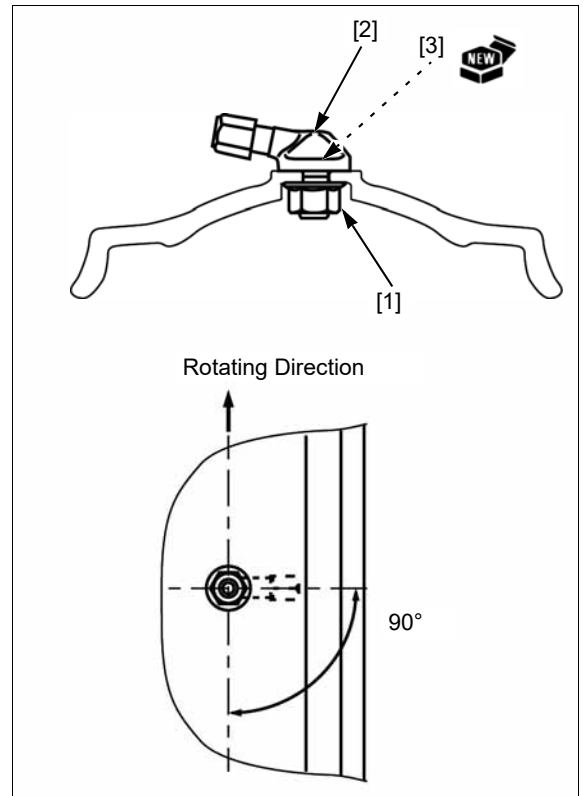
Make sure the valve seating surface is fully seated on the wheel and tighten the valve nut while holding the tire valve.

TORQUE: 6.5 N·m (0.7 kgf·m, 4.8 lbf·ft)

After the tire valve installation, confirm the following items.

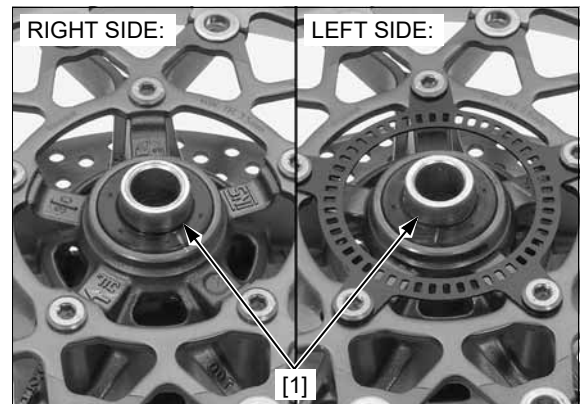
- The tire valve neck is facing to the right side and parallel to the axle direction.

Install the tire.



INSTALLATION

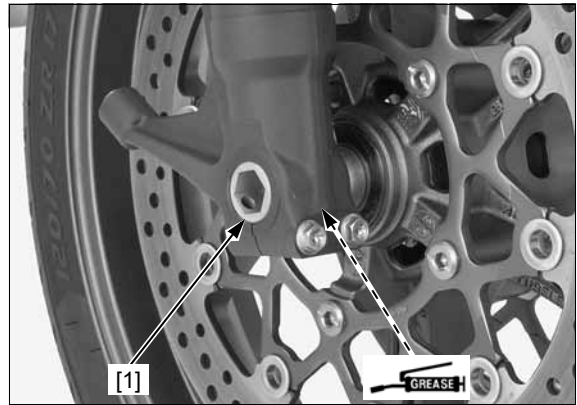
Install the right and left side collars [1].



FRONT WHEEL/SUSPENSION/STEERING

Be careful not to damage the pulser ring.

Install the front wheel between the fork legs.
Apply a thin layer of grease to the front axle surface.
Install the front axle [1] from the right side.

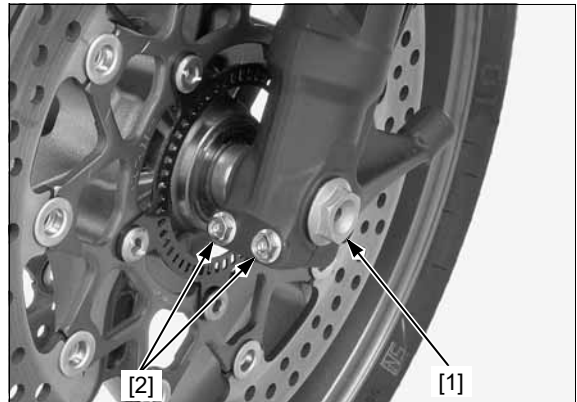


Install the axle bolt [1].
Hold the axle and tighten the axle bolt to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)

Tighten the left axle holder bolts [2] to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

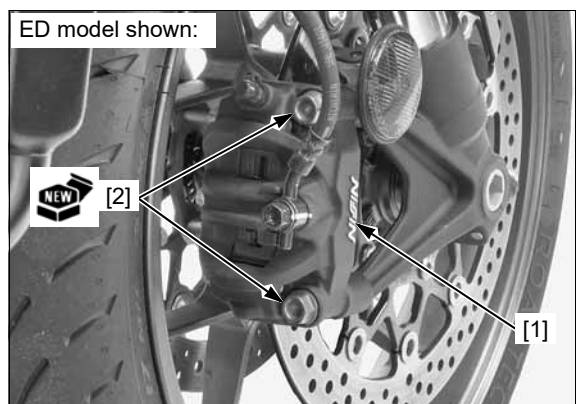


Be careful not to damage the brake pads.

Install the brake caliper [1] onto the fork leg so that the disc is positioned between the pads.
Install new mounting bolts [2] and tighten them to the specified torque.

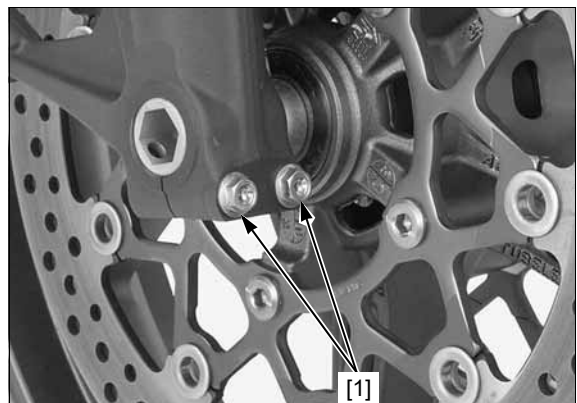
TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)

Install the other brake caliper.
Check the brake operation by applying the brake lever.
With the front brake applied, pump the fork up and down several times to seat the axle.



Tighten the right axle holder bolts [1] to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



FORK

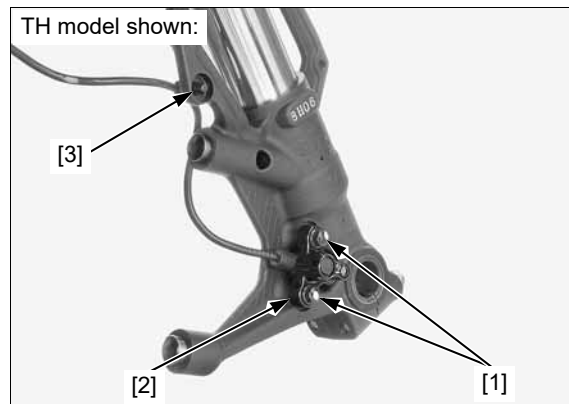
REMOVAL (CBR650RA)

Remove the following:

- Front wheel (page 16-15)
- Front fender (page 2-5)

Left side only: Remove the bolts [1] and front wheel speed sensor guard [2] from the left fork.

Release the wire clip [3] from the left fork (TH, IITH IIBR models).



Loosen the pinch bolts [1] of the handlebar and top bridge.



Take care not to scratch the cap head. When the fork leg will be disassembled, loosen the fork cap [1], but do not remove it yet.

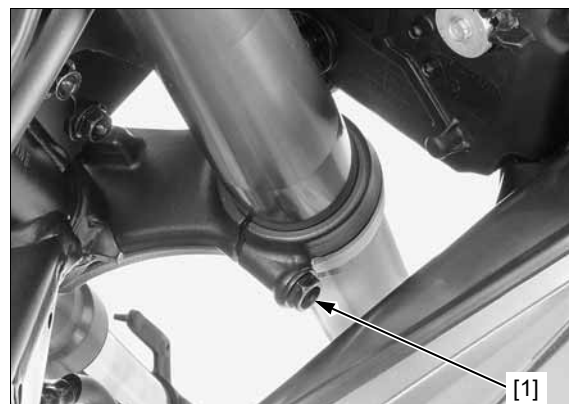
Loosen the fork cap, but do not remove it yet.

TOOL:

- [2] Fork cap wrench 070MA-MGP0100



Keep the master cylinder reserve tank upright to prevent air from entering the hydraulic system. While holding the fork leg, loosen the bottom bridge pinch bolts [1]. Pull the fork leg down and remove it out of the fork bridges.



FRONT WHEEL/SUSPENSION/STEERING

INSTALLATION (CBR650RA)

When the fork is disassembled:

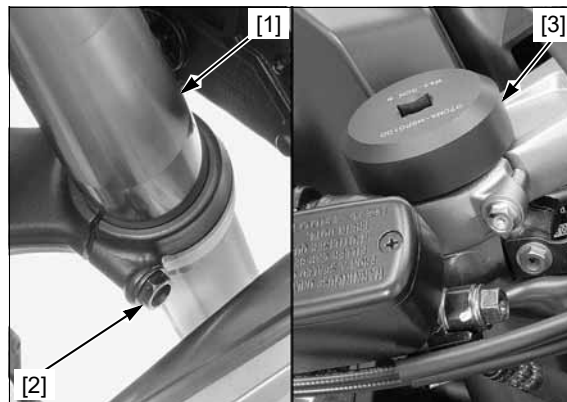
Insert the fork leg [1] into the bottom bridge, handlebar, top bridge and temporarily tighten the pinch bolt [2].

Tighten the fork cap to the specified torque using the special tools.

TOOL:

[3] Fork cap wrench 070MA-MGP0100

TORQUE: 35 N·m (3.6 kgf·m, 26 lbf·ft)



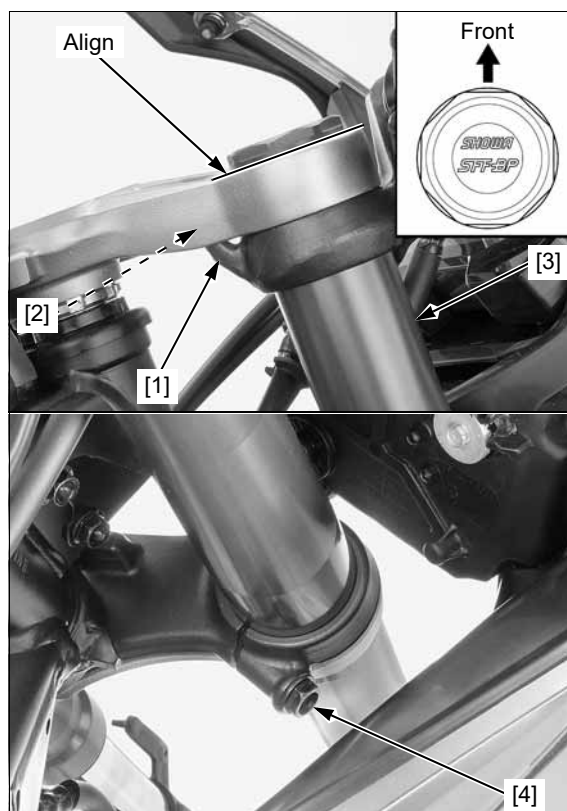
Route the wires, cables and hose properly (page 1-22).

Install the fork leg into the bottom bridge, handlebar and top bridge. Be sure to align the handlebar stopper pin [1] with the hole [2] in the top bridge.

Align the top end of the fork pipe [3] with the upper surface of the top bridge as shown.

Tighten the bottom bridge pinch bolts [4] to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)



Tighten the top bridge pinch bolt [1] to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Tighten the handlebar pinch bolts [2] to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



Left side only: Install the front wheel speed sensor guard [1] and new mounting bolts [2] onto the left fork.

NOTE:

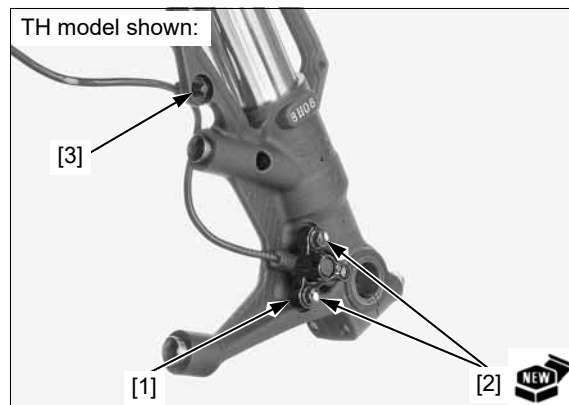
- Always replace the front wheel speed sensor guard mounting bolts with new ones.

Install the wire clip [3] onto the left fork (TH, IITH IIBR models).

Install the following:

- Front fender (page 2-5)
- Front wheel (page 16-15)

TH model shown:



REMOVAL (CB650RA)

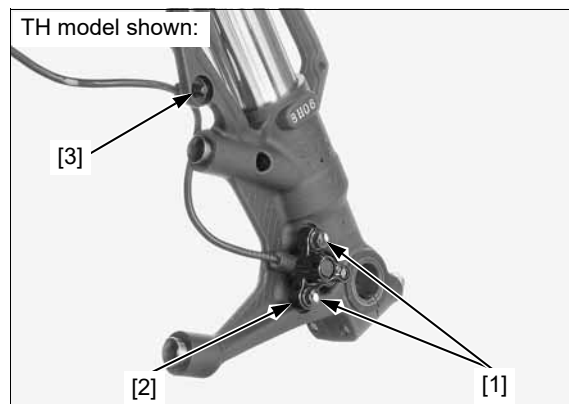
Remove the following:

- Front wheel (page 16-15)
- Front fender (page 2-5)
- Front turn signal light (page 21-4)

Left side only: Remove the bolts [1] and front wheel speed sensor guard [2] from left fork.

Release the wire clip [3] from the left fork (TH, IN, BR models).

TH model shown:



Loosen the pinch bolt [1] of the top bridge.



Keep the master cylinder reserve tank upright to prevent air from entering the hydraulic system. While holding the fork leg, loosen the bottom bridge pinch bolts [1]. Pull the fork leg down and remove it out of the fork bridges.



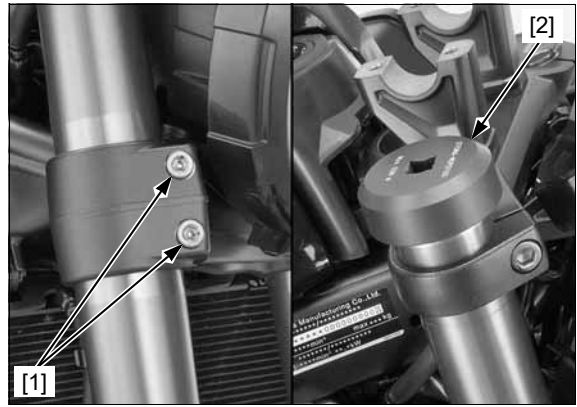
FRONT WHEEL/SUSPENSION/STEERING

If it is necessary to disassemble the fork leg, perform the following procedure:

- Remove the handlebar (page 16-9)
- Loosen the pinch bolt of the top bridge (page 16-23)

While holding the fork leg, loosen the bottom bridge pinch bolts [1]. Lift up the fork leg and tighten the pinch bolts.

Loosen the fork cap, but do not remove it yet.
TOOL:
[2] Fork cap wrench **070MA-MGP0100**



INSTALLATION (CB650RA)

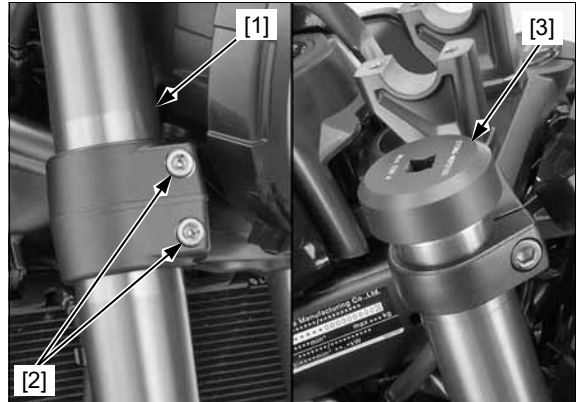
When the fork is disassembled:

Insert the fork leg [1] into the bottom bridge, top bridge and temporarily tighten the pinch bolt [2].

Tighten the fork cap to the specified torque using the special tools.

TOOL:
[3] Fork cap wrench **070MA-MGP0100**

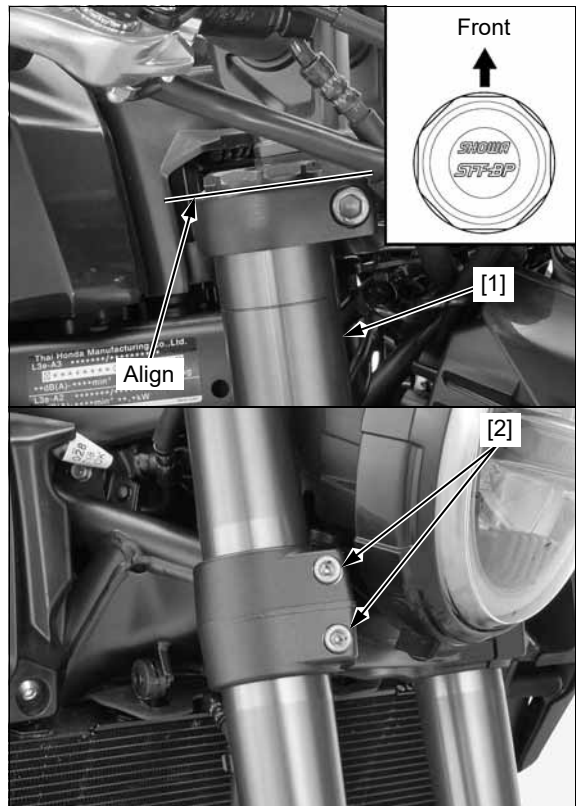
TORQUE: 35 N·m (3.6 kgf·m, 26 lbf·ft)



Route the wires, cables and hose properly (page 1-22). Install the fork leg into the bottom bridge and top bridge. Align the top end of the fork pipe [1] with the upper surface of the top bridge as shown.

Tighten the bottom bridge pinch bolts [2] to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



Tighten the top bridge pinch bolt [1].

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



Left side only: Install the front wheel speed sensor guard [1] and new mounting bolts [2] onto the left fork.

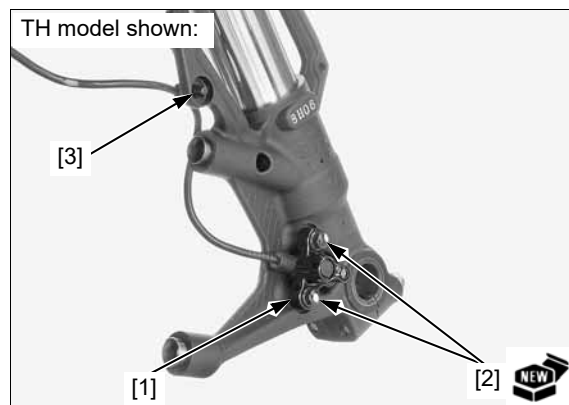
NOTE:

- Always replace the front wheel speed sensor guard mounting bolts with new ones.

Install the wire clip [3] onto the left fork (TH, IN, BR models).

Install the following:

- Front fender (page 2-5)
- Front wheel (page 16-15)
- Front turn signal light (page 21-4)
- Handlebar (page 16-11)



DISASSEMBLY

RIGHT SIDE

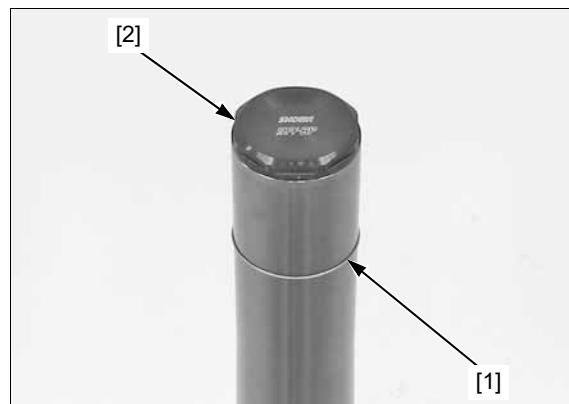
Remove the stopper ring [1] being careful not to scratch the outer tube (CBR650RA).

Remove the fork cap [2] with the special tool.

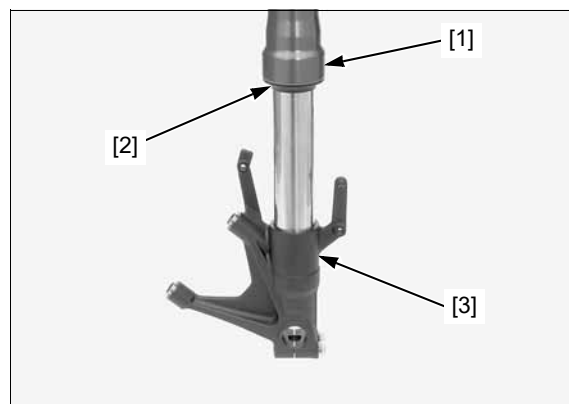
TOOL:

Fork cap wrench

070MA-MGP0100

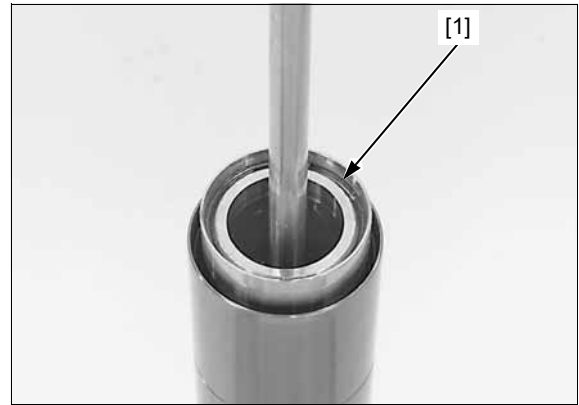


Push the outer tube [1] slowly down, and gently seat the dust seal [2] onto the axle holder [3].

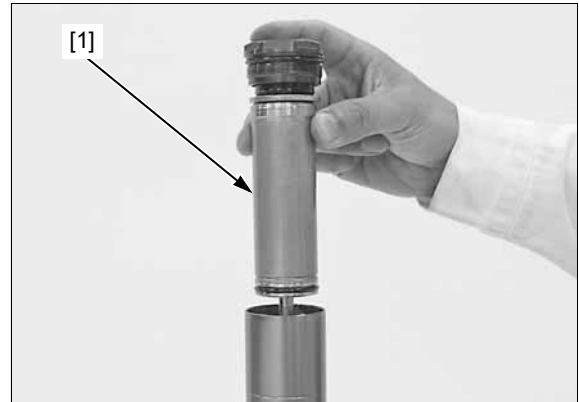


FRONT WHEEL/SUSPENSION/STEERING

Remove the stopper ring [1] from the groove in the fork pipe.

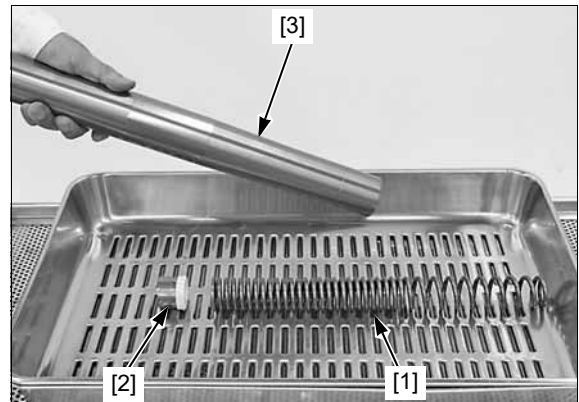


Pull up and remove the fork rod assembly [1].



Remove the fork spring [1] and spring collar [2].

Pour out the fork fluid by pumping the outer tube [3] several times.



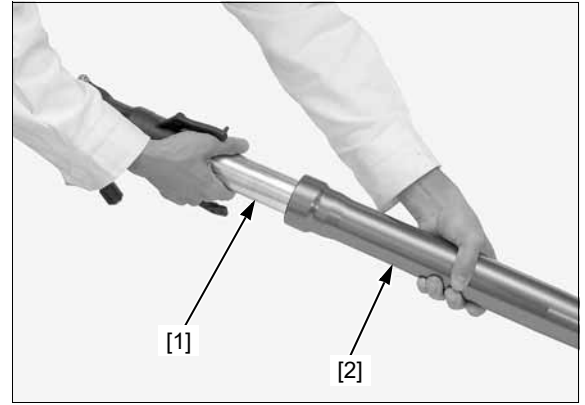
Remove the dust seal [1].

Remove the stopper ring [2].

Be careful not to scratch the slide pipe sliding surface.



Pull the slide pipe assembly [1] out until you feel resistance from the slider bushing. Then move it in and out, tapping the bushing lightly until the outer tube [2] separates from the slide pipe assembly. The guide bushing will be forced out by the slider bushing.



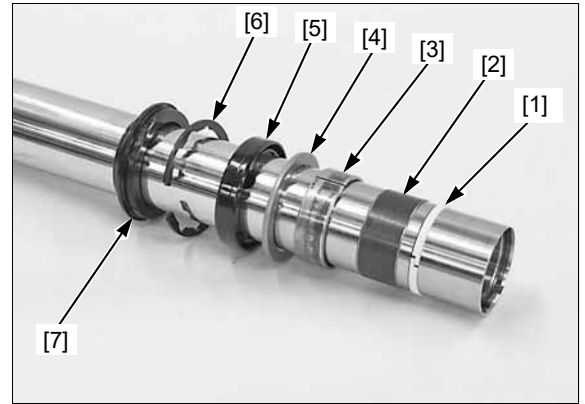
Slightly spread the end of the piston B ring [1] and remove it.

Do not damage the slider bushing, especially the sliding surface. To prevent loss of tension, do not open the slider bushing more than necessary.

Carefully remove the slider bushing [2] by prying the slot with a screwdriver until the slider bushing can be pulled off by hand.

Remove the following:

- Guide bushing [3]
- Back-up ring [4]
- Oil seal [5]
- Stopper ring [6]
- Dust seal [7]

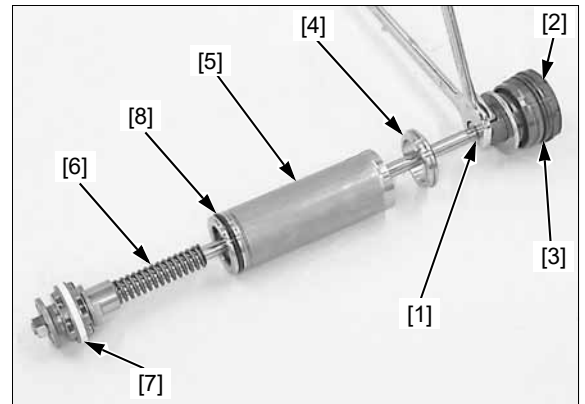


Loosen the lock nut [1] while holding the fork cap [2], then remove the fork cap.

Remove the O-ring [3] from the fork cap groove.

Remove the stopper seat [4], rod guide case [5], rebound spring [6] and piston ring [7].

Remove the O-ring [8] from the rod guide case.



FRONT WHEEL/SUSPENSION/STEERING

LEFT SIDE

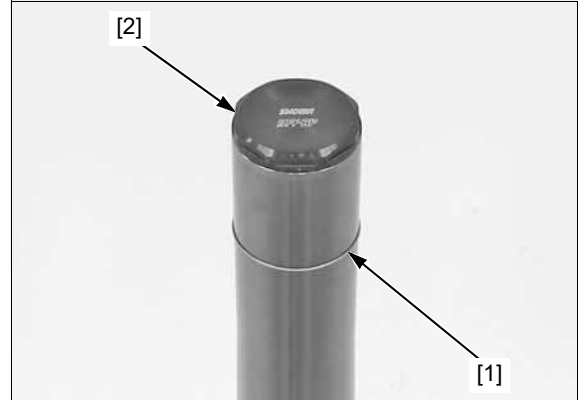
Remove the stopper ring [1] being careful not to scratch the outer tube (CBR650RA).

Remove the fork cap [2] with the special tool.

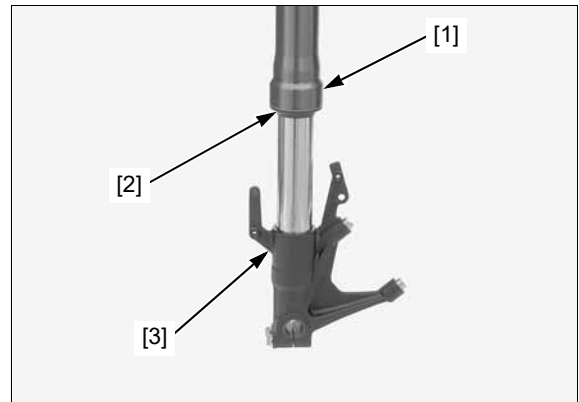
TOOL:

Fork cap wrench

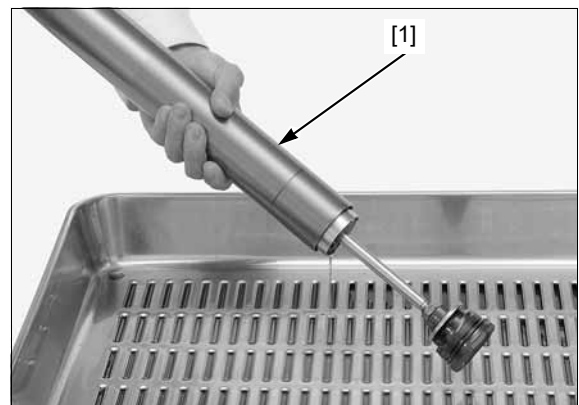
070MA-MGP0100



Push the outer tube [1] slowly down, and gently seat the dust seal [2] onto the axle holder [3].

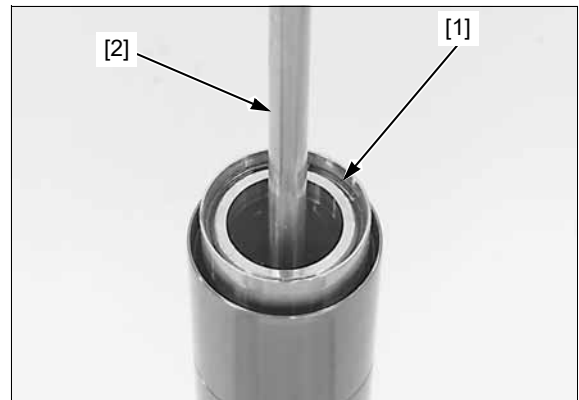


Pour out the fork fluid by pumping the outer tube up [1] and down several times.



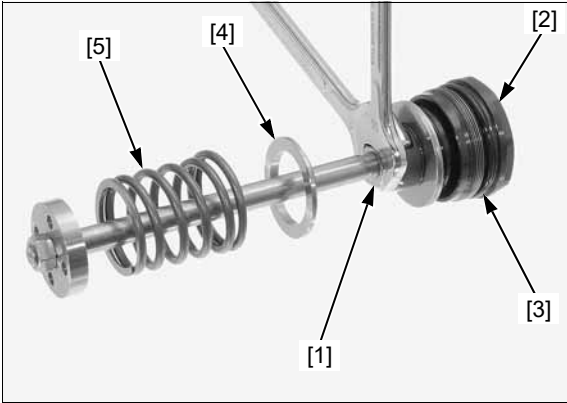
Push the fork cap down and compress the fork spring, then remove the stopper ring [1] from the groove in the fork pipe.

Remove the fork rod assembly [2].

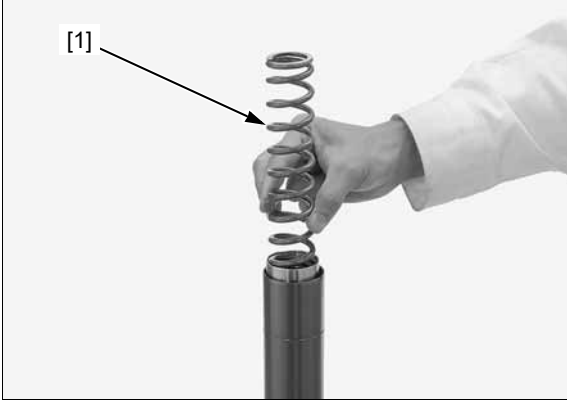


FRONT WHEEL/SUSPENSION/STEERING

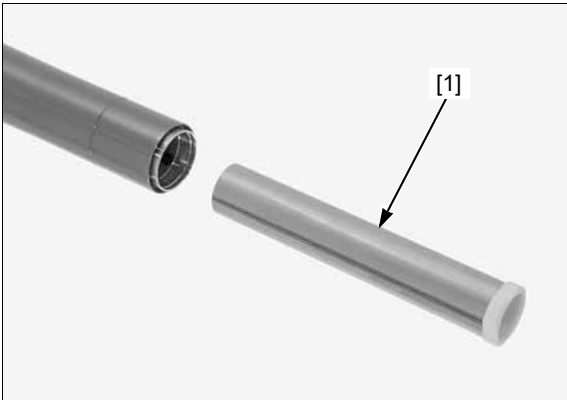
Loosen the lock nut [1] while holding the fork cap [2], then remove the fork cap.
Remove the O-ring [3] from the fork cap groove.
Remove the spring seat [4] and rebound spring [5].



Remove the fork spring [1].



Remove the spring collar [1].



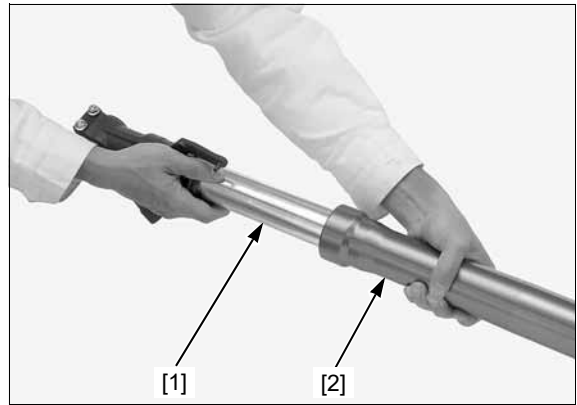
Remove the dust seal [1].
Remove the oil seal stopper ring [2].

Be careful not to scratch the slide pipe sliding surface.



FRONT WHEEL/SUSPENSION/STEERING

Pull the slide pipe assembly [1] out until you feel resistance from the slider bushing. Then move it in and out, tapping the bushing lightly until the outer tube [2] separates from the slide pipe assembly. The guide bushing will be forced out by the slider bushing.

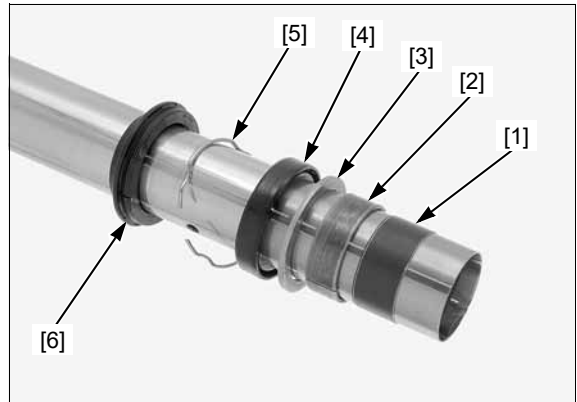


Do not damage the slider bushing, especially the sliding surface. To prevent loss of tension, do not open the slider bushing more than necessary.

Carefully remove the slider bushing [1] by prying the slot with a screwdriver until the slider bushing can be pulled off by hand.

Remove the following:

- Guide bushing [2]
- Back-up ring [3]
- Oil seal [4]
- Stopper ring [5]
- Dust seal [6]



INSPECTION

Inspect the following parts for damage, abnormal wear, bend, deformation, scoring and teflon coating wear.

- Fork tube
- Fork slider
- Fork spring
- Rebound spring
- Spring collar
- Piston ring (Right side only)
- Fork rod
- Rod guide case (Right side only)
- Piston B ring (Right side only)
- Guide bushing
- Fork tube bushing
- Back-up ring

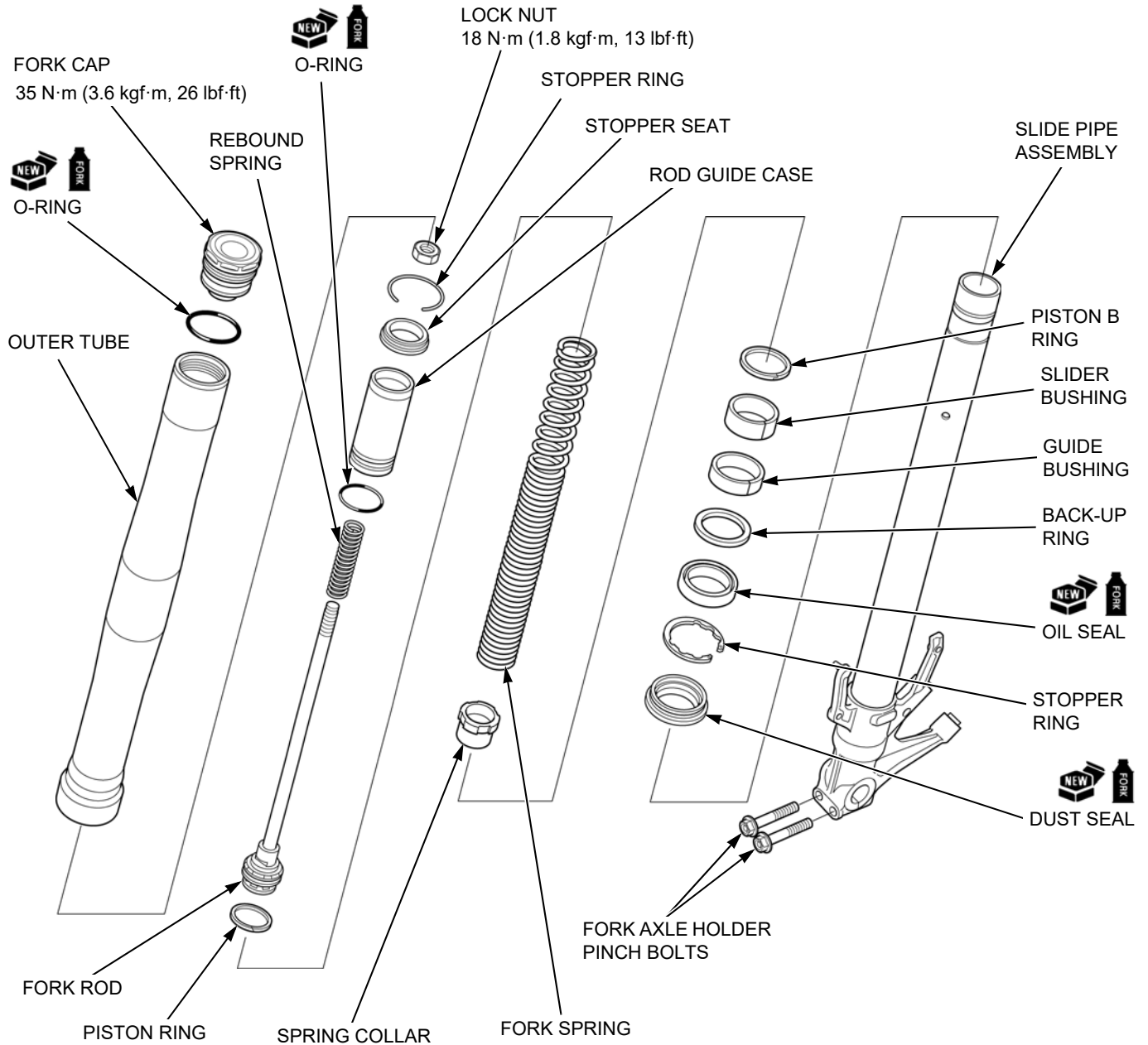
Measure each part according to FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS (page 1-9).

Replace any part if it is out of service limit.

ASSEMBLY

RIGHT SIDE

Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them off completely.



When installing the fork dust seal and oil seal, wrap the edge and groove of the slide pipe with tape [1].



FRONT WHEEL/SUSPENSION/STEERING

Apply fork fluid to new dust seal and oil seal lips.

Install the oil seal with its marked side facing toward the axle holder.

Install the dust seal [1], stopper ring [2] and oil seal [3].

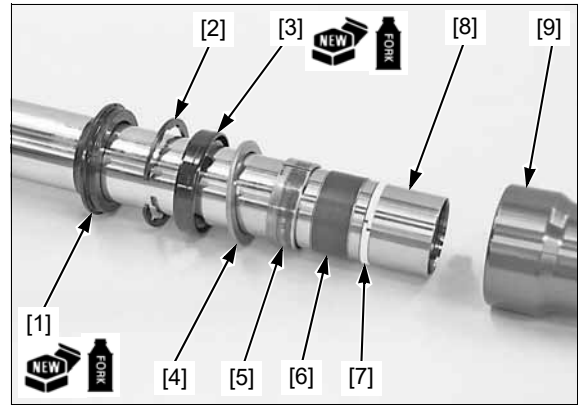
Install the back-up ring [4] and guide bushing [5].

Install the slider bushing [6] and piston B ring [7] if they are removed.

NOTE:

- Remove any burrs from the bushing mating surface, being careful not to peel off the coating.
- Do not open the slider bushing slit more than necessary.

Install the slide pipe assembly [8] into the outer tube [9].

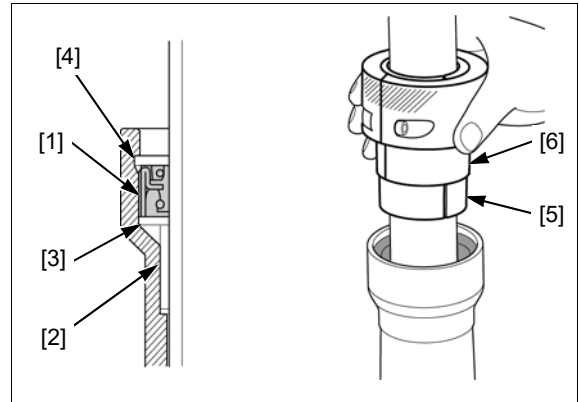


Drive the oil seal [1] with the guide bushing [2] and back-up ring [3] into the outer tube until the stopper ring groove [4] is visible using the special tools.

TOOLS:

[5] Fork seal driver attachment 07RMD-MW40100

[6] Fork seal driver, 45.2 mm 07KMD-KZ30100



Do not scratch the fork pipe sliding surface.

Install the stopper ring [1] into the groove securely.

Install the dust seal [2].



Install a new O-ring [1] to the rod guide case [2].

Install the piston ring [3], rebound spring [4] and rod guide case to the fork rod [5].

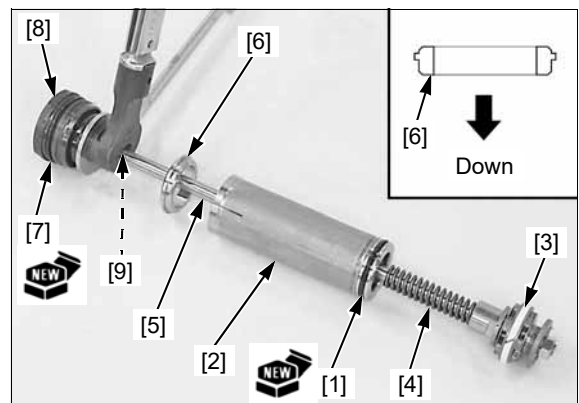
Install the stopper seat [6] in the shown direction.

Install a new O-ring [7] to the fork cap [8].

Install the fork cap to the fork rod and tighten it until it stops.

Hold the fork cap then tighten the fork rod lock nut [9] to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



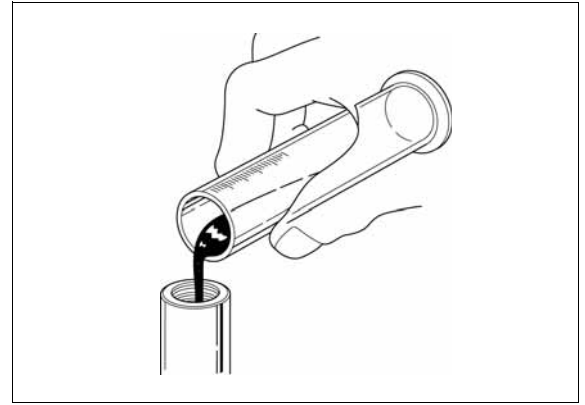
Pour the specified amount of recommended fork fluid.

RECOMMENDED FORK FLUID:

Fork fluid (viscosity: 10W)

FORK FLUID CAPACITY:

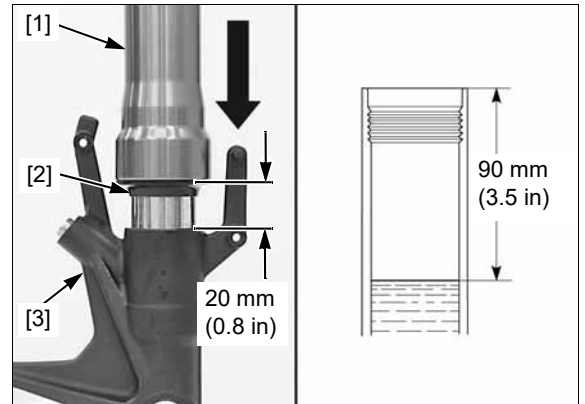
465 ± 2.5 cm³ (15.7 ± 0.08 US oz, 16.3 ± 0.09 Imp oz)



Slowly push the outer tube [1] and pump the fork pipe several times to remove the trapped air from the lower portion of the fork pipe.
Leave it for 5 minutes to remove air bubbles from the fluid.

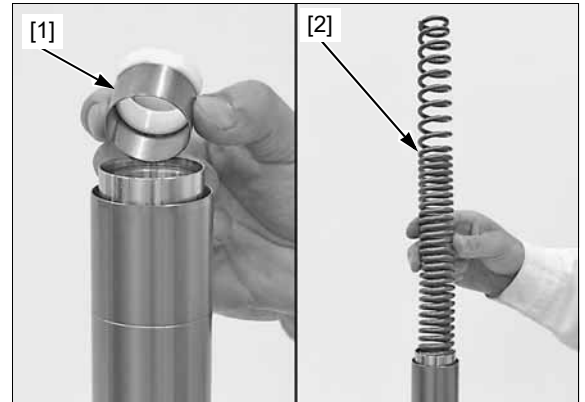
Position the outer tube so that the distance between the dust seal flat part [2] and the top of the axle holder [3] is 20 mm (0.8 in) as shown, and measure the oil level from the top of the slide pipe.

FORK FLUID LEVEL: 90 mm (3.5 in)



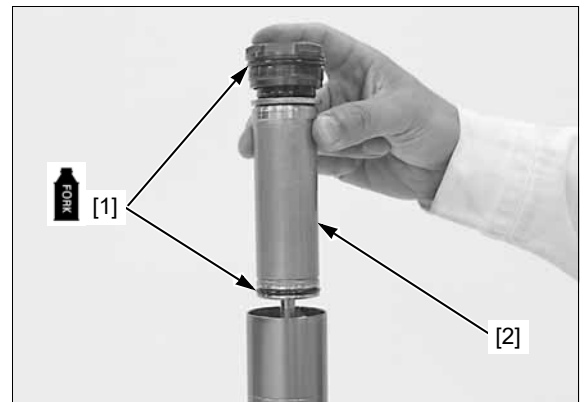
Install the spring collar [1].

Install the fork spring [2] into the slide pipe assembly with the tightly wound side facing down.



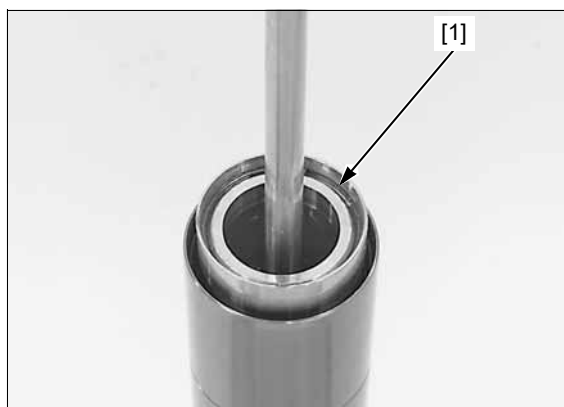
Apply fork fluid to the O-rings [1].

Install the fork rod assembly by pushing the rod guide case [2] into the slide pipe assembly.



FRONT WHEEL/SUSPENSION/STEERING

Install the stopper ring [1] into the groove in the fork pipe.

