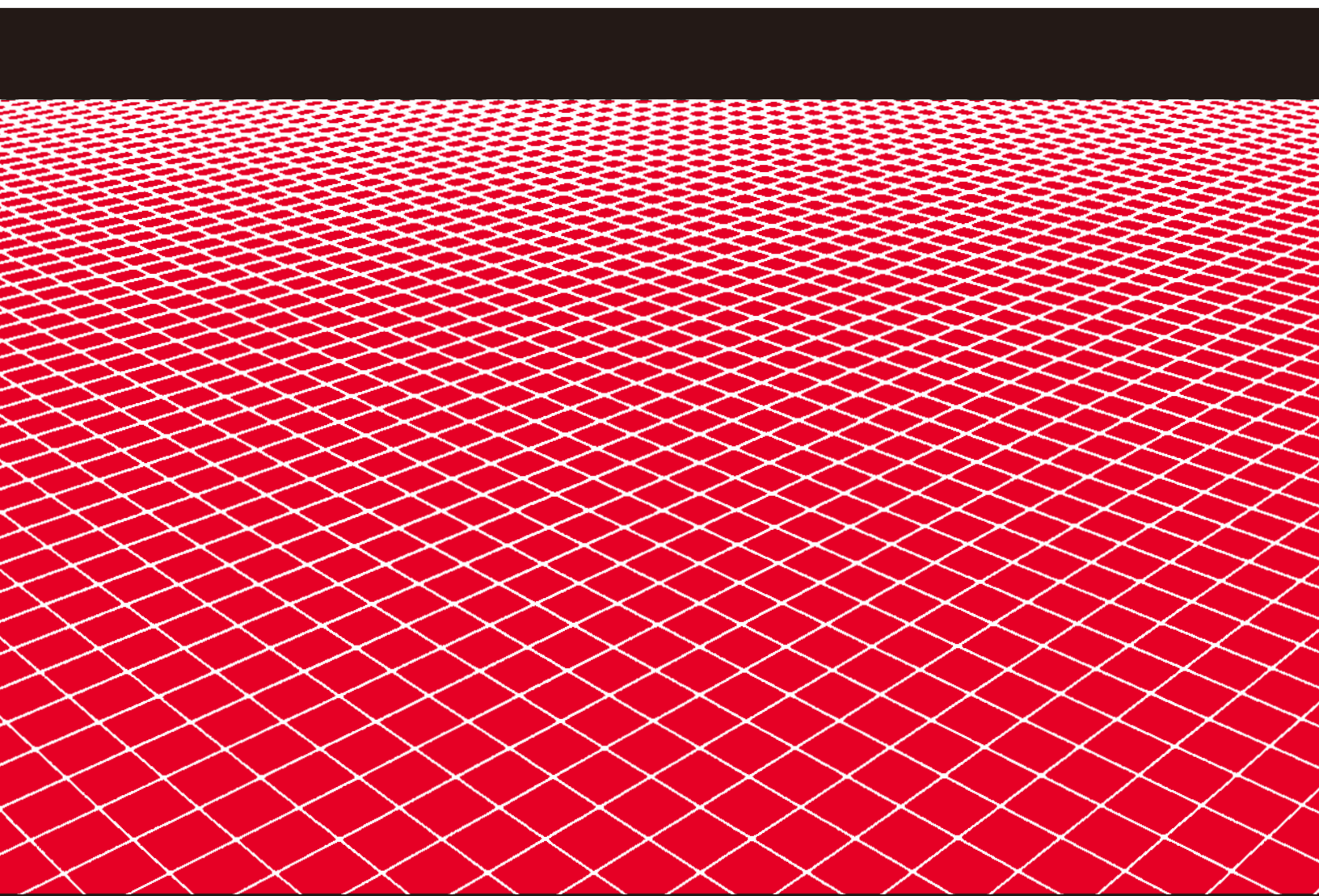




SHOP MANUAL

CB1000RA



CB1000RA_M

CB1000RA_N

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 genuine Honda 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 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 CB1000RA.

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

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

If you are not familiar with this motorcycle, read Technical feature in section 1.

Follow the Maintenance Schedule recommendations to ensure that the vehicle is in peak operating condition.

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

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

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

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.

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SERVICE PUBLICATION OFFICE

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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: • 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: • 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 a locking agent. Use a medium strength locking agent unless otherwise specified.
	Apply sealant.
	Use DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified.
	Use fork or suspension fluid.

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GENERAL INFORMATION

SERVICE RULES

1. Use Honda genuine or Honda-recommended parts and lubricants or their equivalents. Parts that don't meet Honda's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown in the Cable and Harness Routing (page 1-24).
9. Do not bend or twist control cables. Damaged control cables will not operate smoothly and may stick or bind.

ABBREVIATION

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

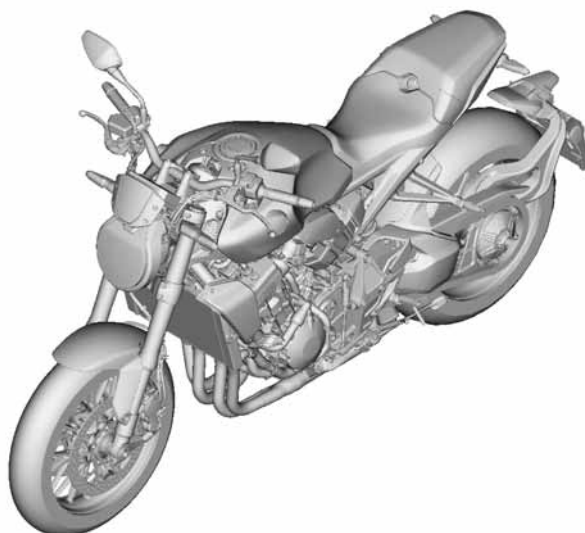
Abbrev. term	Full term
ABS	Anti-lock Brake System
APS	Accelerator Position Sensor
A/F sensor	Air/Fuel sensor
BCU	Body Control Unit
CKP sensor	Crankshaft Position sensor
DLC	Data Link Connector
DTC	Diagnostic Trouble Code
ECM	Engine Control Module
ECT sensor	Engine Coolant Temperature sensor
EEPROM	Electrically Erasable Programmable Read Only Memory
EOP switch	Engine Oil Pressure switch
ESS	Emergency Stop Signal
EVAP	Evaporative Emission
GST	Generic Scan Tool
HSTC	Honda Selectable Torque Control
HISS	Honda Ignition Security System
HSVCs	Honda Smartphone Voice Control system
IAT sensor	Intake Air Temperature sensor
MAP sensor	Manifold Absolute Pressure sensor
MCS	Motorcycle Communication System
MIL	Malfunction Indicator Lamp
PAIR	Pulse Secondary Air Injection
PGM-FI	Programmed Fuel Injection
SCS short connector	Service Check Signal short connector
TBW	Throttle By Wire
TP sensor	Throttle Position sensor
VS sensor	Vehicle Speed sensor

DESTINATION CODES

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

DESTINATION CODE	REGION
ED, II ED	European direct sales
TH, III TH	Thailand
FO, II FO	Taiwan
GS, II GS	GCC Countries
KO, III KO	Korea
RU, II RU	Russia
U	Australia, New Zealand
CH, III CH	China
BR, IIBR	Brazil

MODEL IDENTIFICATION

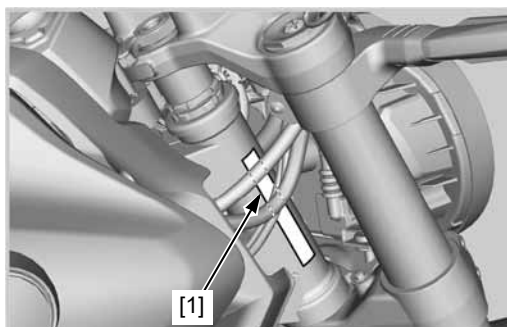


Model	Destination code	Quick shifter	Single seat cowl	Meter Visor
CB1000RA	ED	—	—	—
	II ED	○	○	○
	TH	—	—	—
	III TH	○	○	○
	FO	—	—	—
	II FO	○	○	○
	GS	—	—	—
	II GS	○	○	○
	KO	—	—	—
	III KO	○	—	○
	RU	—	—	—
	II RU	○	○	○
	U	—	—	—
	CH	—	—	—
	III CH	○	—	○
	BR	—	—	—
	II BR	○	○	○

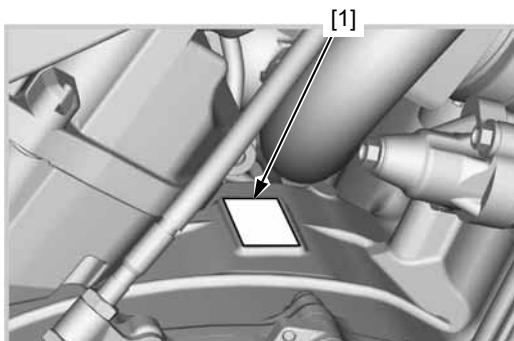
GENERAL INFORMATION

SERIAL NUMBERS/LABELS

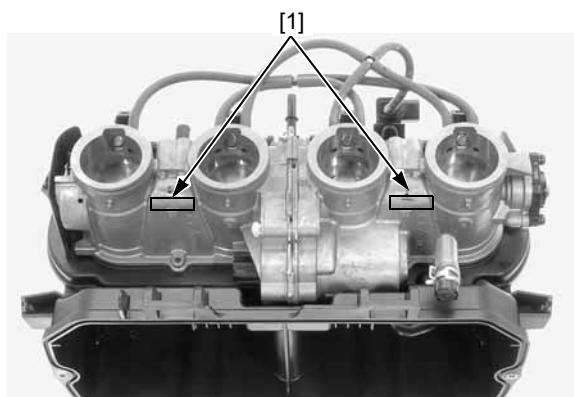
The Vehicle Identification Number (V.I.N) [1] is stamped on the right side of the steering head.



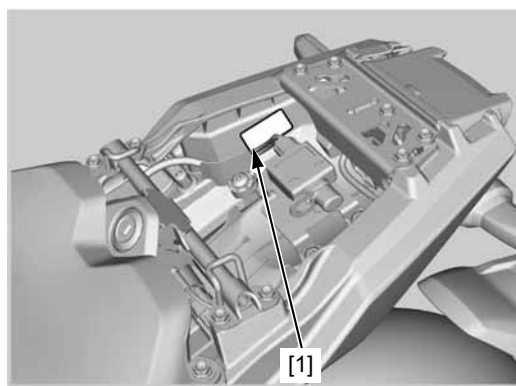
The engine serial number [1] is stamped on the right side of the upper crankcase.



The throttle body identification numbers [1] are stamped on the front lower surfaces of the throttle body.



The color label [1] is attached to the under the pillion seat.



SPECIFICATIONS

GENERAL SPECIFICATIONS

ITEM			SPECIFICATIONS
DIMENSIONS	Overall length	Except FO, II FO, CH, III CH, BR, II BR models	2,120 mm (83.5 in)
		FO, II FO, CH, III CH models	2,115 mm (83.3 in)
		BR, II BR models	2,123 mm (83.6 in)
	Overall width	Except KO, III KO models	789 mm (31.06 in)
		KO, III KO models	790 mm (31.10 in)
	Overall height	Except BR, II BR models	1,090 mm (42.9 in)
		BR, II BR models	1,093 mm (43.0 in)
	Wheelbase	Except FO, II FO, CH, III CH, BR, II BR models	1,455 mm (57.3 in)
		FO, II FO, CH, III CH models	1,460 mm (57.5 in)
		BR, II BR models	1,452 mm (57.2 in)
	Seat height	ED, II ED, RU, II RU, U models	830 mm (32.7 in)
		Except ED, II ED, RU, II RU, U models	833 mm (32.8 in)
	Footpeg height		375 mm (14.8 in)
	Ground clearance	Except BR, II BR models	135 mm (5.3 in)
		BR, II BR models	132 mm (5.2 in)
	Curb weight	ED, TH, FO, GS, RU, U, CH, BR models	213 kg (469 lbs)
		II ED, III TH, II FO, II GS, II RU, III CH, II BR models	214 kg (471 lbs)
KO, III KO models		215 kg (474 lbs)	
Maximum weight capacity	Except KO, III KO models	188 kg (414 lbs)	
	KO, III KO models	168 kg (370 lbs)	
FRAME	Frame type		Diamond type
	Front suspension		Telescopic fork
	Front axle travel		109 mm (4.3 in)
	Rear suspension		Swingarm
	Rear axle travel	Except FO, II FO, CH, III CH models	131 mm (5.2 in)
		FO, II FO, CH, III CH models	132 mm (5.2 in)
	Front tire size		120/70ZR17 M/C (58W)
	Rear tire size		190/55ZR17 M/C (75W)
	Front tire brand	Except GS, II GS models	POWER 5(MICHELIN), DIABLO ROSSO III E(PIRELLI)
		GS, II GS models	DIABLO ROSSO III E(PIRELLI)
	Rear tire brand	Except GS, II GS models	POWER 5(MICHELIN), DIABLO ROSSO III E(PIRELLI)
		GS, II GS models	DIABLO ROSSO III E(PIRELLI)
	Front brake		Hydraulic double disc
	Rear brake		Hydraulic single disc
	Caster angle		25.00°
	Trail length		100 mm (3.9 in)
	Fuel tank capacity	Except BR, II BR models	16.2 liters (4.28 US gal, 3.56 Imp gal)
		BR, II BR models	16.1 liters (4.25 US gal, 3.54 Imp gal)

GENERAL INFORMATION

ITEM				SPECIFICATIONS	
ENGINE	Cylinder arrangement			4 cylinders in-line, inclined 27° from vertical	
	Bore and stroke			75.0 x 56.5 mm (2.95 x 2.22 in)	
	Displacement			998 cm ³ (60.9 cu-in)	
	Compression ratio			11.6 : 1	
	Valve train			Chain driven, DOHC	
	Intake valve	opens	at 1 mm (0.04 in) lift	20° BTDC	
		closes	at 1 mm (0.04 in) lift	30° ABDC	
	Exhaust valve	opens	at 1 mm (0.04 in) lift	35° BBDC	
		closes	at 1 mm (0.04 in) lift	11° ATDC	
	Lubrication system			Forced pressure and wet sump	
	Oil pump type			Trochoid	
	Cooling system			Liquid cooled	
	Air filtration			Viscous paper element	
	Engine dry weight			64.8 kg (142.9 lbs)	
	Emission control system			Crankcase emission control system Secondary air supply system Three-way catalytic converter Evaporative emission control system	
FUEL DELIVERY SYSTEM	Firing order			1 - 2 - 4 - 3	
	Cylinder number			Left 1 - 2 - 3 - 4	
FUEL DELIVERY SYSTEM	Type			PGM-FI	
	Throttle bore			44 mm (1.7 in)	
DRIVE TRAIN	Clutch system			Multi-plate, wet	
	Clutch operation system			Cable operating	
	Transmission			Constant mesh, 6-speeds	
	Primary reduction			1.604 (77/48)	
	Final reduction		Except FO, II FO, CH, III CH models	2.933 (44/15)	
			FO, II FO, CH, III CH models	2.866 (43/15)	
	Gear ratio	1st		2.538 (33/13)	
			2nd	Except FO, II FO, CH, III CH models	1.941 (33/17)
			FO, II FO, CH, III CH models	1.833 (33/18)	
		3rd	Except FO, II FO, CH, III CH models	1.578 (30/19)	
			FO, II FO, CH, III CH models	1.500 (33/22)	
		4th	Except FO, II FO, CH, III CH models	1.363 (30/22)	
			FO, II FO, CH, III CH models	1.318 (29/22)	
		5th	Except FO, II FO, CH, III CH models	1.217 (28/23)	
			FO, II FO, CH, III CH models	1.173 (27/23)	
		6th	Except FO, II FO, CH, III CH models	1.115 (29/26)	
			FO, II FO, CH, III CH models	1.074 (29/27)	
	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
IAT sensor resistance (at 40°C/104°F)	1 – 2 kΩ
Fuel injector resistance (at 24°C /75°F)	11 – 13 Ω
PAIR control solenoid valve resistance (at 20°C/68°F)	23 – 27 Ω
EVAP purge control solenoid valve resistance (at 20°C/68°F)	22 – 26 Ω
A/F sensor heater resistance (20°C/68°F)	3.6 – 6.0 Ω

IGNITION SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Spark plug (Iridium)	NGK IMR9E-9HES
	DENSO VUH27ES
Spark plug gap	0.8 – 0.9 mm (0.03 – 0.04 in)
Ignition coil peak voltage	100 V minimum
Ignition timing ("F" mark)	5.2° BTDC at idle

FUEL SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Throttle body identification number	GNH7A
Idle speed	1,200 ± 100 min ⁻¹ (rpm)
Fuel pressure at idle	343 kPa (3.5 kgf/cm ² , 50 psi)
Fuel pump flow (at 12 V)	393 cm ³ (13.3 US oz, 13.8 Imp oz) minimum/10 seconds
CO concentration	BR, IIBR models only 0.5 % maximum
HC concentration	BR, IIBR models only 200 ppm maximum

COOLING SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Coolant capacity	Replacement 2.59 liters (2.74 US qt, 2.28 Imp qt)
	After disassembly 2.75 liters (2.91 US qt, 2.42 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	Except TH, III TH, CH, III CH models High quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors
	TH, III TH, CH, III CH models Honda PRE-MIX Coolant
Standard coolant concentration	Except TH, III TH, CH, III CH models 1:1 mixture with distilled water

LUBRICATION SYSTEM SPECIFICATIONS

ITEM	STANDARD	SERVICE LIMIT
Engine oil capacity	After draining 2.6 liters (2.7 US qt, 2.3 Imp qt)	–
	After oil filter change 2.9 liters (3.1 US qt, 2.6 Imp qt)	–
	After disassembly 3.5 liters (3.7 US qt, 3.1 Imp qt)	–
Recommended engine oil	Honda "4-stroke motorcycle oil" or an equivalent motor oil. API service classification: SJ or higher JASO T903 standard: MA Viscosity: SAE 10W-30	–
Oil pressure at EOP switch	510 kPa (5.2 kgf/cm ² , 74 psi) at 6,000 min ⁻¹ (rpm)/(80°C/176°F)	–
Oil pump	Tip clearance 0.15 (0.006)	0.20 (0.008)

Unit: mm (in)

GENERAL INFORMATION

CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,300 kPa (13.3 kgf/cm ² , 188 psi) at 300 min ⁻¹ (rpm)	—
Valve clearance		IN	0.16 ± 0.03 (0.006 ± 0.001)	—
		EX	0.30 ± 0.03 (0.012 ± 0.001)	—
Camshaft	Cam lobe height	IN	36.38 – 36.54 (1.432 – 1.438)	36.35 (1.431)
		EX	36.32 – 36.48 (1.429 – 1.436)	36.29 (1.429)
			—	0.05 (0.002)
	Runout		—	0.05 (0.002)
	Oil clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
Valve lifter	Valve lifter O.D.		25.978 – 25.993 (1.0228 – 1.0233)	25.97 (1.022)
	Valve lifter bore I.D.		26.010 – 26.026 (1.0240 – 1.0246)	26.04 (1.025)
Valve, valve guide	Valve stem O.D.	IN	3.975 – 3.990 (0.1565 – 0.1571)	3.965 (0.1561)
		EX	3.965 – 3.980 (0.1561 – 0.1567)	3.955 (0.1557)
	Valve guide I.D.		4.000 – 4.012 (0.1575 – 0.1580)	4.042 (0.1591)
	Stem-to-guide clearance	IN	0.005 – 0.042 (0.0002 – 0.0017)	—
		EX	0.015 – 0.052 (0.0006 – 0.0020)	—
	Valve guide projection above cylinder head	IN	16.1 – 16.4 (0.63 – 0.65)	—
		EX	15.5 – 15.8 (0.61 – 0.62)	—
	Valve seat width		0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length		IN	35.0 (1.38)	34.3 (1.35)
		EX	35.0 (1.38)	34.3 (1.35)
Cylinder head warpage			—	0.10 (0.004)

CLUTCH/STARTER CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch lever freeplay		10 – 20 (0.4 – 0.8)	–
Clutch	Spring free length	58.7 (2.31)	57.7 (2.27)
	Disc thickness	3.22 – 3.38 (0.127 – 0.133)	2.9 (0.11)
	Plate warpage	–	0.30 (0.012)
Clutch outer guide A (Without ID mark)	I.D.	27.993 – 28.003 (1.1021 – 1.1025)	–
	O.D.	35.004 – 35.012 (1.3781 – 1.3784)	–
Clutch outer guide B (With ID mark)	I.D.	27.993 – 28.003 (1.1021 – 1.1025)	–
	O.D.	34.996 – 35.004 (1.3778 – 1.3781)	–
Primary driven gear I.D.	A	41.008 – 41.016 (1.6145 – 1.6148)	–
	B	41.000 – 41.008 (1.6142 – 1.6145)	–
Oil pump drive sprocket guide	I.D.	28.000 – 28.021 (1.1024 – 1.1032)	28.030 (1.1035)
	O.D.	34.975 – 34.991 (1.3770 – 1.3776)	34.965 (1.3766)
Oil pump drive sprocket I.D.		35.025 – 35.145 (1.3789 – 1.3837)	35.155 (1.3841)
Mainshaft O.D. at clutch outer guide		27.980 – 27.990 (1.1016 – 1.1020)	27.96 (1.101)
Mainshaft O.D. at oil pump drive sprocket guide		27.980 – 27.990 (1.1016 – 1.1020)	27.96 (1.101)
Starter idle gear	Gear I.D.	10.013 – 10.035 (0.3942 – 0.3951)	10.05 (0.396)
	Shaft O.D.	9.991 – 10.000 (0.3933 – 0.3937)	9.98 (0.393)
Starter driven gear boss O.D.		45.657 – 45.673 (1.7975 – 1.7981)	45.642 (1.7969)

TRANSMISSION/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Shift fork	I.D.		12.000 – 12.018 (0.4724 – 0.4731)	12.03 (0.474)
	Claw thickness		5.93 – 6.00 (0.233 – 0.236)	5.9 (0.23)
Shift fork shaft O.D.			11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)
Transmission	Gear I.D.	M5, M6	31.000 – 31.025 (1.2205 – 1.2215)	31.04 (1.222)
		C1	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
		C2, C3, C4	33.000 – 33.025 (1.2992 – 1.3002)	33.04 (1.301)
	Gear busing O.D.	M5,	30.955 – 30.980 (1.2187 – 1.2197)	30.935 (1.2179)
		M6	30.950 – 30.975 (1.2185 – 1.2195)	30.930 (1.2177)
		C2	32.955 – 32.980 (1.2974 – 1.2984)	32.935 (1.2967)
		C3, C4	32.950 – 32.975 (1.2972 – 1.2982)	32.930 (1.2964)
	Gear-to-bushing clearance	M5	0.020 – 0.070 (0.0008 – 0.0028)	0.10 (0.004)
		M6	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
		C2	0.020 – 0.070 (0.0008 – 0.0028)	0.10 (0.004)
		C3, C4	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
	Gear bushing I.D.	M5	27.985 – 28.006 (1.1018 – 1.1026)	28.016 (1.1030)
		C2	29.985 – 30.006 (1.1018 – 1.1813)	30.021 (1.1819)
	Mainshaft O.D.	at M5	27.967 – 27.980 (1.1011 – 1.1016)	27.957 (1.1007)
	Countershaft O.D.	at C2	29.967 – 29.980 (1.1798 – 1.1803)	29.960 (1.1795)
	Bushing-to-shaft clearance	M5	0.005 – 0.039 (0.0002 – 0.0015)	0.06 (0.002)
		C2	0.005 – 0.039 (0.0002 – 0.0015)	0.06 (0.002)

CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance		0.05 – 0.20 (0.002 – 0.008)	0.30 (0.012)
	Crankpin bearing oil clearance		0.030 – 0.052 (0.0012 – 0.0020)	0.06 (0.002)
	Main journal bearing oil clearance		0.019 – 0.037 (0.0007 – 0.0015)	0.05 (0.002)
	Runout		–	0.05 (0.002)
Piston, piston rings	Piston O.D. at 9.0 (0.35) from bottom		74.960 – 74.980 (2.9512 – 2.9520)	74.895 (2.9486)
	Piston pin bore I.D.		17.002 – 17.008 (0.6694 – 0.6696)	17.030 (0.6705)
	Piston pin O.D.		16.994 – 17.000 (0.6690 – 0.6693)	16.980 (0.6685)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)
	Piston ring end gap	Top	0.22 – 0.32 (0.009 – 0.013)	0.42 (0.017)
		Second	0.48 – 0.63 (0.019 – 0.025)	0.73 (0.029)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	0.9 (0.04)
	Piston ring-to-ring groove clearance	Top	0.050 – 0.085 (0.0020 – 0.0033)	0.125 (0.0049)
		Second	0.015 – 0.045 (0.0006 – 0.0018)	0.075 (0.0030)
Cylinder	I.D.		75.000 – 75.015 (2.9528 – 2.9533)	75.15 (2.959)
	Out of round		–	0.10 (0.004)
	Taper		–	0.10 (0.004)
	Warpage		–	0.10 (0.004)
Cylinder-to-piston clearance			0.020 – 0.055 (0.0008 – 0.0022)	0.10 (0.004)
Connecting rod small end I.D.			17.030 – 17.042 (0.6705 – 0.6709)	17.048 (0.6712)
Connecting rod-to-piston pin clearance			0.030 – 0.046 (0.0012 – 0.0018)	0.07 (0.003)

GENERAL INFORMATION

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
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		—	0.1 (0.004)
Wheel rim runout	Radial	—	0.3 (0.012)
	Axial	—	0.3 (0.012)
Wheel balance weight		60 g (2.1 oz) max.	—
Fork	Spring free length		309.8 (12.20)
	Recommended fork fluid		Fork Fluid (viscosity: 10W)
	Fluid level	Right	80 (3.1)
		Left	85 (3.3)
	Fluid capacity	Right	622 ± 2.5 cm ³ (21.0 ± 0.08 US oz, 21.9 ± 0.09 Imp oz)
		Left	589 ± 2.5 cm ³ (19.9 ± 0.08 US oz, 20.7 ± 0.09 Imp oz)
	Pre-load adjuster initial setting		7 turns clockwise from softest position
	Rebound damping adjuster initial setting		5 turns out from hardest position
	Compression damping adjuster initial setting		5-3/4 turns out from hardest position

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		—	0.1 (0.004)
Wheel rim runout	Radial	—	0.3 (0.012)
	Axial	—	0.3 (0.012)
Wheel balance weight		60 g (2.1 oz) max.	—
Drive chain slack		45 – 50 (1.8 – 2.0)	55 (2.1)
Drive chain size/link		RK	—
Shock absorber	Spring pre-load adjuster standard position		3 position from softest position
	Rebound damping adjuster initial setting		1-3/4 turns out from hardest position

HYDRAULIC BRAKE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Front	Specified brake fluid		Honda DOT 4 brake fluid
	Brake disc thickness		4.3 – 4.5 (0.17 – 0.18)
	Brake disc warpage		—
Rear	Specified brake fluid		Honda DOT 4 brake fluid
	Brake disc thickness		5.8 – 6.2 (0.23 – 0.24)
	Brake disc warpage		—

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Type		YTZ10S
	Capacity		12 V-7.3 Ah (10 HR) / 12 V-9.1 Ah (20 HR)
	Voltage (at 20°C/68°F)	Fully charged	12.8 V minimum
		Needs charging	Below 12.4 V
	Charging current	Normal	0.9 A/5 – 10 h
		Quick	4.5 A/1 h
Current leakage			0.42 mA max.
Alternator capacity			0.42 kW/5,000 min ⁻¹ (rpm)
Alternator charging coil resistance (at 20°C/68°F)			0.1 – 0.5 Ω

LIGHTS/METERS/SWITCHES SPECIFICATIONS

ITEM			SPECIFICATIONS
Bulbs	Headlight	Hi	LED
		Lo	LED
	Headlight position light (CH, III CH models only)		LED
	Turn signal light		LED
	Brake/taillight		LED
	License light		LED
	Instrument light		LED
	Turn signal indicator		LED
	High beam indicator		LED
	Neutral indicator		LED
	MIL		LED
	HISS indicator		LED
	Low fuel indicator		LED
	ABS indicator		LED
	Low oil pressure indicator		LED
	High coolant temperature indicator		LED
	Torque control indicator		LED
	Torque control off indicator		LED
Fuse	Main fuse		30 A
	FI fuse		15 A
	Sub-fuse		30 A x 1, 15 A x 3, 10 A x 2, 7.5 A x 6
ECT sensor resistance		50°C (122°F)	6.8 – 7.4 kΩ
		80°C (176°F)	2.1 – 2.7 kΩ

GENERAL INFORMATION

TORQUE VALUES

STANDARD TORQUE VALUES

FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm bolt and nut	5.2 (0.5, 3.8)	5 mm screw	4.2 (0.4, 3.1)
6 mm bolt (Include SH flange 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 (Include NSHF) and nut	12 (1.2, 9)
10 mm bolt and nut	34 (3.5, 25)	8 mm flange bolt and nut	27 (2.8, 20)
12 mm bolt and nut	54 (5.5, 40)	10 mm flange bolt and nut	39 (4.0, 29)

ENGINE & FRAME TORQUE VALUES

FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Seat rail mounting upper bolt	2	10	39 (4.0, 29)	
Seat rail mounting lower bolt	2	10	44 (4.5, 32)	
Fuel tank mounting nut	1	6	10 (1.0, 7)	
Sidestand pivot bolt	1	10	–	See page 2-13
Sidestand pivot nut	1	10	39 (4.0, 29)	See page 2-13
Front fender mounting bolt	4	6	12 (1.2, 9)	
Reflector mounting nut	2	6	1.8 (0.2, 1.3)	
Pivot bracket upper mounting bolt	2	10	39 (4.0, 29)	
Pivot bracket lower mounting bolt	2	10	39 (4.0, 29)	
Pivot bracket pinch bolt	2	8	27 (2.8, 20)	
Muffler band bolt	2	8	22 (2.2, 16)	
Muffler cover bolt	1	6	9 (0.9, 7)	
Muffler tail cap bolt	2	6	9 (0.9, 7)	
Muffler heat guard bolt (FO, II FO models only)	2	6	9 (0.9, 7)	
Main step mounting socket bolt	4	8	37 (3.8, 27)	
Exhaust pipe joint nut	8	7	12 (1.2, 9)	
Exhaust pipe stud bolt	8	8	–	See page 2-19
Exhaust pipe mounting bolt	2	8	22 (2.2, 16)	
EVAP canister stay mounting bolt	4	6	12 (1.2, 9)	
Cross upper plate mounting bolt	4	6	16 (1.6, 12)	
Radiator shroud mounting bolt	4	6	9 (0.9, 7)	
Shroud panel mounting bolt	4	5	0.4 (0.04, 0.3)	
Inner shroud mounting bolt	2	5	0.3 (0.03, 0.2)	
Rear reflector mounting nut	1	5	1.7 (0.2, 1.3)	
Rear fender D mounting torx bolt	3	8	35 (3.6, 26)	Apply locking agent to the threads. See page 2-11.
Number stay mounting socket bolt	3	5	12 (1.2, 9)	
Meter visor mounting special bolt (II ED/ III TH/III KO/II FO/II GS/II RU/III CH/II BR models only)	4	5	0.4 (0.04, 0.3)	

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Air cleaner element tapping screw	7	4	0.8 (0.1, 0.6)	
Lower air cleaner housing mounting bolt	4	5	4.2 (0.4, 3)	
Duct cover mounting screw	2	5	1.1 (0.1, 1)	
Duct cover mounting bolt	2	5	4.2 (0.4, 3)	
Spark plug	4	10	16 (1.6, 12)	
Timing hole cap	1	45	18 (1.8, 13)	Apply grease to the threads.
Oil drain bolt	1	12	30 (3.1, 22)	
Oil filter boss (crankcase side)	1	20	–	Apply locking agent to the threads. See page 3-13
Oil filter cartridge	1	20	26 (2.7, 19)	Apply engine oil to the threads and O-ring.
Axle bearing holder pinch bolt	2	8	27 (2.8, 20)	
Drive sprocket bolt	1	10	54 (5.5, 40)	
Driven sprocket nut	6	10	64 (6.5, 47)	Self-lock nut
Rear master cylinder push rod lock nut	1	8	17 (1.7, 13)	

PGM-FI SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
ECT sensor	1	12	23 (2.3, 17)	
A/F sensor	2	12	24.5 (2.5, 18)	
IAT sensor mounting screw	2	5	1.1 (0.1, 0.8)	
MAP sensor mounting screw	1	5	1.1 (0.1, 0.8)	
APS mounting screw	4	4	2.0 (0.2, 1.5)	
Shift drum angle sensor bolt	2	6	12 (1.2, 9)	
Right handlebar switch screw	2	5	2.5 (0.3, 1.8)	
Shift spindle switch	1	10	12 (1.2, 9)	
Shift spindle switch terminal nut	1	4	1.7 (0.2, 1.3)	

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.
Ignition coil mounting bolt	2	6	1.0 (0.1, 0.7)	

ELECTRIC STARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Starter motor terminal nut	1	6	10 (1.0, 7)	
Starter motor setting bolt	2	5	3.9 (0.4, 3.0)	Apply locking agent to the threads.
Negative brush mounting screw	1	5	3.7 (0.4, 2.7)	

FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel pump mounting nut	7	6	12 (1.2, 9)	See page 7-7
Fuel tank mounting nut	1	6	10 (1.0, 7)	
Fuel fill cap socket bolt	3	4	1.8 (0.2, 1.3)	
Fuel rail mounting bolt	4	5	5.1 (0.5, 3.8)	
EVAP canister stay mounting bolt	4	6	12 (1.2, 9)	
Air cleaner housing tapping screw	6	4	0.8 (0.1, 0.6)	
Air funnel screw	6	5	4.2 (0.4, 3.1)	
Harness mount stay screw	4	5	1.1 (0.1, 0.8)	
Harness clamping stay bolt	1	6	1.0 (0.1, 0.7)	

GENERAL INFORMATION

COOLING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Water pump assembly bolt	4	6	12 (1.2, 9)	CT bolt
Water pump drain bolt	1	6	12 (1.2, 9)	CT bolt
Thermostat cover bolt	2	6	13 (1.3, 10)	CT bolt
Fan motor mounting bolt	3	5	5.0 (1.5, 3.7)	
Fan motor shroud mounting bolt	4	6	8.4 (0.9, 6.2)	
Cooling fan mounting nut	1	5	2.7 (0.3, 2.0)	Apply locking agent to the threads.
Radiator reserve tank mounting bolt	2	5	0.4 (0.04, 0.3)	

LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil pump driven sprocket bolt	1	6	15 (1.5, 11)	Apply locking agent to the threads.
Oil pump assembly bolt	3	6	8.0 (0.8, 6)	CT bolt

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head mounting bolt	10	9	51 (5.2, 38)	Apply molybdenum oil solution to the threads and seating surface.
Camshaft holder flange bolt	20	6	12 (1.2, 9)	
Cylinder head sealing bolt	2	18	28 (2.9, 21)	Apply a locking agent to the threads.
Cylinder head cover bolt	4	6	10 (1.0, 7)	
PAIR read valve cover bolt	4	6	12 (1.2, 9)	Apply a locking agent to the threads.
Cam sprocket flange knock bolt	4	7	20 (2.0, 15)	Apply a locking agent to the threads.
Cam chain tensioner pivot bolt	1	6	10 (1.0, 7)	Apply a locking agent to the threads.
Cam chain guide torx bolt	1	6	12 (1.2, 9)	Apply a locking agent to the threads.
Exhaust pipe stud bolt	8	8	See page 2-16	

CLUTCH/STARTER CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch center lock nut	1	25	128 (13.1, 94)	Apply engine oil to the threads and seating surface. Stake.
Starter clutch outer mounting bolt	1	10	83 (8.5, 61)	Apply engine oil to the threads and seating surface.
Clutch spring bolt	3	6	12 (1.2, 9)	

ALTERNATOR

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

TRANSMISSION/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Transmission holder mounting bolt	6	8	29 (3.0, 21)	
Countershaft bearing set plate bolt	1	6	12 (1.2, 9)	Apply a locking agent to the threads.
Mainshaft bearing set plate bolt	3	6	12 (1.2, 9)	Apply a locking agent to the threads.
Shift drum stopper arm pivot bolt	1	6	12 (1.2, 9)	
Gearshift spindle return spring pin	1	8	23 (2.3, 17)	
Shift drum bearing setting bolt	2	6	12 (1.2, 9)	Apply a locking agent to the threads.
Gearshift cam bolt	1	6	12 (1.2, 9)	Apply a locking agent to the threads.
Gearshift pedal pivot bolt	1	8	27 (2.8, 20)	

CRANKCASE/CRANKSHAFT/BALANCER/PISTON

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Crankcase	7 mm bolt	12	7	18 (1.8, 13)
	8 mm bolt	6	8	24 (2.4, 18)
	9 mm bolt (main journal bolt)	10	9	See page 14-15
Lower crankcase sealing bolt	1	22	59 (6.0, 44)	Apply a locking agent to the threads.
Lower crankcase socket bolt	1	10	12 (1.2, 9)	Apply a locking agent to the threads.
Lower crankcase sealing bolt	1	20	30 (3.1, 22)	Apply a locking agent to the threads.
Lower crankcase socket bolt	1	8	23 (2.3, 17)	Apply a locking agent to the threads.
Connecting rod bolt (new bolt)	8	8	See page 14-19	Apply engine oil to the threads and seating surface.
Connecting rod bolt (retightening)	8	8	See page 14-25	Apply engine oil to the threads and seating surface.
Pulser plate mounting bolt	3	8	19 (1.9, 14)	Apply a locking agent to the threads.

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Drive sprocket bolt	1	10	54 (5.5, 40)	
Front engine hanger bolt	2	12	59 (6.0, 44)	
Rear upper engine hanger nut	1	12	59 (6.0, 44)	
Rear lower engine hanger nut	1	12	59 (6.0, 44)	
Starter motor terminal nut	1	6	12 (1.2, 9)	

GENERAL INFORMATION

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 holder bolt	4	8	27 (2.8, 20)	
Left handlebar switch screw	2	5	2.5 (0.3, 1.8)	
Right handlebar switch screw	2	5	2.5 (0.3, 1.8)	
Front master cylinder holder bolt	2	6	12 (1.2, 9)	
Front pulser ring torx bolt	5	5	7.0 (0.7, 5.2)	Pre-coated bolt; replace with new ones.
Front brake disc bolt	10	6	20 (2.0, 15)	Pre-coated bolt; replace with new ones.
Tire valve nut	1	8V1	6.5 (0.7, 4.8)	
Front axle bolt	1	18	79 (8.1, 58)	
Front axle holder bolt	4	8	22 (2.2, 16)	
Front brake caliper mounting bolt	4	10	45 (4.6, 33)	Pre-coated bolt; replace with new ones.
Fork piston rod nut	2	12	27.5 (2.8, 20)	
Fork rod guide case	2	40.5	90 (9.2, 66)	
Fork cap	2	46.5	35 (3.6, 26)	
Bottom bridge pinch bolt	4	8	27 (2.8, 20)	
Steering stem adjusting nut	1	26	27 (2.8, 20)	See page 16-27
Steering stem adjusting lock nut	1	26	—	See page 16-27

REAR WHEEL/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear axle nut	1	35	201 (20.5, 148)	Stake.
Rear wheel nut	5	12	108 (11.0, 80)	
Rear brake disc nut	5	8	34 (3.5, 25)	U-nut
Driven sprocket nut	6	10	64 (6.5, 47)	U-nut
Shock absorber upper mounting nut	1	12	64 (6.5, 47)	U-nut
Shock absorber lower mounting nut	1	10	42 (4.3, 31)	U-nut
Swingarm pivot nut	1	18	93 (9.5, 69)	
Main step bracket mounting bolt	4	8	37 (3.8, 27)	
Axle bearing holder pinch bolt	2	8	27 (2.8, 20)	
Drive chain slider socket bolt	2	5	4.2 (0.4, 3.0)	Pre-coated bolt; replace with a new one.
Drive chain guide socket bolt	2	5	4.2 (0.4, 3.0)	Pre-coated bolt; replace with a new one.
Air guide mounting bolt	2	5	4.2 (0.4, 3.0)	Pre-coated bolt; replace with a new one.
Tire valve nut	1	8V1	6.5 (0.7, 4.8)	

HYDRAULIC BRAKE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front brake hose clamp nut	1	6	10 (1.0, 7)	
Front master cylinder bleed valve	1	8	5.4 (0.6, 4.0)	
Front brake caliper bleed valve	2	8	8.0 (0.8, 5.9)	
Rear brake caliper bleed valve	1	8	5.4 (0.6, 4.0)	
Front brake caliper mounting bolt	4	10	45 (4.6, 33)	Pre-coated bolt; replace with new ones.
Rear brake caliper mounting bolt	2	8	30 (3.1, 22)	Pre-coated bolt; replace with new ones.
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	6	10	34 (3.5, 25)	
Front brake lever pivot bolt	1	6	1.0 (0.1, 0.7)	Apply silicone grease to the sliding surface.
Front brake lever pivot nut	1	6	6.0 (0.6, 4.4)	
Front brake light switch screw	1	4	1.2 (0.1, 0.9)	
Rear master cylinder push rod lock nut	1	8	17 (1.7, 13)	
Rear master cylinder mounting bolt	2	6	12 (1.2, 9)	Pre-coated bolt; replace with new ones.
Main step bracket mounting bolt	4	8	37 (3.8, 27)	
Rear brake reservoir mounting bolt	1	6	10 (1.0, 7)	
Rear brake caliper pin	1	12	27 (2.8, 20)	
Rear master cylinder reservoir hose joint screw	1	4	1.5 (0.15, 1.1)	Apply a locking agent to the threads.
Front master cylinder oil cup mounting screw	2	4	1.5 (0.15, 1.1)	Apply a locking agent to the threads.
Front master cylinder oil cap screw	2	4	1.5 (0.15, 1.1)	
Rear master cylinder oil cap screw	2	4	1.5 (0.15, 1.1)	

ANTI-LOCK BRAKE SYSTEM (ABS)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake pipe joint nut	8	10	14 (1.4, 10)	Apply brake fluid to the threads.

LIGHTS/METERS/SWITCHES

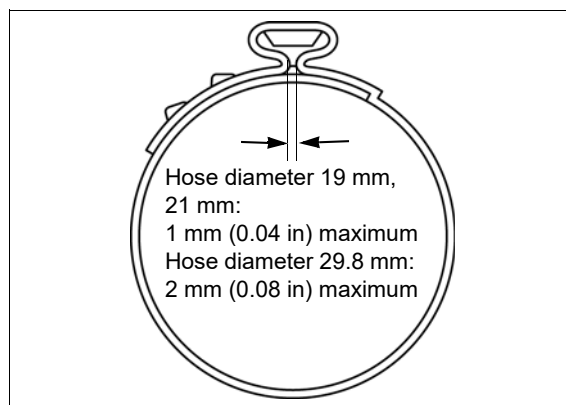
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Combination meter mounting screw	3	5	1.0 (0.1, 0.7)	
EOP switch	1	PT 1/8	12 (1.2, 9)	Apply sealant to the threads.
EOP switch wire terminal bolt	1	4	2.0 (0.2, 1.5)	
Ignition switch mounting bolt	2	8	27 (2.8, 20)	Replace with a new one.
Ignition switch stay mounting bolt	2	8	1.0 (0.1, 0.7)	
Clutch switch mounting screw	1	3	0.6 (0.1, 0.4)	Pre-coated screw; replace with a new one.
Neutral switch	1	10	12 (1.2, 9)	
Neutral switch wire terminal nut	1	4	1.7 (0.2, 1)	
Sidestand switch mounting bolt	1	6	10 (1.0, 7)	Pre-coated bolt; replace with a new one.
Meter visor mounting bolt	4	5	0.4 (0.04, 0.3)	
Rear fender stay inner cover mounting screw	3	5	0.9 (0.1, 1)	
License light cover screw	2	5	0.9 (0.1, 1)	
Fuel level sensor mounting nut	4	6	12 (1.2, 9)	

OTHERS

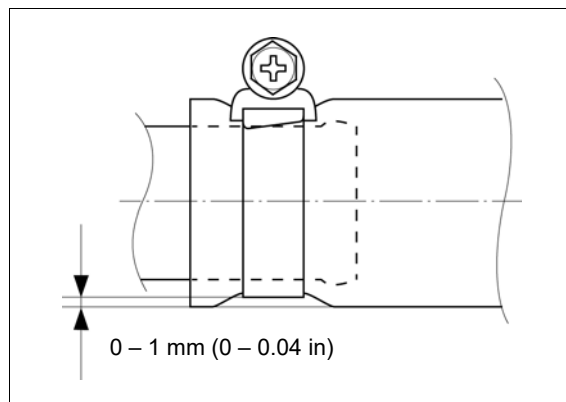
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Delay valve mounting bolt	2	5	0.8 (0.08, 0.6)	
Bank sensor mounting bolt	2	6	11 (1.1, 8)	

GENERAL INFORMATION

Water hose band:



Water hose clamp:



LUBRICATION & SEAL POINTS

ENGINE

MATERIAL	LOCATION	REMARKS
Liquid sealant (Three Bond 1207B or equivalent)	Crankcase mating surface	See page 14-6
	Oil pan mating surface	See page 9-6
	Right crankcase cover mating surface	See page 11-5
	Alternator cover mating surface	See page 12-4
	EOP switch threads	See page 14-12
	Gearshift linkage cover	See page 13-5
Liquid sealant (Three Bond 5211C or equivalent)	Cylinder head semi-circular cut-out	See page 10-5
Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	Main journal bearing surface	
	Piston pin sliding surface	
	Connecting rod bearing surface	
	Connecting rod small end inner surface	
	Crankshaft thrust surface	
	Camshaft lobes, journals and thrust surface	Do not apply to mating surface of the camshaft holder
	Valve stem (valve guide sliding surface)	
	Valve lifter outer sliding surface	
	Clutch outer/primary driven gear sliding surface	
	Clutch outer guide sliding surface	
	Oil pump drive sprocket and collar sliding surface	
	M3/4, C5, C6 shifter gear (shift fork grooves)	
	Starter reduction gear shaft sliding surface	
	Starter idle gear shaft sliding surface	
	Water pump shaft thrust washer sliding surface	
	Cylinder head mounting bolt threads and seating surface	
Engine oil	Piston and piston ring sliding surface	
	Oil strainer packing whole surface	
	Clutch disc whole surface	
	Starter one-way clutch sliding surface	
	Flywheel bolt threads and seating surface	
	Clutch center lock nut threads and seating surface	
	Oil filter cartridge threads and O-ring surface	
	Camshaft holder bolt threads and seating surface	
	Starter clutch mounting bolt threads and seating surface	
	Connecting rod bolt threads and seating surface	
	Each gear teeth and rotating surface	
	Each bearing rolling surface	
	Each O-ring whole surface	
	Other rotating area and sliding surface	
Multi-purpose grease	Timing hole cap threads	
	Balancer damper rubber fitting area	
	Each oil seal lips	

GENERAL INFORMATION

MATERIAL	LOCATION	REMARKS
Locking agent	Gearshift linkage cover bolt threads	See page 13-7
	Lower crankcase 22 mm sealing bolt threads	
	Lower crankcase 20 mm sealing bolt threads	
	Lower crankcase 10 mm sealing bolt threads	
	Lower crankcase 8 mm sealing bolt threads	
	Cam chain guide A pivot bolt threads	
	Cylinder head cover breather joint threads	
	Pulser plate mounting bolt	Coating width: 4.0 ± 1 mm
	Oil pump driven sprocket bolt threads	Coating width: 6.5 ± 1 mm
	Shift drum bearing setting bolt threads	Coating width: 6.5 ± 1 mm
	Oil filter boss threads (stud side)	Coating width: 6.5 ± 1 mm
	Mainshaft/countershaft bearing set plate bolt threads	Coating width: 6.5 ± 1 mm
	Cam sprocket bolt threads	Coating width: 6.5 ± 1 mm
	Shift drum center bolt threads	Coating width: 6.5 ± 1 mm
	Cam chain tensioner pivot bolt threads	Coating width: 6.5 ± 1 mm
	Gearshift cam bolt threads	Coating width: 6.5 ± 1 mm
	Orifice bolt	Coating width: 6.5 ± 1 mm
	PAIR check valve cover bolt	Coating width: 6.5 ± 1 mm

FRAME

MATERIAL	LOCATION	REMARKS
Multi-purpose grease	Sidestand pivot sliding area	
	Clutch lever pivot bolt sliding surface	
	Driven sprocket hub bearing dust seal lips	
	Torque link stopper contact surface	
	Gearshift pedal link tie-rod ball joints	
	Gearshift pedal pivot sliding area	
	Rear brake pedal pivot sliding area	
	Front wheel dust seal lips	
	Throttle grip and APS contacting surface	
	Main step sliding surface	
	Pillion step sliding surface	
	Seat catch hook sliding area	
	Swingarm pivot dust seal lips	
	Swingarm pivot needle bearings	
	Driven flange O-ring	
	Bearing holder dust seal lip	
	Shock absorber pivot dust seal lips	
	Shock absorber needle bearings	
Urea based multi-purpose grease with extreme pressure agent (example: EXCELITE EP2 manufactured by KYODO YUSHI, Japan), Shell Stamina EP2 or equivalent	Upper and lower steering head bearing	Apply 3 – 5 g each
	Steering head dust seal lips	Apply 3 – 5 g each
Engine oil	Steering head bearing adjusting nut threads	
Cable lubricant	Clutch cable inside	
	Seat lock cable	
Honda bond A or equivalent	Handlebar grip rubber inside	
Silicone grease	Brake caliper main and sub slide pin sliding surfaces	Apply 0.4 g each
	Brake pad pin stopper ring	
	Front brake lever pivot/adjuster/push rod sliding area	Apply 0.1 g
	Front brake lever pivot	Apply 0.1 g
	Front brake lever-to-master piston contact area	Apply 0.1 g
	Rear master cylinder push rod-to-master piston contact area	Apply 0.1 g
	Rear master cylinder push rod boot inside	Apply 0.1 g
	Rear brake caliper dust seals and piston seals	
DOT 4 brake fluid	Master cylinder inside	
	Brake master pistons and cups	
	Rear brake caliper pistons	
	Front brake caliper pistons and piston seals and dust seals	
	Brake pipe threads	
Fork fluid	Fork cap O-ring	
	Fork dust seal and oil seal lips	
Locking agent	Brake caliper sub slider pin threads	
	Rear master cylinder connector screw	
	Caliper bracket retainer	
	Front master cylinder oil cup mounting screw	
	Rear fender D stay bolt	
Dive chain lubricant designed specifically for O-ring chains or SAE #80-90 gear oil	Drive chain whole surface	

GENERAL INFORMATION

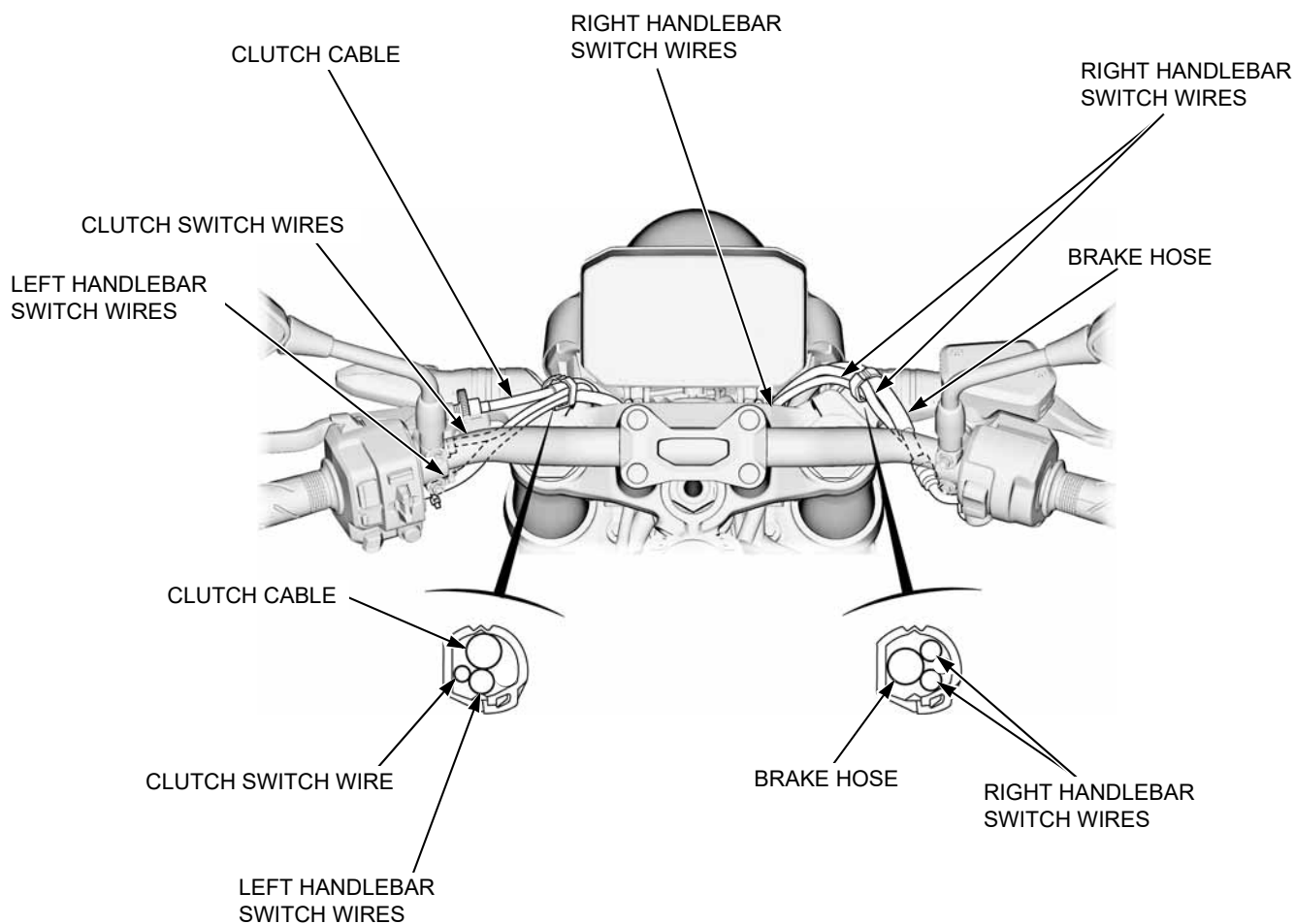
SPECIAL TOOL LIST

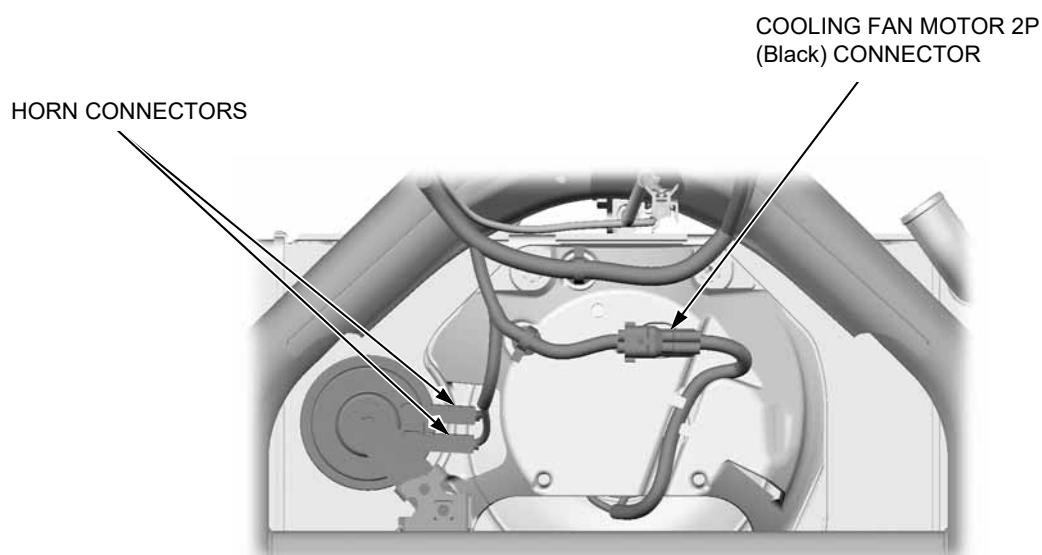
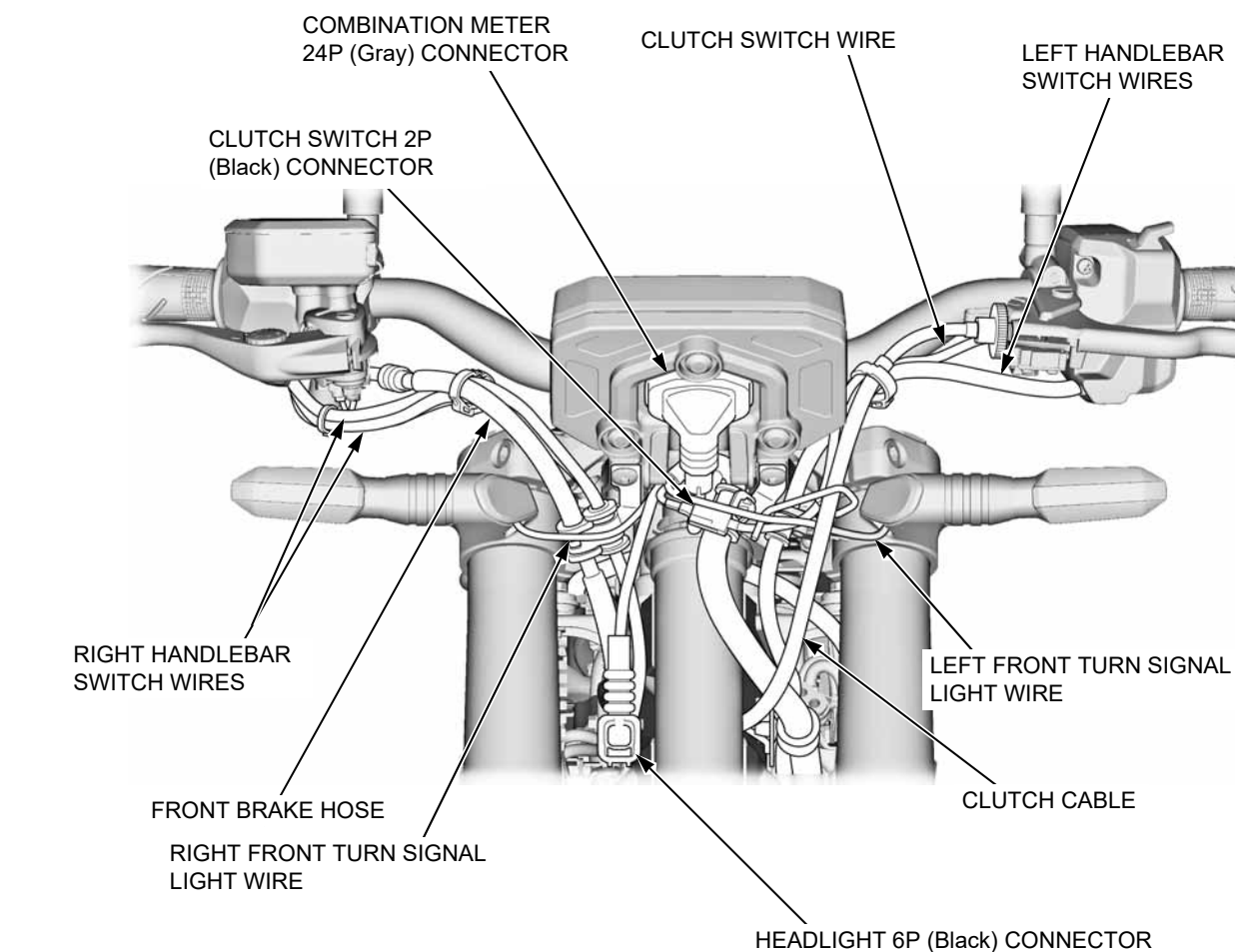
TITLE	TOOL No	TOOL NAME
MAINTENANCE	070MG-0010100	Tensioner stopper
	07HAA-PJ70101	Oil filter wrench
	07HMH-MR10103	Drive chain tool set
PGM-FI SYSTEM	070MZ-0010300	SCS short connector
	07ZAJ-RDJA110	Test probe
IGNITION SYSTEM	07HGJ-0020100	Peak voltage adaptor
	07ZAJ-RDJA110	Test probe
FUEL SYSTEM	07406-0040004	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	07RMJ-MY50100	Compression gauge attachment
	070MG-0010100	Cam chain tensioner holder
	07HMG-MR70002	Tappet hole protector
	07757-0010000	Valve spring compressor
	07959-KM30101	Valve spring compressor attachment
	07JMD-KY20100	Valve guide driver
	07743-0020000	Valve guide driver
	07MMH-MV90100	Valve guide reamer, 4.008 mm
	07781-0010600	Cutter holder, 4.5 mm
	07780-0010300	Seat cutter, 29 mm (45° IN)
	07780-0010200	Seat cutter, 27.5 mm (45° EX)
	07780-0012200	Flat cutter, 30 mm (32° IN)
	07780-0013300	Flat cutter, 27 mm (32° EX)
	07780-0014000	Interior cutter, 30 mm (60° IN)
CLUTCH/STARTER CLUTCH	07724-0050002	Clutch center holder
	07916-9690000	Lock nut wrench 30 x 40 mm
	07724-0010100	Gear holder, M2.5
ALTERNATOR	070MB-MELC100	Flywheel holder
	07733-0020001	Rotor puller
TRANSMISSION/GEARSHIFT LINKAGE	07936-3710600	Bearing remover set, 20 mm
	07741-0010201	Remover weight
	07936-3710100	Remover handle
	07749-0010000	Driver
	07746-0010500	Attachment, 62 x 68 mm
	07746-0010400	Attachment, 52 x 55 mm
	07746-0010300	Attachment, 42 x 47 mm
	07746-0041100	Pilot, 28 mm
	07746-0040500	Pilot, 20 mm
	07746-0040600	Pilot, 25 mm
CRANKCASE/CRANKSHAFT/BALANCER/PISTON	07936-3710600	Bearing remover set, 20 mm
	07741-0010201	Remover weight
	07936-3710100	Remover handle
	07749-0010000	Driver
	07936-3710400	Bearing remover shaft, 35 mm
	07746-0010600	Attachment, 72 x 75 mm
	07746-0010500	Attachment, 62 x 68 mm
	07746-0010400	Attachment, 52 x 55 mm
	07746-0010300	Attachment, 42 x 47 mm
	07746-0040800	Pilot, 35 mm
	07746-0041100	Pilot, 28 mm
	07746-0040500	Pilot, 20 mm
	07746-0040600	Pilot, 25 mm

GENERAL INFORMATION

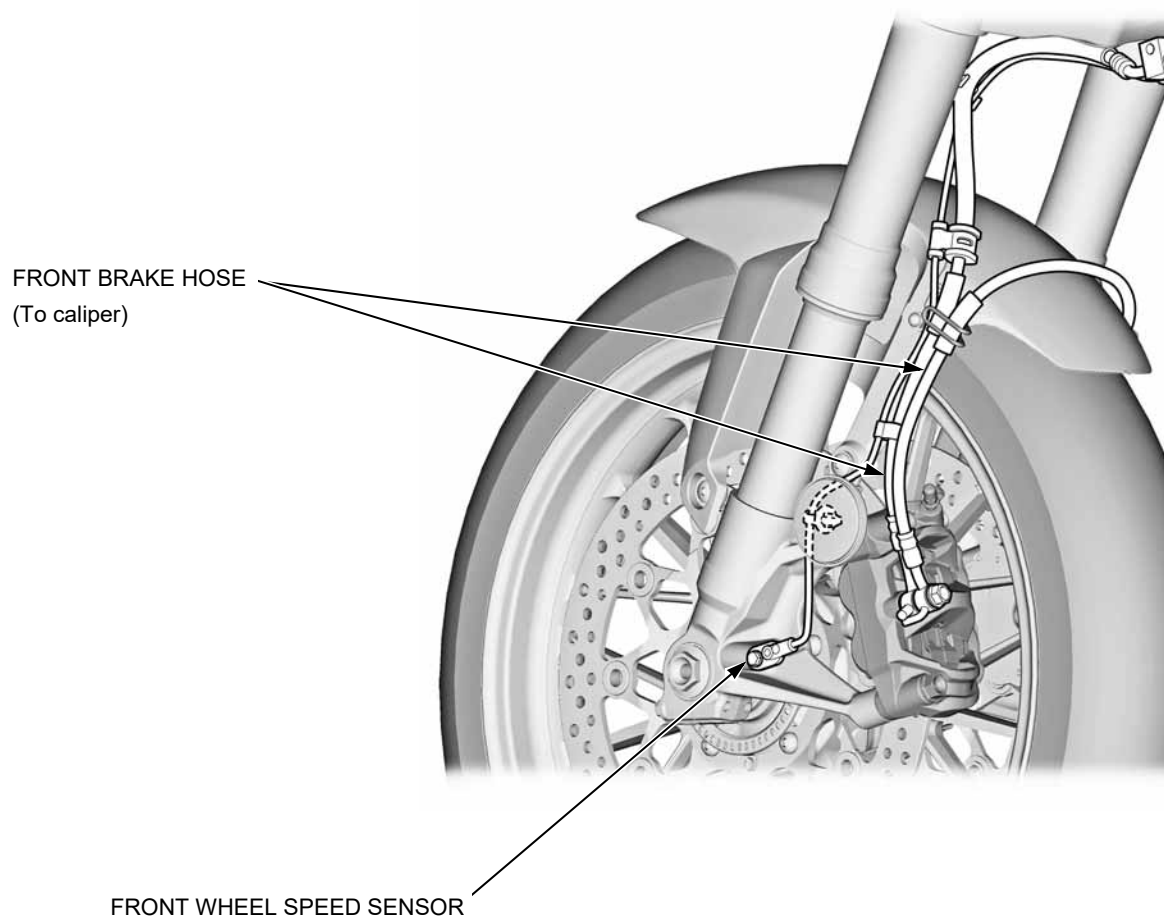
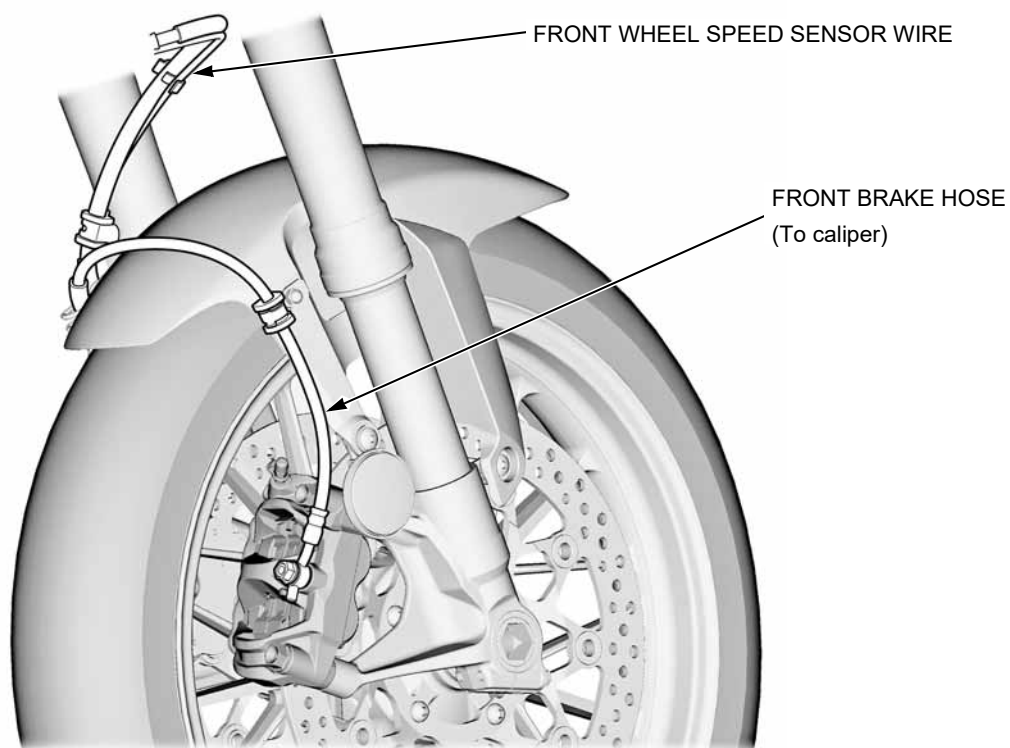
TITLE	TOOL No	TOOL NAME
FRONT WHEEL/SUSPENSION/STEERING	07702-0020001	Adjustable pin spanner
	07749-0010000	Driver
	07746-0010300	Attachment, 42 x 47 mm
	07953-MJ10100	Attachment, 40
	07746-0030300	Attachment, 30 mm I.D.
	07746-0010300	Attachment, 42 x 47 mm
	07746-0010400	Attachment, 52 x 55 mm
	07746-0040600	Pilot, 25 mm
	070MA-MGP0100	Fork cap wrench
	070MB-MGP0100	Rod guide case wrench
	07YMD-MCF0100	Fork seal driver
	07746-0050800	Bearing remover head, 25 mm
	07GGD-0010100	Bearing remover shaft
	07953-MJ10200	Remover handle
	07946-3710500	Bearing remover
REAR WHEEL/SUSPENSION	07749-0010000	Driver
	07949-3710001	Driver
	07946-MJ00100	Driver shaft
	07HMC-MR70100	Needle bearing remover
	070MJ-MGH0100	Wheel hub attachment
	07ZMD-MBW0100	Attachment, 34 mm
	07ZMD-MBW0200	Attachment, 37 mm
	07746-0010300	Attachment, 42 x 47 mm
	07746-0010200	Attachment, 37 x 40 mm
	07746-0010700	Attachment, 24 x 26 mm
	07746-0010500	Attachment, 62 x 68 mm
	07746-0010400	Attachment, 52 x 55 mm
	07746-0040400	Pilot, 17 mm
	07746-0040500	Pilot, 20 mm
	07746-0041100	Pilot, 28 mm
	07746-0040800	Pilot, 35 mm
	07746-0040900	Pilot, 40 mm
ANTI-LOCK BRAKE SYSTEM (ABS)	07ZAJ-RDJA110	Test probe
LIGHT/METERS/SWITCHES	07ZAJ-RDJA110	Test probe
IMMOBILIZER SYSTEM (HISS)	07ZAJ-RDJA110	Test probe
	070MZ-0010300	SCS short connector

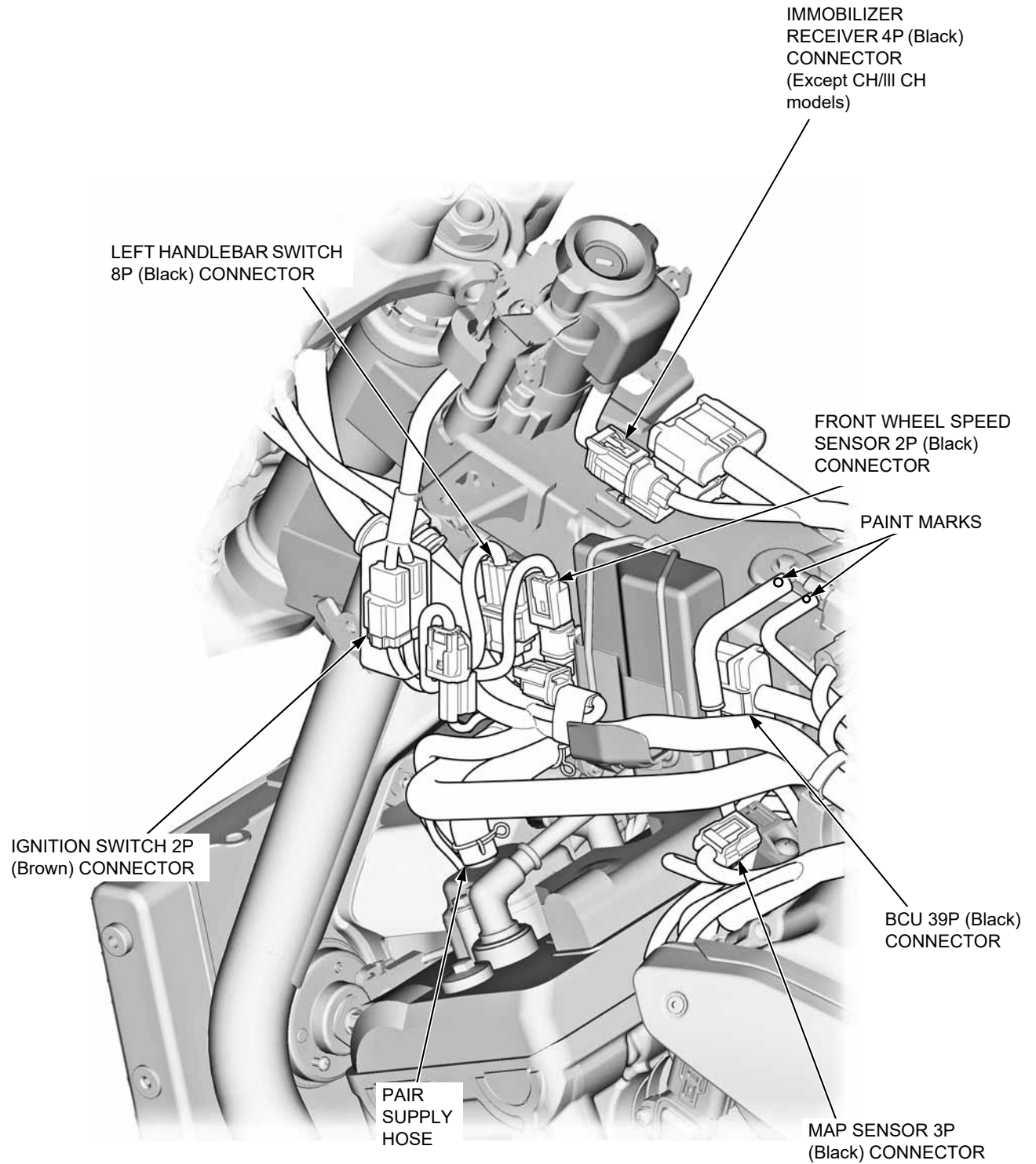
CABLE & HARNESS ROUTING



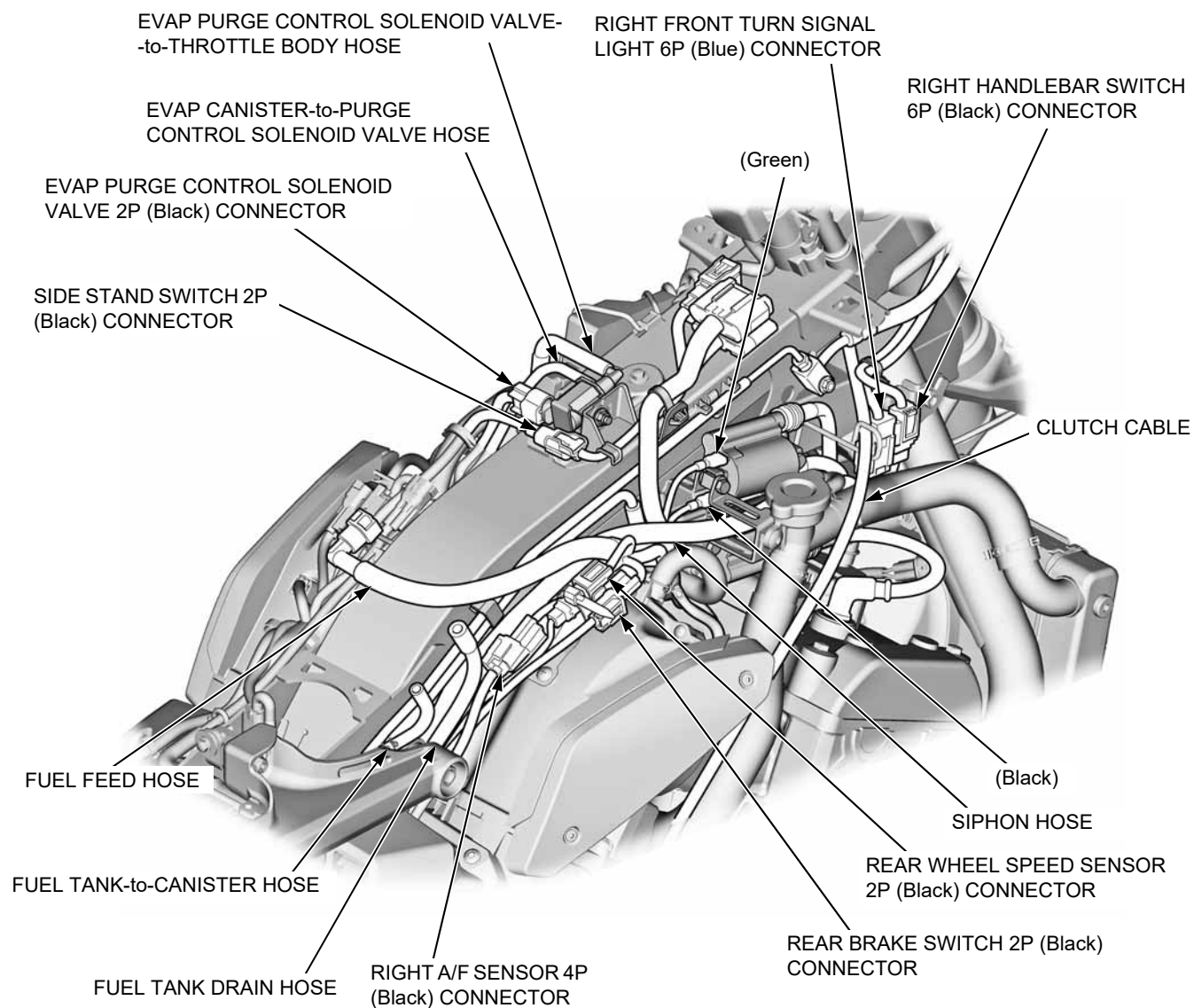


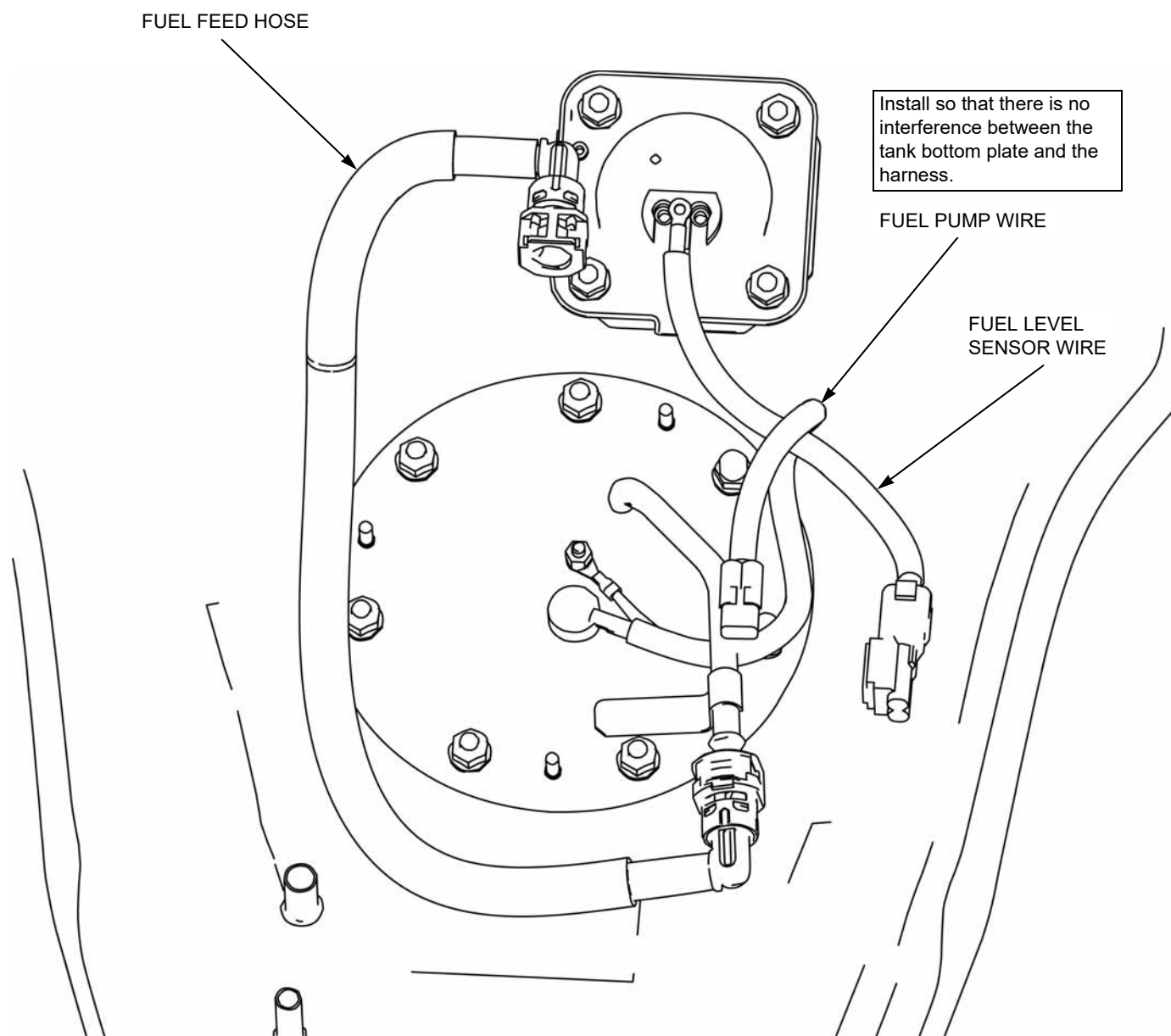
GENERAL INFORMATION



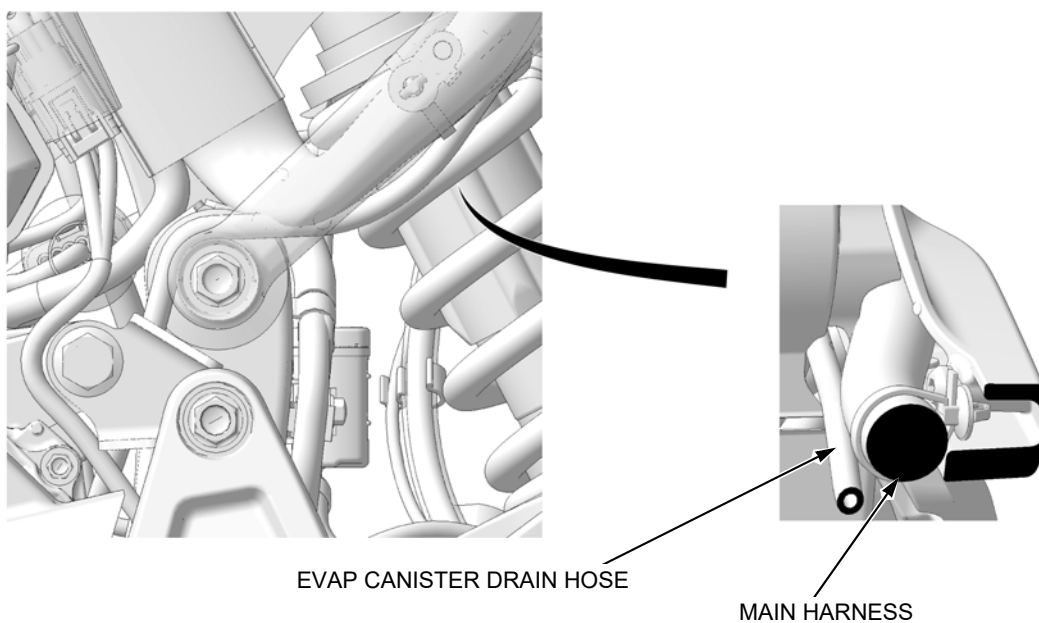
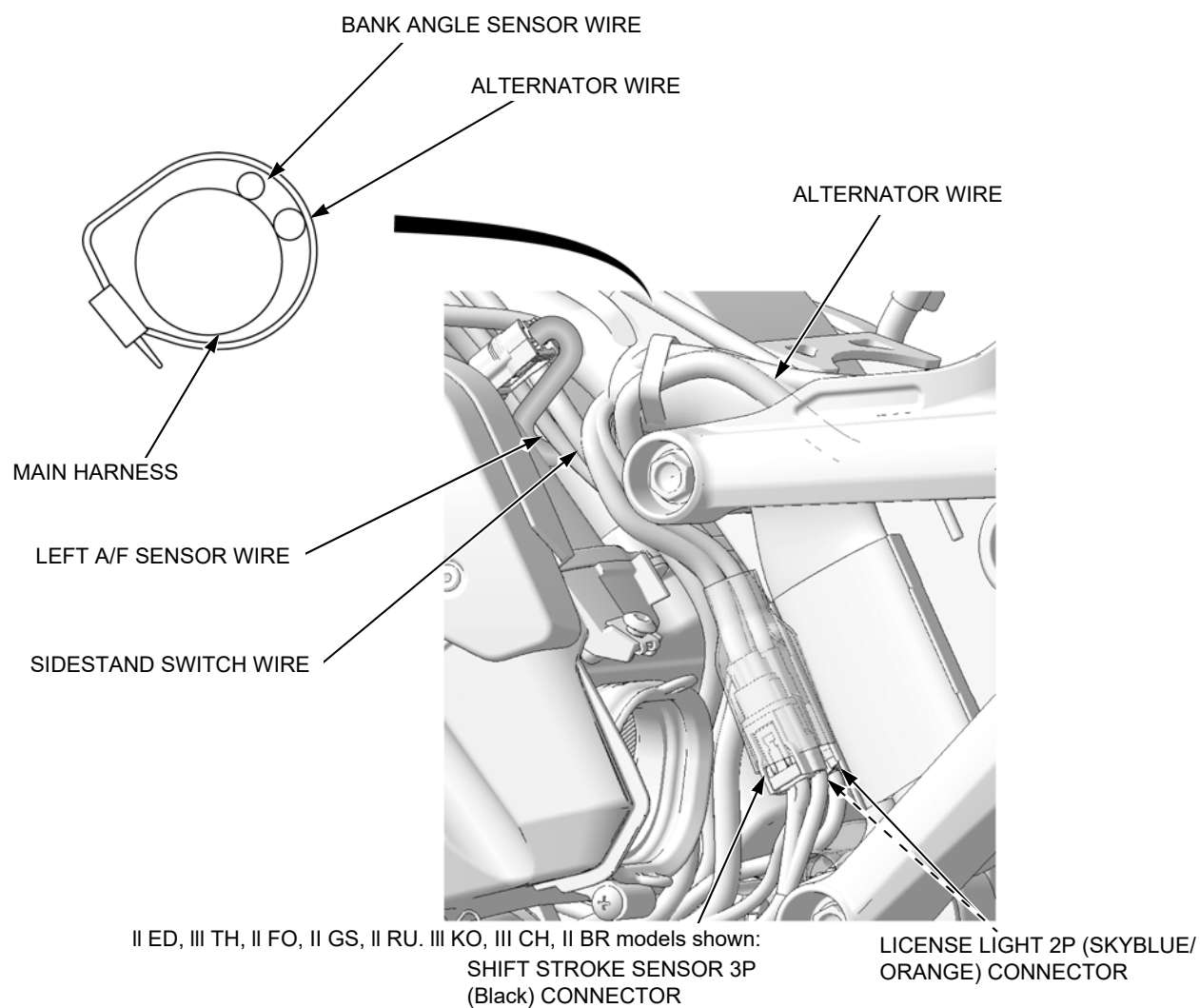


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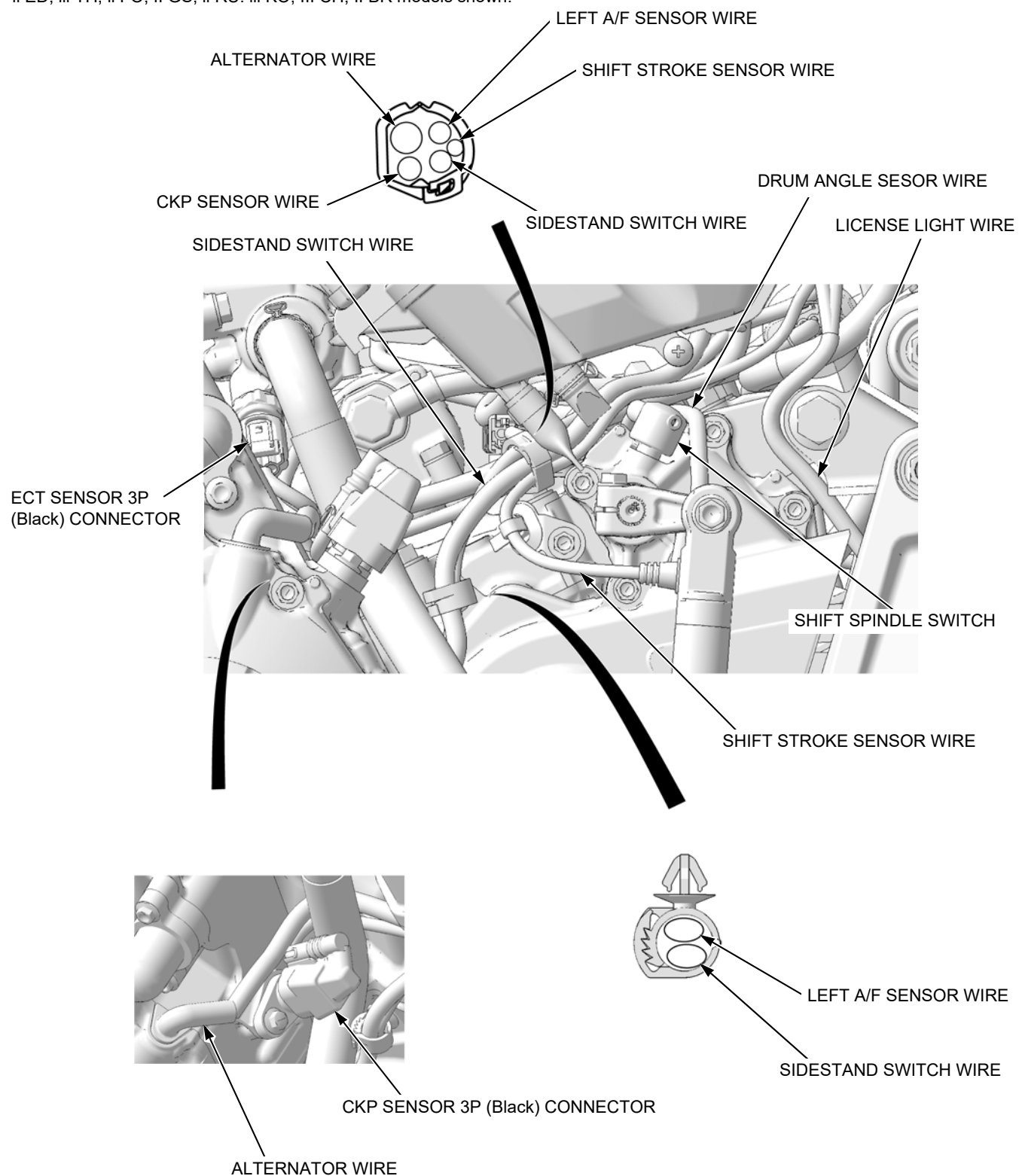




GENERAL INFORMATION



II ED, III TH, II FO, II GS, II RU. III KO, III CH, II BR models shown:



GENERAL INFORMATION

II ED, III TH, II FO, II GS, II RU. III KO, III CH, II BR models shown:

LEFT A/F SENSOR WIRE

SHIFT STROKE SENSOR WIRE

SIDESTAND SWITCH WIRE

LEFT A/F SENSOR WIRE

SIDESTAND SWITCH WIRE

SIDESTAND SWITCH WIRE

OVERFLOW HOSE

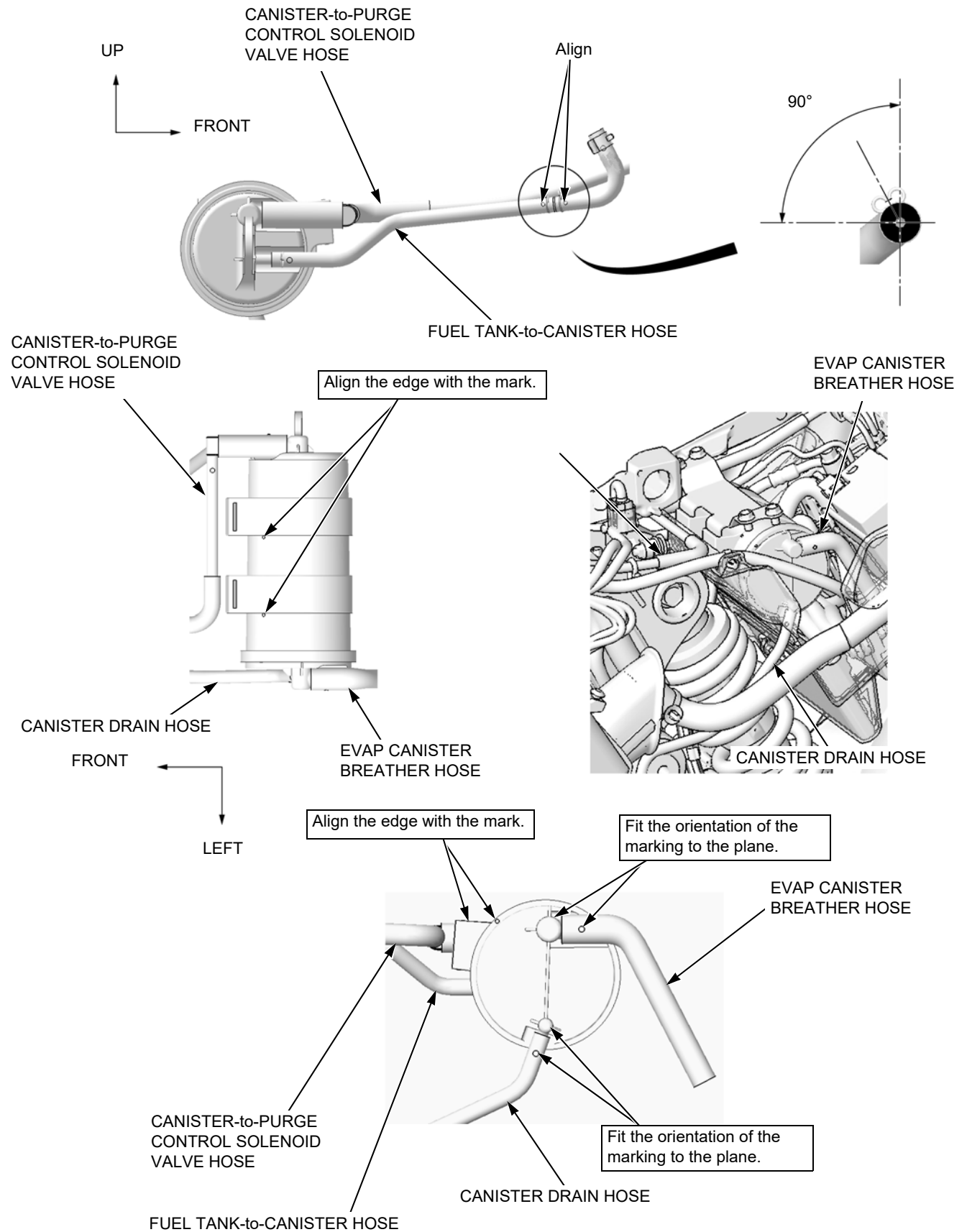
CANISTER DRAIN HOSE

FUEL TANK DRAIN HOSE

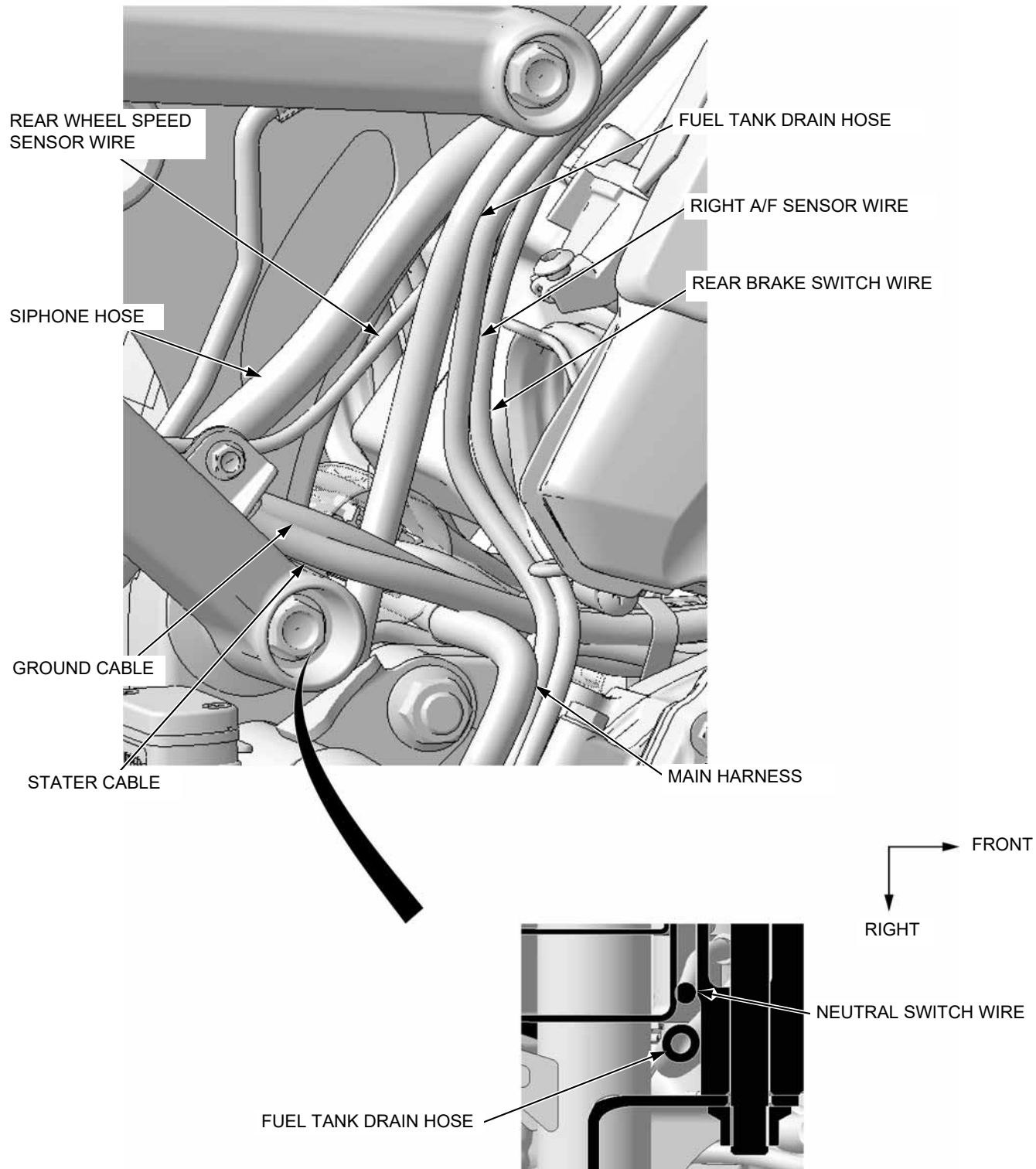
20 – 30 mm (0.79 – 1.18 in)

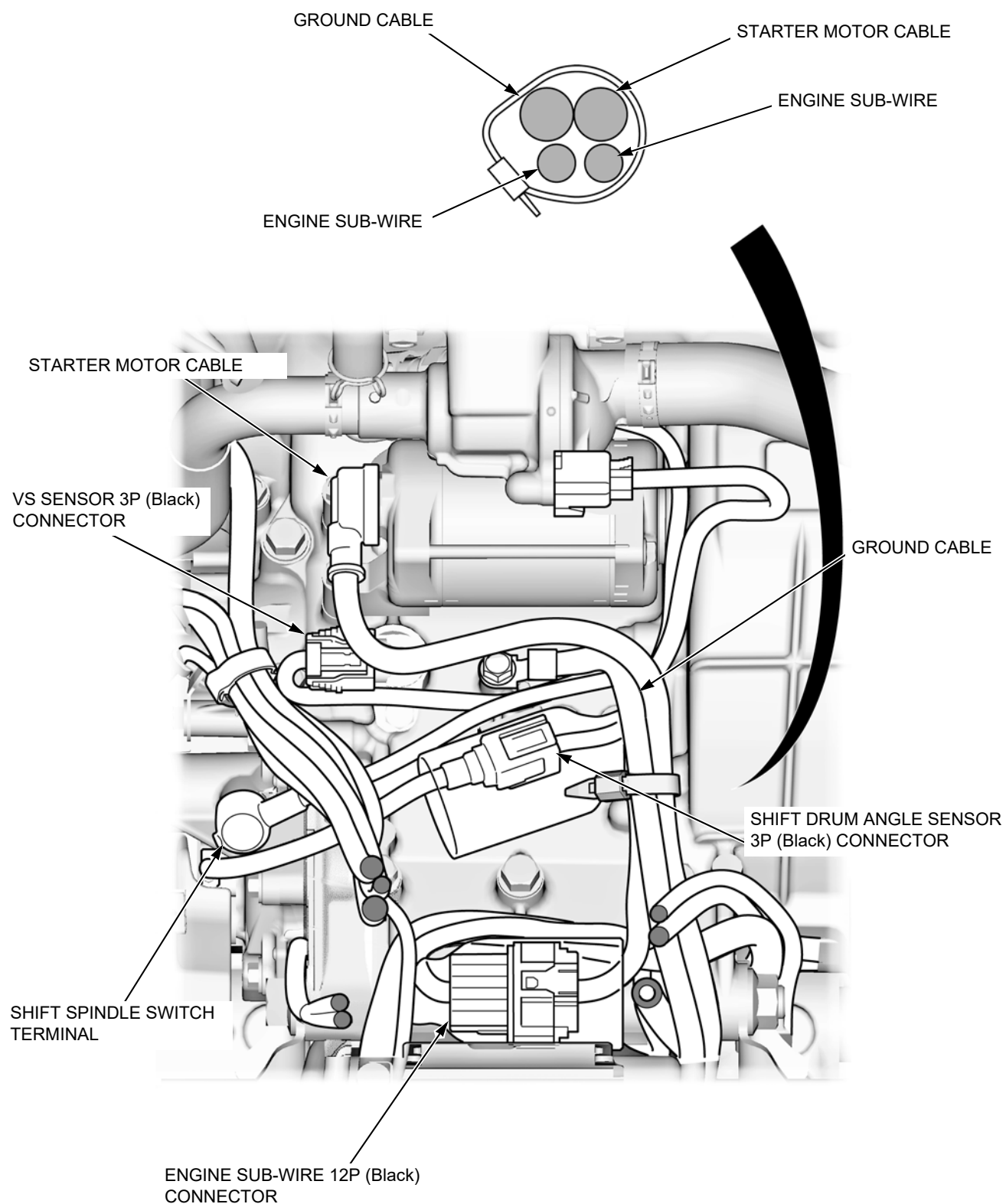
SIDESTAND SPRINGS

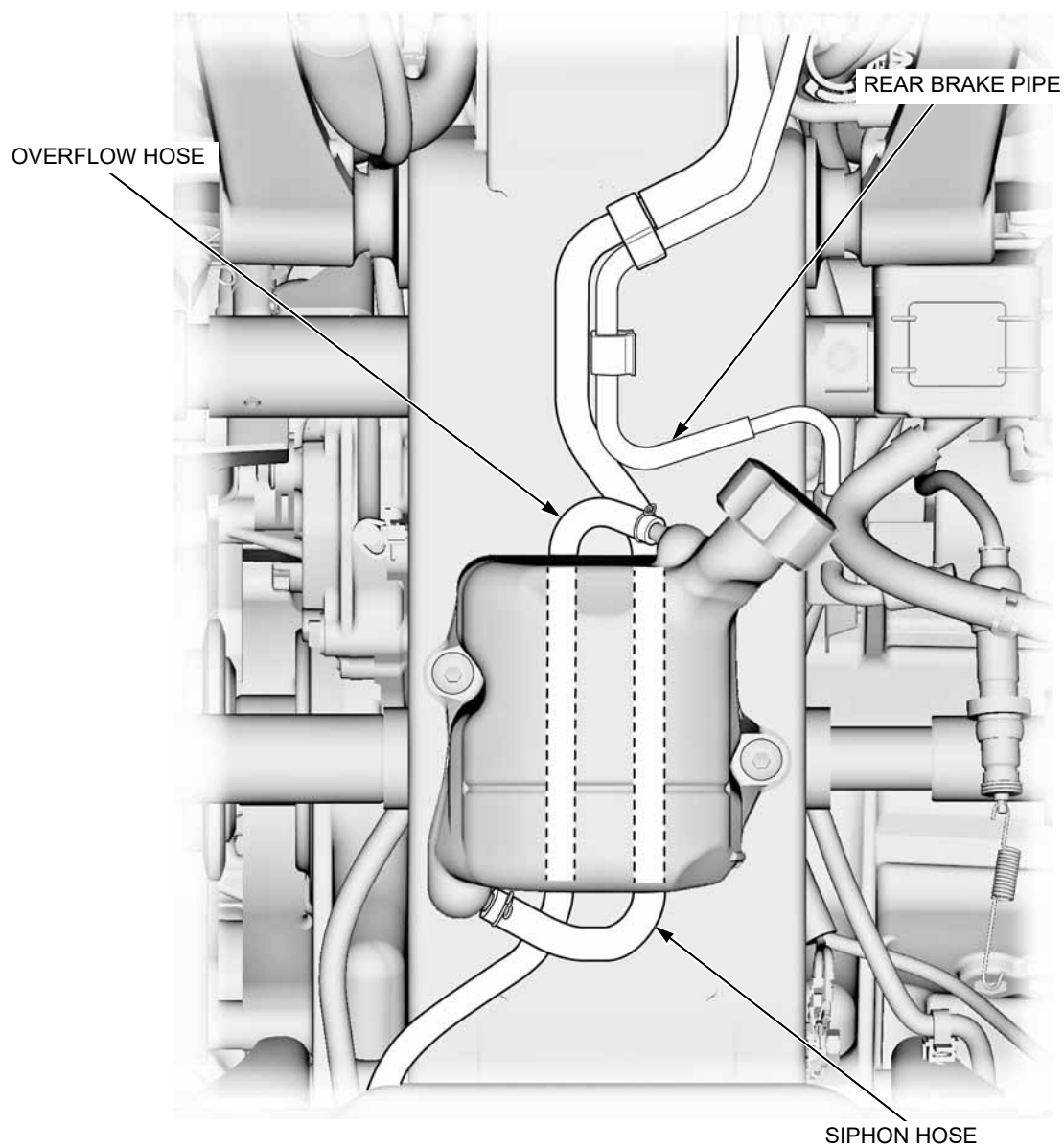
II ED, III TH, II FO, II GS, II RU. III KO, III CH, II BR models shown:

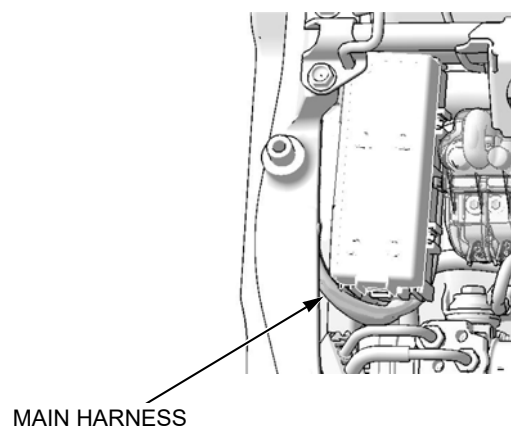
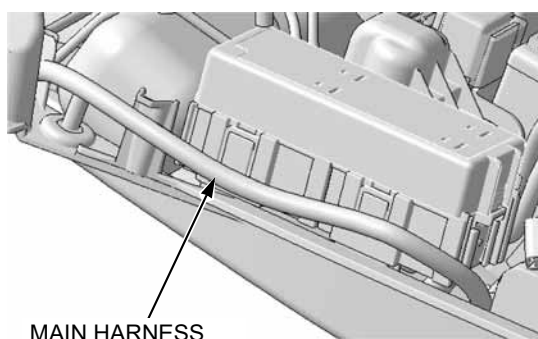
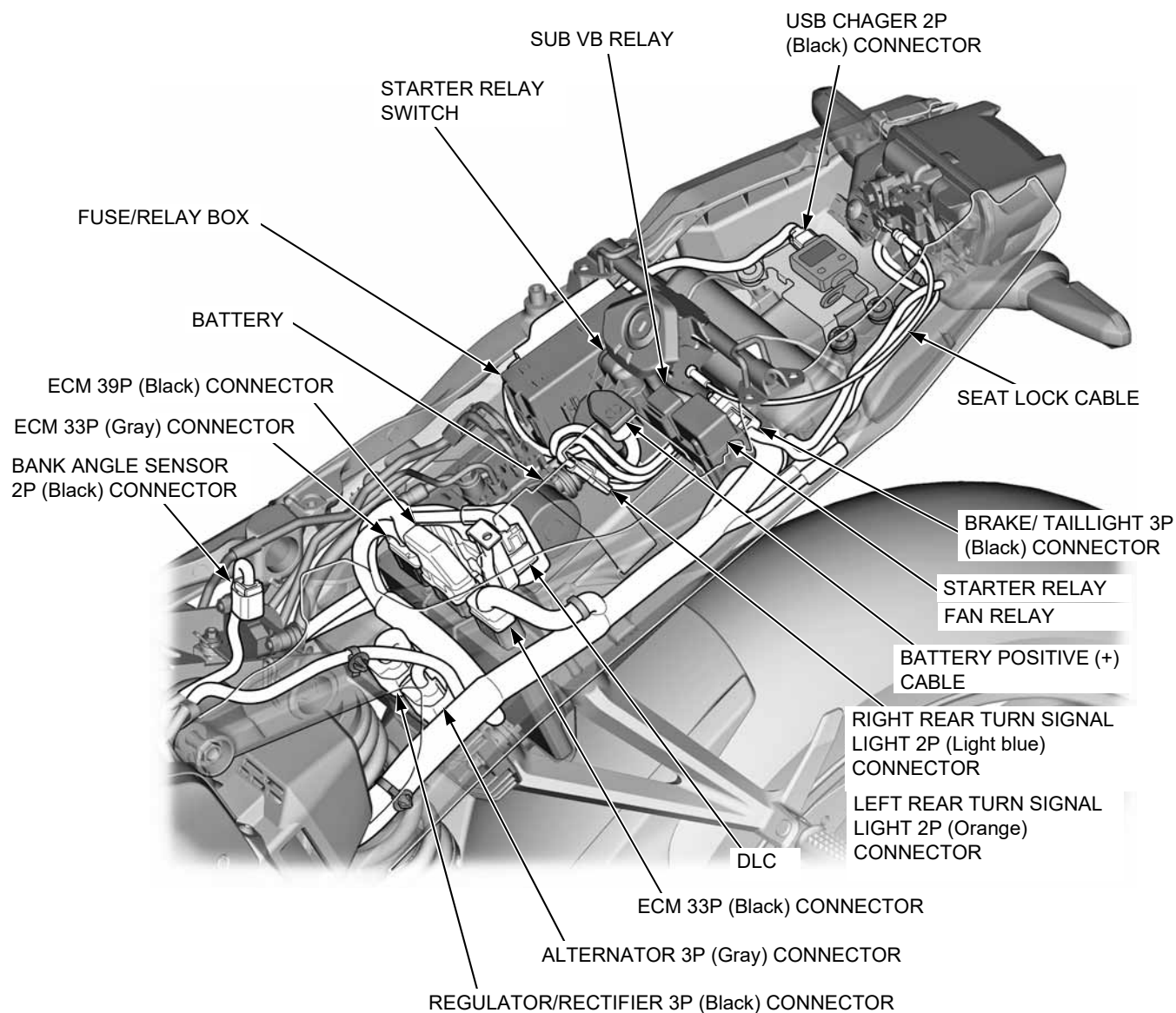


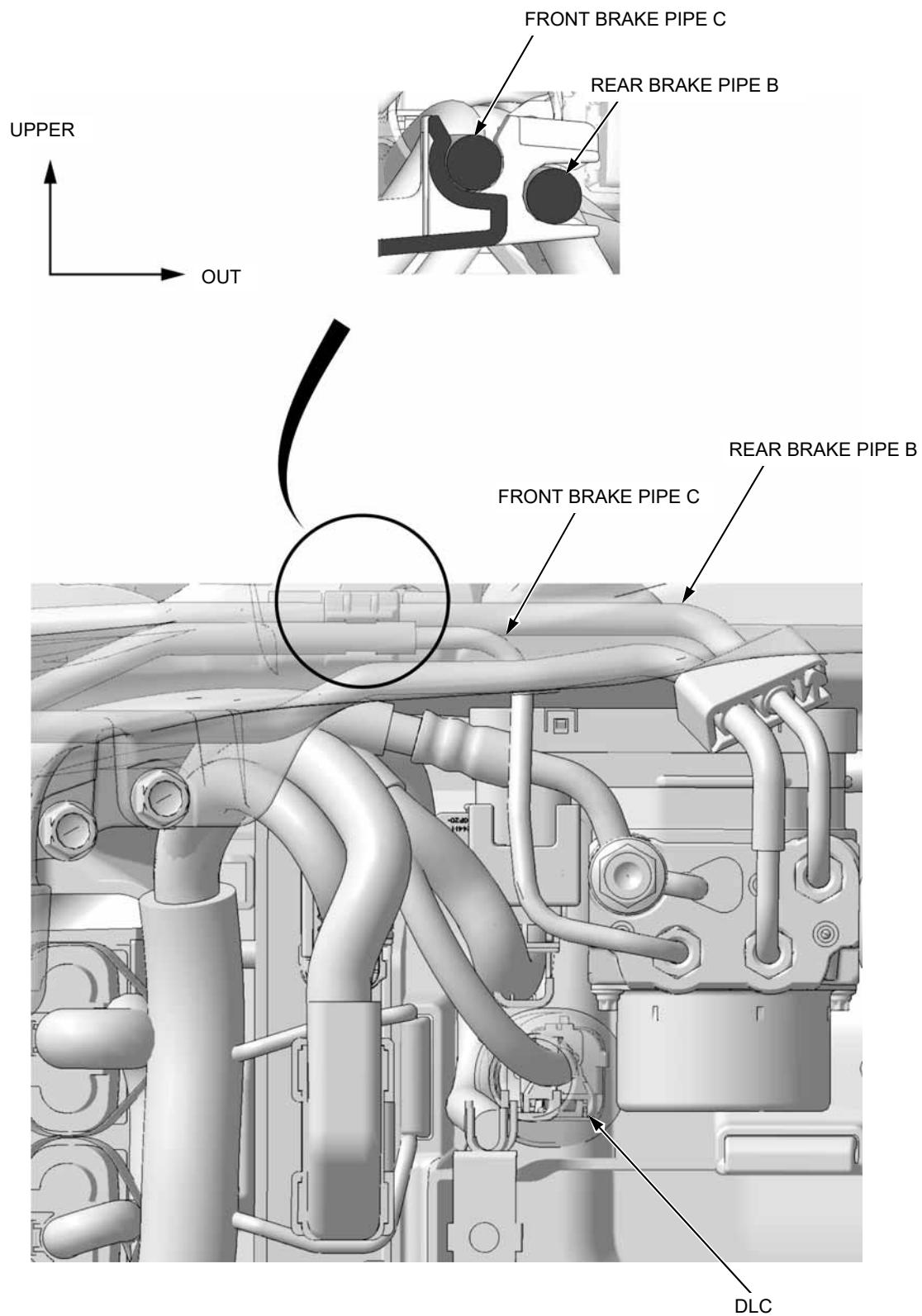
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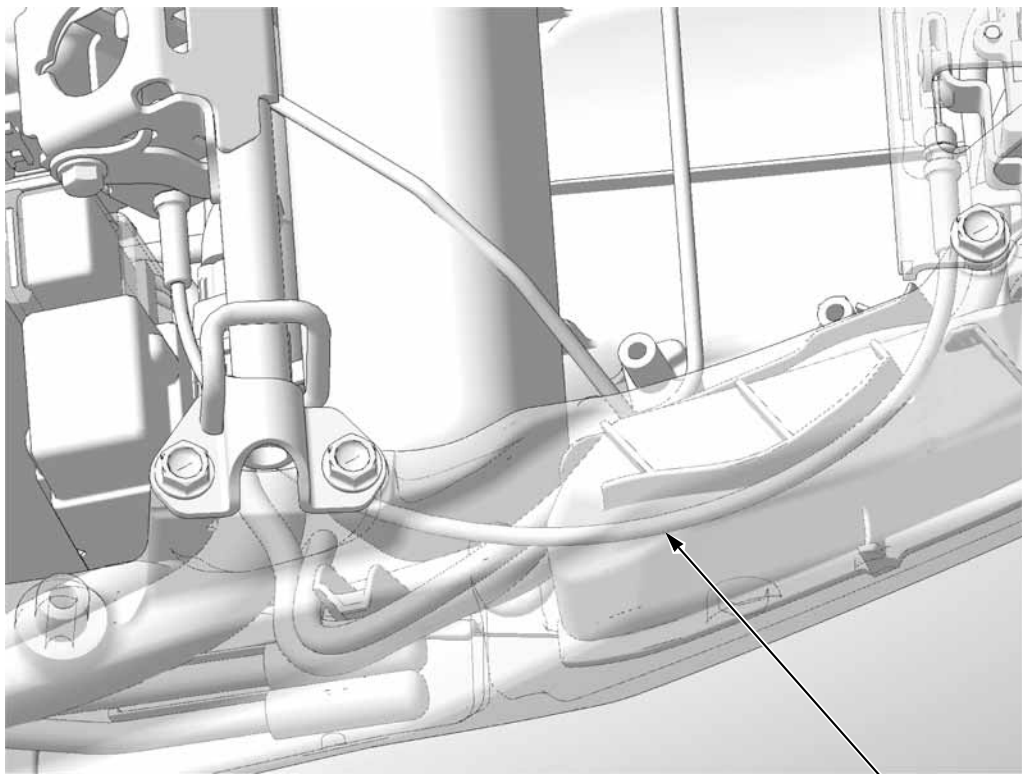






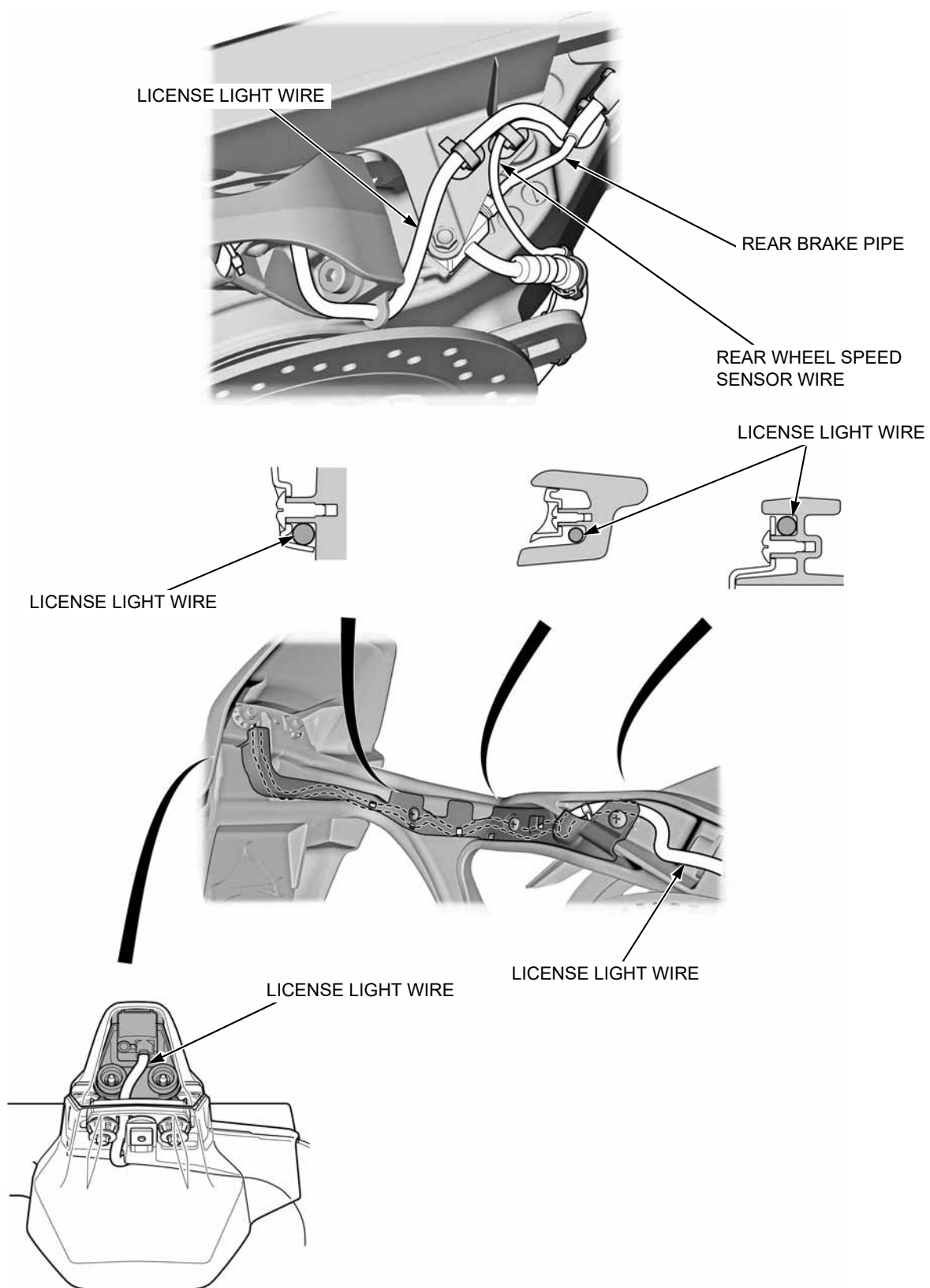


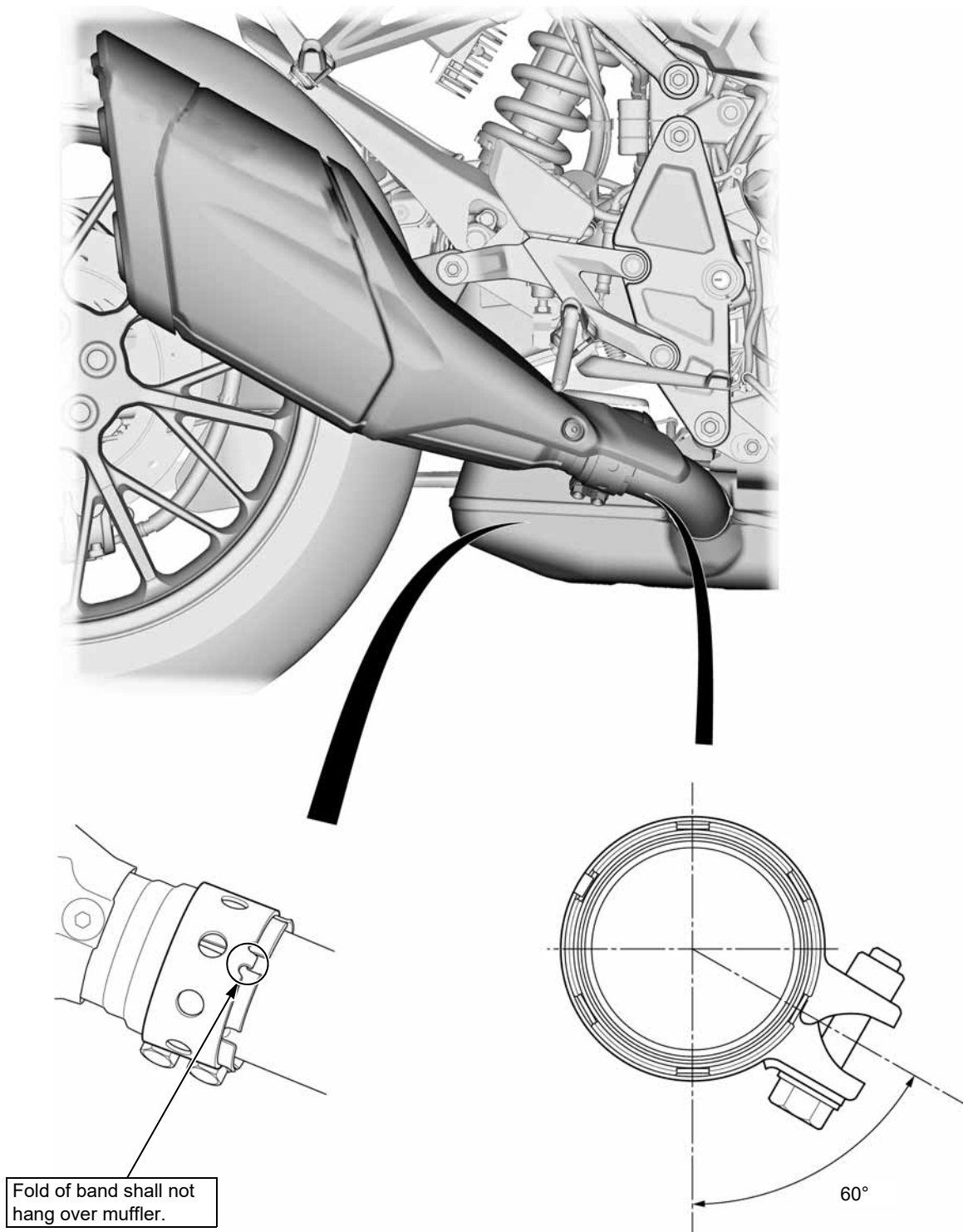


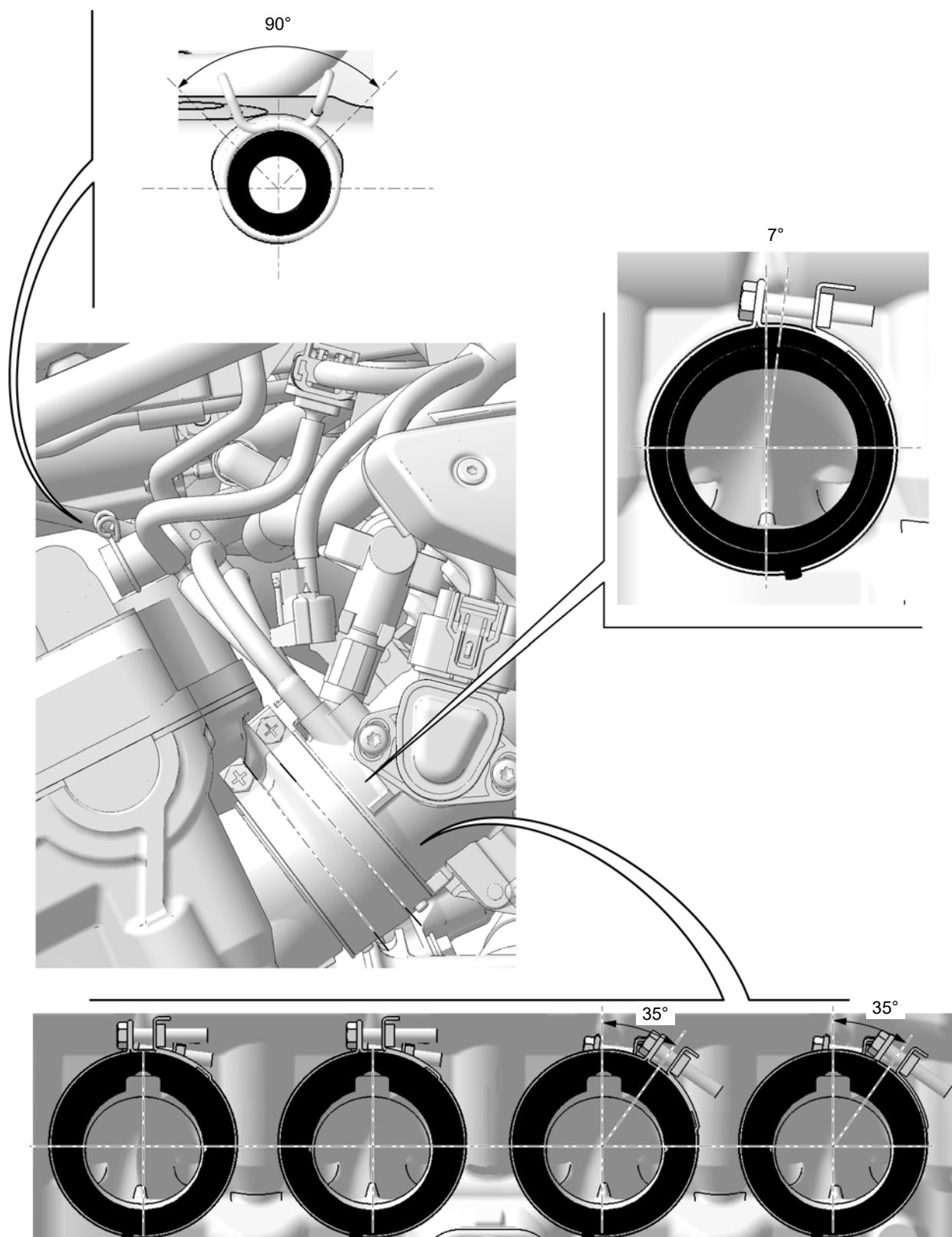


SEAT LOCK CABLE

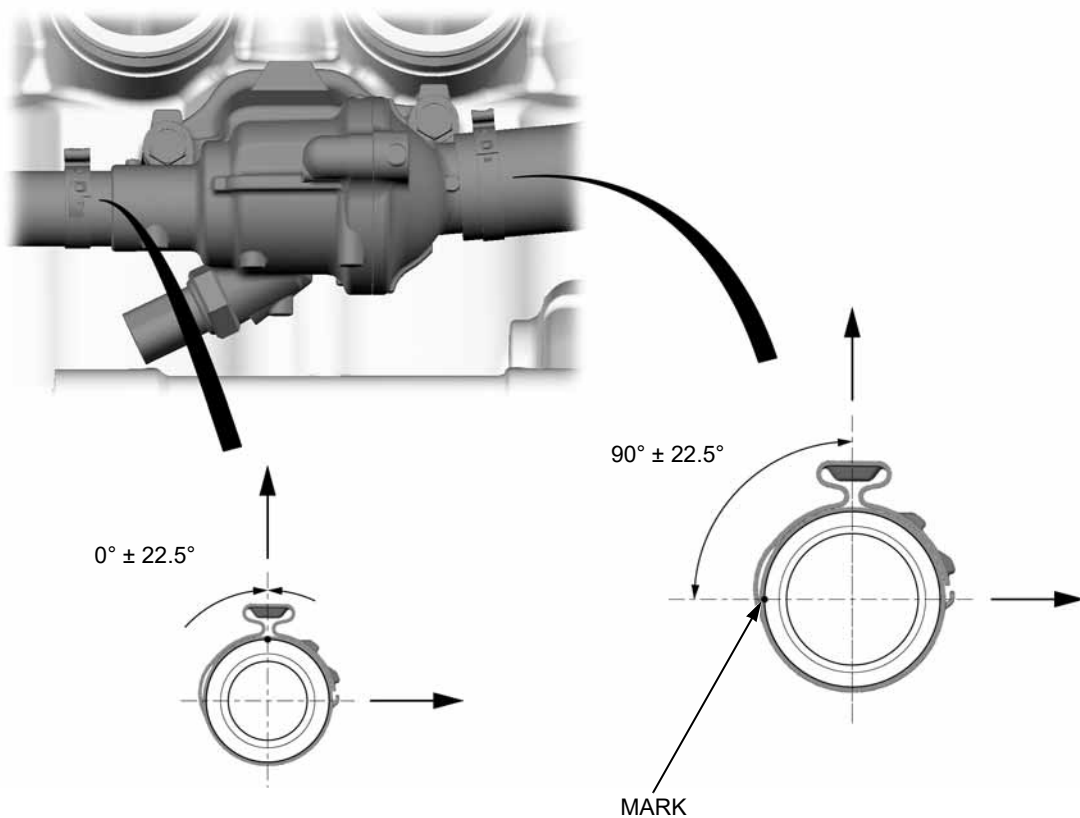
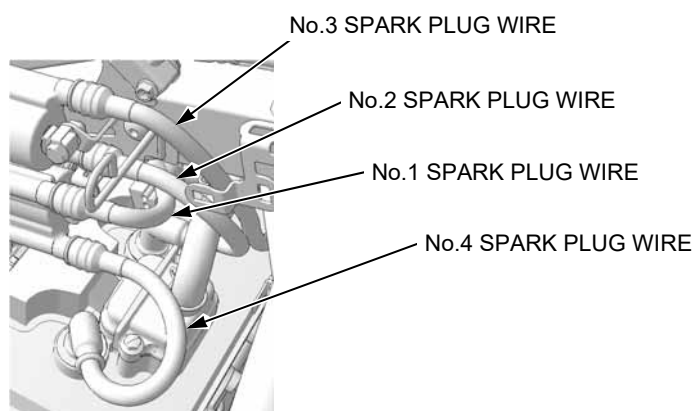
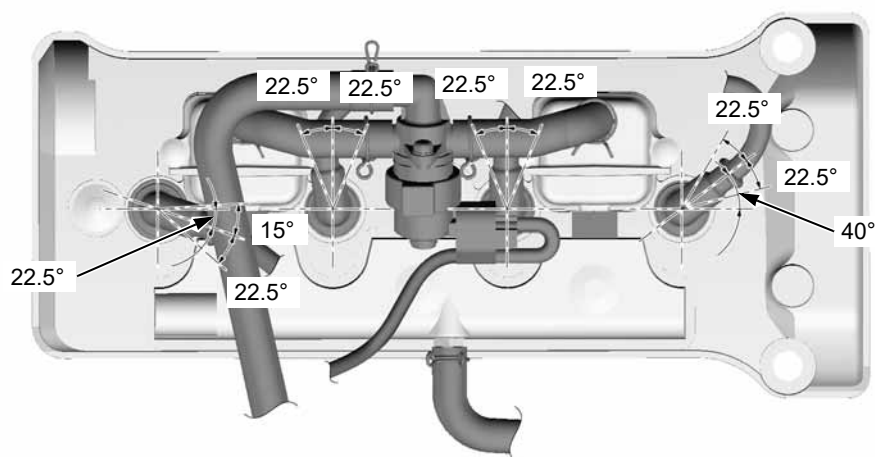


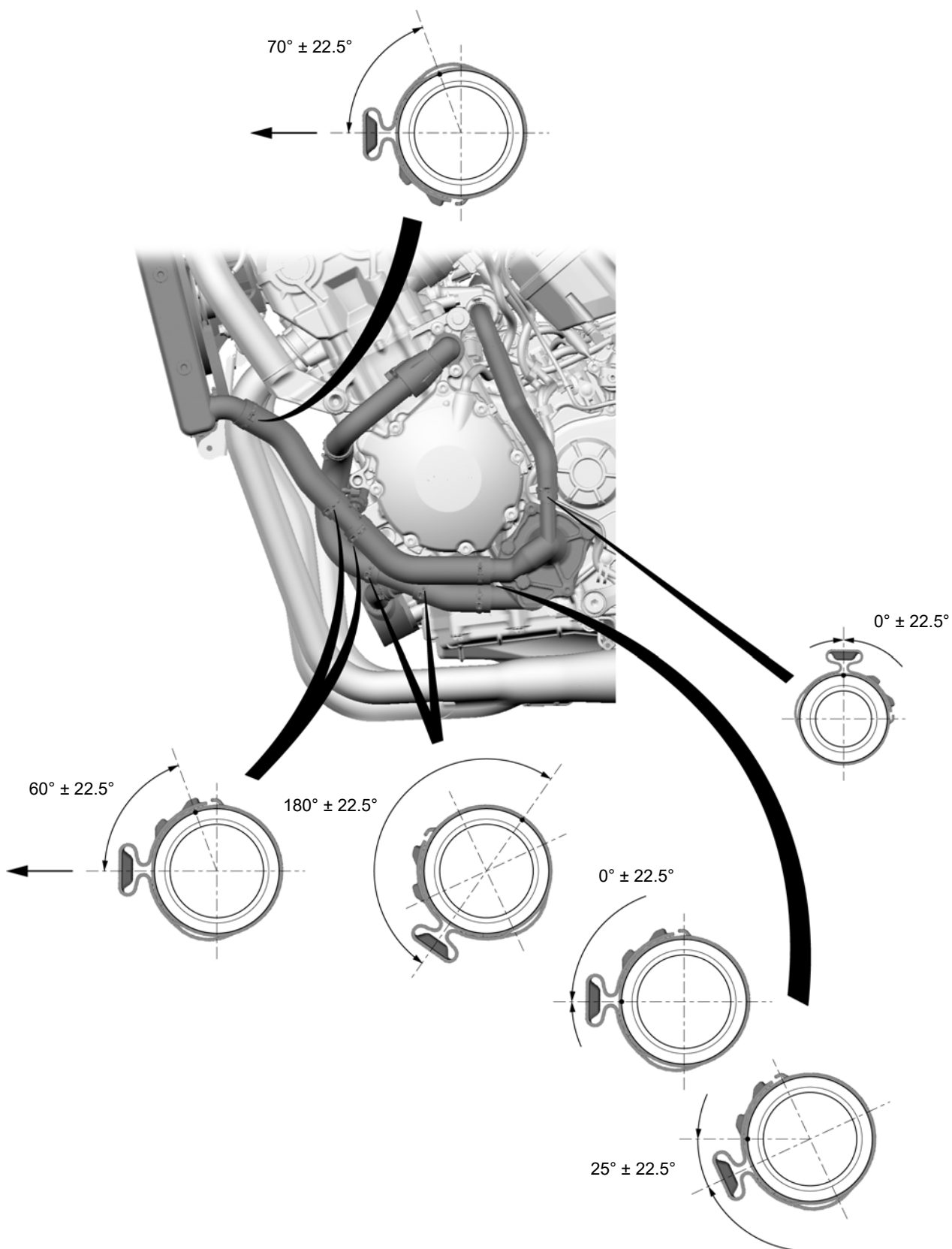


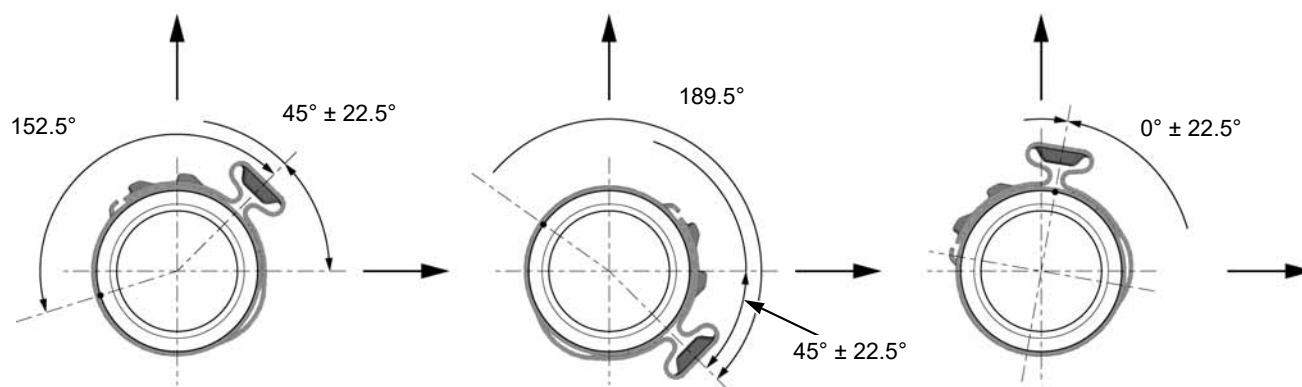
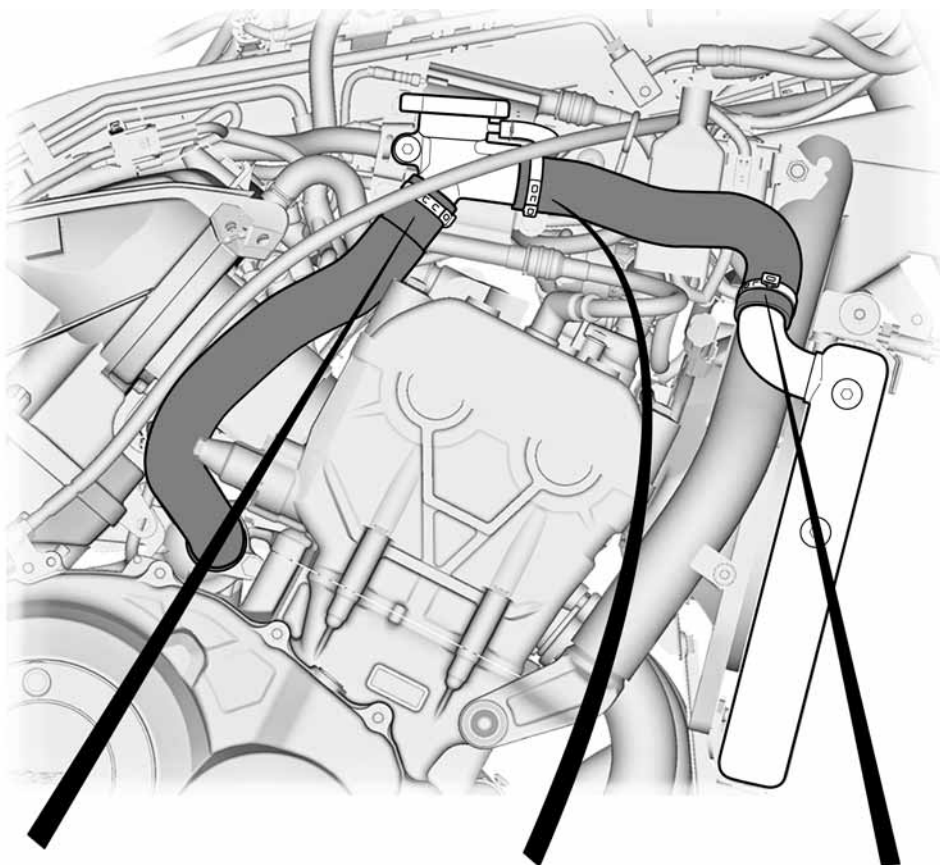


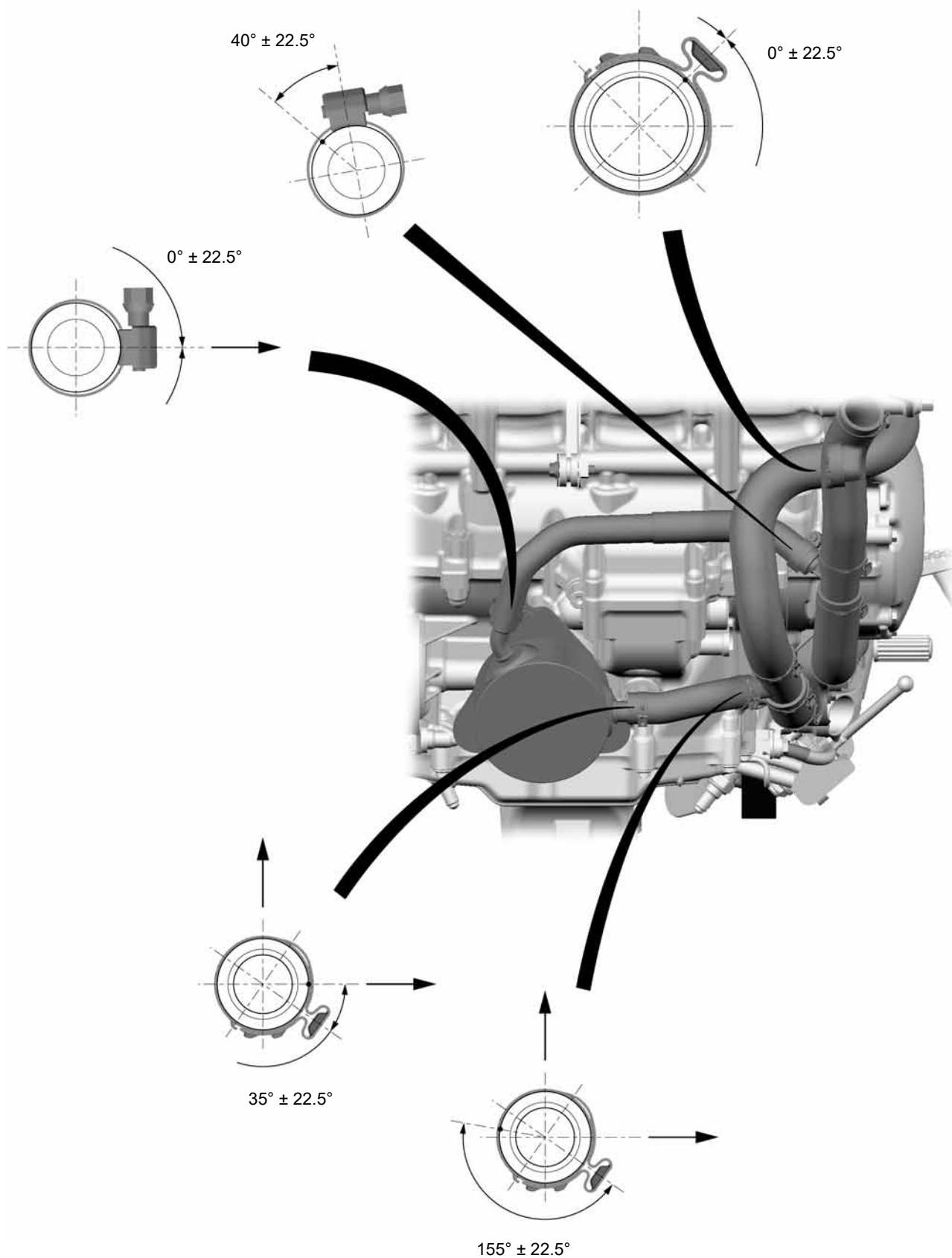


GENERAL INFORMATION









GENERAL INFORMATION

EMISSION CONTROL SYSTEMS

SOURCE OF EMISSIONS

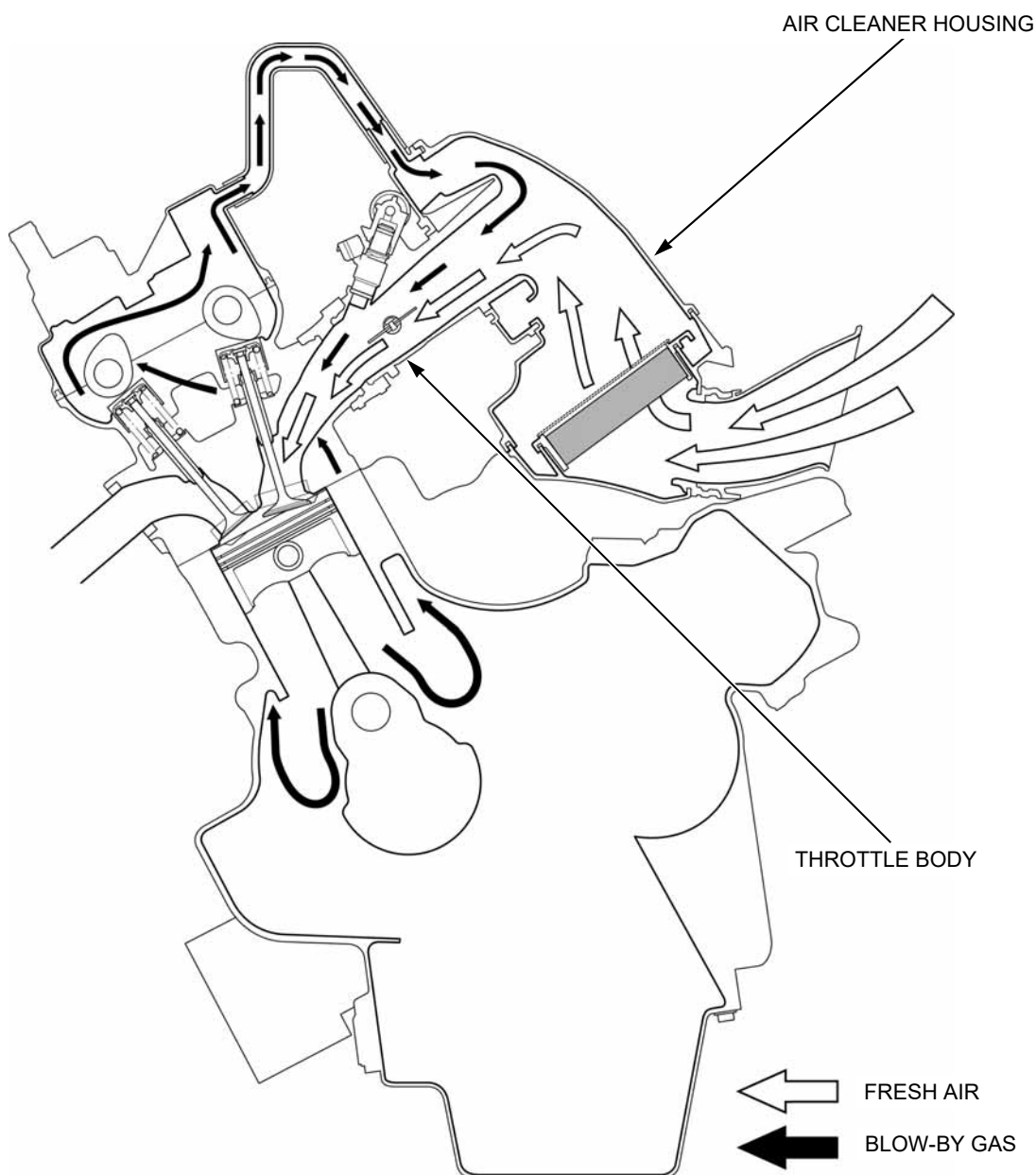
The combustion process produces carbon monoxide (CO), oxides of nitrogen (NO_x) and hydrocarbons (HC). Control of carbon monoxide, oxides of nitrogen and hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subject to sunlight. Carbon monoxide does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

Honda Motor Co., Ltd. utilizes various system (page 1-48) to reduce carbon monoxide, oxides of nitrogen and hydrocarbons.

CRANKCASE EMISSION CONTROL SYSTEM

The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere.

Blow-by gas is returned to the combustion chamber through the air cleaner housing and throttle body.



EXHAUST EMISSION CONTROL SYSTEM (SECONDARY AIR SUPPLY SYSTEM)

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

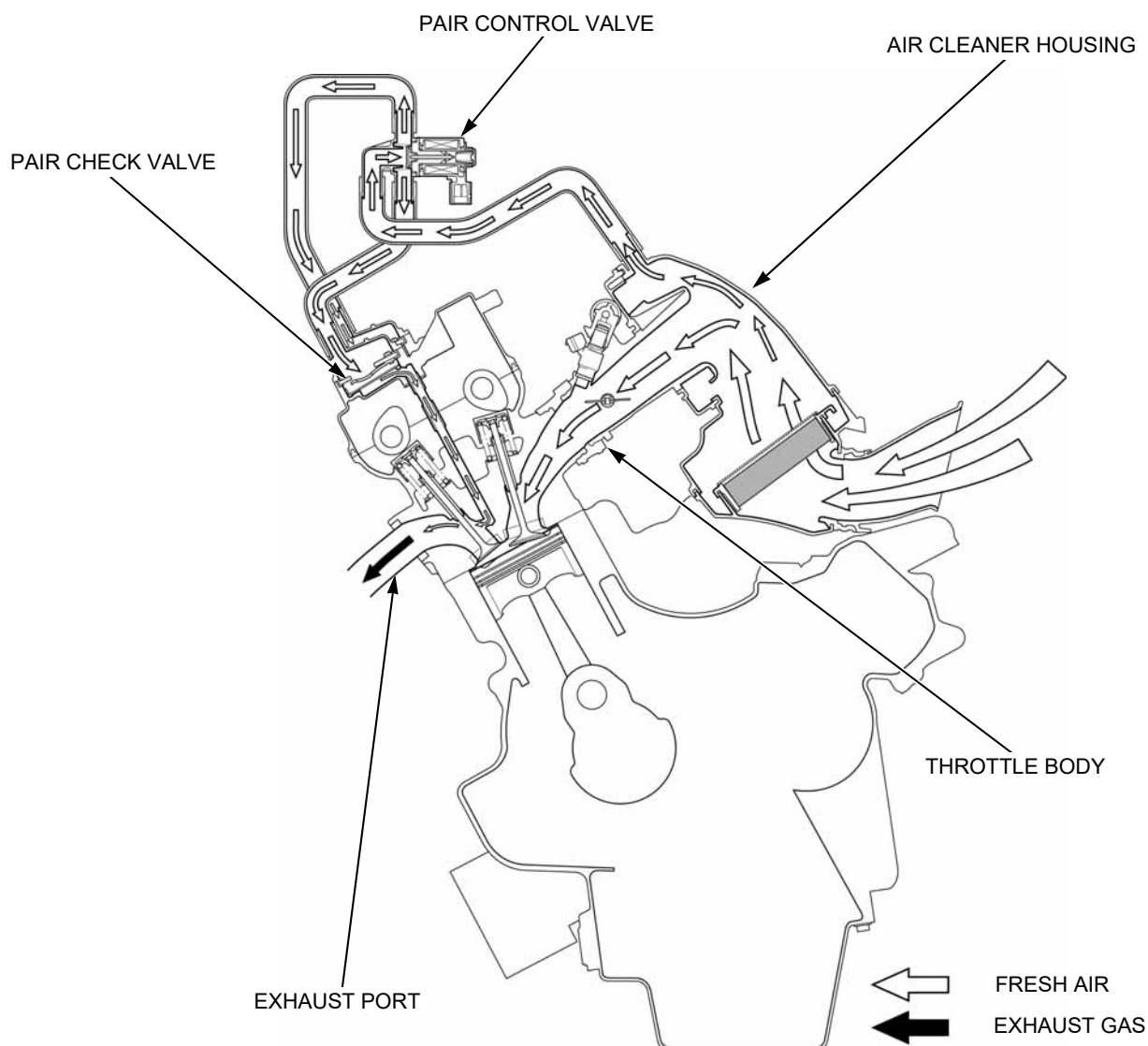
SECONDARY AIR SUPPLY SYSTEM

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

This charge of fresh air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water vapor.

The reed valve prevents reverse air flow through the system. The PAIR control valve is operated by the solenoid valve. The solenoid valve is controlled by the ECM, and the fresh air passage is opened/closed according to running conditions (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.



THREE-WAY CATALYTIC CONVERTER

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

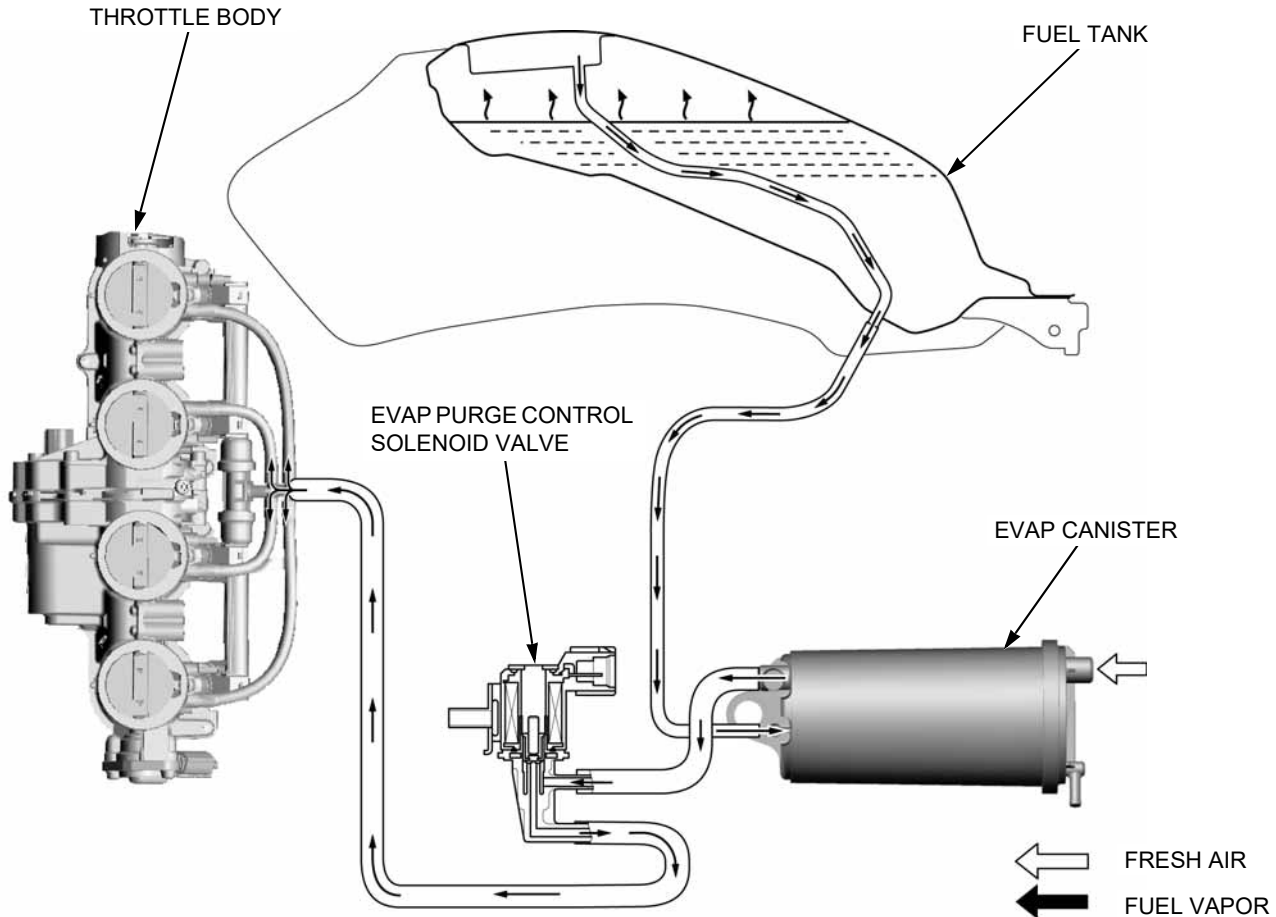
The three-way catalytic converter is in the exhaust system. Through chemical reactions, it converts HC, CO and NO_x in the engine's exhaust to carbon dioxide (CO₂), nitrogen (N₂), and water vapor.

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

GENERAL INFORMATION

EVAPORATIVE EMISSION CONTROL SYSTEM

Fuel vapor from the fuel tank is routed into the EVAP canister where it is absorbed and stored while the engine is stopped. When the engine is running and the EVAP purge control solenoid valve is open, fuel vapor in the EVAP canister is drawn into the engine.



NOISE EMISSION CONTROL SYSTEM

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

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

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

TECHNICAL FEATURES

OBD (On-Board Diagnostic) SYSTEM (European Market)

This motorcycle 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 motorcycle.

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

PGM-FI SELF-DIAGNOSTIC SYSTEM

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

- EVAP Canister Purge valve circuit
- Ignition Primary circuit
- PAIR valve 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 or sidestand switch ON.

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 for OBD			Existing PGM-FI		
	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

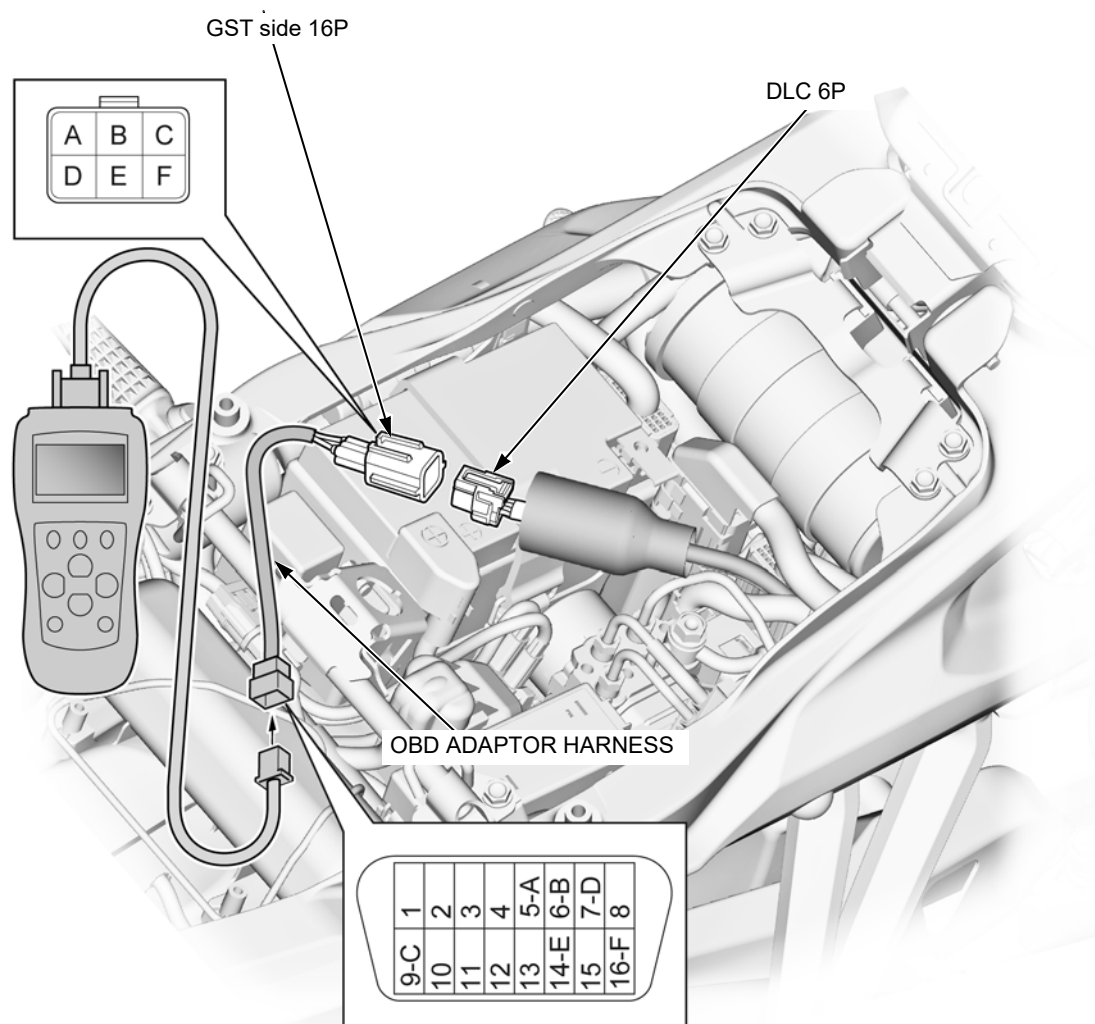
GST (General Scan Tool) CONNECTION

The PGM-FI system of this motorcycle supports the connection of the GST that is commercially available as the diagnostic tool for the motorcycle. 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 4-9) for each DTC and troubleshooting detail.

16P connector on GST is also standardized by ISO standard. To connect the GST to the motorcycle, connect the OBD adaptor harness so to change 4P DLC (Data Link Connector) to 16P connector.

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



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

	DLC side 4P	GST side 16P
K-line (Serial line)	A	7
Signal ground	B	5
Permanent positive battery	C	16
Discretionary (SCS line)	D	9

OBD2 (ED/II ED/KO/III KO models only)

This motorcycle complies with OBD2.

Comparison of OBD1 and OBD2:

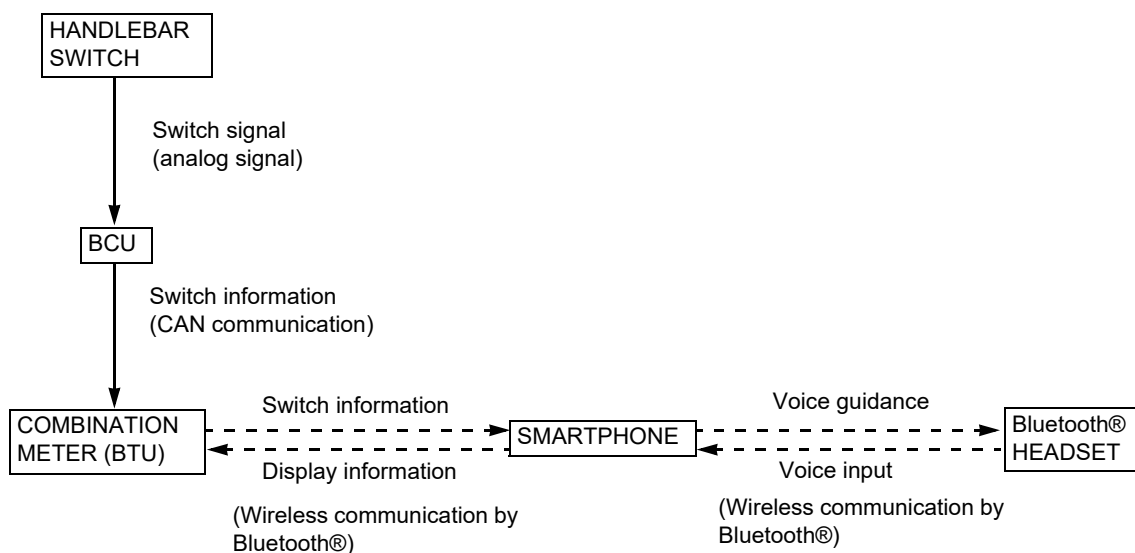
ITEMS	OBD1	OBD2
Diagnostic method	Function diagnosis	Threshold diagnosis (Diagnosis of deterioration) or Function diagnosis
	Circuit diagnostics	Threshold diagnosis (Diagnosis of deterioration)/ For items that can not be function diagnosed, perform circuit diagnostics
Failure judgment criteria	No stipulation	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

HSVCs (Honda Smartphone Voice Control system)

The HSVCs consists of the BTU integrated in the combination meter, HSVCs application, smartphone and headset. The smartphone and headset are commercially available parts.

The smartphone is wirelessly connected to the BTU and headset by the Bluetooth® (pairing).

The telephone, mail, audio and navigation system function of the smartphone can be used by operating the handlebar switch or inputting your voice through the Bluetooth® headset.



GENERAL INFORMATION

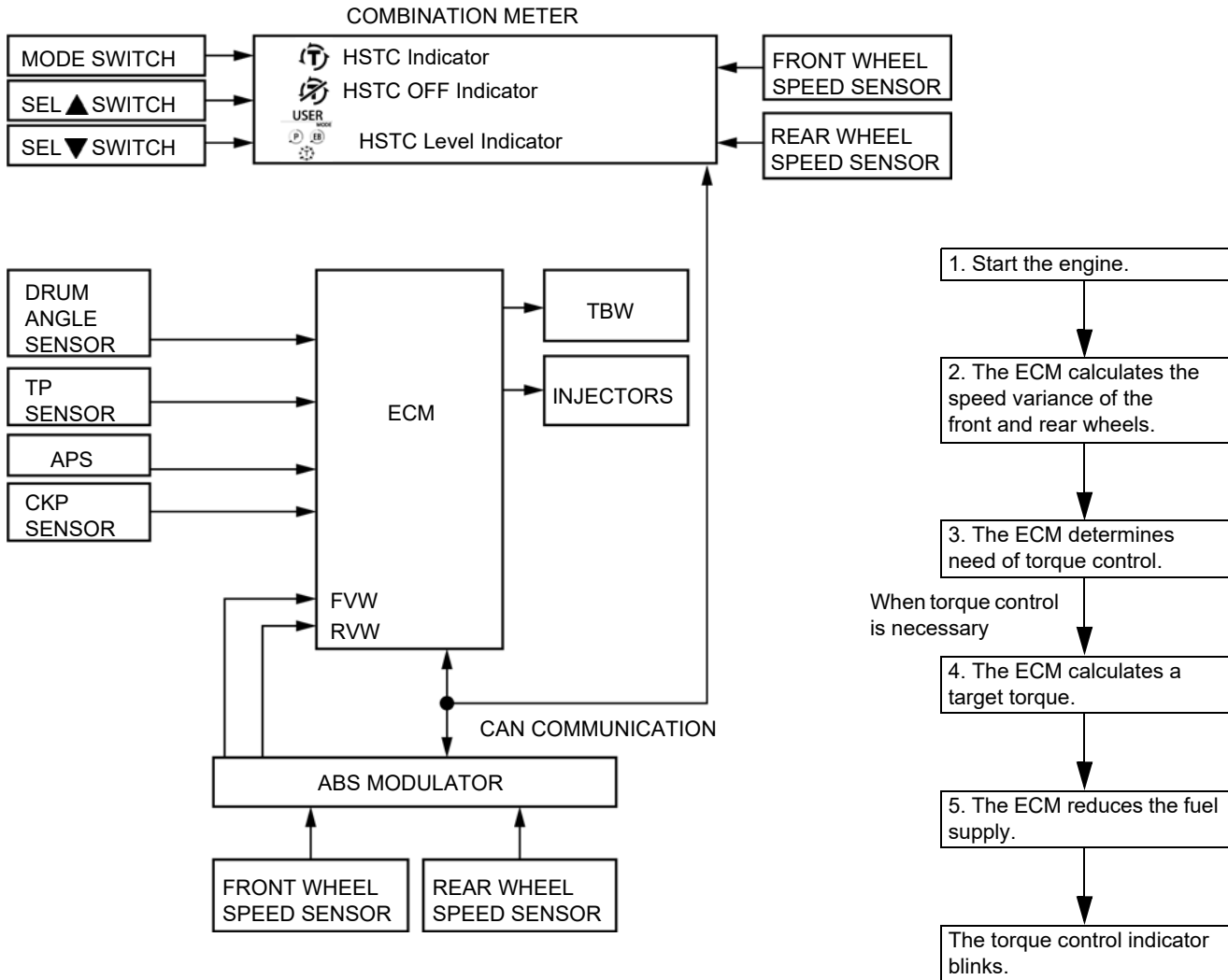
Honda Selectable Torque Control System

The torque control system limits the engine torque by reducing the fuel supply to control the rotational speed of the rear wheel when opening the throttle rapidly or riding in rain.

This system allows the rider to select ten different levels of torque control.

How the torque control works

The ECM detects the speed variance between the front and rear wheels while the motorcycle is running. When the difference of the rotational speed exceeds the specified limit, the ECM controls the TBW and fuel injection from the injectors so that the engine torque is target value according to the speed difference. Thus, the system reduces the wheel speed difference.



Indicators

When the torque control is active, the torque control indicator blinks.

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

The following figures show the indication status before the pre-start self-diagnosis is completed with the ignition switch turned ON. The torque control indicator stays on at this time.

The pre-start self-diagnosis is completed when the motorcycle speed reaches 5 km/h (3 mph) (the torque control indicator goes off when the system is normal).

Note that the control level cannot be changed when the torque control is active.

HSTC OFF INDICATOR



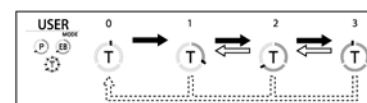
- Comes on when the Torque Control is turned off (Level 0).

HSTC INDICATOR



- Comes on when the ignition switch is turned to the ON position. Goes off when motorcycle speed reaches approximately 5 km/h (3 mph).

HSTC LEVEL INDICATOR



- Press the SEL ▲ (up) button
- ⇌ Press the SEL ▼ (down) button
- ⋯ Press and hold the SEL ▲ (up) button

Motorcycle behavior control

If the ECM detects acceleration in the rear drive wheel at the same time as deceleration in the front driven wheel, it reduces the TBW throttle position unit the front wheel acceleration returns, which controls torque and reduces the occurrence of wheels.



Quick Shifter System

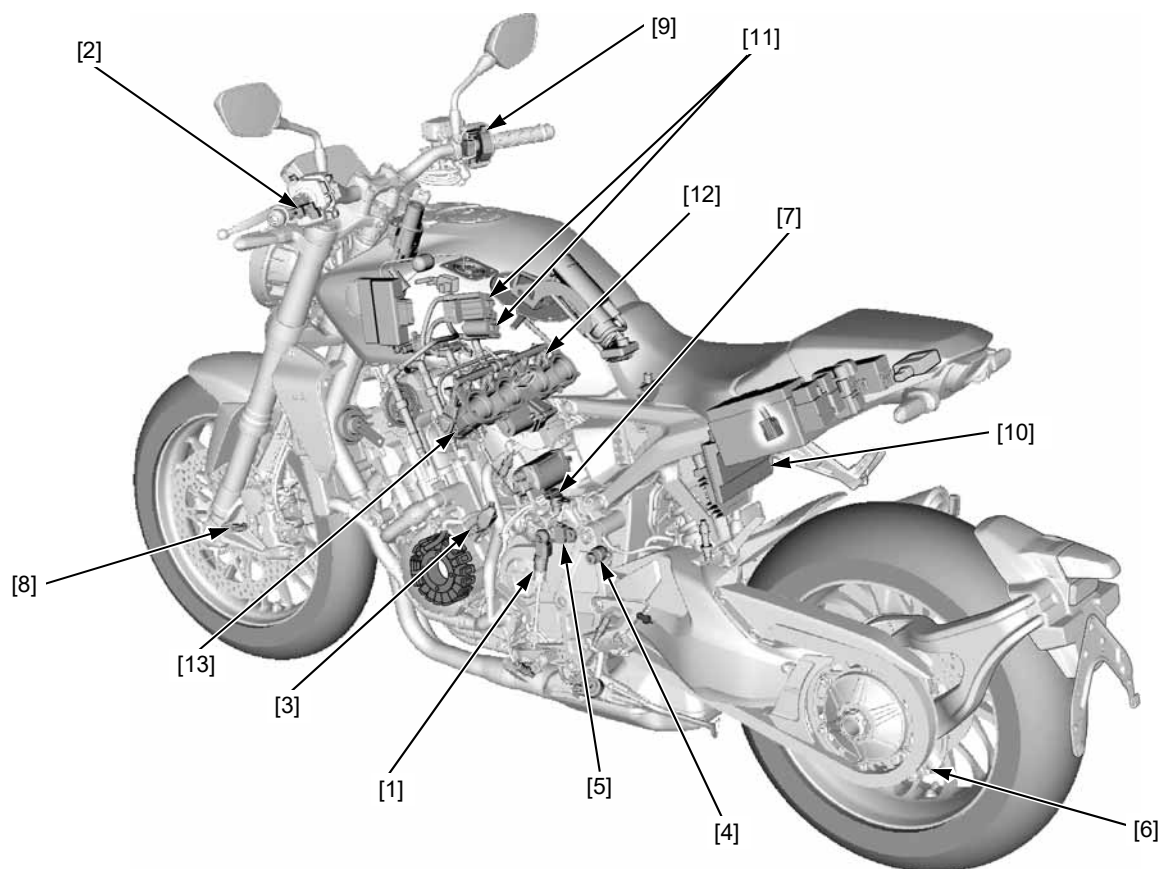
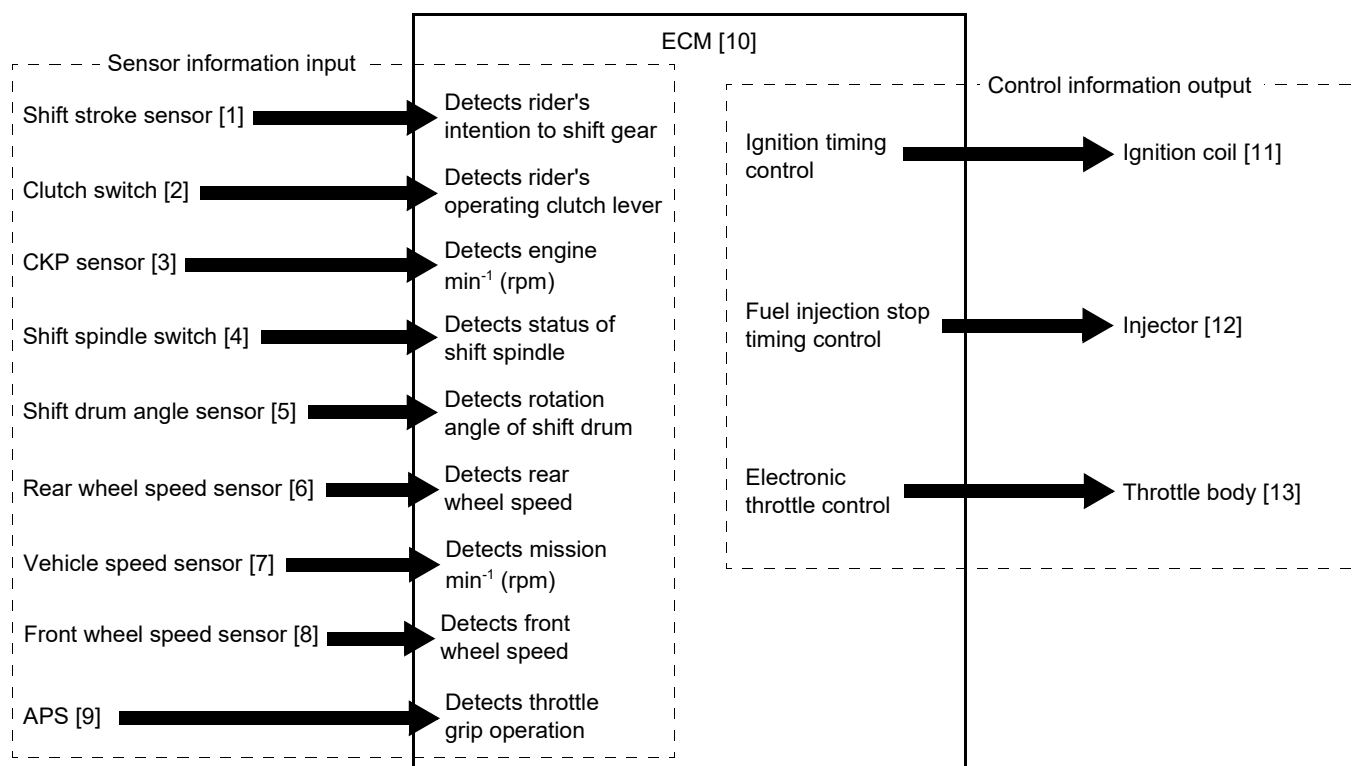
Overview

Quick shifter is a system that enables clutchless upshifts under acceleration and blipping on downshifts under acceleration/deceleration by systematically utilizing input of sensor information and output of control information.

It allows the rider to upshift and downshift only using the shift pedal. There is no need to touch either the clutch lever or throttle grip. In the traditional way of gear shifting, the rider disengages the clutch to reduce transmission torque. With this system, to cut down transmission torque to enable a gear shifting, electrical throttle opening, ignition timing, and fuel injection stop timing are controlled by the system in response to; a shift operation by the rider, acceleration/deceleration of the engine, and position of the gear.

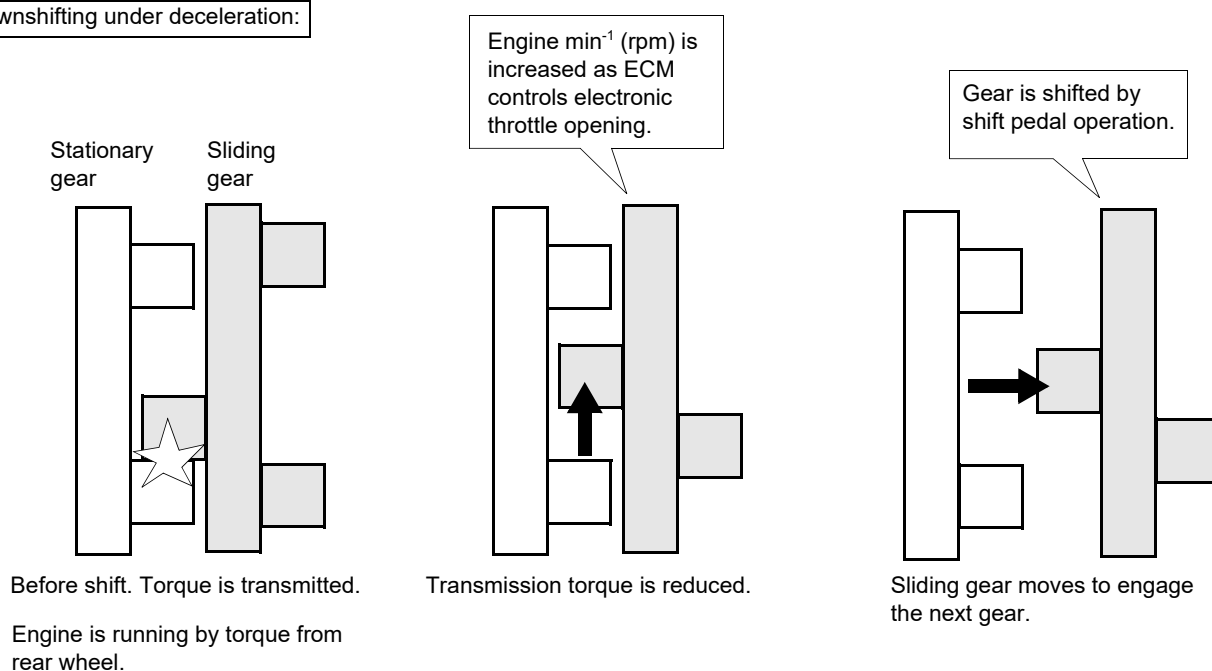
System configuration

GENERAL INFORMATION



Mechanisms of disengagement of dog (gear) due to reduction in transmission torque and gear change

Downshifting under deceleration:

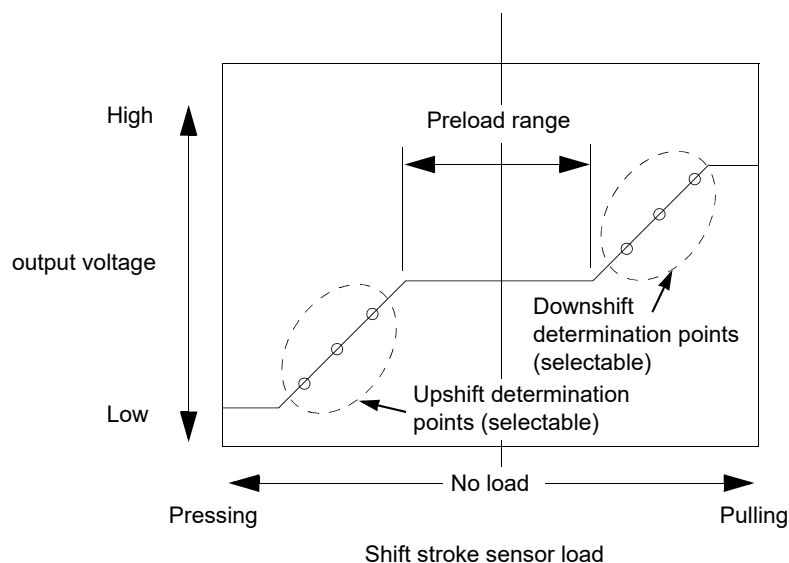


Shift stroke sensor

Upon receiving a shift pedal operation load, the shaft inside the shift stroke sensor moves linearly, contracting its inner spring. The sensor then detects the amount of the motion (stroke) of the shaft by transducing it into output voltage with the Hall effect sensor.

Touching the shift pedal only lightly does not move the shaft due to the preload reaction force preset on the inner spring. However, when a shift pedal operation load high enough to determine that the rider is intending to shift gear is received, the output voltage changes proportionally.

Taking advantage of these characteristics, the operation load to determine that the rider has executed a pedal shift operation can be adjusted to rider's preference by changing the value preset in the ECM using the meter panel.



MEMO

2. FRAME/BODY PANELS/EXHAUST SYSTEM

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SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the body panels, exhaust system and seat rail.
- Always replace the exhaust pipe gaskets with new ones after removing the exhaust pipe from the engine.
- When installing the exhaust system, loosely install all of the exhaust pipe fasteners. Always tighten the exhaust clamps first, then tighten the mounting fasteners.
- Always inspect the exhaust system for leaks after installation.

TROUBLESHOOTING

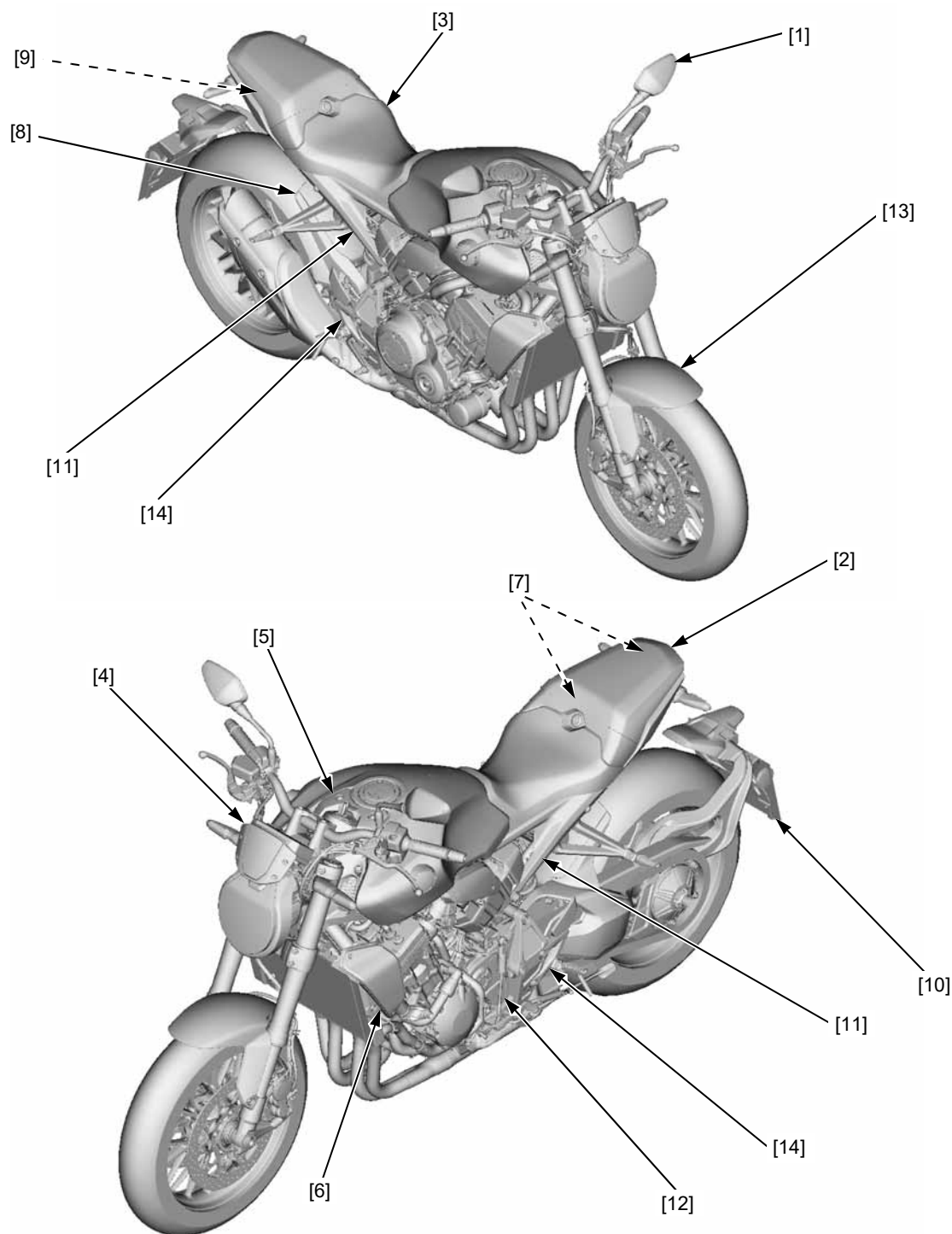
Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

BODY PANEL LOCATIONS



- [1] Rearview mirror (page 2-9)
- [2] Pillion seat (page 2-4)
- [2] Single seat cowl (II ED/III TH/II FO/II GS/II RU/II BR models only) (page 2-4)
- [3] Main seat (page 2-4)
- [4] Meter visor (II ED/III TH/III KO/II FO/II GS/II RU/III CH/II BR models only) (page 2-5)
- [5] Tank cover (page 2-6)
- [6] Radiator shroud (page 2-7)
- [7] Cross upper plate/Cross upper pipe (page 2-7)

- [8] Rear fender C (page 2-9)
- [9] Rear fender B (page 2-10)
- [10] Rear fender D (page 2-11)
- [11] Seat rail (page 2-12)
- [12] Sprocket cover (page 2-13)
- [13] Front fender (page 2-14)
- [14] Pivot bracket (page 2-19)

PILLION SEAT

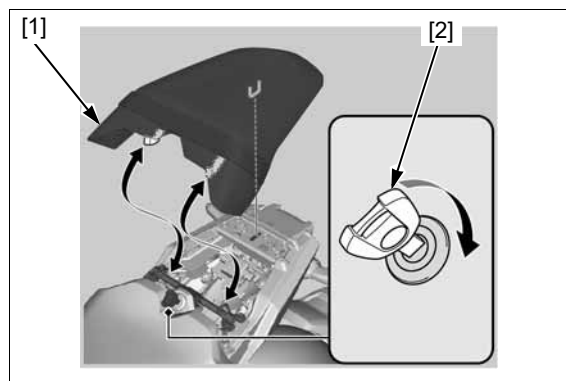
REMOVAL/INSTALLATION

Unlock the pillion seat [1] using the ignition key [2].

Remove the pillion seat by pulling it up and back.

Install the pillion seat by inserting the tabs into the recess.

Push the pillion seat down to lock it.



SINGLE SEAT COWL (II ED/III TH/II FO/II GS/II RU/II BR models only)

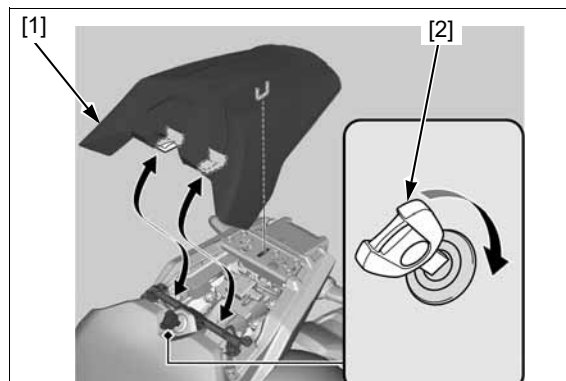
REMOVAL/INSTALLATION

Unlock the single seat cowl [1] using the ignition key [2].

Remove the single seat cowl by pulling it up and back.

Install the single seat cowl by inserting the tabs into the recess.

Push the single seat cowl down to lock it.



MAIN SEAT

REMOVAL/INSTALLATION

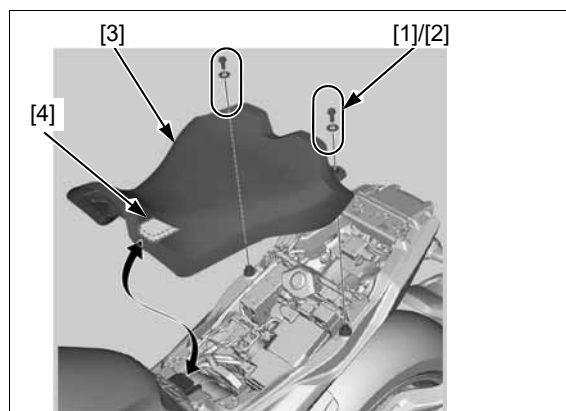
Remove the pillion seat (page 2-4).

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

Remove the main seat [3] by sliding it rearward.

Install the main seat by inserting the prong [4] under the frame.

Install the washers and screws, and tighten screws securely.



METER VISOR (II ED/III TH/III KO/II FO/II GS/II RU/III CH/ II BR models only)

REMOVAL/INSTALLATION

Release the right handlebar switch wire and front brake hose from the right side stay [1].

Remove the following:

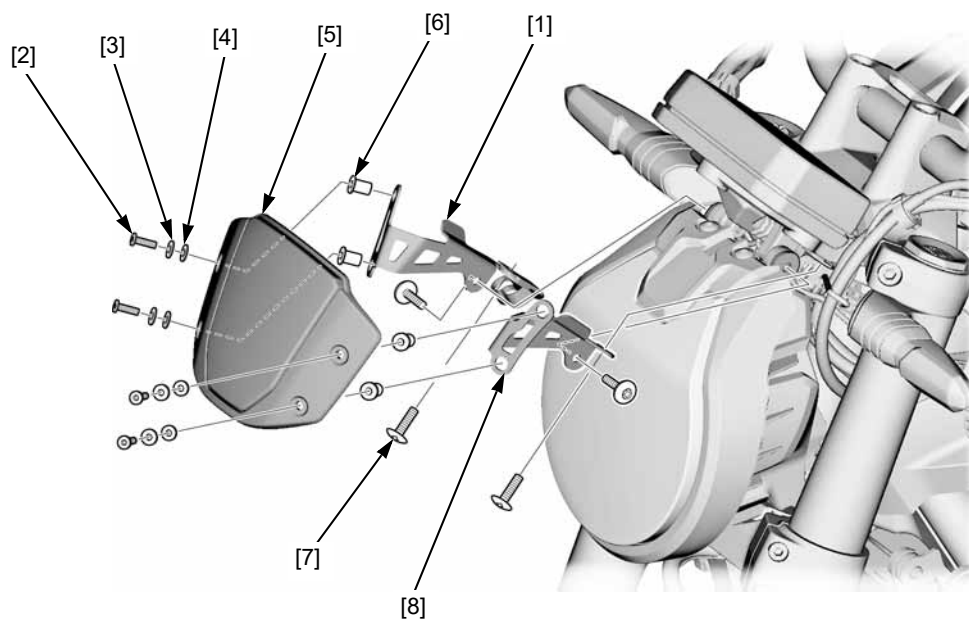
- four special bolts [2]
- four plastic washers [3]
- four rubber washers [4]
- meter visor [5]
- four well nuts [6]
- four socket bolts [7]
- left side stay [8]

Installation is in the reverse order of removal.

TORQUE:

Special bolt:

0.4 N·m (0.04 kgf·m, 0.3 lbf·ft)



TANK COVER

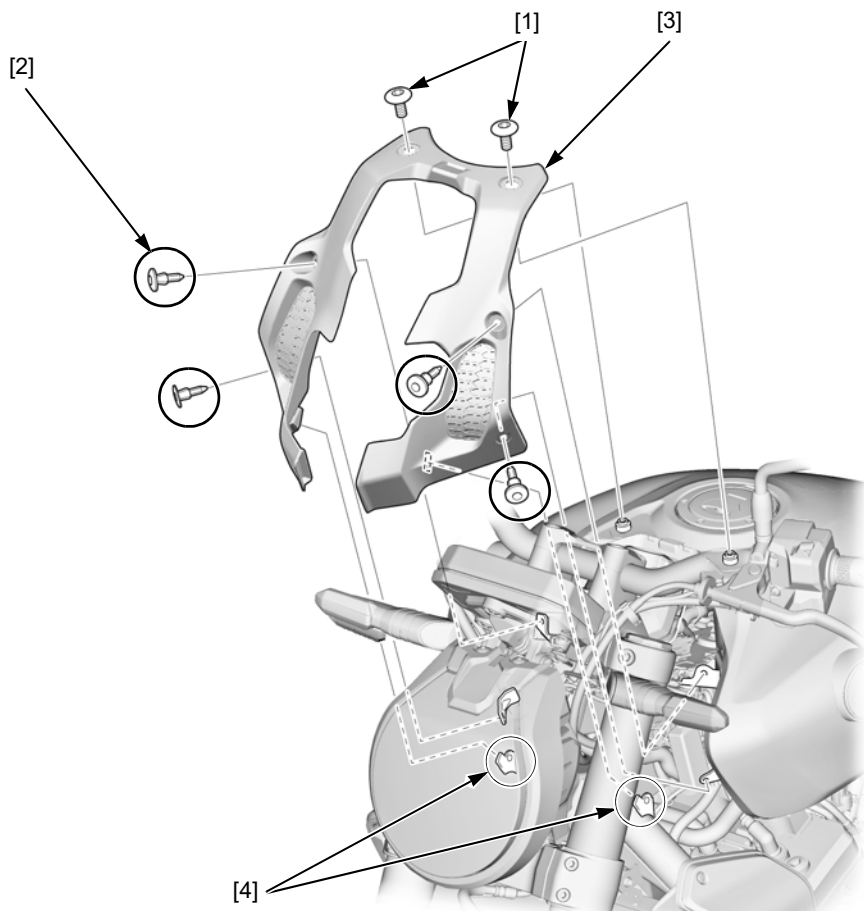
REMOVAL/INSTALLATION

Remove the socket bolts [1], trim clips [2] and tank cover [3].

Installation is in the reverse order of removal.

NOTE:

When installing the tank cover, carefully align the holders with the setting rubbers [4] so they are not dislodged.



RADIATOR SHROUD

REMOVAL/INSTALLATION

Remove the mounting socket bolts [1] and shroud panel [2].

Remove the radiator shroud mounting socket bolts [3], clip [4] and radiator shroud [5] from the radiator.

Installation is in the reverse order of removal.

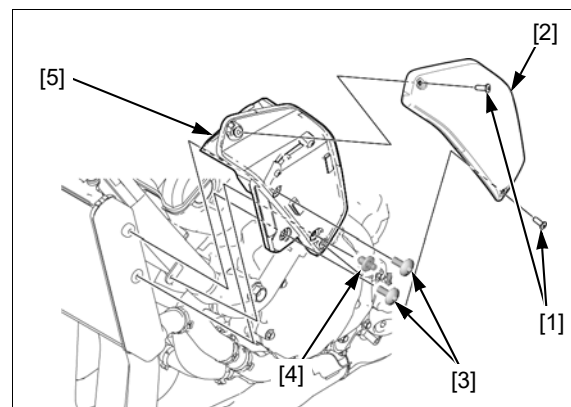
TORQUE:

Radiator shroud mounting bolt:

9 N·m (0.9 kgf·m, 7 lbf·ft)

Shroud panel mounting bolt:

0.4 N·m (0.04 kgf·m, 0.3 lbf·ft)

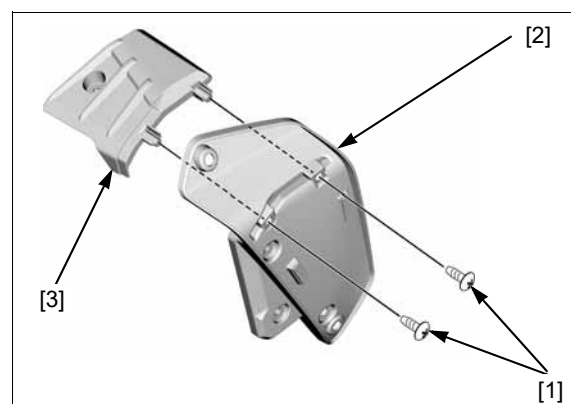


DISASSEMBLY/ASSEMBLY

Remove the screws [1].

Disassemble the radiator shroud [2] and inner shroud [3].

Assembly is in the reverse order of disassembly.



CROSS UPPER PLATE/CROSS UPPER PIPE

REMOVAL/INSTALLATION

Remove the following:

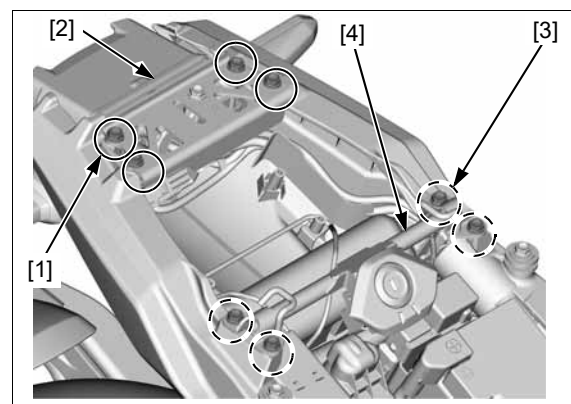
- Main seat (page 2-4).
- Cross upper plate mounting bolts [1]
- Cross upper plate [2]
- Cross upper pipe mounting bolts [3]
- Cross upper pipe [4]

Installation is in the reverse order of removal.

TORQUE:

Cross upper plate mounting bolt:

16 N·m (1.6 kgf·m, 12 lbf·ft)



SEAT LOCK REMOVAL/INSTALLATION

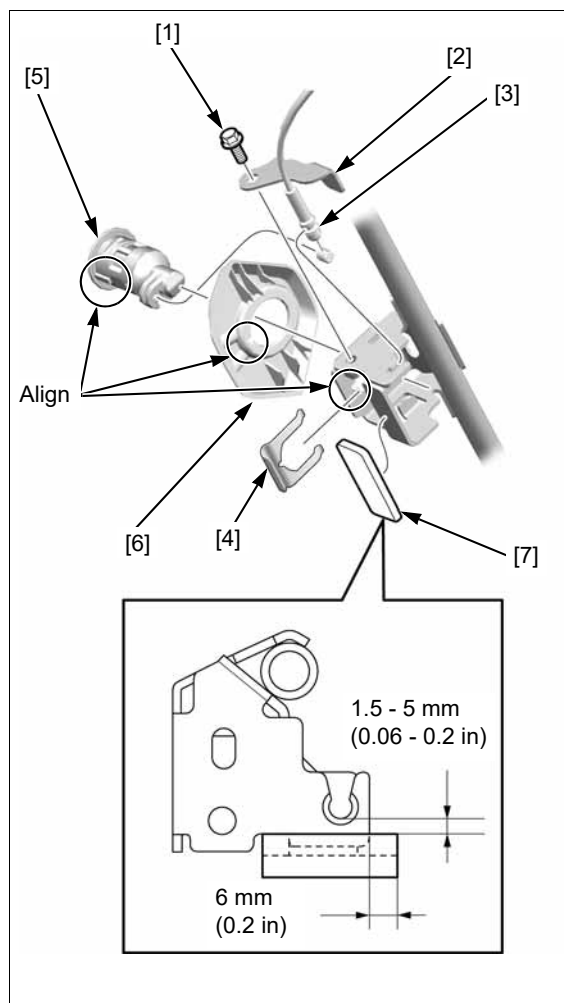
Remove the following from the front cross upper plate:

- Bolt [1]
- Set plate [2]
- Seat lock cable [3]
- Setting spring [4]
- Seat lock cylinder [5]
- Cover [6]

Installation is in the reverse order of removal.

NOTE:

- Align the lock cylinder lug with the grooves in the cover and cross upper plate.
- The sponge rubber [7] are always replaced with new ones whenever they are removed. Do not reuse them.
- Attach the sponge rubber as shown.



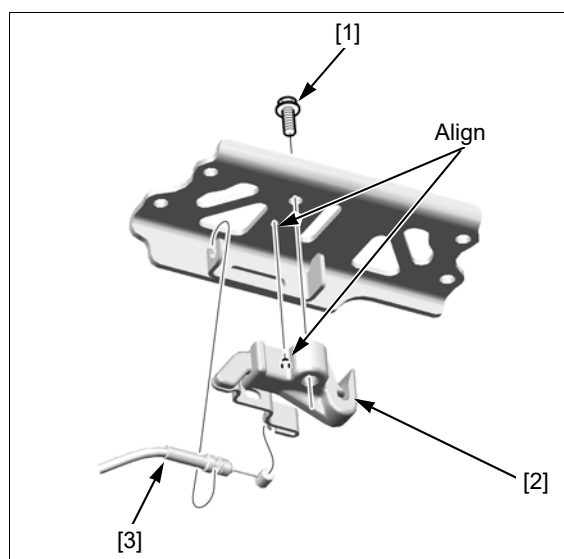
Remove the following from the rear cross upper plate:

- Bolt [1]
- Seat catch hook [2]
- Seat lock cable [3]

Installation is in the reverse order of removal.

NOTE:

- Align the seat catch hook pin with the rear cross upper plate hole.



REARVIEW MIRROR

REMOVAL/INSTALLATION

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

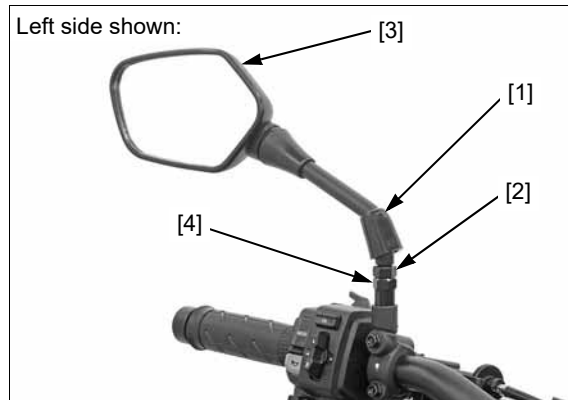
Loosen the lock nut (left-hand threads) and remove the rearview mirror [3].

Remove the mirror adaptor [4].

Installation is in the reverse order of removal.

TORQUE:

Rearview mirror adapter/lock nut
19 N·m (1.9 kgf·m, 14 lbf·ft)



REAR FENDER C

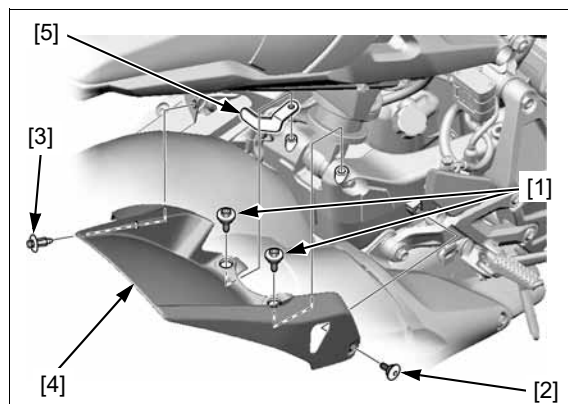
REMOVAL/INSTALLATION

Remove the two special bolts [1], socket bolt [2] and clip [3].

Be careful not to drop the guide plate.

Remove the rear fender C [4] and harness guide plate [5].

Installation is in the reverse order of removal.



REAR FENDER B

REMOVAL/INSTALLATION

Remove the following:

- left rear seat rail (page 2-12)
- EVAP canister (page 7-19)
- ECM (page 4-58)
- brake/taillight unit (page 21-7)
- turn signal light unit (page 21-4)

Release the following from rear fender B:

- turn signal light connector holders [1]
- fuse/relay box [2]
- fan relay/stater relay [3]
- SUB VB relay [4]
- starter relay switch [5]

Remove the following from rear fender B:

- ABS modulator mounting bolt [6]/ collar [7]/ grommet [8]
- ABS modulator mounting socket bolt [9]/ washer [10]/ collar [11]/ grommet [12]

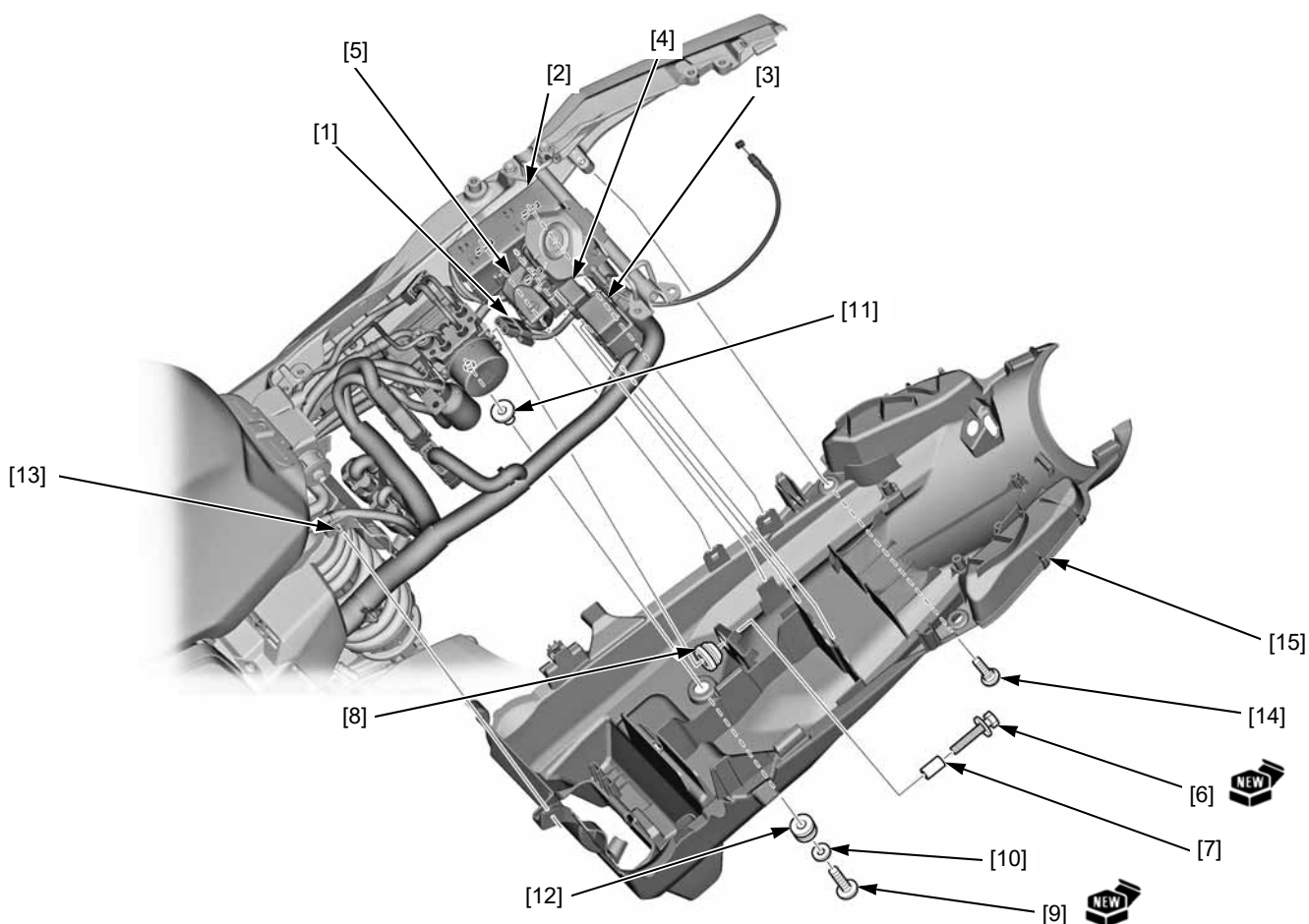
Remove the wire clip [13] from rear fender B

Remove the socket bolt [14] from rear fender B [15].

Remove rear fender B from the seat rail.

Installation is in the reverse order of removal.

Route the wires, cables and brake pipes properly (page 1-24).



REAR FENDER D

REMOVAL/INSTALLATION

Remove the license light unit (page 21-5).

Remove the three mounting torx bolts [1], washer [2], two washers [3] and rear fender D [4] from swingarm.

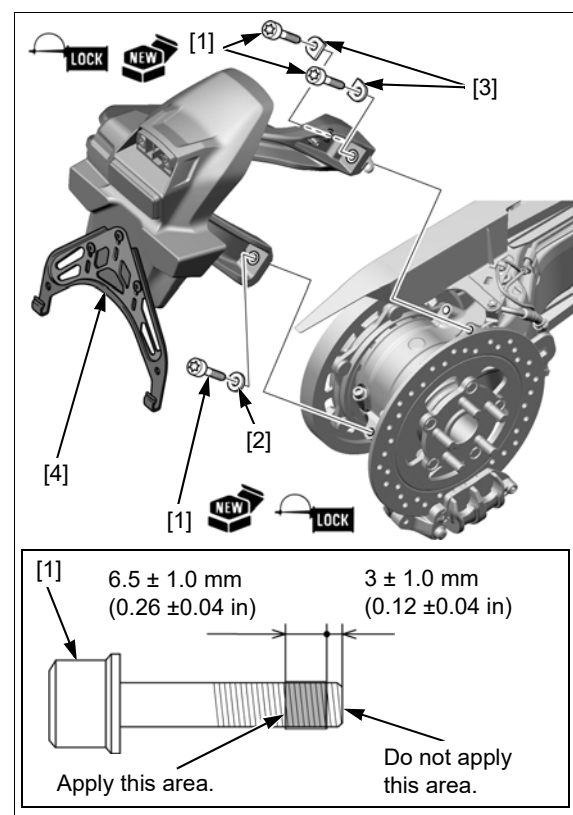
Installation is in the reverse order of removal.

NOTE:

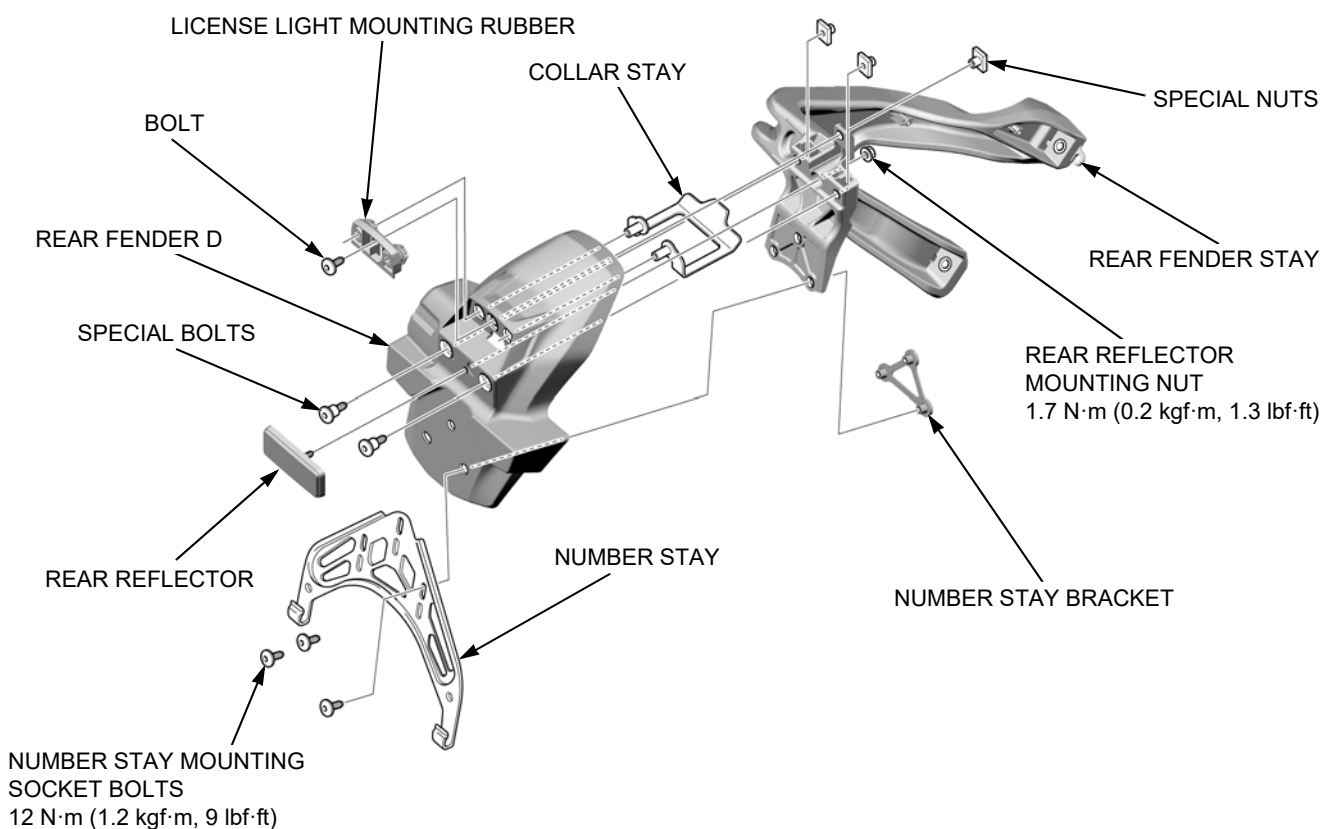
- Apply locking agent to the new mounting torx bolt threads as shown.

TORQUE:

Rear fender D mounting torx bolt:
35 N·m (3.6 kgf·m, 26 lbf·ft)



DISASSEMBLY/ASSEMBLY



SEAT RAIL

REMOVAL/INSTALLATION

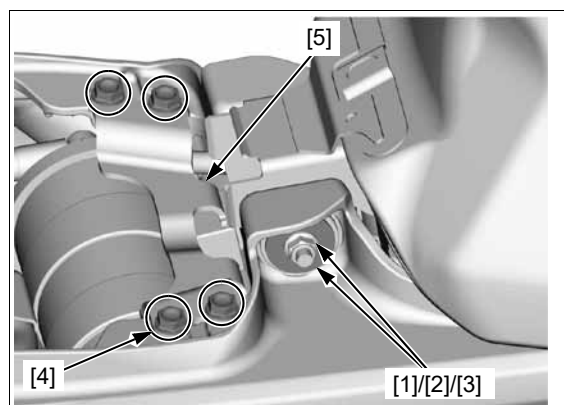
Remove the following:

- Cross upper pipe (page 2-7)
- Cross upper plate (page 2-7)
- Air cleaner duct cover (page 3-5)

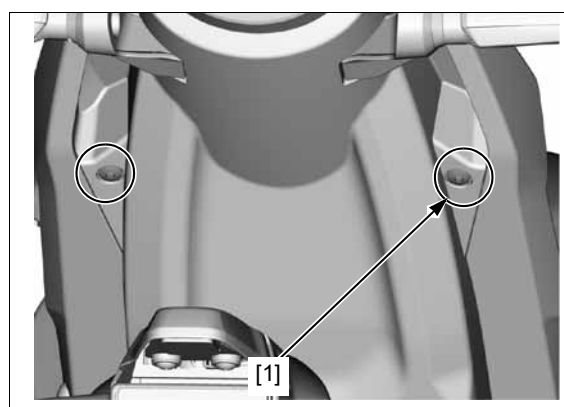
Support the fender B by inserting a suitable support under fender B.

Remove the fuel tank mounting bolt [1], nut [2] and collars [3].

Remove the bolts [4] and EVAP canister mount stay [5].



Remove the socket bolts [1].



Right side:

Remove the clamp stay mounting bolt [1], seat rail mounting bolt [2] and seat rail [3].

Installation is in the reverse order of removal.

TORQUE:

Seat rail mounting bolt (upper side):

39 N·m (4.0 kgf·m, 29 lbf·ft)

Seat rail mounting bolt (lower side):

44 N·m (4.5 kgf·m, 32 lbf·ft)

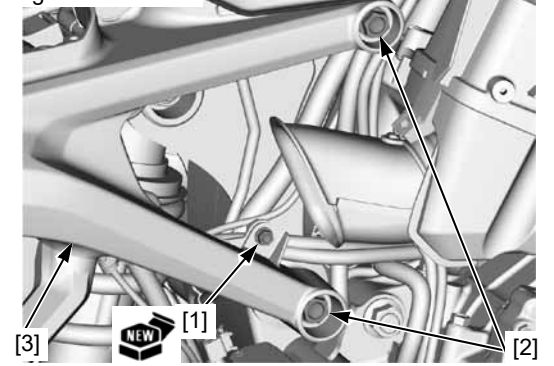
Fuel tank mounting nut:

10 N·m (1.0 kgf·m, 7 lbf·ft)

EVAP canister stay mounting bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)

Right side shown:



Left side:

Remove the band clip [1], seat rail mounting bolts [2] and seat rail [3].

Installation is in the reverse order of removal.

TORQUE:

Seat rail mounting bolt (upper side):

39 N·m (4.0 kgf·m, 29 lbf·ft)

Seat rail mounting bolt (lower side):

44 N·m (4.5 kgf·m, 32 lbf·ft)

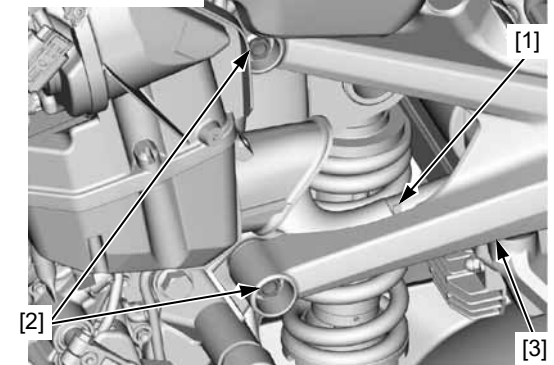
Fuel tank mounting nut:

10 N·m (1.0 kgf·m, 7 lbf·ft)

EVAP canister stay mounting bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)

Left side shown:



SIDESTAND

REMOVAL/INSTALLATION

Remove the sidestand switch (page 21-24).

Support the motorcycle securely using a hoist or equivalent.

Remove the sidestand return spring [1].

Hold the pivot bolt [2] and remove the pivot nut [3].

Remove the pivot bolt and sidestand [4].

Apply multi-purpose grease to the sidestand pivot.

Install the sidestand and pivot bolt, and tighten the bolt to the specified torque.

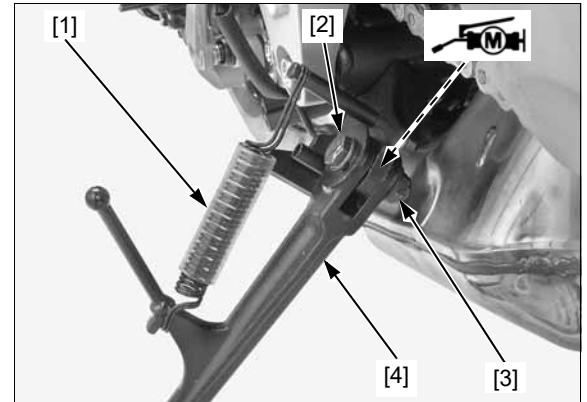
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

After tighten the pivot bolt, return the pivot bolt 45 ° to 90°.

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

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

Install the sidestand switch (page 21-24).



SPROCKET COVER

REMOVAL/INSTALLATION

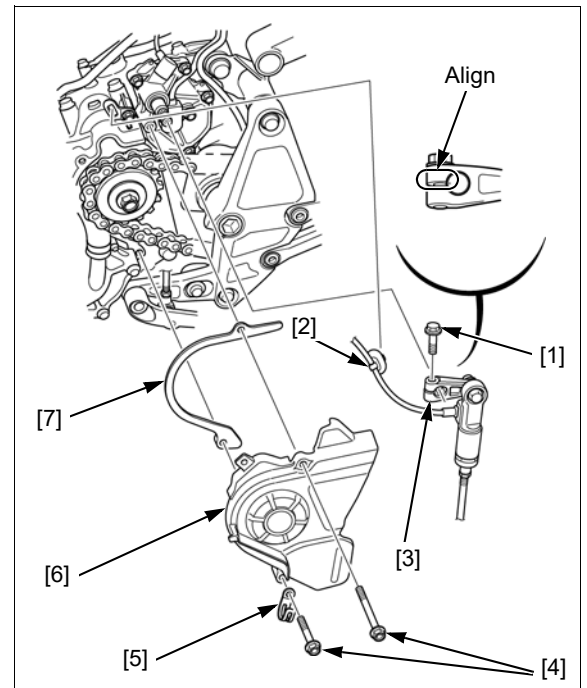
Remove the following:

- Pinch bolt [1]
- II ED/III TH/III KO/II FO/II GS/II RU/III CH/II BR models: band clip [2]
- Gearshift arm [3]
- Bolts [4]
- Wire band [5]
- Sprocket cover [6]
- Guide plate [7]

Installation is in the reverse order of removal.

NOTE:

- Route the wires properly
- Align the shift arm slit with the punch mark on the gearshift spindle.



FRONT FENDER

REMOVAL/INSTALLATION

Remove the following:

- Cap nut [1] and brake hose clamp [2]
- Two mounting socket bolts, 6 x 20 mm [3]
- Band clip [4]
- Front fender [5]
- Two reflectors [6], two reflector mount stays [7] and two mounting nuts [8]
- Two collars [9]
- Four grommets [10]

Installation is in the reverse order of removal.

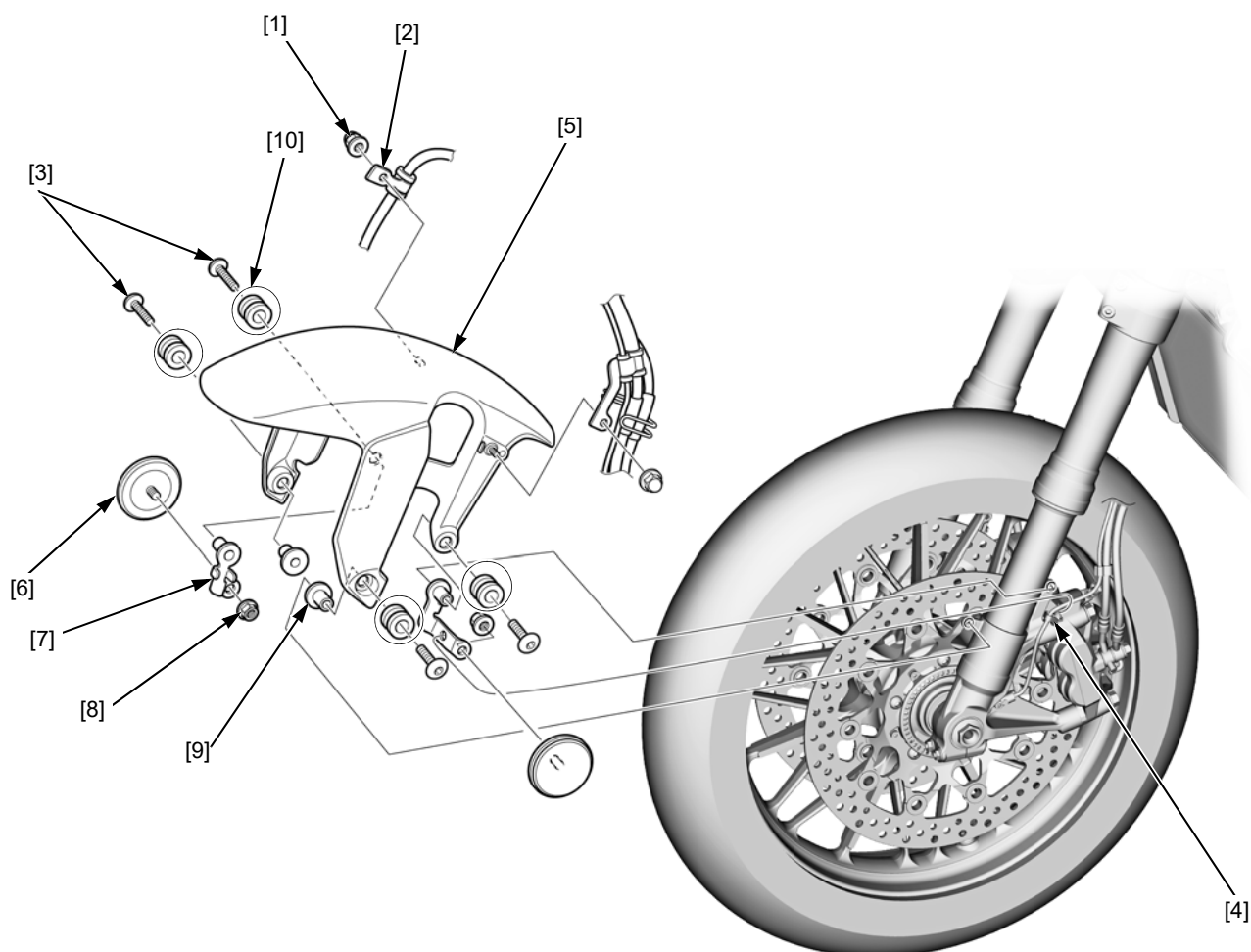
TORQUE:

Front fender mounting bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)

Reflector mounting nut:

1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)



MUFFLER

REMOVAL/INSTALLATION

Remove the muffler mounting nut [1], bolt [2], washer [3] and collar [4].

Loosen the muffler band bolts [5] then remove the muffler [6] and gasket [7].

FO, II FO models only: Remove the bolts [8], grommet [9] and heat guard [10].
Installation is in the reverse order of removal.

NOTE:

- Replace the gasket with a new one.

TORQUE:

Muffler band bolt:

22 N·m (2.2 kgf·m, 16 lbf·ft)

Muffler cover bolt:

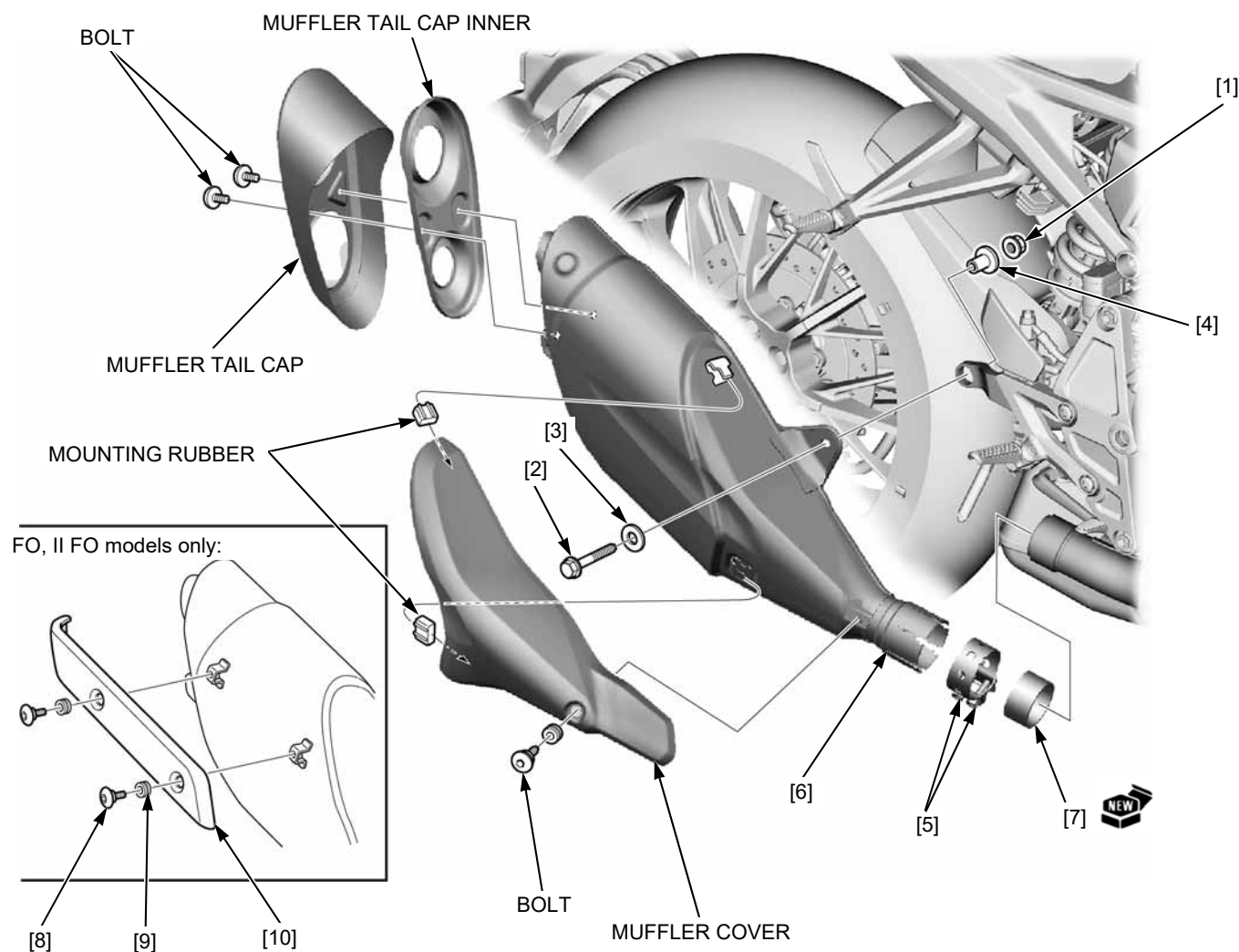
12 N·m (0.9 kgf·m, 7 lbf·ft)

Muffler tail cap bolt:

9 N·m (0.9 kgf·m, 7 lbf·ft)

Muffler heat guard bolt:

9 N·m (0.9 kgf·m, 7 lbf·ft)



EXHAUST PIPE

REMOVAL/INSTALLATION

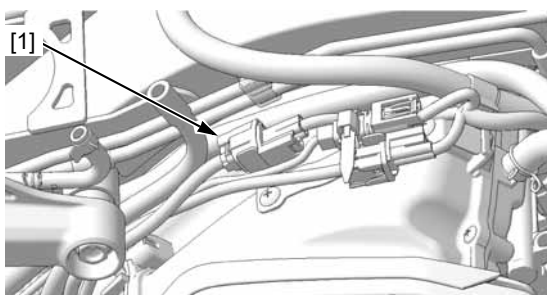
Remove the following:

- Muffler (page 2-15)
- Side cover (page 3-5)
- Duct cover (page 3-5)

Lift and support the fuel tank (page 7-6).

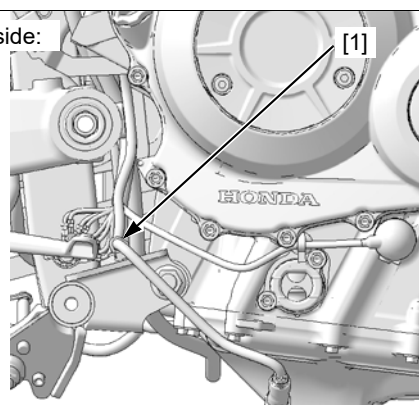
Right side: Remove the A/F sensor 4P (Black) connector [1] from the stay and disconnect it.

Right side:



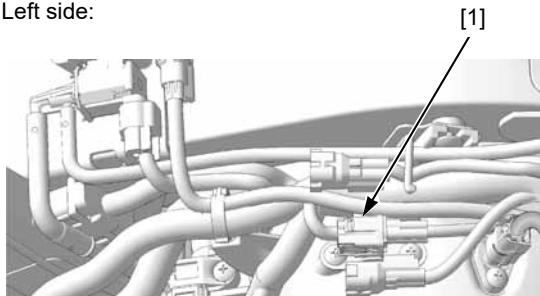
Right side: Remove the wire clip [1].

Right side:



Left side: Remove the A/F sensor 4P (Black) connector [1] from the stay and disconnect it.

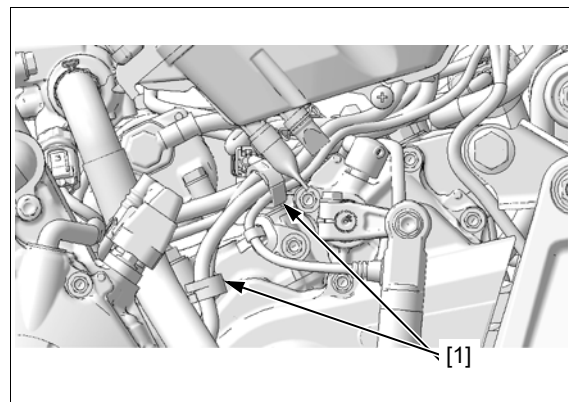
Left side:



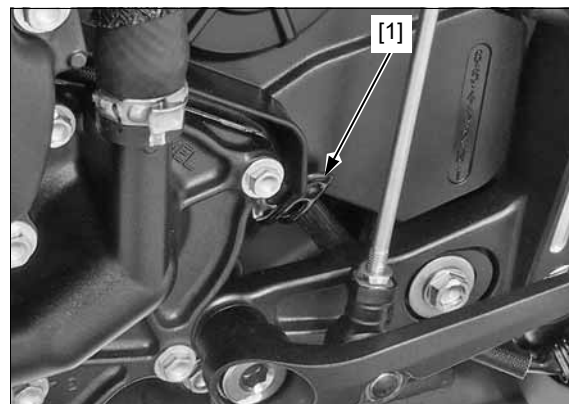
Disconnect the TP sensor 6P (Black) connector [1].



Remove the wire bands [1].



Release the A/F sensor wire from the clamps [1].



FRAME/BODY PANELS/EXHAUST SYSTEM

Loosen the exhaust pipe mounting bolts [1].

Remove the following:

- Radiator mounting bolts [2]
- Radiator (without disconnecting the hoses) (page 8-8) [3]
- Eight joint nuts [4]
- Four gasket [5]
- Exhaust pipe mounting bolt
- Washer [6]
- Exhaust pipe assembly [7]

Installation is in the reverse order of removal.

NOTE:

- Always replace the exhaust pipe joint gaskets with new ones.
- Loosely install all of the exhaust pipe fasteners, and tighten the joint nuts to the specified torque first, then tighten the other mounting fasteners.
- A/F sensor removal/installation (page 4-68).

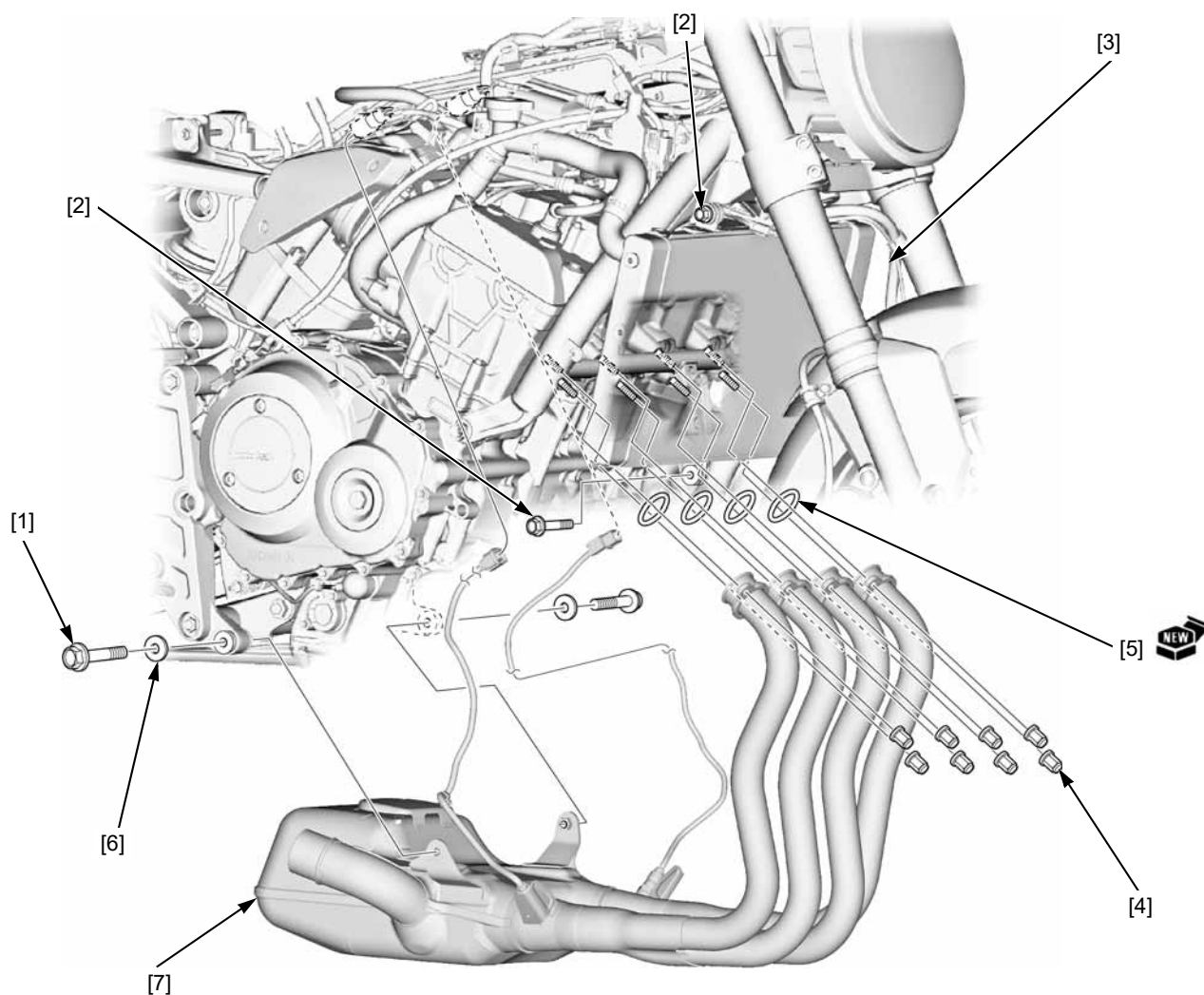
TORQUE:

Exhaust pipe joint nut:

12 N·m (1.2 kgf·m, 9 lbf·ft)

Exhaust pipe mounting bolt:

22 N·m (2.2 kgf·m, 16 lbf·ft)



STUD BOLT REPLACEMENT

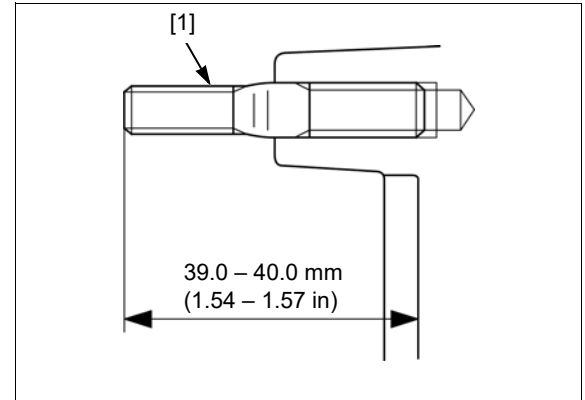
Remove the exhaust pipe (page 2-16).

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

Install a new stud bolt [1] into the cylinder head.

After installing the stud bolt, check that the length from the bolt head to the exhaust port is within specification.

SPECIFIED LENGTH: 39.0 – 40.0 mm (1.54 – 1.57 in)

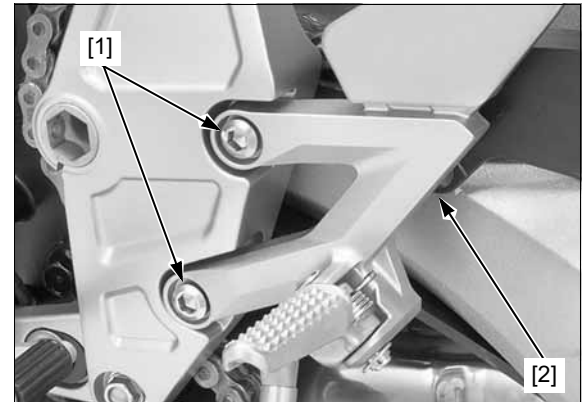


PIVOT BRACKET

REMOVAL/INSTALLATION

Left side:

Remove the two socket bolts [1] and left main step bracket [2].



FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the following:

- Mounting bolt [1], hose guide stay [2].
- Exhaust pipe mounting bolt [3], washer [4], collar [5], grommets [6].
- Pivot bracket pinch bolt [7]
- Pivot bracket upper bolt [8] and washer [9]
- Pivot bracket lower bolt [10] and washer [11]

Installation is in the reverse order of removal.

Tighten the pivot bracket mounting bolts and pinch bolt to the specified torque in the specified sequence as shown.

TORQUE:

Exhaust pipe mounting bolt:

22 N·m (2.2 kgf·m, 16 lbf·ft)

Pivot bracket upper mounting bolt:

39 N·m (4.0 kgf·m, 29 lbf·ft)

Pivot bracket lower mounting bolt:

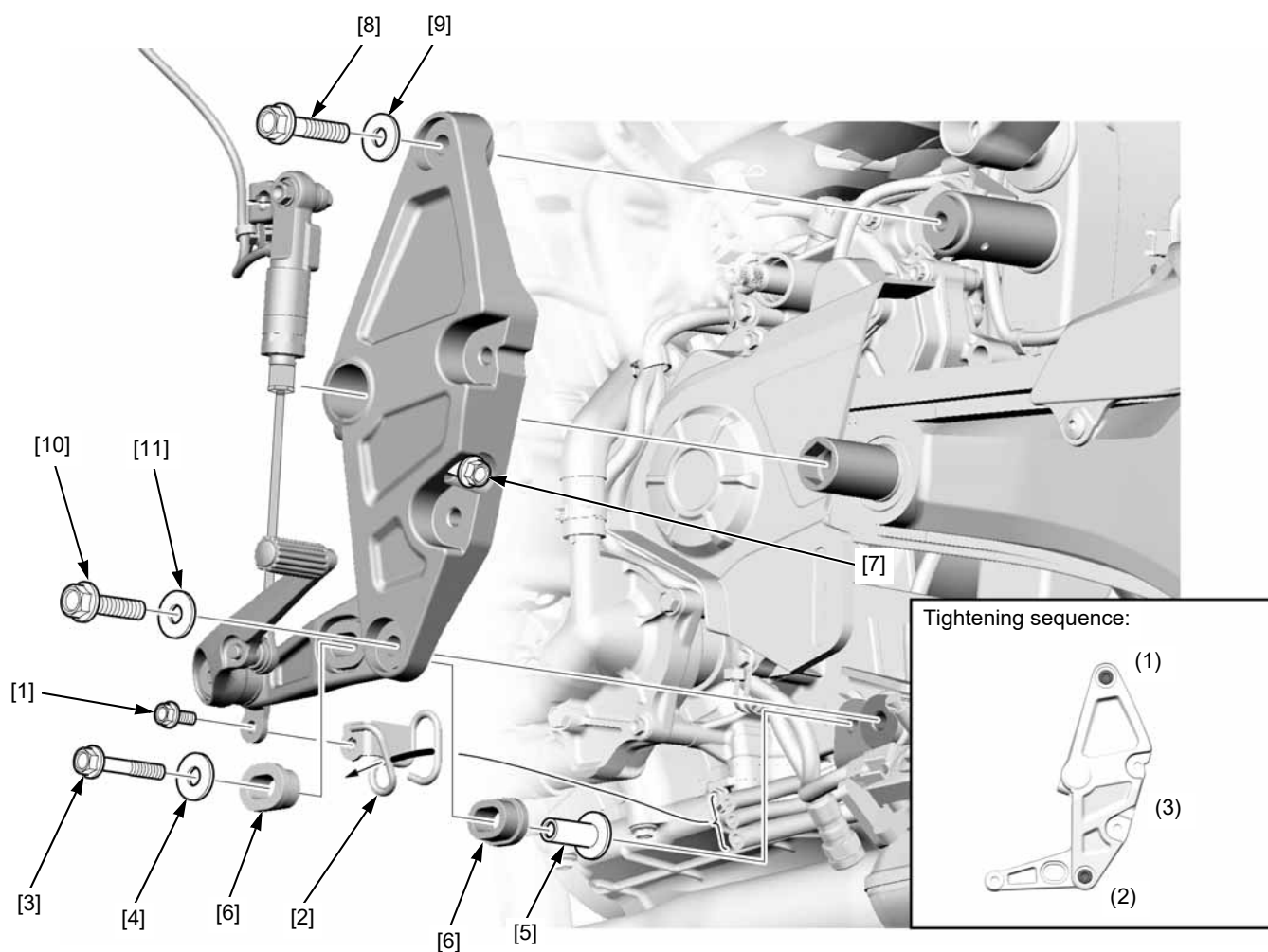
39 N·m (4.0 kgf·m, 29 lbf·ft)

Pivot bracket pinch bolt:

27 N·m (2.8 kgf·m, 20 lbf·ft)

Main step mounting socket bolt:

37 N·m (3.8 kgf·m, 27 lbf·ft)



Right side:

Remove the following:

- Muffler mounting nut [1], bolt [2], washer [3].
- Main step bracket mounting socket bolts [4]
- Exhaust pipe mounting bolt [5], washer [6], collar [7], grommets [8].
- Pivot bracket pinch bolt [9]
- Pivot bracket upper bolt [10] and washer [11]
- Pivot bracket lower bolt [12] and washer [13]

Installation is in the reverse order of removal.

Tighten the pivot bracket mounting bolts and pinch bolt to the specified torque in the specified sequence as shown.

TORQUE:

Exhaust pipe mounting bolt:

22 N·m (2.2 kgf·m, 16 lbf·ft)

Pivot bracket upper mounting bolt:

39 N·m (4.0 kgf·m, 29 lbf·ft)

Pivot bracket lower mounting bolt:

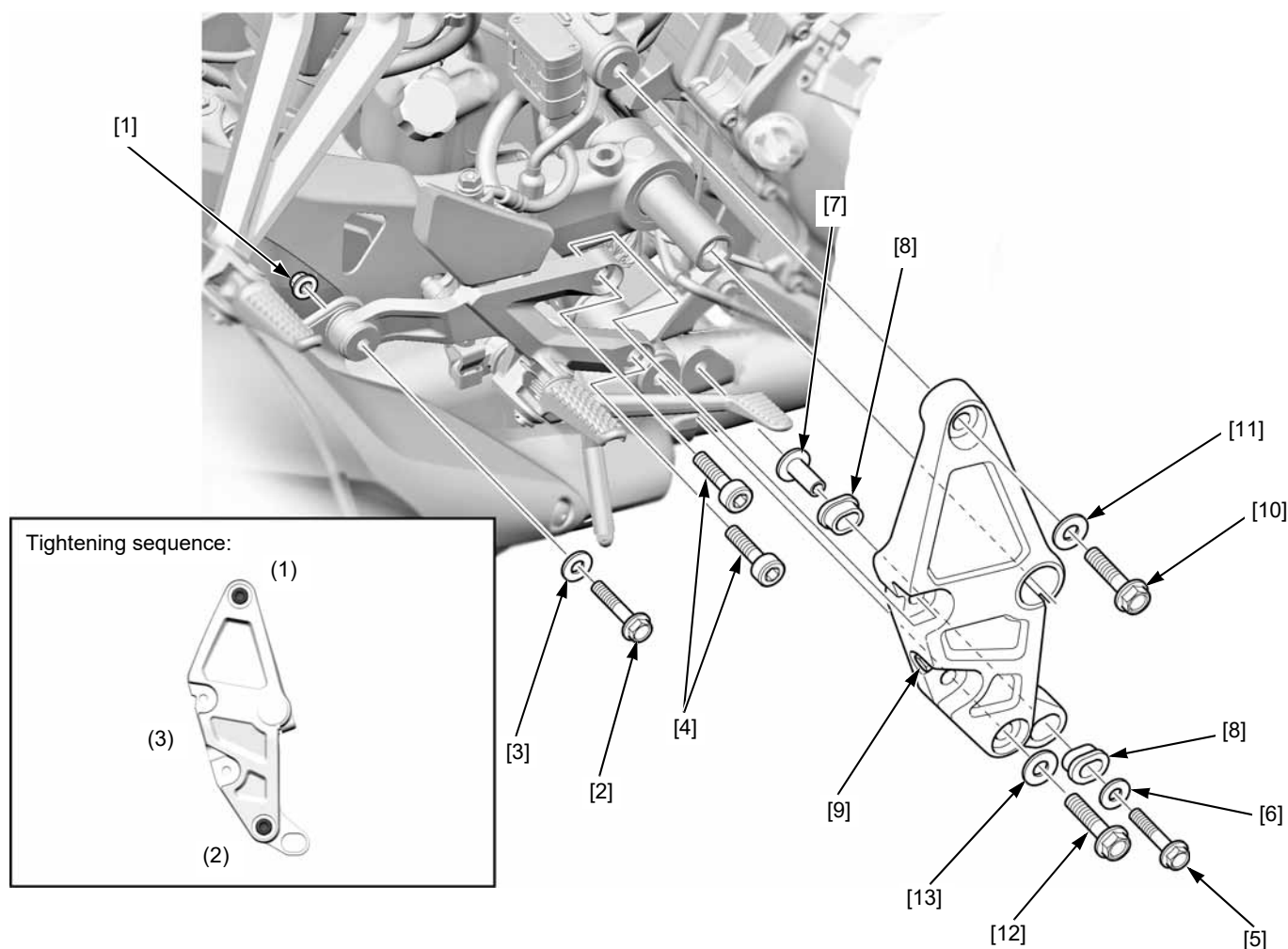
39 N·m (4.0 kgf·m, 29 lbf·ft)

Pivot bracket pinch bolt:

27 N·m (2.8 kgf·m, 20 lbf·ft)

Main step mounting socket bolt:

37 N·m (3.8 kgf·m, 27 lbf·ft)



MEMO

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MAINTENANCE

SERVICE INFORMATION

GENERAL

- Place the motorcycle on level ground before starting any work.

MAINTENANCE SCHEDULE

ED/II ED/KO/III KO/RU/II RU/U:

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
CRANKCASE BREATHER	NOTE 3			C	C	C	C			3-7
* SPARK PLUG					I		R			3-7
* VALVE CLEARANCE						I				3-8
ENGINE OIL			R	R	R	R	R	R		3-12
ENGINE OIL FILTER			R		R		R			3-13
* ENGINE IDLE SPEED				I	I	I	I	I		3-15
RADIATOR COOLANT	NOTE 4			I	I	I	I	I	3 years	3-16
* COOLING SYSTEM				I	I	I	I	I		3-16
* SECONDARY AIR SUPPLY SYSTEM					I		I			3-16
* EVAPORATIVE EMISSION CONTROL SYSTEM					I		I			3-17
DRIVE CHAIN			EVERY 1,000 km (600 mi): I, L							3-17
DRIVE CHAIN SLIDER				I	I	I	I			3-20
BRAKE FLUID	NOTE 4			I	I	I	I	I	2 years	3-21
BRAKE PADS WEAR				I	I	I	I	I		3-21
BRAKE SYSTEM				I	I	I	I	I		3-22
BRAKE LIGHT SWITCH				I	I	I	I	I		3-23
HEADLIGHT AIM				I	I	I	I	I		3-23
CLUTCH SYSTEM				I	I	I	I	I		3-24
SIDESTAND				I	I	I	I	I		3-24
* SUSPENSION				I	I	I	I	I		3-25
* NUTS, BOLTS, FASTENERS				I	I	I	I	I		3-27
** WHEELS/TIRES				I	I	I	I	I		3-27
** STEERING HEAD BEARINGS				I	I	I	I	I		3-27

* 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 your motorcycle after each periodic maintenance is carried out.

NOTES:

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

TH/III TH/FO/II FO/MA/GS/II GS/CH/III CH/BR/II BR:

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
** THROTTLE BODY	NOTE5				C		C		C			3-5
* AIR CLEANER	NOTE2,6					R		R				3-5
* AIR CLEANER	NOTE2,5				R		R		R			
CRANKCASE BREATHER	NOTE 3			C	C	C	C	C	C			3-7
* SPARK PLUG		EVERY 24,000 km (16,000 mi): I, EVERY 48,000 km (32,000 mi): R										3-7
* VALVE CLEARANCE									I			3-8
ENGINE OIL			R		R		R		R	R		3-12
ENGINE OIL FILTER			R				R					3-13
* ENGINE IDLE SPEED					I		I		I	I		3-15
RADIATOR COOLANT	NOTE4				I		I		I	I	3 years	3-16
* COOLING SYSTEM					I		I		I	I		3-16
* SECONDARY AIR SUPPLY SYSTEM							I					3-16
* EVAPORATIVE EMISSION CONTROL SYSTEM							I					3-17
DRIVE CHAIN		EVERY 1,000 km (600 mi): I, L										3-17
DRIVE CHAIN SLIDER					I		I		I			3-20
BRAKE FLUID	NOTE4			I	I	I	I	I	I	I	2 years	3-21
BRAKE PADS WEAR				I	I	I	I	I	I	I		3-21
BRAKE SYSTEM					I		I		I	I		3-22
BRAKE LIGHT SWITCH					I		I		I	I		3-23
HEADLIGHT AIM					I		I		I	I		3-23
CLUTCH SYSTEM				I	I	I	I	I	I	I		3-24
SIDESTAND					I		I		I	I		3-24
* SUSPENSION					I		I		I	I		3-25
* NUTS, BOLTS, FASTENERS					I		I		I	I		3-27
** WHEELS/TIRES					I		I		I	I		3-27
** STEERING HEAD BEARINGS					I		I		I	I		3-27

* 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 reading, repeat at the frequency interval established here.
- Service more frequently when riding in unusually wet or dusty areas.
- Service more frequently when riding in rain or at full throttle.
- Replacement requires mechanical skill.
- CH/III CH models only.
- Except CH/III CH models.

FUEL LINE

FUEL TANK LIFTING/LOWERING

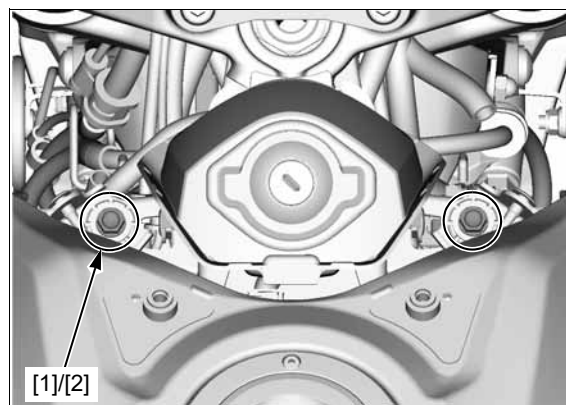
Remove the following:

- Main seat (page 2-4)
- Tank cover (page 2-6)

Remove the fuel tank front mounting bolts [1]/washers [2].

Lift the fuel tank front end and support the fuel tank by inserting a suitable support under the tank.

Lower the fuel tank in the reverse order of lifting.



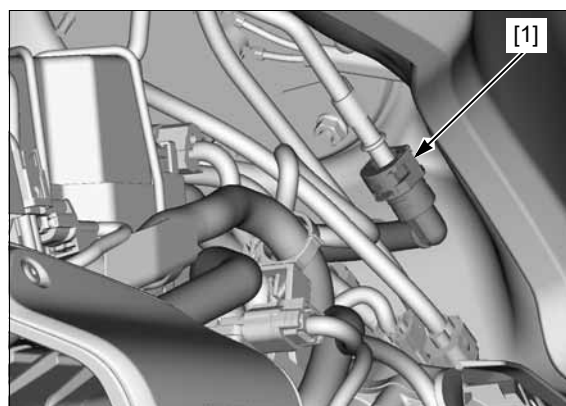
INSPECTION

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

Check the fuel lines [1] for deterioration, damage or leakage. Replace the fuel lines if necessary.

Also check the fuel line fittings for leakage.

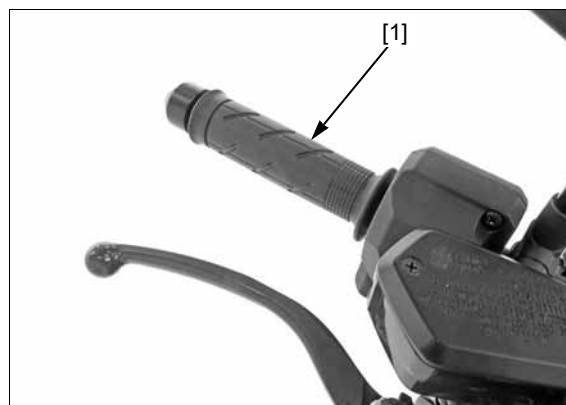
Lower the fuel tank (page 3-4).



THROTTLE OPERATION

Check for smooth operation of the throttle grip [1] and that it returns automatically to the fully closed position from any open position.

Replace the APS if the throttle operation is not smooth (page 4-61).



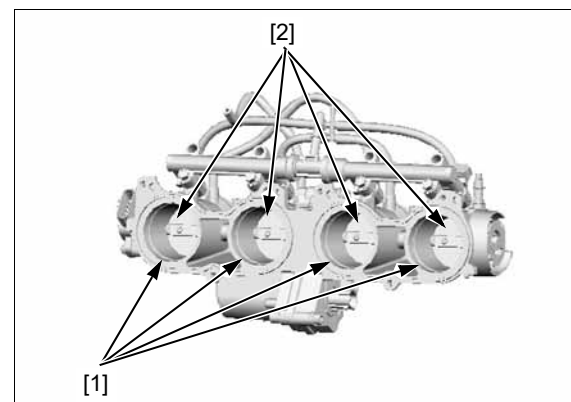
THROTTLE BODY (CH/III CH models only)

Remove the throttle body (page 7-14).

Clean the throttle bore [1] and throttle valve [2] surface by lightly rubbing with a shop towel soaked with a commercially available carburetor cleaner until the carbon deposits are completely removed.

- Do not spray the carburetor cleaner directly into the throttle bore.
- Do not allow any foreign material or carbon deposit remain inside the throttle bore.

Install the throttle body (page 7-14).

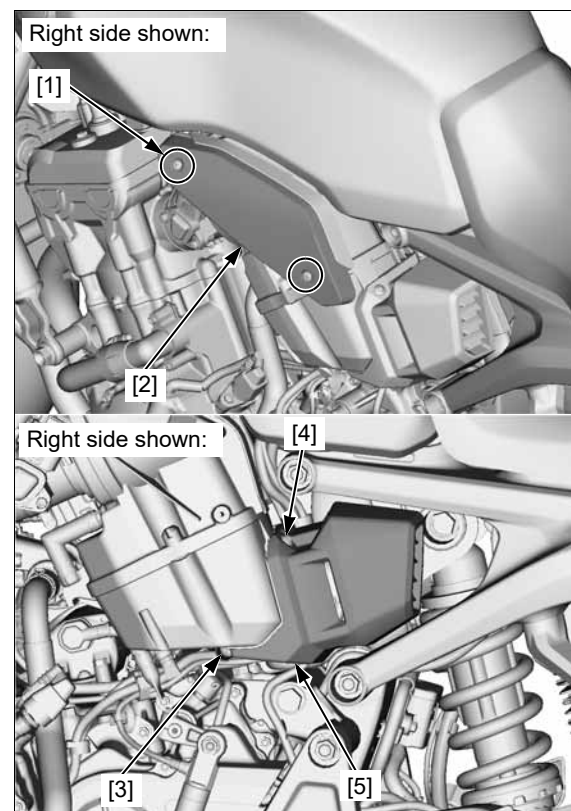


AIR CLEANER

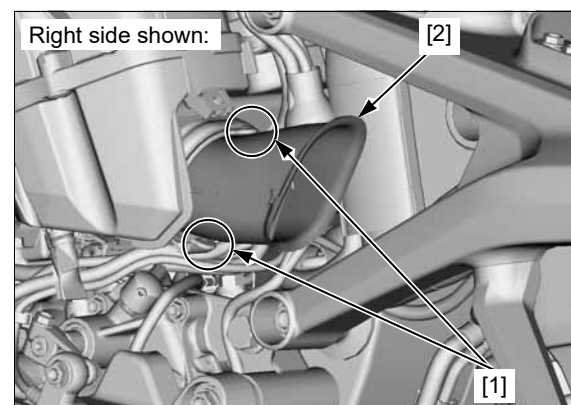
Lift and support the fuel tank (page 3-4).

Remove the socket bolts [1] and the side cover [2].

Remove the tapping screws [3], special bolts [4] and duct covers [5].



Release the tabs [1] of air cleaner duct from hole of duct joint and remove the air cleaner duct [2].



MAINTENANCE

Remove the socket bolts [1].

Release the tabs [2] of lower air cleaner housing from the holes [3] of upper air cleaner housing.

Slide the air cleaner lower housing [4] leftward.

Remove the tapping screws [5] and remove the air cleaner element [6].

Replace the air cleaner element in accordance with the maintenance schedule or any time it is excessively dirty or damaged.

NOTE:

- The viscous paper element cannot be cleaned because the element contains a dust adhesive.

Installation is in the reverse order of removal.

TORQUE:

Duct cover mounting bolt:

4.2 N·m (0.4 kgf·m, 3 lbf·ft)

Duct cover mounting screw:

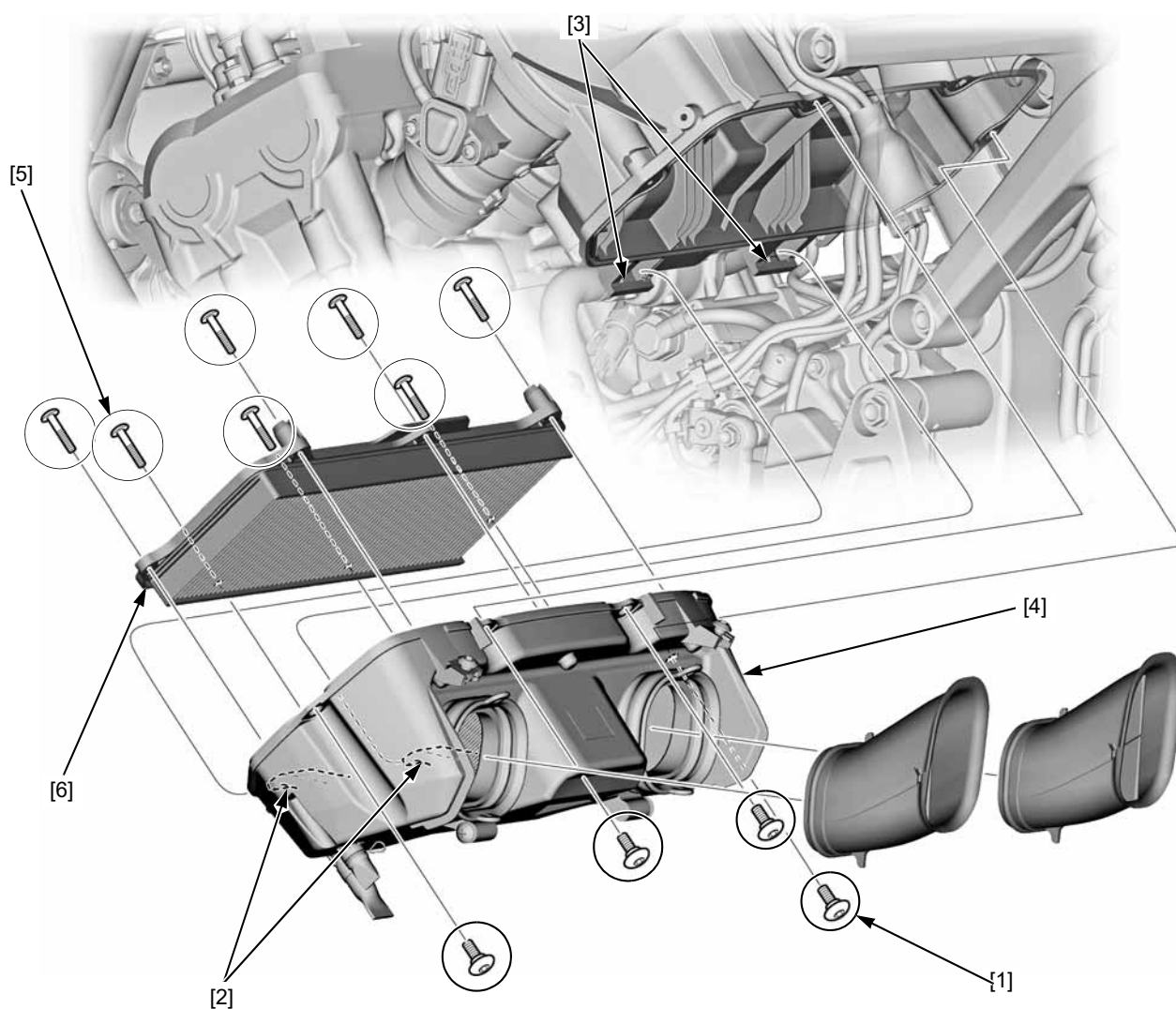
1.1 N·m (0.1 kgf·m, 1 lbf·ft)

Lower air cleaner housing mounting bolt:

4.2 N·m (0.4 kgf·m, 3 lbf·ft)

Air cleaner element tapping screw:

0.8 N·m (0.1 kgf·m, 0.6 lbf·ft)



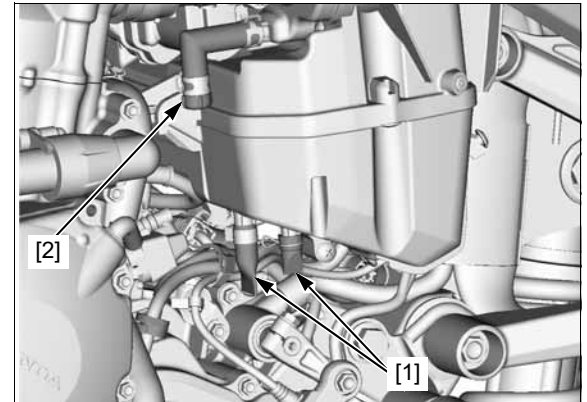
CRANKCASE BREATHER

NOTE:

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

Remove the crankcase breather drain tubes [1] and drain the deposits into a suitable container, then reinstall the drain tubes with the tube clamp.

Remove the crankcase breather drain tube plug [2] and drain the deposits into a suitable container, then reinstall the drain tube plug with the tube clamp.



SPARK PLUG

REMOVAL/INSTALLATION

Remove the PAIR control solenoid valve (page 7-17)

Remove the radiator mounting bolts (page 8-8).

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

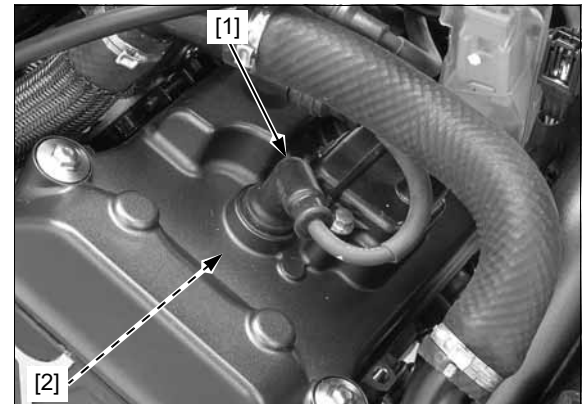
Remove the spark plug caps [1] and spark plugs [2].

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

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

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Install the PAIR control solenoid valve (page 7-17).



INSPECTION

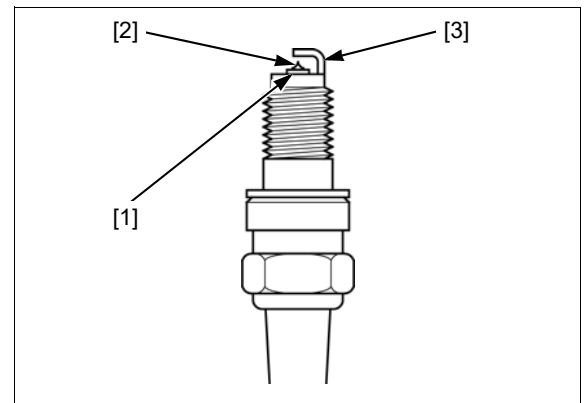
This motorcycle's spark plug is equipped with an iridium center electrode. Do not clean the electrodes.

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

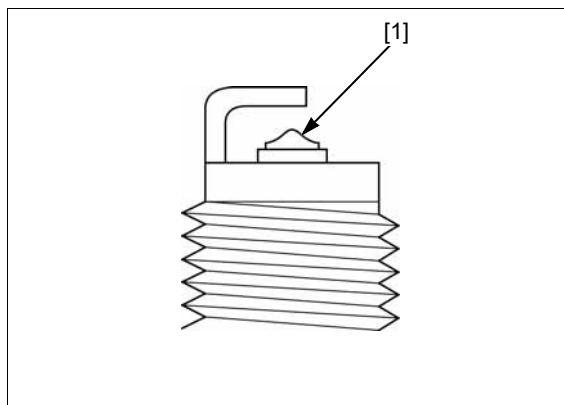
DENSO: VUH27ES



MAINTENANCE

Always use specified spark plugs on this motorcycle.

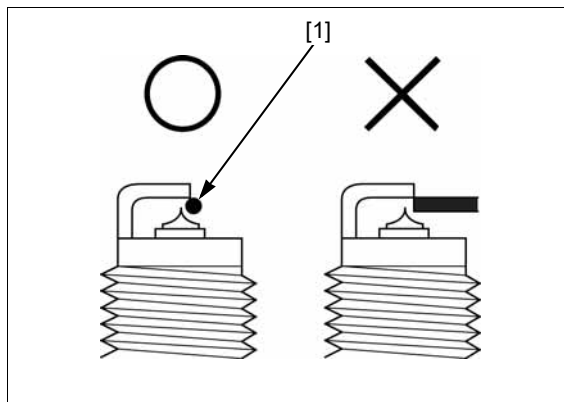
Replace the plug with the specified one if the center electrode [1] is rounded as shown.



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

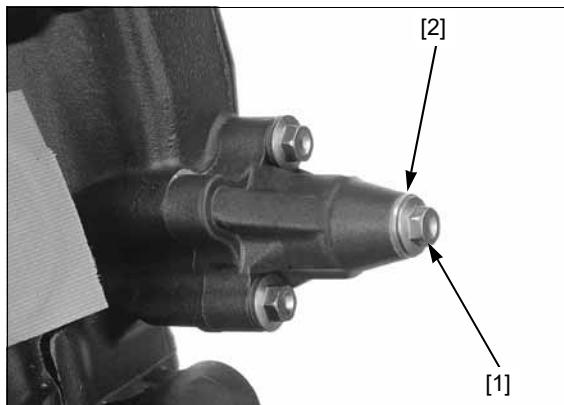
NOTE:

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

INSPECTION

Remove the cylinder head cover (page 10-4).

Remove the bolt [1] and sealing washer [2] from the cam chain tensioner lifter.

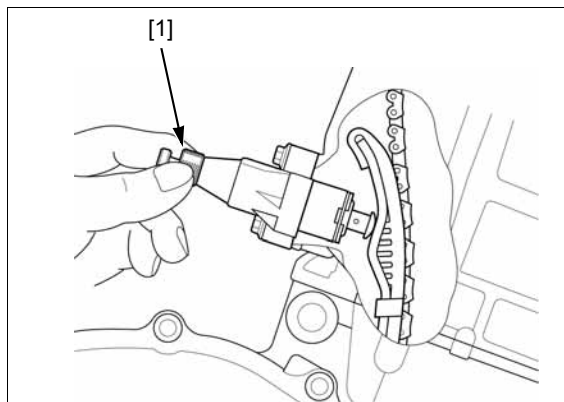


Turn the tensioner lifter shaft fully in (clockwise) and secure it using the special tool.

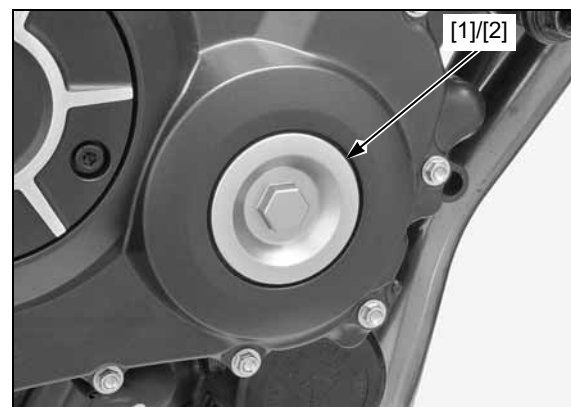
TOOL:

Tensioner stopper [1]

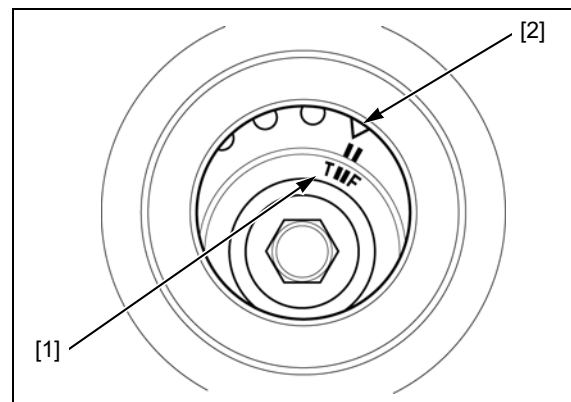
070MG-0010100



Remove the timing hole cap [1] and O-rings [2].

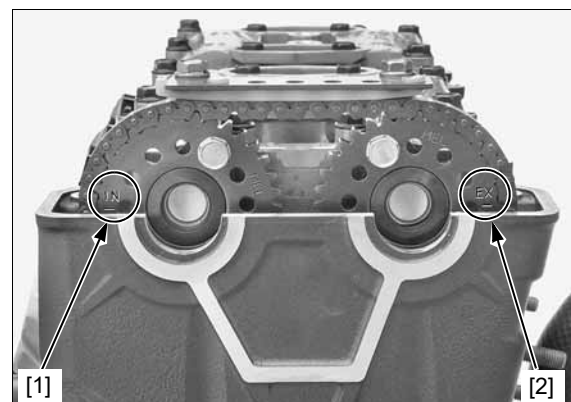


Turn the crankshaft clockwise, align the "T" mark [1] on the CKP sensor rotor with the index mark [2] on the right crankcase cover.



The timing marks ("IN" [1] and "EX" [2]) on the cam sprockets must be flush with the cylinder head surface and facing outward as shown.

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



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

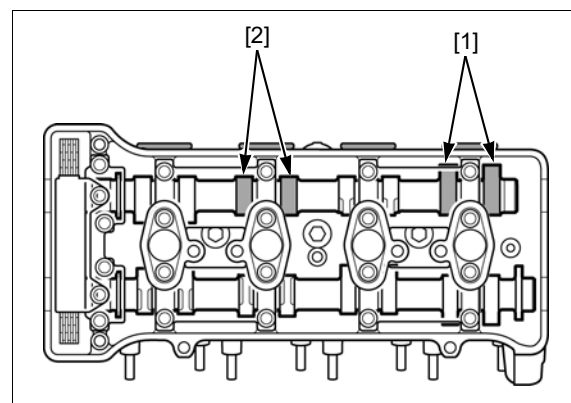
Record the clearance for each valve for reference in shim selection if adjustment is required.

Check the valve clearance for the No.1 cylinder intake valves [1] and No.3 cylinder intake valves [2] using a feeler gauge.

VALVE CLEARANCE:

IN: 0.16 ± 0.03 mm (0.006 ± 0.001 in)

Turn the crankshaft clockwise 1/2 turn (180°).



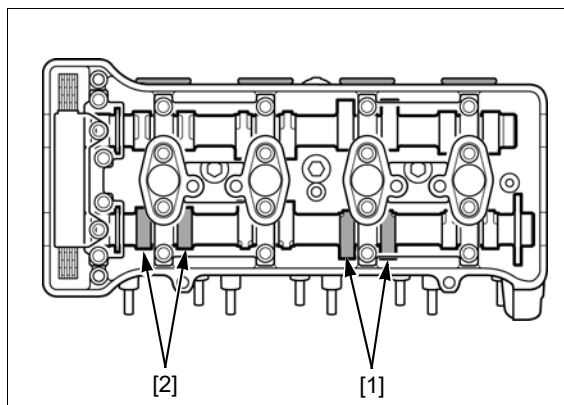
MAINTENANCE

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

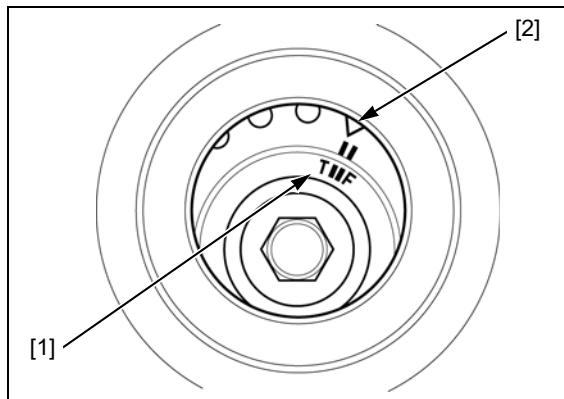
Check the valve clearance for the No.2 cylinder exhaust valves [1] and No.4 cylinder exhaust valves [2] using a feeler gauge.

VALVE CLEARANCE:

EX: 0.30 ± 0.03 mm (0.012 ± 0.001 in)



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



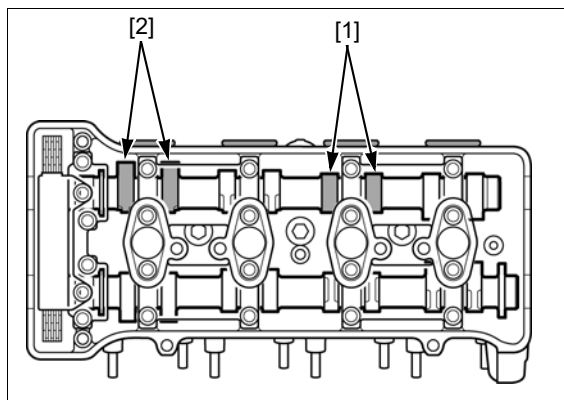
Record the clearance for each valve for reference in shim selection if adjustment is required.

Check the valve clearance for the No.2 cylinder intake valves [1] and No.4 cylinder intake valves [2] using a feeler gauge.

VALVE CLEARANCE:

IN: 0.16 ± 0.03 mm (0.006 ± 0.001 in)

Turn the crankshaft clockwise 1/2 turn (180°).



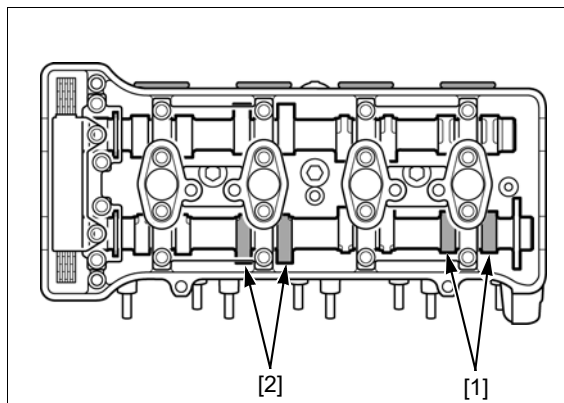
Record the clearance for each valve for reference in shim selection if adjustment is required.

Check the valve clearance for the No.1 cylinder exhaust valves [1] and No.3 cylinder exhaust valves [2] using a feeler gauge.

VALVE CLEARANCE:

EX: 0.30 ± 0.03 mm (0.012 ± 0.001 in)

Adjust the valve clearance if necessary (page 3-11).



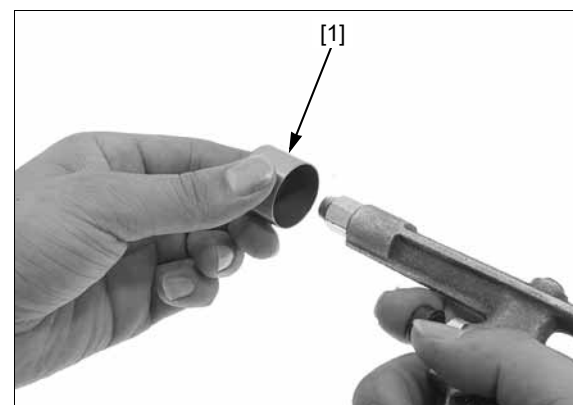
ADJUSTMENT

NOTE:

Use genuine Honda parts for the shims replacement. In case of the wrong shims usage, its material may damage to the intake valve titanium surface.

Remove the valve lifters and shims (page 10-9).

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



Measure the thickness of the shim [1] and record it.

Sixty-five different thickness shims are available from the thinnest 1.200 mm thickness shim to the thickest 2.800 mm thickness shim in increments of 0.025 mm.

Calculate the new shim thickness using the equation below.

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

A: New shim thickness

B: Recorded valve clearance

C: Specified valve clearance

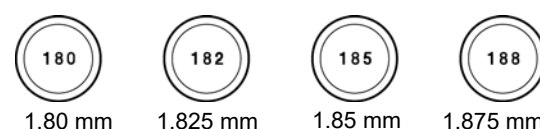
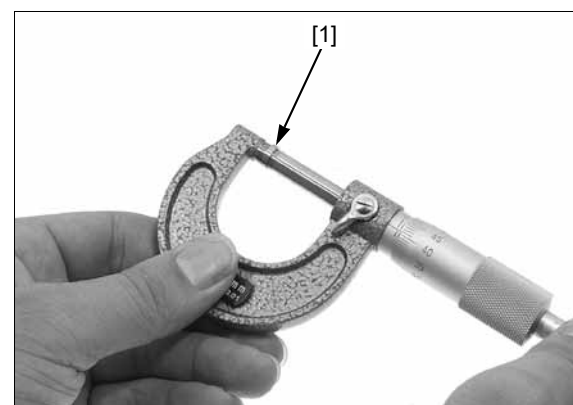
D: Old shim thickness

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

Install the newly selected shim on the valve spring retainer.

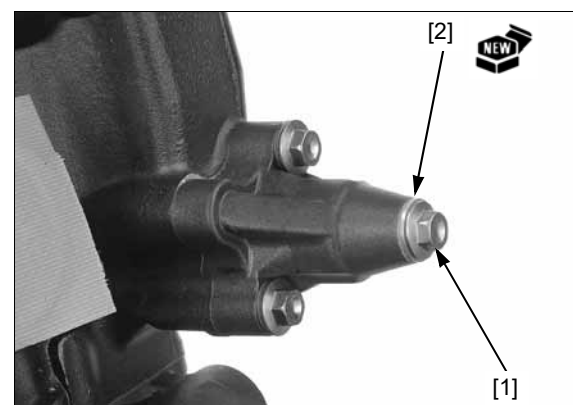
Install the valve lifter and camshafts (page 10-10).

Rotate the crankshaft clockwise several times and recheck the valve clearance (page 3-8).



Remove the special tool from the cam chain tensioner lifter.

Install the bolt [1] with a new sealing washer [2] and tighten it securely.

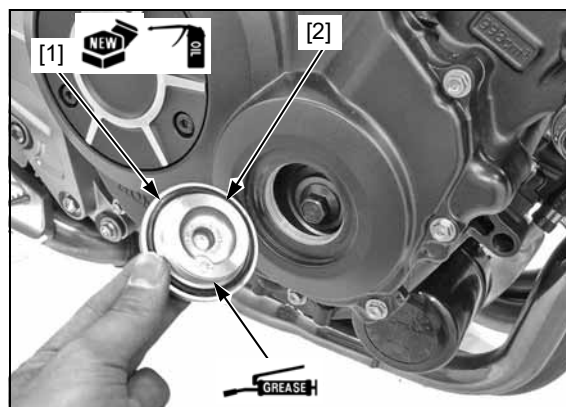


MAINTENANCE

Coat new O-rings [1] with engine oil and install them onto the timing hole cap [2].
Apply grease to the hole cap threads and install them.
Install and tighten the timing hole cap to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Install the cylinder head cover (page 10-4).



ENGINE OIL

OIL LEVEL INSPECTION

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.

Check the oil level through the inspection window.

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

RECOMMENDED ENGINE OIL:

Honda "4-stroke motorcycle oil" or an equivalent motor oil.

API service classification: SJ or higher

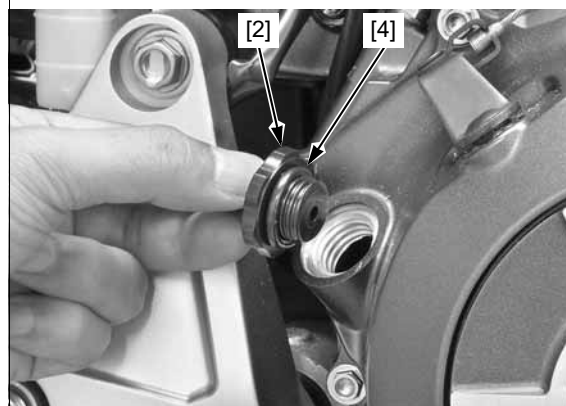
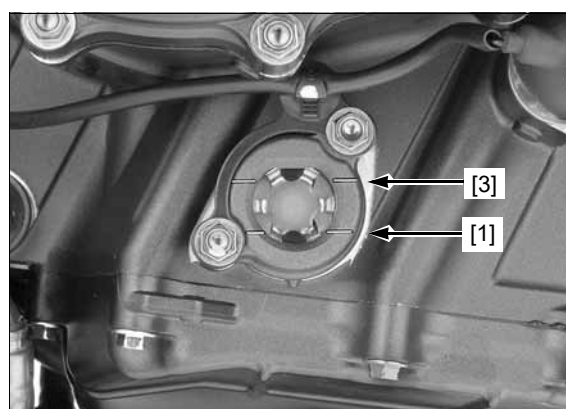
JASO T903 standard: MA

Viscosity: SAE 10W-30

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.



OIL CHANGE

Warm up the engine.

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

Place an oil pan under the engine to catch the engine oil.

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

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

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Fill the crankcase with recommended engine oil (page 3-12).

OIL CAPACITY:

2.6 liter (2.7 US qt, 2.3 Imp qt) after draining

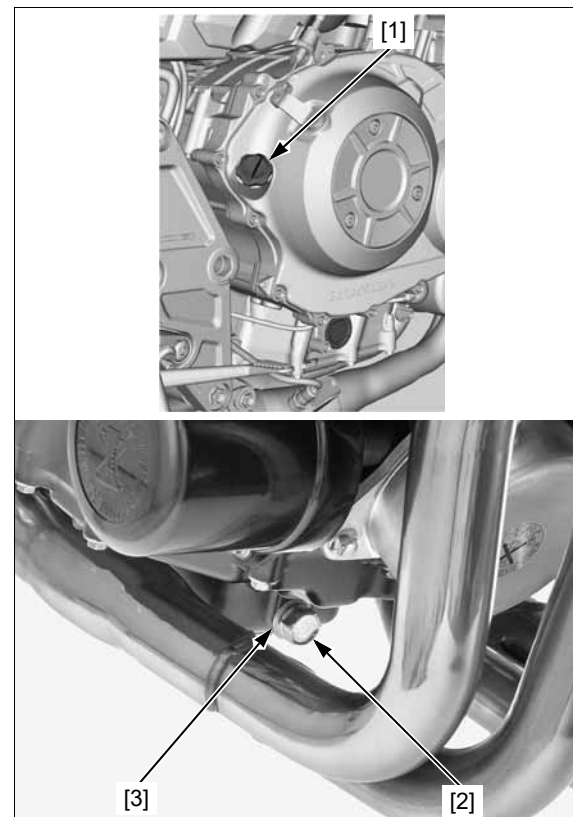
2.9 liter (3.1 US qt, 2.6 Imp qt) after oil filter change

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

Install the oil filler cap.

Check the oil level (page 3-12).

Check that there are no oil leaks.



ENGINE OIL FILTER

Drain the engine oil (page 3-13).

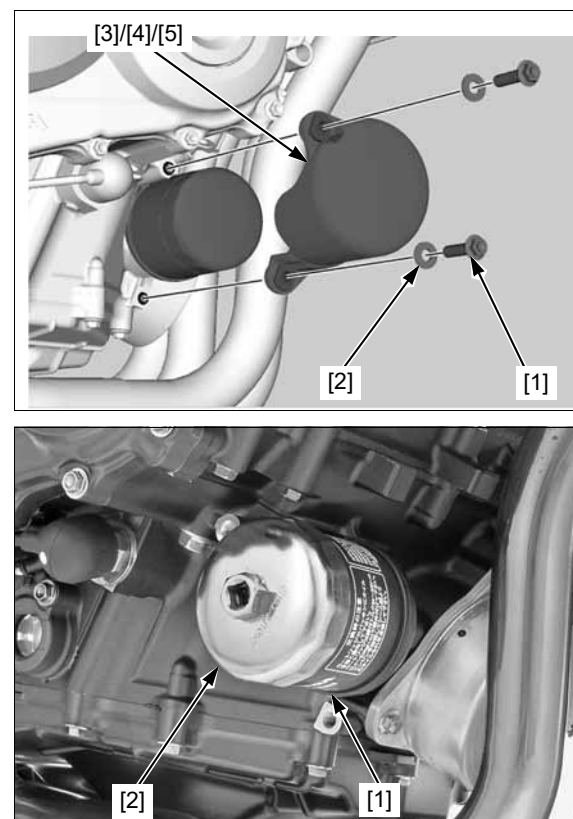
Remove the bolts [1], washers [2], grommets [3], collars [4] and oil filter guard [5].

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

TOOL:

Oil filter wrench [2]

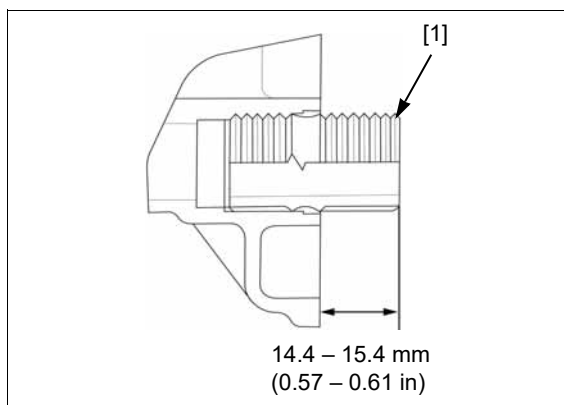
07HAA-PJ70101



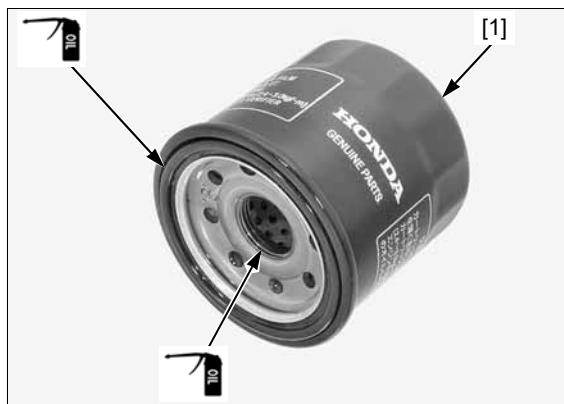
MAINTENANCE

Check that the oil filter boss [1] protrusion from the crankcase is specified length as shown.

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



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



Install the oil filter cartridge [1] and tighten it to the specified torque using the special tool.

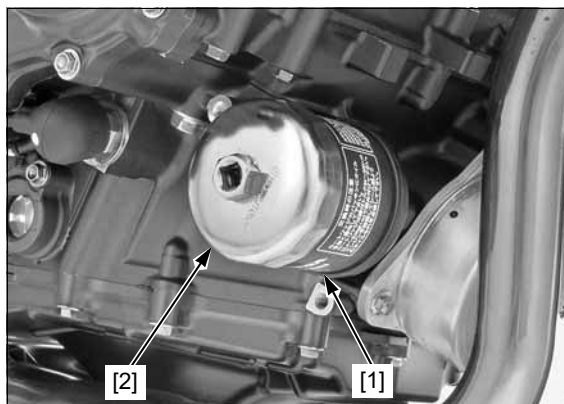
TOOL:

Oil filter wrench [2] 07HAA-PJ70101

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)

Fill the engine with the recommended engine oil (page 3-13).

Check that there are no oil leaks.



ENGINE IDLE SPEED

IDLE SPEED INSPECTION

NOTE:

- Inspect the idle speed after all other engine maintenance items have been performed and are within specifications.
- Before checking the idle speed, inspect the following items.
 - No DTC and no MIL indicated
 - Spark plug condition (page 3-7)
 - Air cleaner condition (page 3-5)
- The engine must be warm for accurate idle speed inspection.
- This system eliminates the need for manual idle speed adjustment compared to previous designs.

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

Let the engine idle and check the idle speed.

ENGINE IDLE SPEED: 1,200 min⁻¹ (rpm)

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

- Throttle operation (page 3-4)
- Intake air leak
- Engine top-end problem (page 10-2)

EXHAUST SYSTEM (BR, IIBR models only)

EXHAUST EMISSION MEASUREMENT AT IDLE

Inspect after checking engine idle speed (page 3-15).

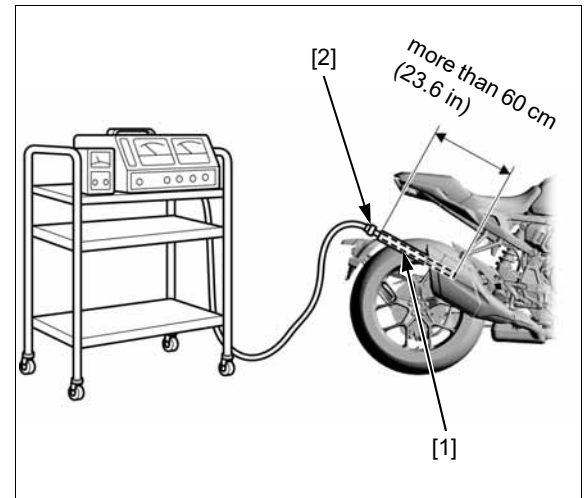
1. Support the motorcycle on its sidestand on a level surface.
2. Connect an appropriate pipe or hose [1] (heat-resistant, chemical-resistant) to the muffler so that the probe [2] can be inserted by more than 60 cm (23.6 in).
3. Start the engine and warm it up until the drain bolt temperature is 65 ±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

IDLE SPEED: 1,200 ± 100 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 200 ppm



RADIATOR COOLANT

Check the coolant level of the reserve tank [1] with the engine running at normal operating temperature.

The level should be between the "UPPER" level line [2] and "LOWER" level line [3].

If necessary, add recommended coolant.

RECOMMENDED ANTIFREEZE:

Except TH, III TH, CH, III CH models:

High quality ethylene glycol antifreeze
containing silicate-free corrosion inhibitors

TH, III TH, CH, III CH models:

Honda PRE-MIX Coolant

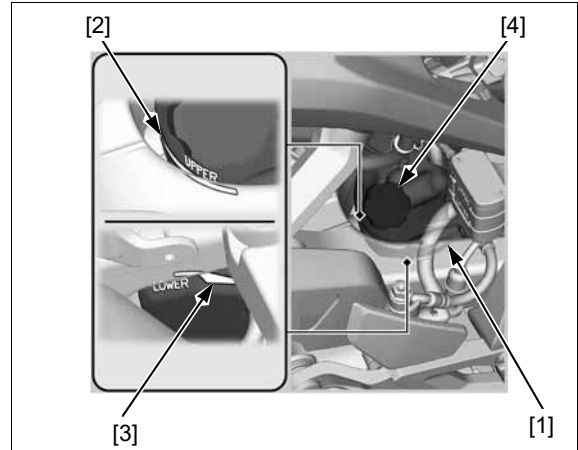
RECOMMENDED MIXTURE

(Except TH, III TH, CH, III CH models):

1:1 mixture with distilled water

Remove the reserve tank filler cap [4] and fill to the "UPPER" level line.

Reinstall the filler cap.



COOLING SYSTEM

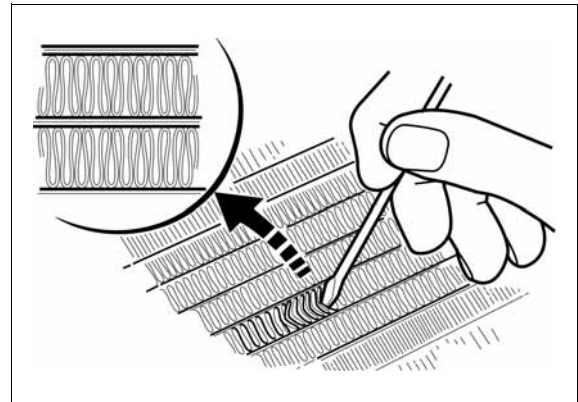
Check the radiator air passages for clogging or damage.

Straighten bent fins with a small, 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.

Inspect the water hoses for cracks or deterioration, and replace them if necessary.

Check the tightness of all hose clamps and fasteners.



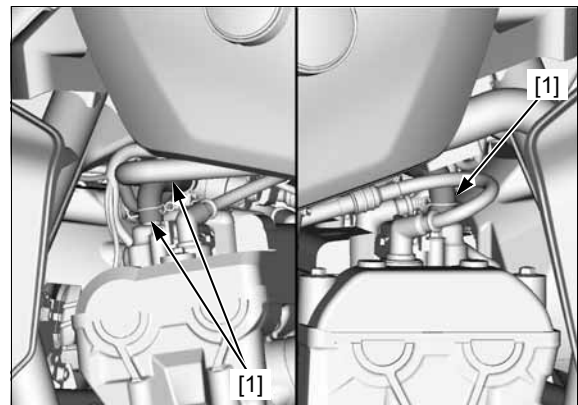
SECONDARY AIR SUPPLY SYSTEM

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

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

Check the PAIR air suction hoses [1] between the PAIR control solenoid valve and cylinder head cover for deterioration, damage or loose connections. Make sure that the hoses are not cracked.

Check the PAIR air suction hose between the air cleaner housing and PAIR control solenoid valve for deterioration, damage or loose connections. Make sure that the hoses are not kinked, pinched or cracked.



EVAPORATIVE EMISSION CONTROL SYSTEM

Remove the following:

- Fuel tank (page 7-6)
- Main seat (page 2-4)

Check the following for deterioration, damage or loose connections.

- Fuel tank-to-EVAP canister hose [1]
- EVAP canister-to-EVAP purge control solenoid valve hose [2]
- EVAP purge control solenoid valve-to-throttle body hoses [3]

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

Check the EVAP canister [4] for cracks or other damage.

For EVAP canister removal/installation (page 7-19).

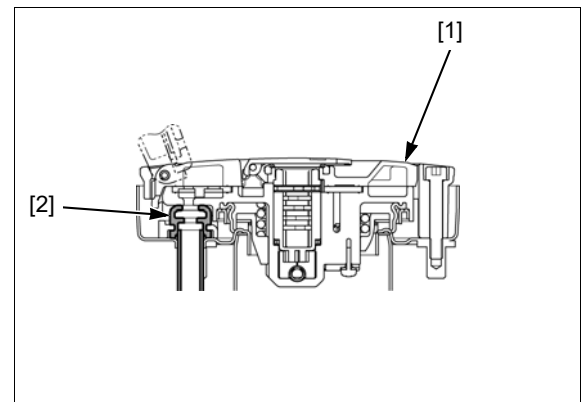
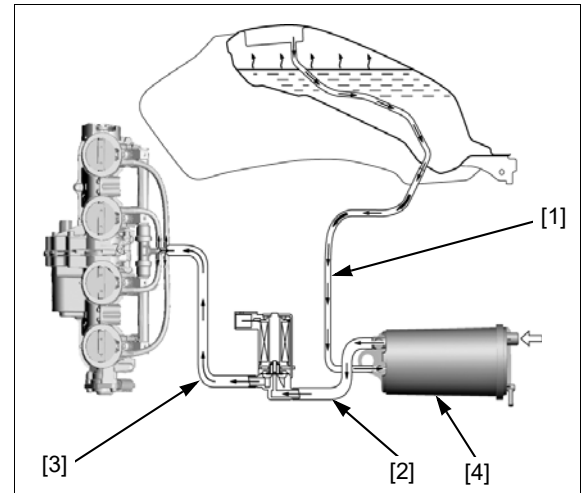
For EVAP purge control solenoid valve inspection (page 7-18).

Open the fuel filler cap [1].

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

NOTE:

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



DRIVE CHAIN

⚠ WARNING

Amputation hazard. Never inspect or adjust the drive chain while the engine is running.

DRIVE CHAIN SLACK INSPECTION

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

Check the slack in the lower half of the drive chain midway between the sprockets.

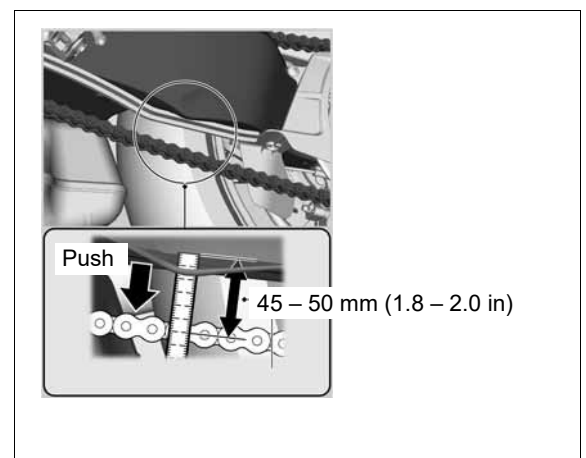
DRIVE CHAIN SLACK: 45 – 50 mm (1.8 – 2.0 in)

NOTICE

Push the lower part of the drive chain down and check the chain slack between the drive chain and swingarm at the lower end of the swingarm.

Excessive chain slack, 55 mm (2.1 in) or more, may damage the frame.

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



ADJUSTMENT

Loosen the rear axle bearing holder pinch bolts [1]. Turn the axle bearing holder using the equipped tool until the correct drive chain slack is obtained. Tighten the rear axle bearing holder pinch bolts to the specified torque.

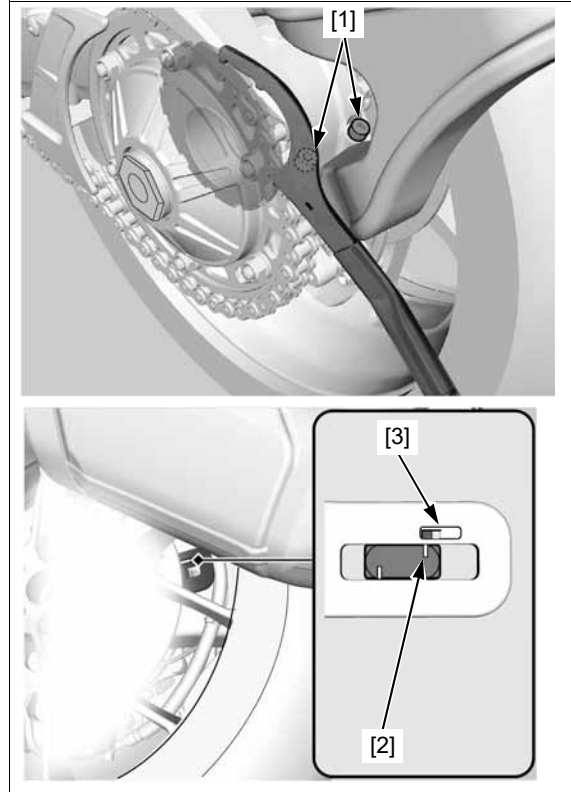
TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Recheck the drive chain slack and free wheel rotation.

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

Check the drive chain wear indicator label.

If the index mark [2] reaches red zone [3] of the indicator label, replace the drive chain with a new one (page 3-19).



CLEANING AND LUBRICATION

Clean the drive chain [1] with a chain cleaner designed specifically for O-ring chains. 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].

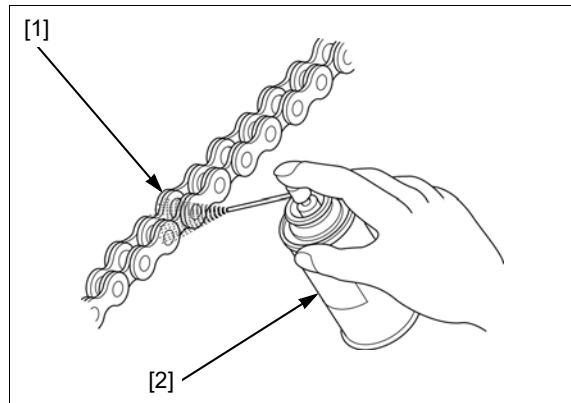
RECOMMENDED LUBRICANT:

Drive chain lubricant 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.

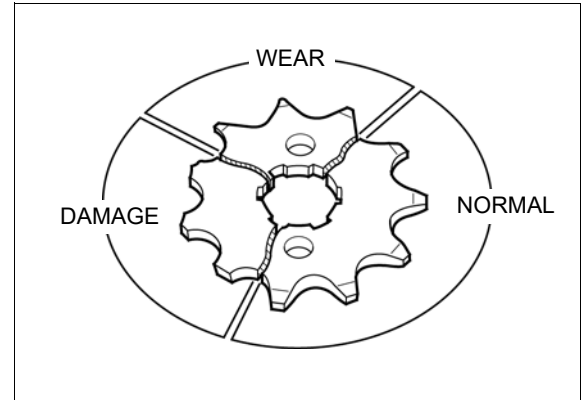


SPROCKET INSPECTION

Remove the sprocket cover (page 2-13).

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

Never use a new drive chain on worn sprockets. Both chain and sprockets must be in good condition, or the replacement chain will wear rapidly.



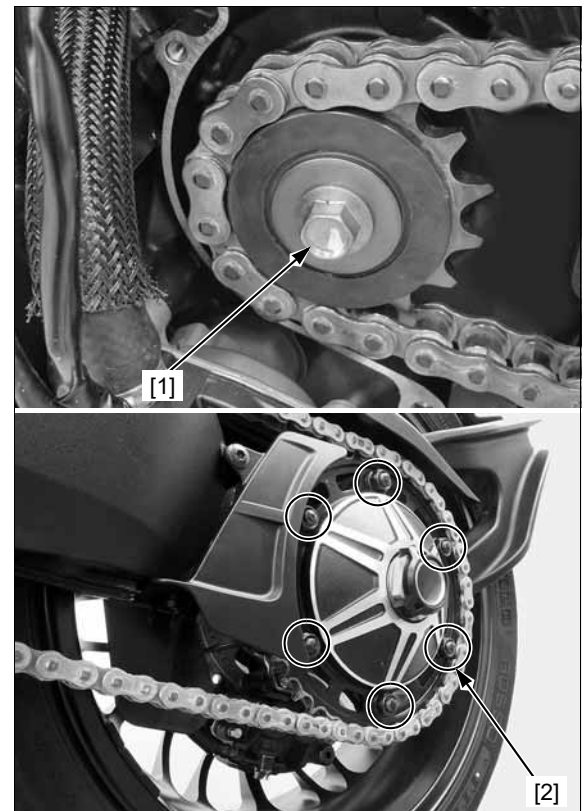
Check the drive sprocket bolt [1] and driven sprocket nuts [2] on the drive and driven sprockets. If any are loose, torque them.

TORQUE:

Drive sprocket bolt: 54 N·m (5.5 kgf·m, 40 lbf·ft)

Driven sprocket nut: 64 N·m (6.5 kgf·m, 47 lbf·ft)

Install the sprocket cover (page 2-13).



REPLACEMENT

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

Fully slacken the drive chain (page 3-17).

Remove the drive chain using the special tool.

TOOL:

Drive chain tool set

07HMH-MR10103

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

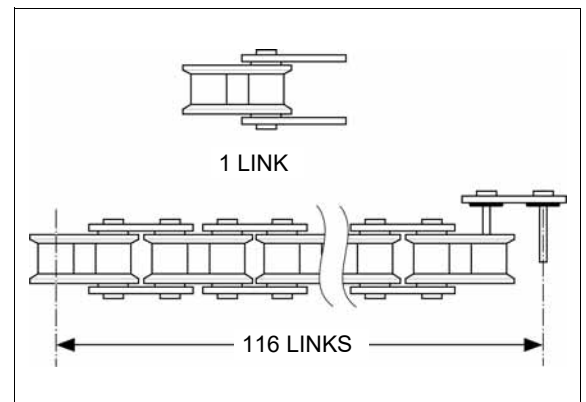
STANDARD LINKS: 116 LINKS

REPLACEMENT CHAIN

RK: RK525ROZ7/116L

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

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



MAINTENANCE

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

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

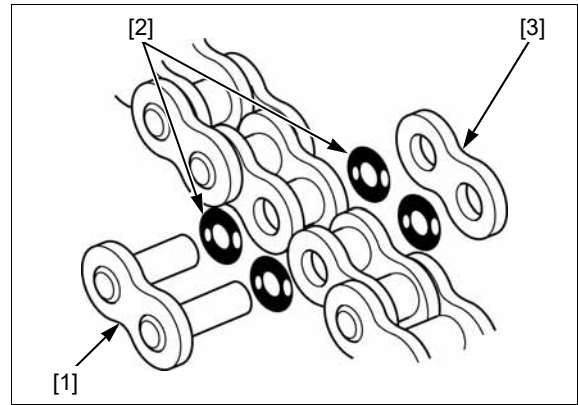
Insert a new master link [1] with new O-rings [2] from the inside of the drive chain, and install new O-rings and a new plate [3] with the identification mark facing the outside.

Assemble the master link, O-rings and plate.

TOOL:

Drive chain tool set

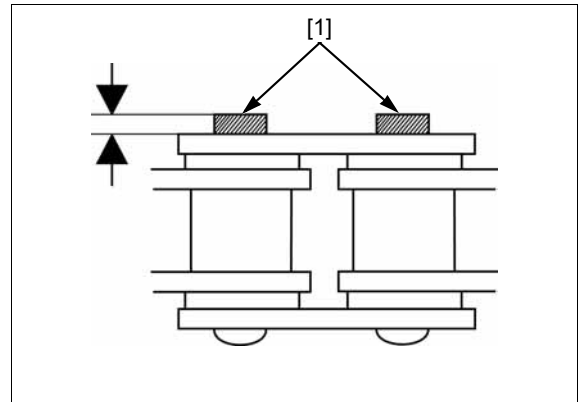
07HMH-MR10103



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

STANDARD LENGTH: 1.2 – 1.4 mm (0.05 – 0.06 in)

Stake the master link pins.



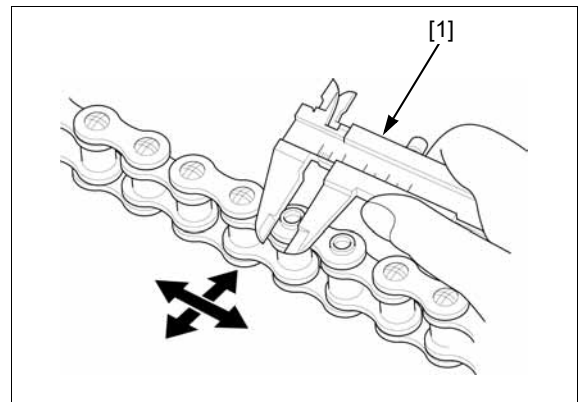
Make sure that the pins are staked properly by measuring the diameter of the staked area using a caliper [1].

DIAMETER OF THE STAKED AREA:

5.50 – 5.80 mm (0.22 – 0.23 in)

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

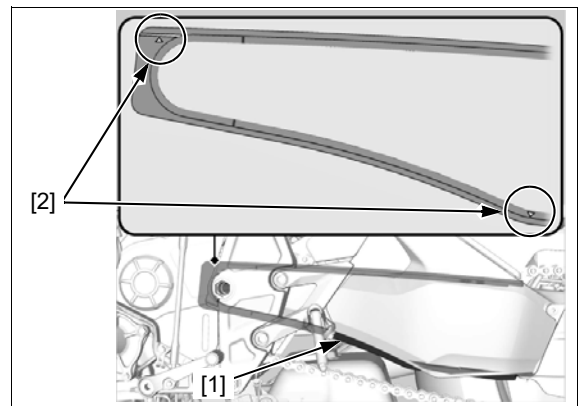
If there is any cracking, replace the master link, O-rings and plate.



DRIVE CHAIN SLIDER

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

If it is worn to the wear indicators [2], replace the drive chain slider (page 17-16).



BRAKE FLUID

NOTICE

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

NOTE:

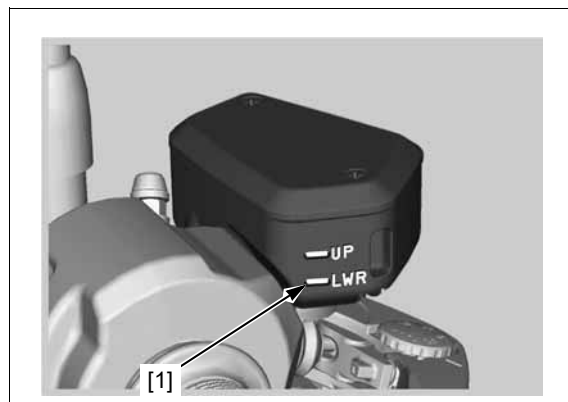
- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reserve tank.
- A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper piston is pushed out, and this accounts for a low fluid level.

FRONT BRAKE

Turn the handlebar so that the reservoir is level and check the front brake fluid level.

If the level is near the LOWER level line [1], check the brake pad for wear (page 3-21).

If the brake pads are not worn and the fluid level is low, check entire system for leaks (page 3-22).



REAR BRAKE

Place the motorcycle on a level surface, support it an upright position and check the rear brake fluid level.

If the level is near the LOWER level line [1], check the brake pad wear (page 3-21).

If the brake pads are not worn and the fluid level is low, check entire system for leaks (page 3-22).

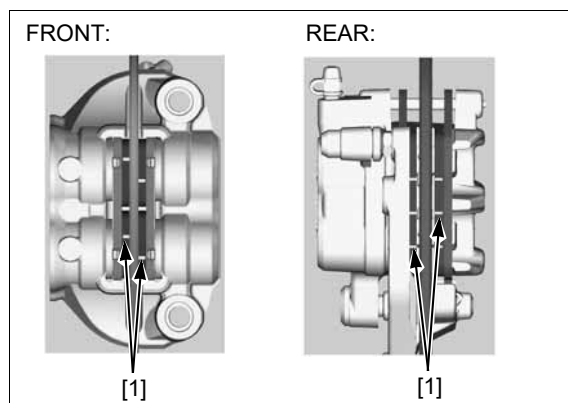


BRAKE PADS WEAR

Check the brake pads for wear.

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

For brake pad replacement (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 18-6).

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

Tighten any loose fittings.

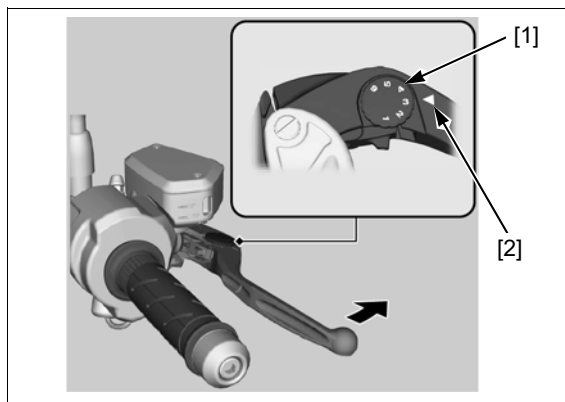
Replace hoses and fittings as required.



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 PEDAL HEIGHT ADJUSTMENT

Loosen the lock nut [1] and turn the push rod [2] until the correct pedal height is obtained.

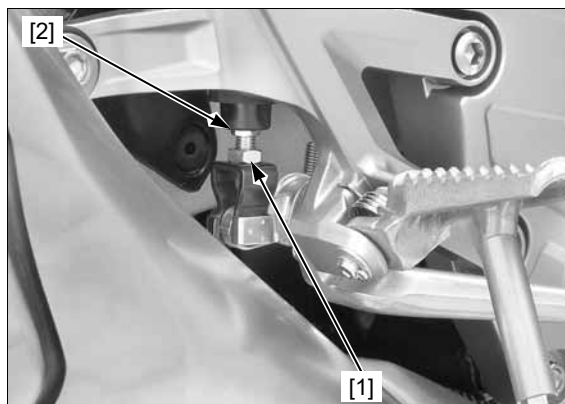
After adjustment, tighten the lock nut to the specified torque.

- Refer to the push rod length adjustment (page 18-16)

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

NOTE:

After adjusting the brake pedal height, check the rear brake light switch operation (page 3-23).



BRAKE LIGHT SWITCH

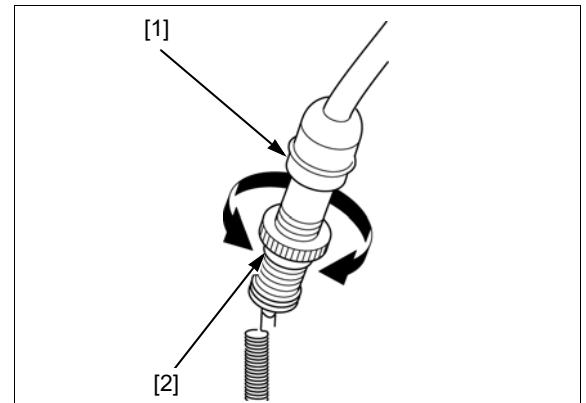
NOTE:

- The front brake light switch does not require adjustment.

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

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

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



HEADLIGHT AIM

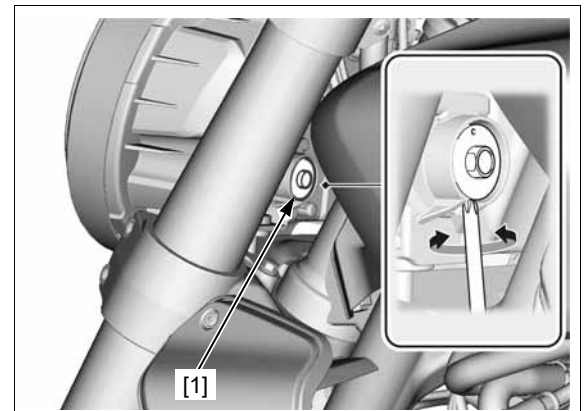
NOTE:

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

Place the motorcycle on a level surface.

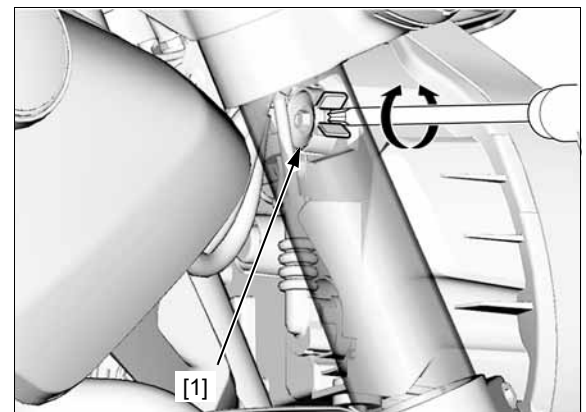
Adjust the headlight beams vertically by turning the vertical beam adjuster [1].

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



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

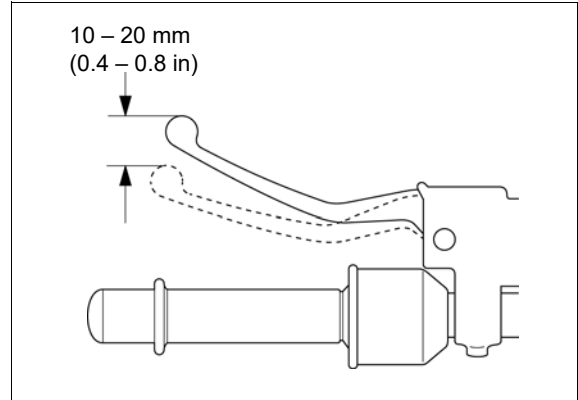
A counterclockwise rotation moves the beam left and clockwise rotation moves the beam right.



CLUTCH SYSTEM

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

FREEPLAY: 10 – 20 mm (0.4 – 0.8 in)

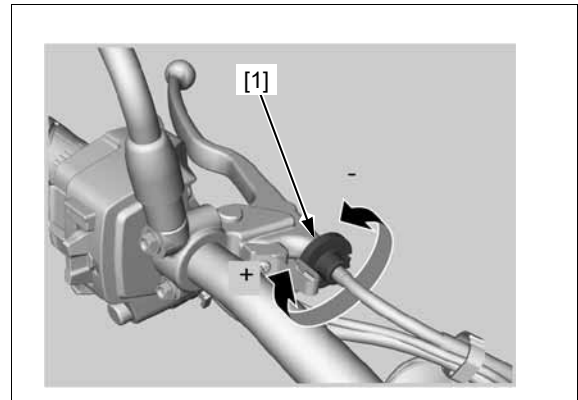


Minor adjustment is made with the upper adjuster [1] at the clutch lever.

Turn the adjuster to adjust the freeplay.

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

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

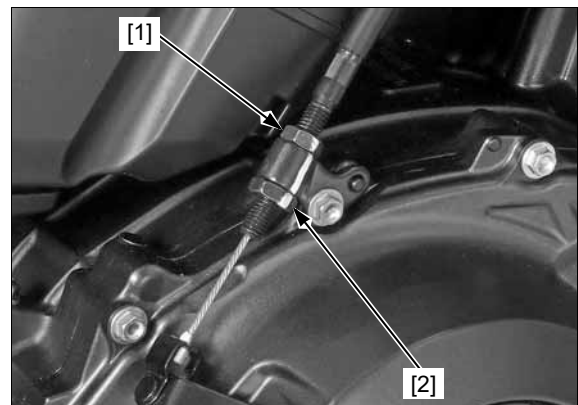


Major adjustment is performed at the clutch lifter lever.

Loosen the lock nut [1] and turn the adjusting nut [2] to adjust the freeplay.

Tighten the lock nut securely while holding the adjusting nut.

If proper freeplay cannot be obtained, or the clutch slips during test ride, disassemble and inspect the clutch (page 11-6).



SIDESTAND

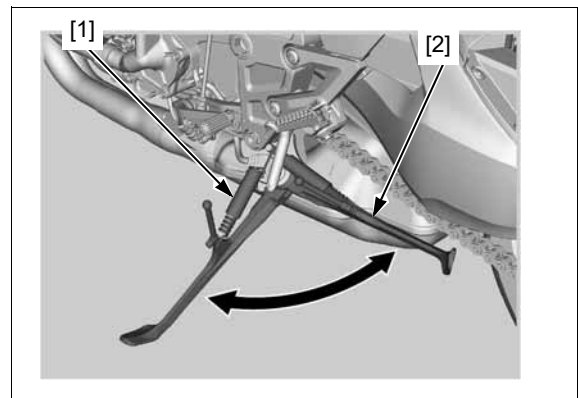
Check the sidestand return springs [1] for damage or loss of tension.

Check the sidestand [2] for movement and lubricate the sidestand pivot if necessary.

Check the sidestand ignition cut-off system:

- Sit astride the motorcycle and raise the sidestand.
- Start the engine with the transmission in neutral, then, with the clutch lever fully squeezed, shift the transmission into gear.
- Move the sidestand full down.
- The engine should stop as the sidestand is lowered.

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



SUSPENSION

FRONT SUSPENSION INSPECTION

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

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

Loose, worn or damaged suspension parts impair the motorcycle's stability and control.

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

For fork service (page 16-15).

FRONT SUSPENSION ADJUSTMENT

SPRING PRE-LOAD ADJUSTER

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

TURN CLOCKWISE:

 Increase the spring pre-load

TURN COUNTERCLOCKWISE:

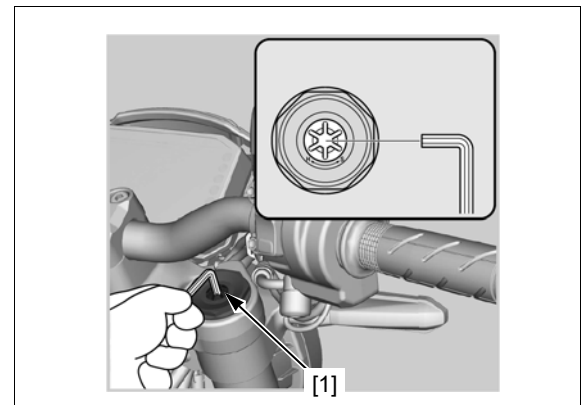
 Decrease the spring pre-load

PRE-LOAD ADJUSTER ADJUSTABLE RANGE:

 20 turns

PRE-LOAD ADJUSTER STANDARD POSITION:

 7 turns clockwise from softest position



COMPRESSION AND REBOUND DAMPING ADJUSTERS

NOTICE

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

The compression and rebound damping can be adjusted by turning the adjusters.

DIRECTION H: Increase the damping force (harder)

DIRECTION S: Decrease the damping force (softer)

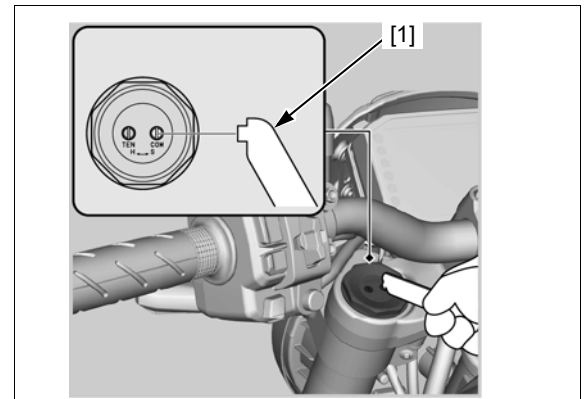
Turn the compression damping adjuster [1] clockwise until it stops (hardest position), then turn it counterclockwise.

COMPRESSION ADJUSTER ADJUSTABLE RANGE:

 7 turns

COMPRESSION ADJUSTER STANDARD POSITION:

 5-3/4 turns out from hardest position



MAINTENANCE

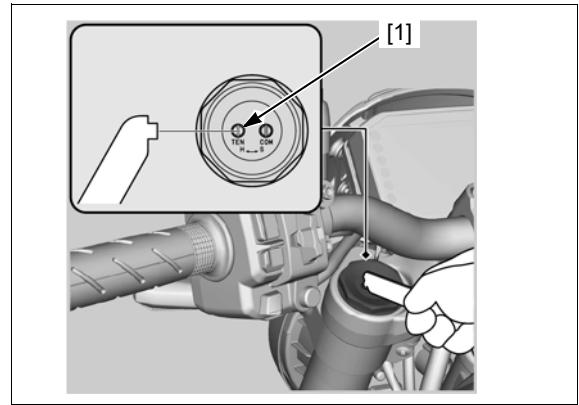
Turn the rebound damping adjuster [1] clockwise until it stops (hardest position), then turn it counterclockwise.

REBOUND ADJUSTER ADJUSTABLE RANGE:

5-1/2 turns

REBOUND ADJUSTER STANDARD POSITION:

5 turns out from hardest position



REAR SUSPENSION INSPECTION

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

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

Loose, worn or damaged suspension parts impair the motorcycle's stability and control.

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

For shock absorber service (page 17-12).

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

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

Replace the bearings if any are looseness is noted.

For swingarm service (page 17-14).

REAR SUSPENSION ADJUSTMENT

SPRING PRE-LOAD ADJUSTER

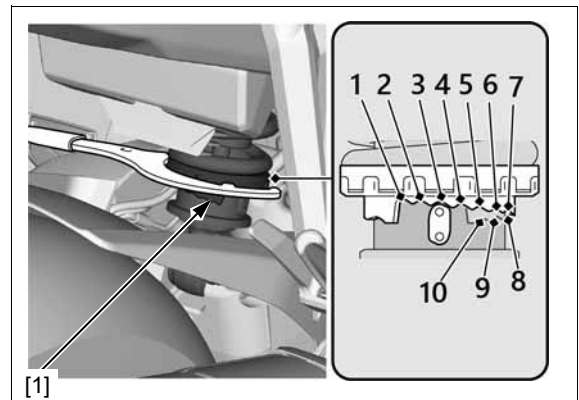
Spring pre-load can be adjusted by turning the spring pre-load adjuster [1].

PRE-LOAD ADJUSTER ADJUSTABLE RANGE:

10 positions

PRE-LOAD ADJUSTER STANDARD POSITION:

3 position from softest position



REBOUND DAMPING ADJUSTERS

NOTICE

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

The compression and rebound damping can be adjusted by turning the adjusters.

DIRECTION H: Increase the damping force

DIRECTION S: Decrease the damping force

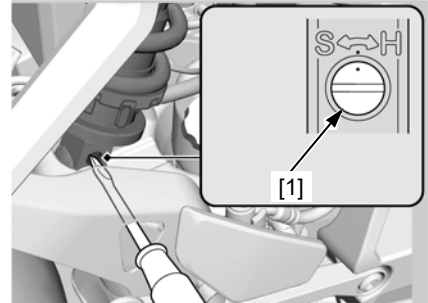
Turn the rebound damping adjuster [1] clockwise until it stops (hardest position), then turn it counterclockwise.

REBOUND ADJUSTER ADJUSTABLE RANGE:

3 turns

REBOUND ADJUSTER STANDARD POSITION:

1-3/4 turns from hardest position



NUTS, BOLTS, FASTENERS

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

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

WHEELS/TIRES

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

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

Front wheel service (page 16-9).

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

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

Rear wheel service (page 17-4).

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

- Front tire pressure: page 1-10
- Rear tire pressure: page 1-10

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

STEERING HEAD BEARINGS

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

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

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 16-24).

MEMO

SERVICE INFORMATION	4-2	SHIFT DRUM ANGLE SENSOR	4-63
PGM-FI SYSTEM LOCATION	4-3	SHIFT STROKE SENSOR (II ED/III TH/III KO/II FO/II GS /II RU/ III CH/II BR models only)	4-63
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PGM-FI SYMPTOM TROUBLESHOOTING ·	4-8	MAP SENSOR	4-66
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MIL CIRCUIT TROUBLESHOOTING	4-58	BANK ANGLE SENSOR	4-67
ECM	4-58	A/F SENSOR	4-68
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VS SENSOR	4-62		

SERVICE INFORMATION

GENERAL

- A faulty PGM-FI system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- The PGM-FI system is equipped with the Self-Diagnostic System (page 4-4). If the MIL comes on, follow the Self-Diagnostic Procedures to remedy the problem.
- When checking the PGM-FI, always follow the steps in the troubleshooting flow chart.
- If the ECM is replaced, perform the following procedure:
 - Quickshifter initialization (page 4-65)
 - Key registration procedure (page 22-3)
- If the CKP sensor is removed, perform the crank pulse initialize learning procedure (page 4-69) (ED, II ED, KO, III KO models only).
- The PGM-FI system is provided with fail-safe function to secure a minimum running capability even when there is any trouble in the system. When any abnormality is detected by the self-diagnosis function, running capability is secured by making use of the numerical values of a situation preset in the simulated program map.
It must be remembered, however, that when any abnormality is detected in an injector, the fail-safe function stops the engine to protect it from damage.
- For PGM-FI system location (page 4-3).
- Use a digital tester for PGM-FI system inspection.
- The following color codes are used throughout this section.