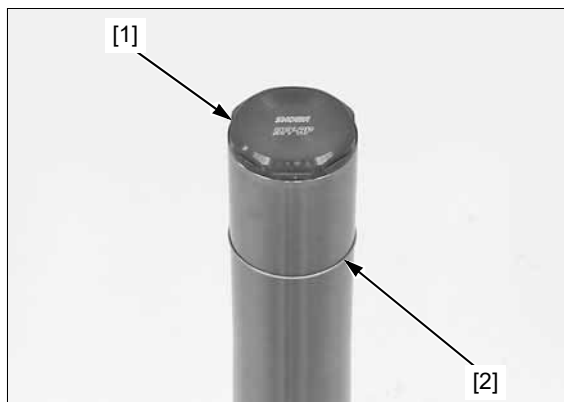


Completely extend the outer tube.

Install and tighten the fork cap [1] into the outer tube.

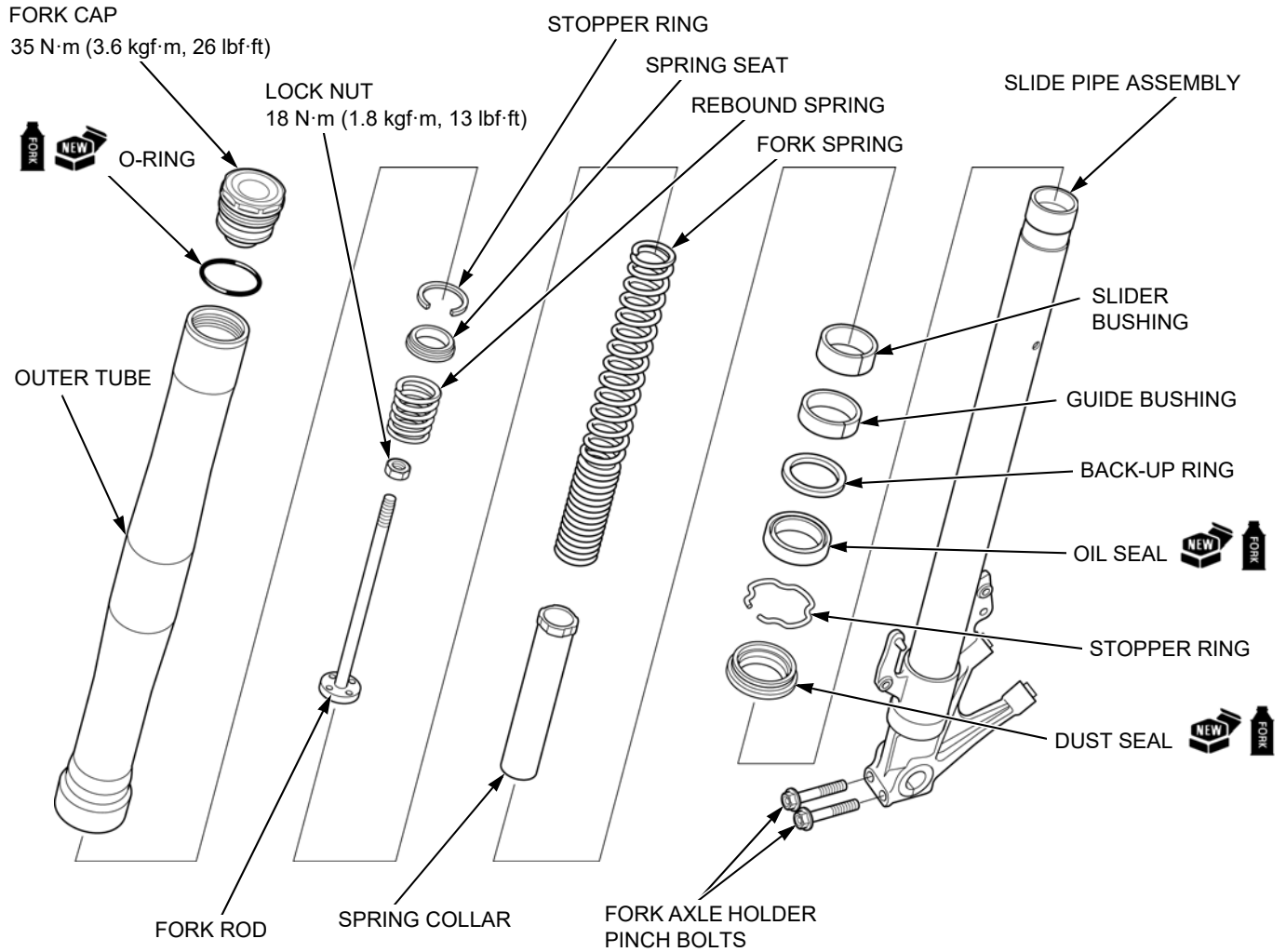
Install the stopper ring [2] being careful not to scratch the outer tube (CBR650RA).

Tighten the fork cap to the specified torque after installing the fork leg into the steering stem (page 16-21).

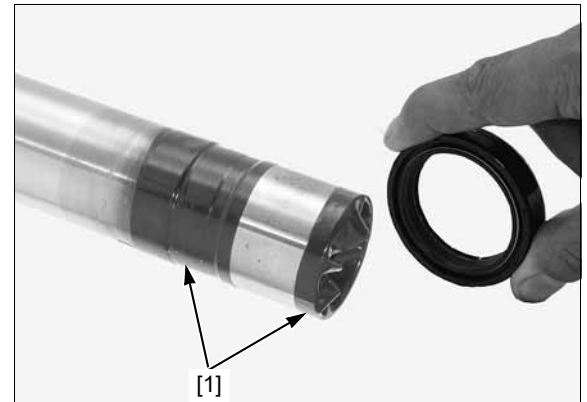


LEFT SIDE

Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them off completely.



When installing the fork dust seal and oil seal, wrap the edge and groove of the slide pipe with tape [1].



FRONT WHEEL/SUSPENSION/STEERING

Apply fork fluid to new dust seal and oil seal lips.

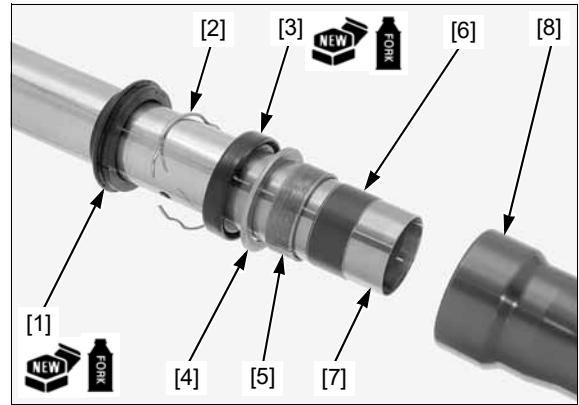
Install the oil seal with its marked side facing toward the axle holder.

Install the dust seal [1], stopper ring [2] and oil seal [3].
Install the back-up ring [4] and guide bushing [5].
Install the slider bushing [6] if it is removed.

NOTE:

- Remove any burrs from the bushing mating surface, being careful not to peel off the coating.
- Do not open the slider bushing slit more than necessary.

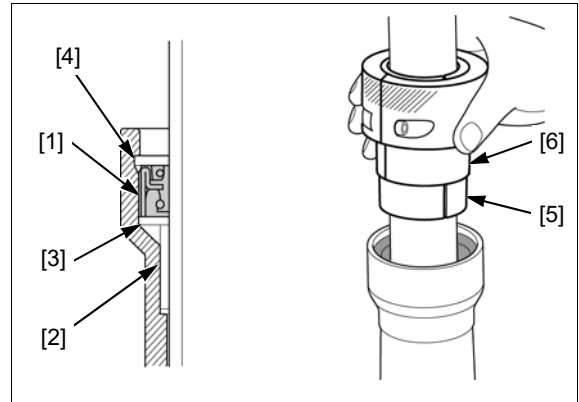
Install the slide pipe assembly [7] into the outer tube [8].



Drive the oil seal [1] with the guide bushing [2] and back-up ring [3] into the outer tube until the stopper ring groove [4] is visible using the special tools.

TOOLS:

[5] Fork seal driver attachment 07RMD-MW40100
[6] Fork seal driver, 45.2 mm 07KMD-KZ30100



Do not scratch the fork pipe sliding surface.

Install the stopper ring [1] into the groove securely.
Install the dust seal [2].



Pour the specified amount of recommended fork fluid into the fork pipe.

RECOMMENDED FORK FLUID:

Fork fluid (viscosity: 10W)

FORK FLUID CAPACITY:

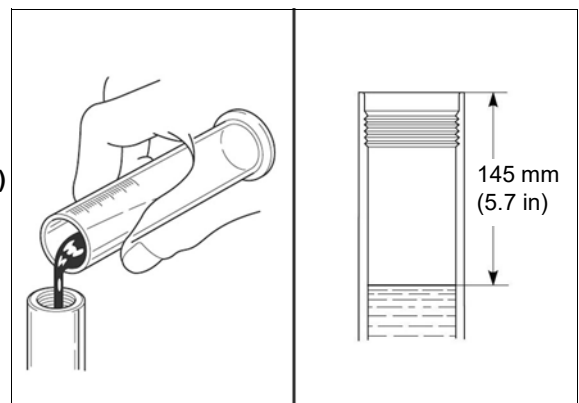
503 ± 2.5 cm³ (17.0 ± 0.08 US oz, 17.7 ± 0.09 Imp oz)

Slowly pump the fork pipe several times to remove the trapped air from the lower portion of the fork pipe.

Compress the fork pipe fully and leave it for 5 minutes to remove air bubbles from the fluid.

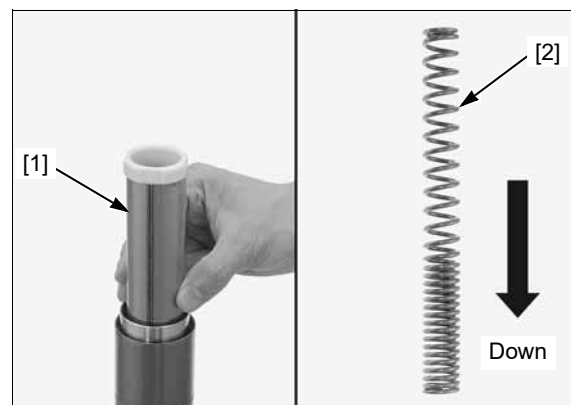
Measure the oil level from the top of the fork pipe by supporting the fork leg vertically.

FORK FLUID LEVEL: 145 mm (5.7 in)



Install the spring collar [1].

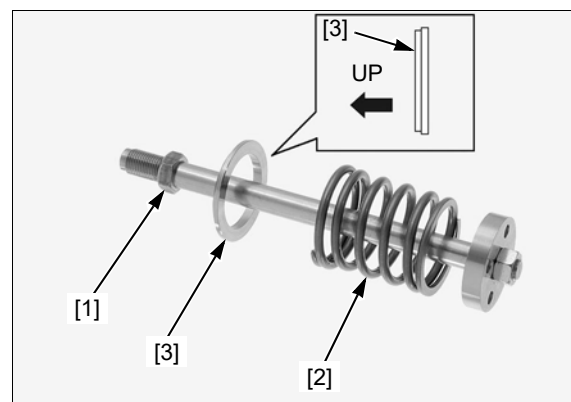
Install the fork spring [2] into the slide pipe assembly with the tightly wound side facing down.



Tighten the lock nut [1] until it stops.

Install the rebound spring [2] to the fork rod.

Install the spring seat [3] in the shown direction.

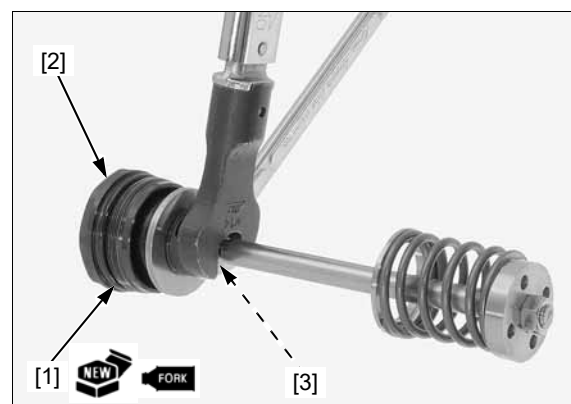


Apply recommended fork oil to a new O-ring [1], and install it to the fork cap [2].

Install the fork cap to the fork rod and tighten it until it stops.

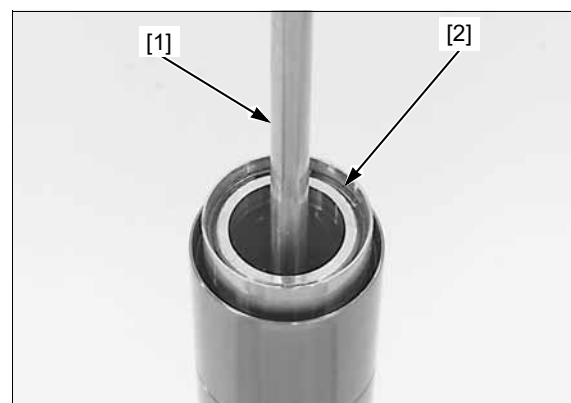
Hold the fork cap then tighten the fork rod lock nut [3] to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



Install the fork rod assembly [1] into the slide pipe assembly.

Push the fork cap down and compress the fork spring, then install the stopper ring [2] into the groove in the fork pipe.



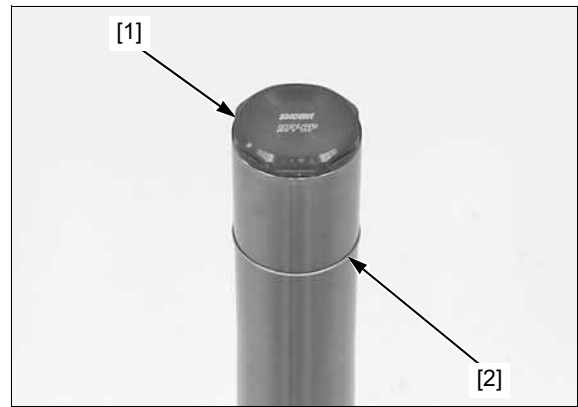
FRONT WHEEL/SUSPENSION/STEERING

Completely extend the outer tube.

Install and tighten the fork cap [1] into the outer tube.

Install the stopper ring [2] being careful not to scratch the outer tube (CBR650RA).

Tighten the fork cap to the specified torque after installing the fork leg into the steering stem (page 16-21).



STEERING STEM

REMOVAL

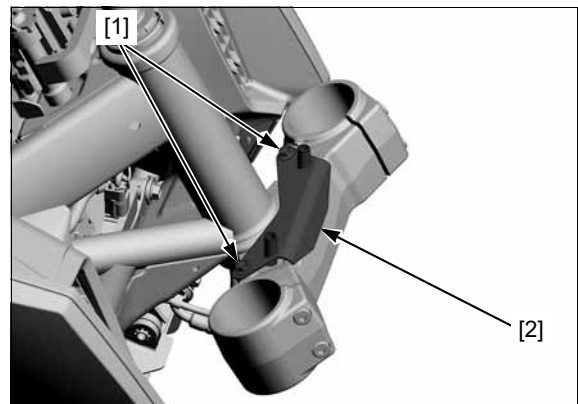
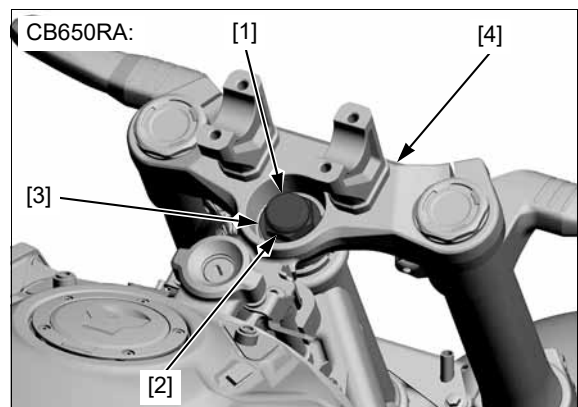
CBR650RA: Remove the following:

- Handlebars (page 16-5)
- Fork legs (page 16-21)

CB650RA: Remove the following:

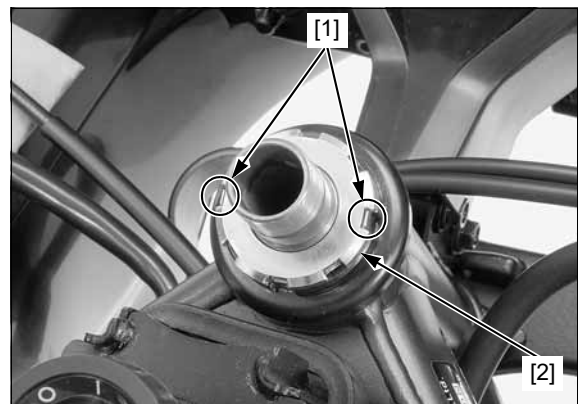
- Handlebar (page 16-5)
- Headlight (page 21-3)
- Combination meter (page 21-6)
- Ignition switch cover (page 21-15)
- Cap [1]
- Steering stem nut [2]
- Washer [3]
- Top bridge [4]
- Fork legs (page 16-23)

CB650RA: Remove the bolts [1] and headlight lower stay [2].



Straighten the lock washer tabs [1].

Remove the lock nut [2] and lock washer.

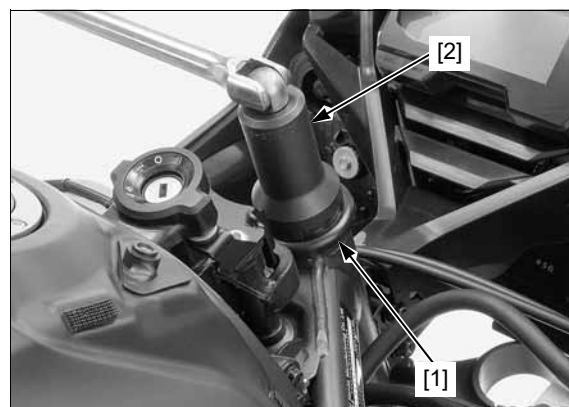


Loosen the steering bearing adjustment nut [1] using the special tool.

TOOL:

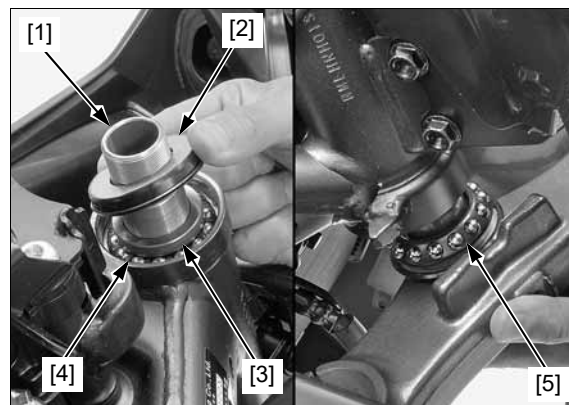
[2] Steering stem socket 07916-3710101

While holding the steering stem, remove the adjustment nut.



Remove the following:

- Steering stem [1]
- Upper dust seal [2]
- Upper inner race [3]
- Upper steering bearing [4]
- Lower steering bearing [5]



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

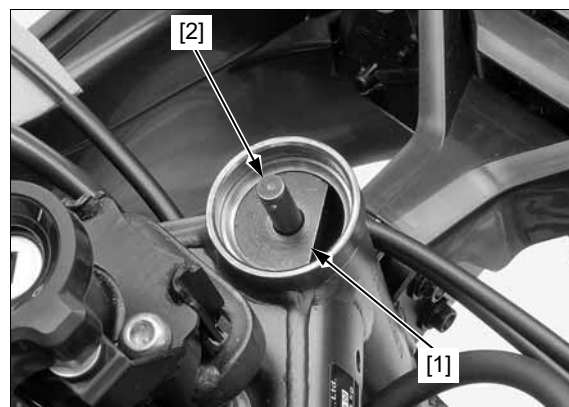
07953-MJ10000

- [1] Remover attachment

07953-MJ10100

- [2] Remover shaft

07953-MJ10200



Remove the lower outer race using the special tool and a suitable shaft.

TOOL:

[1] Bearing remover

07946-3710500

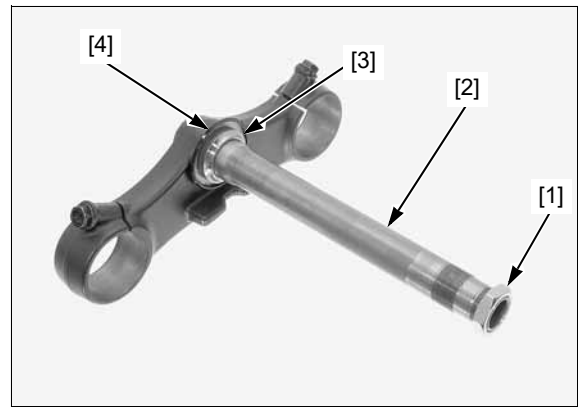


FRONT WHEEL/SUSPENSION/STEERING

Install the stem nut [1] onto the steering stem [2] to prevent the threads from being damaged when removing the lower inner race [3].

Remove the lower inner race with a chisel or equivalent tool, being careful not to damage the stem.

Remove the lower dust seal [4].

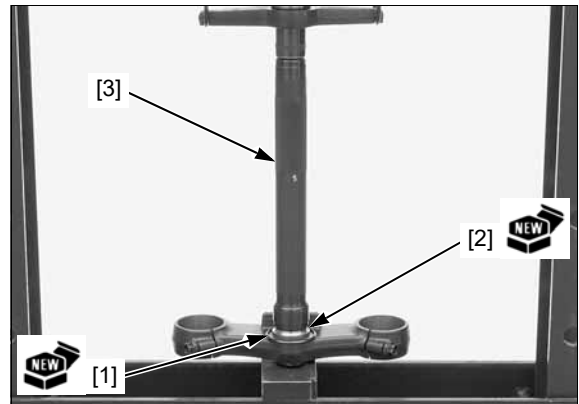


Install a new lower dust seal [1] onto the steering stem.

Press a new lower inner race [2] using the special tool.

TOOL:

[3] Steering stem driver 07946-MB00000



Drive in a new upper outer race [1] into the steering head pipe using the special tool.

TOOLS:

[2] Driver 07749-0010000

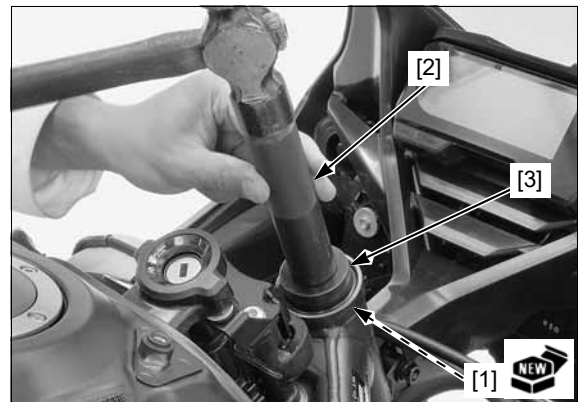
[3] Attachment, 42 x 47 mm 07746-0010300

Drive in a new lower outer race.

TOOLS:

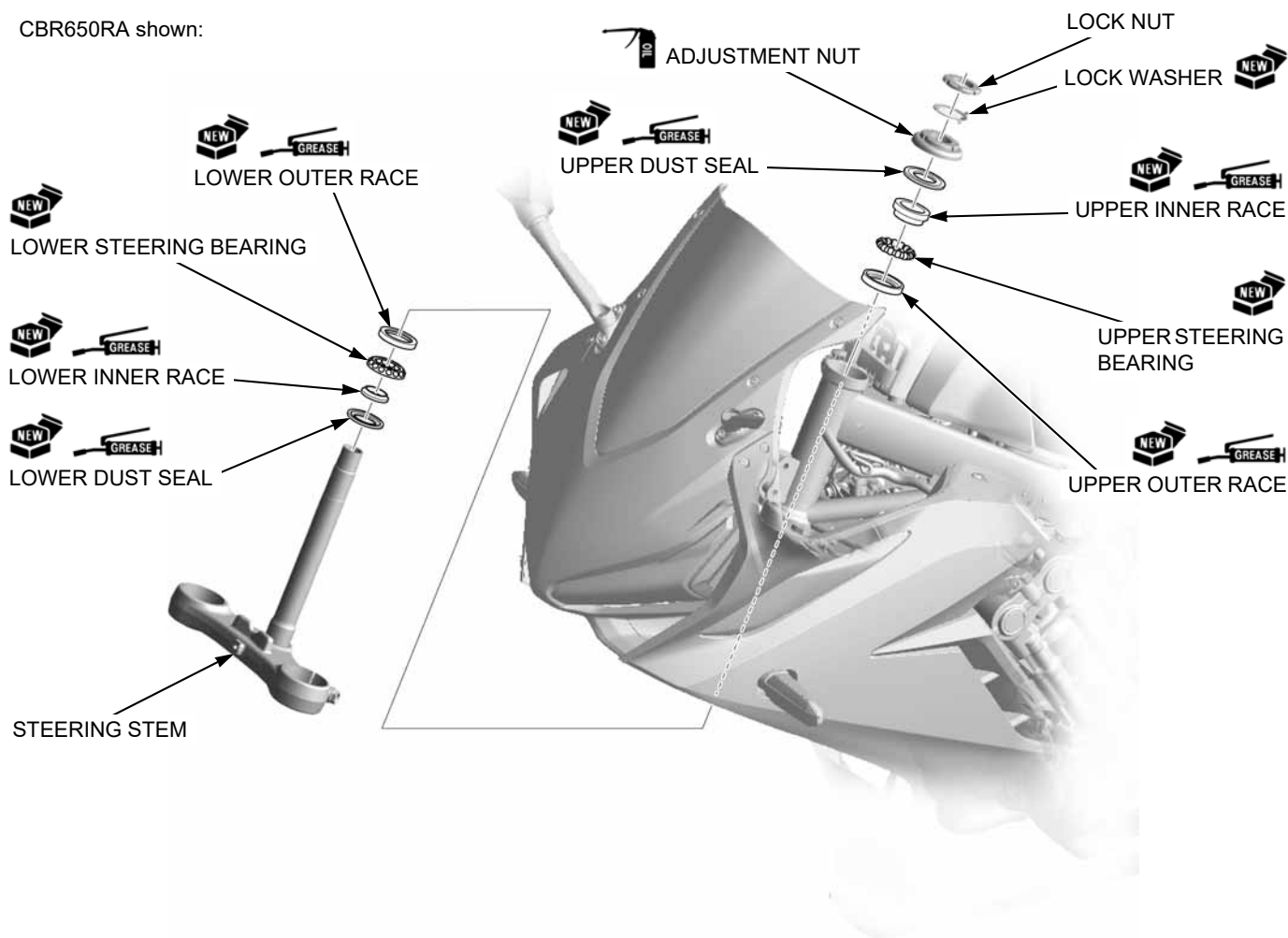
Driver 07749-0010000

Attachment, 52 x 55 mm 07746-0010400



INSTALLATION

CBR650RA 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].

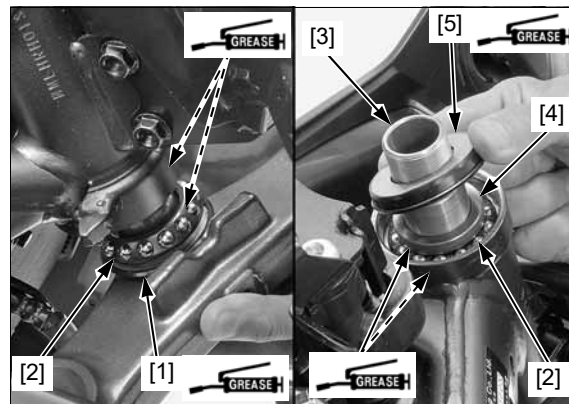
Apply 3 – 5 g (0.1 – 0.2 oz) (per each bearing) of grease to the bearing race sliding surfaces.

Install the bearings [2] in the lower inner race and upper outer race.

Install the steering stem [3] and upper inner race [4].

Apply grease to the lip of a new upper dust seal [5].

Install the upper dust seal.



FRONT WHEEL/SUSPENSION/STEERING

Apply engine oil to the threads of the adjustment nut [1].

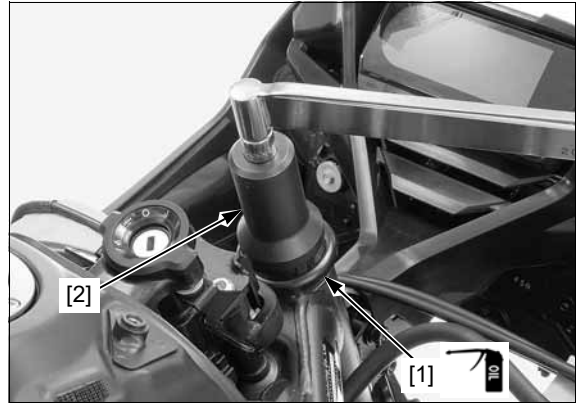
Install the adjusting nut.

Tighten the adjustment nut to the specified torque using the special tool while holding the steering stem.

TOOL:

[2] Steering stem socket 07916-3710101

TORQUE: 31 N·m (3.2 kgf·m, 23 lbf·ft)

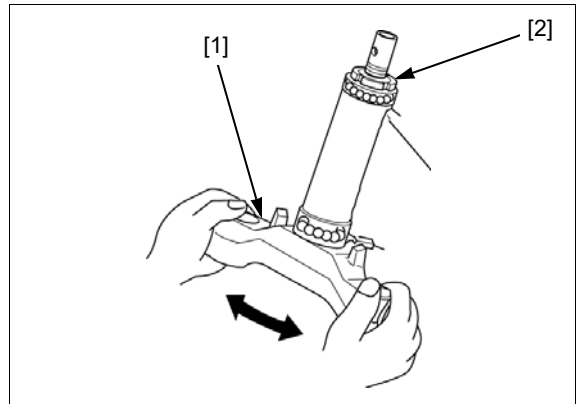


Turn the steering stem [1] left and right, lock-to-lock five times to seat the bearings.

Completely loosen the adjustment nut [2].

Retighten the adjustment nut to the same torque.

TORQUE: 31 N·m (3.2 kgf·m, 23 lbf·ft)

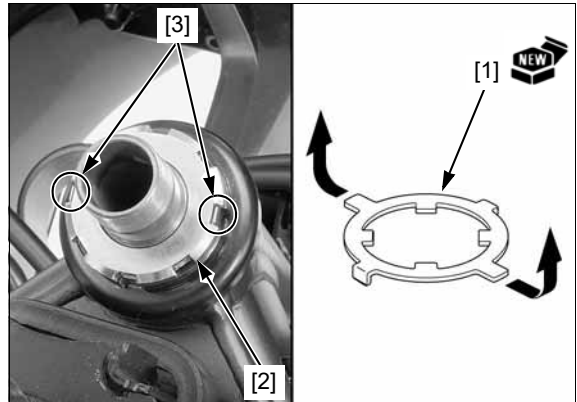


Install a new lock washer [1], aligning its bent tabs with the grooves in the adjustment nut.

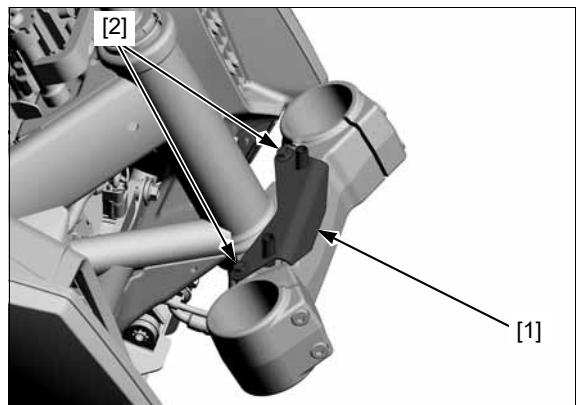
Install the lock nut [2] and finger tighten it all the way.

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.



CB650RA: Install the headlight lower stay [1] and bolts [2].



Clean the threads of the stem with a degreasing agent.

CBR650RA: Install the following:

- Handlebars (page 16-5)
- Fork legs (page 16-21)

Make sure the steering stem moves smoothly, without play or binding.

CB650RA: 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.

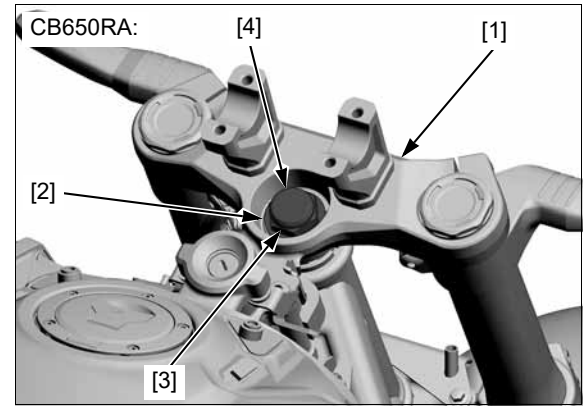
Tighten the stem nut to the specified torque.

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

Make sure the steering stem moves smoothly, without play or binding.

Install the following:

- Stem cap [4]
- Fork legs (page 16-24)
- Handlebar (page 16-5)
- Ignition switch cover (page 21-15)
- Combination meter (page 21-6)
- Headlight (page 21-3)



MEMO

17. REAR WHEEL/SUSPENSION

SERVICE INFORMATION.....	17-2	REAR WHEEL.....	17-4
TROUBLESHOOTING	17-2	SHOCK ABSORBER.....	17-8
COMPONENT LOCATION.....	17-3	SWINGARM.....	17-10

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.
- After the rear wheel installation, check the brake operation by applying the brake pedal.
- Use only genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.
- For brake system service (page 18-2).

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 3-15)
- 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

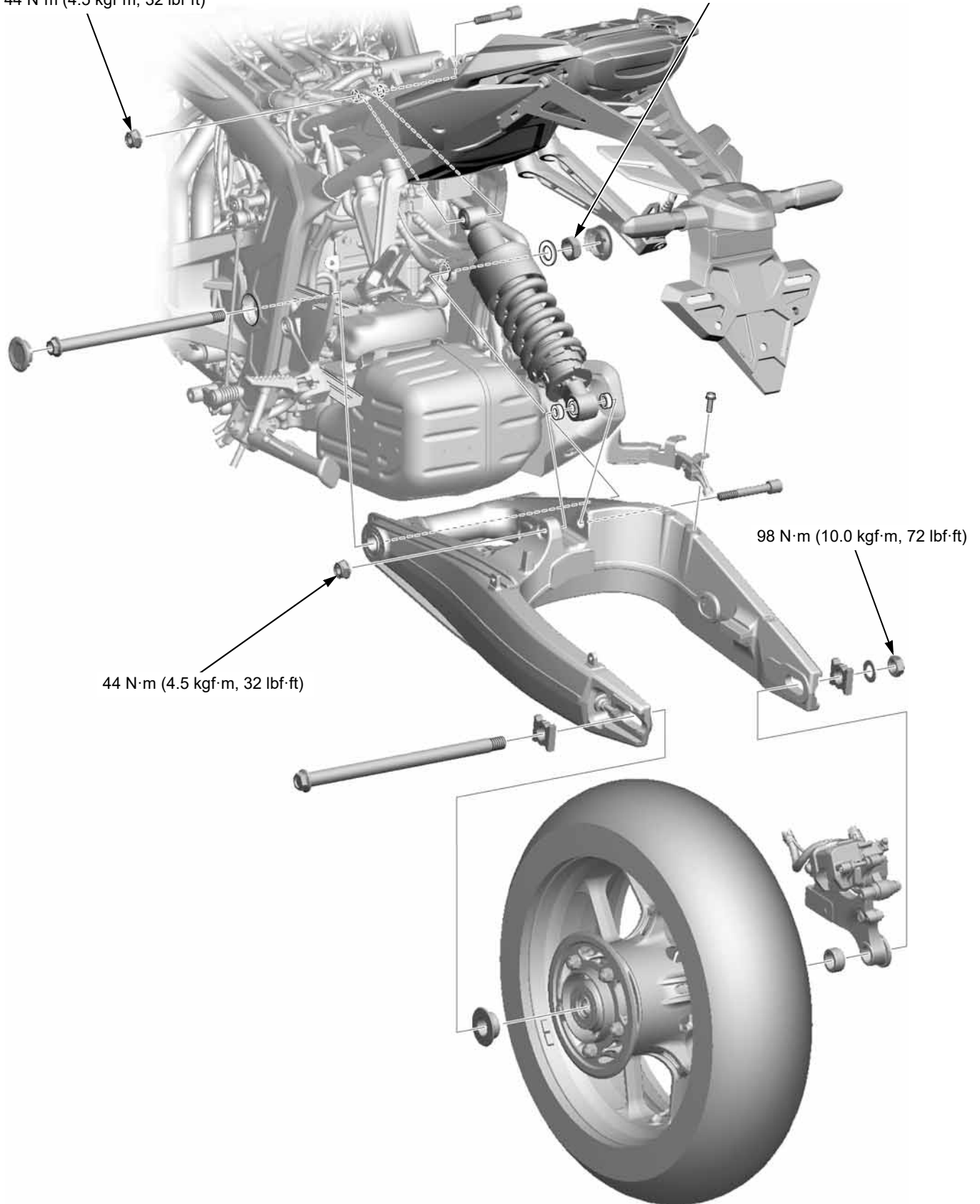
- Loose suspension fasteners
- Worn or damaged suspension pivot bearings
- Faulty shock absorber

COMPONENT LOCATION

Except MA, IIMA, IN, U, IIU shown:

44 N·m (4.5 kgf·m, 32 lbf·ft)

103 N·m (10.5 kgf·m, 76 lbf·ft)



REAR WHEEL/SUSPENSION

REAR WHEEL

REMOVAL/INSTALLATION

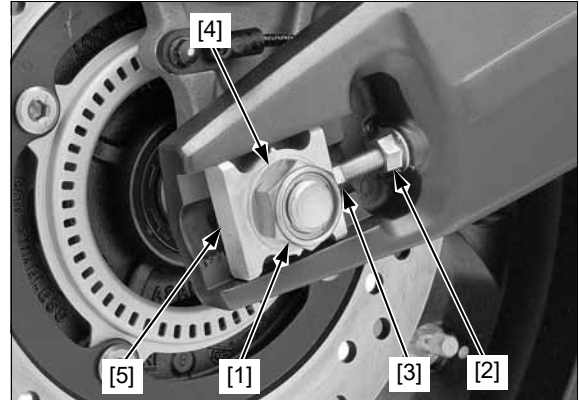
Loosen the axle nut [1].

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

Loosen the lock nuts [2] and turn the adjusting bolts [3] so the wheel can be moved forward all the way.

Support the caliper so it does not hang from the brake hose. Do not twist the brake hose

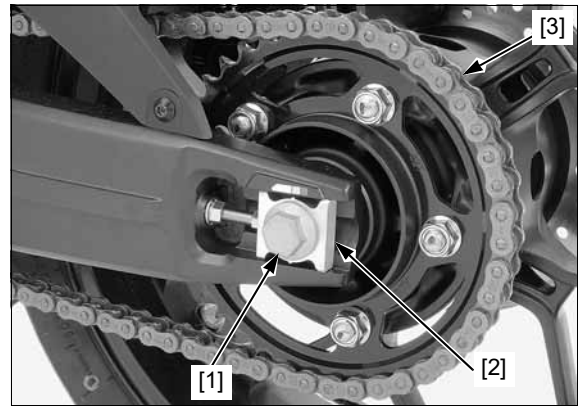
Remove the axle nut, washer [4] and right adjusting plate [5].



Push the rear wheel forward.

Remove the axle [1] and left adjusting plate [2].

Derail the drive chain [3] from the driven sprocket and remove the rear wheel.

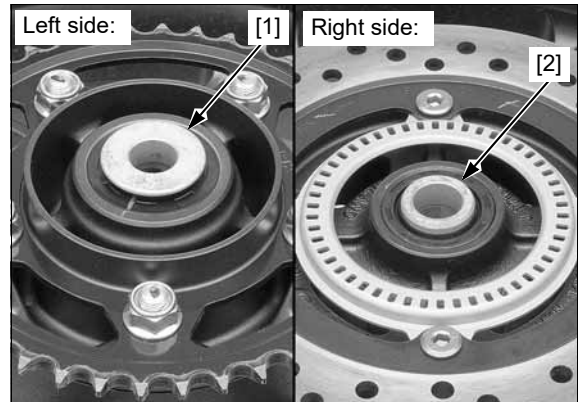


NOTE:

- 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.

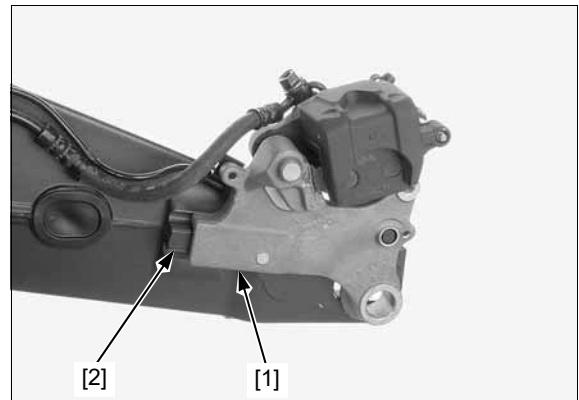
NOTE:

- When installing the wheel, take care not to let the caliper bracket [1] come off the swingarm boss [2] and not to damage the brake pads.
- The axle is installed from the left side.

Adjust the drive chain slack (page 3-15).

TORQUE:

Rear axle nut: 98 N·m (10.0 kgf·m, 72 lbf·ft)



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
- Wheel hub
- Wheel rim
- Driven sprocket (page 3-16)
- Damper rubbers (page 17-5)

Measure each part according to REAR WHEEL/SUSPENSION SPECIFICATIONS (page 1-10).

Replace any part if it is out of service limit.

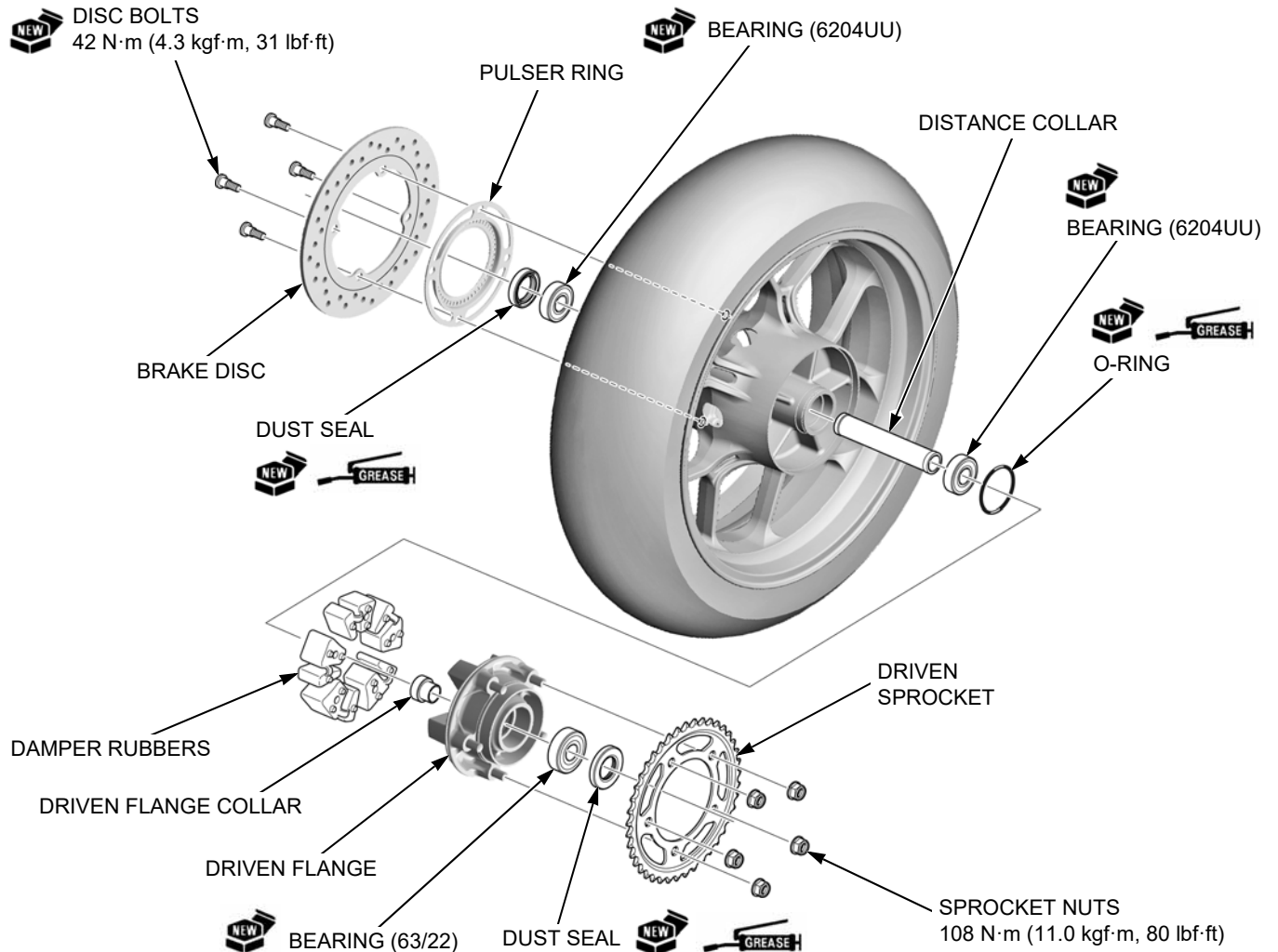
Refer to following:

- Wheel balance service (page 16-16)
- Tire valve service (page 16-19)

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the rear wheel as following illustration.

- For wheel balance service (page 16-16).
- Install the rear wheel dust seal with the flat side facing out so that it is flush with the wheel hub.
- Install driven flange dust seal with the flat side facing out so that it is flush with the driven flange end face.
- Install the brake disc with the rotation mark (arrow) facing out.



REAR WHEEL/SUSPENSION

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, 20 mm 07746-0050600

Bearing remover shaft 07GGD-0010100

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.

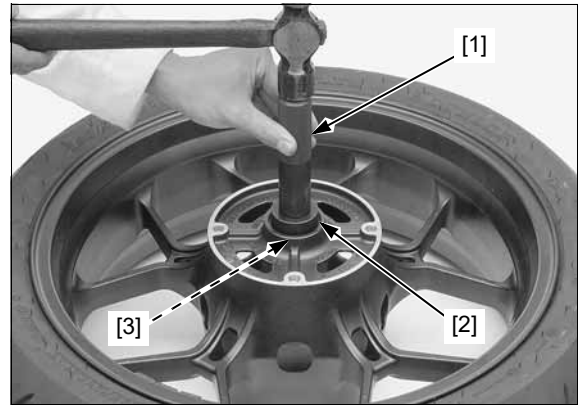
Drive in a new left side bearing squarely with the marked side facing up until it is fully seated.

TOOLS:

[1] Driver 07749-0010000

[2] Attachment, 42 x 47 mm 07746-0010300

[3] Pilot, 20 mm 07746-0040500



DRIVEN FLANGE BEARING

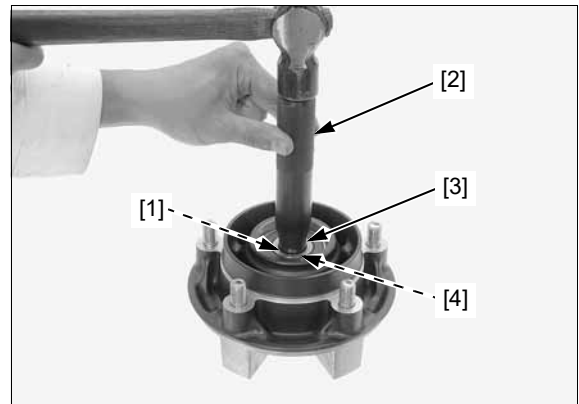
Drive out the driven flange collar [1] from the bearing.

TOOLS:

[2] Driver 07749-0010000

[3] Attachment, 22 x 24 mm 07746-0010800

[4] Pilot, 20 mm 07746-0040500



Drive out the driven flange bearing [1].

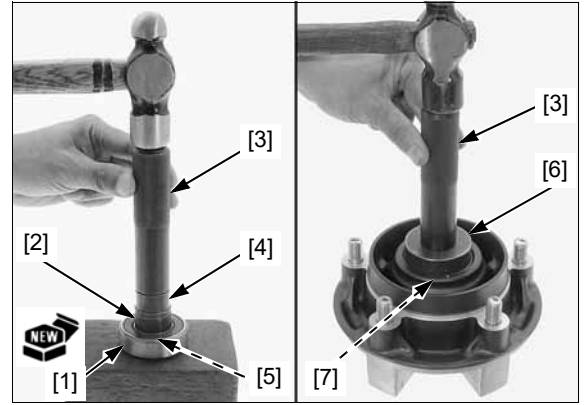


Place a new bearing [1] with the marked side facing down. Install the driven flange collar [2] into the bearing until it is fully seated.

- TOOLS:**
 [3] Driver 07749-0010000
 [4] Attachment, 28 x 30 mm 07946-1870100
 [5] Pilot, 20 mm 07746-0040500

Drive in the driven flange bearing/collar squarely with the collar side facing down until it is fully seated.