Bl = Black

Bu = Blue

Gr = Gray

O = Orange

R = Red

W = White

Br = Brown

G = Green

Lg = Light green

P = Pink

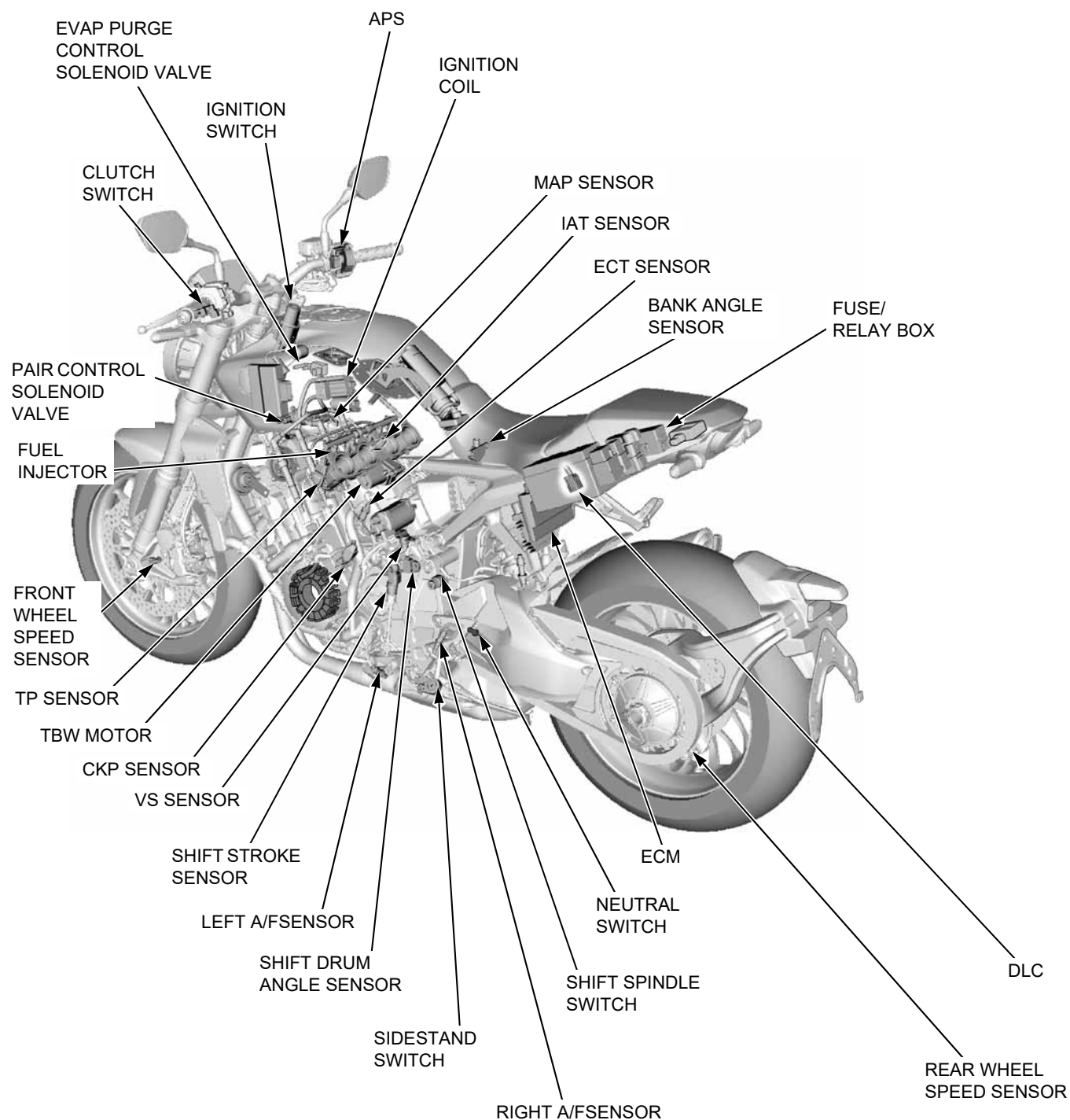
V = Violet

Y = Yellow

Lb = Light blue

Be = Beige

PGM-FI SYSTEM LOCATION



PGM-FI TROUBLESHOOTING INFORMATION

GENERAL TROUBLESHOOTING

Intermittent Failure

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

Opens and Shorts

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

If the MIL has come on

Refer to DTC READOUT (page 4-5).

If the MIL did not stay on

If the MIL did not stay on, but there is a driveability problem, do the SYMPTOM TROUBLESHOOTING (page 4-8).

SYSTEM DESCRIPTION

SELF-DIAGNOSIS SYSTEM

The PGM-FI system is equipped with a 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 Blink Pattern

- DTC can be read from the ECM memory by the MIL [1] blink pattern.
- The MIL will blink the current DTC by shorting SCS circuit (reading DTC with DLC connector).
- When the ECM stores more than one DTC, the MIL will indicate them by blinking in the order from the lowest number to highest number.



MIL Check

When the ignition switch is turned ON the MIL will stay on for a few seconds, then go off. If the MIL does not come on, troubleshoot the MIL circuit (page 4-58).

CURRENT DTC/STORED 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 4-5).

GST (Generic Scan Tool) INFORMATION

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

How to connect the GST

Turn the ignition switch OFF.

Remove the main seat (page 2-4).

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

Connect the special tool to the DLC.

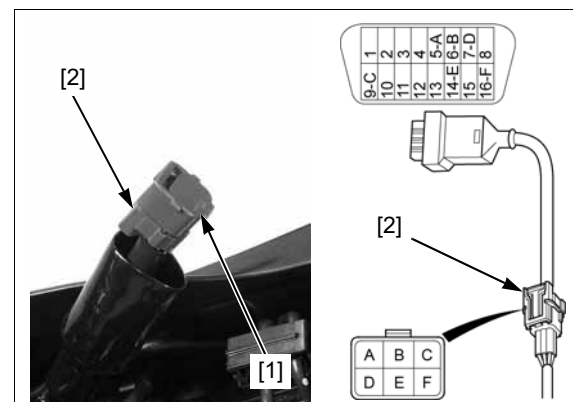
Connect the GST to the DLC.

Turn the ignition switch ON.

Check the DTC and stored data.

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



MCS INFORMATION

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

How to connect the MCS

Turn the ignition switch OFF.

Remove the dummy connector from the DLC (page 4-5).

Connect the MCS to the DLC.

Turn the ignition switch ON and check the DTC and stored data.

NOTE:

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

DTC READOUT

Start the engine and check the MIL.

If the MIL stays on, connect the GST to the DLC (page 4-5) or connect the MCS to the DLC (page 4-5).

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

To read the DTC by the MIL blinks, refer to the following procedure.

Reading DTC with the MIL

Turn the ignition switch OFF.

Remove the main seat (page 2-4).

Remove the dummy connector [1] from the DLC.

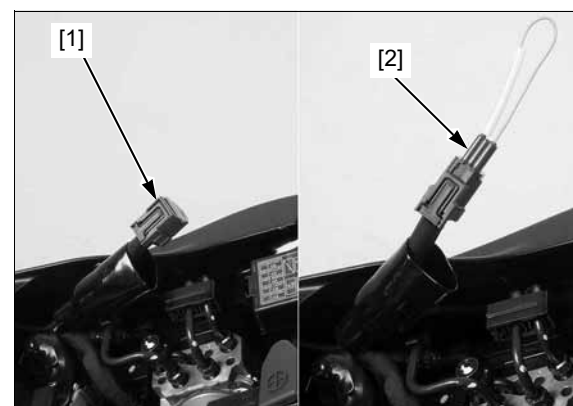
Short the DLC terminals using a special tool.

TOOL:

SCS short connector [2] 070MZ-0010300

CONNECTION: Blue – Green

Turn the ignition switch ON, read, note the MIL blinks and refer to the DTC index (page 4-9).



PGM-FI SYSTEM

Reading current DTC with the combination meter

Turn the ignition switch ON.

1. Push and hold the SEL switch [1] to the right until the SETTING mode is displayed.
2. Push the down side of the SEL switch to select the SERVICE menu, and push it to the right.
3. Push the down side of the SEL switch to select the DTC menu, and push it to the right.
The CURRENT DTC(s) will be displayed.

Read the current DTC(s) and follow the DTC index (page 4-9).



ERASING STORED DTC

NOTE:

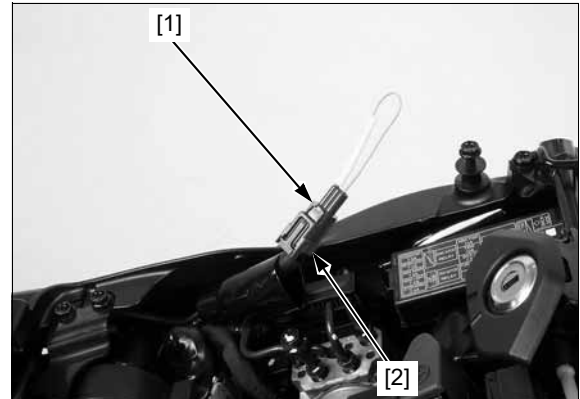
- When the ERASING DTC procedure is performed, the DTCs of DCT system are erased at the same time.

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

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

How to clear the DTC with SCS short connector

1. Connect the SCS connector to the DLC (page 4-5).
2. Turn the ignition switch ON.
3. Disconnect the SCS short connector [1] from the DLC [2].
Reconnect the SCS short connector to the DLC while the MIL stays ON about 5 seconds (reset receiving pattern).
4. The stored DTC is erased if the MIL goes off and starts blinking (successful pattern).
 - The DLC must be jumped while the MIL light in ON. If not, the MIL will not start blinking. In that case, turn the ignition switch OFF and try again.
 - Note that the self-diagnostic memory cannot be erased if the ignition switch is turned OFF before the MIL starts blinking.

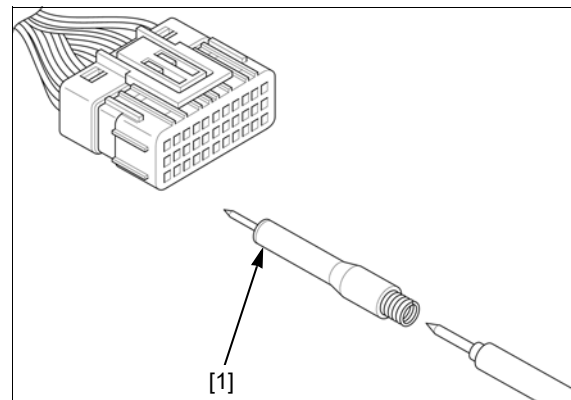


CIRCUIT INSPECTION

- Always clean around and keep any foreign material away from the ECM connector before disconnecting it.
- A faulty PGM-FI system is often related to poorly connected or corroded terminals. Check those connections before proceeding.
- In testing at the ECM connector (wire harness 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:

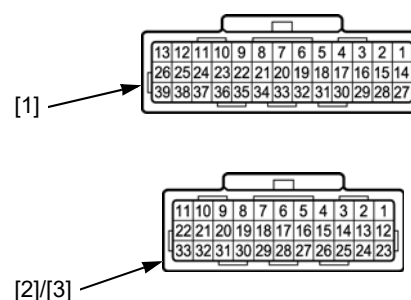
Test probe 07ZAJ-RDJA110



The ECM connector terminals (wire harness side) are numbered as shown in the illustration.

- ECM 39P (Black) connector A [1]
- ECM 33P (Black) connector B [2]
- ECM 33P (Gray) connector C [3]

WIRE HARNESS SIDE TERMINAL LAYOUT:



PGM-FI SYMPTOM TROUBLESHOOTING

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

Symptom	Diagnosis procedure	Also check for
Engine cranks but won't start (No DTC and MIL blinking)	1. Check the spark plug condition (page 3-7). 2. Inspect the ignition system (page 5-5). 3. Check the cylinder compression (page 10-4).	• Contaminated/deteriorated fuel • No fuel to fuel injector – Clogged fuel filter – Pinched or clogged fuel tank breather hose – Pinched or clogged fuel feed hose • Faulty fuel injector • Intake air leak • Faulty IMU or related circuit
Engine cranks but won't start (No fuel pump operation sound when turning the ignition ON)	1. ECM power/ground circuits malfunction (page 4-58) 2. Check the fuel pump (page 7-7).	• Faulty FI relay or related circuit • Faulty engine stop switch or related circuit
Engine stalls, hard to start, rough idling	1. Check the idle speed (page 3-15). 2. Inspect the fuel supply system (page 7-3). 3. Inspect the battery charging system (page 20-5). 4. Inspect the ignition system (page 5-5).	• Contaminated/deteriorated fuel • Intake air leak • Pinched or clogged fuel tank breather hose • Faulty ignition system
Afterburn when engine braking is used	1. Inspect the secondary air supply system (page 7-16). 2. Inspect the ignition system (page 5-5).	
Backfiring or misfiring during acceleration	Inspect the ignition system (page 5-5).	
Poor performance (driveability) and poor fuel economy	1. Inspect the fuel supply system (page 7-3). 2. Inspect the air cleaner element (page 3-5). 3. Inspect the ignition system (page 5-5).	• Faulty pressure regulator (fuel pump) • Faulty fuel injector
Idle speed is below specifications or fast idle too low (No DTC and MIL blinking)	1. Inspect the fuel supply system (page 7-3). 2. Check the idle speed (page 3-15). 3. Inspect the ignition system (page 5-5).	
Idle speed is above specifications or fast idle too high (No DTC and MIL blinking)	1. Check the idle speed (page 3-15). 2. Check the throttle operation (page 3-4).	• Faulty ignition system • Intake air leak • Engine top-end problem • Air cleaner condition
MIL never comes on at all	1. Check the CAN line circuit. 2. Inspect the meter (page 21-8).	
MIL stays on but no DTCs set	Inspect the MIL circuit (page 4-58). • DLC circuit malfunction • CAN line circuit malfunction	

PGM-FI SYSTEM DTC INDEX

NOTE:

- When using GST or MCS, check the lighting or blinking state of the MIL and shift indicator, and then refer to DTC index.
- Follow the prior diagnosis notes before performing the troubleshooting, refer to the PRIOR DIAGNOSIS (page 4-12).

DTC	MIL blinks	Detected D/C (Driving Cycle)	DTC name	Refer to page
P0031	38	1	A/F Sensor Heater Circuit Low (Right A/F Sensor Heater Circuit Low Voltage)	4-13
P0032	38	1	A/F Sensor Heater Circuit High (Right A/F Sensor Heater Circuit High Voltage)	
P0051	39	1	A/F Sensor Heater Circuit Low (Left A/F Sensor Heater Circuit Low Voltage)	
P0052	39	1	A/F Sensor Heater Circuit High (Left A/F Sensor Heater Circuit High Voltage)	
P00D1	38	1	A/F Sensor Heater Control Circuit Performance Problem (Right A/F Sensor Heater Control Circuit Range/performance)	4-14
P00D3	39	1	A/F Sensor Heater Control Circuit Performance Problem (Left A/F Sensor Heater Control Circuit Range/performance)	
P0105	1	2	MAP Sensor Circuit (MAP Sensor Stuck)	4-15
P0106	1	2	MAP Sensor Circuit Range Problem (MAP Sensor Circuit Range/performance)	4-15
P0107	1	1	MAP Sensor Circuit Low (MAP Sensor Circuit Low Voltage)	4-16
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)	4-17
P0112	9	1	IAT Sensor Circuit Low (IAT Sensor Circuit Low Voltage)	4-17
P0113	9	1	IAT Sensor Circuit High (IAT Sensor Circuit High Voltage)	
P0115	7	2	ECT Sensor Circuit (ECT Sensor Stuck)	4-19
P0117	7	1	ECT Sensor Circuit Low (ECT Sensor Circuit Low Voltage)	4-19
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)	4-20
P0121	71	1	TP Sensor 1 Circuit Range Problem (TP Sensor 1 Circuit Range/performance)	4-21
P0122	71	1	TP Sensor Circuit Low (TP Sensor 1 Low Voltage)	
P0123	71	1	TP Sensor Circuit High (TP Sensor 1 High Voltage)	
P0125	7	2	Insufficient Coolant Temperature for Closed Loop Fuel Control	4-23
P0131	36	1	O2/AF Sensor Circuit Low Voltage (Right A/F Sensor Circuit Low Voltage)	4-23
P0132	36	1	O2/AF Sensor Circuit High Voltage (Right A/F Sensor Circuit High Voltage)	
P0133	36	2	O2/AF Sensor Circuit No Activity Detected (Left A/F Sensor Circuit No Activity Detected)	4-25
P0134	36	1	O2/AF Sensor Circuit No Activity Detected (Left A/F Sensor Circuit Slow Response)	
P0151	37	1	O2/AF Sensor Circuit Low Voltage (Left A/F Sensor Circuit Low Voltage)	4-23
P0152	37	1	O2/AF Sensor Circuit High Voltage (Left A/F Sensor Circuit High Voltage)	

PGM-FI SYSTEM

DTC	MIL blinks	Detected D/C (Driving Cycle)	DTC name	Refer to page
P0153	37	2	O2/AF Sensor Circuit Slow Response Problem (Right A/F Sensor Circuit Slow Response)	4-25
P0154	37	1	O2/AF Sensor Circuit No Activity Detected (Right A/F Sensor Circuit No Activity Detected)	
P0201	12	1	Cylinder 1 Injector Circuit (No. 1 Fuel Injector Malfunction)	4-26
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)	
P0221	72	1	TP Sensor 2 Circuit Range Problem (TP Sensor 2 Circuit Range/performance)	4-27
P0222	72	1	TP Sensor 2 Circuit Low (TP Sensor 2 Low Voltage)	4-28
P0223	72	1	TP Sensor 2 Circuit High (TP Sensor 2 High Voltage)	
P0300	133	1	Random/multiple Cylinder Misfire Detected (Random/multiple Cylinder Misfire Detected A) (When the MIL is blinking)	4-29
	133	2	Random/multiple Cylinder Misfire Detected (Random/multiple Cylinder Misfire Detected B) (When the MIL is lighting)	
P0315	142	1	CKP Sensor Variation Not Learned (Crankshaft Position System Variation Not Learned)	4-30
P0351	91	1	Ignition Coil 1 Primary Control Circuit Open No.1 and No.4 Cylinder Ignition Coil Circuit Malfunction)	4-31
P0352	92	1	Ignition Coil 2 Primary Control Circuit Open No.2 and 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
P0562	126	1	System Voltage (Sub VB Relay Malfunction)	4-36
P0606	84	1	Control Module Processor (CPU in the ECM Malfunction)	4-37
P062F	33	1	ICM EEPROM Error (ECM EEPROM Malfunction)	4-37
P064D	131	1	ICM O2 Sensor CPU Performance Problem (Right A/F Sensor IC Circuit Abnormal)	4-38
P064E	144	1	ICM O2 Sensor Processor Performance Problem (Left A/F Sensor IC Circuit Abnormal)	
P0686	126	1	ECM/PCM Power Relay Control Circuit Low (Ignition Hold Relay Stuck OFF)	4-36
P0687	126	1	ECM/PCM Power Relay Control Circuit High (Ignition Hold Relay Stuck ON)	
P0704	113	1	Clutch Switch Input Circuit Malfunction (Clutch Switch Circuit Low Voltage)	4-38
P0722	11	1	OS Sensor Circuit No Signal (VS Sensor Circuit No Signal)	4-39
P1000	54	1	Bank Angle Sensor Circuit Low (Bank Angle Sensor Circuit Low Voltage)	4-40
P1001	54	1	Bank Angle Sensor Circuit High (Bank Angle Sensor Circuit High Voltage)	4-42
P1658	85	1	TBW Switch Malfunction (ON Side) (TBW Relay Failure (ON Side))	4-42
P1659	85	1	TBW Switch Malfunction (OFF Side) (TBW Relay Failure (OFF Side))	

DTC	MIL blinks	Detected D/C (Driving Cycle)	DTC name	Refer to page
P1684	77	1	TBW Switch Malfunction (TBW Return Spring Malfunction)	4-43
P1702	41	1	Shift drum angle Sensor Circuit Low (Shift drum angle Sensor Low Voltage)	4-45
P1703	41	1	Shift drum angle Sensor Circuit High (Shift drum angle Sensor High Voltage)	4-45
P1708	108	1	Shift Spindle Angle Sensor Low Voltage (Shift Spindle Switch Circuit Low Voltage)	4-46
P1709	108	1	Shift Spindle Angle Sensor High Voltage (Shift Spindle Switch Circuit High Voltage)	4-46
P170D	107	1	Shift Sensor Ground Fault (Shift Stroke Sensor Circuit Low Voltage)	4-47
P170E	107	1	Shift Sensor Open Circuit (Shift Stroke Sensor Circuit High Voltage)	
P2101	79	1	Throttle Actuator Circuit Performance Problem (TBW System Control Correlation Failure)	4-48
P2118	78	1	Throttle Actuator Current Performance Problem (TBW Motor Malfunction)	
P2121	74	1	APS 1 Sensor Circuit Range Problem (APS 1 (TCP) Circuit Range/performance)	4-49
P2122	74	1	APS 1 Sensor Circuit Low (APS 1 (TCP) Low Voltage)	4-50
P2123	74	1	APS 1 Sensor Circuit High (APS 1 (TCP) High Voltage)	
P2126	75	1	APS 2 Sensor Circuit Range Problem (APS 2 (TCP) Circuit Range/performance)	4-49
P2127	75	1	APS 2 Sensor Circuit Low (APS 2 (TCP) Low Voltage)	4-51
P2128	75	1	APS 2 Sensor Circuit High (APS 2 (TCP) High Voltage)	
P2135	73	1	TP Sensor 1/2 Voltage Correlation (TP Sensors 1 and 2 Voltage Correlation Malfunction)	4-52
	73	1	TP Sensor 1/2 Voltage Correlation (TP Sensors 1 and 2 Short Circuit)	
P2138	76	1	APS 1/2 Sensor Voltage Correlation (APS 1 – 2 (TCP) Voltage Correlation Malfunction)	4-52
P2158	66	1	VSP Sensor 2 Malfunction (Rear Wheel Speed Sensor Malfunction)	4-53
P2195	36	2	O2/AF Sensor Signal Biased/stuck Lean (Left A/F Sensor Signal Biased/stuck Lean)	4-54
P2196	36	2	O2/AF Sensor Signal Biased/stuck Rich (Left A/F Sensor Signal Biased/stuck Rich)	
P2197	37	2	O2/AF Sensor Signal Biased/stuck Lean (Right A/F Sensor Signal Biased/stuck Lean)	
P2198	37	2	O2/AF Sensor Signal Biased/stuck Rich (Right A/F Sensor Signal Biased/stuck Rich)	
P2A00	36	2	O2/AF Sensor Circuit Range Problem (Left A/F Sensor Circuit Range/performance)	4-54
P2A03	37	2	O2/AF Sensor Circuit Range Problem (Right A/F Sensor Circuit Range/performance)	
U0001	103	1	CAN Communication Malfunction	4-55
U0121	103	1	CAN Communication Malfunction (PCM-ABS) (ABS CAN Communication Malfunction)	4-56
U0155	103	1	CAN Communication Malfunction (TCM-GCM) (Meter CAN Communication Malfunction)	4-57

PGM-FI SYSTEM DTC TROUBLESHOOTING (ED, II ED, KO, III KO models)

PRIOR DIAGNOSIS

Before processing the DTC troubleshooting, check as follows:

- Check for loose or poor contact on the DTC related connectors (each sensor, solenoid, unit etc.), then recheck the DTC.
- Erase the DTC (page 4-6) and recheck it.
- Refer to probable cause of each detected DTC and check the listed items first. If possible, correct the abnormally.

NOTE:

- Always turn the ignition switch OFF when checking the continuity of the circuit and before disconnecting the connectors.
- Some DTCs have a recheck function, so that the priority DTC is detected when the ignition switch is switched from OFF to ON. Wait for 10 seconds and check the DTC again.

COMMON TROUBLESHOOTING INFORMATION

NOTE:

- Always use the test probe when inspecting at the ECM, ABS modulator, and BCU connectors.

TOOL:

Test probe **07ZAJ-RDJA110**

- If the ECM is replaced, perform the following:
 - CKP sensor initialize learning procedure (page 4-70)
 - Key Registration Procedure (page 22-3)
- If the Left crankcase cover or CKP sensor is removed, perform the crank pulse initialize learning procedure (page 4-69).
- When performing the test ride in the procedure of the troubleshooting, set the motorcycle to the preferred value as below chart. Conduct a test ride with your confirmation.

Motorcycle speed*:	About 60 km/h (37 mph)
Running time:	1 minute or more
Engine revolution:	4,000 – 7,500 r/min
Throttle opening angle:	14 degrees or more

*: If the test ride cannot be performed, replace parts that may be abnormal.

DTC P0031/DTC P0032/DTC P0051/ DTC P0052

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 39P connector (page 4-58).
Disconnect the ECM 33P (Gray) connector (page 4-58).
Disconnect the A/F sensor connector (page 4-68).
Check for continuity between the wire harness side right A/F sensor connector [1] and ECM 39P connector [2].

CONNECTION: White – A14

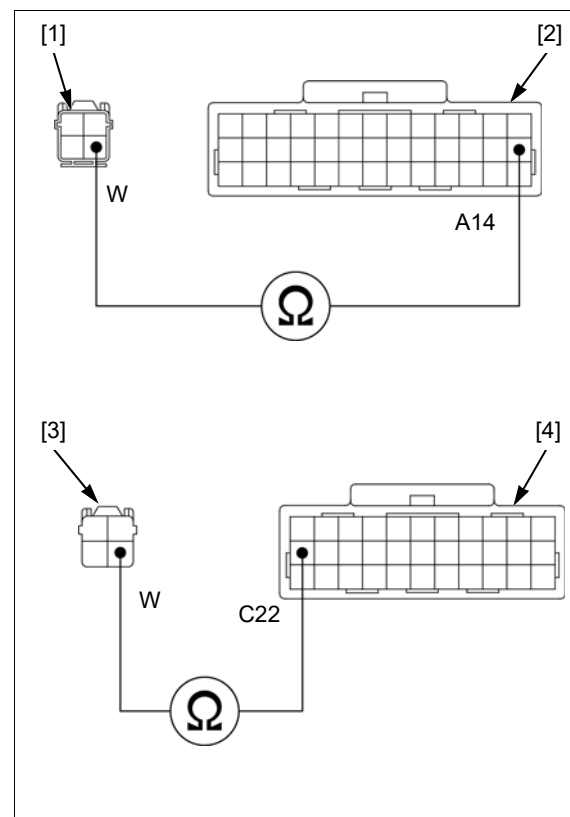
Check for continuity between the wire harness side left A/F sensor connector [3] and ECM 33P (Gray) connector [4].

CONNECTION: White – C22

Is there continuity?

YES – GO TO STEP 2.

NO – Open circuit in the White wire



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

Check for continuity between the wire harness side A/F sensor connector [1] and ground.

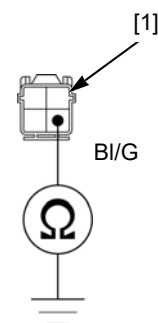
CONNECTION: Black/green – Ground

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Black/green wire

Right side shown:



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

Check for continuity between the wire harness side A/F sensor connector [1] and ground.

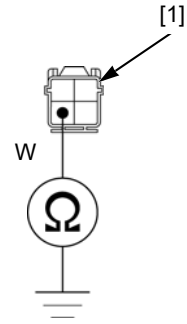
CONNECTION: White – Ground

Is there continuity?

YES – Short circuit in the White wire

NO – GO TO STEP 4.

Right side shown:



4. A/F Sensor Inspection

Replace the A/F sensor with a new one.
Connect the disconnected connector(s).
Erase the DTC.
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/DTC P00D3

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.
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 hose
- Clogged MAP sensor hose
- 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.

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.

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

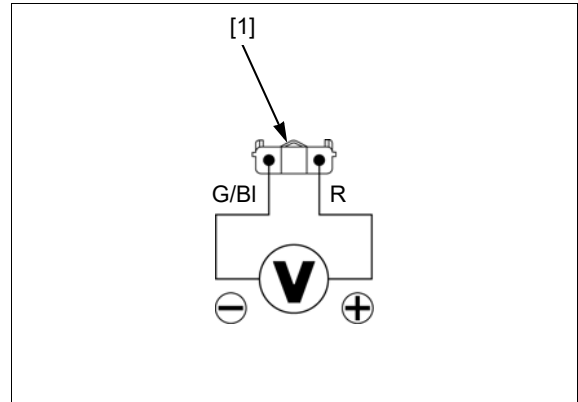
Disconnect the MAP sensor connector (page 4-66).
Turn the ignition switch ON.
Measure the voltage at the wire harness side MAP sensor connector [1].

CONNECTION: Red (+) – Green/black (–)

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 2.

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



2. MAP Sensor Signal Line Open Circuit Inspection

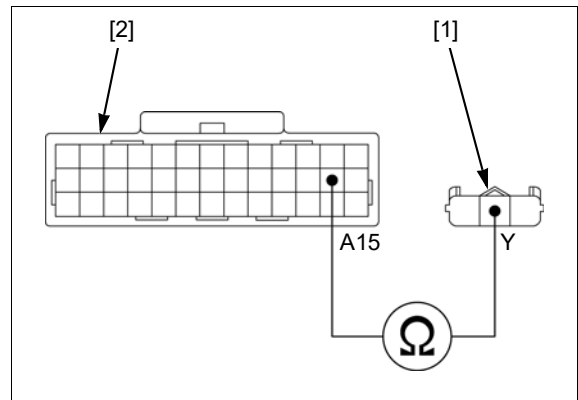
Disconnect the ECM 39P connector (page 4-58).
Check for continuity between the wire harness side MAP sensor connector [1] and ECM 39P connector [2].

CONNECTION: Yellow – A15

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Yellow wire



3. MAP Sensor Signal Line Short Circuit Inspection

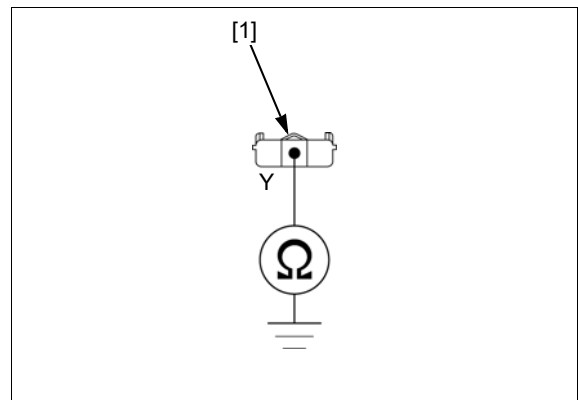
Check for continuity between the wire harness side MAP sensor connector [1] and ground.

CONNECTION: Yellow – Ground

Is there continuity?

YES – Short circuit in the Yellow wire

NO – GO TO STEP 4.



4. MAP Sensor Inspection

Replace the MAP sensor with a new one.
 Connect the disconnected connector(s).
 Erase the DTC.
 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.
 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

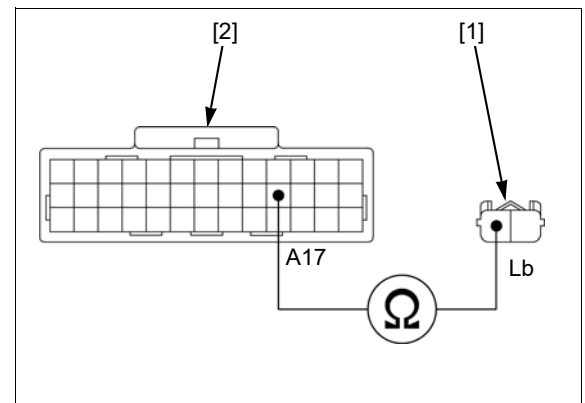
1. IAT Sensor Output Line Open Circuit Inspection

Disconnect the ECM 39P connector (page 4-58).
 Disconnect the IAT sensor connector (page 4-67).
 Check for continuity between the wire harness side IAT sensor connector [1] and ECM 33P (Gray) connector [2].

CONNECTION: Light blue – B20

Is there continuity?

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



2. IAT Sensor Output Line Short Circuit Inspection

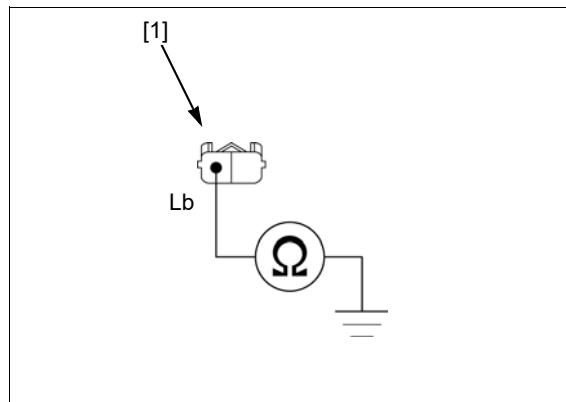
Check for continuity between the wire harness side IAT sensor connector [1] and ground.

CONNECTION: Light blue – Ground

Is there continuity?

YES – Short circuit in the Light blue wire

NO – GO TO STEP 3.



3. IAT Sensor Ground Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-58).

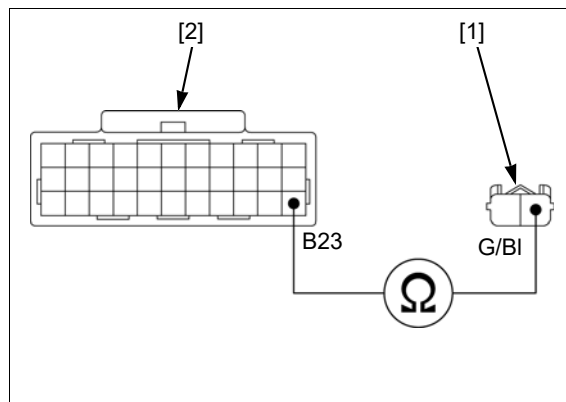
Check for continuity between the wire harness side IAT sensor connector [1] and ECM 33P (Black) connector [2].

CONNECTION: Green/black – B23

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Green/black wire



4. IAT Sensor Inspection

Replace the IAT sensor with a new one.

Erase the DTC.

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.

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 39P (Black) connector (page 4-58).

Disconnect the ECT sensor 3P (Black) connector (page 4-67).

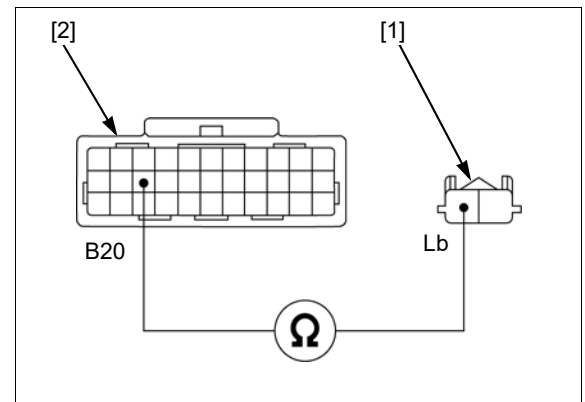
Check for continuity between the wire harness side ECT sensor 3P (Black) connector [1] and ECM 39P (Black) connector [2].

CONNECTION: Light blue – B20

Is there continuity?

YES – GO TO STEP 2.

NO – Open circuit in the Light blue wire

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

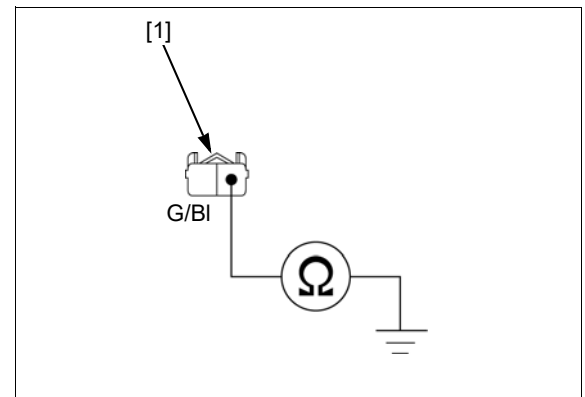
Check for continuity between the wire harness side ECT sensor 3P (Black) connector [1] and ground.

CONNECTION: Green/black – Ground

Is there continuity?

YES – Short circuit in the green/black wire

NO – GO TO STEP 3.



3. ECT Sensor Ground Line Open Circuit Inspection

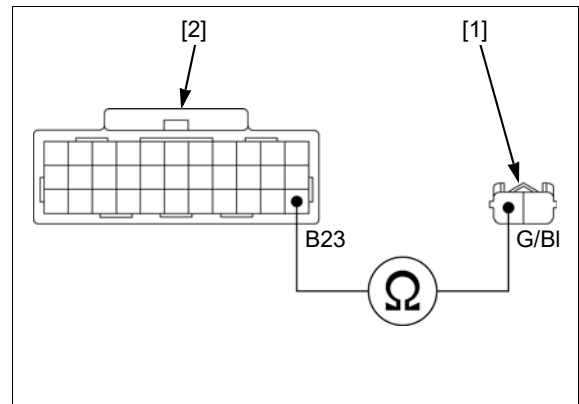
Check for continuity between the wire harness side ECT sensor 3P (Black) connector [1] and ECM 33P (Black) connector [2].

CONNECTION: Green/black – B23

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the green/black wire



4. ECT Sensor Inspection

Replace the ECT sensor with a new one.

Erase the DTC.

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

NOTE:

- Before processing the DTC troubleshooting, stop the engine and wait for 6 hours if the motorcycle is running.
- Do not disconnect the battery cable.

1. ECT Sensor Inspection

Replace the ECT sensor with a new one.

Erase the DTC.

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.
 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 P0121

Probable cause:

- Faulty TP sensor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Driveability deterioration
- Motorcycle speed is limited: approximately 120 km/h (75 mph)
- HSTC does not operate

1. TP Sensor 1 Inspection

Replace the throttle body (TP sensor).
 Erase the DTC.
 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 TP 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
- HSTC does not operate

1. TP Sensor 1 Input Voltage Inspection

Disconnect the TBW unit 6P (Black) connector (page 7-14).
 Turn the ignition switch ON.
 Measure the voltage at the wire harness side TBW unit connector [1].

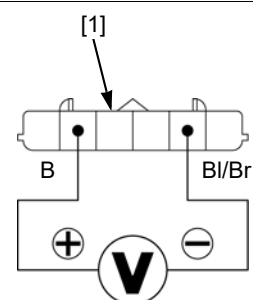
CONNECTION: Black (+) – Black/brown (–)

Is about 5 V indicated?

YES – GO TO STEP 2.

NO –

- Open or short circuit in the Black wire
- Open circuit in the Black/brown wire
- If the wire is OK, replace the ECM with a new one, and recheck.



2. TP Sensor 1 Output Line Open Circuit Inspection

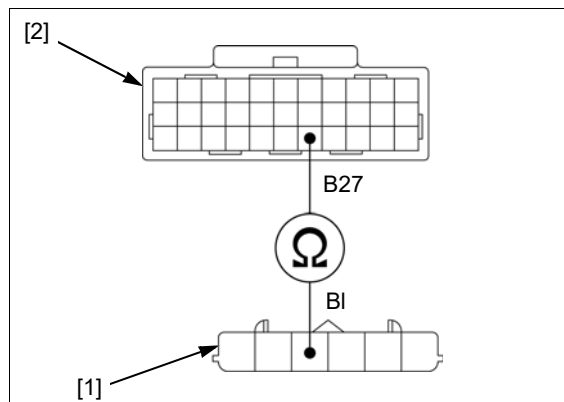
Disconnect the ECM 33P (Black) connector (page 4-58).
Check for continuity between the wire harness side TBW unit 6P (Black) connector [1] and ECM 33P (Black) connector [2].

CONNECTION: Black – B27

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Black wire



3. TP Sensor 1 Output Line Short Circuit Inspection

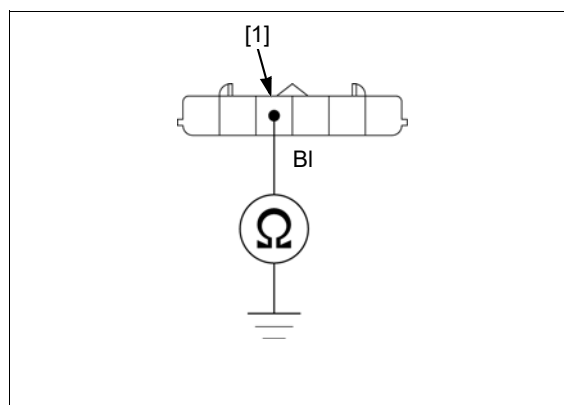
Check for continuity between the wire harness side TBW unit connector [1] and ground.

CONNECTION: Black – Ground

Is there continuity?

YES – Short circuit in the Black wire

NO – GO TO STEP 4.



4. TP Sensor 1 Inspection

Replace the throttle body (TP sensor).
Connect the disconnected connector(s).
Erase the DTC.
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 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.

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/DTC P0151/
DTC P0152**

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

Disconnect the A/F sensor connector (page 4-68).

Disconnect the ECM connectors:

- Left A/F sensor: ECM 39P connector (page 4-58)
- Right A/F sensor: ECM 33P (Gray) connector (page 4-58)

Right A/F sensor: Check for continuity between the wire harness side A/F sensor connector [1] and ECM 39P connector [2].

Left A/F sensor: Check for continuity between the wire harness side A/F sensor connector [3] and ECM 33P (Gray) connector [4].

CONNECTION:

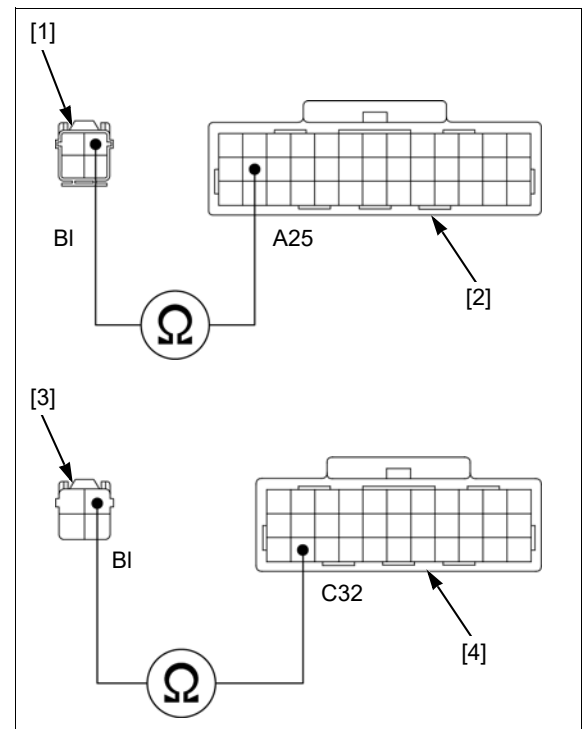
Right A/F sensor: Black – A25

Left A/F sensor: Black – C32

Is there continuity?

YES – GO TO STEP 2.

NO – Open circuit in the Black wire



2. A/F Sensor Output Line Short Circuit Inspection

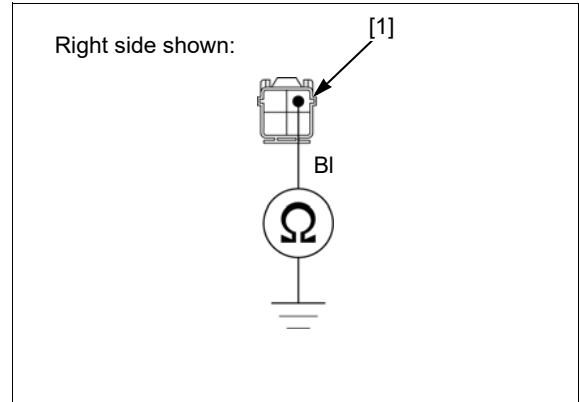
Check for continuity between the wire harness side A/F sensor connector [1] and ground.

CONNECTION: Black – Ground

Is there continuity?

YES – Short circuit in the Black wire

NO – GO TO STEP 3.



3. A/F Sensor Ground Line Open Circuit Inspection

Right A/F sensor: Check for continuity between the wire harness side A/F sensor connector [1] and ECM 39P connector [2].

Left A/F sensor: Check for continuity between the wire harness side A/F sensor connector [3] and ECM 33P (Gray) connector [4].

CONNECTION:

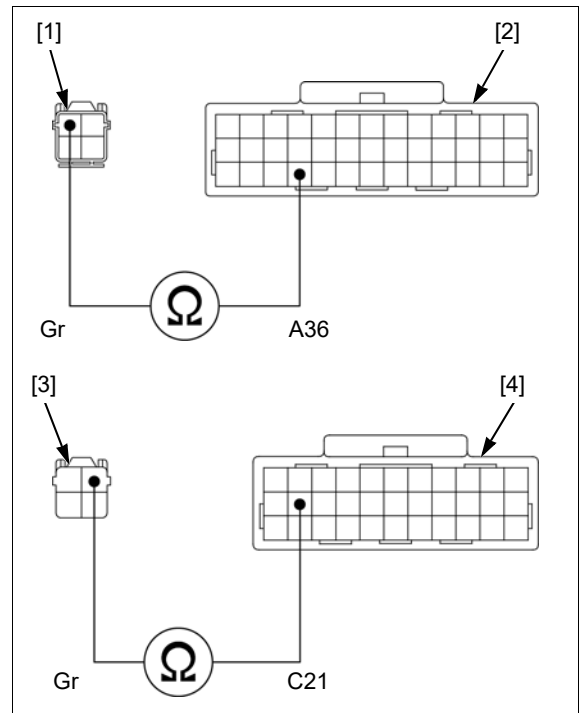
Right A/F sensor: Gray – A36

Left A/F sensor: Gray – C21

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Gray wire



4. Diode Inspection

Replace the diode with a new one (page 6-9).

Erase the DTC.

Check the DTC with GST or MCS.

Is same DTC indicated?

YES – GO TO STEP 5.

NO – Faulty original diode

5. A/F sensor Inspection

Replace the A/F sensor with a new one.

Connect the disconnected connector(s).

Erase the DTC.

Start the engine and wait for a minute.

Stop the engine.

Check the DTC with GST or MCS.

Is same DTC indicated?

YES – GO TO STEP 6.

NO – Faulty original A/F sensor

6. A/F Sensor Input Line Open Circuit Inspection

Remove the diode (page 6-9).

Check for continuity between the wire harness side ECM 39P connector [1] and wire harness (fuse box) side diode connector [2].

CONNECTION:

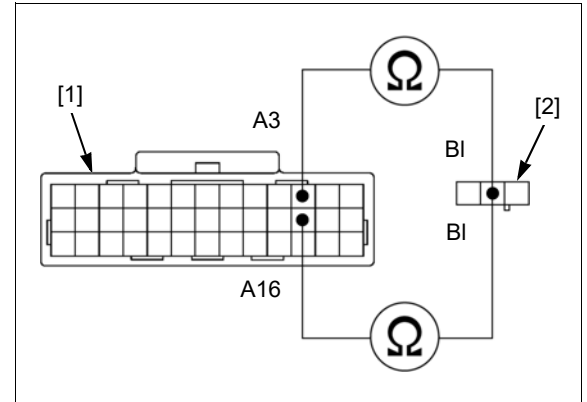
Right A/F sensor: Black – A16

Left A/F sensor: Black – A3

Is there continuity?

YES – GO TO STEP 7.

NO – open circuit in the Black wire



7. A/F Sensor Input Line Open Circuit Inspection

Remove the IGN relay (page 21-26).

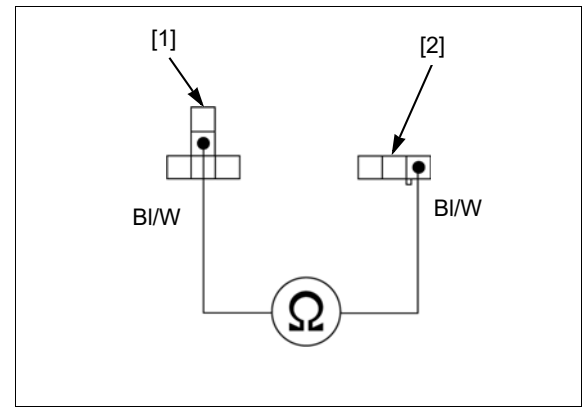
Check for continuity between the wire harness side IGN relay connector [1] and wire harness (fuse box) side diode connector [2].

CONNECTION: Black/white – Black/white

Is there continuity?

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

NO – Open circuit in the Black/white wire



DTC P0133/DTC P0134/DTC P0153/ DTC P0154

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
- Detected value feedback stops

1. A/F sensor Inspection

Replace the A/F sensor with a new one.

Erase the DTC.

Warm up the engine until the coolant temperature is above 50°C (122°F) and keep the engine revolution at 3,000 – 11,500 r/min with no 100 r/min variation a second.

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 P203/DTC P204

Probable cause:

- Faulty fuel injector or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

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

1. Fuel Injector Input Voltage Inspection

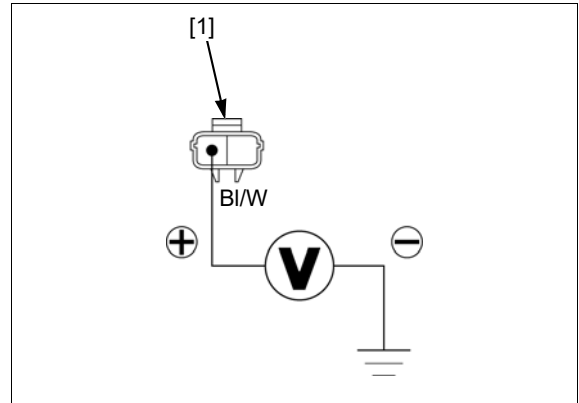
Disconnect the fuel injector connector (page 7-15).
Turn the ignition switch ON.
Measure the voltage between the wire harness side fuel injector connector [1] and ground.

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

Is there battery voltage?

YES – GO TO STEP 2.

NO – Open circuit in the Black/white wire



2. Fuel Injector Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Black)/(Gray) connectors (page 4-58).
Check for continuity between the wire harness side fuel injector connector [1] and ECM 33P (Black) connector [2] and 33P (Gray) connector [3].

CONNECTION:

No.1: Light blue – B7

No.2: Orange – B8

No.3: Pink – B5

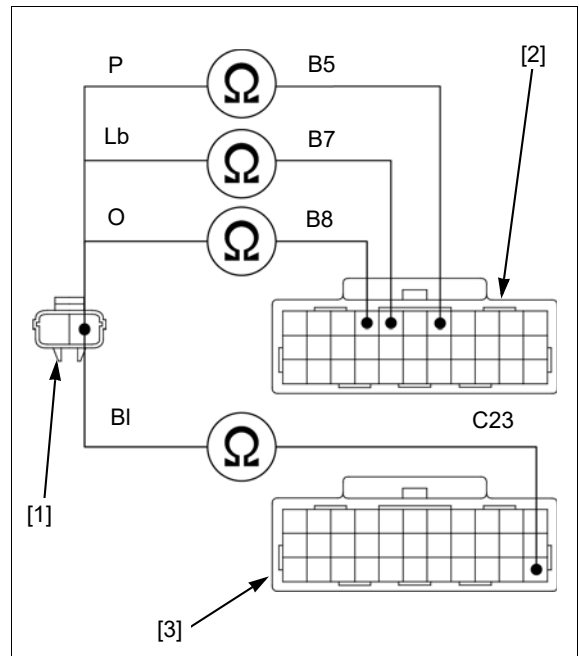
No.4: Black – C23

Is there continuity?

YES – GO TO STEP 3.

NO –

- No.1: Open circuit in the Light blue wire
- No.2: Open circuit in the Orange wire
- No.3: Open circuit in the Pink wire
- No.4: Open circuit in the Black wire



3. Fuel Injector Signal Line Short Circuit Inspection

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

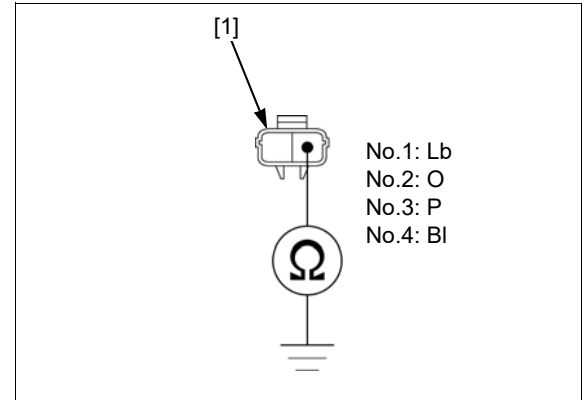
CONNECTION:

- No.1: Blue – Ground
- No.2: Orange – Ground
- No.3: Pink – Ground
- No.4: Black – Ground

Is there continuity?

- YES** –
- No.1: Short circuit in the Light blue wire
 - No.2: Short circuit in the Orange wire
 - No.3: Short circuit in the Pink wire
 - No.4: Short circuit in the Black 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.
 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 P0221

Probable cause:

- Faulty TP sensor
- Faulty ECM

Symptom/Fail-safe function:

- Driveability deterioration
- Motorcycle speed is limited: approximately 120 km/h (75 mph)
- HSTC does not operate

1. TP Sensor 2 Inspection

Replace the throttle body (TP sensor).
 Erase the DTC.
 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 TP Sensor

DTC P0222/DTC P0223

Probable cause:

- Faulty TP sensor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates at idle speed

1. TP Sensor 2 Input Voltage Inspection

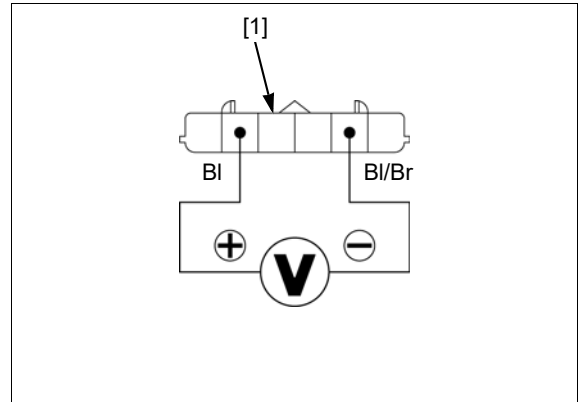
Disconnect the TBW unit connector (page 7-14).
Turn the ignition switch ON.
Measure the voltage at the wire harness side TBW unit connector [1].

CONNECTION: Black (+) – Black/brown (–)

Is about 5 V indicated?

YES – GO TO STEP 2.

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



2. TP Sensor 2 Output Line Open Circuit Inspection

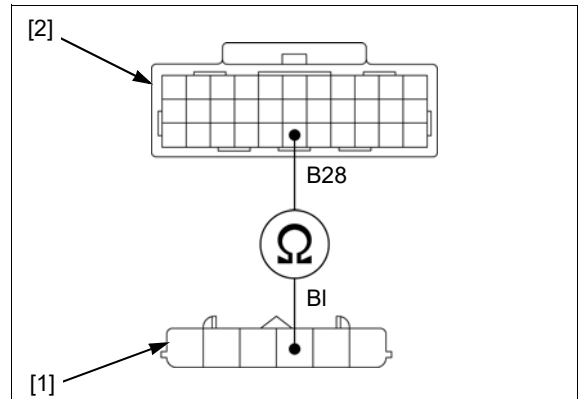
Disconnect the ECM 33P (Black) connector (page 4-58).
Check for continuity between the wire harness side TBW unit connector [1] and ECM 33P (Black) connector [2].

CONNECTION: Black – B28

Is there continuity?

YES – GO TO STEP 3.

- NO** – Open circuit in the Black wire



3. TP Sensor 2 Output Line Short Circuit Inspection

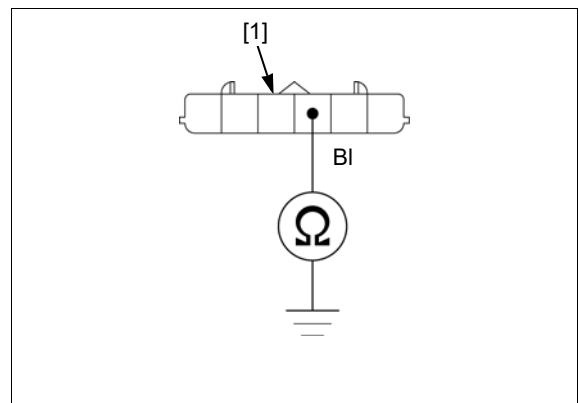
Check for continuity between the wire harness side TBW unit connector [1] and ground.

CONNECTION: Black – Ground

Is there continuity?

- YES** – Short circuit in the Black wire

NO – GO TO STEP 4.



4. TP Sensor 2 Inspection

Replace the throttle body (TP sensor).
Connect the disconnected connector(s).
Erase the DTC.
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 TP Sensor

DTC P0300

Probable causes:

- Faulty ignition system
- Faulty fuel supply system
- Faulty air supply system
- Faulty cylinder compression
- Faulty MAP sensor, IAT sensor, ECT sensor, CKP sensor, APS, TP 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 (e.g. air cleaner, insulator, throttle body)
- Cylinder compression
- Related sensors

Erase the DTC.

Perform the test ride (page 4-12).

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.

Check for CKP sensor circuit (page 4-69).

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 crank pulser plate and CKP sensor
- Crank pulser plate slits for obstruction
- Installation condition of the crank pulser plate or CKP sensor for looseness
- Crank pulser plate and CKP sensor tip for deformation or damage

Are the crank pulser plate and CKP sensor in good condition?

YES – GO TO STEP 3.

NO – Replace abnormal parts

3. Crank Pulse Initialize Learning (ED, II ED, KO, III KO models only)

Perform the crank pulse learning (page 4-69).

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

Turn the ignition switch ON.

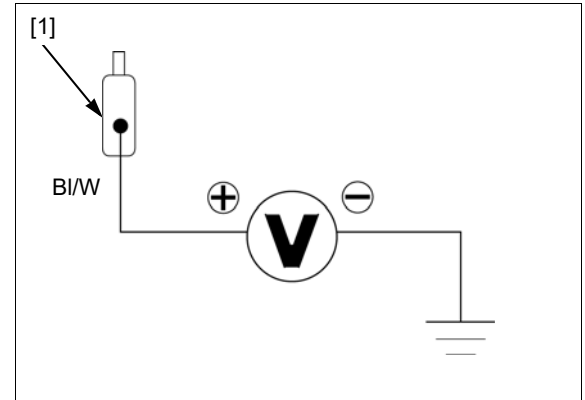
Measure the voltage between the wire harness side ignition coil wire connector [1] and ground.

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

Is there battery voltage?

YES – GO TO STEP 2.

NO – Open circuit in the Black/white wire.

**2. Ignition Coil Primary Coil Signal Line Open Circuit Inspection**

Disconnect the ECM 33P (Black) connector (page 4-58).

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

CONNECTION:

No.1: Brown – B33

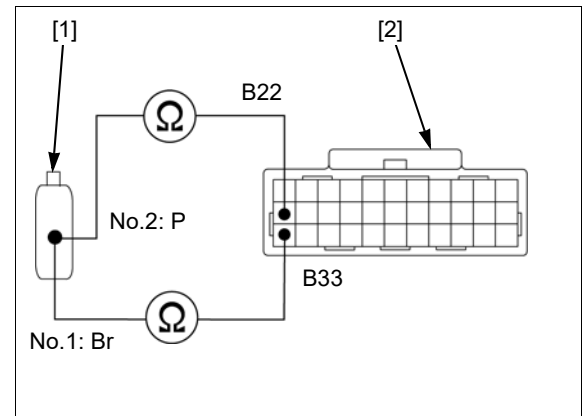
No.2: Pink – B22

Is there continuity?

YES – GO TO STEP 3.

NO –

- No.1: Open circuit in the Brown wire
- No.2: Open circuit in the Pink 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:

No.1: Brown – Ground

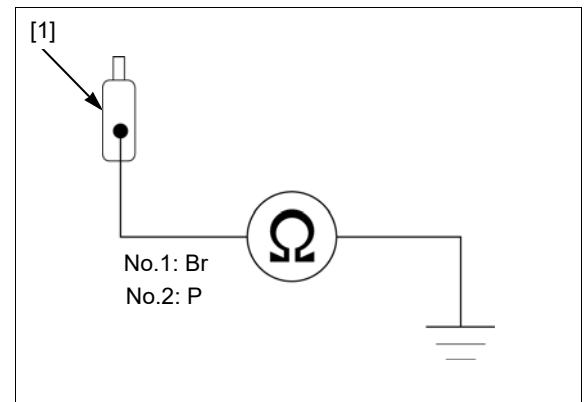
No.2: Pink – Ground

Is there continuity?

YES –

- No.1: Short circuit in the Brown wire
- No.2: Short circuit in the Pink 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 5-5).

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.
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

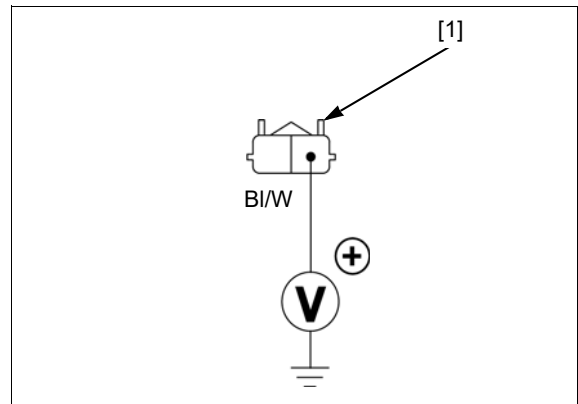
Disconnect the PAIR control solenoid valve connector (page 7-17).
Turn the ignition switch ON.
Measure the voltage between the wire harness side PAIR control solenoid valve connector [1] and ground.

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

Is there battery voltage?

YES – GO TO STEP 2.

NO – Open circuit in the Black/white wire



2. PAIR Control Solenoid Valve Signal Line Open Circuit Inspection

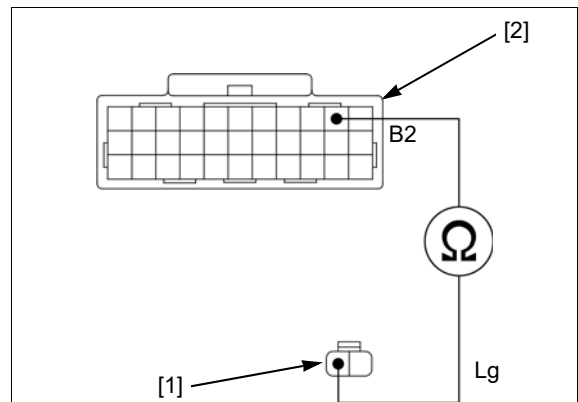
Disconnect the ECM 33P (Black) connector (page 4-58).
Check for continuity between the wire harness side PAIR control solenoid valve connector [1] and ECM 33P (Black) connector [2].

CONNECTION: Light green – B2

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Light green wire



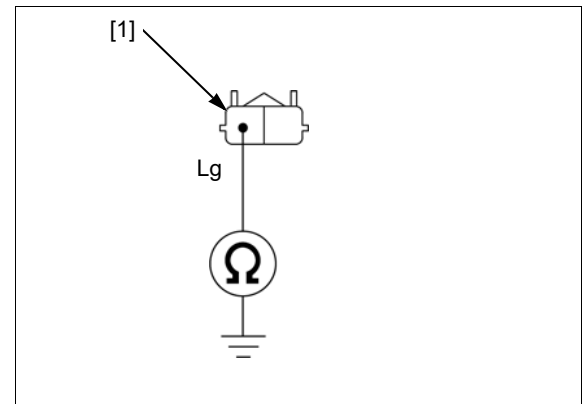
3. PAIR Control Solenoid Valve Signal Line Short Circuit Inspection

Check for continuity between the wire harness side PAIR control solenoid valve connector [1] and ground.

CONNECTION: Light green – Ground

Is there continuity?

- YES** – Short circuit in the Light green 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.

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 connector (page 7-18).

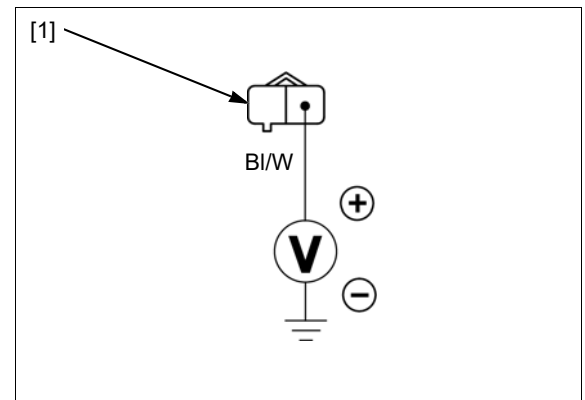
Turn the ignition switch ON.

Measure the voltage between the wire harness side EVAP purge control solenoid valve connector [1] and ground.

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

Is there battery voltage?

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



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

Disconnect the ECM 33P (Black) connector (page 4-58).

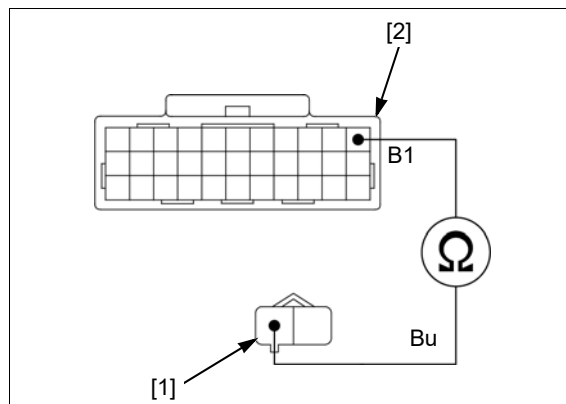
Check for continuity between the wire harness side EVAP purge control solenoid valve connector [1] and ECM 33P (Black) connector [2].

CONNECTION: Blue – B1

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Blue wire



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

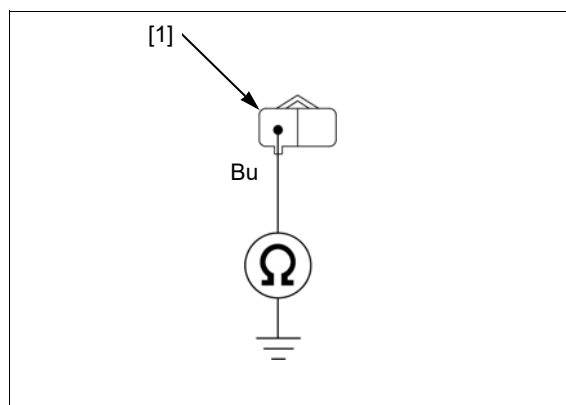
Check for continuity between the wire harness side EVAP purge control solenoid valve connector [1] and ground.

CONNECTION: Blue – Ground

Is there continuity?

YES – Short circuit in the Blue 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.

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

Disconnect the following:

- ABS modulator connector (page 19-23)
- ECM 33P (Black) connector (page 4-58)

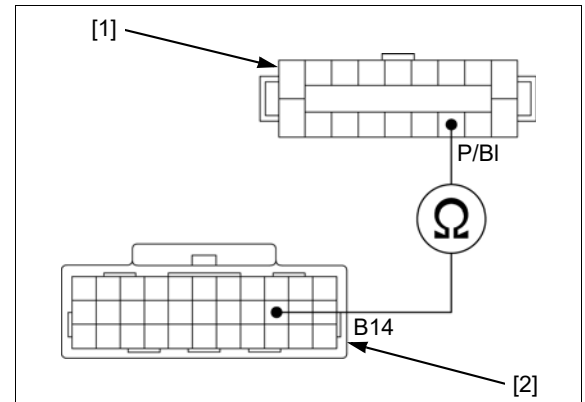
Check for continuity between the wire harness side ABS modulator connector [1] and ECM 33P (Black) connector [2].

CONNECTION: Pink/black – B14

Is there continuity?

YES – GO TO STEP 2.

NO – Open circuit in the Pink/black wire



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

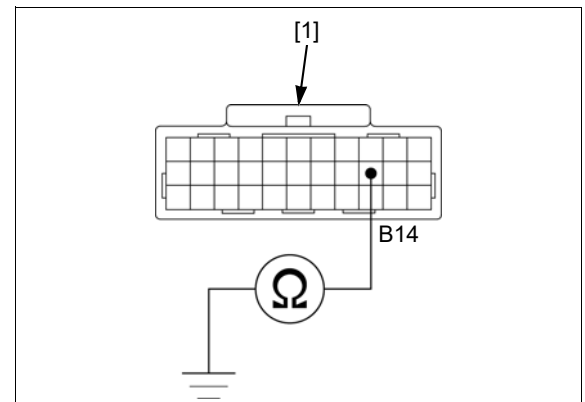
Check for continuity between the wire harness side ECM 33P (Black) connector [1] and ground.

CONNECTION: B14 – Ground

Is there continuity?

YES – Short circuit in the Pink/black wire

NO – GO TO STEP 3.



3. ECM Inspection

Replace the ECM with a new one.
Connect the disconnected connector(s).
Erase the DTC.
Perform the test ride (page 4-12).
Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original ECM

DTC P0562/DTC P0686/DTC P0687

Probable cause:

- Faulty sub VB relay or its related circuit
- Blown sub fuse FI 10 A
- Blown MAIN 30 A fuse
- Faulty TCM
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

1. Sub VB Relay Power Supply Voltage Inspection

Remove the sub VB relay (page 21-26).

Turn the ignition switch ON.

Measure the voltage at the wire harness (power box) side sub VB relay connector [1].

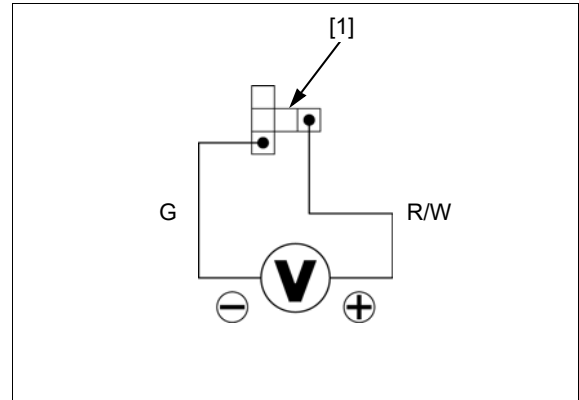
CONNECTION: Red/white (+) – Green (–)

Is there battery voltage?

YES – GO TO STEP 2.

NO –

- Open circuit in the Red/white wire
- Open circuit in the Green wire



2. Sub VB Relay Coil Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 39P connector (page 4-58).

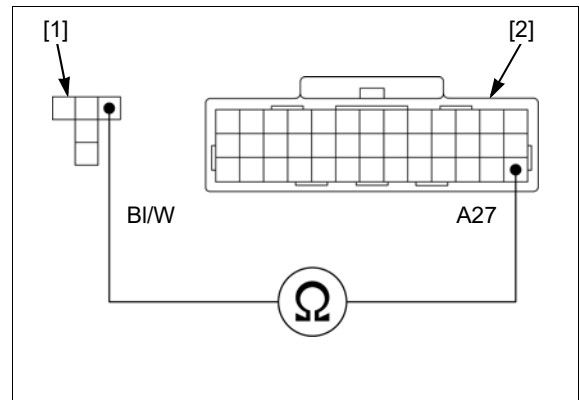
Check for continuity between the wire harness side sub VB relay connector [1] and ECM 39P connector [2].

CONNECTION: Black/white – A27

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Black/white wire



3. Sub VB Relay Line Open Circuit Inspection

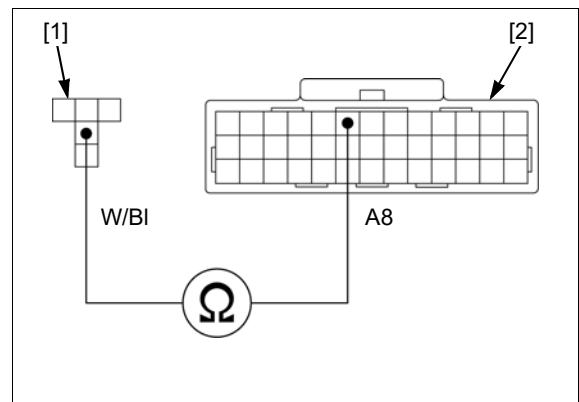
Check for continuity between the wire harness side sub VB relay connector [1] and ECM 39P connector [2].

CONNECTION: White/black – A8

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the White/black wire



4. Sub VB Relay Inspection

Replace the sub VB relay with a new one.
Connect the disconnected connector(s).
Erase the DTC.
Turn the ignition switch ON and wait for 10 seconds.
Check the DTC with GST or MCS.

Is same DTC indicated?

- YES** – • Faulty TCM
 • Faulty ECM
- NO** – Faulty original sub VB relay

DTC P0606

Probable cause:

- Faulty ECM

Symptom/Fail-safe function:

- Hard to start

Diagnostic procedure:

1. Replace the ECM with a new one.
2. Erase the DTC.
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 P062F

Probable cause:

- Faulty ECM

Symptom/Fail-safe function:

- Hard to start
- Does not hold the self-diagnosis data
 - The MIL 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.
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/DTC P064E

Probable cause:

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

Symptom/Fail-safe function:

- Fuel consumption deterioration
- Driveability deterioration

1. A/F Sensor Inspection

Replace the A/F sensor with a new one.

Erase the DTC.

Turn the ignition switch ON and wait for 10 seconds or 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

DTC P0704

Probable cause:

- Faulty clutch switch or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

1. Clutch Switch Output Line Open Circuit Inspection

Disconnect the left handlebar switch 8P connector (page 21-18).

Disconnect the ECM 33P (Gray) connector (page 4-58).

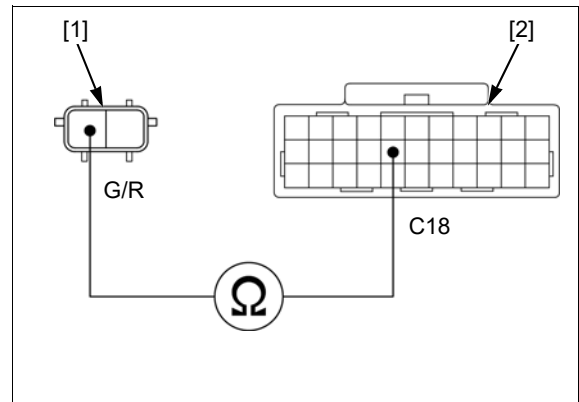
Check for continuity between the wire harness side 2P (Black) connector [1] and ECM 33P (Gray) connector [2].

CONNECTION: Green/red – C18

Is there continuity?

YES – GO TO STEP 2.

NO – Open circuit in the Green/red wire



2. Clutch Switch Output Line Short Circuit Inspection

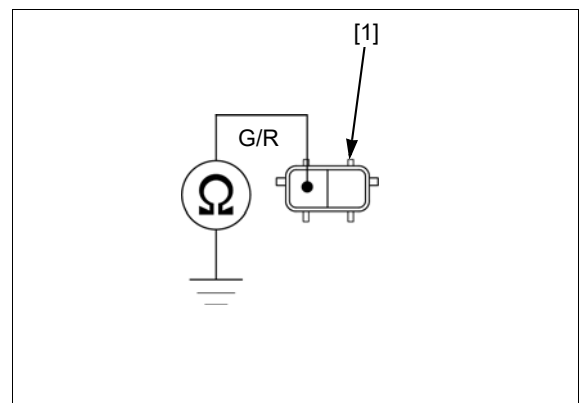
Check for continuity between the wire harness side 2P (Black) connector [1] and ground.

CONNECTION: Green/red – Ground

Is there continuity?

YES – Short circuit in the Green/red wire

NO – GO TO STEP 3.



3. Clutch Switch Inspection

Replace the clutch switch with a new one.
Erase the DTC.
Perform the test ride (page 4-12).
Check the DTC with GST or MCS.

Is same DTC indicated?

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

DTC P0722

Probable cause:

- Faulty VS sensor or its circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

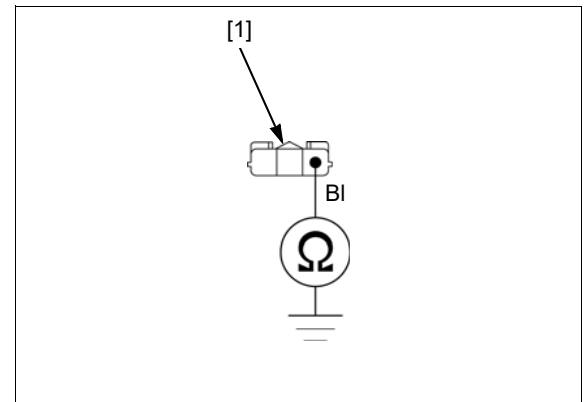
1. VS Sensor Ground Line Open Circuit Inspection

Disconnect the VS sensor connector (page 4-62).
Check for continuity between the wire harness side VS sensor connector [1] and ground.

CONNECTION: Black – Ground

Is there continuity?

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



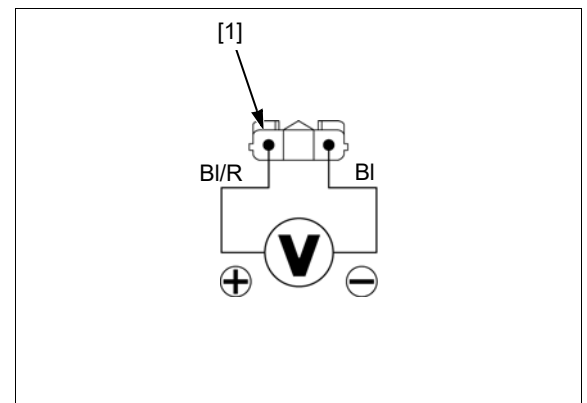
2. VS Sensor Input Line Open Circuit Inspection

Temporarily install the removed electrical parts in the reverse order of removal.
Turn the ignition switch ON.
Measure the voltage between the wire harness side VS sensor connector [1] and ground.

CONNECTION: Black/red (+) – Black (–)

Is there battery voltage?

- YES** – GO TO STEP 3.
NO – Open circuit in the Black/red wire or its related circuit



3. VS Sensor Signal Line Short Circuit Inspection

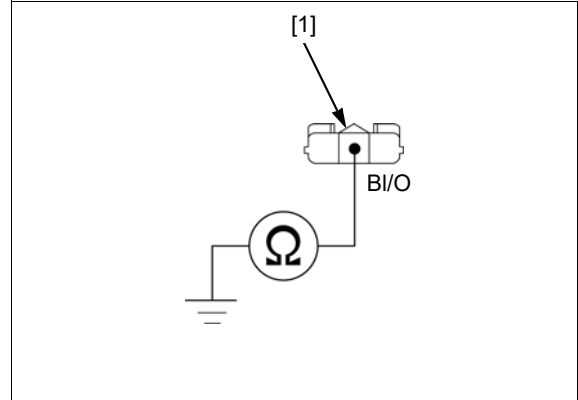
Check for continuity between the wire harness side VS sensor connector [1] and ground.

CONNECTION: Black/orange – Ground

Is there continuity?

YES – Short circuit in the Black/orange wire

NO – GO TO STEP 4.



4. VS Sensor Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Gray) connector (page 4-58).

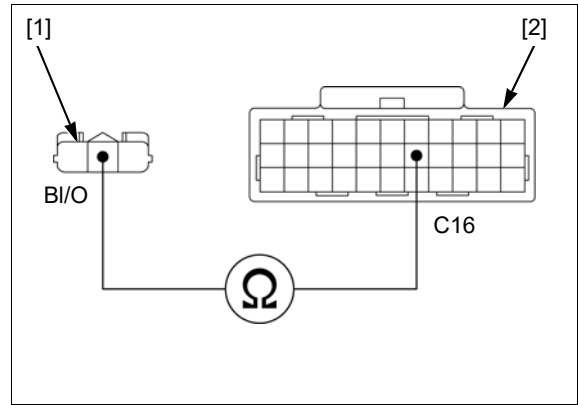
Check for continuity between the wire harness side VS sensor connector [1] and ECM 33P (Gray) connector [2].

CONNECTION: Black/orange – C16

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in the Black/orange wire



5. VS Sensor Inspection

Replace the VS sensor with a new one.
Connect the disconnected connector(s).
Erase the DTC.
Perform the test ride (page 4-12).
Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original VS sensor

DTC P1000

- Before starting the inspection, check for loose or poor contact on the bank angle sensor 2P (Black) and ECM 39P (Black) connector, and recheck the DTC.

1. Bank Angle Sensor System Inspection

Erase the DTC (page 4-6).
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 following:

- Bank angle sensor 2P (Black) connector (page 4-67)
- ECM 39P (Black) connector (page 4-58)

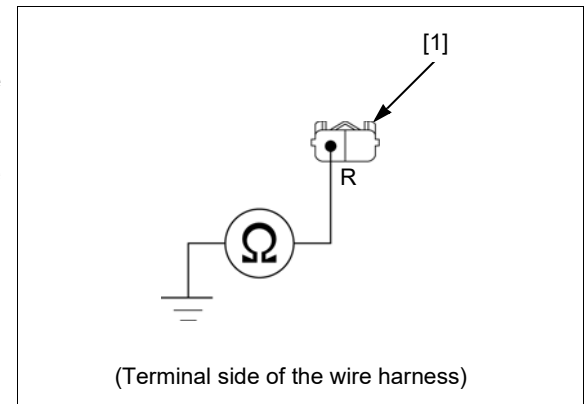
Check for continuity between the wire harness side bank angle sensor 2P (Black) connector [1] terminal and ground.

CONNECTION: Red – Ground

Is there continuity?

YES – Short circuit in the Red wire

NO – GO TO STEP 3.



3. Bank Angle Sensor Signal Line Open Circuit Inspection

Check for continuity between the wire harness side bank angle sensor 2P (Black) connector [1] and ECM 39P (Black) connector [2] terminals.

TOOL:

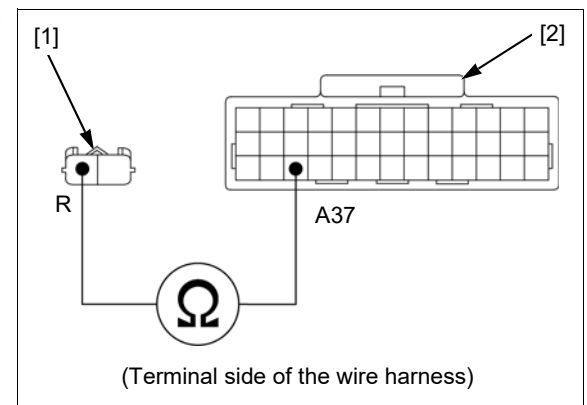
Test probe 07ZAJ-RDJA110

CONNECTION: Red – A37

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Red wire



4. Bank Angle Sensor Input Voltage Inspection

Temporarily install the ECM to the wire harness by connecting the 39P (Black) connector.

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

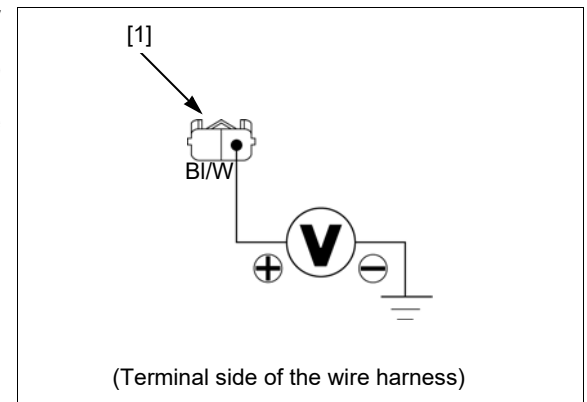
Measure the voltage between the wire harness side bank angle sensor 2P (Black) connector [1] terminal and ground.

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

Is there battery voltage?

YES – GO TO STEP 5.

NO – Open circuit in Black/white wire



5. Bank Angle Sensor Inspection

Check the bank angle sensor (page 4-67).

Is the bank angle sensor normal?

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

NO – Faulty bank angle sensor

DTC P1001

1. Bank Angle Sensor System Inspection

Erase the DTC (page 4-6).
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 4-67).

Erase the DTC (page 4-6).
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

DTC P1658/DTC P1659

Probable cause:

- Faulty TBW relay or its related circuit
- Blown sub fuse TBW 10 A
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

1. TBW Relay Input Voltage Inspection

Remove the TBW relay (page 7-14).
Measure the voltage at the wire harness (power box) side TBW relay connector [1].

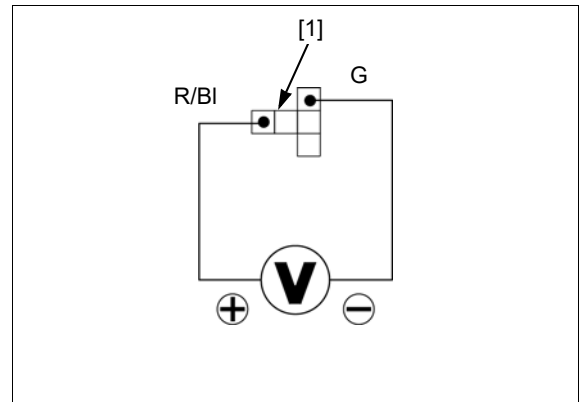
CONNECTION: Red/black (+) – Green (–)

Is there battery voltage?

YES – GO TO STEP 2.

NO –

- Open circuit in the Red/black wire
- Open circuit in the Green wire



2. TBW Relay Line Open Circuit Inspection

Disconnect the ECM 39P and ECM 33P (Gray) connectors (page 4-58).

Check for continuity between the wire harness side TBW relay connector [1] and ECM 39P connector [2]/ECM 33P (Gray) connector [3].

CONNECTION:

Black – A1

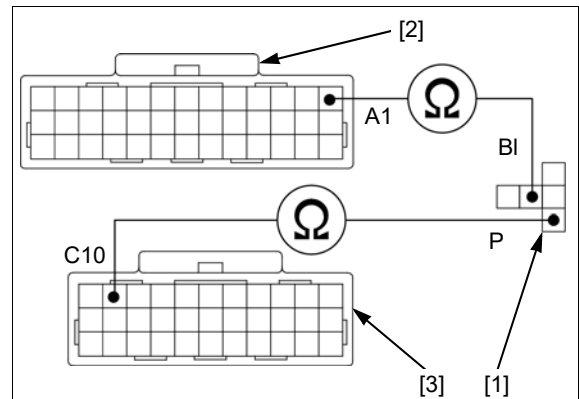
Pink – C10

Is there continuity?

YES – GO TO STEP 3.

NO –

- Open circuit in the Black wire
- Open circuit in the Pink wire



3. TBW Relay Line Short Circuit Inspection

Check for continuity between the wire harness side TBW relay connector [1] and ground.

CONNECTION:

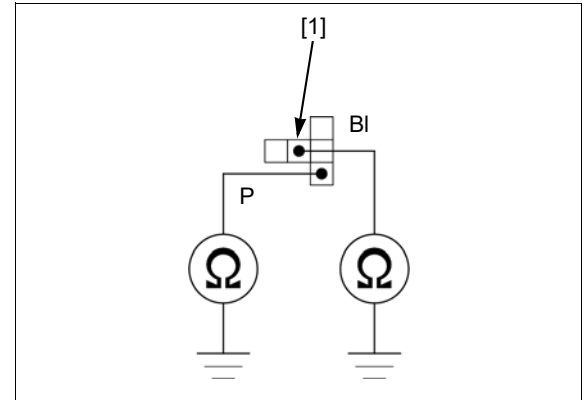
Black – Ground

Pink – Ground

Is there continuity?

YES – • Short circuit in the Black wire
• Short circuit in the Pink wire

NO – GO TO STEP 4.

**4. TBW Relay Inspection**

Replace the TBW relay with a new one.

Connect the disconnected connector(s).

Erase the DTC.

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 TBW relay

DTC P1684

Probable cause:

- Faulty TBW return spring
- Faulty ECM

Symptom/Fail-safe function:

- Motorcycle speed is limited: approximately 120 km/h (75 mph)

1. Throttle Valve and Return Spring Inspection

- Be careful not to damage the throttle valves.
- The return spring cannot be replaced. If the return spring is faulty, replace the throttle body.

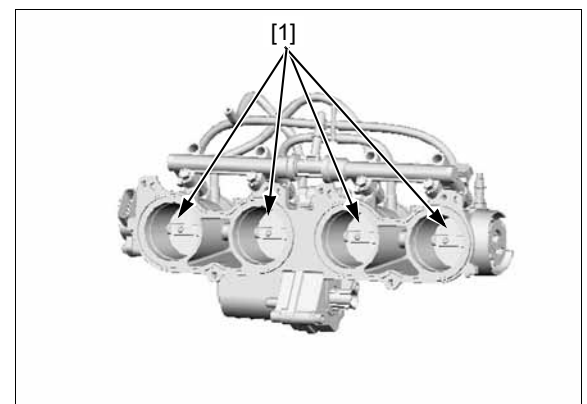
Remove the throttle body (page 7-14).

Open the throttle valve [1] with your finger.

Does the throttle valve open and return smoothly?

YES – GO TO STEP 2.

NO – Faulty throttle body (throttle valve and/or return spring)



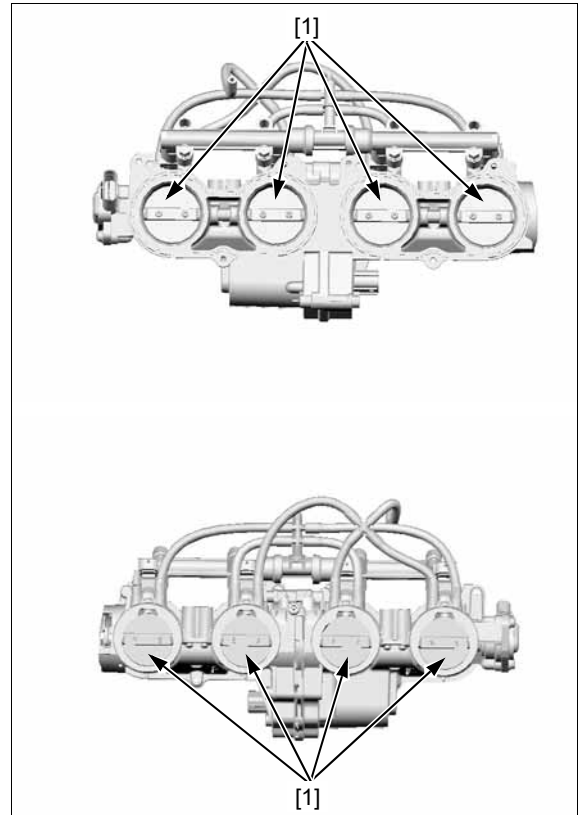
2. Throttle Body Inspection

Check the throttle bores [1] and valves visually for carbon deposits.

Is there contamination?

YES – Clean the throttle bores and valves carefully.

NO – GO TO STEP 3.



3. TBW System Inspection

Replace the throttle body with a new one.

Erase the DTC.

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 throttle body

DTC P1702/DTC P1703

Probable cause:

- Faulty shift drum angle sensor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

1. Shift drum angle Sensor Input Voltage Inspection

Disconnect the shift drum angle sensor connector (page 4-63).

Turn the ignition switch ON.

Measure the voltage at the wire harness side shift drum angle sensor connector [1].

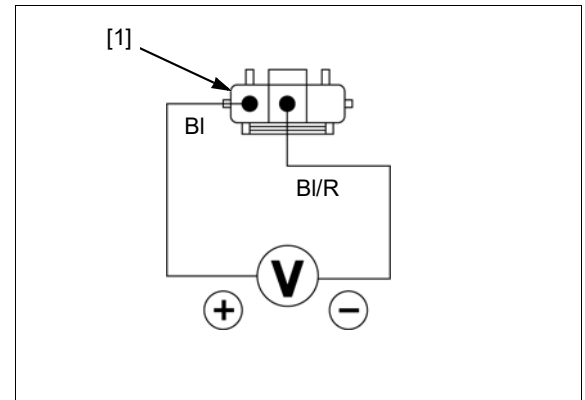
CONNECTION: Black (+) – Black/red (–)

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 2.

NO –

- Open or short circuit in the Black wire
- Open circuit in the Black/red wire
- If the wire is OK, replace the ECM with a new one, and recheck.

**2. Shift drum angle Sensor Signal Line Open Circuit Inspection**

Disconnect the ECM 33P (Black) connector (page 4-58).

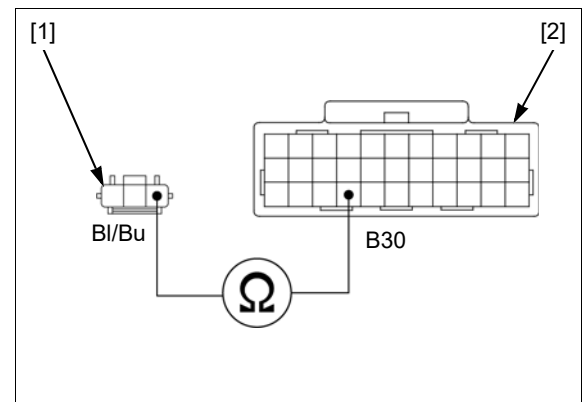
Check for continuity between the wire harness side shift drum angle sensor connector [1] and ECM 33P (Black) connector [2].

CONNECTION: Black/blue – B30

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Black/blue wire

**3. Shift drum angle Sensor Output Line Short Circuit Inspection**

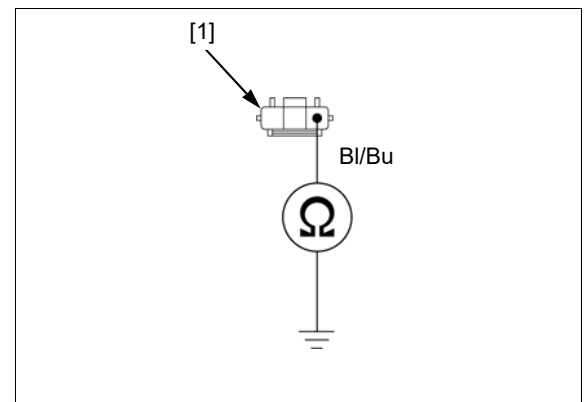
Check for continuity between the wire harness side shift drum angle sensor connector [1] and ground.

CONNECTION: Black/blue – Ground

Is there continuity?

YES – Short circuit in the Black/blue wire

NO – GO TO STEP 4.



4. Shift drum angle Sensor Inspection

Replace the shift drum angle sensor with a new one.
Connect the disconnected connector(s).
Erase the DTC.
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 shift drum angle sensor

DTC P1708/DTC P1709

Probable cause:

- Faulty shift spindle switch or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

1. Shift Spindle Switch Input Line Short Circuit Inspection

Disconnect the ECM 33P (Gray) connector (page 4-58).
Remove the shift spindle switch terminal (page 4-66).
Check for continuity between the wire harness side shift spindle switch terminal and ground.

CONNECTION: Black – Ground

Is there continuity?

- YES** – Short circuit in the Black wire
- NO** – GO TO STEP 2.

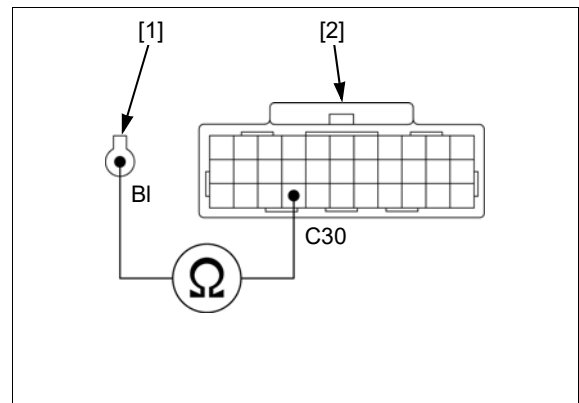
2. Shift Spindle Switch Line Open Circuit Inspection

Check for continuity between the wire harness side shift spindle switch terminal [1] and ECM 33P (Gray) connector [2].

CONNECTION: Black – C30

Is there continuity?

- YES** – GO TO STEP 3.
- NO** – Open circuit in the Black wire



3. Shift Spindle Switch Inspection

Replace the shift spindle switch with a new one.
Erase the DTC.
DTC P1708: Operate the UP shift three times or more.
DTC P1709: Operate the DOWN shift three times or more.
Check the DTC with GST or MCS.

Is same DTC indicated?

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

DTC P170D/DTC P170E

Probable cause:

- Faulty shift stroke sensor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally
- Gearshift function does not work

1. Shift Stroke Sensor Input Voltage Inspection

Disconnect the shift stroke sensor (option) connector.

Turn the ignition switch ON.

Measure the voltage at the wire harness side shift stroke sensor connector [1].

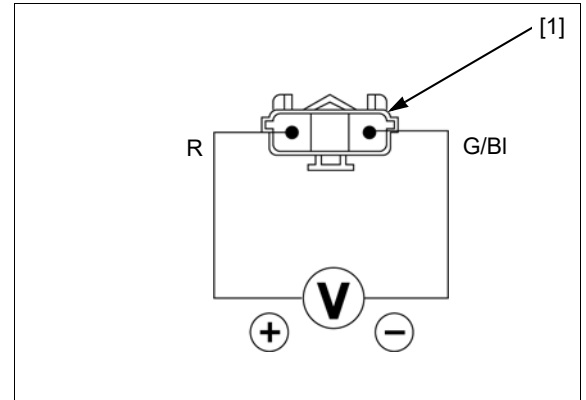
CONNECTION: Red (+) – Green/black (–)

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 2.

NO –

- Open or short circuit in the Red wire
- Open circuit in the Green/black wire
- If the wire is OK, replace the ECM with a new one, and recheck.



2. Shift Stroke Sensor Output Line Open Circuit Inspection

Disconnect the ECM 33P (Gray) connector (page 4-58).

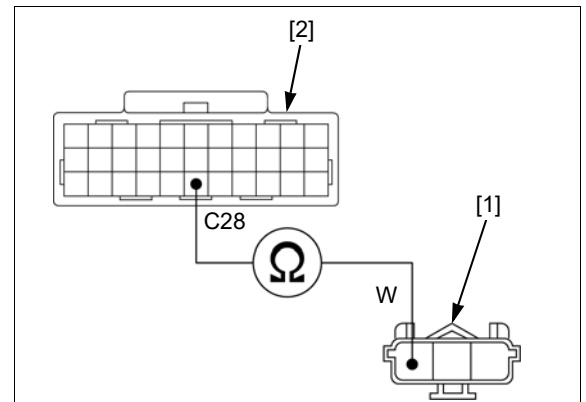
Check for continuity between the wire harness side shift stroke sensor connector [1] and ECM 33P (Gray) connector [2].

CONNECTION: White – C28

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the White wire



3. Shift Stroke Sensor Output Line Short Circuit Inspection

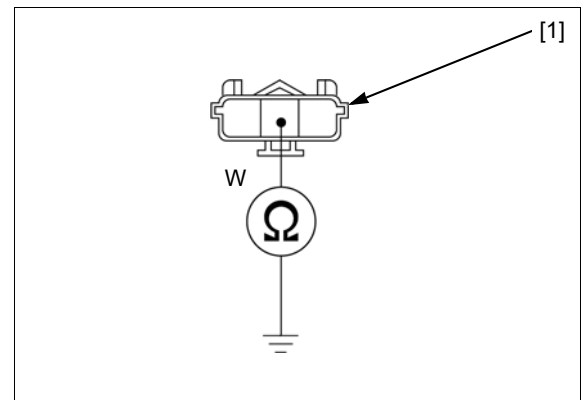
Check for continuity between the wire harness side shift stroke sensor connector [1] and ground.

CONNECTION: White – Ground

Is there continuity?

YES – Short circuit in the White wire

NO – GO TO STEP 4.



4. Shift Stroke Sensor Inspection

Replace the shift stroke sensor with a new one.
Connect the disconnected connector(s).
Erase the DTC.
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 shift stroke sensor

DTC P1712

Probable cause:

- Faulty TCM or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Gearshift function does not work

1. TCM Inspection

Replace the TCM with a new one.
Erase the DTC.
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 TCM

DTC P2101/DTC P2118

Probable cause:

- Faulty TBW motor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates at idle speed
- HSTC does not operate

1. TBW Motor Line Open Circuit Inspection

Disconnect the TBW motor connector (page 7-14).
Disconnect the ECM 33P (Black) connector (page 4-58).
Check for continuity between the wire harness side TBW motor connector [1] and ECM 33P (Black) connector [2].

CONNECTION:

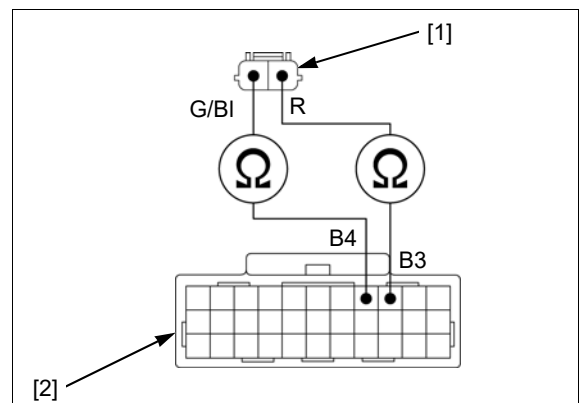
Red – B3

Green/black – B4

Is there continuity?

YES – GO TO STEP 2.

- NO** –
- Open circuit in the Red wire
 - Open circuit in the Green/black wire



2. TBW Motor Line Short Circuit Inspection 1

Check for continuity between the wire harness side TBW motor connector [1] and ground.

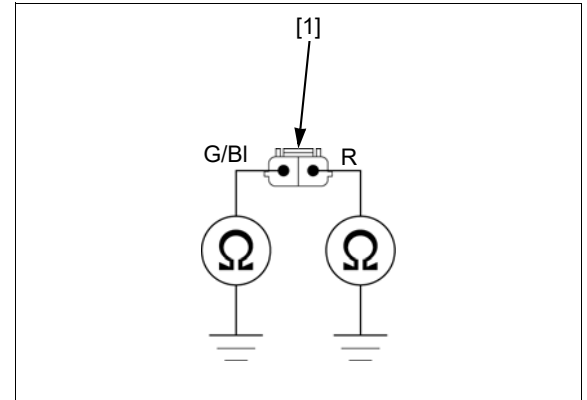
CONNECTION:

Red – Ground

Green/black – Ground

Is there continuity?

- YES** – • Short circuit in the Red wire
• Short circuit in the Green/black wire
- NO** – GO TO STEP 3.



3. TBW Motor Inspection

Replace the throttle body (TBW motor).
Connect the disconnected connector(s).
Erase the DTC.
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 TBW motor

DTC P2121/DTC P2126

Probable cause:

- Faulty APS 1 or its related circuit
- Faulty APS 2 or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates at idle speed

1. APS Inspection

Replace the grip APS with a new one.
Erase the DTC.
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 grip APS

DTC P2122/DTC P2123

Probable cause:

- Faulty APS 1 or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates at idle speed

1. APS 1 Input Voltage Inspection

Disconnect the grip APS connector (page 4-60).

Turn the ignition switch ON.

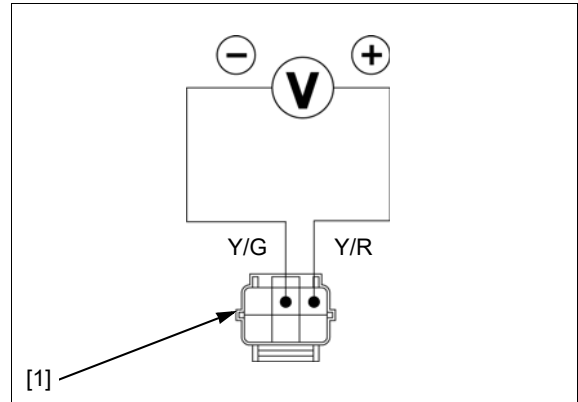
Measure the voltage at the wire harness side grip APS connector [1].

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

Is about 5 V indicated?

YES – GO TO STEP 2.

- NO** –
- Open circuit in the Yellow/red wire
 - Open circuit in the Yellow/green wire
 - If the wires are OK, replace the ECM with a new one, and recheck.



2. APS 1 Output Line Open Circuit Inspection

Disconnect the ECM 39P connector (page 4-58).

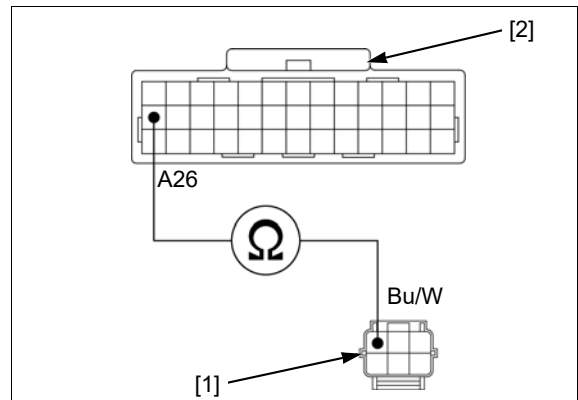
Check for continuity between the wire harness side grip APS connector [1] and ECM 39P connector [2].

CONNECTION: Blue/white – A26

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Blue/white wire



3. APS 1 Output Line Short Circuit Inspection

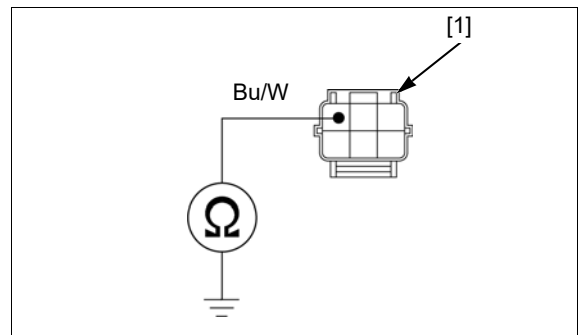
Check for continuity between the wire harness side grip APS connector [1] and ground.

CONNECTION: Blue/white – Ground

Is there continuity?

YES – Short circuit in the Blue/white wire

NO – GO TO STEP 4.



4. APS 1 Inspection

Replace the grip APS (right handlebar switch).

Connect the disconnected connector(s).

Erase the DTC.

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 APS

DTC P2127/DTC P2128

Probable cause:

- Faulty APS 2 or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates at idle speed

1. APS 2 Input Voltage Inspection

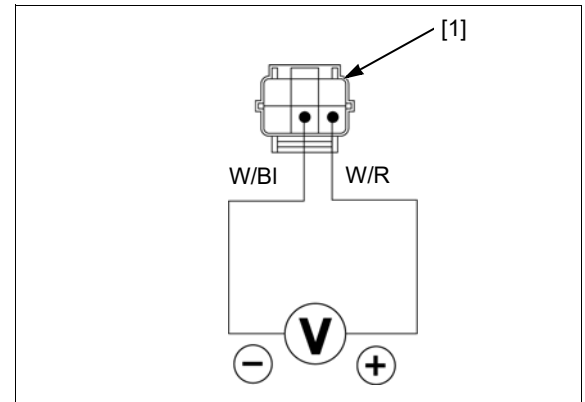
Disconnect the grip APS connector (page 4-60).
Turn the ignition switch ON.
Measure the voltage at the wire harness side grip APS connector [1].

CONNECTION: White/red (+) – White/black (–)

Is about 5 V indicated?

YES – GO TO STEP 2.

- NO** –
- Open circuit in the White/red wire
 - Open circuit in the White/black wire
 - If the wires are OK, replace the ECM with a new one, and recheck.



2. APS 2 Output Line Open Circuit Inspection

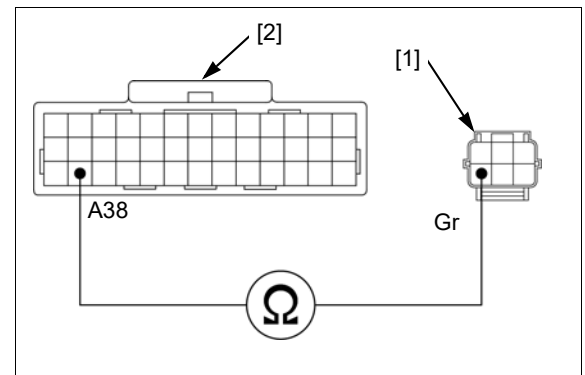
Disconnect the ECM 39P connector (page 4-58).
Check for continuity between the wire harness side grip APS connector [1] and ECM 39P connector [2].

CONNECTION: Gray – A38

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Gray wire



3. APS 2 Output Line Short Circuit Inspection

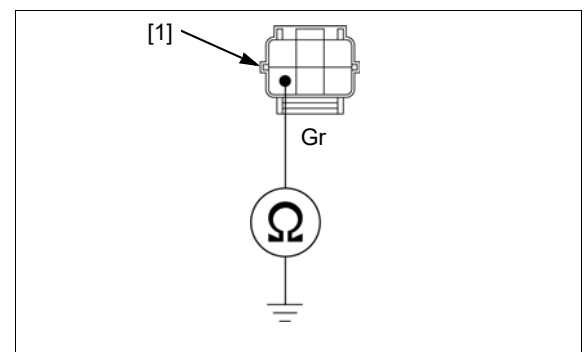
Check for continuity between the wire harness side grip APS connector [1] and ground.

CONNECTION: Gray – Ground

Is there continuity?

YES – Short circuit in the Gray wire

NO – GO TO STEP 4.



4. APS 2 Inspection

Replace the grip APS (right handlebar switch).
Connect the disconnected connector(s).
Erase the DTC.
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 grip APS

DTC P2135

Probable cause:

- Faulty TP sensor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates at idle speed

NOTE:

- When other DTC is displayed, together with P0500, troubleshoot it first.
- Clean the throttle bores and valves carefully.

1. TP Sensor Line Short Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-58).

Disconnect the TBW unit connector (page 7-14).

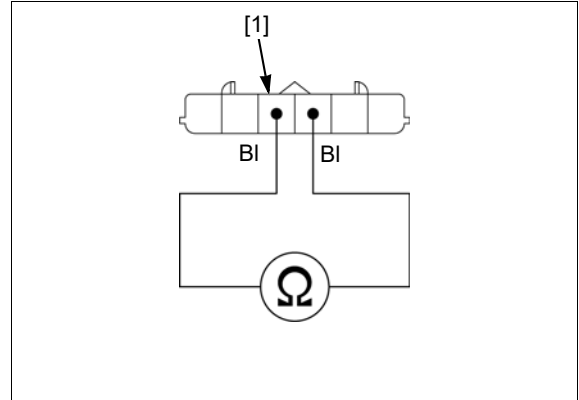
Check for continuity at the wire harness side TBW unit connector [1].

CONNECTION: Black – Black

Is there continuity?

YES – Short circuit of the Black-to-Black wire

NO – GO TO STEP 2.



2. TP Sensor Inspection

Replace the throttle body (TP sensor).

Connect the disconnected connector(s).

Erase the DTC.

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 TP sensor

DTC P2138

Probable cause:

- Faulty APS 1 and/or APS 2 or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates at idle speed

1. APS Line Short Circuit Inspection

Disconnect the ECM 39P connector (page 4-58).

Disconnect the grip APS connector (page 4-60).

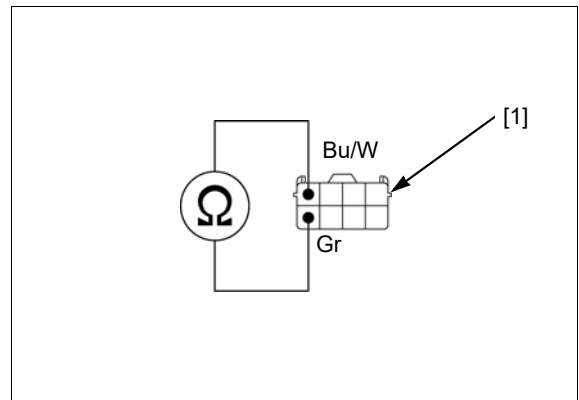
Check for continuity at the wire harness side APS connector [1].

CONNECTION: Blue/white – Gray

Is there continuity?

YES – Short circuit of the Blue/white wire-to-Gray wire

NO – GO TO STEP 2.



2. APS Inspection

Replace the grip APS (right handlebar switch).
 Connect the disconnected connector(s).
 Erase the DTC.
 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 APS

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
- HSTC does not operate

NOTE:

- When other DTC is displayed together with P2158, troubleshoot it first.

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

Disconnect the following:

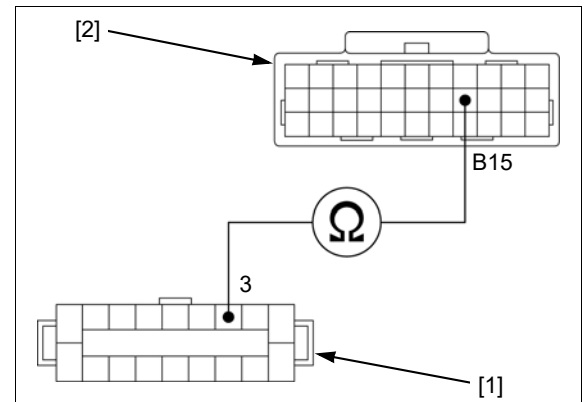
- ABS modulator connector (page 19-23)
- ECM 33P (Black) connector (page 4-58)

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

CONNECTION: 3 – B15

Is there continuity?

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

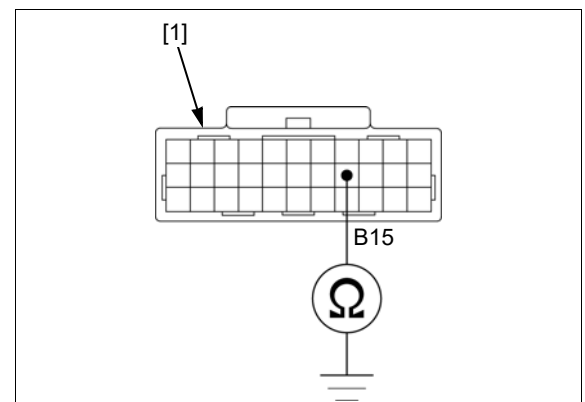
**2. Rear Wheel Speed Sensor Signal Output Line Short Circuit Inspection**

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

CONNECTION: B15 – Ground

Is there continuity?

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



3. ECM Inspection

Replace the ECM with a new one.
Connect the disconnected connector(s).
Erase the DTC.
Perform the test ride (page 4-12).
Check the DTC with GST or MCS.

Is same DTC indicated?

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

NO – Faulty original ECM

DTC P2195/DTC P2196/DTC P2197/ DTC P2198

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.
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/DTC P2A03

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.
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

DTC U0001

NOTE:

- When other DTC is displayed, together with U0001, troubleshoot it first.

Probable cause:

- Faulty CAN line(s)
- Faulty CAN connected unit(s)

Symptom/Fail-safe function:

- CAN communication failure

1. CAN Line (ECM-to-BCU) Open Circuit Inspection

Disconnect the following:

- ECM 39P connector (page 4-58)
- BCU 39P connector (page 21-28)

Check the continuity between the wire harness side ECM 39P connector [1] and BCU 39P connector [2].

CONNECTION:

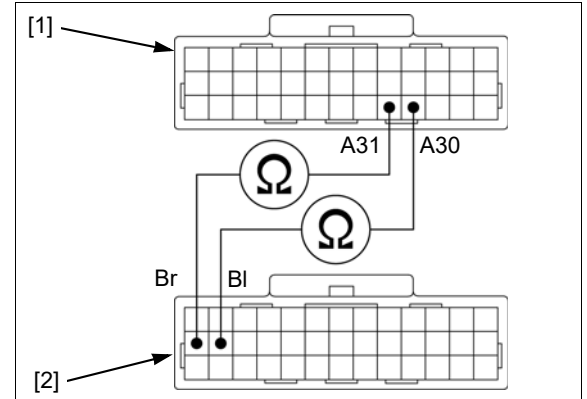
A31 – Brown

A30 – Black

Is there continuity?

YES – GO TO STEP 2.

- NO** –
- Open circuit in the Brown wire
 - Open circuit in the Black wire



2. CAN Line (ECM-to-Meter) Open Circuit Inspection

Disconnect the meter 24P connector (page 21-8).

Check the continuity between the wire harness side ECM 39P connector [1] and meter connector [2].

CONNECTION:

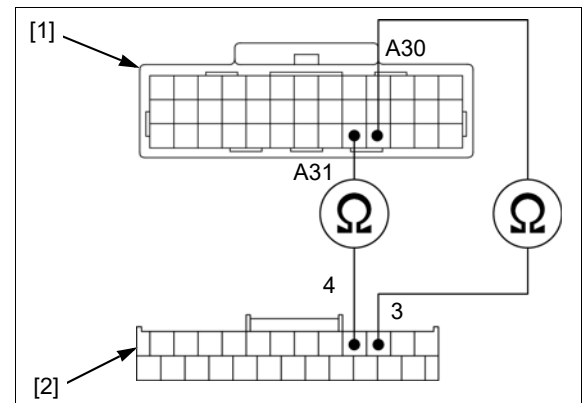
A31 – Brown

A30 – Black

Is there continuity?

YES – GO TO STEP 3.

- NO** –
- Open circuit in the Brown wire
 - Open circuit in the Black wire



3. CAN Line (ECM-to-ABS Modulator) Open Circuit Inspection

Disconnect the ABS modulator connector (page 19-23).

Check the continuity between the wire harness side ECM 39P connector [1] and ABS modulator connector [2].

CONNECTION:

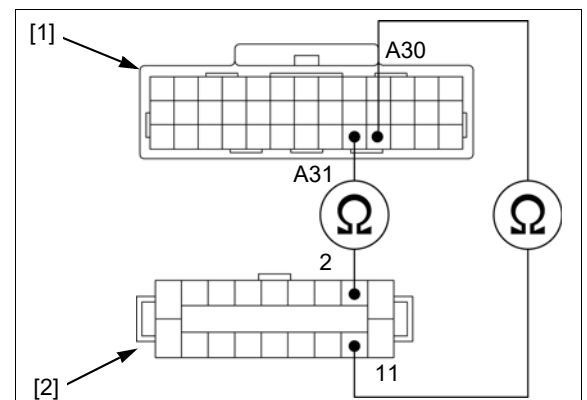
A31 – 2

A30 – 11

Is there continuity?

YES – GO TO STEP 4.

- NO** –
- Open circuit in the Brown wire
 - Open circuit in the Black wire



4. CAN Line Short Circuit Inspection

Check for continuity between the wire harness side ECM 39P connector [1] and ground.

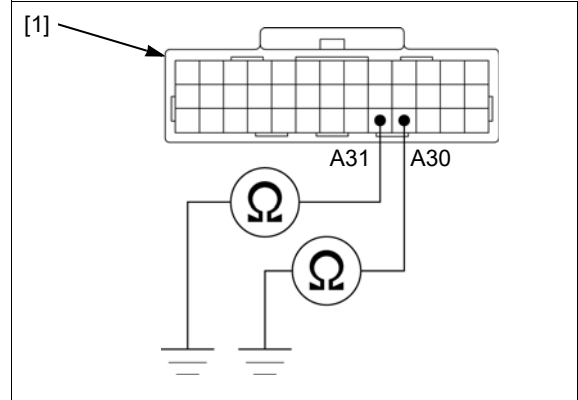
CONNECTION:

A31 – Ground

A30 – Ground

Is there continuity?

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



5. Communicated Part Inspection

Connect the disconnected connector(s).
Erase the DTC.
Replace the BCU, meter, and ABS modulator one by one in order with a new one.
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 part

DTC U0121

Probable cause:

- Faulty CAN line(s)
- Faulty CAN connected unit(s)

Symptom/Fail-safe function:

- CAN communication failure

1. CAN Line Open Circuit Inspection

Disconnect the following:

- ECM 39P connector (page 4-58)
- ABS modulator connector (page 19-23)

Check the continuity between the wire harness side ECM 39P connector [1] and ABS modulator connector [2].

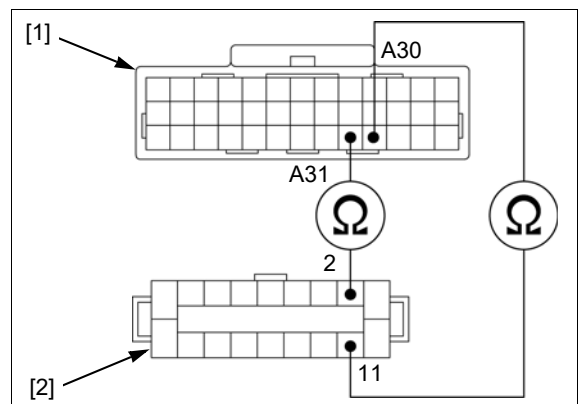
CONNECTION:

A31 – 2

A30 – 11

Is there continuity?

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



2. ABS Modulator Inspection

Replace the ABS modulator with a new one.
 Connect the disconnected connector(s).
 Erase the DTC.
 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 ABS modulator

DTC U0155

Probable cause:

- Faulty CAN line(s)
- Faulty CAN connected unit(s)

Symptom/Fail-safe function:

- CAN communication failure

1. CAN Line Open Circuit Inspection

Disconnect the following:

- ECM 39P connector (page 4-58)
- Meter 24P connector (page 21-8)

Check the continuity between the wire harness side ECM 39P connector [1] and meter connector [2].

CONNECTION:

A31 – Brown

A30 – Black

Is there continuity?

YES – GO TO STEP 2.

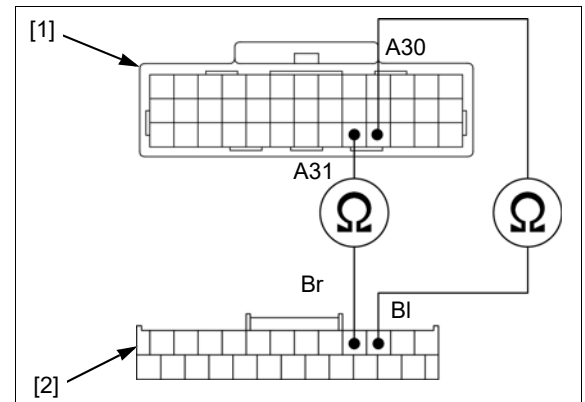
- NO** –
- Open circuit in the Brown wire
 - Open circuit in the Black wire

2. Meter Inspection

Replace the meter with a new one.
 Connect the disconnected connector(s).
 Erase the DTC.
 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 meter



MIL CIRCUIT TROUBLESHOOTING

When The Ignition Switch ON, The MIL Does Not Come On

Check that the MIL comes on a few seconds and goes off when the ignition switch is turned ON.

If the MIL and digital display do not function at all, refer to meter power/ground line inspection (page 21-8).

When The Ignition Switch ON, The MIL Does Not Go Off Within A Few Seconds (Engine Starts)

NOTE:

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

If the MIL stays on, check the meter indication when the CAN line is abnormal (page 4-55).

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

Turn the ignition switch OFF.

Disconnect the ECM 39P connector (page 4-58).

Check for continuity between the wire harness side ECM 39P connector [1] and ground.

TOOL:

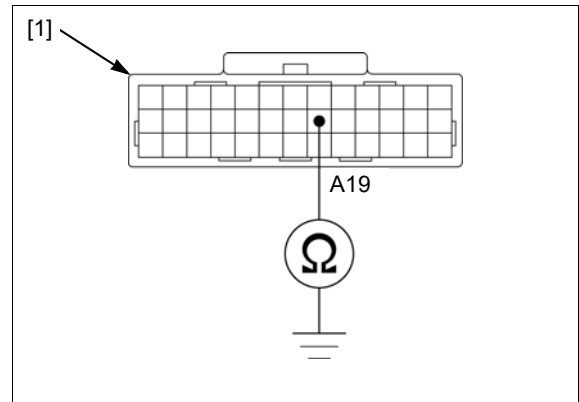
Test probe

07ZAJ-RDJA110

CONNECTION: A19 – Ground

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

If there is no continuity, replace the ECM with a known good one and recheck (page 4-58).



ECM

REMOVAL/INSTALLATION

Remove the battery (page 20-5).

Disconnect the following connectors:

- ABS modulator 18P (Black) (page 19-23)
- ECM 39P (Black) [1]
- ECM 33P (Black) [2]
- ECM 33P (Gray) [3]

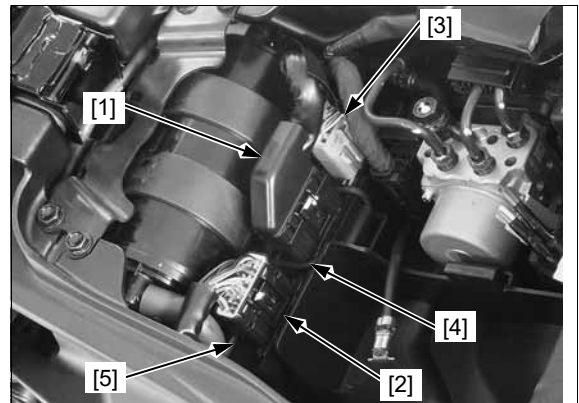
Unhook the band [4].

Remove the ECM [5].

Installation is in the reverse order of removal.

Register the key (page 22-3).

Initialize the quickshifter (page 4-65).



POWER/GROUND LINE INSPECTION

Disconnect the ECM 39P (Black) connector (page 4-58).

POWER INPUT LINE

Measure the voltage between the wire harness side ECM 39P (Black) connector [1] and ground.

TOOL:

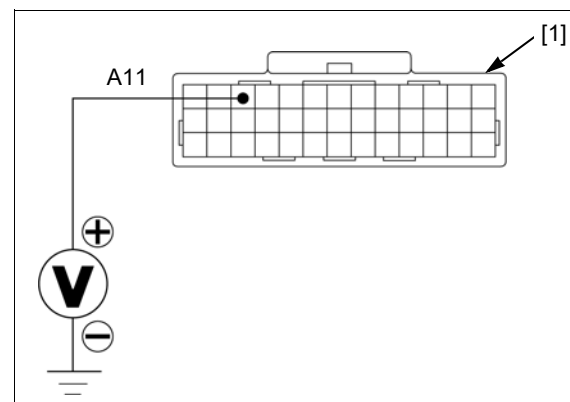
Test probe 07ZAJ-RDJA110

CONNECTION: A11 (+) – Ground (–)

There should be battery voltage with the ignition switch turned ON.

If there is no voltage, check the following:

- Blown FI/IGN/START fuse 7.5 A
- Open circuit in the Black/white or Red/black wire between the ECM and ignition switch



GROUND LINE

Disconnect the ECM 39P (Black) connector (page 4-58).

Check for continuity between the wire harness side ECM 39P (Black) [1] connector and ground.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION: A9 – Ground

A10 – Ground

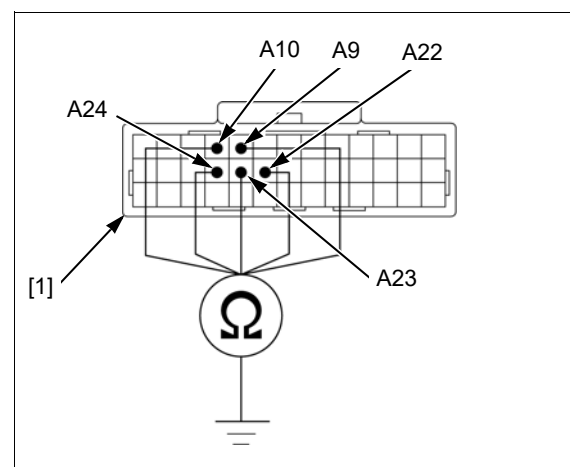
A22 – Ground

A23 – Ground

A24 – Ground

There should be continuity at all times.

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



APS

INSPECTION

NOTE:

- Before starting the inspection, check for loose or poor contact on the APS connector and ECM connector, then recheck the DTC.

1. APS 1 and 2 Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the APS 6P (Black) connector [1] (page 4-61).

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

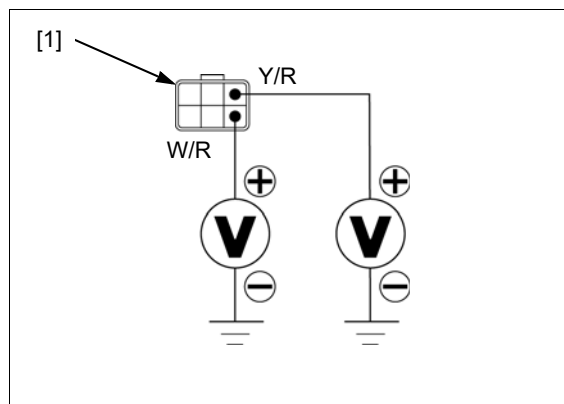
Measure the voltage at the harness side.

Connection: Yellow/red (+) [VCC 1] – Ground
White/red (+) [VCC 2] – Ground

Is the voltage about 5 V?

YES – GO TO STEP 2.

NO – Open or short circuit in the White/red or Yellow/red wire. If the wires are OK, replace the ECM with a known good one and recheck.



2. APS 1 and 2 System Inspection

Erase the DTC (page 4-6).

Check the APS 1 and 2 with the MCS.

Note the APS 1 and 2 output voltage.

Calculate the 5 V / input voltage x output voltage.

Standard (at throttle opened):

APS 1: 4.433 – 4.567 V

APS 2: 2.183 – 2.317 V

Standard (at throttle closed):

APS 1: 0.433 – 0.567 V

APS 2: 0.183 – 0.317 V

Is the voltage within standard?

YES – Intermittent failure

NO – GO TO STEP 3.

3. APS System Inspection

Connect a 5 V battery to the APS connector terminals at the APS side as shown.

Connection: Yellow/red (+) – Yellow/black (–)
White/red (+) – White/black (–)

Measure the voltage at the harness side.

Connection: Blue/white (+) – Yellow/black (–)
Gray (+) – White/black (–)

Calculate the 5 V / input voltage x output voltage.

Standard (at throttle opened):

APS 1: 4.433 – 4.567 V

APS 2: 2.183 – 2.317 V

Standard (at throttle closed):

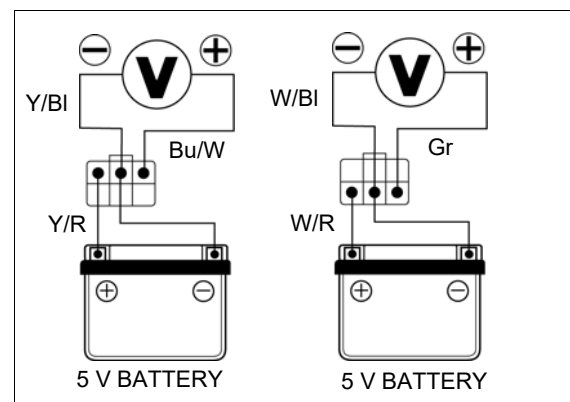
APS 1: 0.433 – 0.567 V

APS 2: 0.183 – 0.317 V

Is the voltage within standard?

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

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



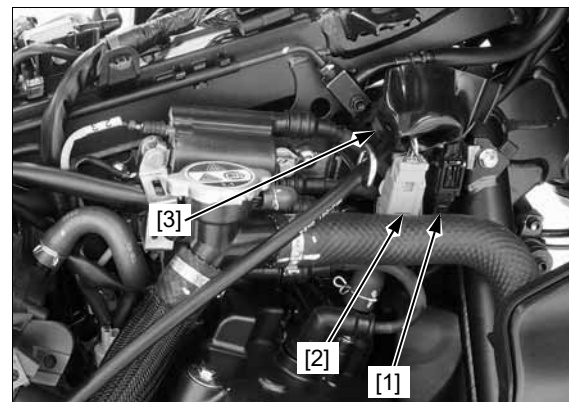
REMOVAL/INSTALLATION

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

Loosen the master cylinder holder bolt (page 16-4).

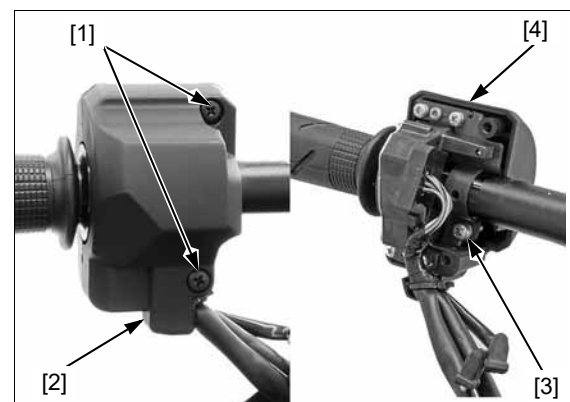
Disconnect the right handlebar switch 6P (Black) [1] and 6P (Blue) [2] connectors.

Remove the wire band [3].



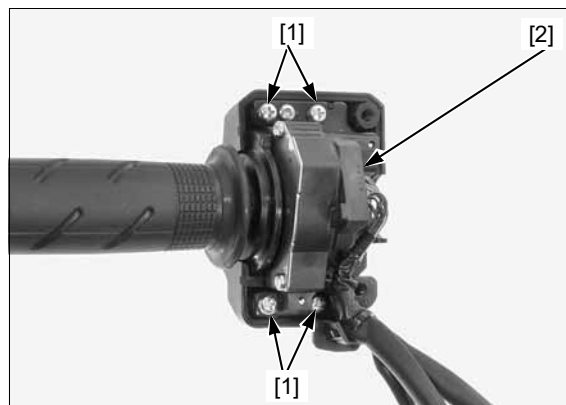
Remove the screws [1] and throttle housing cover [2].

Loosen the screw [3] and remove the throttle housing [4].



PGM-FI SYSTEM

Remove the screws [1] and APS [2].



Route the wire properly (page 1-24).

Installation is in the reverse order of removal.

NOTE:

- Do not disassemble the APS.
- Apply grease to the throttle grip and APS contacting surfaces in the dimensions shown.

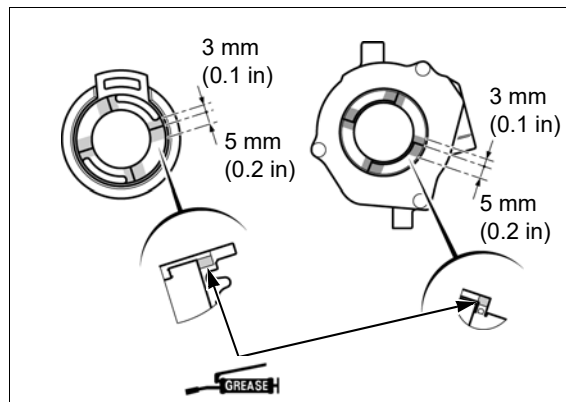
TORQUE:

APS mounting screw:

2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)

Right handlebar switch screw:

2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)



VS SENSOR

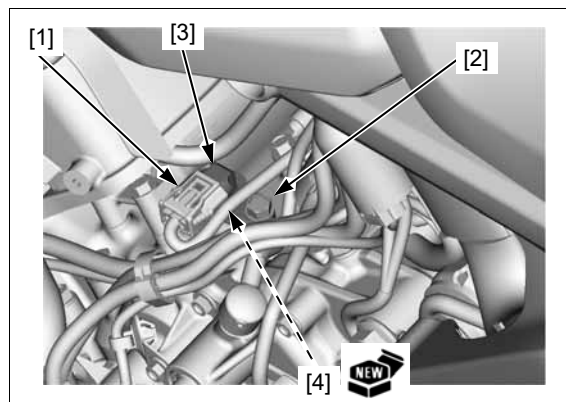
REMOVAL/INSTALLATION

Remove the air cleaner lower housing (page 3-5).

Disconnect the VS sensor 3P connector [1].

Remove the bolt [2], VS sensor [3] and O-ring [4].

Installation is in the reverse order of removal.



SHIFT DRUM ANGLE SENSOR

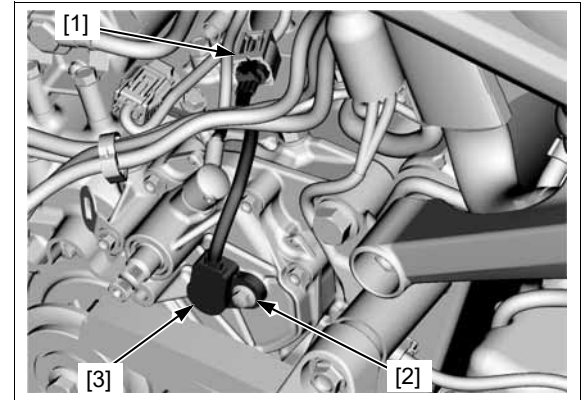
REMOVAL/INSTALLATION

Remove the following :

- Sprocket cover (page 2-13)
- Air cleaner lower housing (page 3-5)

Disconnect the shift drum angle sensor 3P (Black) connector [1].

Remove the bolt [2] and shift drum angle sensor [3].



Route the wire properly (page 1-24).

Installation is in the reverse order of removal.

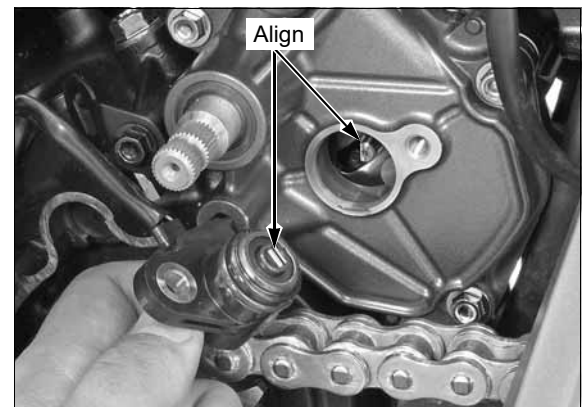
NOTE:

- Align the cut out of the shift drum and shift drum angle sensor.

TORQUE:

Shift drum angle sensor bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

Initialize the quickshifter (page 4-65).



SHIFT STROKE SENSOR (II ED/III TH/III KO/II FO/II GS /II RU/ III CH/II BR models only)

INSPECTION

NOTE:

- If the gear position indicator blinks between gear position and "-" in alternate shifts, perform the below troubleshooting.
- Before the troubleshooting check the following:
 - Tire air pressure
 - Tire size
 - Pulser ring for deformation or damage
 - Wheel speed sensor for loose mounting
 - VS sensor for loose mounting
 - Correct drive and driven sprockets number of teeth
- Test-ride the motorcycle with gradual acceleration.

1. Shift Stroke Sensor System Inspection 1

Wait for more than 1.0 second with neutral gear position.

Shift up the gear more than four times continually then shift down the gear more than four times continually.

Initialize the quickshifter (page 4-65).

Is the gear position indicator blinks between gear position and "-" in alternate shifts?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Shift Stroke Sensor System Inspection 2

Check the shift stroke sensor with the GST or MCS.

Is about 2.1 – 2.9 V indicated?

YES – Intermittent failure

NO – Replace the shift stroke sensor and recheck and test-ride.

- Recheck the following:
 - Tire air pressure
 - Tire size
 - Pulser ring for deformation or damage
 - Wheel speed sensor for loose mounting
 - VS sensor for loose mounting
 - Correct drive and driven sprockets number of teeth
- Test-ride the motorcycle with gradually acceleration.

After recheck and test-ride, if the gear position indicator blinks between gear position and "-" in alternate shifts, replace the ECM.

REMOVAL/INSTALLATION

Remove the shift pedal assembly (page 13-7).

Remove the following:

- Bolt [1]
- Nut [2]
- Arm [3]
- Shift pedal [4]
- Lock nut [5]
- Lock nut (left-hand thread) [6]
- Rod [7]
- Shift stroke sensor [8]

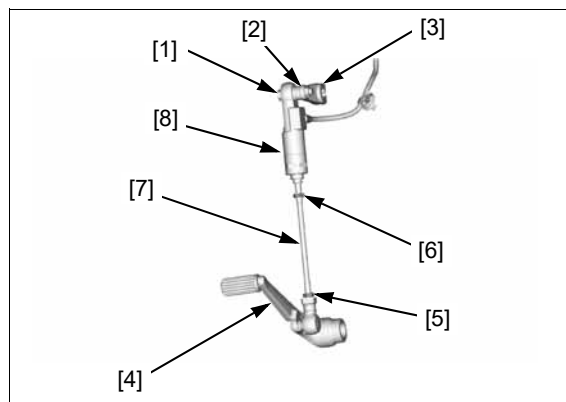
Installation is in the reverse order of removal.

NOTE:

- Do not disassemble the shift stroke sensor.

Adjust the shift pedal assembly (page 13-8).

Initialize the quickshifter (page 4-65).



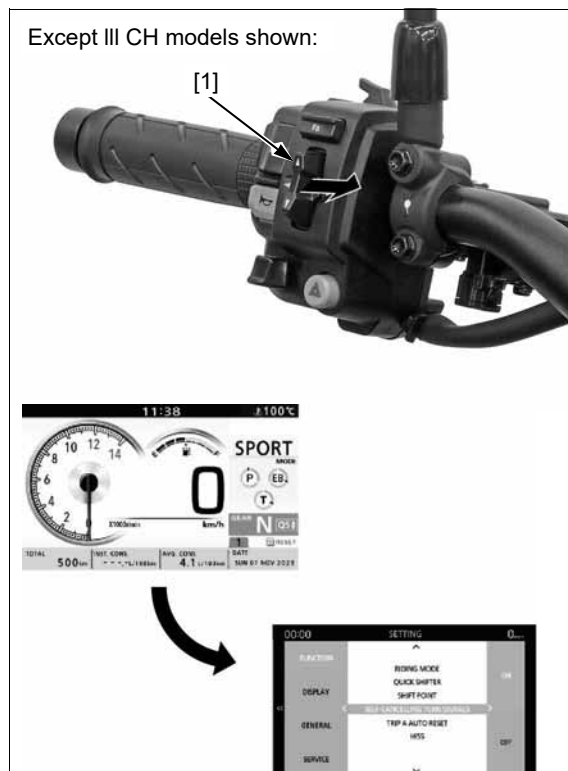
QUICKSHIFTER INITIALIZATION

Connect the SCS short connector to the DLC (page 4-4).

Do not start the engine.

Turn the ignition switch ON and engine stop switch "O". Push and hold the SEL-RIGHT [1] switch.

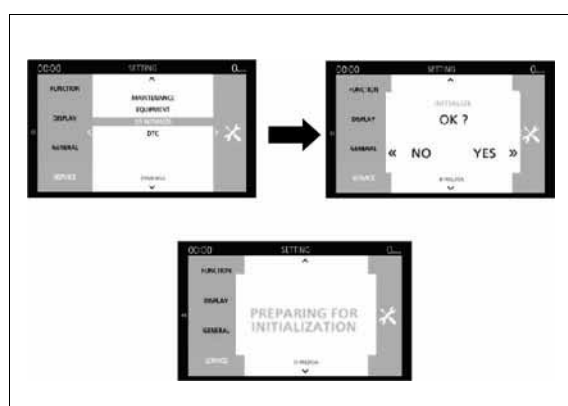
Except III CH models shown:



Select the item with SEL-UP/SEL-DOWN switches then decide the item with Fn switch.

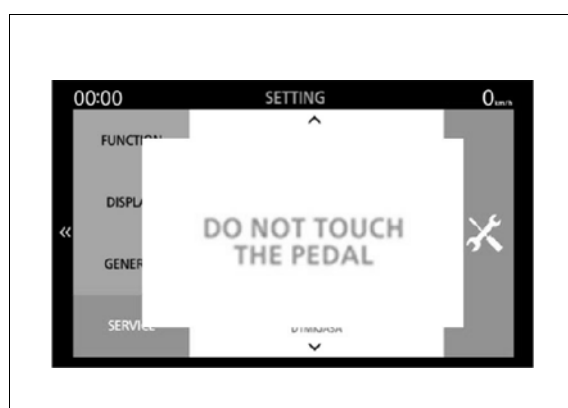
- "QUICKSHIFTER"
- "INITIALIZE"

The display shows the message that "PREPARING FOR INITIALIZATION" then start the engine and let it idle.



Do not operate the throttle grip.

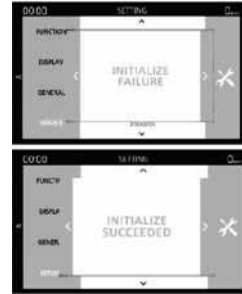
Shift the transmission to the neutral position then do not touch the pedal.



PGM-FI SYSTEM

Wait for the display shows the message that "INITIALIZE SUCCEEDED" then turn the ignition switch OFF and remove the SCS short connector.

If the display shows the message that "INITIALIZE FAILURE", check the mounting conditions of the shift stroke and shift drum angle sensors, then restart the initialization again.



SHIFT SPINDLE SWITCH

REMOVAL/INSTALLATION

Remove the air cleaner lower housing (page 3-5).

Remove the nut [1], shift spindle switch wire [2], shift spindle switch [3] and sealing washer [4].

Route the wire properly (page 1-24).

Installation is in the reverse order of removal.

TORQUE:

Shift spindle switch:

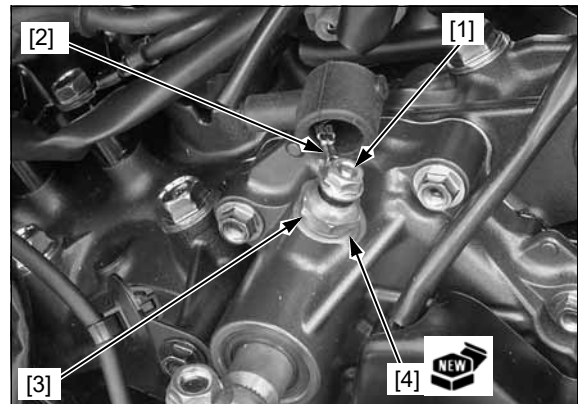
12 N·m (1.2 kgf·m, 9 lbf·ft)

Shift spindle switch terminal nut:

1.7 N·m (0.2 kgf·m, 1.3 lbf·ft)

NOTE:

- Replace the sealing washer with a new one.



MAP SENSOR

REMOVAL/INSTALLATION

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

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

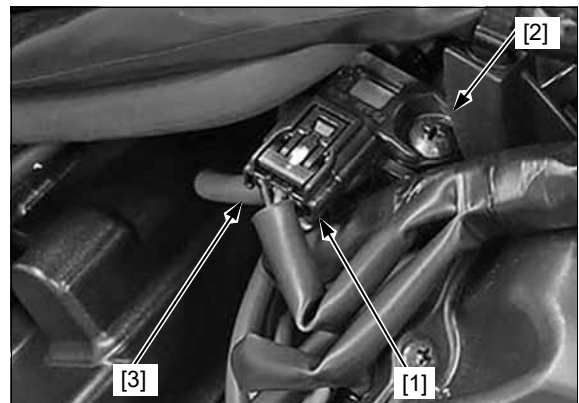
Remove the screw [2] and MAP sensor [3] from the air cleaner housing.

Installation is in the reverse order of removal.

TORQUE:

MAP sensor mounting screw:

1.1 N·m (0.1 kgf·m, 0.8 lbf·ft)



IAT SENSOR

REMOVAL/INSTALLATION

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

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

Remove the screws [2] and IAT sensor [3] from the air cleaner housing cover.

Remove the O-ring [4].

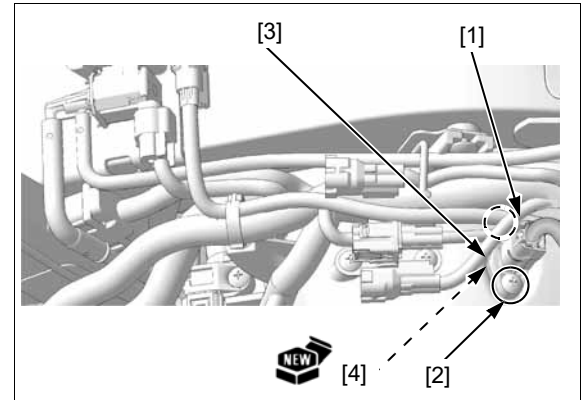
Installation is in the reverse order of removal.

NOTE:

- Replace the O-ring with a new one.

TORQUE:

IAT sensor mounting screw:
1.1 N·m (0.1 kgf·m, 0.8 lbf·ft)



ECT SENSOR

REMOVAL/INSTALLATION

Remove the air cleaner lower housing (page 3-5).

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

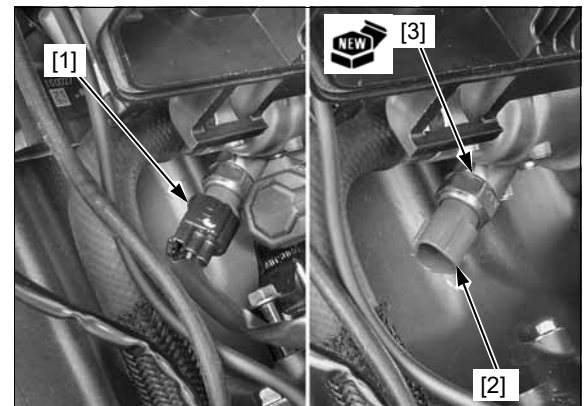
Remove the ECT sensor [2] and sealing washer [3].

Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washer with a new one.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



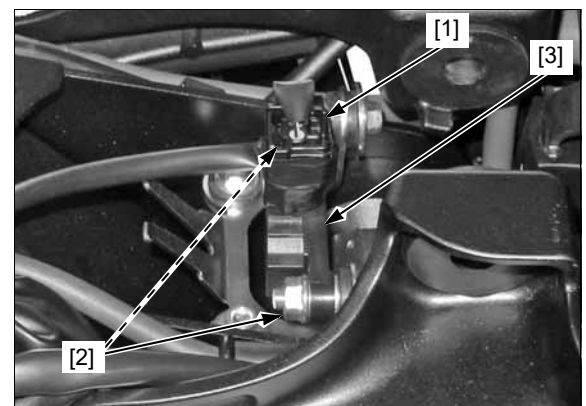
BANK ANGLE SENSOR

REMOVAL/INSTALLATION

Remove the fuel tank (page 7-6).

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

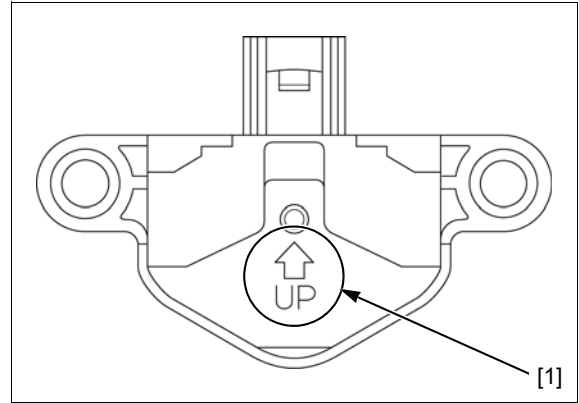
Remove the nuts [2] and bank angle sensor [3] from the stay.



PGM-FI SYSTEM

Installation is in the reverse order of removal.

- Install the bank angle sensor with its "UP" mark [1] facing up.



SYSTEM INSPECTION

Connect the MCS (page 4-8).

Remove the bank angle sensor (page 4-67).

Connect the bank angle sensor 2P (Black) connector.

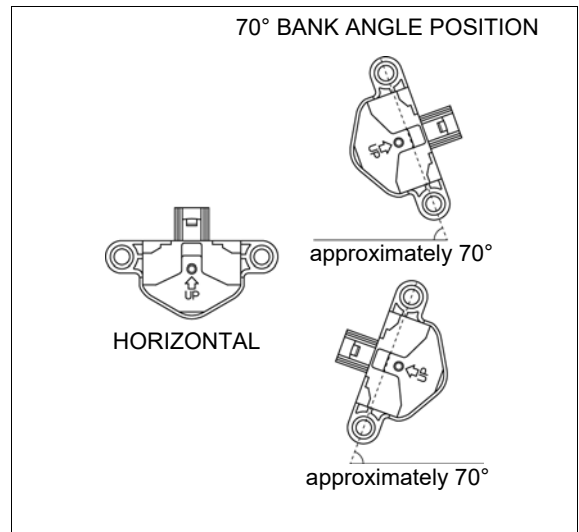
Place the bank angle sensor horizontally as shown.

Turn the ignition switch ON and engine stop switch "O".
Read the voltage with the MCS.

STANDARD: 7.00 – 8.80 V

Incline the bank angle sensor approximately 70° to the left or right with keeping the ignition switch ON.
Read the voltage with MCS.

STANDARD: 0.40 – 0.84 V



A/F SENSOR

REMOVAL/INSTALLATION

Remove the exhaust pipe (page 2-16).

Remove the A/F sensor [1] using the special tool.

TOOL:

Sensor socket wrench [2]

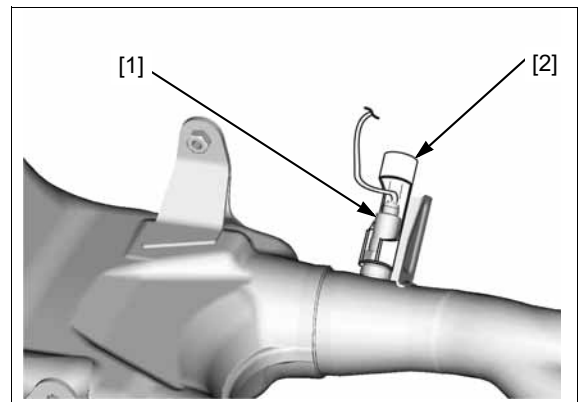
**FRXM17 (Snap on)
or equivalent**

NOTICE

- Handle the A/F sensor with care.
- Do not get grease, oil, or other materials in the A/F sensor air hole.
- Be careful not to damage the sensor wire.
- Do not use an impact wrench while removing or installing the A/F sensor.

Installation is in the reverse order of removal.

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



CKP SENSOR

REMOVAL/INSTALLATION

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

Remove the CKP sensor bolt [2], CKP sensor [3], and O-ring [4].

Installation is in the reverse order of removal.

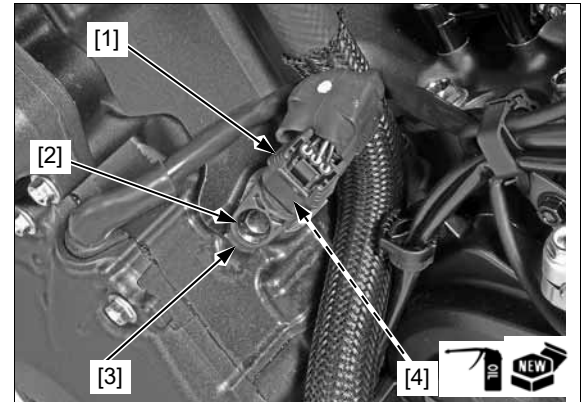
TORQUE:

CKP sensor bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:

- Replace the O-ring with a new one.
- Apply engine oil to a new O-ring.
- After installing, perform the crank pulse initialize learning procedure (page 4-69)(ED, II ED, KO, III KO models only).



CRANK PULSE LEARNING (ED, II ED, KO, III KO models only)

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 4-5).
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.

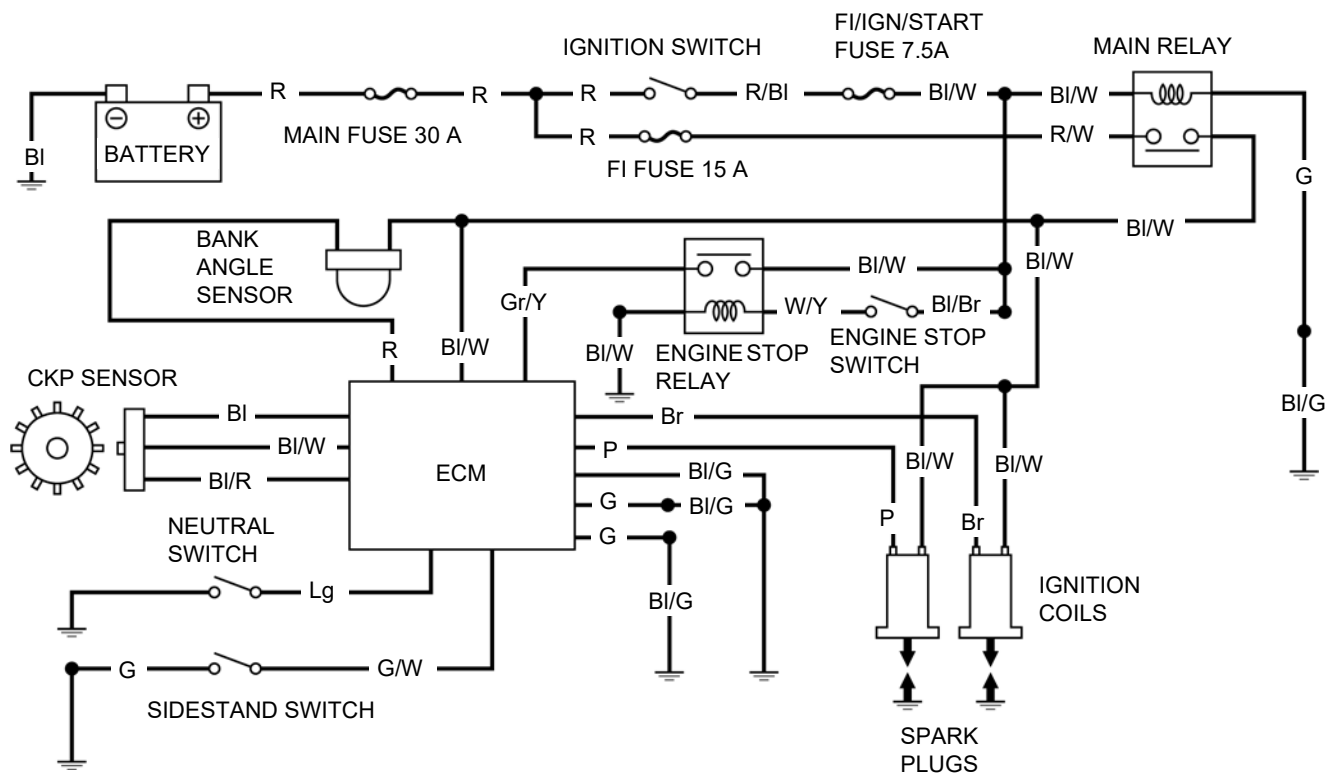
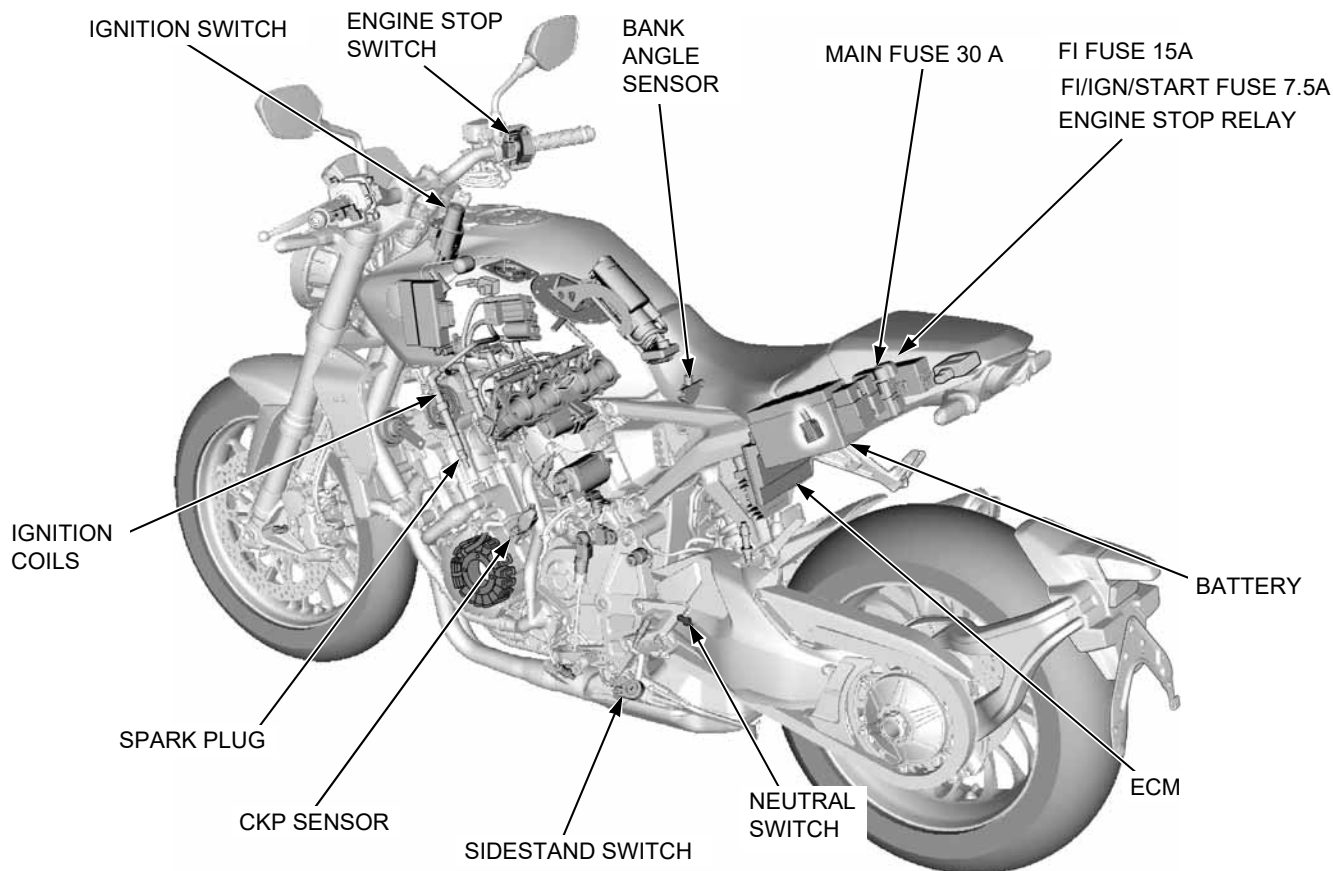
NOTE:

- If the crank pulse learning procedure is unsuccessful, perform the learning procedure from step 1 again.

SYSTEM DIAGRAM	5-2	IGNITION SYSTEM INSPECTION	5-5
SERVICE INFORMATION.....	5-3	IGNITION COIL	5-6
TROUBLESHOOTING	5-3	IGNITION TIMING	5-7

IGNITION SYSTEM

SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

NOTICE

- *The ECM may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn off the ignition switch before servicing.*
- *Use spark plug of the correct heat range. Using spark plug with an incorrect heat range can damage the engine.*
- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.
- When servicing the ignition system, always follow the steps in the troubleshooting sequence (page 5-3).
- The ignition timing does not normally need to be adjusted since the ECM is factory preset.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding.
Make sure the battery is adequately charged.
- Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plug.
- For PGM-FI troubleshooting information (page 4-4).
- The following components information
 - Ignition switch (page 21-17)
 - Engine stop switch (page 21-21)
 - Engine stop relay (page 21-26)
 - Sidestand switch (page 21-24)
 - Neutral switch (page 21-24)
 - ECM (page 4-58)

TROUBLESHOOTING

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

IGNITION SYSTEM

No spark at all plugs

Unusual condition		Probable cause (Check in numerical order)
Ignition coil primary voltage	No initial voltage with the ignition ON and engine stop switch turned "Q" (other electrical components are normal).	1. Faulty engine stop relay. 2. An open circuit in Black/white wire between the ignition coil and engine stop relay. 3. Loose or poor connect of the ignition coil connectors, or an open circuit in primary coil (Check at the ECM connector). 4. Faulty ECM (in case when the initial voltage is normal while disconnecting ECM connectors).
	Initial voltage is normal, but it drops down to 2 – 4 V while cranking the engine.	1. Incorrect peak voltage adaptor connections. 2. Undercharged battery. 3. No voltage between the Black/white (+) and body ground (–) at the ECM connector or loosen ECM connection. 4. An open circuit or loose connection in Green wire. 5. An open circuit or loose connection in Pink or Brown wires between the ignition coils and ECM. 6. Short circuit in ignition primary coil. 7. Faulty sidestand switch or neutral switch. 8. An open circuit or loose connection in No.7 related circuit wires. – Sidestand switch line: Green/white or Green wire – Neutral switch line: Light green wires 9. Faulty CKP sensor (measure the peak voltage). 10. Faulty ECM (in case when above No. 1 - 9 are normal).
	Initial voltage is normal, but no peak voltage while cranking the engine.	1. Faulty peak voltage adaptor connections. 2. Faulty peak voltage adaptor. 3. Faulty CKP sensor (Measure the peak voltage). 4. Faulty ECM (in case when above No. 1- 3 are normal).
	Initial voltage is normal, but peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Faulty CKP sensor (Measure the peak voltage). 3. Cranking speed is too low (battery under charged). 4. 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). 5. Faulty ECM (in case when above No. 1 – 4 are normal).
	Initial and peak voltage are normal, but does not spark.	1. Faulty spark plug or leaking ignition coil secondary current ampere. 2. Faulty ignition coil (s). 3. Faulty engine stop relay or related circuit 4. Faulty engine stop switch or related circuit
CKP sensor	Peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too low (battery 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 – 3 are normal).
	No peak voltage.	1. Faulty peak voltage adaptor. 2. Faulty CKP sensor.

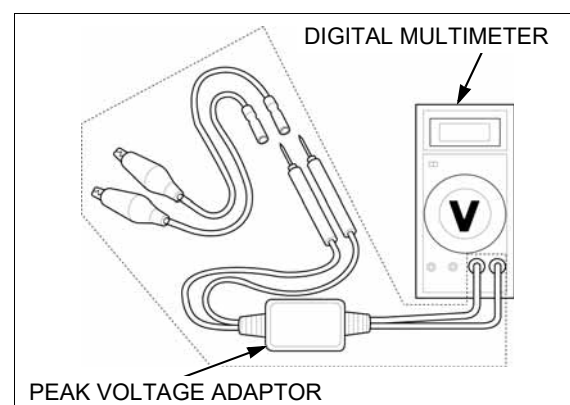
IGNITION SYSTEM INSPECTION

- If there is no spark at any plug, check all connections for loose or poor contact before measuring each peak voltage.
- Use the recommended digital multimeter or commercially available digital multimeter with an impedance of 10 M Ω /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If the Imrie diagnostic tester (model 625) is used, follow the manufacturer's instruction.

Connect the peak voltage tester or peak voltage adaptor to the digital multimeter.

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

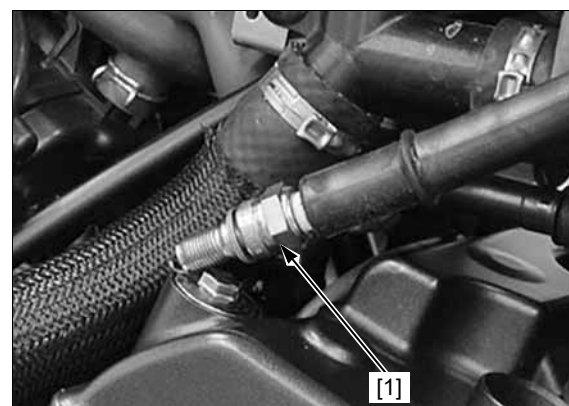
- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that the spark plugs are installed correctly.