- TOOLS:**
 Driver 07749-0010000
 [6] Attachment, 52 x 55 mm 07746-0010400
 [7] Pilot, 20 mm 07746-0040500



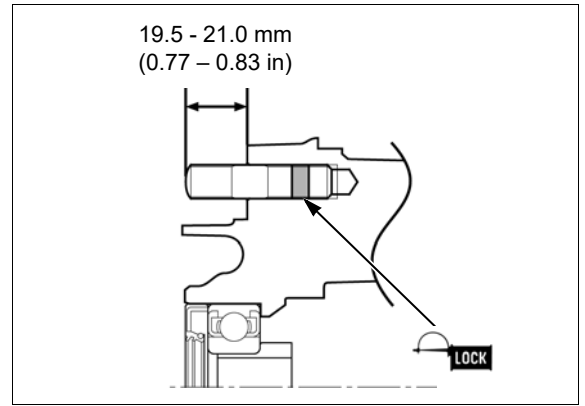
DRIVEN FLANGE STUD BOLT REPLACEMENT

Check that the length from the bolt head to the driven flange surface is within specifications.

STANDARD: 19.5 – 21.0 mm (0.77 – 0.83 in)

When removing the driven flange stud bolts, install and tighten new stud bolts into the driven flange so that the length from the bolt head to the driven flange surface is within specifications.

- When installing the driven flange stud bolt, Apply locking agent to the stud bolt as shown.



SHOCK ABSORBER

REMOVAL/INSTALLATION

Remove the drive chain cover/mud guard (page 2-16).

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

Remove the shock absorber upper mounting nut [1] and bolt [2].



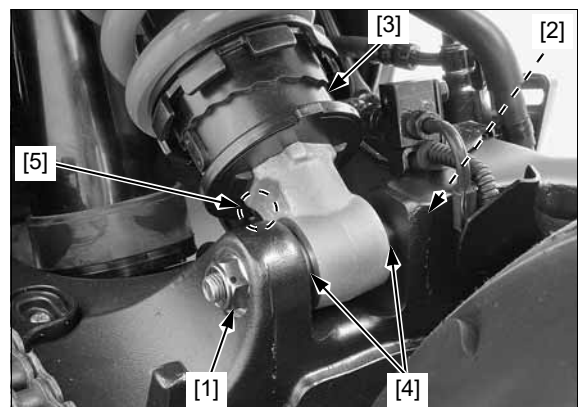
Remove the shock absorber lower mounting nut [1] and bolt [2].

Remove the shock absorber [3] and collars [4], out of the frame.

Installation is in the reverse order of removal.

NOTE:

- Turn the slit [5] to the lower side.
- The mounting bolt is installed from the right side.



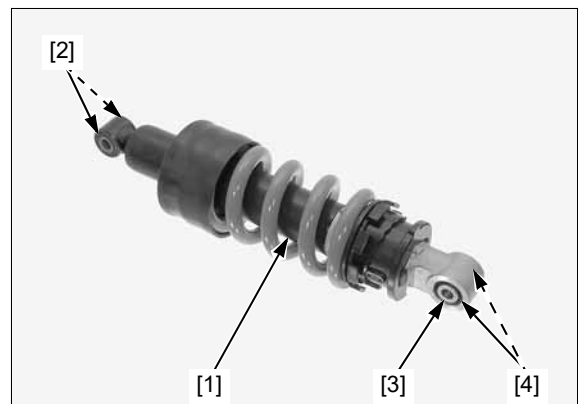
TORQUE:

Shock absorber mounting nut:
44 N·m (4.5 kgf·m, 32 lbf·ft)

INSPECTION

Inspect the following parts of the shock absorber for damage, abnormal wear, oil leakage or bend.

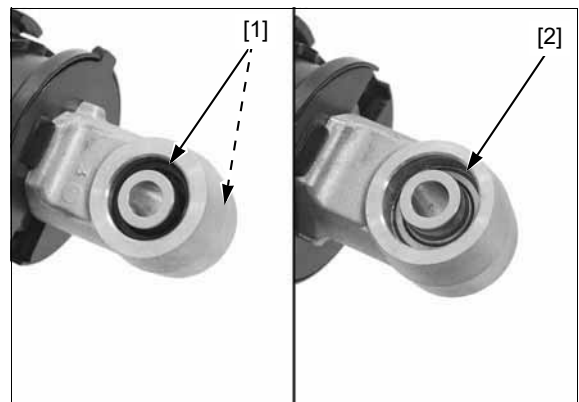
- Damper unit [1]
- Pivot bushing [2]
- Spherical bearing [3]
- Dust seal [4]



BEARING REPLACEMENT

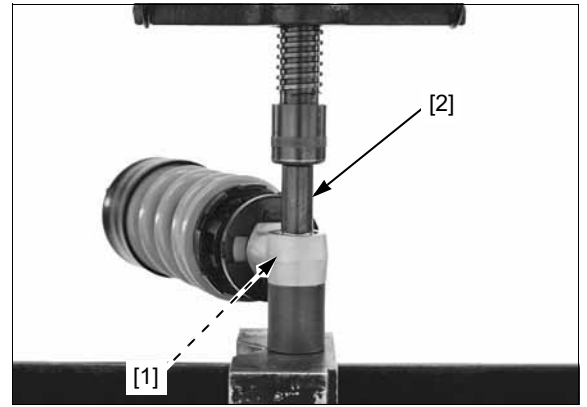
Remove the following:

- Dust seals [1]
- Stopper ring [2]



Press the spherical bearing [1] out of the shock absorber using the special tools.

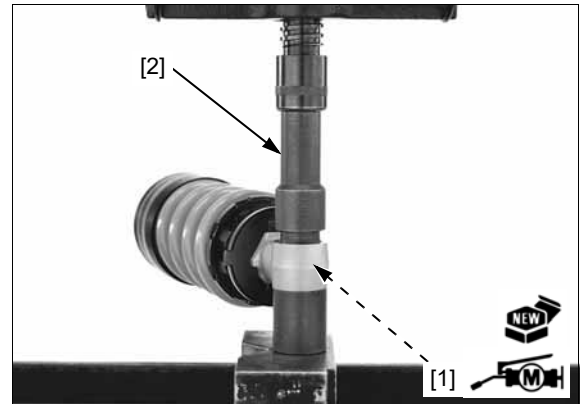
TOOL:
[2] Spherical Bearing Installer 07HMF-HC00100
10 x 19



Apply molybdenum disulfide grease to the spherical bearing rotating area.

Install the spherical bearing [1] into the shock absorber until it is fully seated using a hydraulic press and special tools as shown.

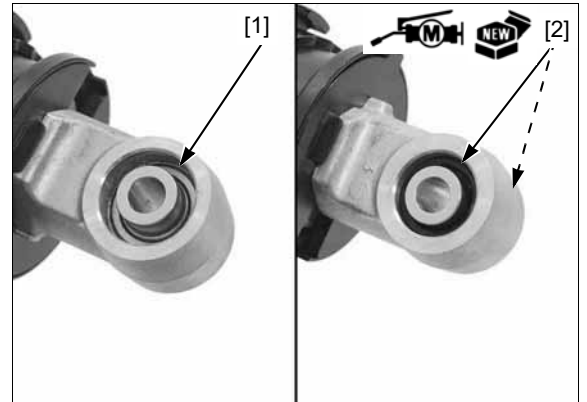
TOOL:
[2] Crank assembly collar 07965-GM00100



Securely attach the stopper ring [1] to the stopper ring groove.

Apply molybdenum disulfide grease to new dust seal lips.

Install the dust seal [2] with the flat surface facing outward and push until it is fully seated in the bearing.



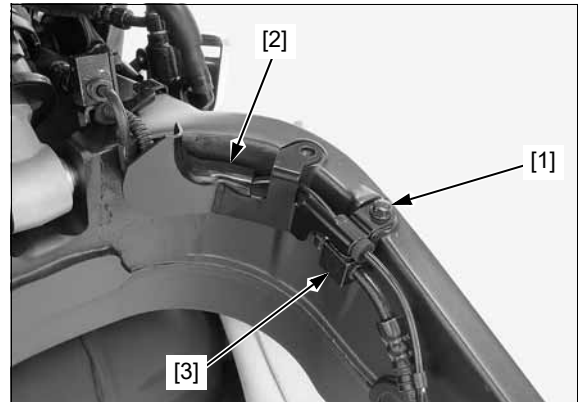
SWINGARM

REMOVAL/INSTALLATION

Remove the following:

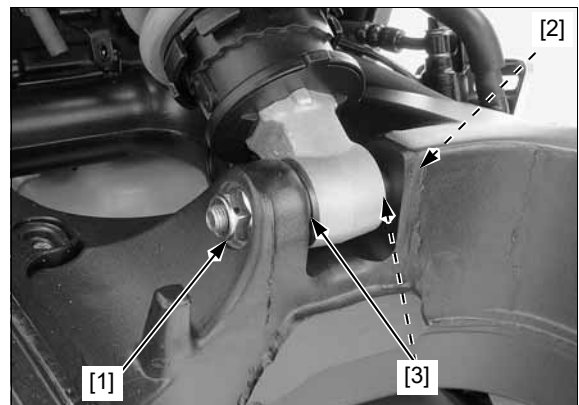
- Drive chain cover/mud guard (page 2-16)
- Rear wheel (page 17-4)
- EVAP canister (Except MA, IIMA, IN, U, IIU models) (page 7-23)

Remove the bolt [1], brake pipe stay [2] and brake pipe [3].



Remove the shock absorber lower mounting nut [1] and bolt [2].

Slide the shock absorber up and remove the collars [3].



Remove the following:

- Pivot caps [1]
- Pivot nut [2]
- Washer [3]
- Pivot bolt [4]

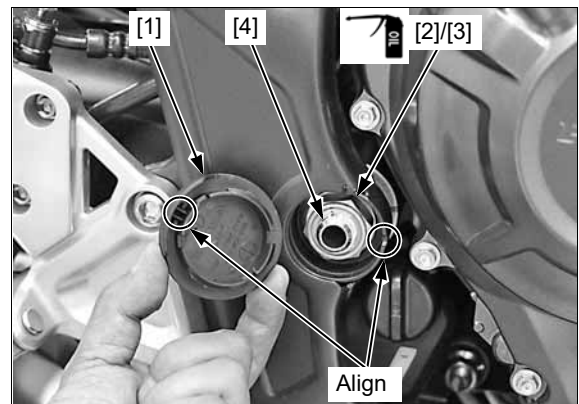
Support the caliper so it does not hang from the brake hose. Do not twist the brake hose

Move the brake hose, speed sensor wire and drive chain out of the way and remove the swingarm 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.
- Install the pivot cap by aligning the tabs with the cut-out of the frame.



TORQUE:

Swingarm pivot nut:

103 N·m (10.5 kgf·m, 76 lbf·ft)

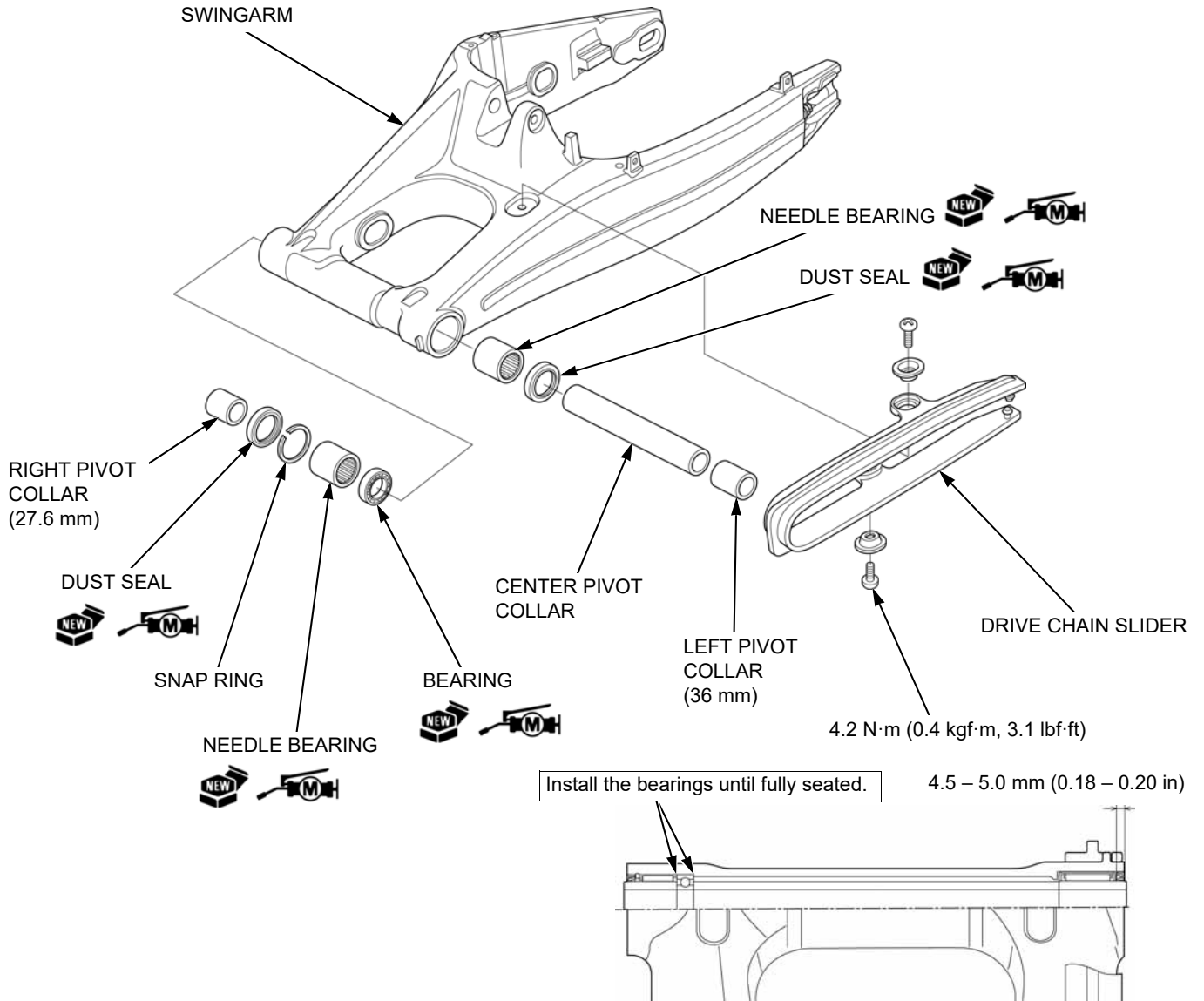
Shock absorber mounting nut:

44 N·m (4.5 kgf·m, 32 lbf·ft)

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

Inspect the following parts for damage, abnormal wear, deformation.

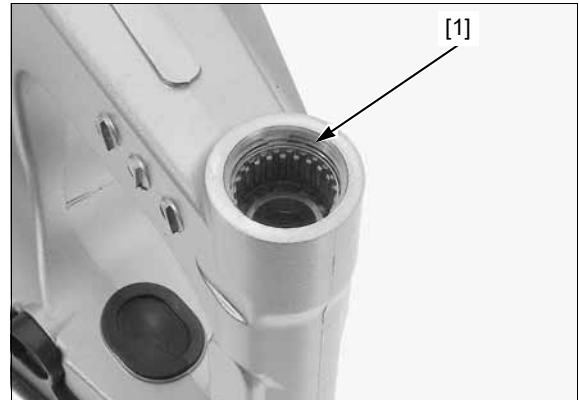
- Swingarm
- Pivot collars
- Bearings
- Drive chain slider (page 3-17)

REAR WHEEL/SUSPENSION

SWINGARM PIVOT BEARING REPLACEMENT

RIGHT SIDE

Remove the snap ring [1].



Press the ball bearing [1] and needle bearing [2] out of the right pivot using the special tools.

TOOLS:

[3] Driver, 15 x 280L

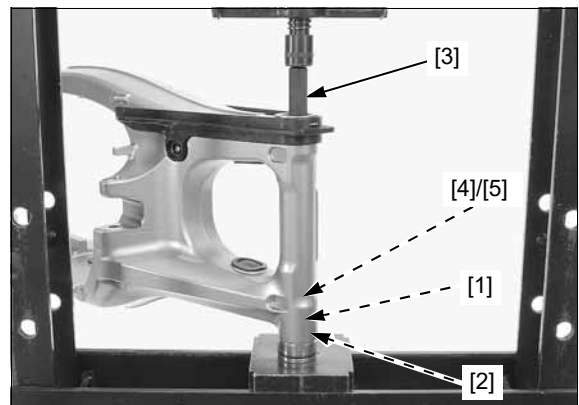
07949-3710001

[4] Attachment, 24 x 26 mm

07746-0010700

[5] Pilot 20 mm

07746-0040500



Apply molybdenum disulfide grease to the rotating area of a new ball bearing.

Install the ball bearing [1] into the right pivot with the marked side facing out until it is fully seated using a hydraulic press and special tools as shown.

TOOLS:

[2] Driver

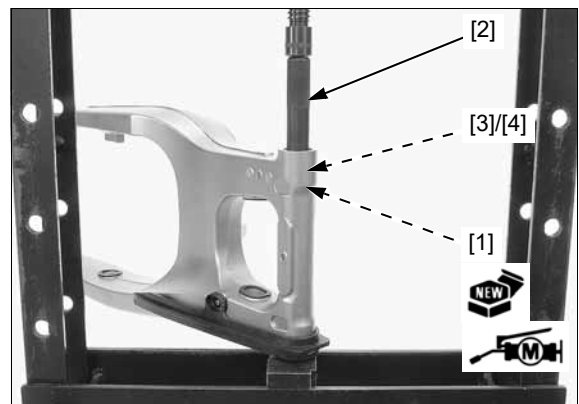
07749-0010000

[3] Attachment, 37 mm

07ZMD-MBW0200

[4] Pilot 20 mm

07746-0040500



Apply molybdenum disulfide grease to a new needle bearing rotating area.

Install the needle bearing [1] into the right pivot with the marked side facing out until it is fully seated using a hydraulic press and special tools as shown.

TOOLS:

[2] Driver

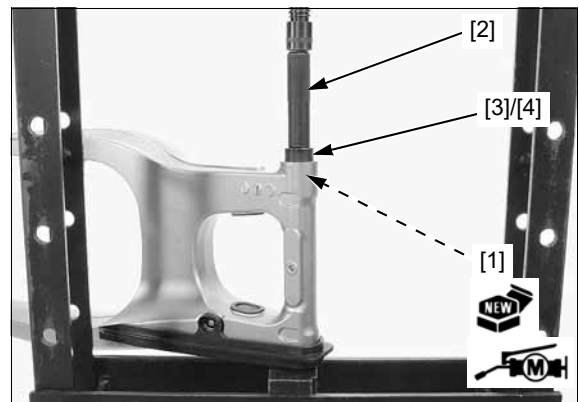
07749-0010000

[3] Attachment, 37 mm

07ZMD-MBW0200

[4] Pilot 30 mm

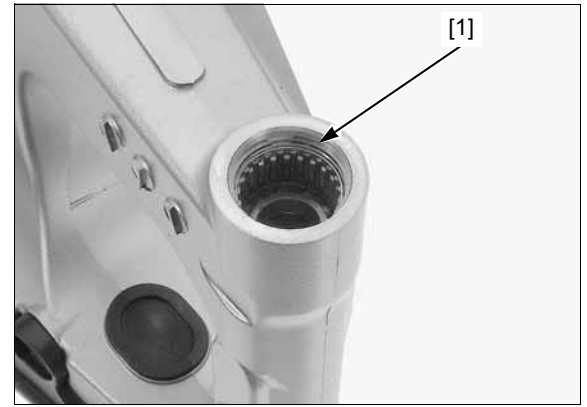
07746-0040700



Install the snap ring [1] into the right pivot groove securely.

NOTE:

- Do not reuse worm snap ring which could easily spin in the groove.
- Make sure that the snap ring is firmly seated in the groove.

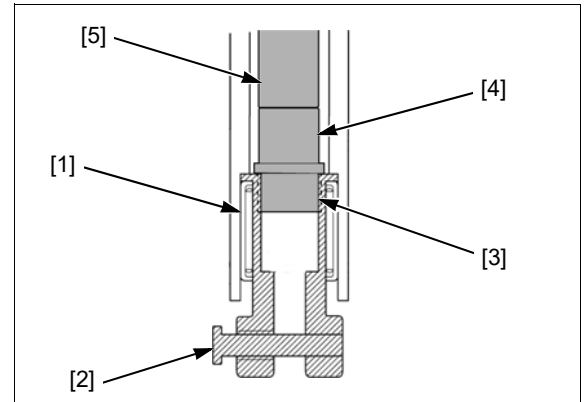


LEFT SIDE

Press the needle bearing [1] out of the swingarm using the special tools.

TOOLS:

- [2] Remover attachment, 28 mm 07HMC-MR70100
- [3] Pilot 17 mm 07746-0040400
- [4] Attachment, 22 x 24 mm 07746-0010800
- [5] Driver, 15 x 280L 07949-3710001

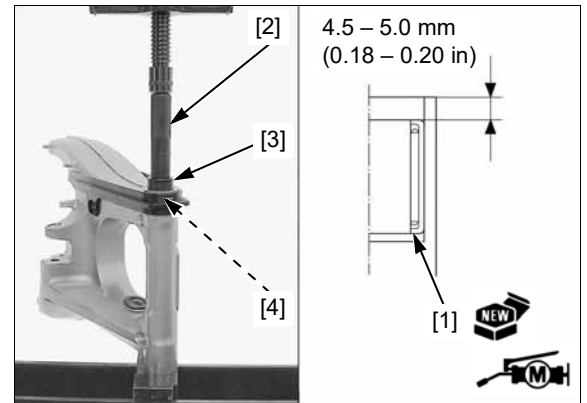


Apply molybdenum disulfide grease to the rotating area of a new needle bearing [1].

Carefully press the bearing in the left pivot with the marked side facing up until the depth from the pivot end surface is 4.5 – 5.0 mm (0.18 – 0.20 in), using the special tools.

TOOLS:

- [2] Driver 07749-0010000
- [3] Attachment, 37 mm 07ZMD-MBW0200
- [4] Pilot, 28 mm 07746-0041100 or 07JAD-PH80400



MEMO

18. HYDRAULIC BRAKE

SERVICE INFORMATION.....	18-2	FRONT MASTER CYLINDER.....	18-10
TROUBLESHOOTING	18-2	REAR MASTER CYLINDER.....	18-12
COMPONENT LOCATION.....	18-3	FRONT BRAKE CALIPER	18-14
BRAKE FLUID REPLACEMENT/ AIR BLEEDING	18-5	REAR BRAKE CALIPER.....	18-15
BRAKE PAD/DISC	18-8	BRAKE PEDAL	18-16

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 service (page 19-2).
- This model is equipped with the ABS, however, the brake fluid replacement procedure is performed in the same manner as in the ordinary air bleeding procedure. Note that replacement and bleeding air from the brake fluid in the ABS modulator is not necessary, as it is sealed in the modulator.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid, they may not be compatible.
- Never allow 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.
- 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 19-23).

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

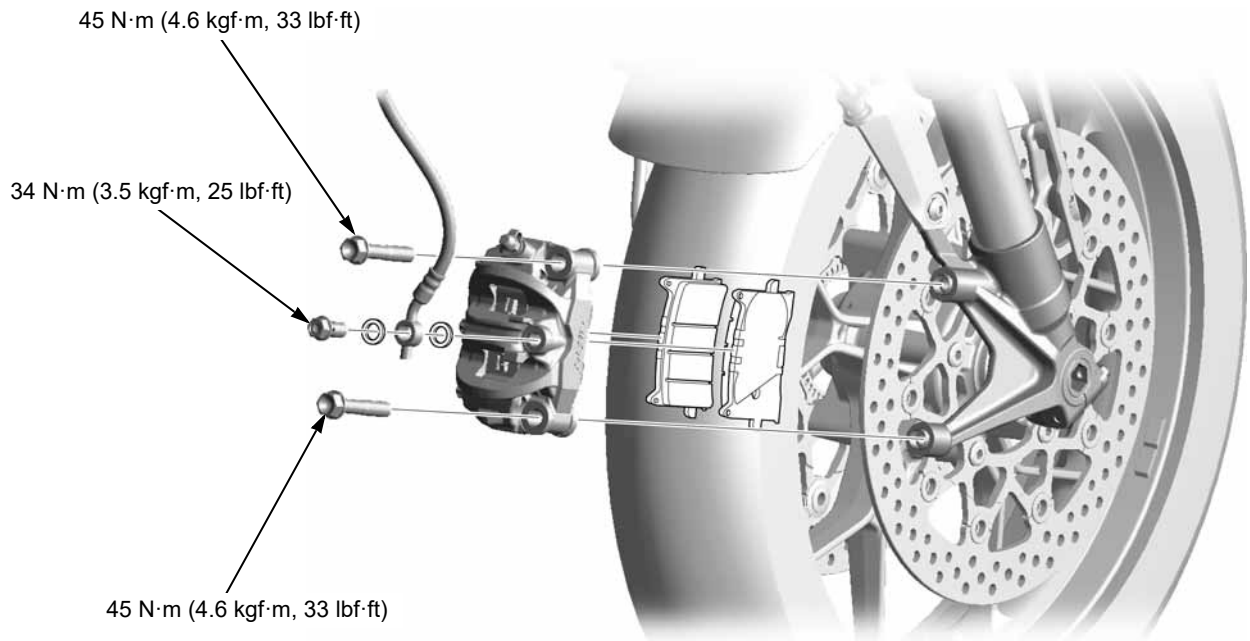
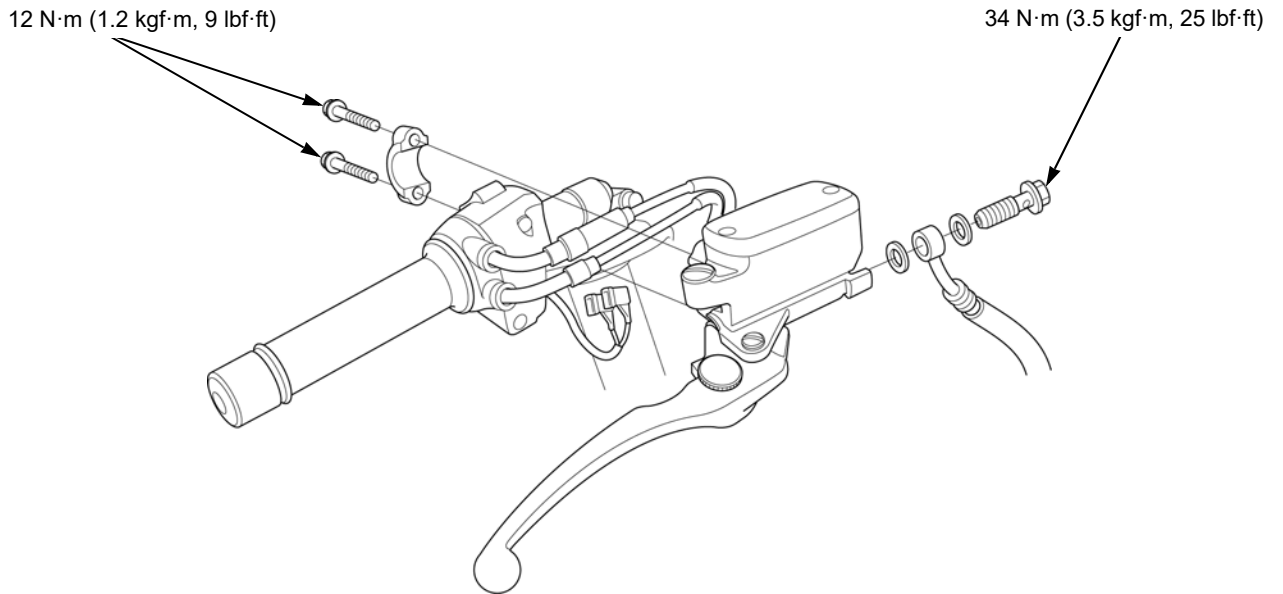
Brake drags

- 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

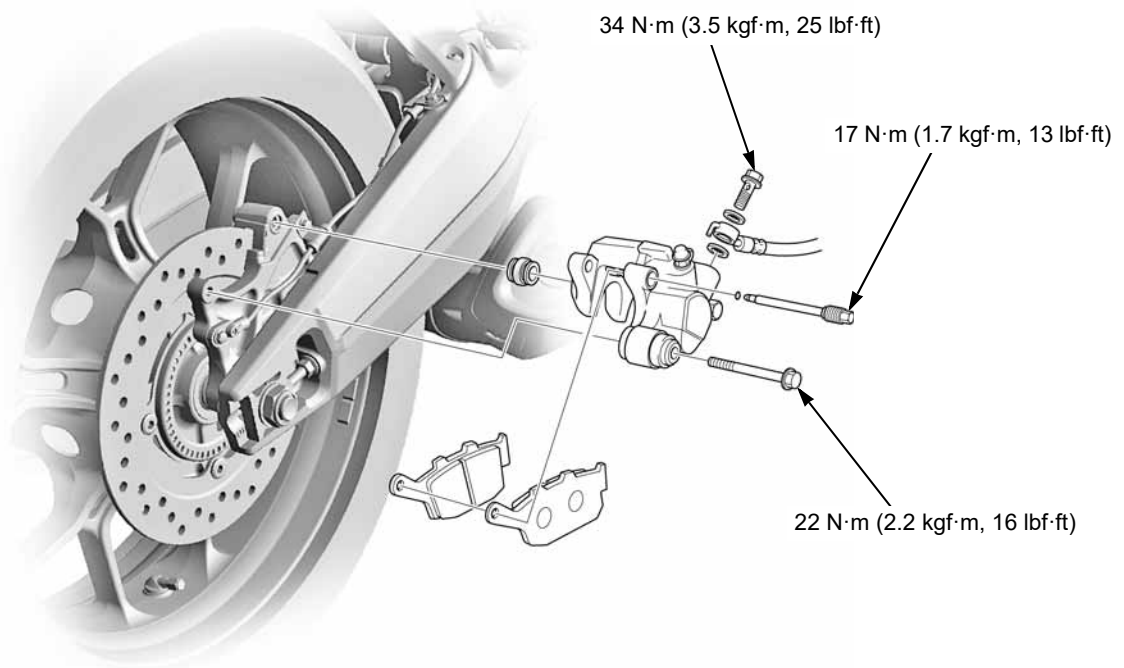
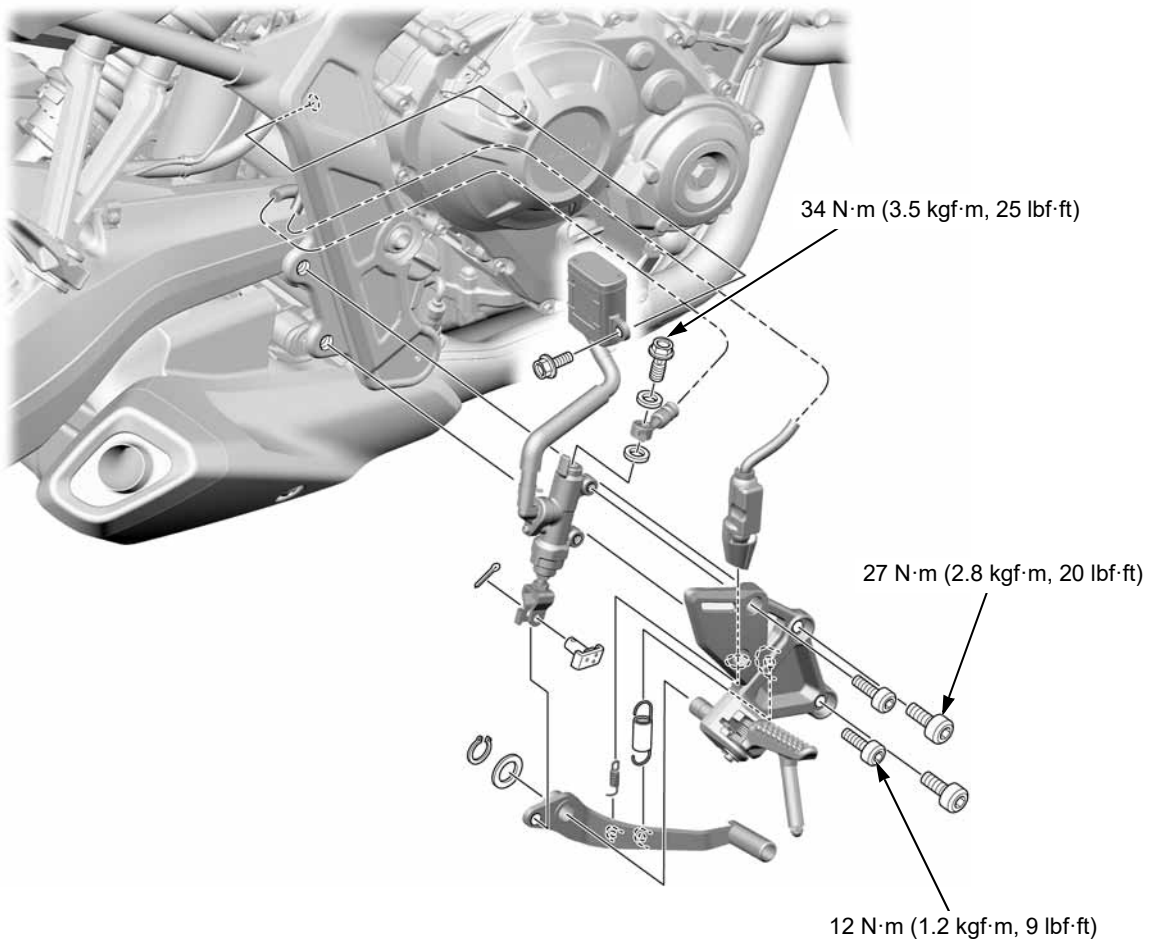
FRONT:

CBR650RA shown:



HYDRAULIC BRAKE

REAR:



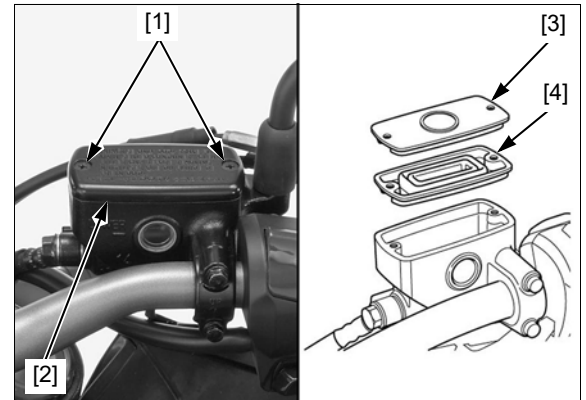
BRAKE FLUID REPLACEMENT/AIR BLEEDING

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]

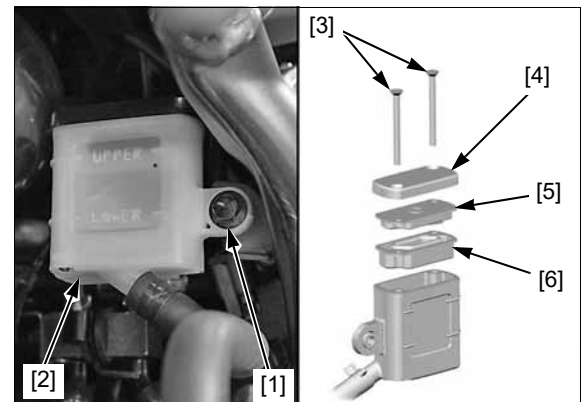


For rear brake: Remove the bolt [1] and reservoir [2] from the stay.

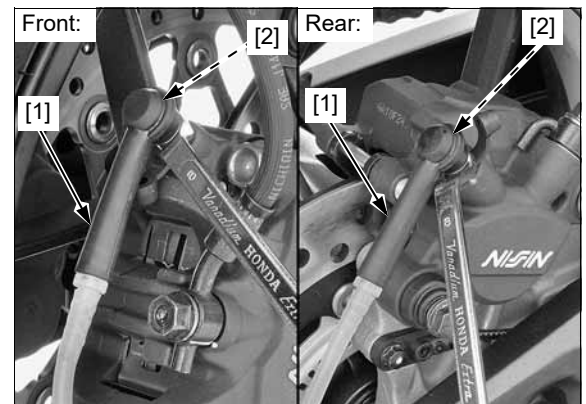
Remove the following:

- Two screws [3]
- Reservoir cap [4]
- Set plate [5]
- Diaphragm [6]

Take care not to spill the fluid out of the reservoir. Temporarily install the reservoir onto the stay with the mounting bolt.



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.



HYDRAULIC BRAKE

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 [2].

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.

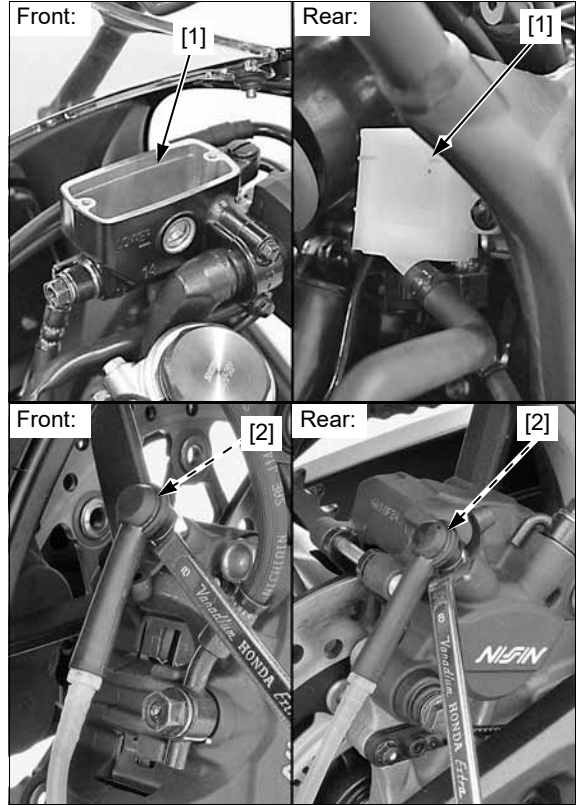
Perform the bleeding procedure until the system is completely flushed/bled.

Close the bleed valve and operate the brake lever or pedal. If it still feels spongy, bleed the system again.

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.



If the brake bleeder is not available, use the following procedure.

Fill the reservoir to the upper level line [1] with DOT 4 brake fluid from a sealed container.

Connect a bleed hose to the bleed valve [2].

Pump up the system pressure with the brake lever/pedal until the lever/pedal resistance is felt.

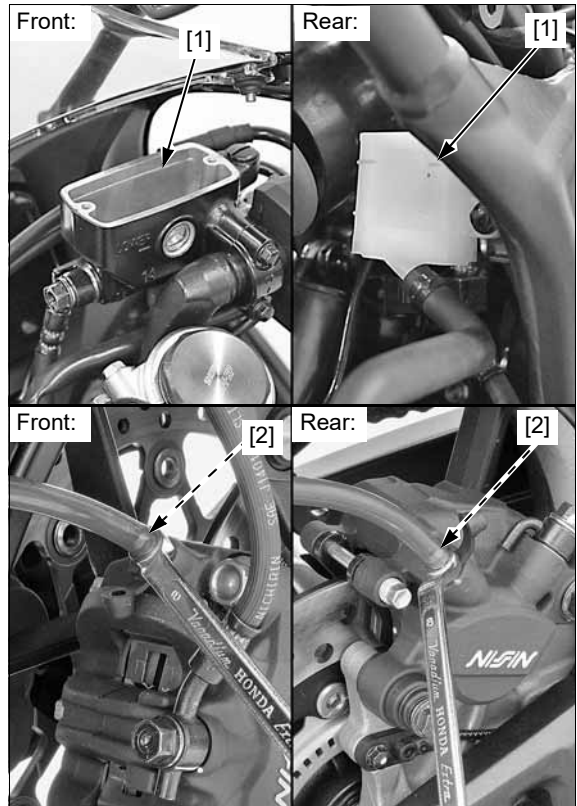
Do not release the brake lever or pedal until the bleed valve has been closed.

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.

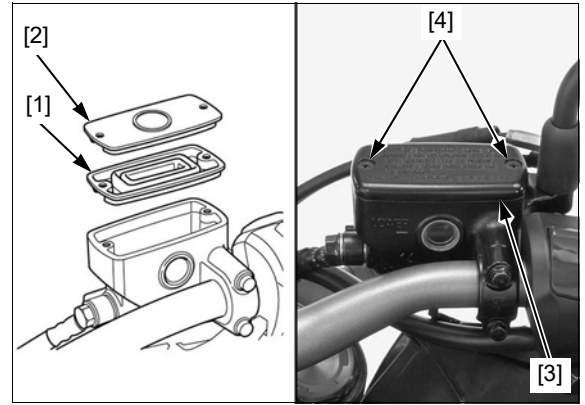
TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

Fill the reservoir to the upper level line with DOT 4 brake fluid.



For front brake: Install the diaphragm [1], set plate [2], reservoir cap [3] and tighten the screws [4] to the specified torque.

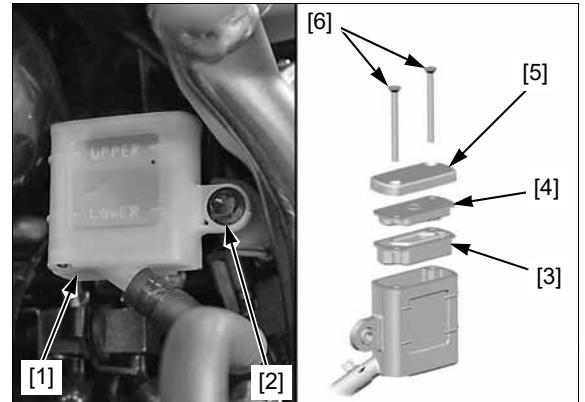
TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)



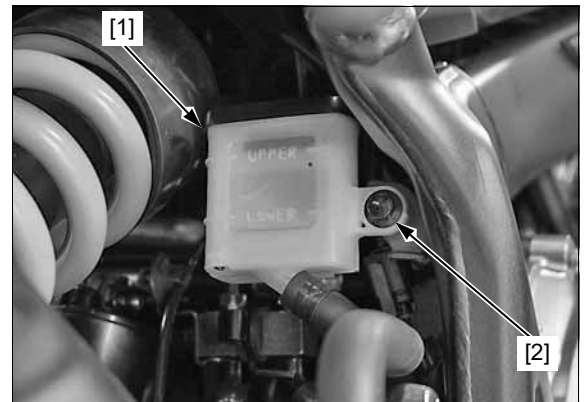
For rear brake: Carefully remove the reservoir [1] from the stay by removing the mounting bolt [2].

Install the diaphragm [3], set plate [4], reservoir cap [5] and tighten the screws [6] to the specified torque.

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



Install the reservoir [1] and tighten the mounting bolt [2].



HYDRAULIC BRAKE

BRAKE PAD/DISC

BRAKE PAD REMOVAL/ INSTALLATION

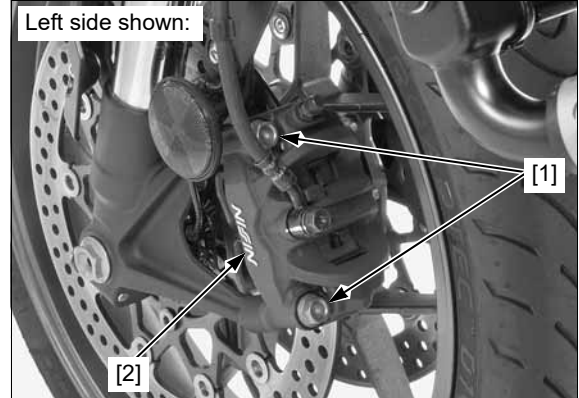
NOTE:

- Always replace the brake pads in pairs to ensure even disc pressure.
- Check the fluid level in the reservoir as this operation causes the fluid level to rise.

FRONT

Do not operate the brake lever after removing the brake caliper.

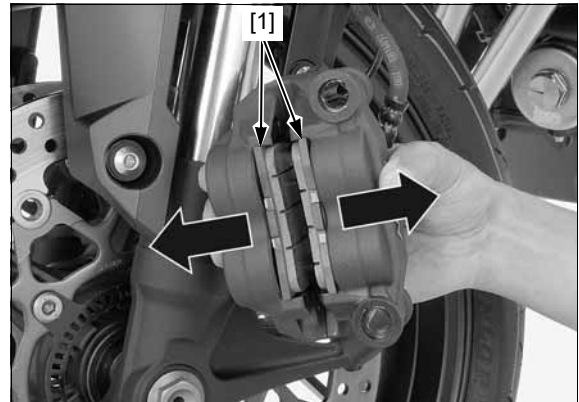
Remove the brake caliper mounting bolts [1] and brake caliper [2].



Push the caliper pistons all the way in to allow installation of new brake pads by pushing the brake pads [1] with a screwdriver or equivalent.

NOTE:

- Check the fluid level in the reservoir as this operation causes the fluid level to rise.



Slide the one pad [1] inward to release its tabs [2] from the grooves in the caliper body, and remove it.

Remove the other pad in the same manner.

Remove the pad spring [3].

Clean the inside of the caliper body especially around the caliper pistons.

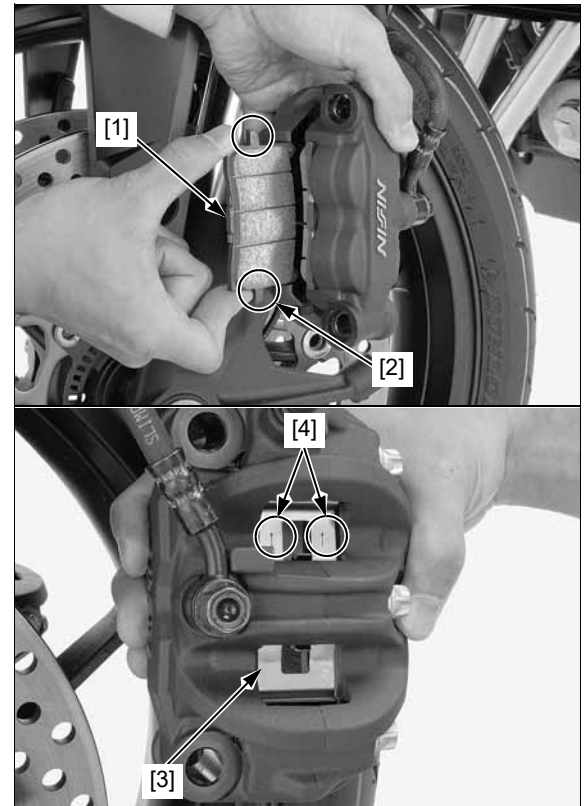
Set the pad spring into the caliper body as shown.

NOTE:

- Install the pad spring with the arrows [4] facing up.

Install the one pad by setting the tabs into the grooves in the caliper body while pushing in the pad against the pad spring straight. Slide the pad to seat it on the caliper pistons.

Install the other pad in the same manner.



Install the brake caliper [1] to the fork leg so that the disc is positioned between the pads.

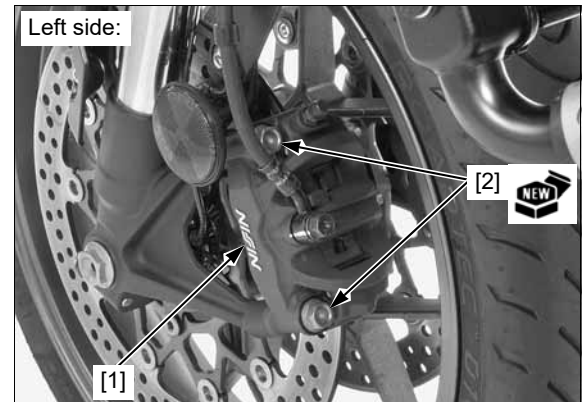
Install new mounting bolts [2] and tighten them to the specified torque.

NOTE:

- Do not to damage the brake pads.

TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)

Operate the brake lever to seat the caliper pistons against the pads.

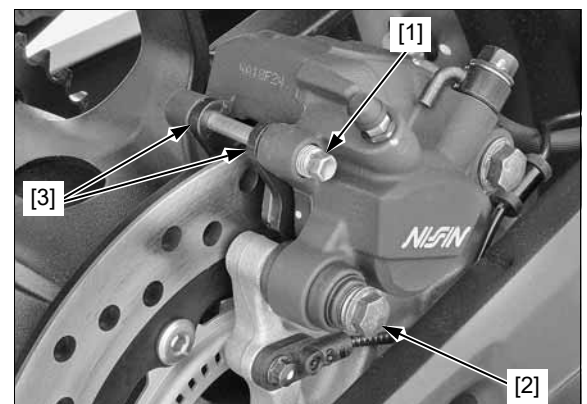


REAR

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 18-15).

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.

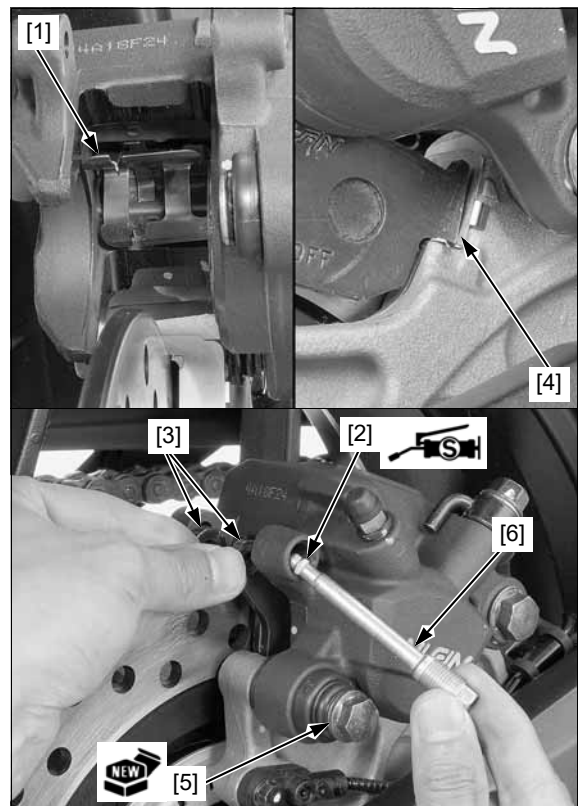
Tighten the caliper bolt to the specified torque.

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 1-10) and replace if necessary.

FRONT MASTER CYLINDER

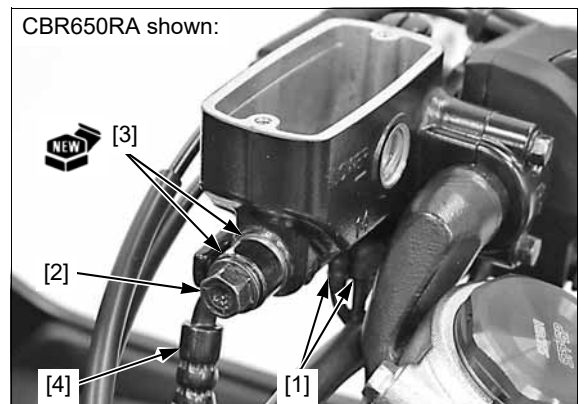
REMOVAL/INSTALLATION

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:

- Brake light switch connectors [1]
- Oil bolt [2]
- Sealing washers [3]
- Brake hose [4]

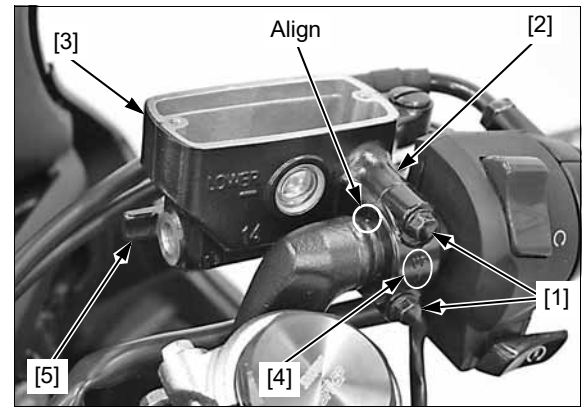


- Two bolts [1]
- Master cylinder holder [2]
- Master cylinder [3]

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 onto the stopper [5] when connecting the brake hose.



TORQUE:

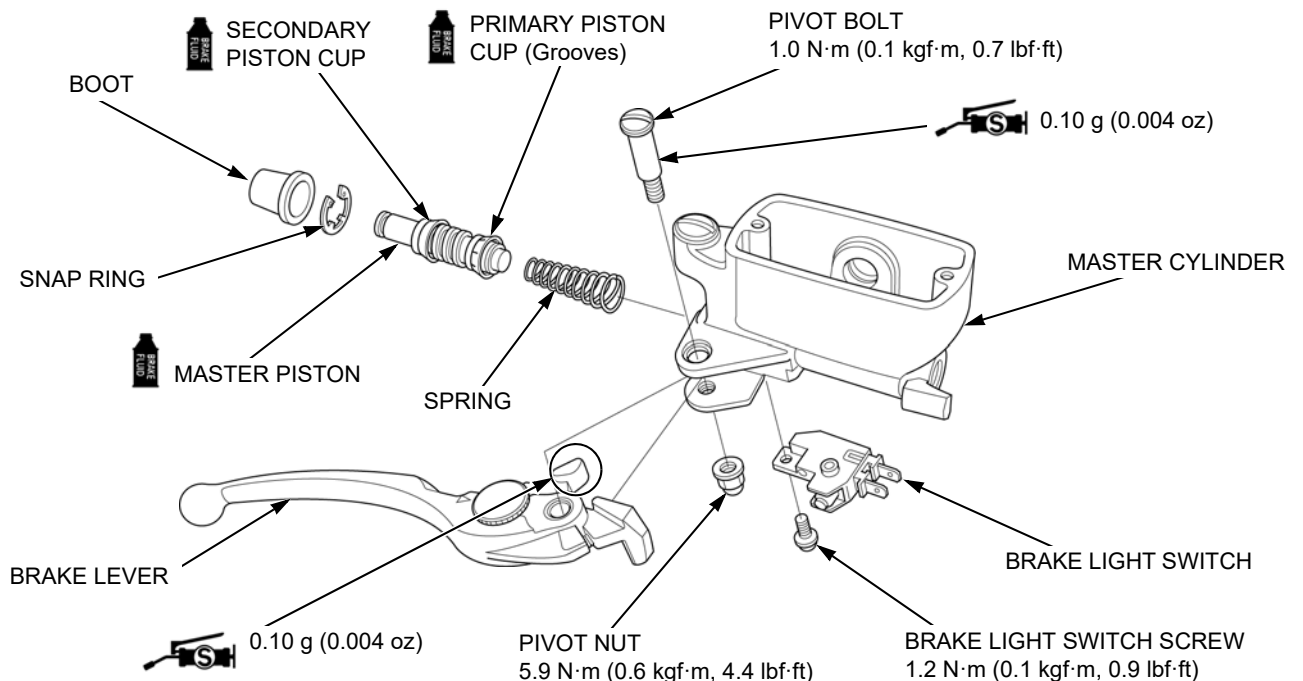
Front master cylinder holder bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)
Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the front brake hydraulic system (page 18-6).

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 worm snap ring which could easily spin in the groove.
- Align the switch boss with the master cylinder hole properly.
- When tightening the pivot nut, hold the pivot bolt securely.



INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

- Master cylinder
- Master piston
- Piston cups
- Spring
- Boot

Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

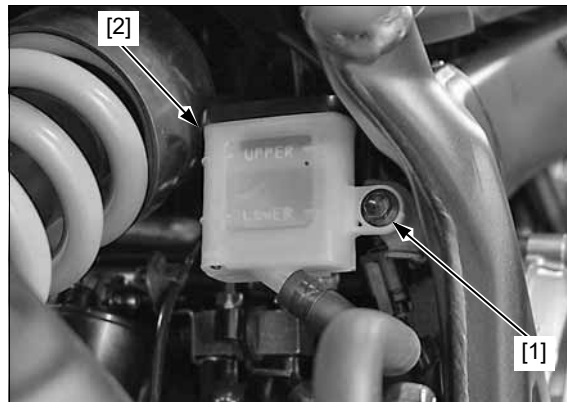
HYDRAULIC BRAKE

REAR MASTER CYLINDER

REMOVAL/INSTALLATION

Drain the brake fluid from the rear brake hydraulic system (page 18-5).

Remove the stay bolt [1] and rear brake reservoir [2].

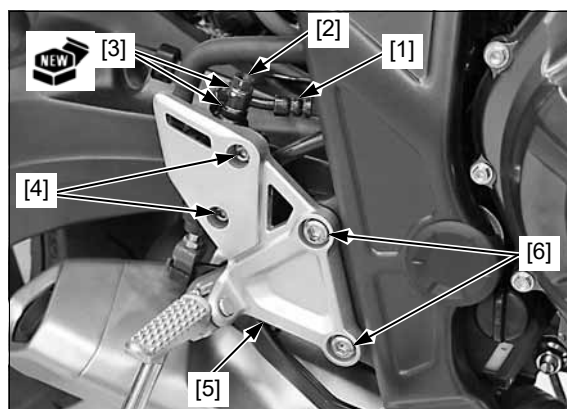


When removing the oil bolt, cover the end of the brake hose to prevent contamination.

Disconnect the brake hose [1] by removing the oil bolt [2] and sealing washers [3].

Loosen the master cylinder mounting socket bolts [4].

Support the right rider footpeg bracket [5] securely and remove the bracket socket bolts [6].



Remove the following.

- Cotter pin [1]
- Joint pin [2]
- Mounting socket 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.

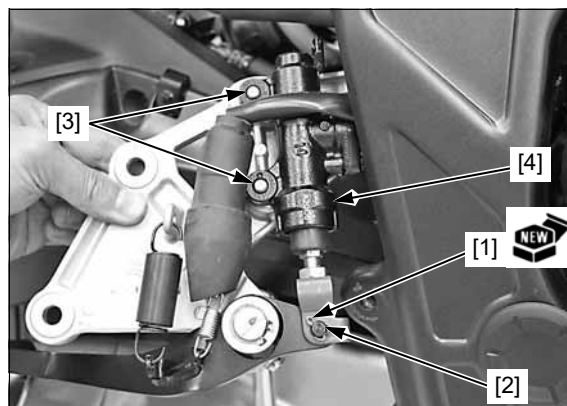
TORQUE:

Rider footpeg bracket socket bolt:
27 N·m (2.8 kgf·m, 20 lbf·ft)

Rear master cylinder mounting socket bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

Oil bolt:
34 N·m (3.5 kgf·m, 25 lbf·ft)

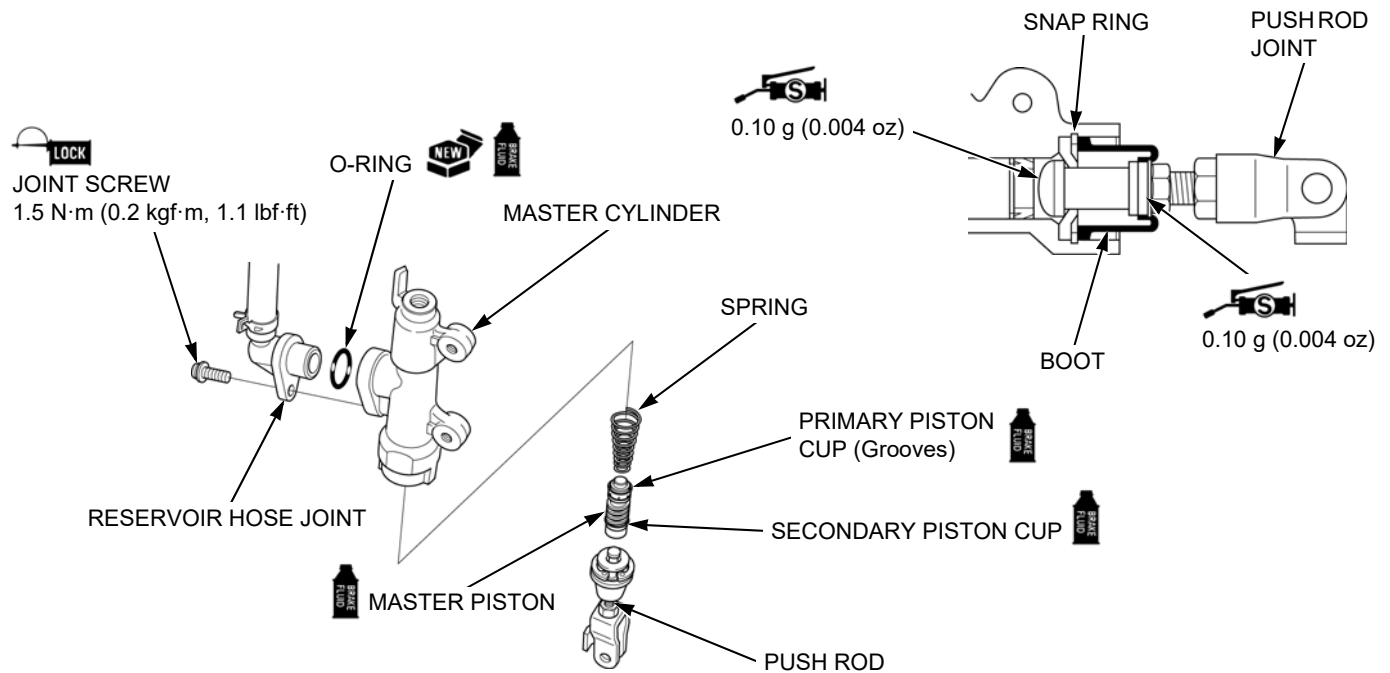
Fill and bleed the rear brake hydraulic system (page 18-6).



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 worm snap ring which could easily spin in the groove.



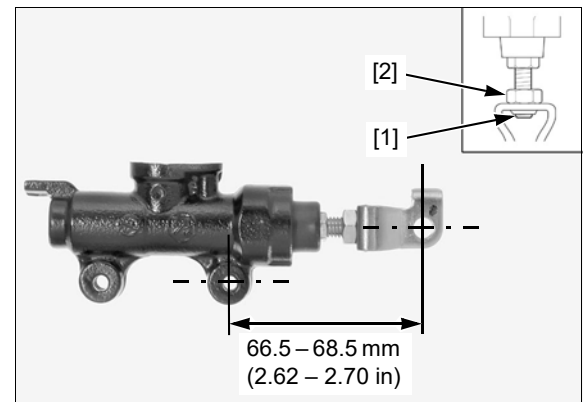
When the push rod has been disassembled, adjust the push rod length so that the distance from the center of the master cylinder lower mounting bolt hole to the center of the joint pin hole is standard length as shown.

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)



INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

- Master cylinder
- Master piston
- Piston cups
- Spring
- Boot

Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

FRONT BRAKE CALIPER

REMOVAL/INSTALLATION

Drain the brake fluid from the front brake hydraulic system (page 18-5).

Remove the following:

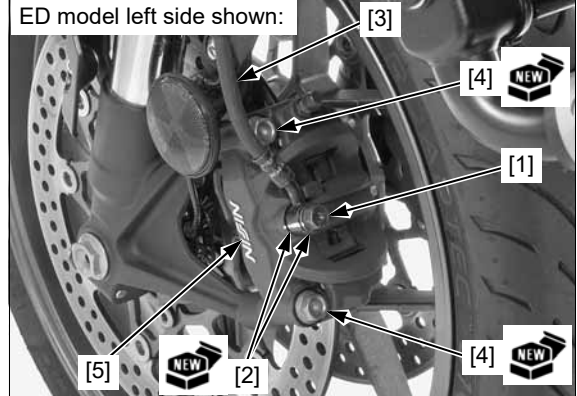
When removing the oil bolt, cover the end of brake hose to prevent contamination.

- Oil bolt [1]
- Sealing washers [2]
- Brake hose [3]
- Mounting bolts [4]
- Brake caliper [5]

Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washers and brake caliper mounting bolts with new ones.
- Be sure to rest the eyelet joint against the stopper when tightening the oil bolt.



TORQUE:

Front brake caliper mounting bolt: 45 N·m (4.6 kgf·m, 33 lbf·ft)

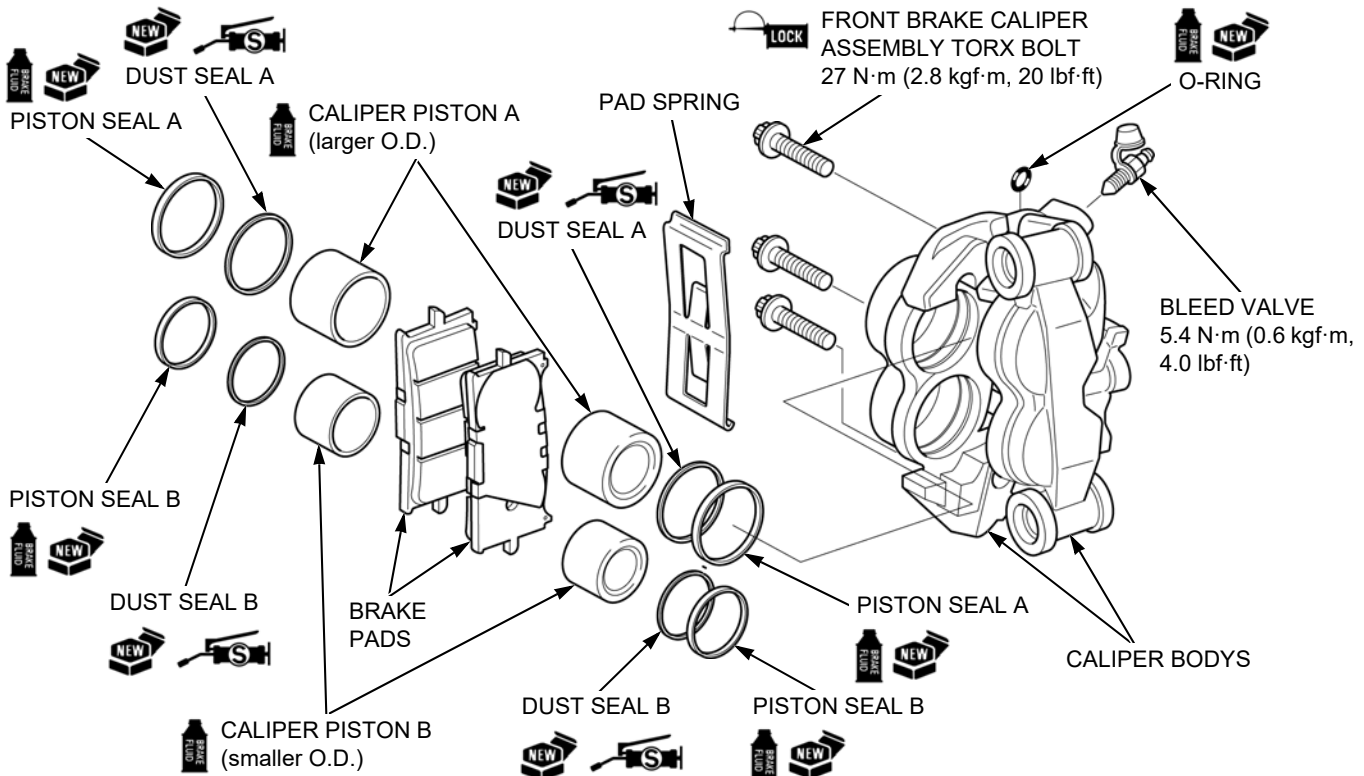
Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the front brake hydraulic system (page 18-6).

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the front brake caliper as following illustration.

- Be careful not to damage each piston.
- 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 each caliper piston in their proper locations.
 - Piston A: larger O.D.
 - Piston B: smaller O.D.
- Do not disassemble the caliper bodies unless necessary.



INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

- Caliper cylinders
- Caliper pistons

Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

REAR BRAKE CALIPER

REMOVAL/INSTALLATION

Drain the brake fluid from the rear brake hydraulic system (page 18-5).

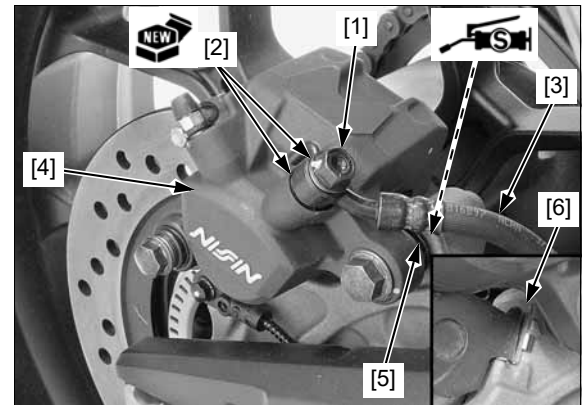
When removing the oil bolt, cover the end of brake hose to prevent contamination.

- Oil bolt [1]
- Sealing washers [2]
- Brake hose [3]
- Brake pads (page 18-8)
- Brake caliper [4]
- Caliper pin boot [5]

Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washers with new ones.
- If the pad retainer [6] was removed, apply Honda Bond A or equivalent to the retainer seating surface.
- Apply 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.



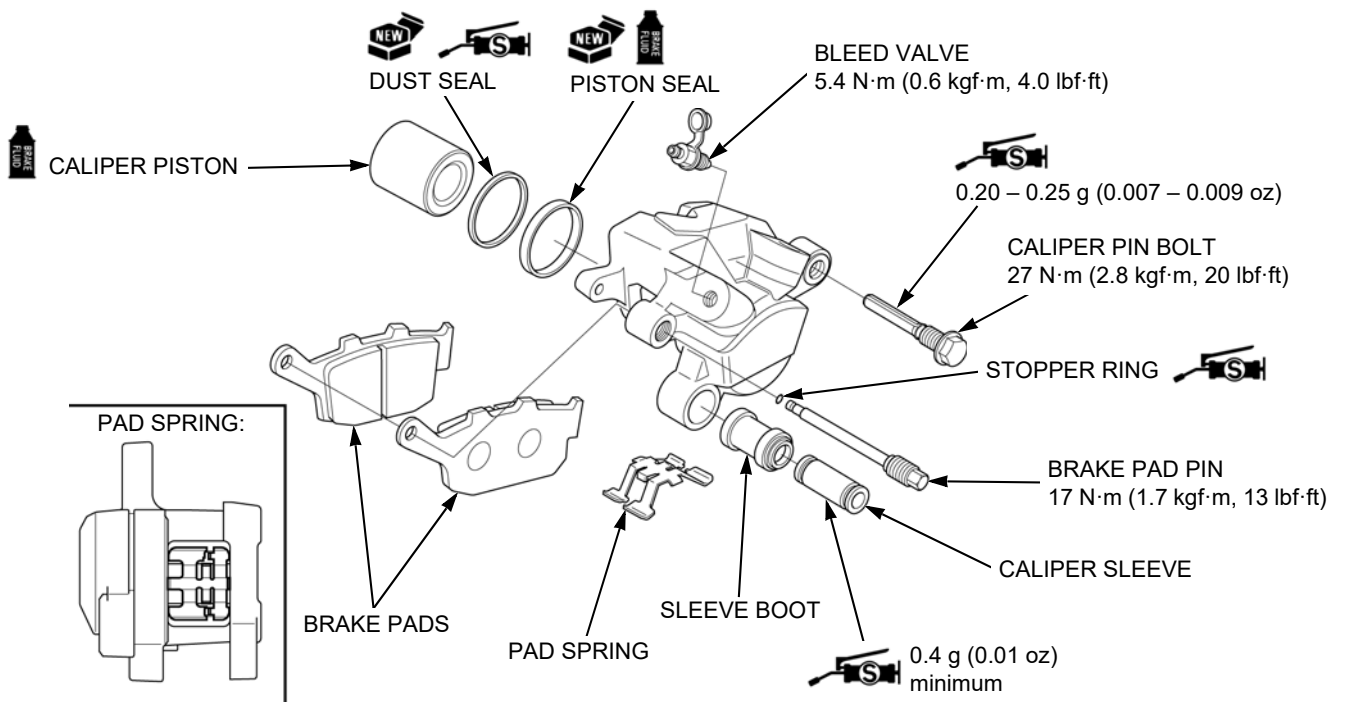
TORQUE: Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the rear brake hydraulic system (page 18-6).

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.



HYDRAULIC BRAKE

INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

- Caliper cylinder
- Caliper piston

Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

BRAKE PEDAL

REMOVAL/INSTALLATION

Support the right rider footpeg bracket [1] securely and remove the bracket socket bolts [2].



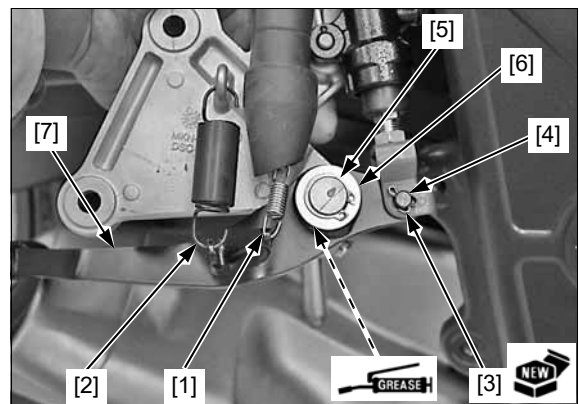
Remove the following:

- 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.
- 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 worm snap ring which could easily spin in the groove.
- Replace the cotter pin with a new one.
- Install each spring in the direction as shown.



TORQUE:

Rider footpeg bracket socket bolt:
27 N·m (2.8 kgf·m, 20 lbf·ft)

19. ANTI-LOCK BRAKE SYSTEM (ABS)

SERVICE INFORMATION.....	19-2	ABS INDICATOR CIRCUIT TROUBLESHOOTING	19-12
SYSTEM LOCATION	19-3	ABS TROUBLESHOOTING	19-14
SYSTEM DIAGRAM	19-4	WHEEL SPEED SENSOR	19-23
ABS TROUBLESHOOTING INFORMATION.....	19-6	ABS MODULATOR	19-26
DTC INDEX.....	19-10		

ANTI-LOCK BRAKE SYSTEM (ABS)

SERVICE INFORMATION

GENERAL

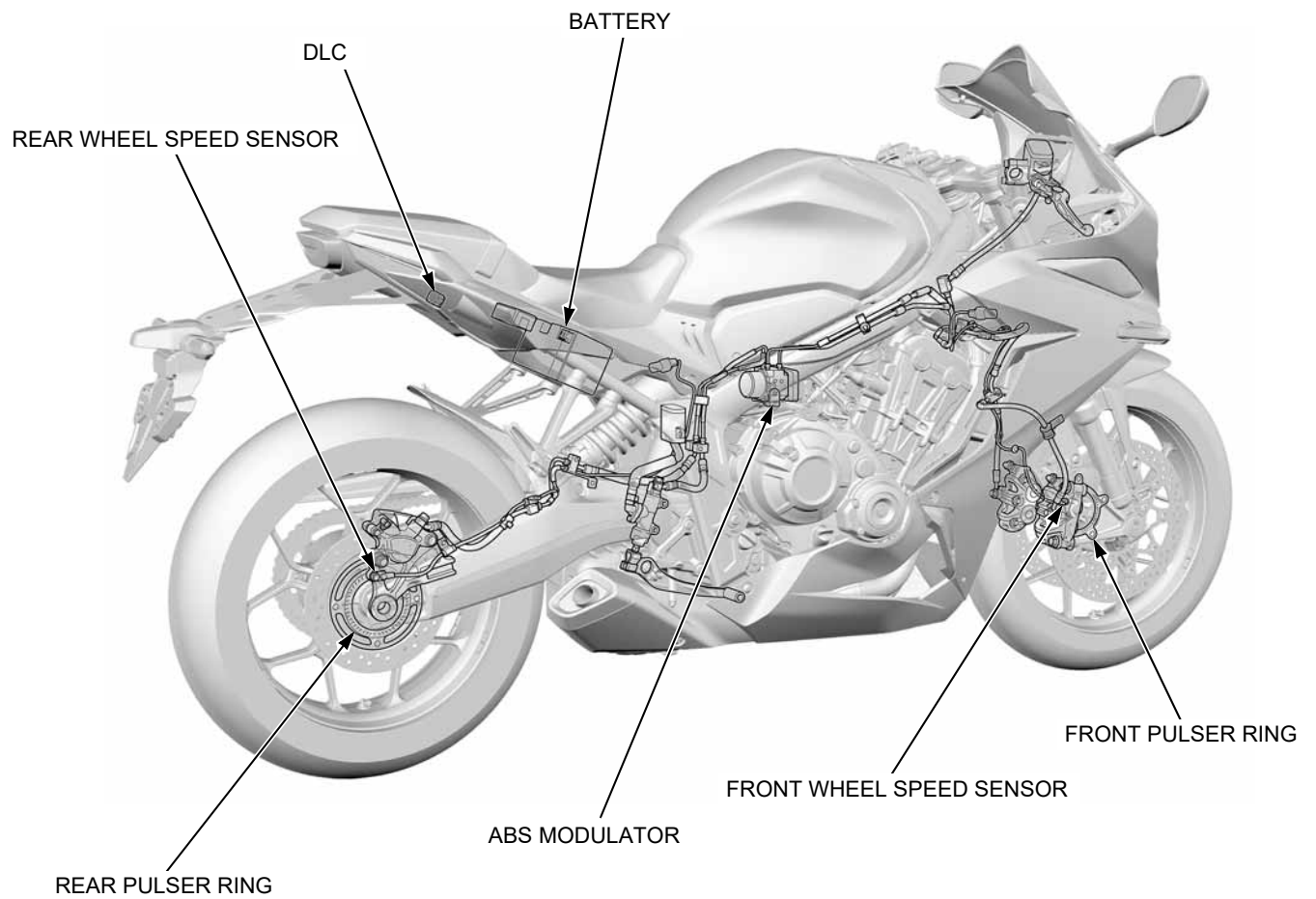
NOTICE

- *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 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 the 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 19-6).
- 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 19-23).
- The following color codes are used throughout this section.

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

SYSTEM LOCATION

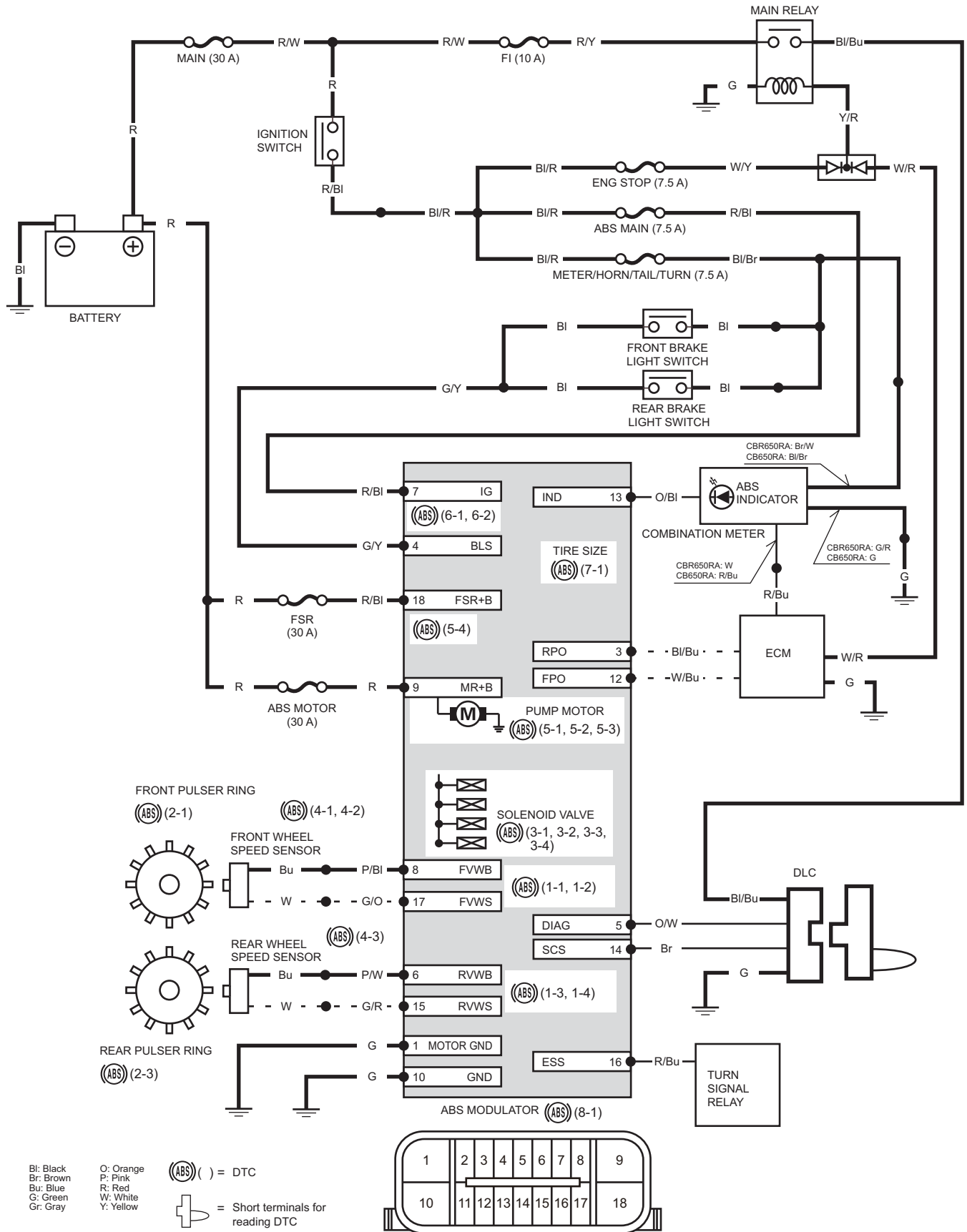
CBR650RA shown:



ANTI-LOCK BRAKE SYSTEM (ABS)

SYSTEM DIAGRAM

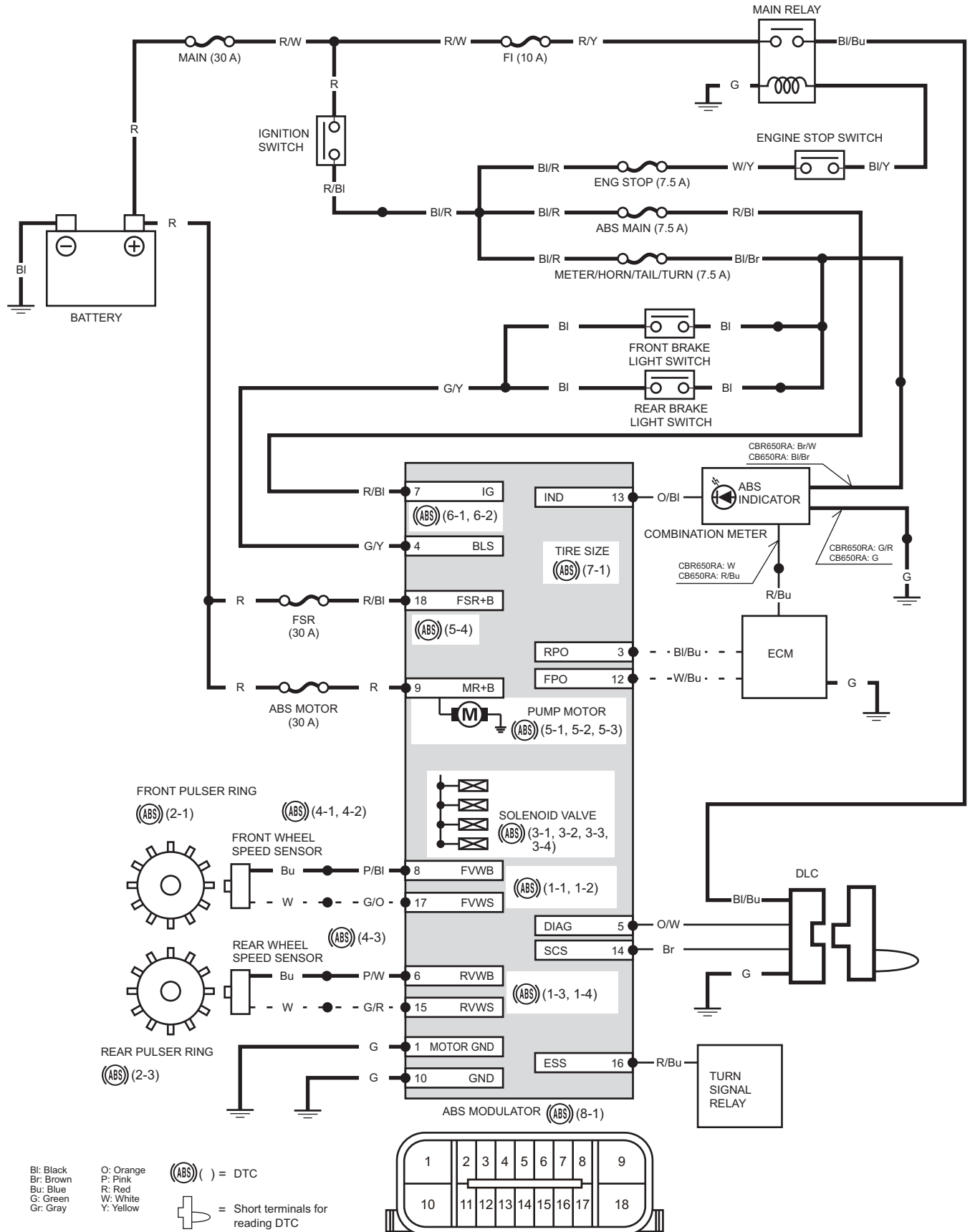
ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models



ABS MODULATOR 18P (Black) CONNECTOR (MODULATOR SIDE)

ANTI-LOCK BRAKE SYSTEM (ABS)

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models



ABS MODULATOR 18P (Black) CONNECTOR (MODULATOR SIDE)

ANTI-LOCK BRAKE SYSTEM (ABS)

ABS TROUBLESHOOTING INFORMATION

SYSTEM DESCRIPTION

SUMMARY OF ABS PRE-START SELF-DIAGNOSIS SYSTEM

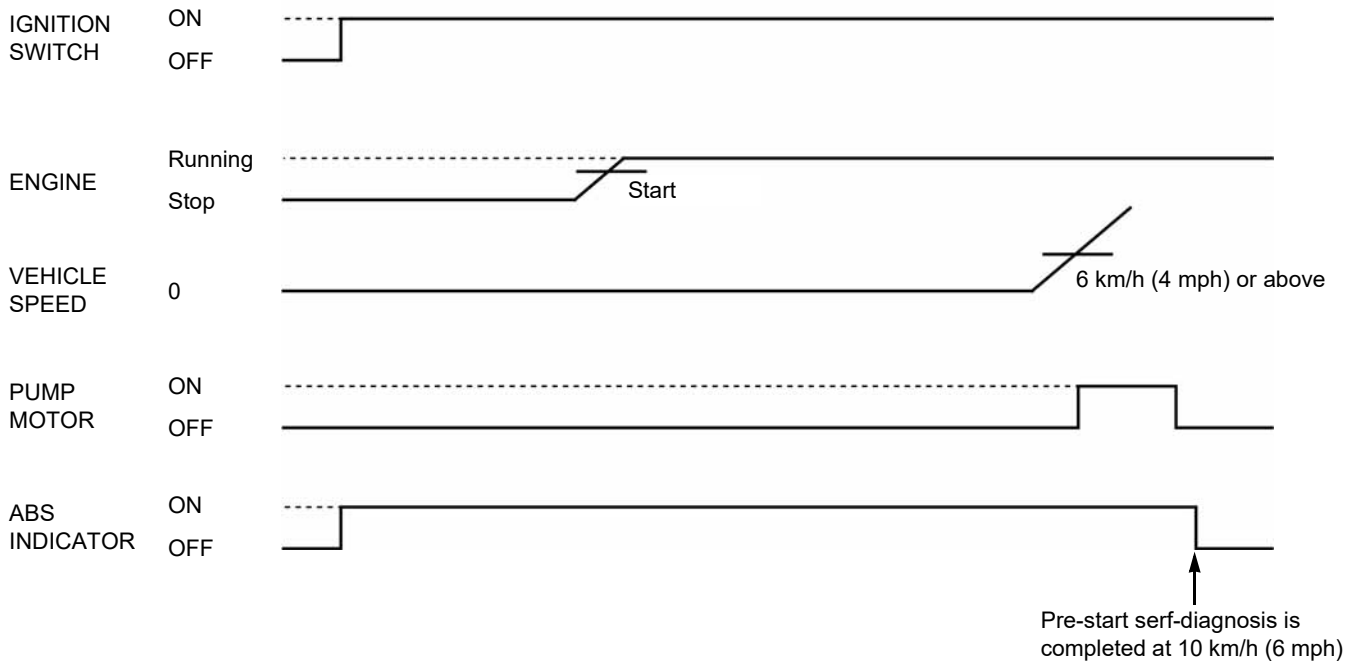
The ABS pre-start self-diagnosis system diagnoses the electrical system as well as the operating status of the modulator. When there is any abnormality, the problem and the associated part can be detected by reading the DTC.

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 19-7).

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 19-14).

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.

MCS INFORMATION

- The MCS can read out and erase the DTC.

How to connect the MCS

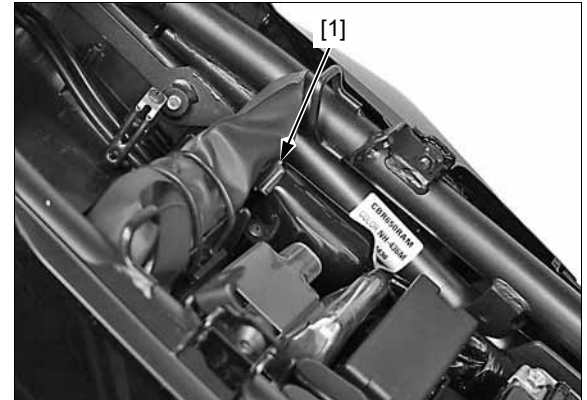
Remove the main seat (page 2-11).

Turn the ignition switch OFF.

Remove the dummy connector [1] from the DLC.

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 19-6).
- Do not apply the brake during DTC readout.

Connect the MCS to the DLC (page 19-7).

Read the DTC and follow the DTC index (page 19-10).

- If the MCS is not available, perform the following.

Reading DTC with the ABS indicator

Remove the main seat (page 2-11).

Turn the ignition switch OFF.

Remove the dummy connector [1] from the DLC.

Short the DLC terminals using the special tool.

TOOL:

[2] SCS short connector 070MZ-0010300

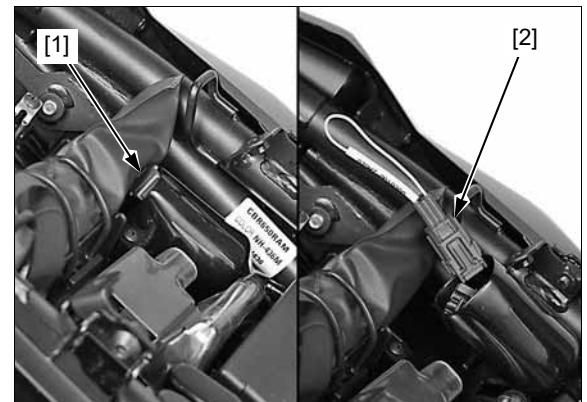
CONNECTION: Brown – Green

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.

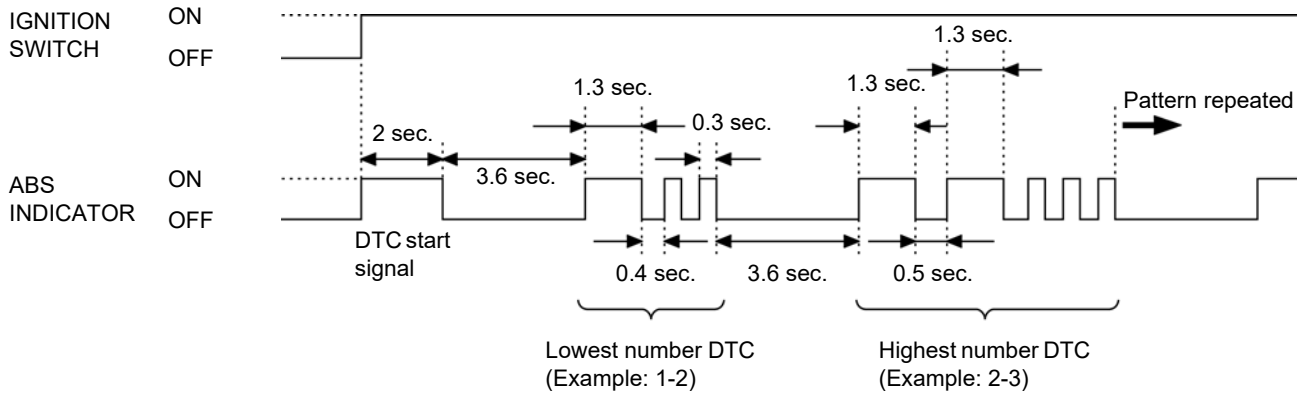
If the DTC is not stored, the ABS indicator stays on.



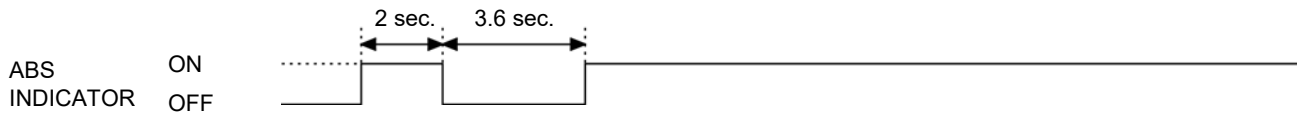
ANTI-LOCK BRAKE SYSTEM (ABS)

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.

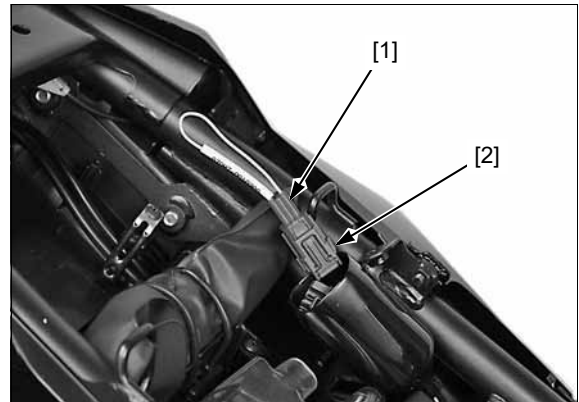
How to erase the DTC without MCS

1. Connect the SCS short connector [1] to the DLC [2] (page 19-7).
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 short connector from the DLC.

Install the main seat (page 2-11).



CIRCUIT INSPECTION

INSPECTION AT ABS MODULATOR CONNECTOR

Remove the ABS modulator cover (page 4-76).

Turn the ignition switch OFF.

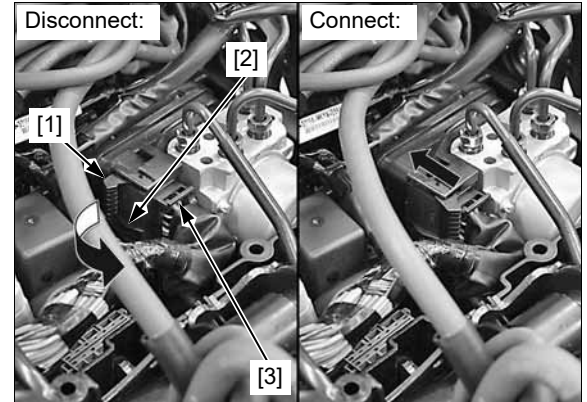
Disconnecting procedure:

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.

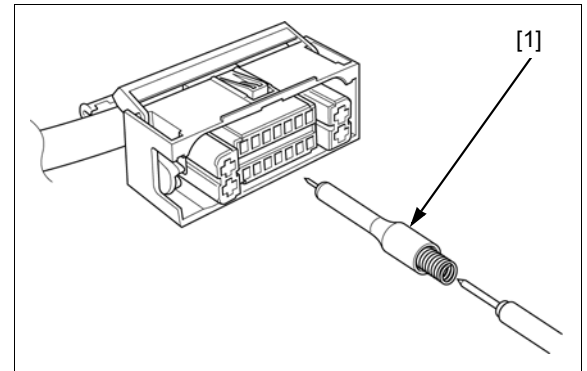


- Always clean around and keep any foreign material away from the connector before disconnecting it.
- A faulty ABS is often related to poorly connected or corroded connections. Check those connections before proceeding.
- In testing at ABS modulator 18P (Black) connector terminals (wire harness side; except No.1, No.9, No.10 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.

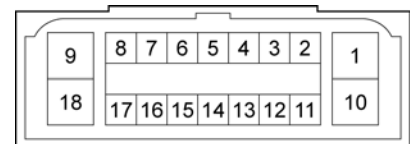
TOOL:

Test probe

07ZAJ-RDJA110



TERMINAL LAYOUT:



(Terminal side of the wire harness)

ANTI-LOCK BRAKE SYSTEM (ABS)

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 19-8).
Then, test-ride the motorcycle above 30 km/h and check the DTC (page 19-7). 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 • speedometer • ABS modulator • ABS MAIN fuse (7.5 A)			• ABS indicator never comes ON at all	19-12
				• ABS indicator stays ON at all	19-12
1-1	Front wheel speed sensor circuit malfunction • Wheel speed sensor or related wires	○	○	• Stops ABS operation	19-14
1-2	Front wheel speed sensor malfunction • Wheel speed sensor, pulser ring or related wires • Electromagnetic interference		○	• Stops ABS operation	19-14
1-3	Rear wheel speed sensor circuit malfunction • Wheel speed sensor or related wires	○	○	• Stops ABS operation	19-16
1-4	Rear wheel speed sensor malfunction • Wheel speed sensor, pulser ring or related wires • Electromagnetic interference		○	• Stops ABS operation	19-16
2-1	Front pulser ring • Pulser ring or related wires		○	• Stops ABS operation	19-14
2-3	Rear pulser ring • Pulser ring or related wires		○	• Stops ABS operation	19-16
3-1	Solenoid valve malfunction (ABS modulator)			• Stops ABS operation	19-18
3-2					
3-3		○	○		
3-4					
4-1	Front wheel lock • Riding condition		○	• Stops ABS operation	19-14
4-2	Front wheel lock (Wheelie) • Riding condition		○		
4-3	Rear wheel lock • Riding condition		○	• Stops ABS operation	19-16
5-1	Pump motor lock • Pump motor (ABS modulator) or related wires • ABS MOTOR fuse (30 A)	○	○	• Stops ABS operation	19-18
5-2	Pump motor stuck off • Pump motor (ABS modulator) or related wires • ABS MOTOR fuse (30 A)	○	○	• Stops ABS operation	19-18
5-3	Pump motor stuck on • Pump motor (ABS modulator) or related wires • ABS MOTOR fuse (30 A)	○	○	• Stops ABS operation	19-18
5-4	Fail safe relay malfunction • Fail safe relay (ABS modulator) or related wires • FSR fuse (30 A)	○	○	• Stops ABS operation	19-20

ANTI-LOCK BRAKE SYSTEM (ABS)

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	19-21
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	19-22
8-1	ABS control unit <ul style="list-style-type: none">• ABS control unit malfunction (ABS modulator)	○	○	• Stops ABS operation	19-22

(A) Pre-start self-diagnosis (page 19-6).