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

Disconnect the spark plug caps from the spark plugs.

Shift the transmission into neutral.

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



With the ignition coil primary wire connected, connect the peak voltage adaptor [1] or peak voltage tester to the ignition coil primary wire terminals [2].

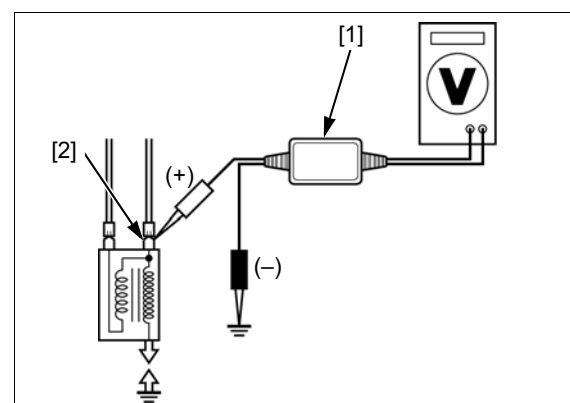
CONNECTION:

#1/#4 coil:

Brown (+) - body ground (-)

#2/#3 coil:

Pink (+) - body ground (-)



Turn the ignition switch ON and engine stop switch "O".
Check for initial voltage at this time.
The battery voltage should be measured.
If the initial voltage cannot be measured, check the power supply circuit (refer to the troubleshooting, page 5-3).

PEAK VOLTAGE: 100 V minimum

ENGINE STOP SWITCH SIGNAL LINE

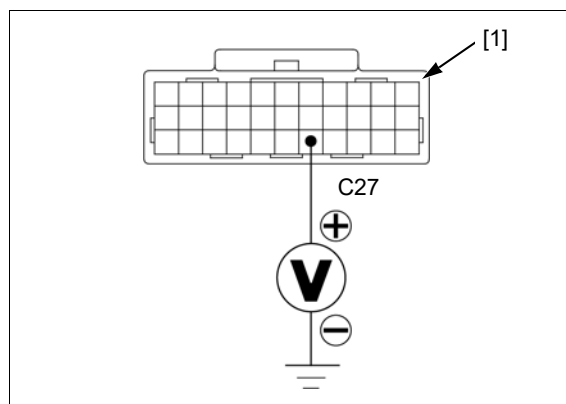
TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION: C27 (+) – Ground (–)

If there is no voltage, check the following:

- Open circuit in the Gray/yellow or Black/white wire between the ECM and FI/IGN/START fuse 7.5A
- Engine stop relay (page 21-26)
- Engine stop switch (page 21-21)
- Open circuit in the White/yellow, Black/brown or Black/white wire between the engine stop relay and FI/IGN/START fuse 7.5A
- Open circuit in the Green wire between the engine stop relay and ground

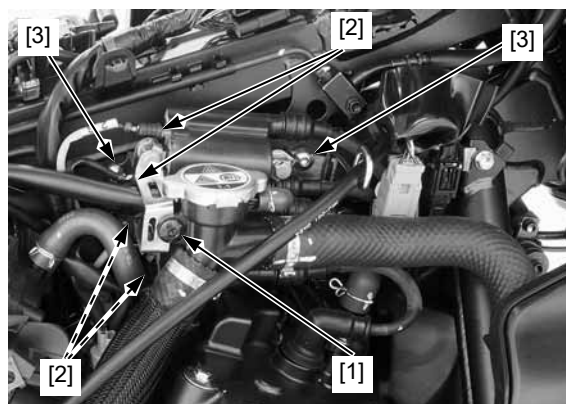


REMOVAL/INSTALLATION

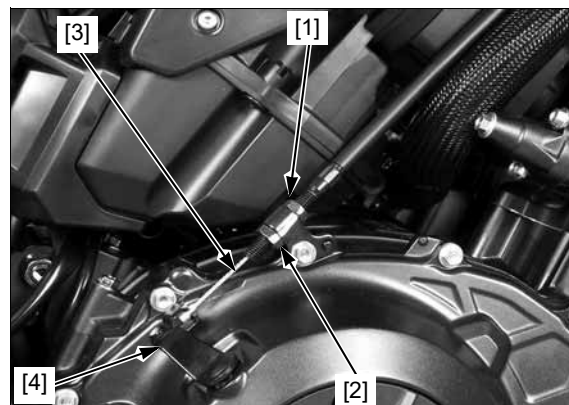
Remove the socket bolt [1].

Remove the two socket bolts [3] and ignition coil stay.

Disconnect the spark plug caps from the spark plugs (page 3-7).



Loosen the lock nut [1] and the adjusting nut [2].
Disconnect the clutch cable [3] end from the clutch lifter lever [4].



Remove the following:

- Bolts [1]
- Stay [2]
- Ignition coils [3]
- Ignition coil mount stay [4]

*Route the spark
plug wires properly
(page 1-24).*

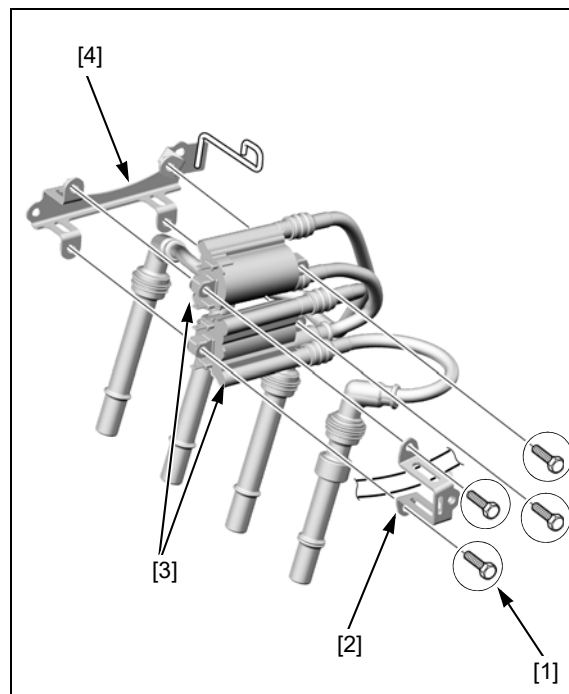
Installation is in the reverse order of removal.

TORQUE:

Ignition coil mounting bolt:
1.0 N·m (0.1 kgf·m, 1 lbf·ft)

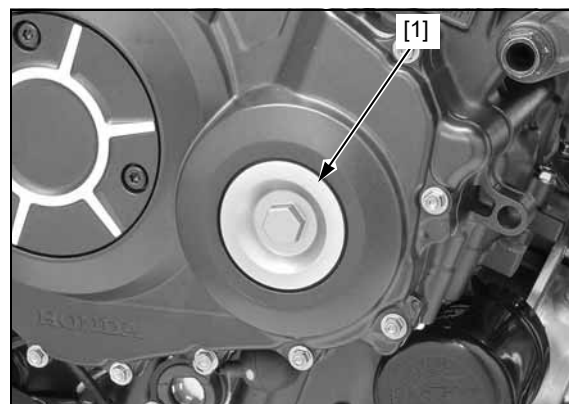
NOTE:

- Adjust the clutch lever freeplay (page 3-24).



IGNITION TIMING

Warm up the engine.
Stop the engine and remove the timing hole cap [1].



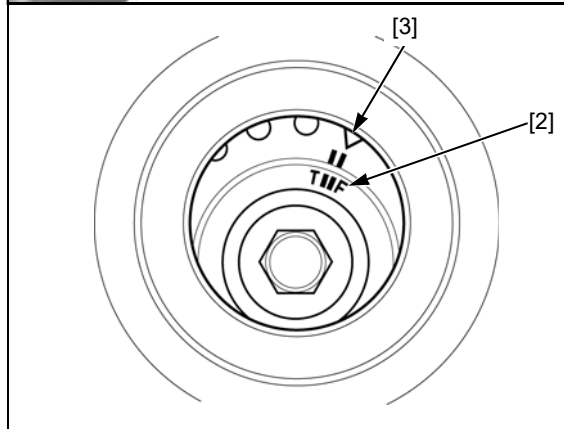
IGNITION SYSTEM

Read the instructions for timing light operation.

Connect the timing light [1] to the No.1 spark plug wire.
Start the engine and let it idle.

IDLE SPEED: 1,200 min⁻¹(rpm)

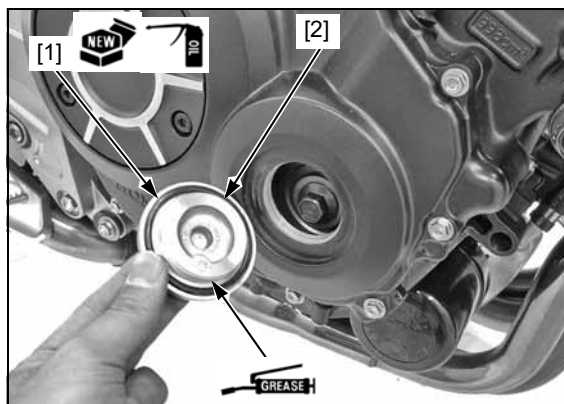
The ignition timing is correct if the "F" mark [2] on the CKP sensor rotor aligns with the index notch [3] on the right crankcase cover at idle.



Coat new O-rings [1] with engine oil and install them onto the timing hole cap [2].
Apply grease to the hole cap threads and install them.

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

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



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

SERVICE INFORMATION

GENERAL

NOTICE

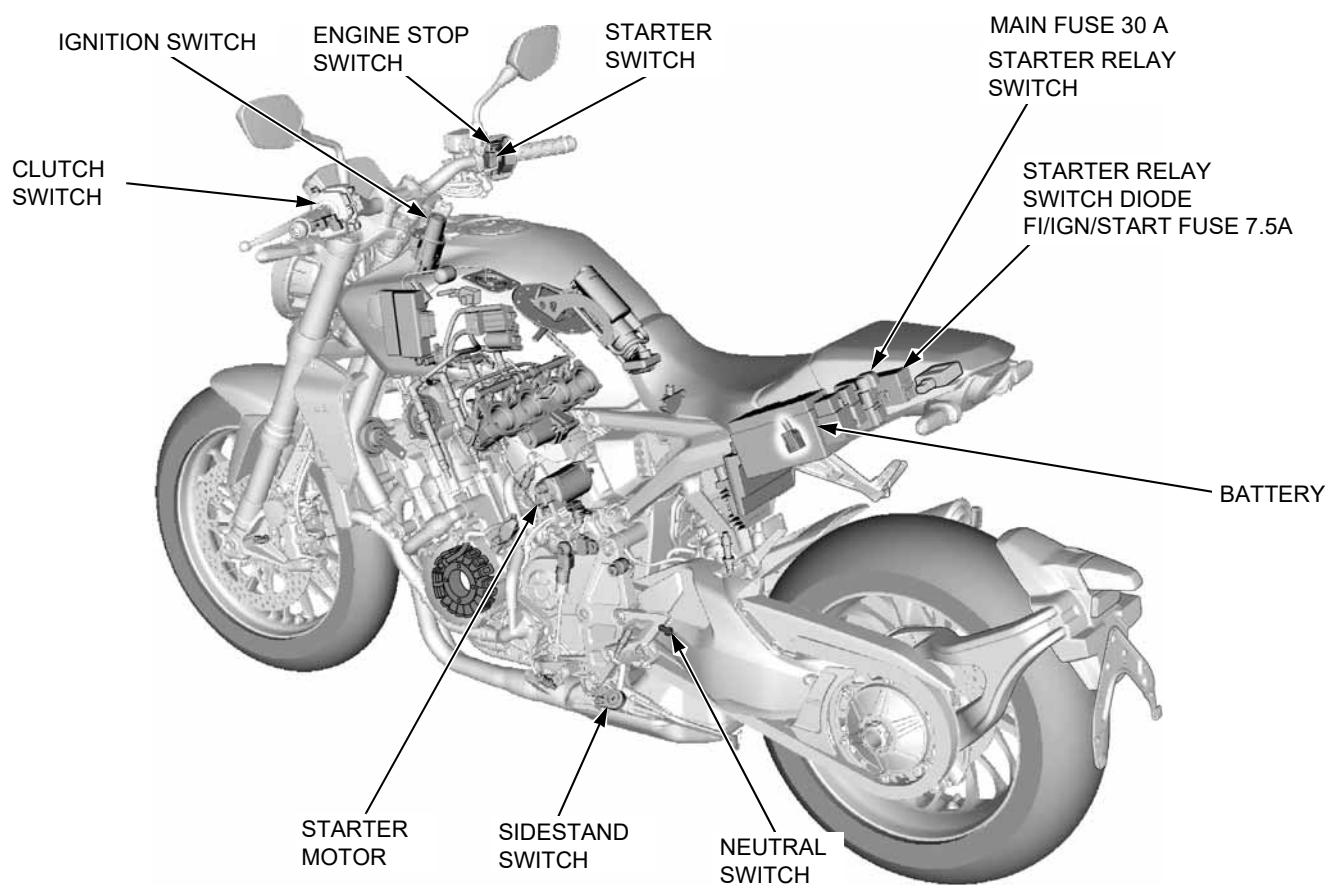
If current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.

- Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.
- The starter motor can be serviced with the engine in the frame.
- When checking the starter system, always follow the steps in the troubleshooting flow chart (page 6-2).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- For the starter clutch servicing (page 11-16).
- Refer to the following components information.
 - Ignition switch (page 21-17)
 - Starter switch (page 21-21)
 - Neutral switch (page 21-24)
 - Sidestand switch (page 21-24)
 - Clutch switch (page 21-23)

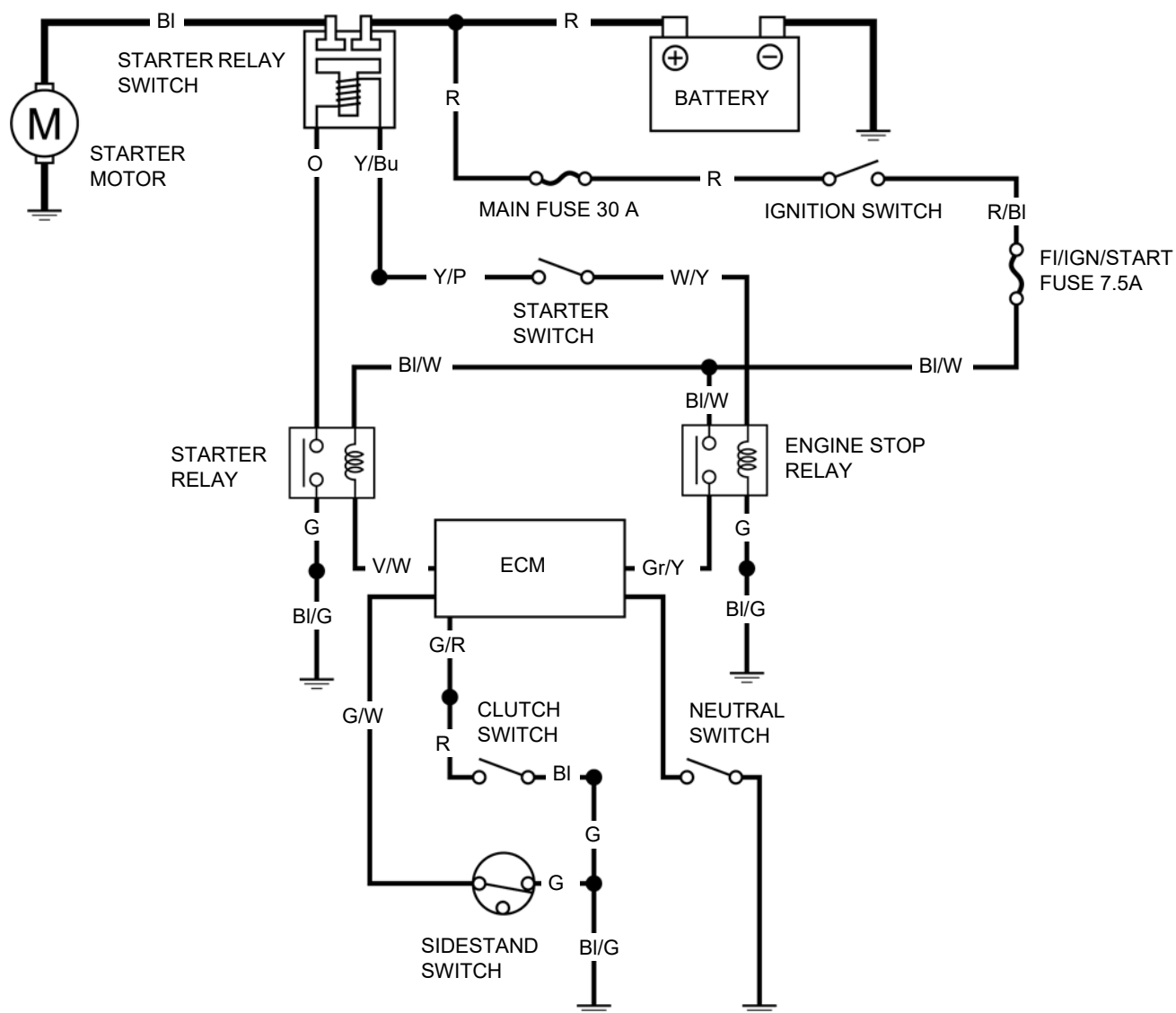
TROUBLESHOOTING

Unusual condition		Probable cause (Check in numerical order)
Starter motor	Starter motor does not turn	1. Loose or poor contact on related connectors and terminals 2. Blown fuse 3. Weak battery 4. Faulty starter relay switch 5. Faulty starter motor 6. Loose connection, open or short circuit in starter motor cable 7. Faulty starter switch 8. Open circuit in starter relay switch ground circuit 9. Faulty starter relay 10. Open or short circuit in starter relay switch power circuit 11. Loose contact or open circuit in related wires
	Starter motor does not turn when the transmission is in any gear with the sidestand retracted and clutch lever pulled in	1. Loose or poor contact on related connectors and terminals 2. Faulty diode 3. Faulty clutch switch 4. Faulty sidestand switch 5. Loose contact or open circuit in related wires
	Starter motor does not turn when the transmission is in neutral with the sidestand lowered and clutch lever released	1. Loose or poor contact on related connectors and terminals 2. Faulty diode 3. Faulty neutral switch 4. Loose contact or open circuit in related wires
	Starter motor turns slowly	1. Low battery voltage 2. Poorly connected battery terminal cable 3. Poorly connected starter motor cable 4. Faulty starter motor 5. Poorly connected battery ground cable
	Starter motor turns, but engine does not turn	1. Starter motor is running backwards – Case assembled improperly – Terminals connected improperly 2. Faulty starter clutch 3. Damaged or faulty starter idle gear and/or reduction gear
	Starter relay switch "Clicks", but engine does not turn over	1. Crankshaft does not turn due to engine problems

SYSTEM DIAGRAM



ELECTRIC STARTER



STARTER MOTOR

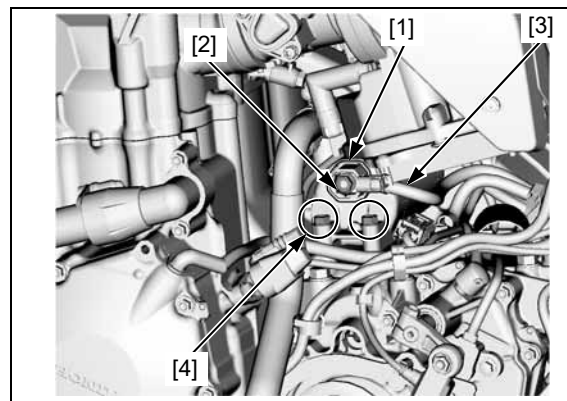
REMOVAL/INSTALLATION

- With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.

Remove the air cleaner lower housing (page 3-5)

Remove the rubber cap [1], then remove the terminal nut [2] and starter motor cable [3] from the starter motor.

Remove the bolts [4] and pull the starter motor out of the crankcase.



Remove the O-ring [1] from the starter motor.

Installation is in the reverse order of removal.

NOTE:

- Replace the O-ring with a new one.
- Apply engine oil to the new O-ring.

TORQUE:

Terminal nut:

12 N·m (1.2 kgf·m, 9 lbf·ft)

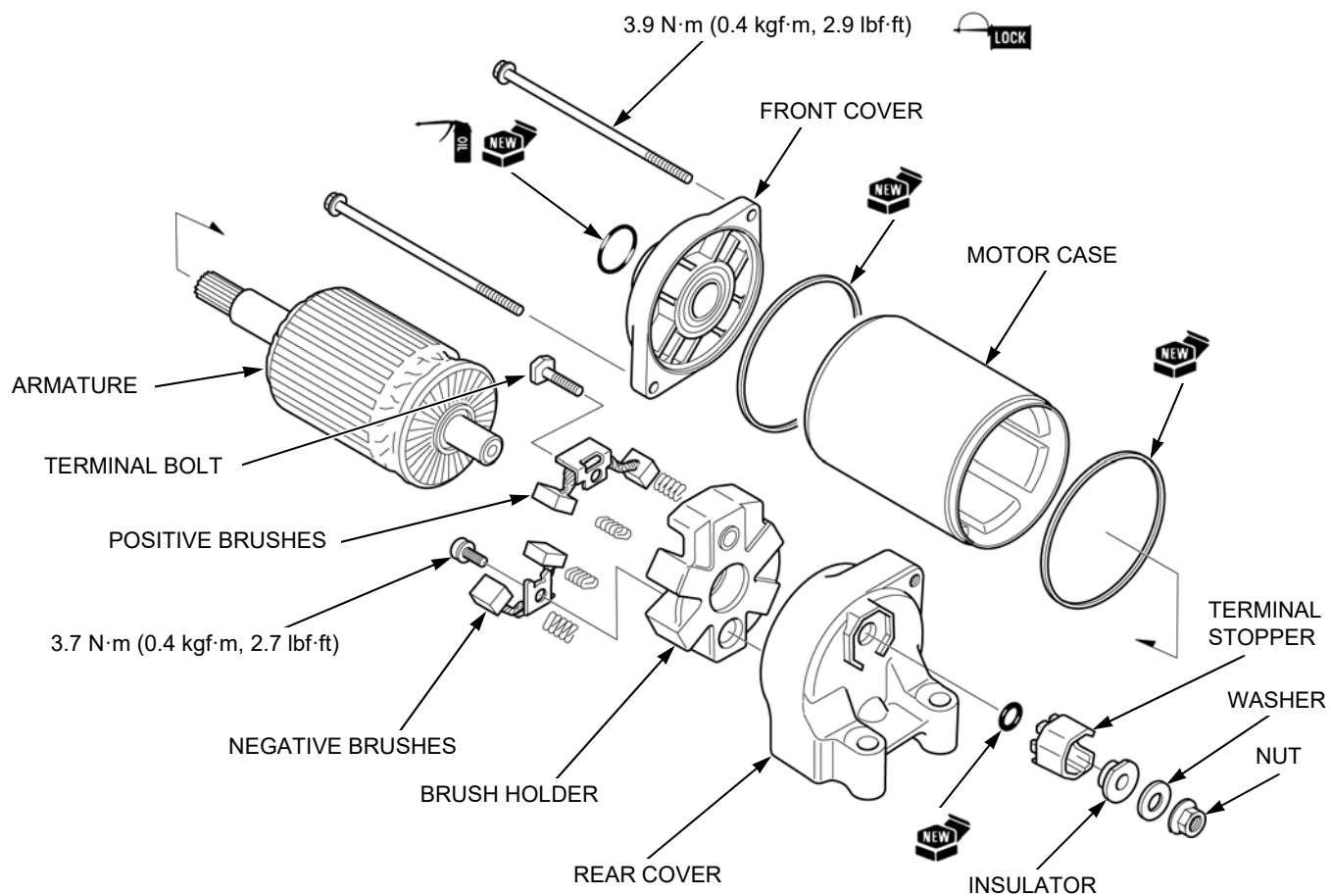


ELECTRIC STARTER

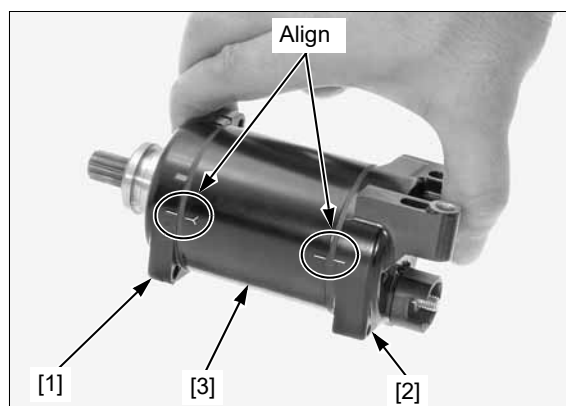
DISASSEMBLY/ASSEMBLY

NOTICE

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



When installing the front cover [1] and rear cover [2] onto the motor case [3], align the lines as shown.



INSPECTION

FRONT COVER

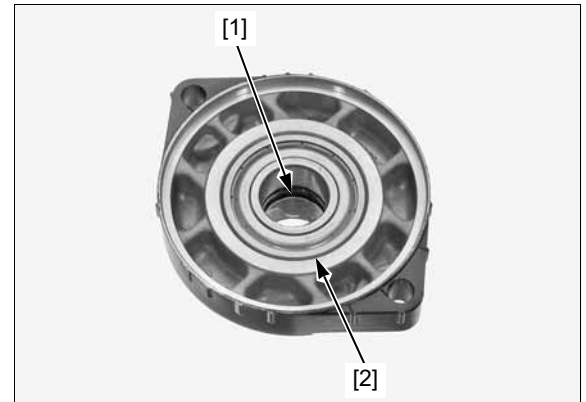
Check the oil seal [1] in the front cover for deterioration, wear, or damage.

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

The bearing should turn smoothly and quietly.

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

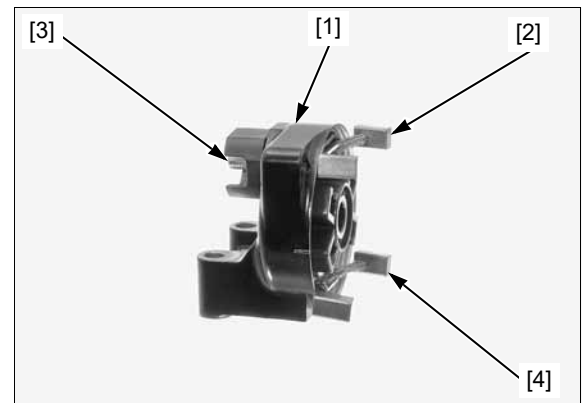
Replace the starter motor as an assembly if necessary.



REAR COVER

Check for continuity or no continuity for each part of rear cover [1] as below:

- Between the positive brush [2] and cable terminal [3]: should be continuity.
- Between the cable terminal and the rear cover: should be no continuity.
- Between the positive brush and rear cover: should be no continuity.
- Between positive brush and negative brush [4]: should be no continuity.



ARMATURE

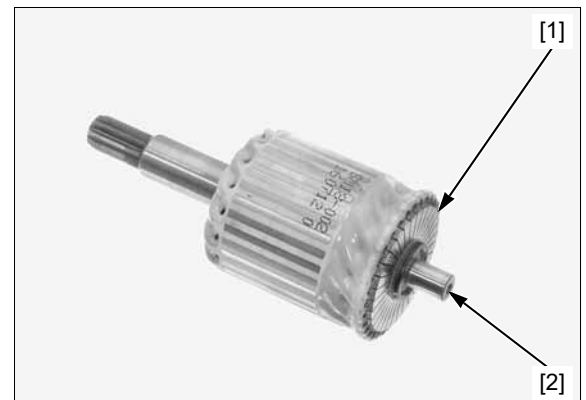
Clean the metallic debris off the commutator bars [1].

Check the commutator bars for discoloration.

Check for continuity on the armature as below:

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

Replace the starter motor as an assembly if necessary.



STARTER RELAY SWITCH

REMOVAL/INSTALLATION

Remove the main seat (page 2-4).

Turn the ignition switch OFF.

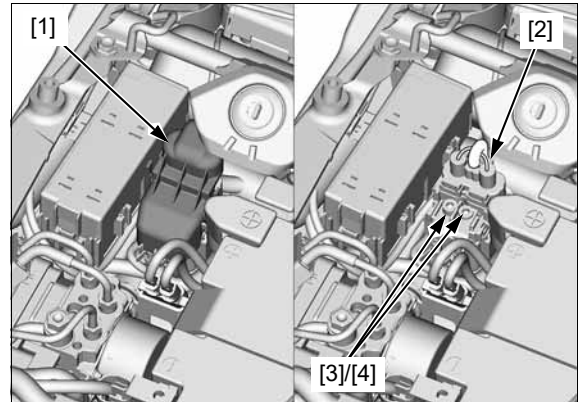
Remove the starter relay switch cover [1].

Disconnect the battery negative (–) cable (page 20-5).
Disconnect the starter relay switch 4P (Black) connector [2].

Remove the bolts [3] and disconnect the starter relay switch wires [4].

Remove the starter relay switch.

Installation is in the reverse order of removal.



INSPECTION

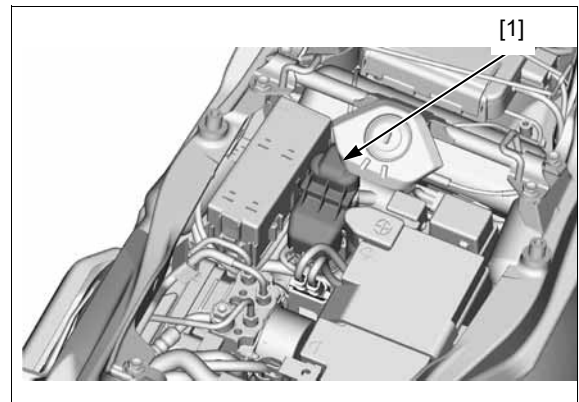
Remove the main seat (page 2-4).

Shift the transmission into neutral.

Turn the ignition switch ON and press the starter switch button.

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

If you don't hear the switch "CLICK", inspect the relay switch using the procedure below.

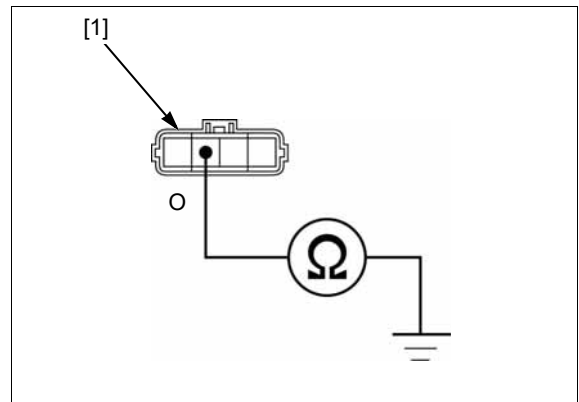


GROUND LINE INSPECTION

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

Check for continuity between the Orange terminal (ground line) and ground.

If there is continuity when the transmission is in neutral and clutch lever released or when the clutch lever pulled and the sidestand up, the ground circuit is normal (In neutral, there is a slight resistance due to the diode).



INPUT LINE INSPECTION

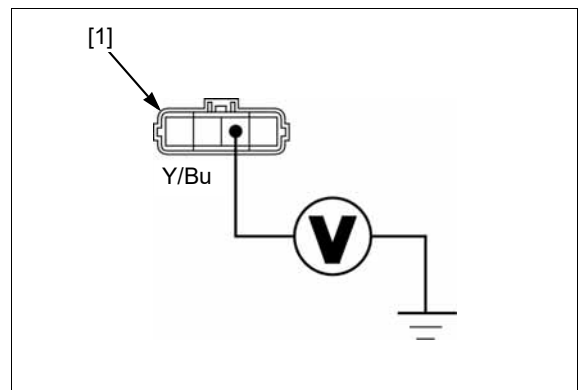
Measure the voltage between the Yellow/Blue terminal (input line) and ground.

Turn the ignition switch ON and press the starter switch button.

There should be battery voltage.

If there is no battery voltage, inspect the following:

- Main fuse (30 A)
- FI/IGN/START fuse (7.5 A), FI fuse (15 A)
- Ignition switch (page 21-17)
- Starter switch (page 21-21)
- Open circuit in related wire



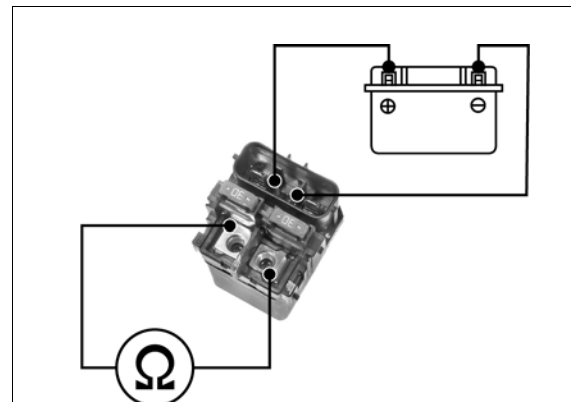
CONTINUITY INSPECTION

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

Connect an ohmmeter to the starter relay switch large terminals.

Connect a fully charged 12 V battery positive (+) wire to the starter relay switch Yellow/Blue terminal and negative (-) wire to the Orange terminal.

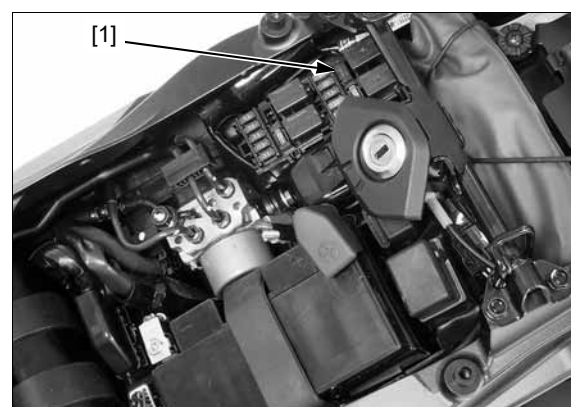
There should be continuity between the large terminals while the battery is connected, and no continuity when the battery is disconnected.

**DIODE****REMOVAL/INSTALLATION**

Remove the main seat (page 2-4).

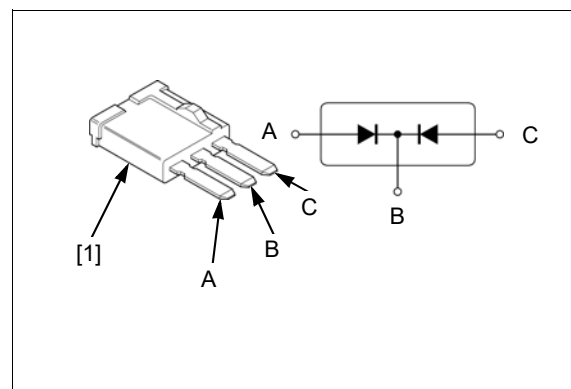
Open the fuse/relay box and remove the diodes [1].

Installation is in the reverse order of removal.

**INSPECTION**

Check for continuity between the diode [1] terminals. When there is continuity, a small resistance value will register.

If there is continuity in one direction, the diode is normal.



MEMO

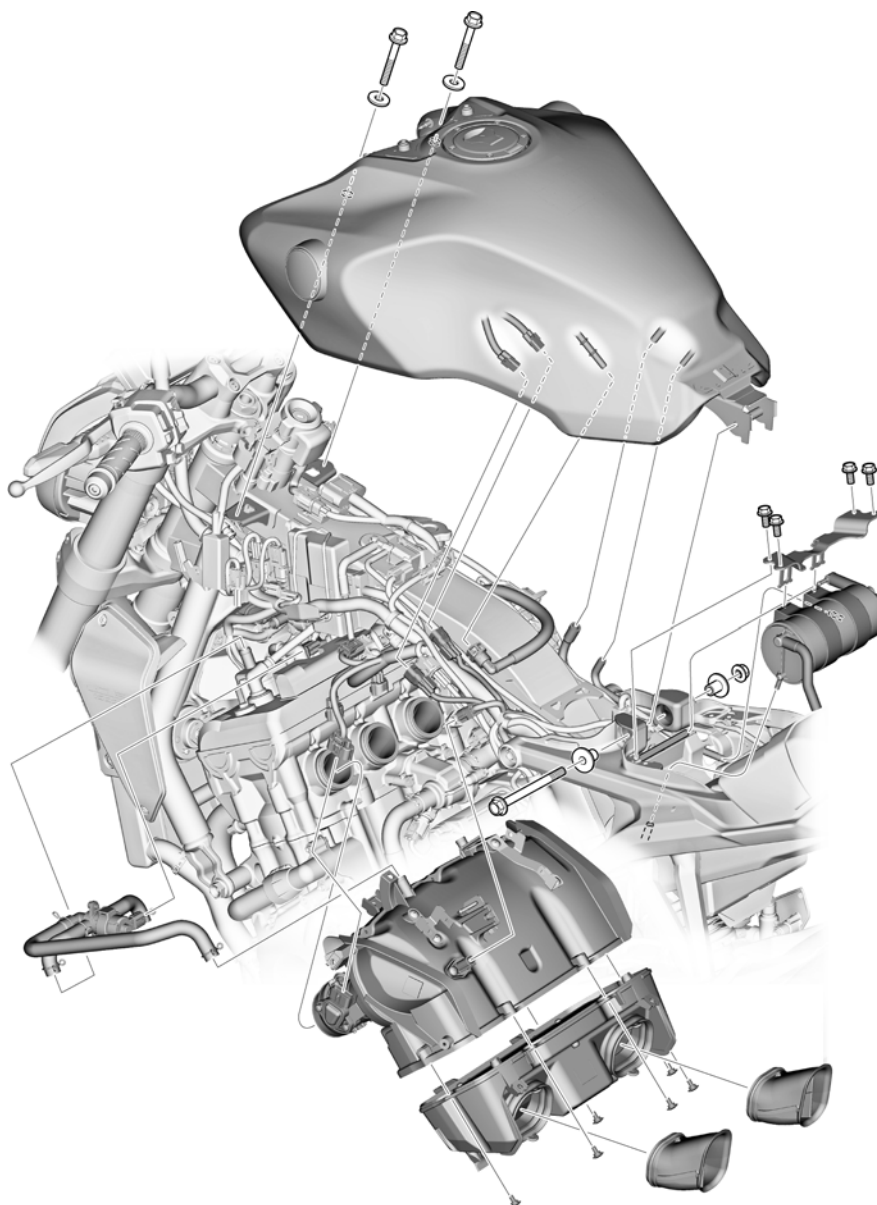
SERVICE INFORMATION.....	7-2	AIR CLEANER HOUSING	7-9
COMPONENT LOCATION.....	7-2	THROTTLE BODY	7-14
FUEL LINE INSPECTION	7-3	INJECTOR.....	7-15
FUEL TANK.....	7-6	SECONDARY AIR SUPPLY SYSTEM.....	7-16
FUEL PUMP UNIT.....	7-7	EVAP.....	7-18

SERVICE INFORMATION

GENERAL

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- Before disconnecting the fuel feed hose, relieve fuel pressure from the system (page 7-3).
- Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of motorcycle control.
- Do not snap the throttle valve from full open to full close. It may cause incorrect idle operation.
- Seal the intake ports with tape or a clean cloth to keep dirt and debris from entering the engine after the throttle body or fuel rail 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 compressed air if necessary.
- Do not loosen or tighten the white painted nuts and screws of the throttle body. Loosening or tightening them can cause throttle valve and idle control failure.
- The parts of the throttle body not shown in this manual should not be disassembled.
- For fuel level sensor inspection (page 21-16)

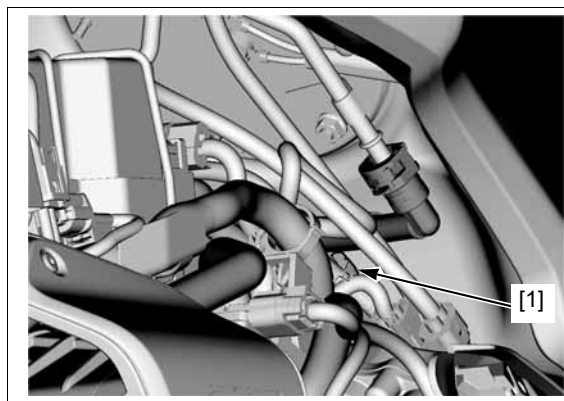
COMPONENT LOCATION



FUEL LINE INSPECTION

FUEL PRESSURE RELIEVING

- Before disconnecting the fuel hose, relieve pressure from the system as follows.
1. Turn the ignition switch OFF.
Lift and support the fuel tank (page 3-4).
 2. Disconnect the fuel pump 2P (Black) connector [1].
 3. Start the engine, and let it idle until the engine stalls.
 4. Turn the ignition switch OFF.



QUICK CONNECT FITTING REMOVAL/INSTALLATION

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.

Relieve the fuel pressure (page 7-3).

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

Push the retainer tab [1] forward.

Press down the retainer [2] and disconnect the connector [3] from the fuel pump joint.

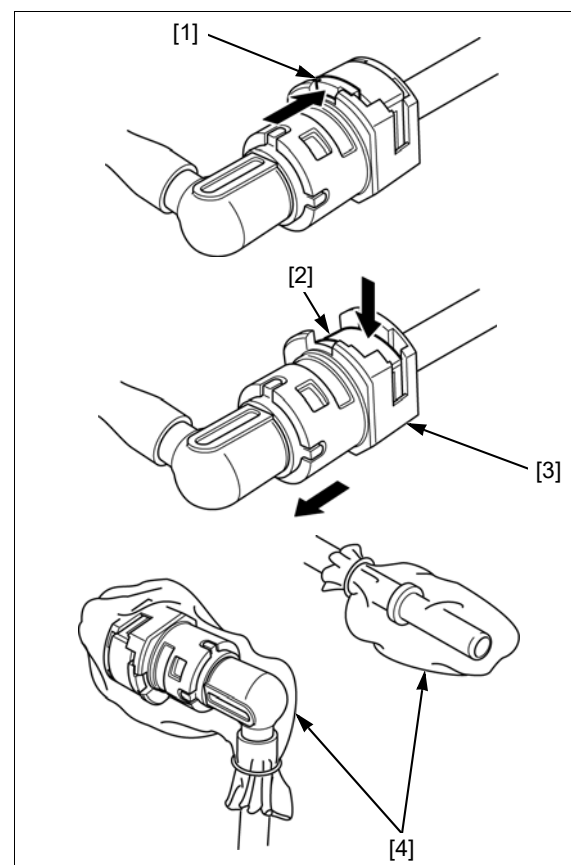
NOTE:

- Check the retainer condition and replace it if necessary.
- To prevent damage and keep foreign matter out, cover the disconnected connector and pipe end with the plastic bags [4].

Press the connector onto the fuel pump joint until the retainer locks with a “CLICK”. If it is hard to connect, put a small amount of engine oil on the pipe end.

Make sure the connection is secure; check visually and by pulling the connector.

Normalize the fuel pressure (page 7-4).

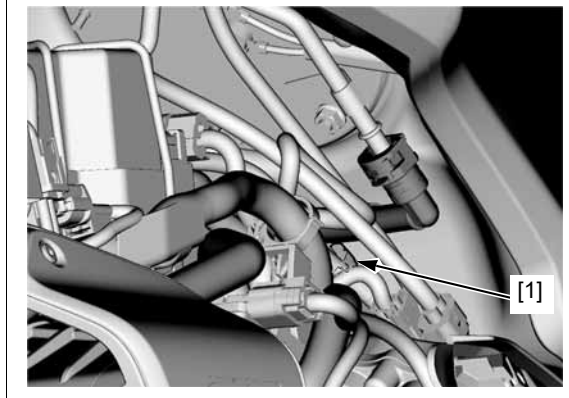


FUEL PRESSURE NORMALIZATION

1. Connect the fuel pump unit 2P (Black) connector [1].
Connect the battery negative (–) cable (page 20-5).
2. Turn the ignition switch ON and engine stop switch "O".
The fuel pump will run for about 2 seconds and fuel pressure will rise.

NOTE:

- Do not start the engine.
3. Turn the ignition switch OFF.
 4. Repeat 2 or 3 times, and check that there is no leakage in the fuel supply system.
 5. Remove the support and close the fuel tank (page 3-4).



FUEL PRESSURE TEST

Relieve the fuel pressure (page 7-3).
Disconnect the quick connect fitting (fuel pump side) (page 7-3).

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

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 battery negative (–) cable and fuel pump unit 2P (Black) connector.
Start the engine and let it idle.
Read the fuel pressure.

Standard:

343 kPa (3.5 kgf/cm², 50 psi)

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

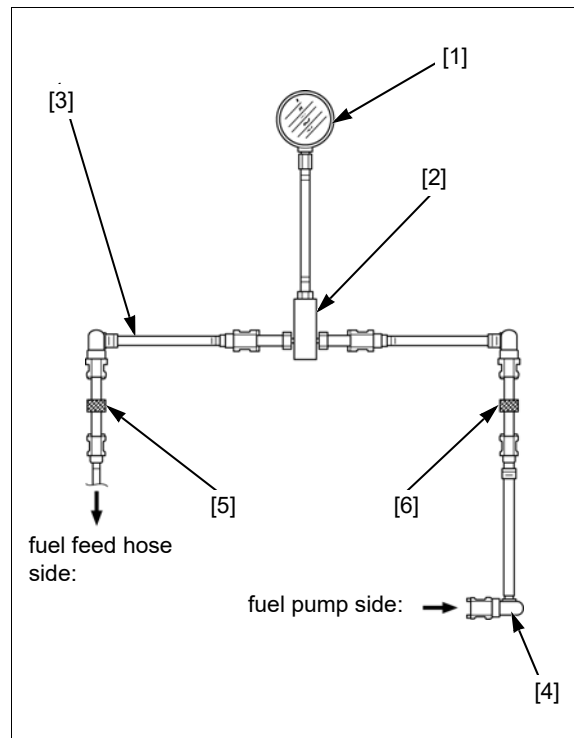
If the fuel pressure is lower than specified, inspect the following:

- Fuel line leaking
- Pinched or clogged fuel hose or fuel tank breather hose
- Fuel pump unit (page 7-7)

After inspection, relieve the fuel pressure (page 7-3).

Remove the special tools.

Connect the quick connect fitting (page 7-3).



FUEL FLOW INSPECTION

NOTE:

- Check the fuel tank breather hose for bends or pinches when the fuel tank is lifted.

Disconnect the quick connect fitting from the fuel tank.(page 7-3)

Wipe off spilled out gasoline.

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

Temporarily connect the battery negative (–) cable.

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

The fuel pump operates for 2 seconds. Repeat 5 times to meet the total measuring time.

NOTE:

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

Measure the amount of fuel flow.

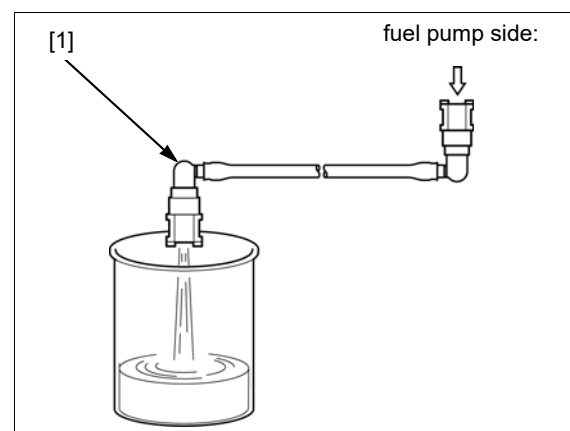
Amount of fuel flow:

**393 cm³ (13.3 US oz, 13.8 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 for pinch or clogs
- fuel filter (in fuel pump) for clogs
- fuel pump (page 7-7)

Connect the quick connect fitting (page 7-3).



FUEL TANK

REMOVAL/INSTALLATION

Relieve the fuel pressure (page 7-3) and disconnect the quick connect fitting from the fuel tank.

Remove the following:

- Bolts [1]
- Washers [2]
- Collars [3]
- Mounting bolt [4]
- Collars [5]
- Nut [6]

Disconnect the following:

- Fuel pump 2P (Black) connector [7]
- Fuel reserve sensor 2P connector [8]
- Fuel tank drain hose [9]
- EVAP canister hose [10]

Remove the fuel tank.

Route the hoses, wires and harness properly (page 1-24).

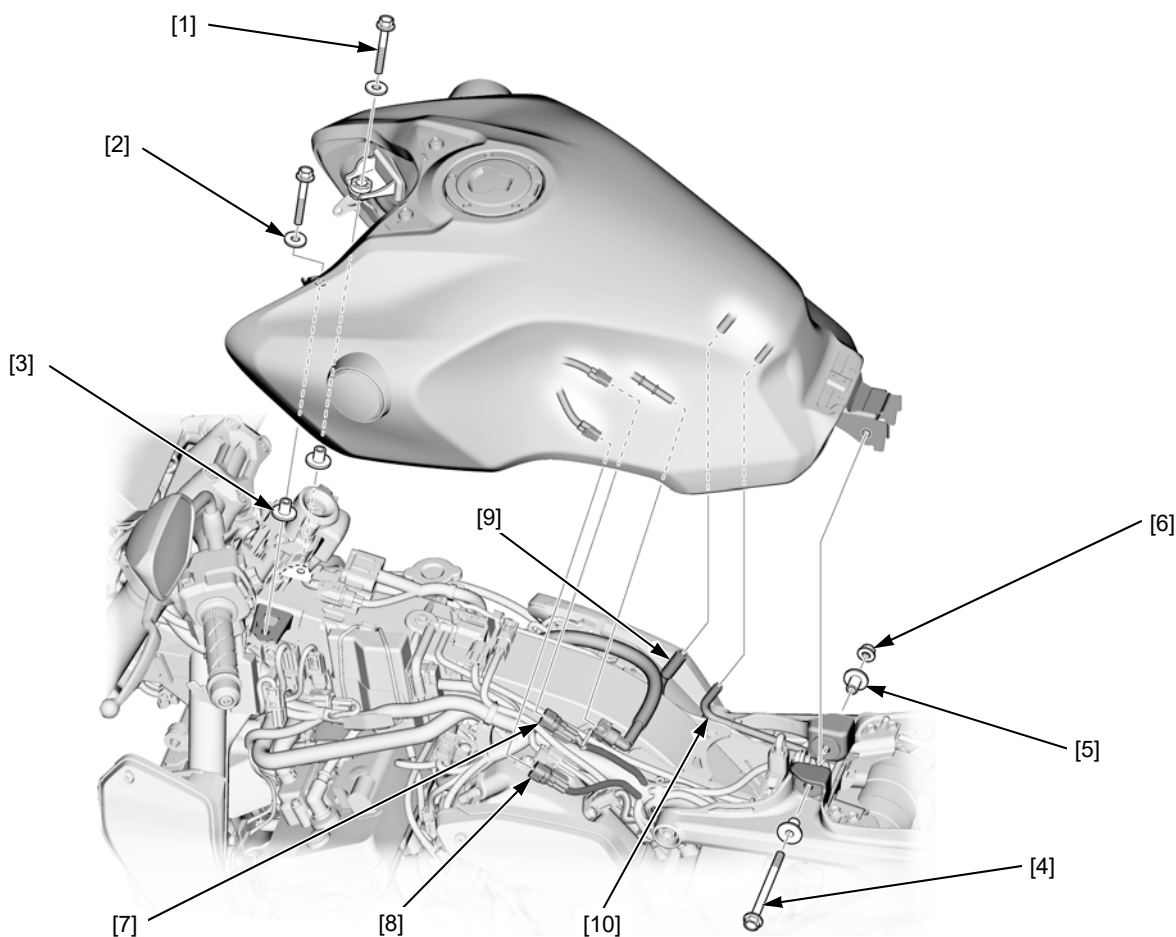
Install the fuel tank in the reverse order of removal.

Connect the quick connect fitting (page 7-3).

TORQUE:

Fuel tank mounting nut:

10 N·m (1.0 kgf·m, 7 lbf·ft)



Installation is in the reverse order of removal.

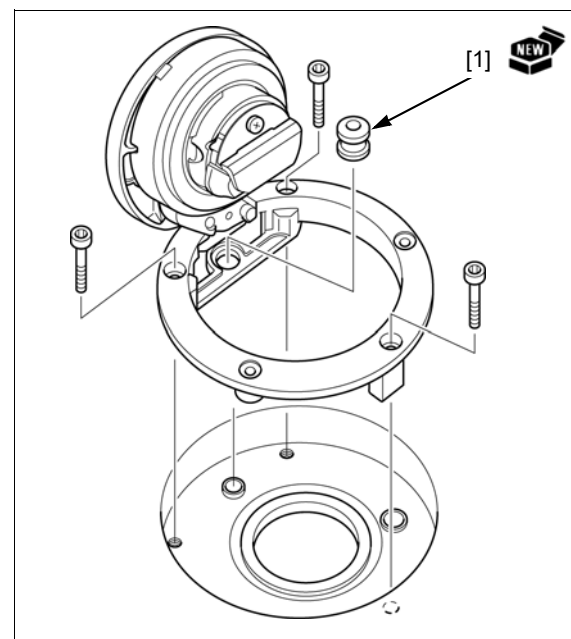
NOTE:

- 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.
- If the fuel filler cap was removed, replace the breather seal [1] with a new one.
- Route the hoses, wires and harness properly.
- Be careful not to damage the harness and hose.
- After installing the fuel tank, make sure the drain, breather hose and fuel hoses are not kinked or bound.

TORQUE:

Fuel filler cap bolt:

1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)



FUEL PUMP UNIT

INSPECTION

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

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

Turn the ignition switch OFF.

Disconnect the fuel pump unit 2P (Black) connector (page 7-7).

Turn the ignition switch ON.

Measure the voltage at the wire harness side 2P (Black) connector [1].

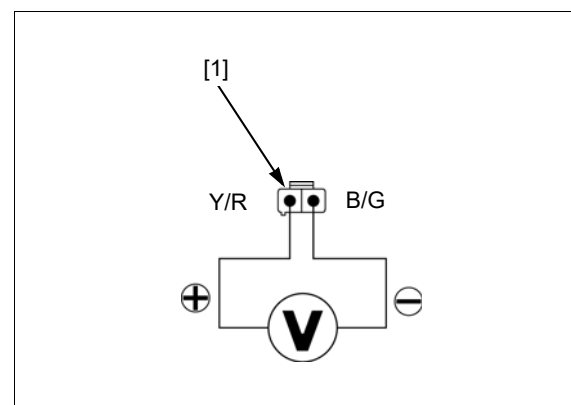
CONNECTION: Yellow/Red (+) – Black/Green (–)

There should be battery voltage for a few seconds.

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

If there is no battery voltage, inspect the following:

- Fuel pump relay
- Fuel pump relay related circuit
- Open circuit in the Yellow/Red or Black/Green wire
- ECM power/ground line (page 4-59)



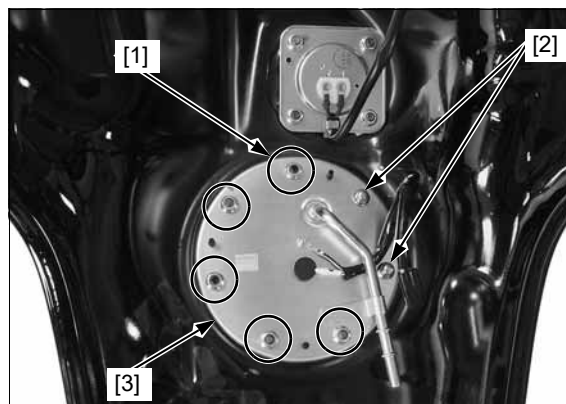
FUEL SYSTEM

REMOVAL

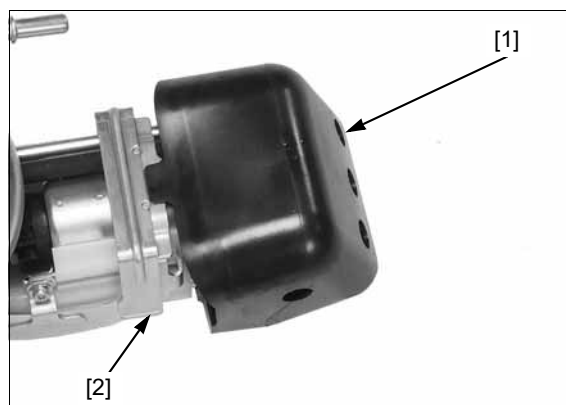
Remove the fuel tank (page 7-6).

Be careful not to damage the pump wire.

Remove the fuel pump unit mounting nuts [1], cap nuts [2] and fuel pump unit [3].



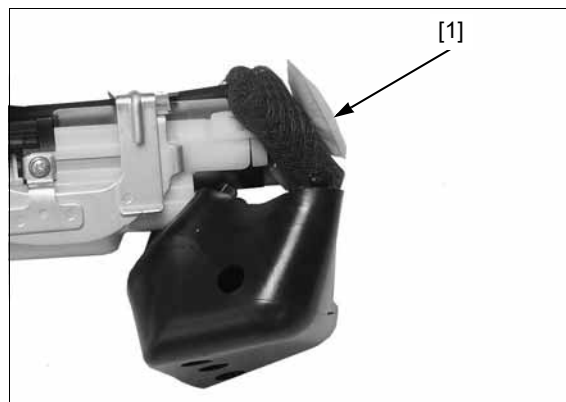
Remove the fuel pump chamber [1] from fuel pump unit [2].



INSPECTION

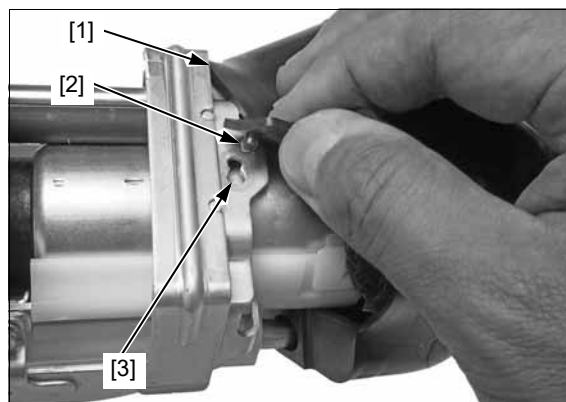
Check the fuel pump unit for wear or damage, replace it if necessary.

Clean the fuel strainer screen [1] with non-flammable or high flash point solvent.



INSTALLATION

Install the fuel pump chamber [1], hooking its tab [2] to the hole [3] of fuel pump unit.

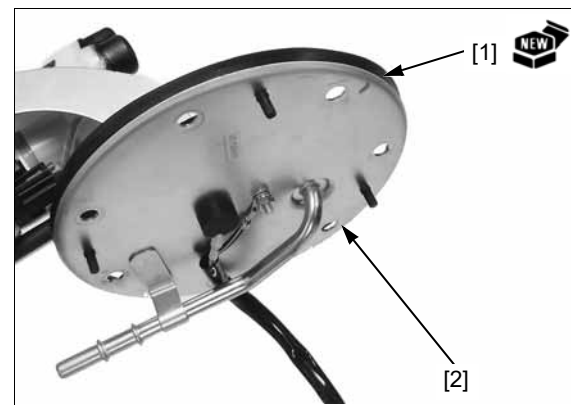


Always replace the packing with a new one.

Be careful not to damage the pump wire.

Place a new packing [1] onto the fuel pump unit [2].

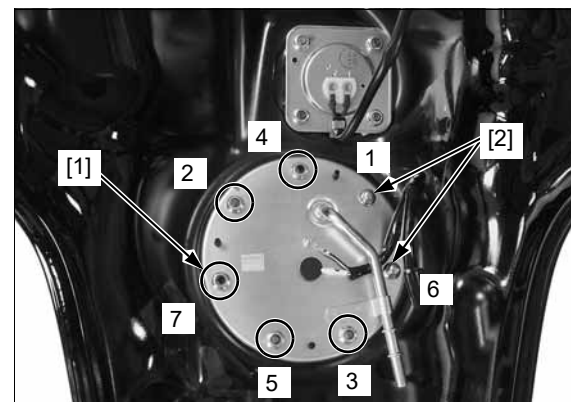
Install the fuel pump unit into the fuel tank.



Install the fuel pump mounting nuts [1] and cap nuts [2]. Tighten the nuts in the specified sequence as shown.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the fuel tank (page 7-6).

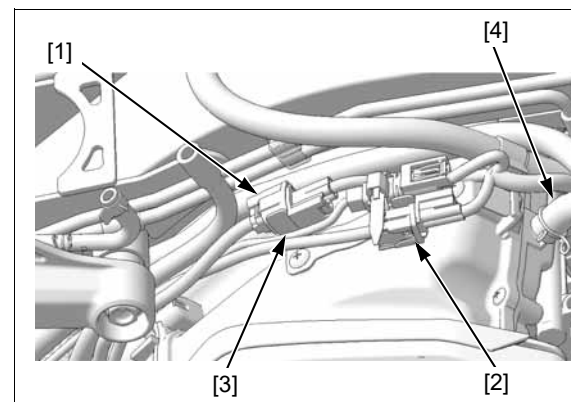


AIR CLEANER HOUSING

REMOVAL/INSTALLATION

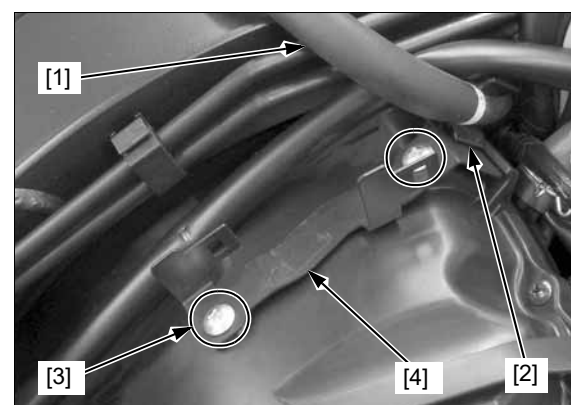
Remove the following:

- Fuel tank (page 7-6)
- Air cleaner lower housing (page 3-5)
- A/F sensor 4P (Black) connector [1]
- Rear brake light switch 2P (Black) connector [2].
- Rear wheel speed sensor 2P (Gray) connector [3]
- Breather hose [4]



Release the fuel feed hose [1] from the clip [2].

Remove the screws [3] and harness mount stay [4].



FUEL SYSTEM

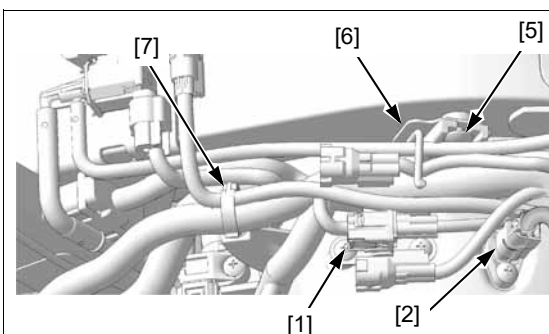
Release A/F sensor 4P (Black) connector [1] from the harness mount stay.

Disconnect the following:

- IAT sensor 2P (Black) connector [2]
- MAP sensor 3P (Black) connector [3]

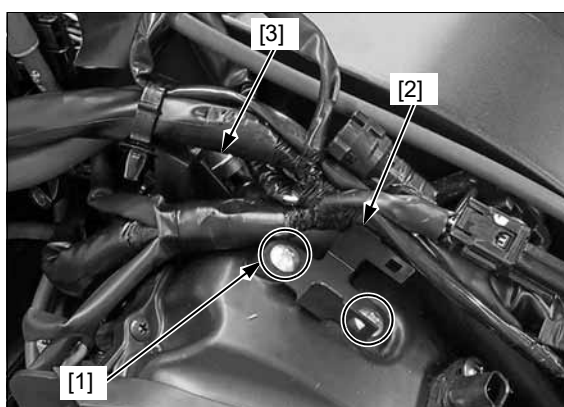
Remove the following:

- MAP sensor mount screw [4]
- Socket bolt [5]
- Harness clamber stay [6]
- Harness clamber clip [7]



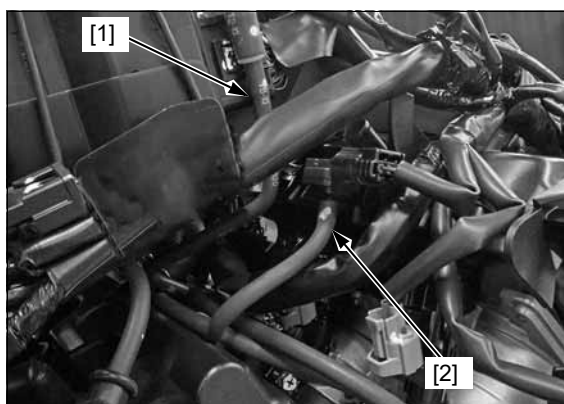
Remove the tapping screws [1] and harness mount stay [2].

Disconnect the Pair air suction hose [3].

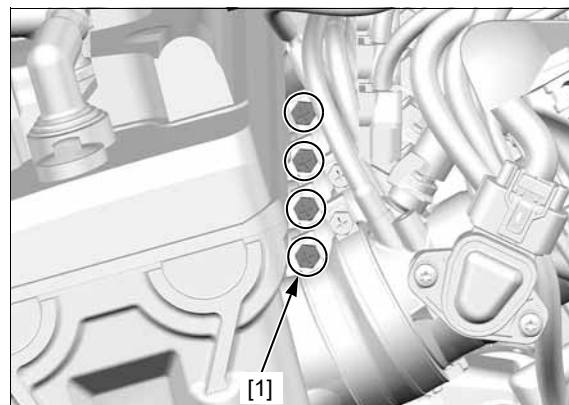


Disconnect the following:

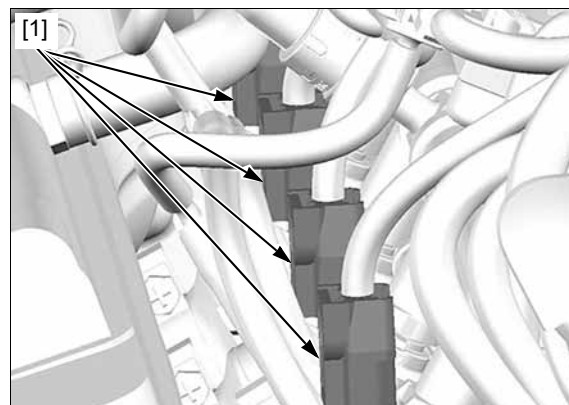
- EVAP purge control solenoid valve-to-throttle body hose [1] (EVAP purge control solenoid valve side)
- MAP sensor-to-throttle body hose [2] (MAP sensor side)



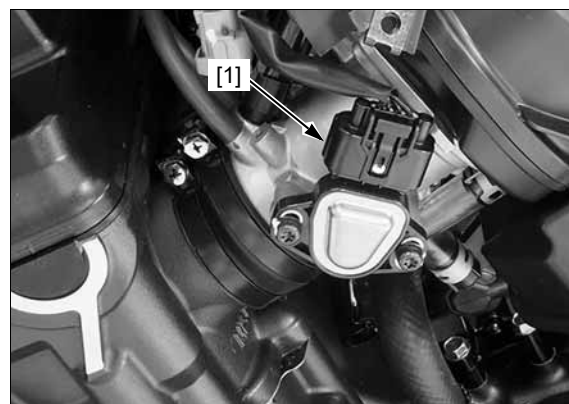
Loosen the throttle body insulator band screws [1] (cylinder head side).



Disconnect the injector 2P (Black) connectors [1].

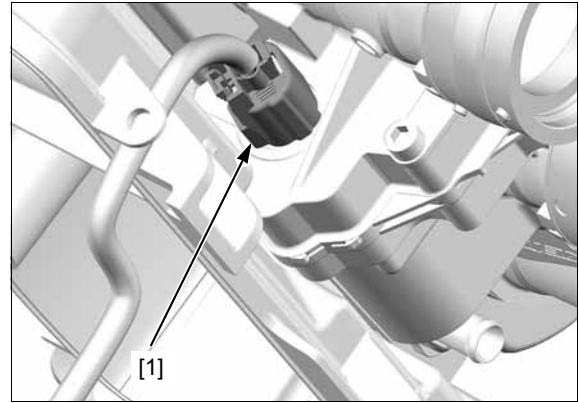


Disconnect the TP sensor 6P (Black) connector [1].
Pull out the air cleaner housing with the throttle body to the left side.



FUEL SYSTEM

Disconnect the TBW sensor 3P (Black) connector [1] from the air cleaner housing.



Installation is in the reverse order of removal.

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

TORQUE:

Harness mount stay screw:

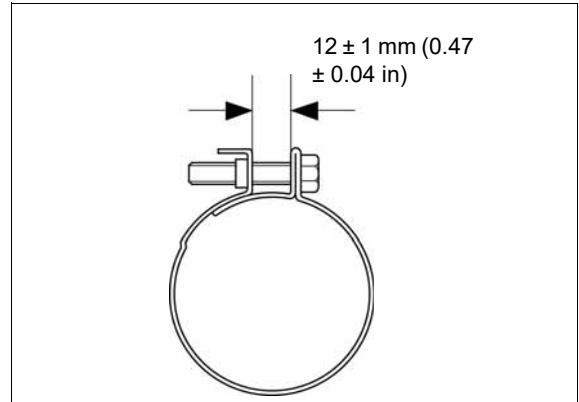
1.1 N·m (0.1 kgf·m, 1 lbf·ft)

Harness clamper stay bolt:

1.0 N·m (0.1 kgf·m, 1 lbf·ft)

MAP sensor mount screw:

1.1 N·m (0.1 kgf·m, 1 lbf·ft)



DISASSEMBLY/ASSEMBLY

Remove the map sensor (page 4-66)

Disassemble and assemble the air cleaner housing as shown in the following illustration.

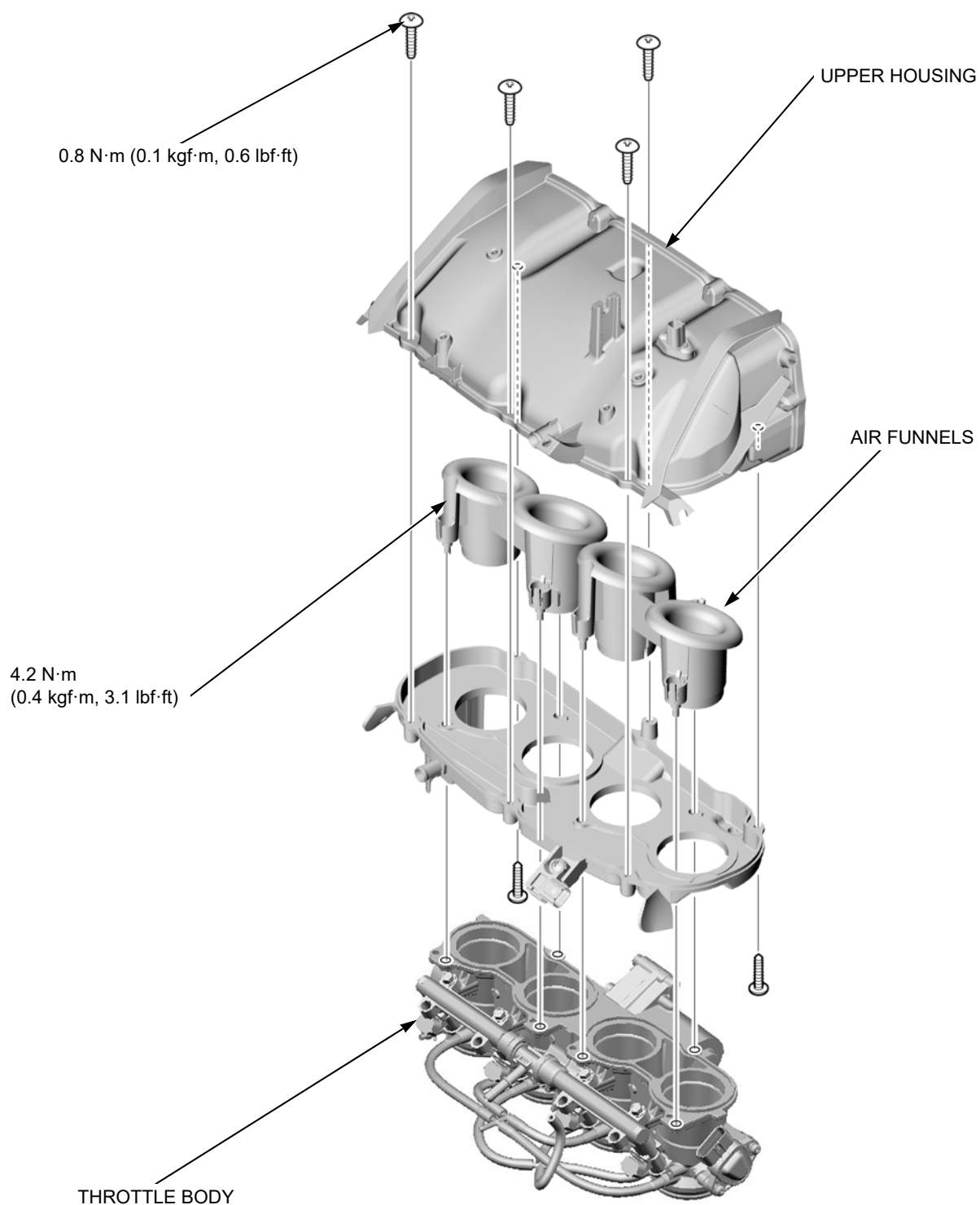
TORQUE:

Air cleaner housing screw:

0.8 N·m (0.1 kgf·m, 0.6 lbf·ft)

Air funnel screw:

4.2 N·m (0.4 kgf·m, 3.1 lbf·ft)



THROTTLE BODY

REMOVAL

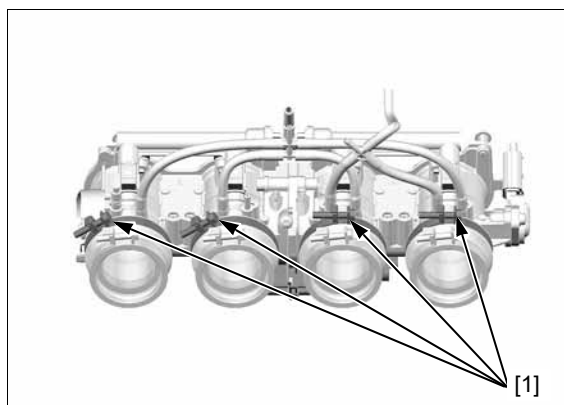
Remove the throttle body from the air cleaner housing (page 7-9)

Loosen the insulator band screws [1] and remove the insulators.

NOTE:

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

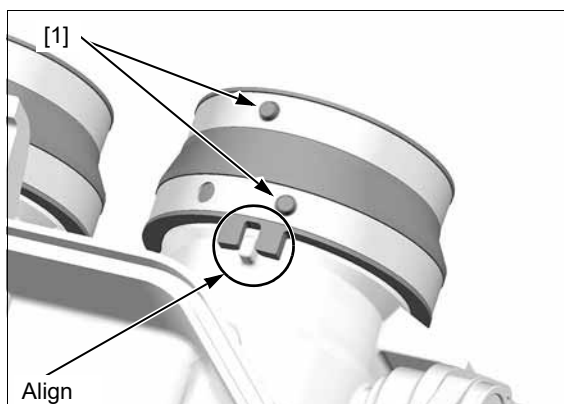
- Do not loosen or tighten the painted white bolts, nut and screws of the throttle body. Loosening or tightening them can cause throttle valve failure.
- The throttle body is factory pre-set. Do not disassemble.
- Do not loosen or tighten the bolts and screws of the throttle body. Loosening or tightening them can cause throttle valve and idle control failure.



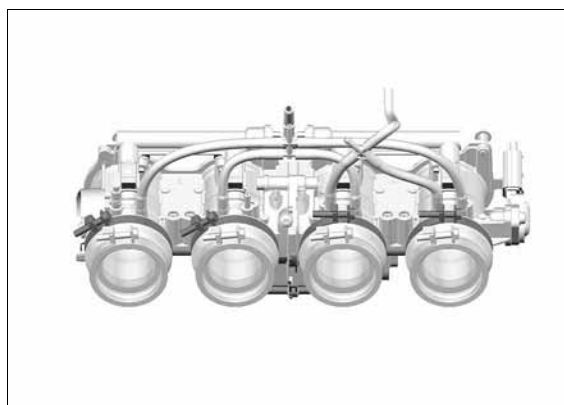
INSTALLATION

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

Align the hole on each insulator band with the boss [1] on the insulator.



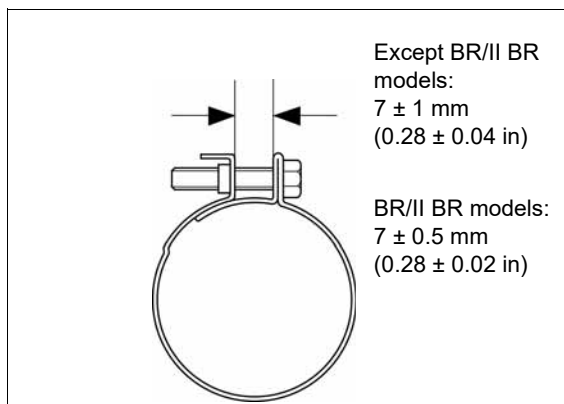
Before installing the throttle body, make sure the insulator band's screws are positioned correctly, as shown in the illustration.



Except BR/ II BR: Tighten the throttle body side insulator band screws so that the width between the band ends is 7 ± 1 mm (0.28 ± 0.04 in).

BR/ II BR: Tighten the throttle body side insulator band screws so that the width between the band ends is 7 ± 0.5 mm (0.28 ± 0.02 in).

Install the throttle body onto the air cleaner housing (page 7-13).



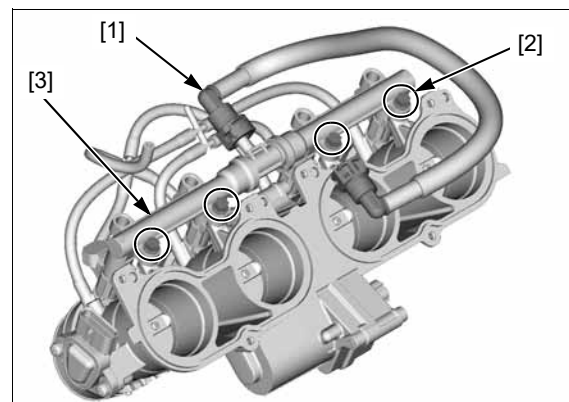
INJECTOR

REMOVAL/INSTALLATION

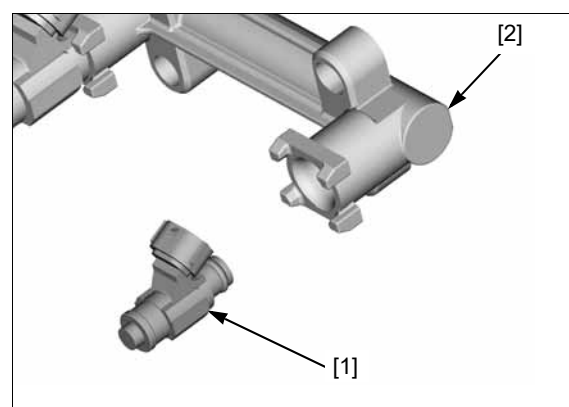
Remove the throttle body (page 7-14).

Disconnect the quick connect fitting [1] (page 7-3).

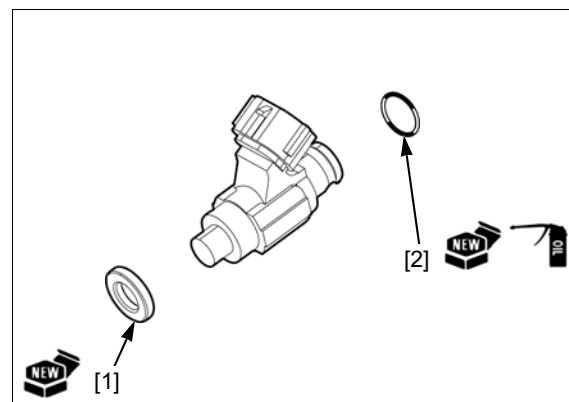
Remove the bolts [2] and fuel rail assembly [3].



Remove the injectors [1] from the fuel rail [2].



Remove the seal ring [1] and O-ring [2].



Remove the fuel rails [1] and O-rings [2] from the fuel rail joint [3].

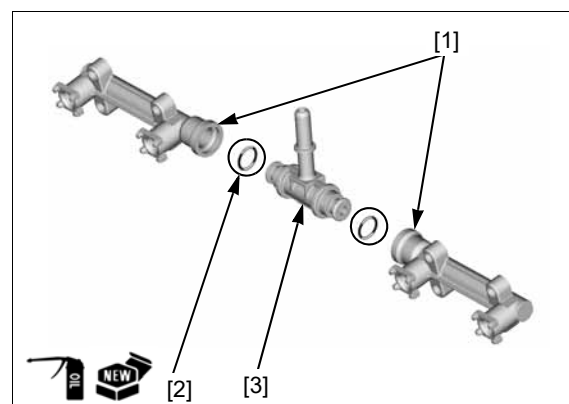
Installation is in the reverse order of removal.

NOTE:

- Apply oil to new O-rings and install them.

TORQUE:

Fuel rail mounting bolts:
5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)



SECONDARY AIR SUPPLY SYSTEM

SYSTEM INSPECTION

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

Stop the engine.

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

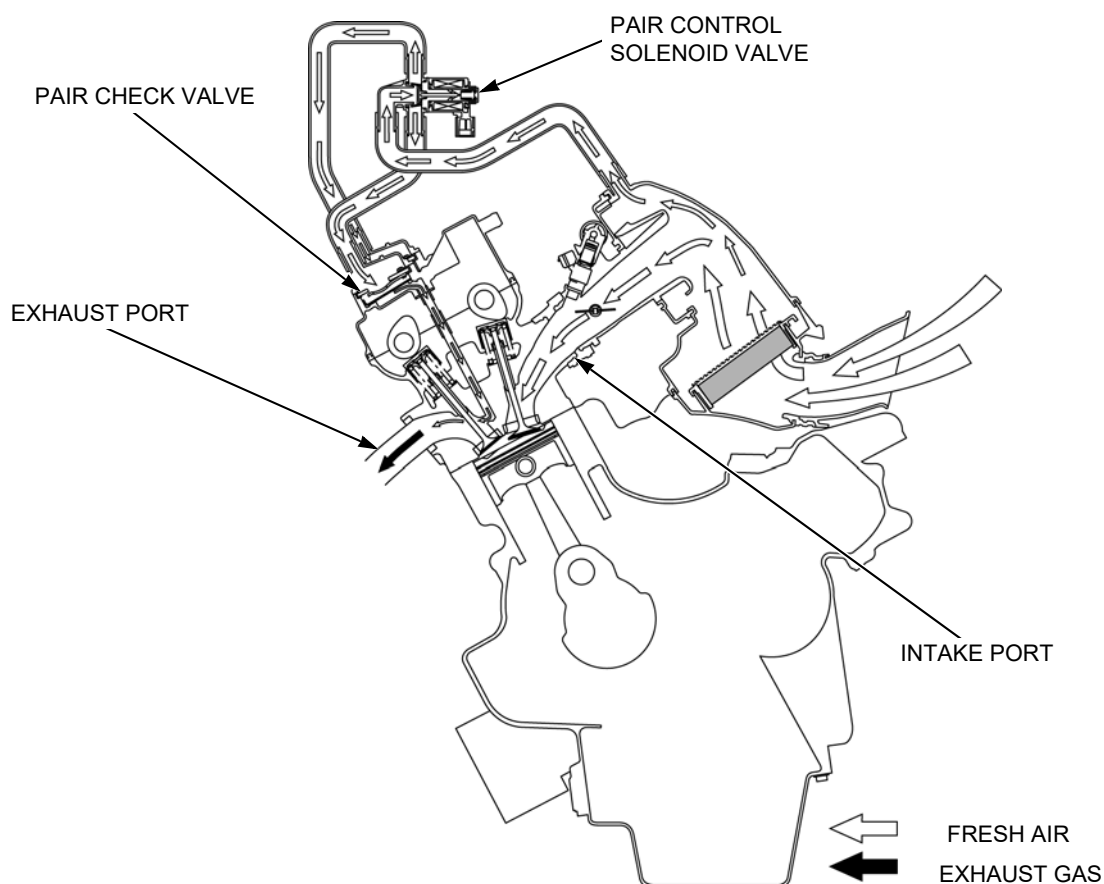
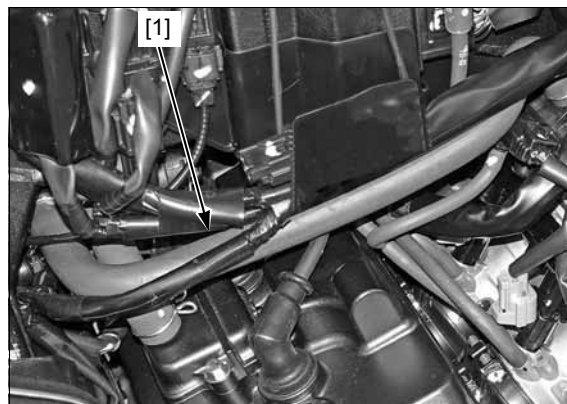
Disconnect the air supply hose [1] from the air cleaner housing.

Check that the secondary air intake port is clean and free of carbon deposits.

Check the PAIR check valves if the port is carbon fouled (page 7-17).

Start the engine and open the throttle slightly to be certain that air is sucked in through the air intake port.

If the air is not drawn in, check the air suction hoses for clogs and PAIR control solenoid valve.



PAIR CONTROL SOLENOID VALVE

REMOVAL/INSTALLATION

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

Remove the radiator mounting bolt (without disconnecting the hoses) (page 8-8).

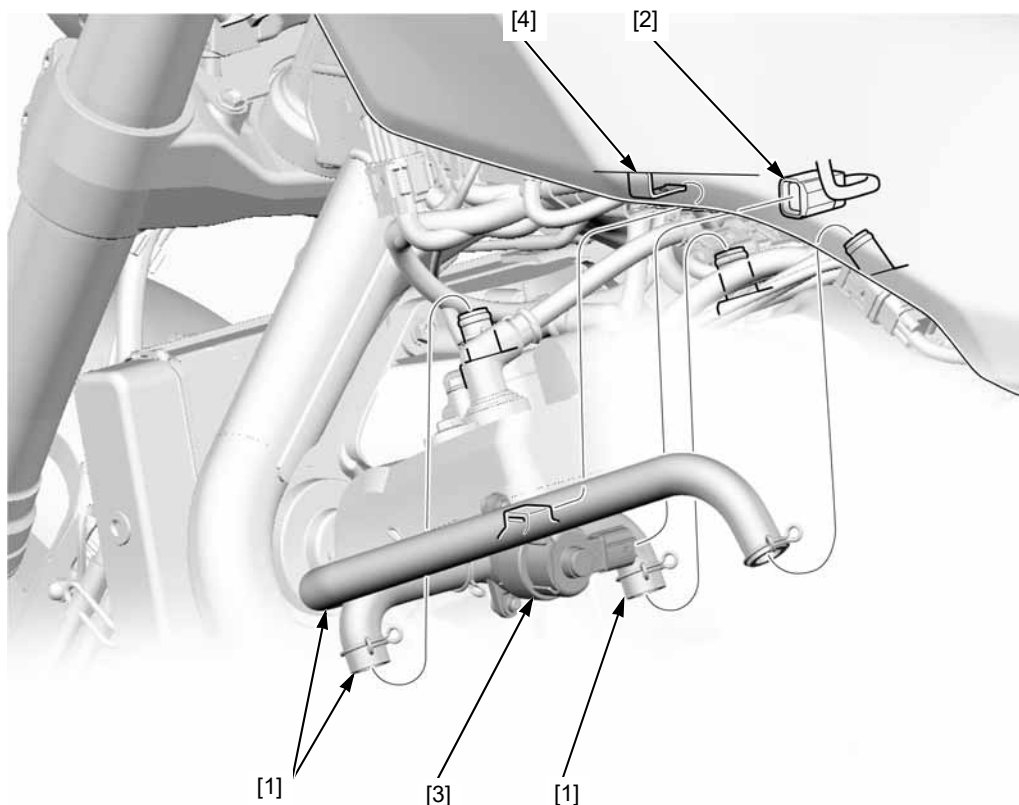
Remove the ignition coil mount stay (page 5-6).

Disconnect the PAIR air suction hoses [1].

Disconnect the PAIR control solenoid valve 2P (Black) connector [2].

Remove the PAIR control solenoid valve [3] from the stay [4].

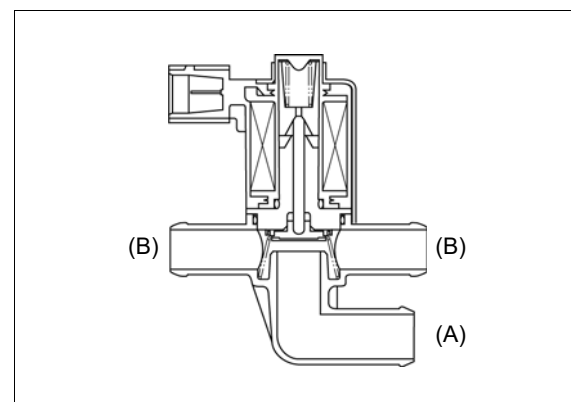
Installation is in the reverse order of removal.



INSPECTION

Remove the PAIR control solenoid valve.

Check that air does not flow (A) to (B) when a 12 V battery is connected to the PAIR control solenoid valve terminals. Air should flow (A) to (B) when there is no voltage applied to the PAIR valve terminals.

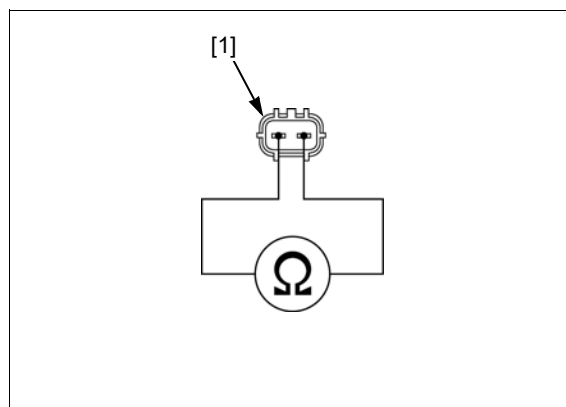


FUEL SYSTEM

Check the resistance between the terminals of the PAIR control solenoid valve connector [1].

Standard: 23 – 27 Ω (20°C/68°F)

If the resistance is out of specification, replace the PAIR control solenoid valve.



EVAP

EVAP PURGE CONTROL SOLENOID VALVE REMOVAL/INSTALLATION

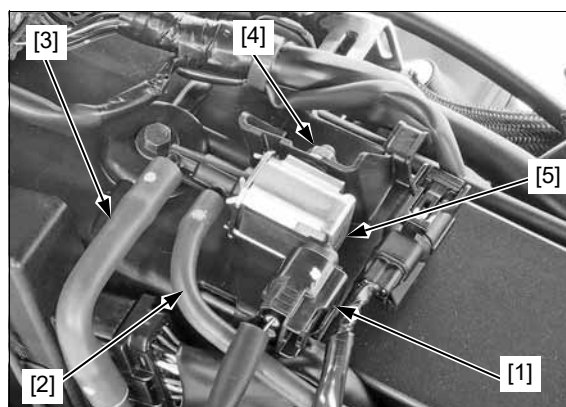
Remove the fuel tank (page 7-6).

Disconnect the following:

- EVAP purge control solenoid valve 2P (Black) connector [1].
- EVAP purge control solenoid valve-to-throttle body hose [2]
- EVAP canister-to-purge control solenoid valve hose [3]

Remove the nut [4] and EVAP purge control solenoid valve [5].

Installation is in the reverse order of removal.

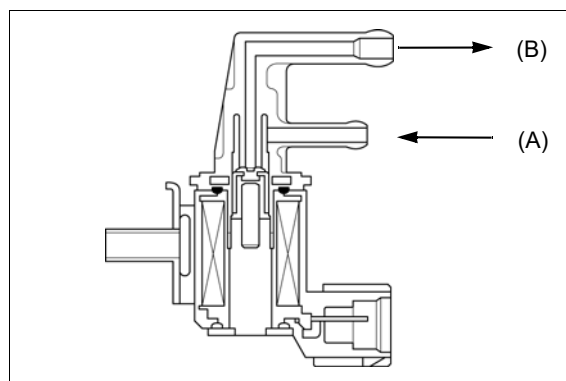


EVAP PURGE CONTROL SOLENOID VALVE INSPECTION

Remove the EVAP purge control solenoid valve (page 7-18).

Check that air flows from (A) to (B) only when a 12 V battery is connected to the EVAP purge control solenoid valve terminal.

Install the EVAP purge control solenoid valve (page 7-18).



EVAP CANISTER REMOVAL/ INSTALLATION

Remove the following:

- Regulator/rectifier (page 20-7)
- Battery (page 20-5)

Remove the bolts [1], stays [2] and canister [3].

Disconnect the following:

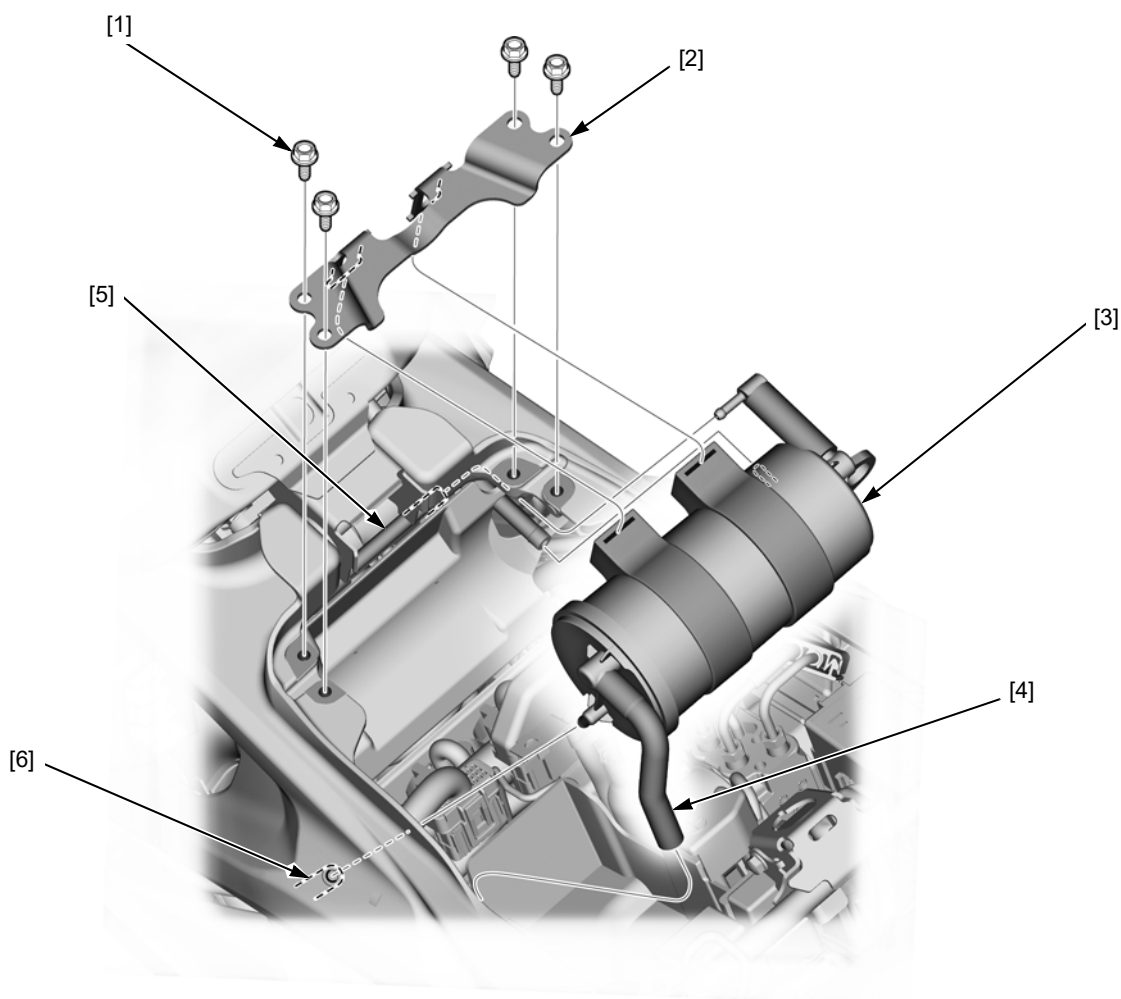
- Fuel tank-to-canister hose [4]
- Canister-to-purge control solenoid valve hose [5]
- Canister drain hose [6]

Correctly route the hoses (page 1-24).

Installation is in the reverse order of removal.

TORQUE:

Canister stay mounting bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)



MEMO

SERVICE INFORMATION.....	8-2	THERMOSTAT	8-6
TROUBLESHOOTING	8-2	RADIATOR/COOLING FAN	8-8
SYSTEM FLOW PATTERN.....	8-3	WATER PUMP	8-11
SYSTEM TESTING.....	8-4	RADIATOR RESERVE TANK.....	8-13
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SERVICE INFORMATION

GENERAL

WARNING

Removing the radiator cap while the engine is hot can allow the coolant to spray out, seriously scalding you. Always let the engine and radiator cool down before removing the radiator cap.

NOTICE

Using coolant with silicate inhibitors may cause premature wear of water pump seals or blockage of radiator passages. Using tap water may cause engine damage.

- Use only genuine Honda PRE-MIX COOLANT containing corrosion inhibitors, specifically recommended for aluminum engines when adding or replacing the coolant.
Genuine Honda PRE-MIX COOLANT is excellent at preventing corrosion and overheating. (TH, III TH models only)
- Use any genuine Honda PRE-MIX COOLANT without diluting with water. (TH, III TH models only)
- 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 coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done with the engine installed in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- For ECT sensor inspection (page 21-12).
- For ECT sensor removal/installation (page 4-70).

TROUBLESHOOTING

Engine temperature too high

- Faulty engine coolant temperature meter or ECT sensor
- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passage blocked in radiator, hoses or water jacket
- Air in system
- Faulty cooling fan motor
- Faulty fan control relay
- Faulty water pump

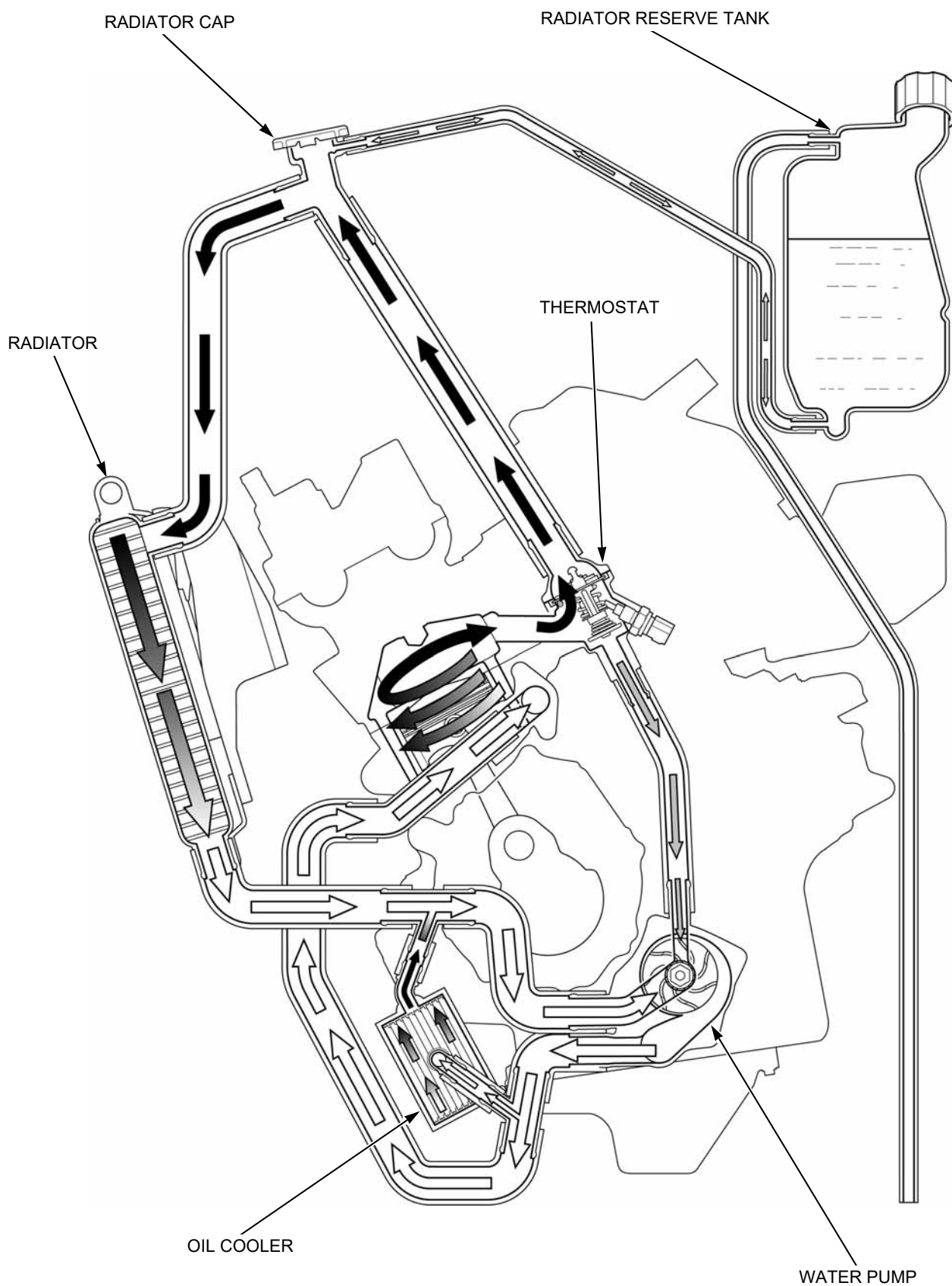
Engine temperature too low

- Faulty temperature gauge or ECT sensor
- 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

SYSTEM FLOW PATTERN



SYSTEM TESTING

RADIATOR CAP/SYSTEM PRESSURE INSPECTION

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

Remove the radiator cap [1].



Wet the sealing surfaces of the cap, then install the cap onto the tester [1].

Pressure test the radiator cap.

Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low.

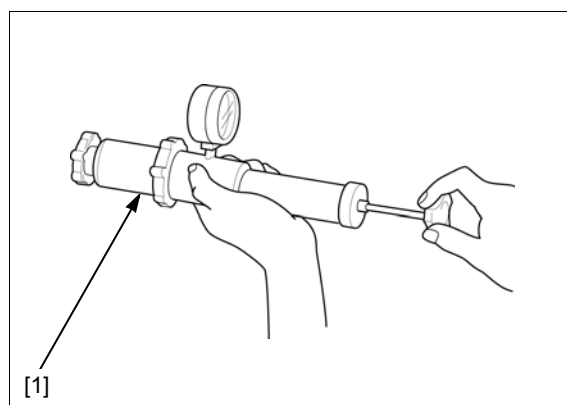
It must hold specified pressure for at least 6 seconds.

RADIATOR CAP RELIEF PRESSURE:

108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)

Install the tester to the radiator.

Apply pressure to the radiator, engine, and hoses and check for leaks.



NOTICE

Excessive pressure can damage the cooling system components. Do not exceed 137 kPa (1.4 kgf/cm², 20 psi).

Repair or replace components if the system will not hold specified pressure for at least 6 seconds.

COOLANT REPLACEMENT

REPLACEMENT/AIR BLEEDING

NOTE:

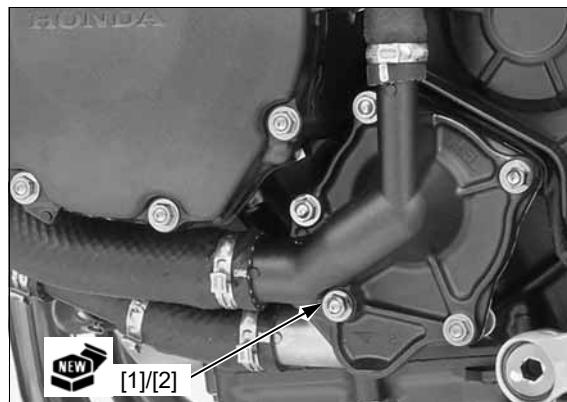
- When filling the system or reserve tank with coolant or checking the coolant level, place the motorcycle in an upright position on a flat, level surface.
- Drain the coolant while the engine is cold.

Remove the radiator cap (page 8-4).

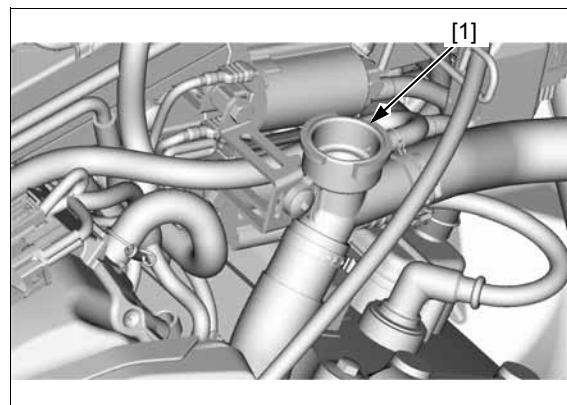
Remove the drain bolt [1] on the water pump cover and drain the system coolant.

Reinstall the drain bolt with a new sealing washer [2]. Tighten the water pump drain bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



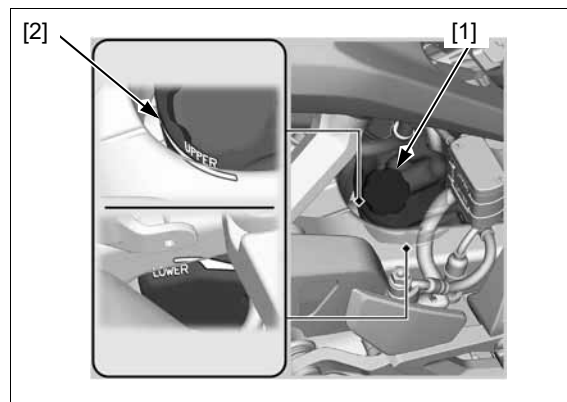
Fill the system with the recommended coolant through the filler opening up to filler neck [1].



Remove the radiator reserve tank cap [1] and fill the reserve tank to the upper level line [2].

Bleed air from the system as follows:

1. Shift the transmission into neutral. Start the engine and let it idle for 2 – 3 minutes.
2. Snap the throttle three or four times to bleed air from the system.
3. Stop the engine and add coolant up to the filler neck if necessary.
4. Install the radiator cap.
5. Check the level of coolant in the reserve tank and fill to the upper level if it is low.



NOTE:

- When air bleeding is insufficient, level of coolant in the reserve tank will decrease. If so, fill to the upper level line with coolant.

Install the radiator reserve tank cap.

After installation, check that there are no coolant leaks.

Install the removed parts in the reverse order of removal.

THERMOSTAT

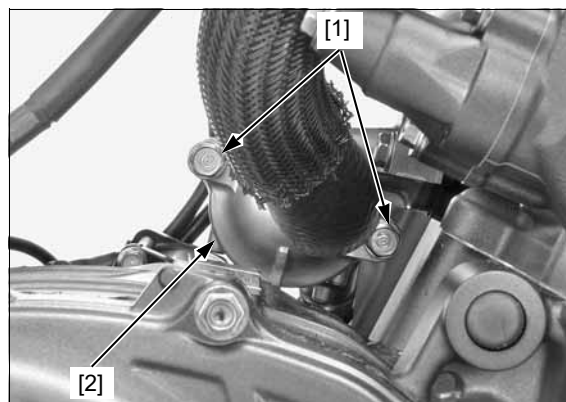
- For ECT sensor removal/installation (page 4-67).

REMOVAL/INSTALLATION

Drain the coolant (page 8-4).

Remove the air cleaner housing (page 3-5).

Remove the bolts [1] and thermostat housing cover [2].



Remove the thermostat [1] from the housing [2].

Installation is in the reverse order of removal.

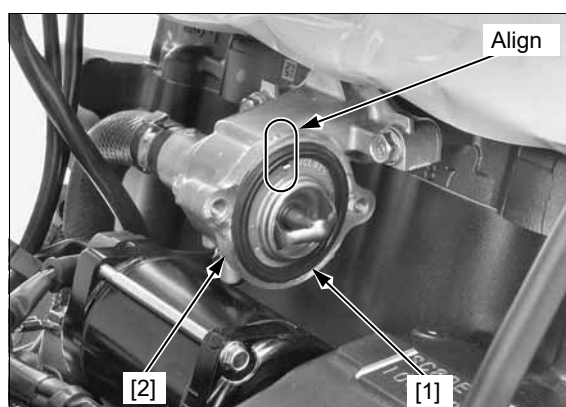
NOTE:

- Install the thermostat into the housing by aligning the thermostat air bleed hole with the housing "O" mark.
- Fill the system with the recommended coolant and bleed any air (page 8-4).

TORQUE:

Thermostat cover bolt:

12 N·m (1.3 kgf·m, 10 lbf·ft)



THERMOSTAT HOUSING REMOVAL/INSTALLATION

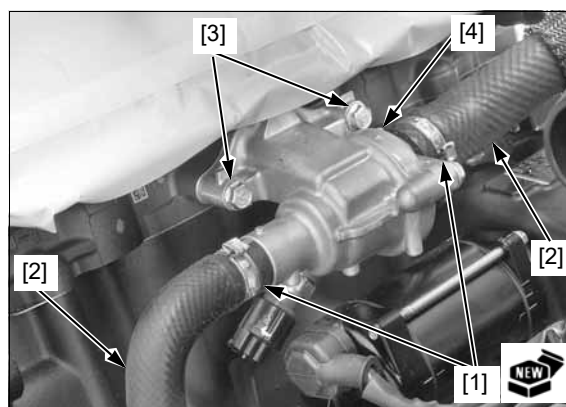
Drain the coolant (page 8-4).

Remove the air cleaner housing (page 7-9).

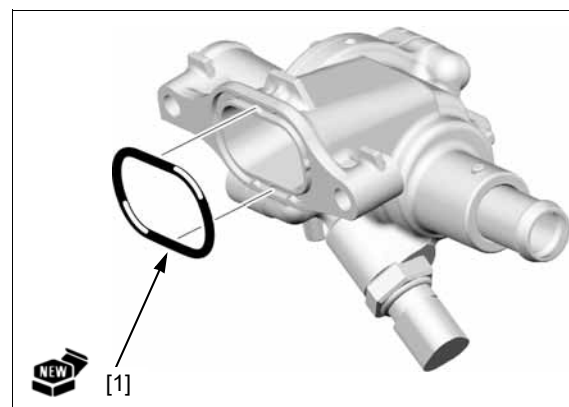
Disconnect the ECT sensor 3P (Gray) connector (page 4-67).

Cut off and remove the hose clamps [1] then disconnect the water hoses [2].

Remove the bolts [3] and thermostat housing [4].



Remove the O-ring [1] from the thermostat housing groove.



Installation is in the reverse order of removal.

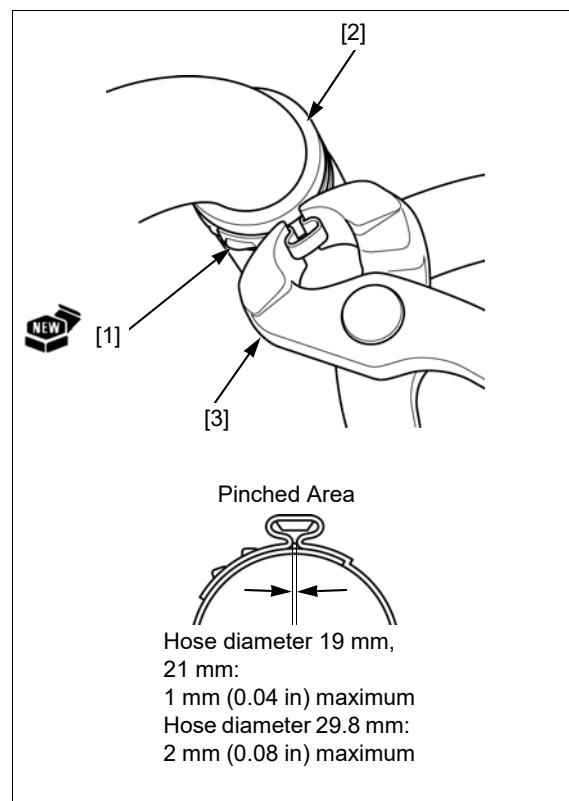
NOTE:

- Install a new water hose bands [1] onto the water hose [2] then connect the water hoses.
- Pinch the ear portion of the water hose band with a pincher until the pinched area clearance is 1 mm (0.04 in) or 2 mm (0.08 in) maximum as shown to secure water hose.
- Fill the system with the recommended coolant and bleed any air (page 8-4).

TOOL:

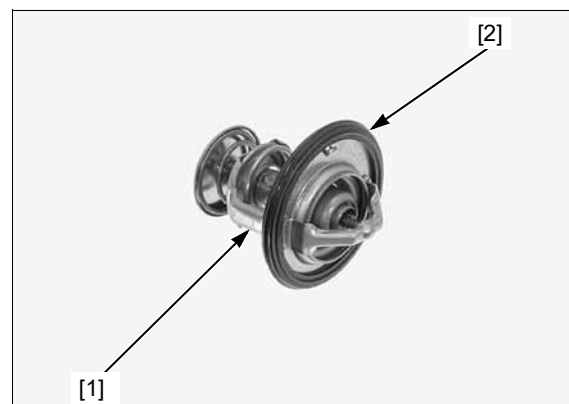
Pincher [3]

Oetiker 1098 or equivalent



INSPECTION

Visually inspect the thermostat [1] for damage.
Replace the thermostat if the valve stays open at room temperature.
Check for damage of the seal ring [2].



COOLING SYSTEM

Do not let the thermostat or thermometer [2] touch the container, or you will get a false reading.

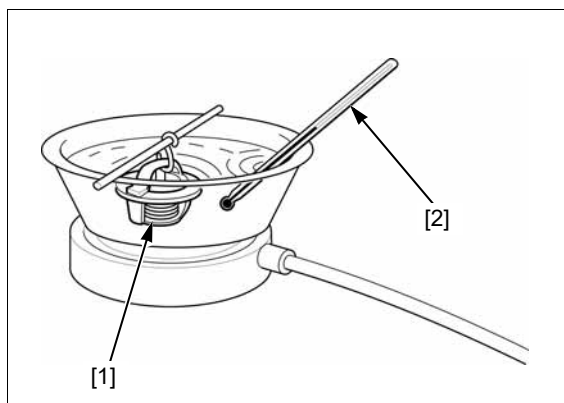
Heat a container of water with an electric heating element for 5 minutes.

Suspend the thermostat [1] in heated water to check its operation.

THERMOSTAT BEGIN TO OPEN:
80 – 84°C (176 – 183°F)

VALVE LIFT:
8 mm (0.3 in) minimum at 95°C (203°F)

Replace the thermostat if the valve opens at a temperature other than those specified.



RADIATOR/COOLING FAN

REMOVAL/INSTALLATION

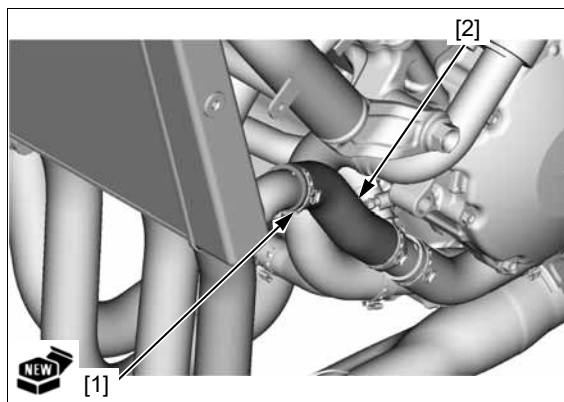
NOTE:

- Be careful not to damage the radiator fins.

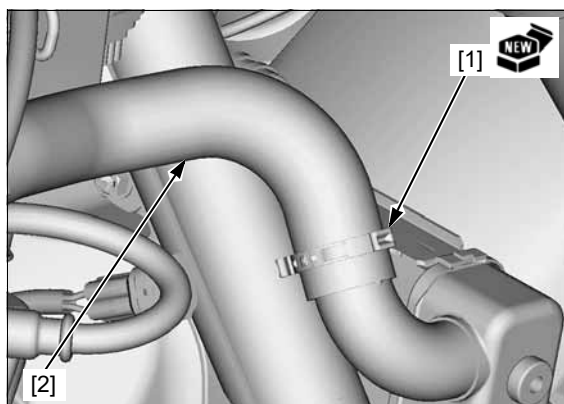
Drain the coolant (page 8-4).

Remove the radiator shroud (page 2-7).

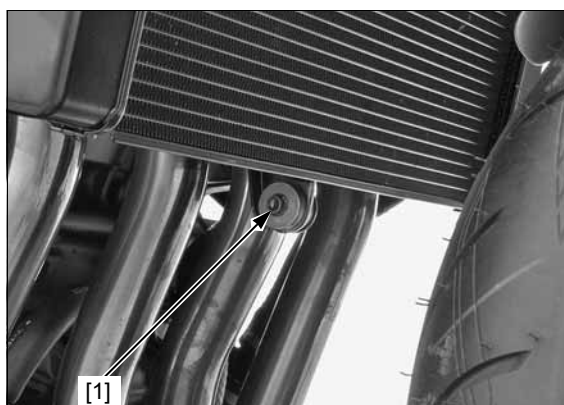
Cut off and remove the hose clamp [1] then disconnect the left radiator hose [2].



Cut off and remove the hose clamp [1] then disconnect the water hose [2].



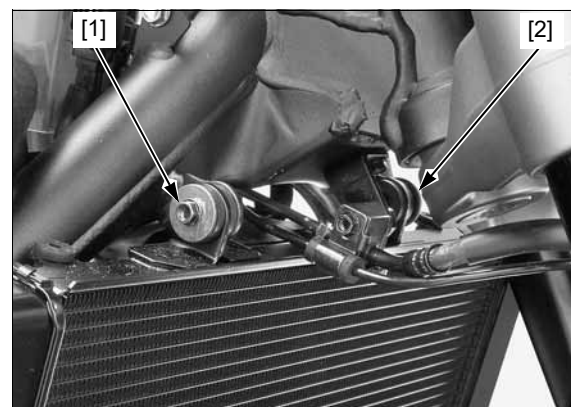
Remove the radiator lower mounting bolt [1].



Remove the radiator upper mounting bolt [1].

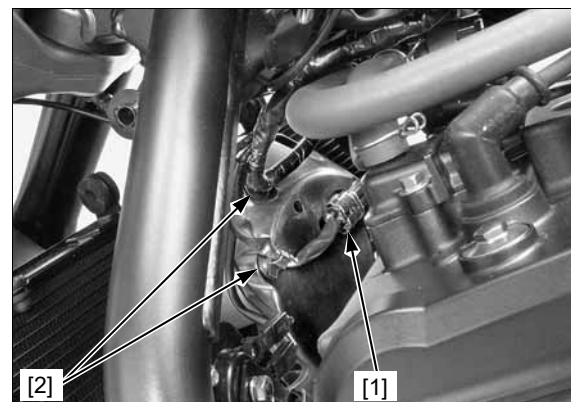
Be careful not to damage the radiator fins.

Release the radiator upper grommet [2] from the frame boss to remove the radiator.



Disconnect the fan motor 2P (Black) connector [1].

Remove the wire clips [2] from the fan motor shroud.



Installation is in the reverse order of removal.

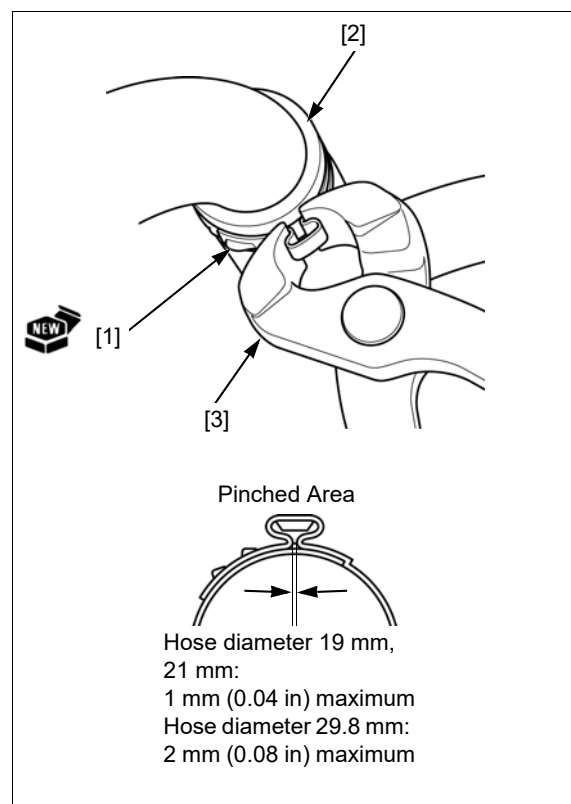
NOTE:

- Install a new water hose bands [1] onto the water hose [2] then connect the water hoses.
- Pinch the ear portion of the water hose band with a pincher until the pinched area clearance is 1 mm (0.04 in) or 2 mm (0.08 in) maximum as shown to secure water hose.
- Fill the system with the recommended coolant and bleed any air (page 8-4).

TOOL:

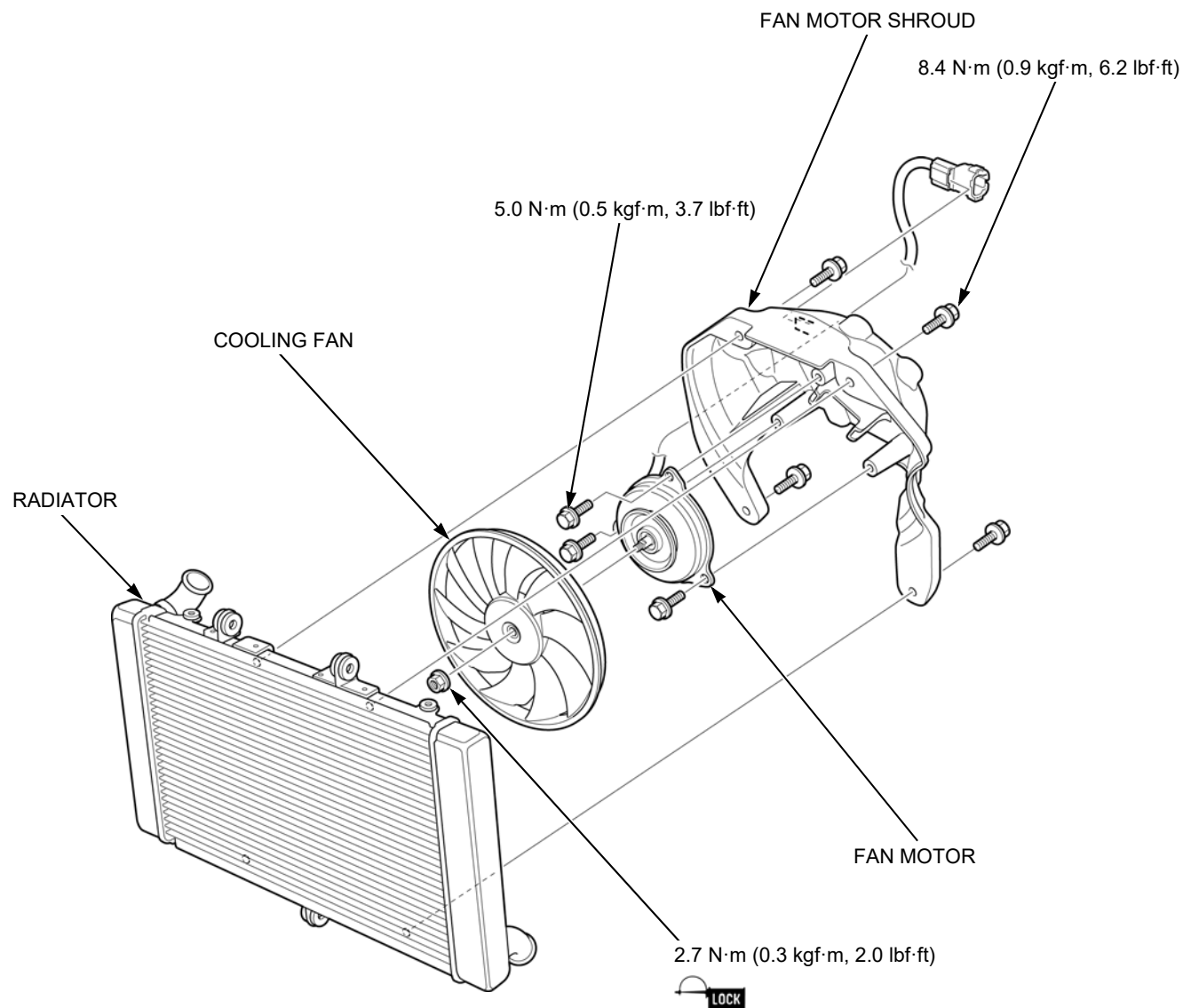
Pincher [3]

Oetiker 1098 or equivalent



COOLING SYSTEM

DISASSEMBLY/ASSEMBLY



NOTE:

- Install the cooling fan to the fan motor shaft by aligning the flat surfaces.
- Apply locking agent to the cooling fan mounting nut threads.

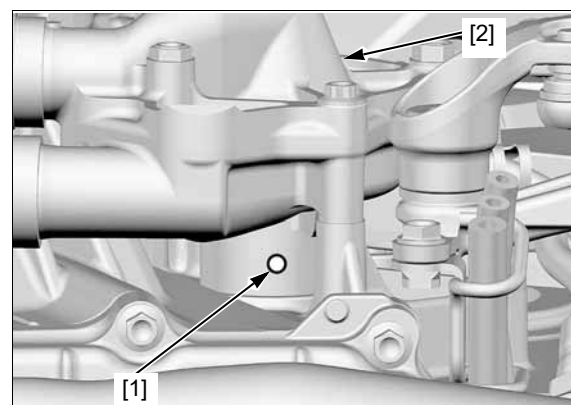
WATER PUMP

MECHANICAL SEAL INSPECTION

Check the bleed hole [1] of the water pump [2] for signs of coolant leakage.

- A small amount of coolant weeping from the bleed hole is normal.
- Make sure that there is no continuous coolant leakage from the bleed hole while operating the engine.

Replace the water pump as an assembly if necessary.



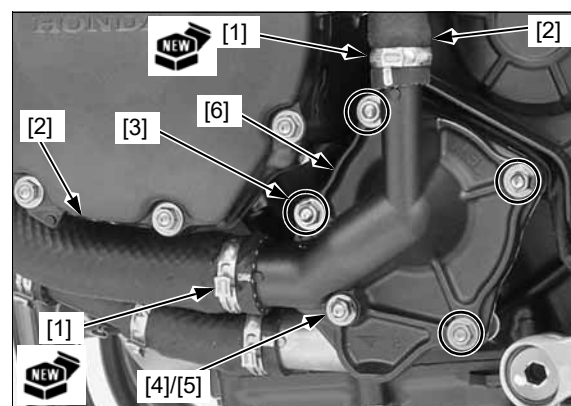
REMOVAL/INSTALLATION

Drain the coolant (page 8-4).

Cut off and remove the hose clamps [1] then disconnect the water hoses [2].

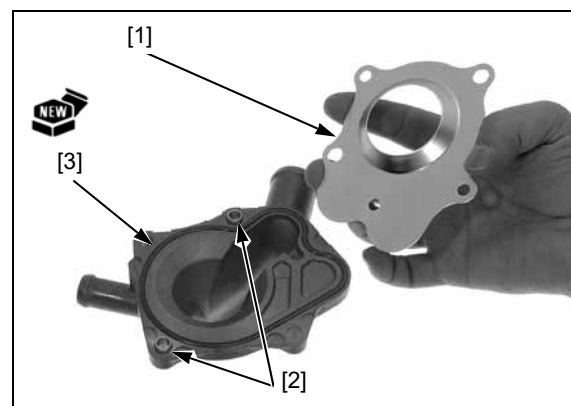
Remove the flange bolts [3], drain bolt [4] and sealing washer [5].

Remove the water pump cover assembly [6].



Remove the separator plate [1] from the water pump cover.

Remove the dowel pins [2] and O-ring [3] from the water pump cover.

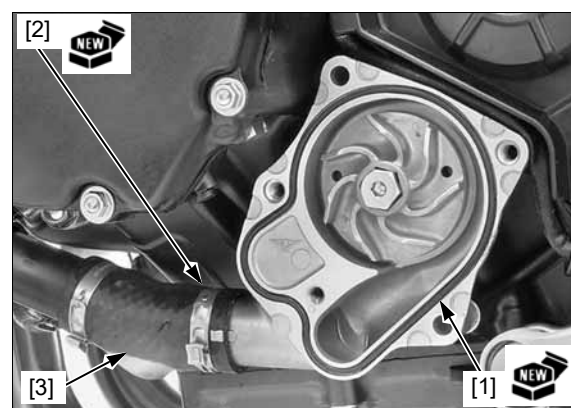


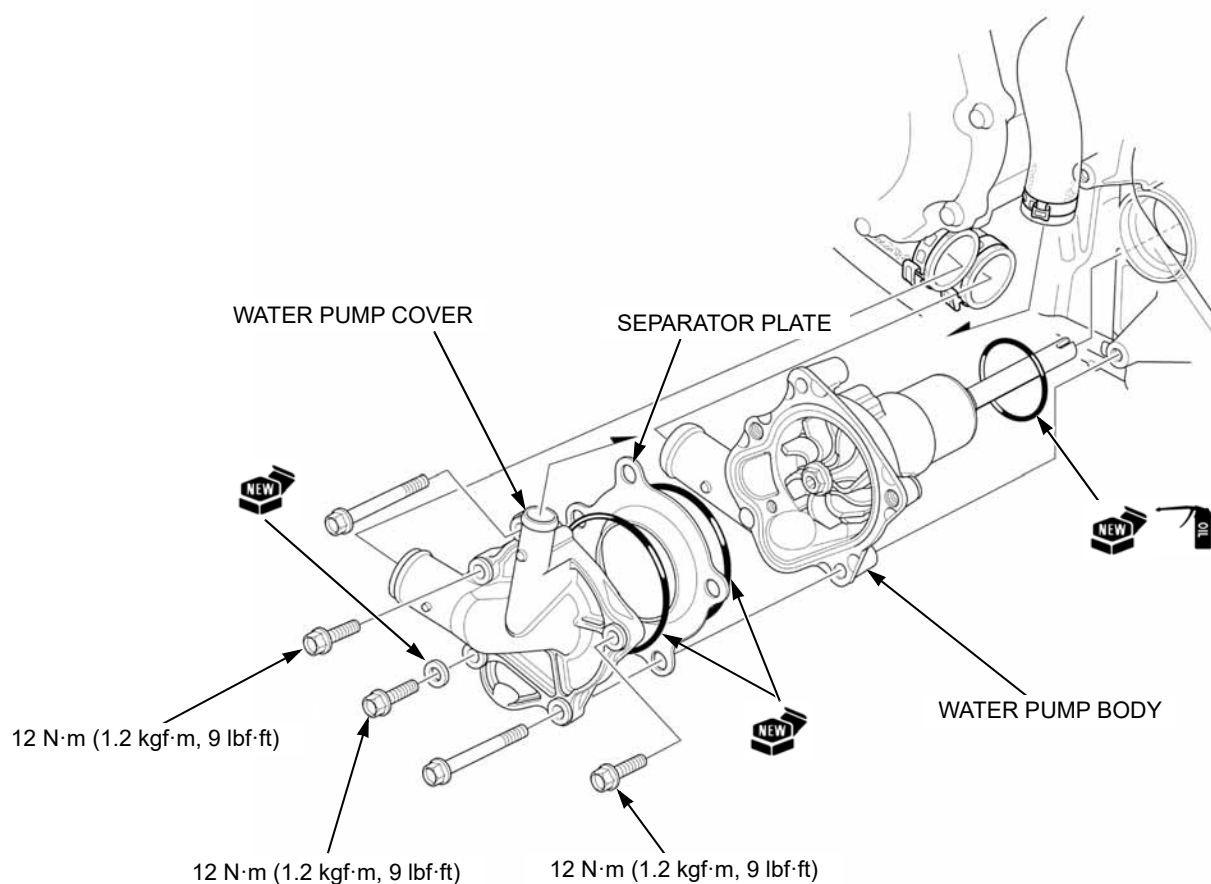
Remove the O-ring [1] from the water pump body.

Cut off and remove the hose clamps [2] then disconnect the water hoses [3].

NOTE:

Do not disassemble the water pump body.





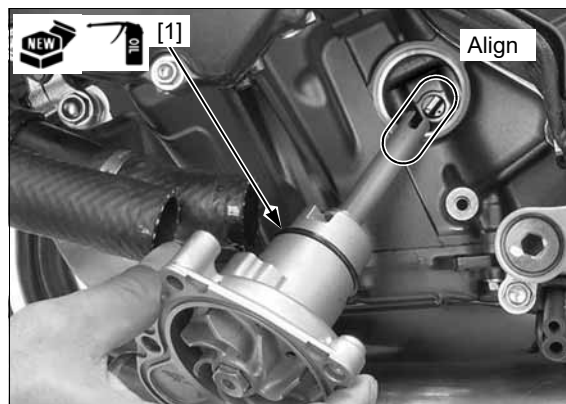
Installation is in the reverse order of removal.

NOTE:

- Apply oil to a new O-ring [1] and install it onto the stepped portion of the water pump body.
- Install the water pump body into the crankcase while aligning the water pump shaft groove with the oil pump shaft end by turning the water pump impeller.

TORQUE:

Water pump assembly bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

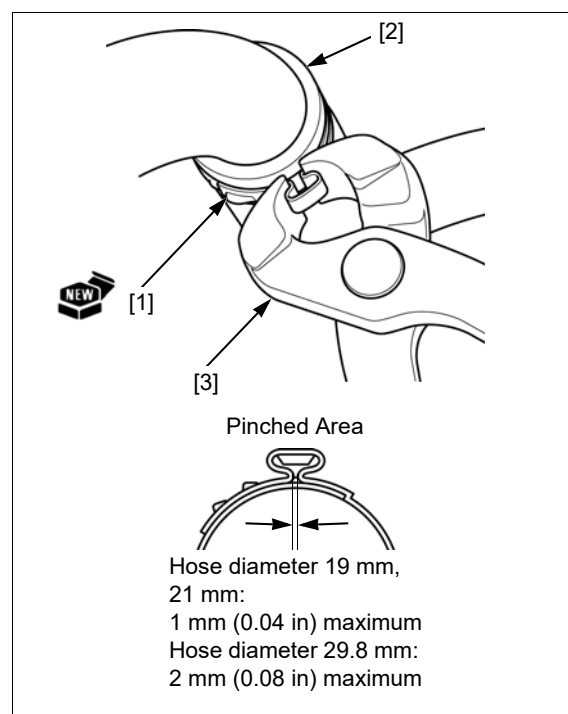


- Install a new water hose bands [1] onto the water hose [2] then connect the water hoses.
- Pinch the ear portion of the water hose band with a pincher until the pinched area clearance is 1 mm (0.04 in) or 2 mm (0.08 in) maximum as shown to secure water hose.
- Fill the system with the recommended coolant and bleed any air (page 8-4).

TOOL:

Pincher [3]

Oetiker 1098 or equivalent



RADIATOR RESERVE TANK

REMOVAL/INSTALLATION

Remove the swingarm (page 17-14).

Remove the radiator reserve tank mounting bolt [1] and radiator reserve tank [2].

Disconnect and release the siphon hose [3] from the radiator, then drain the coolant from the reserve tank. Disconnect the coolant overflow hose [4] from the reserve tank.

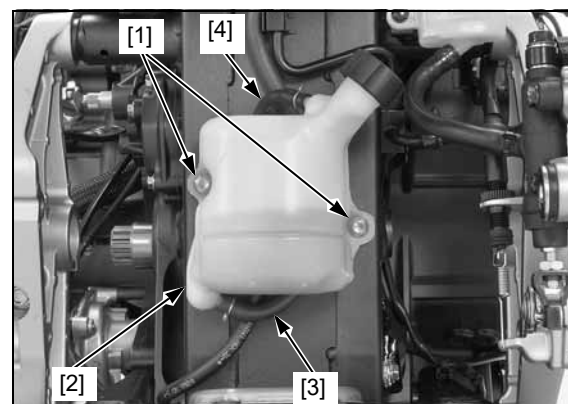
Route the hose properly (page 1-22)

Installation is in the reverse order of removal.

TORQUE:

Radiator reserve tank mounting bolt:
0.4 N·m (0.04 kgf·m, 0.3 lbf·ft)

Fill the reserve tank with coolant (page 8-4).

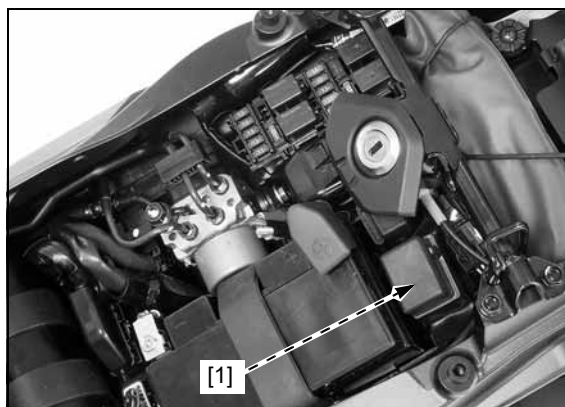


FAN CONTROL RELAY

INSPECTION

Remove the main seat (page 2-4).

Disconnect the fan control relay [1].



Connect the ohmmeter to the fan control relay [1] connector terminals.

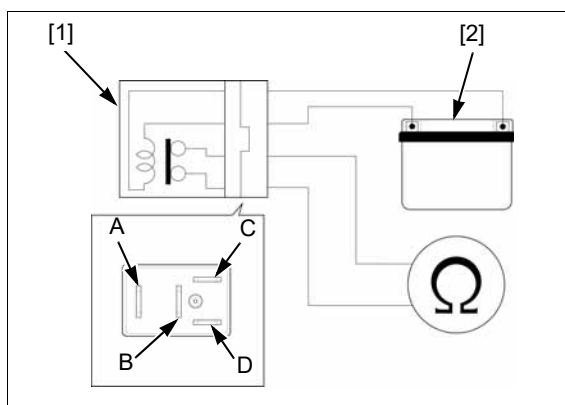
Connection: A (Black) – B (Black/blue)

Connect a 12 V battery [2] to the following engine stop relay connector terminals.

Connection: C (Gray) – D (Black/white)

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

If there is no continuity when the 12 V battery is connected, replace the fan control relay.



SERVICE INFORMATION.....	9-2	OIL STRAINER/ PRESSURE RELIEF VALVE	9-4
TROUBLESHOOTING	9-2	OIL PUMP	9-7
LUBRICATION SYSTEM DIAGRAM.....	9-3	OIL COOLER	9-9
OIL PRESSURE INSPECTION	9-4		

SERVICE INFORMATION

GENERAL

CAUTION

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

- This section covers service of the oil pump and oil cooler.
- The oil pump can be serviced with the engine installed in the frame.
- The service procedures in this section must be performed with the engine oil drained.
- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.
- 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.

TROUBLESHOOTING

Oil level too low

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

Low oil pressure

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

No oil pressure

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

High oil pressure

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

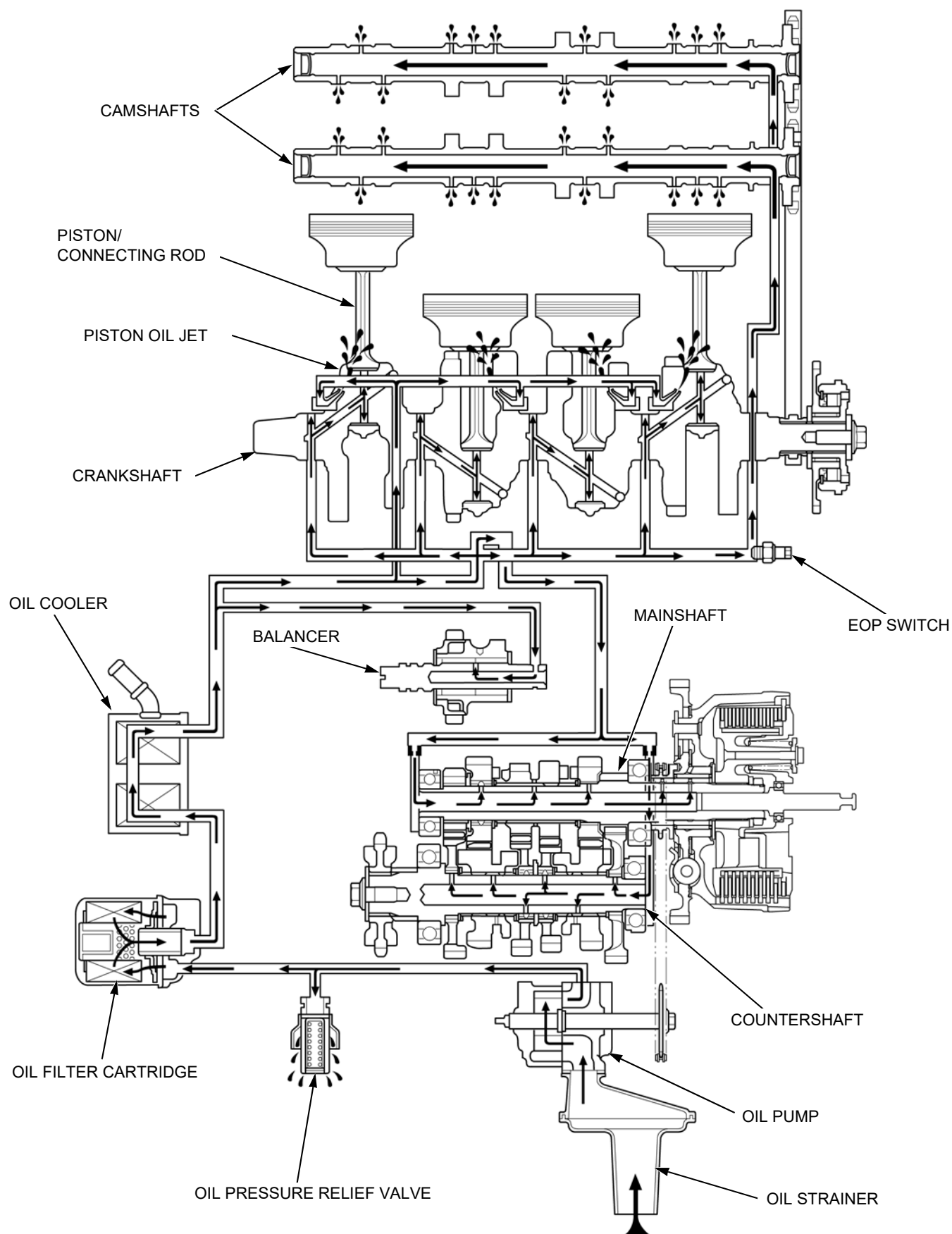
Oil contamination

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

Oil emulsification

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

LUBRICATION SYSTEM DIAGRAM



LUBRICATION SYSTEM

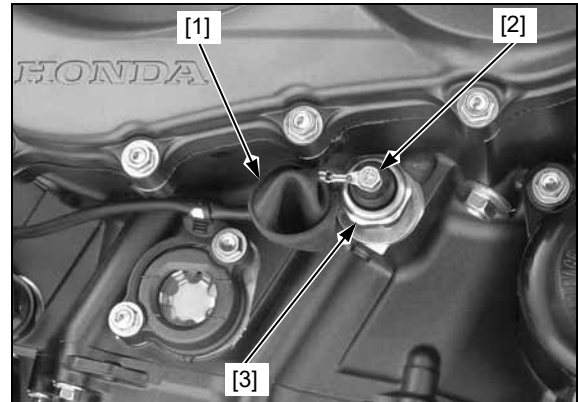
OIL PRESSURE INSPECTION

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

Remove the rubber cap [1] from the EOP switch.

Remove the terminal bolt [2] and disconnect the EOP switch wire.

Remove the EOP switch [3] while holding the switch base.



Install the oil pressure gauge attachment to the switch base.

Connect the oil pressure gauge to the oil pressure gauge attachment.

TOOLS:

Oil pressure gauge set [1] 07506-3000001 or equivalent commercially available
Oil pressure gauge attachment [2] 07406-0030000 or equivalent commercially available



Check the oil level and add the recommended oil if necessary (page 3-12).

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

OIL PRESSURE:

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

Stop the engine and remove the tools.

Install the EOP switch (page 21-15).

Check the oil level and add the recommended oil if the level is below the lower level line (page 3-12).

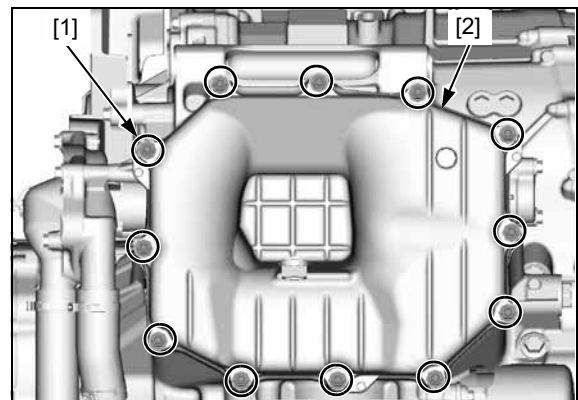
OIL STRAINER/PRESSURE RELIEF VALVE

REMOVAL

Drain the engine oil (page 3-13).

Remove the exhaust pipe (page 2-16).

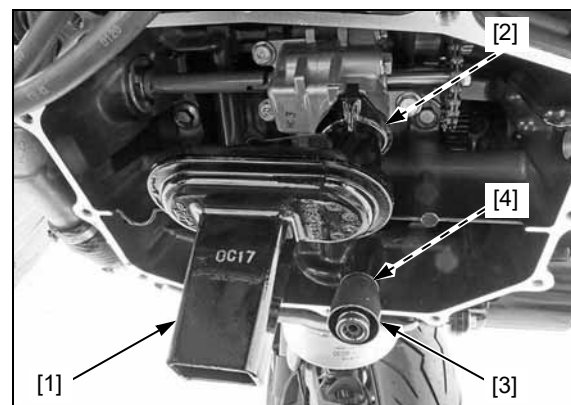
Remove the flange bolts [1] and the oil pan [2].



Remove the following:

- Oil strainer [1]
- Packing [2]
- Pressure relief valve [3]
- O-ring [4]

Clean the oil strainer screen.



INSPECTION

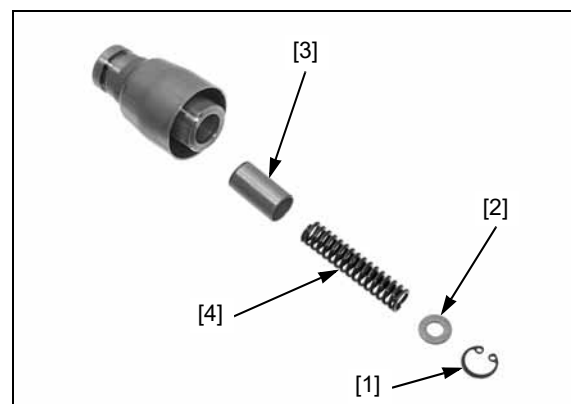
Check the operation of the pressure relief valve by pushing on the piston.

Disassemble the relief valve by removing the snap ring [1] and washer [2].

Inspect the piston [3] for wear, unsmooth movement or damage.

Inspect the spring [4] for fatigue or damage.

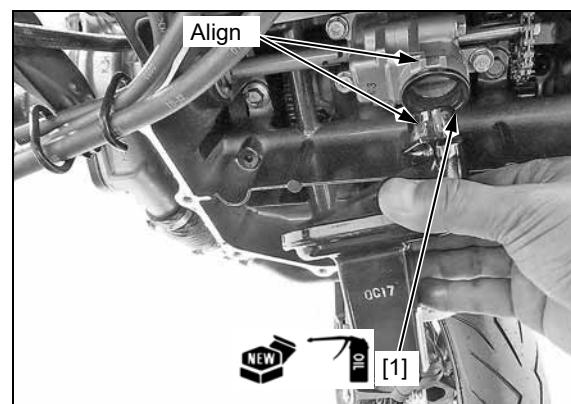
Assemble the relief valve in the reverse order of disassembly.



INSTALLATION

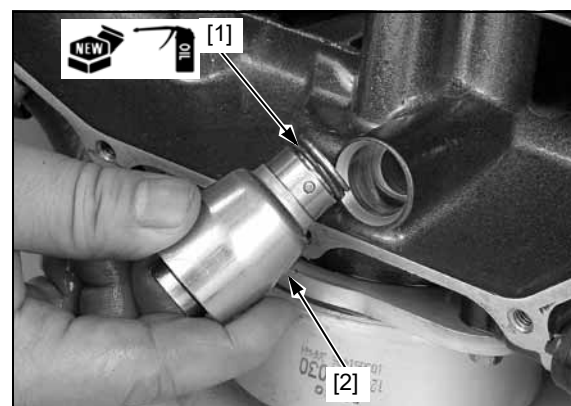
Apply engine oil to new packing [1] and install it onto the oil strainer flange.

Install the oil strainer into the oil pump while aligning the oil strainer boss with the groove of the oil pump.



Apply engine oil to new O-ring [1] and install it onto the relief valve groove.

Install the relief valve [2] into the crankcase.

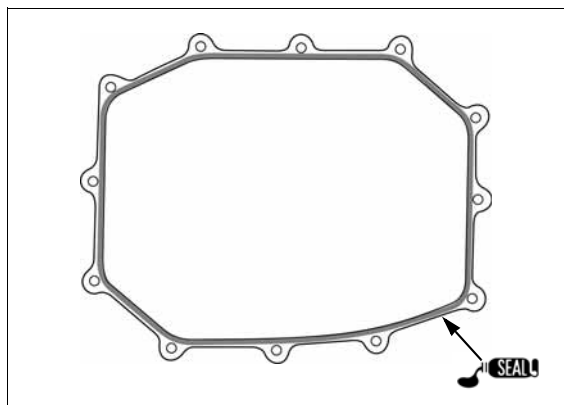


LUBRICATION SYSTEM

Clean the oil pan mating surface thoroughly.

*Do not apply more
sealant than
necessary.*

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



Install the oil pan [1] onto the lower crankcase.

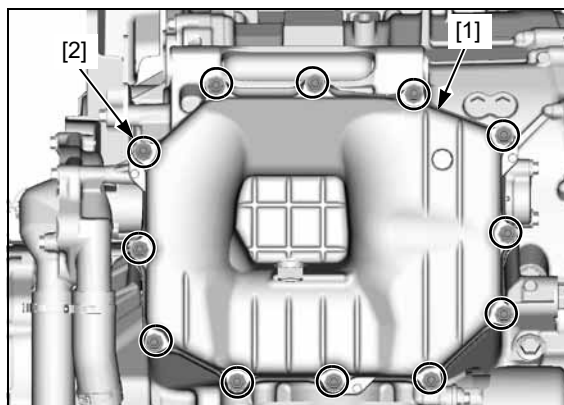
Install the flange bolts.

Tighten the bolts [2] in a crisscross pattern in two to three steps.

Install the exhaust pipe (page 2-16).

Fill the crankcase with the recommended oil (page 3-13).

After installation, check that there are no oil leaks.



OIL PUMP

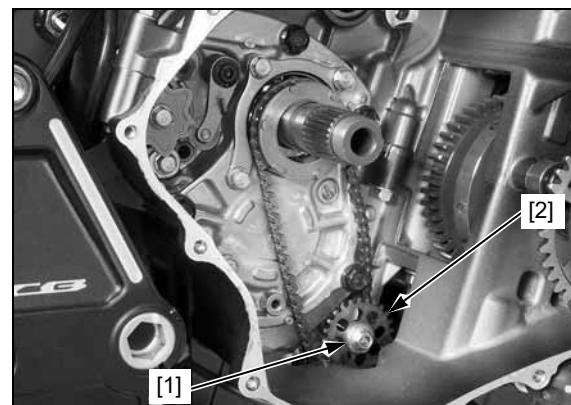
REMOVAL/INSTALLATION

Drain the engine oil (page 3-13).

Remove the clutch (page 11-6).

To gain access to the oil pump driven sprocket, first remove the oil pan.

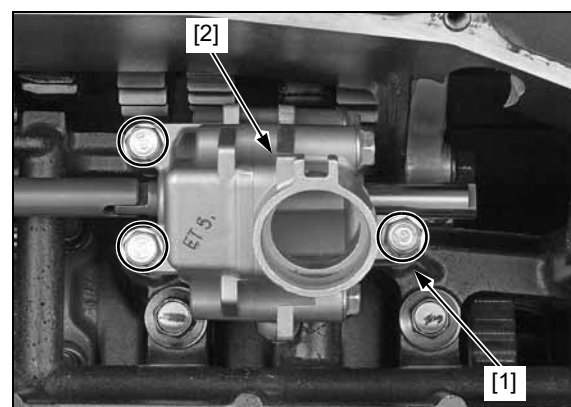
Remove the bolt/washer [1] and oil pump driven sprocket [2].



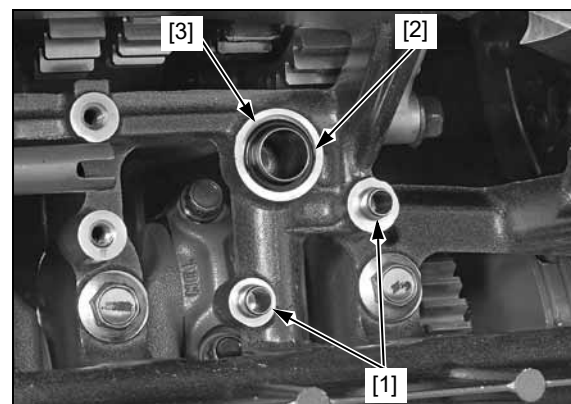
Remove the oil pan (page 9-7).

Remove the following:

- Oil pump mounting bolts [1]
- Oil pump assembly [2]



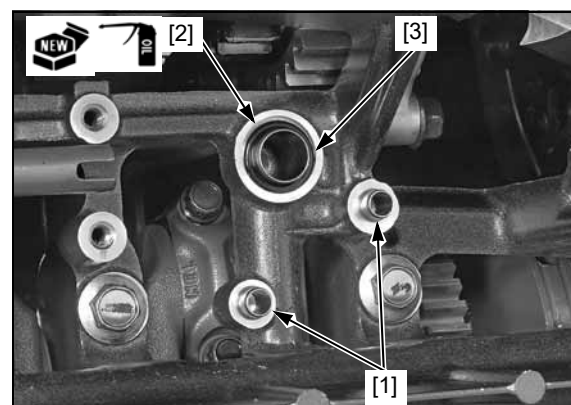
- Dowel pins [1]
- Oil pass collar [2]/O-ring [3]



INSTALLATION

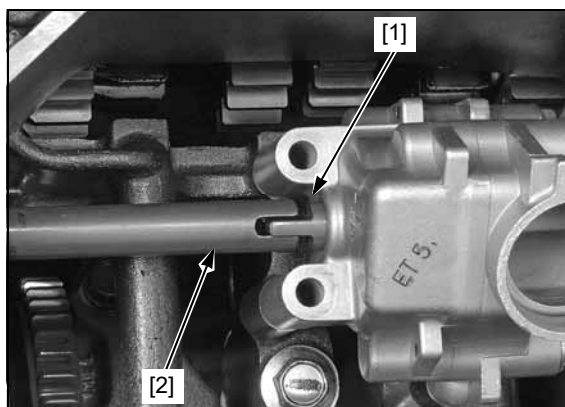
Install the dowel pins [1].

Apply engine oil to new O-ring [2] and install it with the oil pass collar [3].

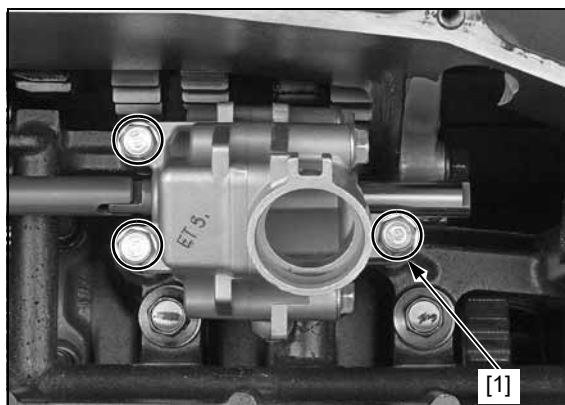


LUBRICATION SYSTEM

Install the oil pump assembly onto the crankcase while aligning the oil pump shaft lug [1] with the water pump shaft groove [2] by turning the oil pump shaft.



Install and tighten the flange bolts [1] securely.



Apply oil to the oil pump driven sprocket and drive chain. Install the driven sprocket with its "OUT" mark [1] facing out.

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

Install and tighten the driven sprocket bolt [2]/washer [3] to the specified torque.

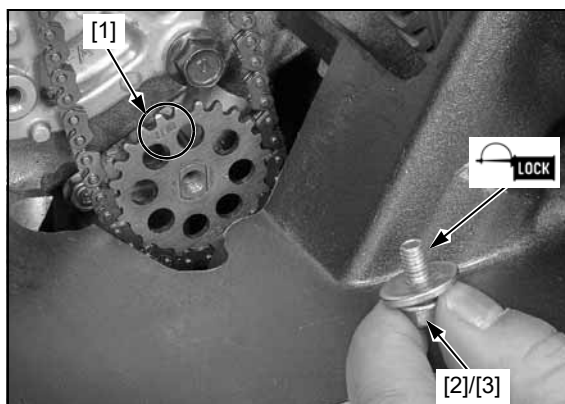
TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

Install the clutch (page 11-6).

Install the right crankcase cover (page 11-4).

After installation, fill the crankcase with the recommended oil (page 3-12) and check that there is no oil leaks.

Check the oil pressure (page 9-4).



OIL COOLER

REMOVAL

Drain the engine oil (page 3-12).

Drain the coolant from the system (page 8-4).

Loosen the hose band screws [1] and disconnect the oil cooler water hoses from the oil cooler.

Cut off and remove the hose clamp [2] then disconnect the oil cooler water hose.

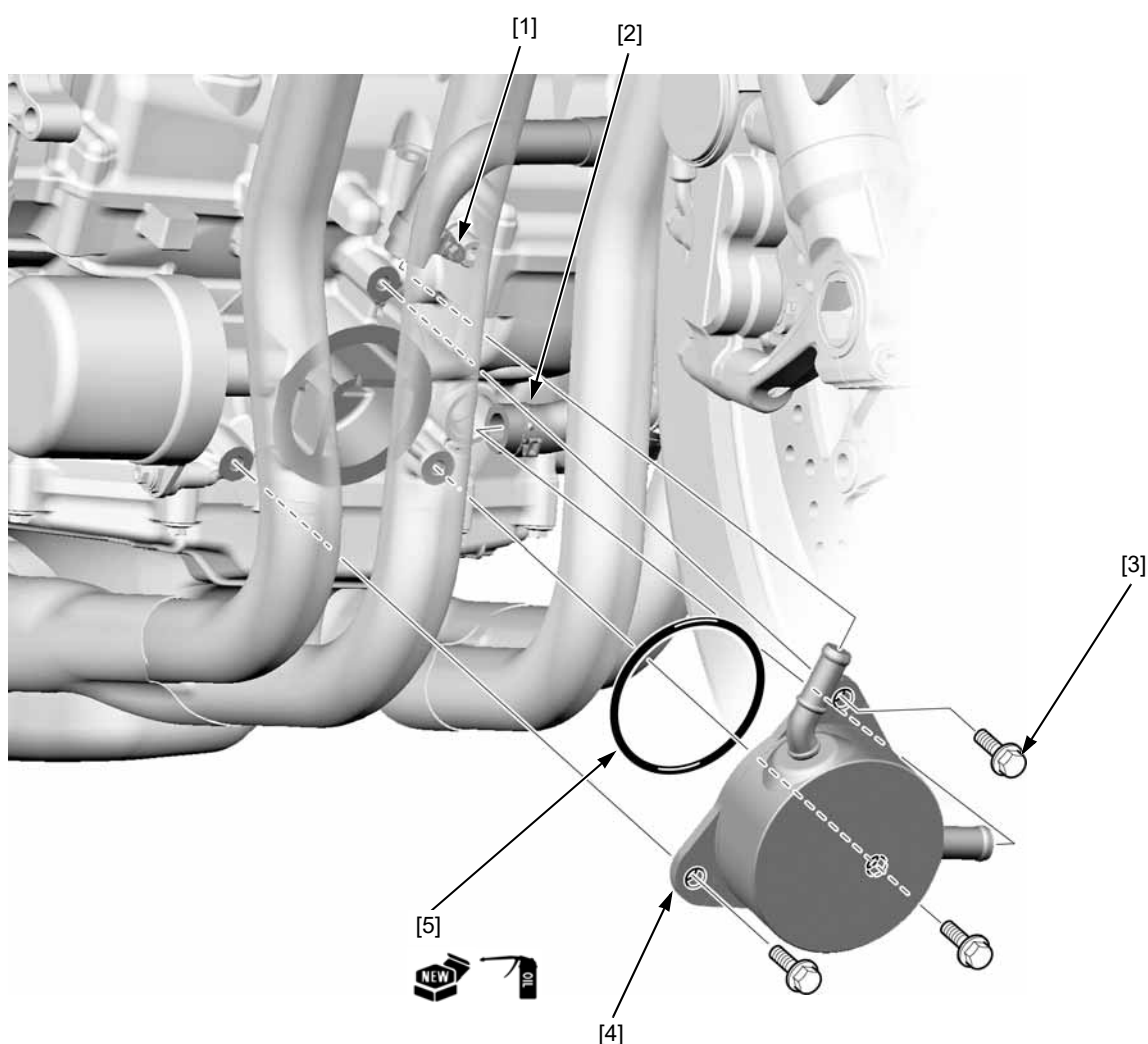
Remove the three bolts [3] and the oil cooler [4].

Remove the O-ring [5] from the oil cooler.

Check the oil cooler for damage.

NOTE:

Apply oil to a new O-ring and install it into the oil cooler groove.



LUBRICATION SYSTEM

Installation is in the reverse order of removal.

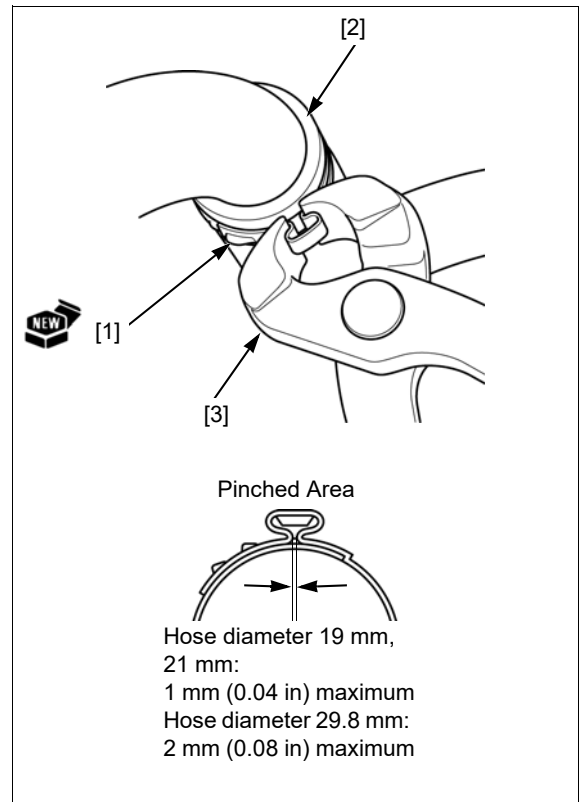
NOTE:

- Fill the crankcase with the recommended oil (page 3-13).
- Install a new water hose bands [1] onto the oil cooler water hose [2] then connect the water hoses.
- Pinch the ear portion of the oil cooler water hose band with a pincher until the pinched area clearance is 1 mm (0.04 in) or 2 mm (0.08 in) maximum as shown to secure water hose.
- Fill the cooling system and bleed any air (page 8-4).
- Fill the crankcase with the recommended oil (page 3-12).
- Check for coolant and oil leaks.

TOOL:

Pincher [3]

Oetiker 1098 or equivalent



10. CYLINDER HEAD/VALVES

SERVICE INFORMATION.....	10-2	CAMSHAFT REMOVAL	10-6
TROUBLESHOOTING	10-2	CAMSHAFT INSTALLATION	10-10
COMPONENT LOCATION	10-3	CYLINDER HEAD REMOVAL	10-14
CYLINDER COMPRESSION	10-4	CYLINDER HEAD DISASSEMBLY.....	10-15
CYLINDER HEAD COVER REMOVAL/ INSTALLATION.....	10-4	CYLINDER HEAD ASSEMBLY.....	10-19
CYLINDER HEAD COVER DISASSEMBLY	10-5	CYLINDER HEAD INSTALLATION	10-21
		CAM CHAIN TENSIONER LIFTER	10-22

SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves and camshaft.
- The camshaft services can be done with the engine installed in the frame. The cylinder head service requires engine removal.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling cylinder head.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problems 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.