(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 21-6).

1. Indicator Operation Inspection

Turn the ignition switch OFF.
Disconnect the ABS modulator 18P (Black) connector (page 19-9).
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:

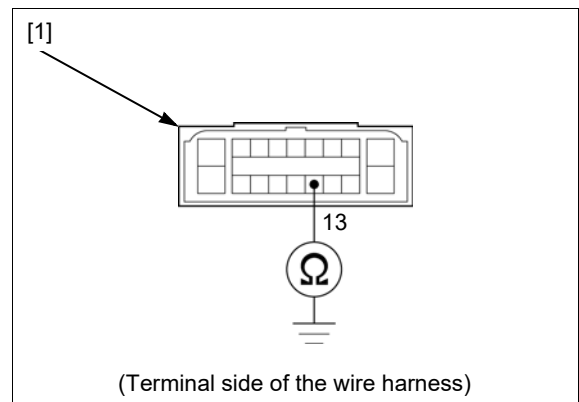
Test probe 07ZAJ-RDJA110

CONNECTION: 13 – Ground

Is there continuity?

YES – Short circuit in the Orange/black 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 19-9).
Check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

TOOL:

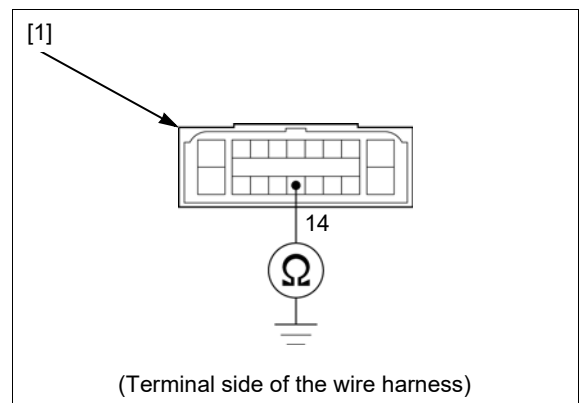
Test probe 07ZAJ-RDJA110

CONNECTION: 14 – Ground

Is there continuity?

YES – Short circuit in the Brown wire

NO – GO TO STEP 2.



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**

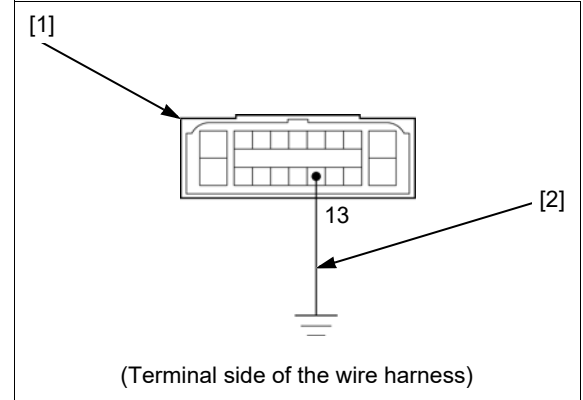
CONNECTION: 13 – Ground

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/black wire
• Faulty combination meter (if the Orange/black 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.

TOOL:

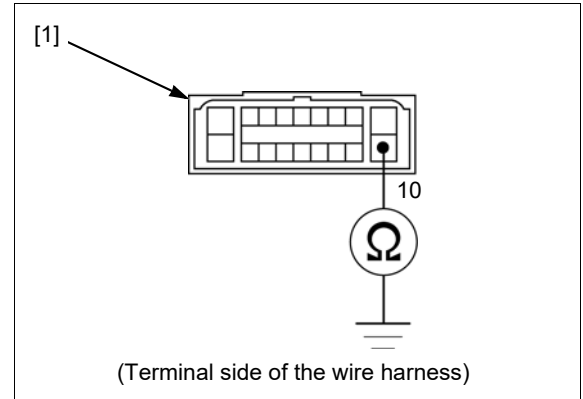
Test probe **07ZAJ-RDJA110**

CONNECTION: 10 – Ground

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Green wire



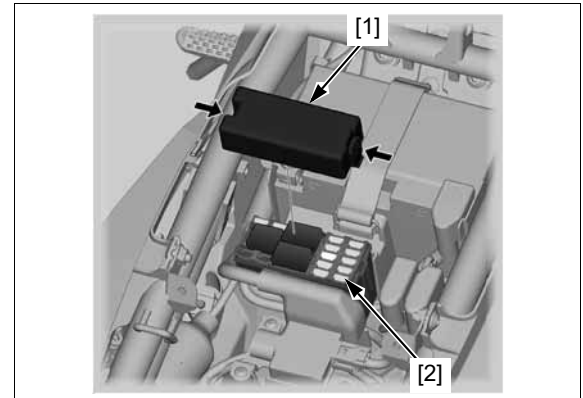
4. Fuse Inspection

Remove the fuse/relay box cover [1] and check the ABS MAIN fuse (7.5 A) [2] for blown.

Is the fuse blown?

YES – GO TO STEP 5.

NO – GO TO STEP 6.



ANTI-LOCK BRAKE SYSTEM (ABS)

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:

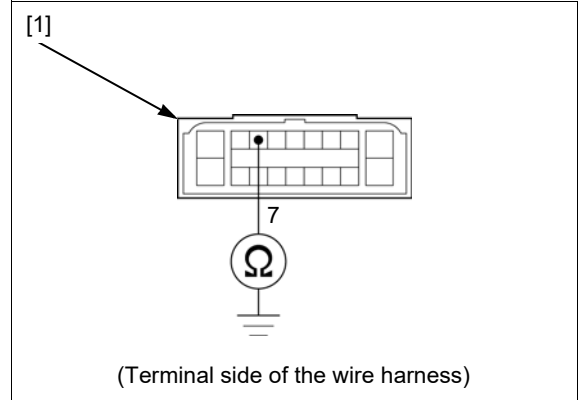
Test probe 07ZAJ-RDJA110

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.

Measure the voltage between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

TOOL:

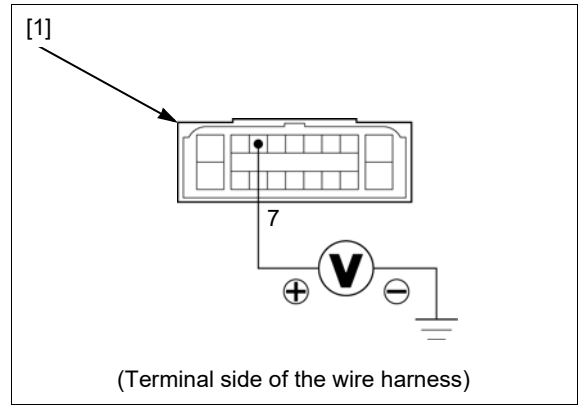
Test probe 07ZAJ-RDJA110

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 19-8).
Test-ride the motorcycle to check that the ABS indicator operates normally during pre-start self-diagnosis (page 19-6).

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 19-10). This is temporary failure. Erase the DTC (page 19-8).
Test-ride the motorcycle above 30 km/h check that the ABS indicator operates normally (page 19-7)
- 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 19-23).

Is the air gap correct?

YES – GO TO STEP 2.

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

2. Speed Sensor Condition Inspection

Inspect the area around the 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 3.

NO – Remove any deposits. Install properly or replace faulty part.



3. Front Wheel Speed Sensor Line Short Circuit Inspection (at sensor side)

Turn the ignition switch OFF.

Disconnect the front wheel speed sensor 2P (Black) connector (page 19-23).

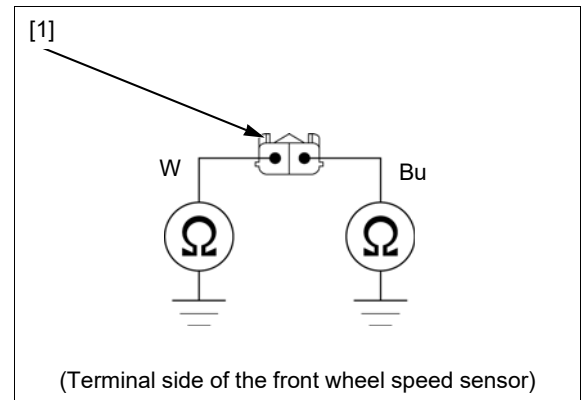
Check for continuity between each terminal of the sensor side front wheel speed sensor 2P (Black) connector [1] and ground.

**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 19-9).

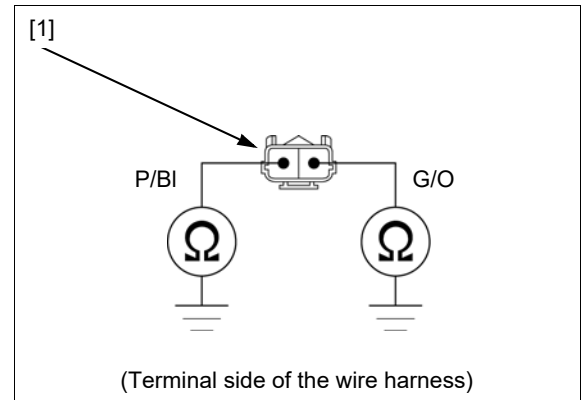
Check for continuity between each terminal of the wire harness side front wheel speed sensor 2P (Black) connector [1] and ground.

**CONNECTION: Pink/black – Ground
Green/orange – Ground**

Is there continuity?

YES – • Short circuit in the Pink/black wire
• Short circuit in the Green/orange wire

NO – GO TO STEP 5.



ANTI-LOCK BRAKE SYSTEM (ABS)

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

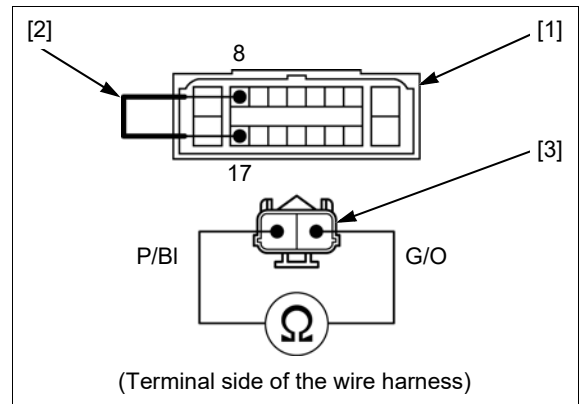
Check for continuity between the wire harness side front wheel speed sensor 2P (Black) connector [3] terminals.

CONNECTION: Pink/black – Green/orange

Is there continuity?

YES – GO TO STEP 6.

NO – Open circuit in the Pink/black or Green/orange wire



6. Failure Reproduction with a New Speed Sensor

Replace the front wheel speed sensor with a new one (page 19-23).

Connect the ABS modulator 18P (Black) and front wheel speed sensor 2P (Black) connectors.

Erase the DTC (page 19-8).

Test-ride the motorcycle above 30 km/h.

Recheck the DTC (page 19-7).

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 19-10). This is temporary failure. Erase the DTC (page 19-8). Test-ride the motorcycle above 30 km/h check that the ABS indicator operates normally (page 19-7).
- 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 19-23).

Is the air gap correct?

YES – GO TO STEP 2.

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

2. Speed Sensor Condition Inspection

Inspect the area around the 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.

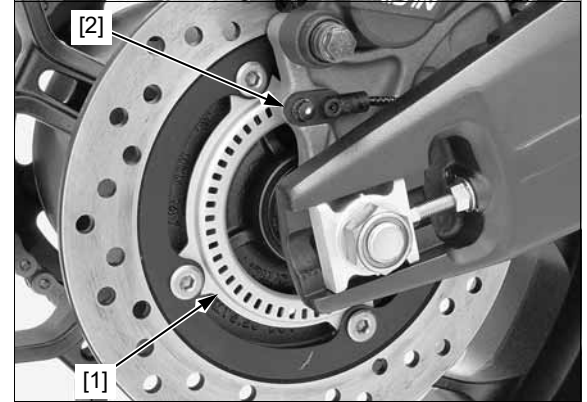
Check the installation condition of the pulser ring or wheel speed sensor for looseness.

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 3.

NO – Remove any deposits. Install properly or replace faulty part.



3. Rear Wheel Speed Sensor Line Short Circuit Inspection (at sensor side)

Turn the ignition switch OFF.

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

Disconnect the rear wheel speed sensor 2P (Black) connector [1].



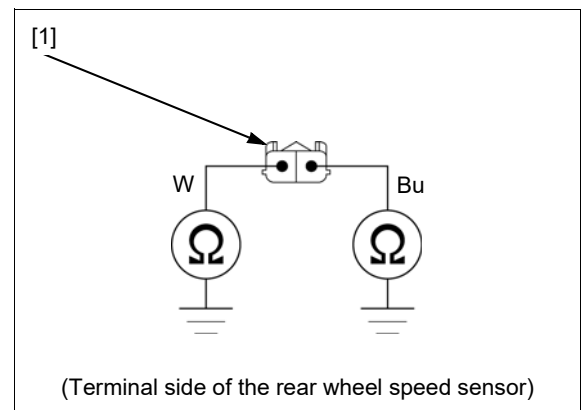
Check for continuity between each terminal of the sensor side rear wheel speed sensor 2P (Black) connector [1] and ground.

**CONNECTION: White – Ground
Blue – Ground**

Is there continuity?

YES – Faulty rear wheel speed sensor

NO – GO TO STEP 4.



4. Rear Wheel Speed Sensor Line Short Circuit Inspection

Disconnect the ABS modulator 18P (Black) connector (page 19-9).

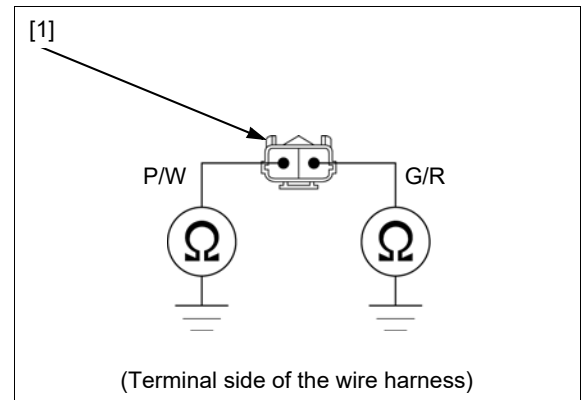
Check for continuity between each terminal of the wire harness side rear wheel speed sensor 2P (Black) connector [1] and ground.

**CONNECTION: Pink/white – Ground
Green/red – Ground**

Is there continuity?

YES – • Short circuit in the Pink/white wire
• Short circuit in the Green/red wire

NO – GO TO STEP 5.



ANTI-LOCK BRAKE SYSTEM (ABS)

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

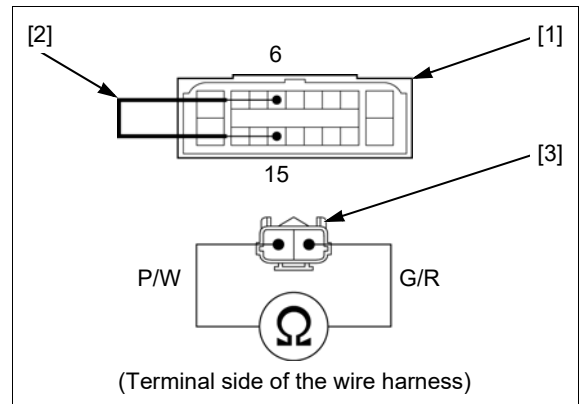
Check for continuity between the wire harness side rear wheel speed sensor 2P (Black) connector [3] terminals.

CONNECTION: Pink/white – Green/red

Is there continuity?

YES – GO TO STEP 6.

NO – Open circuit in the Pink/white or Green/red 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 (Black) connectors.

Erase the DTC (page 19-8).

Test-ride the motorcycle above 30 km/h.

Recheck the DTC (page 19-7).

Is the DTC 1-3, 1-4, 2-3, or 4-3 indicated?

YES – Faulty ABS modulator

NO – Faulty original wheel speed sensor

DTC 3-1, 3-2, 3-3 or 3-4 (Solenoid Valve)

1. Failure Reproduction

Erase the DTC (page 19-8).

Test-ride the motorcycle above 30 km/h.

Recheck the DTC (page 19-7).

Is the DTC 3-1, 3-2, 3-3 or 3-4 indicated?

YES – Faulty ABS modulator

NO – Solenoid valve is normal (intermittent failure).

DTC 5-1, 5-2 or 5-3 (Pump Motor Lock/Stuck Off/stuck On)

1. Fuse Inspection

Turn the ignition switch OFF.

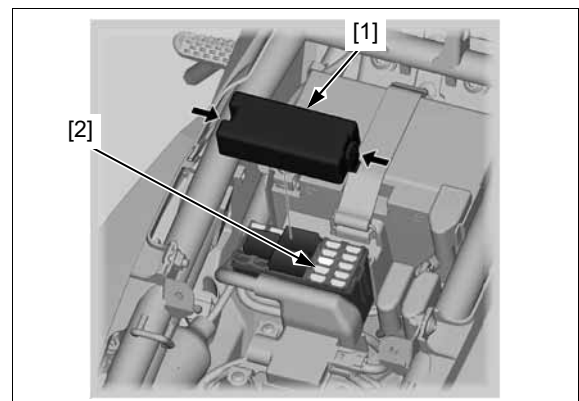
Remove the main seat (page 2-11).

Remove the fuse/relay box cover [1] and check the ABS MOTOR fuse (30 A) [2] 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 19-9).
 With the ABS MOTOR fuse (30 A) removed, check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

TOOL:

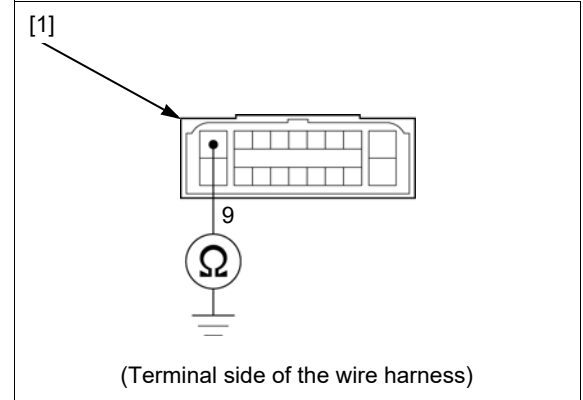
Test probe 07ZAJ-RDJA110

CONNECTION: 9 – Ground

Is there continuity?

YES – Short circuit in the Red wire between the fuse/relay box and ABS modulator 18P (Black) connector

NO – Intermittent failure. Replace the ABS MOTOR fuse (30 A) with a new one, and recheck.



3. Motor Power Input Line Open Circuit Inspection

Install the ABS MOTOR fuse (30 A).
 Disconnect the ABS modulator 18P (Black) connector (page 19-9).
 Measure the voltage between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

TOOL:

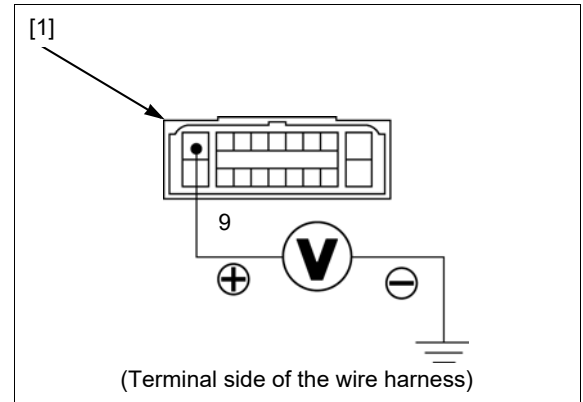
Test probe 07ZAJ-RDJA110

CONNECTION: 9 (+) – Ground (-)

Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in the Red wire between the battery and ABS modulator 18P (Black) connector



4. Motor Power Ground Line Open Circuit Inspection

Check for continuity between the wire harness side 18P (Black) connector [1] and ground.

TOOL:

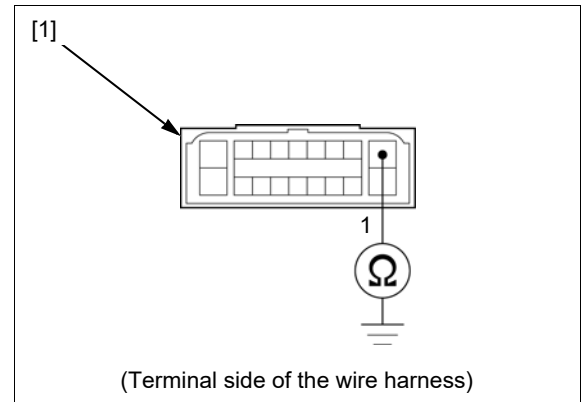
Test probe 07ZAJ-RDJA110

CONNECTION: 1 – Ground

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in the Green wire



5. Failure Reproduction

Turn the ignition switch OFF.
 Connect the ABS modulator 18P (Black) connector.
 Erase the DTC (page 19-8).
 Test-ride the motorcycle above 30 km/h.
 Recheck the DTC (page 19-7).

Is the DTC 5-1, 5-2 or 5-3 indicated?

YES – Faulty ABS modulator

NO – Pump motor is normal (intermittent failure).

ANTI-LOCK BRAKE SYSTEM (ABS)

DTC 5-4 (Fail Safe Relay)

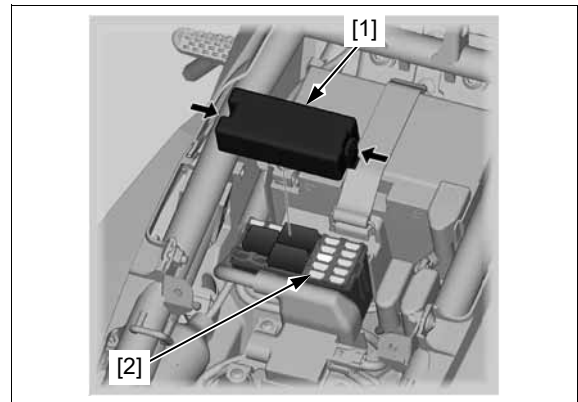
1. Fuse Inspection

Turn the ignition switch OFF.
Remove the main seat (page 2-11).
Remove the fuse/relay box cover [1] and check the FSR fuse (30 A) [2] for blown.

Is the fuse blown?

YES – GO TO STEP 2.

NO – GO TO STEP 3.



2. Relay Input Line Short Circuit Inspection

Disconnect the ABS modulator 18P (Black) connector (page 19-9).
With the FSR fuse (30 A) removed, check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

TOOL:

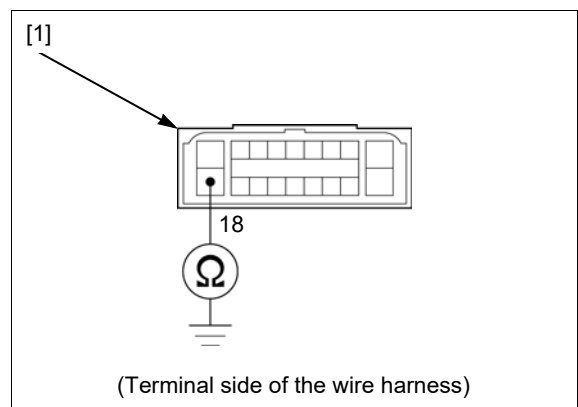
Test probe 07ZAJ-RDJA110

CONNECTION: 18 – Ground

Is there continuity?

YES – Short circuit in the Red/black wire between the fuse/relay box and ABS modulator 18P (Black) connector

NO – Intermittent failure. Replace the FSR fuse (30 A) with a new one, and recheck.



(Terminal side of the wire harness)

3. Relay Input Line Open Circuit Inspection

Install the FSR fuse (30 A).
Disconnect the ABS modulator 18P (Black) connector (page 19-9).
Measure the voltage between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

TOOL:

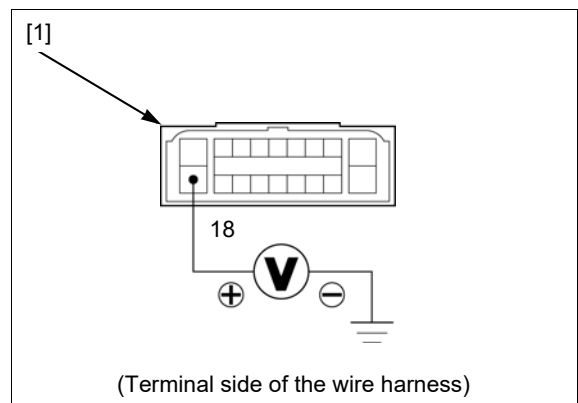
Test probe 07ZAJ-RDJA110

CONNECTION: 18 (+) – Ground (-)

Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in the Red/black wire between the battery and ABS modulator 18P (Black) connector



(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 19-8).
 Test-ride the motorcycle above 30 km/h.
 Recheck the DTC (page 19-7).

Is the DTC 5-4 indicated?

YES – Faulty ABS modulator

NO – Fail safe relay is normal (intermittent failure).

DTC 6-1 or 6-2 (Power Circuit)

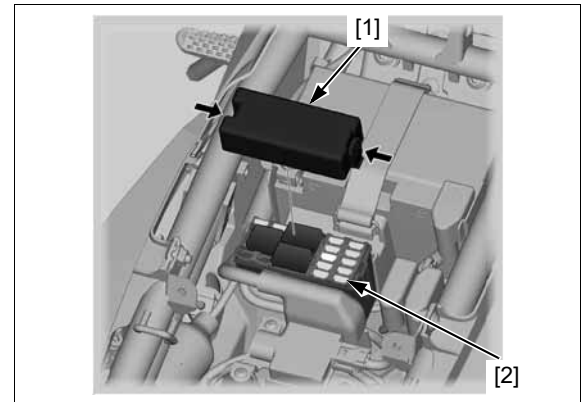
1. Fuse Inspection

Turn the ignition switch OFF.
 Remove the main seat (page 2-11).
 Remove the fuse/relay box cover [1] and check the ABS MAIN fuse (7.5 A) [2] 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 19-9).
 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:

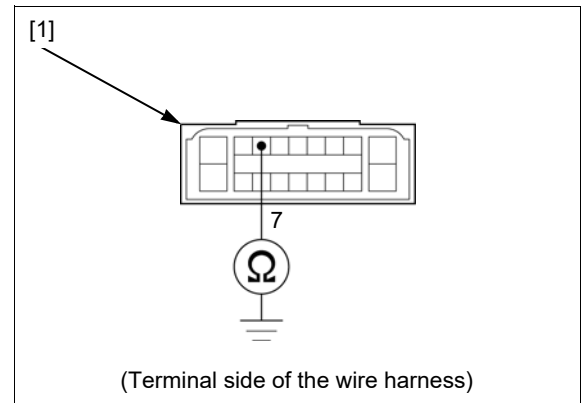
Test probe **07ZAJ-RDJA110**

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.



3. Power Input Line Open Circuit Inspection

Install the ABS MAIN fuse (7.5 A).
 Disconnect the ABS modulator 18P (Black) connector (page 19-9).
 Turn the ignition switch ON.
 Measure the voltage between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

TOOL:

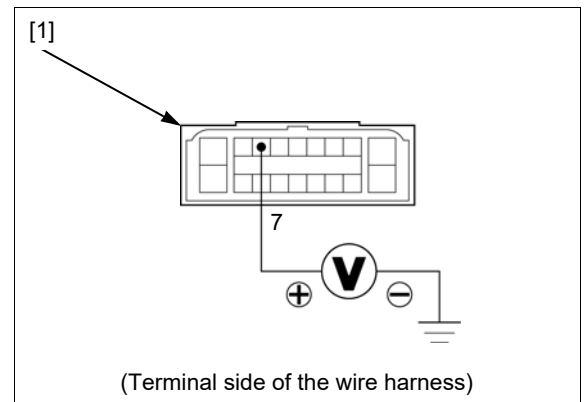
Test probe **07ZAJ-RDJA110**

CONNECTION: 7 (+) – Ground (-)

Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in Red/black wire



4. Failure Reproduction

Turn the ignition switch OFF.
Connect the ABS modulator 18P (Black) connector.
Erase the DTC (page 19-8).
Test-ride the motorcycle above 30 km/h.
Recheck the DTC (page 19-7).

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 19-8).
Test-ride the motorcycle above 30 km/h.
Recheck the DTC (page 19-7).

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 19-8).
Test-ride the motorcycle above 30 km/h.
Recheck the DTC (page 19-7).

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 air gap at several points by turning the wheel slowly.

- Front: Between the wheel speed sensor guard and pulser ring
- Rear: Between the caliper bracket and pulser ring

It must be within specification.

STANDARD:

Front: 0.73 – 1.40 mm (0.029 – 0.055 in)

Rear: 0.40 – 1.22 mm (0.016 – 0.048 in)

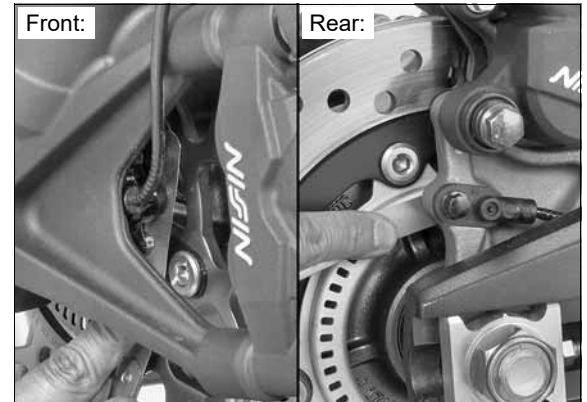
The clearance (air gap) cannot be adjusted.

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 16-18)
- Rear pulser ring (page 17-5)



REMOVAL/INSTALLATION

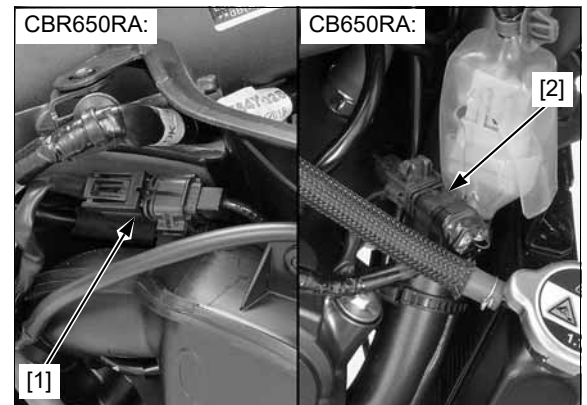
FRONT WHEEL SPEED SENSOR

Pull down the radiator (page 8-7).

Remove the front wheel (page 16-15).

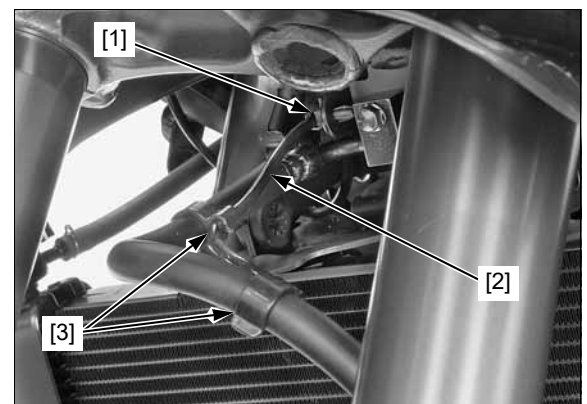
CBR650RA: Release the front wheel speed sensor 2P (Black) connector [1] from the right intake air duct and disconnect it.

CB650RA: Disconnect the front wheel speed sensor 2P (Black) connector [2].



Remove the wire clip [1].

Release the front wheel speed sensor wire [2] from the clamps [3].



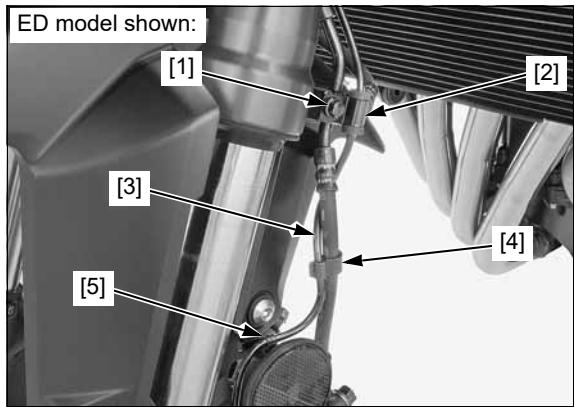
ANTI-LOCK BRAKE SYSTEM (ABS)

Remove the bolt [1] and front wheel speed sensor wire guide [2].

Release the front wheel speed sensor wire [3] from the clamp [4].

Remove the wire clip [5].

ED model shown:



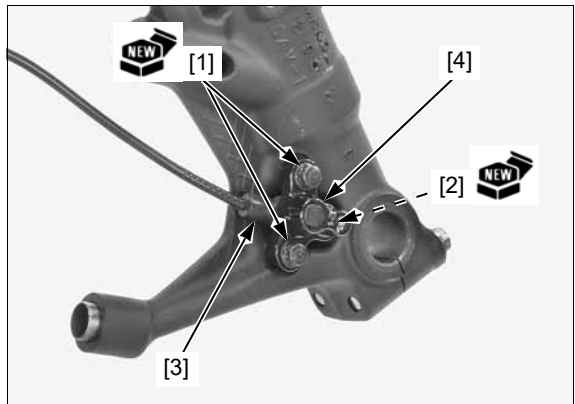
Remove the front wheel speed sensor guard bolts [1].

Remove the bolt [2] and front wheel speed sensor [3] from wheel speed sensor guard [4].

Installation is in the reverse order of removal.

NOTE:

- Clean around the sensor tip and sensor installation area (front wheel speed sensor guard) thoroughly, and be sure that no foreign material is allowed to enter the mounting hole.
- Always replace the front wheel speed sensor mounting bolt and front wheel speed sensor guard mounting bolts with new ones.
- The clearance gap cannot be adjusted. If it is not within specification, check related part for deformation, looseness, or damage.



After installation, check the air gap (page 19-23).

REAR WHEEL SPEED SENSOR

Remove the drive chain cover/mud guard (page 2-16).

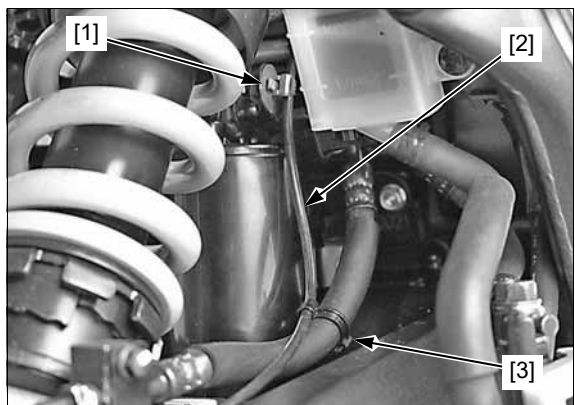
Lift the fuel tank and support it (page 3-4).

Disconnect the rear wheel speed sensor 2P (Black) connector [1].

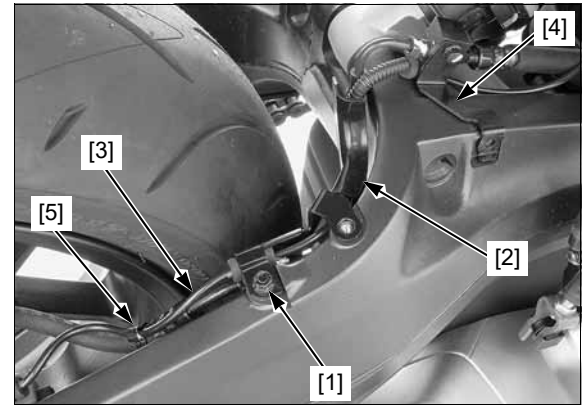


Remove the wire clip [1].

Release the rear wheel speed sensor wire [2] from the clamp [3].



Remove the bolt [1] and brake pipe stay [2].
Release the rear wheel speed sensor wire [3] from the stay [4] and clamp [5].



Remove the following:

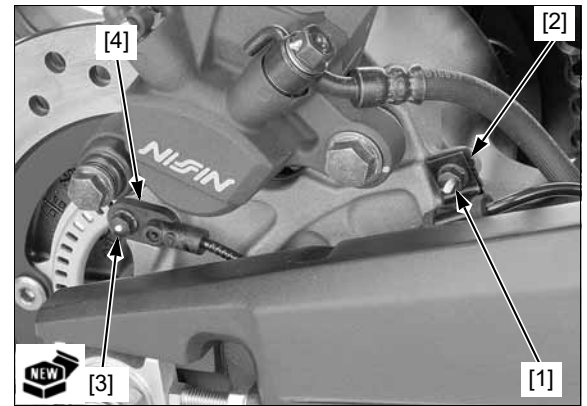
- Bolts [1]
- Clamp [2]
- Sensor bolt [3]
- Rear wheel speed sensor [4]

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.
- Always replace the rear wheel speed sensor mounting bolt with new a one.
- The clearance gap cannot be adjusted.
If it is not within specification, check related part for deformation, looseness, or damage.

After installation, check the air gap (page 19-23).



ABS MODULATOR

REMOVAL/INSTALLATION

Drain the brake fluid from the rear brake hydraulic systems (page 18-5).

Remove the following:

- Throttle body (page 7-13)
- ABS modulator cover (page 4-76)

Disconnect the ABS modulator 18P (Black) connector (page 19-9).

Pull the ECM [1] upward as shown.

Loosen the brake pipe joint nuts [2] to disconnect the brake pipes.

- When disconnecting, cover the end of the brake pipes to prevent contamination.

Remove the trim clips [3].

Release the boss [4] and slightly pull the ABS modulator tray [5] upward.

Remove the following:

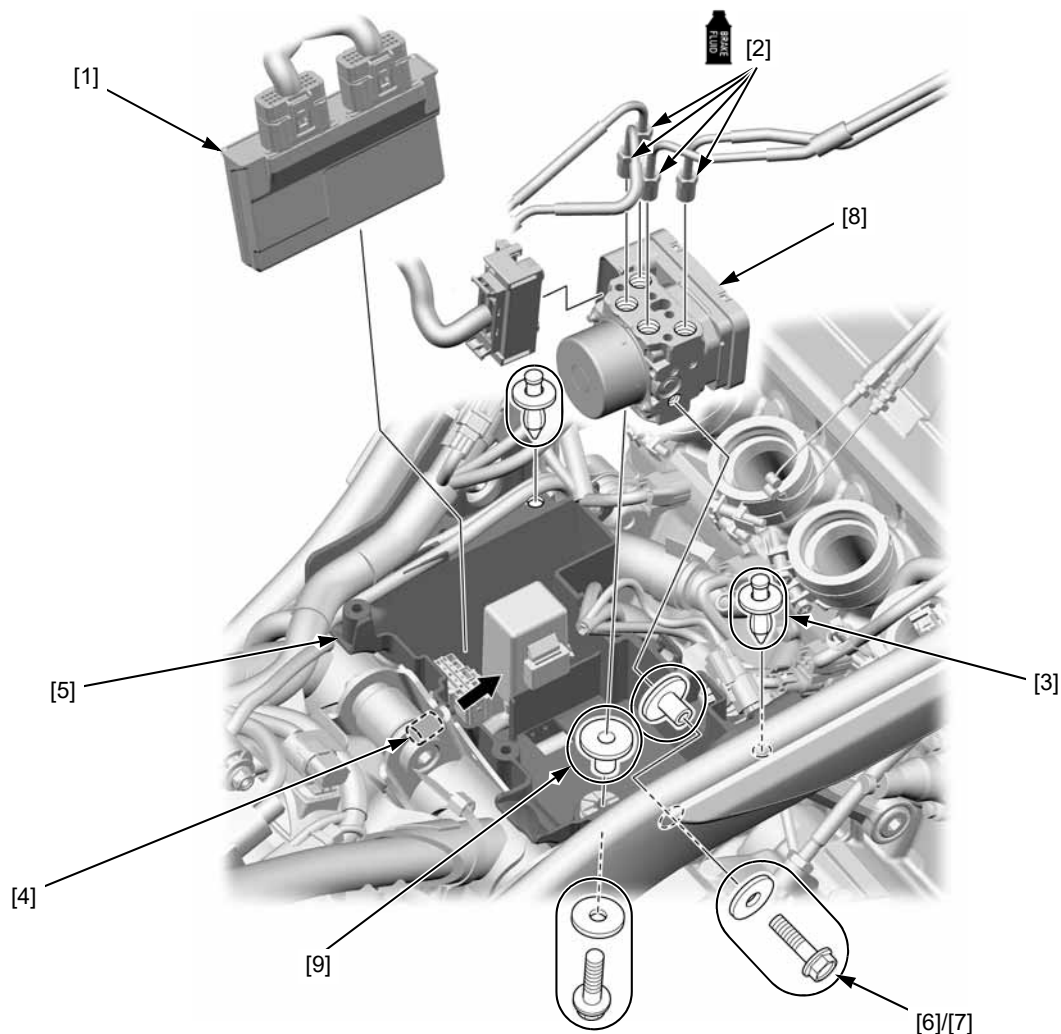
- Two bolts [6] and washers [7]
- ABS modulator [8]
- Two collars [9]

Installation is in the reverse order of removal.

- Apply brake fluid to the threads of the brake pipe joint nuts.

TORQUE: Brake pipe joint nut: 14 N·m (1.4 kgf·m, 10 lbf·ft)

Fill and bleed the front and rear brake hydraulic systems (page 18-6).



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: BM-210 or BATTERY MATE or equivalent

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: BM-210 or BATTERY MATE 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 2.8 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 2.8 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?

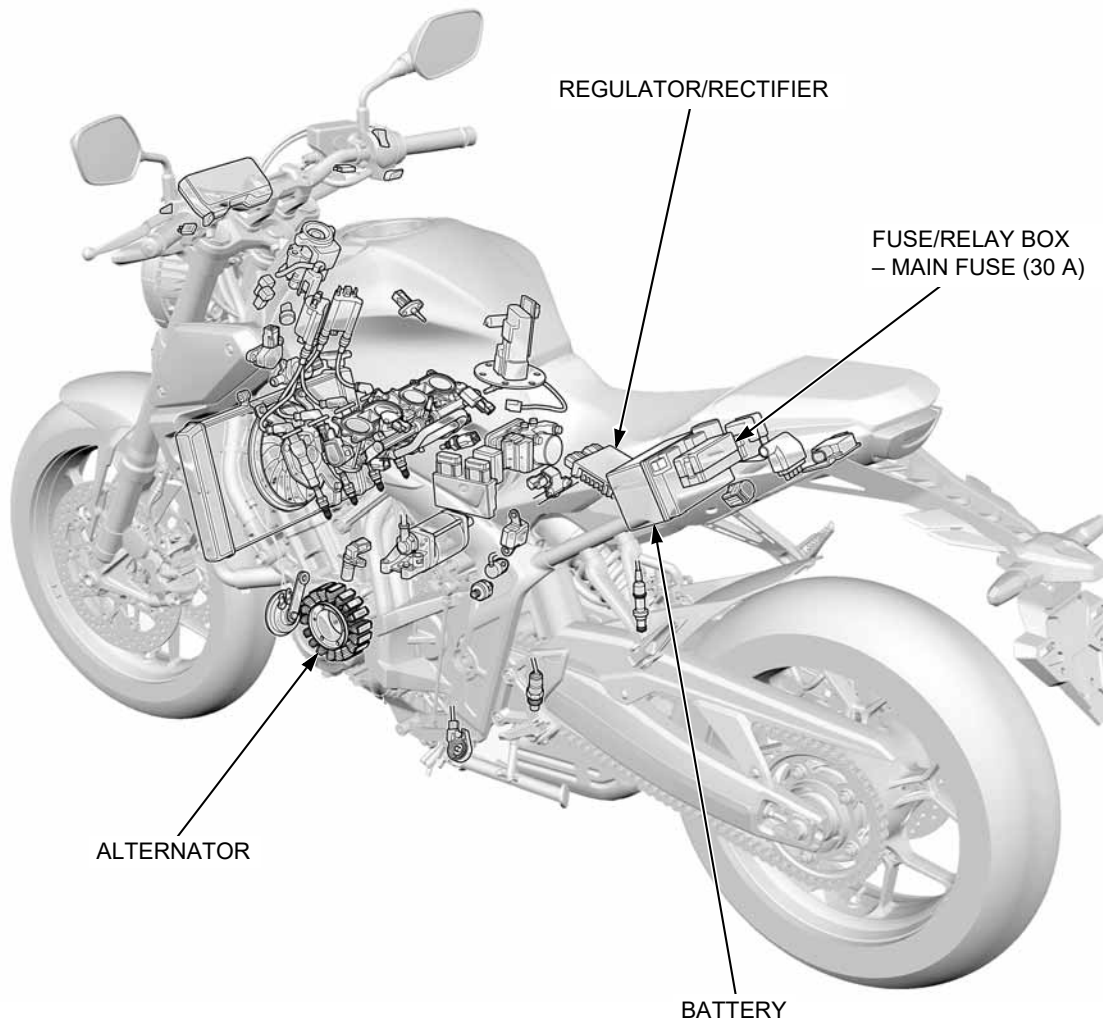
YES – Faulty regulator/rectifier

NO –

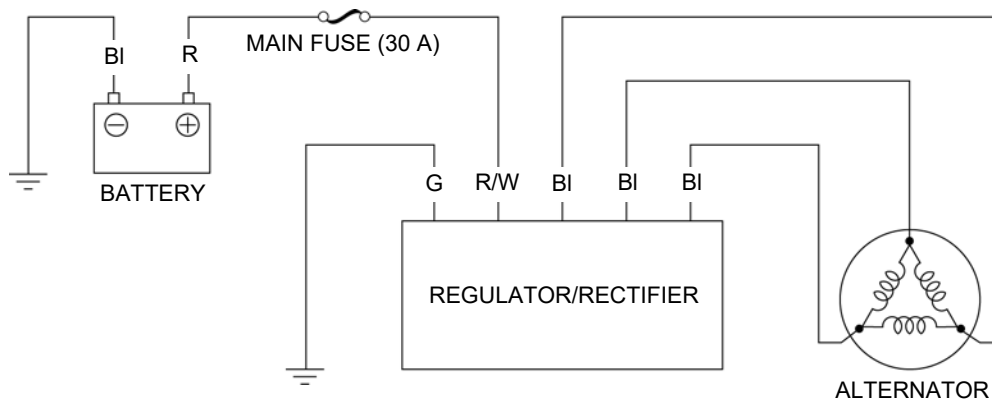
- Open circuit in related wire
- Loose or poor contacts of related terminal
- Shorted wire harness

BATTERY/CHARGING SYSTEM

SYSTEM LOCATION



SYSTEM DIAGRAM



BI: Black
G: Green
R: Red
W: White

BATTERY

REMOVAL/INSTALLATION

Remove the main seat (page 2-11).

Turn the ignition switch OFF.

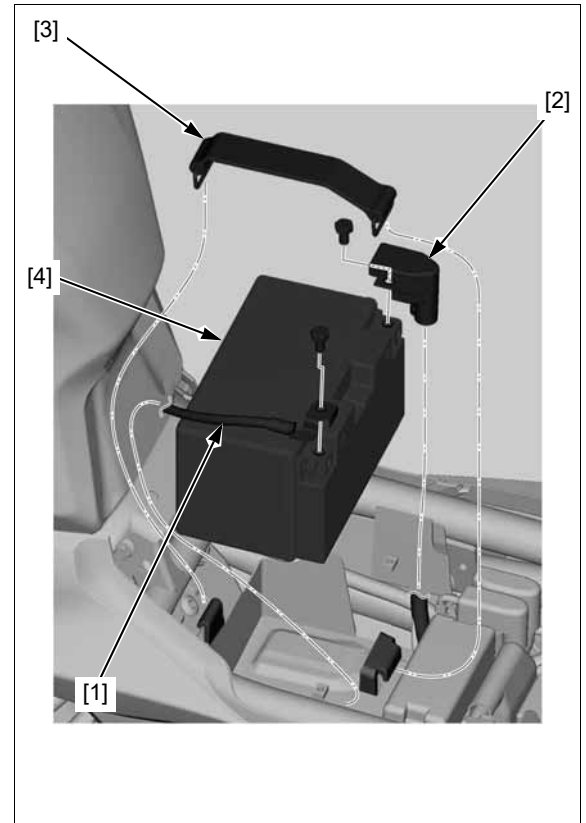
Disconnect the negative (-) cable [1] first and then disconnect the positive (+) cable [2] by removing the terminal bolts.

Remove the rubber strap [3] and the battery [4].

Installation is in the reverse order of removal.

NOTE:

- Connect the positive (+) cable first, then connect the negative (-) cable.
- For digital clock setting procedure (page 21-10).



VOLTAGE INSPECTION

Remove the main seat (page 2-11).

Measure the battery voltage using a digital multimeter.

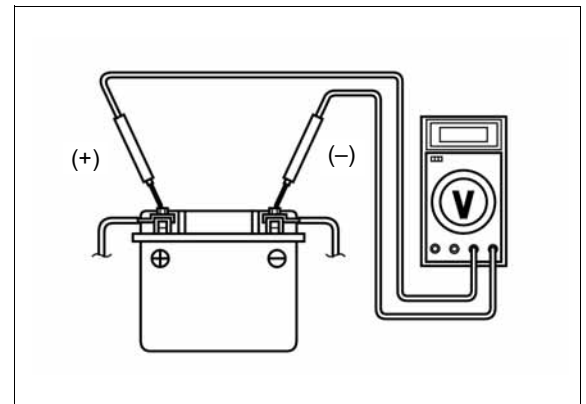
VOLTAGE (20°C/68°F):

Fully charged: 12.8 V minimum

Needs charging: Below 12.3 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.



CHARGING SYSTEM INSPECTION

CURRENT LEAKAGE TEST

Remove the main seat (page 2-11).

Turn the ignition switch OFF.

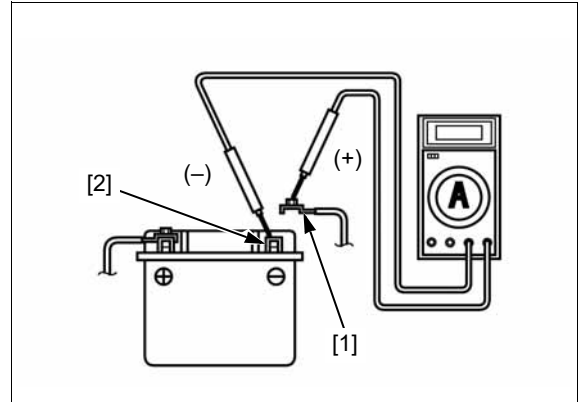
Remove the terminal bolt and disconnect the negative (-) cable [1] from the battery.

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 the fuse in the tester.
- While measuring current, do not turn the ignition switch ON. A sudden surge of current may blow the fuse in the tester.



SPECIFIED CURRENT LEAKAGE: 2.8 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:

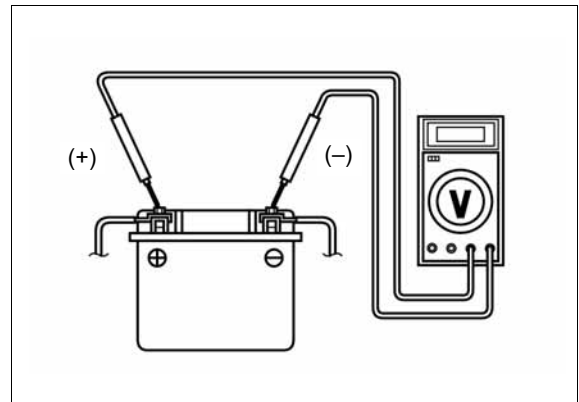
- Be sure the battery is in good condition before performing this test.
- Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.

Warm up the engine to normal operating temperature. Stop the engine.

Remove the main seat (page 2-11).

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 min⁻¹ (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

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

Disconnect the alternator 3P (Gray) connector [1] from the regulator/rectifier.

Check the connector for loose contacts or corroded terminals.

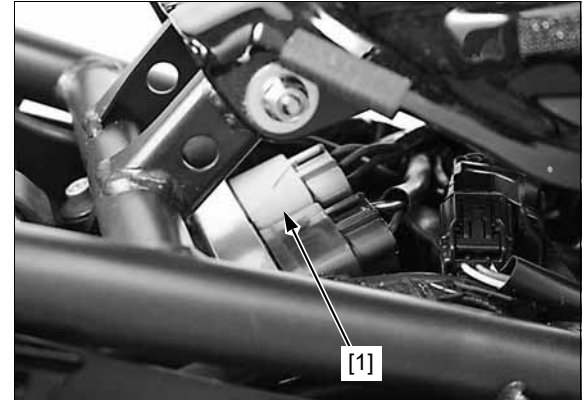
Measure the resistance between the Black wire terminals of the alternator side 3P (Gray) connector.

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

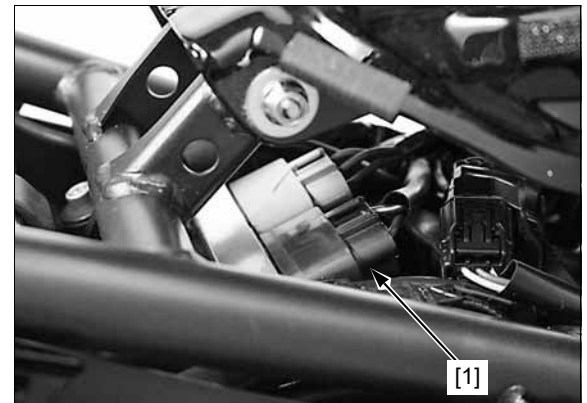
Lift the fuel tank and support it (page 3-4).

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.

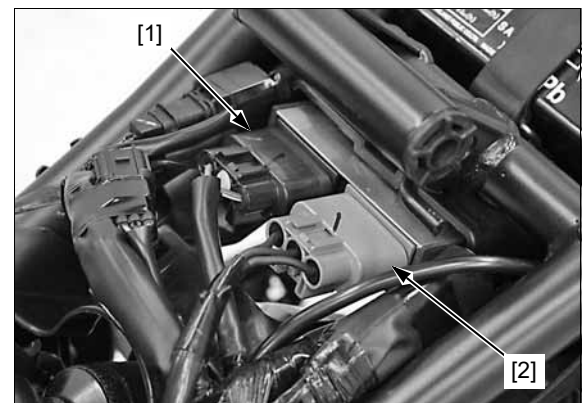
- Battery Line:
Measure the voltage between the Red/white wire terminal (+) and ground (-). There should be battery voltage at all times.
- Ground Line:
Check for continuity between the Green wire terminal and ground. There should be continuity at all times.



REMOVAL/INSTALLATION

Remove the fuel tank (page 7-7).

Disconnect the regulator/rectifier 3P (Black) [1] and alternator 3P (Gray) [2] connectors.

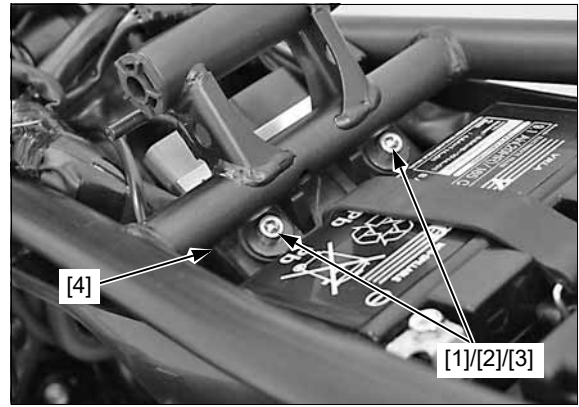


BATTERY/CHARGING SYSTEM

Remove the following:

- Two nuts [1]
- Two socket bolts [2]
- Two washers [3]
- Regulator/rectifier [4]

Installation is in the reverse order of removal.



21. LIGHTS/METERS/SWITCHES

SERVICE INFORMATION.....	21-2	FUEL GAUGE/FUEL LEVEL SENSOR ...	21-13
SYSTEM LOCATION.....	21-2	IGNITION SWITCH.....	21-14
HEADLIGHT	21-3	HANDLEBAR SWITCH	21-16
TURN SIGNAL LIGHT	21-4	BRAKE LIGHT SWITCH.....	21-17
BRAKE/TAIL LIGHT.....	21-5	CLUTCH SWITCH.....	21-18
LICENSE LIGHT	21-5	SIDESTAND SWITCH.....	21-18
COMBINATION METER	21-6	HORN	21-19
SPEEDOMETER.....	21-10	HSTC (Honda Selectable Torque Control) SYSTEM	21-20
TACHOMETER.....	21-11	TURN SIGNAL RELAY	21-21
COOLANT TEMPERATURE GAUGE/ECT SENSOR	21-11	CONTROL RELAY	21-24
ENGINE OIL PRESSURE INDICATOR/ EOP SWITCH.....	21-12	USB CHARGER UNIT (Except KO, IIKO, U, IIU, BR, IIBR)	21-25

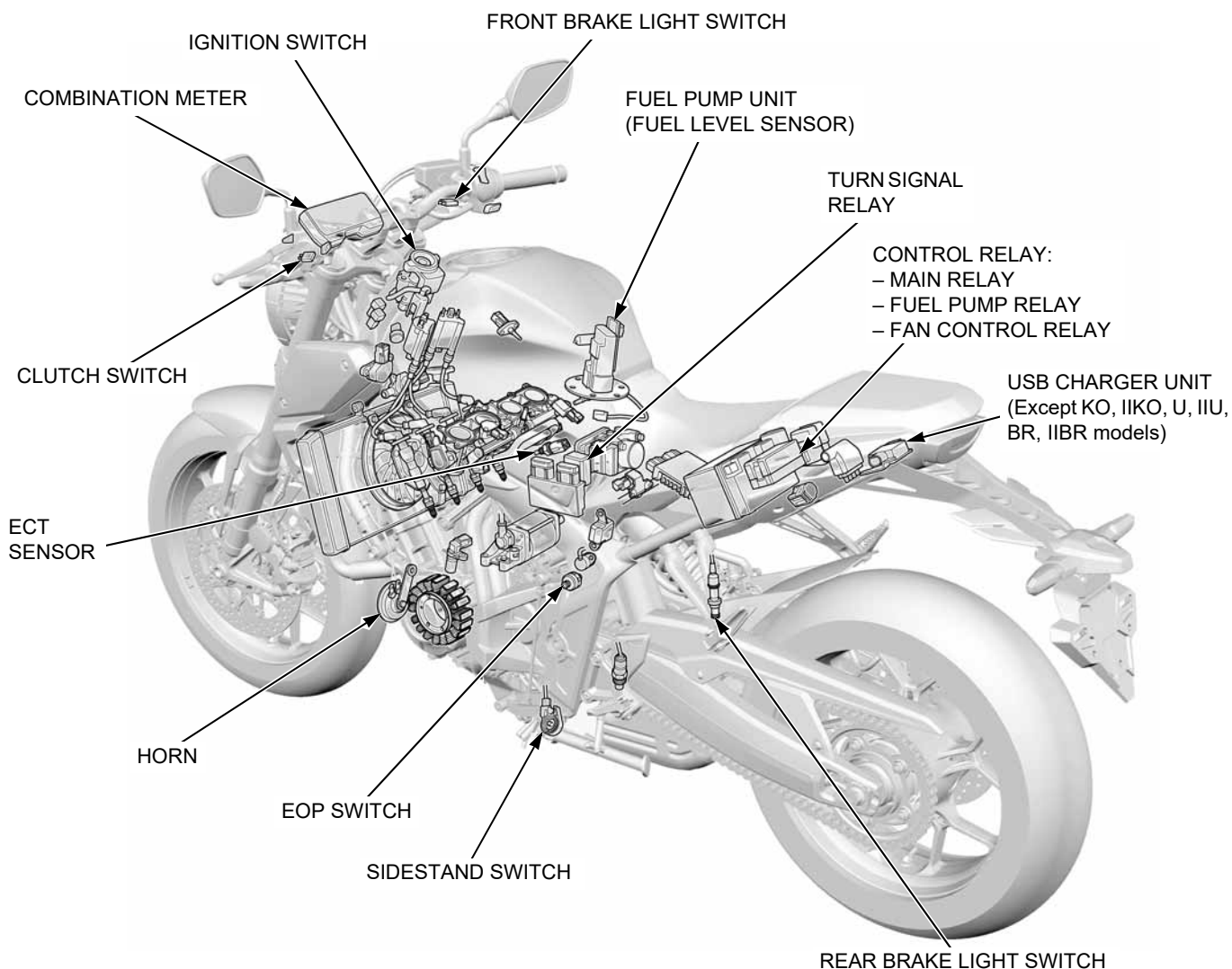
SERVICE INFORMATION

GENERAL

- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.
- Use an electric heating element to heat the coolant for the ECT sensor inspection. Keep flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.
- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models: If the ECM is replaced, perform the following procedure.
 - Key Registration Procedures (page 22-4)
 - Crank pulse initialize learning procedure (page 4-84)
- MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models: If the ECM is replaced, perform the Key Registration Procedures (page 22-7).
- The following color codes are used throughout this section.

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

SYSTEM LOCATION



HEADLIGHT

REMOVAL/INSTALLATION

CBR650RA:

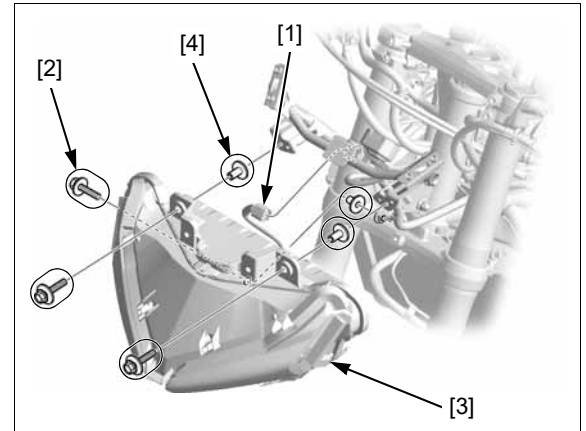
Remove the upper inner panel (page 2-8).
Remove the front lower cowl (page 2-9).

Disconnect the headlight 6P (Black) connector [1].

Remove the following.

- Three bolts [2]
- Headlight [3]
- Three collars [4]

Installation is in the reverse order of removal.



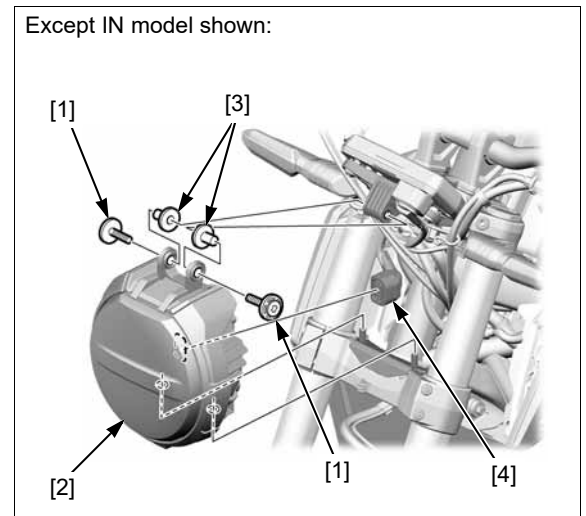
CB650RA

Remove the following.

- Two torx bolts [1]
- Headlight [2]
- Two collars [3]

Disconnect the headlight 8P (Black) connector [4].

Installation is in the reverse order of removal.



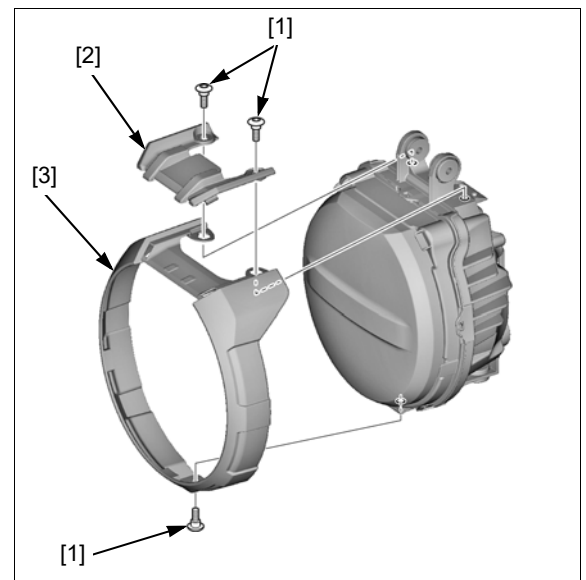
DISASSEMBLY/ASSEMBLY

CB650RA:

Remove the following.

- Three socket bolts [1]
- Headlight upper cover [2]
- Headlight rim [3]

Assembly is in the reverse order of disassembly.



TURN SIGNAL LIGHT

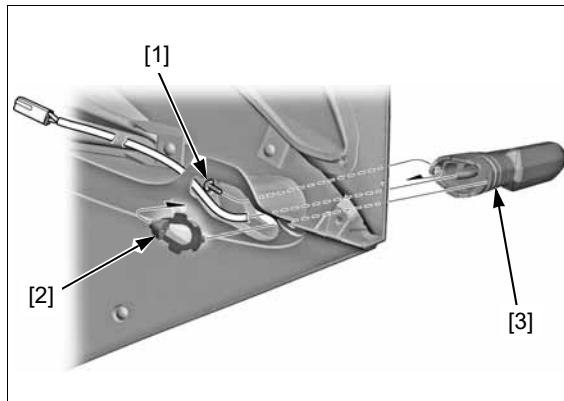
FRONT TURN SIGNAL LIGHT REMOVAL/INSTALLATION

CBR650RA:

Remove the following:

- Middle cowl (page 2-7)
- Screw [1]
- Turn signal holder [2]
- Front turn signal light [3]

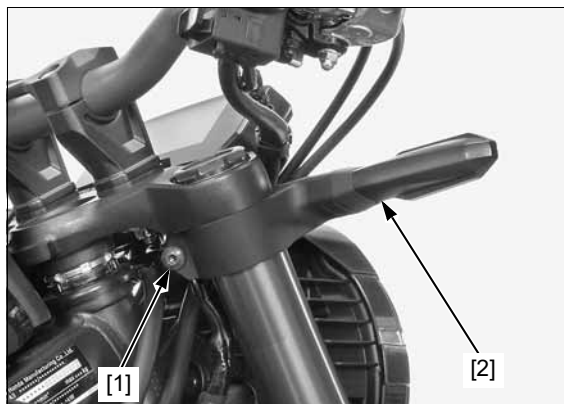
Installation is in the reverse order of removal.



CB650RA:

Remove the following:

- Socket bolt [1]
- Front turn signal unit [2]

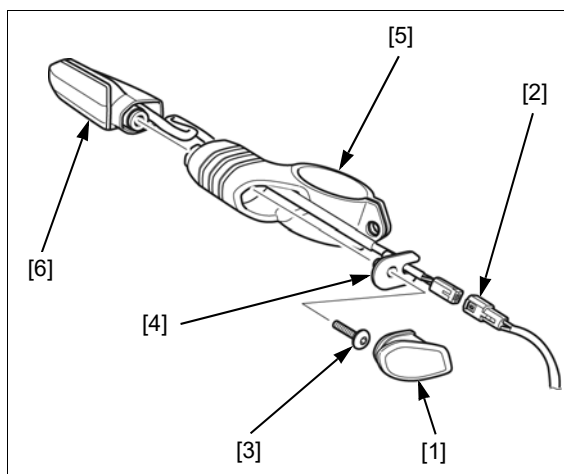


Remove the cover [1] and disconnect the turn signal 7P connector (right; Green/left; Black) [2].

Remove the following:

- Socket bolt [3]
- Collar [4]
- Turn signal mount rubber [5]
- Front turn signal light [6]

Installation is in the reverse order of removal.



REAR TURN SIGNAL LIGHT REMOVAL/INSTALLATION

Remove the rear turn signal light (page 2-13).

BRAKE/TAIL LIGHT

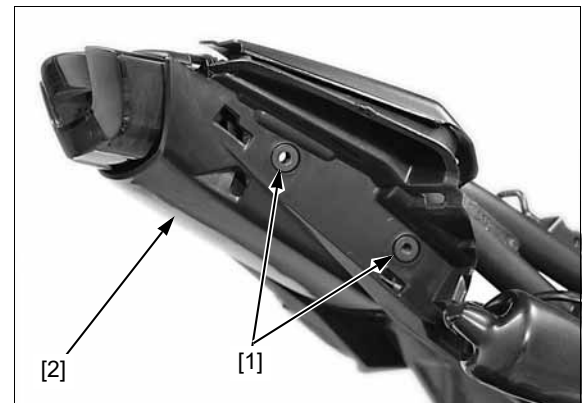
BRAKE/TAIL LIGHT UNIT REMOVAL/ INSTALLATION

Remove the rear fender stay (page 2-13).

Disconnect the brake/tail light 3P connector [1].



Release the bosses [1] and lower the rear fender B [2].

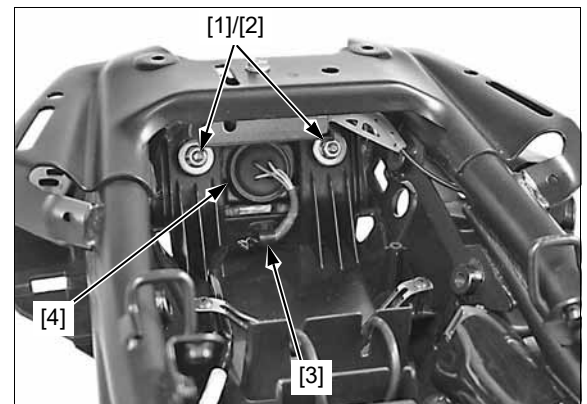


Remove the two nuts [1], washers [2], wire clip [3] and brake/tail light unit [4].

Installation is in the reverse order of removal.

TORQUE:

Brake/tail light mounting nut:
9 N·m (0.9 kgf·m, 7 lbf·ft)



LICENSE LIGHT

REMOVAL/INSTALLATION

Remove the license light (page 2-13).

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 increase to full scale, then 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 4-76).

If the digital display does not function at all, inspect the combination meter power/ground line (page 21-6).

If the power and ground lines are OK, replace the combination meter (page 21-8).



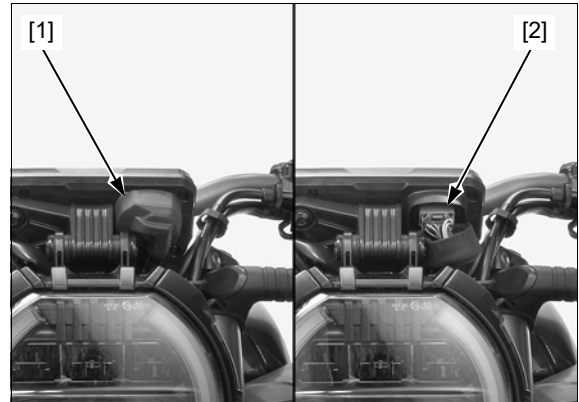
POWER/GROUND LINE INSPECTION

NOTE:

- The DTC P0600 (MIL blinks 86: 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 4-9).

CBR650RA: Remove the meter panel (page 2-8).

CB650RA: Remove the dust cover [1], disconnect the 20P (Gray) connector [2] from the combination meter and check the following:



POWER INPUT LINE

Measure the voltage between the combination meter 20P (Gray) connector [1] terminal and ground.

CONNECTION:

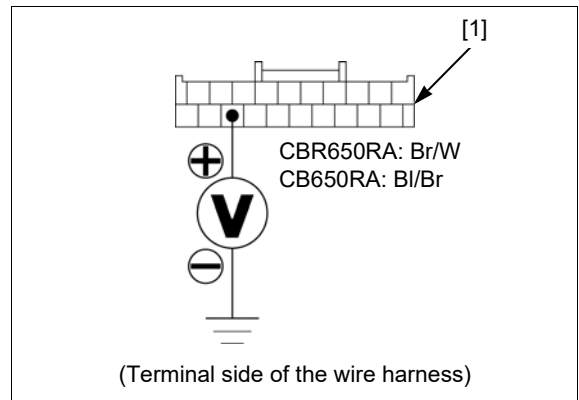
CBR650RA: Brown/white – Ground

CB650RA: Black/brown – Ground

There should be battery voltage with the ignition switch turned ON.

If there is no battery voltage, check the following:

- *CBR650RA:*
Brown/white or Black/brown wire between the fuse/relay box and combination meter for open circuit
- *CB650RA:*
Black/brown wire between the fuse/relay box and combination meter for open circuit
- METER/HORN/TAIL/TURN fuse (7.5 A)



GROUND LINE

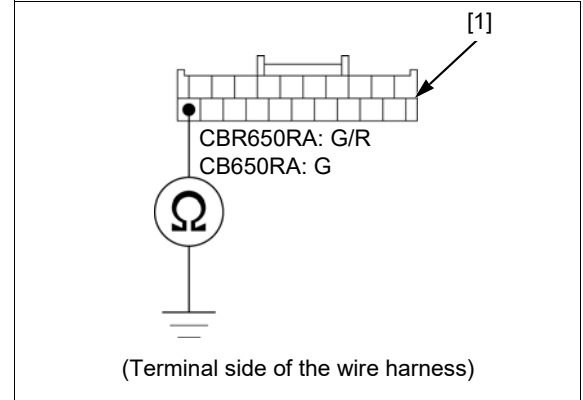
Check for continuity between the combination meter 20P (Gray) connector [1] terminal and ground.

CONNECTION:

- CBR650RA: Green/Red – Ground**
- CB650RA: Green – Ground**

There should be continuity at all times.

- CBR650RA:* If there is no continuity, check for open circuit in the Green/red or Green wire.
- CB650RA:* If there is no continuity, check for open circuit in the Green wire.

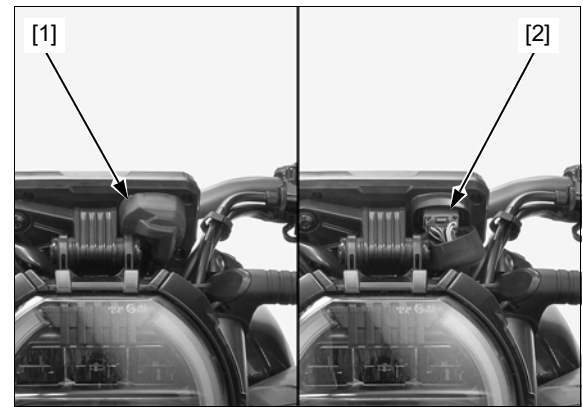


SERIAL COMMUNICATION LINE INSPECTION

Disconnect the following:

- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models: ECM 33P (Black) connector (page 4-76)
- MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models: ECM 33P (Gray) connector (page 4-76)

- CBR650RA:* Remove the meter panel (page 2-8).
- CB650RA:* Remove the dust cover [1], disconnect the 20P (Gray) connector [2] from the combination meter and check the following:



1. Serial Communication Line Short Circuit Inspection

Check for continuity between the combination meter 20P (Gray) connector [1] terminal and ground.

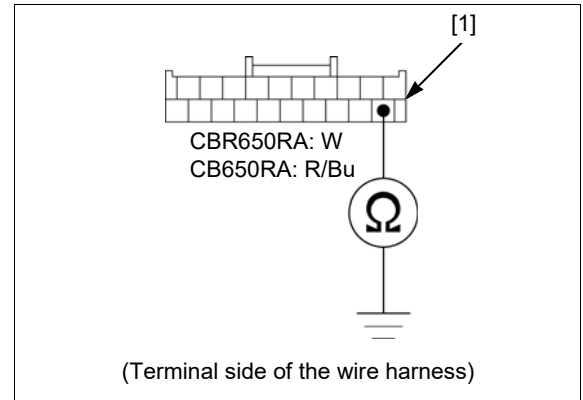
CONNECTION:

- CBR650RA: White – Ground**
- CB650RA: Red/blue – Ground**

Is there continuity?

- YES** - • CBR650RA
Short circuit in the Red/blue or White wire between the combination meter and ECM
- CB650RA
Short circuit in the Red/blue wire between the combination meter and ECM

NO - GO TO STEP 2.



LIGHTS/METERS/SWITCHES

2. Serial Communication Line Open Circuit Inspection

Check for continuity between the combination meter 20P (Gray) connector [1] and ECM 33P (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models: Black), (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models: Gray) connector [2] terminals.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION:

CBR650RA: Red/blue – White

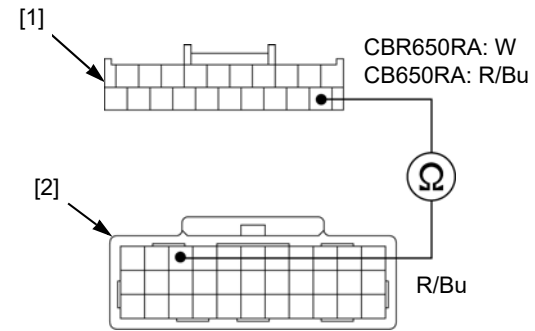
CB650RA: Red/blue – Red/blue

Is there continuity?

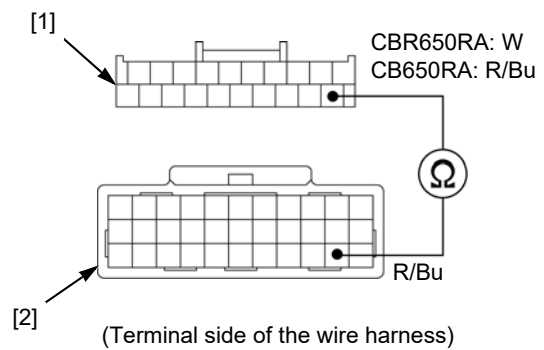
YES – Loose or poor contact on the related connectors.

- NO** –
- CBR650RA:
Open circuit in the White or Red/blue wire between the combination meter and ECM
 - CB650RA:
Open circuit in the Red/blue wire between the combination meter and ECM

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models:



MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models:



REMOVAL/INSTALLATION

CBR650RA:

Remove the following:

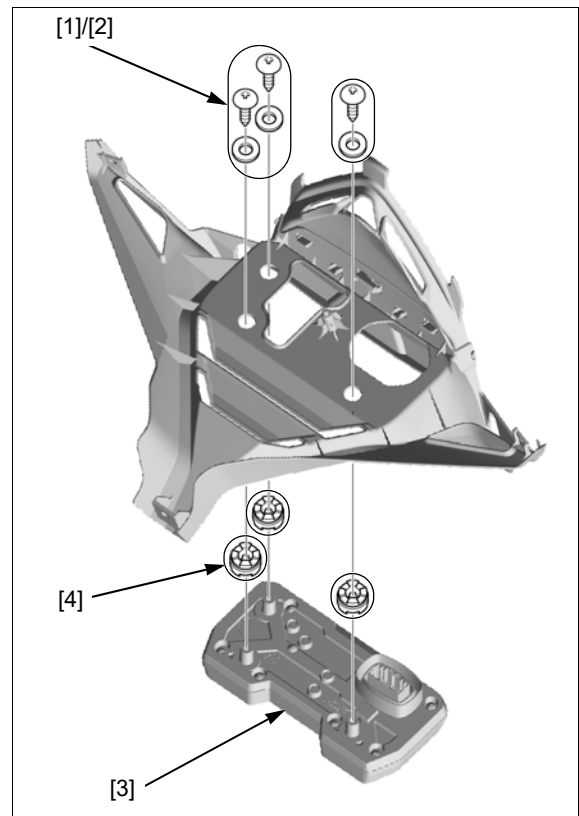
- Meter panel (page 2-8)
- Three tapping screws [1]
- Three washers [2]
- Combination meter [3]
- Three grommets [4]

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)



CB650RA:

Remove the headlight (page 21-3) (Except IN model).

Remove the front license plate stay (page 2-15) (IN model only).

Remove the dust cover [1] and disconnect the 20P (Gray) connector [2].

Release the main wire harness band bosses [3] from the cable guide.

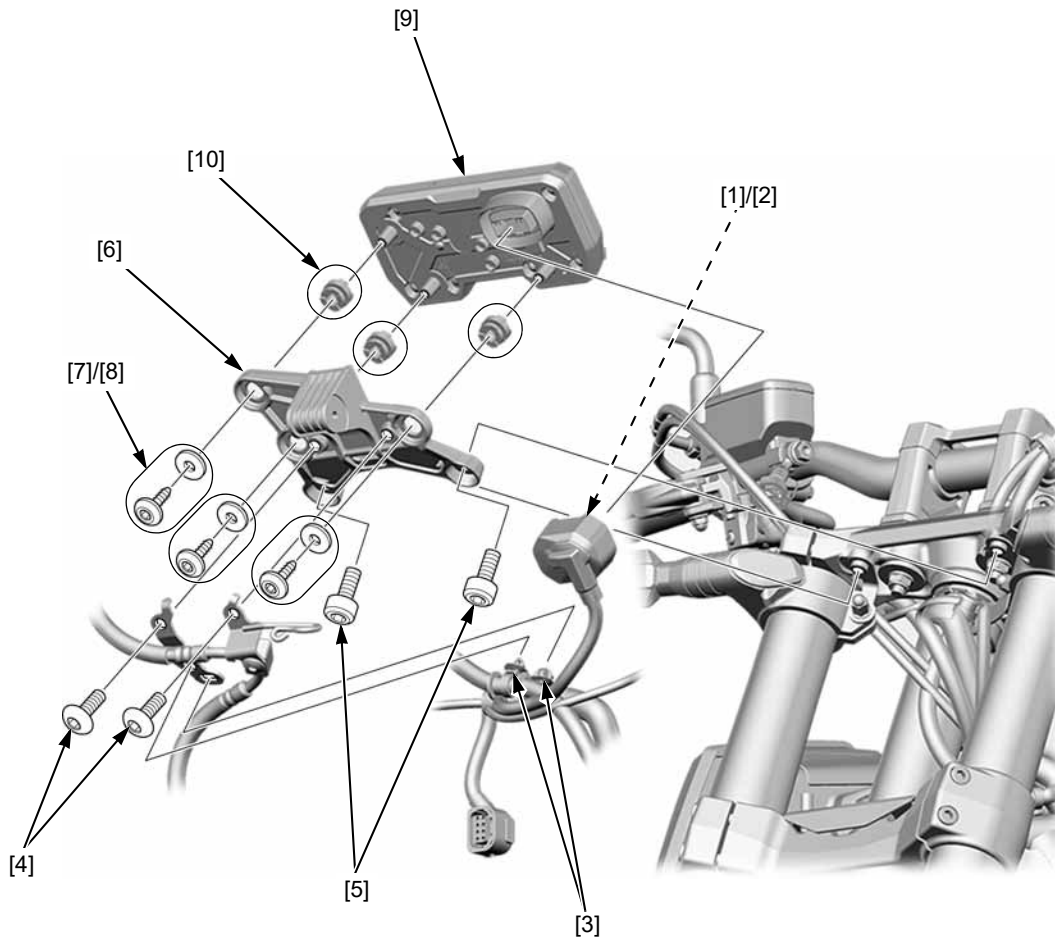
Remove the following:

- Two cable guide mounting socket bolts [4] (Except IN model)
- Two meter stay mounting bolts [5], and meter stay [6]
- Three meter mounting screws [7], washers [8] and combination meter [9]
- Three grommets [10]

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)**



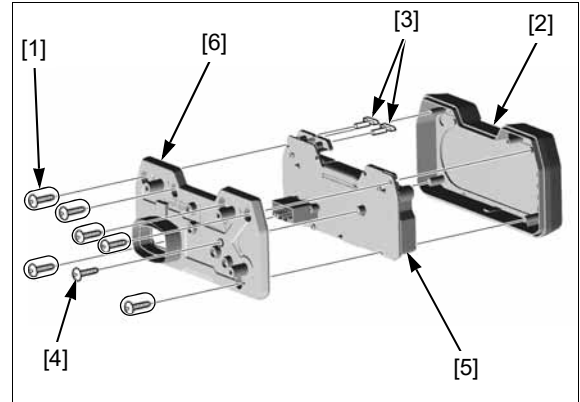
LIGHTS/METERS/SWITCHES

DISASSEMBLY/ASSEMBLY

Remove the following:

- Six tapping screws [1]
- Upper case [2]
- Key tops [3]
- Tapping screw [4]
- Meter assembly [5]
- Lower case [6]

Assembly is in the reverse order of disassembly.

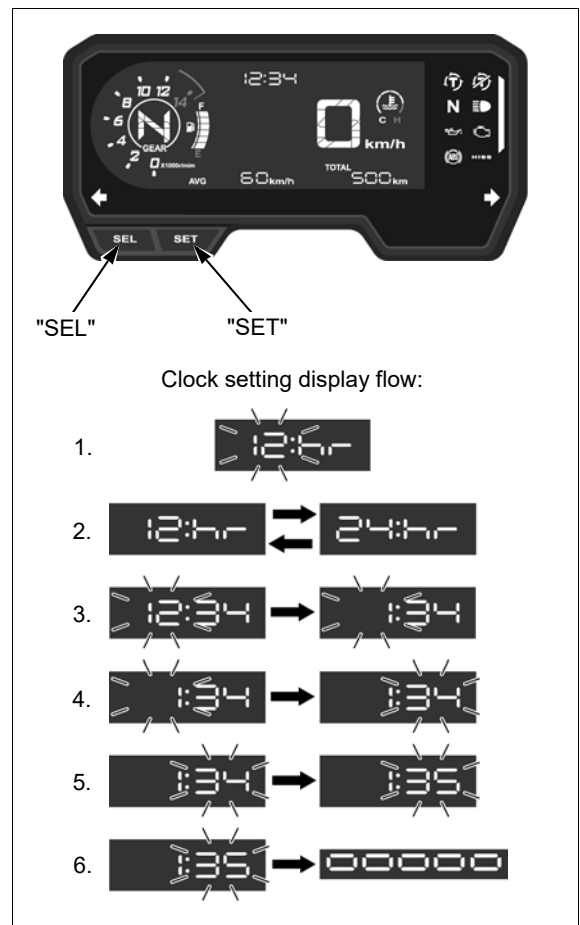


DIGITAL CLOCK SETTING PROCEDURE

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 start flashing.
2. Press SEL button to select "12hr" or "24hr". Press SET button. The time format is set, and then the display moves to the clock adjustment.
3. Press the SEL button until the desired hour is displayed (press and hold to advance the hour fast).
4. Press the SET button. The minute digits start flashing.
5. Press the SEL button until the desired minute is displayed (press and hold to advance the minute fast).
6. Press the SET button. The clock is set, and then the display moves to the backlight brightness adjustment ("00000" – "0" is indicated). Turn the ignition switch OFF.



SPEEDOMETER

SYSTEM INSPECTION

If the speedometer does not operate, check the following:

- Combination meter initial operation (page 21-6)
- MIL blinking: If the MIL blinks, check the PGM-FI DTC
 - ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models (page 4-12)
 - MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models (page 4-46)

If the above items are OK, replace the combination meter (page 21-6).

TACHOMETER

SYSTEM INSPECTION

If the tachometer does not operate, check the following:

- Combination meter initial operation (page 21-6)
- Combination meter indication when the serial communication line is abnormal (page 4-3)
- CKP sensor
 - ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models (page 4-83)
 - MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models (page 5-9)

If the above items are OK, replace the combination meter (page 21-6).

COOLANT TEMPERATURE GAUGE/ECT SENSOR

SYSTEM INSPECTION

NOTE:

- If the coolant temperature gauge does not operate, refer to combination meter initial operation check (page 21-6).

If the coolant temperature gauge does not operate properly, check the following:

- MIL blinking: If the MIL blinks, check the PGM-FI DTC
 - ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models (page 4-12)
 - MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models (page 4-46)
- Combination meter indication when the serial communication line is abnormal (page 4-3)
- ECT sensor (page 21-11)

If the above items are OK, replace the combination meter (page 21-6).

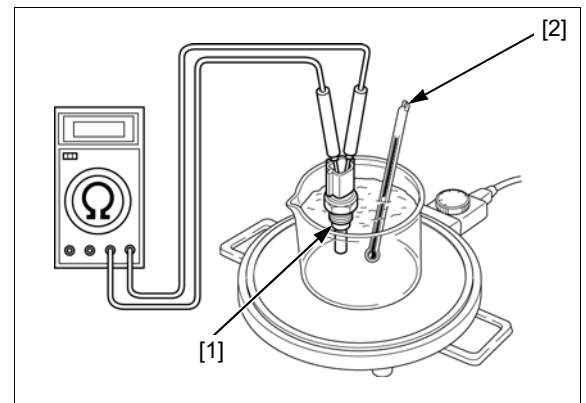
ECT SENSOR INSPECTION

Remove the ECT sensor (page 4-79).

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 4-79).

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 21-6).

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 21-12).

If the engine oil pressure indicator stays on after the engine is started, stop the engine immediately and confirm the indication conditions:

- 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 21-12)
 - Engine oil pressure (page 9-4)

If the above items are OK, replace the combination meter (page 21-6).

EOP SWITCH LINE INSPECTION

Turn the ignition switch OFF.

Disconnect the EOP switch wire (page 21-13).

Engine oil pressure indicator does not come on when the ignition switch is turned ON

Remove the EOP switch wire terminal (page 21-13).

Ground the wire terminal with a jumper wire.

Turn the ignition switch ON and check the oil pressure indicator.

The indicator should come on.

If the indicator comes on, replace the EOP switch (page 21-13).

If the indicator does not come on, check for an open circuit in the Black wire between the EOP switch and combination meter.

If the wires are normal, replace the combination meter.

Indicator stays on while the engine is running

Remove the EOP switch wire terminal (page 21-13).

Turn the ignition switch ON and check the oil pressure indicator.

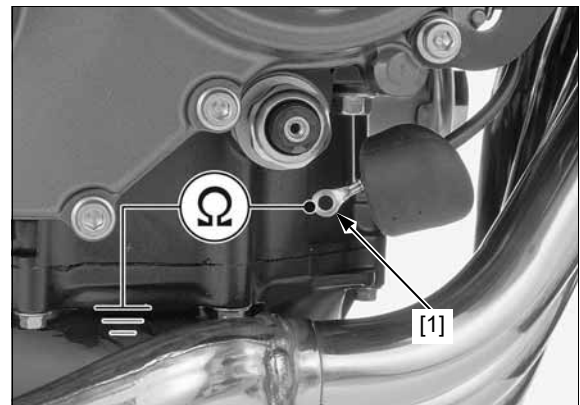
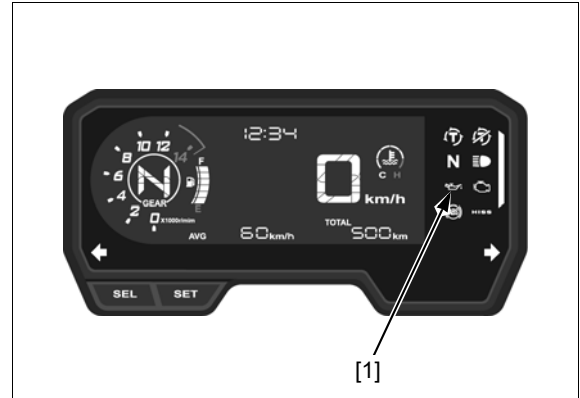
If the indicator does not come on, check the following:

- Engine oil level (page 3-10)
- Engine oil pressure (page 9-4)

If they are normal, replace the EOP switch (page 21-13).

If the indicator comes on, check for short circuit in the Black wire between the EOP switch and combination meter.

If the wires are OK, replace the combination meter.



EOP SWITCH REMOVAL/ INSTALLATION

Remove the under cowl (page 2-11) (CBR650RA).

Place the motorcycle on its sidestand on a level surface.

Release the rubber cap [1].

Remove the terminal screw [2] and disconnect the switch wire [3].

Remove the EOP switch [4].

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 (TB1207B manufactured by ThreeBond or an equivalent) to the EOP switch threads. Do not apply to the sensor tip in the area as shown.

TORQUE:

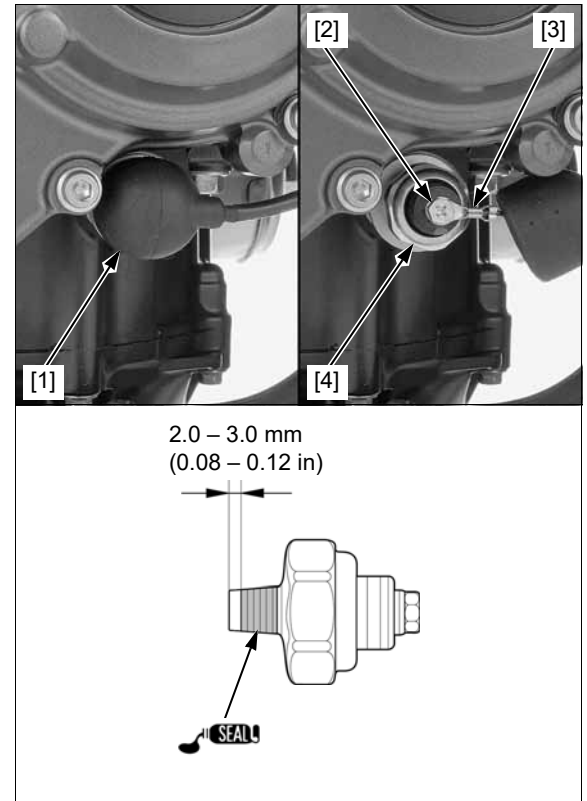
EOP switch:

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

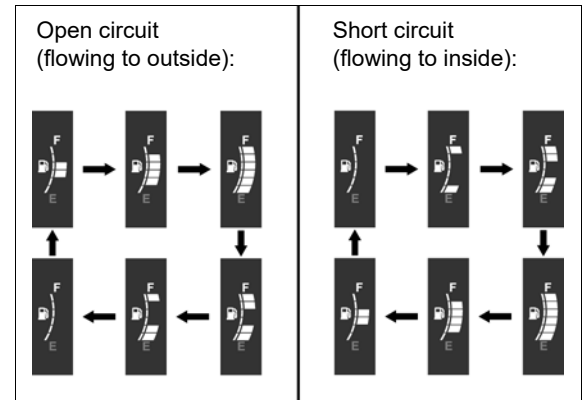
FUEL GAUGE INSPECTION

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 wire between the combination meter and fuel pump unit.

- CBR650RA (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models): Pink or Red/black wire
- CBR650RA (MA, IIMA, TH, IITH, U, IIU, IIBR models): Pink or Yellow/white wire
- CB650RA (ED, IIIED, FO, KO models): Red/black wire
- CB650RA (MA, IN, TH, U, BR models): Yellow/white wire

If the wire is OK, check the fuel level sensor (page 21-14).

If the fuel level sensor is OK, replace the combination meter (page 21-6).



LIGHTS/METERS/SWITCHES

FUEL LEVEL SENSOR INSPECTION

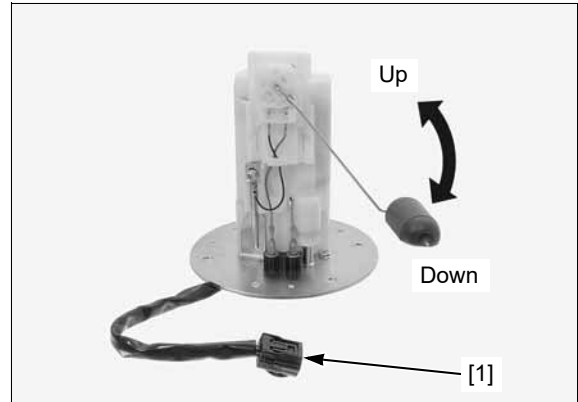
Remove the fuel pump unit (page 7-9).

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)	6 – 10 Ω	384 – 396 Ω

If the resistance is out of specification, replace the fuel level sensor (page 21-14).



REMOVAL/INSTALLATION

Remove the fuel pump unit (page 7-9).

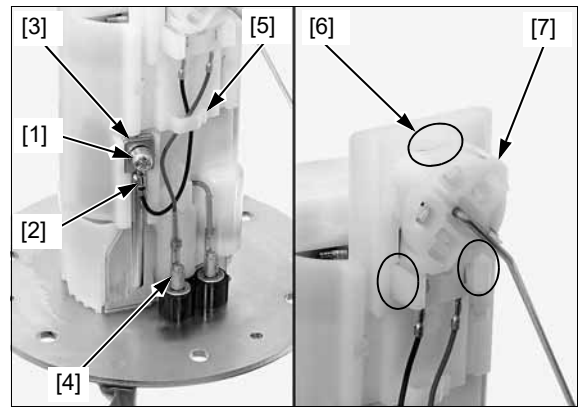
Remove the screw [1], Black wire terminal [2] and stopper [3].

Disconnect the Pink wire connector [4].

Release the wires from the guides [5] of the fuel pump unit.

Press the tabs [6] and remove the fuel level sensor assembly [7] from the fuel pump unit.

Installation is in the reverse order of the removal.



IGNITION SWITCH

INSPECTION

Remove the ignition switch cover (page 21-15).