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

Compression too high, overheating or knocking

- Excessive carbon build-up on piston crown or on combustion chamber

Excessive smoke

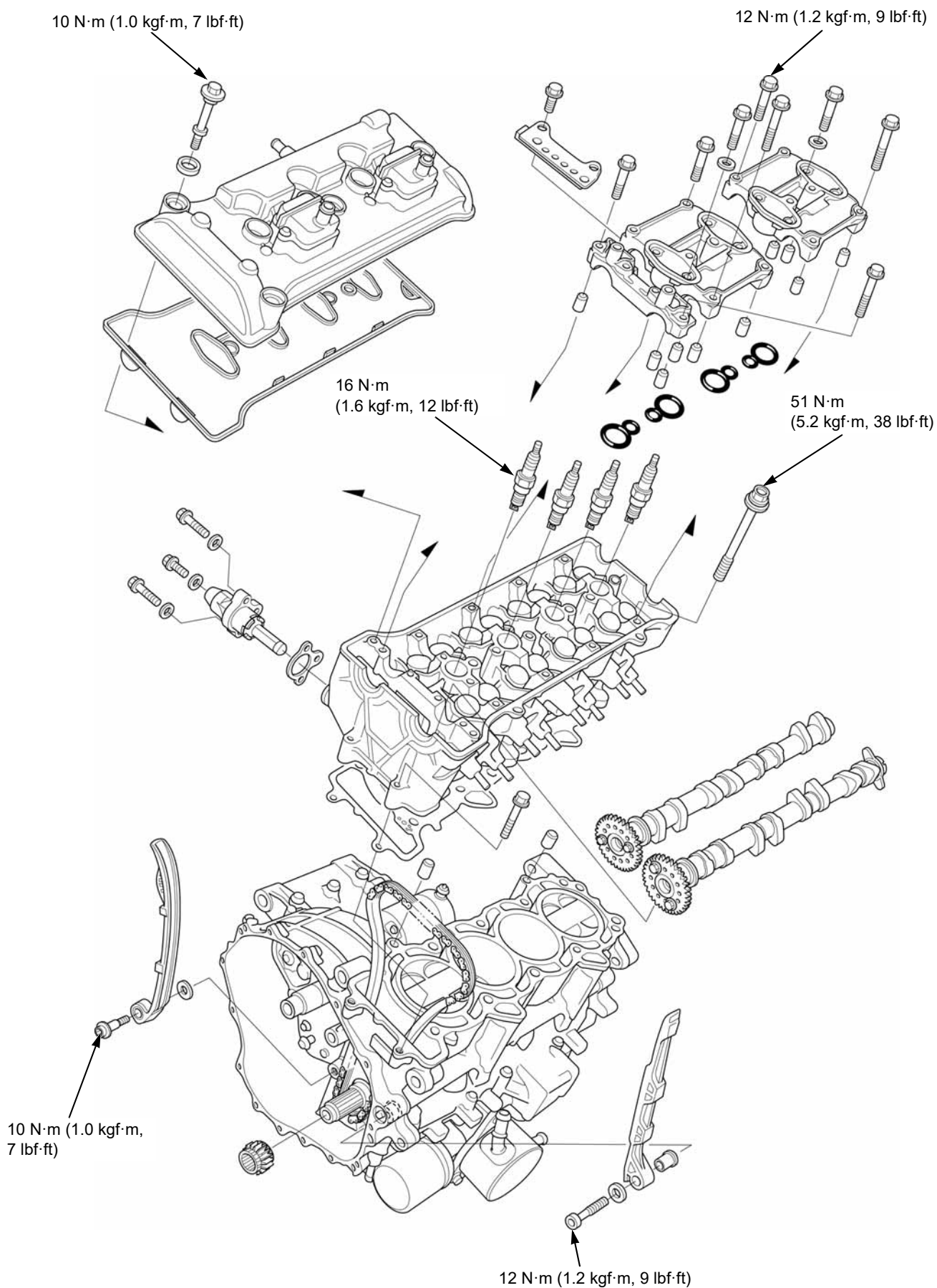
- Cylinder head:
 - Worn valve stem or valve guide
 - Damaged stem seal
- Worn cylinder, piston or piston rings

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

Rough idle

- Low cylinder compression

COMPONENT LOCATION

CYLINDER COMPRESSION

Warm up the engine to normal operating temperature. Stop the engine, disconnect the spark plug caps and remove the spark plugs (page 3-7).

Install the compression gauge [1] into the spark plugs hole.

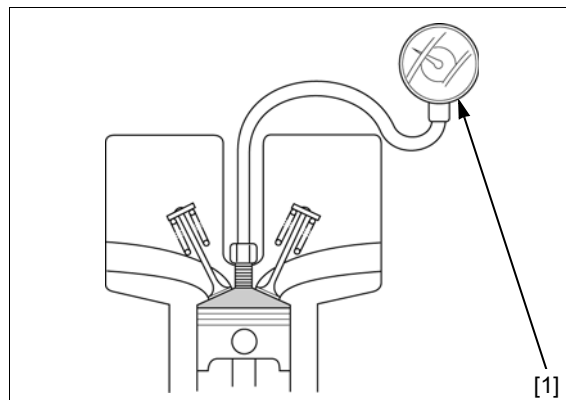
TOOL:

Compression gauge attachment 07RMJ-MY50100

Turn the ignition switch ON.

Shift the transmission into the neutral position.

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:

1294 kPa (13.2 kgf/cm², 187 psi) at 300 min⁻¹ (rpm)

Low compression can be caused by:

- Blown cylinder head gasket
- Improper valve adjustment
- Valve leakage
- Worn piston ring or cylinder

High compression can be caused by:

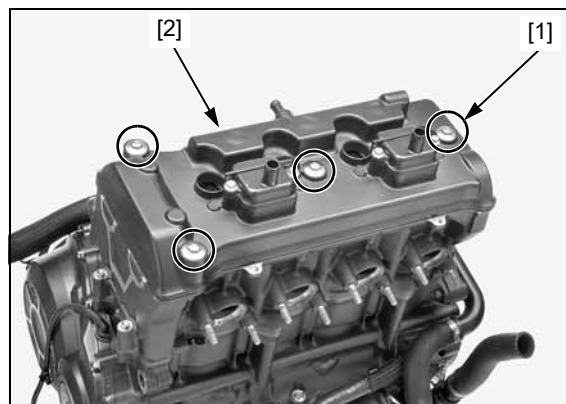
- Carbon deposits in combustion chamber or on piston head

CYLINDER HEAD COVER REMOVAL/INSTALLATION

Disconnect the spark plug caps (page 3-7).

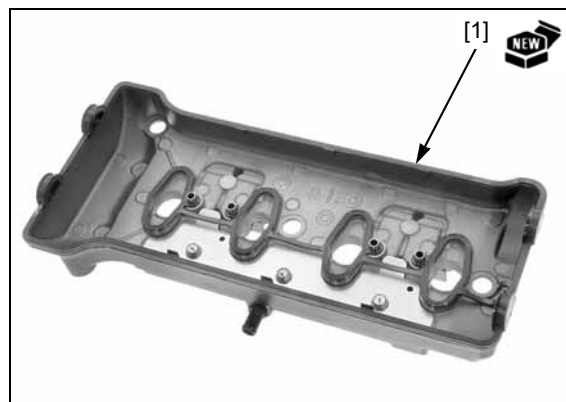
Remove the cylinder head cover bolts [1].

Remove the cylinder head cover [2] from the cylinder head.



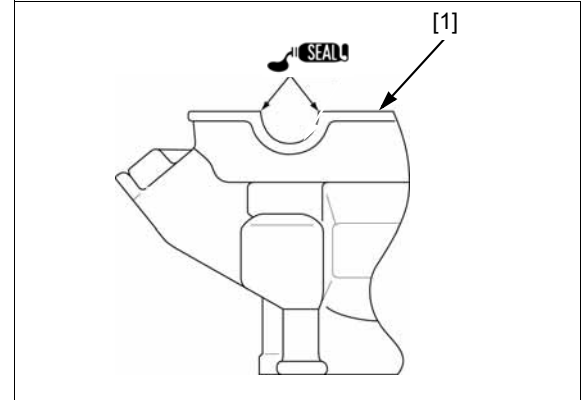
Remove the cylinder head cover packing [1].

Installation is in the reverse order of removal.



NOTE:

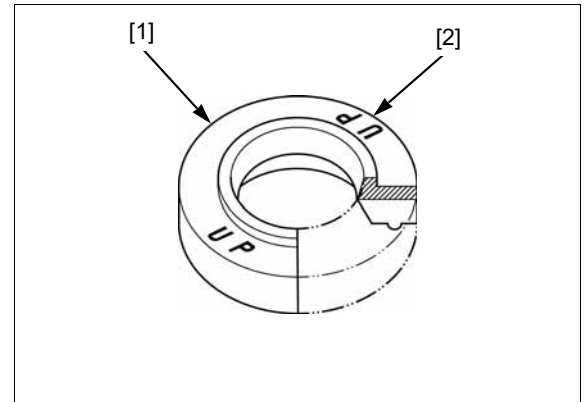
- Clean the cylinder head mating surface [1] thoroughly.
- Apply liquid sealant (TB5211C manufactured by ThreeBond, KE45T manufactured by Shin-Etsu Silicone or an equivalent) to the cylinder head as shown.
- Do not apply more liquid sealant than necessary.



- Check that the mounting rubbers [1] are in good condition, and replace them if necessary.
- Install the mounting rubbers with their "UP" marks [2] facing up.

TORQUE:

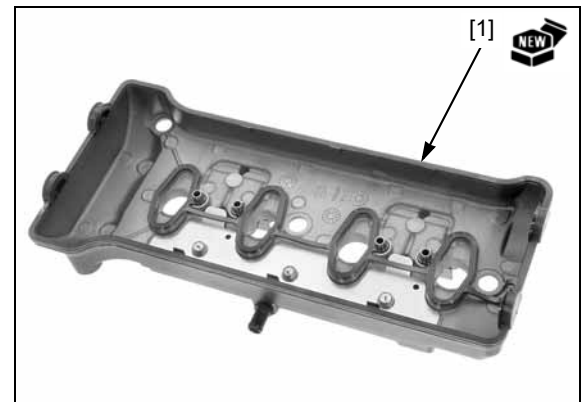
Cylinder head cover bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)



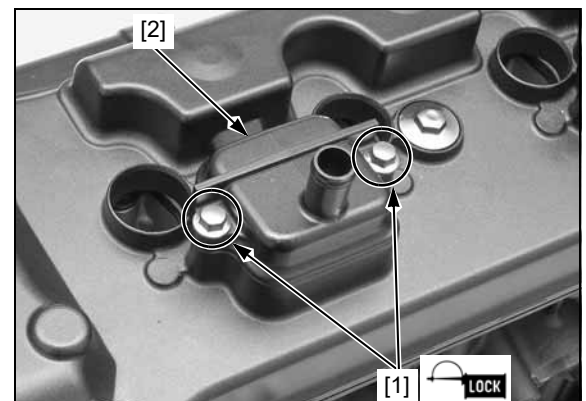
CYLINDER HEAD COVER DISASSEMBLY

Remove the cylinder head cover (page 10-4).

Remove the cylinder head cover packing [1].



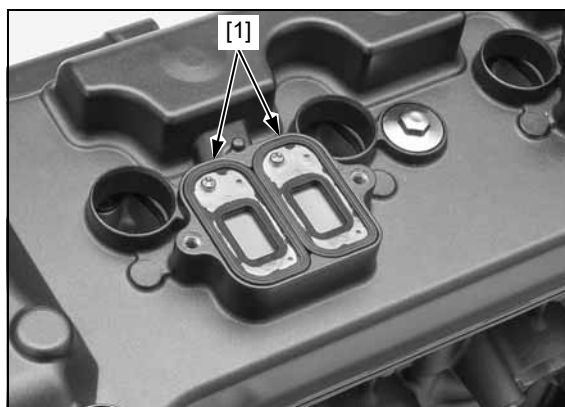
Remove the bolts [1] and PAIR check valve cover [2].



CYLINDER HEAD/VALVES

Remove the PAIR check valves [1] from the cylinder head cover.

Check the PAIR check valve for wear or damage, replace if necessary.



Remove the port plates [1] from the cylinder head cover.

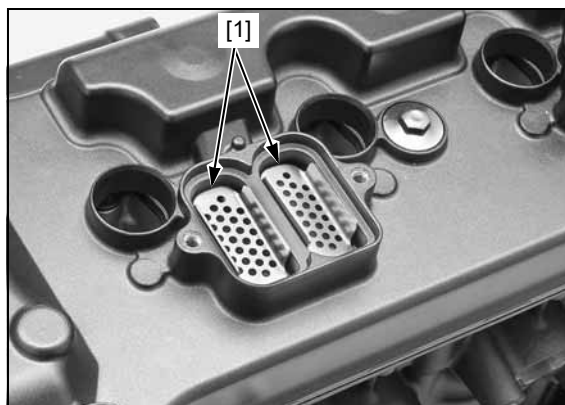
Assembly is in the reverse order of disassembly.

NOTE:

- Apply a locking agent to the PAIR check valve cover mounting bolt threads.

TORQUE:

PAIR read valve cover bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

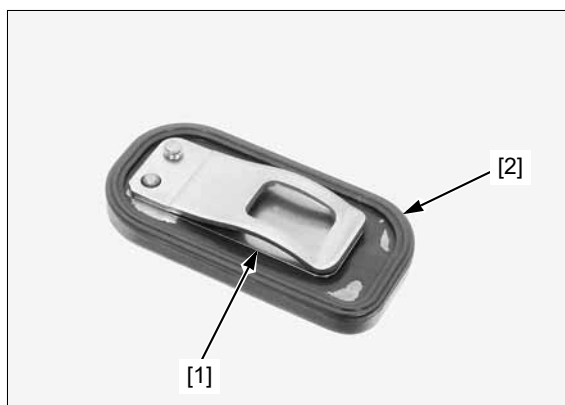


PAIR CHECK VALVE INSPECTION

Remove the PAIR check valves (page 10-5).

Check the reed valve [1] for damage or fatigue. Replace if necessary.

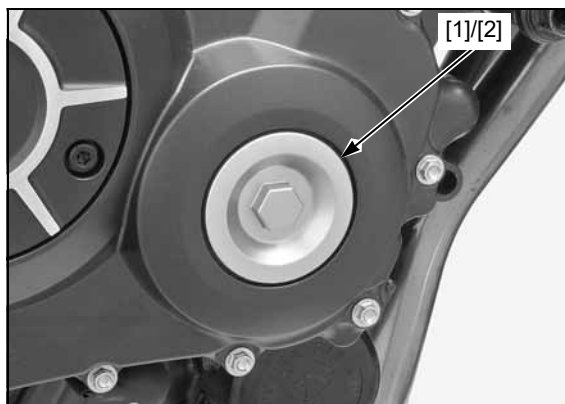
Replace the PAIR check valve if the rubber seat [2] is cracked, deteriorated or damaged, or if there is clearance between the reed and seat.



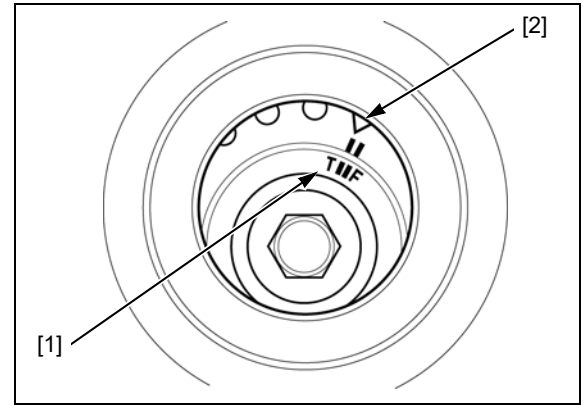
CAMSHAFT REMOVAL

Remove the cylinder head cover (page 10-4).

Remove the timing hole cap [1] and O-ring [2].

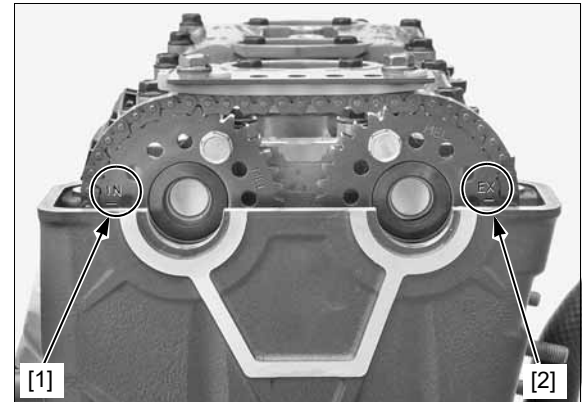


Turn the crankshaft clockwise, align the "T" mark [1] on the starter clutch outer with the index notch [2] on the right crankcase cover.

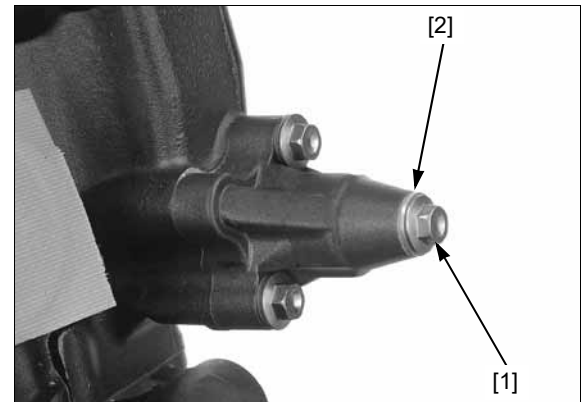


The cam sprocket outside timing marks ("IN" [1] and "EX" [2]) must be flush with the cylinder head upper surface and facing outward as shown.

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

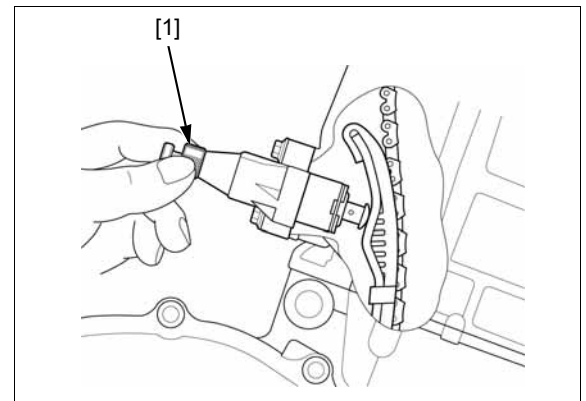


Remove the cam chain tensioner lifter sealing bolt [1] and sealing washer [2].



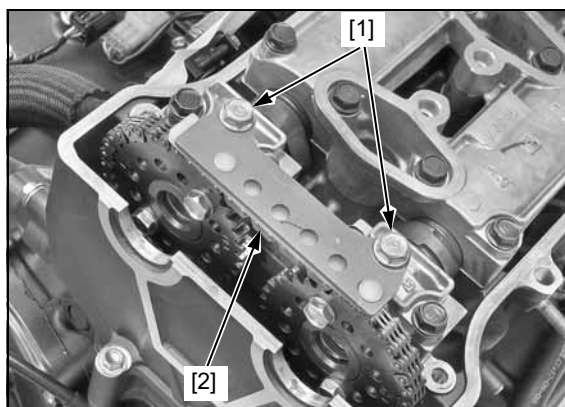
Turn the tensioner lifter shaft fully in (clockwise) and secure it using the special tool to prevent damaging the cam chain.

TOOL:
Cam chain tensioner holder [1] 070MG-0010100



CYLINDER HEAD/VALVES

Remove the bolts [1] and cam chain guide B [2].

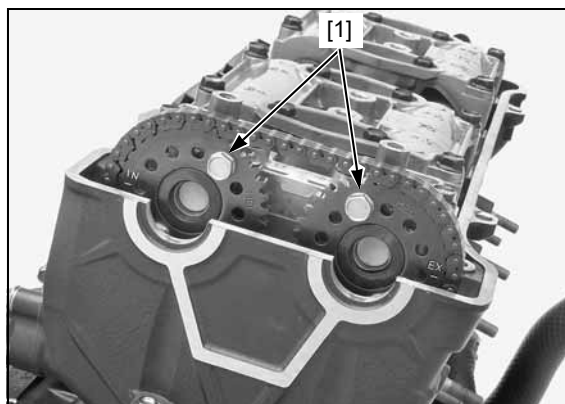


It is not necessary to remove the cam sprocket from the camshaft except when replacing the camshaft and/or cam sprocket.

If you plan to replace the camshaft and/or cam sprocket, loosen and remove the cam sprocket bolts [1] as follows:

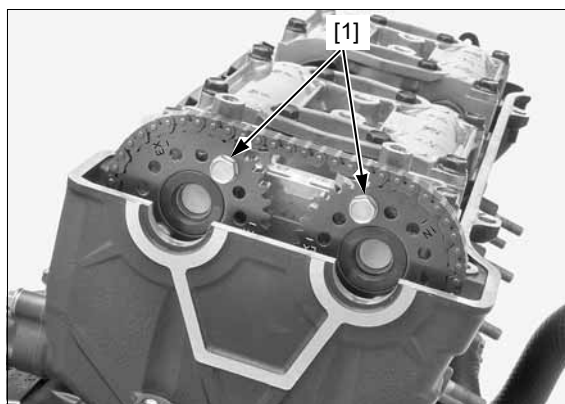
Be careful not to drop the cam sprocket bolts and cam sprocket into the crankcase.

- Remove the cam sprocket bolts from the intake and exhaust camshafts.



- Turn the crankshaft clockwise one full turn (360°), remove the other cam sprocket bolts [1] from the camshafts.

Remove the cam sprockets from the camshafts.



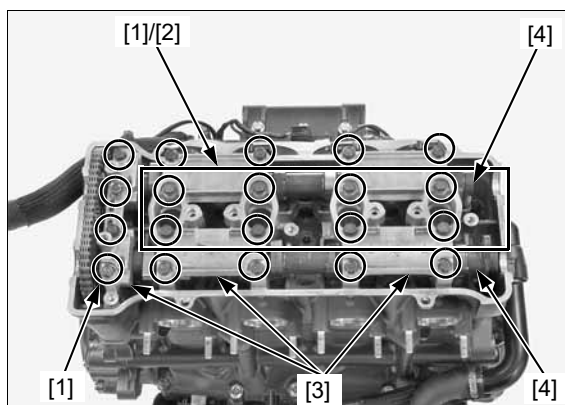
Suspend the cam chain with a piece of wire to prevent the chain from falling into the crankcase.

Loosen and remove the camshaft holder bolts [1], washers [2], then remove the camshaft holders [3] and camshafts [4].

NOTE:

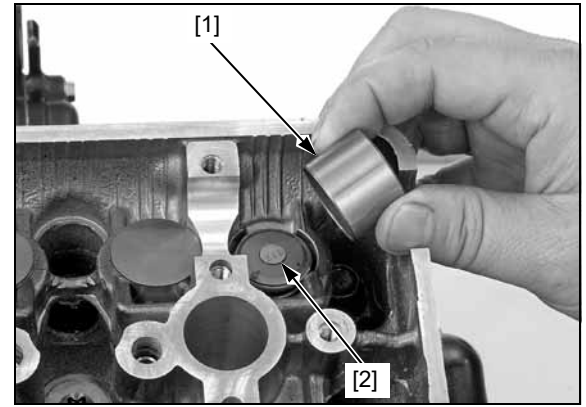
From outside to inside, loosen the bolts in a crisscross pattern in several steps or the camshaft holder might break.

Do not forcibly remove the dowel pins from the camshaft holders.



Remove the valve lifters [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 sprocket
- Camshaft
- Camshaft holder/dowel pin
- Cam chain guide B
- Valve lifter

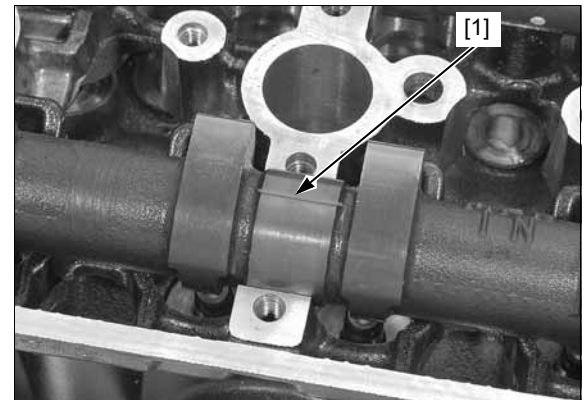
Measure each part according to CYLINDER HEAD/ VALVE SPECIFICATIONS (page 1-8).

Replace any part if it is out of the service limit.

CAMSHAFT OIL CLEARANCE

Do not rotate the camshaft when using plastigauge.

Wipe any oil from the journals of the camshaft, cylinder head and camshaft holders. Lay a strip of plastigauge [1] lengthwise on top of each camshaft journal.



Be sure the dowel pins in the camshaft holder align the holes in the cylinder head.

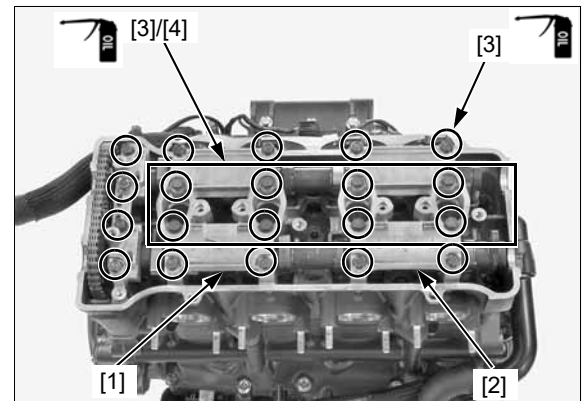
Install the each camshaft holder to the correct locations with the identification marks.

- "R" mark [1]: center camshaft holder (Holder A)
- "L" mark [2]: left camshaft holder (Holder B)
- No mark: right camshaft holder (Holder C)

Apply engine oil to the threads and seating surfaces of the camshaft holder bolts [3].

Install the twenty holder bolts with the eight sealing washers [4].

Finger tighten the bolts.



CYLINDER HEAD/VALVES

First gradually tighten the four bolts (No.1 – No.2 – No.7 – No.8) in the numerical order cast on the camshaft holders.

Gradually tighten the other camshaft holder bolts until the camshaft holders lightly contact the cylinder head surface.

NOTICE

Failure to tighten the camshaft holder in a crisscross pattern might cause a camshaft holder to break.

Tighten all camshaft holder bolts in the numerical order cast on the camshaft holders.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

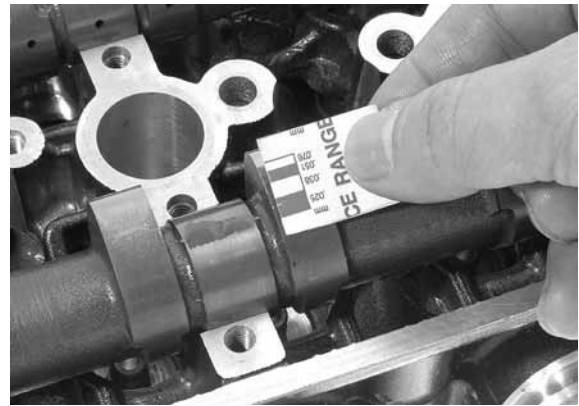
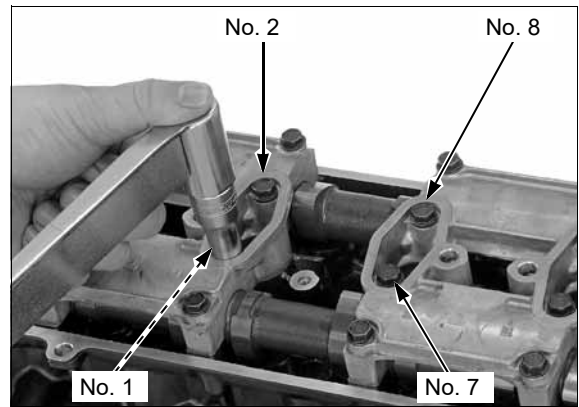
Remove the camshaft holders and measure the width of each plastigauge.

The widest thickness determines the oil clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)

When the service limits are exceeded, replace the camshaft and recheck the oil clearance.

Replace the cylinder head and camshaft holders as a set if the clearance still exceeds the service limit.

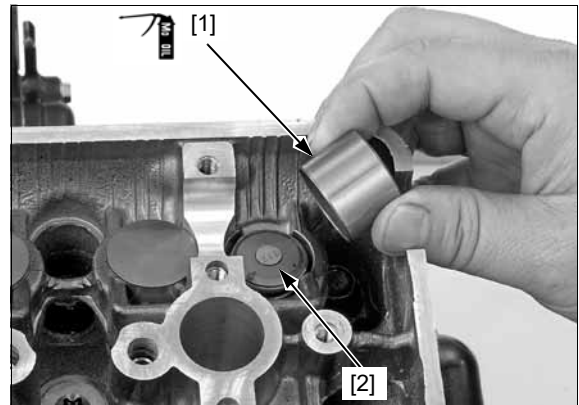


CAMSHAFT INSTALLATION

Apply molybdenum oil solution to the outer surface of the each valve lifter [1].

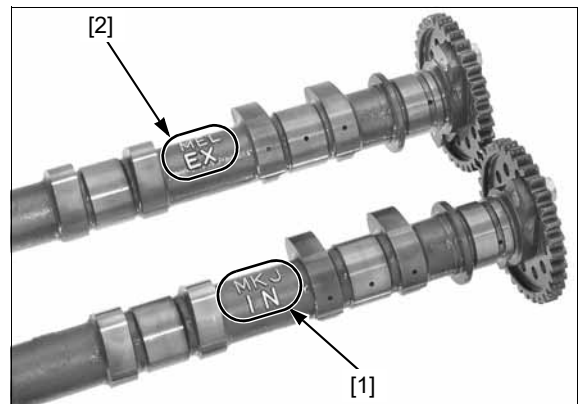
Install the shims and valve lifters in their original locations.

Install the shims [2] on the retainers and valve lifters into the valve lifter bores.



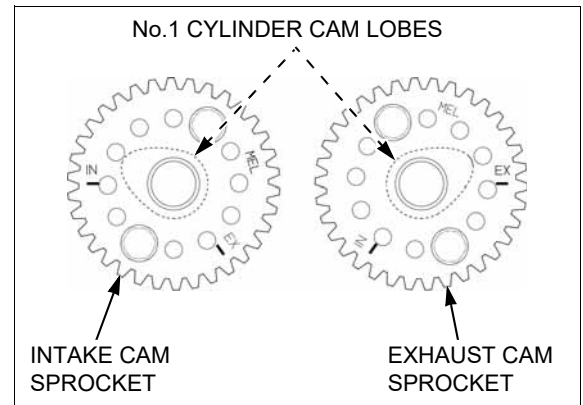
The each camshaft has identification mark.

- IN [1]: Intake camshaft
- EX [2]: Exhaust camshaft

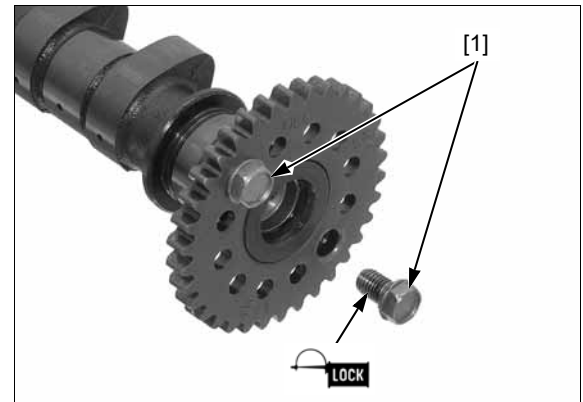


If the cam sprockets are removed, install the cam sprockets onto the camshafts.

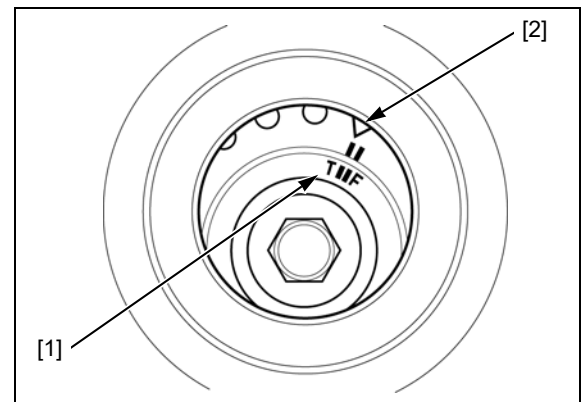
- Install the intake cam sprocket with the timing mark (IN) facing outward and the No.1 cam lobes facing up and out as shown.
- Install the exhaust cam sprocket with the timing mark (EX) facing outward and the No.1 cam lobes facing up and out as shown.



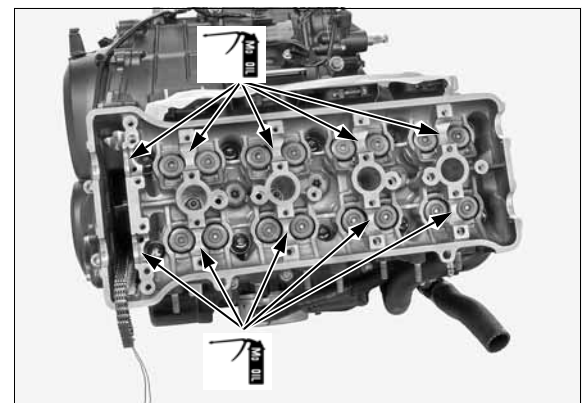
Clean the cam sprocket bolt threads and apply a locking agent.
Install the cam sprockets and bolts [1].



Turn the crankshaft clockwise and align the "T" mark [1] on the starter clutch outer with the index notch [2] on the right crankcase cover.



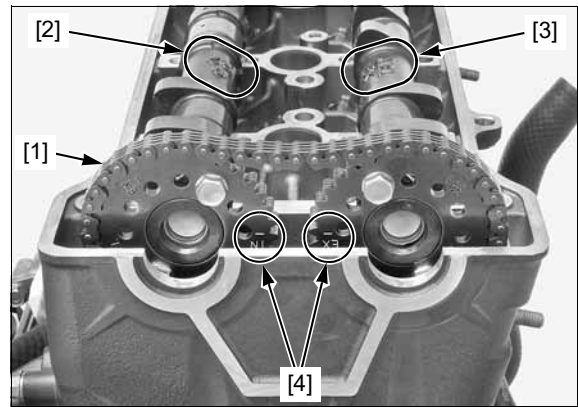
Apply molybdenum oil solution to the camshaft journal of the cylinder head.



CYLINDER HEAD/VALVES

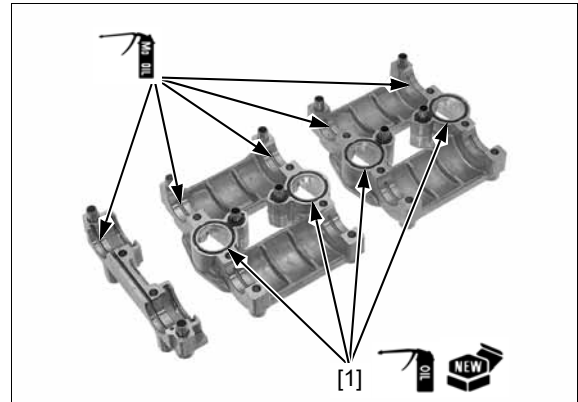
Install the cam chain [1] over the cam sprockets and then install the intake and exhaust camshafts.

- Install each camshaft to the correct locations with the identification marks.
"IN" [2]: Intake camshaft
"EX" [3]: Exhaust camshaft
- Make sure that the timing marks [4] on the cam sprockets are facing inward and flush with the cylinder head upper surface as shown.



Coat new O-rings [1] with clean engine oil and install them into the grooves in the camshaft holders.

Apply molybdenum oil solution to the camshaft journals of the camshaft holders.



Be sure the dowel pins in the cam shaft holder align the holes in the cylinder head.

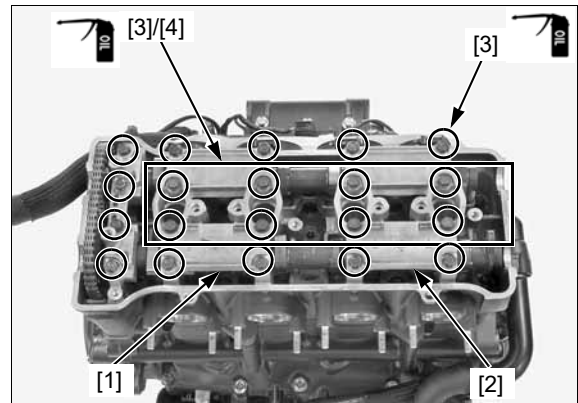
Install the each camshaft holder to the correct locations with the identification marks.

- "R" mark [1]: center camshaft holder (Holder A)
- "L" mark [2]: left camshaft holder (Holder B)
- No mark: right camshaft holder (Holder C)

Apply engine oil to the threads and seating surfaces of the camshaft holder bolts [3].

Install the twenty holder bolts with the eight sealing washers [4].

Finger tighten the bolts.



First gradually tighten the four bolts (No.1 – No.2 – No.7 – No.8) in the numerical order cast on the camshaft holders.

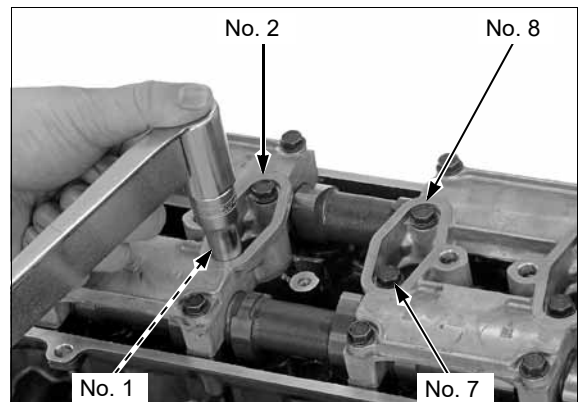
Gradually tighten the other camshaft holder bolts until the camshaft holders lightly contact the cylinder head surface.

NOTICE

Failure to tighten the camshaft holder in a crisscross pattern might cause a camshaft holder to break.

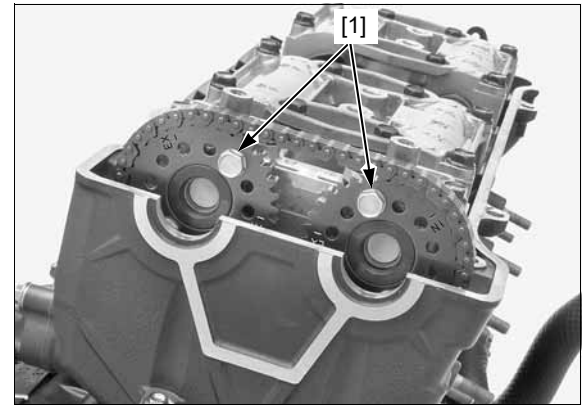
Tighten all camshaft holder bolts in the numerical order cast on the camshaft holders.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



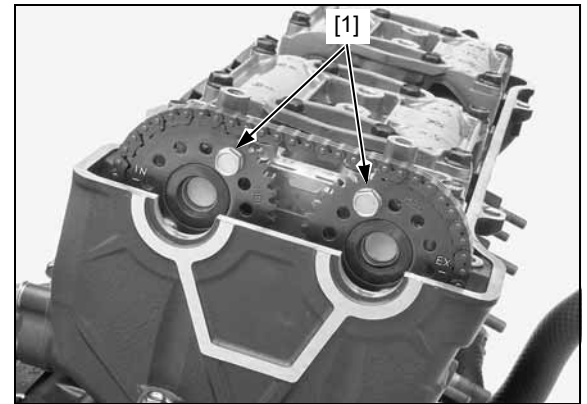
If the cam sprockets are removed, tighten the cam sprocket bolts [1] to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

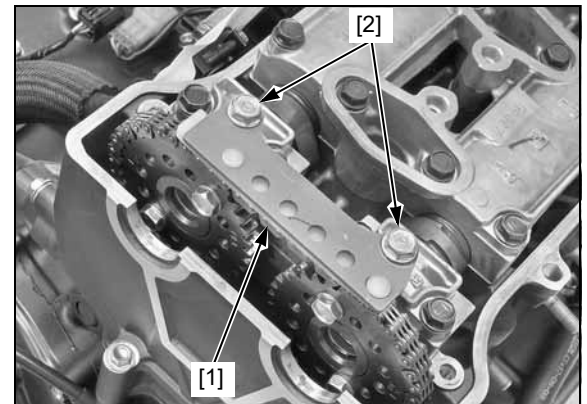


Turn the crankshaft clockwise one full turn (360°) and tighten the other cam sprocket bolts [1] to the specified torque.

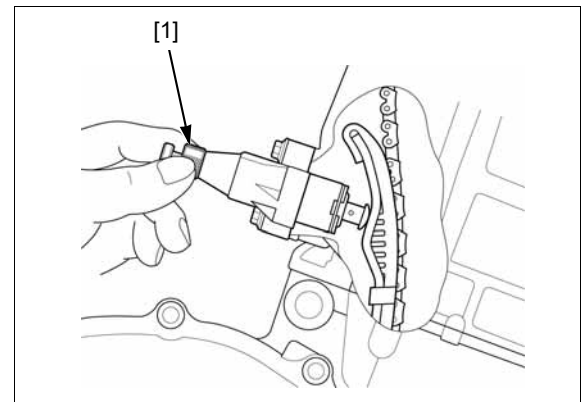
TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



Install the cam chain guide B [1], and tighten the bolts [2] securely.



Remove the special tool from the cam chain tensioner lifter [1].

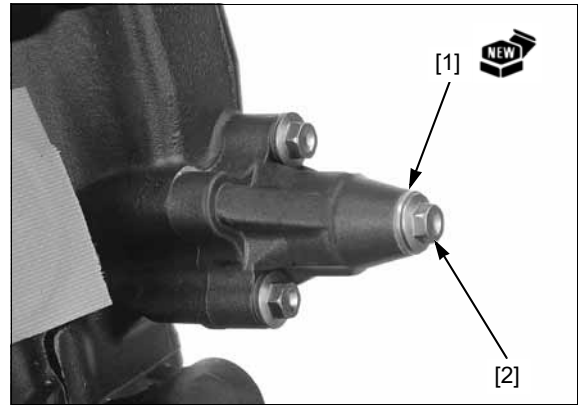


CYLINDER HEAD/VALVES

Install a new sealing washer [1] and tighten the sealing bolt [2].

Recheck the valve timing.

Install the cylinder head cover (page 10-4).



CYLINDER HEAD REMOVAL

Remove the following:

- Engine (page 15-4)
- Thermostat housing (page 8-6)
- Cam chain tensioner lifter (page 10-22)
- Camshaft (page 10-6)

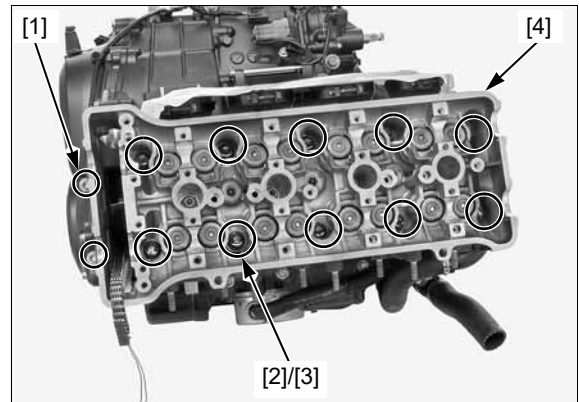
Tilt the engine and drain the coolant from the cylinder head and cylinder.

Remove the two 6 mm bolts [1].

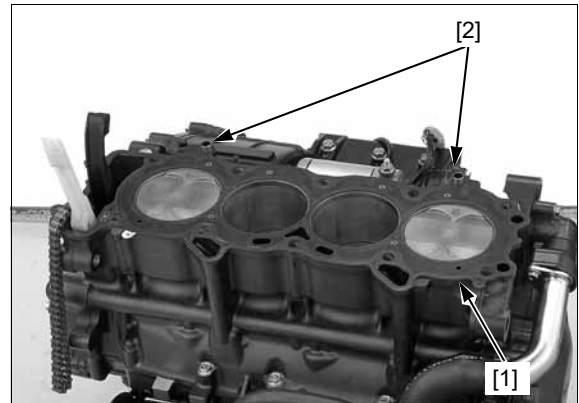
Loosen the 9 mm bolts in a crisscross pattern in two or three steps.

Remove the ten 9 mm bolts [2]/washers [3].

Remove the cylinder head [4].



Remove the gasket [1] and dowel pins [2].

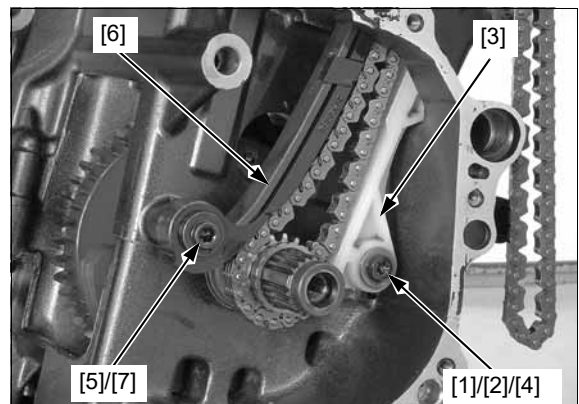


Remove the following:

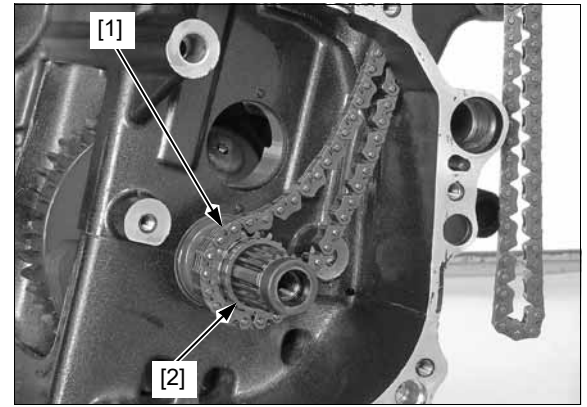
- Right crankcase cover (page 11-4)
- Starter clutch (page 11-16)

Remove the torx bolt [1], washer [2], cam chain guide A [3] and pivot collar [4].

Remove the pivot bolt [5], cam chain tensioner [6] and washer [7].



Remove the cam chain [1] and timing sprocket [2] from the crankshaft.



CYLINDER HEAD DISASSEMBLY

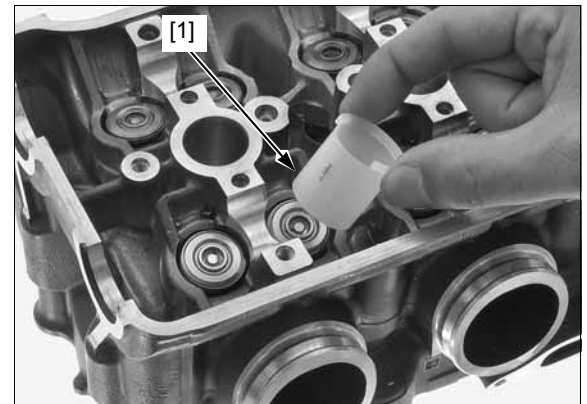
Remove the cylinder head (page 10-14).

Remove the spark plugs from the cylinder head.

Install the tappet hole protector into the valve lifter bore.

TOOL:

Tappet hole protector [1] 07HMG-MR70002



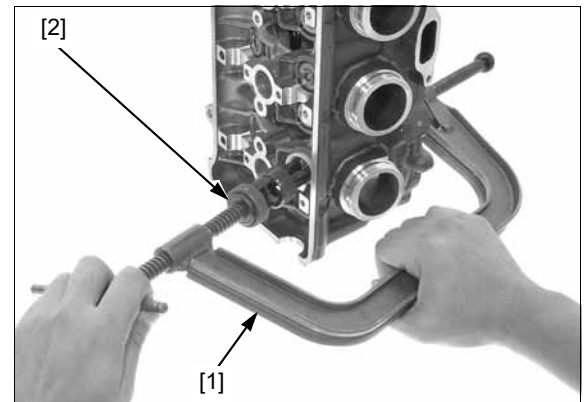
To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.

Remove the valve spring cotters using the special tools as shown.

TOOLS:

Valve spring compressor [1] 07757-0010000

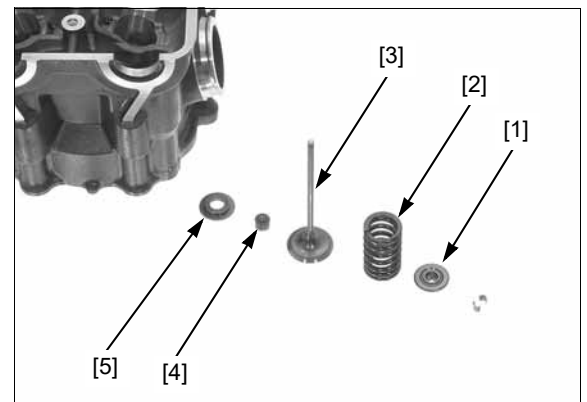
Valve spring compressor attachment [2] 07959-KM30101



Mark all parts during disassembly so they can be placed back in their original locations.

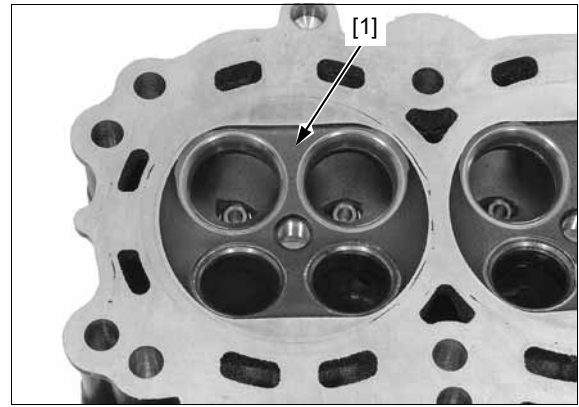
Remove the following:

- Spring retainer [1]
- Valve spring [2]
- Valve [3]
- Stem seal [4]
- Valve spring seat [5]



CYLINDER HEAD/VALVES

Avoid damaging the gasket surface. Remove carbon deposits from the combustion chambers [1]. Check the spark plug hole and valve areas for cracks.



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning or clogs in oil passages.

- Cylinder head
- Valve springs
- Cam chain tensioner
- Cam chain guide A
- Valves
- Valve guides

Measure each part according to CYLINDER HEAD/ VALVE SPECIFICATIONS (page 1-8).

Replace any part if it is out of service limit.

NOTE:

- Ream the valve guide using the valve guide reamer to remove any carbon build up before measuring the guide (page 10-16).
- Refer to valve seat inspection (page 10-17).

VALVE GUIDE REPLACEMENT

Chill the replacement valve guides in the freezer section of a refrigerator for about an hour.

Do not use a torch to heat the cylinder head; it may cause warping.

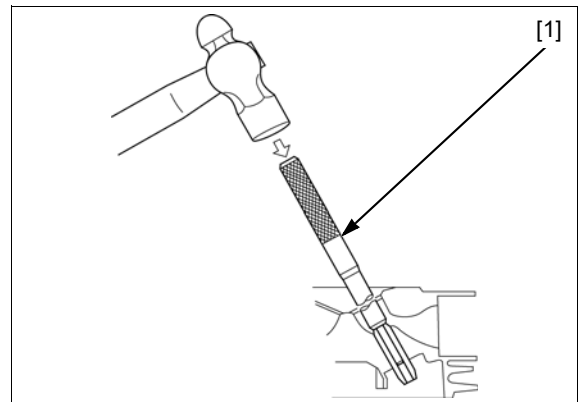
Heat the cylinder head to 100 – 150°C (212 – 302°F) with a hot plate or oven.

To avoid burns, wear heavy gloves when handling the heated cylinder head.

Support the cylinder head and drive out the valve guides from combustion chamber side of the cylinder head.

TOOL:

Valve guide driver [1] 07JMD-KY20100



Adjust the valve guide driver [1] to the specified depth.

SPECIFIED DEPTH:

IN: 16.1 – 16.4 mm (0.63 – 0.65 in)

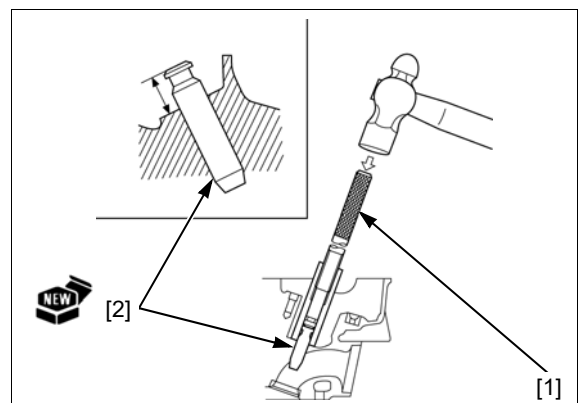
EX: 15.5 – 15.8 mm (0.61 – 0.62 in)

TOOL:

Valve guide driver 07743-0020000

While the cylinder head is still heated, drive in new valve guides [2] from the camshaft side until the exposed depth is the specified value.

Let the cylinder head cool to room temperature.



Use cutting oil on the reamer during this operation.

Ream new valve guides after installation.
Insert the reamer [1] from the combustion chamber side of the head and also always rotate the reamer clockwise.

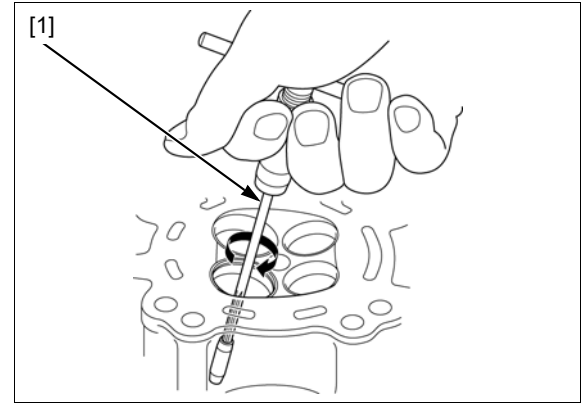
TOOL:

Valve guide reamer, 4.008 mm 07MMH-MV90100

- Take care not to tilt or lean the reamer in the guide while reaming.

Clean the cylinder head thoroughly to remove any metal particles.

Reface the valve seat (page 10-17).



VALVE SEAT INSPECTION/REFACING

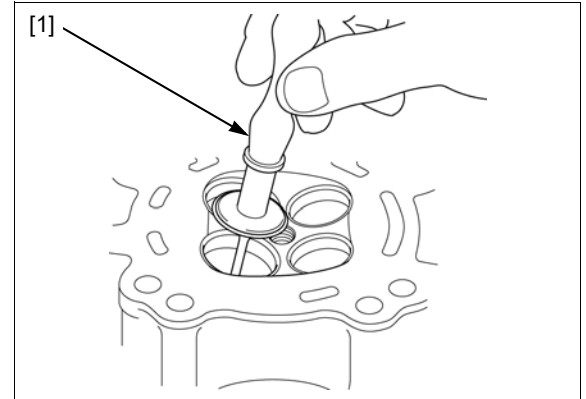
Disassemble the cylinder head (page 10-5).

Clean the intake and exhaust valves thoroughly to remove carbon deposits.

Apply a light coating of Prussian Blue to the valve seats.

Tap the valves and seats using a rubber hose or other hand-lapping tool [1].

Measure the valve seat width according to CYLINDER HEAD/VALVE SPECIFICATIONS (page 1-8).



The valves cannot be ground. If the valve face is burned, badly worn, or if it contacts the seat unevenly, replace the valve.

Inspect the valve seat face for:

- Uneven seat width:
 - replace the valve and reface the valve seat.
- Damaged face:
 - replace the valve and reface the valve seat.
- Contact area (too high or too low)
 - reface the valve seat.

CYLINDER HEAD/VALVES

REFACING

Reface the valve seat using the following tools.

TOOLS:

Cutter holder, 4.5 mm	07781-0010600
Seat cutter, 29 mm (45° IN)	07780-0010300
Seat cutter, 27.5 mm (45° EX)	07780-0010200
Flat cutter, 30 mm (32° IN/EX)	07780-0012200
Flat cutter, 27 mm (32° IN/EX)	07780-0013300
Interior cutter, 30 mm (60° IN/EX)	07780-0014000

Standard:

IN/EX: 0.90 – 1.10 mm (0.035 – 0.043 in)

SERVICE LIMIT:

IN/EX: 1.5 mm (0.06 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.

INTAKE SIDE:

After refacing, wash the cylinder head and valves.

NOTICE

- Do not lap the intake valves. They are titanium and have a thin oxide coating. Lapping will damage this coating.
- Use the intake valve as new ones.

EXHAUST SIDE:

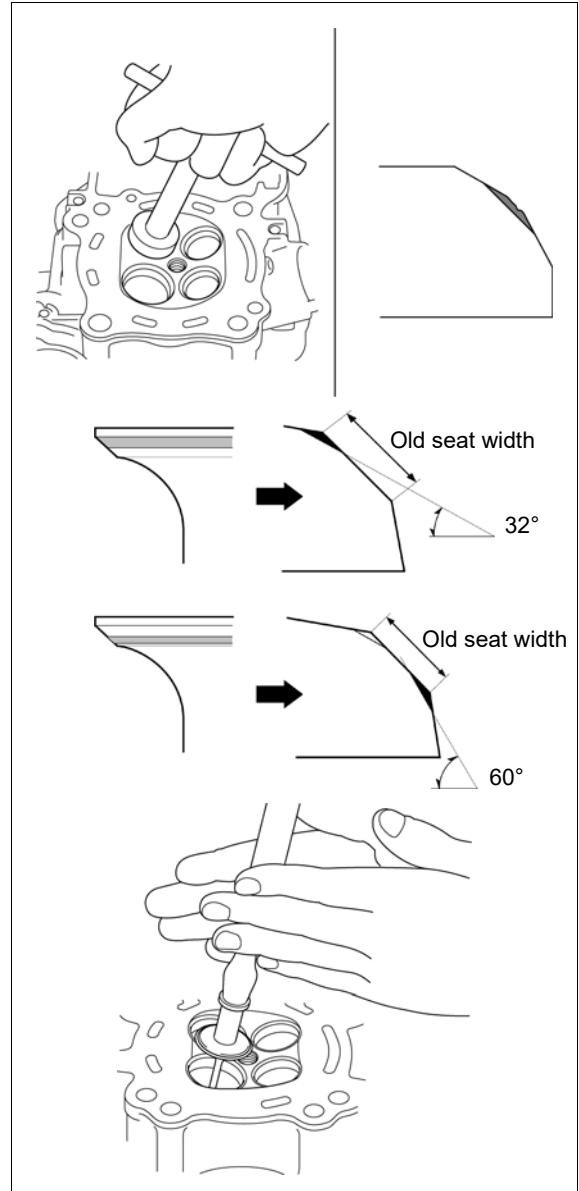
After cutting the exhaust seat, apply lapping compound to the exhaust valve face, and lap the exhaust valve using light pressure.

After lapping, wash all residual compound off the cylinder head and valve.

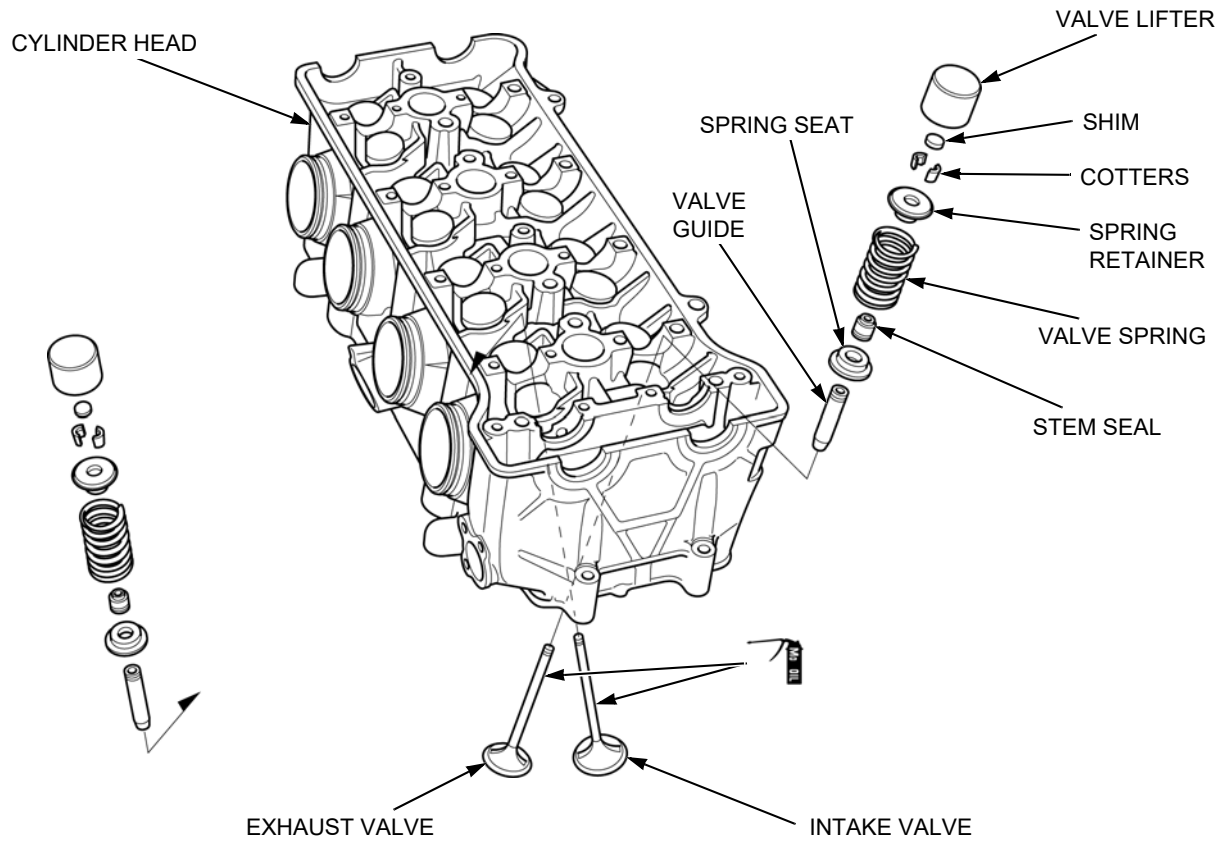
NOTICE

- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool frequently to prevent uneven seat wear.
- Do not allow any lapping compound to enter the guides.

Assemble the cylinder head (page 10-4).



CYLINDER HEAD ASSEMBLY

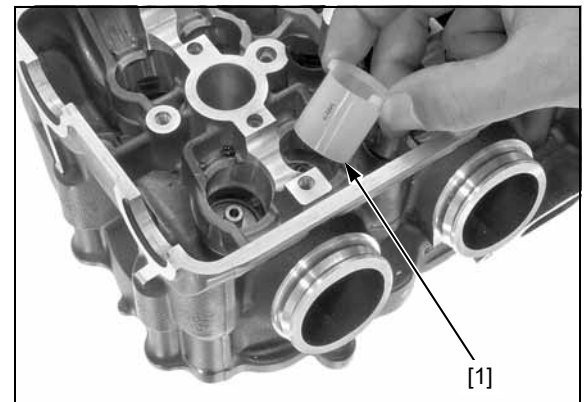


Blow through all oil passages in the cylinder head with compressed air.

Install the tappet hole protector into the valve lifter bore.

TOOL:

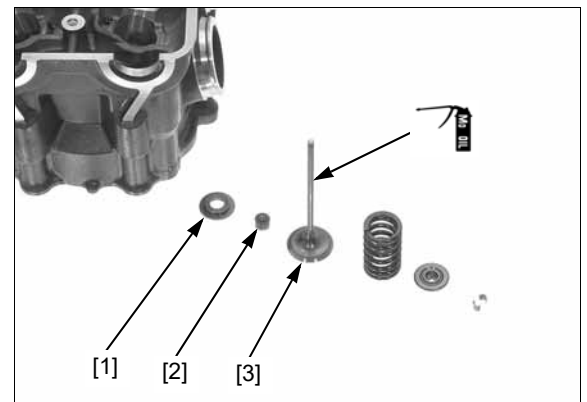
Tappet hole protector [1] 07HMG-MR70002



Install the valve spring seats [1].

Install the new stem seals [2].

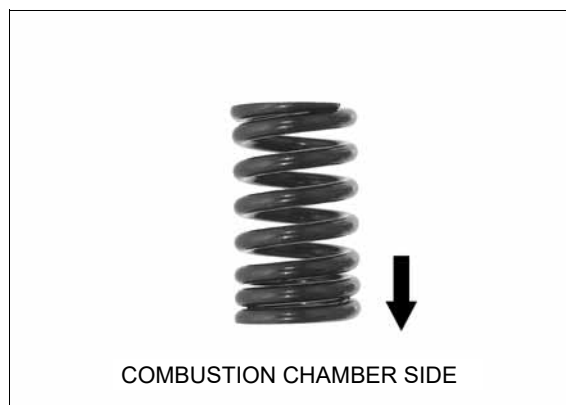
Lubricate the valve stems with molybdenum oil solution. Insert the valve [3] into the valve guide while turning it slowly to avoid damage to the stem seal.



CYLINDER HEAD/VALVES

Install the valve springs with the tightly wound coils facing the combustion chamber.

Install the valve spring retainer.



Grease the cotters to ease installation.

Install the valve cotters using the special tools as shown.

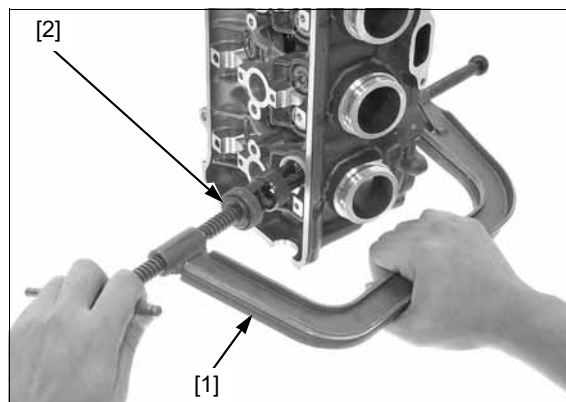
NOTE:

To prevent loss of tension, do not compress the valve spring more than necessary.

TOOLS:

Valve spring compressor [1] 07757-0010000

Valve spring compressor attachment [2] 07959-KM30101

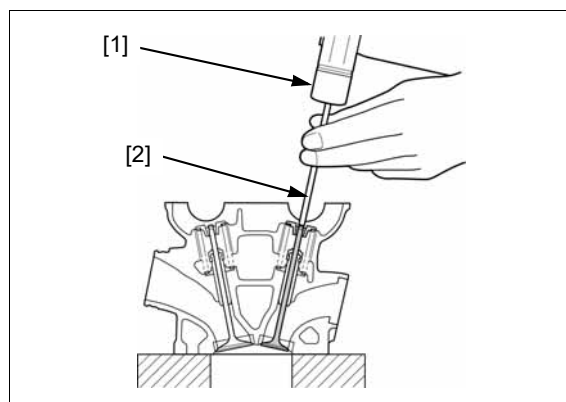


Support the cylinder head above the work bench surface to prevent possible valve damage.

Tap the valve stems gently with plastic hammers [1] and pin driver [2] as shown to seat the cotters firmly.

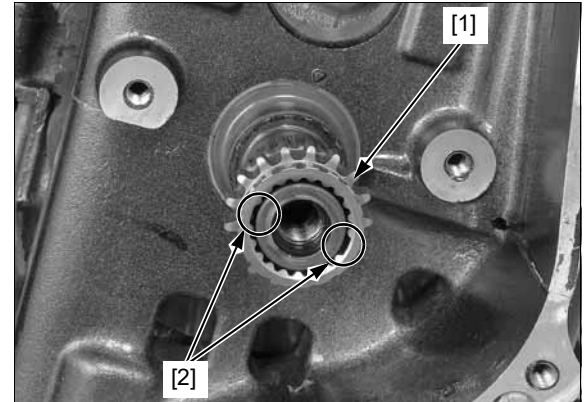
Install and tighten the spark plugs.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

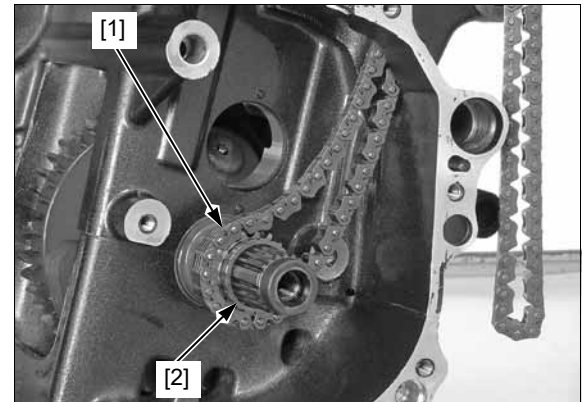


CYLINDER HEAD INSTALLATION

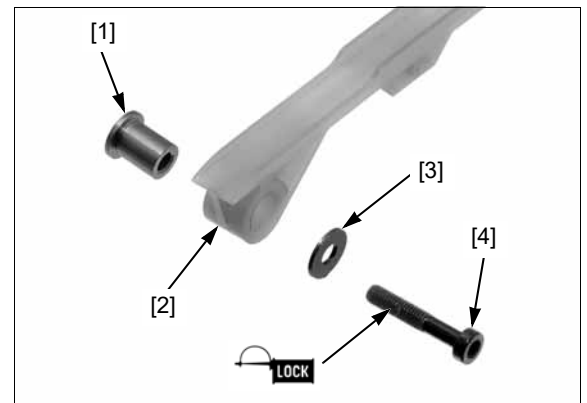
Install the timing sprocket [1] by aligning the wide teeth [2] between the crankshaft and timing sprocket.



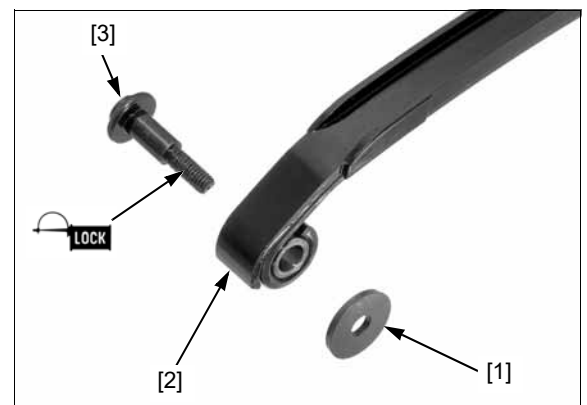
Install the cam chain [1] to the timing sprocket [2].



Apply a locking agent to the cam chain guide torx bolt threads.
Install the pivot collar [1], cam chain guide [2], washer [3] and torx bolt [4].



Apply a locking agent to the cam chain tensioner socket bolt threads.
Install the washer [1], cam chain tensioner [2] and pivot bolt [3].



CYLINDER HEAD/VALVES

Tighten the cam chain guide torx bolt [1] to the specified torque.

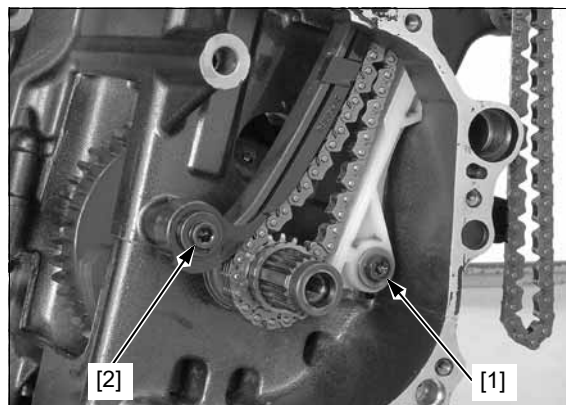
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Tighten the cam chain tensioner pivot bolt [2] to the specified torque.

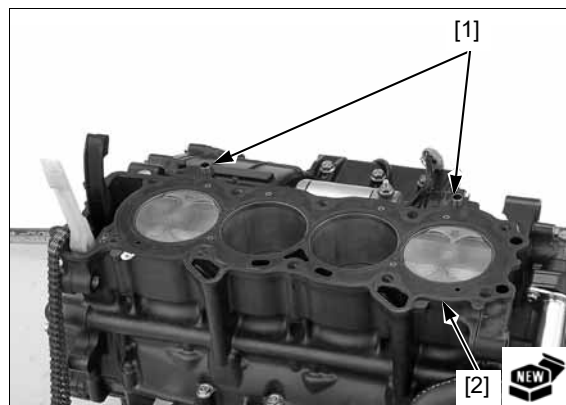
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the following:

- Starter clutch (page 11-16)
- Right crankcase cover (page 11-4)



Install the dowel pins [1] and a new cylinder head gasket [2] as shown.



Apply molybdenum disulfide oil solution to the threads and seating surface of the 9 mm bolts [1] /washers [2] and install them.

Install the two 6 mm flange bolts [3].

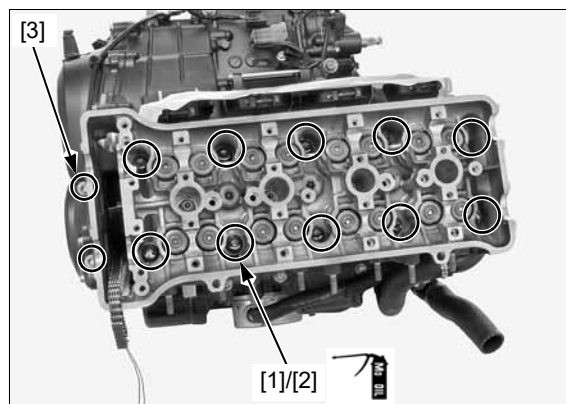
Tighten the 9 mm bolts in a crisscross pattern in two or three steps to the specified torque.

TORQUE: 51 N·m (5.2 kgf·m, 38 lbf·ft)

Tighten the 6 mm flange bolts securely.

Install the following:

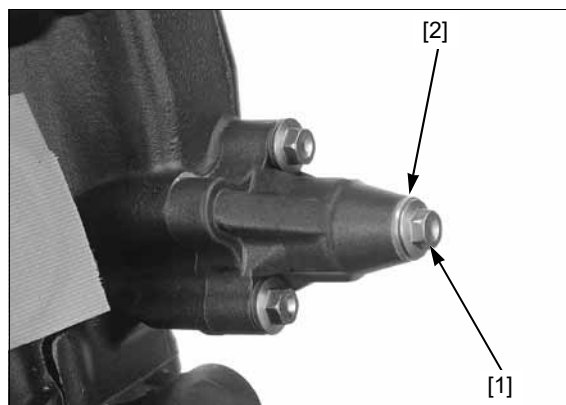
- Engine (page 15-7)
- Thermostat housing (page 8-6)
- Cam chain tensioner lifter (page 10-22)
- Camshaft (page 10-6)



CAM CHAIN TENSIONER LIFTER

REMOVAL/INSTALLATION

Remove the cam chain tensioner bolt [1] and sealing washer [2].



Install the tensioner stopper [1].

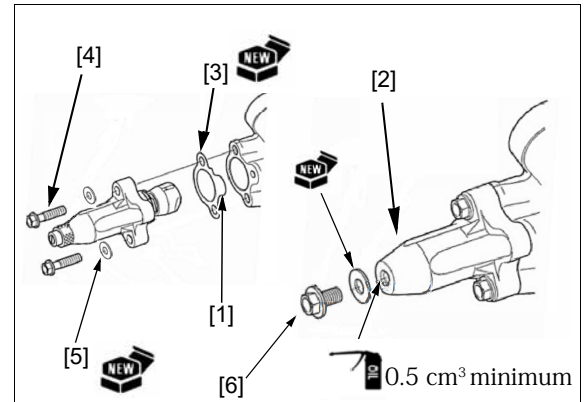
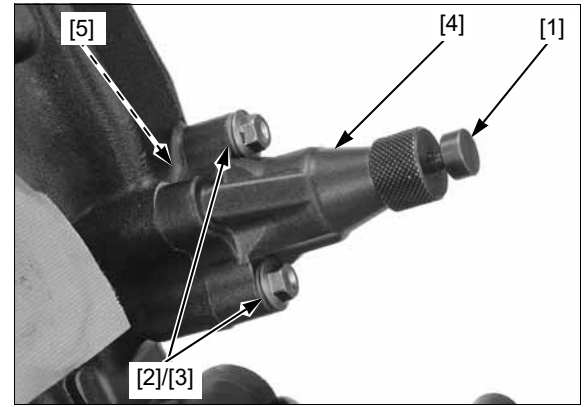
TOOL:
Tensioner stopper 070MG-0010100

Remove the bolts [2], sealing washers [3], cam chain tensioner lifter [4] and gasket [5].

Install the cam chain tensioner lifter [2] onto the cylinder head with new gasket [3].

Make sure the gasket tab [1] is in the direction as shown. Install the mounting bolts [4] with the new sealing washers [5].
Tighten the mounting bolts securely.

Before installing the cam chain tensioner bolt [6], inject at least 0.5 cm³ of engine oil into the cam chain tensioner lifter.



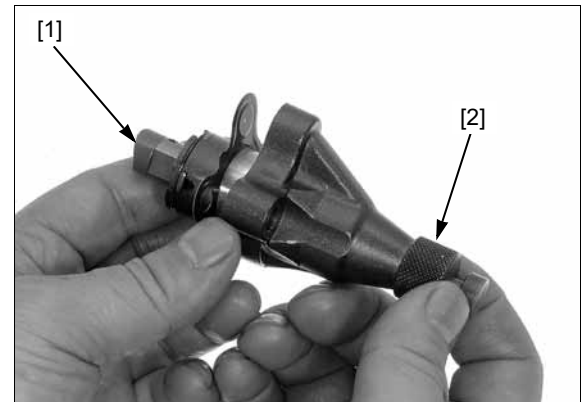
INSPECTION

– Ch Teckhe cam chainthe cam chain tensionetensioner lifter [1] operation:r lifter shaft should not go

into the lifter body when it is pushed.

– When it is turned clockwise with the tensioner stopper or a screwdriver, the shaft should be pulled into the lifter body. The shaft should spring out of the lifter body as soon as the tensioner holder is released.

TOOL:
Tensioner stopper [2] 070MG-0010100



MEMO

11. CLUTCH/STARTER CLUTCH

SERVICE INFORMATION.....	11-2	RIGHT CRANKCASE COVER	11-4
TROUBLESHOOTING	11-2	CLUTCH	11-6
COMPONENT LOCATION	11-3	STARTER CLUTCH	11-16

SERVICE INFORMATION

GENERAL

- This section covers service of the clutch 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.
- The primary drive gear and clutch outer guide inserts are select fit and identified by codes. Select replacement bearings from the code tables (page 11-11).
- When using the lock nut wrench, use a deflecting beam type torque wrench 500 mm (20.0 in) long. The lock nut wrench increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the lock nut. The specification given below is the actual torque applied to the lock nut, not the reading on the torque wrench when used with the lock nut wrench. The procedure later in the text gives both actual and indicated torque readings.
- For CKP sensor inspection (page 4-69)
- If the following parts are removed, perform the crank pulse initialize learning procedure (page 4-69)(ED, II ED, KO and III KO models only).
 - Alternator cover
 - Stator
 - Flywheel

TROUBLESHOOTING

Clutch lever is too hard to pull in

- Damaged clutch lifter mechanism
- Faulty clutch lifter bearing
- Clutch lifter piece installed improperly

Clutch slips when accelerating

- Worn clutch disc
- Weak clutch springs
- Engine oil mixed with molybdenum or graphite additive

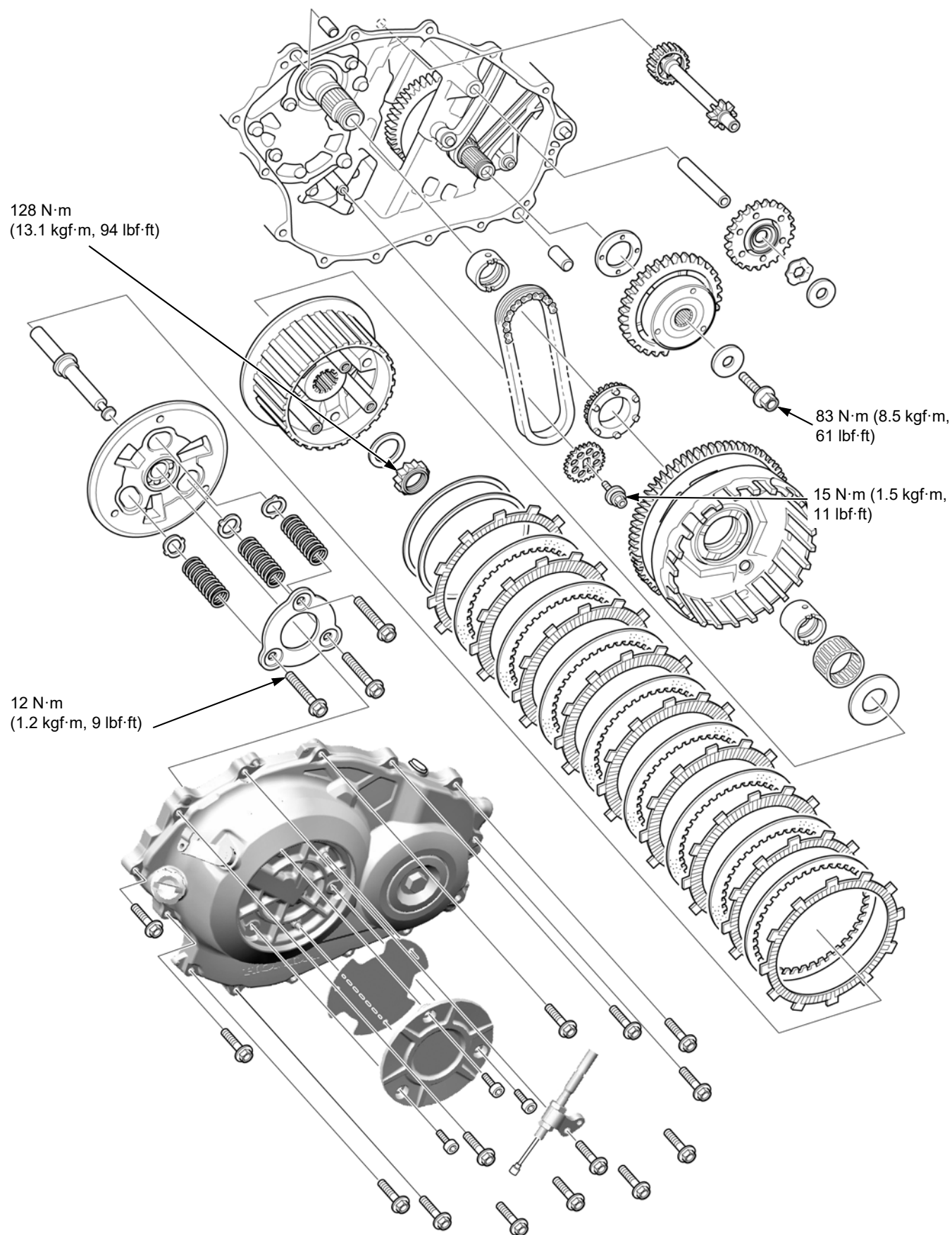
Clutch will not disengage or motorcycle creeps with clutch disengaged

- Clutch plate warped
- Loose clutch center lock nut
- Oil level too high
- Improper oil viscosity
- Damaged clutch lifter mechanism
- Clutch lifter piece installed improperly

Engine does not turn

- Faulty starter clutch
- Damaged reduction gear/shaft
- Damaged idle gear/shaft

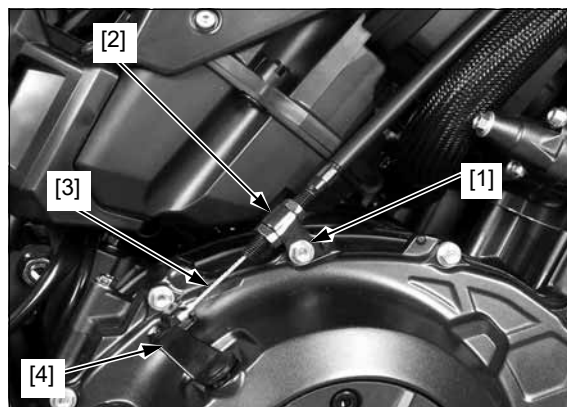
COMPONENT LOCATION



RIGHT CRANKCASE COVER

REMOVAL/INSTALLATION

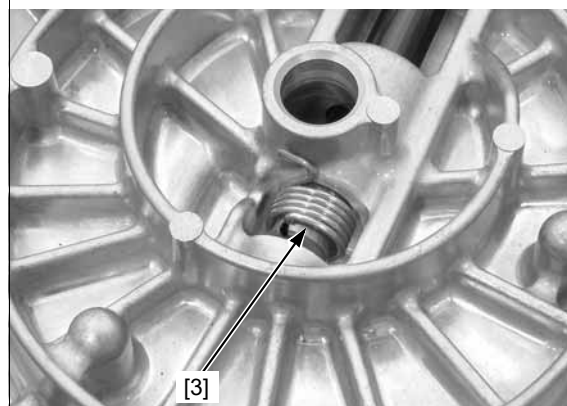
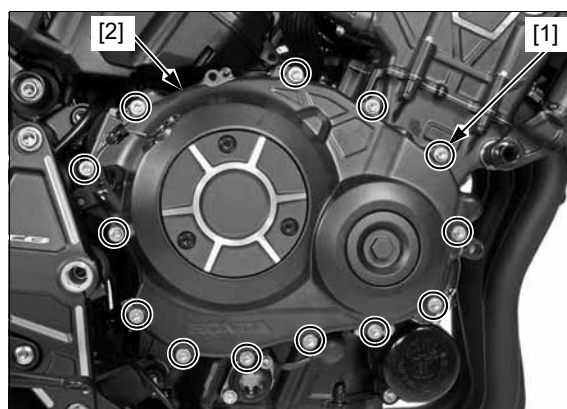
Remove the bolt [1] and clutch cable guide plate [2], then disconnect the clutch cable [3] end from the clutch lifter lever [4].



Loosen the right crankcase cover bolts [1] crisscross pattern in two or three steps.

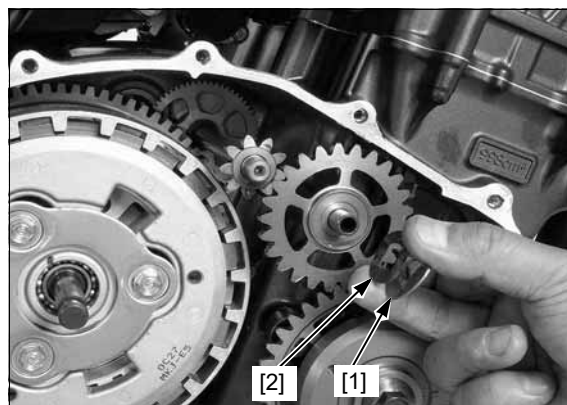
Be careful not to drop the clutch lifter lever return spring [3] into the oil pan.

Remove the right crankcase cover [2] while turning the clutch lifter lever counterclockwise to disengage the lifter lever spindle from the lifter piece.



Be careful not to drop the thrust/wave washers into the oil pan.

Remove the thrust washer [1] and wave washer [2] from the starter idle gear shaft.

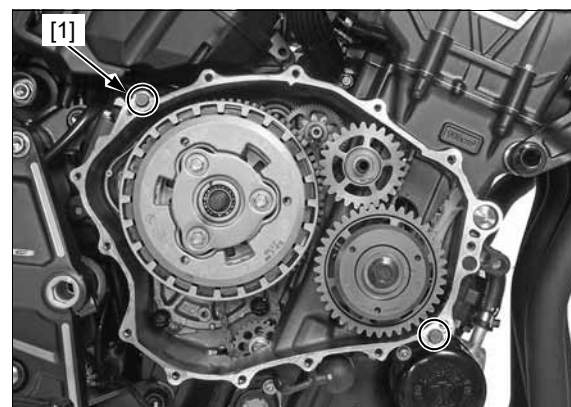


Remove the four dowel pins [1].

Clean off any sealant from the right crankcase cover mating surfaces.

NOTE:

- Do not turn the crankshaft counterclockwise after removing the right crankcase cover to prevent the starter reduction gear from damage.

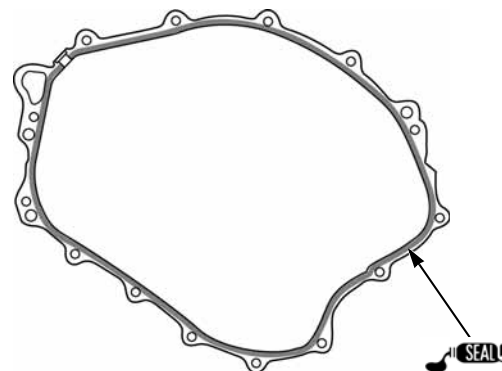


Installation is in the reverse order of removal.

NOTE:

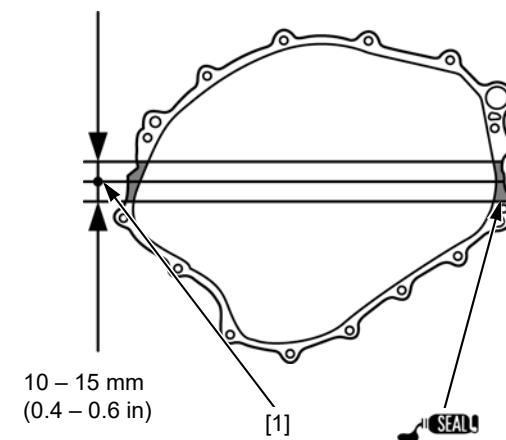
- Apply sealant (TB1207B or equivalent) to the mating surface of the right crankcase cover as shown.
- Apply sealant (TB1207B or equivalent) to the crankcase mating surface area [1] of the crankcase as shown.
- Install the right crankcase cover while turning the lifter lever clockwise to engage the lifter lever spindle groove with the lifter piece flange.
- Check that there are no oil leaks.
- Adjust the clutch lever freeplay (page 3-24).

Cover side:



Crankcase side:

10 – 15 mm
(0.4 – 0.6 in)



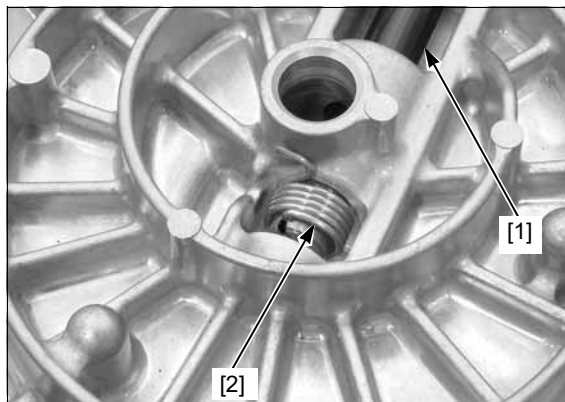
10 – 15 mm
(0.4 – 0.6 in)

CLUTCH/STARTER CLUTCH

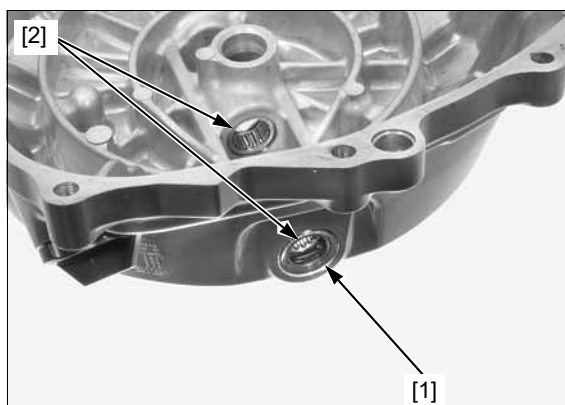
CLUTCH LIFTER LEVER

Remove the clutch lifter lever and return spring from the right crankcase cover.

Check the lifter lever [1] spindle for wear or damage.
Check the return spring [2] for fatigue or damage.

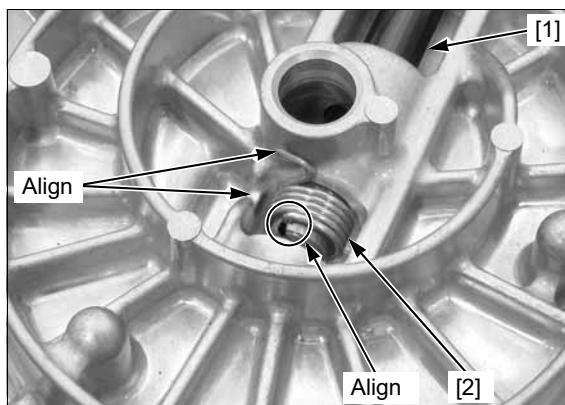


Check the oil seal [1] and needle bearings [2] for wear or damage.



Install the clutch lifter lever [1] and return spring [2] to the right crankcase cover as shown.

- Align the return spring end with the clutch lifter lever groove.
- Align the return spring hook with the right crankcase cover groove.



CLUTCH

REMOVAL

Remove the right crankcase cover (page 11-4).

Remove the starter idle gear [1] and shaft [2].



Loosen the set plate bolts [1] in a crisscross pattern in 2 or 3 steps, and remove the bolts, set plate [2], and clutch springs [3].

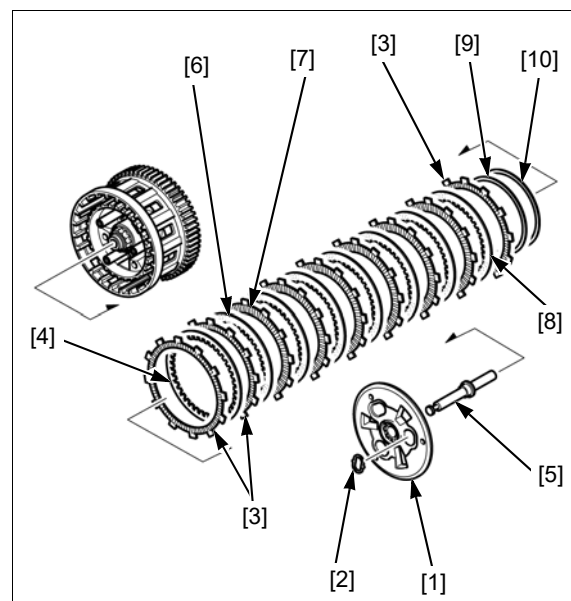


Remove the following:

- Clutch pressure plate [1]
- Clutch spring seats [2]
- Clutch disc B [3] (3 pcs)
- Clutch plate C [4]
- Clutch lifter pin [5]
- Clutch plates A [6] (6 pcs)
- Clutch discs A [7] (6 pcs)
- Clutch plate B [8]
- Judder spring [9]
- Judder spring seat [10]

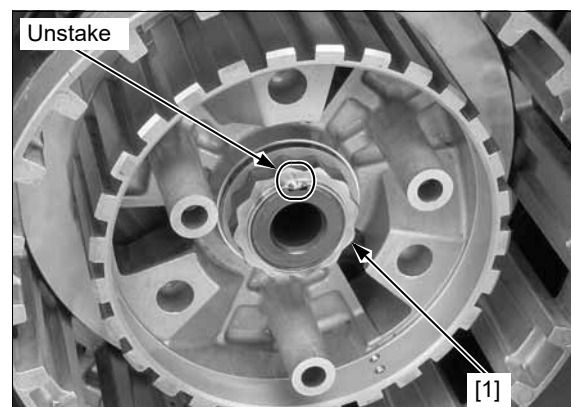
NOTE:

- When removing the clutch discs and plates, note the number of the clutch discs and plates.



Be careful not to damage the mainshaft threads.

Unstake the clutch center lock nut [1].



Install special tools and loosen the clutch center lock nut [1] while holding the clutch center with the special tool.

TOOLS:

Clutch center holder [2] 07724-0050002
Lock nut wrench 30 x 40 mm [3] 07916-9690000

Remove the lock nut.

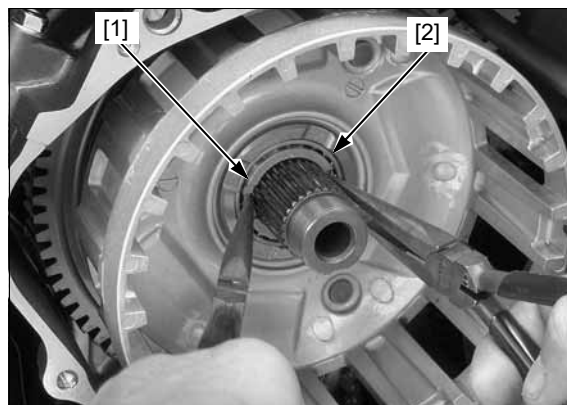


CLUTCH/STARTER CLUTCH

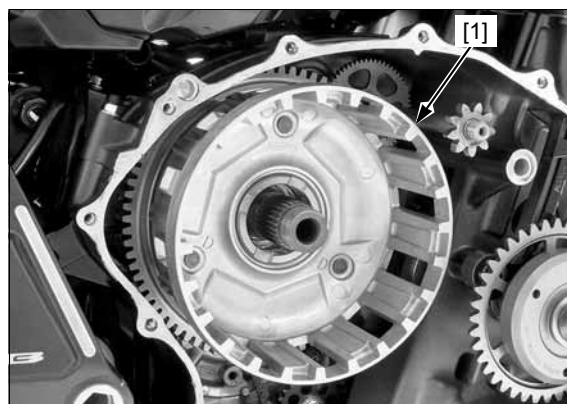
Remove the thrust washer [1].



Remove the clutch outer guide [1] and needle bearing [2].



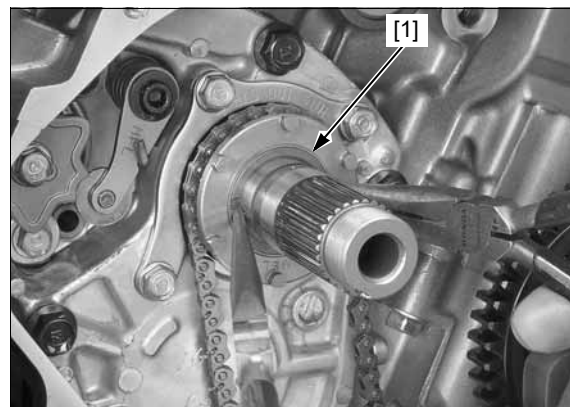
Remove the clutch outer [1].



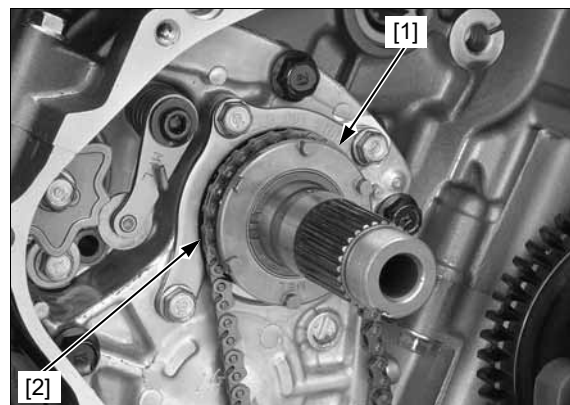
Remove the starter reduction gear [1] from the crankcase.



Remove the oil pump drive sprocket guide [1].



Remove the oil pump drive sprocket [1] and chain [2].

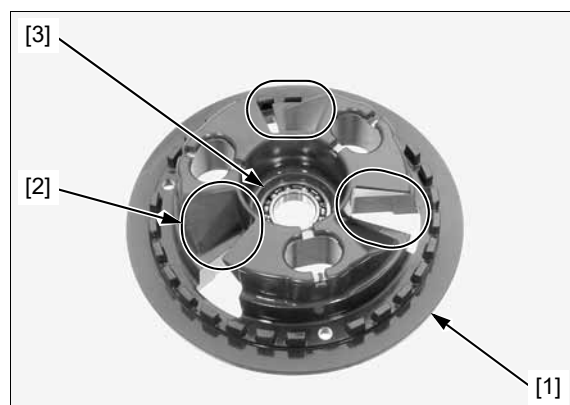


INSPECTION

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]

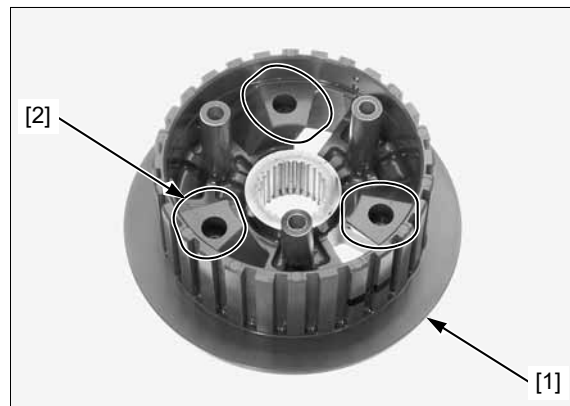
Replace the clutch pressure plate if necessary.



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.

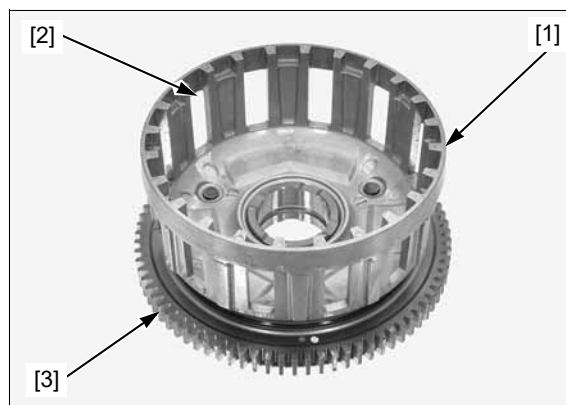


CLUTCH/STARTER CLUTCH

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.



Inspect the following parts for scratches, damage, abnormal wear and deformation. Replace if necessary.

- Clutch springs
- Clutch spring seats
- Clutch lifter pin
- Clutch discs/plates
- Judder spring
- Judder spring seat
- Clutch outer guide

Measure each part according to CLUTCH/STARTER CLUTCH SPECIFICATIONS (page 1-8).

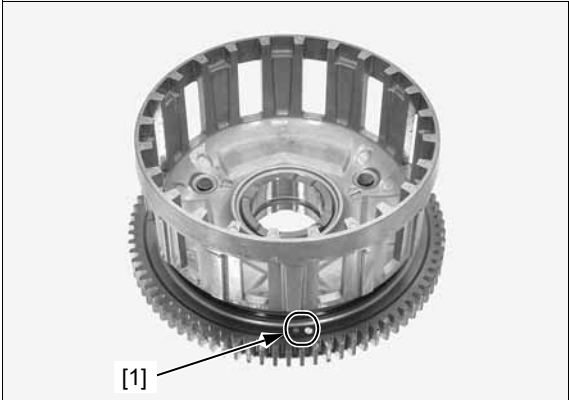
Replace any part if it is out of service limit.

NOTE:

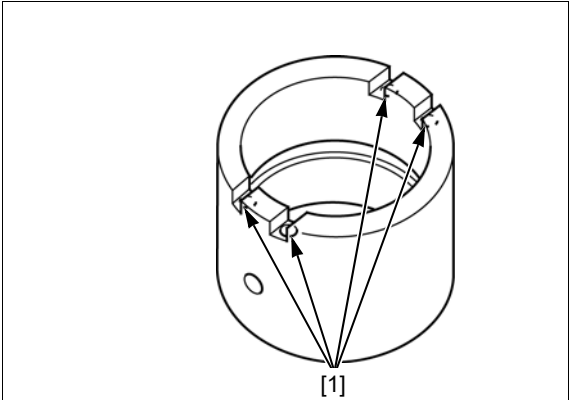
- Replace the clutch springs as a set.
- Replace the clutch discs and plates as a set.

NEEDLE BEARING SELECTION

The primary driven gear has I.D. code paint [1].



The clutch outer guide has O.D. code marks [1] as shown.



Cross-reference the primary driven gear and clutch outer guide codes to determine the replacement needle bearing.
Refer to the selection table below for bearing selection.



NEEDLE BEARING SELECTION TABLE:

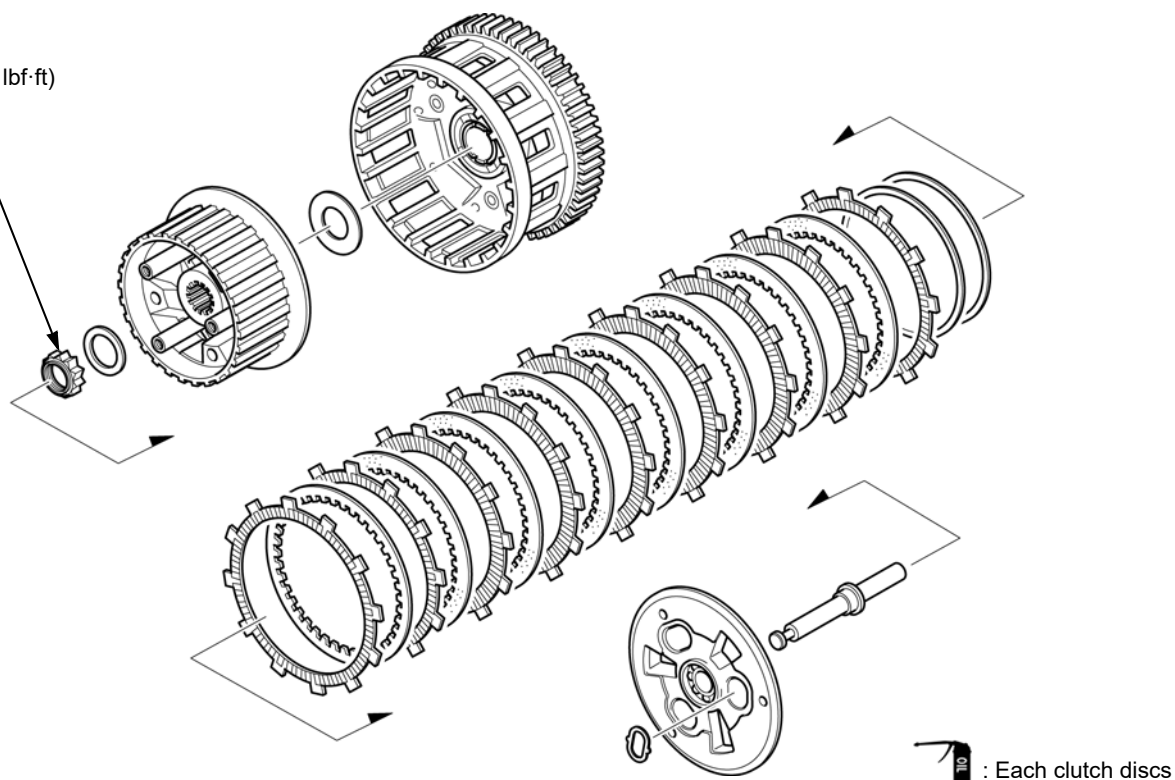
			CLUTCH OUTER GUIDE ID MARK	
			GUIDE A (Without ID mark)	GUIDE B (With ID mark)
			35.004 – 35.012 mm (1.3781 – 1.3784 in)	34.996 – 35.004 mm (1.3778 – 1.3781 in)
PRIMARY DRIVEN GEAR I.D. MARK	A	41.008 – 41.016 mm (1.6145 – 1.6148 in)	NEEDLE BEARING B (White)	NEEDLE BEARING A (Red)
	B	41.000 – 41.008 mm (1.6142 – 1.6145 in)	NEEDLE BEARING C (yellow)	NEEDLE BEARING B (White)

CLUTCH/STARTER CLUTCH

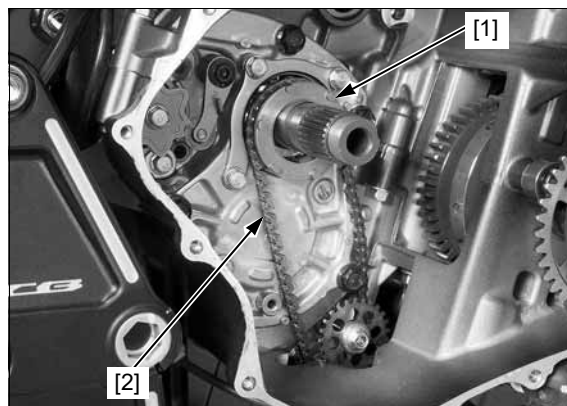
INSTALLATION



128 N·m
(13.1 kgf·m, 94 lbf·ft)

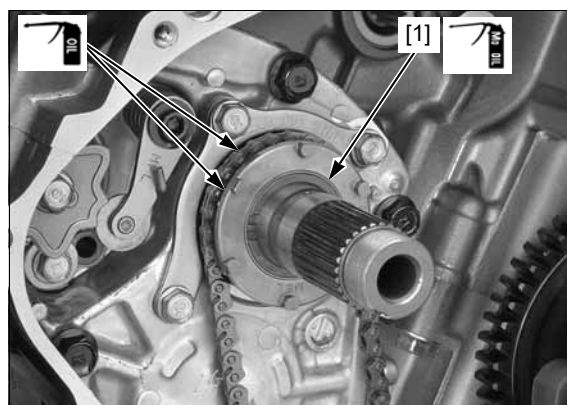


Install the oil pump drive sprocket [1] and drive chain [2].



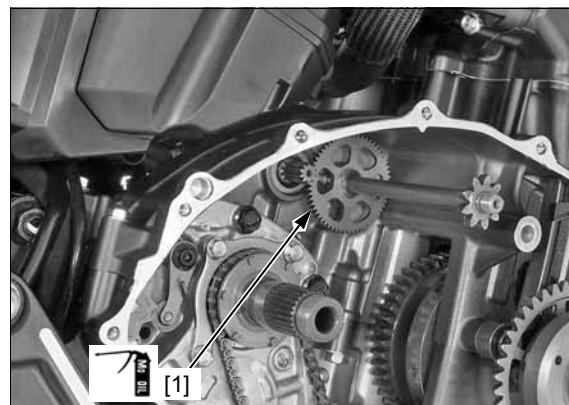
Apply molybdenum oil solution to the oil pump drive sprocket guide [1] sliding surface and install it to the mainshaft.

Apply oil to the oil pump drive sprocket teeth and drive chain.



Apply molybdenum oil solution to the starter reduction gear [1] sliding surface.

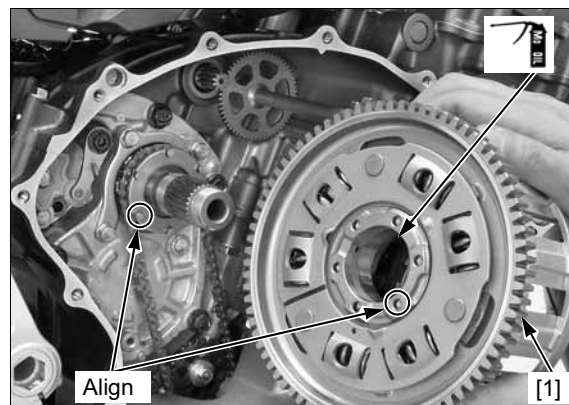
Install the starter reduction gear into the crankcase.



Apply molybdenum oil solution to the clutch outer [1] sliding surface.

Make sure the starter reduction gear is installed into the crankcase before installing the clutch outer.

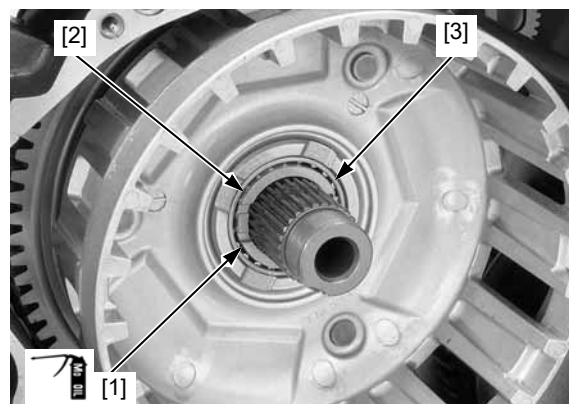
Install the clutch outer by aligning the tabs of the oil pump drive sprocket with the holes of the clutch outer.



Apply molybdenum oil solution to the clutch outer guide [1] sliding surface.

Install the clutch outer guide with its grooves [2] facing out.

Install the clutch outer guide and needle bearing [3] onto the mainshaft.



Install the thrust washer [1].



CLUTCH/STARTER CLUTCH

Apply engine oil to a new clutch center lock nut threads and seating surface.

Install the clutch center lock nut [1] onto the mainshaft.

Install special tools and tighten the clutch center lock nut to the specified torque by holding the clutch center with the special tool.

TOOLS:

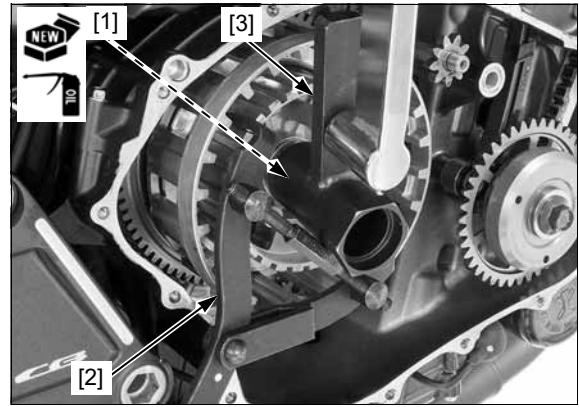
Clutch center holder [2] 07724-0050002

Lock nut wrench 30 x 40 mm [3] 07916-9690000

TORQUE:

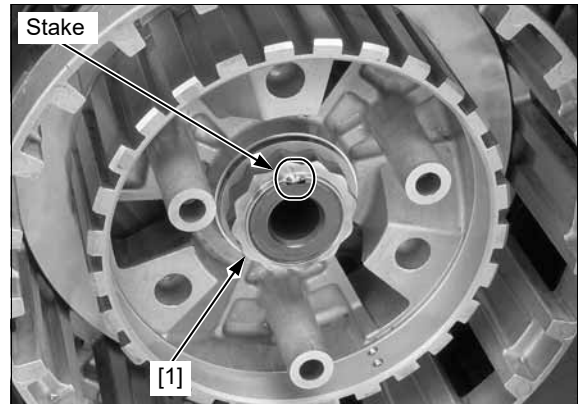
Actual: 128 N·m (13.1 kgf·m, 94 lbf·ft)

Indicated: 116 N·m (11.8 kgf·m, 86 lbf·ft)



Be careful not to damage the mainshaft threads.

Stake the lock nut [1] into the mainshaft groove with a punch.



Apply molybdenum oil solution to the entire surface of judder spring seat and judder spring.

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.

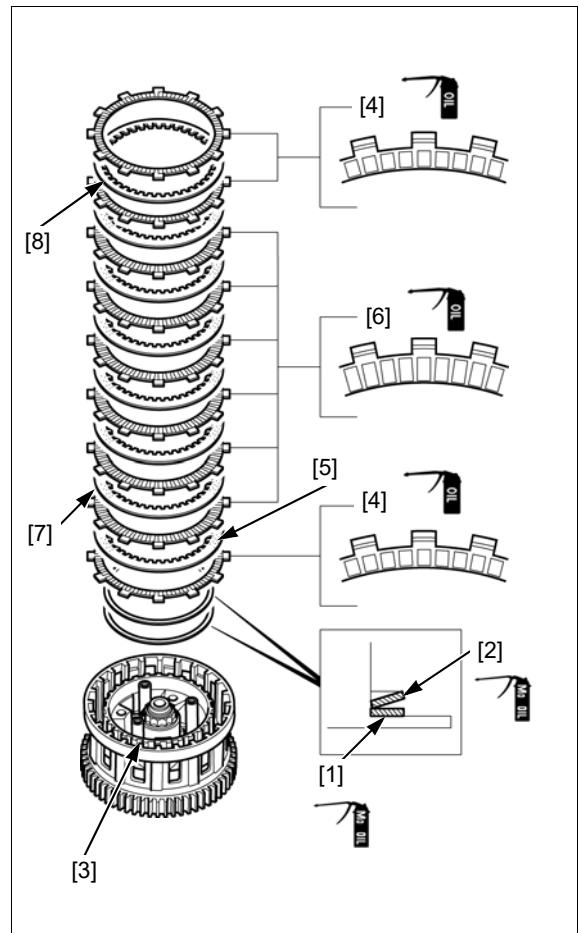
Install the clutch disc B [4] and plate B [5] onto the clutch center.

NOTE:

- Clutch disc B: smaller lining width than disc A
- Clutch plate B: surface treatment difference from clutch plate A

Install the clutch discs A [6] (6 pcs) and plates A [7] (6 pcs) alternately, starting with the disc A.

Install the clutch disc B, plate C [8], disc B.



Install the clutch lifter pin [1].

Install the spring seats [2] onto the clutch pressure plate [3] grooves.

NOTE:

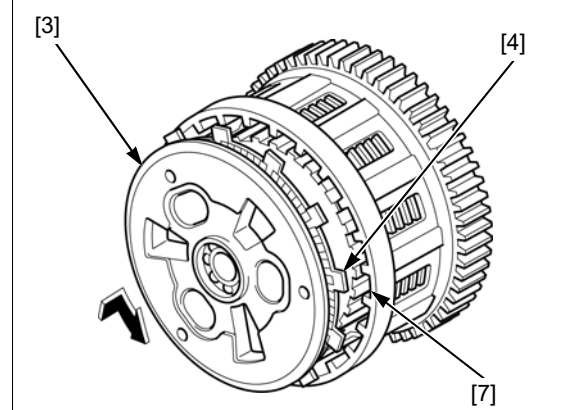
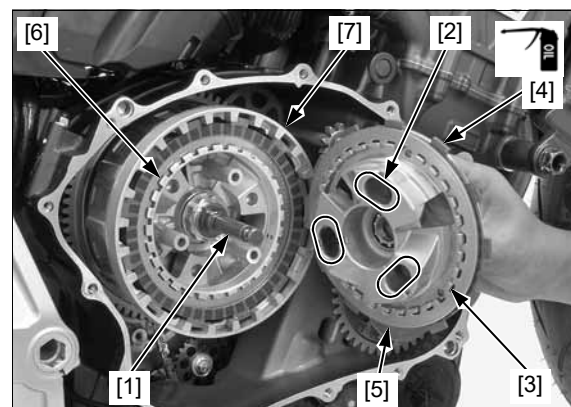
- Make sure that the spring seats are fully seated in the pressure plate grooves.

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 C [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].



Install the clutch springs [1], set plate [2] and set plate bolts [3].

Tighten the set plate bolts in a crisscross pattern in 2 or 3 steps.



Apply molybdenum oil solution to the starter idle gear shaft sliding surface.

Install the starter idle gear [1] and shaft [2].

Install the right crankcase cover (page 11-4).



STARTER CLUTCH

REMOVAL/INSTALLATION

Remove the clutch (page 11-6).

Remove the starter reduction gear [1] from the crankcase.



Be careful not to drop the gear holder into the crankcase.

Temporarily install the following:

- Oil pump drive sprocket guide
- Oil pump drive sprocket
- Clutch outer
- Clutch outer guide
- Needle bearing

Insert the gear holder [1] between the primary drive and driven gear as shown.

TOOL:

Gear holder, M2.5

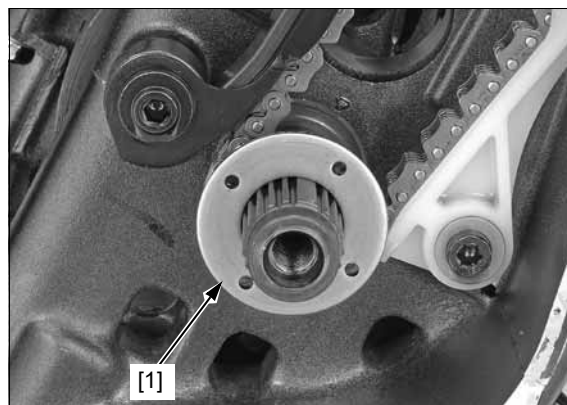
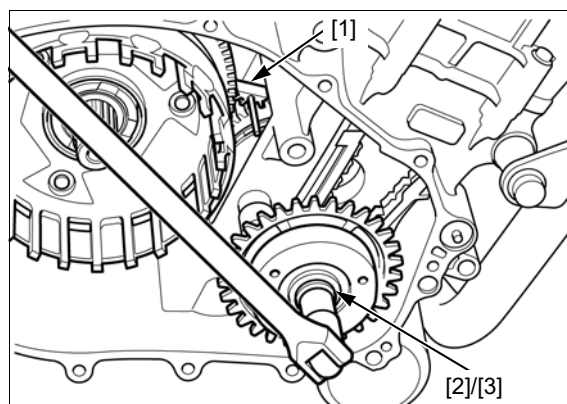
07724-0010100

Remove the starter clutch outer special bolt [2] and washer [3].

Remove the temporarily installed parts.

Remove the starter clutch outer assembly.

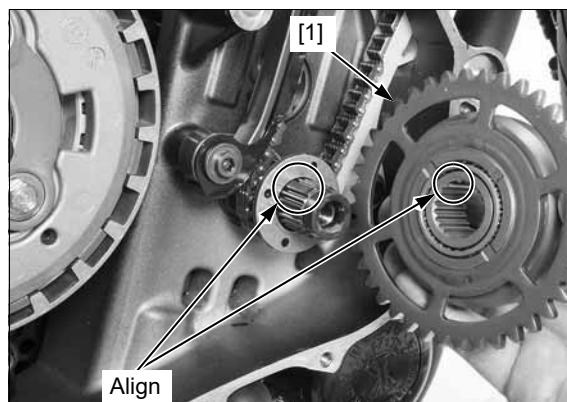
Remove the thrust washer [1].



Installation is in the reverse order of removal.

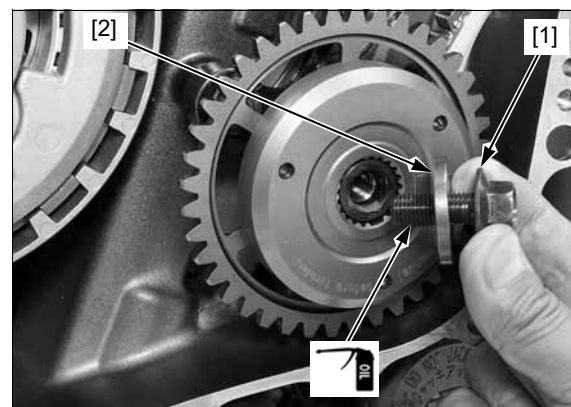
NOTE:

- Install the starter clutch outer assembly [1] onto the crankshaft while aligning its wide groove with the wide teeth of the crankshaft.



Apply engine oil to the starter clutch outer special bolt [1] threads and seating surface.

Install the washer [2] and starter clutch outer special bolt.



Temporarily install the following:

- Oil pump drive sprocket outer guide
- Oil pump drive sprocket
- Clutch outer
- Clutch outer guide
- Clutch outer needle bearing

Be careful not to drop the gear holder into the crankcase.

Attach the gear holder [1] between the primary drive gear and driven gear.

TOOL:

Gear holder, M2.5

07724-0010100

Tighten the starter clutch special bolt [2] to the specified torque.

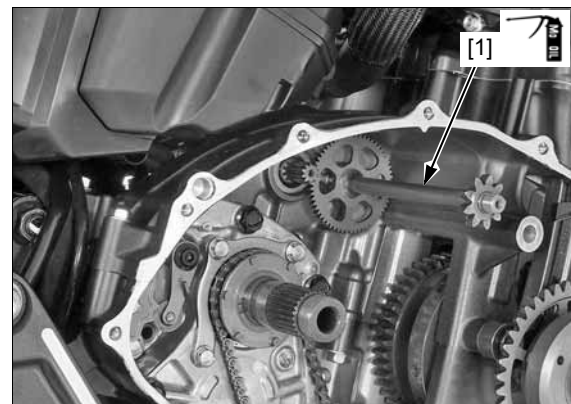
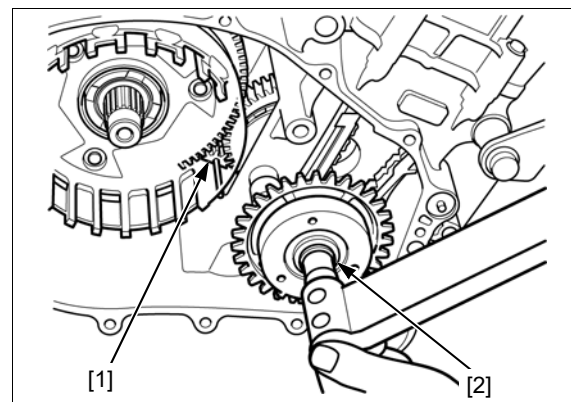
TORQUE: 83 N·m (8.5 kgf·m, 61 lbf·ft)

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 11-6).

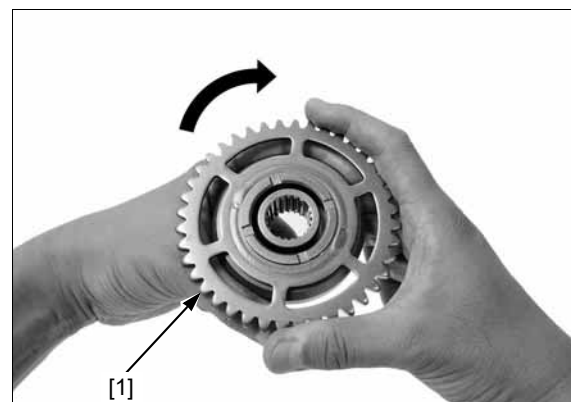


DISASSEMBLY/ASSEMBLY

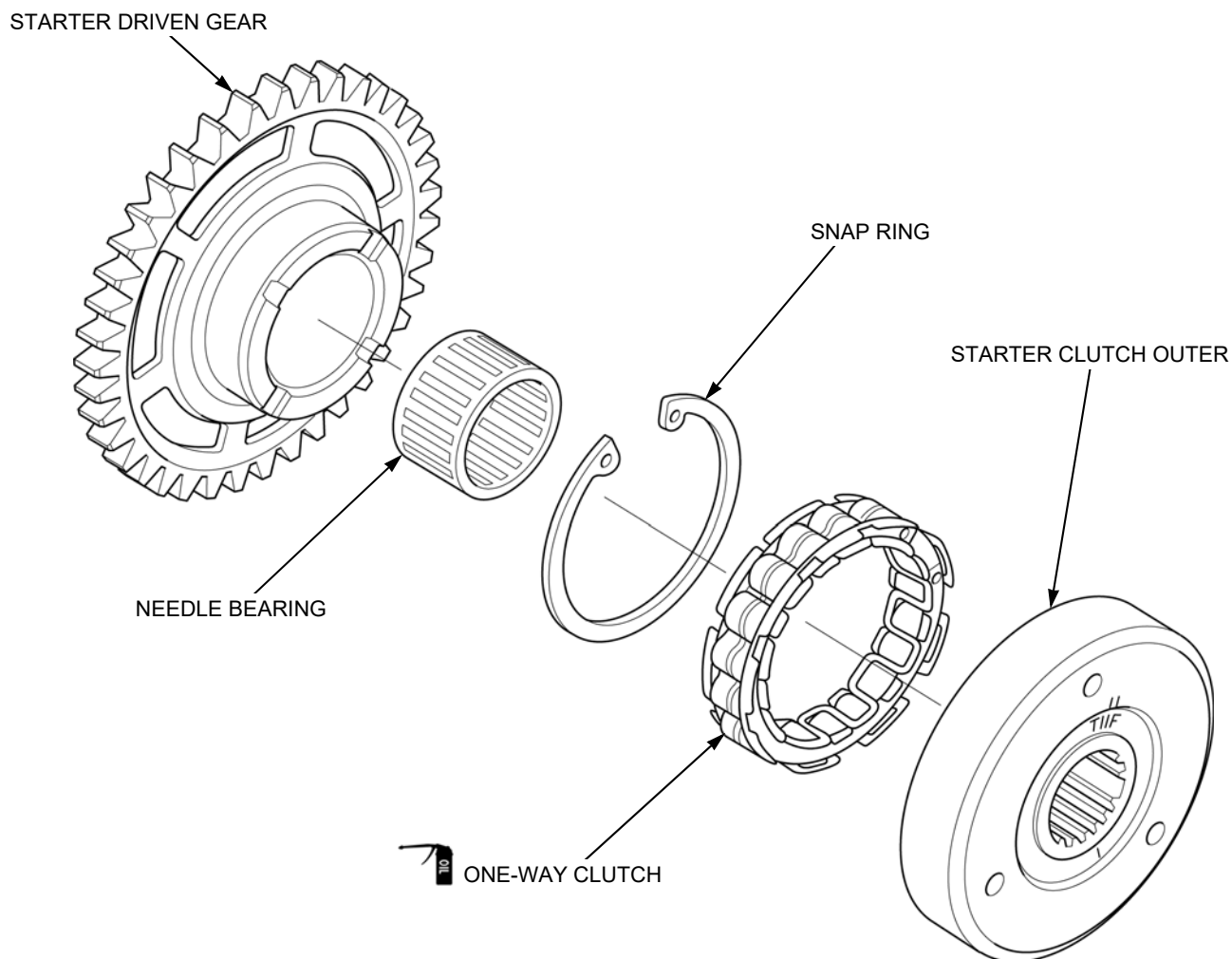
Check the operation of the one-way clutch by turning the driven gear [1].

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.



CLUTCH/STARTER CLUTCH



Inspect the following parts for scratches, damage, abnormal wear, or deformation.

- Starter driven gear
- Starter clutch outer
- Starter one-way clutch

Measure each part according to CLUTCH/STARTER CLUTCH SPECIFICATIONS (page 1-8).

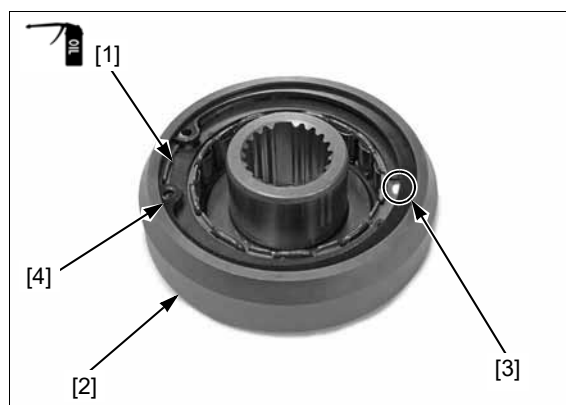
Replace the any part if necessary.

Apply oil to the one-way clutch [1] sliding surface.

Install the one-way clutch into the starter clutch outer [2] with its paint mark [3] facing out.

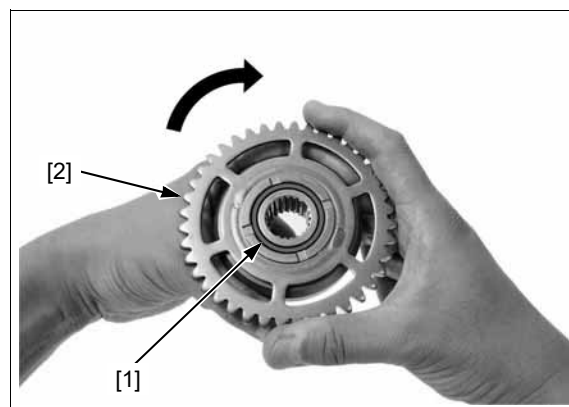
Install the snap ring [4] into the starter clutch outer groove securely.

After installing the snap ring, always rotate it in its groove to be sure it is fully seated.



Install the starter driven gear and needle bearing [1] into the starter clutch outer while turning the starter driven gear [2] clockwise.

Recheck the one-way clutch operation.



MEMO

SERVICE INFORMATION.....	12-2	STATOR	12-5
COMPONENT LOCATION.....	12-2	FLYWHEEL	12-5
ALTERNATOR COVER.....	12-3		

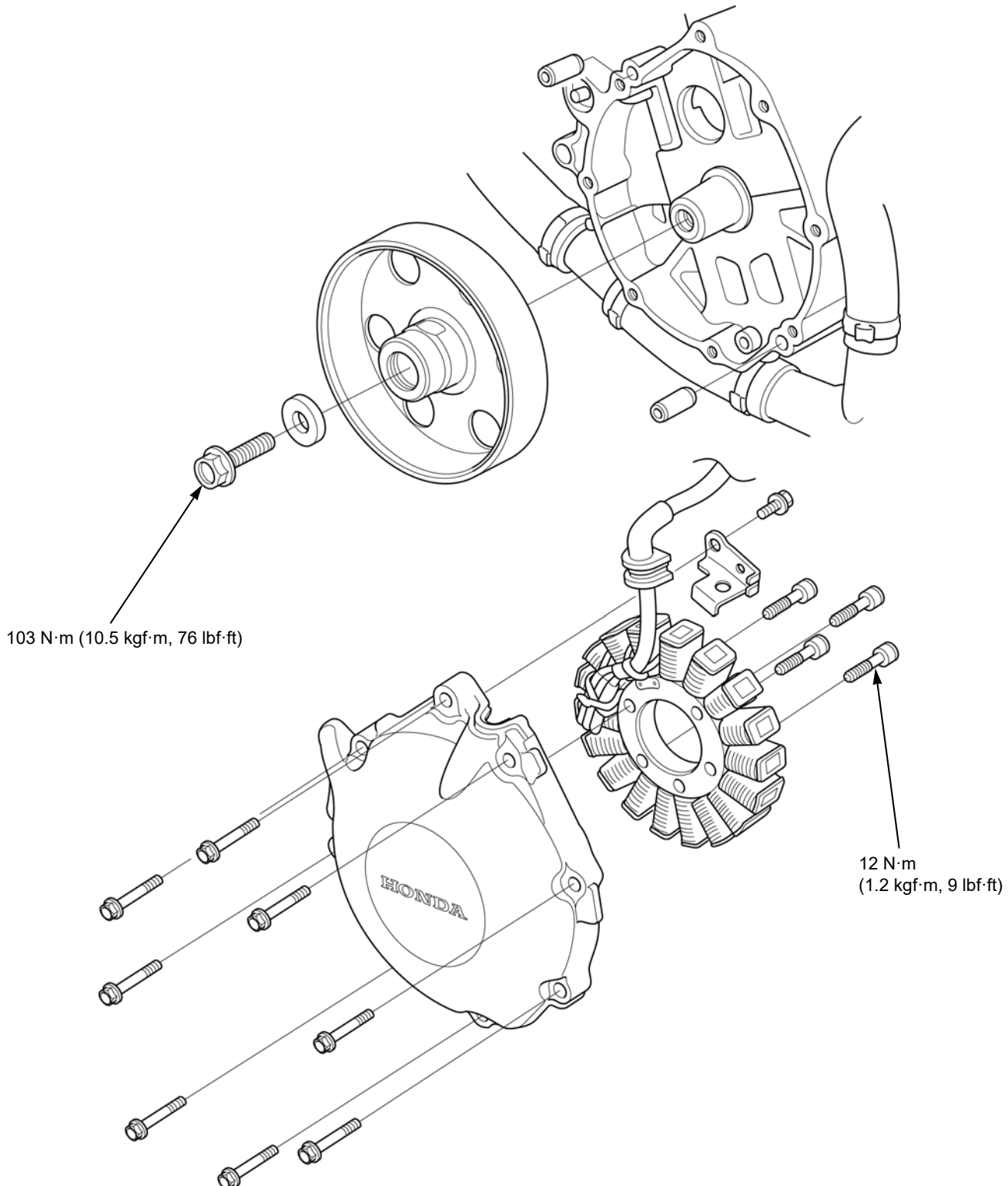
ALTERNATOR

SERVICE INFORMATION

GENERAL

- This section covers service of the stator and flywheel. All service can be done with the engine installed in the frame.
- For stator inspection (page 20-6).

COMPONENT LOCATION



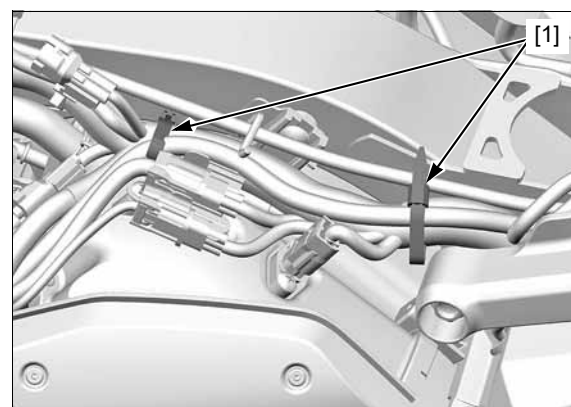
ALTERNATOR COVER

REMOVAL/INSTALLATION

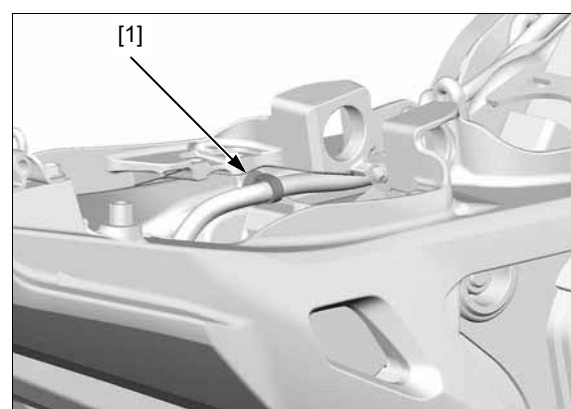
Remove the following:

- Fuel tank (page 7-6)
- EVAP canister (page 7-18)

Release the alternator wire bands [1].



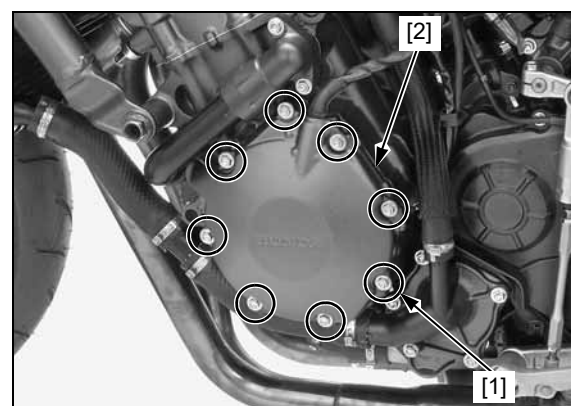
Remove the wire clamp [1] from rear fender B.



The alternator cover (stator) is magnetically attached to the flywheel, be careful during removal.

Remove the alternator cover bolts [1] and alternator cover [2].

- Engine oil will run out when the alternator cover is removed. Set a clean oil pan under the engine and add the recommended oil to the specified level after installation.



Remove the dowel pins [1].

Clean off any sealant from the alternator cover mating surfaces.

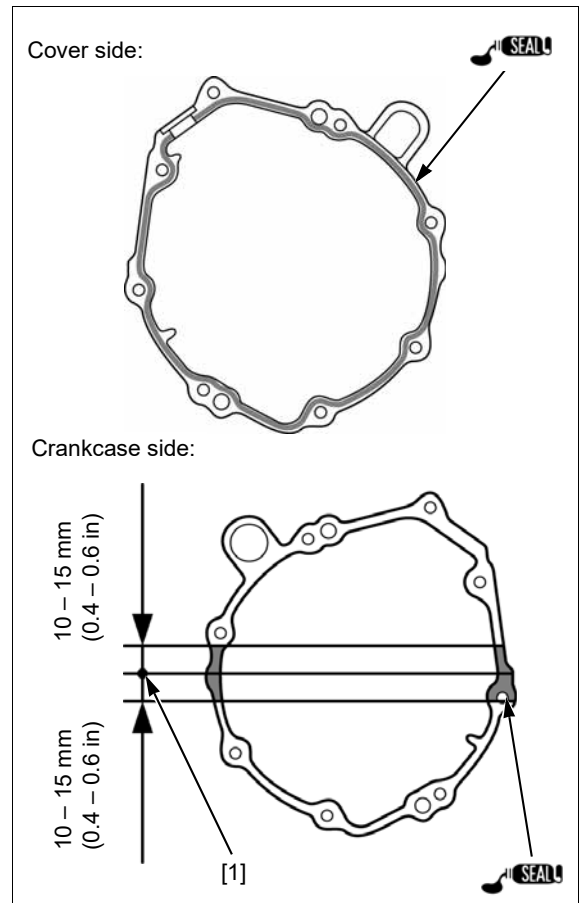


ALTERNATOR

Installation is in the reverse order of removal.

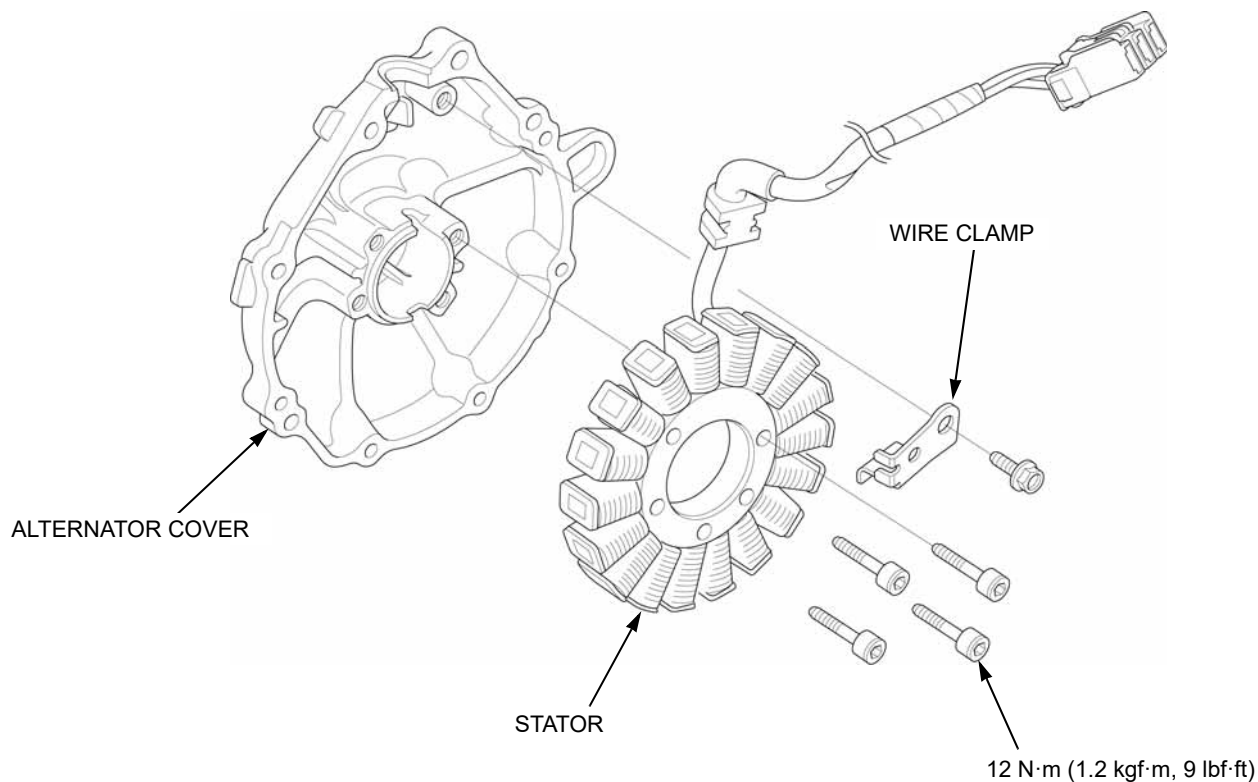
NOTE:

- Apply sealant (TB 1207B or equivalent) to the mating surface of the alternator cover.
- Apply sealant (TB 1207B or equivalent) to the crankcase mating surface area [1] of the crankcase.
- After installation, add the recommended engine oil to the specified level.
- Check the engine oil level (page 3-12).



STATOR

DISASSEMBLY/ASSEMBLY



NOTE:

- Apply locking agent to the stator mounting bolt.

TORQUE:

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

FLYWHEEL

REMOVAL/INSTALLATION

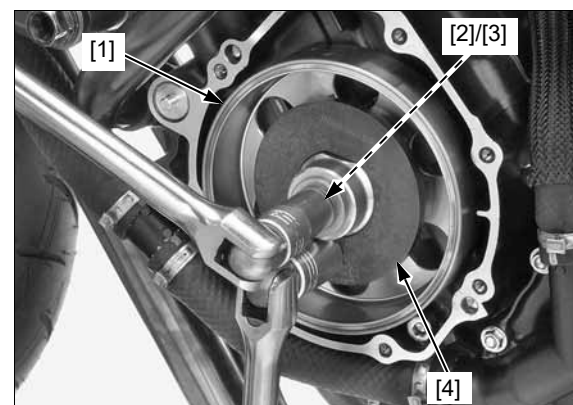
Remove the alternator cover (page 12-3).

Hold the flywheel [1] using the special tool then remove the flywheel bolt [2] and washer [3].

TOOL:

Flywheel holder [4]

070MB-MELC100



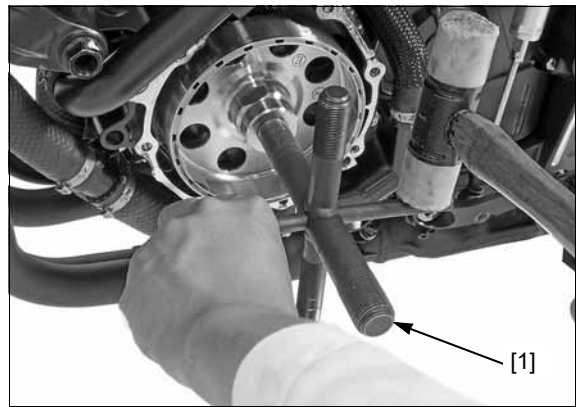
ALTERNATOR

Remove the flywheel using the special tool.

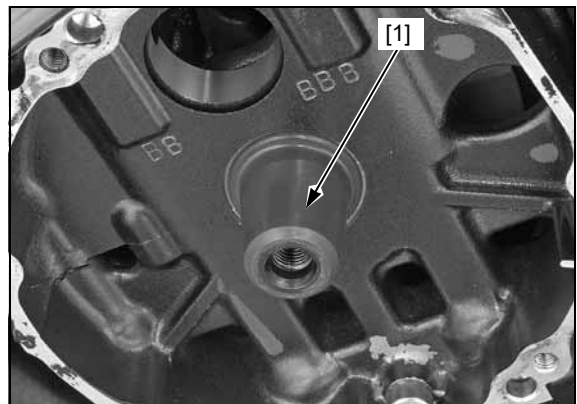
TOOL:

Rotor puller [1]

07733-0020001



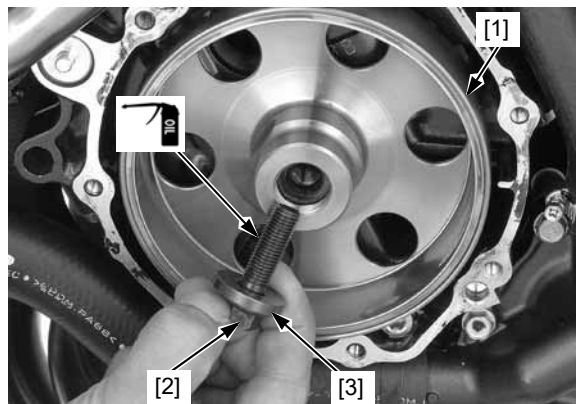
Clean any oil from the crankshaft taper area [1].



Install the flywheel [1].

Apply oil to the flywheel bolt threads and seating surface.

Install the washer [2] and flywheel bolt [3].



Hold the flywheel [1] using the special tool, then tighten the bolt [2] to the specified torque.

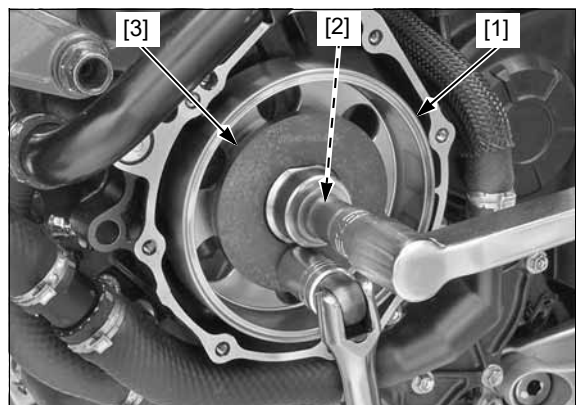
TOOL:

Flywheel holder [3]

070MB-MELC100

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

Install the alternator cover (page 12-3).



13. TRANSMISSION/GEARSHIFT LINKAGE

SERVICE INFORMATION.....	13-2	GEARSHIFT LINKAGE	13-5
TROUBLESHOOTING	13-2	GEARSHIFT PEDAL	13-7
COMPONENT LOCATION	13-3	TRANSMISSION.....	13-9

SERVICE INFORMATION

GENERAL

- This section covers the transmission and gearshift linkage service. These service can be done with the engine installed in the frame.

TROUBLESHOOTING

Hard to shift

- Improper clutch operation
- Incorrect engine oil weight
- Bent shift fork
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum cam groove
- Bent gearshift spindle

Transmission jumps out of gear

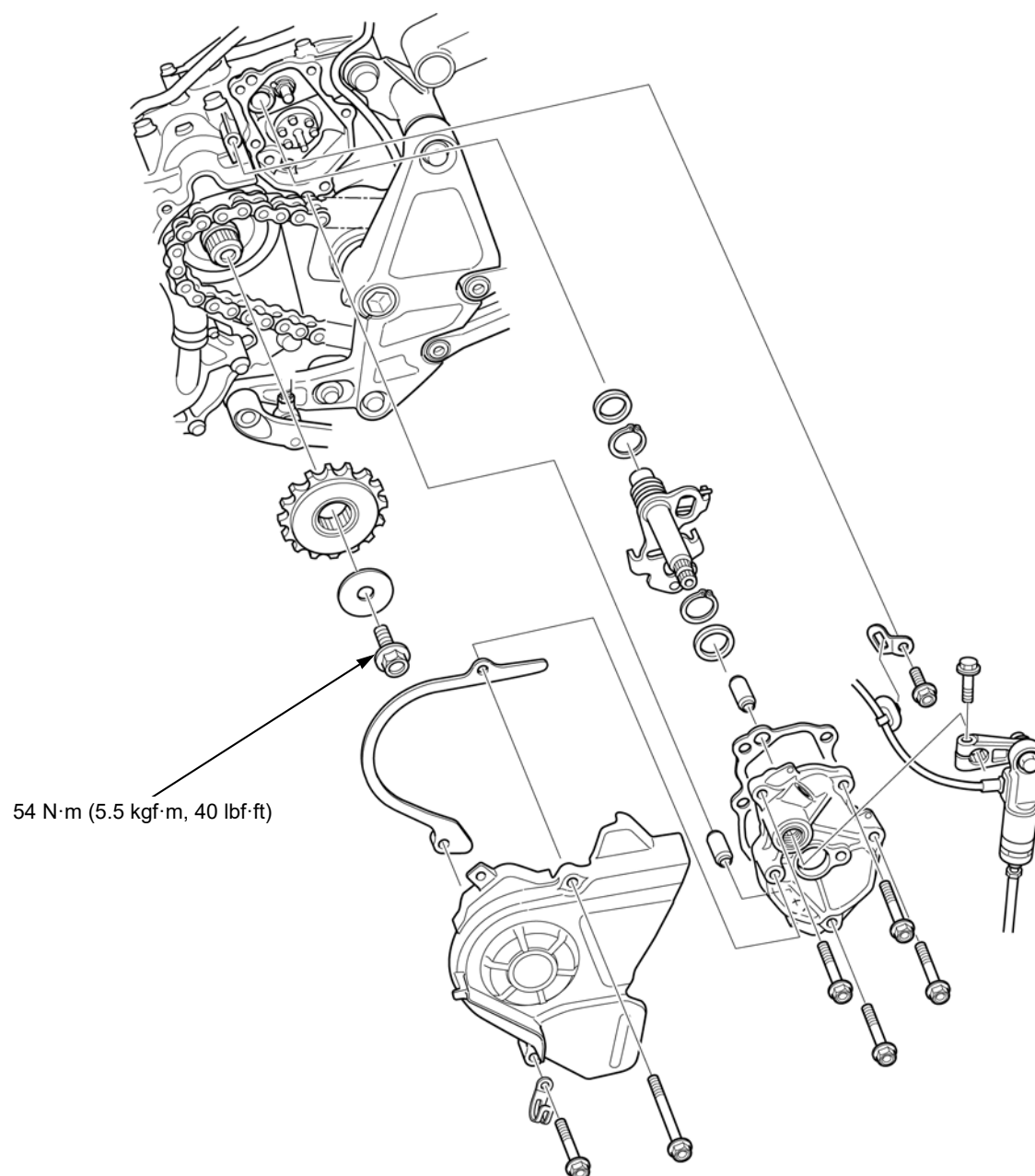
- Worn gear dogs
- Worn gear shifter groove
- Bent shift fork shaft
- Broken shift drum stopper arm
- Broken shift drum stopper arm spring
- Worn or bent shift forks
- Broken gearshift spindle return spring

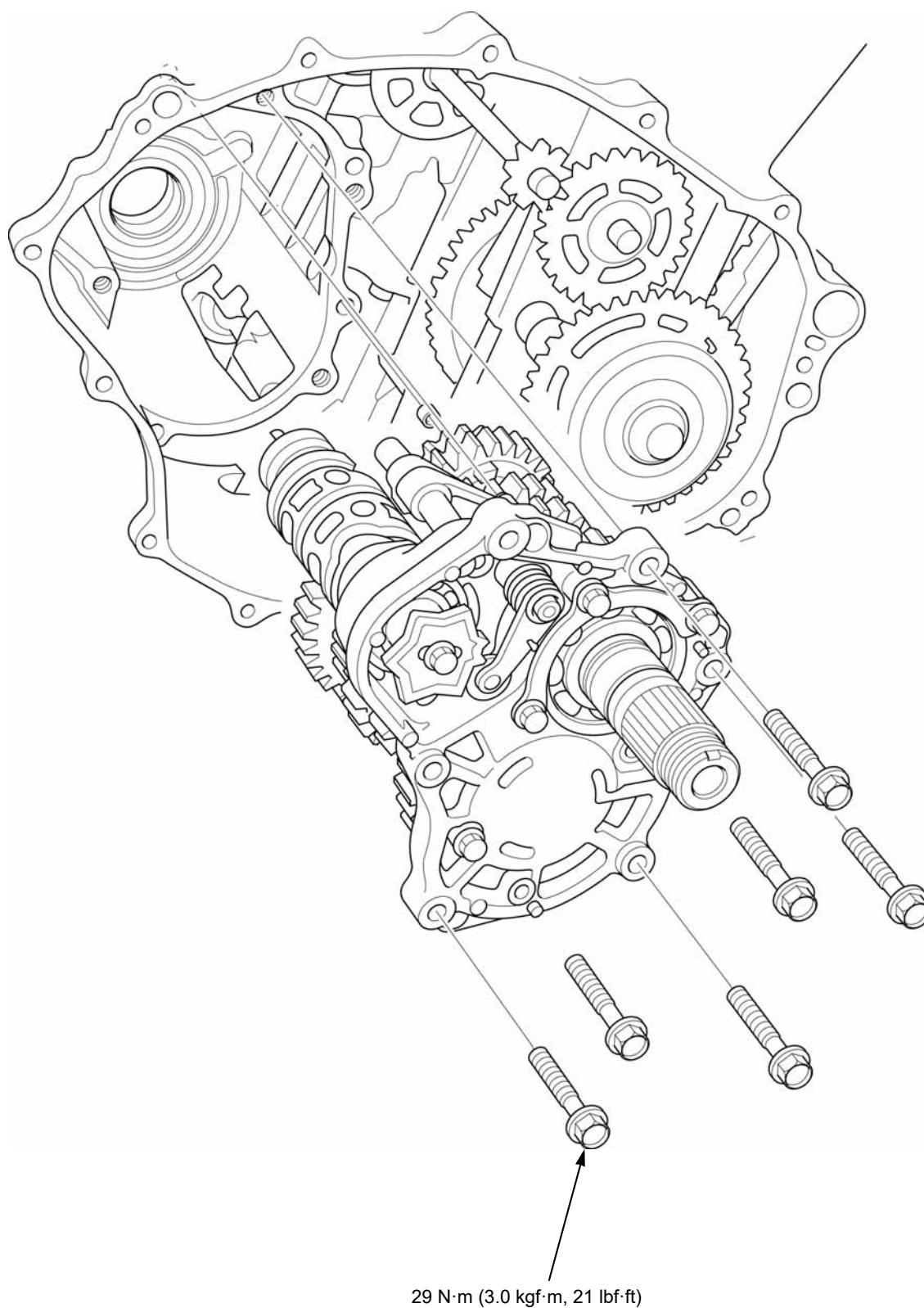
Gearshift pedal will not return

- Weak or broken gearshift spindle return spring
- Bent gearshift spindle

Excessive engine noise

- Worn or damaged transmission gear
- Worn or damaged transmission bearings

COMPONENT LOCATION



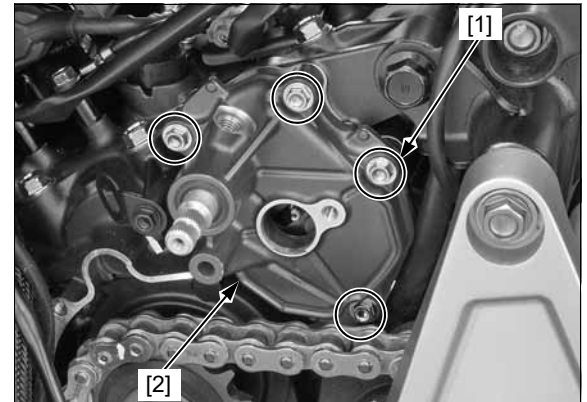
GEARSHIFT LINKAGE

REMOVAL

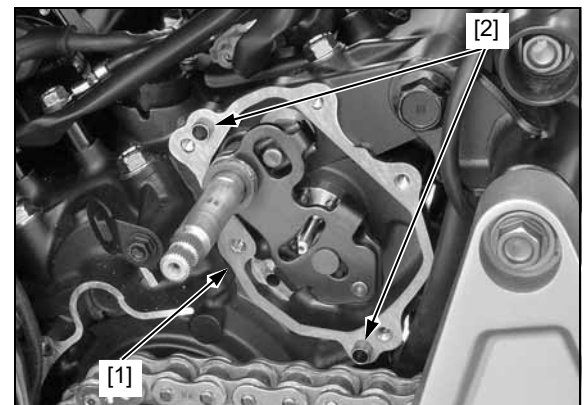
Remove the following:

- Sprocket cover (page 2-13)
- Shift drum angle sensor (page 4-63)

Remove the bolts [1] and gearshift linkage cover [2].



Remove the gasket [1] and dowel pins [2].



Remove the gearshift spindle [1] and washers [2].

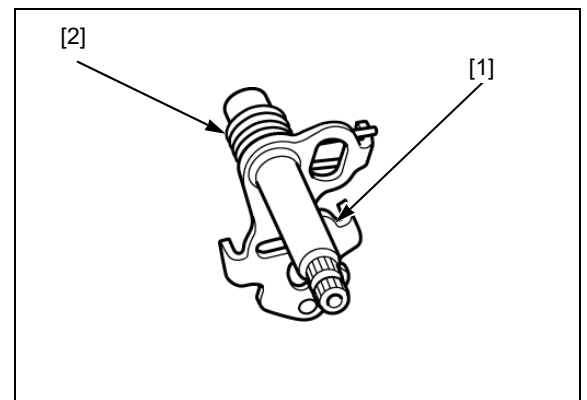


INSPECTION

Check the gearshift spindle [1] for wear, damage or bending.

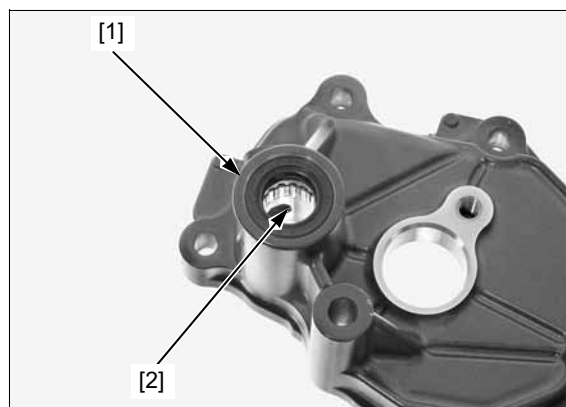
Check the return spring [2] for fatigue or damage.

If the snap rings are removed, install them with their chamfered side facing the return spring.



TRANSMISSION/GEARSHIFT LINKAGE

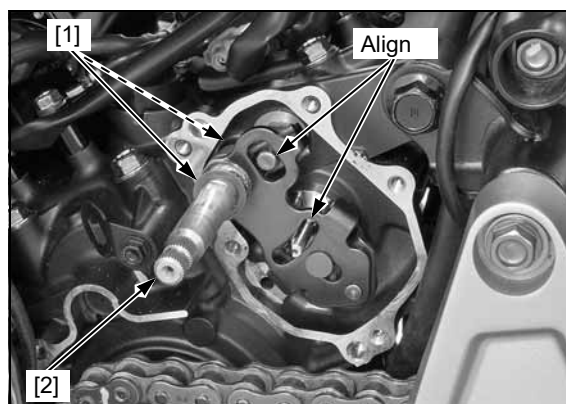
Check the dust seal [1] for damage or deterioration.
Check the needle bearing [2] for wear or damage.



INSTALLATION

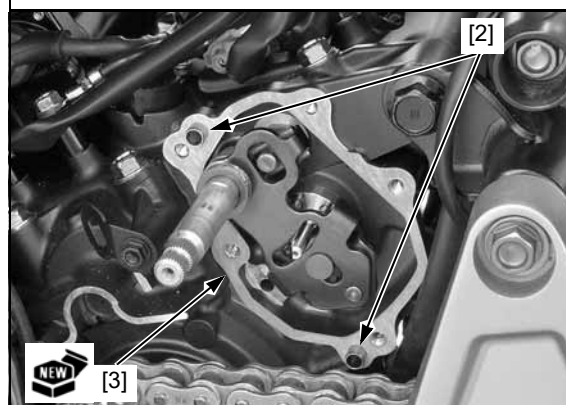
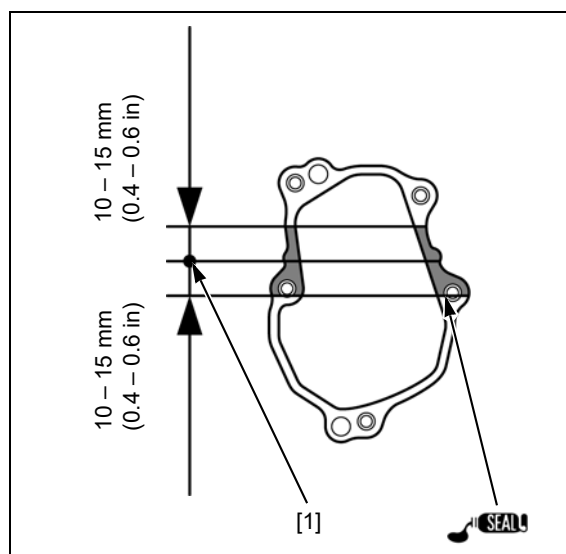
Install the washers [1] to the gearshift spindle [2].

Install the gearshift spindle assembly into the crankcase while aligning the spring ends with the crankcase stopper pin and shift drum pin.



Apply sealant (TB 1207B or equivalent) to the crankcase mating surface area [1] of the crankcase.

Install a dowel pins [2] and new gasket [3].



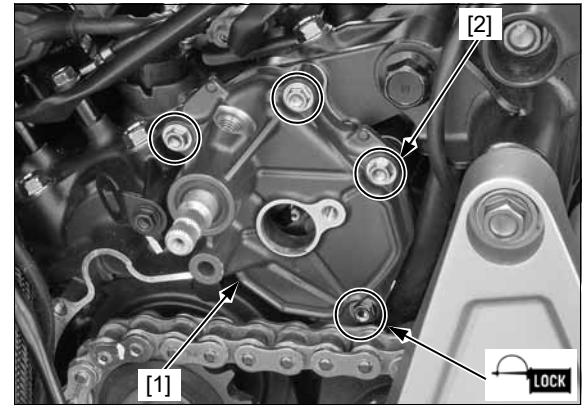
Install the gearshift linkage cover [1] being careful not to damage the oil seal lips.

Apply a locking agent to the threads of the bolt indicated.

Install and tighten the linkage cover bolts [2] securely.

Install the following:

- Sprocket cover (page 2-13)
- shift dram angle sensor (page 4-63)



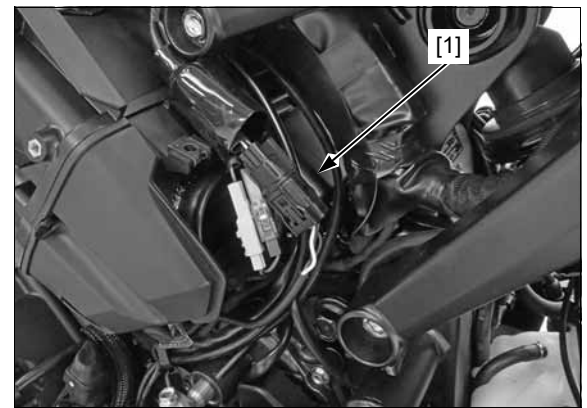
GEARSHIFT PEDAL

REMOVAL/INSTALLATION

Remove the air cleaner duct (page 3-5).

*II ED/III TH/III KO/
II FO/II GS/II RU/
III CH/II BR modes
only:*

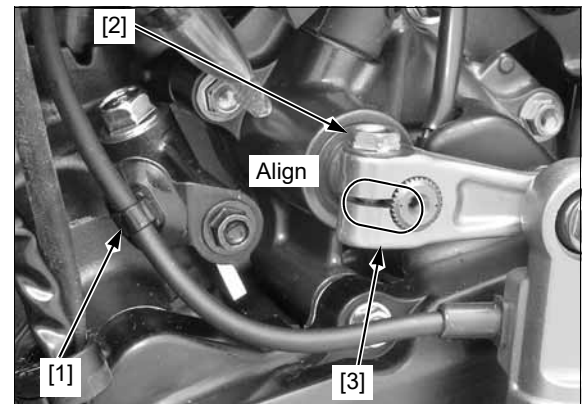
Disconnect the shift stroke sensor 3P (Black) connector [1].



*II ED/III TH/III KO/
II FO/II GS/II RU/
III CH/II BR modes
only:*

Remove the harness clamp [1].

Remove the pinch bolt [2] and gearshift arm [3] from the gearshift spindle.



Remove the pivot bolt [1], wave washer [2], washer [3] and gearshift pedal [4].

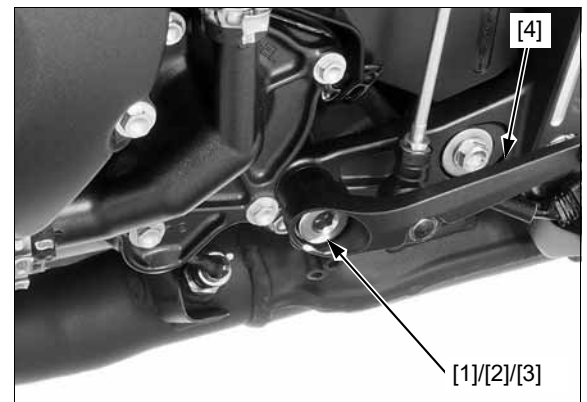
Installation is in the reverse order of removal.

TORQUE:

Gearshift pedal pivot bolt:
27 N·m (2.8 kgf·m, 20 lbf·ft)

NOTE:

- Apply grease to the gearshift pedal pivot sliding area (grease groove) of the pivot bolt.
- Align the slit of the gearshift arm with the punch mark on the spindle.



TRANSMISSION/GEARSHIFT LINKAGE

ADJUSTMENT

When adjusting the gearshift pedal height, perform the procedure as follows:

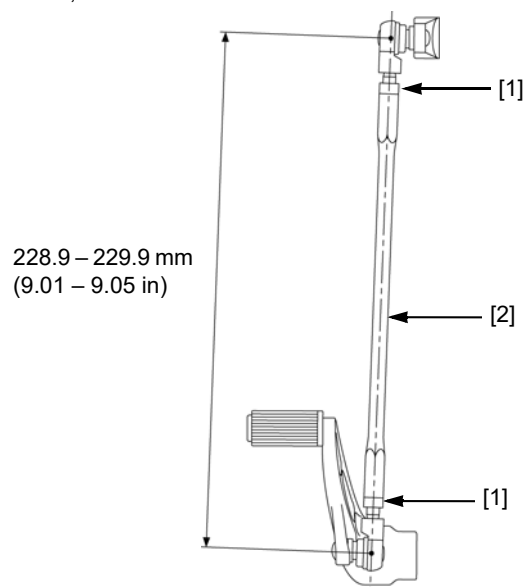
*The upper lock nut
has left hand
threads.*

Loosen the lock nuts [1].

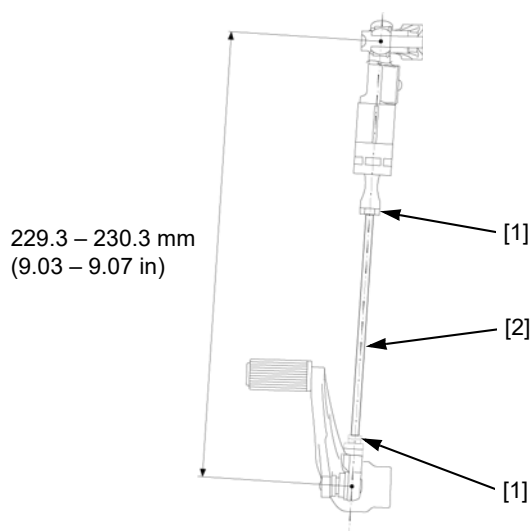
Adjust the tie-rod [2] length so that the distance between the ball joint ends is standard length as shown.

After adjustment tighten the lock nuts securely.

Except II ED, III TH, II FO, II GS, II RU, III KO, III CH, II BR models shown:



II ED, III TH, II FO, II GS, II RU, III KO, III CH, II BR models shown:



TRANSMISSION

REMOVAL

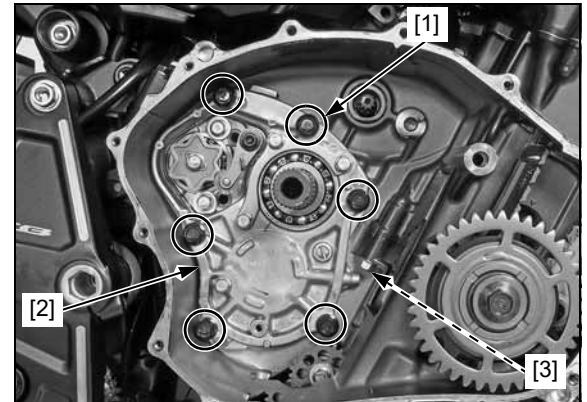
Remove the following:

- Clutch (page 11-6)
- Drive sprocket (page 15-4)

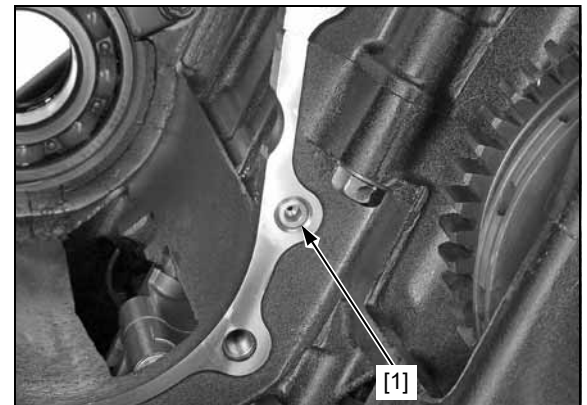
Remove the transmission holder mounting bolts [1].

Be careful not to fall the oil orifice [3] into the crankcase when removing the transmission holder.

Pull out the transmission holder and transmission assembly [2] from the crankcase.

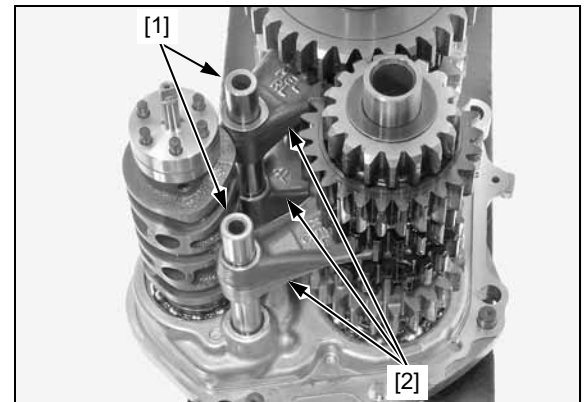


Remove the oil orifice [1] from the crankcase.

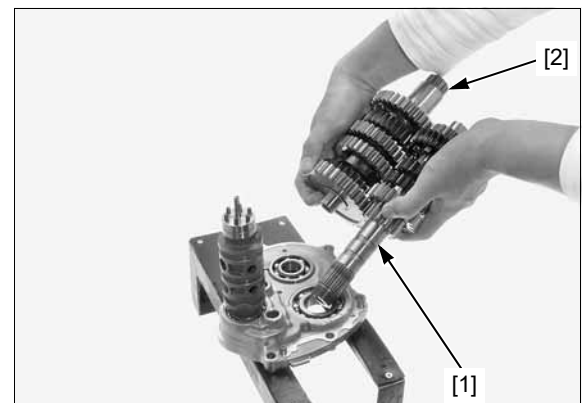


DISASSEMBLY

Remove the shift fork shafts [1] and shift forks [2].

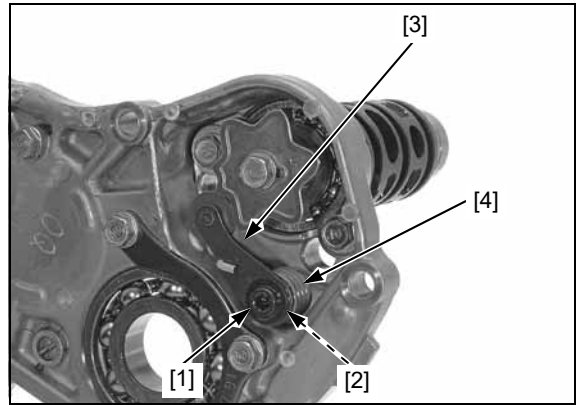


Remove the mainshaft [1] and countershaft [2] assembly.

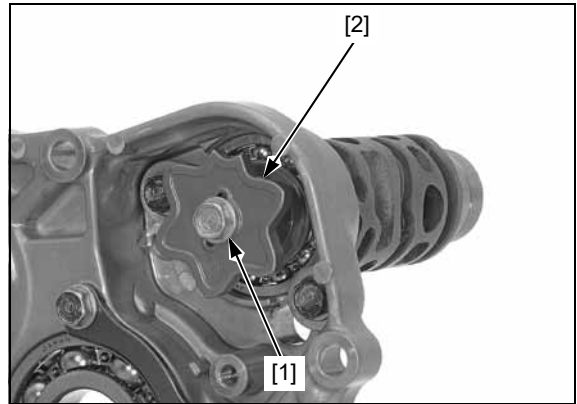


TRANSMISSION/GEARSHIFT LINKAGE

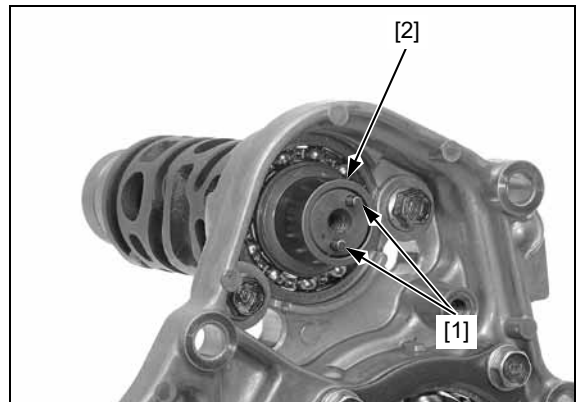
Remove the pivot bolt [1], washer [2], stopper arm [3] and return spring [4].



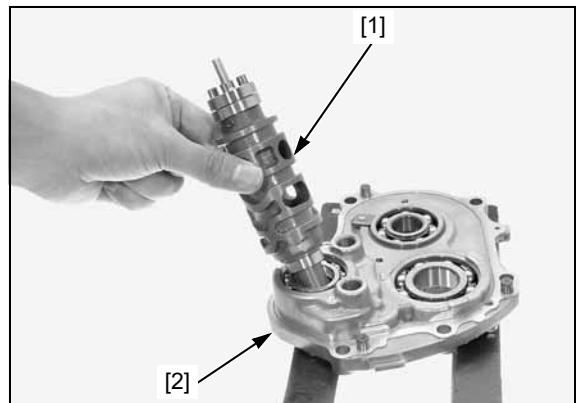
Remove the bolt [1] and gearshift cam [2].



Remove the dowel pins [1] from the shift drum. Remove the flange collar [2].



Remove the shift drum [1] from the transmission holder [2].



INSPECTION

Inspect the following parts for scratches, damage, abnormal wear, or deformation.

- Transmission gears
- Transmission bushings
- Transmission bearings
- Shift drum/bearing
- Shift forks
- Shift fork shafts
- orifice

Measure each part according to TRANSMISSION/GEARSHIFT LINKAGE SPECIFICATIONS (page 1-9).

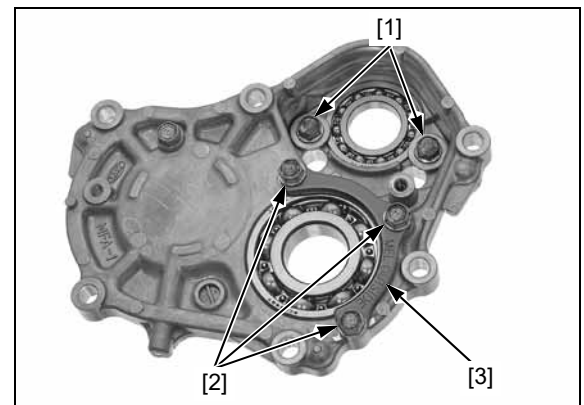
Replace any part if necessary.

TRANSMISSION BEARING REPLACEMENT

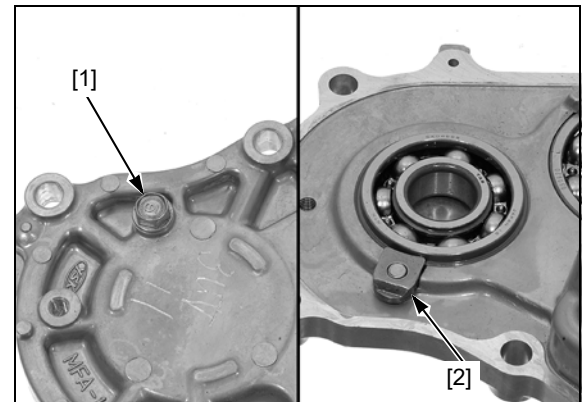
Replace the transmission holder and crankcase as a set.

Remove the shift drum bearing setting bolts [1].

Remove the bolts [2] and mainshaft bearing set plate [3].



Remove the bolt [1] and countershaft bearing set plate [2].

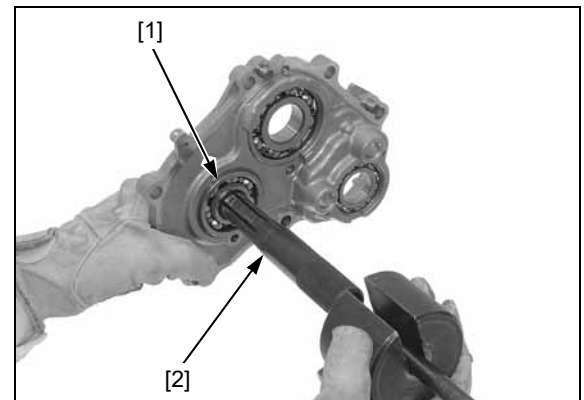


Remove the countershaft bearing [1] using the special tools [2].

TOOLS:

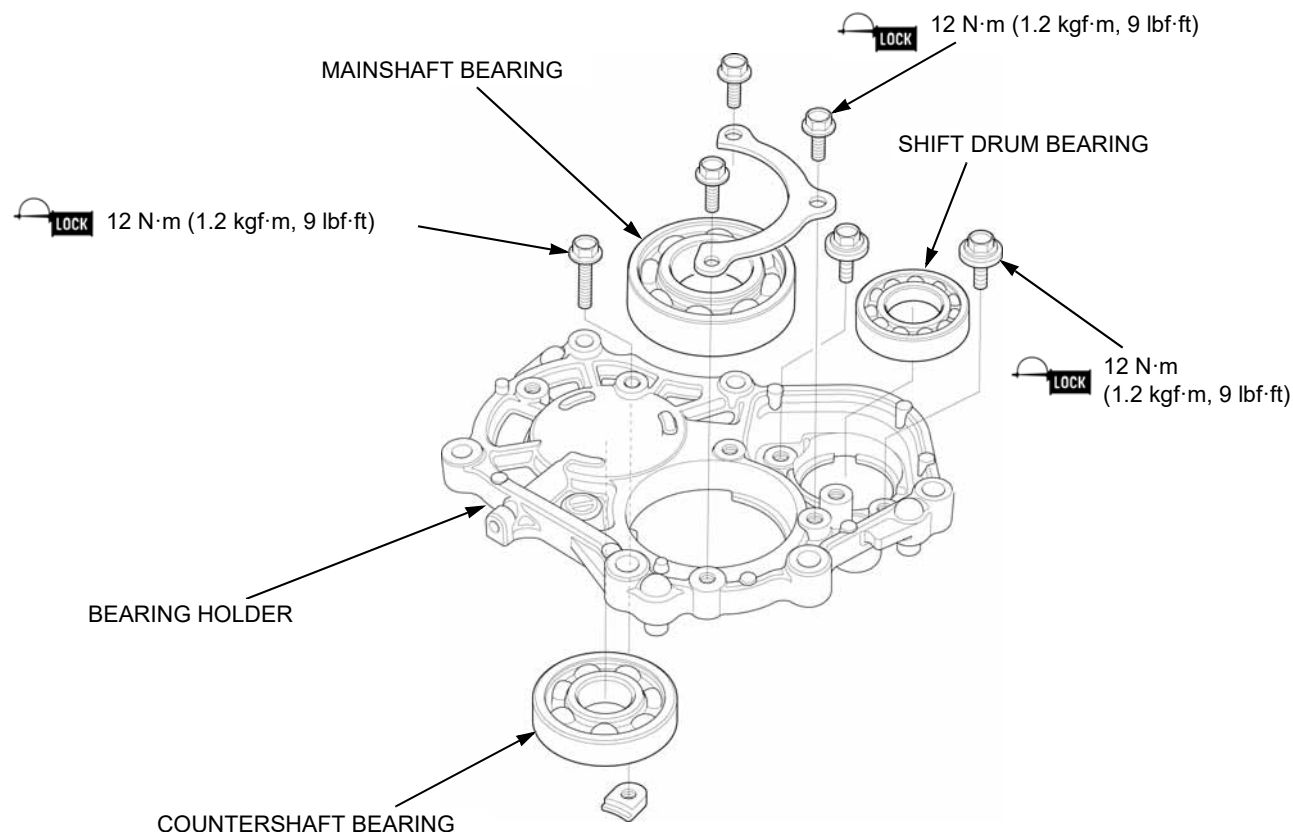
Bearing remover handle	07936-3710100
Bearing remover set, 20 mm	07936-3710600
Remover weight	07741-0010201

Drive out the mainshaft bearing and shift drum bearing.



TRANSMISSION/GEARSHIFT LINKAGE

Bearing Locations:



Drive the each bearing into the bearing holder using the special tools.

TOOLS:

Mainshaft bearing [1]:

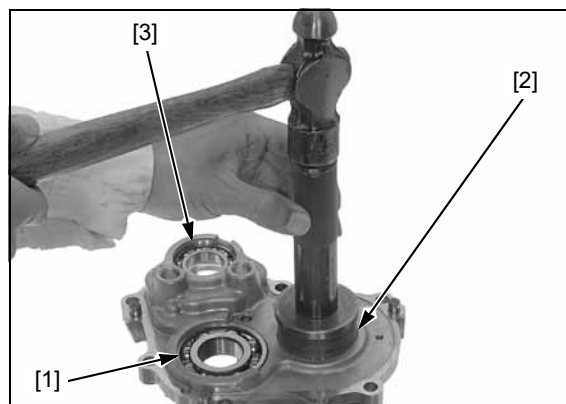
Driver	07749-0010000
Attachment, 62 x 68 mm	07746-0010500
Pilot, 28 mm	07746-0041100

Countershaft bearing [2]:

Driver	07749-0010000
Attachment, 52 x 55 mm	07746-0010400
Pilot, 20 mm	07746-0040500

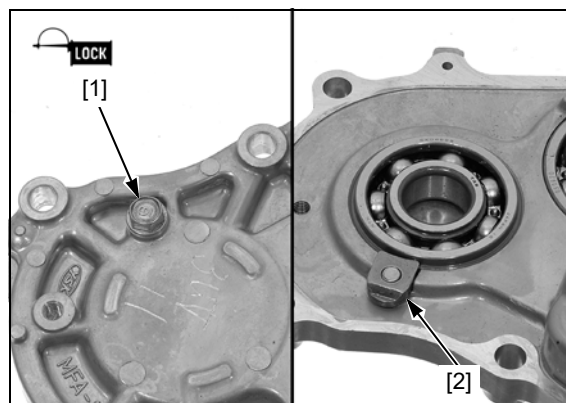
Shift drum bearing [3]:

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 25 mm	07746-0040600



Clean and apply a locking agent to the countershaft bearing set plate bolt [1] threads. Install the set plate [2] and tighten the bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

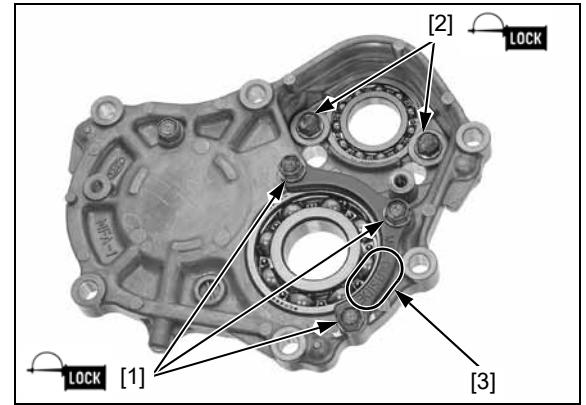


Clean and apply a locking agent to the mainshaft bearing set plate bolt threads [1] and shift drum bearing setting bolt threads [2].

Install the mainshaft bearing set plate with its "OUTSIDE" mark [3] facing out.

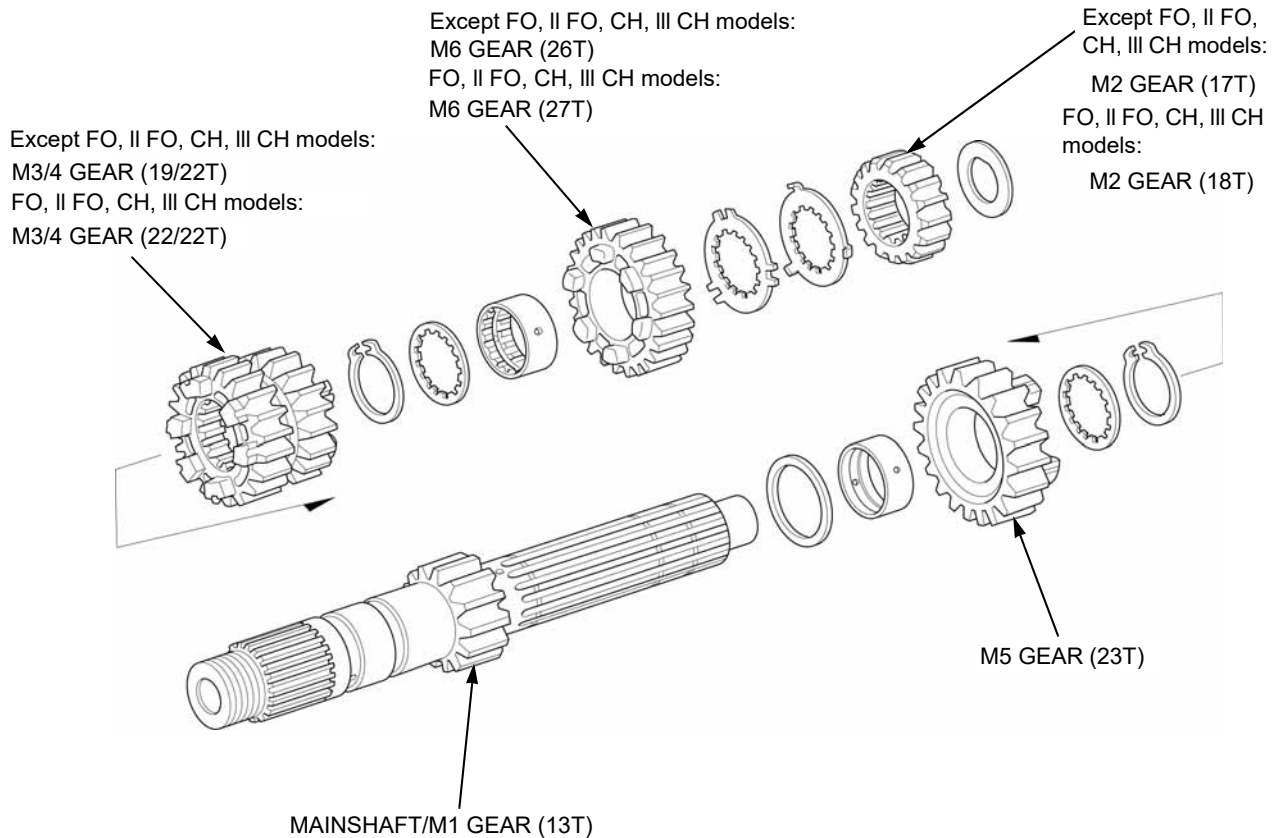
Install and tighten the bearing set plate bolts and setting bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



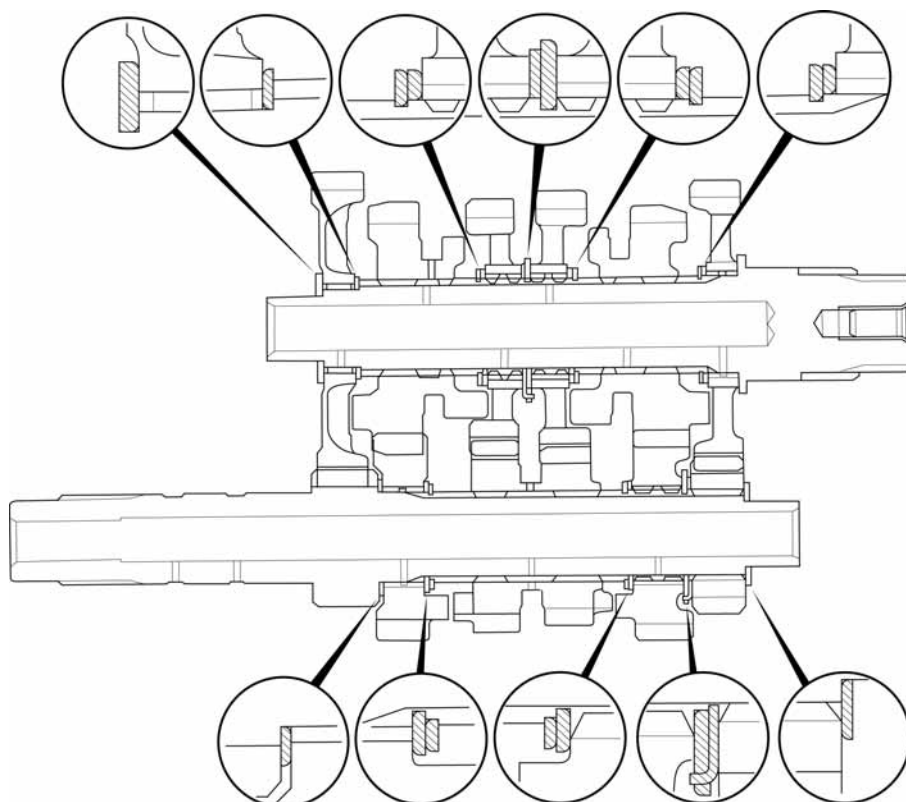
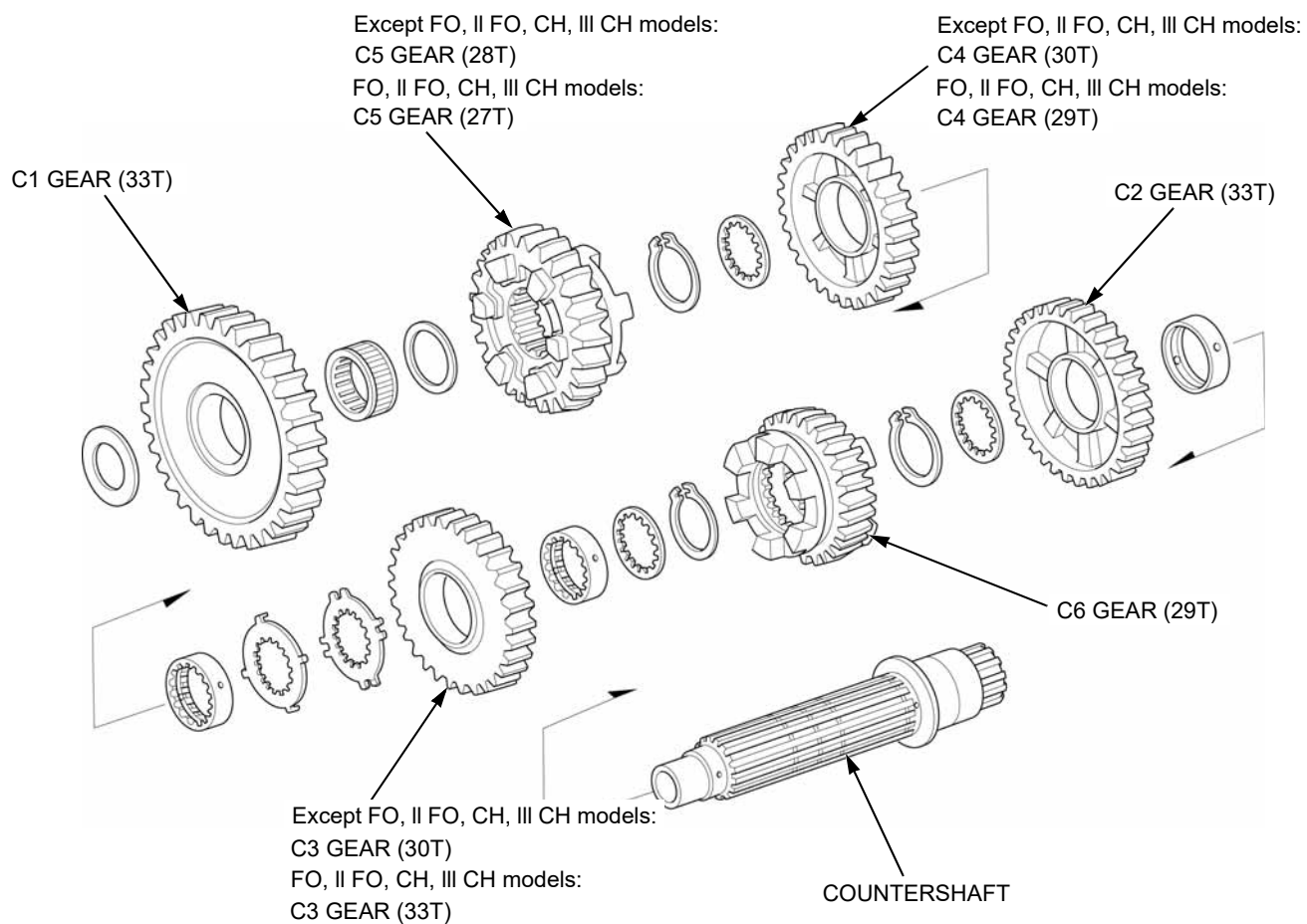
ASSEMBLY

Mainshaft:



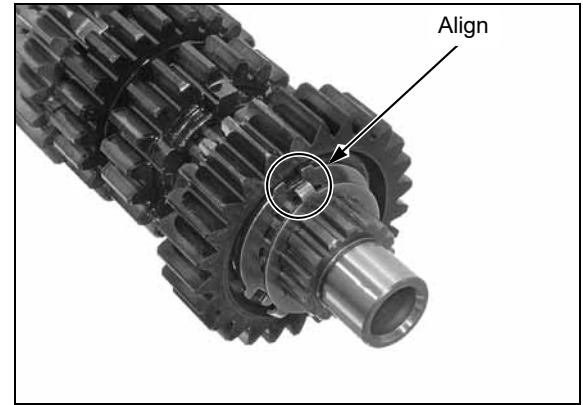
TRANSMISSION/GEARSHIFT LINKAGE

Countershaft:

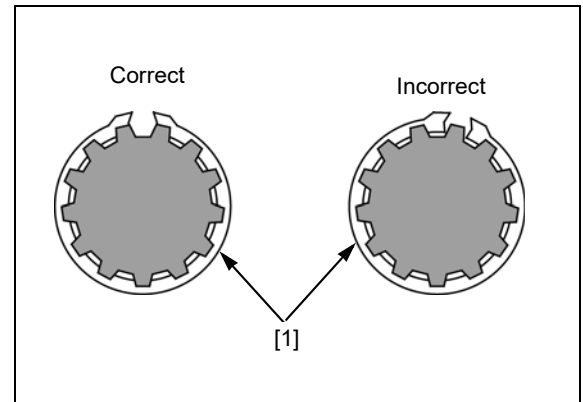


Assemble the transmission gears and shafts.

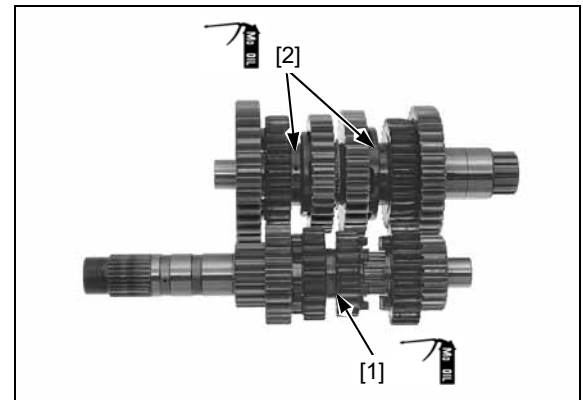
- Coat each gear with clean engine oil and check for smooth movement.
- Align the lock washer tabs with the spline washer grooves.



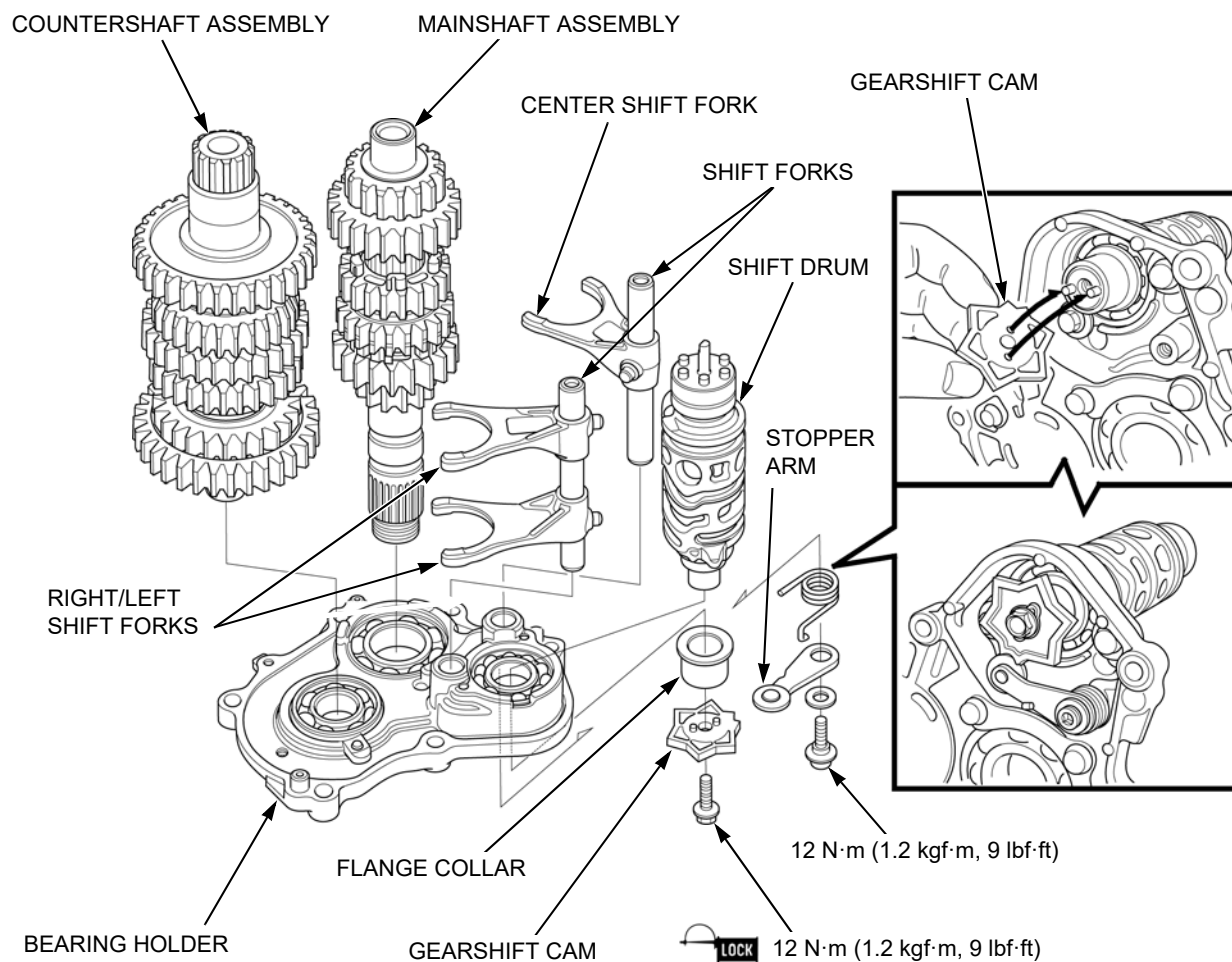
- Always install the thrust washer and snap ring [1] with the chamfered (rolled) edge facing away from the thrust load.
- Install the snap ring so that its end gap aligns with the groove in the splines.
- Make sure that the snap ring is fully seated in the shaft groove after installing it.



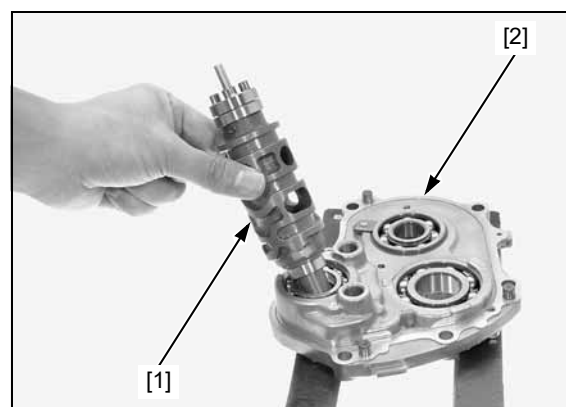
Apply molybdenum oil solution to the shift fork grooves in the M3/4 [1], C5 and C6 shift gear [2].



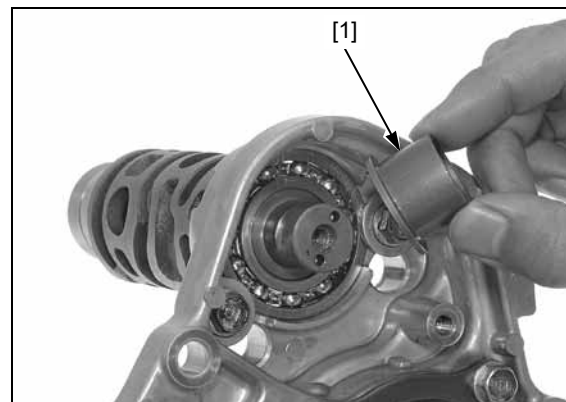
TRANSMISSION/GEARSHIFT LINKAGE



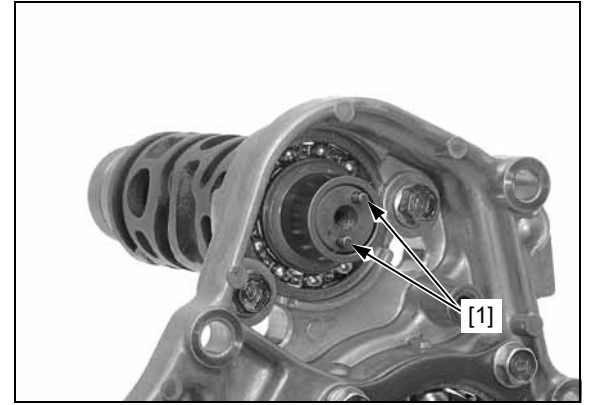
Install the shift drum [1] into the bearing holder [2].



Install the flange collar [1] with its flange facing in.

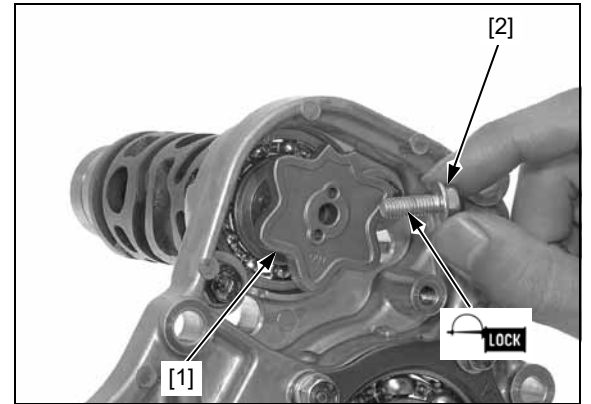


Install the dowel pins [1] onto the gearshift drum.



Install the gearshift cam [1] onto the gearshift drum.
Clean and apply a locking agent to the gearshift cam bolt threads [2].
Install and tighten the bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

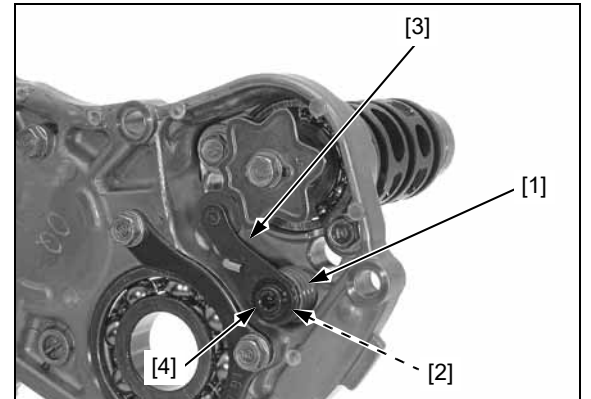


Install the following:

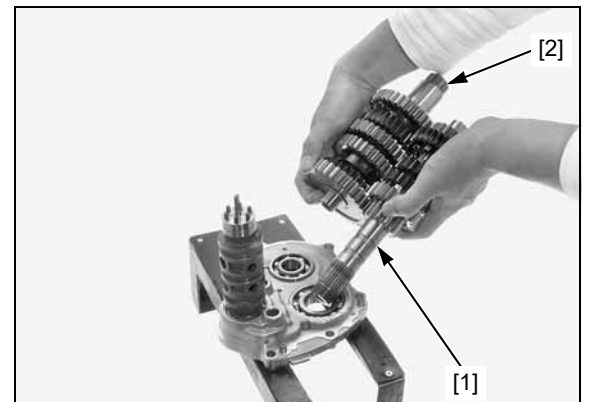
- Return spring [1]
- Washer [2]
- Stopper arm [3]
- Pivot bolt [4]

Tighten the stopper arm pivot bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



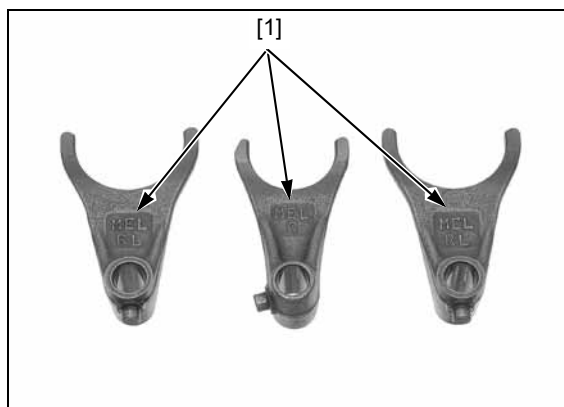
Install the mainshaft [1] and countershaft [2] as an assembly to the transmission holder.



TRANSMISSION/GEARSHIFT LINKAGE

The shift forks have location marks [1]:

- "RL" for right and left
- "C" for center

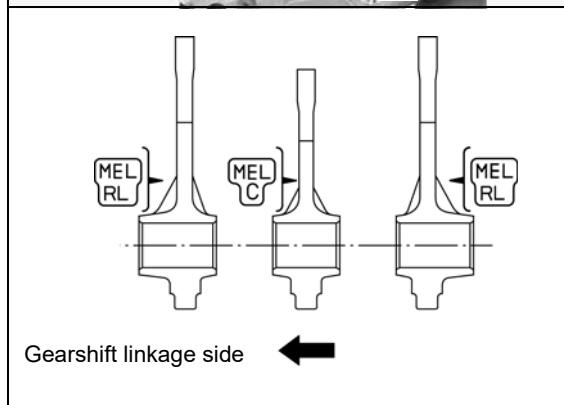
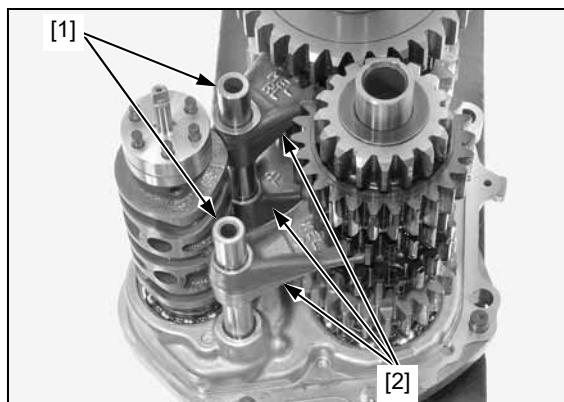


Install each shift forks [1] and align its claw [2] with each shifter groove.

- Face the shift fork marks as follows:
 - "RL" marks to the outside
 - "C" mark to the right side (gearshift linkage side)

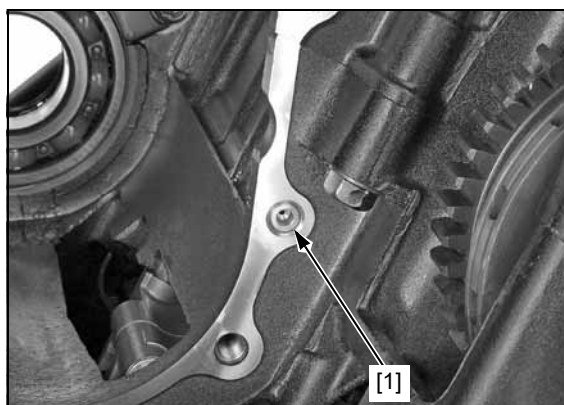
The shaft for center shift fork is shorter than that for right/left shift forks.

Install the shift fork shafts onto the transmission holder.



Be careful not to drop the oil orifice into the crankcase.

Install the oil orifice [1] with its small I.D. side facing in.



Turn the shift drum while turning the mainshaft, and position the transmission into neutral.

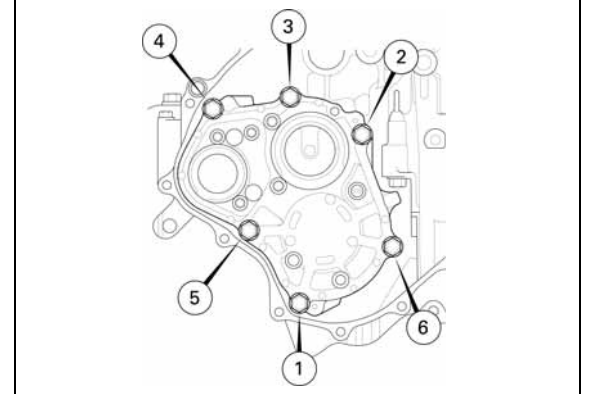
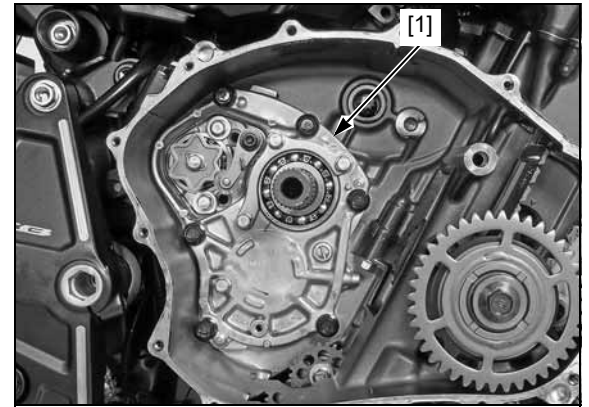
Install the bearing holder and transmission assembly [1] into the crankcase.

Install and tighten the bearing holder mounting bolts in numerical order in the illustration in two to three steps to the specified torque.

TORQUE: 29 N·m (3.0 kgf·m, 21 lbf·ft)

Install the following:

- Clutch (page 11-6)
- Drive sprocket (page 15-4)



MEMO

14. CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

SERVICE INFORMATION.....	14-2	MAIN JOURNAL BEARING	14-15
TROUBLESHOOTING	14-2	CRANKPIN BEARING	14-19
COMPONENT LOCATION	14-3	PISTON/CYLINDER	14-22
CRANKCASE SEPARATION	14-4	COUNTERSHAFT BEARING REPLACEMENT	14-26
CRANKCASE ASSEMBLY	14-6	BALANCER	14-27
CRANKSHAFT	14-12		

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the following:
 - Crankshaft (page 14-12)
 - Piston/connecting rod/cylinder (page 14-22)
 - Balancer (page 14-27)
- The following components must be removed before separating the crankcase:
 - Engine (page 15-4)
 - Clutch (page 11-6)
 - Cylinder head (page 10-4)
 - Flywheel (page 12-5)
 - Gearshift linkage/transmission (page 13-5)
 - Oil pan (page 9-4)
 - Oil pump (page 9-7)
 - Oil cooler (page 9-9)
 - Starter clutch (page 11-16)
 - Starter motor (page 6-5)
 - Water pump (page 8-11)
 - EOP switch (page 21-15)
- Replace the crankcase and transmission holder as an assembly.
- Be careful not to damage the crankcase mating surfaces when servicing.
- Prior to assembling the crankcase halves, apply sealant to their mating surfaces. Wipe off excess sealant thoroughly.
- Mark and store the connecting rods, bearing caps and bearing inserts to be sure of their correct locations for reassembly.
- The crankpin and main journal bearing inserts are select fit and are identified by color codes. Select replacement bearings from the code tables. After selecting new bearings, recheck the oil clearance with a plastigauge. Incorrect oil clearance can cause major engine damage.

TROUBLESHOOTING

Cylinder compression is too low, hard to start or poor performance at low speed

- Leaking cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston

Cylinder compression too high, 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

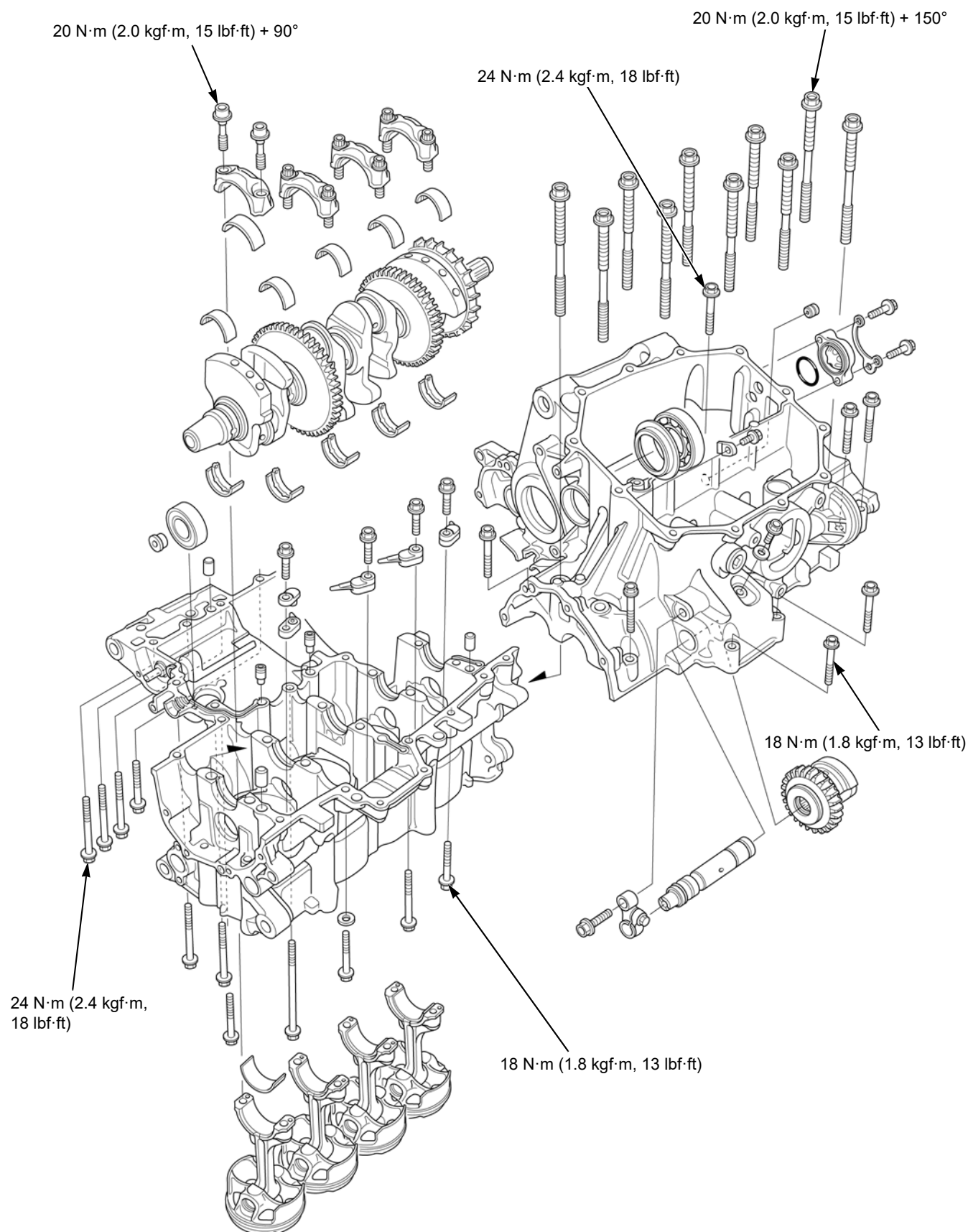
Abnormal noise

- 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
- Improper balancer timing

COMPONENT LOCATION



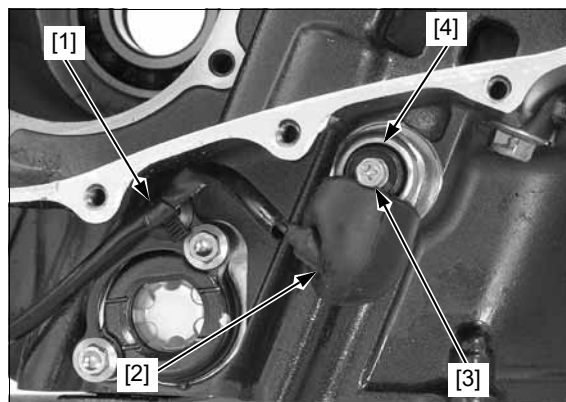
CRANKCASE SEPARATION

Refer to Service Information for removal of necessary parts before separating the crankcase (page 14-2).

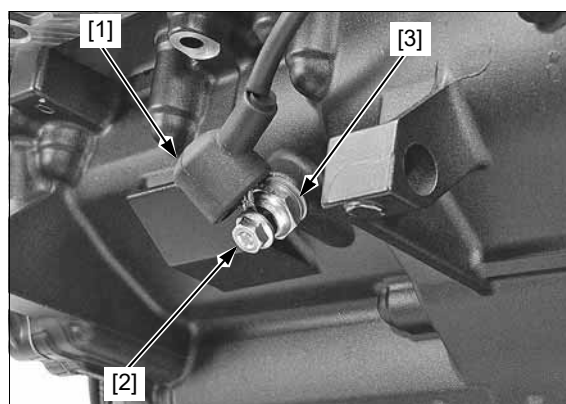
Unhook the EOP switch wire clip [1] from stay [2] and remove the dust cover [2].

Remove the terminal bolt [3] and terminal eyelet from the EOP switch.

Remove the EOP switch [4].

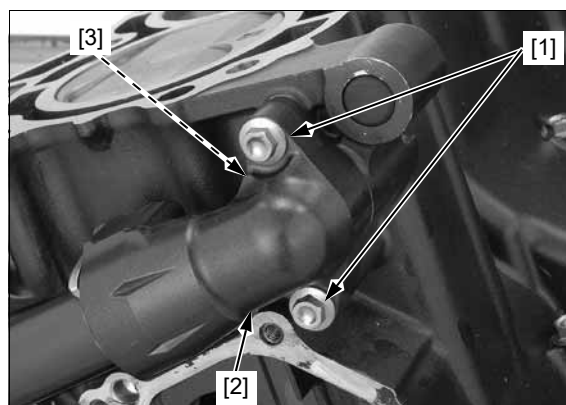


Remove the dust cover [1], terminal nut [2] and terminal eyelet from the neutral switch [3].



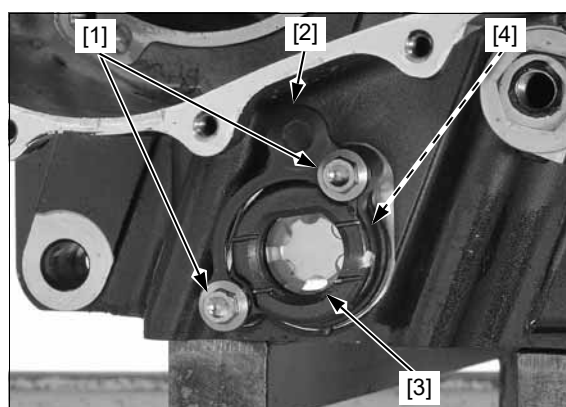
Remove the bolts [1] and water hose joint [2].

Remove the O-ring [3] from the hose joint.



Remove the bolts [1], stay [2] and oil inspection window [3].

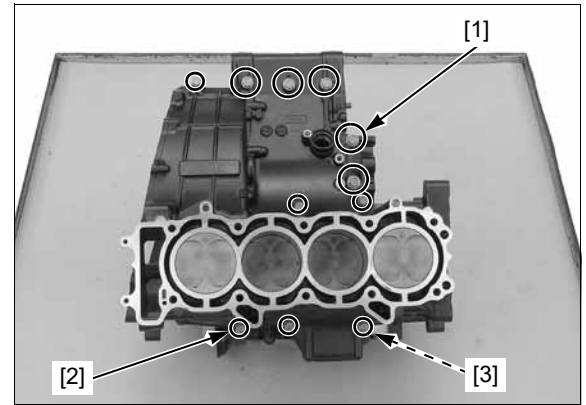
Remove the O-ring [4] from the oil inspection window.



CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

Loosen the 7 mm bolts (six) in two to three steps.
Loosen the 8 mm bolts (five) in two to three steps.

Remove the 8 mm bolts [1], 7 mm bolts [2] and sealing washer [3].

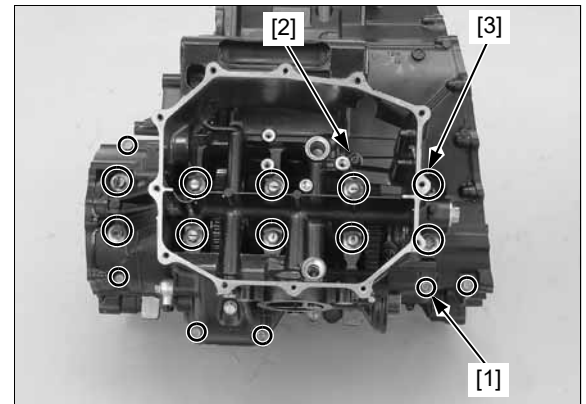


Place the engine upside down.

Loosen the 7 mm bolts (six) [1] and 8 mm bolt [2] in a crisscross pattern in two to three steps, then remove the bolts.

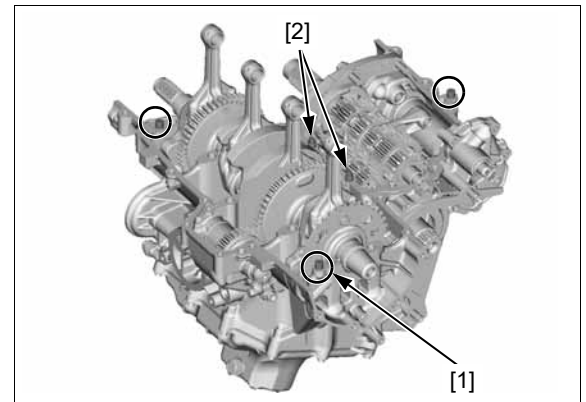
Loosen the 9 mm bolts (main journal bolts) [3] in a crisscross pattern in two to three steps, then remove the bolts.

Separate the lower crankcase from the upper crankcase.

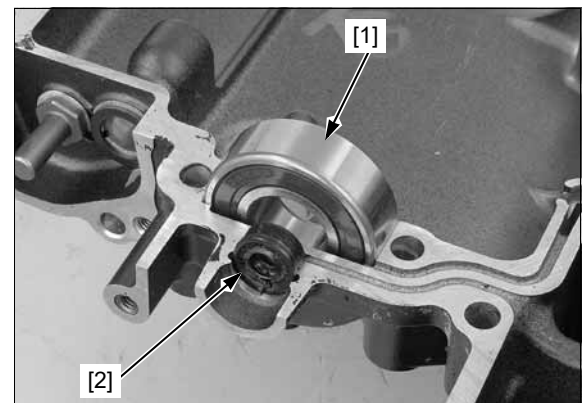


Remove the three dowel pins [1] and two oil orifices [2].

Clean any sealant off from the crankcase mating surface.



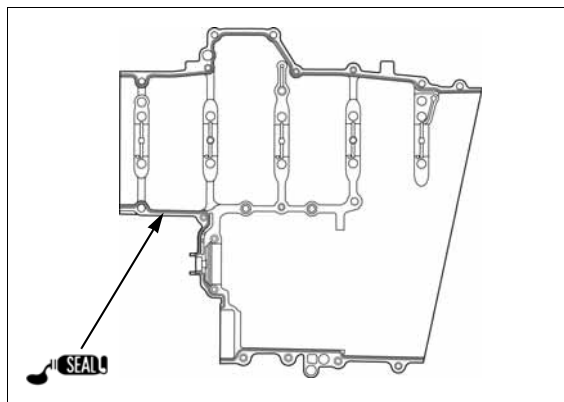
Remove the mainshaft bearing [1] and clutch lifter rod oil seal [2] from the upper crankcase.



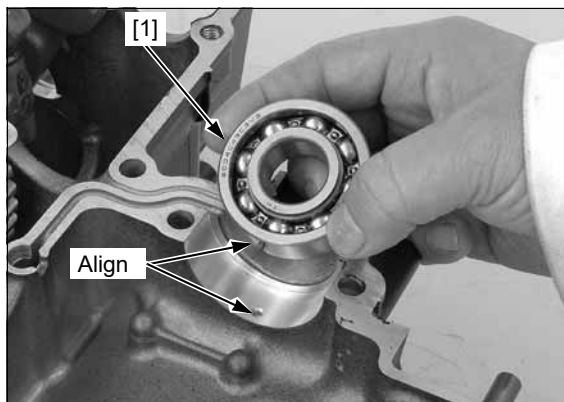
CRANKCASE ASSEMBLY

Replace the transmission bearing holder and crankcase as a set.

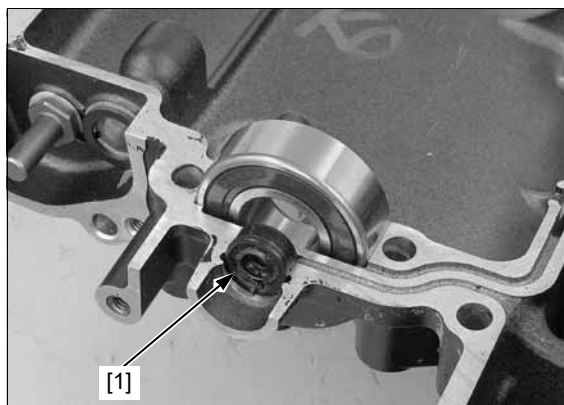
Apply a light, but thorough, coating of liquid sealant (Three Bond 1207B or equivalent) to the crankcase mating surface. Do not apply sealant to the crankcase 9 mm bolt (main journal bolt) area and the oil passage area as shown.



Install the mainshaft bearing [1] while aligning its locating pin with the crankcase hole.

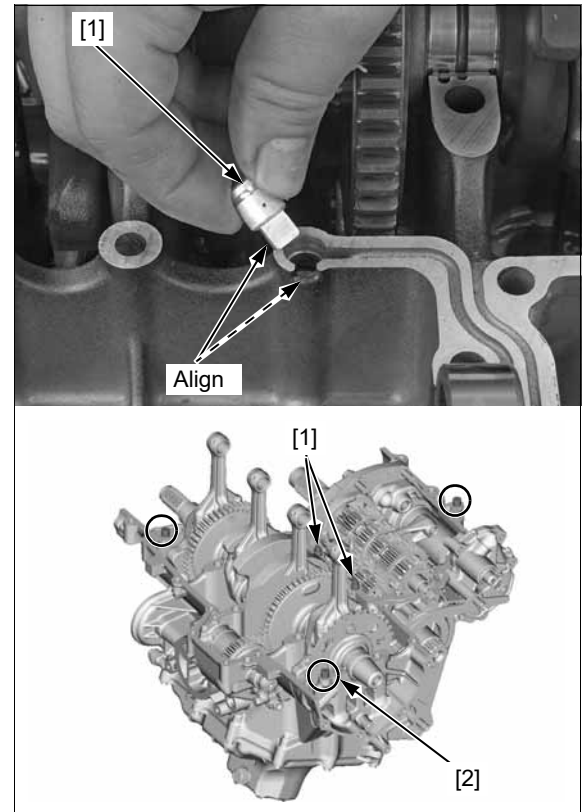


Install the clutch lifter rod oil seal [1].



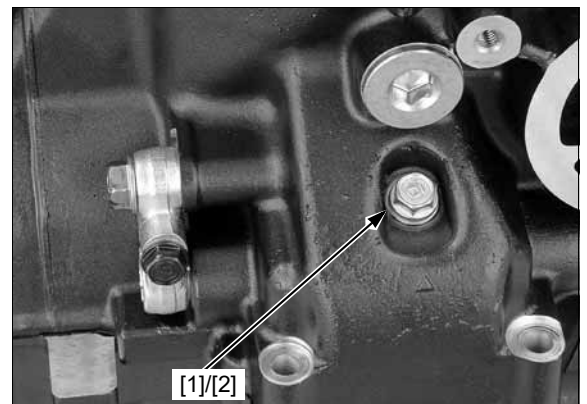
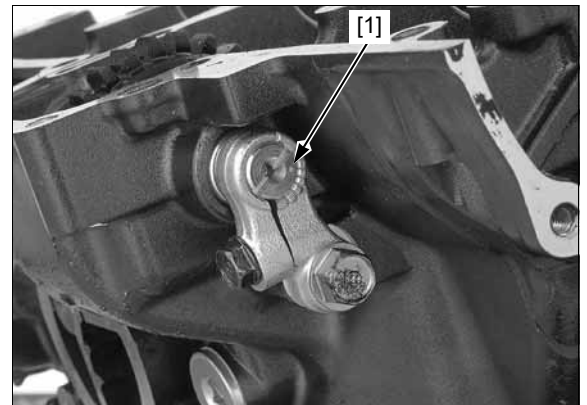
Align each flat of the oil orifice and crankcase.

- Install the oil orifices [1] in the upper crankcase.
Install the three dowel pins [2].



BALANCER TIMING ALIGNMENT/ LOWER CRANKCASE INSTALLATION

1. Avoid damaging the balancer drive and driven gear, turn the balancer shaft and place the punch mark [1] facing down, make the balancer backlash maximum.
2. Remove the sealing bolt [1] and sealing washer [2] from the lower crankcase.

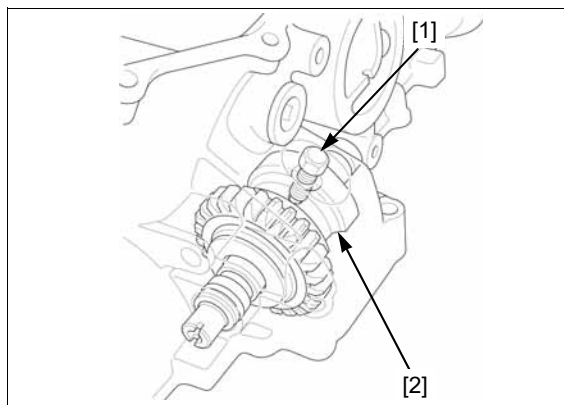


CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

3. Temporarily install the special bolt [1] into the sealing bolt hole, hold the balancer weight [2] securely.

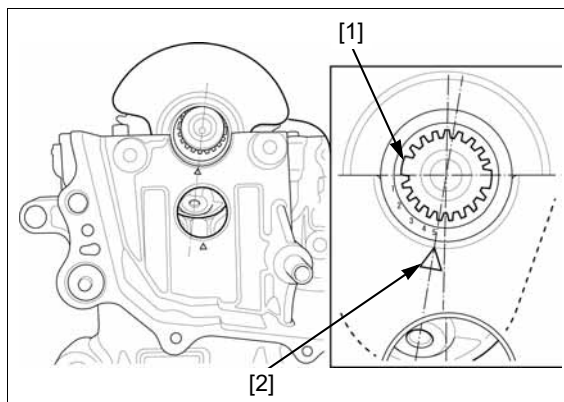
Make sure the special bolt tip into the balancer weight hole.

Special bolt, 6 x 18 mm: 90004-MM5-00



4. Place the crankshaft onto the upper crankcase so that the No.1 piston at TDC (Top Dead Center).

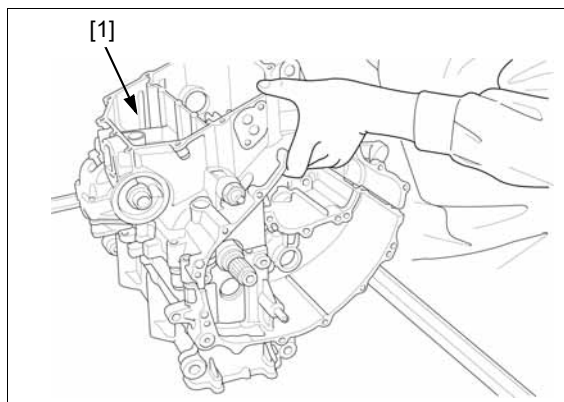
Slightly turn the crankshaft clockwise and align the crankshaft 5th spline center (from the wide spline) [1] with the "△" mark [2] on the upper crankcase as shown.



5. Carefully place the lower crankcase [1] onto the upper crankcase.

NOTE:

The crankshaft will slightly move counterclockwise when engaging the balancer gears.



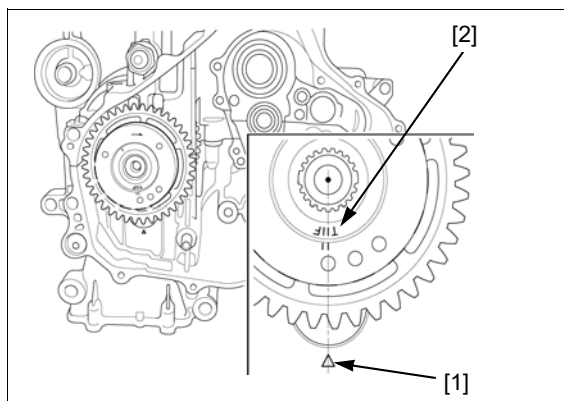
6. Check that the upper and lower crankcase seats properly.

Check that the crankshaft 5th spline center aligns with the next "△" mark [1] on the upper crankcase as shown.

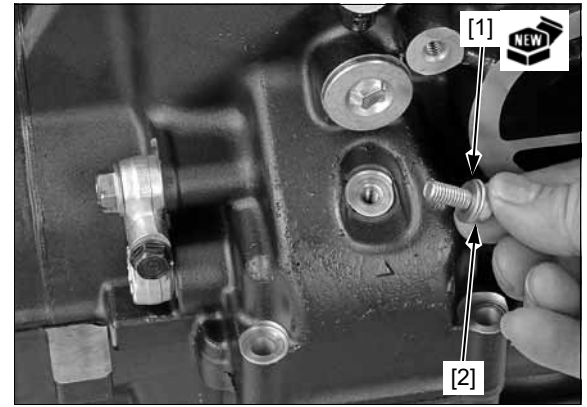
Make sure the No.1 piston at TDC (Top Dead Center) [2].

If the crankshaft is not proper position, reassemble the crankcase halves from the beginning.

Temporarily install the starter clutch assembly to check the TDC.



7. Remove the temporarily installed special bolt from the balancer weight.
- Install a new sealing washer [1] and sealing bolt [2], and tighten the bolt securely.



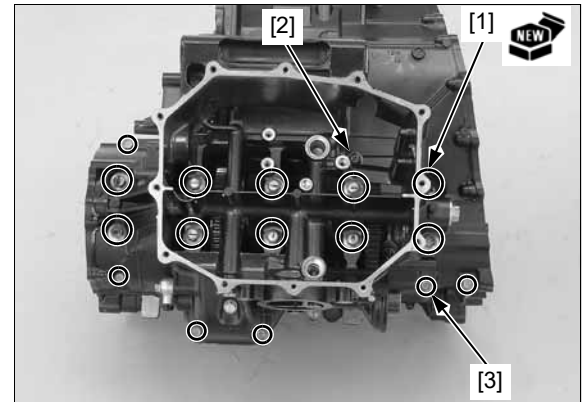
CRANKCASE BOLT TIGHTENING PROCEDURE

Install new crankcase 9 mm bolts (main journal bolts) [1].

Loosely install all the lower crankcase bolts (8 mm bolt [2] and 7 mm bolts [3]).

Make sure the upper and lower crankcase are seated firmly.

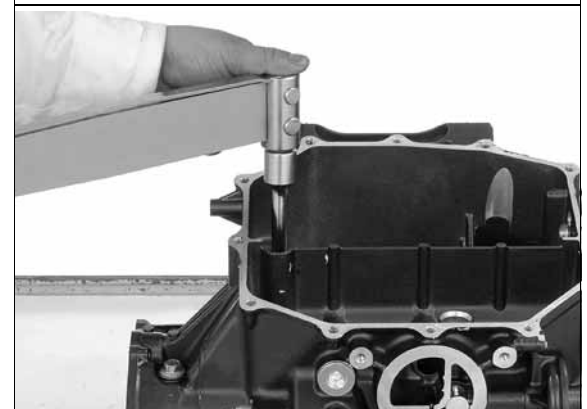
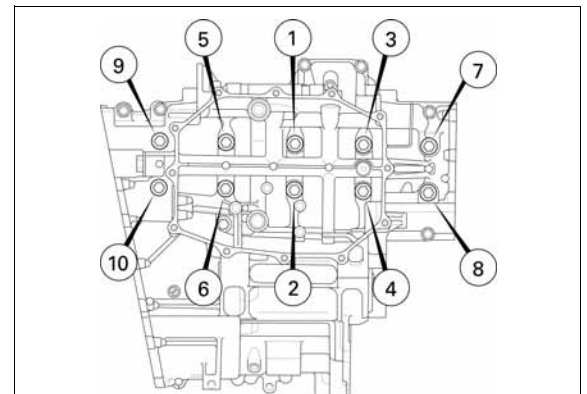
- Tighten the crankcase 9 mm bolts (main journal bolts) using the Plastic Region Tightening Method described on next procedure.
- Do not reuse the crankcase 9 mm bolts (main journal bolts), because the correct axial tension will not be obtained.
- The crankcase 9 mm bolts (main journal bolts) are pre-coated with an oil additive for axial tension stability. Do not remove the oil additive from the new 9 mm bolts (main journal bolts) surface.



Tighten the crankcase 9 mm bolts (main journal bolts) in numerical order in the illustration in two to three steps to the specified torque.

Further tighten the crankcase 9 mm bolts (main journal bolts) 150 degrees.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft) + 150 °



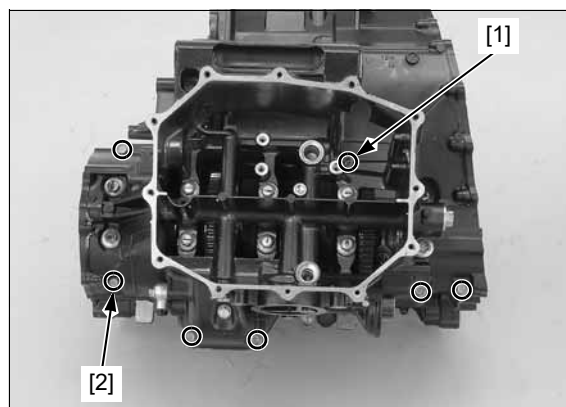
CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

Tighten the 8 mm bolt [1] to the specified torque.

TORQUE: 24 N·m (2.4 kgf·m, 18 lbf·ft)

From the inside to outside, tighten the 7 mm bolts [2] to the specified torque.

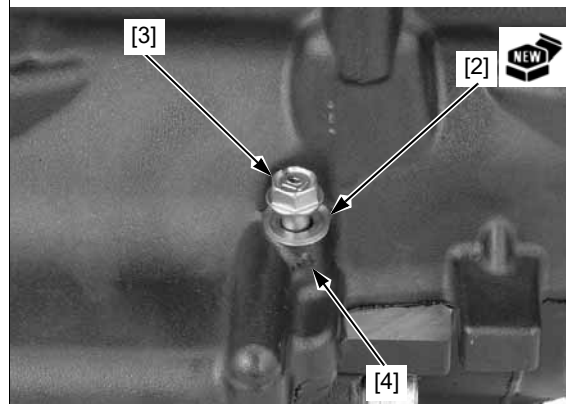
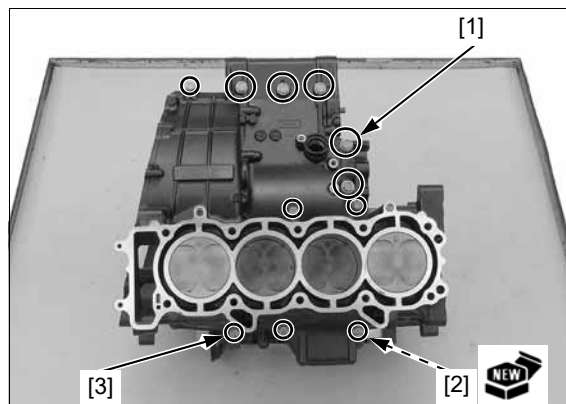
TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



Place the engine with the lower side down.

Install the upper crankcase 8 mm bolts [1], new sealing washer [2] and 7 mm bolts [3].

The sealing washer locations are indicated on the upper crankcase using the "△" mark [4].

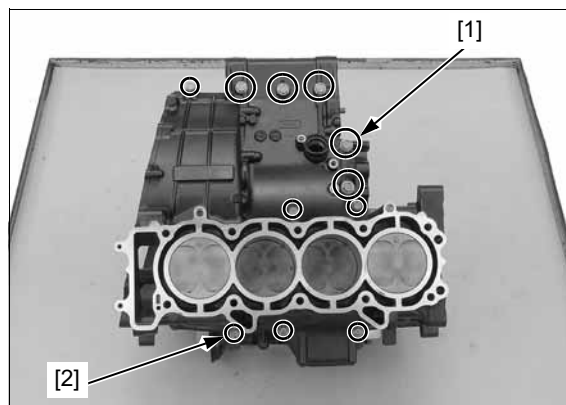


Tighten the 8 mm bolts [1] in a crisscross pattern in 2 to 3 steps.

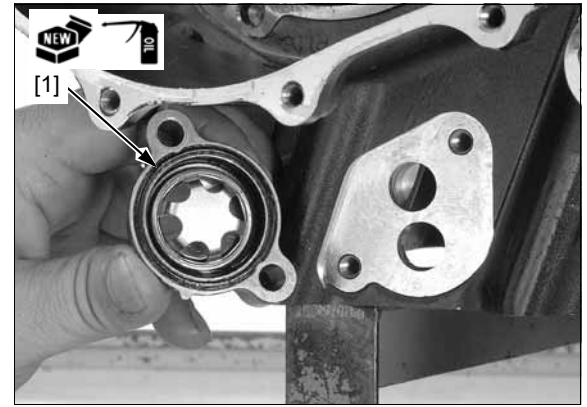
TORQUE: 24 N·m (2.4 kgf·m, 18 lbf·ft)

Tighten the 7 mm bolts [2] in a crisscross pattern in 2 to 3 steps.

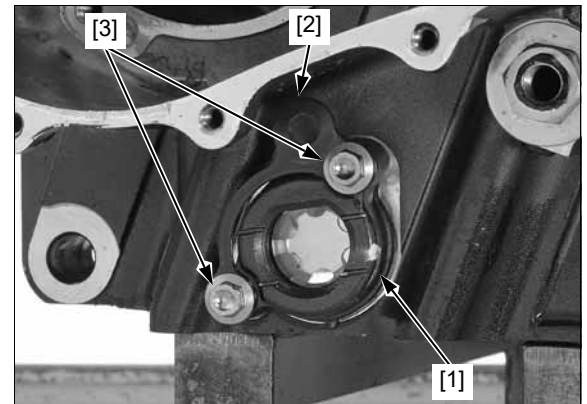
TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



Apply engine oil to new O-ring [1] and install it into the oil inspection window groove.



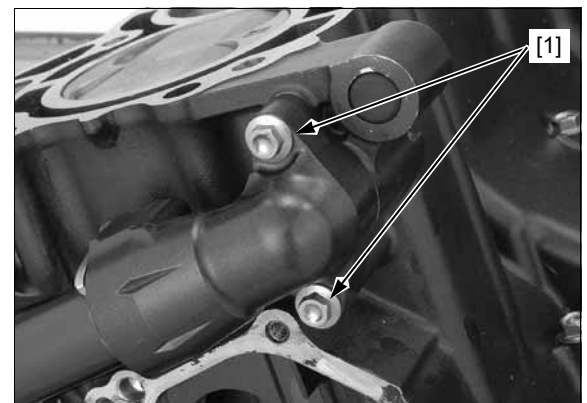
Install the oil inspection window [1] and stay [2] onto the lower crankcase.
Install the bolts [3] and tighten the bolts securely.



Install a new O-ring [1] into the water hose joint groove.



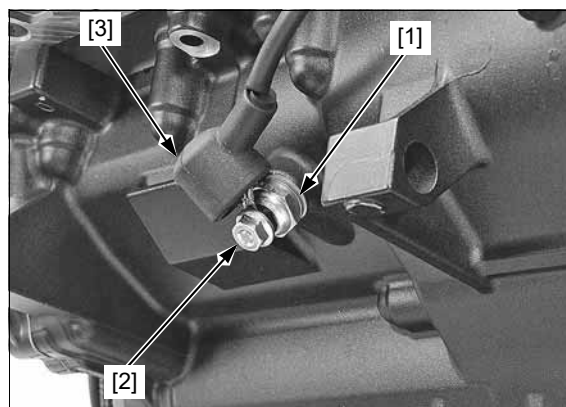
Install the water hose joint to the crankcase, then tighten the two bolts [1] securely.



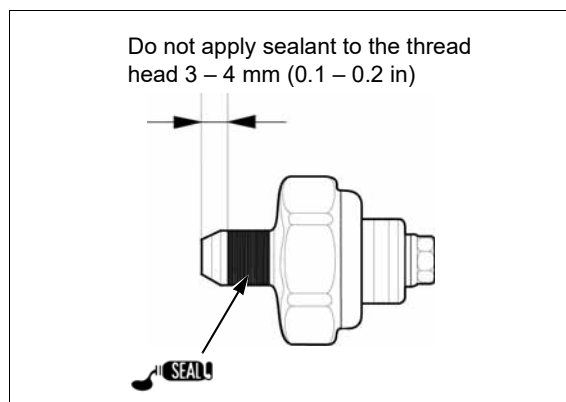
CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

Connect the terminal eyelet to the neutral switch [1] and tighten the terminal nut [2].

Install the dust cover [3] over the neutral switch.



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



Tighten the EOP switch [1] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

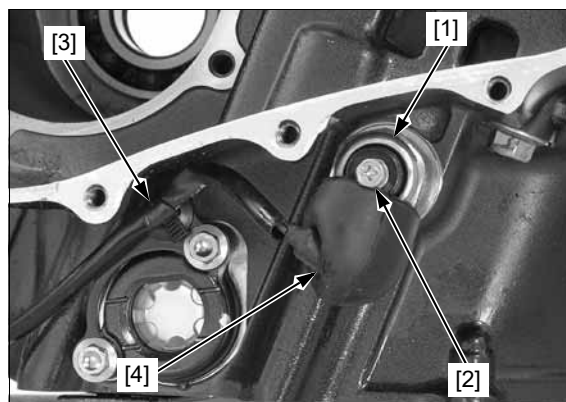
Connect the terminal eyelet to the oil pressure switch, and tighten the terminal bolt [2] to the specified torque.

TORQUE: 2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)

Refer to "Cable & Harness Routing" for EOP switch wire (page 1-24).

Install the EOP switch wire clip [3] to stay and install the dust cover [4].

Install the removed parts in the reverse order of removal.



CRANKSHAFT

SIDE CLEARANCE INSPECTION

Separate the crankcase halves (page 14-4).

Measure the connecting rod side clearance.

SERVICE LIMIT: 0.25 mm (0.098 in)

If the clearance exceeds the service limit, replace the connecting rod.

Recheck and if still out of limit, replace the crankshaft.



REMOVAL

NOTICE

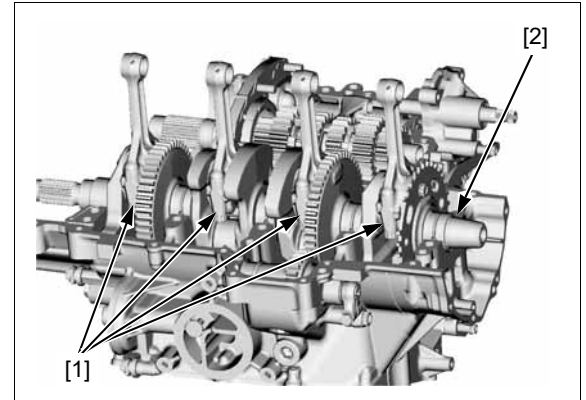
- Before removal, position all the pistons at TDC (Top Dead Center) to prevent damaging the crankpin with the connecting rod.
- Do not interchange the bearing inserts. they must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

Mark the bearing caps [1] and bearings as you remove them to indicate the correct cylinder for reassembly.

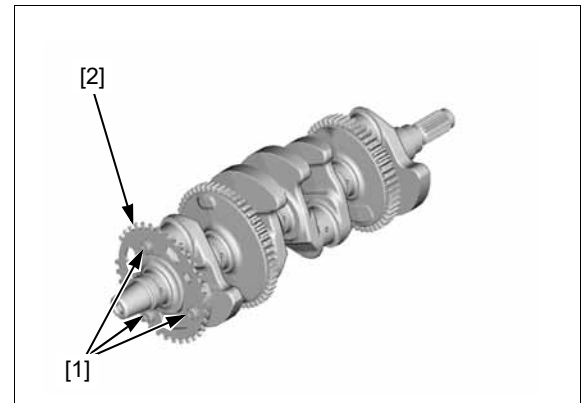
Tap the side of the bearing cap lightly if it is hard to remove.

Remove the connecting rod bolts and bearing caps.

Position all the pistons at TDC (Top Dead Center), then remove the crankshaft [2].



Remove the bolts [1] and pulser plate [2] from the crankshaft.



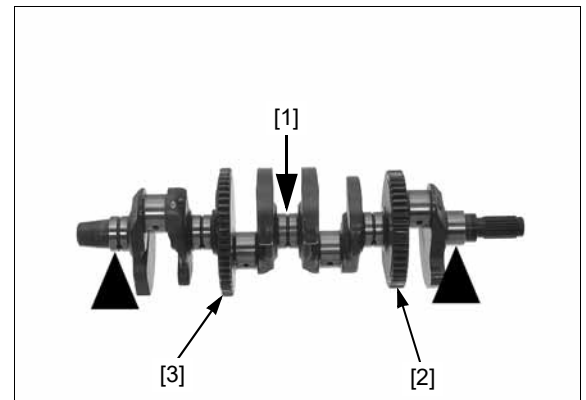
INSPECTION

Support the crankshaft on both end journals. Set a dial gauge on the center main journal of the crankshaft.

Rotate the crankshaft two revolutions and read the runout at the measurement point [1].

SERVICE LIMIT: 0.05 mm (0.002 in)

Check the primary drive gear [2] and balancer drive gear [3] teeth for abnormal wear or damage.

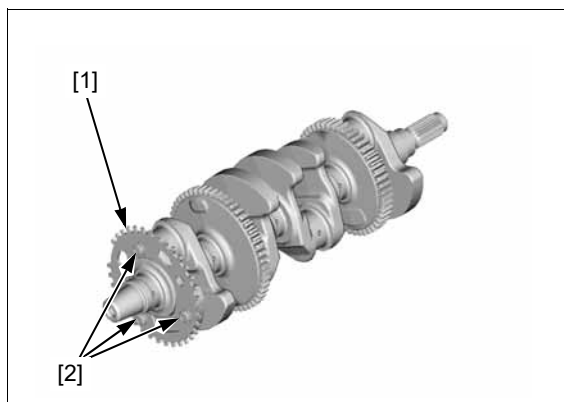


INSTALLATION

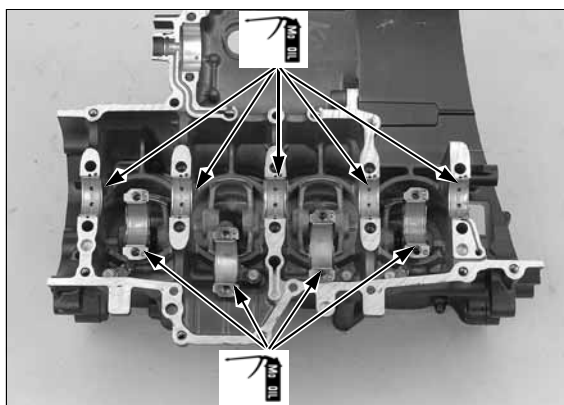
Apply a locking agent to the pulser plates mounting bolt threads.

Install the pulser plate [1] and the bolts [2] to the crankshaft.

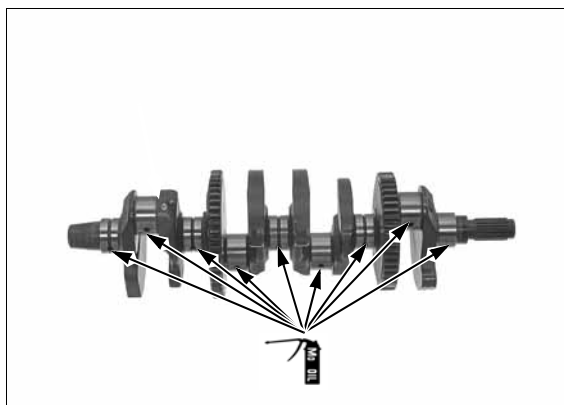
TORQUE: 19 N·m (1.9 kgf·m, 14 lbf·ft)



Apply molybdenum oil solution to the main journal bearing sliding surfaces on the upper crankcase and the crankpin bearing sliding surfaces on the connecting rods.



Apply molybdenum oil solution to each thrust surface of the crankshaft as shown.



NOTICE

Position all the pistons at TDC (Top Dead Center) to prevent damaging the crankpin with the connecting rod.

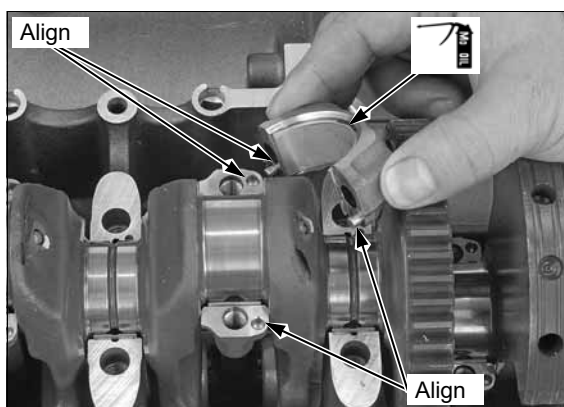
Install the crankshaft carefully onto the upper crankcase.

Set the connecting rods onto the crankpins.

Apply molybdenum oil solution to the crankpin bearing sliding surfaces on the connecting rod bearing caps.

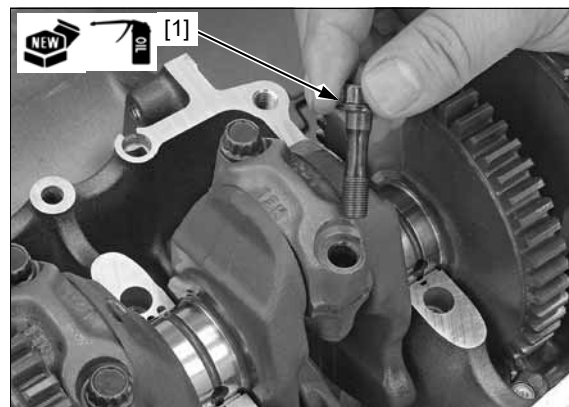
Install the connecting rod bearing caps, aligning the dowel pins with the holes in the connecting rods.

Be sure each part is installed in its original position, as noted during removal.



The connecting rod bolts cannot be reused. Once the connecting rod bolts have been loosened, replace them with new ones.

Apply engine oil to new connecting rod bolt [1] threads and seating surfaces, and install the bolts.



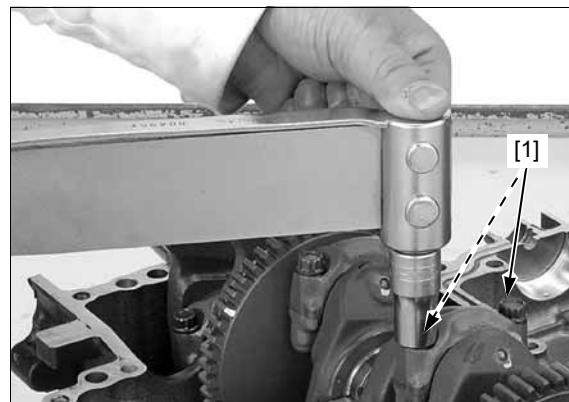
Tighten the connecting rod bolts with a Plastic Region Tightening Method.

Tighten the bolts [1] in two to three steps alternately, then tighten the bolts to the specified torque.

Further tighten the connecting rod bolts 90 degrees.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft) + 90°

Assemble the upper and lower crankcase (page 14-6).



MAIN JOURNAL BEARING

NOTICE

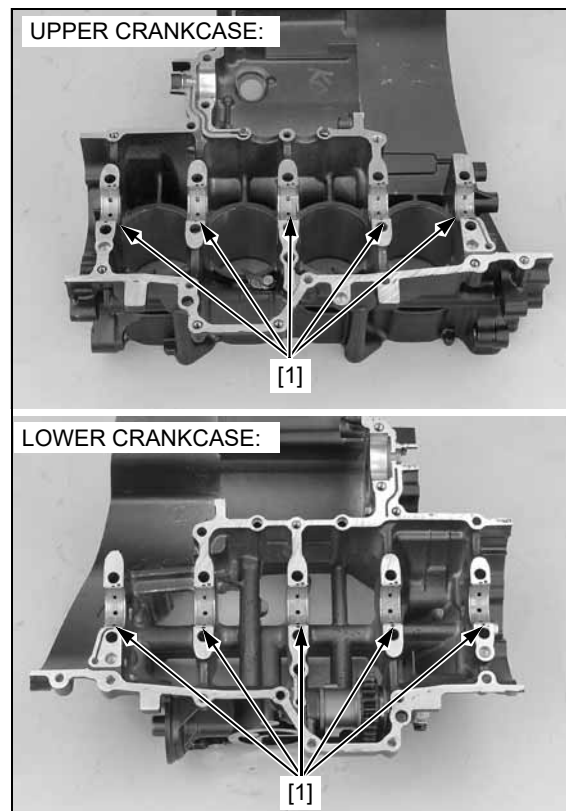
Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

BEARING INSPECTION

Remove the crankshaft (page 14-12).

Inspect the main journal bearing inserts [1] on the upper and lower crankcase halves for unusual wear or peeling.

Check the bearing tabs for damage.



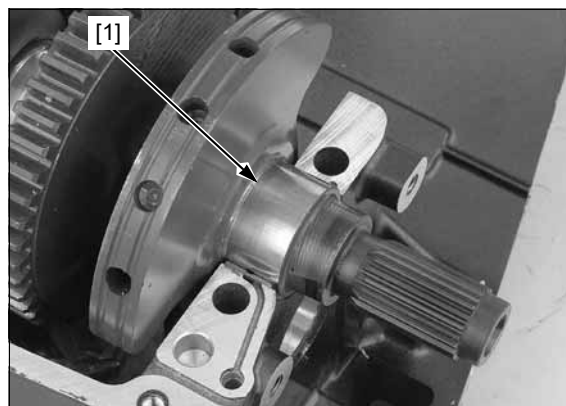
OIL CLEARANCE INSPECTION

Clean off any oil from the bearing inserts and main journals.

Install the crankshaft onto the upper crankcase.

Put a strip of plastigauge [1] lengthwise on each main journal avoiding the oil hole.

- Do not rotate the crankshaft during inspection.

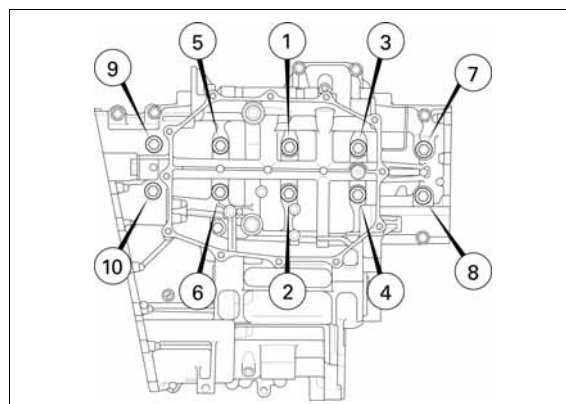


Install the three dowel pins (page 14-7).

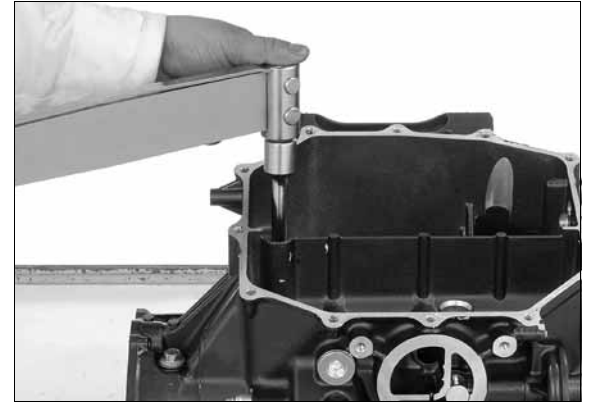
Install the lower crankcase onto the upper crankcase, then install the crankcase 9 mm bolts (main journal bolts).

Tighten the crankcase 9 mm bolts (main journal bolts) in numerical order in the illustration in two to three steps to the specified torque.

Further tighten the crankcase 9 mm bolts (main journal bolts) 150 degrees.



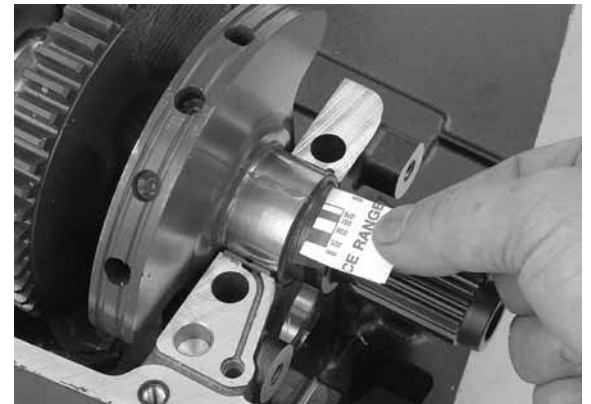
TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)+ 150°



Remove the crankcase 9 mm bolts (main journal bolts) and the lower crankcase, measure the compressed plastigauge at its widest point on each main journal to determine the oil clearance.

SERVICE LIMIT: 0.05 mm (0.002 in)

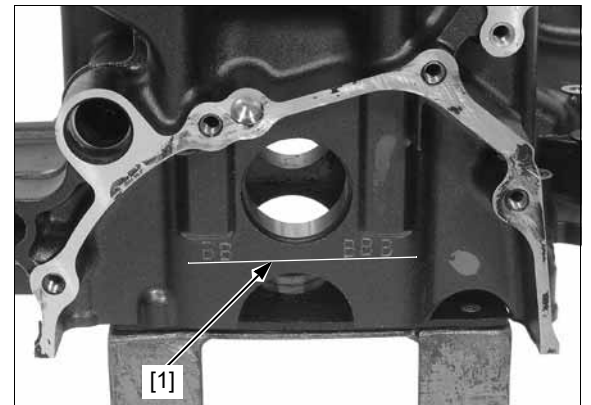
If the oil clearance exceeds the service limit, select a replacement bearing (page 14-20).



BEARING SELECTION

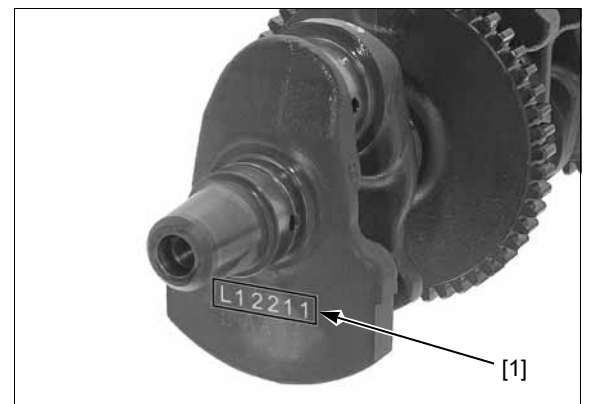
Letters (A, B or C) on the left side of upper crankcase are codes for the bearing support I.D. from left to right.

Record the crankcase bearing support I.D. code [1] letters from the left side of the upper crankcase as shown.



Numbers (1, 2 or 3) on the crank weight are codes for the main journal O.D. from left to right.

Record the corresponding main journal O.D. code numbers [1] from the crank weight.



CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

Cross reference the main journal and bearing support codes to determine the replacement bearing color code.

MAIN JOURNAL BEARING SELECTION TABLE:

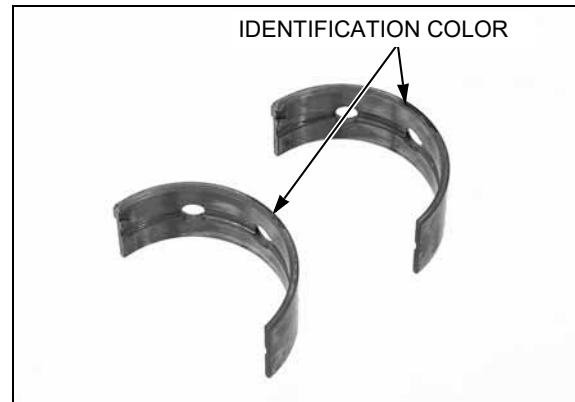
			BEARING SUPPORT I.D.CODE		
			A	B	C
			37.000 – 37.006 mm (1.4567 – 1.4569 in)	37.006 – 37.012 mm (1.4569 – 1.4572 in)	37.012 – 37.018 mm (1.4572 – 1.4574 in)
MAIN JOURNAL O.D. CODE	1	34.000 – 34.006 mm (1.3386 – 1.3388 in)	Red	Pink	Yellow
	2	33.994 – 34.000 mm (1.3383 – 1.3386 in)	Pink	Yellow	Green
	3	33.988 – 33.994 mm (1.3381 – 1.3383 in)	Yellow	Green	Brown

BEARING THICKNESS:

Brown: **Thickest**
Green:
Yellow: ↓
Pink:
Red: **Thinnest**

NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

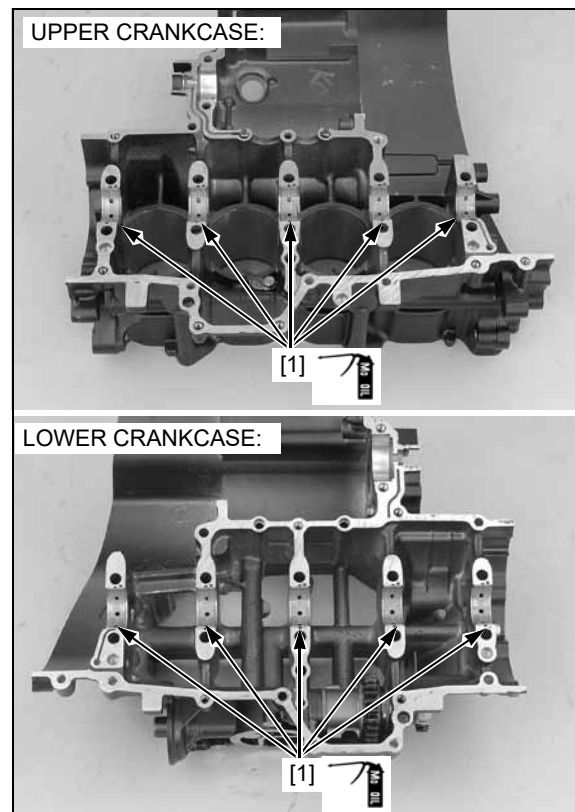


BEARING INSTALLATION

Clean the bearing outer surfaces and crankcase bearing supports.

Apply molybdenum oil solution to the main journal bearing sliding surfaces on the upper and lower crankcase.

Install the main journal bearing [1] inserts onto the crankcase bearing supports, aligning each tabs with each grooves.



CRANKPIN BEARING

BEARING INSPECTION

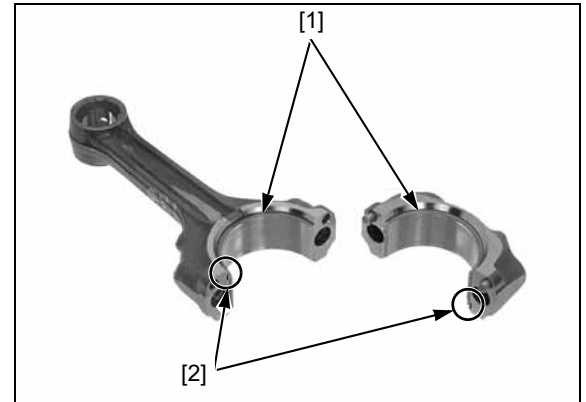
NOTICE

Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

Remove the crankshaft (page 14-12).

Check the bearing inserts [1] for unusual wear or peeling.

Check the bearing tabs [2] for damage.



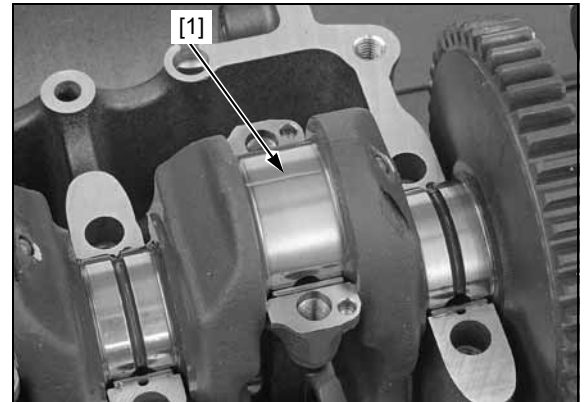
OIL CLEARANCE INSPECTION

Clean off any oil from the bearing inserts and crankpins. Carefully install the crankshaft onto the upper crankcase.

Set the connecting rods onto the crankpins.

Put a strip of plastigauge [1] lengthwise on each crankpin avoiding the oil hole.

- Do not rotate the crankshaft during inspection.



Carefully install the connecting rod bearing caps, aligning the dowel pins with the holes in the connecting rods.

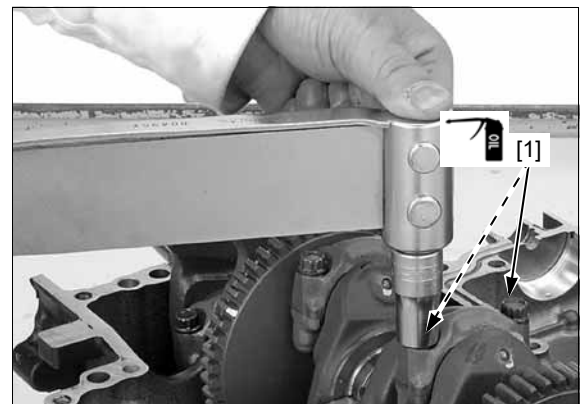
Use the removed connecting rod bolts when checking the oil clearance.

Apply oil to the connecting rod bolt threads and seating surfaces and install the bolts.

Tighten the bolts [1] in two to three steps alternately, then tighten the bolts to the specified torque.

Further tighten the connecting rod bolts 90 degrees.

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft) + 90°



CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

Remove the bolts and bearing caps, and measure the compressed plastigauge at its widest point on the crankpin to determine the oil clearance.

SERVICE LIMIT: 0.06 mm (0.002 in)

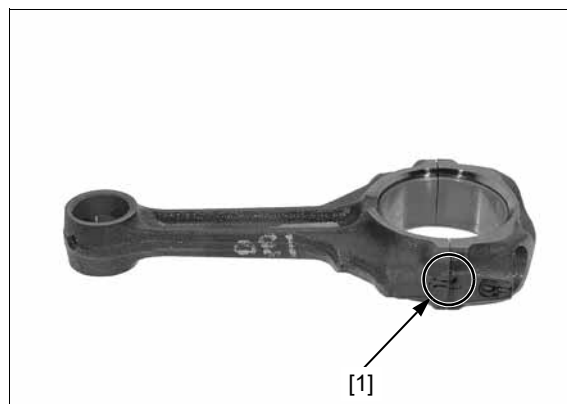
If the oil clearance exceeds the service limit, select the correct replacement bearings (page 14-20).



BEARING SELECTION

Numbers (1, 2 or 3) on the connecting rods are the codes for the connecting rod I.D.

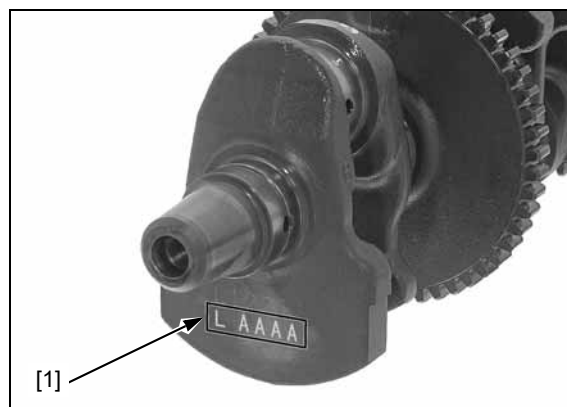
Record the connecting rod I.D. code number [1] (1, 2 or 3) or measure the I.D. with the connecting rod bearing cap installed without bearing inserts.



Letters (A, B or C) on the crankweight are the codes for the crankpin O.D.s from left to right.

If you are replacing the crankshaft, record the corresponding crankpin O.D. code letter [1] (A, B or C).

If you are reusing the crankshaft, measure the crankpin O.D. with the micrometer.



Cross-reference the connecting rod and crankpin codes to determine the replacement bearing color [1].

BEARING THICKNESS:

Blue: Thickest

Black:

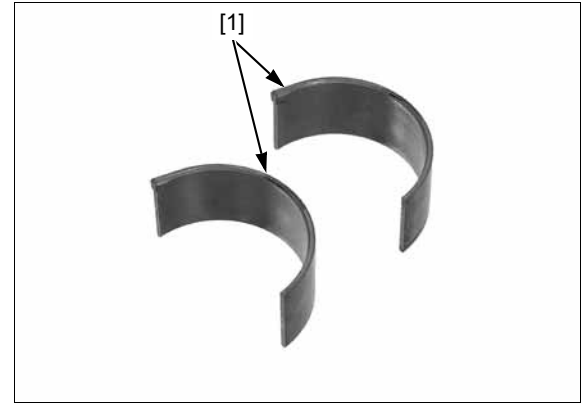
Brown: ↑

Green:

Yellow: Thinnest

NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.



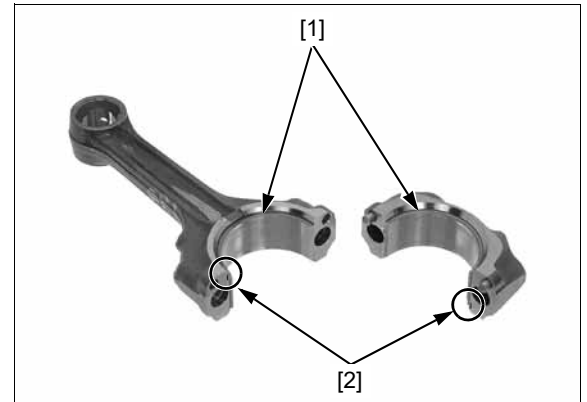
CRANKPIN BEARING SELECTION TABLE:

			CONNECTING ROD I.D.CODE		
			1	2	3
			39.500 – 39.506 mm (1.5551 – 1.5554 in)	39.506 – 39.512 mm (1.5554 – 1.5556 in)	39.512 – 39.518 mm (1.5556 – 1.5558 in)
CRANK PIN O.D.CODE	A	36.497 – 36.503 mm (1.4369 – 1.4371 in)	Yellow	Green	Brown
	B	36.491 – 36.497 mm (1.4367 – 1.4369 in)	Green	Brown	Black
	C	36.485 – 36.491 mm (1.4364 – 1.4367 in)	Brown	Black	Blue

BEARING INSTALLATION

Clean the bearing outer surfaces, connecting rod bearing cap and connecting rod.

Install the crankpin bearing inserts [1] onto the bearing cap and connecting rod, aligning each tab [2] with each groove.



PISTON/CYLINDER

PISTON/CONNECTING ROD REMOVAL

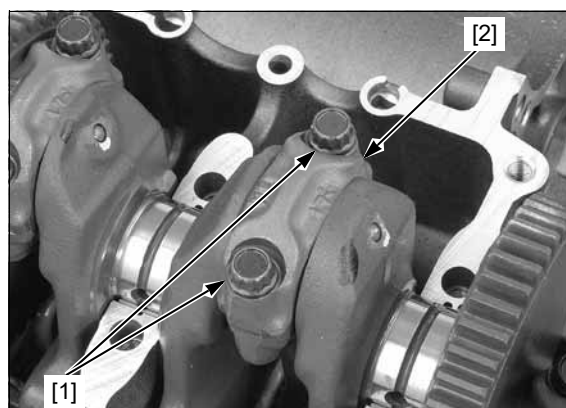
NOTICE

- This motorcycle is equipped with aluminum cylinder sleeves. Before piston removal, place a clean shop towel around the connecting rod to prevent damaging the cylinder sleeve.
- Do not try to remove the piston/connecting rod assembly from bottom of the cylinder; the assembly will get stuck in the gap between the cylinder liner and the upper crankcase.
- Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

Separate the crankcase halves (page 14-4).

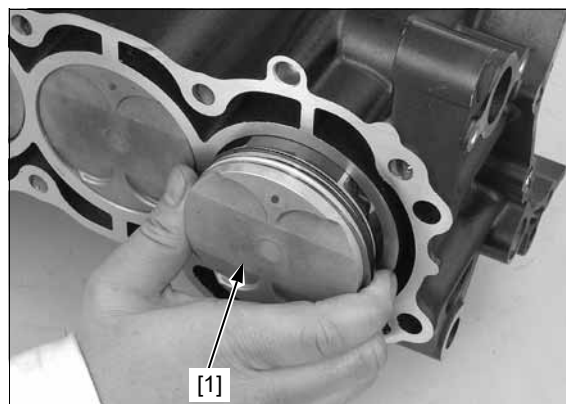
Mark all parts as you remove them to indicate the correct cylinder for reassembly.

Remove the connecting rod bolts [1] and connecting rod bearing caps [2].



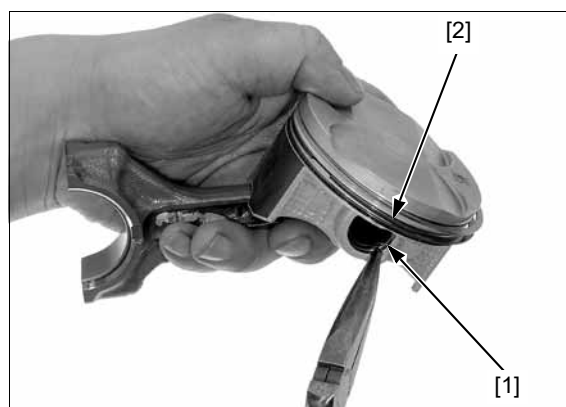
Do not try to remove the connecting rod/piston assembly from the bottom of the cylinder; the assembly will be locked so that the oil ring expands in the gap between the cylinder liner and the upper crankcase.

Remove the piston/connecting rod assembly [1] from the top of the cylinder.



PISTON REMOVAL

Remove the piston pin clip [1] with pliers. Push the piston pin [2] out of the piston and connecting rod, and remove the piston.



PISTON RING REMOVAL

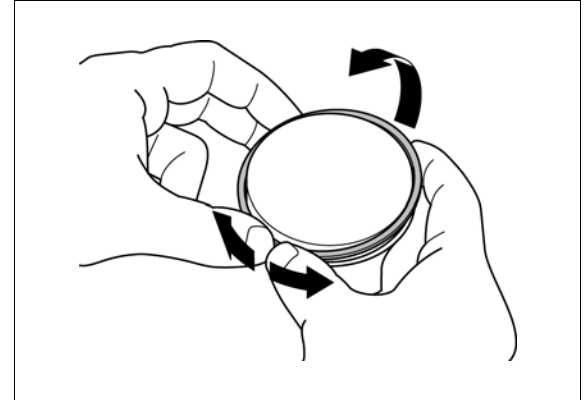
Be careful not to damage the piston ring by spreading the ends too far.

Spread each piston ring ends and remove them by lifting up at a point opposite the gap.

Clean carbon deposits from the piston ring grooves with a ring that will be discarded.

NOTE:

- Never use a wire brush; it will scratch the groove.



INSPECTION

Inspect the following parts for scratches, damage, abnormal wear, or deformation.

- 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 INSTALLATION

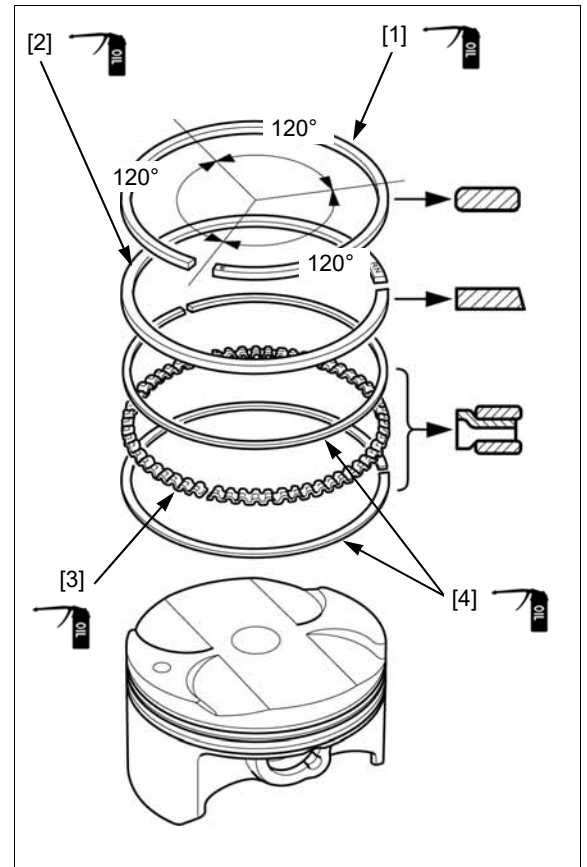
Clean the piston ring grooves thoroughly and install the piston rings.

- Apply engine oil to the piston rings.
- Avoid piston and piston ring damage during installation.
- Install the piston rings with the marking (R: top ring, RN: second ring) facing up. Do not confuse the top [1] and second [2] rings.
- To install the oil ring, install the spacer [3] first, then install the side rails [4].

Stagger the piston ring end gaps 120° apart from each other.

Stagger the side rail end gaps as shown.

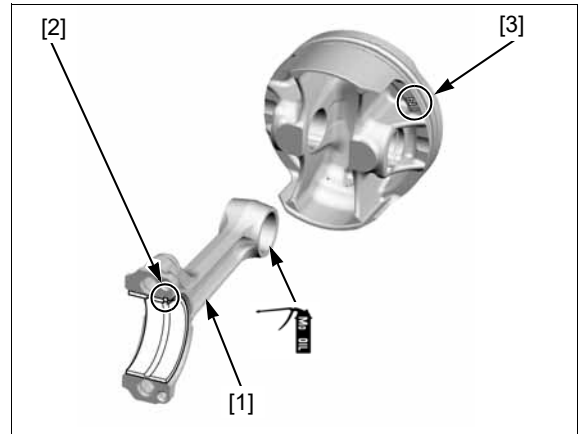
After installation, the rings should rotate freely in the ring groove.



CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

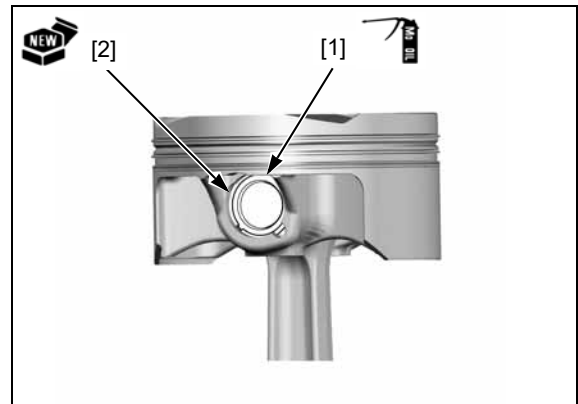
Apply molybdenum oil solution to the connecting rod [1] small end inner surfaces and piston pin sliding surfaces.

Assemble the piston and connecting rod with the journal bearing tab [2] facing to the piston "IN" mark [3].



Install the piston pin [1] and secure it using new piston pin clips [2].

- Make sure that the piston pin clips are seated in the groove securely.
- Do not align the piston pin clip end gap with the cut-out of the piston bore.



Coat the cylinder walls, piston outer surfaces and piston rings with engine oil.

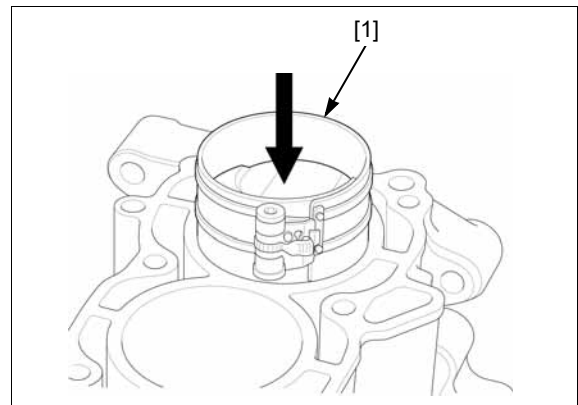
Install the piston/ connecting rod assembly with the piston "IN" mark facing the intake side.

Install the piston/connecting rod assemblies into the cylinders using a commercially available piston ring compressor tool [1].

When reusing the connecting rods, they must be installed in their original locations.

NOTICE

- While installing the piston, be careful not to damage the top surface of the cylinder, especially around the cylinder bore.
- Be careful not to damage the cylinder sleeve and crankpin with the connecting rod.



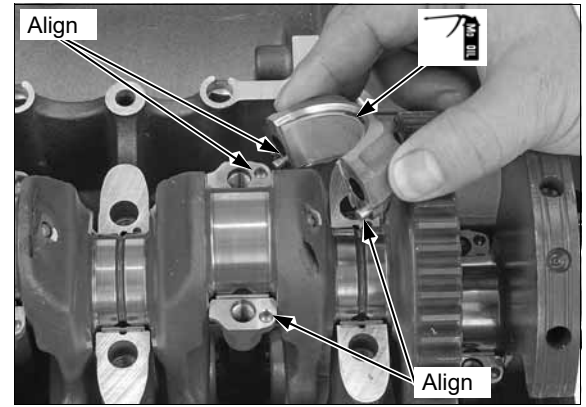
Make sure the piston ring compressor tool sits flush on the top surface of the cylinder.

Use the handle of a plastic hammer or equivalent tool to tap the piston into the cylinder.

Install the crankshaft (page 14-12).

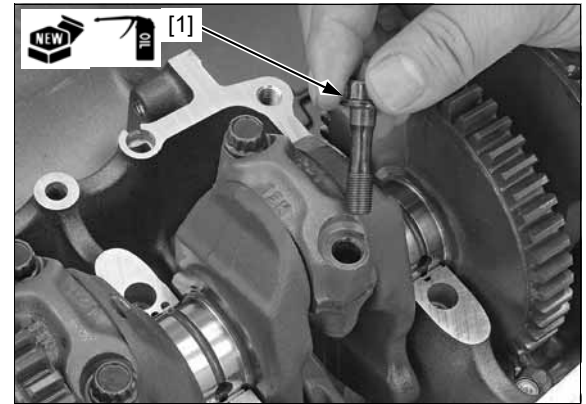
Apply molybdenum oil solution to the crankpin bearing sliding surface on the bearing caps.

Install the connecting rod bearing caps, aligning the dowel pins with the holes in the connecting rods.



The connecting rod bolts cannot be reused. Once the connecting rod bolts have been loosened, replace them with new ones.

Apply engine oil to new connecting rod bolt [1] threads and seating surfaces, and install the bolts.



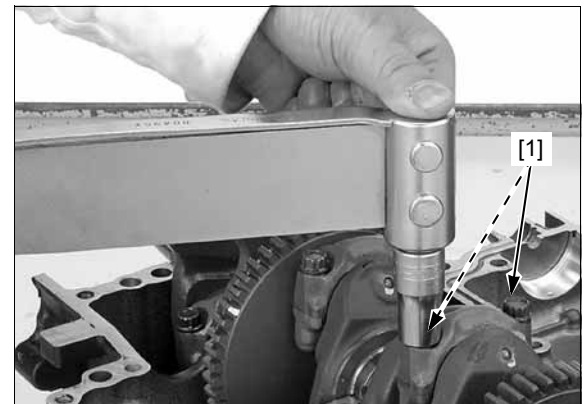
Tighten the connecting rod bolts with a Plastic Region Tightening Method.

Tighten the bolts [1] in two to three steps alternately, then tighten the bolts to the specified torque.

Further tighten the connecting rod bolts 90 degrees.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft) + 90°

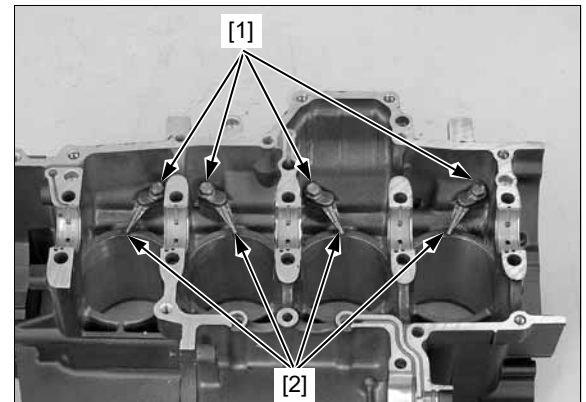
Assemble the upper and lower crankcase (page 14-6).



PISTON OIL JET REPLACEMENT

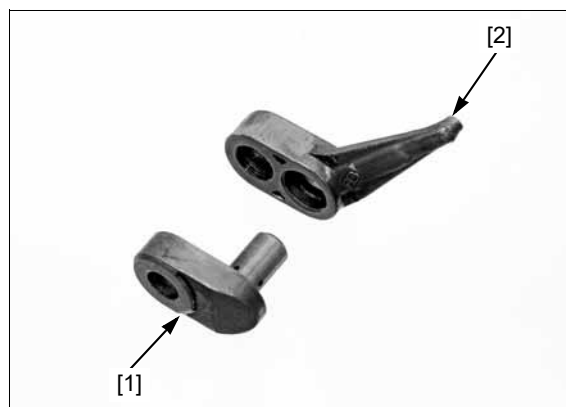
Remove the bolts [1] and piston oil jets [2] from the upper crankcase.

Inspect the oil jets for clogs, and replace if it necessary.



CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

Install the oil jet collar [1] onto the oil jet [2].

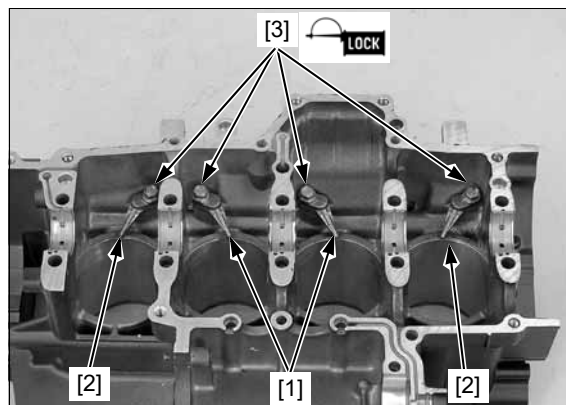


The piston oil jet has identification marks (A or B) on the body.

Install the oil jet A [1] into the No.2 and 3 cylinder, and the oil jet B [2] into the No.1 and 4 cylinder as shown.

Apply a locking agent to the piston oil jet mounting bolts threads.

Install and tighten the piston oil jet mounting bolts [3].

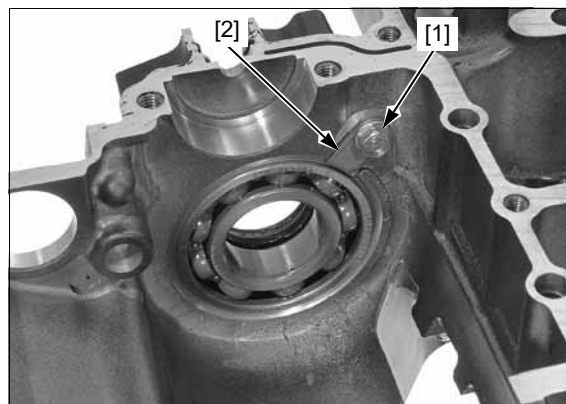


COUNTERSHAFT BEARING REPLACEMENT

Separate the crankcase halves (page 14-4).

Remove the main journal bearings from the lower crankcase (page 14-15).

Remove the bolt [1] and bearing set plate [2].



Remove the countershaft bearing from the lower crankcase using the special tool.

TOOLS:

Bearing remover shaft, 35 mm

07936-3710400

Remover shaft handle

07936-3710100

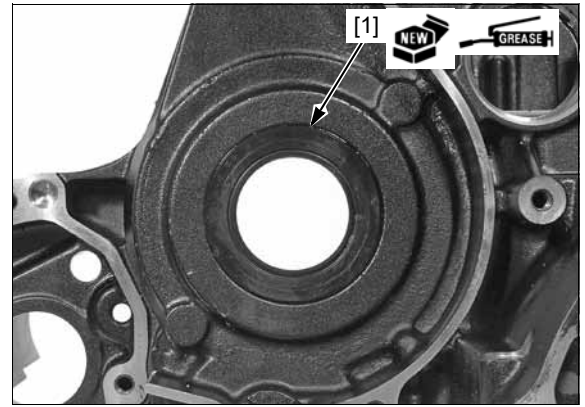
Remover weight

07741-0010201



Remove the countershaft oil seal [1] from inside of the crankcase.

Apply grease to new countershaft oil seal lips and install it to inside of the crankcase.



Drive the new countershaft bearing [1] into the lower crankcase using the special tool.

TOOLS:

Driver [2]

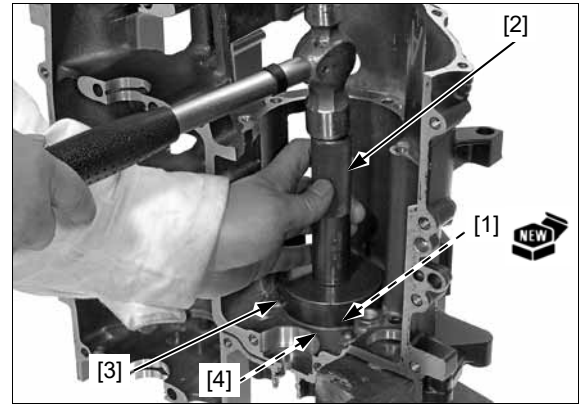
07749-0010000

Attachment, 72 x 75 mm [3]

07746-0010600

Pilot, 35 mm [4]

07746-0040800



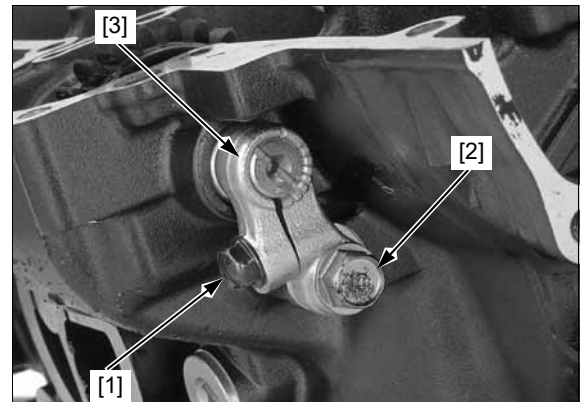
BALANCER

REMOVAL

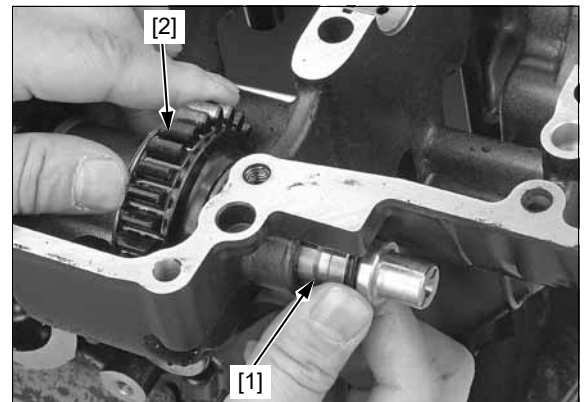
Separate the crankcase halves (page 14-4).

Loosen the balancer shaft pinch bolt [1].

Remove the balancer shaft holder bolt [2] and balancer holder [3].



Pull the balancer shaft [1] out and remove the balancer weight assembly [2] from the lower crankcase.



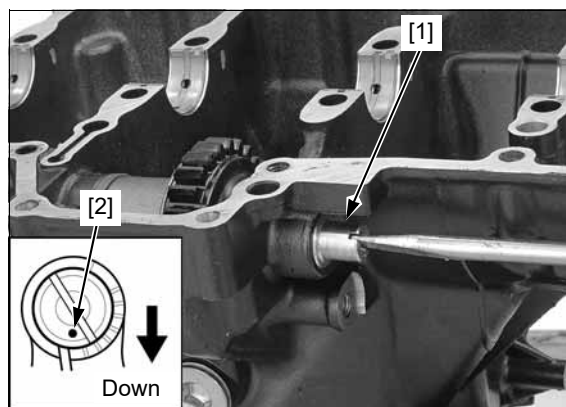
CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

Installation is in the reverse order of removal.

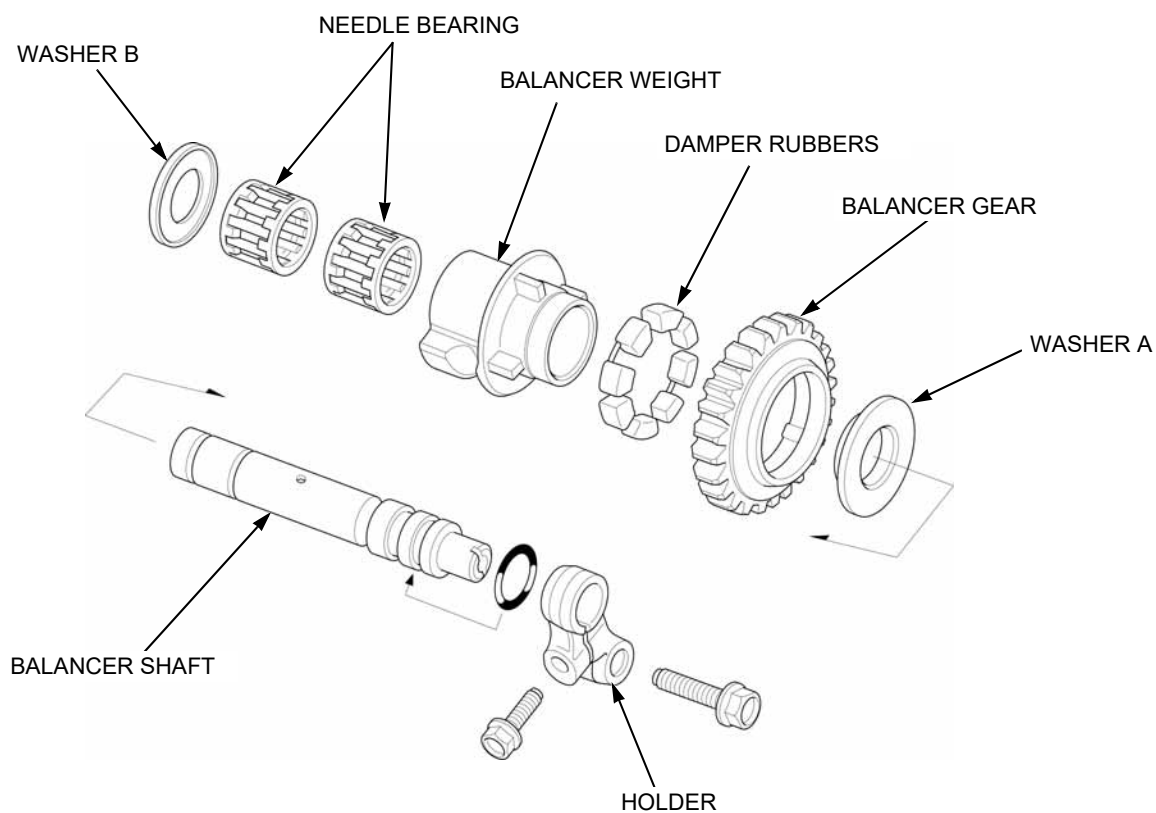
Turn the balancer shaft [1] and place the punch mark [2] on the shaft facing down.

NOTE:

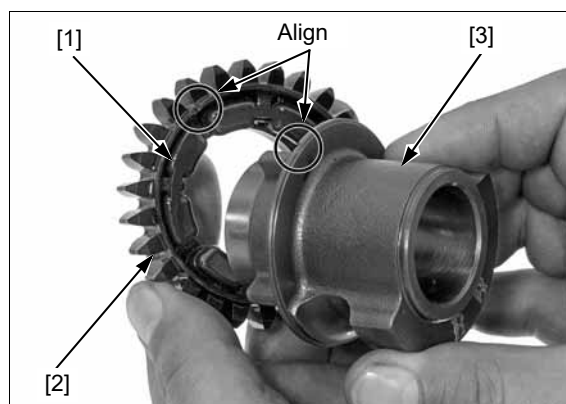
- Adjust the backlash (page 14-31).



DISASSEMBLY

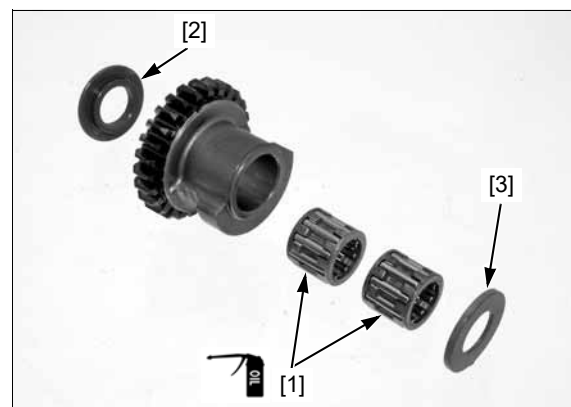


Install the damper rubbers [1] into the balancer gear [2]. Assemble the balancer gear and weight [3] while aligning the index marks.

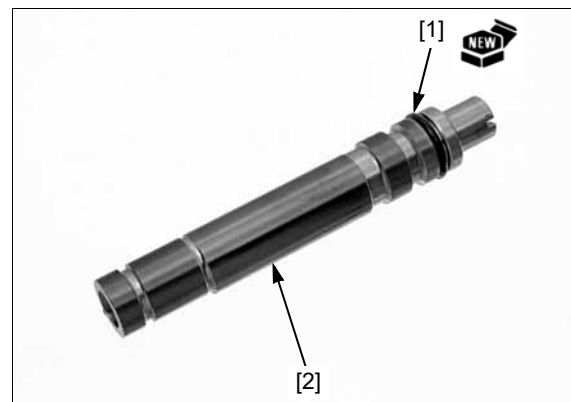


Apply engine oil to the needle bearings [1], install them into the balancer weight.

Install the washer A [2] and B [3] to the balancer weight assembly.



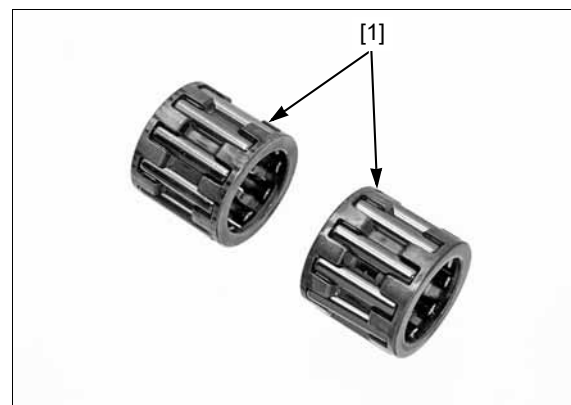
Install a new O-ring [1] to the balancer shaft [2] groove.



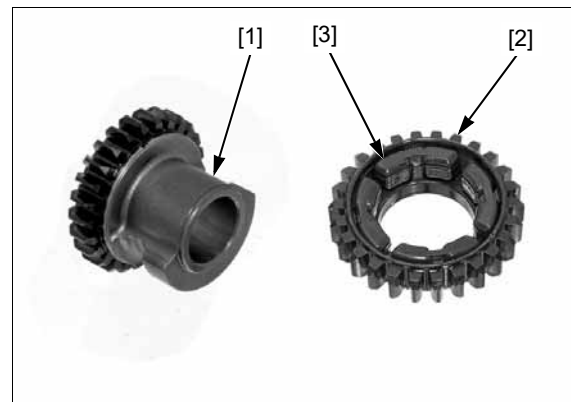
INSPECTION

*Replace the
balancer weight,
balancer shaft,
needle bearings as
a set*

Check the needle bearing [1] for wear or damage, replace if necessary.



Check the balancer weight [1] and gear [2] for wear or damage.
Check the damper rubbers [3] for fatigue or damage, replace if necessary.



CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

BALANCER BEARING SELECTION

The balancer weight and needle bearings are select fitted.

The balancer weight has weight side I.D. code letter [1] and gear side I.D. code letter [2] as shown. The marking identify each I.D. of the balancer weight as shown.



Reference the balancer weight I.D. code letters to determine the replacement bearing [1] color. Refer to the selection table below for bearing selection.



BALANCER BEARING SELECTION TABLE:

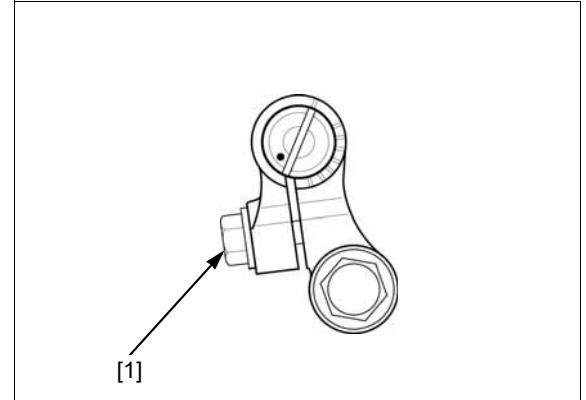
		BALANCER WEIGHT I.D. CODE		
		A	B	C
		27.000 – 27.004 mm (1.0630 – 1.0631 in)	26.991 – 26.996 mm (1.0626 – 1.0628 in)	26.987 – 26.991 mm (1.0624 – 1.0626 in)
BALANCER SHAFT	17.990 – 17.996 mm (0.7083 – 0.7085 in)	Blue	White	Green

BACKLASH ADJUSTMENT

Install the engine into the frame (page 15-7).

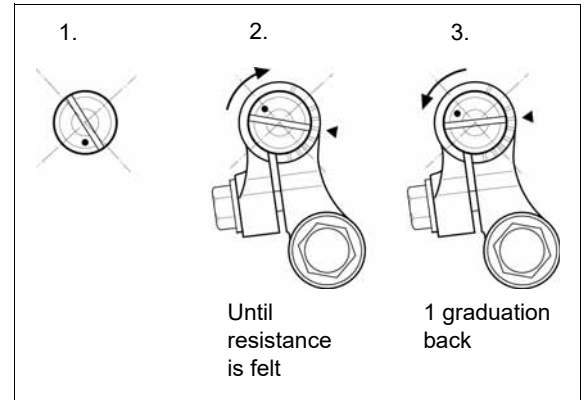
Adjust the backlash while the engine is cold (below 35°C/ 95°F) and the engine is not running.

Loosen the balancer shaft holder pinch bolts [1].



Excessive force can cause balancer gear, bearing and shaft damage. Do not turn the shaft more than necessary.

Turn the balancer shaft clockwise until resistance is felt, then back it off one graduation using the punch mark as a measure.



Warm up the engine and let it idle.

If the balancer gear noises are excessive, adjust the balancer backlash as follows:

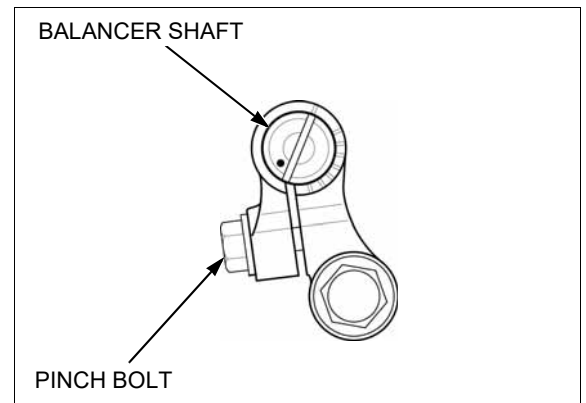
Turn the balancer gear shaft counterclockwise until the gears begin to make a "whining" noise. Then turn the gear shaft clockwise until the gear "whining" noise disappears.

Tighten the balancer shaft pinch bolt.

After all gear backlash adjustments are done, snap the throttle and make sure the gear noises are not excessive.

If the gear "whine" noise is excessive, the backlash is too small.

If the gear "rattling" noise is excessive, the backlash is excessive.



MEMO

15. ENGINE REMOVAL/INSTALLATION

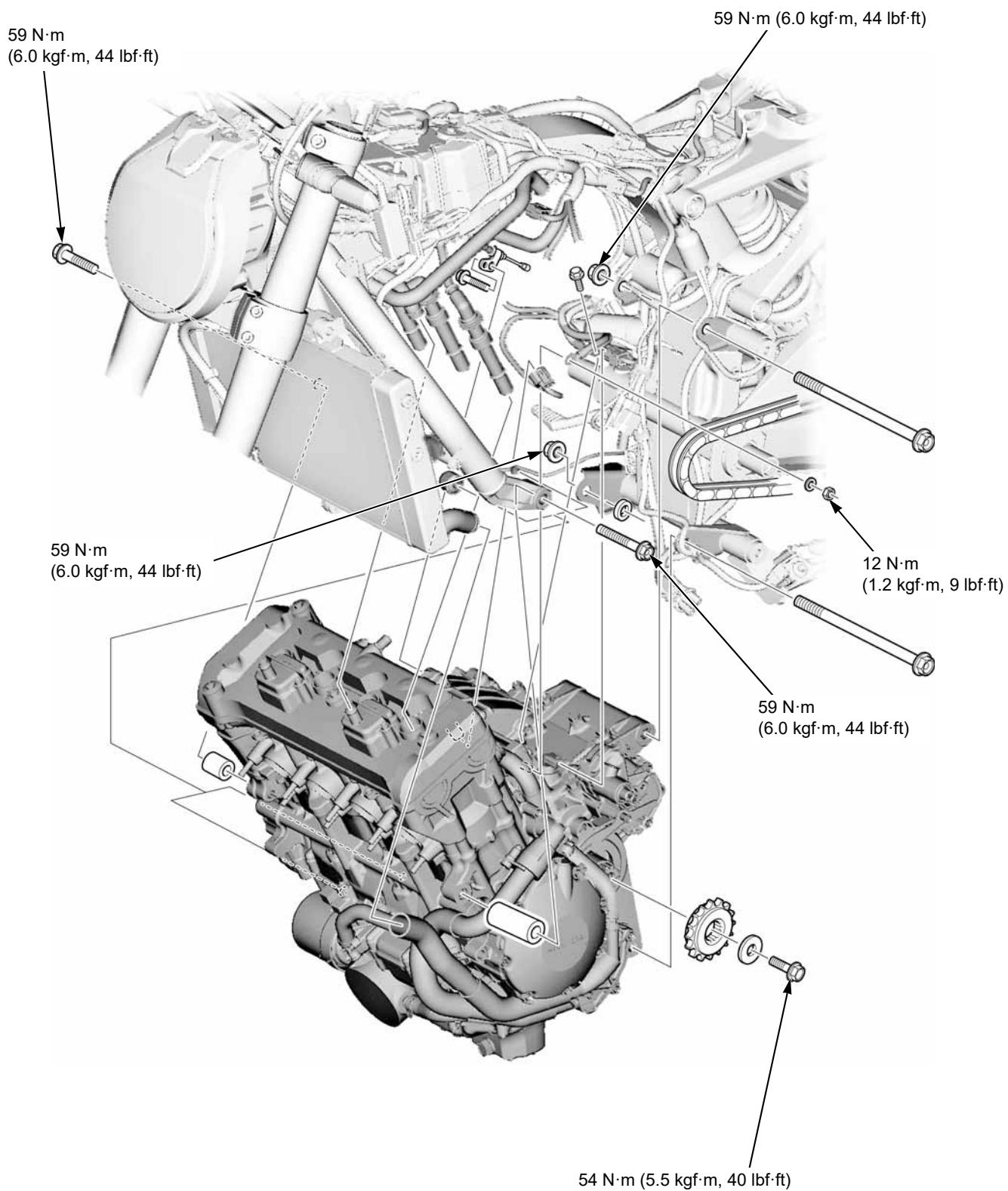
SERVICE INFORMATION.....	15-2	ENGINE REMOVAL	15-4
COMPONENT LOCATION.....	15-3	ENGINE INSTALLATION	15-7

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.
- Do not use the oil filter and oil cooler as a jacking point.
- When using the lock nut wrench for the engine hanger lock nut, use a deflecting beam type torque wrench 500 mm (20.0 in) long.
The lock nut wrench increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the lock nut. The specification given is the actual torque applied to the lock nut, not the reading on the torque wrench. Do not overtighten the lock nut. The specification later in the text gives both actual and indicated.
- The following components can be serviced with the engine installed in the frame.
 - Alternator (page 12-3)
 - Clutch (page 11-6)
 - Camshaft (page 10-6)
 - Gearshift linkage (page 13-5)
 - Oil cooler (page 9-9)
 - Oil pump (page 9-7)
 - Water pump (page 8-11)
 - Shift fork/shift drum/transmission (page 13-9)
- The following components require engine removal for service.
 - Cylinder head (page 10-4)
 - Crankshaft (page 14-12)
 - Piston/cylinder (page 14-22)
 - Balancer (page 14-27)
- 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.

COMPONENT LOCATION



ENGINE REMOVAL

Drain the engine oil (page 3-12).

Drain the coolant from the system (page 8-4).

Remove the following:

- Air cleaner housing (page 7-9)
- EVAP canister (page 7-18)
- Exhaust pipe (page 2-16)
- Radiator (page 8-8)
- Shift stroke sensor (III CH model) (page 4-63)
- Left swingarm pivot bracket (page 2-19)

NOTE:

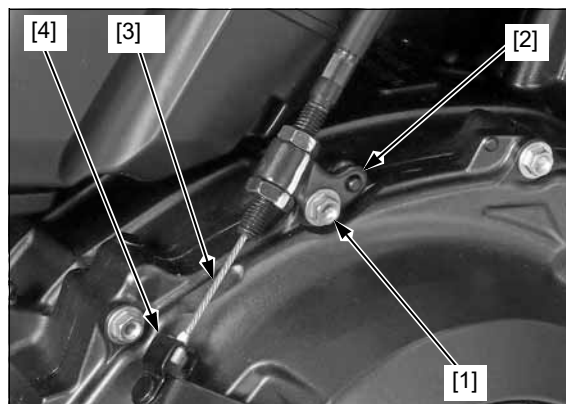
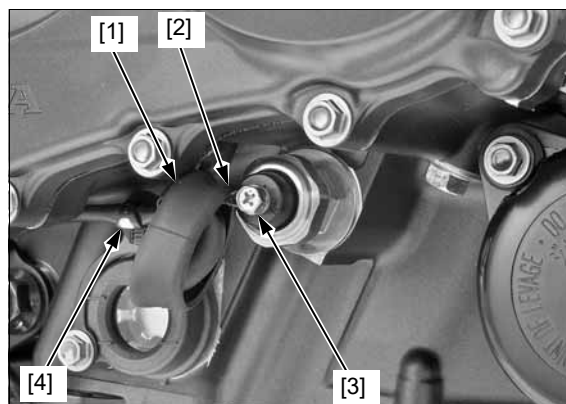
- With the ignition switch OFF, disconnect the battery negative (–) cable (page 20-5).
- Seal the cylinder head intake ports with tape or a clean cloth to keep dirt and debris from entering the intake ports.

Fully slacken the drive chain (page 3-17).

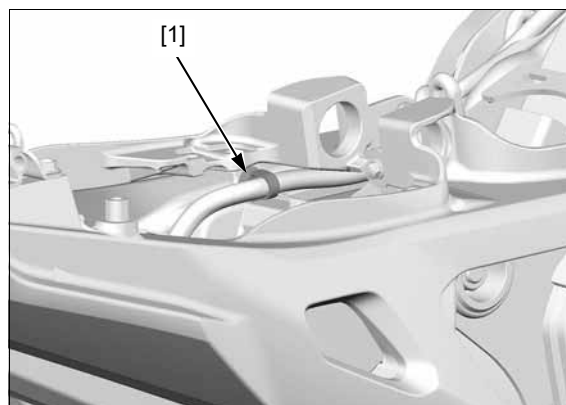
Remove the rubber cap [1], and disconnect the EOP switch wire [2] by removing the terminal bolt [3].

Remove the wire clamp [4].

Remove the bolt [1] and clutch cable guide plate [2], then disconnect the clutch cable [3] end from the clutch lifter lever [4].



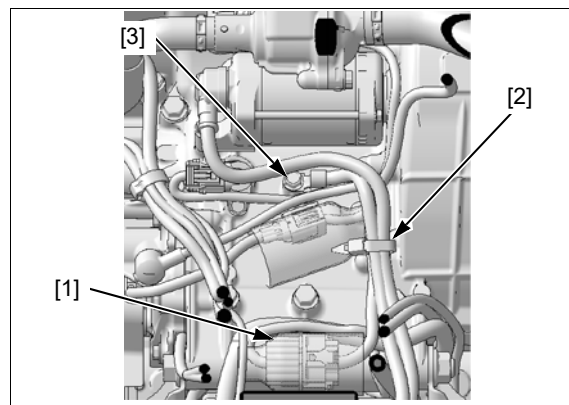
Remove the alternator wire clamp [1] from the rear fender B.



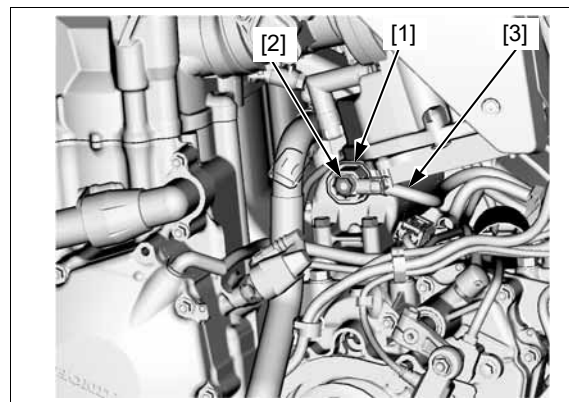
Disconnect the engine sub harness 12P (Black) connector [1].

Remove the wire band [2].

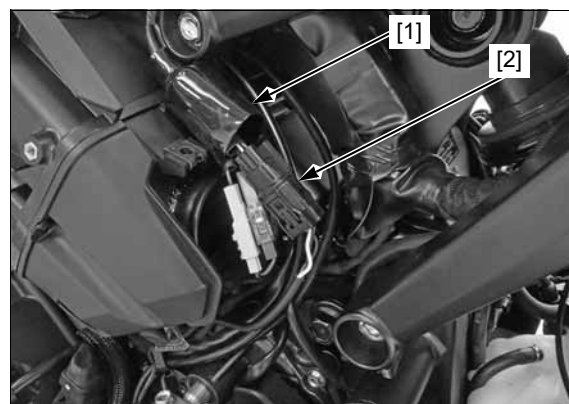
Remove the ground cable bolt [3] and ground cable.



Remove the rubber cap [1], then remove the terminal nut [2] and starter motor cable [3] from the starter motor.



// ED, // TH, // KO, // FO, // GS, // RU, // CH, // BR models only: Pull back the boot [1] and disconnect the shift stroke sensor 3P (Black) connector [2].

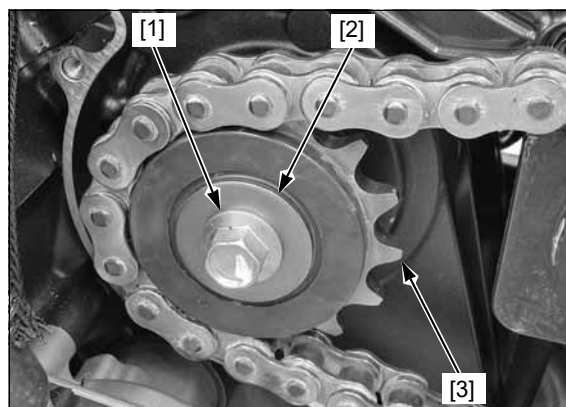


Disconnect the CKP sensor 3P (Black) connector [1].



ENGINE REMOVAL/INSTALLATION

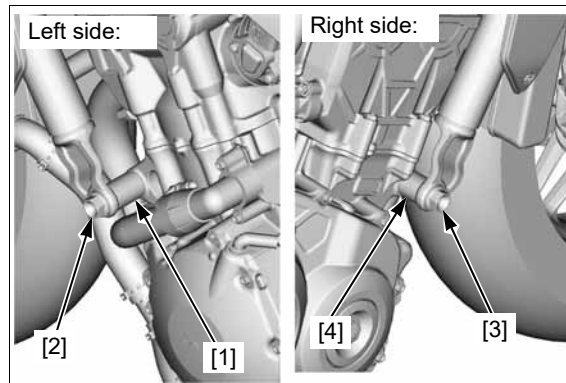
Remove the bolt [1], washer [2] and drive sprocket [3].



Support the engine using a jack or other adjustable support.

Left side: Remove the front engine hanger long bolt [1] and long collar [2].

Right side: Remove the front engine hanger short bolt [3] and short collar [4].

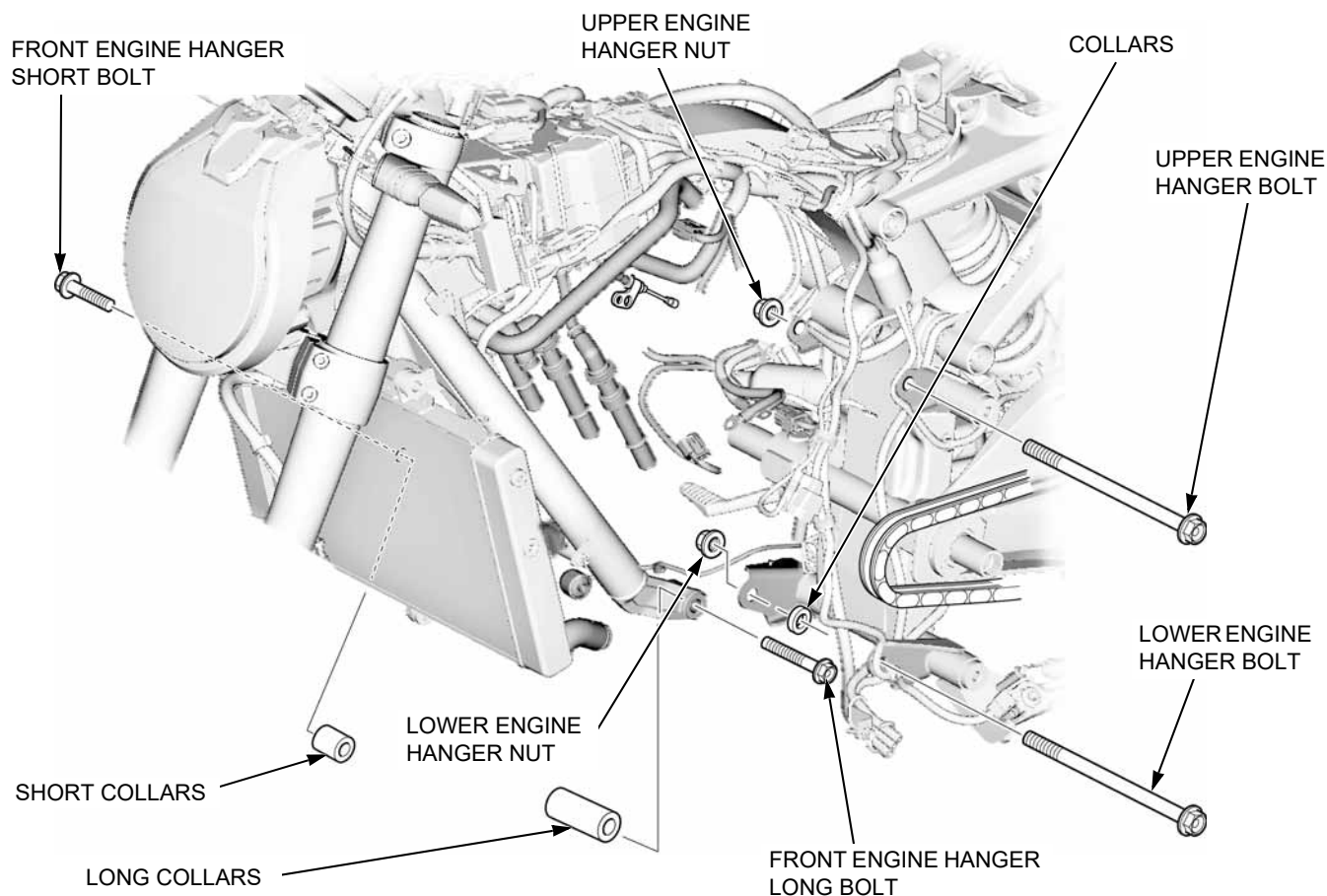


During engine removal, hold the engine securely and be careful not to damage the frame and engine.

Remove the rear upper and rear lower engine hanger bolts [1], nuts [2] and collar [3].



ENGINE INSTALLATION



NOTE:

- Note the direction of the engine hanger bolts.
- Place the jack or other adjustable support under the engine.
- 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, water hose, wires and cables.
- All the engine mounting bolts and nuts loosely install, then tighten the bolts and nuts to the specified torque.
- Route the water hose, wires and cables properly (page 1-24).

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, nuts and collars.

Tighten the rear lower engine hanger nut [1] and rear upper engine hanger nut [2] to the specified torque in the specified sequence as shown.

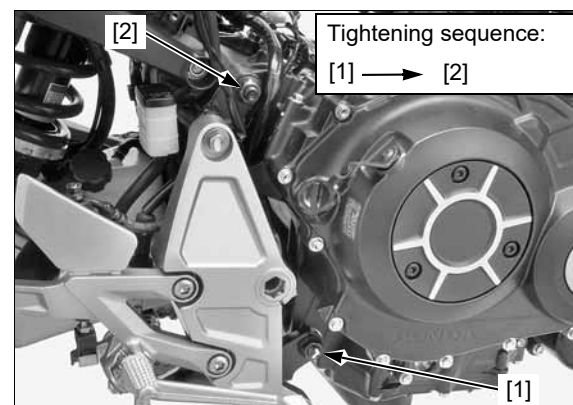
TORQUE:

Rear upper engine hanger nut:

59 N·m (6.0 kgf·m, 44 lbf·ft)

Rear lower engine hanger nut:

59 N·m (6.0 kgf·m, 44 lbf·ft)



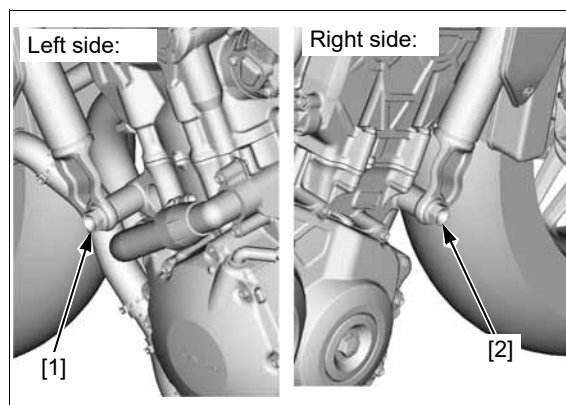
ENGINE REMOVAL/INSTALLATION

Tighten the front engine hanger long bolt [1] and short bolt [2] to the specified torque.

TORQUE:

Front engine hanger bolt:

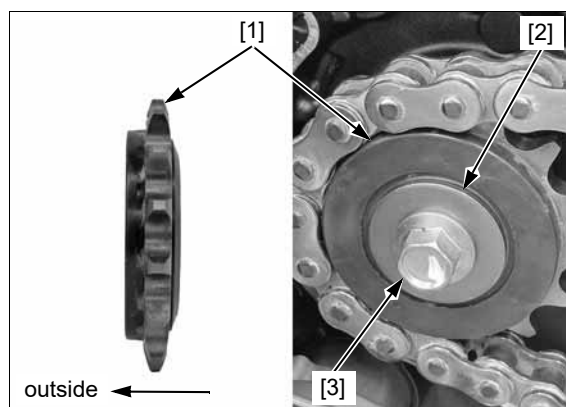
59 N·m (6.0 kgf·m, 44 lbf·ft)



Install the drive sprocket [1] with its flat facing out.

Install the washer [2] and drive sprocket bolt [3], then tighten the bolt to the specified torque.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

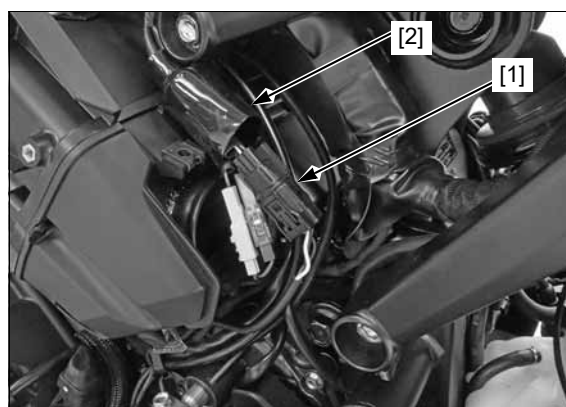


Connect the CKP sensor 3P (Black) connector [1].



II ED, III TH, II KO, II FO, II GS, II RU, III CH, II BR models only:

Connect the shift stroke sensor 3P (Black) connector [1] and slide boot [2] to cover connectors.

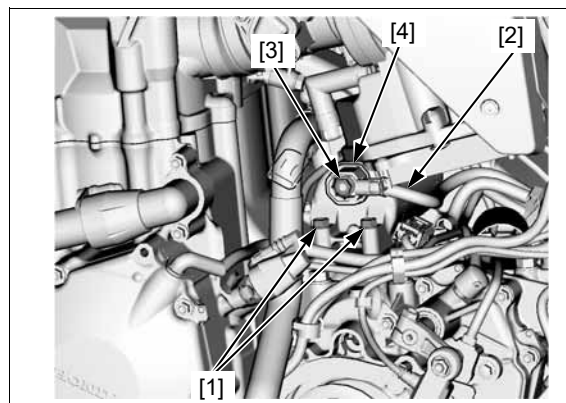


Tighten the starter motor mounting bolts [1].

Connect the starter motor cable [2], then tighten the terminal nut [3] to the specified torque.