Remove the dust cover [1] and disconnect the ignition switch 2P (Brown) connector [2].

Check for continuity between the switch side 2P (Brown) connector terminals in each switch position according to the continuity chart.

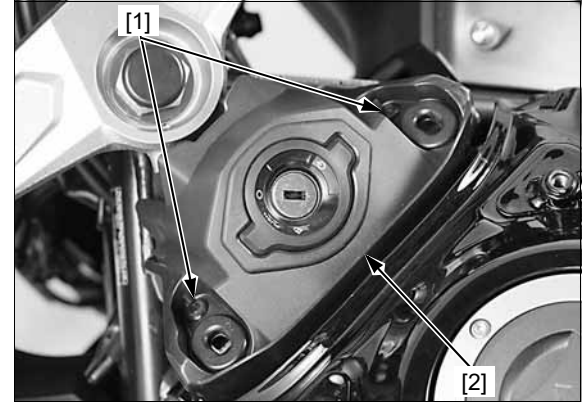
- CBR650RA: ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models (page 23-2)
- CBR650RA: MA, IIMA, TH, IITH, U, IIU, IIBR models (page 23-3)
- CB650RA: ED, IIIED, FO, KO models (page 23-4)
- CB650RA: MA, IN, TH, U, BR models (page 23-5)



REMOVAL/INSTALLATION

Remove the tank cover (page 2-7).

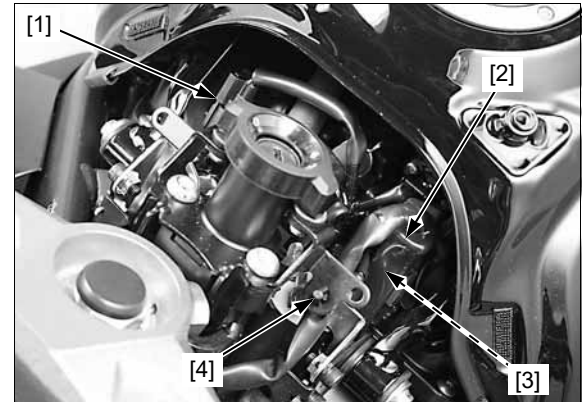
Remove the two clips [1] and ignition switch cover [2].



Disconnect the immobilizer receiver 4P (Black) connector [1].

Remove the dust cover [2] and disconnect the ignition switch 2P (Brown) connector [3].

Remove the wire clip [4].



Remove the following:

- Two socket bolts [1]
- Immobilizer receiver mount stay [2]
- Ignition switch [3]
- Ignition switch mount stay [4]
- Two screws [5]
- Immobilizer receiver [6]
- Two washers [7]
- Two collars [8]
- Two grommets [9]

Route the wires properly (page 1-22)

Install the removed parts in the reverse order of removal.

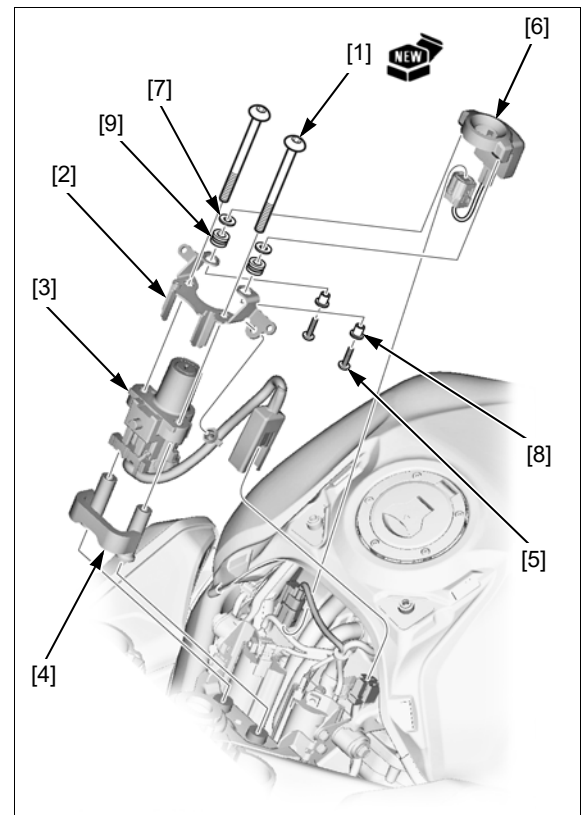
TORQUE:

Ignition switch mounting bolt:

27 N·m (2.8 kgf·m, 20 lbf·ft)

NOTE:

- Replace the switch mounting socket bolts with new ones.
- If the ignition switch is replaced, perform the key registration procedures (page 22-7).



HANDLEBAR SWITCH

LEFT HANDLEBAR SWITCH

CBR650RA:

Remove the left middle cowl (page 2-7).

Disconnect the left handlebar switch 10P (Gray) connector [1].

Check for continuity between the switch side 10P (Gray) connector terminals in each switch position according to the continuity chart.

- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models (page 23-2)
- MA, IIMA, TH, IITH, U, IIU, IIBR models (page 23-3)



CB650RA:

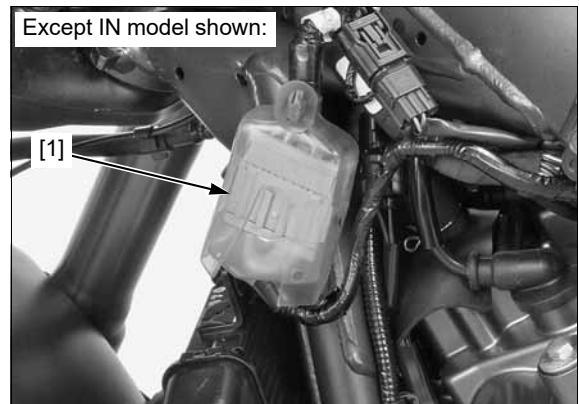
Remove the left shroud (page 2-10).

Disconnect the following:

- Left handlebar switch 14P (Gray) connector [1] (Except IN model)
- Left handlebar switch 10P (Gray) connector (IN model)

Check for continuity between the switch side connector terminals in each switch position according to the continuity chart.

- ED, IIIED, FO, KO models (page 23-4)
- MA, IN, TH, U, BR models (page 23-5)



RIGHT HANDLEBAR SWITCH

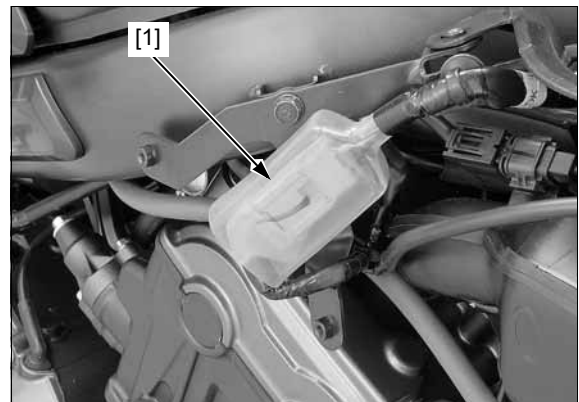
CBR650RA:

Remove the right middle cowl (page 2-7).

Disconnect the right handlebar switch 6P (Gray) connector [1].

Check for continuity between the switch side 6P (Gray) connector terminals in each switch position according to the continuity chart.

- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models (page 23-2)
- MA, IIMA, TH, IITH, U, IIU, IIBR models (page 23-3)



CB650RA:

Remove the right shroud (page 2-10).

Disconnect the right handlebar switch 5P (Gray) connector [1].

Check for continuity between the switch side 5P (Gray) connector terminals in each switch position according to the continuity chart.

- ED, IIIED, FO, KO models (page 23-4)
- MA, IN, TH, U, BR models (page 23-5)



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.

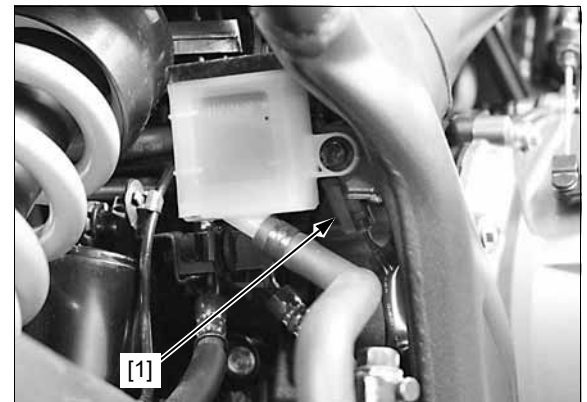


REAR

Disconnect the rear brake light switch 2P (Black) connector [1].

Check for continuity between the switch side connector terminals.

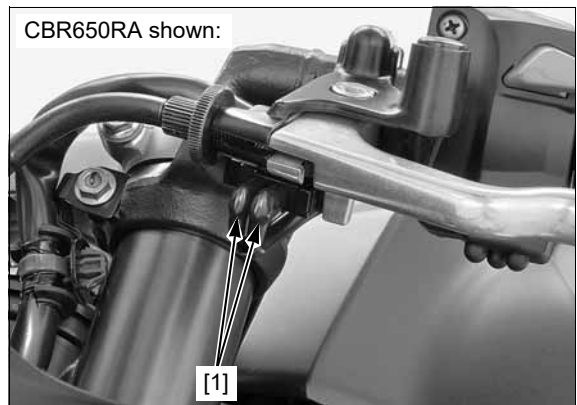
There should be continuity with the brake pedal depressed, and no continuity when the brake pedal is released.



CLUTCH SWITCH

Disconnect the clutch switch connectors [1] and check for continuity between the switch terminals.

There should be continuity with the clutch lever squeezed, and no continuity when the clutch lever is released.



SIDESTAND SWITCH

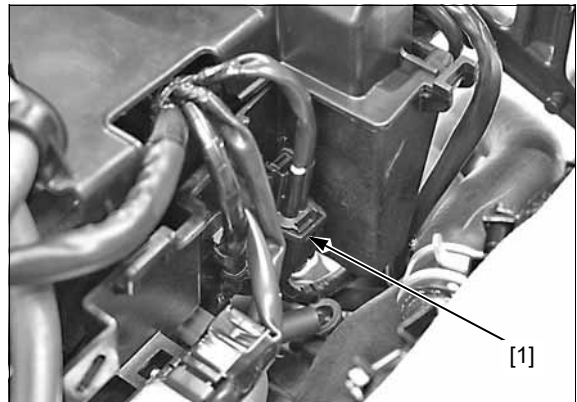
INSPECTION

Remove the throttle body (page 7-13).

Disconnect the sidestand switch 2P (Black) connector [1].

Check for continuity between the switch side connector terminals.

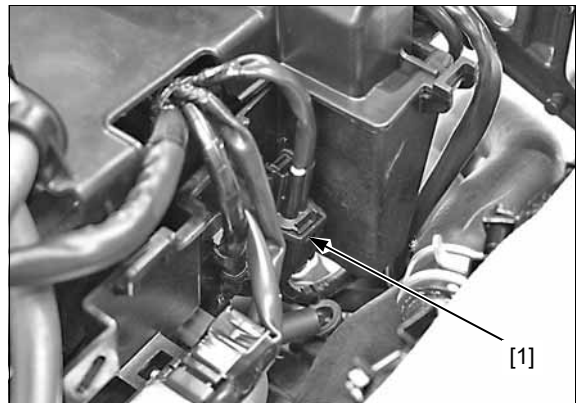
There should be continuity with the sidestand retracted, and, no continuity when the sidestand is lowered.



REMOVAL/INSTALLATION

Remove the throttle body (page 7-13).

Disconnect the sidestand switch 2P (Black) connector [1] and remove the sidestand switch wire [2] out of the frame.



Remove the bolt [1] and sidestand switch [2].

Installation is in the reverse order of removal.

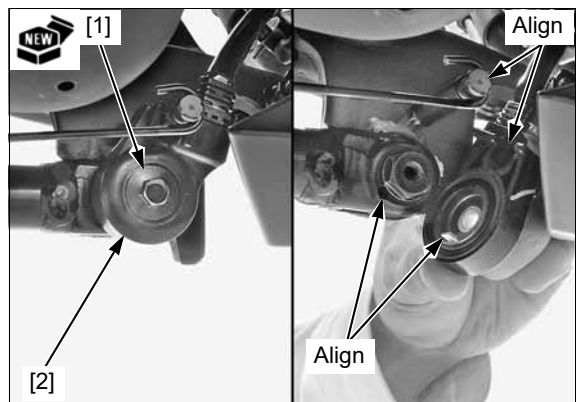
NOTE:

- Align the switch pin with the hole in the sidestand and the switch groove with the return spring pin.
- Replace the switch bolt with a new one.

TORQUE:

Sidestand switch mounting bolt:

10 N·m (1.0 kgf·m, 7 lbf·ft)



HORN

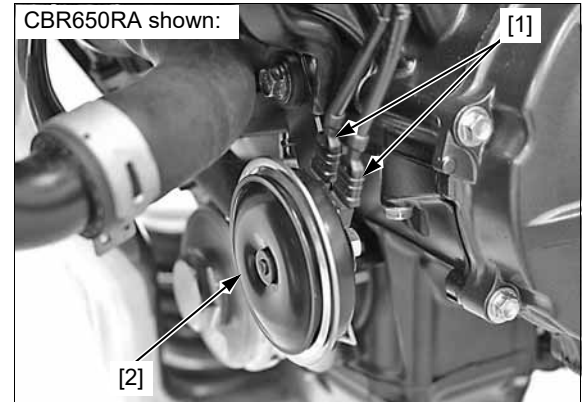
INSPECTION

Remove the left middle cowl (page 2-7) (CBR650RA).

Disconnect the connectors [1] from the horn [2].

Connect a 12 V battery to the horn terminals.

The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.



REMOVAL/INSTALLATION

Remove the left middle cowl (page 2-7) (CBR650RA).

Disconnect the connectors [1].

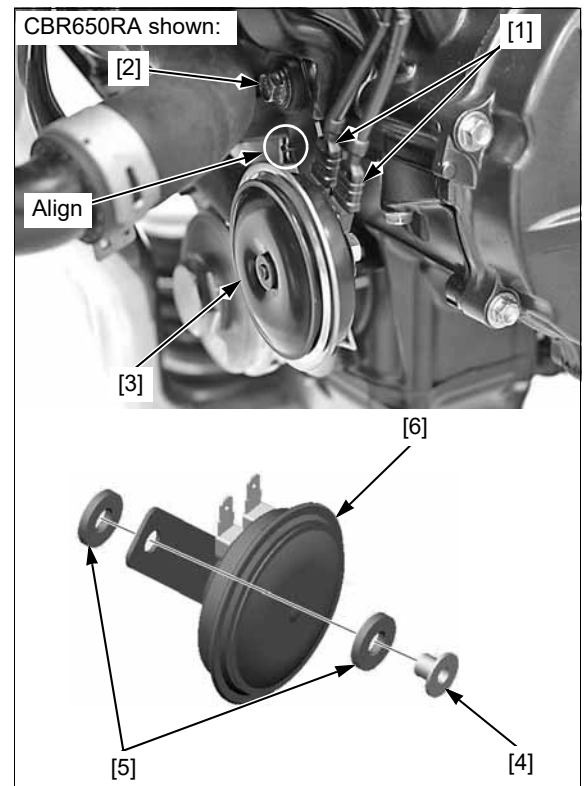
Remove the mounting bolt [2] and horn assembly [3].

Remove the collar [4], two rubber mounts [5] from the horn [6].

Installation in the reverse order of removal.

NOTE:

- When tightening the mounting bolt, align the stay end of the horn with the stopper of the frame.



HSTC (Honda Selectable Torque Control) SYSTEM

NOTE:

- The HSTC system utilizes various PGM-FI/ABS components. If any of the related items and/or circuit has problem, the system will fail and the torque control indicator remains on in order to notify the rider of the problem.
- If any DTC is indicated, repair the malfunctioned part(s) first.

SYSTEM INSPECTION

PRE-START SELF-DIAGNOSIS PROCEDURE

1. Turn the ignition switch ON and engine stop switch "O".
2. The torque control indicator turns ON.
3. Start the engine.
4. Test ride the motorcycle and increase the motorcycle speed to approximately 10 km/h (6 mph).
5. The system is normal if the indicator goes off.

TORQUE CONTROL INDICATOR REMAINS ON AFTER THE PRE-START SELF DIAGNOSIS IS COMPLETED, OR IT TURNS AND REMAINS ON WHILE RIDING.

Check the following:

- No PGM-FI DTC
 - ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models (page 4-12)
 - MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models (page 4-46)
- No ABS DTC (page 19-10)
- Combination meter serial communication line (page 21-7)

If all of the above items are normal, replace the combination meter with a known good one (page 21-6) and recheck the torque control indicator.

TORQUE CONTROL CAN NOT BE TURNED OFF BY PRESSING THE TORQUE CONTROL SWITCH

Check the following:

- CBR650RA: Green/white wire between the torque control switch and ECM for open or short circuit.
- CB650RA: Yellow/red wire between the torque control switch and ECM for open or short circuit.
- Green wire between the torque control switch and ground for open circuit.
- Torque control switch (page 21-20)
- Combination meter serial communication line (page 21-7)

If all of the above items are normal, replace the ECM with a known good one and recheck.

TORQUE CONTROL SWITCH INSPECTION

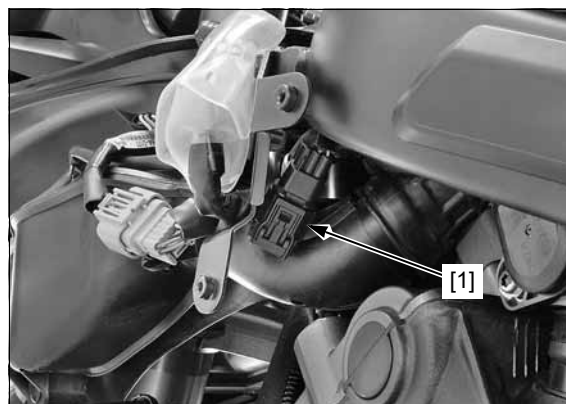
CBR650RA:

Remove the left middle cowl (page 2-7).

Disconnect the Torque control switch 3P (Black) connector [1].

Check for continuity between the switch side 3P (Black) connector terminals in each switch position according to the continuity chart.

- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models (page 23-2)
- MA, IIMA, TH, IITH, U, IIU, IIBR models (page 23-3)



CB650RA:

Remove the left shroud (page 2-10).

Disconnect the Torque control switch 3P (Black) connector [1].

Check for continuity between the switch side 3P (Black) connector terminals in each switch position according to the continuity chart.

- ED, IIIED, FO, KO models (page 23-4)
- MA, IN, TH, U, BR models (page 23-5)



TURN SIGNAL RELAY

REMOVAL/INSTALLATION

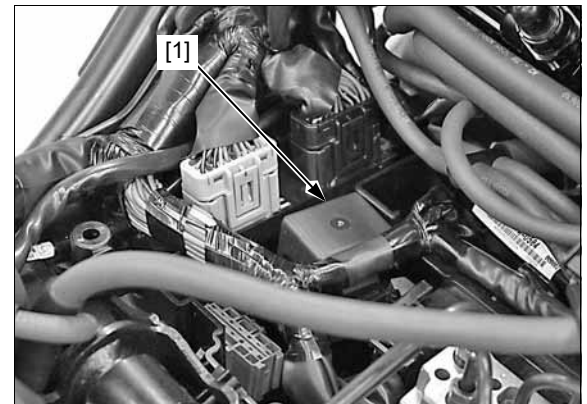
Remove the ABS modulator cover (page 4-76).

Turn the ignition switch OFF.

Remove the turn signal relay [1] from the stay.

Disconnect the 8P (Gray) connector.

Installation is in the reverse order of removal.



SYSTEM INSPECTION

NOTE:

- If any LED in the turn signal light does not turn on, replace the turn signal light (page 21-4).
- The turn signal lights are controlled by the LED turn signal relay.
- CB650RA (Except IN model): The front turn signal lights have position light function.
- If there is an open circuit in the one (front or rear) turn signal light, the other turn signal light blinks faster than usual in order to notify the rider of the problem.
- The hazard flasher system can be operated with the ignition switch turned ON.
- Check the following before troubleshooting:
 - Battery condition
 - 7.5A METER/HORN/TAIL/TURN fuse
 - Turn signal switch and hazard switches

ESS SYSTEM INSPECTION

NOTE:

- While the hazard system is operating, the ESS system will not operate.

Check the following:

- No ABS DTC indicated (page 19-7)
- Turn signal light operating
- Hazard system operating
- Turn signal relay (page 21-21)
- Brake light switch (page 21-17)
- Brake light switch line open circuit (page 21-22)
- Brake light switch line short circuit (page 21-23)
- ESS line open circuit (page 21-23)
- ESS line short circuit (page 21-23)

NOTE:

- Even if any turn signal lights are abnormal, other normal turn signal lights will work with the ESS system.
- If the ESS system operates at all times, replace the ABS modulator with a new one (page 19-26).

To forcibly activate the ESS system, perform the procedure as follows:

1. Connect the SCS short connector to the DLC (page 4-9).
2. Turn the ignition switch ON.
3. Apply the front or rear brake and check the turn signal lights operation.

The turn signal lights should be blinking with the brake applied and turning OFF with the brake released.

BRAKE LIGHT SWITCH LINE OPEN CIRCUIT INSPECTION

Disconnect the following:

- Right handlebar switch 6P (Gray) connector (page 21-16) (CBR650RA)
- Right handlebar switch 5P (Gray) connector (page 21-16) (CB650RA)
- Rear brake light switch 2P (Black) connector (page 21-17)
- ABS modulator 18P (Black) connector (page 19-9)

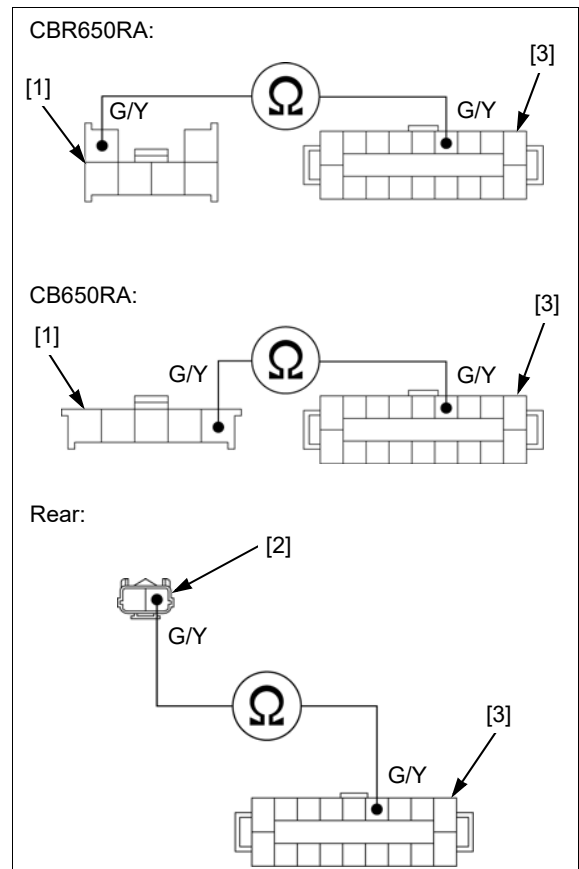
Check for continuity between the right handlebar switch (Gray) [1], rear brake light switch 2P (Black) [2] and ABS modulator 18P (Black) [3] connector terminals at the harness side.

CONNECTION:

Green/yellow – Green/yellow

There should be continuity.

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



BRAKE LIGHT SWITCH LINE SHORT CIRCUIT INSPECTION

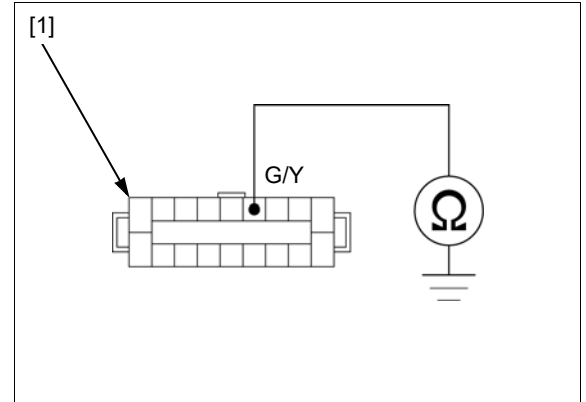
Disconnect the ABS modulator 18P (Black) connector (page 19-9).

Check for continuity between the ABS modulator 18P (Black) connector [1] terminal and ground.

CONNECTION: Green/yellow – Ground

There should be no continuity.

If there is continuity, check for short circuit in Green/yellow wire.



ESS LINE OPEN CIRCUIT INSPECTION

Disconnect the following:

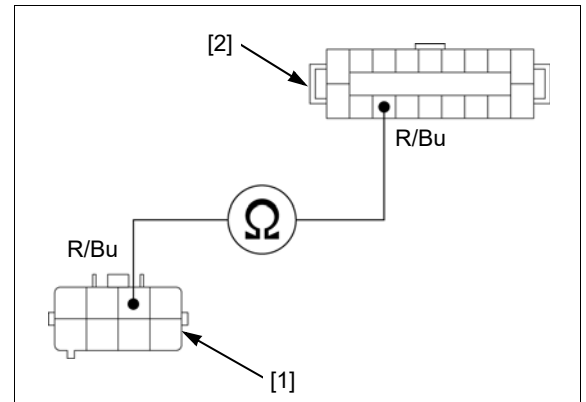
- Turn signal relay 8P (Gray) connector (page 21-21)
- ABS modulator 18P (Black) connector (page 19-9)

Check for continuity between the turn signal relay 8P (Gray) connector [1] and ABS modulator 18P (Black) connector [2] terminals at the harness side.

CONNECTION: Red/blue – Red/blue

There should be continuity.

If there is no continuity, check for open circuit in Red/blue wire.



ESS LINE SHORT CIRCUIT INSPECTION

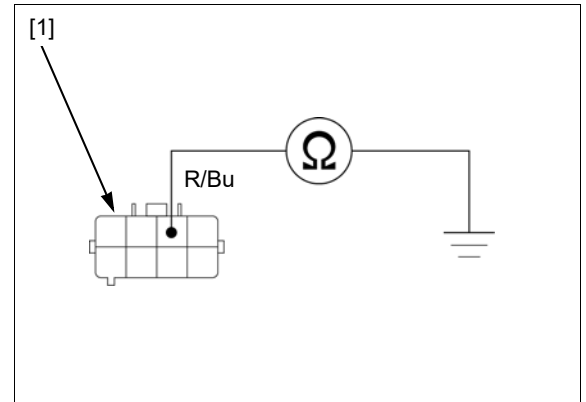
Disconnect the turn signal relay 8P (Gray) connector (page 21-21).

Check for continuity between the turn signal relay 8P (Gray) connector [1] terminal and ground.

CONNECTION: Red/blue – Ground

There should be no continuity.

If there is continuity, check for short circuit in Red/blue wire.



CONTROL RELAY

RELAY REMOVAL/INSTALLATION

MAIN RELAY/FUEL PUMP RELAY/FAN CONTROL RELAY

Remove the main seat (page 2-11).

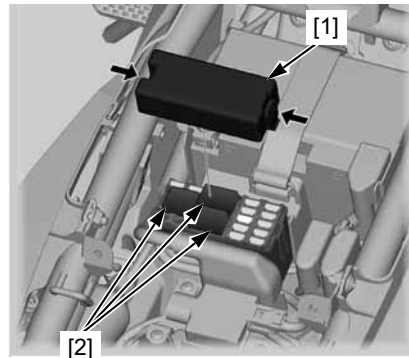
Turn the ignition switch OFF.

Remove the fuse/relay box cover [1], and remove the following relays [2] by pulling it up.

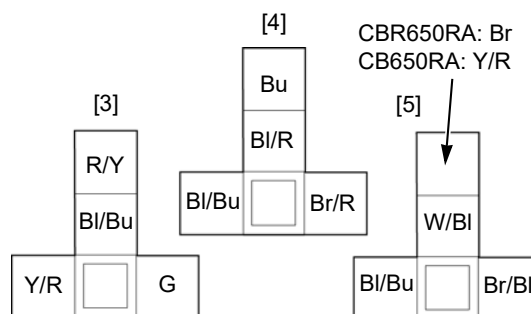
- Main relay [3]
- Fan control relay [4]
- Fuel pump relay [5]

Installation is in the reverse order of removal.

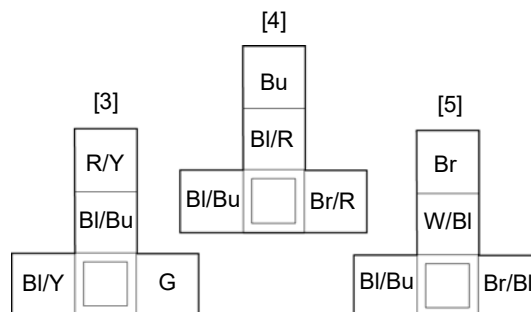
Except KO, IIKO U, IIU models shown:



ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models:



MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models:



RELAY INSPECTION

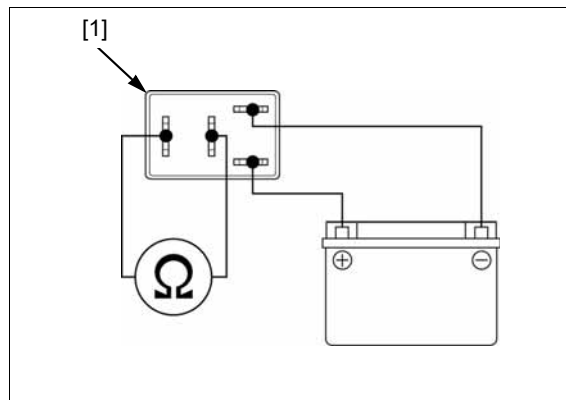
NOTE:

- 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 relay [1] terminals as shown.

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



USB CHARGER UNIT (Except KO, IIKO, U, IIU, BR, IIBR)

INSPECTION

Remove the main seat (page 2-11).

Turn the ignition switch OFF.

Disconnect the USB charger unit 2P (Black) connector [1].

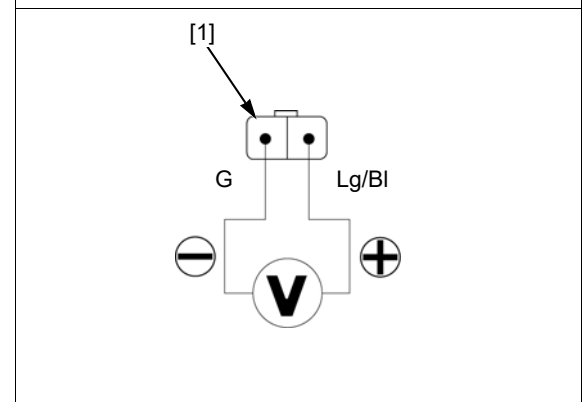
Turn the ignition switch ON.

Measure the voltage between the connector terminals.

CONNECTION: Light green/black (+) – Green (-)

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

- If there is no voltage, check for blown fuse (OP fuse 7.5 A) or an open circuit in the wire harness.
- If the fuse and the circuit are normal but the USB charger unit does not function, replace the a USB charger unit.



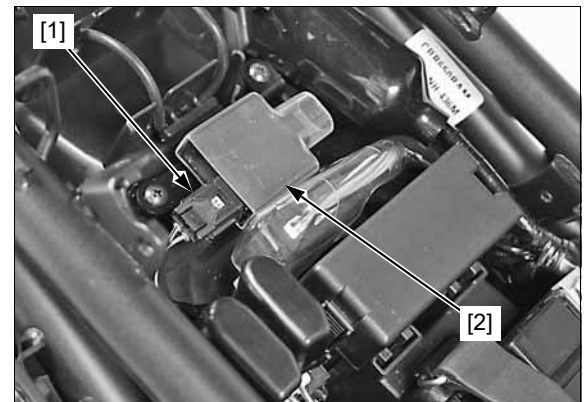
REMOVAL/INSTALLATION

Remove the main seat (page 2-11).

Turn the ignition switch OFF.

Disconnect the USB charger unit 2P (Black) connector [1] and remove the USB charger unit [2].

Installation is in the reverse order of removal.



MEMO

22. IMMOBILIZER SYSTEM (HISS)

SERVICE INFORMATION.....	22-2	KEY REGISTRATION PROCEDURES (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)	22-7
SYSTEM LOCATION	22-2	DIAGNOSTIC CODE INDICATION	22-11
SYSTEM DIAGRAM	22-3	TROUBLESHOOTING	22-13
KEY REGISTRATION PROCEDURES (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models)	22-4	IMMOBILIZER RECEIVER	22-14
		REPLACEMENT PARTS FOR PROBLEM ..	22- 17

IMMOBILIZER SYSTEM (HISS)

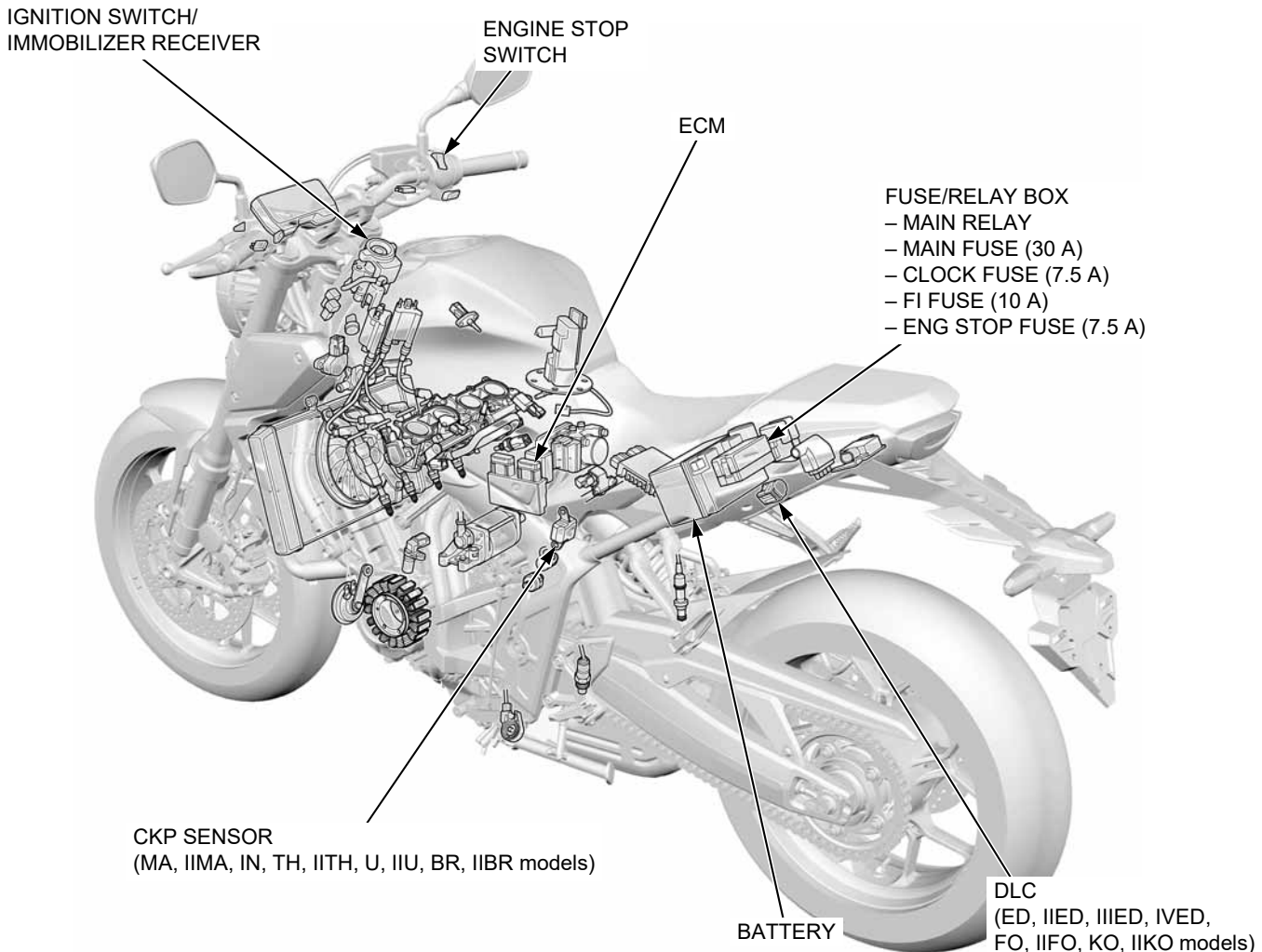
SERVICE INFORMATION

GENERAL

- When checking the immobilizer system (HISS), follow the steps in the troubleshooting flow chart (page 22-13).
- Keep the immobilizer key away from the other vehicle's immobilizer key when using it. The jamming of the key code signal may occur and the proper operation of the system will be obstructed.
- The key has built-in electronic part (transponder). Do not drop and strike the key against a hard material object, and do not leave the key on the dashboard in the car, etc. where the temperature will rise. Do not leave the key in the water for a prolonged time such as by washing the clothes.
- The ECM as well as the transponder keys must be replaced if all transponder keys have been lost.
- The system does not function with a duplicated key unless the code is registered into the transponder with the immobilizer system (HISS).
- The ECM can store up to four key codes (The four keys can be registered).
- Do not modify the immobilizer system as it can cause the system failure (The engine cannot be started).
- For ignition system inspection (page 5-7).
- For ignition switch inspection (page 21-14).
- For engine stop switch inspection (page 21-16).
- ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models: If the ECM is replaced, perform the following procedure.
 - Key Registration Procedures (page 22-4)
 - Crank pulse initialize learning procedure (page 4-84)
- MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models: If the ECM is replaced, perform the Key Registration Procedures (page 22-7).
- The following color codes are used throughout this section.

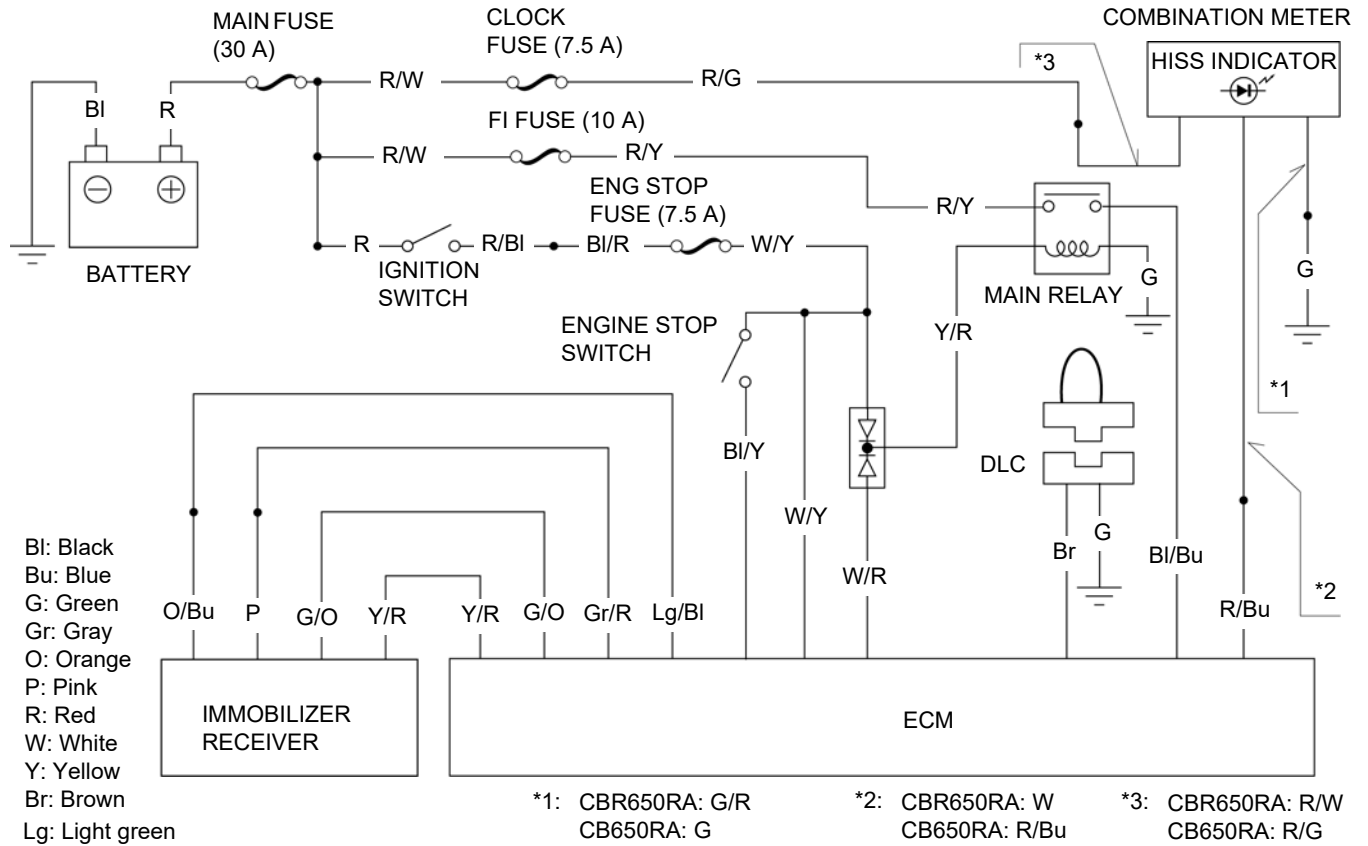
Bl = Black	G = Green	Lg = Light Green	R = Red
Br = Brown	Gr = Gray	O = Orange	W = White
Bu = Blue	Lb = Light Blue	P = Pink	Y = Yellow

SYSTEM LOCATION

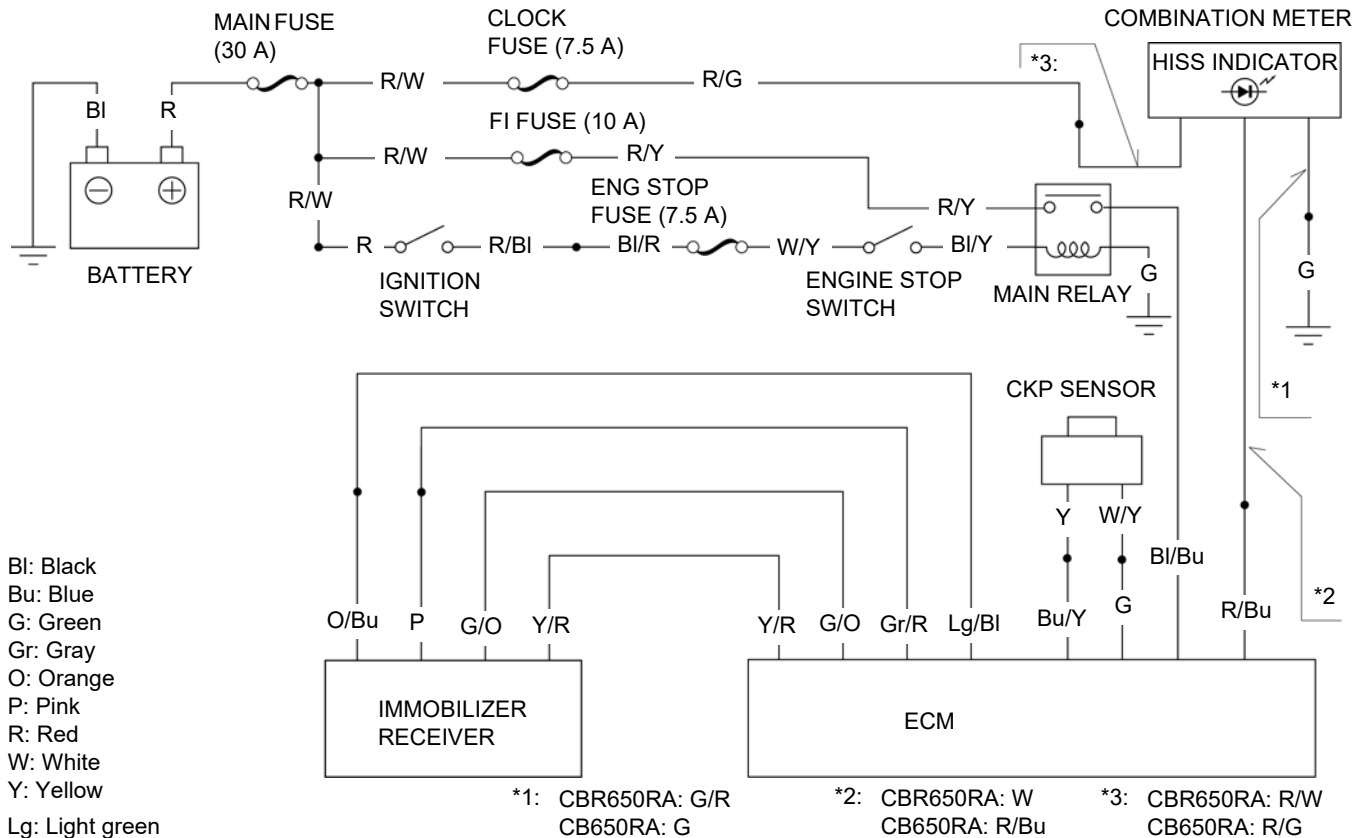


SYSTEM DIAGRAM

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models



MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models

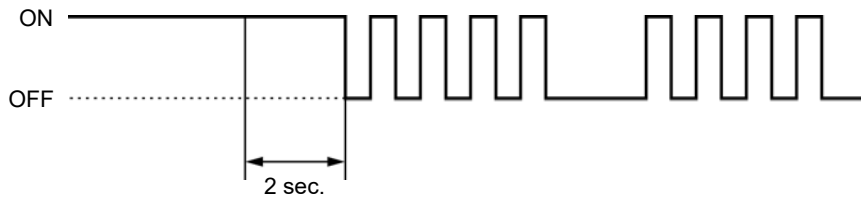


IMMOBILIZER SYSTEM (HISS)

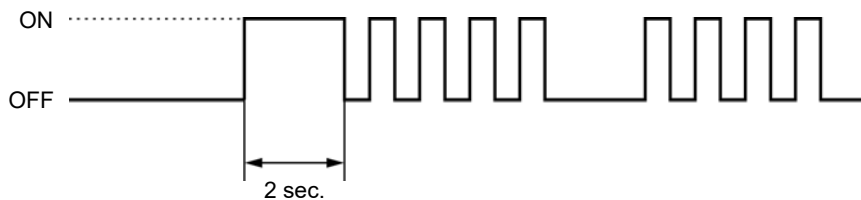
KEY REGISTRATION PROCEDURES (ED, IIED, IIED, IVED, FO, IIFO, KO, IIKO models)

When the key has been lost, or additional spare key is required:

1. Obtain a new transponder key.
2. Grind the key in accordance with the shape of the original key.
3. Connect the SCS short connector to the DLC (page 22-11).
4. Open the throttle grip 5 ° to 60 ° and hold.
5. Turn the engine stop switch "O" and the ignition switch ON with the original key. The HISS indicator comes on and it remains on.
 - The code of the original key recognized by the ECM.
 - If there is any problem in the immobilizer system (HISS), the system will enter the diagnostic mode and the indicator will remain on for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
6. Wait two seconds or more, then completely close the throttle grip.
7. Wait two seconds or more, then open the throttle grip fully and hold.
8. Wait two seconds or more, then the indicator remains on for approx. two seconds, then it blinks four times repeatedly.



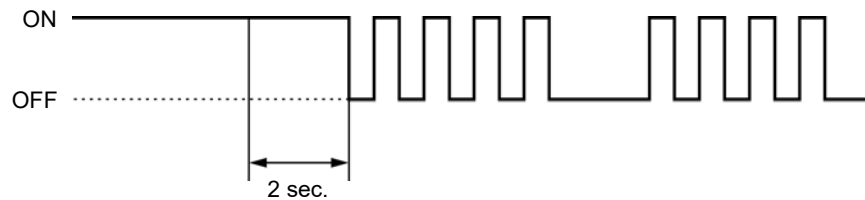
- The immobilizer system (HISS) enters the registration mode. Registrations of all key except the original key inserted in the ignition switch are cancelled (Registration of the lost key or spare key is cancelled). The spare key must be registered again.
 - Complete the procedure 5 through 7 within 25 seconds. If 25 seconds or more have passed, restart from the step 4.
9. Turn the ignition switch OFF and remove the key. Completely close the throttle grip.
 10. Open the throttle grip 5 ° to 60 ° and hold.
 11. Turn the ignition switch ON with a new key or the spare key (Never use the key registered in previous steps). The indicator comes on for two seconds then it blinks four times repeatedly.