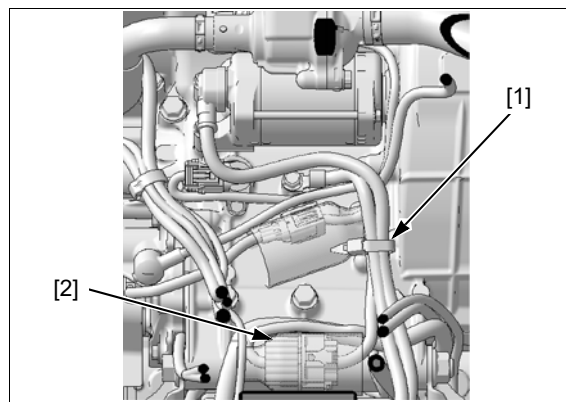
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the boots [4].

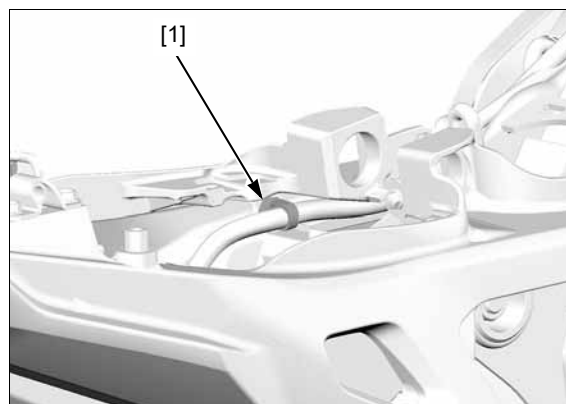


Install the wire band [1].

Connect the engine sub harness 12P (Black) connector [2].



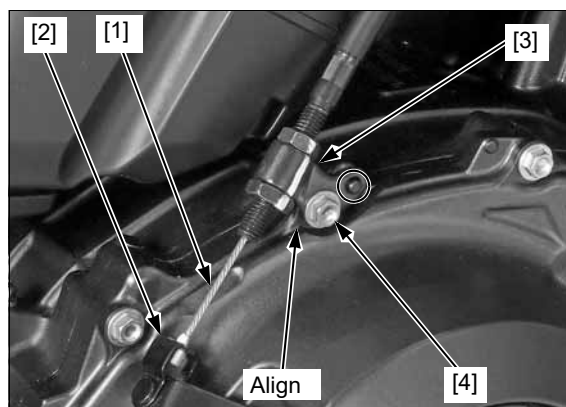
Install the alternator wire clamp [1] to the rear fender B.



ENGINE REMOVAL/INSTALLATION

Connect the clutch cable end [1] to the clutch lifter lever [2].

Install the clutch cable guide plate [3] by aligning its hole with the right crankcase cover boss and tighten the bolt [4] securely.



Install the wire clip [1].

Connect the EOP switch wire [2], then tighten the terminal bolt [3] and install the rubber cap [4].

Install the following:

- Air cleaner housing (page 7-9)
- EVAP canister (page 7-18)
- Exhaust pipe (page 2-16)
- Radiator (page 8-8)
- Left swingarm pivot bracket (page 2-19)

Adjust the drive chain slack (page 3-17).

Fill the crankcase with engine oil (page 3-13).

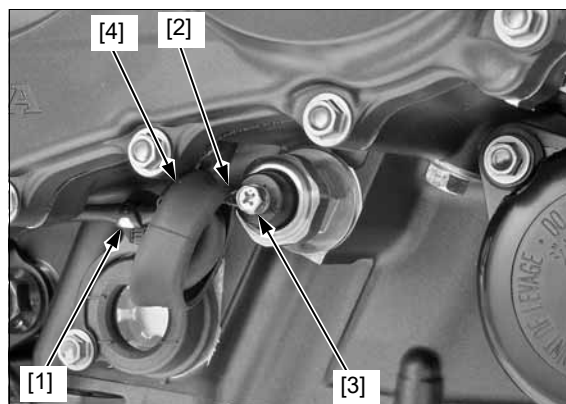
Fill the cooling system and bleed any air (page 8-4).

Check the engine oil level (page 3-12).

Check the clutch lever freeplay (page 3-24).

Check the exhaust system for leaks.

Check for coolant leaks.



16. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION.....	16-2	FRONT WHEEL.....	16-9
TROUBLESHOOTING	16-2	FORK	16-15
COMPONENT LOCATION.....	16-3	STEERING STEM	16-24
HANDLEBAR.....	16-4		

SERVICE INFORMATION

GENERAL

- When servicing the front wheel, fork or steering stem, support the motorcycle using a safety stand or hoist.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- After the front wheel installation, check the brake operation by applying the brake lever.
- For brake system information (page 18-2).
- When using the adjustable pin spanner for the steering stem adjusting nut, use a deflecting beam type torque wrench 500 mm (20.0 in) long.
The adjustable pin spanner increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the steering stem adjusting nut. The specification given is the actual torque applied to the steering stem adjusting nut, not the reading on the torque wrench. Do not overtighten the steering stem adjusting nut. The specification later in the text gives both actual and indicated.

TROUBLESHOOTING

Hard steering

- Steering stem adjusting nut too tight
- Worn or damaged steering head bearings
- Bent steering stem
- Insufficient tire pressure

Steers to one side or does not track straight

- Damaged or loose steering head bearings
- Bent forks
- Bent axle
- Bent frame
- Worn or damaged wheel bearings
- Worn or damaged swingarm pivot bearings

Front wheel wobbling

- Bent rim
- Worn or damaged front wheel bearings
- Faulty tire
- Unbalanced front tire and wheel

Front wheel turns hard

- Faulty front wheel bearings
- Bent front axle
- Front brake drag

Soft suspension

- Insufficient fluid in fork
- Incorrect fork fluid weight
- Weak fork springs
- Insufficient tire pressure

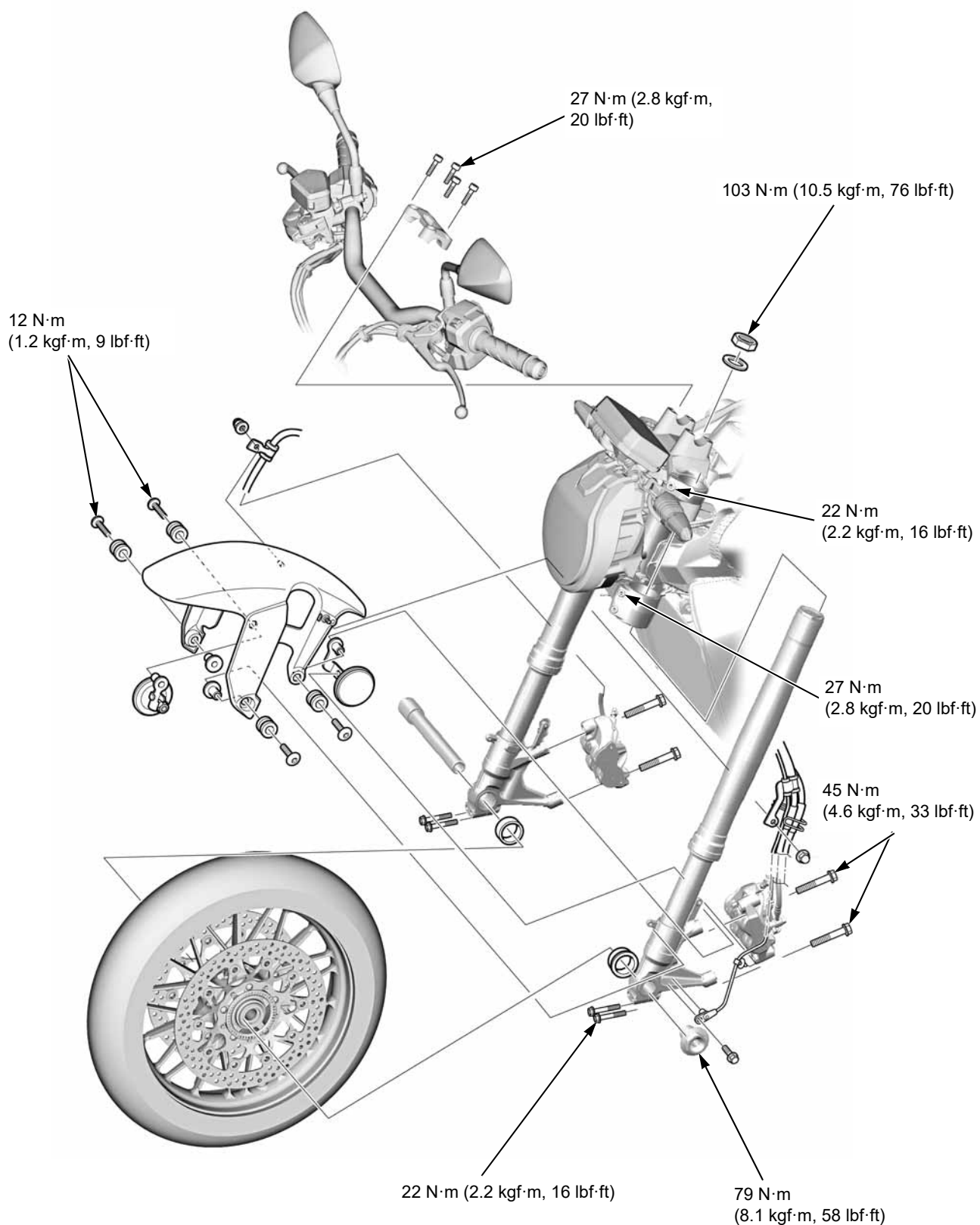
Hard suspension

- Bent fork tubes
- Too much fluid in fork
- Incorrect fork fluid weight
- Clogged fork fluid passage

Front suspension noise

- Insufficient fluid in fork
- Loose fork fasteners

COMPONENT LOCATION



HANDLEBAR

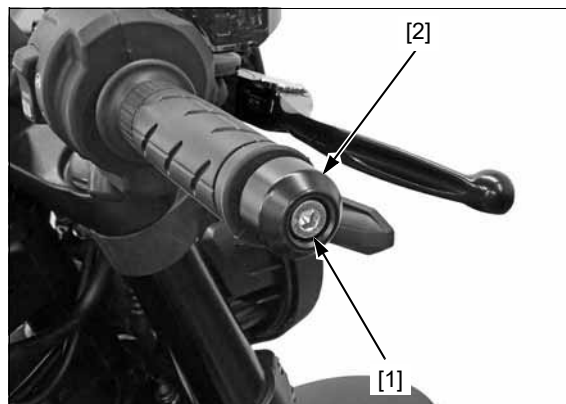
REMOVAL

NOTICE

This vehicle is using an aluminum alloy handlebar. In the event of any crash, always check the handlebar for bends and scratches to prevent further breakage.

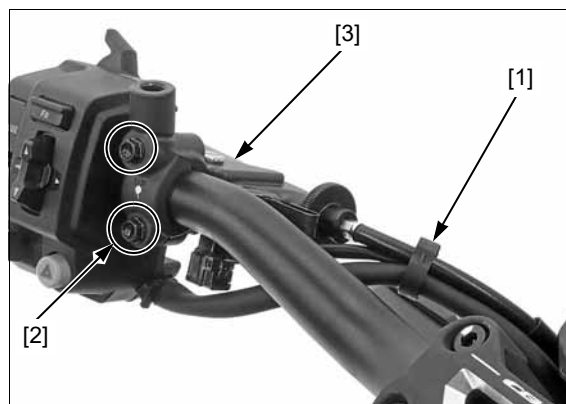
Remove the rearview mirrors (page 2-9).

For inner weight replacement (page 16-9). Hold the handlebar weights and remove the socket bolts [1], then remove both handlebar weights [2] from the handlebar.

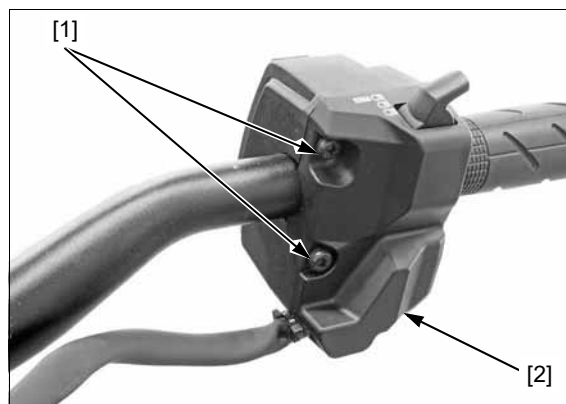


Remove the following:

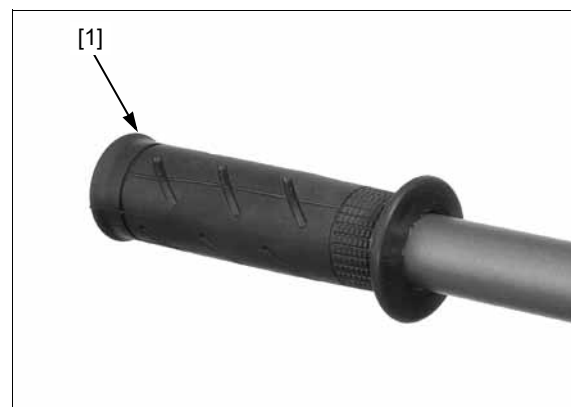
- wire band [1]
- bolts [2]
- clutch lever bracket [3]



Remove the screws [1] and left handlebar switch housing [2].

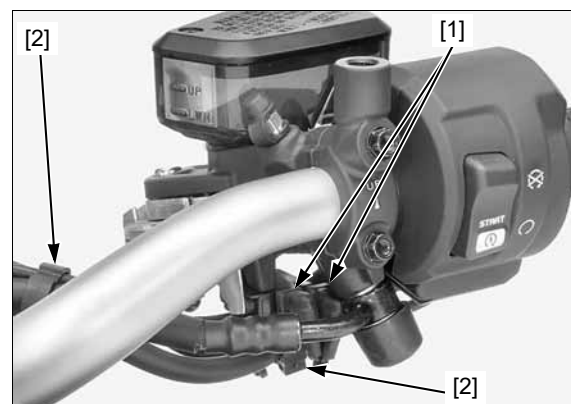


Remove the left handlebar grip [1] from the handlebar.



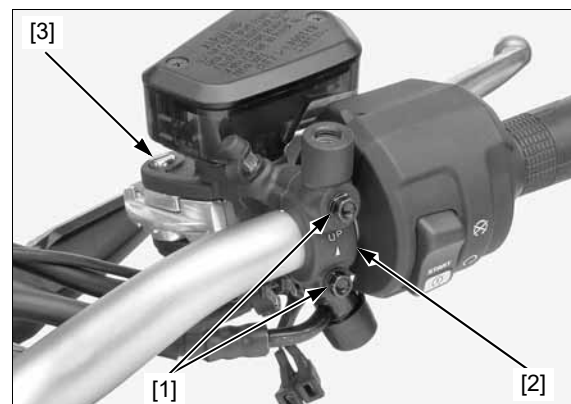
Disconnect the front brake light switch wire connectors [1] from the front brake light switch.

Remove the wire bands [2].

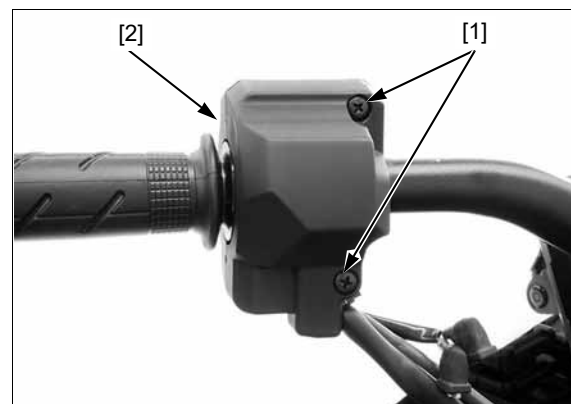


Keep the brake master cylinder upright to prevent air from entering the hydraulic system

Remove the front brake master cylinder holder bolts [1], holder [2] and the front brake master cylinder assembly [3].

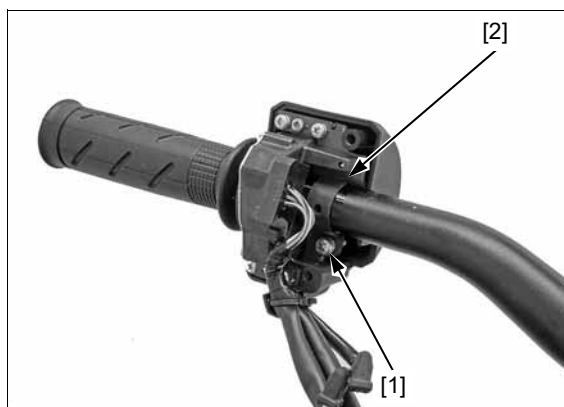


Remove the screws [1] and right handlebar switch cover [2].



FRONT WHEEL/SUSPENSION/STEERING

Remove the screw [1] and unhook the tab of the stay [2] from the hole of the right handlebar.



Remove the handlebar bolts [1] and handlebar holder [2].

Remove the grip APS and throttle grip from the handlebar.

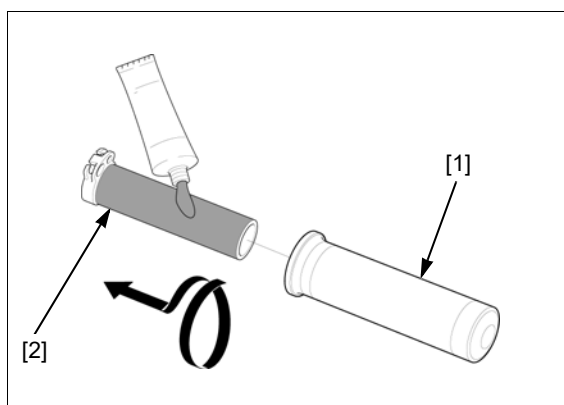


INSTALLATION

Apply Honda Bond A or equivalent to the inside surface of the right handlebar grip [1] and to the clean surfaces of the throttle pipe [2].

Allow the adhesive to dry for 1 hour before using.

Wait 3–5 minutes and install the grip. Rotate the grip for even application of the adhesive.



Install the grip APS and throttle grip to the handlebar.

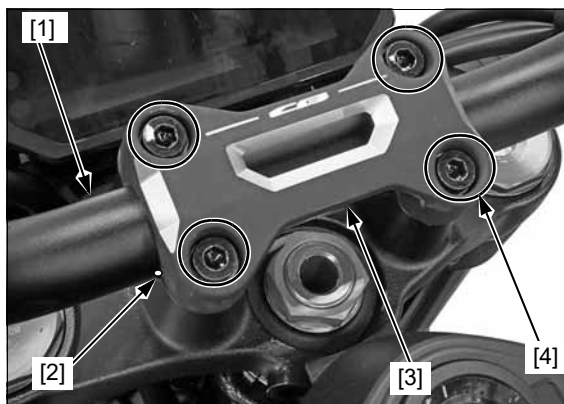
Place the handlebar [1] on the lower holders aligning the paint mark [2] on the handlebar with the edge of the lower holder.

Install the handlebar holder [3] with its direction as shown.

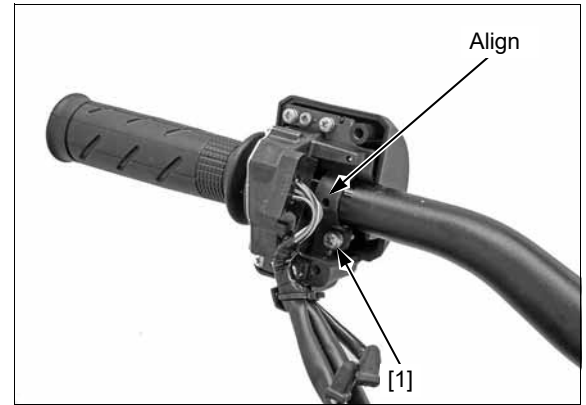
Install the handlebar holder bolts [4].

Tighten the front bolts first, then tighten the rear bolts to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



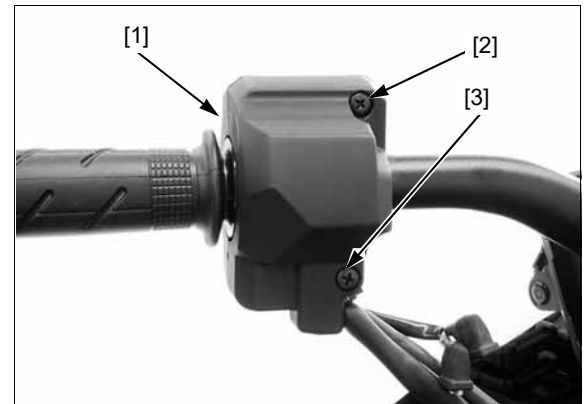
Align the holder boss of the handlebar switch/APS with the hole in the handlebar, and tighten the holder screw [1] securely.



Install the housing cover [1] onto the right handlebar switch.

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)

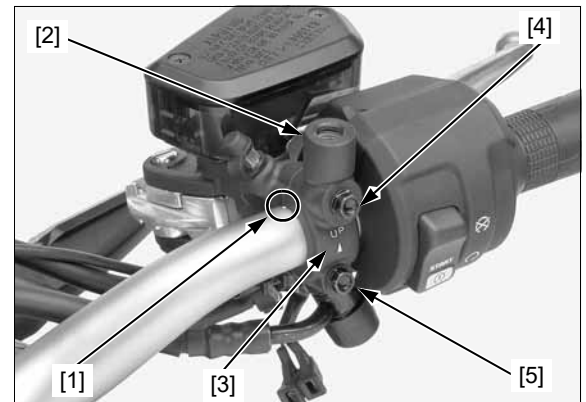


Install the front brake master cylinder by aligning the edge of the front brake master cylinder with the paint mark [1] on the handlebar.

Install the front brake master cylinder holder [2] with the "UP" mark [3] facing up.

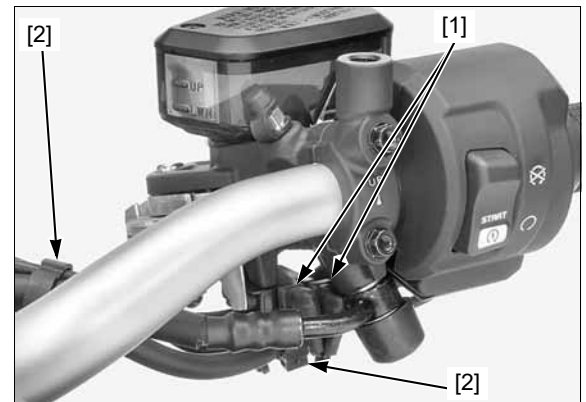
Tighten the upper bolt first [4], then the lower bolt [5] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



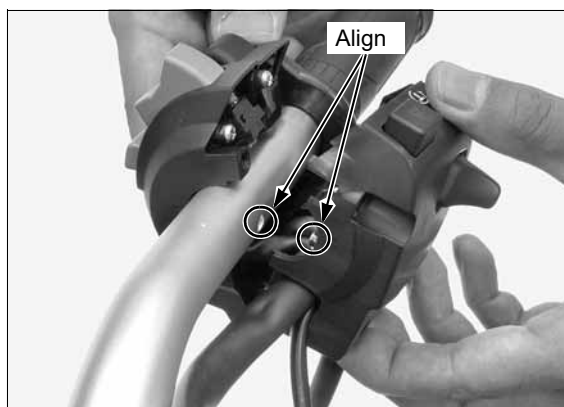
Connect the front brake light switch wire connectors [1] to the front brake light switch.

Install the wire bands [2].



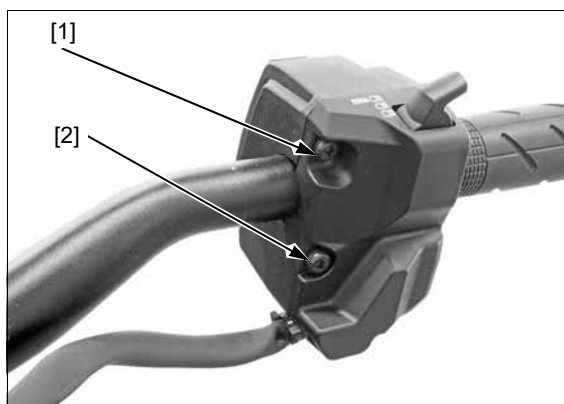
FRONT WHEEL/SUSPENSION/STEERING

Install the left handlebar switch housing aligning its location pin with the hole in the handlebar.



Tighten the upper screw [1] first, then tighten the lower screw [2] to the specified torque.

TORQUE: 2.7 N·m (0.3 kgf·m, 2.0 lbf·ft)

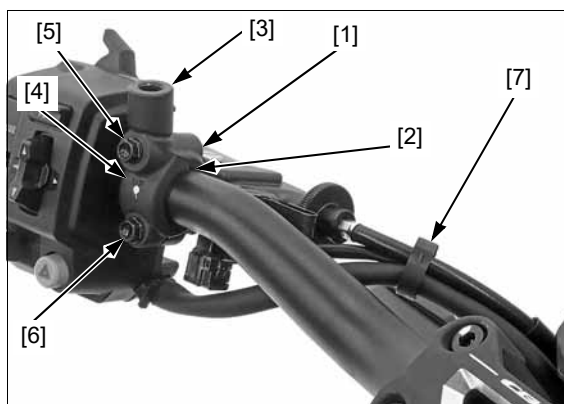


Install the clutch lever bracket [1] by aligning the edge of the clutch lever bracket with the paint mark [2] on the handlebar.

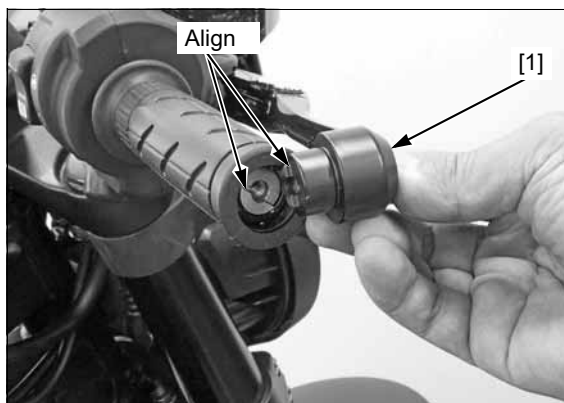
Install the clutch lever holder [3] with the "UP" mark [4] facing up.

Tighten the upper bolt first [5], then the lower bolt [6].

Install the wire band [7].



Install both handlebar weights onto the inner weights [1], aligning each cut-out of the weights.

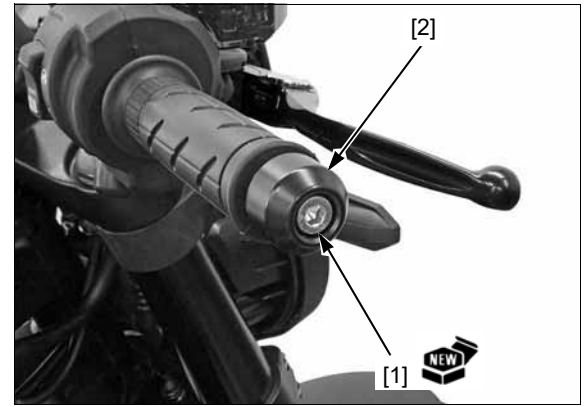


Tighten both new bolts [1] while holding the weights [2] securely.

Install the rearview mirrors (page 2-9).

Check the following:

- Throttle operation and grip freeplay (page 3-4)
- Clutch operation (page 3-24)
- Brake operation (page 3-22)



HANDLEBAR INNER WEIGHT REPLACEMENT

Remove the left handlebar grip and throttle pipe.

Straighten the retainer tab with a screwdriver or punch.

Apply lubricant spray through the tab locking hole for easy removal.

Temporarily install the handlebar weight and bolt, then remove the inner weight by turning the handlebar weight.

Remove the handlebar weight, retainer and rubber cushions from the inner weight.

Discard the retainer.

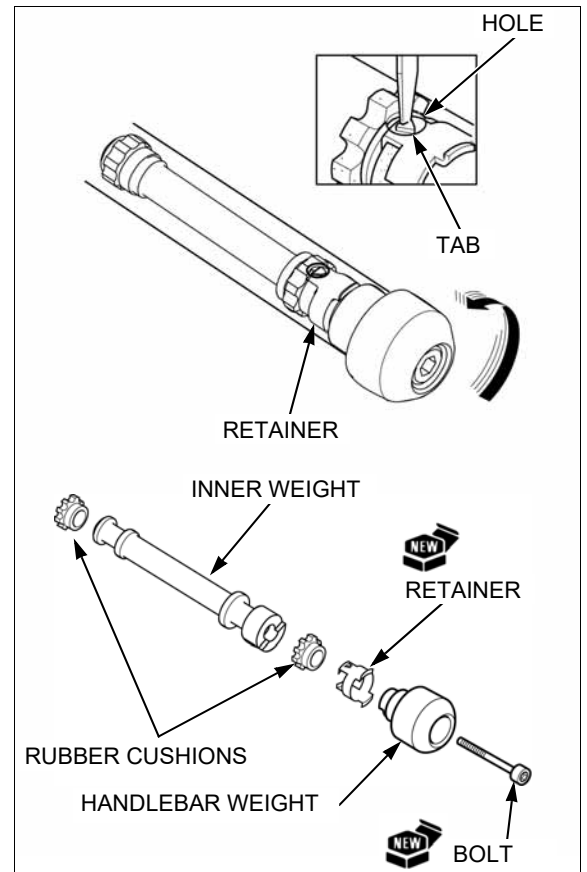
Install the rubber cushions onto the inner weight.

Install the new retainer onto the inner weight, aligning the flats each other. Tighten new bolt while holding the weight securely.

Insert the weight assembly into the handlebar.

Turn the handlebar weight and hook the retainer tab with the hole in the handlebar.

Install the left handlebar grip and throttle grip.



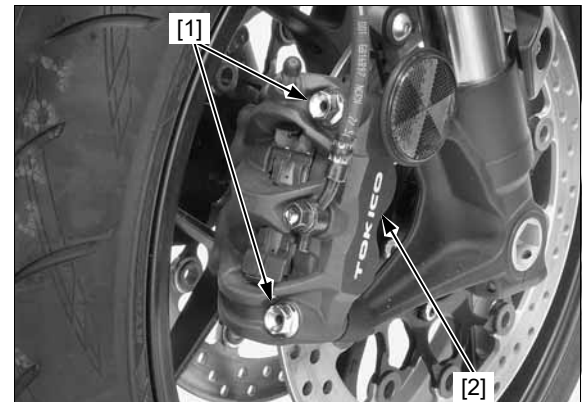
FRONT WHEEL

REMOVAL

Remove the 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.

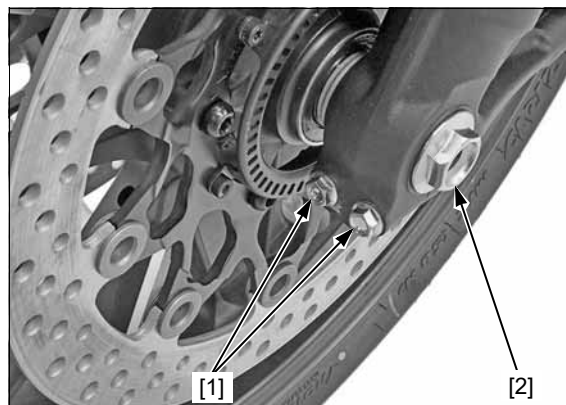


FRONT WHEEL/SUSPENSION/STEERING

Loosen the left axle holder bolts [1].

Remove the axle bolt [2].

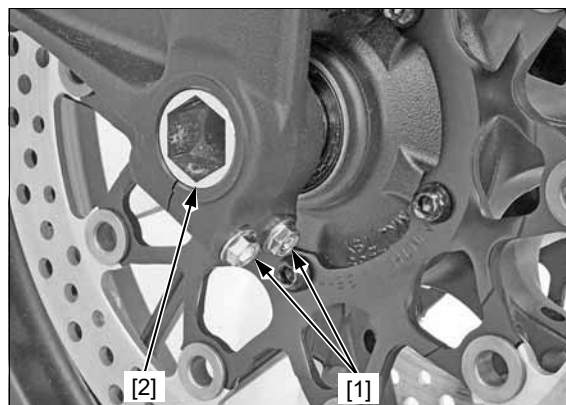
Support the motorcycle securely and raise the front wheel off the ground using a safety stand or a hoist.



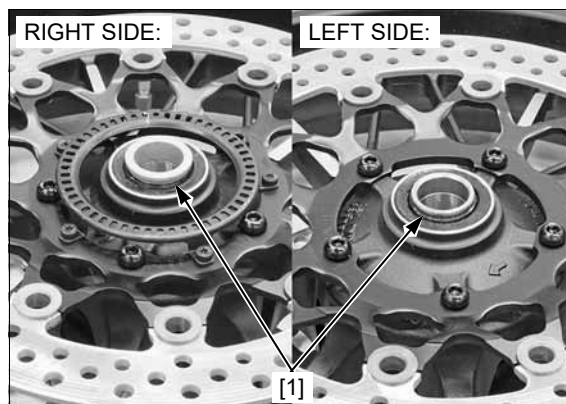
Loosen the right axle holder bolts [1].

Be careful not to damage the pulser ring.

Remove the axle [2] and front wheel.



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 outer race fits tightly in the wheel hub.

Inspect the following parts for damage, abnormal wear, deformation, or bend.

- Front axle
- Front wheel

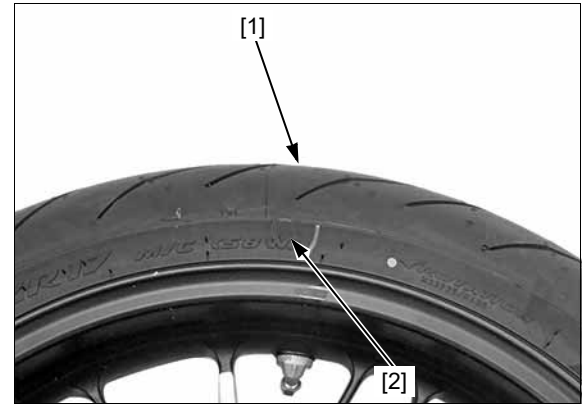
Measure each part according to FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS (page 1-10).

Replace any part if it is out of service limit.

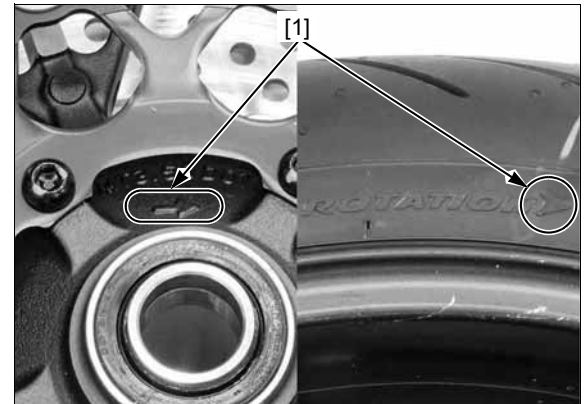
WHEEL BALANCE

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.

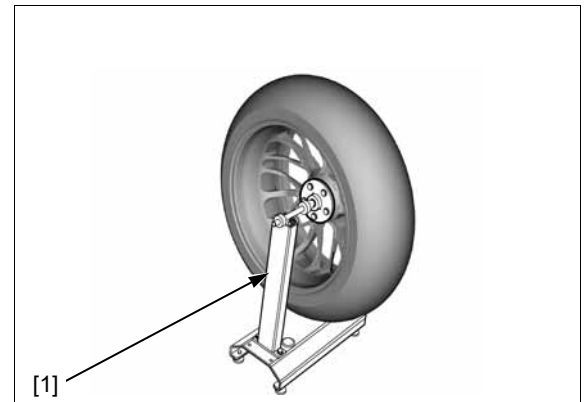


Mount the wheel, tire and brake discs assembly in an inspection stand [1].

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.



FRONT WHEEL/SUSPENSION/STEERING

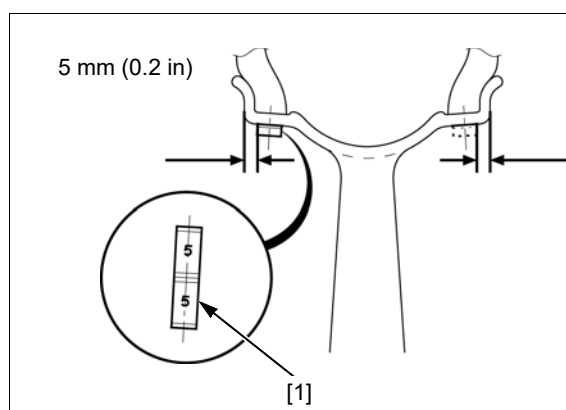
To balance the wheel, install the balance weights [1] on the highest side of the rim, on the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun.

Do not add more than 60 g to the wheel.

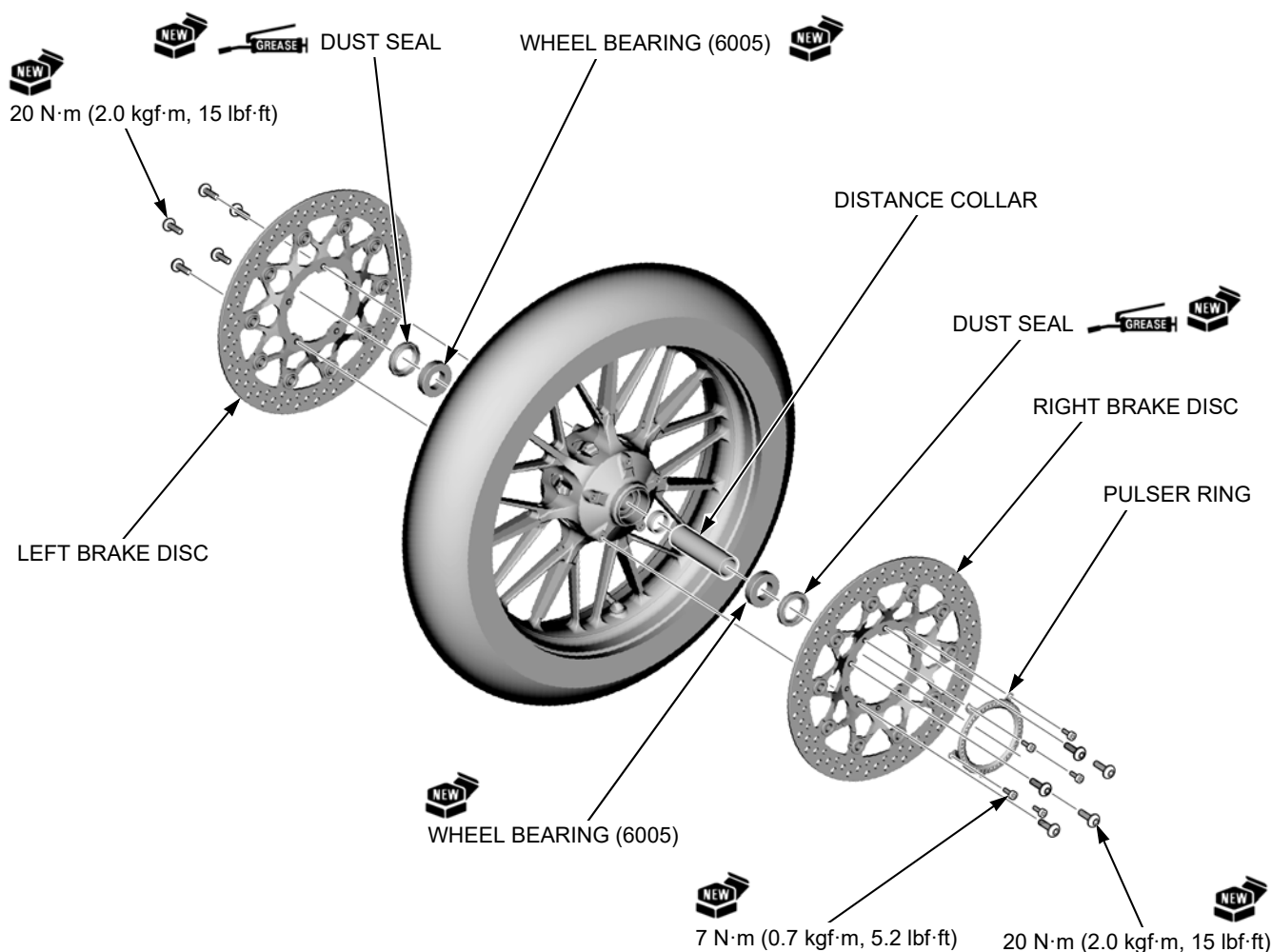
Press the weights by your hands firmly and make sure they are not come off the rim.

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.



DISASSEMBLY/ASSEMBLY



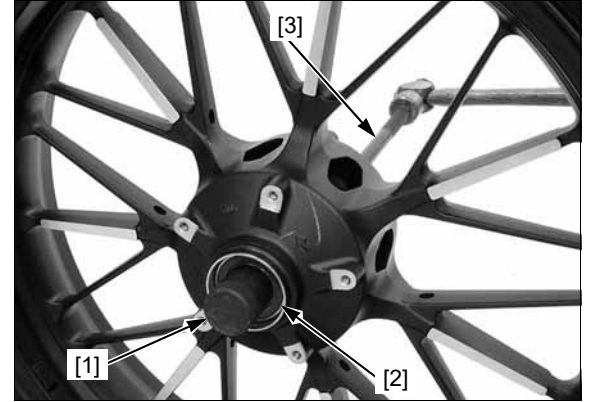
WHEEL BEARING REPLACEMENT

Install the bearing remover head [1] into the bearing [2]. From the opposite side, install the bearing remover shaft [3] and drive the bearing out of the wheel hub.

TOOLS:

Bearing remover head, 25 mm 07746-0050800
Bearing remover shaft 07GGD-0010100

Remove the distance collar and drive out the other bearing.



Never install the old bearings. Once the bearings have been removed, the bearings must be replaced with new ones.

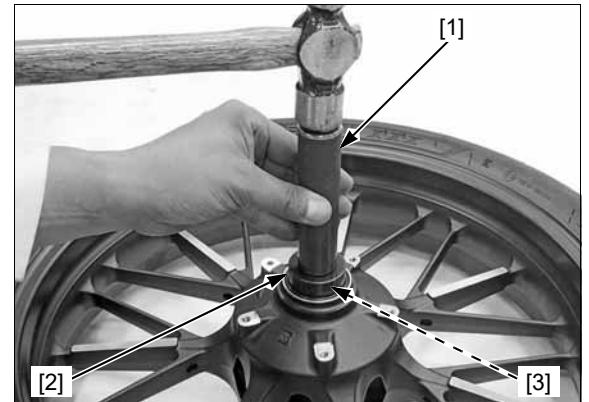
Drive in a new left bearing squarely with its marked side facing up until it is fully seated using the special tools.

Install the distance collar.

Drive in a new right bearing squarely with its marked side facing up until it is seated to the distance collar using the special tools.

TOOLS:

Driver [1] 07749-0010000
Attachment, 42 x 47 mm [2] 07746-0010300
Pilot, 25 mm [3] 07746-0040600



TIRE VALVE REMOVAL/ INSTALLATION

Remove the tire.

Remove the nut [1], tire valve [2] and O-ring [3].

Clean the valve installation area of the rim with a degreasing agent.

If a puncture repair product was used, thoroughly clean the inside of the wheel rim.

Do not apply grease to the O-ring.

Install a new O-ring onto the tire valve.

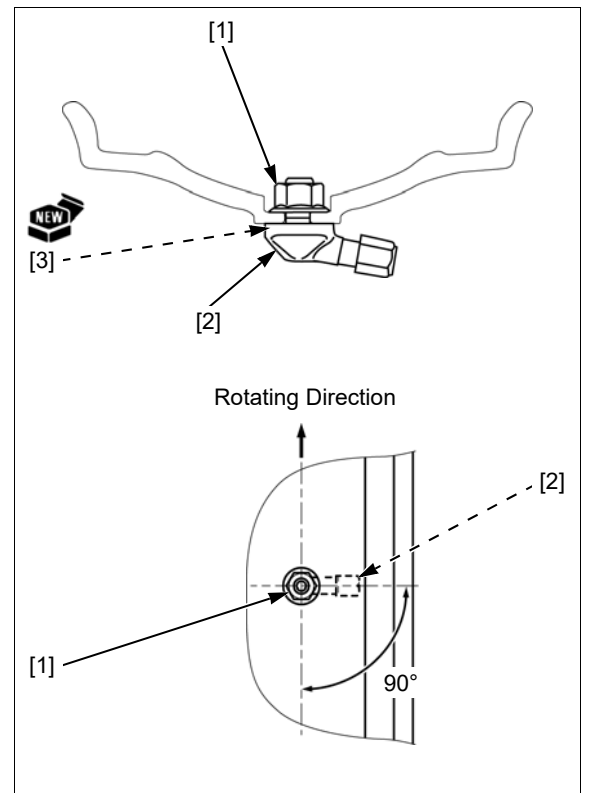
Gradually screw in the tire valve and position it with the valve neck facing the right side of the motorcycle and parallel with the axle.

Make sure that 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, make sure that the tire valve neck is facing to the right side and parallel to the axle direction.

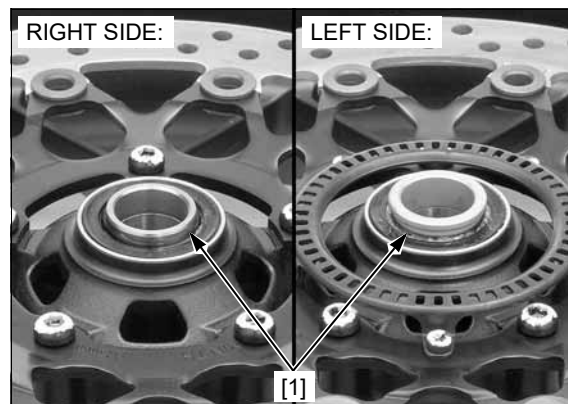
Install the tire.



FRONT WHEEL/SUSPENSION/STEERING

INSTALLATION

Install the right and left side collars [1].



Be careful not to damage the pulser ring.

Install the front wheel between the fork legs.

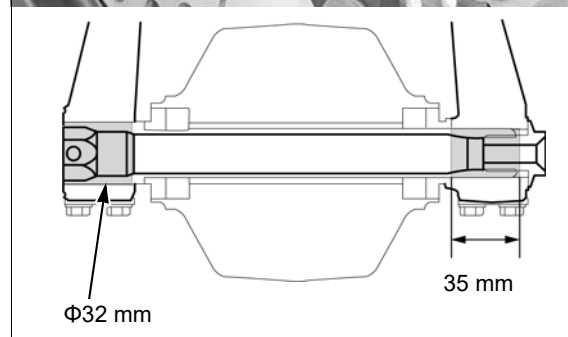
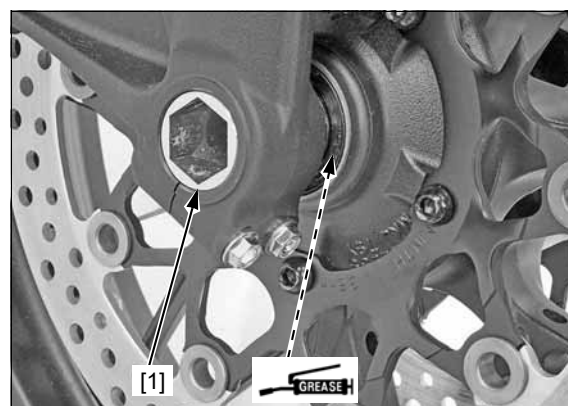
Apply a thin layer of grease to the front axle surface.

Install the front axle [1] from the right side.

NOTE:

Do not apply grease to the following fork tightening parts.

- $\Phi 32$ mm
- 35 mm from the tip



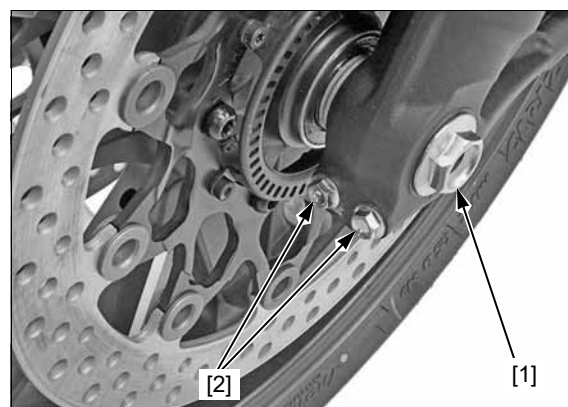
Install the axle bolt [1].

Hold the axle and tighten the axle bolt to the specified torque.

TORQUE: 79 N·m (8.1 kgf·m, 58 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.

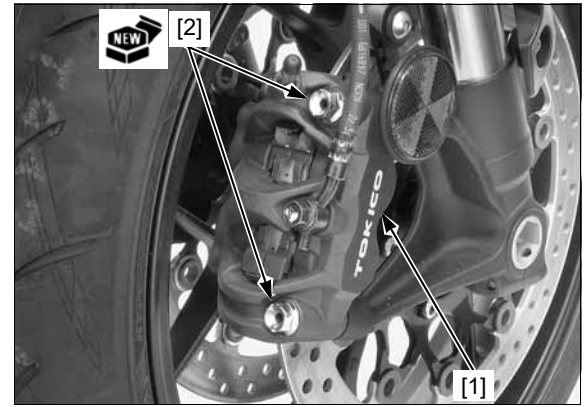
Install new mounting bolts [2] and tighten them to the specified torque.

TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)

Install the other brake caliper.

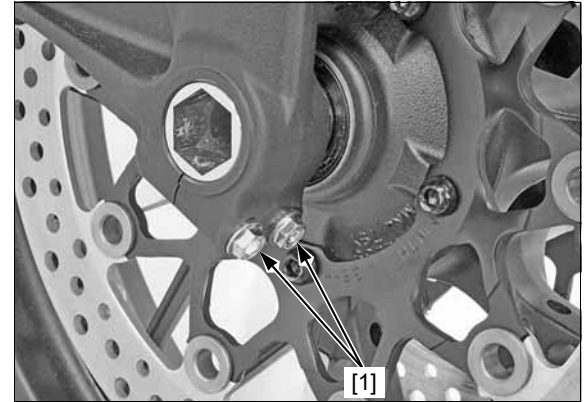
Check the brake operation by applying the brake lever.

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

Remove the following:

- Front wheel (page 16-9)
- Front fender (page 2-14)

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 16-4)
- Loosen the pinch bolt of the top bridge (page 16-15)

While holding the fork leg, loosen the bottom bridge pinch bolts [1]. Lift up the fork leg and tighten the pinch bolts.

Take care not to scratch the cap head.

Loosen the fork cap, but do not remove it yet.

TOOL:

Fork cap wrench [2]

070MA-MGP0100

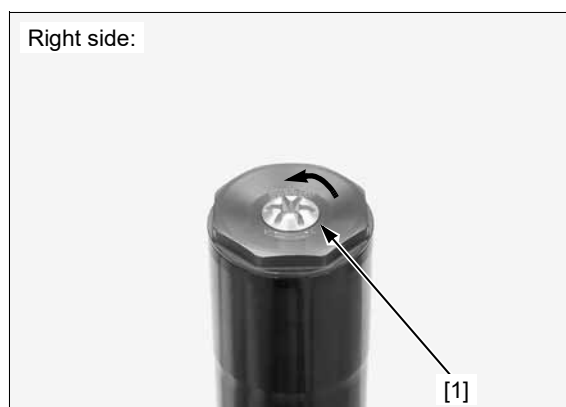


Keep the master cylinder reserve tank upright to prevent air from entering the hydraulic system.

DISASSEMBLY

Right side: Turn the spring pre-load adjuster [1] counterclockwise to the softest position (be sure to record the number of turns from the starting position).

Right side:



Take care not to scratch the cap head.

Remove the fork cap [1] from the outer tube.

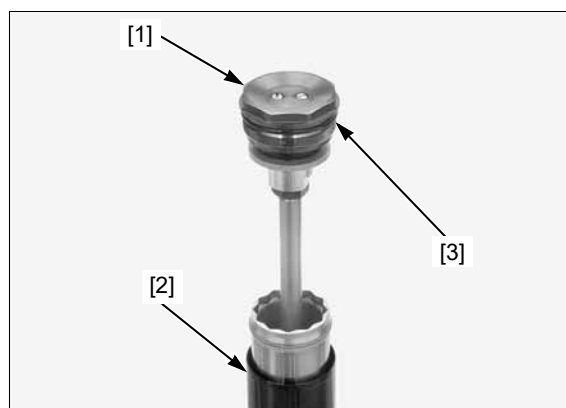
TOOL:

Fork cap wrench

070MA-MGP0100

Lower the outer tube [2] slowly and rest it onto the axle holder.

Remove the O-ring [3] from the fork cap.



Hold the axle holder on the slide pipe in a vise with soft jaws or shop towels.

Loosen the rod guide case [1] using the special tool.

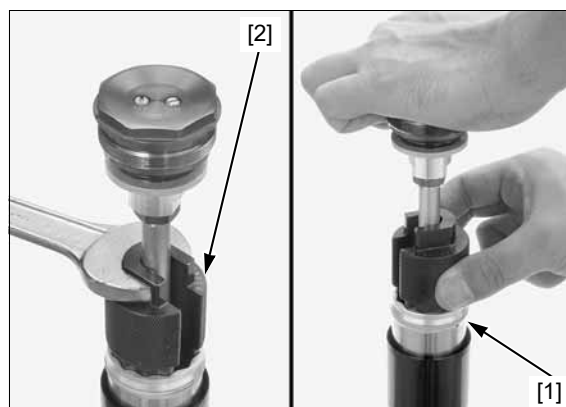
TOOL:

Rod guide case wrench [2]

070MB-MGP0100

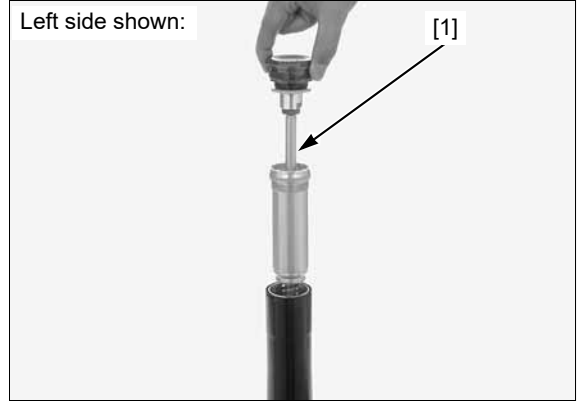
Rod guide case is under spring pressure; use care when loosening it.

Remove the rod guide case from the slide pipe by turning the tool by hand.

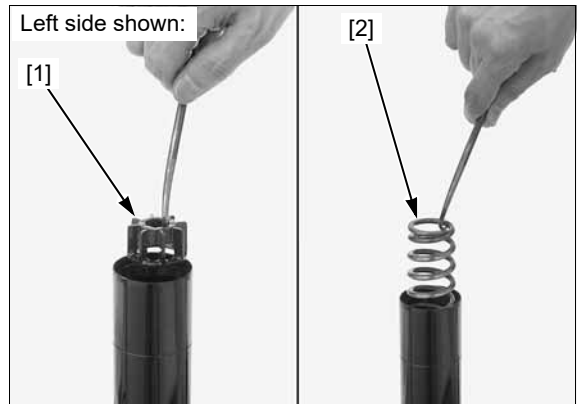


Remove the following:

- Piston rod assembly [1]



- Spring collar B [1]
- Fork spring [2]

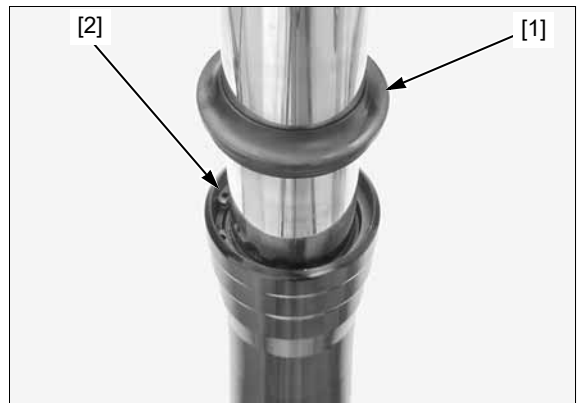


- Pour out the fork fluid by pumping the slide pipe up and down several times.



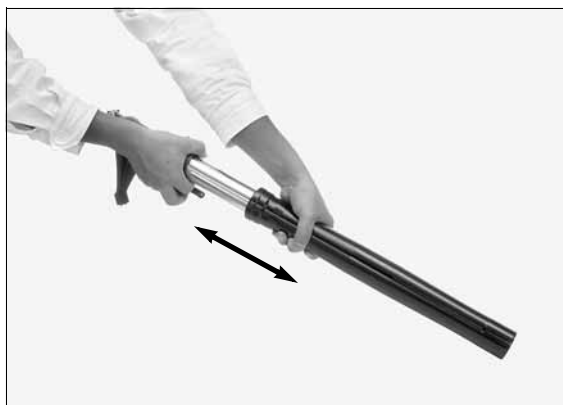
Be careful not to scratch the slide pipe.

- Dust seal [1]
- Snap ring [2]



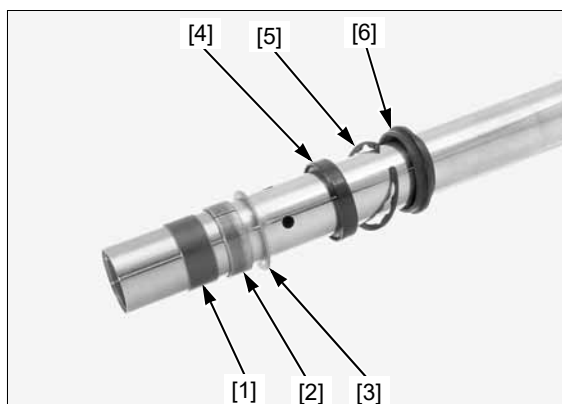
FRONT WHEEL/SUSPENSION/STEERING

Using quick successive motions, pull the slide pipe out of the outer tube.



Remove the following from the slide pipe:

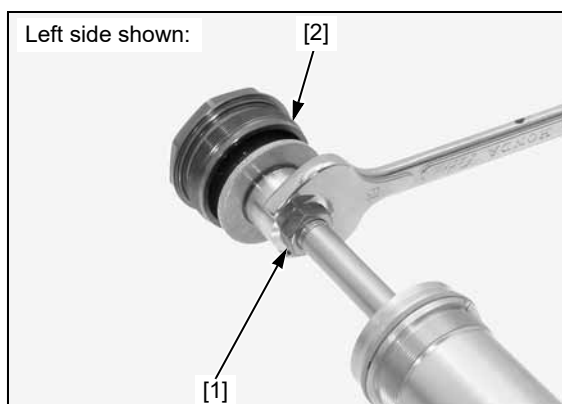
- Slider bushing [1]
- Guide bushing [2]
- Back-up ring [3]
- Oil seal [4]
- Snap ring [5]
- Dust seal [6]



Take care not to scratch the cap head.

Loosen the lock nut [1] while holding the fork cap [2] with a wrench, then remove the fork cap.

Left side shown:



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, looseness or bend.

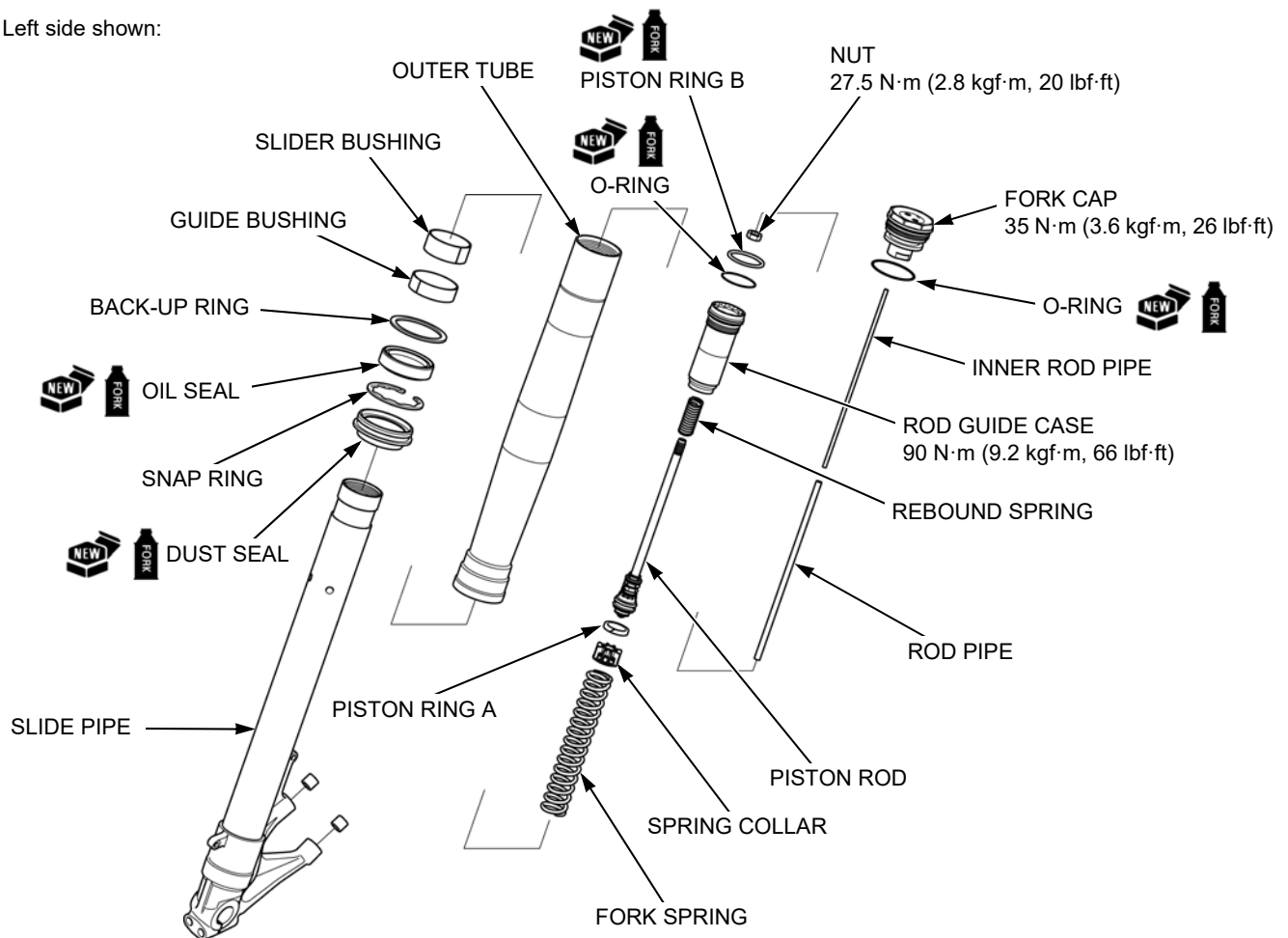
- Fork cap
- Rod pipes
- Rod guide case
- Piston rod
- Rebound spring/fork spring
- Spring collars
- Outer tube
- Slider bushing
- Guide bushing
- Back-up ring
- Snap rings
- Slide pipe

Measure each part according to FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS (page 1-10).

Replace any part if it is out of service limit.

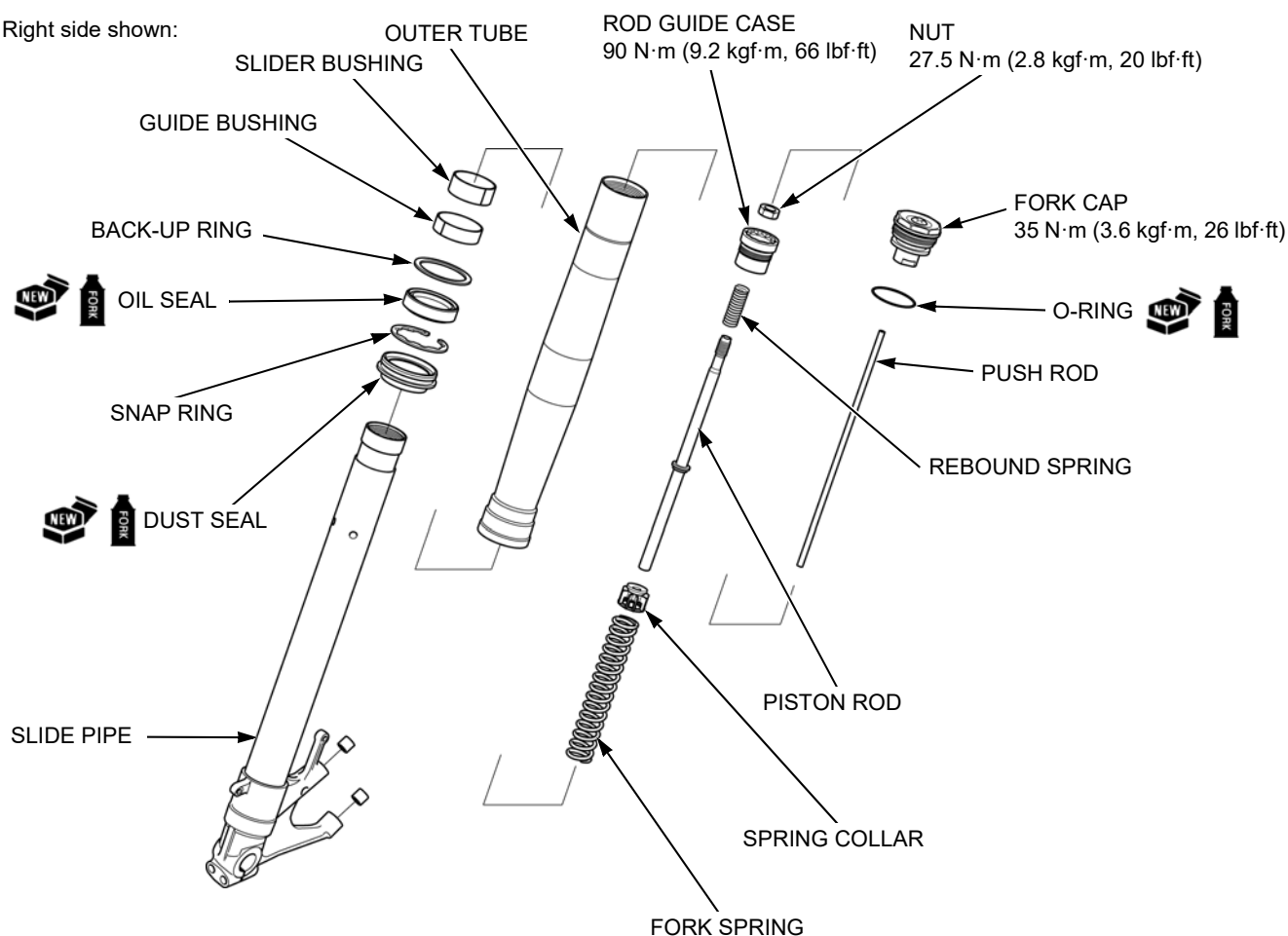
ASSEMBLY

Left side shown:



FRONT WHEEL/SUSPENSION/STEERING

Right side shown:



Assemble the piston rod and rod guide case.

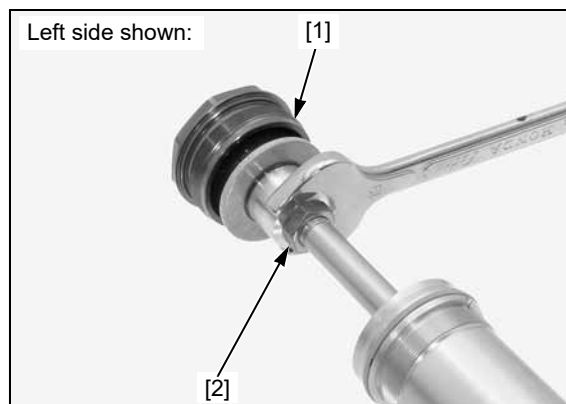
Install the fork cap [1] onto the piston rod and screw it until the cap just touches the rod end.

Take care not to scratch the cap head.

Hold the fork cap with a wrench, then tighten the lock nut [2] to the specified torque.

TORQUE: 27.5 N·m (2.8 kgf·m, 20 lbf·ft)

Left side shown:



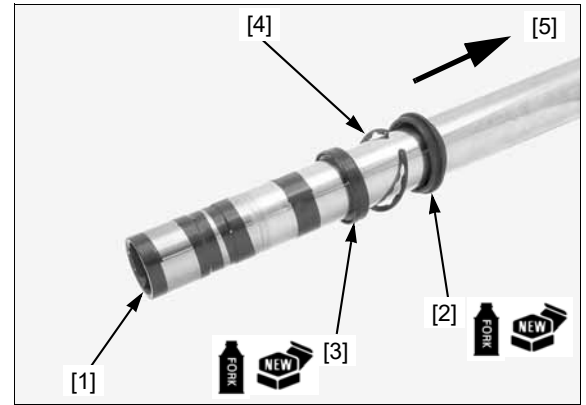
Wrap the stepped part of the fork pipe with a tape [1].

Apply fork fluid to the lips of a new dust seal [2] and a oil seal [3].

Install the following onto the slide pipe:

- Dust seal
- Snap ring [4]
- Oil seal (with the marked side facing the axle holder side [5])

Remove the tape from the fork pipe.

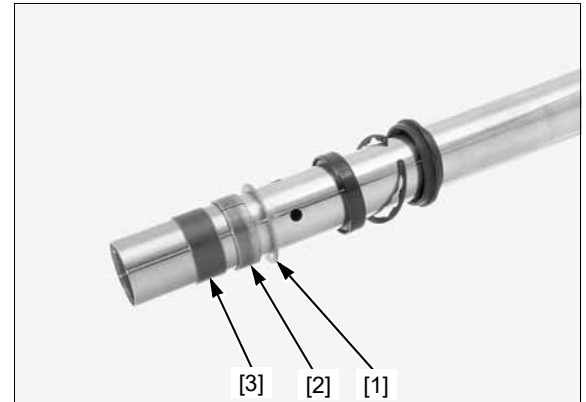


Remove the burrs from the slider bushing mating surface, being careful not to peel off the coating.

Install the following onto the slide pipe:

- Back-up ring [1] (with the groove facing the outer tube)
- Guide bushing [2]
- Slider bushing [3]

Install the slide pipe into the outer tube.



Be careful not to damage the coating on the bushing. Do not spread open the bushing more than necessary.

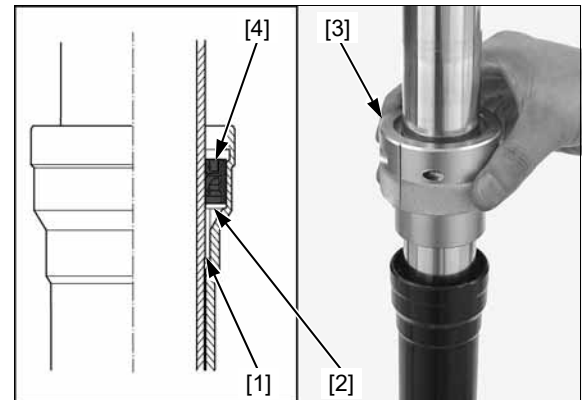
Rest the guide bushing [1] and back-up ring [2] on the outer tube, and drive the guide bushing into place, using the special tool.

TOOL:

Fork seal driver [3]

07YMD-MCF0100

Drive the oil seal [4] until the snap ring groove is visible, using the same tool.



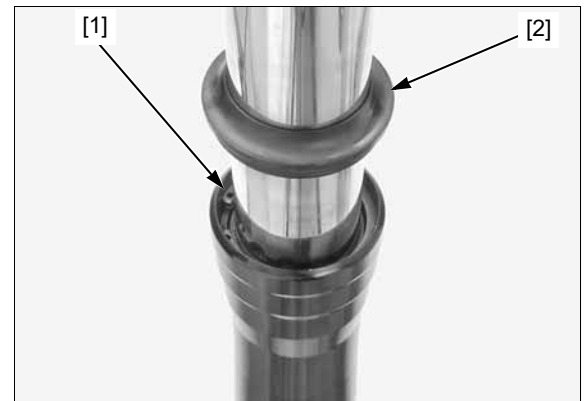
Do not scratch the fork tube sliding surface.

Install the snap ring [1] into the groove in the outer tube.

NOTE:

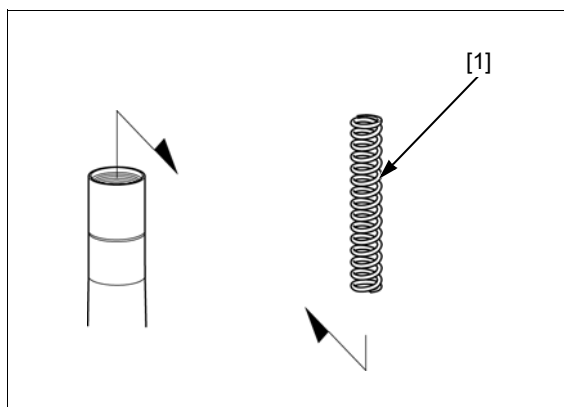
- Make sure the snap ring is securely set in the groove.

Install the dust seal [2] into the outer tube.



FRONT WHEEL/SUSPENSION/STEERING

Lower the outer tube and rest it onto the axle holder.
Insert the Fork spring [1] into the slide pipe.



After installing the piston rod assembly, pour the total amount of fluid as described in the later step.

Pour the recommended fork fluid up to the side holes in the slide pipe with the fork leg compressed.

RECOMMENDED FORK FLUID:

Fork fluid (viscosity: 10 w)

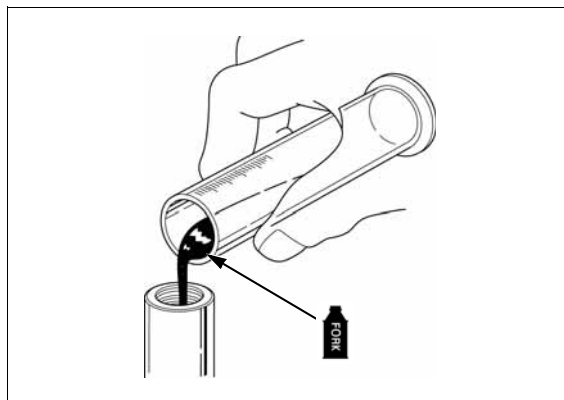
FORK FLUID CAPACITY:

Right side:

$622 \pm 2.5 \text{ cm}^3$ (21.0 $\pm$ 0.08 US oz, 21.9 $\pm$ 0.09 Imp oz)

Left side:

$589 \pm 2.5 \text{ cm}^3$ (19.9 $\pm$ 0.08 US oz, 20.7 $\pm$ 0.09 Imp oz)



Slowly pump the outer tube 8 – 10 times to remove any trapped air completely.

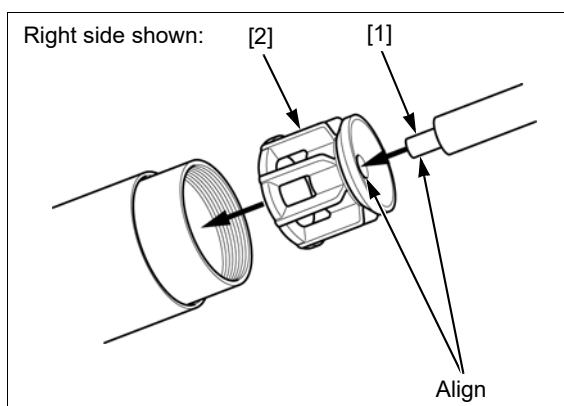


Right side: Align the push rod [1] with the groove of the Spring collar [2] and insert it into the slide pipe.

Left side: Insert the Spring collar (with the flange side facing down) into the slide pipe.

NOTE:

Note the installation direction of the collar.



Insert the piston rod assembly [1] into the slide pipe while extending the outer tube [2] with the fork cap [3] held down.

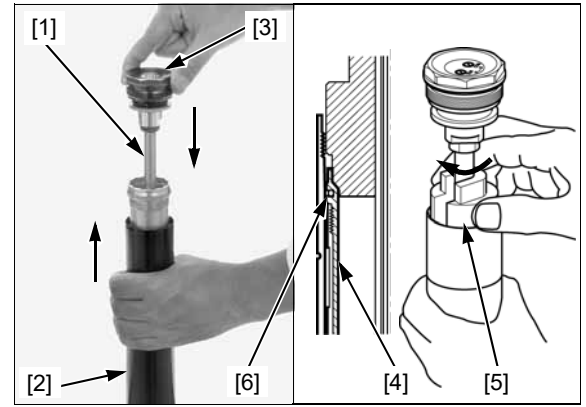
Using the special tool, screw the rod guide case [4] by hand to install it into the slide pipe with the outer tube lifted up.

TOOL:

Rod guide case wrench [5] 070MB-MGP0100

NOTE:

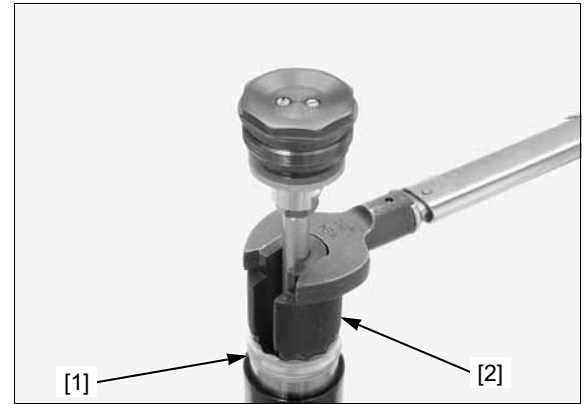
Left side only: Be careful not to damage piston ring B [6] on the rod guide case on the edge or threads.



Hold the axle holder on the slide pipe in a vise with soft jaws or shop towels.

Tighten the rod guide case [1] to the specified torque, using the same tool [2].

TORQUE: 90 N·m (9.2 kgf·m, 66 lbf·ft)



Fill the rod guide case with the remaining fork fluid.

RECOMMENDED FORK FLUID:

Fork fluid (viscosity: 10 w)

Hold the fork cap [1] down, then pump the outer tube [2] several times to remove any trapped air completely.

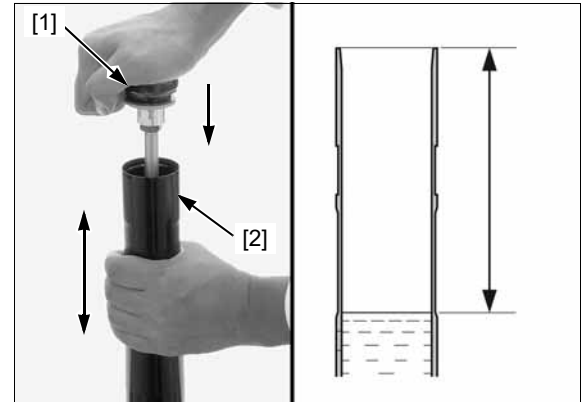
Compress the outer tube fully and measure the fluid level from the top of the slide pipe by supporting the fork leg vertically.

FORK FLUID LEVEL:

Right side: 80 mm (3.1 in)

Left side: 85 mm (3.3 in)

Adjust the fluid level as required.



Do not clamp the tube too tight or it could get damaged.

Place the outer tube in a vise with soft jaws or shop towels.

Coat a new O-ring [1] with fork fluid and install it into the fork cap groove.

Take care not to scratch the cap head.

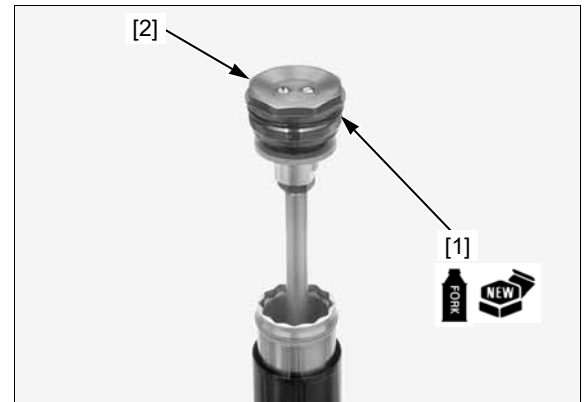
Install the fork cap [2] into the outer tube and tighten it.

TOOL:

Fork cap wrench

070MA-MGP0100

TORQUE: 35 N·m (3.6 kgf·m, 26 lbf·ft)



FRONT WHEEL/SUSPENSION/STEERING

INSTALLATION

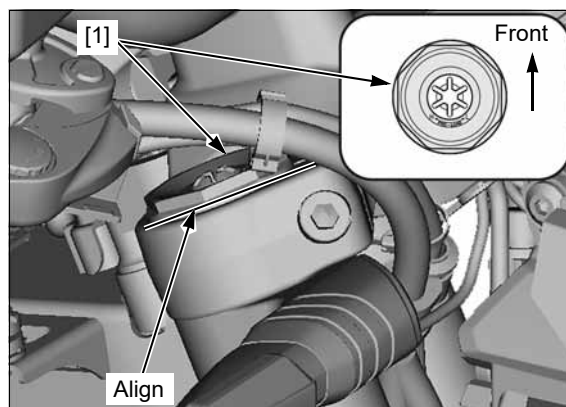
Route the wires, cables and hose properly (page 1-24).

Install the fork leg into the bottom bridge and top bridge.

Align the top of the outer tube with the upper surface of the top bridge and parallel the adjusters on the fork cap [1] to the top bridge (rider can be read characters) as shown, then tighten the bottom bridge pinch bolt to determine the fork position.

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)

Install the following:

- Front fender (page 2-14)
- Front wheel (page 16-14)
- Handlebar (page 16-4)



STEERING STEM

REMOVAL

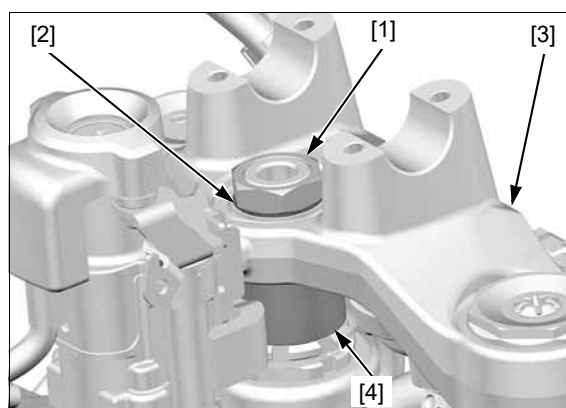
Remove the following:

- Handlebar (page 16-4)
- Combination meter (page 21-8)
- Ignition switch cover (page 21-17)

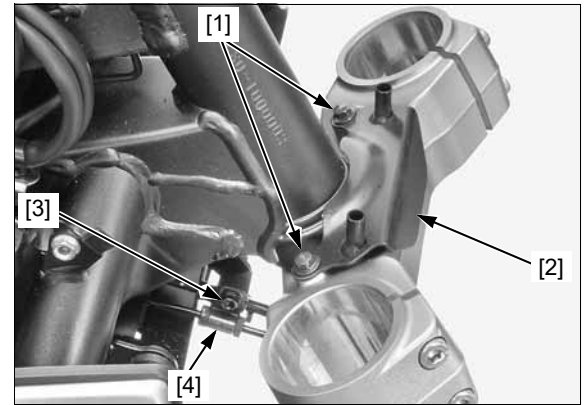
Remove the steering stem nut [1] and washer [2].

Remove the forks (page 16-15).

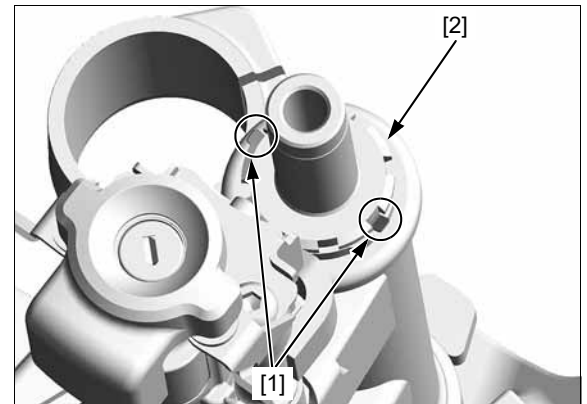
Remove the top bridge [3] and collar [4].



Remove the bolts [1] and headlight lower stay [2].
Remove the bolt [3] and the mount stay [4].

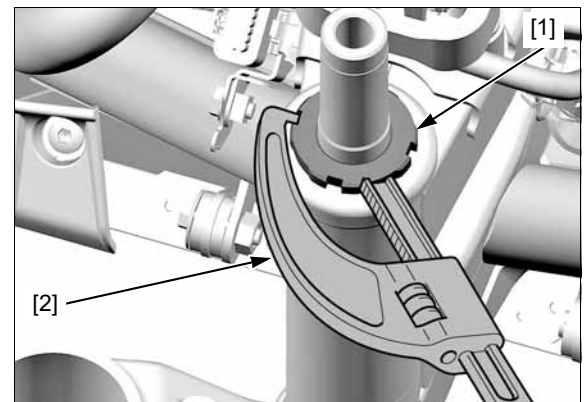


Straighten the lock washer tabs [1].
Remove the lock nut [2] and lock washer.



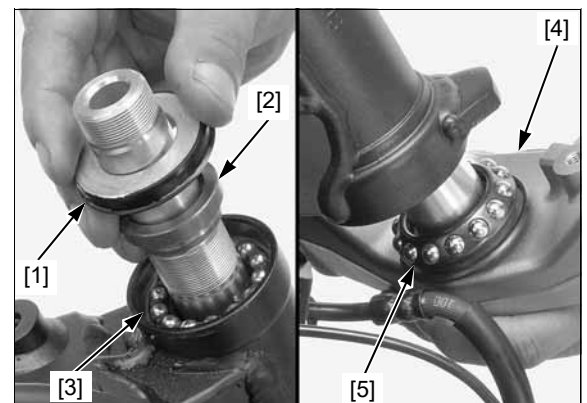
Remove the steering stem adjusting nut [1] using the special tool.

TOOL:
Adjustable pin spanner [2] 07702-0020001



Remove the following:

- Dust seal [1]
- Upper bearing inner race [2]
- Upper bearing [3]
- Steering stem [4]
- Lower bearing [5]



FRONT WHEEL/SUSPENSION/STEERING

BEARING REPLACEMENT

Replace the bearing outer and inner races as a set.

Remove the upper outer race using a special tool.

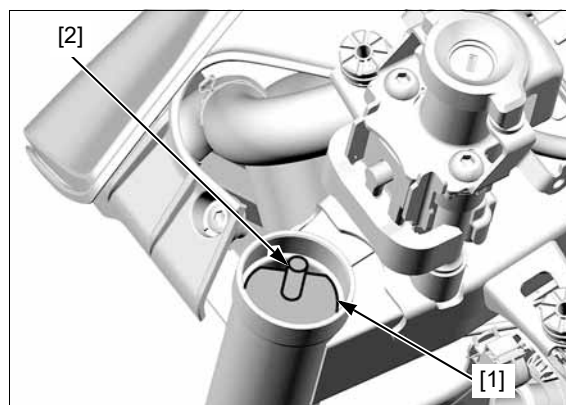
TOOLS:

Remover attachment 40 [1]

07953-MJ10100

Remover handle [2]

07953-MJ10200

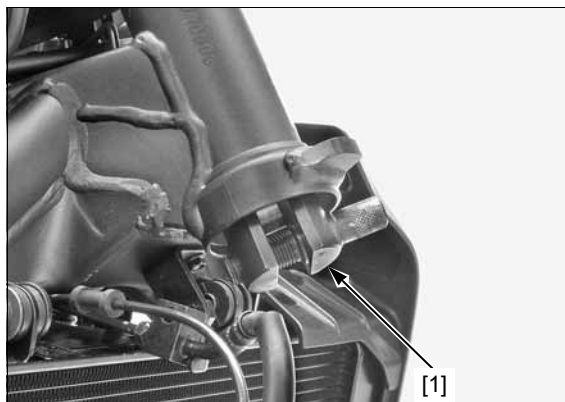


Remove the lower outer race using the special tool and suitable shaft.

TOOL:

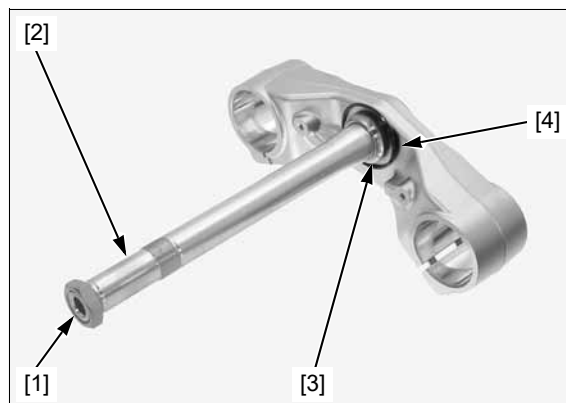
Bearing remover [1]

07946-3710500



Temporarily install the steering stem nut [1] onto the steering stem [2] to prevent the threads from being damaged when removing the lower inner race [3] from the steering stem.

Remove the lower inner race with a chisel or equivalent tools, being careful not to damage the steering stem. Remove the lower dust seal [4].



Apply specified grease to a new lower dust seal lips (page 1-19).

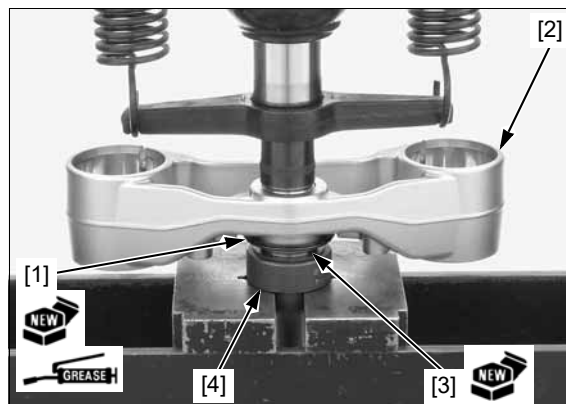
Install the dust seal [1] to the steering stem [2].

Install a new lower inner race [3] using a hydraulic press and special tool [4].

TOOL:

Attachment, 30 mm I.D. [4]

07746-0030300



Drive in a new upper outer race [1] using the special tools.

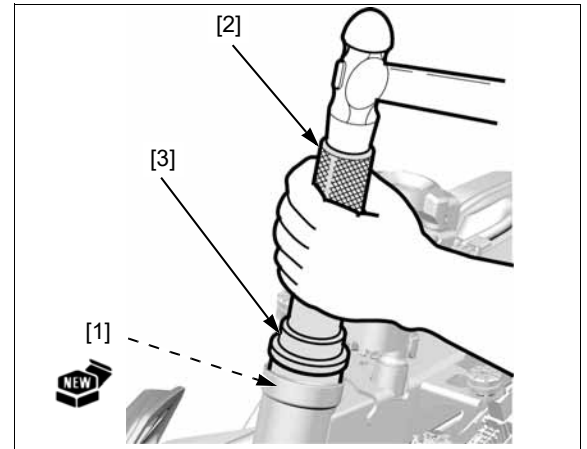
TOOLS:

Driver [2]

07749-0010000

Attachment, 42 x 47 mm [3]

07746-0010300



Drive in a new lower outer race [1] using the special tools.

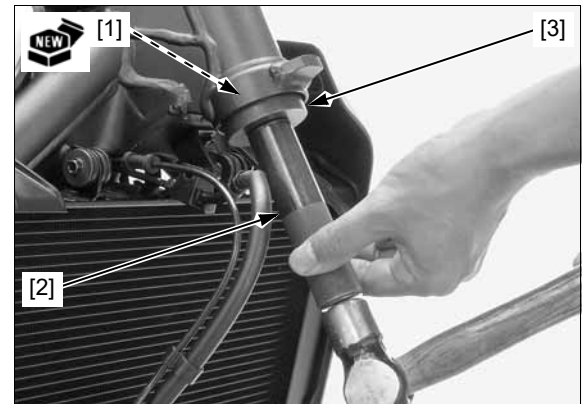
TOOLS:

Driver [2]

07749-0010000

Attachment, 52 x 55 mm [3]

07746-0010400

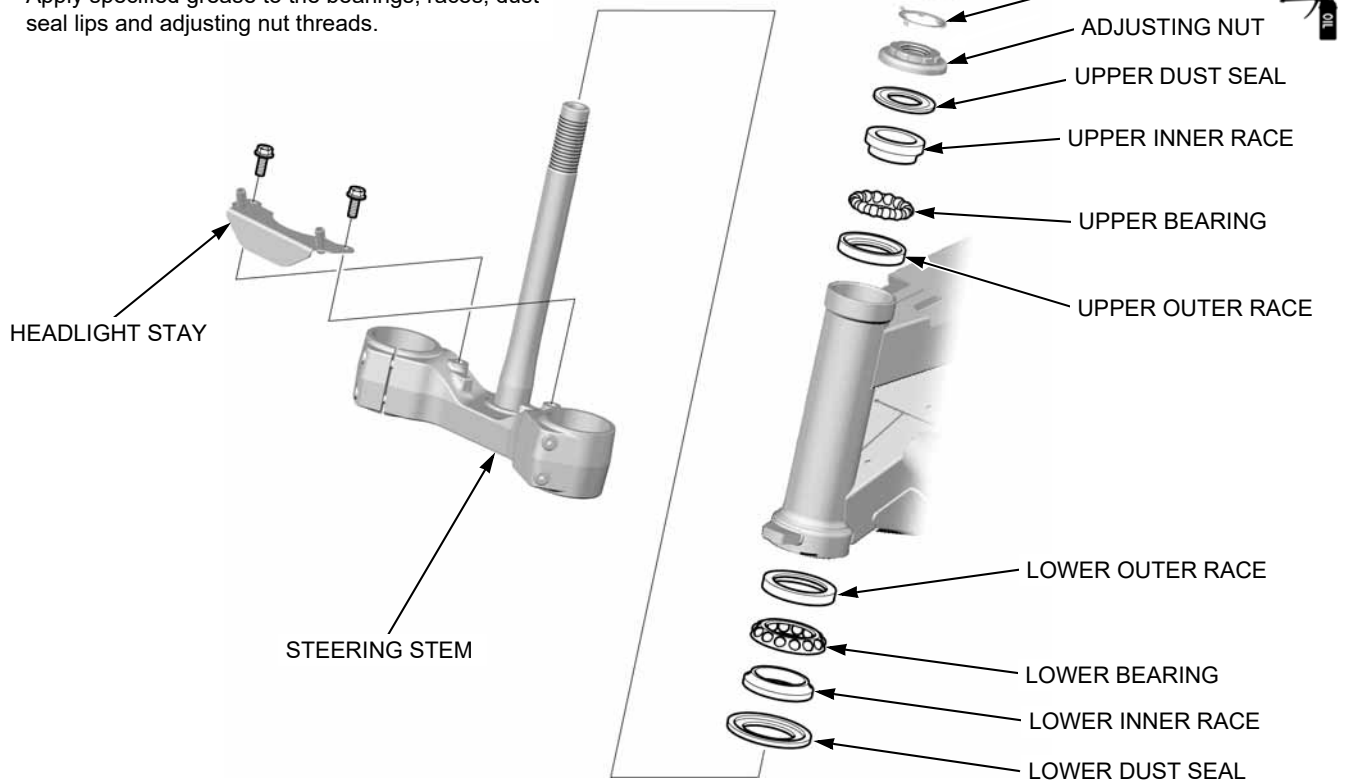


INSTALLATION



: Lock washer, bearing, races and dust seals

Apply specified grease to the bearings, races, dust seal lips and adjusting nut threads.



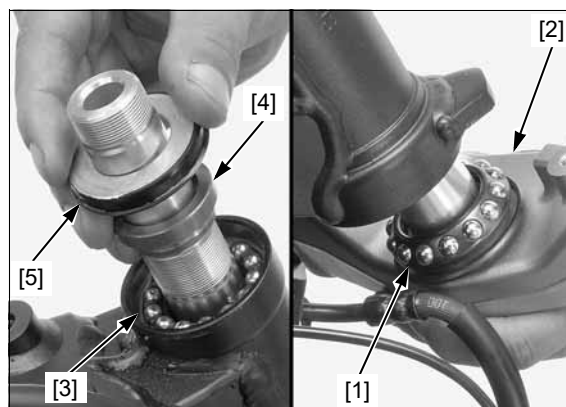
FRONT WHEEL/SUSPENSION/STEERING

Apply the specified grease (page 1-19) to the upper and lower bearings and bearing races.

Install the lower bearing [1] onto the steering stem [2].

Insert the steering stem into the steering head pipe.

Install the upper bearing [3], inner race [4] and dust seal [5].



Apply the oil to the steering stem adjusting nut threads (page 1-19).

Tighten the steering stem adjusting nut [1] to the initial torque.

TOOL:

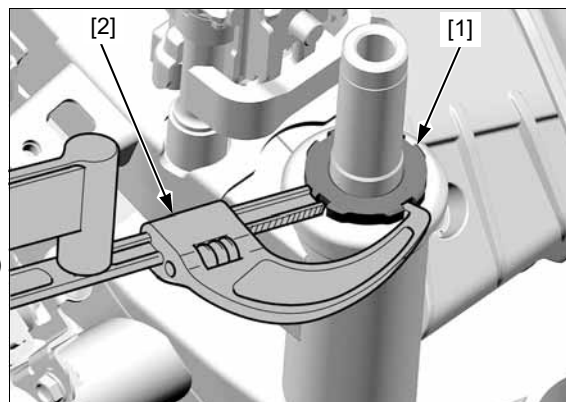
Adjustable pin spanner [2] 07702-0020001

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

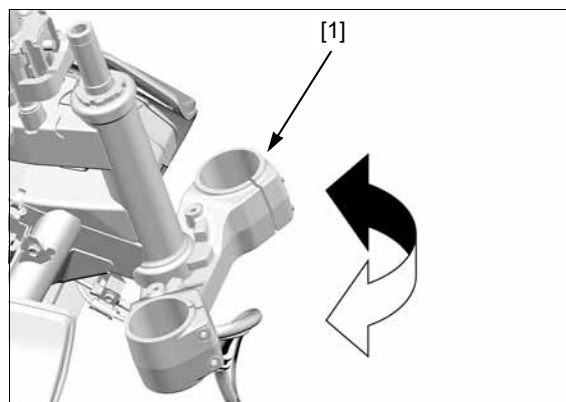
INDICATED TORQUE: 22.6 N·m (2.3 kgf·m, 16.7 lbf·ft)

NOTE:

Using the special tool, the torque setting above gives actual torque value (page 16-2).



Move the steering stem [1] right and left, lock-to-lock, five times to seat the bearings.



Retighten the steering stem adjusting nut [1] to the specified torque.

TOOL:

Adjustable pin spanner [2] 07702-0020001

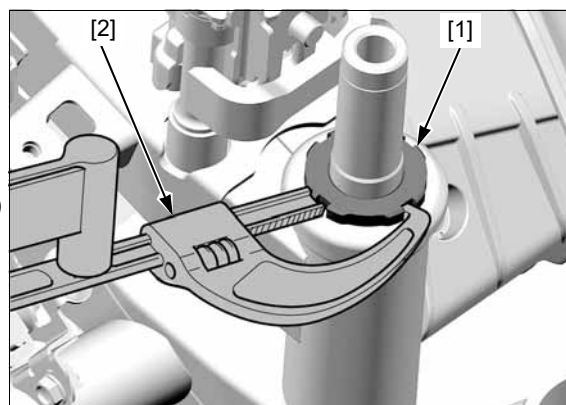
ACTUAL TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

INDICATED TORQUE: 22.6 N·m (2.3 kgf·m, 16.7 lbf·ft)

Recheck that the steering stem moves smoothly without play or binding.

NOTE:

Using the special tool, the torque setting above gives actual torque value (page 16-2).



Install a new lock washer [1] onto the steering stem.

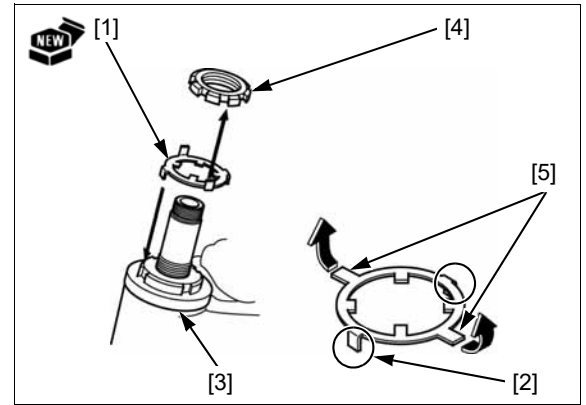
Align the tabs [2] of the lock washer with the grooves in the adjusting nut [3].

Do not over tighten the lock nut, this will flatten the lock washer.

Install the lock nut [4] until it contacts with the lock washer.

Hold the adjusting nut and further tighten the lock nut within 1/4 turn (90°) enough to align its grooves with the lock washer tabs.

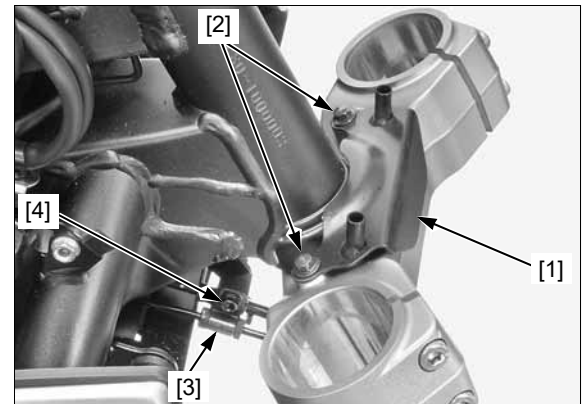
Bend the lock washer tabs [5] up into the lock nut grooves.



Install the headlight lower stay [1] and bolts [2].

Install the mount stay [3] and bolt [4].

Make sure that the steering stem moves smoothly, without play or binding.



Install the collar [1] and top bridge [2].

Install the washer [3] steering stem nut [4], but do not tighten it yet.

Temporarily install the forks.

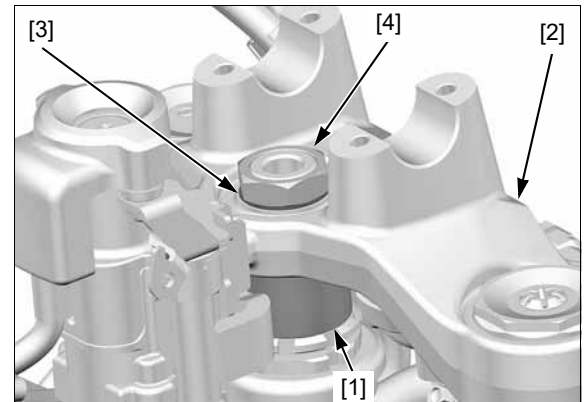
Tighten the steering stem nut to the specified torque.

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

Turn the steering stem left and right, lock-to-lock several times to make sure the steering stem moves smoothly without play or binding.

Install the following:

- Handlebar (page 16-4)
- Forks (page 16-15)
- Combination Meter (page 21-8)



MEMO

17. REAR WHEEL/SUSPENSION

SERVICE INFORMATION.....	17-2	DRIVEN FLANGE/REAR AXLE	17-6
TROUBLESHOOTING	17-2	SHOCK ABSORBER	17-12
COMPONENT LOCATION	17-3	SWINGARM	17-14
REAR WHEEL	17-4		

REAR WHEEL/SUSPENSION

SERVICE INFORMATION

GENERAL

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- After the rear wheel installation, check the brake operation by applying the brake lever and pedal.
- The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock absorber.
- When servicing the rear wheel and suspension, support the motorcycle using a safety stand or hoist.
- Use genuine Honda replacement bolts and nuts for all suspension pivot and mounting point.
- Refer to the brake system information (page 18-2).

TROUBLESHOOTING

Soft suspension

- Weak shock absorber spring
- Incorrect suspension adjustment
- Oil leakage from damper unit
- Insufficient tire pressure

Hard suspension

- Incorrect suspension adjustment
- Damaged rear suspension pivot bearings
- Bent damper rod
- Incorrect swingarm pivot fasteners tightening
- Tire pressure too high

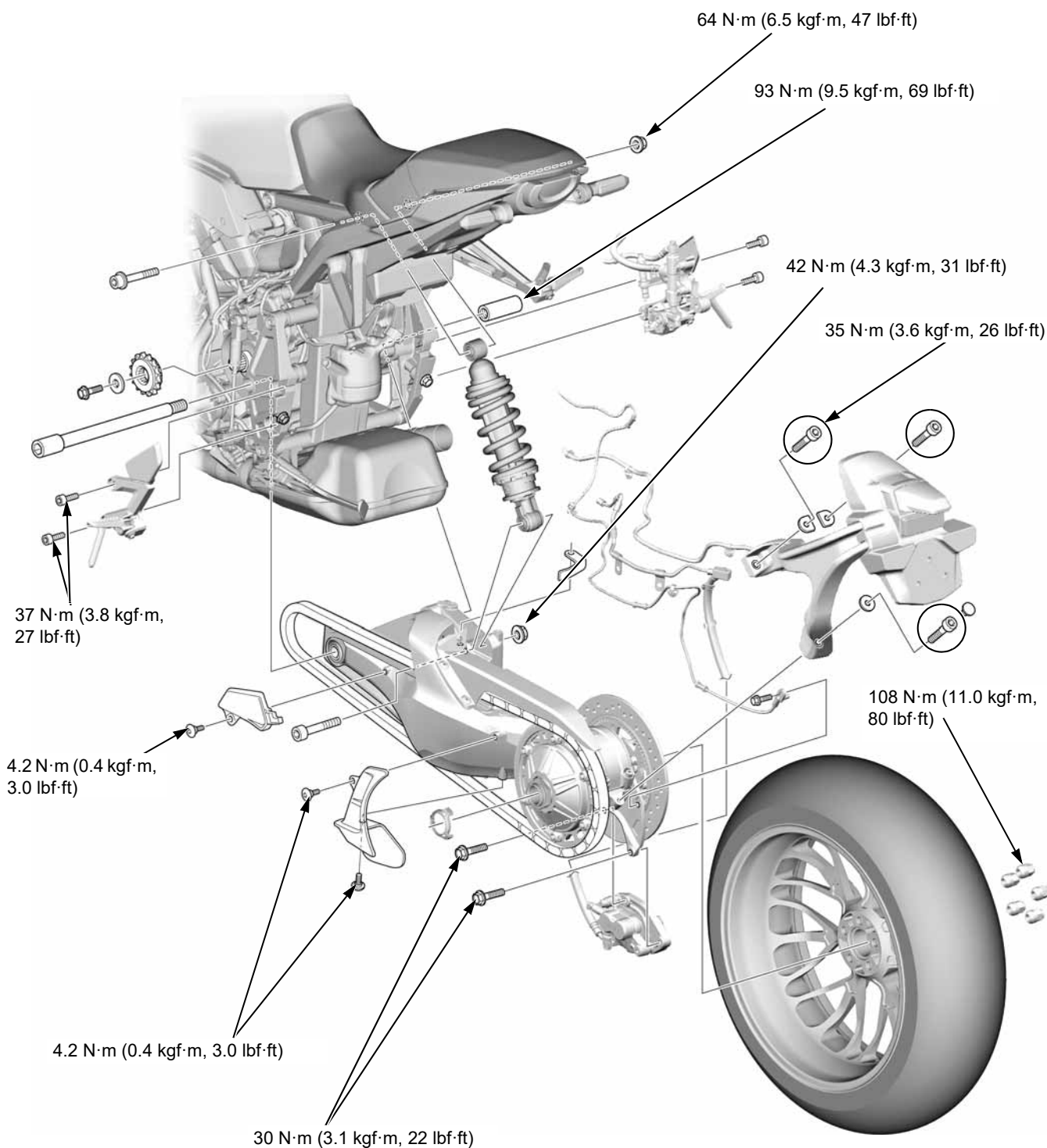
Rear wheel wobbling

- Bent rim
- Worn or damaged rear axle bearings
- Faulty rear tire
- Unbalanced rear tire and wheel
- Insufficient rear tire pressure
- Faulty swingarm pivot bearings

Steers to one side or does not track straight

- Bent rear axle

COMPONENT LOCATION

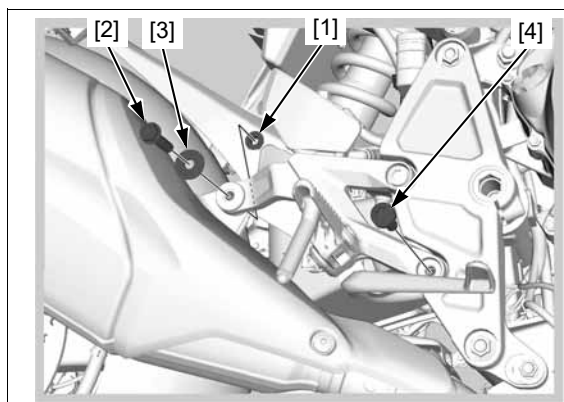


REAR WHEEL

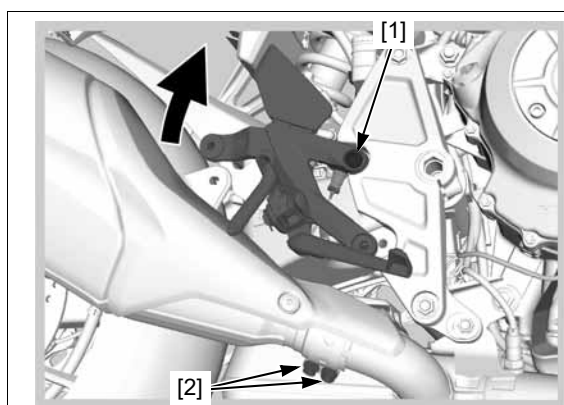
REMOVAL/INSTALLATION

Remove the muffler mounting nut [1], bolt [2] and washer [3].

Remove the main step lower mounting socket bolt [4].

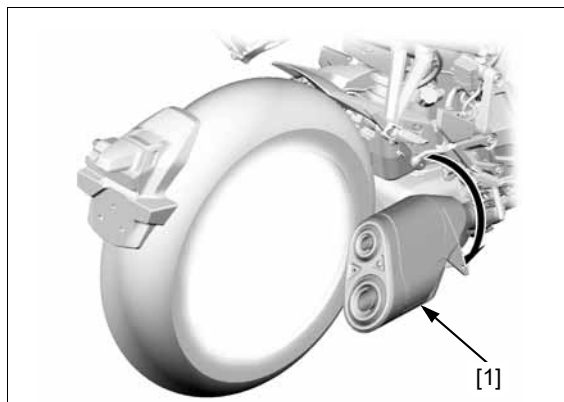


Loosen the main step upper socket bolt [1] and muffler band bolts [2] then lift up main step upward as shown.



Swing the muffler [1] outward as shown.

Tighten the muffler band bolts temporarily.



Loosen the wheel nuts [1].

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

Remove the wheel nuts and rear wheel.

Installation is in the reverse order of removal.

TORQUE:

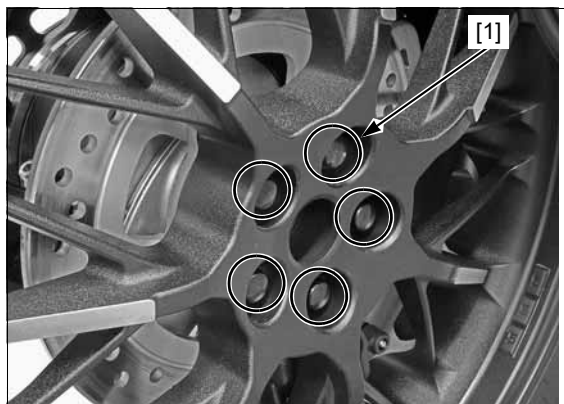
Rear wheel nut:

108 N·m (11.0 kgf·m, 80 lbf·ft)

Muffler band bolt:

22 N·m (2.2 kgf·m, 16 lbf·ft)

After installation, check the exhaust system for leaks.



TIRE VALVE REMOVAL/ INSTALLATION

Remove the tire.

Remove the nut [1], tire valve [2] and O-ring [3].

Clean the valve installation area of the rim with a degreasing agent.

If a puncture repair product was used, thoroughly clean the inside of the wheel rim.

*Do not apply grease
to the O-ring.*

Install a new O-ring onto the tire valve.

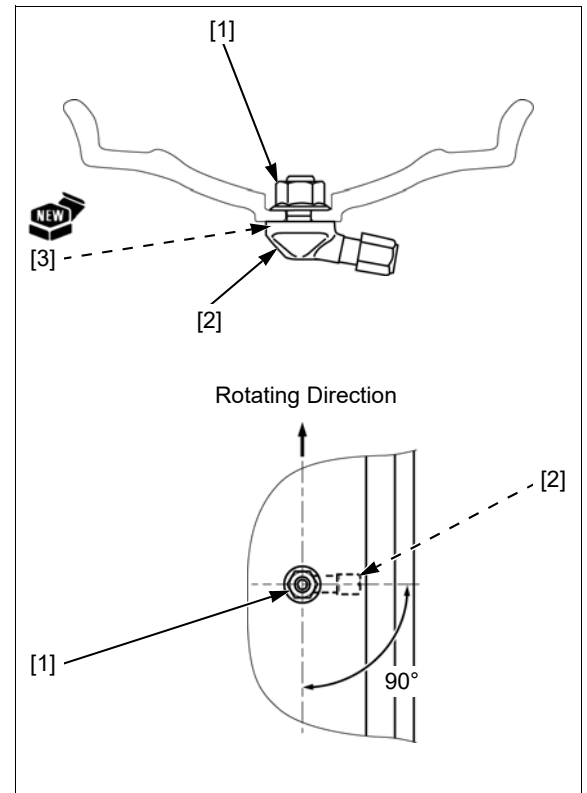
Gradually screw in the tire valve and position it with the valve neck facing the right side of the motorcycle and parallel with the axle.

Make sure that 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, make sure that the tire valve neck is facing to the right side and parallel to the axle direction.

Install the tire.



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation or bends.

- Wheel bolt hole
- Wheel rim

Measure each part according to REAR WHEEL/SUSPENSION SPECIFICATIONS (page 1-10).

Replace any part if it is out of service limit.

Refer to the wheel balance servicing (page 17-5).

WHEEL BALANCE

Check the direction marks and tire balance mark (page 16-11).

Install the special tool to the rear wheel and tighten the rear wheel nuts.

TOOL:

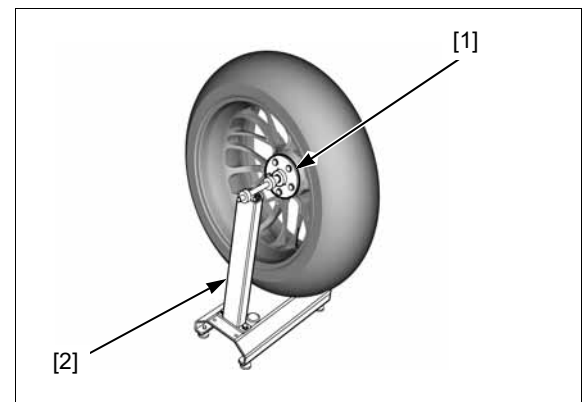
[1] Wheel hub attachment 070MJ-MGH0100

Mount the wheel in an inspection stand [2].

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.



REAR WHEEL/SUSPENSION

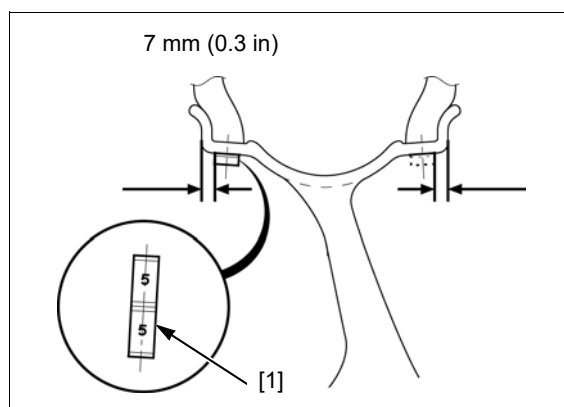
To balance the wheel, install the balance weights [1] on the highest side of the rim, on the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun.

Do not add more than 60 g 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 7 mm (0.3 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.



DRIVEN FLANGE/REAR AXLE

REMOVAL

Remove the following:

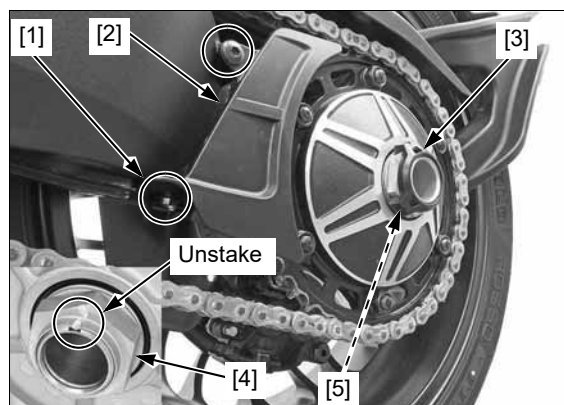
- mounting bolts [1]
- air guide [2]
- cap [3]

Unstake the rear axle nut [4].

Loosen the axle nut while applying the rear brake.

Remove the nut and cone washer [5].

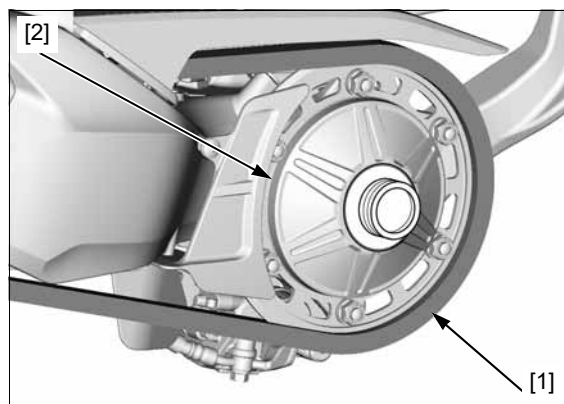
Remove the rear wheel (page 17-4).



Loosen the drive chain (page 3-17).

Derail the drive chain [1] from the driven sprocket.

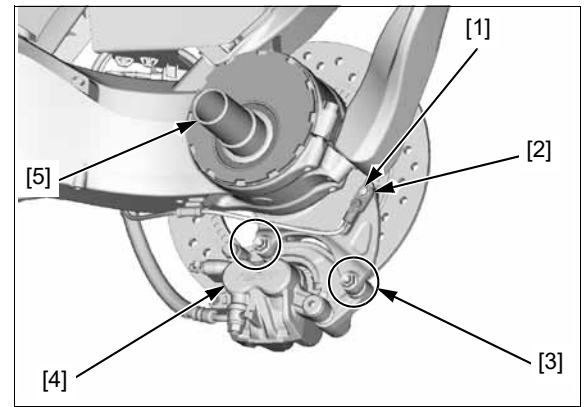
Remove the driven flange assembly [2] from the axle.



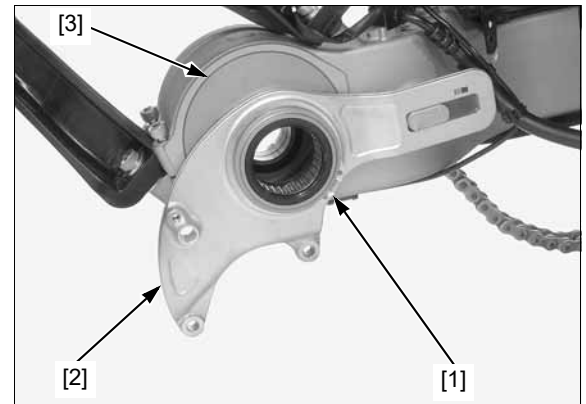
Remove the bolt [1] and front wheel speed sensor [2].
 Remove the rear brake caliper mounting bolts [3].
 Remove the caliper [4] from the brake disc.
 Remove the rear axle/brake disc assembly [5].

NOTE:

- Do not operate the brake pedal or lever after the brake caliper is removed.

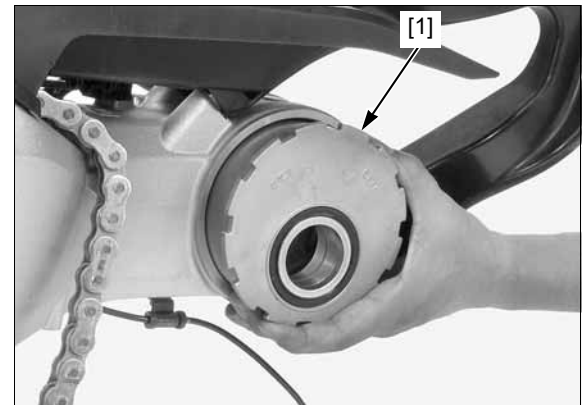


Remove the snap ring [1], brake caliper stay [2] and bearing holder [3].



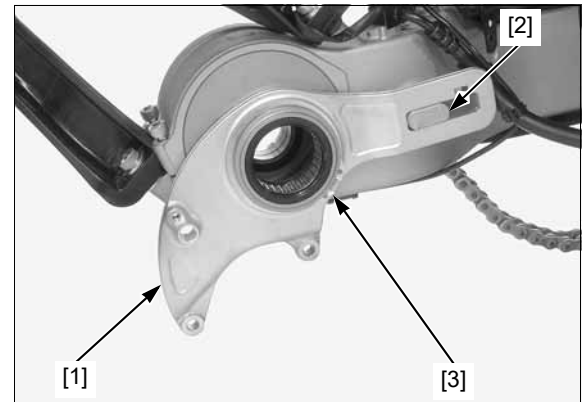
INSTALLATION

Install the bearing holder [1] into the swingarm.



Install the rear brake caliper stay [1] onto the bearing holder while aligning the groove on the rear brake caliper stay with the guide pin [2] on the swingarm.

Install the snap ring [3] to the bearing holder groove securely.



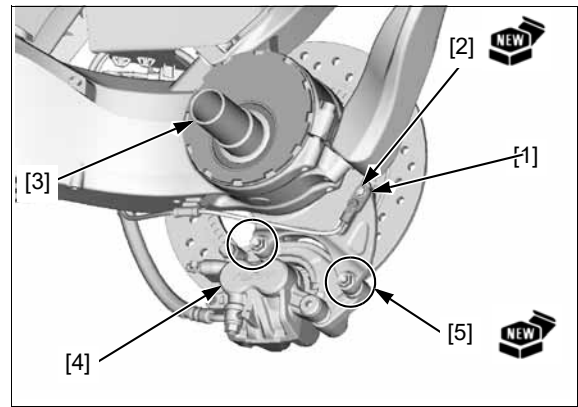
REAR WHEEL/SUSPENSION

Install the rear wheel speed sensor [1] onto the caliper bracket, tighten the new mounting bolt [2] securely.

Install the rear axle/brake disc assembly [3] from the right side through the bearing holder.

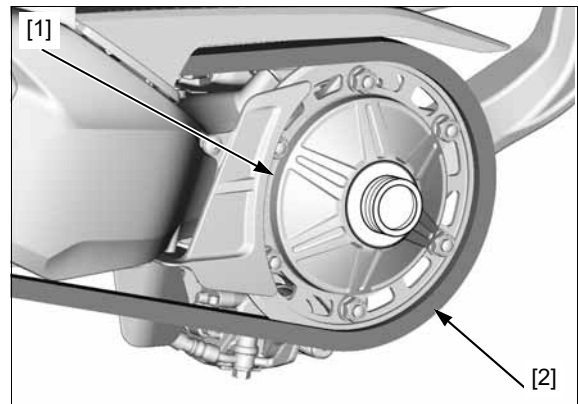
Install the rear brake caliper [4] over the brake disc, tighten the new mounting bolts [5] to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



Install the driven flange assembly [1] onto the rear axle while aligning the splines.

Install the drive chain [2] over the driven sprocket.



Install the air guide [1] to the swingarm, then tighten new mounting bolts [2] to the specified torque.

TORQUE: 4.2 N·m (0.40 kgf·m, 3.0 lbf·ft)

Install the cone washer [3] with the concave side facing in.

Install a axle nut [4] and temporarily tighten it.

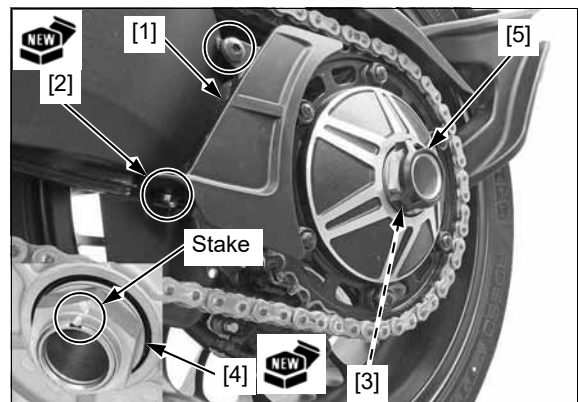
Install the rear wheel (page 17-4).

Operate the brake pedal to seat the caliper piston against the pads.

Tighten the rear axle nut to the specified torque while applying the rear brake.

Stake the rear axle nut against the rear axle groove.

Install the cap [5].



TORQUE:

Air guide mounting bolt:

4.2 N·m (0.40 kgf·m, 3.0 lbf·ft)

Rear axle nut:

201 N·m (20.5 kgf·m, 148 lbf·ft)

INSPECTION

Turn the inner race of each ball bearing in the bearing holder and hub with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the holder and hub.

Check the needle bearing in the bearing holder for wear or damage.

Check the following parts for damage, abnormal wear, deformation or crack.

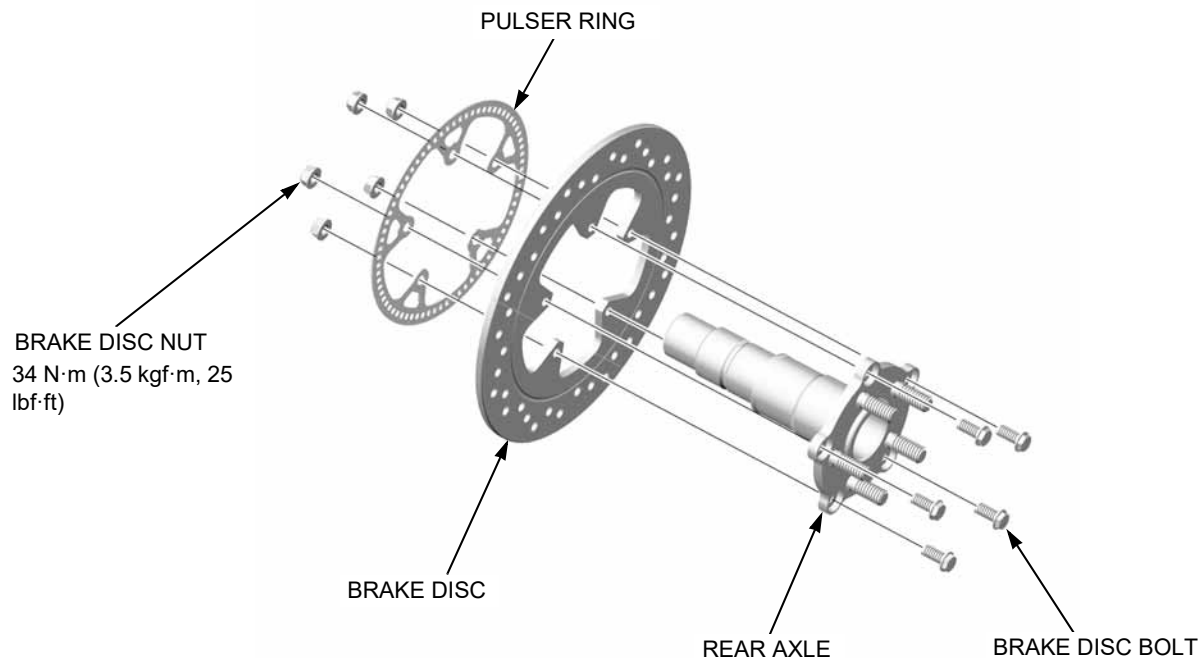
- rear axle (page 17-9)
- driven sprocket (page 17-9)
- damper rubbers (page 17-9)

DISASSEMBLY/ASSEMBLY

REAR AXLE/BRAKE DISC

Disassemble and assemble the rear axle/disc as following illustration.

- Install the brake disc with its rotating direction mark facing out.



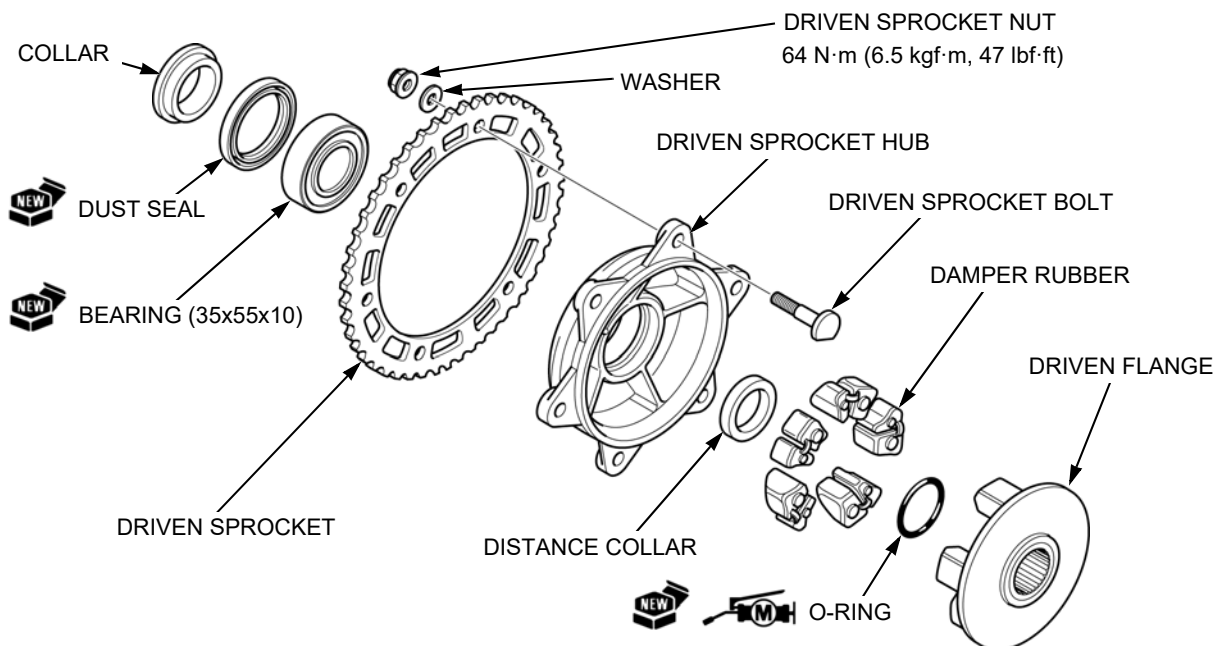
DRIVEN FLANGE

Disassemble and assemble the driven flange as following illustration.

- Install the dust seal with the flat side facing out so that it is flush with the hub.
- Install the driven sprocket with the stepped surface facing out.

REAR WHEEL/SUSPENSION

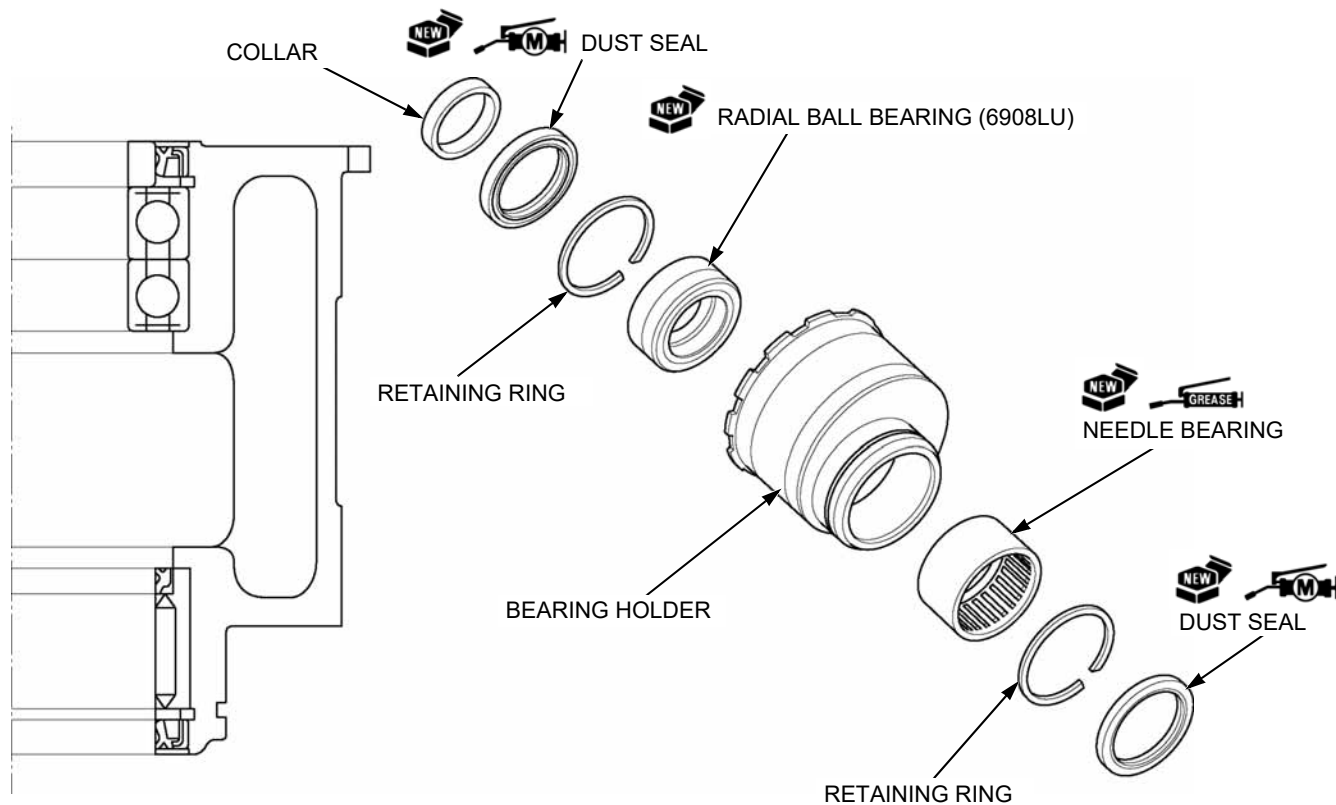
- Install the washers with their chamfered side facing the driven sprocket.



AXLE BEARING HOLDER

Disassemble and assemble the bearing holder as following illustration.

- Install the dust seal with the flat side facing out until it is fully seated.
- Install the snap ring with the chamfered edge facing the bearing side and be certain it is firmly seated in the groove. Do not reuse the snap ring which could easily spin in the groove.



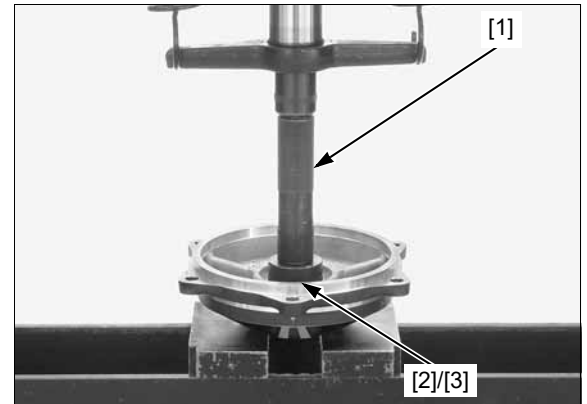
BEARING REPLACEMENT

DRIVEN SPROCKET HUB

Press the bearing out of the sprocket hub using the special tools.

TOOLS:

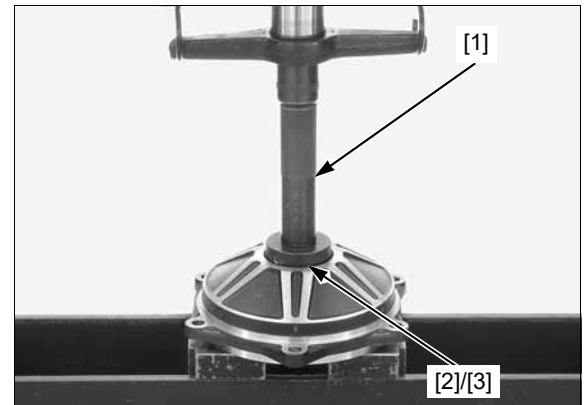
Driver [1]	07749-0010000
Attachment, 42 x 47 mm [2]	07746-0010300
Pilot, 35 mm [3]	07746-0040800



Press a new bearing in the sprocket hub using the special tools until it is fully seated.

TOOLS:

Driver [1]	07749-0010000
Attachment, 52 x 55 mm [2]	07746-0010400
Pilot, 35 mm [3]	07746-0040800



BEARING HOLDER

Press the ball bearing [1] out of the bearing holder using the special tools.

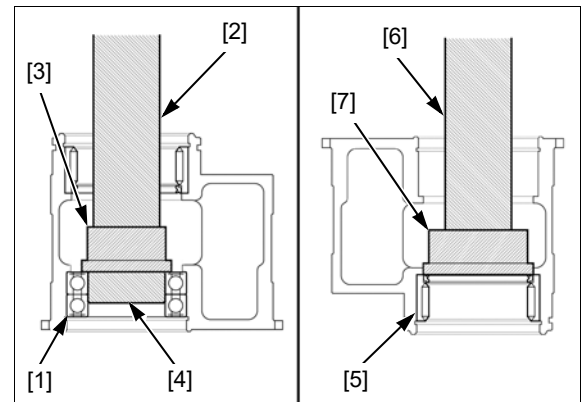
TOOLS:

Driver [2]	07749-0010000
Attachment, 42 x 47 mm [3]	07746-0010300
Pilot, 40 mm [4]	07746-0040900

Press the needle bearing [5] out from the bearing holder using the special tools.

TOOLS:

Driver [6]	07749-0010000
Attachment, 52 x 55 mm [7]	07746-0010400



REAR WHEEL/SUSPENSION

Apply grease to the rotating area and dust seal lips of a new needle bearing [1].

Press in the needle bearing with the dust seal [2] (in the bearing) facing down until it is fully seated, using the special tools.

TOOLS:

Driver [3] 07749-0010000

Attachment, 62 x 68 mm [4] 07746-0010500

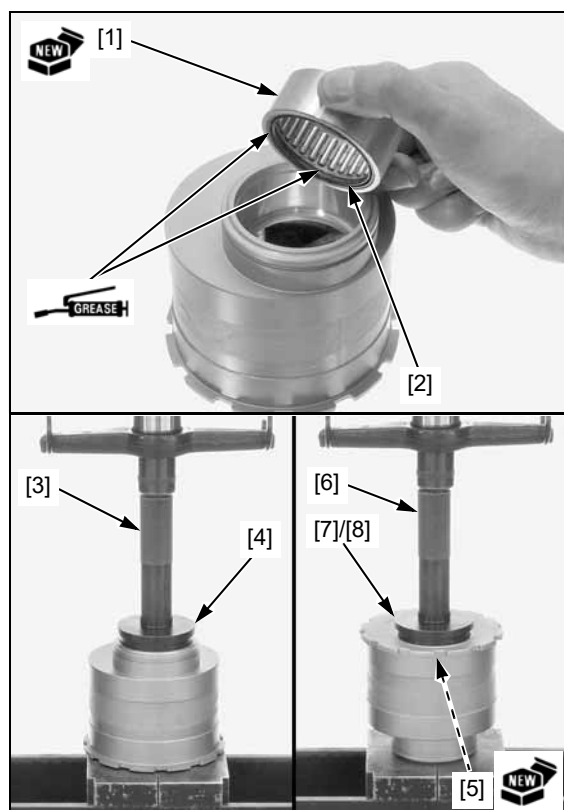
Press in a new ball bearing [5] with the marked side facing up, using the special tools.

TOOLS:

Driver [6] 07749-0010000

Attachment, 62 x 68 mm [7] 07746-0010500

Pilot, 40 mm [8] 07746-0040900



SHOCK ABSORBER

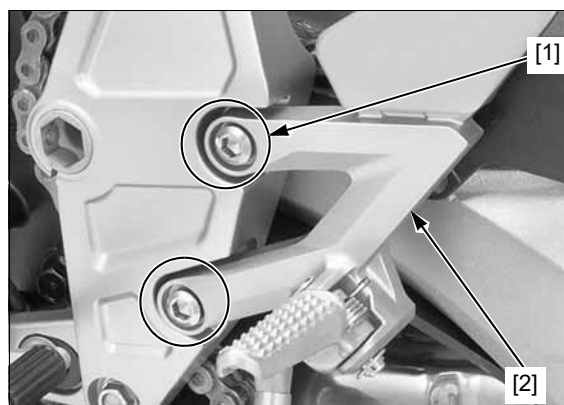
REMOVAL

Remove the rear fender C (page 2-9).

Remove the muffler (page 2-15)

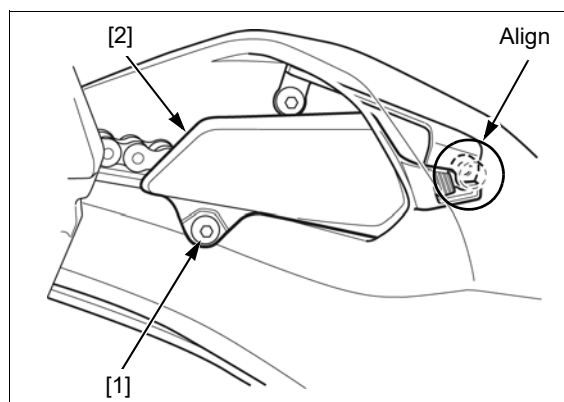
Support the motorcycle securely using a hoist or equivalent and raise the rear wheel off the ground.

Remove the mounting bolts [1] and the left footpeg holder [2].

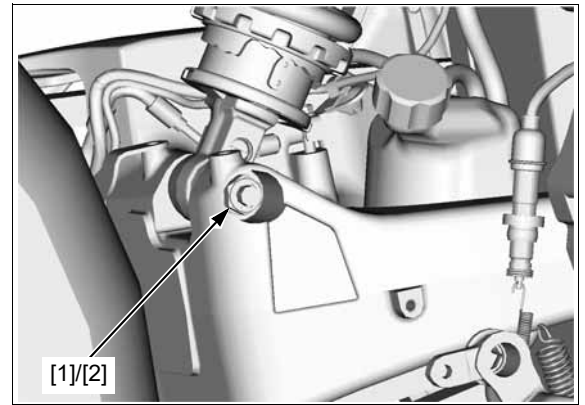


Remove the mounting bolt [1] and the drive chain case B [2].

- Install the drive chain case B with its groove to the pin on the swingarm and tighten the mounting bolt.



Remove the shock absorber lower mounting nut [1] and bolt [2].



Remove the shock absorber upper mounting nut [1] and bolt [2], then remove the shock absorber from the frame.

Installation is in the reverse order of removal.

TORQUE:

Shock absorber upper mounting nut:

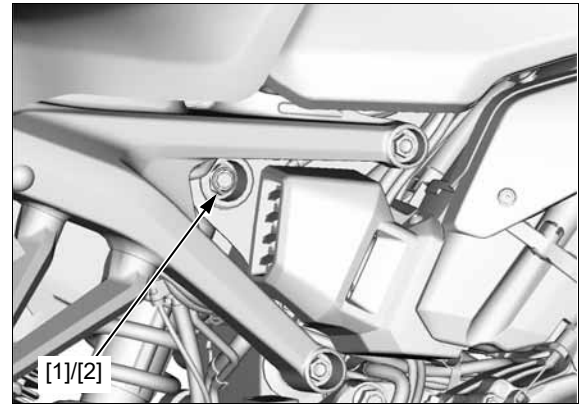
64 N·m (6.5 kgf·m, 47 lbf·ft)

Shock absorber lower mounting nut:

42 N·m (4.3 kgf·m, 31 lbf·ft)

Main step mounting socket bolt:

37 N·m (3.8 kgf·m, 27 lbf·ft)



INSPECTION

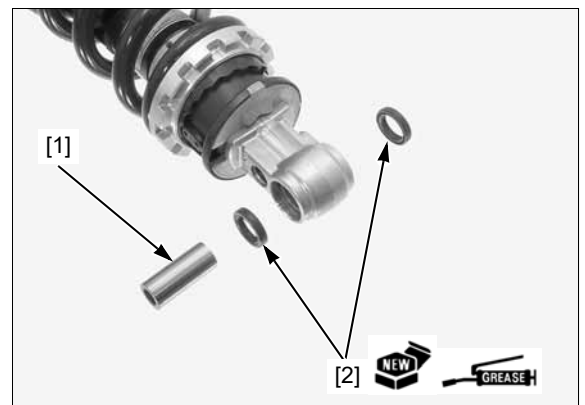
Check the following parts of the shock absorber for damage, abnormal wear, oil leakage or bend.

- damper unit
- pivot collar
- pivot bushing
- pivot dust seal
- needle bearing

NEEDLE BEARING REPLACEMENT

Remove the pivot collar [1] and dust seals [2].

- Apply grease (REPSOL MP2) to the new dust seal lips, install them into the lower mount.



REAR WHEEL/SUSPENSION

Press out the needle bearing out of the shock absorber lower mount using the special tools.

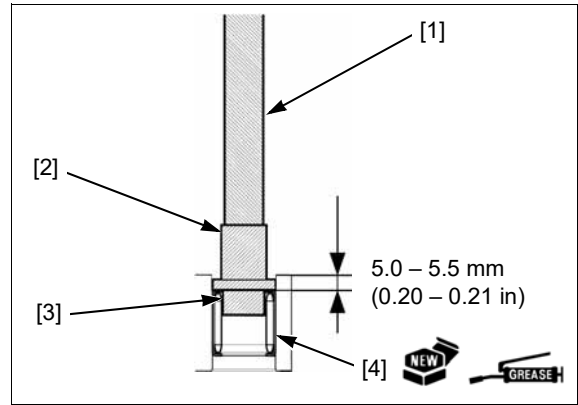
TOOLS:

Driver shaft [1] 07946-MJ00100
Attachment, 24 x 26 mm [2] 07746-0010700
Pilot, 17 mm [3] 07746-0040400

Apply grease to rotating areas of a new needle bearing [4].

Press the needle bearing into the lower mount with the marked side facing out.

Press a new needle bearing into the lower mount so that the needle bearing surface is lower 5.0 – 5.5 mm (0.20 – 0.21 in) from the end of the lower mount using the same tools.



SWINGARM

REMOVAL/INSTALLATION

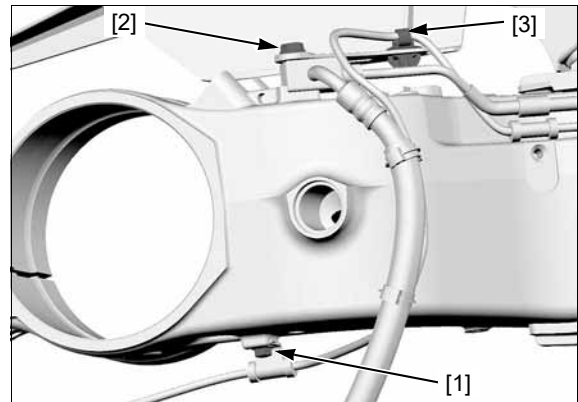
Remove the following:

- Drive sprocket (page 15-6)
- Axle bearing holder (page 17-10)
- Rear shock absorber lower mounting bolt/nut (page 17-12)
- Rear fender C (page 2-9)
- Rear fender D (page 2-11)

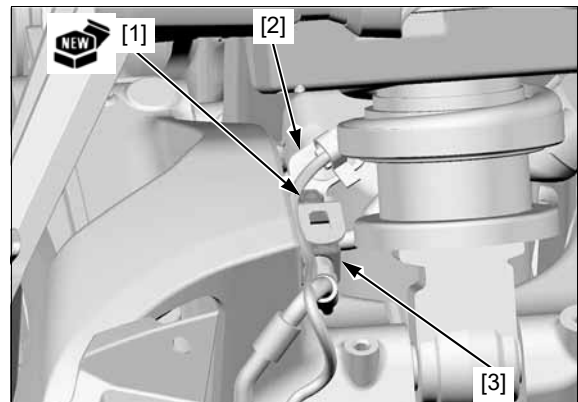
Remove the bolt [1] to remove the clamp.

Remove the bolt [2] to remove the hose joints.

Remove the harness clip [3] from the chain case.



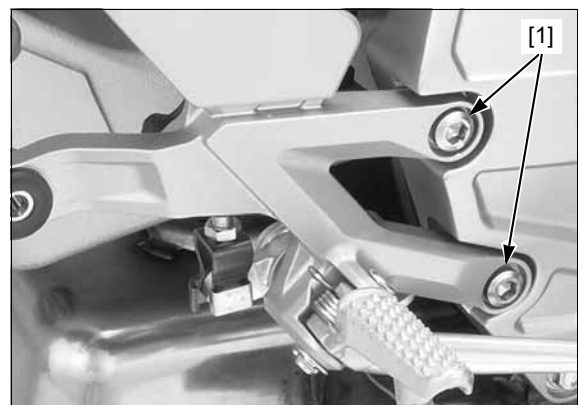
Remove the bolt [1], harness mount stay [2] and hose joint [3] from the swingarm.



Remove the two bolts [1] and left right footpeg [2].

NOTE:

Remove the right rider footpeg bracket assembly without disconnecting the brake hose and support it with a strap to avoid interfering with the swingarm.



Loosen the left and right pivot pinch bolts [1].

Support the front side of the swingarm and remove the pivot nut [2] and bolt [3].

Support the caliper so the brake pipe does not bend.

Take care not to damage the speed sensor.

Move the brake hose/pipe and speed sensor wire out of the way.

Remove the swingarm [4].

Installation is in the reverse order of removal.

NOTE:

- The pivot bolt is installed from the left side.
- Tighten the pivot nut first and then the pinch bolts.

TORQUE:

Swingarm pivot nut:

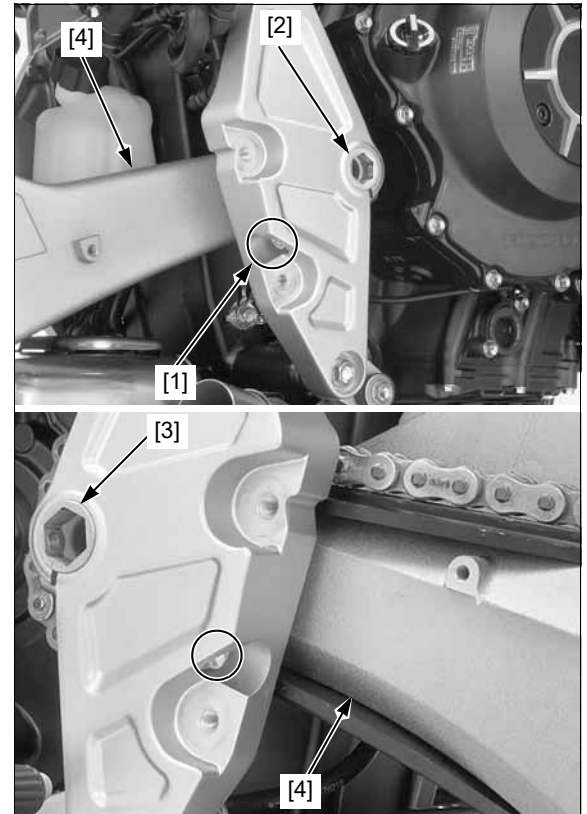
93 N·m (9.5 kgf·m, 69 lbf·ft)

Swingarm pivot pinch bolt:

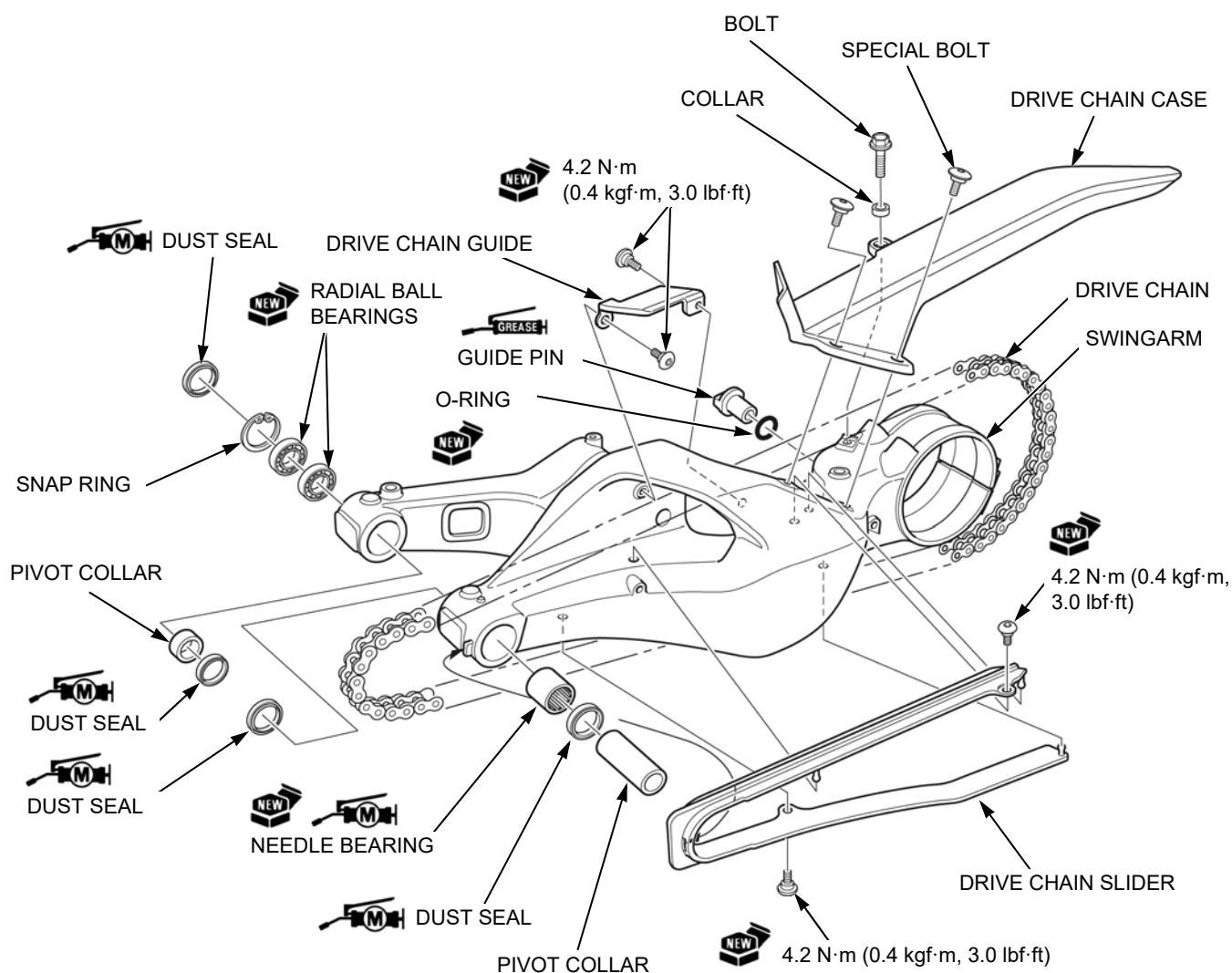
27 N·m (2.8 kgf·m, 20 lbf·ft)

Main step mounting socket bolt:

37 N·m (3.8 kgf·m, 27 lbf·ft)



- Install the swingarm pivot dust seals with the flat side facing out so that they are flush with the pivot end surface.



- swingarm
- pivot collars
- bearings
- drive chain guide
- drive chain slider (page 3-20)

BEARING REPLACEMENT

SWINGARM PIVOT BEARING

Remove the snap ring [1].

Press the ball bearing [2] out of the right pivot using the special tools.

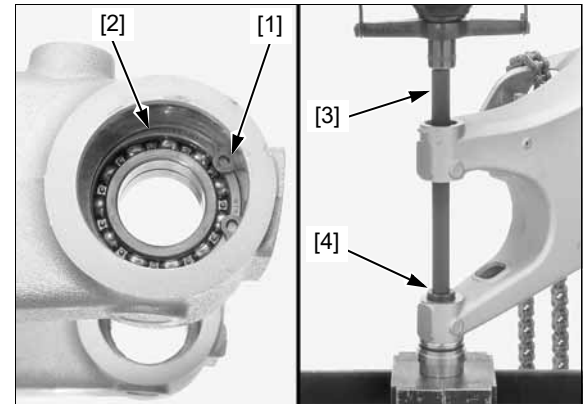
TOOLS:

[3] Driver

07949-3710001

[4] Attachment, 34 mm

07ZMD-MBW0100



Press the needle bearing out of the left pivot using the special tools.

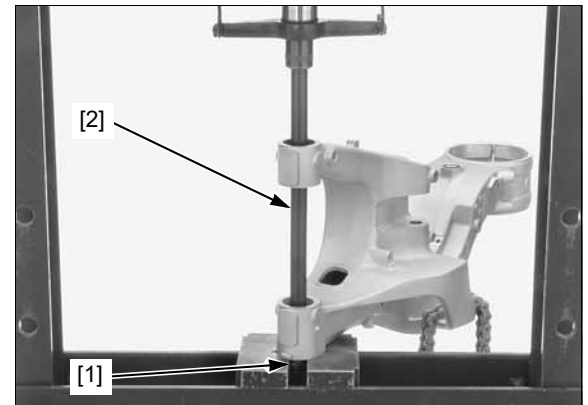
TOOLS:

[1] Needle bearing remover

07HMC-MR70100

[2] Driver shaft

07946-MJ00100



Apply grease to the rotating area of a new needle bearing [1].

Carefully press the bearing in the left pivot with the marked side facing up until the depth from the pivot end surface is 5.0 – 6.0 mm (0.20 – 0.24 in), using the special tools.

TOOLS:

[2] Driver

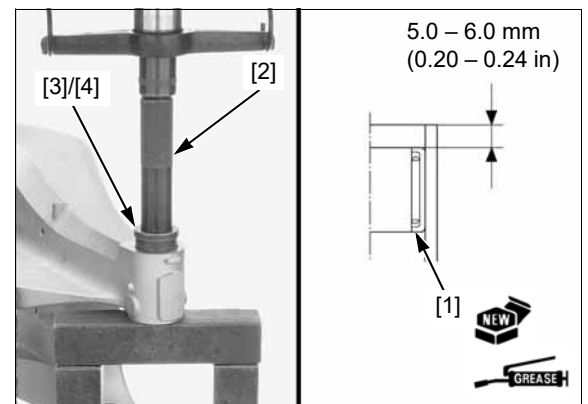
07749-0010000

[3] Attachment, 37 x 40 mm

07746-0010200

[4] Pilot, 28 mm

07746-0041100



Apply grease to the rotating area of new ball bearings [1].

Press the ball bearings in the right pivot with the marked side facing up until they are fully seated, using the special tools.

TOOLS:

[2] Driver

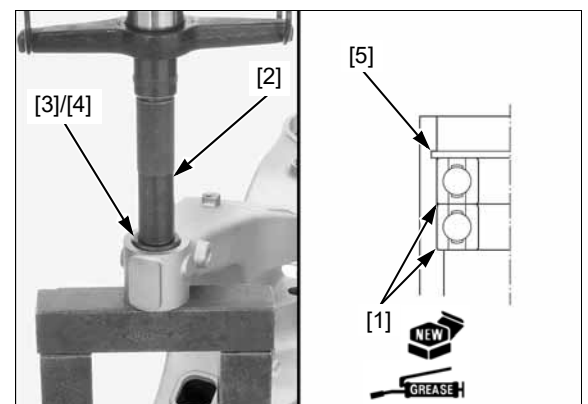
07749-0010000

[3] Attachment, 37 mm

07ZMD-MBW0200

[4] Pilot, 20 mm

07746-0040500



Be certain the snap ring is firmly seated in the groove. Do not reuse it which could easily spin in the groove.

Install the snap ring [5] into the groove with the chamfered edge facing in.

MEMO

SERVICE INFORMATION.....	18-2	FRONT MASTER CYLINDER.....	18-12
TROUBLESHOOTING	18-2	REAR MASTER CYLINDER/ BRAKE PEDAL	18-14
COMPONENT LOCATION.....	18-3	FRONT BRAKE CALIPER	18-17
BRAKE FLUID REPLACEMENT/ AIR BLEEDING	18-5	REAR BRAKE CALIPER.....	18-18
BRAKE PAD/DISC	18-9		

SERVICE INFORMATION

GENERAL

⚠ CAUTION

Frequent inhalation of brake pad dust, regardless of material composition could be hazardous to your health.

- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

NOTICE

Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the front reservoir is horizontal first.

- This section covers service of the conventional brake components of the brake system. For ABS service (page 19-2).
- This motorcycle is equipped with the ABS, however, the brake fluid replacement procedure is performed in the same manner as in the ordinary air bleeding procedure. Note that replacement and bleeding air from the brake fluid in the ABS modulator is not necessary, as it 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 19-20).
- To avoid tarnish of the oil cup, wash with water.

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

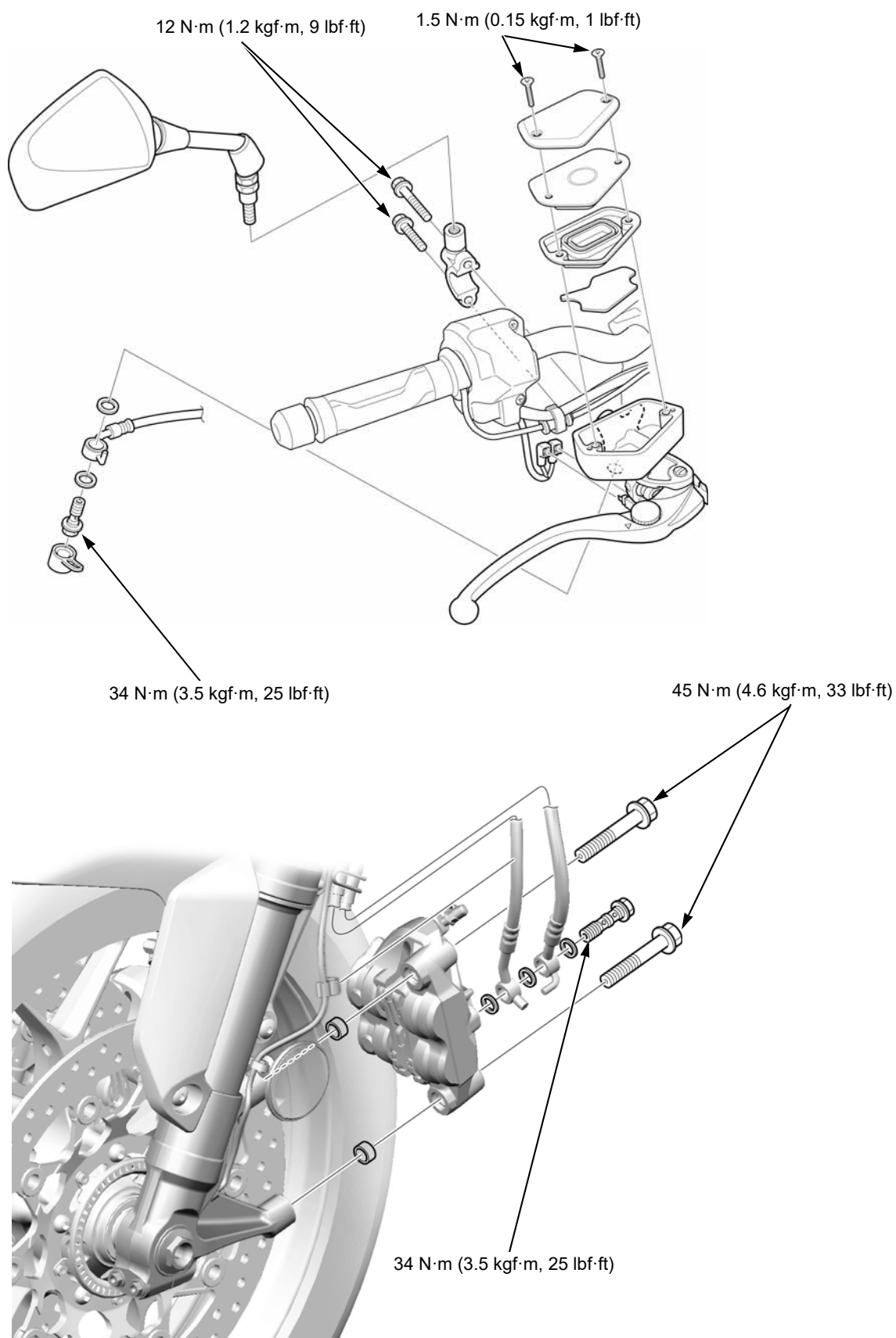
- Clogged/restricted fluid passage
- Sticking/worn caliper piston
- Caliper not sliding properly
- Worn caliper piston seal
- Sticking/worn master piston
- Bent brake lever/pedal

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

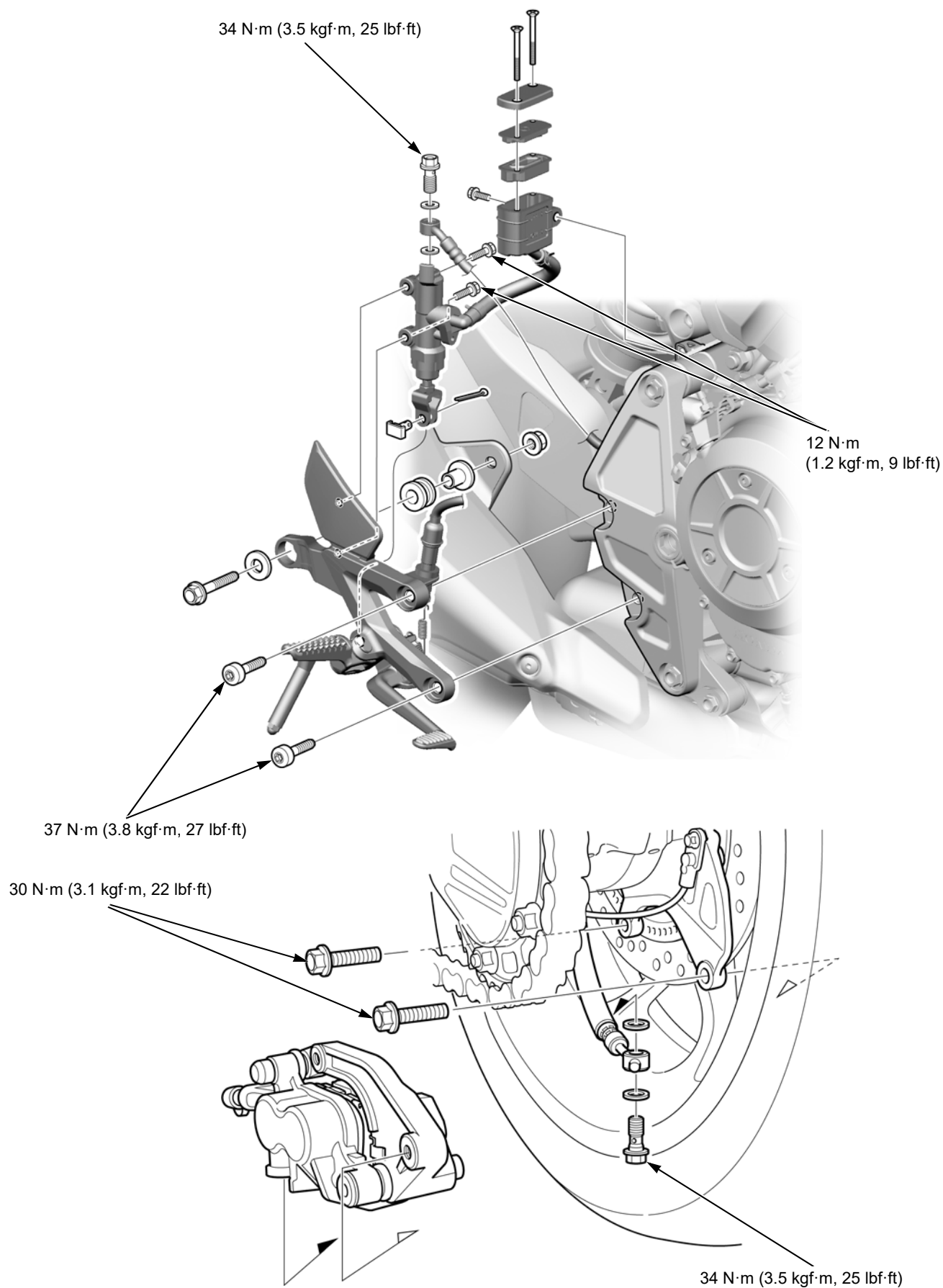
COMPONENT LOCATION

FRONT:



HYDRAULIC BRAKE

REAR:



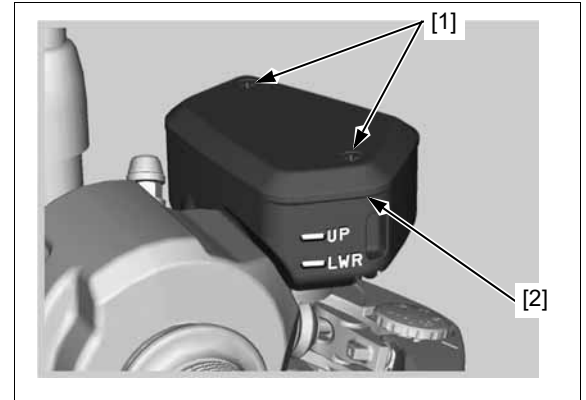
BRAKE FLUID REPLACEMENT/AIR BLEEDING

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
- Diaphragm
- Float



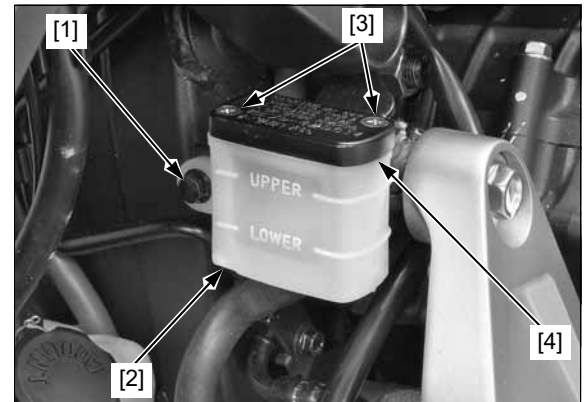
For rear brake: Remove the bolt [1] and reservoir [2] from the stay.