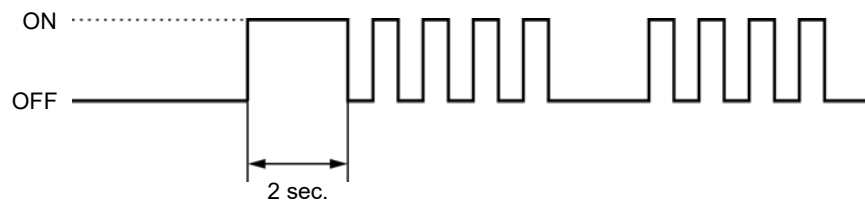
- The new key or spare key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
 - Keep the other transponder key away from the immobilizer receiver more than 50 mm (2.0 in).
12. Turn the ignition switch OFF and remove the key. Completely close the throttle grip.
 13. Repeat the steps 9 through 11 when you continuously register the other new key.
 - The ECM can store up to four key codes (The four keys can be registered).
 14. Disconnect the SCS short connector.
 15. Turn the ignition switch ON with the registered key.
 - The immobilizer system (HISS) returns to the normal mode.
 16. Check that the engine can be started using all registered keys.

When the ignition switch is faulty:

1. Obtain a new ignition switch assembly.
2. Remove the ignition switch (page 21-14).
3. Connect the SCS short connector to the DLC (page 22-11).
4. Set the original (registered) key near the immobilizer receiver so that the transponder in the key can communicate with the receiver.
5. Open the throttle grip 5 ° to 60 ° and hold.
6. Turn the engine stop switch "O". Connect a new ignition switch to the wire harness and turn it to ON with a new transponder key (keep the ignition switch away from the receiver). The HISS indicator comes on and it remains on.
 - The code of the original key is recognized by the ECM.
 - If there is any problem in the immobilizer system (HISS), the system will enter the diagnostic mode and the indicator will remain on for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
7. Wait two seconds or more, then completely close the throttle grip.
8. Wait two seconds or more, then open the throttle grip fully and hold.
9. Wait two seconds or more, then the indicator remains on for approx. two seconds, then it blinks four times repeatedly.



- The immobilizer system (HISS) enters the registration mode. Registrations of all key except the original key set near the receiver are cancelled.
 - Complete the procedure 6 through 8 within 25 seconds. If 25 seconds or more have passed, restart from the step 5.
10. Turn the ignition switch OFF and remove the key. Completely close the throttle grip.
 11. Install the ignition switch (page 21-14).
 12. Open the throttle grip 5 ° to 60 ° and hold.
 13. Turn the ignition switch ON with a first new key. The indicator comes on for two seconds then it blinks four times repeatedly.



- The first new key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
14. Turn the ignition switch OFF then completely close the throttle grip. Disconnect the SCS short connector.
 15. Turn the ignition switch ON (with the first new key registered in step 13). The HISS indicator comes on for two seconds then it goes off.
 - The immobilizer system (HISS) returns to the normal mode.
 16. Turn the ignition switch OFF and connect the SCS short connector.
 17. Open the throttle grip 5 ° to 60 ° and hold.

IMMOBILIZER SYSTEM (HISS)

18. Turn the ignition switch ON (with the first new key registered in step 13). The HISS indicator comes on and it remains on.
 - The code of the first new key is recognized by the ECM.
 - If there is any problem in the immobilizer system (HISS), the system will enter the diagnostic mode and the indicator will remain on for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
19. Wait two seconds or more, then completely close the throttle grip.
20. Wait two seconds or more, then open the throttle grip fully and hold.
21. Wait two seconds or more, then the indicator remains on for approx. two seconds, then it blinks four times repeatedly.
 - The immobilizer system (HISS) enters the registration mode. Registration of the original key used in step 5 is cancelled.
 - Complete the procedure 18 through 20 within 25 seconds. If 25 seconds or more have passed, restart from the step 17.
22. Turn the ignition switch OFF and remove the key. Completely close the throttle grip.
23. Open the throttle grip 5 ° to 60 ° and hold.
24. Turn the ignition switch ON with a second new key (Never use the key registered in previous step). The indicator comes on for two seconds then it blinks four times repeatedly.
 - The second new key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
 - Keep the other transponder key away from the immobilizer receiver more than 50 mm (2.0 in).
25. Repeat the steps 22 and 24 when you continuously register the other new key.

The ECM can store up to four key codes (The four keys can be registered).
26. Turn the ignition switch OFF, then completely close the throttle grip. Disconnect the SCS short connector.
27. Turn the ignition switch ON with the registered key.
 - The immobilizer system (HISS) returns to the normal mode.
28. Check that the engine can be started using all registered keys.

When all keys have been lost:

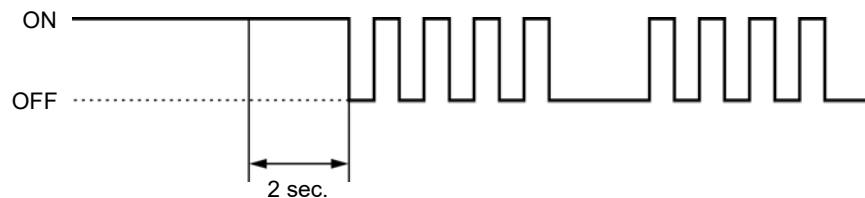
1. Obtain a new ECM and new key set.
2. Replace the ignition switch with a new one (page 21-14).
3. Replace the ECM with a new one (page 4-76).
4. Turn the engine stop switch "O" and the ignition switch ON with a first new key. The HISS indicator comes on for two seconds, then it blinks four times repeatedly.
 - The first new key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
5. Turn the ignition switch OFF and remove the first new key.
6. Turn the ignition switch ON with a second new key. The HISS indicator comes on for two seconds, then it blinks four times repeatedly.
 - The second new key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
7. Turn the ignition switch OFF and remove the second new key.
 - The system will not enter the normal mode unless the two keys are registered in ECM.
 - The third new key cannot be continuously registered. When it is necessary to register the third key, follow the procedures "When the key has been lost, or additional key is required" (page 22-4).
8. Check that the engine can be started using all registered keys.
9. Replace the remaining key set parts.

When the ECM is faulty:

1. Obtain a new ECM and two new transponder keys.
2. Grind the keys in accordance with the shape of the original key.
3. Replace the ECM with a new one (page 4-76).
4. Turn the engine stop switch "O" and the ignition switch ON with a first new key. The HISS indicator comes on for two seconds, then it blinks four times repeatedly.
 - The first new key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
5. Turn the ignition switch OFF and remove the first new key.
6. Turn the ignition switch ON with a second new key. The HISS indicator comes on for two seconds, then it blinks four times repeatedly.
 - The second new key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
7. Turn the ignition switch OFF and remove the second new key.
 - The system will not enter the normal mode unless the two keys are registered in ECM.
 - The third new key cannot be continuously registered. When it is necessary to register the third key, follow the procedures "When the key has been lost, or additional key is required" (page 22-4).
8. Check that the engine can be started using all registered keys.

**KEY REGISTRATION PROCEDURES
(MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)****When the key has been lost, or additional spare key is required:**

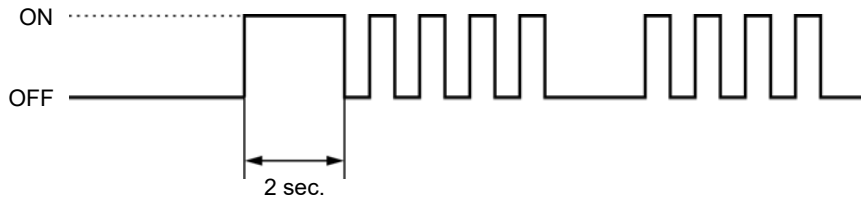
1. Obtain a new transponder key.
2. Grind the key in accordance with the shape of the original key.
3. Apply 12 V battery voltage to the CKP sensor lines of the ECM using the special tool (page 22-11).
4. Turn the engine stop switch "O" and the ignition switch ON with the original key. The HISS indicator comes on and it remains on.
 - The code of the original key recognized by the ECM.
 - If there is any problem in the immobilizer system (HISS), the system will enter the diagnostic mode and the indicator will remain on for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
5. Disconnect the red clip of the inspection adaptor from the battery positive (+) terminal for two seconds or more, then connect it again. The indicator remains on for approx. two seconds, then it blinks four times repeatedly.



- The immobilizer system (HISS) enters the registration mode. Registrations of all key except the original key inserted in the ignition switch are cancelled (Registration of the lost key or spare key is cancelled).
The spare key must be registered again.
6. Turn the ignition switch OFF and remove the key.

IMMOBILIZER SYSTEM (HISS)

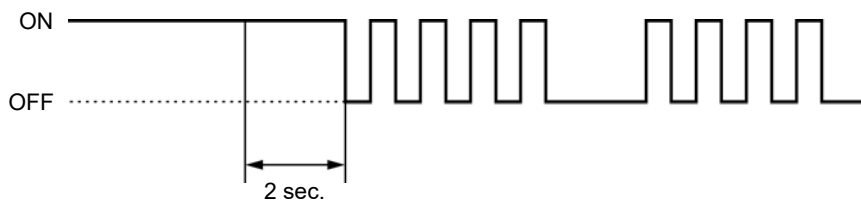
- Turn the ignition switch ON with a new key or the spare key (Never use the key registered in previous steps). The indicator comes on for two seconds then it blinks four times repeatedly.



- The new key or spare key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
 - Keep the other transponder key away from the immobilizer receiver more than 50 mm (2.0 in).
- Repeat the steps 6 and 7 when you continuously register the other new key.
The ECM can store up to four key codes (The four keys can be registered).
 - Turn the ignition switch OFF, remove the inspection adaptor and connect the CKP sensor 2P (Black) connector.
 - Turn the ignition switch ON with the registered key.
 - The immobilizer system (HISS) returns to the normal mode.
 - Check that the engine can be started using all registered keys.

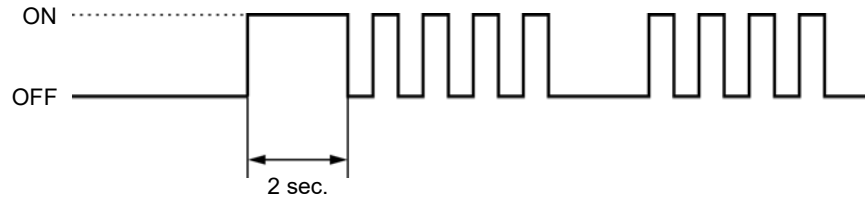
When the ignition switch is faulty:

- Obtain a new ignition switch assembly.
- Remove the ignition switch (page 21-14).
- Apply 12 V battery voltage to the CKP sensor lines of the ECM using the special tool (page 22-11).
- Set the original (registered) key near the immobilizer receiver so that the transponder in the key can communicate with the receiver.
- Turn the engine stop switch "O". Connect a new ignition switch to the wire harness and turn it to ON with a new transponder key (keep the ignition switch away from the receiver). The HISS indicator comes on and it remains on.
 - The code of the original key recognized by the ECM.
 - If there is any problem in the immobilizer system (HISS), the system will enter the diagnostic mode and the indicator will remain on for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
- Disconnect the red clip of the inspection adaptor from the battery positive (+) terminal for two seconds or more, then connect it again. The indicator remains on for approx. two seconds then it blinks four times repeatedly.



- The immobilizer system (HISS) enters the registration mode. Registrations of all key except the original key set near the receiver are cancelled.
- Turn the ignition switch OFF and remove the key.
 - Install the ignition switch (page 21-14).

- Turn the ignition switch ON with a first new key. The indicator comes on for two seconds then it blinks four times repeatedly.



- The first key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
- Turn the ignition switch OFF and disconnect the red clip of the inspection adaptor from the battery positive (+) terminal.
 - Turn the ignition switch ON (with the first key registered in step 9). The HISS indicator comes on for two seconds then it goes off.
 - The immobilizer system (HISS) returns to the normal mode.
 - Turn the ignition switch OFF and connect the red clip of the inspection adaptor to the battery positive (+) terminal.
 - Turn the ignition switch ON (with the first key registered in step 9). The HISS indicator comes on and it remains on.
 - The code if the first key is recognized by the ECM.
 - If there is any problem in the immobilizer system (HISS), the system will enter the diagnostic mode and the indicator will remain on for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
 - Disconnect the red clip of the inspection adaptor from the battery positive (+) terminal for two seconds or more, then connect it again. The indicator remains on for approx. two seconds then it blinks four times repeatedly.
 - The immobilizer system (HISS) enters the registration mode. Registration of the original key used in step 4 is cancelled.
 - Turn the ignition switch OFF and remove the key.
 - Turn the ignition switch ON with a second new key (Never use the key registered in previous step). The indicator comes on for two seconds then it blinks four times repeatedly.
 - The second key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
 - Keep the other transponder key away from the immobilizer receiver more than 50 mm (2.0 in).
 - Repeat the steps 15 and 16 when you continuously register the other new key.

The ECM can store up to four key codes (The four keys can be registered).
 - Turn the ignition switch OFF, remove the inspection adaptor and connect the CKP sensor 2P (Black) connector.
 - Turn the ignition switch ON with the registered key.
 - The immobilizer system (HISS) returns to the normal mode.
 - Check that the engine can be started using all registered keys.

When all keys have been lost:

- Obtain a new ECM and new key set.
- Replace the ignition switch with a new one (page 21-14).
- Replace the ECM with a new one (page 4-76).
- Turn the engine stop switch "O" and the ignition switch ON with a first new key. The HISS indicator comes on for two seconds, then it blinks four times repeatedly.
 - The first key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-11).
- Turn the ignition switch OFF and remove the first key.
- Turn the ignition switch ON with a second new key. The HISS indicator comes on for two seconds, then it blinks four times repeatedly.
 - The second key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-11).

IMMOBILIZER SYSTEM (HISS)

7. Turn the ignition switch OFF and remove the second key.
 - The system will not enter the normal mode unless the two keys are registered in ECM.
 - The third new key cannot be continuously registered. When it is necessary to register the third key, follow the procedures "When the key has been lost, or additional key is required" (page 22-7).
8. Check that the engine can be started using all registered keys.
9. Replace the remaining key set parts.

When the ECM is faulty:

1. Obtain a new ECM and two new transponder keys.
2. Grind the keys in accordance with the shape of the original key.
3. Replace the ECM with a new one (page 4-76).
4. Turn the engine stop switch "O" and the ignition switch ON with a first new key. The HISS indicator comes on for two seconds, then it blinks four times repeatedly.
 - The first key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
5. Turn the ignition switch OFF and remove the first key.
6. Turn the ignition switch ON with a second new key. The HISS indicator comes on for two seconds, then it blinks four times repeatedly.
 - The second key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-12).
7. Turn the ignition switch OFF and remove the second key.
 - The system will not enter the normal mode unless the two keys are registered in ECM.
 - The third new key cannot be continuously registered. When it is necessary to register the third key, follow the procedures "When the key has been lost, or additional key is required" (page 22-7).
8. Check that the engine can be started using all registered keys.

DIAGNOSTIC CODE INDICATION

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models

Turn the ignition switch OFF.

Remove the main seat (page 2-11).

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

TOOL:

SCS short connector [3] 070MZ-0010300

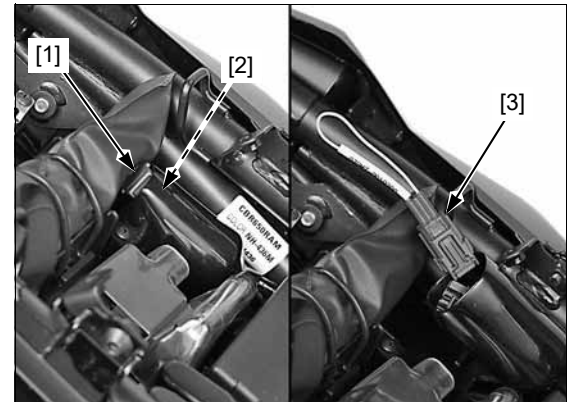
Open the throttle grip 5 ° to 60 ° and hold.

Turn the engine stop switch "O" and the ignition switch ON with the properly registered key.

The HISS indicator [1] will come on for approx. ten seconds then it will start blinking to indicate the diagnostic code if the system is abnormal.

The blinking frequency is repeated.

The HISS indicator remains on when the system is normal (The system is in the normal mode and the diagnostic code does not appear).



MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models

Turn the ignition switch OFF.

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

Connect the adaptors to the wire harness side connector.

Connect the Red clip [2] of the adaptor to the 12 V battery positive (+) terminal and Black clip [3] to the negative (-) terminal.

TOOLS:

[4] Inspection adaptor 07XMZ-MBW0101

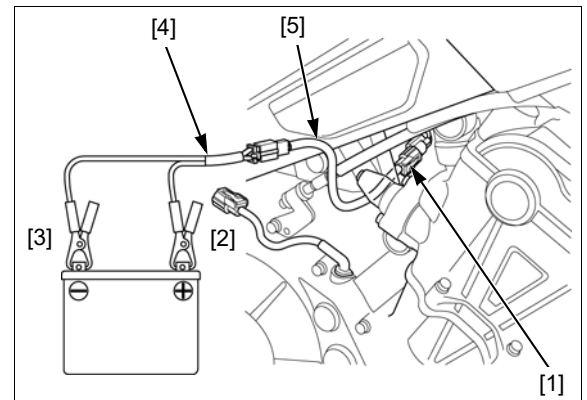
[5] Test harness adaptor 070MZ-MGE0100

Turn the engine stop switch "O" and the ignition switch ON with the properly registered key.

The HISS indicator will come on for approx. ten seconds then it will start blinking to indicate the diagnostic code if the system is abnormal.

The blinking frequency is repeated.

The HISS indicator remains on when the system is normal (The system is in the normal mode and the diagnostic code does not appear).



IMMOBILIZER SYSTEM (HISS)

DIAGNOSTIC CODE

When the system (ECM) enters the diagnostic mode from the normal mode:

BLINKING PATTERN	SYMPTOM	PROBLEM	PROCEDURE
<p>ON --- OFF --- 10 sec.</p>	ECM data is abnormal.	Faulty ECM	Replace the ECM.
	Code signals cannot send or receive.	Faulty immobilizer receiver or wire harness	Follow the troubleshooting (page 22-13).
	Identification code does not match.	Jamming by the other transponder	Keep the other vehicle's transponder key away from the immobilizer receiver more than 50 mm (2.0 in).
	Secret code does not match.		

When the system (ECM) enters the diagnostic mode from the registration mode:

BLINKING PATTERN	SYMPTOM	PROBLEM	PROCEDURE
<p>ON --- OFF --- 10 sec.</p>	Registration is overlapped.	The key is already registered properly.	Use a new key or cancelled key.
	Code signals cannot send or receive.	Communication fails	Follow the troubleshooting (page 22-13).
	Registration is impossible.	The key is already registered on the other system.	Use a new key.

TROUBLESHOOTING

The immobilizer indicator comes on for approx. two seconds then it goes off, when the ignition switch is turned ON with the properly registered key with the engine stop switch turned "O" and the immobilizer system (HISS) functions normally. If there is any problem or the properly registered key is not used, the indicator will remain on.

Immobilizer indicator does not operate properly

1. Combination Meter Initial Operation Check

Check the combination meter initial operation (page 21-6).

Is the initial operation displayed?

YES – GO TO STEP 2.

NO – Check the combination meter power/ground line (page 21-6).

2. Serial Communication Inspection

Check the combination meter indication when the serial communication line is abnormal (page 4-3).

Is the indication according to above condition?

YES – Check the serial communication line (page 21-7).

NO – Replace the combination meter, and recheck (page 21-8).

Immobilizer indicator remains on with the ignition switch turned ON

1. Immobilizer Receiver Jamming Inspection

Check that there is any metal obstruction or the other vehicle's transponder key near the immobilizer receiver and key.

Is there any metal obstruction or the other transponder key?

YES – Remove it and recheck.

NO – GO TO STEP 2.

2. First Transponder Key Inspection

Turn the ignition switch ON with the spare transponder key and check the immobilizer indicator. The indicator should come on for 2 seconds then go off.

Does the indicator go off?

YES – Faulty first transponder key

NO – GO TO STEP 3.

3. Diagnostic Code Inspection

Perform the diagnostic code indication procedure (page 22-11).

Check that the immobilizer indicator comes on then it starts blinking.

Does the indicator blink or stay lit?

BLINKS – Read the diagnostic code (page 22-12).

STAYS LIT – • ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models: Faulty ECM

• MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models: GO TO STEP 4.

4. CKP sensor Line Inspection (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)

Check the CKP sensor lines (page 5-9).

Is there continuity?

YES – • Open circuit in Yellow wire or Blue/yellow wire

• Open circuit in White/yellow wire or Green wire

NO – Faulty ECM

IMMOBILIZER SYSTEM (HISS)

Diagnostic code     is indicated (Code signals cannot send or receive)

1. Immobilizer Receiver Power Input Line Inspection

Check the immobilizer receiver power input line (page 22-15).

Is the input line normal?

YES – GO TO STEP 2.

NO – Open or short circuit in the Yellow/red wire

2. Immobilizer Receiver Ground Line Inspection

Check the immobilizer receiver ground line (page 22-15).

Is the ground line normal?

YES – GO TO STEP 3.

NO – Open circuit in the Green/orange wire

3. Immobilizer Receiver Signal Line Inspection

Check the immobilizer receiver signal lines (page 22-15).

Are the signal lines normal?





YES – GO TO STEP 4.

NO – Open or short circuit in the Gray/red wire

4. Immobilizer Receiver Inspection

Replace the immobilizer receiver with a known good one (page 22-16).

Perform the diagnostic code indication procedure (page 22-11).

Is the diagnostic code     indicated?

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

NO – Faulty original immobilizer receiver.

IMMOBILIZER RECEIVER

INSPECTION

Remove the following:

- Tank cover (page 2-7)
- Ignition switch cover (page 21-15)

Remove the immobilizer receiver 4P (Black) connector [1] from the stay and disconnect it.



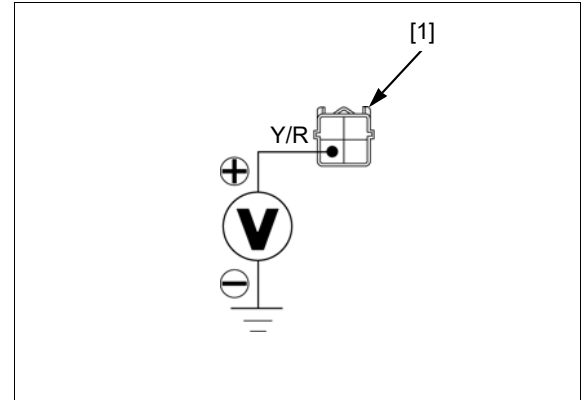
POWER INPUT LINE INSPECTION

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

Measure the voltage between the immobilizer receiver 4P (Black) connector [1] terminal of the wire harness side and ground.

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

There should be approx. 5 V.



GROUND LINE INSPECTION

Disconnect the ECM 33P connector (page 4-76).

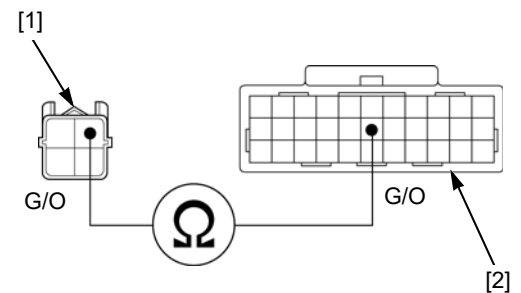
ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models

Check for continuity between the immobilizer receiver 4P (Black) connector [1] terminal and ECM 33P (Gray) connector [2] of the wire harness side.

CONNECTION: Green/orange – Green/orange

There should be continuity at all times.

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models:



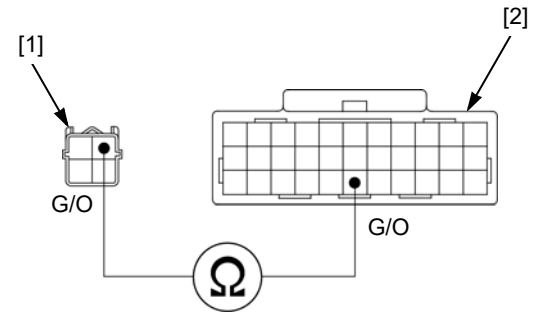
MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models

Check for continuity between the immobilizer receiver 4P (Black) connector [1] terminal and ECM 33P (Black) connector [2] of the wire harness side.

CONNECTION: Green/orange – Green/orange

There should be continuity at all times.

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models:



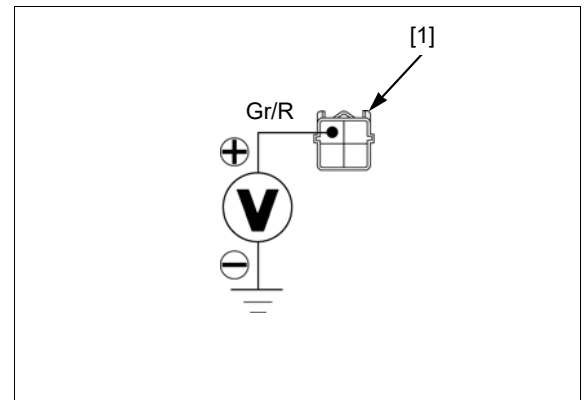
SIGNAL LINE INSPECTION

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

Measure the voltage between the immobilizer receiver 4P (Black) connector [1] terminal of the wire harness side and ground.

CONNECTION: Gray/Red (+) – Ground (-)

There should be approx. 5 V.



IMMOBILIZER SYSTEM (HISS)

Disconnect the ECM 33P connector (page 4-76).

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models Check for continuity between the ECM 33P (Black) connector [1] and immobilizer receiver 4P (Black) connector [2] terminals of the wire harness side.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION: Light green/Black – Light green/Black

There should be continuity.

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models Check for continuity between the ECM 33P (Gray) connector [1] and immobilizer receiver 4P (Black) connector [2] terminals of the wire harness side.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION: Light green/Black – Light green/Black

There should be continuity.

ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models Check for continuity between the ECM 33P (Black) connector [1] terminal of the wire harness side and ground.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION: Light green/Black – Ground

There should be no continuity.

MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models Check for continuity between the ECM 33P (Gray) connector [1] terminal of the wire harness side and ground.

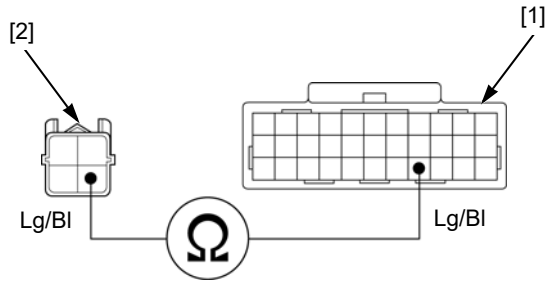
TOOL:

Test probe 07ZAJ-RDJA110

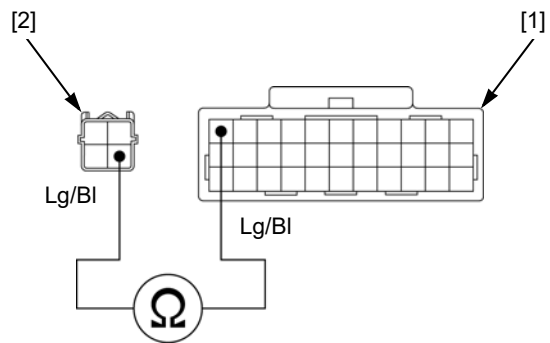
CONNECTION: Light green/Black – Ground

There should be no continuity.

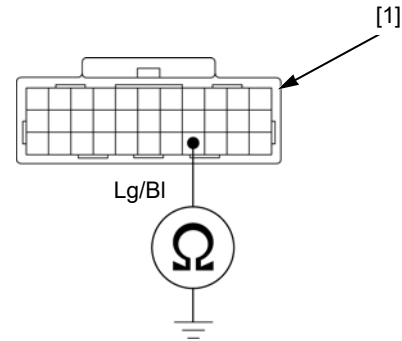
ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models:



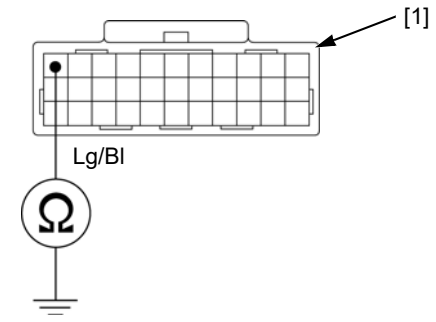
MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models:



ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models:



MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models:



REMOVAL/INSTALLATION

Refer to page 21-14.

REPLACEMENT PARTS FOR PROBLEM

Problem	Replacement Parts					
	Transponder Key	Immobilizer receiver	ECM	Ignition switch assembly	Key set	*Accessory lock and key
One key has been lost, or additional spare key is required	○					
All keys have been lost			○		○	
ECM is faulty	○		○			
Immobilizer receiver is faulty		○				
Ignition switch is faulty				○		
*Accessory lock is faulty						○

*Accessory lock means the fuel fill cap and seat lock.

MEMO

23. WIRING DIAGRAMS

CBR650RA: ED, IIED, IIIED, IVED,
FO, IIFO, KO, IIKO models 23-2

CBR650RA: MA, IIMA, TH, IITH,
U, IIU, IIBR models 23-3

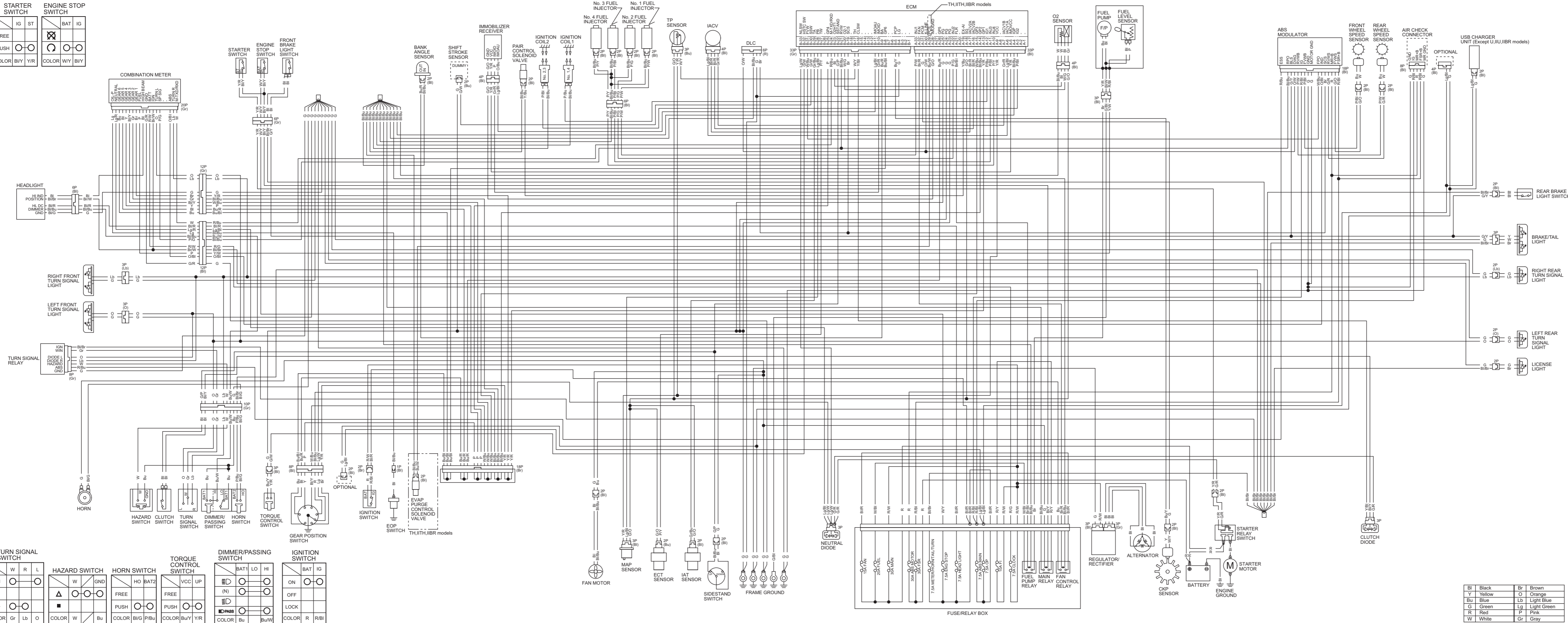
CB650RA: ED, IIIED, FO, KO models 23-4

CB650RA: MA, IN, TH, U, BR models 23-5

WIRING DIAGRAMS

CBR650RA: MA, IIMA, TH, IITH, U, IIU, IIBR models

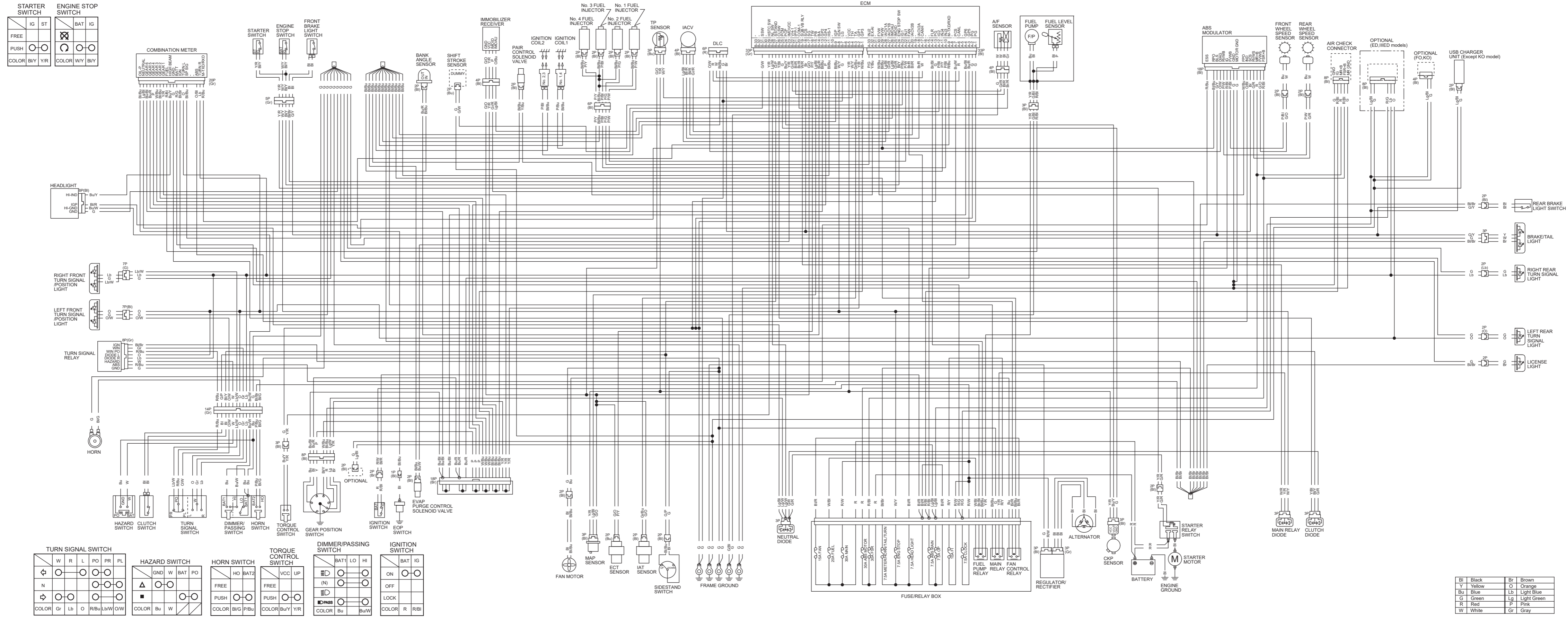
STARTER SWITCH		ENGINE STOP SWITCH	
IG	ST	BAT	IG
FREE			
PUSH			
COLOR	BY/Y	COLOR	W/Y



TURN SIGNAL SWITCH			HAZARD SWITCH			HORN SWITCH		TORQUE CONTROL SWITCH		DIMMER/PASSING SWITCH			IGNITION SWITCH	
W	R	L	W	GND	HO	BAT2	VCC	UP	BAT1	LO	HI	BAT	IG	
N					FREE		FREE					ON		
			COLOR	W	Bu	COLOR	Bi/G	P/Bu	COLOR	Bu	Bu/W	OFF		
COLOR	Gr	Lb	O									LOCK		
													R	
													R/BI	

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

CB650RA: ED, IIIED, FO, KO models



STARTER SWITCH		ENGINE STOP SWITCH	
FREE	IG	BAT	IG
PUSH	○	○	○
COLOR	Bl/Y	Yr	Bl/Y

TURN SIGNAL SWITCH				
W	R	L	PO	PL
○	○	○	○	○
N	○	○	○	○
COLOR	Gr	Lb	O	R/Bu

HAZARD SWITCH			
GND	W	BAT	PO
○	○	○	○
COLOR	Bu	W	

HORN SWITCH		TORQUE CONTROL SWITCH	
HO	BAT2	FREE	VCC UP
○	○	○	○
COLOR	Bl/G	P/Bu	Yr

DIMMER/PASSING SWITCH			IGNITION SWITCH	
BAT1	LO	HI	BAT	IG
○	○	○	ON	○
(N)	○	○	OFF	○
COLOR	Bu	Bu/W	LOCK	○
			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

A/F SENSOR (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models).....	4-80	DTC INDEX (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)	4-46
ABS DTC INDEX.....	19-10	DTC TROUBLESHOOTING (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)	4-48
ABS INDICATOR CIRCUIT TROUBLESHOOTING	19-12	ECM	4-76
ABS MODULATOR.....	19-26	ECT SENSOR	4-79
ABS TROUBLESHOOTING.....	19-14	EMISSION CONTROL SYSTEMS	1-48
ABS TROUBLESHOOTING INFORMATION	19-6	ENGINE IDLE SPEED.....	3-12
AIR CLEANER.....	3-5	ENGINE INSTALLATION.....	15-7
AIR CLEANER HOUSING.....	7-12	ENGINE OIL PRESSURE INDICATOR/EOP SWITCH	21-12
ALTERNATOR CHARGING COIL.....	20-7	ENGINE OIL/OIL FILTER.....	3-10
BANK ANGLE SENSOR.....	4-81	ENGINE REMOVAL.....	15-4
BATTERY.....	20-5	EVAP CANISTER (Except MA, IIMA, IN, U, IIU models).....	7-23
BODY PANEL LOCATIONS/REMOVAL CHART.....	2-3	EVAP PURGE CONTROL SOLENOID VALVE (Except MA, IIMA, IN, U, IIU models).....	7-22
BRAKE FLUID.....	3-18	EVAPORATIVE EMISSION CONTROL SYSTEM (Except MA, IIMA, IN, U, IIU models).....	3-14
BRAKE FLUID REPLACEMENT/AIR BLEEDING	18-5	EXHAUST PIPE/MUFFLER.....	2-17
BRAKE LIGHT SWITCH LIGHTS/METERS/SWITCHES	21-17	EXHAUST SYSTEM (BR, IIBR models only).....	3-12
MAINTENANCE	3-21	FLYWHEEL	12-5
BRAKE PAD/DISC	18-8	FOOTPEG BRACKET.....	2-17
BRAKE PADS WEAR.....	3-20	FORK	16-21
BRAKE PEDAL.....	18-16	FRONT BRAKE CALIPER.....	18-14
BRAKE SYSTEM.....	3-21	FRONT COWL (CBR650RA).....	2-9
BRAKE/TAIL LIGHT.....	21-5	FRONT COWL STAY (CBR650RA).....	2-9
CABLE & HARNESS ROUTING.....	1-22	FRONT FENDER.....	2-5
CAM CHAIN TENSIONER LIFTER.....	10-20	FRONT LICENSE PLATE STAY.....	2-15
CAMSHAFT.....	10-5	FRONT LOWER COWL (CBR650RA).....	2-9
CHARGING SYSTEM INSPECTION.....	20-6	FRONT MASTER CYLINDER.....	18-10
CKP SENSOR ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models.....	4-82	FRONT WHEEL.....	16-15
CKP SENSOR (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)	5-11	FUEL FILLER CAP.....	7-8
CLUTCH.....	11-6	FUEL GAUGE/FUEL LEVEL SENSOR.....	21-13
CLUTCH SWITCH.....	21-18	FUEL INJECTOR.....	7-16
CLUTCH SYSTEM.....	3-23	FUEL LINE.....	3-4
COMBINATION METER.....	21-6	FUEL LINE INSPECTION.....	7-4
COMPONENT LOCATION ALTERNATOR.....	12-2	FUEL PUMP RELAY.....	7-19
CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH.....	11-3	FUEL PUMP UNIT.....	7-8
CRANKCASE/TRANSMISSION.....	13-3	FUEL TANK.....	7-7
CRANKSHAFT/PISTON/CYLINDER.....	14-3	GEAR POSITION SWITCH.....	4-81
CYLINDER HEAD/VALVES.....	10-3	GEARSHIFT LINKAGE.....	11-19
ENGINE REMOVAL/INSTALLATION.....	15-3	HANDLEBAR.....	16-5
FRONT WHEEL/SUSPENSION/STEERING	16-3	HANDLEBAR SWITCH.....	21-16
FUEL SYSTEM.....	7-3	HEADLIGHT.....	21-3
HYDRAULIC BRAKE.....	18-3	HEADLIGHT AIM.....	3-22
REAR WHEEL/SUSPENSION.....	17-3	HORN.....	21-19
CONTROL RELAY.....	21-24	HSTC (Honda Selectable Torque Control) SYSTEM.....	21-20
COOLANT REPLACEMENT.....	8-4	IACV.....	7-17
COOLANT TEMPERATURE GAUGE/ECT SENSOR.....	21-11	IAT SENSOR.....	4-79
COOLING SYSTEM.....	3-13	IGNITION COIL.....	5-11
COOLING SYSTEM FLOW PATTERN.....	8-3	IGNITION SWITCH.....	21-14
COOLING SYSTEM TESTING.....	8-4	IGNITION SYSTEM INSPECTION.....	5-7
CRANKCASE.....	13-4	IGNITION TIMING.....	5-10
CRANKPIN BEARING.....	14-10	IMMOBILIZER RECEIVER.....	22-14
CRANKSHAFT.....	14-4	IMMOBILIZER SYSTEM REPLACEMENT PARTS FOR PROBLEM.....	22-17
CYLINDER COMPRESSION TEST.....	10-4	INSULATOR.....	7-16
CYLINDER HEAD.....	10-11	INTAKE AIR DUCT (CBR650RA).....	2-8
CYLINDER HEAD COVER.....	10-4	KEY REGISTRATION PROCEDURES ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models.....	22-4
DIAGNOSTIC CODE INDICATION.....	22-11	KEY REGISTRATION PROCEDURES (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models).....	22-7
DIODE.....	6-9	LEFT CRANKCASE COVER.....	12-3
DRIVE CHAIN.....	3-15	LICENSE LIGHT.....	21-5
DRIVE CHAIN COVER/MUD GUARD.....	2-16	LUBRICATION & SEAL POINTS.....	1-17
DRIVE CHAIN SLIDER.....	3-17		
DRIVE SPROCKET COVER.....	2-15		

INDEX

LUBRICATION SYSTEM DIAGRAM	9-3	SHROUD (CB650RA)	2-10
MAIN JOURNAL BEARING	14-7	SIDE COVER	2-12
MAIN RELAY	4-85	SIDESTAND	
MAIN RELAY DIODE	4-87	FRAME/BODY PANELS/EXHAUST SYSTEM	2-16
MAIN SEAT	2-11	MAINTENANCE	3-23
MAINTENANCE SCHEDULE	3-2	SIDESTAND SWITCH	21-18
MAP SENSOR	4-79	SPARK PLUG	3-6
METER PANEL (CBR650RA)	2-8	SPECIAL TOOL LIST	1-20
MIDDLE COWL (CBR650RA)	2-7	SPECIFICATIONS	1-5
MIL CIRCUIT TROUBLESHOOTING	4-76	SPEEDOMETER	21-10
MODEL IDENTIFICATION	1-3	STARTER CLUTCH	11-14
NUTS, BOLTS, FASTENERS	3-24	STARTER MOTOR	6-5
O ₂ SENSOR (MA, IIMA, IN, TH, IITH, U, IIU, BR, IIBR models)	4-80	STARTER RELAY SWITCH	6-7
OIL COOLER	9-8	STATOR	12-4
OIL PRESSURE INSPECTION	9-4	STEERING HEAD BEARINGS	3-25
OIL PUMP	9-4	STEERING STEM	16-38
OIL STRAINER	9-6	SUSPENSION	3-24
PGM-FI DTC INDEX		SWINGARM	17-10
ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models	4-12	SYSTEM DIAGRAM	
PGM-FI DTC TROUBLESHOOTING		ANTI-LOCK BRAKE SYSTEM (ABS)	19-4
ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models	4-14	BATTERY/CHARGING SYSTEM	20-4
PGM-FI SYMPTOM TROUBLESHOOTING	4-11	ELECTRIC STARTER	6-4
PGM-FI TROUBLESHOOTING INFORMATION	4-7	IGNITION SYSTEM	5-5
PILLION SEAT	2-12	IMMOBILIZER SYSTEM (HISS)	22-3
PISTON/CYLINDER	14-13	PGM-FI SYSTEM	4-5
PRESSURE RELIEF VALVE	9-6	SYSTEM LOCATION	
RADIATOR COOLANT	3-13	ANTI-LOCK BRAKE SYSTEM (ABS)	19-3
RADIATOR RESERVE TANK	8-9	BATTERY/CHARGING SYSTEM	20-4
RADIATOR/COOLING FAN	8-7	ELECTRIC STARTER	6-4
REAR BRAKE CALIPER	18-15	IGNITION SYSTEM	5-5
REAR COWL	2-12	IMMOBILIZER SYSTEM (HISS)	22-2
REAR FENDER B	2-14	LIGHTS/METERS/SWITCHES	21-2
REAR FENDER STAY	2-13	PGM-FI SYSTEM	4-4
REAR MASTER CYLINDER	18-12	TACHOMETER	21-11
REAR WHEEL	17-4	TANK COVER	2-7
REARVIEW MIRROR	2-5	TECHNICAL FEATURE	1-51
REGULATOR/RECTIFIER	20-7	THERMOSTAT	8-6
RIGHT CRANKCASE COVER	11-4	THERMOSTAT CASE ASSEMBLY	8-12
SECONDARY AIR SUPPLY SYSTEM		THROTTLE BODY	7-13
FUEL SYSTEM	7-19	THROTTLE OPERATION	3-4
MAINTENANCE	3-14	TORQUE VALUES	1-11
SERVICE INFORMATION		TRANSMISSION	13-7
ALTERNATOR	12-2	TROUBLESHOOTING	
ANTI-LOCK BRAKE SYSTEM (ABS)	19-2	BATTERY/CHARGING SYSTEM	20-3
BATTERY/CHARGING SYSTEM	20-2	CLUTCH/GEARSHIFT LINKAGE/ STARTER CLUTCH	11-2
CLUTCH/GEARSHIFT LINKAGE/ STARTER CLUTCH	11-2	COOLING SYSTEM	8-2
COOLING SYSTEM	8-2	CRANKCASE/TRANSMISSION	13-2
CRANKCASE/TRANSMISSION	13-2	CRANKSHAFT/PISTON/CYLINDER	14-2
CRANKSHAFT/PISTON/CYLINDER	14-2	CYLINDER HEAD/VALVES	10-2
CYLINDER HEAD/VALVES	10-2	ELECTRIC STARTER	6-3
ELECTRIC STARTER	6-2	FRAME/BODY PANELS/EXHAUST SYSTEM	2-2
ENGINE REMOVAL/INSTALLATION	15-2	FRONT WHEEL/SUSPENSION/STEERING	16-2
FRAME/BODY PANELS/EXHAUST SYSTEM	2-2	HYDRAULIC BRAKE	18-2
FRONT WHEEL/SUSPENSION/STEERING	16-2	IGNITION SYSTEM	5-3
FUEL SYSTEM	7-2	IMMOBILIZER SYSTEM (HISS)	22-13
HYDRAULIC BRAKE	18-2	LUBRICATION SYSTEM	9-2
IGNITION SYSTEM	5-2	REAR WHEEL/SUSPENSION	17-2
IMMOBILIZER SYSTEM (HISS)	22-2	TURN SIGNAL LIGHT	21-4
LIGHTS/METERS/SWITCHES	21-2	TURN SIGNAL RELAY	21-21
LUBRICATION SYSTEM	9-2	UNDER COWL (CBR650RA)	2-11
MAINTENANCE	3-2	UPPER INNER PANEL (CBR650RA)	2-8
PGM-FI SYSTEM	4-2	USB CHARGER UNIT (Except KO, IIKO, U, IIU, BR, IIBR)	21-25
REAR WHEEL/SUSPENSION	17-2	VALVE CLEARANCE	3-8
SERVICE RULES	1-2	WATER HOSE JOINT B	8-11
SHOCK ABSORBER	17-8	WATER PUMP	8-10
		WHEEL SPEED SENSOR	19-23
		WHEELS/TIRES	3-25

WINDSCREEN (CBR650RA).....	2-6	CBR650RA (ED, IIED, IIIED, IVED, FO, IIFO, KO, IIKO models)	23-2
WIRING DIAGRAM		CBR650RA (MA, IIMA, IN, TH, IITH, U, IIU, IIBR models)	23-3
CB650RA (ED, IIIED, FO, KO models).....	23-4		
CB650RA (MA, IN, TH, U, BR models).....	23-5		

HONDA

The Power of Dreams