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

Remove the following:

- Two screws [3]
- Reservoir cap [4]
- Set plate
- Diaphragm

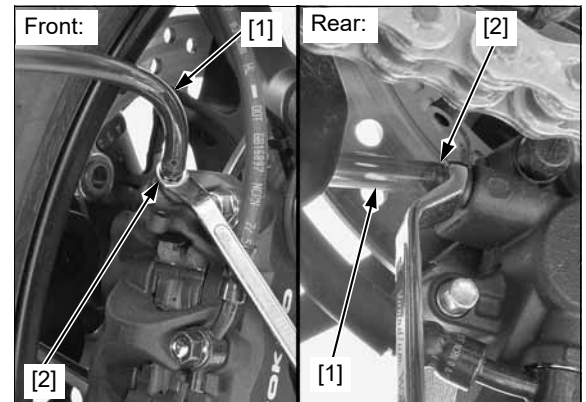
Temporarily install the reservoir onto the stay with the mounting bolt.



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

FRONT BRAKE

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

Connect a commercially available brake bleeder to the front master cylinder bleed valve [1].

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.

NOTE:

- When using a brake bleeding tool, follow the manufacturer's operating instructions.

If air enters the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Perform the bleeding procedure until air bubbles do not appear in the bleed hose.

Tighten the master cylinder bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

Connect a commercially available brake bleeder to the front brake caliper bleed valve [1].

If air enters the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Perform the bleeding procedure until the system is completely flushed/bled.

Close the brake caliper bleed valve and operate the brake lever. If it still feels spongy, bleed the system again.

After bleeding the system completely, tighten the brake caliper bleed valve to the specified torque.

TORQUE: 8.0 N·m (0.8 kgf·m, 5.9 lbf·ft)

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

If the brake bleeder is not available, use the following procedure.

Connect a bleed hose [1] to the front master cylinder bleed valve [2].

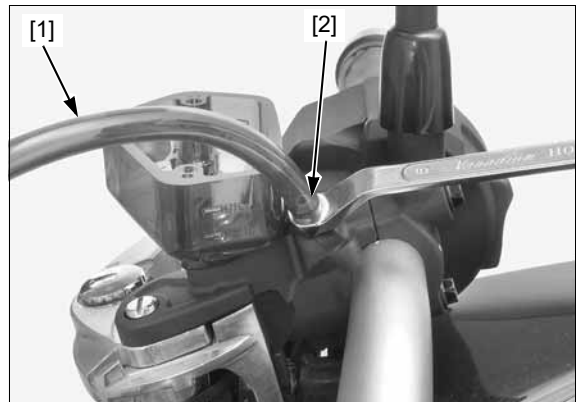
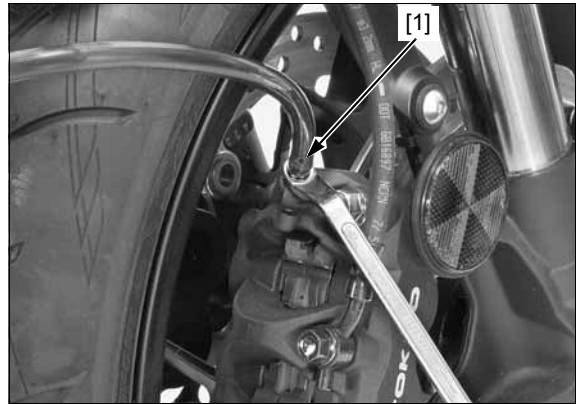
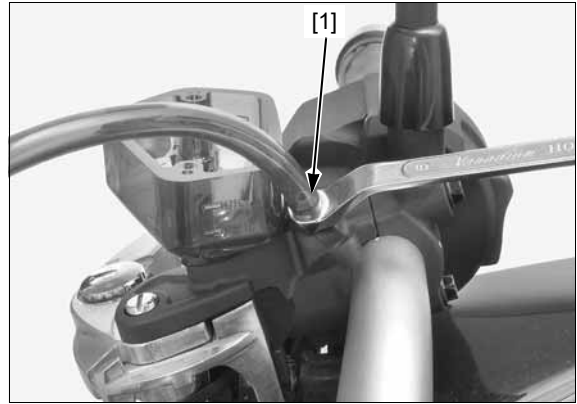
Pump up the system pressure with the brake lever until the lever resistance is felt.

Do not release the brake lever or pedal until the bleed valve has been closed.

1. Squeeze the brake lever 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 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.

Tighten the master cylinder bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)



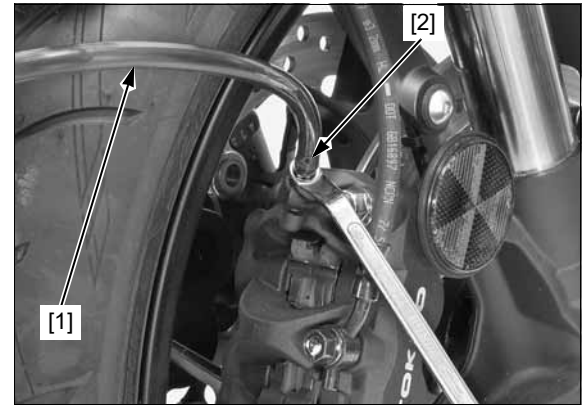
Connect a bleed hose [1] to the front brake caliper bleed valve [2].

Repeat the steps 1 through 3 at the caliper bleed valve.

After bleeding the system completely, tighten the brake caliper bleed valve to the specified torque.

TORQUE: 8.0 N·m (0.8 kgf·m, 5.9 lbf·ft)

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

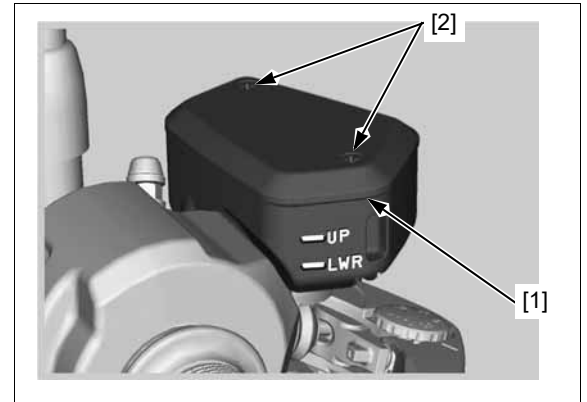


Install the following:

- Diaphragm
- Set plate
- Plate
- Reservoir cap [1]
- Screw [2]

Tighten the screw to the specified torque.

TORQUE: 1.5 N·m (0.15 kgf·m, 1 lbf·ft)



REAR BRAKE

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

Connect a commercially available brake bleeder to the rear brake caliper bleed valve [1].

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.

NOTE:

- When using a brake bleeding tool, follow the manufacturer's operating instructions.

If air enters the bleeder from around the bleed valve threads, seal the threads with teflon tape.

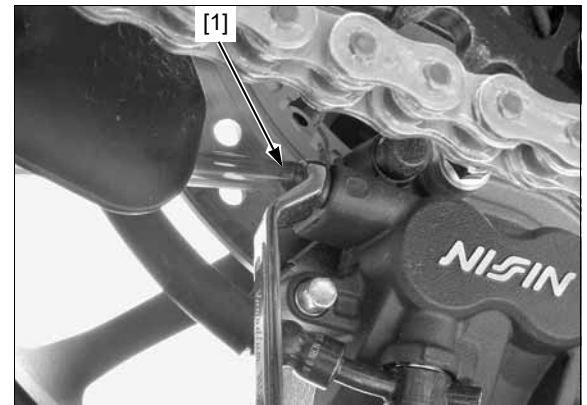
Perform the bleeding procedure until the system is completely flushed/bled.

Close the brake caliper bleed valve and operate the brake pedal. If it still feels spongy, bleed the system again.

After bleeding the system completely, tighten the brake caliper bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

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



HYDRAULIC BRAKE

If the brake bleeder is not available, use the following procedure.

Connect a bleed hose [1] to the rear brake caliper bleed valve [2].

Pump up the system pressure with the brake pedal until the lever resistance is felt.

Do not release the brake lever or pedal until the bleed valve has been closed.

1. 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 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 brake caliper bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

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

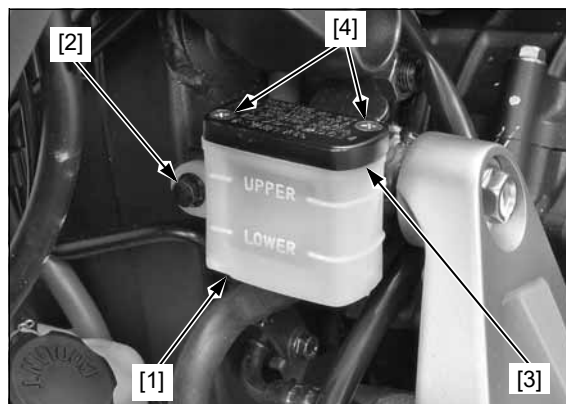
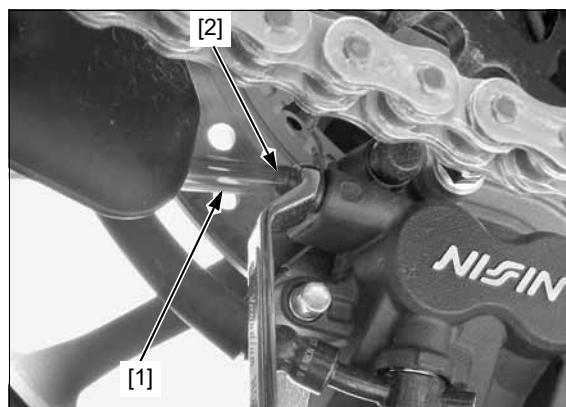
Carefully remove the reservoir [1] from the frame by removing the bolt [2].

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

Install the diaphragm, set plate, reservoir cap [3] and tighten the screws [4] to the specified torque.

TORQUE: 1.5 N·m (0.15 kgf·m, 1 lbf·ft)

Tighten the bolt



BRAKE PAD/DISC

BRAKE PAD REMOVAL/ INSTALLATION

NOTE:

- Always replace the brake pads in pairs to ensure even disc pressure.

FRONT

Remove the brake caliper mounting bolts [1] and brake caliper [2].

NOTE:

- Do not operate the brake lever after removing the caliper.

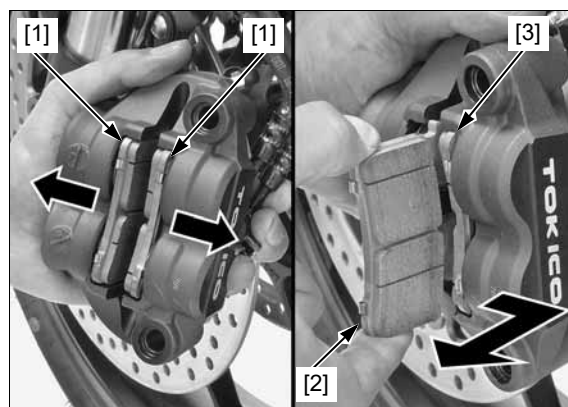
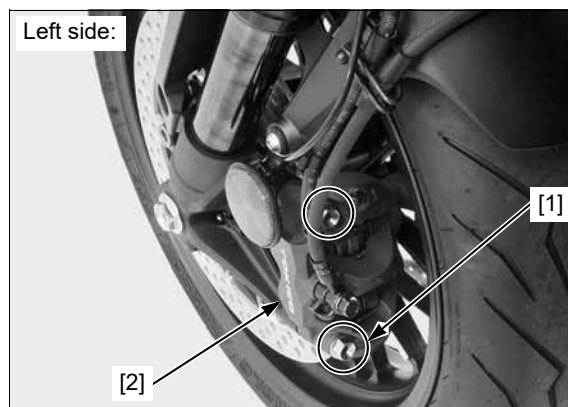
Push the caliper pistons all the way in by pushing the brake pads [1] outward.

NOTE:

- Check the fluid level in the reservoir as this operation causes the fluid level to rise.

Remove the either of brake pad [2] to move to the center.

Remove the other of brake pad [3] to move to the center.



HYDRAULIC BRAKE

Clean the inside of the caliper especially around the caliper pistons.

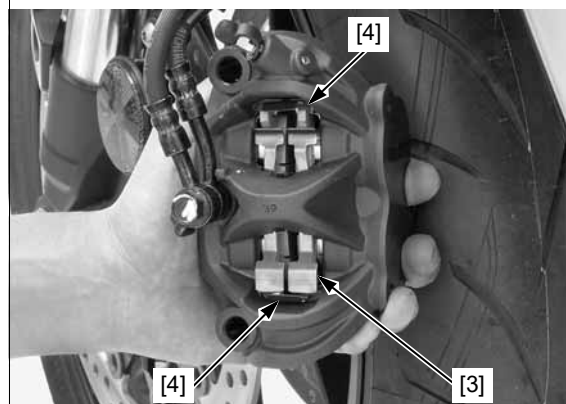
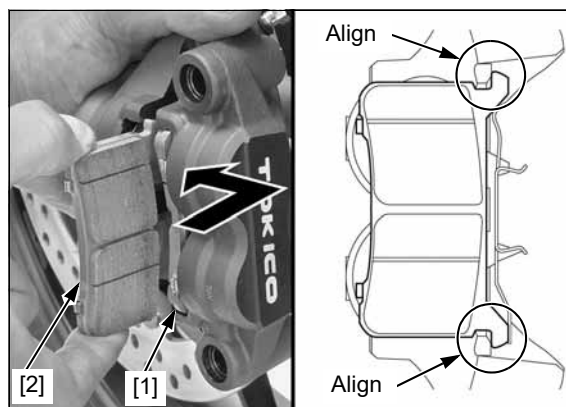
Make sure that the caliper pistons completely pushed back.

Install the either of brake pad [1] by pushing the pad against the pad spring and move to the outside. Install the other of brake pad [2] by pushing the pad against the pad spring and move to the outside.

NOTE:

- Align the brake pad tabs with the retainers as shown.

Make sure the pad spring [3] and retainers [4] is in place.



Install the brake caliper [1] to the fork leg so that the disc is positioned between the pads.

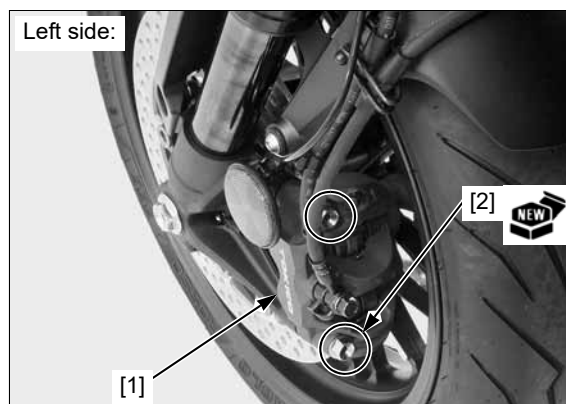
Install new mounting bolts [2] and tighten them to the specified torque.

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

Check the fluid level in the reservoir as this operation causes the fluid level to rise.

Do not operate the brake pedal after removing the caliper.

If you replace the brake pads with new ones, push the caliper pistons all the way in by pushing the caliper body inward to allow installation of new brake pads.

Loosen the pad pin [1].

Cover the wheel rim with a shop towel to prevent damaging it.

Remove the two mounting bolts [2] and brake caliper [3].

Remove the pad pin by pushing the pads [4] against the pad spring, then the brake pads and pad spring [5].

Clean the inside of the caliper especially around the caliper pistons.

Install the pad spring as shown.

Be sure the stopper ring [6] on the pad pin is in good condition, and replace it with a new one if necessary.

Coat the stopper ring with silicone grease.

Install the pads so that their ends are set in the retainer [7] properly.

Install the pad pin by pushing the pads against the pad spring to align the pad pin holes.

Install the brake caliper onto the stay with new mounting bolts, being careful not to damage the brake pads.

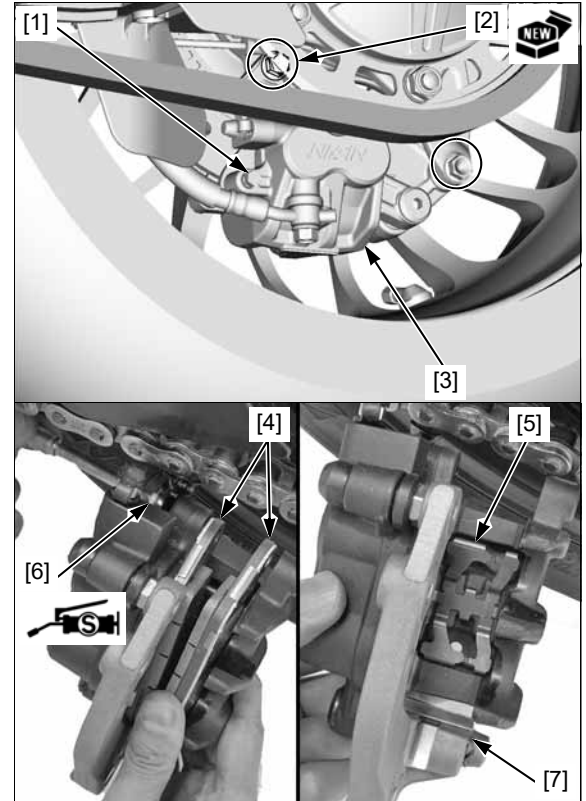
Tighten mounting bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 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 pistons against the pads.



BRAKE DISC INSPECTION

Visually inspect the brake disc for damage or cracks.

Measure the brake disc according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

FRONT MASTER CYLINDER

REMOVAL/INSTALLATION

Drain the brake fluid from the front brake hydraulic system (page 18-5).

Remove the following:

When removing the oil bolt, cover the end of the brake hose to prevent contamination.

- brake light switch connectors [1]
- oil bolt cover [2]
- oil bolt [3]
- sealing washers [4]
- brake hose [5]
- two bolts [6]
- master cylinder holder [7]
- master cylinder [8]

Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washers with new ones.
- Install the master cylinder holder with the "UP" mark facing up.
- Align the edge of the master cylinder with the paint mark on the handlebar, and tighten the upper bolt first then tighten the lower bolt.
- Be sure to rest the eyelet joint against the stopper when tightening the oil bolt.

TORQUE:

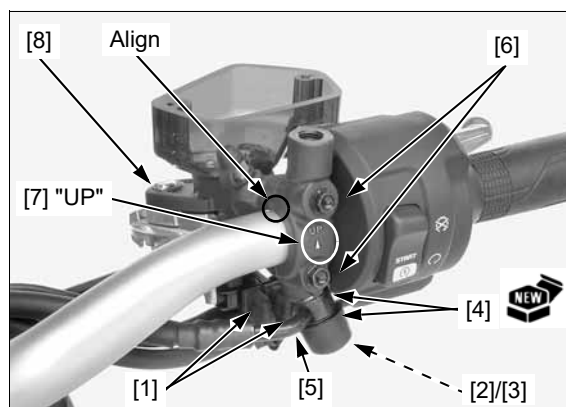
Front master cylinder holder bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)

Oil bolt:

34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the front brake hydraulic system (page 18-5).



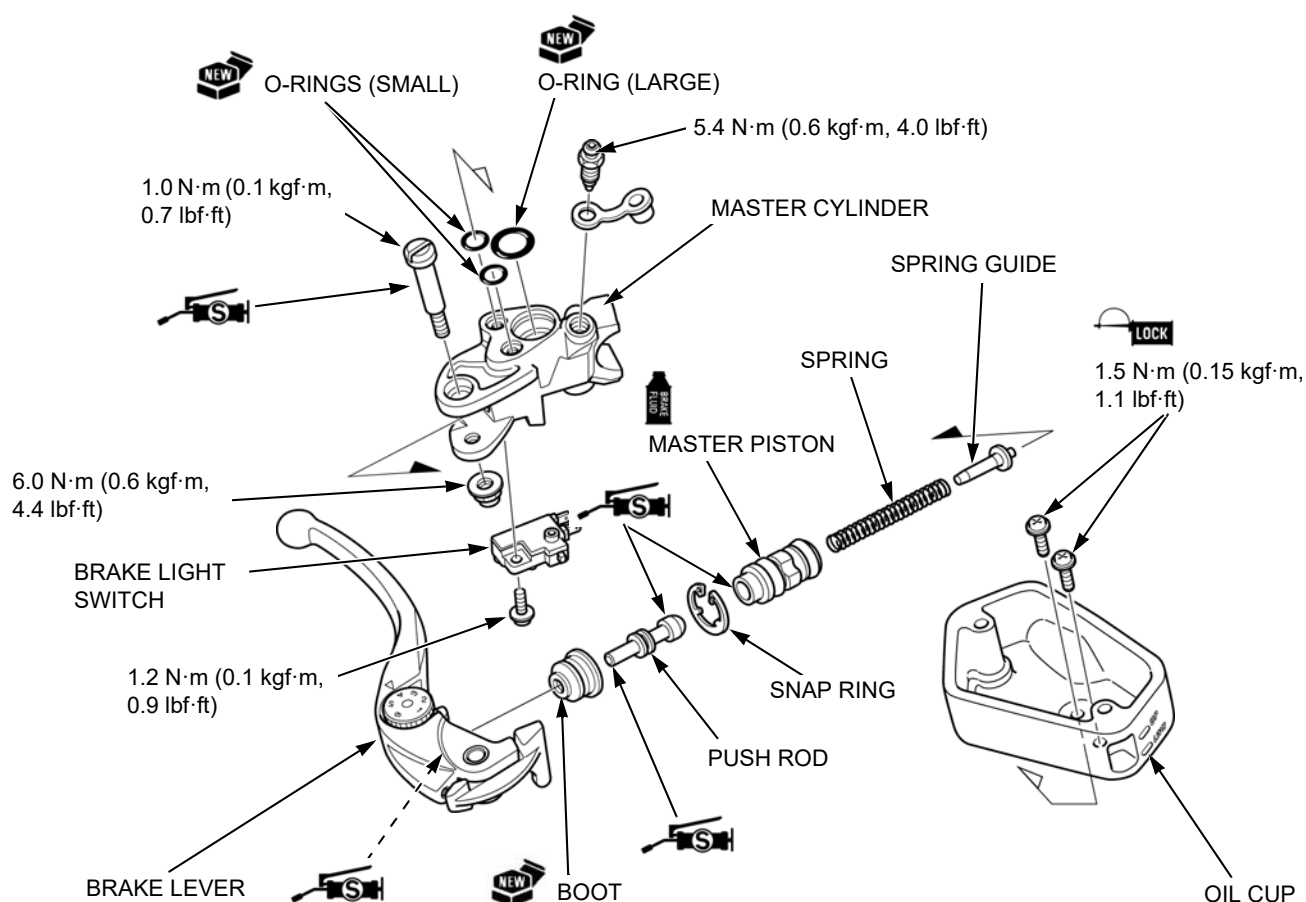
DISASSEMBLY/ASSEMBLY

Disassemble and assemble the front master cylinder as following illustration.

- Do not allow the piston cup lips to turn inside out.
- Install the snap ring with the chamfered edge facing the thrust load side and be certain it is firmly seated in the groove. Do not reuse the snap ring which could easily spin in the groove.
- Align the switch boss with the master cylinder hole properly.
- When tightening the pivot nut, hold the pivot bolt securely.

NOTICE

- To avoid tarnish of the oil cup, wash with water.



INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

- master cylinder
- master piston
- piston cups
- spring
- boot

Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

REAR MASTER CYLINDER/BRAKE PEDAL

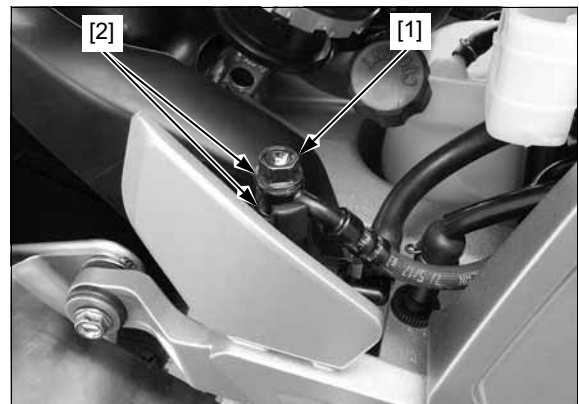
REMOVAL/INSTALLATION

Remove the bolt [1] and reservoir [2] from the stay.



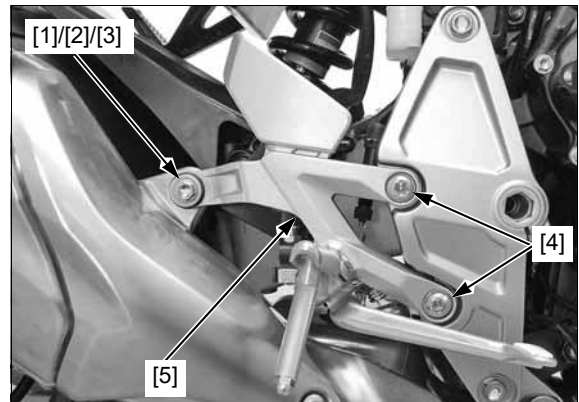
When removing the oil bolt, cover the end of the brake hose to prevent contamination.

Remove the oil bolt [1] and sealing washers [2].



Remove the muffler mounting nut [1], bolt [2] and washer [3].

Remove the socket bolts [4] and main step assembly [5] (and support it securely)



Remove the following:

- switch spring [1]
- brake light switch [2]
- cotter pin [3]
- joint pin [4]
- master cylinder mounting bolts [5]
- master cylinder assembly [6]
- return spring [7]
- snap ring [8] and washer [9]
- brake pedal [10]

NOTE:

- Apply grease to the brake pedal pivot sliding area (grease groove).
- Replace the cotter pin and sealing washers with new ones.
- Replace the master cylinder mounting bolts with new ones.
- Install the snap ring with the chamfered edge facing the thrust load side and be certain it is firmly seated in the groove. Do not reuse the snap ring which could easily spin in the groove.
- Install each spring in the direction as shown.
- Be sure to rest the eyelet joint against the stopper when tightening the oil bolt.

TORQUE:

Main step mounting socket bolt:

37 N·m (3.8 kgf·m, 27 lbf·ft)

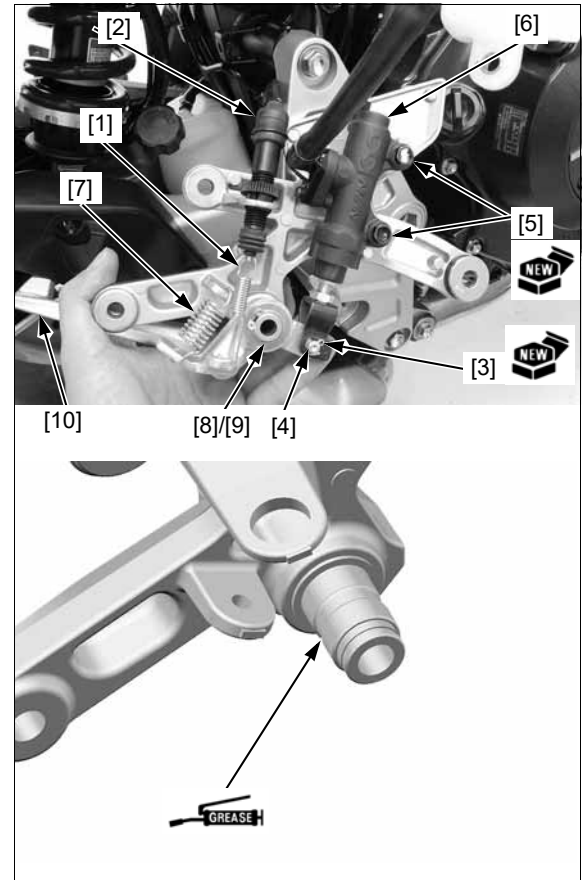
Oil bolt:

34 N·m (3.5 kgf·m, 25 lbf·ft)

Rear master cylinder mounting bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)

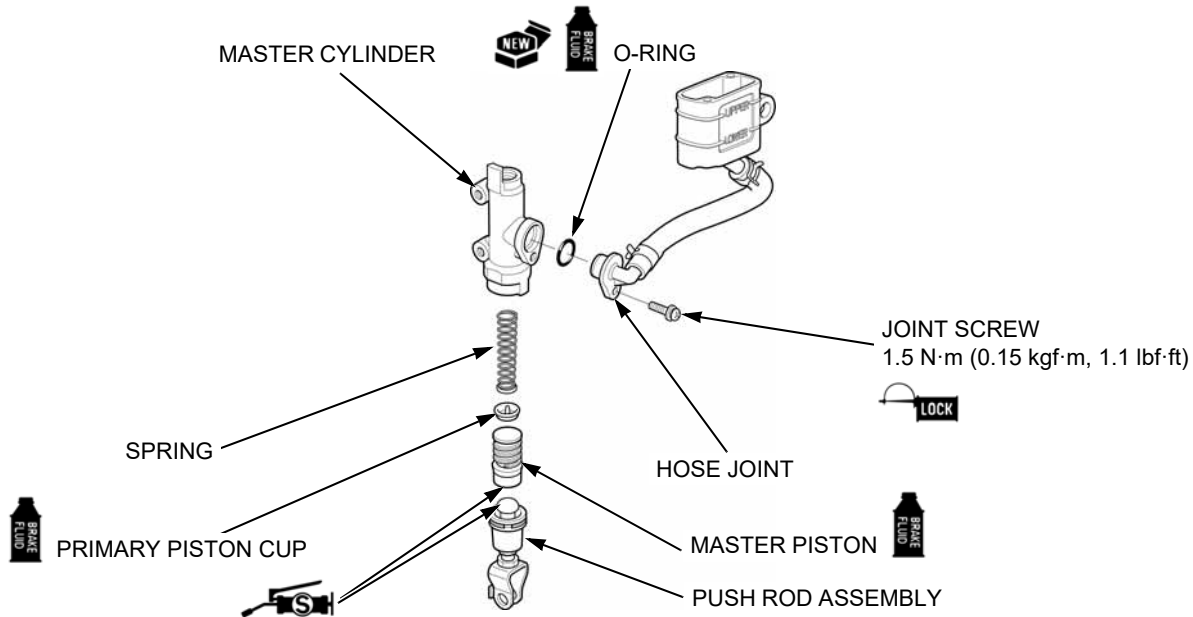
Fill and bleed the rear brake hydraulic system (page 18-5).



MASTER CYLINDER DISASSEMBLY/ ASSEMBLY

Disassemble and assemble the rear master cylinder as following illustration.

- Adjust the push rod length between the center of the lower mounting bolt hole and center of the joint pin hole when installing the push rod joint.
- Do not allow the piston cup lips to turn inside out.
- Install the snap ring with the chamfered edge facing the thrust load side and be certain it is firmly seated in the groove. Do not reuse the snap ring which could easily spin in the groove.

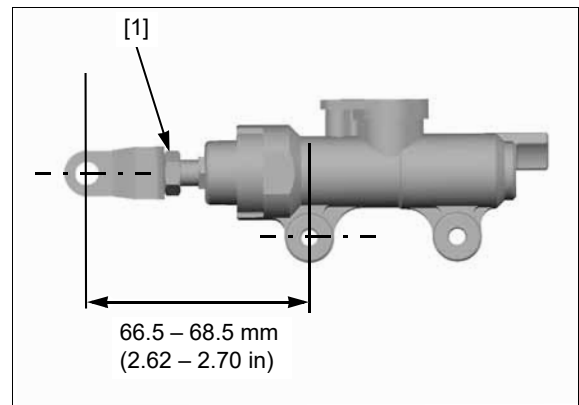


When the push rod has been disassembled, adjust the push rod length so that the distance from the center of the master cylinder lower mounting bolt hole to the center of the joint pin hole is standard length as shown.

After adjustment, tighten the joint nut [1] 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]
 - brake caliper [4]

Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washers with new ones.
- Be sure to rest the eyelet joint against the stopper when tightening the oil bolt.

TORQUE: Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

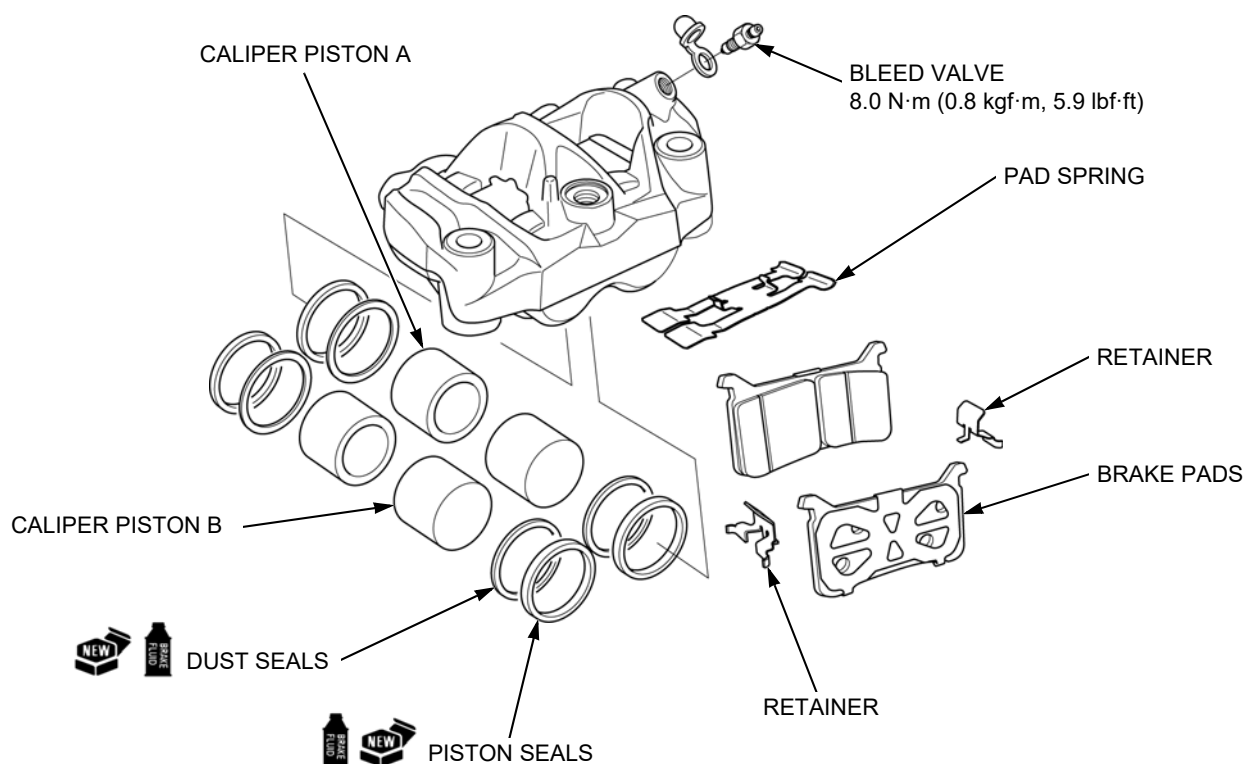
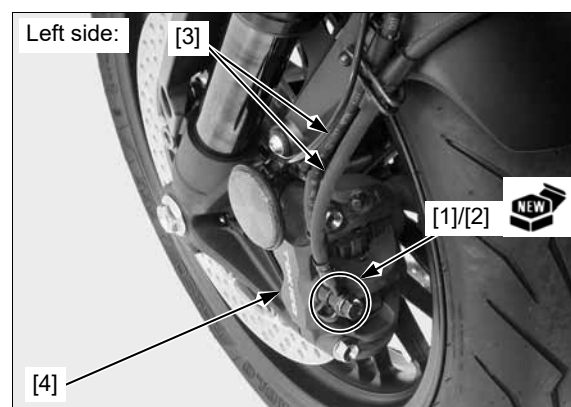
Fill and bleed the front brake hydraulic system (page 18-5).

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the front brake caliper as following illustration.

For brake pad removal/installation (page 18-9).

- Mark the pistons to ensure that they are reinstalled in their original locations.
- When removing the caliper pistons with compressed air, place a shop towel over the pistons to prevent damaging the pistons and caliper body. Do not use high pressure or bring the nozzle too close to the fluid inlet.
- Install the pistons with the opening toward the pads.



HYDRAULIC BRAKE

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).

Remove the following:

When removing the oil bolt, cover the end of brake hose to prevent contamination.

- oil bolt [1]
- sealing washers [2]
- brake hose [3]
- brake caliper [4]

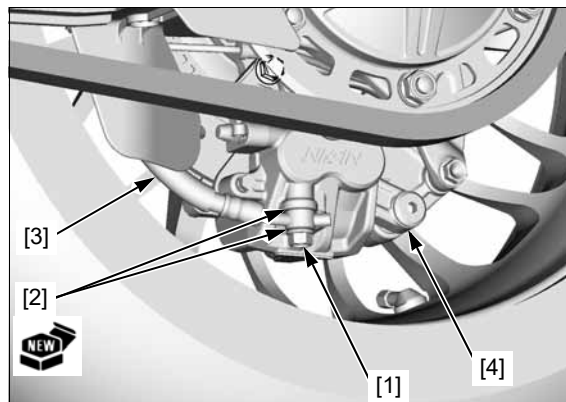
Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washers with new ones.
- Be sure to rest the eyelet stopper pin against the caliper body when tightening the oil bolt.

TORQUE: Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the rear brake hydraulic system (page 18-5).

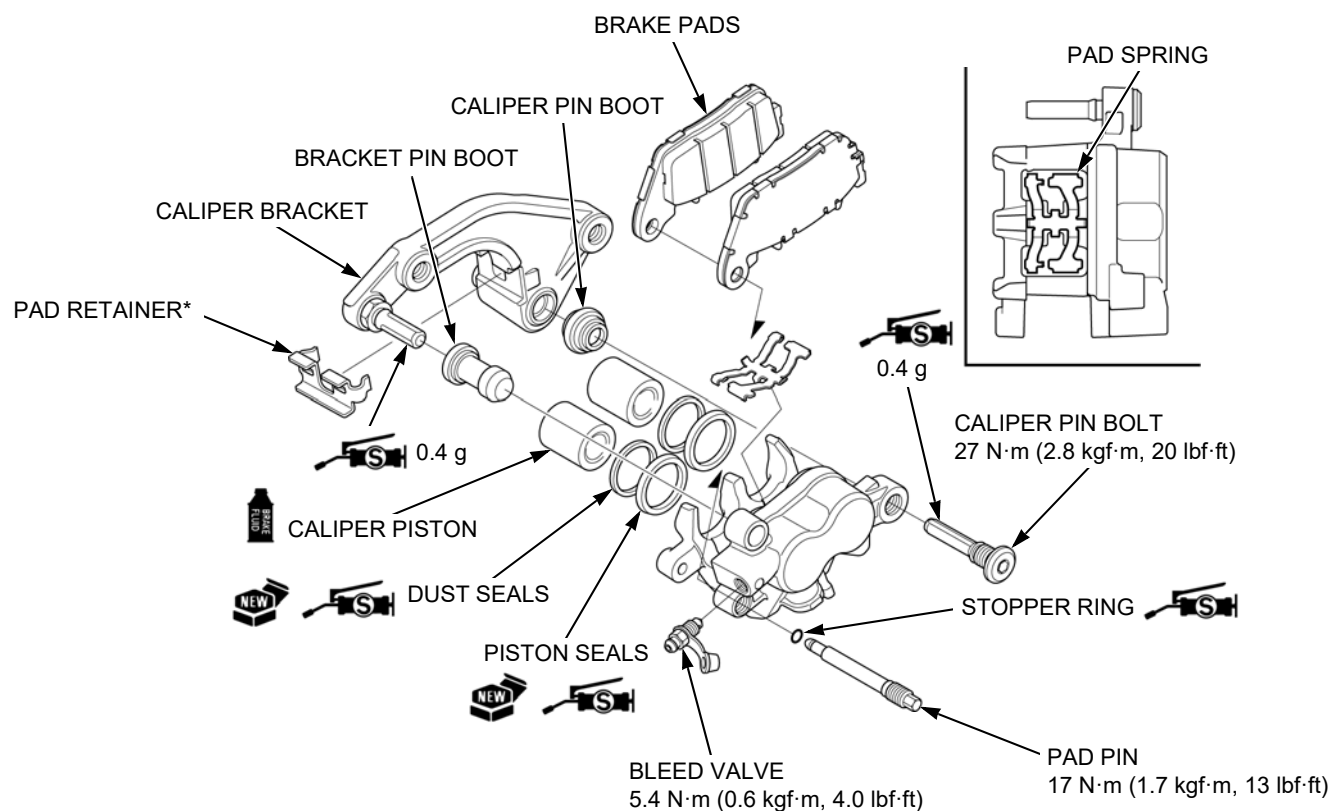


DISASSEMBLY/ASSEMBLY

Disassemble and assemble the rear brake caliper as following illustration.

For brake pad removal/installation (page 18-9).

- When removing the caliper piston with compressed air, place a shop towel over the piston to prevent damaging the piston and caliper body. Do not use high pressure or bring the nozzle too close to the fluid inlet.
- Install the pistons with the opening toward the pads.



*Apply Honda Bond A or equivalent to the retainer seating surface.

INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

- caliper cylinders
- caliper pistons

Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

MEMO

19. ANTI-LOCK BRAKE SYSTEM (ABS)

SERVICE INFORMATION.....	19-2	ABS INDICATOR CIRCUIT TROUBLESHOOTING	19-9
SYSTEM LOCATION	19-2	DTC TROUBLESHOOTING	19-11
SYSTEM DIAGRAM	19-3	WHEEL SPEED SENSOR	19-20
ABS TROUBLESHOOTING INFORMATION.....	19-4	ABS MODULATOR	19-23
DTC INDEX.....	19-7		

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 (conventional brake) of the brake system, see Hydraulic Brake section (page 18-2).
- The ABS control unit is integrated in the modulator. Do not disassemble the ABS modulator. Replace the ABS modulator as an assembly when it is faulty.
- The ABS control unit performs pre-start self-diagnosis to check whether the ABS functions normally until the vehicle speed reaches 10 km/h (6 mph). After pre-start self-diagnosis, the ABS control unit monitors the ABS functions and vehicle running condition constantly until the ignition switch is turned OFF (ordinary self-diagnosis).
- When the ABS control unit detects a problem, it stops the ABS function and switches back to the conventional brake operation, and the ABS indicator blinks or stays on. Take care during the test-ride.
- Read "ABS TROUBLESHOOTING INFORMATION" carefully, inspect and troubleshoot the ABS system according to the troubleshooting flow chart. Observe each step of the procedures one by one. Write down the DTC and probable faulty part before starting diagnosis and troubleshooting.
- Use a fully charged battery. Do not diagnose with a charger connected to the battery.
- After troubleshooting, erase the DTC and perform the pre-start self-diagnosis to be sure that the ABS indicator is operating normally (page 19-4).
- 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 19-20).
- The following color codes are used throughout this section.

Be = Beige
Lg = Light green

Bl = Black
O = Orange

Br = Brown
P = Pink

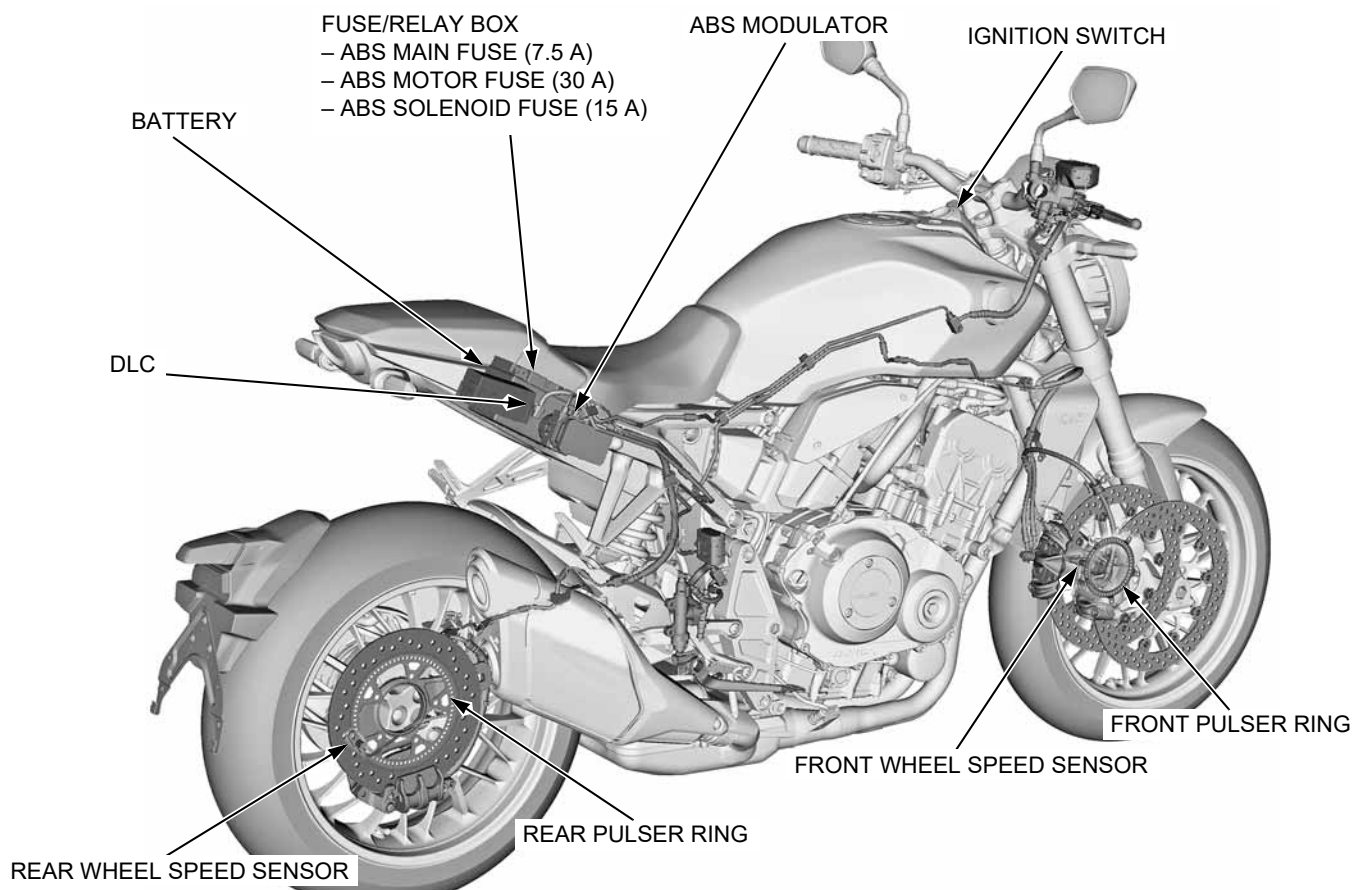
Bu = Blue
R = Red

G = Green
V = Violet

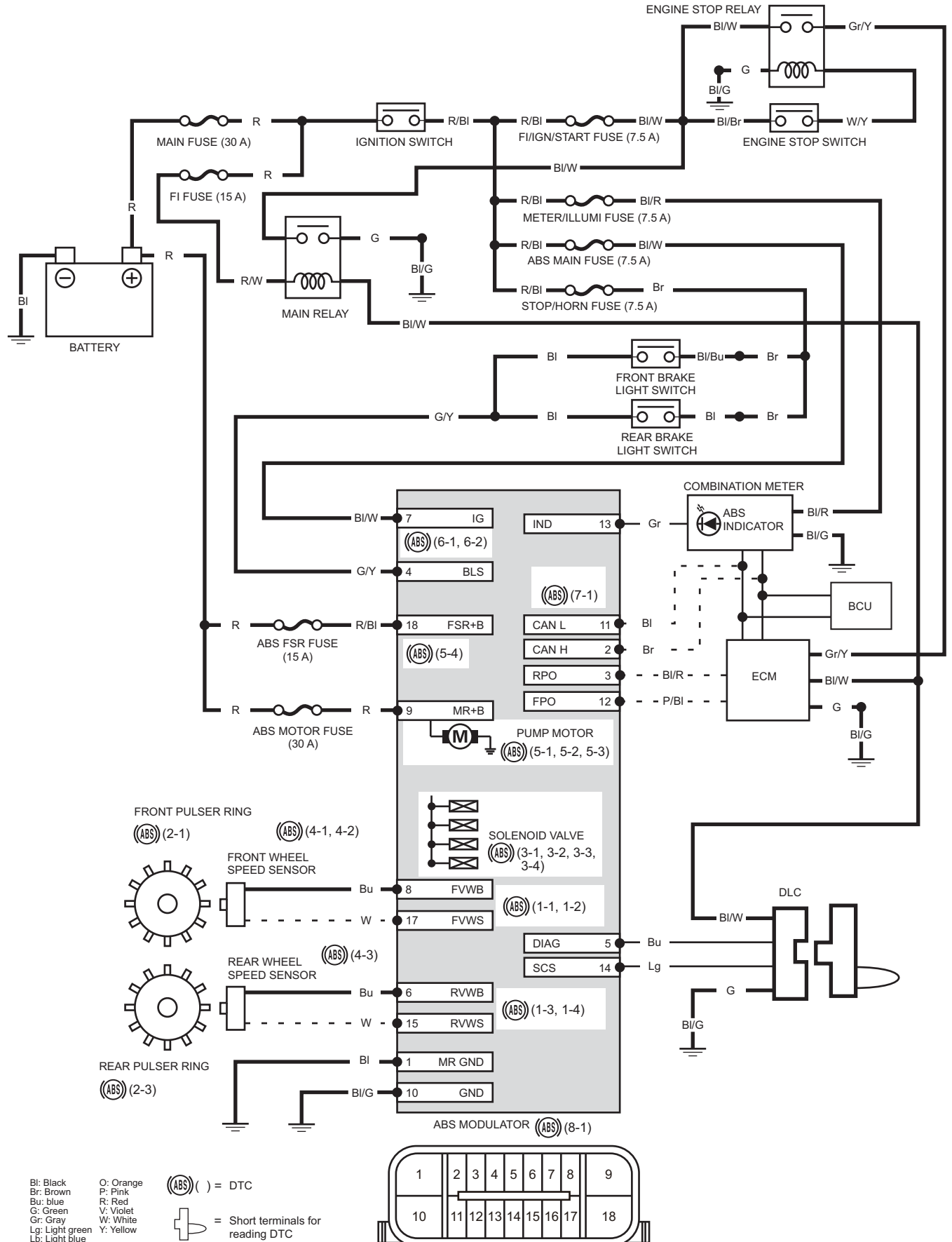
Gr = Gray
W = White

Lb = Light blue
Y = Yellow

SYSTEM LOCATION



SYSTEM DIAGRAM



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.

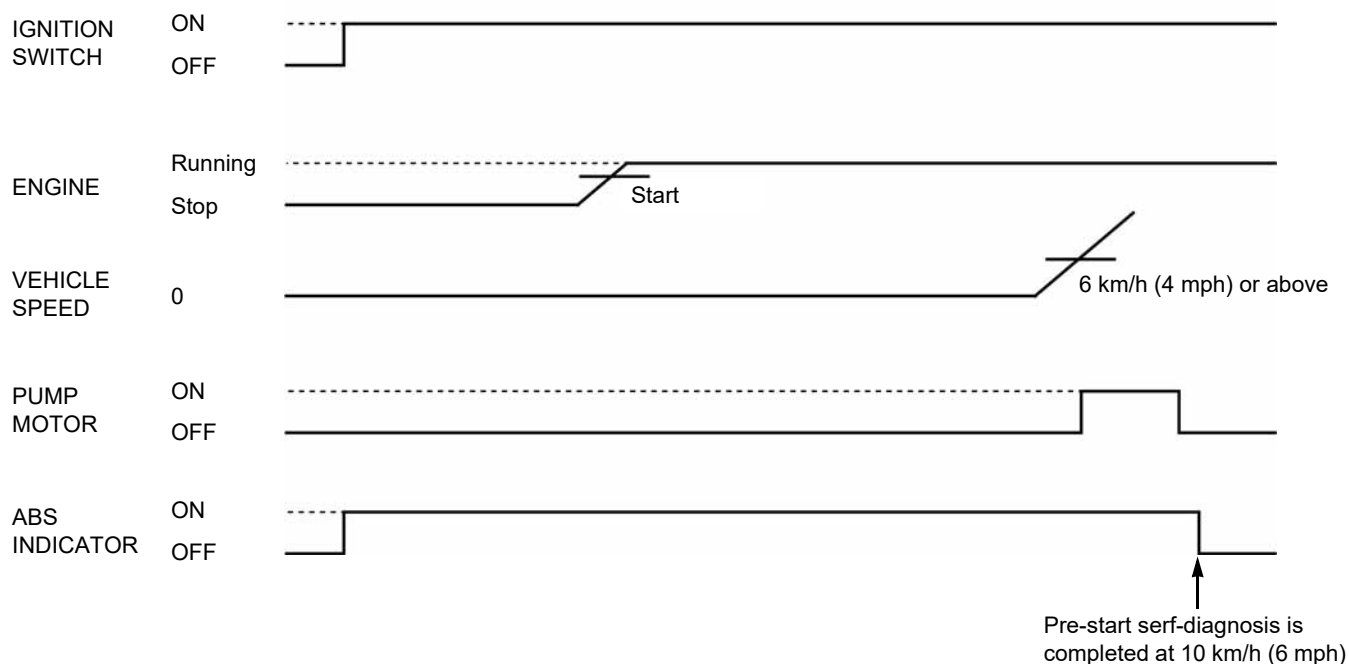
When the motorcycle is running, pulse signals generated at the front and rear wheel speed sensors are sent to the ABS control unit. When the vehicle speed reaches approximately 6 km/h (4 mph), the ABS control unit operates the pump motor to check it. When the vehicle speed reaches 10 km/h (6 mph), the 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 19-5).

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 19-9).

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

Refer to the PGM-FI system (page 4-4).

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 19-4).
- Do not apply the brake during DTC readout.

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

Read the DTC, stored data and follow the DTC index (page 19-7).

If the MCS is not available, perform the following.

Reading DTC with the ABS indicator

1. Connect the SCS short connector to the DLC (page 4-4).
2. Turn the ignition switch ON with the engine stop switch to "O".

The ABS indicator should come on for 2 seconds (start signal), then goes off for 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.

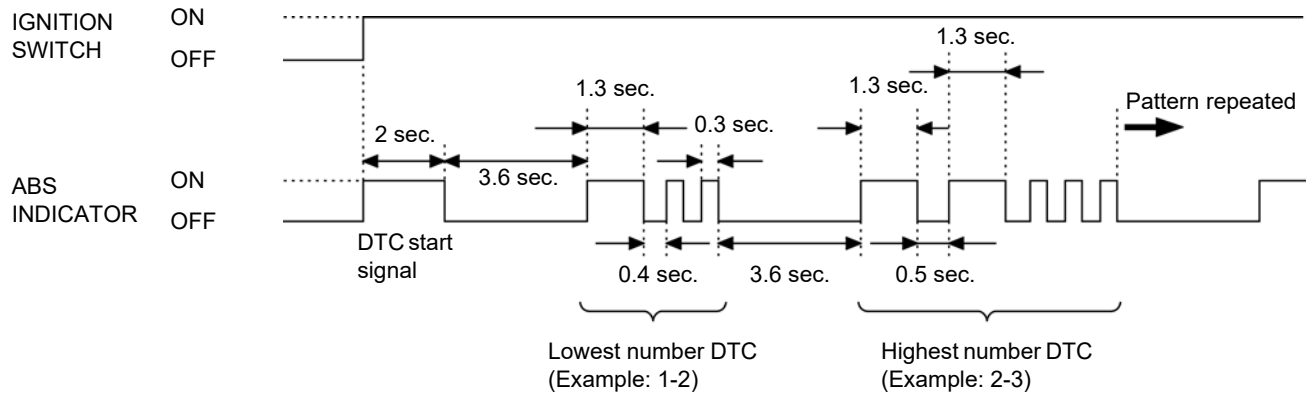
3. Turn the ignition switch OFF and disconnect the SCS short connector.

Install the removed parts in the reverse order of removal.

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.

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

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

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

ANTI-LOCK BRAKE SYSTEM (ABS)

How to erase the DTC without MCS

1. Connect the SCS short connector to the DLC (page 4-4).
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 disconnect the SCS connector from the DLC.

Install the removed parts in the reverse order of removal.

CIRCUIT INSPECTION

INSPECTION AT ABS MODULATOR CONNECTOR

Remove the main seat (page 2-4).

Turn the ignition switch OFF.

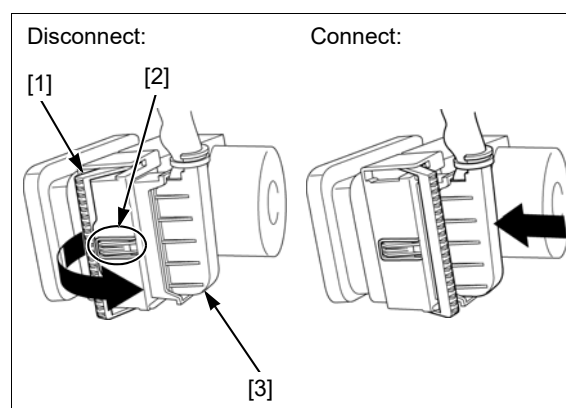
Disconnecting procedure:

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].

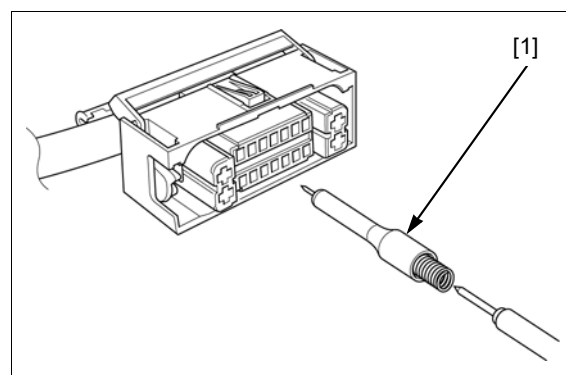
Connecting procedure:

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.

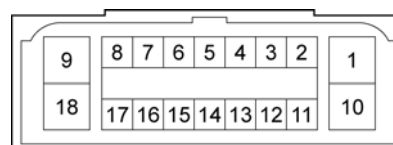
Make sure the connector is locked securely.



- 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.



TERMINAL LAYOUT:



(Terminal side of the wire harness)

DTC INDEX

NOTE:

- The ABS indicator might blink in the following cases. Correct the faulty part.
 - Incorrect tire pressure.
 - Tires not recommended for the motorcycle were installed (incorrect tire size).
 - Deformation of the wheel or tire.
- The ABS indicator might blink while riding under the following conditions. This is temporary failure. Be sure to erase the DTC (page 19-5).

Then, test-ride the motorcycle above 30 km/h (19 mph) and check the DTC (page 19-5). Ask the rider for the riding conditions in detail when the motorcycle is brought in for inspection.

 - The motorcycle has continuously run bumpy roads.
 - The front wheel leaves the ground for a long time when riding (wheelie).
 - Only either the front or rear wheel rotates.
 - The ABS operates continuously.
 - The ABS control unit has been disrupted by an extremely powerful radio wave (electromagnetic interference).

DTC	Function failure	Detection		Symptom/Fail-safe function	Refer to
		A	B		
–	ABS indicator malfunction • ABS modulator voltage input line • Indicator related wires • Combination meter • ABS modulator • ABS MAIN fuse (7.5 A)			• ABS indicator never comes ON at all	19-9
				• ABS indicator stays ON	19-9
1-1	Front wheel speed sensor circuit malfunction (open circuit) • Wheel speed sensor or related wires	○	○	• Stops ABS operation	19-11
1-2	Front wheel speed sensor malfunction • Wheel speed sensor, pulser ring or related wires • Electromagnetic interference		○	• Stops ABS operation	19-11
1-3	Rear wheel speed sensor circuit malfunction (open circuit) • Wheel speed sensor or related wires	○	○	• Stops ABS operation	19-13
1-4	Rear wheel speed sensor malfunction • Wheel speed sensor, pulser ring or related wires • Electromagnetic interference		○	• Stops ABS operation	19-13
2-1	Front pulser ring • Pulser ring or related wires		○	• Stops ABS operation	19-11
2-3	Rear pulser ring • Pulser ring or related wires		○	• Stops ABS operation	19-13
3-1	Solenoid valve malfunction • Fail safe relay (ABS modulator) or related wires • Solenoid valve (ABS modulator) • ABS SOLENOID fuse (15 A)	○	○	• Stops ABS operation	19-15
3-2					
3-3					
3-4					
4-1	Front wheel lock • Riding condition		○	• Stops ABS operation	19-11
4-2	Front wheel lock (Wheelie) • Riding condition		○		19-11
4-3	Rear wheel lock • Riding condition		○	• Stops ABS operation	19-13
5-1	Pump motor lock • Pump motor (ABS modulator) or related wires • ABS MOTOR fuse (30 A)	○	○	• Stops ABS operation	19-15
5-2	Pump motor stuck off • Pump motor (ABS modulator) or related wires • ABS MOTOR fuse (30 A)	○	○	• Stops ABS operation	
5-3	Pump motor stuck on • Pump motor (ABS modulator) or related wires • ABS MOTOR fuse (30 A)	○	○	• Stops ABS operation	
5-4	Fail-safe relay malfunction • Fail-safe relay (ABS modulator) or related wires • ABS SOLENOID fuse (15 A)	○	○	• Stops ABS operation	19-17
6-1	Power circuit under voltage • Input voltage (too low) • ABS MAIN fuse (7.5 A) • ABS MOTOR fuse (30 A)	○	○	• Stops ABS operation	19-18

ANTI-LOCK BRAKE SYSTEM (ABS)

DTC	Function failure	Detection		Symptom/Fail-safe function	Refer to
		A	B		
6-2	Power circuit over voltage • Input voltage (too high) • ABS MAIN fuse (7.5 A)	○	○	• Stops ABS operation	19-18
7-1	Tire malfunction • Tire size		○	• Stops ABS operation	19-19
8-1	ABS control unit • ABS control unit malfunction (ABS modulator)	○	○	• Stops ABS operation	19-19

(A) Pre-start self-diagnosis (page 19-4)

(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 21-8).

1. Indicator Operation Inspection

Turn the ignition switch OFF.
Disconnect the ABS modulator 18P (Black) connector (page 19-6).
Turn the ignition switch ON with the engine stop switch "○".
Check the ABS indicator.

Does the ABS indicator come on?

YES – Faulty ABS modulator

NO – GO TO STEP 2.

2. Indicator Signal Line Short Circuit Inspection

Turn the ignition switch OFF.
Check for continuity between the wire harness side 18P (Black) connector [1] and ground.

TOOL:

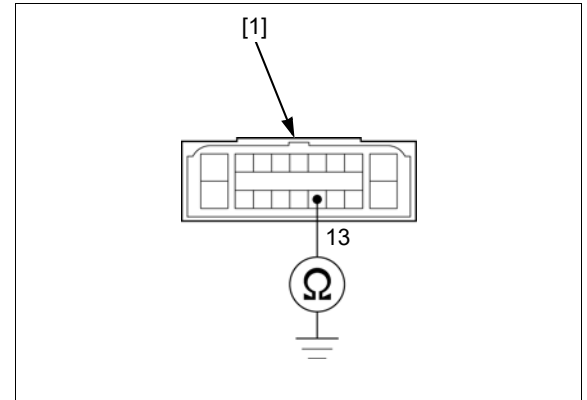
Test probe 07ZAJ-RDJA110

Connection: 13 – Ground

Is there continuity?

YES – Short circuit in the Gray 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 19-6).
Check for continuity between the wire harness side 18P (Black) connector [1] and ground.

TOOL:

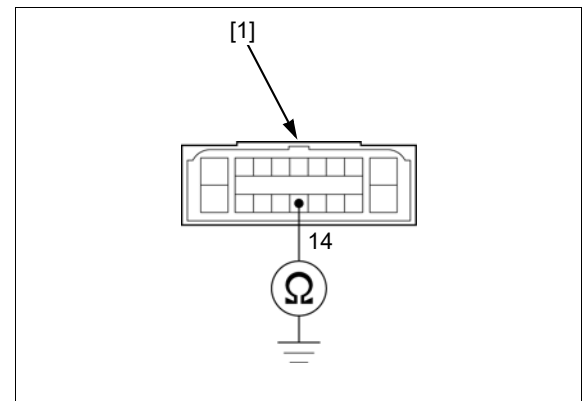
Test probe 07ZAJ-RDJA110

Connection: 14 – Ground

Is there continuity?

YES – Short circuit in the Light green wire

NO – GO TO STEP 2.



ANTI-LOCK BRAKE SYSTEM (ABS)

2. Indicator Signal Line Open Circuit Inspection

Short the wire harness side 18P (Black) connector [1] terminal to the ground with a jumper wire [2].

TOOL:

Test probe 07ZAJ-RDJA110

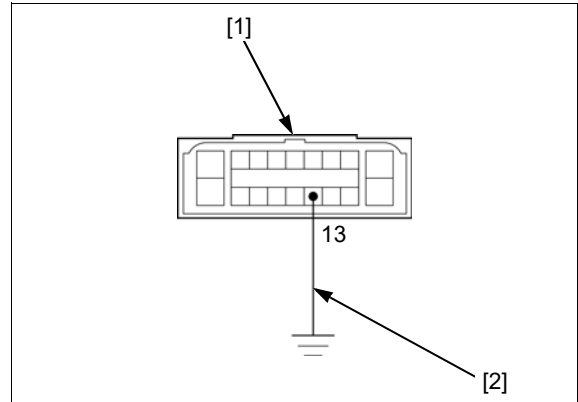
Connection: 13 – Ground

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 Gray wire
• Faulty combination meter (if the Gray wire is OK)



3. Modulator Ground Line Open Circuit Inspection

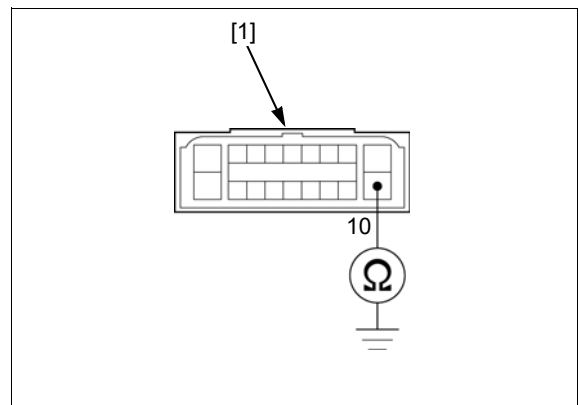
Turn the ignition switch OFF.
Check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

Connection: 10 – Ground

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Green/black wire



4. Fuse Inspection

Open the fuse/relay box cover.
Check the ABS MAIN fuse (7.5 A) for blown.

Is the fuse blown?

YES – GO TO STEP 5.

NO – GO TO STEP 6.

5. Power Input Line Short Circuit Inspection

With the ABS MAIN fuse (7.5 A) removed, check for continuity between the wire harness side 18P (Black) connector [1] and ground.

TOOL:

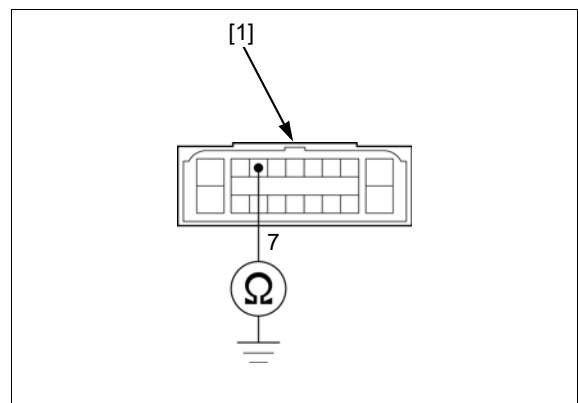
Test probe 07ZAJ-RDJA110

Connection: 7 – Ground

Is there continuity?

YES – Short circuit in the Black/white wire

NO – Intermittent failure. Replace the ABS MAIN fuse (7.5 A) with a new one, and recheck.



6. Power Input Line Open Circuit Inspection

Install the ABS MAIN fuse (7.5 A).
Turn the ignition switch ON with the engine stop switch "O".
Measure the voltage between the wire harness side 18P (Black) connector [1] and ground.

TOOL:

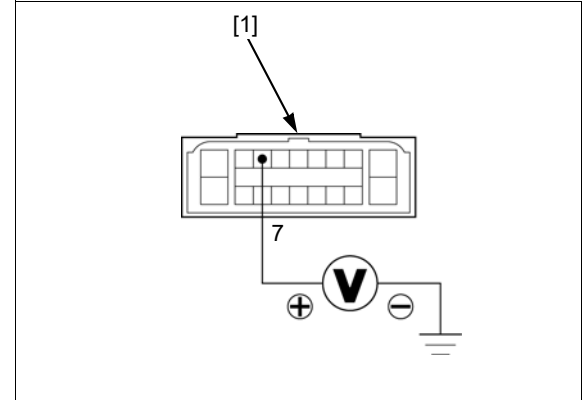
Test probe 07ZAJ-RDJA110

Connection: 7 (+) – Ground (–)

Is there battery voltage?

YES – Faulty ABS modulator

NO – Open circuit in the Black/white wire



DTC 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 19-5).
Then test-ride the motorcycle to check that the ABS indicator operates normally during pre-start self-diagnosis (page 19-4).

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 19-7). This is temporary failure. Erase the DTC (page 19-5).
Then test-ride the motorcycle above 30 km/h (19 mph) and check that the ABS indicator operates normally (page 19-4).
- 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 19-20).

Is the air gap correct?

YES – GO TO STEP 2.

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

ANTI-LOCK BRAKE SYSTEM (ABS)

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.

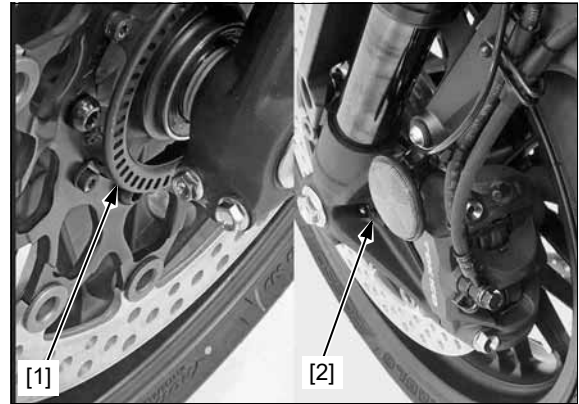
Check the installation condition of the pulser ring or wheel speed sensor for looseness.

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 Short Circuit Inspection

Disconnect the front wheel speed sensor 2P (Gray) connector (page 19-20).

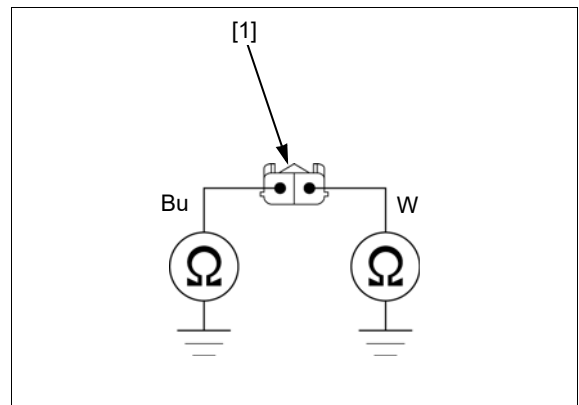
Check for continuity between each terminal of the sensor side 2P (Gray) connector [1] and ground.

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 19-6).

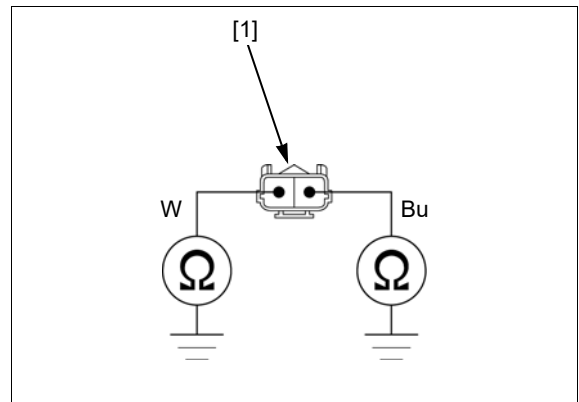
Check for continuity between each terminal of the wire harness side 2P (Gray) connector [1] and ground.

Connection: White – Ground
Blue – Ground

Is there continuity?

YES – • Short circuit in the White wire
• Short circuit in the Blue wire

NO – GO TO STEP 5.



5. Front Wheel Speed Sensor Line Open Circuit Inspection

Short the wire harness side 18P (Black) connector [1] terminals with a jumper wire [2].

Connection: 8 – 17

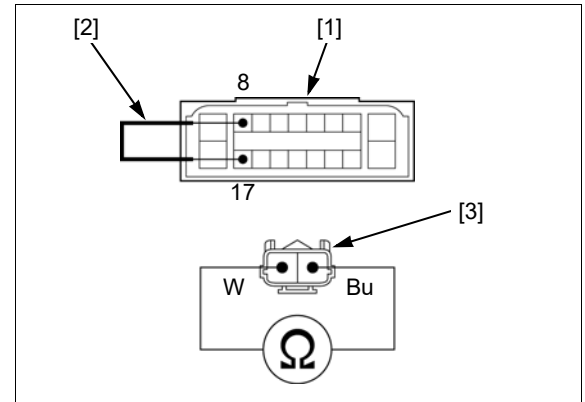
Check for continuity between the wire harness side 2P (Gray) connector [3] terminals.

Connection: White – Blue

Is there continuity?

YES – GO TO STEP 6.

NO – Open circuit in the White or Blue wire



6. Failure Reproduction with a New Speed Sensor

Replace the front wheel speed sensor with a new one (page 19-20).

Connect the 18P (Black) connector and 2P (Gray) connector.

Erase the DTC (page 19-5).

Test-ride the motorcycle above 30 km/h (19 mph).

Recheck the DTC (page 19-5).

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 19-7). This is temporary failure. Erase the DTC (page 19-5). Then test-ride the motorcycle above 30 km/h (19 mph) and check that the ABS indicator operates normally (page 19-4).
- If the DTC 4-3 is indicated, check the rear brake for drag.

1. Speed Sensor Air Gap Inspection

Measure the air gap between the speed sensor and pulser ring (page 19-20).

Is the air gap correct?

YES – GO TO STEP 2.

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

ANTI-LOCK BRAKE SYSTEM (ABS)

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.

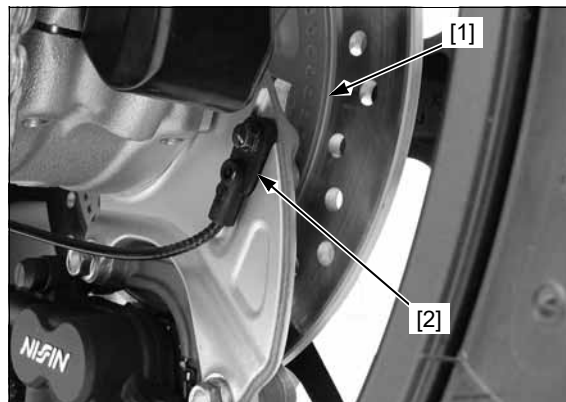
Check the installation condition of the pulser ring or wheel speed sensor for looseness.

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 Short Circuit Inspection

Disconnect the rear wheel speed sensor 2P (Gray) connector (page 19-21).

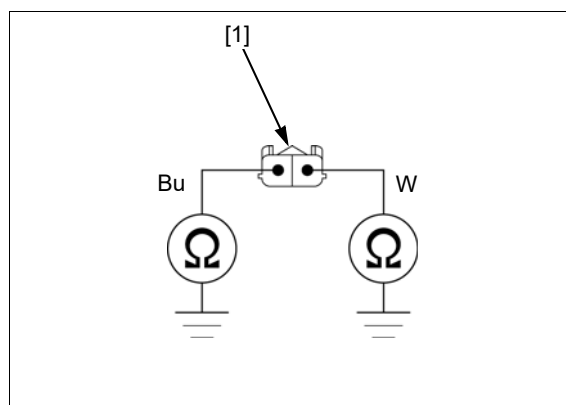
Check for continuity between each terminal of the sensor side 2P (Gray) connector [1] and ground.

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 19-6).

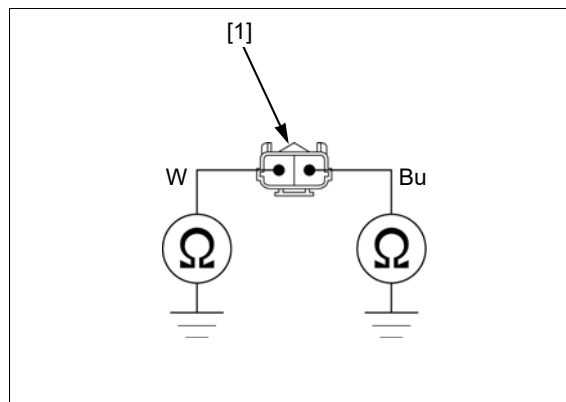
Check for continuity between each terminal of the wire harness side 2P (Gray) connector [1] and ground.

Connection: White – Ground
Blue – Ground

Is there continuity?

YES – • Short circuit in the White wire
• Short circuit in the Blue wire

NO – GO TO STEP 5.



5. Rear Wheel Speed Sensor Line Open Circuit Inspection

Short the wire harness side 18P (Black) connector [1] terminals with a jumper wire [2].

Connection: 6 – 15

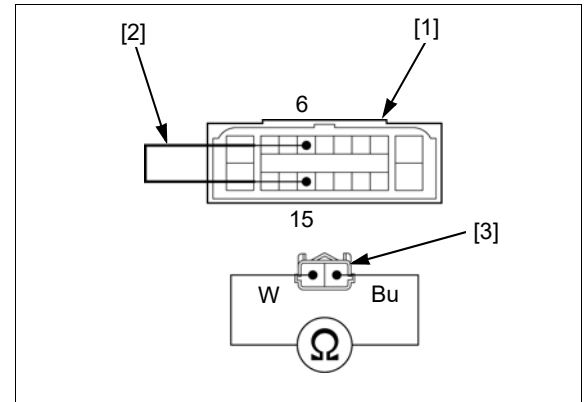
Check for continuity between the wire harness side 2P (Gray) connector [3] terminals.

Connection: White – Blue

Is there continuity?

YES – GO TO STEP 6.

NO – Open circuit in the White or Blue wire



6. Failure Reproduction with a New Speed Sensor

Replace the rear wheel speed sensor with a new one (page 19-21).

Connect the 18P (Black) connector and 2P (Gray) connector.

Erase the DTC (page 19-5).

Test-ride the motorcycle above 30 km/h (19 mph).

Recheck the DTC (page 19-5).

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)

NOTE:

- If the DTC 5-4 is indicated, troubleshoot it first.

1. Failure Reproduction

Erase the DTC (page 19-5).

Test-ride the motorcycle above 30 km/h (19 mph).

Recheck the DTC (page 19-5).

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/ Motor Relay)

1. Fuse Inspection

Turn the ignition switch OFF.

Remove the main seat (page 2-4).

Remove the fuse/relay box cover.

Check the ABS MOTOR fuse (30 A) for blown.

Is the fuse blown?

YES – GO TO STEP 2.

NO – GO TO STEP 3.

ANTI-LOCK BRAKE SYSTEM (ABS)

2. Motor Power Input Line Short Circuit Inspection

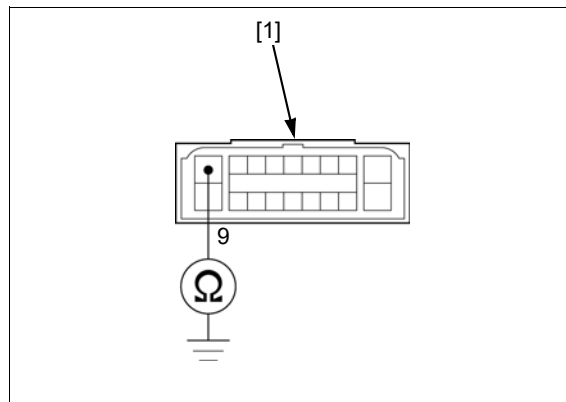
Disconnect the ABS modulator 18P (Black) connector (page 19-6).
With the ABS MOTOR fuse (30 A) removed, check for continuity between the wire harness side 18P (Black) connector [1] and ground.

Connection: 9 – Ground

Is there continuity?

YES – Short circuit in the Red wire

NO – Intermittent failure. Replace the ABS MOTOR fuse (30 A) with a new one, and recheck.



3. Motor Power Input Line Open Circuit Inspection

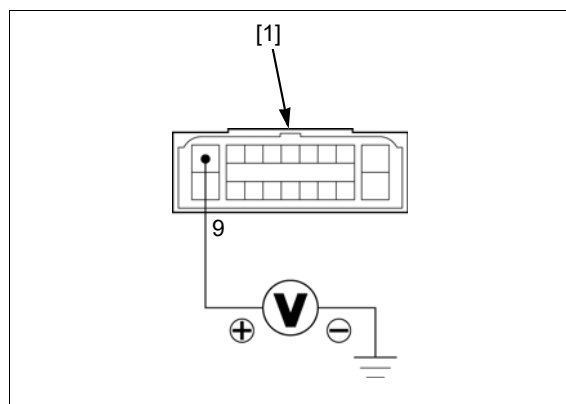
Install the ABS MOTOR fuse (30 A).
Disconnect the ABS modulator 18P (Black) connector (page 19-6).
Measure the voltage between the wire harness side 18P (Black) connector [1] and ground.

Connection: 9 (+) – Ground (-)

Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in the Red wire between the 18P (Black) connector and battery



4. Motor Power Ground Line Open Circuit Inspection

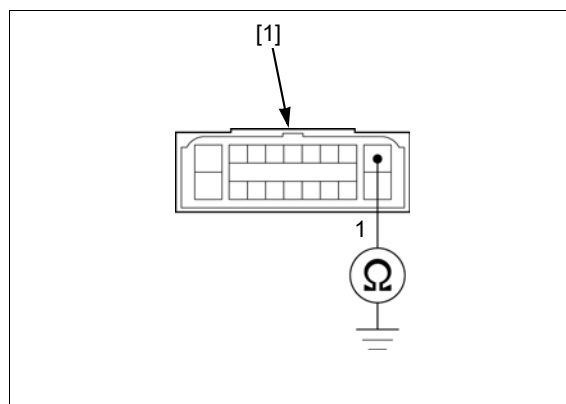
Check for continuity between the wire harness side 18P (Black) connector [1] and ground.

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 19-5).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-5).

Is the DTC 5-1, 5-2 or 5-3 indicated?

YES – Faulty ABS modulator

NO – Motor relay is normal (intermittent failure).

DTC 5-4 (Fail-safe Relay)

1. Fuse Inspection

Turn the ignition switch OFF.
Remove the main seat (page 2-4).
Remove the fuse/relay box cover.
Check the ABS SOLENOID fuse (15 A) for blown.

Is the fuse blown?

YES – GO TO STEP 2.

NO – GO TO STEP 3.

2. Relay Power Input Line Short Circuit Inspection

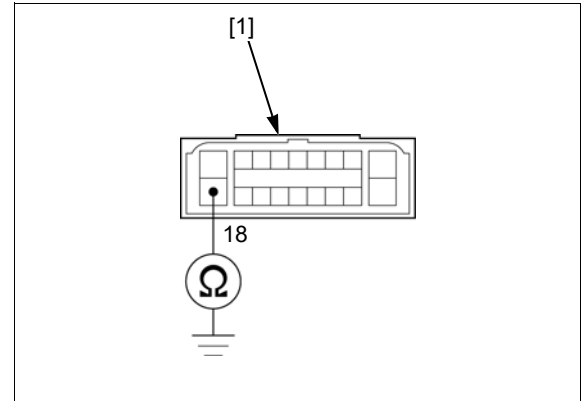
Disconnect the ABS modulator 18P (Black) connector (page 19-6).
With the ABS SOLENOID fuse (15 A) removed, check for continuity between the wire harness side 18P (Black) connector [1] and ground.

Connection: 18 – Ground

Is there continuity?

YES – Short circuit in the Red/black wire

NO – Intermittent failure. Replace the ABS SOLENOID fuse (15 A) with a new one, and recheck.



3. Relay Power Input Line Open Circuit Inspection

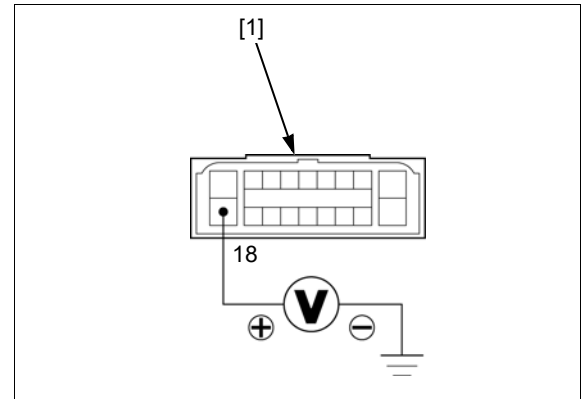
Install the ABS SOLENOID fuse (15 A).
Disconnect the ABS modulator 18P (Black) connector (page 19-6).
Measure the voltage between the wire harness side 18P (Black) connector [1] and ground.

Connection: 18 (+) – Ground (-)

Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in the Red/black or Red wire between the 18P (Black) connector and battery



4. Failure Reproduction

Connect the ABS modulator 18P (Black) connector.
Erase the DTC (page 19-5).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-5).

Is the DTC 5-4 indicated?

YES – Faulty ABS modulator

NO – Fail safe relay is normal (intermittent failure).

ANTI-LOCK BRAKE SYSTEM (ABS)

DTC 6-1 or 6-2 (Power Circuit)

1. Fuse Inspection

Turn the ignition switch OFF.
Remove the main seat (page 2-4).
Remove the fuse/relay box cover.
Check the ABS MAIN fuse (7.5 A) for blown.

Is the fuse blown?

YES – GO TO STEP 2.

NO – GO TO STEP 3.

2. Motor Power Input Line Short Circuit Inspection

Disconnect the ABS modulator 18P (Black) connector (page 19-6).
With the ABS MAIN fuse (7.5 A) removed, check for continuity between the wire harness side 18P (Black) connector [1] and ground.

TOOL:

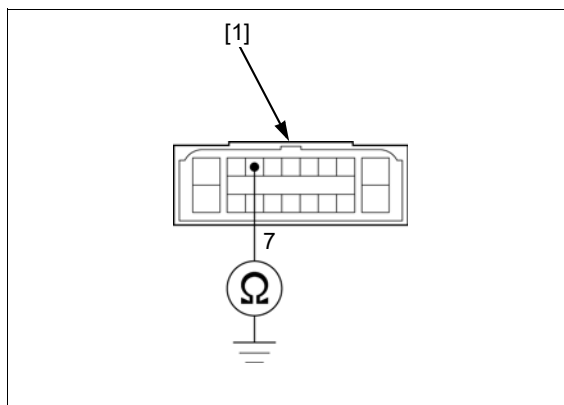
Test probe 07ZAJ-RDJA110

Connection: 7 – Ground

Is there continuity?

YES – Short circuit in the Black/white wire

NO – Intermittent failure. Replace the ABS MAIN fuse (7.5 A) with a new one, and recheck.



3. Motor Power Input Line Open Circuit Inspection

Install the ABS MAIN fuse (7.5 A).
Disconnect the ABS modulator 18P (Black) connector (page 19-6).
Measure the voltage between the wire harness side 18P (Black) connector [1] and ground.

TOOL:

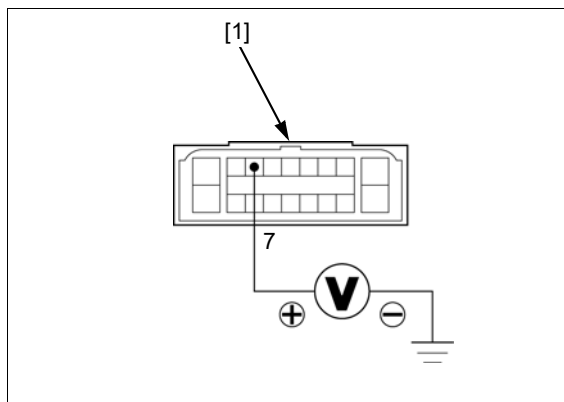
Test probe 07ZAJ-RDJA110

Connection: 7 (+) – Ground (-)

Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in the Black/white wire between the 18P (Black) connector and fuse/relay box



4. Battery Voltage Inspection

Inspect the battery voltage (page 20-5).

Is the battery voltage less than 8.0 V?

YES – Replace the battery (page 20-5).

NO – GO TO STEP 5.

5. Charging Voltage Inspection

Inspect the battery charging voltage (page 20-6).

Is the voltage more than 16.0 V?

YES – Faulty regulator/rectifier

NO – GO TO STEP 6.

6. Failure Reproduction

Erase the DTC (page 19-5).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-5).

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 19-5).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-5).

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 19-5).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-5).

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 fork and pulser ring
- Rear: Between the caliper bracket and pulser ring

It must be within specification.

Standard:

Front: 0.66 – 1.14 mm (0.026 – 0.045 in)

Rear: 0.27 – 1.24 mm (0.011 – 0.049 in)

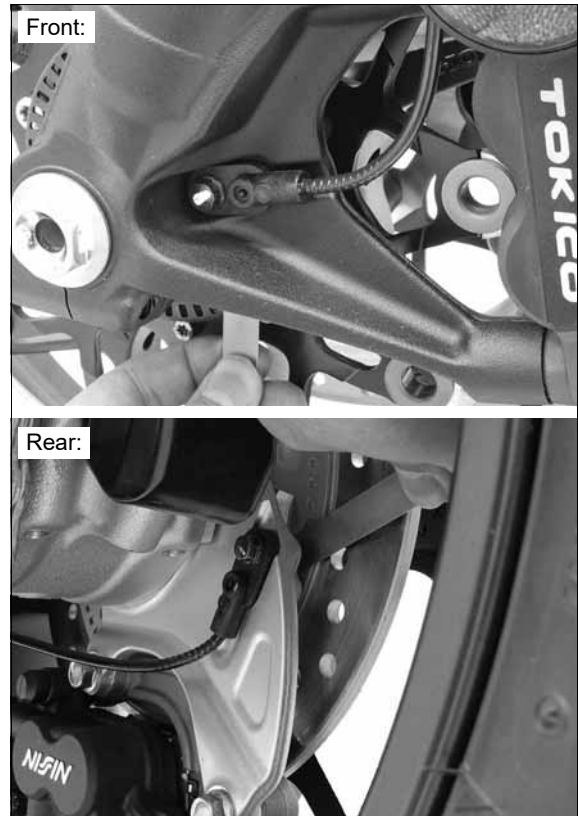
The air gap cannot be adjusted.

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 16-12)
- Rear pulser ring (page 17-9)

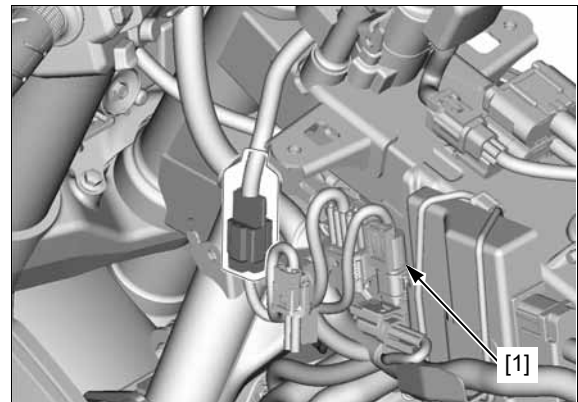


REMOVAL/INSTALLATION

FRONT WHEEL SPEED SENSOR

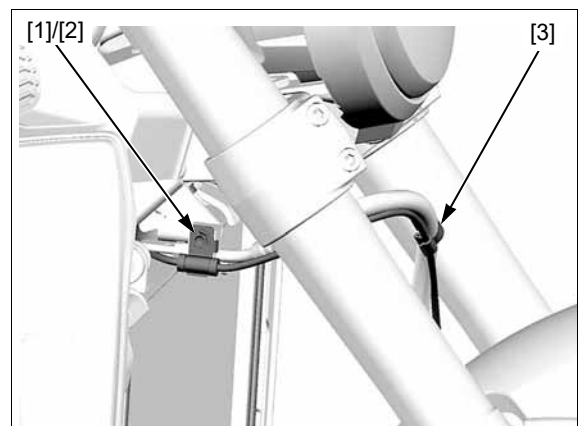
Lift and support the fuel tank (page 3-4).

Disconnect the front wheel speed sensor 2P (Black) connector [1].

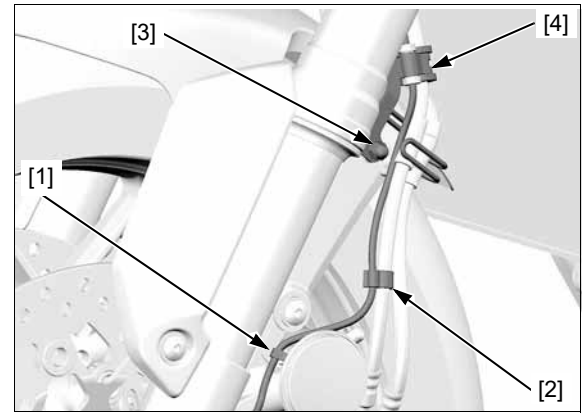


Remove the bolt [1] and wire clamp [2].

Remove the wire band [3].



Remove the wire clip [1] and wire band [2].
Remove the nut [3] and wire clamp [4].



Remove the following:

- Bolt [1]
- Front wheel speed sensor [2]

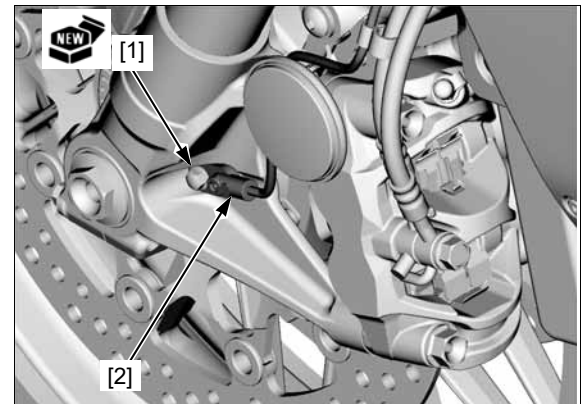
Route the sensor wire properly (page 1-24)

Installation is in the reverse order of removal.

NOTE:

- Clean the sensor tip and sensor installation area thoroughly, and be sure that no foreign materials are allowed.
- Replace the wheel speed sensor mounting bolt with new one.

After installation, check the air gap (page 19-20).



REAR WHEEL SPEED SENSOR

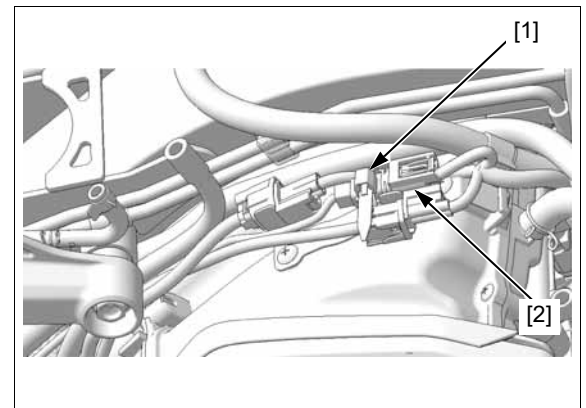
Remove the following:

- Air cleaner duct cover (page 3-5)
- Rear wheel (page 17-4)
- Rear fender C (page 2-9)

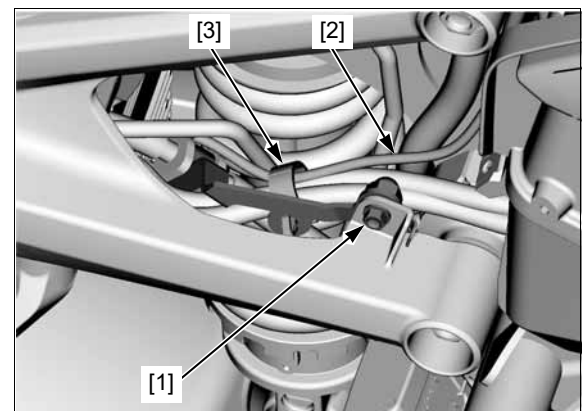
Lift and support the fuel tank (page 3-4).

Remove the band [1].

Disconnect the rear wheel speed sensor 2P (Black) connector [2].

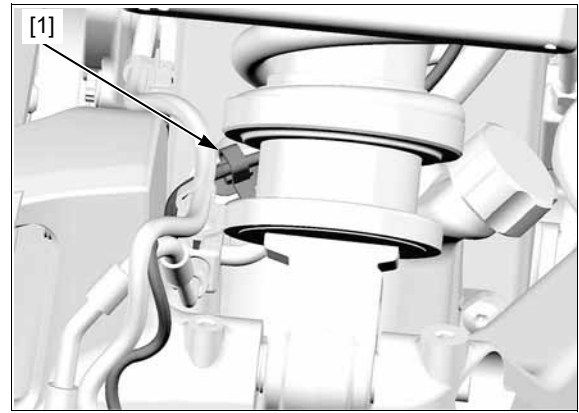


Remove the bolt [1] from the rear side frame and release the sensor wire [2] from the clamp [3].



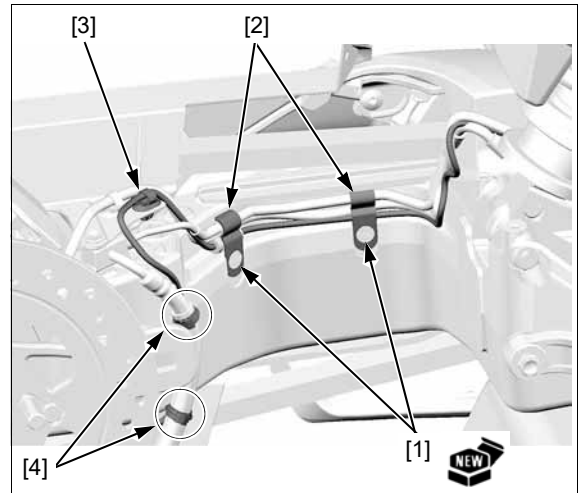
ANTI-LOCK BRAKE SYSTEM (ABS)

Remove the wire clips [1] from the stay.



Remove the following:

- Two screws [1] and clamp [2]
- Wire clip [3]
- Wire bands [4]



Remove the following:

- Bolt [1] and clamp [2]
- Bolt [3] and rear wheel speed sensor [4]

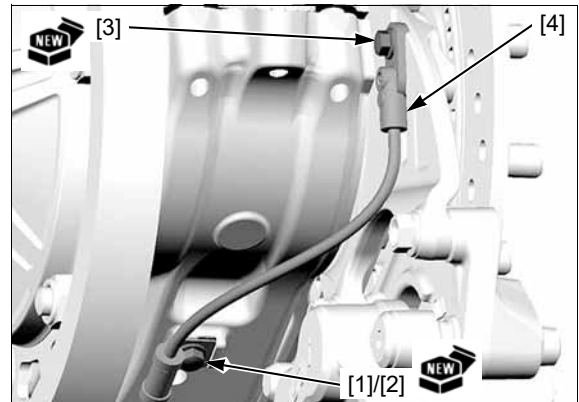
Route the sensor wire properly (page 1-24)

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.
- Replace the wheel speed sensor mounting bolt with new one.
- Replace the stay mounting screws with new one.
- For rear wheel installation (page 17-4)

After installation, check the air gap (page 19-20).



ABS MODULATOR

REMOVAL/INSTALLATION

Drain the brake fluid from the brake hydraulic systems (page 18-5).

Remove the Right seat rail (page 2-12).

- right seat rail (page 2-12)
- stater relay switch (page 6-8)

Disconnect the ABS modulator 18P (Black) connector (page 19-6).

Remove the oil bolt [1] and sealing washers [2].

Loosen the brake pipe joint nuts [3] to disconnect the brake pipes.

NOTE:

- After disconnecting, cover the ends of the brake pipes to prevent contamination.
- Be sure to align the eyelet stopper pin on the ABS modulator hole when tightening the oil bolt.

Remove the following:

- bolt/washer [1] (Except BR/II BR models)
- socket bolt [2] /washer [3] (BR/II BR models)
- socket bolt [4] /washer [5]
- ABS modulator [6]

Installation is in the reverse order of removal.

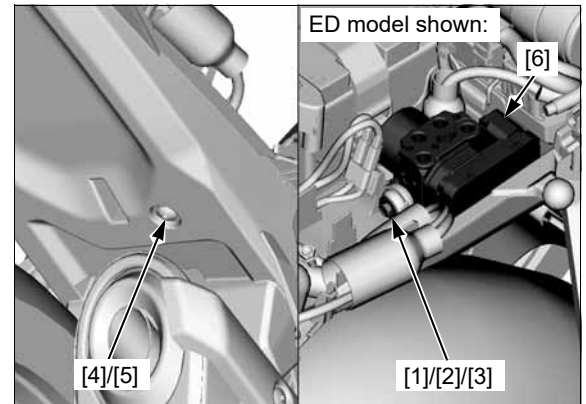
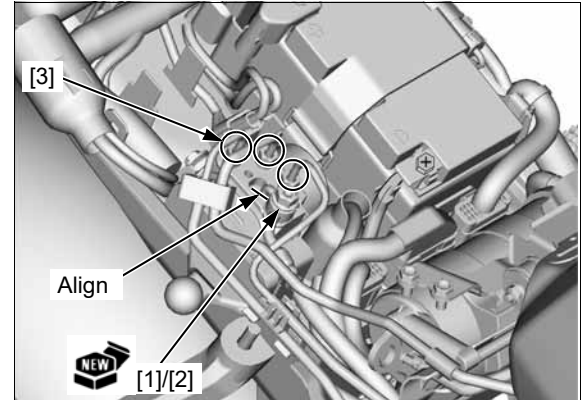
NOTE:

- Apply brake fluid to the threads of the brake pipe joint nuts.
- Install the oil bolt with a new sealing washer and tighten it to the specified torque.

TORQUE:

Brake pipe joint nut: 14 N·m (1.4 kgf·m, 10 lbf·ft)

Fill and bleed the brake hydraulic systems (page 18-5).



MEMO

20. BATTERY/CHARGING SYSTEM

SERVICE INFORMATION.....	20-2	BATTERY.....	20-5
TROUBLESHOOTING	20-3	CHARGING CONDITION INSPECTION.....	20-5
SYSTEM LOCATION	20-4	ALTERNATOR CHARGING COIL	20-6
SYSTEM DIAGRAM	20-4	REGULATOR/RECTIFIER	20-7

SERVICE INFORMATION

GENERAL

WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
 - If electrolyte gets on your skin, flush with water.
 - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
 - If swallowed, drink large quantities of water or milk and call your local Poison Control Center or call a physician immediately.

NOTICE

- *Always turn OFF the ignition switch before disconnecting any electrical component.*
- *Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.*
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.
- The 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 taillight on for long periods of time without riding the motorcycle.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every two weeks to prevent sulfation from occurring.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 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 in the Operation Manual for the recommended battery tester for details about battery testing. The recommended battery tester puts a "load" on the battery so that the actual battery condition can be measured.

Recommended battery tester: BM-210 or BATTERY MATE or equivalent

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 test (page 20-5).

Is the current leakage below 0.4 mA?

YES – GO TO STEP 4.

NO – GO TO STEP 3.

3. CURRENT LEAKAGE TEST WITHOUT REGULATOR/RECTIFIER CONNECTED

Disconnect the regulator/rectifier connector and recheck the battery current leakage.

Is the current leakage below 0.4 mA?

YES – Faulty regulator/rectifier

NO – • Shorted wire harness
• Faulty ignition switch

4. ALTERNATOR CHARGING COIL INSPECTION

Check the alternator charging coil (page 20-6).

Is the alternator charging coil resistance within 0.1 – 1.0 Ω (20°C/68°F)?

YES – GO TO STEP 5.

NO – Faulty charging coil

5. 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 measurement to result of the following calculation.

Standard:

Measured BV < Measured CV < 15.5 V

- **BV = Battery Voltage (page 20-5)**
- **CV = Charging Voltage (page 20-6)**

Is the measured charging voltage within the standard voltage?

YES – Faulty battery

NO – GO TO STEP 6.

6. REGULATOR/RECTIFIER SYSTEM INSPECTION

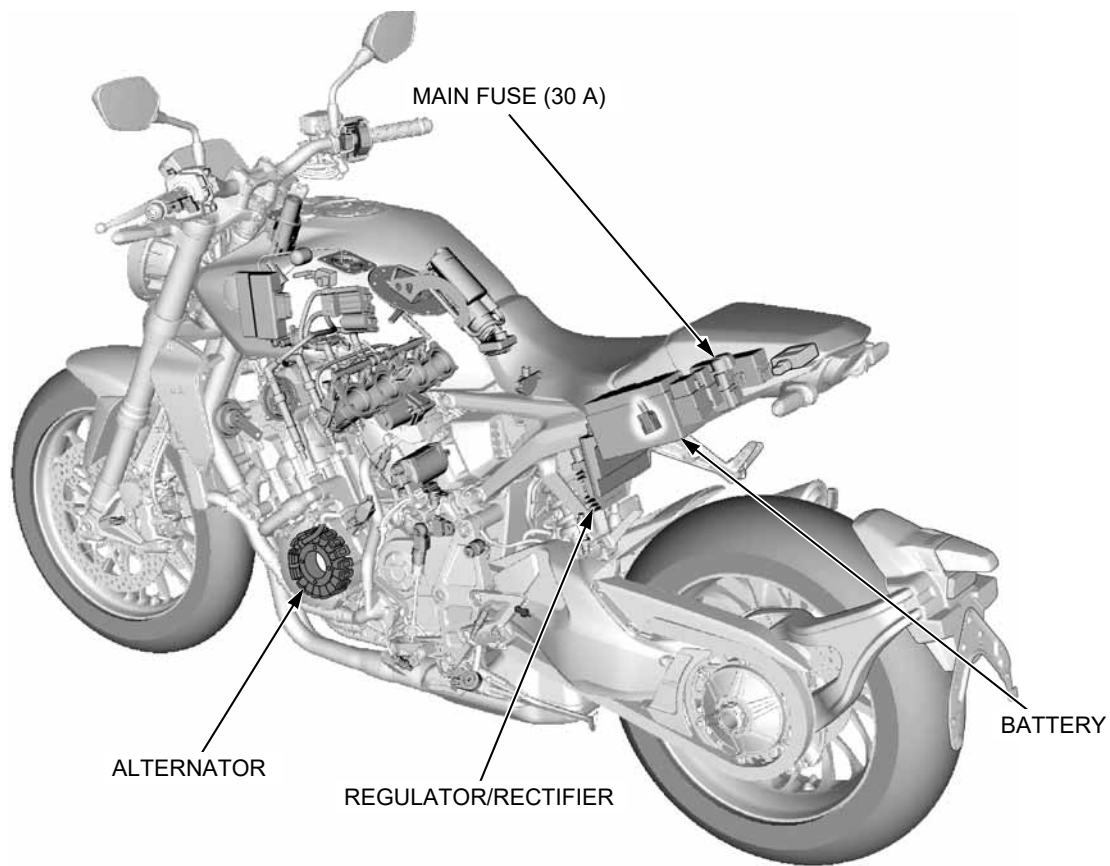
Check the voltage and continuity at the regulator/rectifier connector (page 20-7).

Are the results of checked voltage and continuity correct?

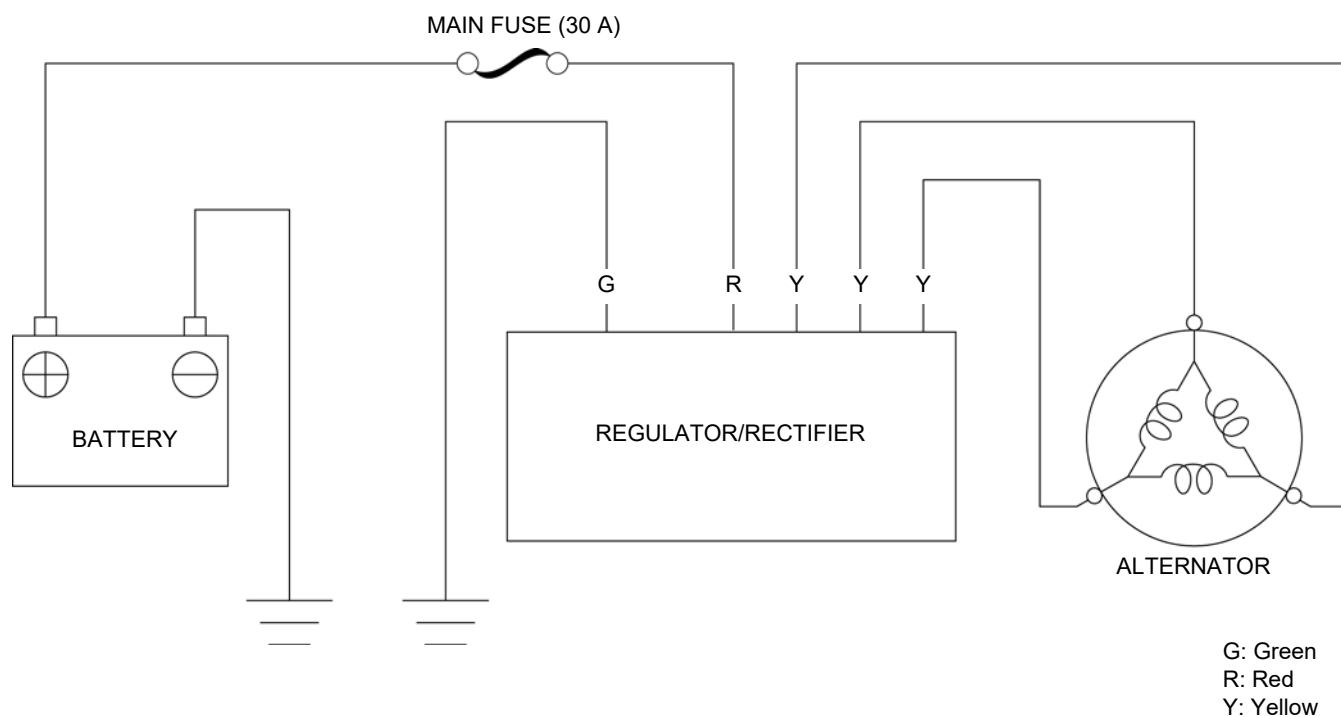
YES – Faulty regulator/rectifier

NO – • Open circuit in related wire
• Shorted wire harness
• Loose or poor contacts of related terminal

SYSTEM LOCATION



SYSTEM DIAGRAM



BATTERY

REMOVAL/INSTALLATION

Always turn the ignition switch OFF before removing the battery.

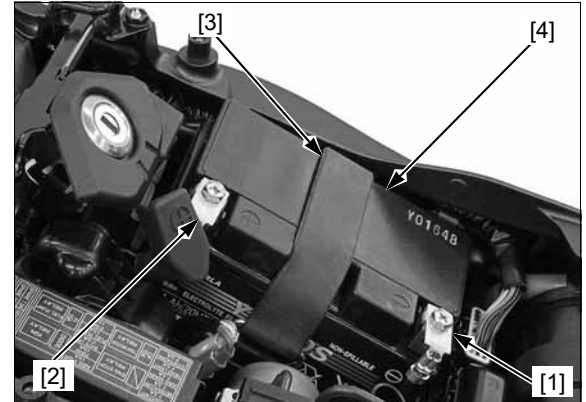
Connect the positive terminal first and then the negative cable.

Remove the main seat (page 2-4).

Disconnect the negative (-) cable [1] and then the positive (+) cable [2].

Remove the battery holder band [3] and battery [4].

Install the battery in the reverse order of removal.



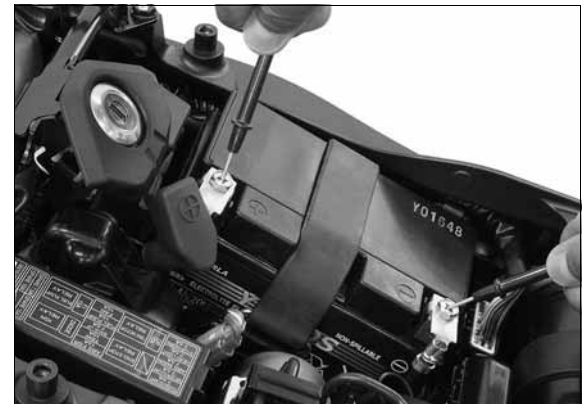
VOLTAGE INSPECTION

Remove the main seat (page 2-4).

Measure the battery voltage using a digital multimeter.

VOLTAGE:

Fully charged: 13.0 – 13.2 V
Under charged: Below 12.4 V



CHARGING CONDITION INSPECTION

CURRENT LEAKAGE TEST

Remove the main seat (page 2-4).

Turn the ignition switch OFF.

Remove the terminal bolt and disconnect the negative (-) cable [1] from the battery.

Connect the ammeter (+) probe to the negative (-) cable and ammeter (-) probe to the battery negative (-) terminal [2].

With the ignition switch turned OFF, check for current leakage.

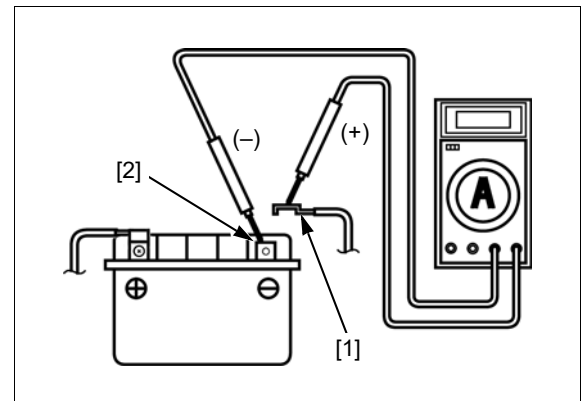
NOTE:

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition switch ON. A sudden surge of current may blow out the fuse in the tester.

SPECIFIED CURRENT LEAKAGE: 0.4 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.



BATTERY/CHARGING SYSTEM

CHARGING VOLTAGE INSPECTION

NOTE:

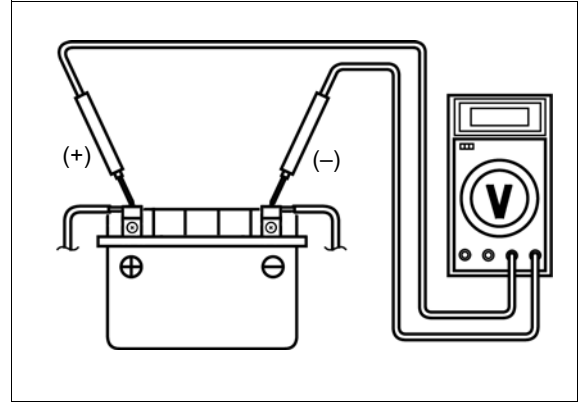
- Be sure the battery is in good condition before performing this test.
- Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.

Warm up the engine to normal operating temperature. Stop the engine.

Remove the main seat (page 2-4).

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

Remove the regulator/rectifier mounting nut [1].

Pull out the regulator/rectifier [2] from the stay and disconnect the alternator 3P (Gray) connector [3].

Check the connector for loose contact or corroded terminals.

Measure the resistance at the wire harness side connector.

Connection: Yellow – Yellow

Standard: 0.1 – 1.0 Ω (at 20°C/68°F)

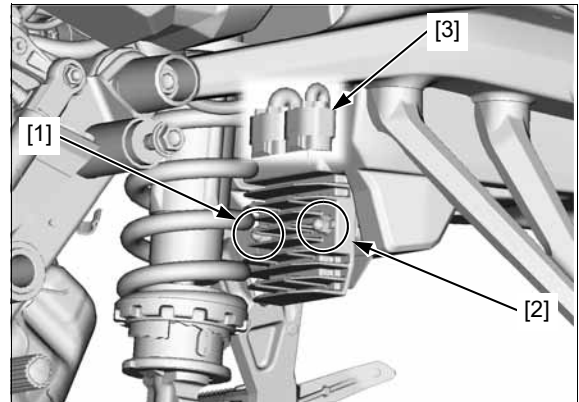
Check for continuity between the wire harness side connector and ground.

Connection: Yellow – Ground

There should be no continuity.

If readings are far beyond the standard, or if any wire has continuity to ground, replace the stator.

For stator replacement (page 12-5).



REGULATOR/RECTIFIER

SYSTEM INSPECTION

Remove the regulator/rectifier mounting nut [1].

Pull out the regulator/rectifier [2] from the stay and disconnect the regulator/rectifier 3P (Black) connector [4].

Check the connector for loose contact or corroded terminals.

Measure the voltage between the wire harness side connector and ground.

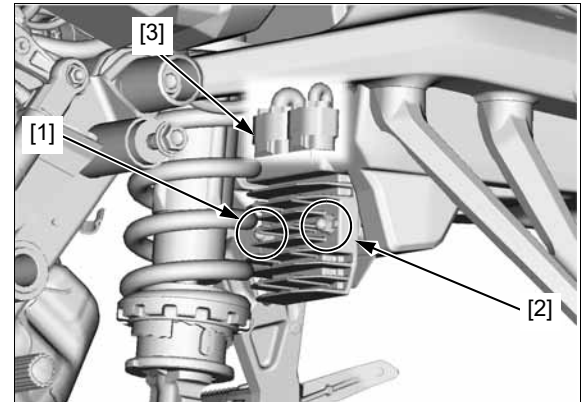
Connection: Red – Ground

There should be battery voltage at all times.

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

Connection: Green – Ground

There should be continuity at all times.



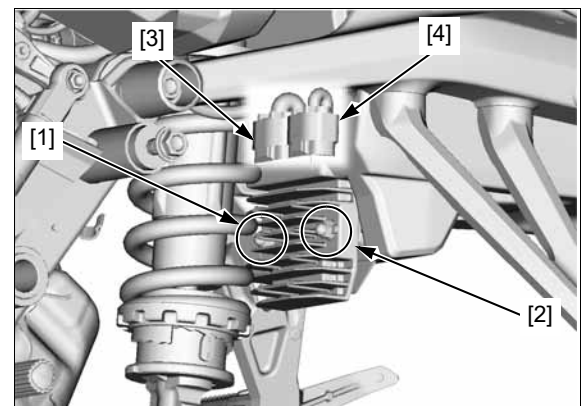
REMOVAL/INSTALLATION

Remove the regulator/rectifier mounting nuts [1].

Pull out the regulator/rectifier [2] from the stay.

Disconnect the regulator/rectifier 3P (Black) connector [3] and the alternator 3P (Gray) connector [4].

Installation is in the reverse order of removal.



MEMO

21. LIGHTS/METERS/SWITCHES

SERVICE INFORMATION	21-2	RIGHT HANDLEBAR SWITCH	21-19
SYSTEM LOCATION	21-2	HSVCs (Honda Smartphone Voice Control system)	21-19
HEADLIGHT	21-3	BRAKE LIGHT SWITCH	21-20
TURN SIGNAL LIGHT	21-4	CLUTCH SWITCH	21-21
LICENSE LIGHT	21-5	NEUTRAL SWITCH	21-22
BRAKE/TAILLIGHT	21-7	SIDESTAND SWITCH	21-22
COMBINATION METER	21-8	HORN	21-24
SPEEDOMETER	21-12	CONTROL RELAY	21-24
TACHOMETER	21-13	USB CHARGER UNIT	21-25
ECT SENSOR	21-13	BCU	21-26
ENGINE OIL PRESSURE INDICATOR/ EOP SWITCH	21-14	BODY CONTROL SYSTEM TROUBLESHOOTING INFORMATION ...	21-27
FUEL LEVEL INDICATOR	21-15	BODY CONTROL SYSTEM DIAGRAM ...	21-28
FUEL LEVEL SENSOR	21-15	BODY CONTROL SYSTEM DTC INDEX	21-29
IGNITION SWITCH	21-16	BODY CONTROL SYSTEM DTC TROUBLESHOOTING	21-30
LEFT HANDLEBAR SWITCHES	21-17		

SERVICE INFORMATION

GENERAL

- Use an electric heating element to heat the water for the ECT sensor inspection, keep flammable materials away from the electric heating element. Wear protective clothing, insulated gloves, and eye protection.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.
- The following color codes are used throughout this section.

Be = Beige
Lg = Light green

Bl = Black
O = Orange

Br = Brown
P = Pink

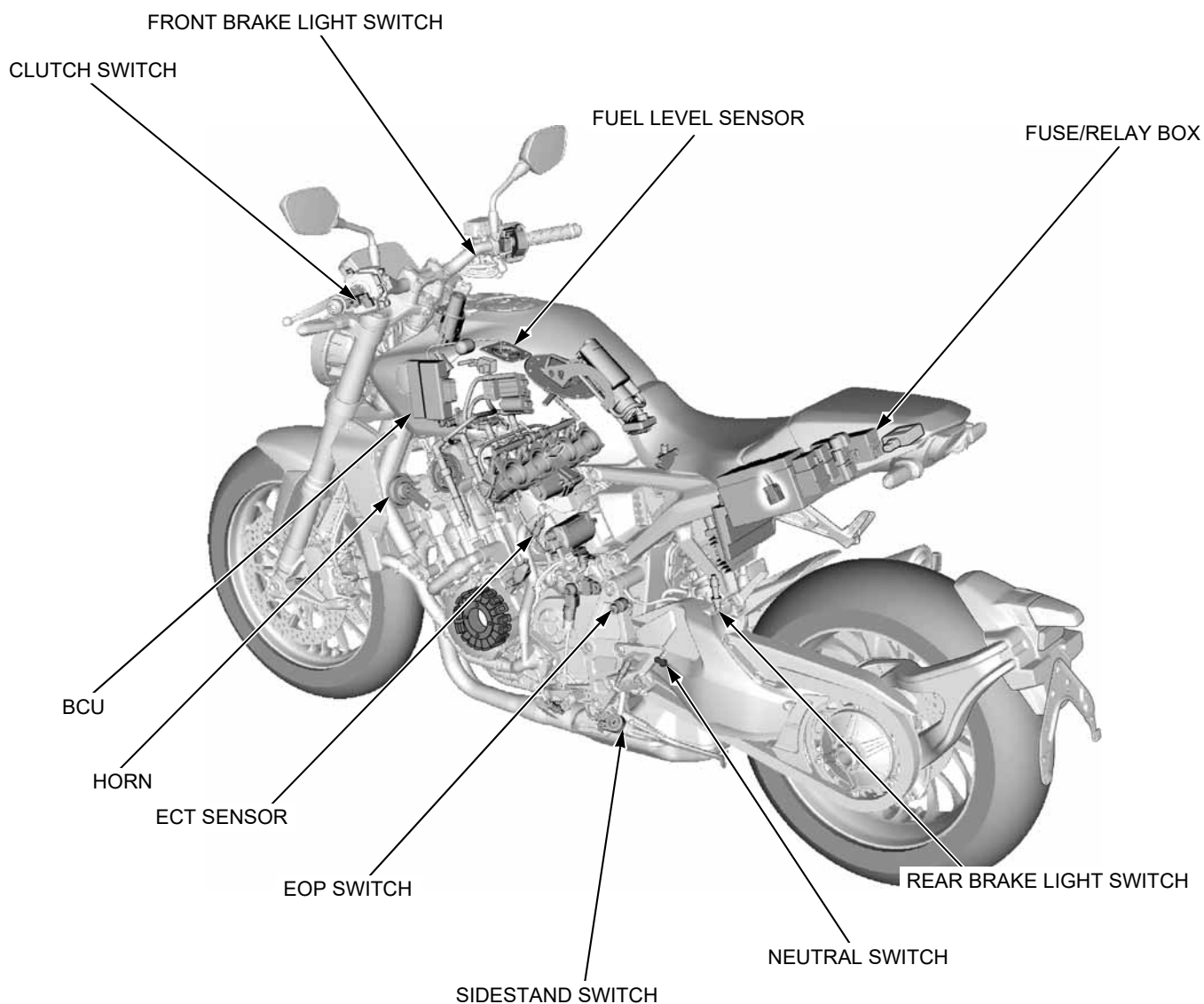
Bu = Blue
R = Red

G = Green
V = Violet

Gr = Gray
W = White

Lb = Light blue
Y = Yellow

SYSTEM LOCATION



HEADLIGHT

REMOVAL/INSTALLATION

II ED/III TH/III KO/ Remove the meter visor (page 2-5).

II FO/II GS/II RU/ Remove the following:

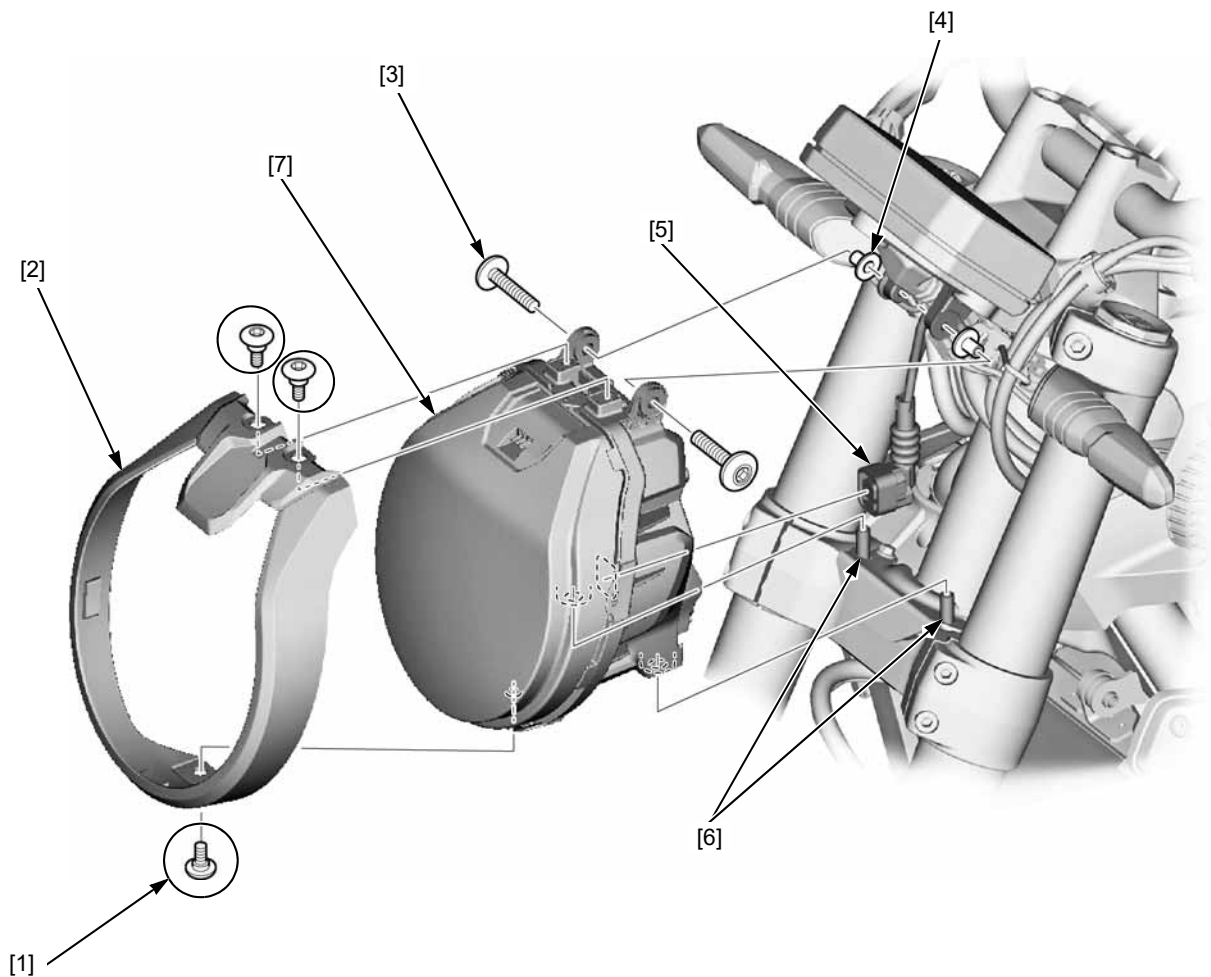
III CH/II BR models
only:

- three special bolts [1]
- headlight cover [2]
- two socket bolts [3]
- two collars [4]

Disconnect the headlight 8P (Black) connector [5].

Release the two bosses [6] and remove the headlight [7].

Installation is in the reverse order of removal.



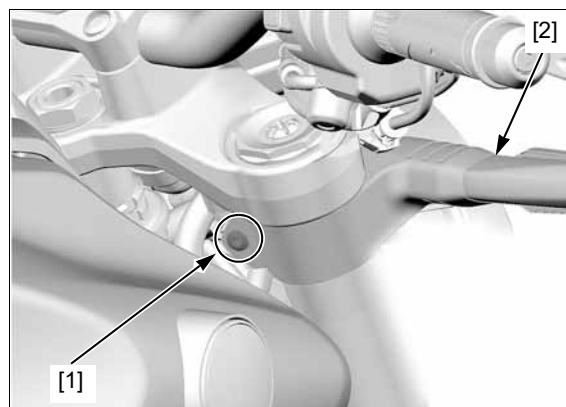
TURN SIGNAL LIGHT

TURN SIGNAL LIGHT REMOVAL/ INSTALLATION

Front side:

Remove the following:

- socket bolt [1]
- front turn signal unit [2]

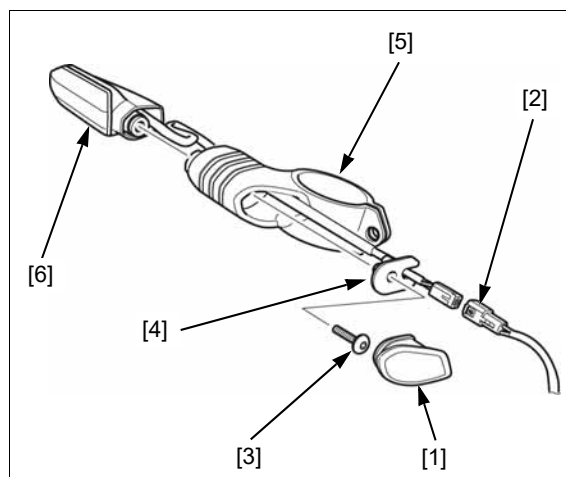


Remove the cover [1] and disconnect the turn signal 7P connector (left; Black/right; Green) [2].

Remove the following:

- socket bolt [3]
- collar [4]
- turn signal mount rubber [5]
- front turn signal unit [6]

Installation is in the reverse order of removal.



Rear side:

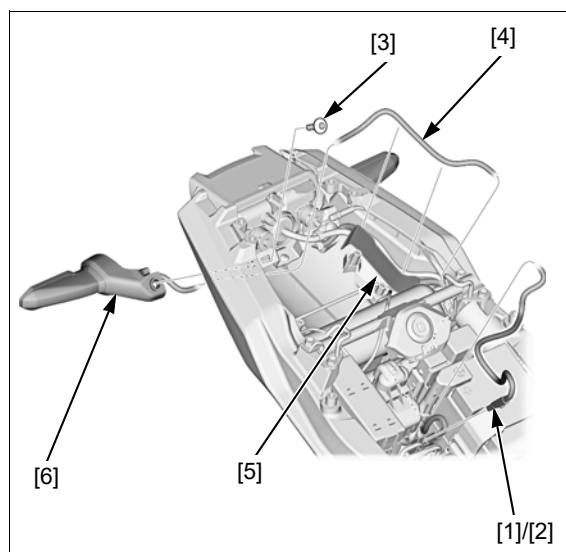
Remove the rear cross upper plate (page 2-7).

Disconnect the turn signal 2P connector (left; Orange/right; Light blue) [1] and 2P connector [2].

Remove the socket bolt [3].

Release the turn signal wire [4] from the guide [5].

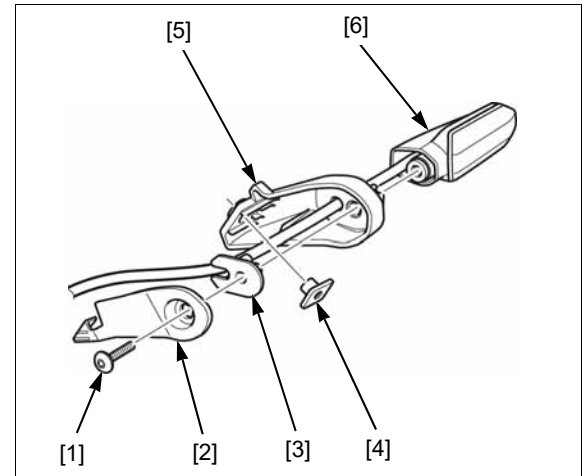
Remove the rear turn signal unit [6].



Remove the following:

- Socket bolt [1]
- Cover [2]
- Collar [3]
- Special nut [4]
- Turn signal mount body [5]
- Rear turn signal unit [6]

Installation is in the reverse order of removal.

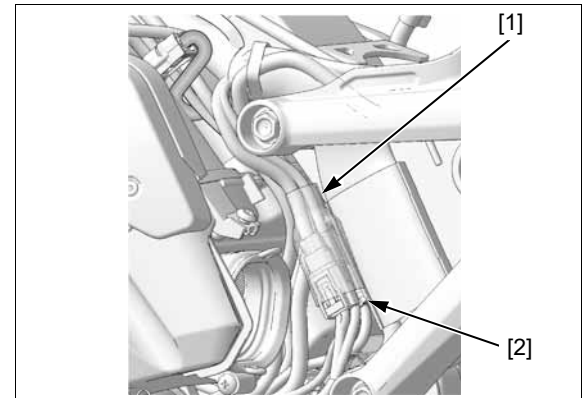


LICENSE LIGHT

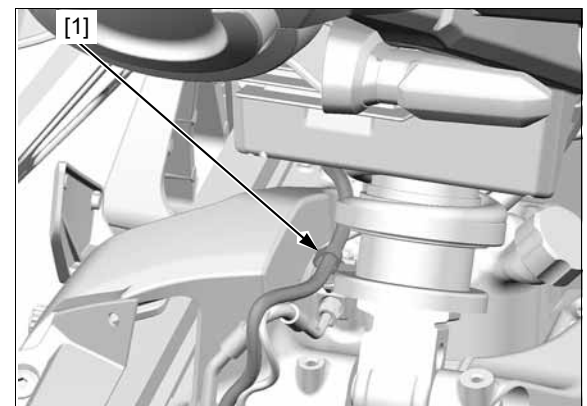
REMOVAL/INSTALLATION

Remove the left air cleaner duct (page 3-5).

Pull back the boot [1] and disconnect the license light 2P (Orange/Light blue) connectors [2].

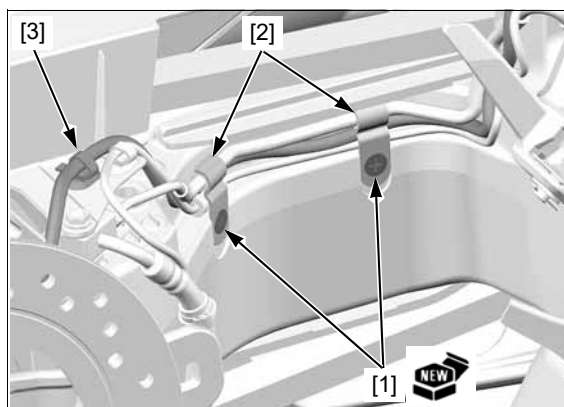


Remove the wire clips [1].



LIGHTS/METERS/SWITCHES

Remove the screws [1] and stays [2] from swingarm.
Remove the wire clip [3] from drive chain case A.



Remove the screws [1], rear fender stay inner cover [2], bolts [3] and license light [4] from fender D.

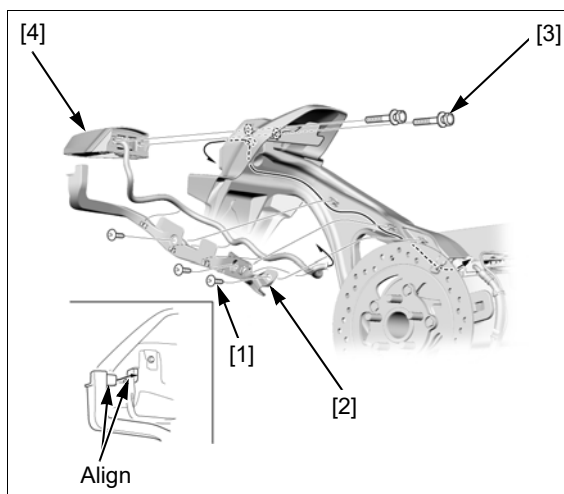
Installation is in the reverse order of removal.

NOTE:

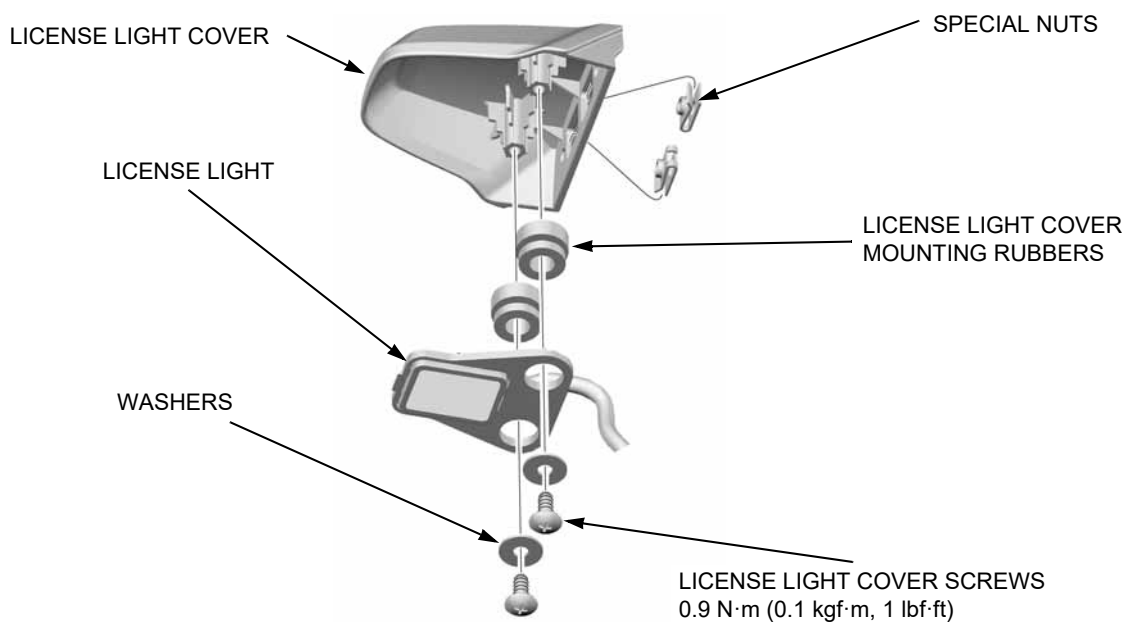
- When installing the rear fender stay inner cover, carefully align the tab with the hole of rear fender D so they are not dislodged.
- Route the wires properly
- Replace the stay mounting screws with new ones.

TORQUE:

Rear fender stay inner cover mounting screw:
0.9 N·m (0.1 kgf·m, 1 lbf·ft)



DISASSEMBLY/ASSEMBLY



BRAKE/TAILLIGHT

REMOVAL/INSTALLATION

Remove the rear cross upper plate (page 2-7).

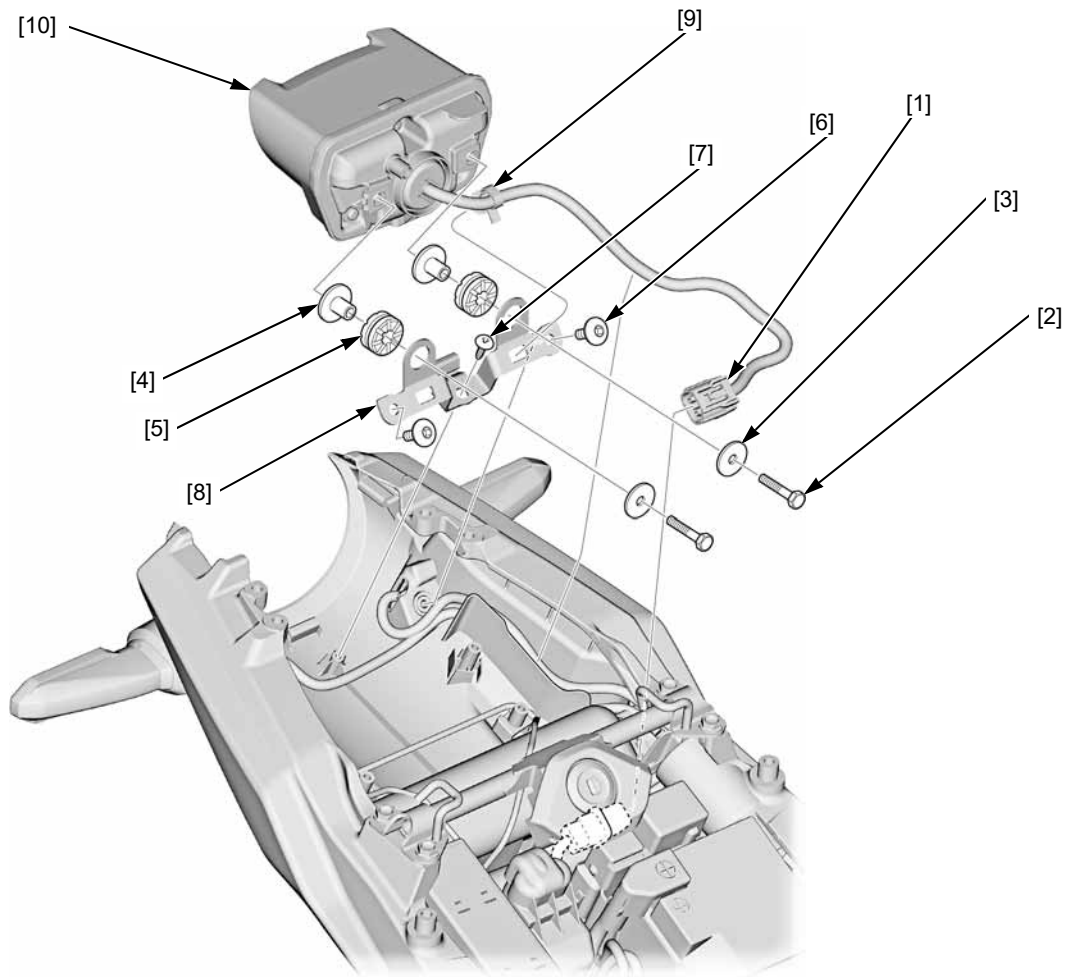
Disconnect the brake/taillight 3P (Black) connector [1].

Remove the following:

- two bolts [2]
- two washers [3]
- two collars [4]
- two grommets [5]
- two socket bolts [6]
- tapping screw [7]
- brake/taillight mounting stay [8]

Release the clip [9] and remove the brake/taillight [10].

Installation is in the reverse order of removal.



COMBINATION METER

SYSTEM INSPECTION

NOTE:

Check for loose or poor contact terminals at the combination meter 24P (Gray) connector.

Turn the ignition switch ON, check that all the modes and digital segments are shown.

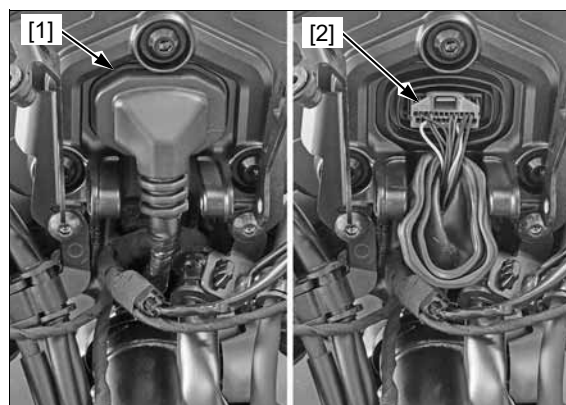
If the power and ground lines are normal, replace the meter assembly (page 21-8).



POWER/GROUND LINE INSPECTION

Remove the headlight (page 21-3).

Remove the dust cover [1], disconnect the 24P (Gray) connector [2] from the combination meter and check the following:



POWER INPUT LINE

Measure the voltage between the wire harness side 24P (Gray) connector [1] and ground.

TOOL:

Test probe

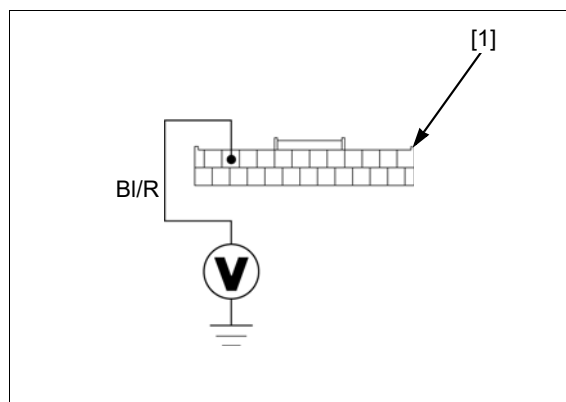
07ZAJ-RDJA110

Connection: Black/red (+) – Ground (–)

There should be battery voltage with the ignition switch turned ON.

If there is no voltage, check the following:

- Open circuit in the Black/red wire between the fuse/relay box and combination meter
- Blown TAIL/METER/LICENCE fuse (7.5 A)



BACK-UP LINE

Measure the voltage between the wire harness side 24P (Gray) connector [1] and ground.

TOOL:

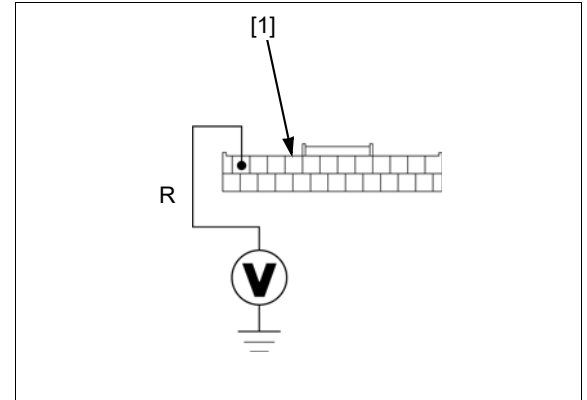
Test probe 07ZAJ-RDJA110

Connection: Red (+) – Ground (–)

There should be battery voltage at all times.

If there is no voltage, check the following:

- Open circuit in the Red wire between the fuse/relay box and combination meter
- Blown BACK UP fuse (7.5 A)



GROUND LINE

Check for continuity between the wire harness side 24P (Gray) connector [1] and ground.

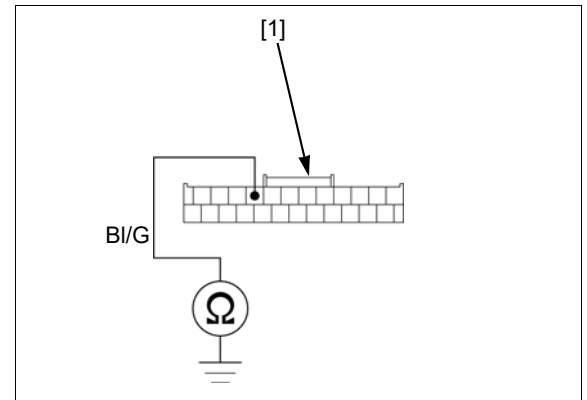
TOOL:

Test probe 07ZAJ-RDJA110

Connection: Black/green – Ground

There should be continuity at all times.

If there is no continuity, check for open circuit in the Green wire between the combination meter and ground point.



REMOVAL/INSTALLATION

Remove the following:

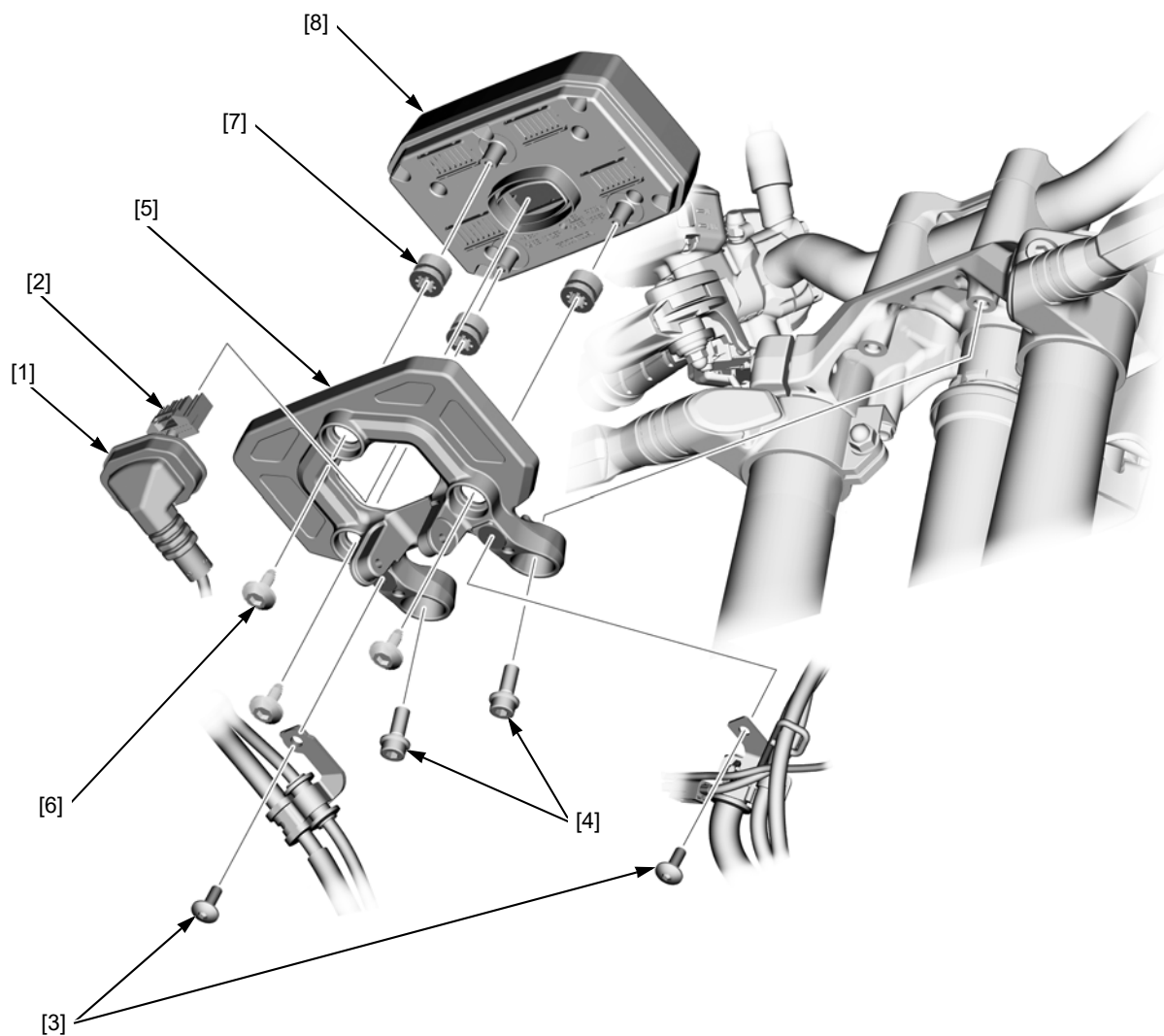
- headlight (page 21-3)
- visor stay (page 2-5) (II ED/III TH/III KO/II FO/II GS/II RU/III CH/II BR models)

Remove the dust cover [1] and disconnect the 24P (Gray) connector [2].

Remove the following:

- Two cable guide mounting socket bolts [3] (except II ED/III TH/III KO/II FO/II GS/II RU/III CH/II BR models only)
- Two meter stay mounting socket bolts [4], and meter stay [5]
- Four meter mounting screws [6] and grommet [7]
- Combination meter [8]

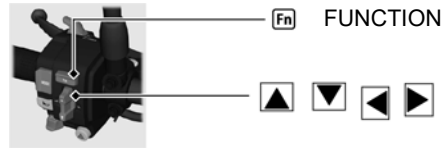
Installation is in the reverse order of removal.



COMBINATION METER DIGITAL CLOCK SET PROCEDURE

BASIC OPERATION

Operate and set the various functions of the display using the switches on the left handlebar.



- | | |
|--|--|
|  or  | : Press  on the SEL switch |
|  or  | : Press  on the SEL switch |
|  | : Push the SEL switch in the direction of  |
|  | : Push the SEL switch in the direction of  |
|  or  | : Press and hold  on the SEL switch |
|  or  | : Press and hold  on the SEL switch |
|  | : Push and hold the SEL switch in the direction of  |
|  | : Push and hold the SEL switch in the direction of  |

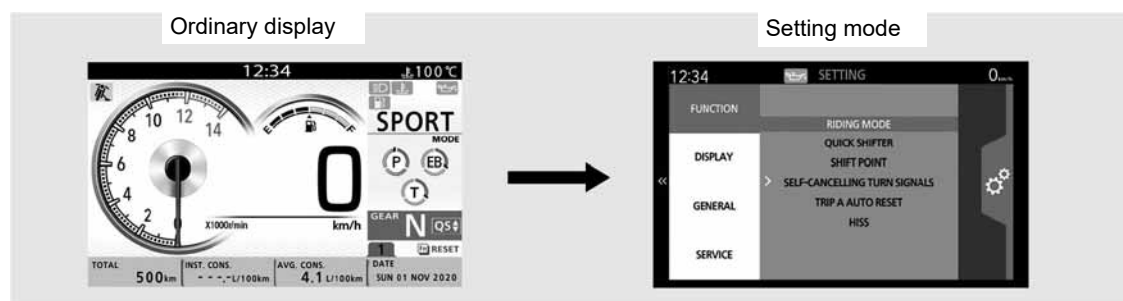
LIGHTS/METERS/SWITCHES

TO SHIFT TO THE SETTING MODE

1. Push and hold the SEL switch in the direction of "▷".
2. To select the desired setting menu, operate the "△" "▽" "◁" "▷" SEL switch on the left handlebar.
 - When switching to setting mode, the clock, indicators and speed are displayed at the top of the screen.

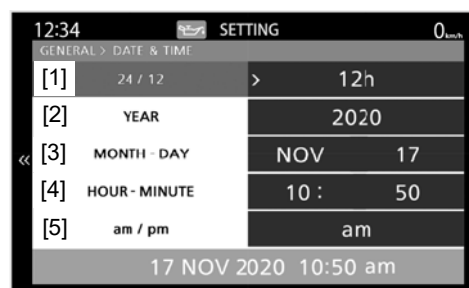
TO RETURN TO THE ORDINARY DISPLAY

1. Press and hold the "Fn" function switch.
2. Push and hold the SEL switch in the direction of "◁", return to the upper hierarchy.
3. The button is not pressed for about 30 seconds.
4. Turn the electrical system is off and on again.



DATE & TIME

1. Select the "24h or 12h" [1], "YEAR" [2], "MONTH - DAY" [3], "HOUR - MINUTE" [4] or "am / pm" [5] using "△" or "▽" of the SEL switch.
 - When "24 / 12" is set to 24-hour indication, "am / pm" cannot be usable.
2. Select the desired setting according to the switch operation guide (page 21-11).
 - When "24 / 12" is set to 24-hour indication, "am / pm" cannot be usable.
3. Return to the ordinary display to complete the setting (page 21-11).
 - To continue setting, push and hold the SEL switch in the direction of "◁" to return to the upper hierarchy.
 - e set value is retained.



SPEEDOMETER

SYSTEM INSPECTION

If the speedometer does not operate, check the following:

- Combination meter initial operation (page 21-8)
- MIL blinking: If the MIL blinks 11 (DTC 11-1), check the VS sensor system (page 4-62)

If the above items are OK, check for open circuit in the Black/red wire.

TACHOMETER

SYSTEM INSPECTION

If the tachometer does not operate, check the following:

- Combination meter initial operation (page 21-8)
- MIL blinking: If the MIL blinks 103 (DTC 103-1), check the CAN communication (page 4-57)
- CKP sensor (page 4-69)

If the above items are normal, replace the combination meter (page 21-8).

ECT SENSOR

INSPECTION

Remove the ECT sensor (page 4-67).

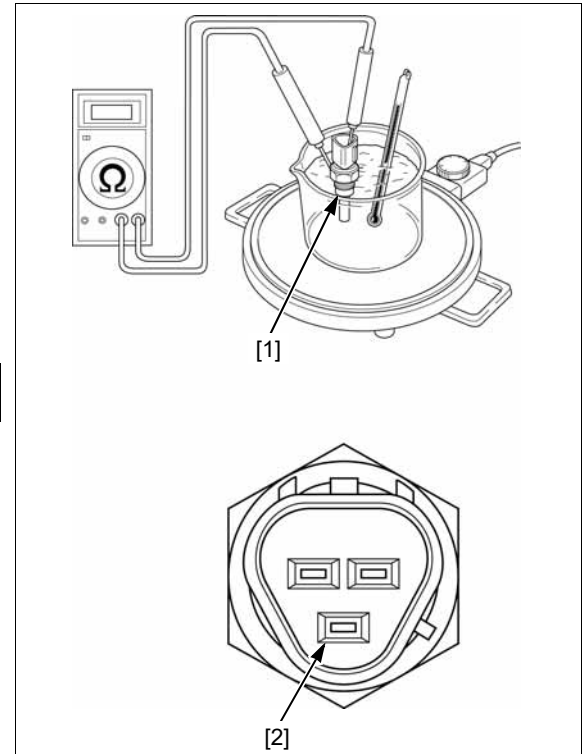
Suspend the ECT sensor [1] in a pan of coolant on an electric heating element and measure the resistance between the sensor terminal [2] and sensor body as the coolant heats up.

- Soak the ECT sensor in coolant up to its threads with at least 40 mm (1.6 in) from the bottom of the pan to the bottom of the sensor.
- Keep the temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect readings. Do not let the thermometer or ECT sensor touch the pan.

Temperature	80°C (176°F)	120°C (248°F)
Resistance	2.1 – 2.6 kΩ	0.65 – 0.73 kΩ

Replace the sensor if it is out of specification.

Install the ECT sensor (page 4-67).



ENGINE OIL PRESSURE INDICATOR/ EOP SWITCH

INSPECTION

NOTE:

- The oil pressure indicator should come on when the ignition switch is turned ON and go off when the engine is started.

Engine oil pressure indicator does not come on when the ignition switch is turned ON

Remove the EOP switch wire terminal (page 21-15).

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.

If the indicator does not come on, check for an open circuit in the Black wires between the 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 21-15).

Turn the ignition switch ON and check the engine oil pressure indicator.

If the indicator does not come on, check the following:

- Engine oil level (page 3-12)
- Engine oil pressure (page 9-4)

If they are normal, replace the EOP switch (page 21-15).

If the indicator comes on, check for short circuit in the Black wires between the switch and combination meter. If the wires are OK, replace the combination meter

REMOVAL/INSTALLATION

Remove the following:

- Dust cover [1]
- Bolt/washer [2]
- Wire terminal [3]
- Oil pressure switch [4]

Installation is in the reverse order of removal.

NOTE:

- Apply sealant (TB1207B manufactured by ThreeBond or equivalent) to the EOP switch treads (page 14-12).

TORQUE:

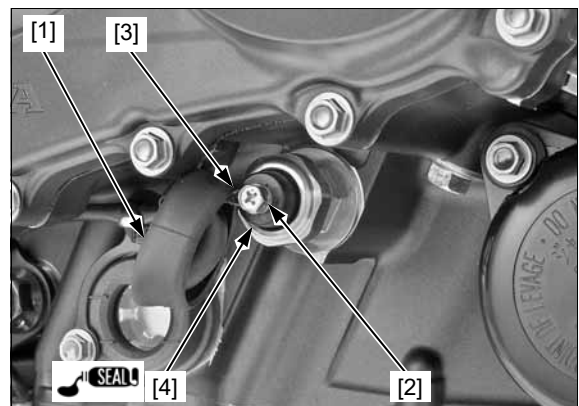
EOP switch:

12 N·m (1.2 kgf·m, 9 lbf·ft)

EOP switch terminal bolt/washer:

2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)

Check the engine oil level (page 3-12).



FUEL LEVEL INDICATOR

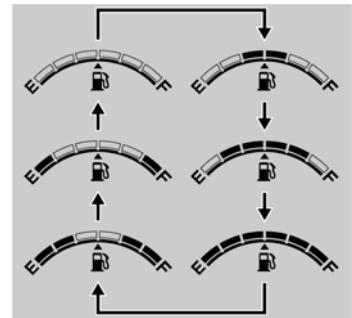
FUEL GAUGE INSPECTION

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 Gray/black wire between the combination meter and fuel pump unit.

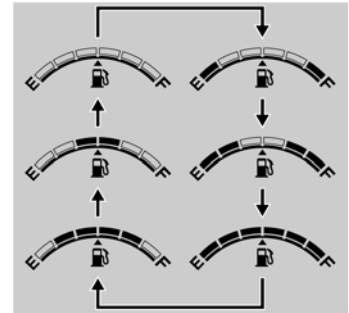
If the Gray/black wire is OK, check the fuel level sensor (page 21-16).

If the fuel level sensor is OK, replace the combination meter (page 21-8).

Open circuit (flowing to outside):



Short circuit (flowing to inside):



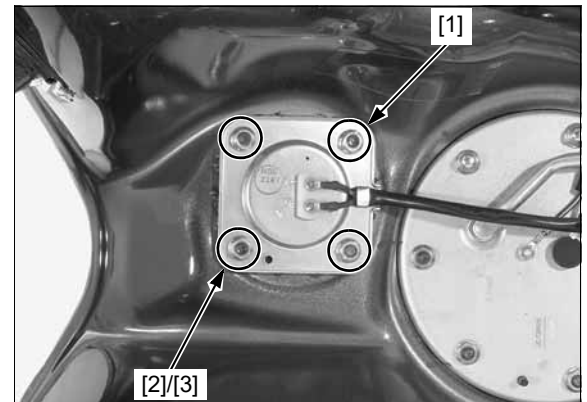
FUEL LEVEL SENSOR

REMOVAL/INSTALLATION

Remove the fuel tank (page 7-6).

Be careful not to damage or bend the level sensor arm.

Remove the nuts [1], fuel level sensor [2] and O-ring [3].

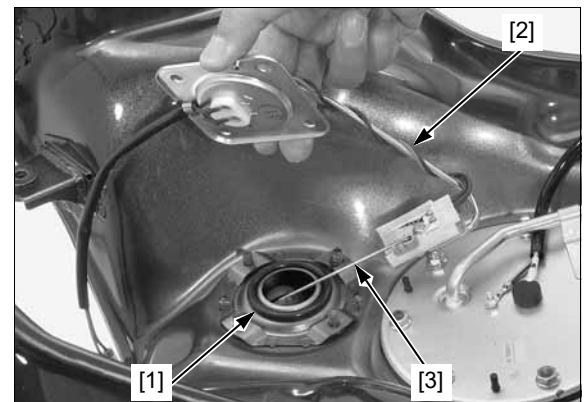


Check the O-ring [1] is in good condition and replace if necessary.

Be careful not to damage or bend the level sensor arm [3].

Install the fuel level sensor [2] into the fuel tank.

Installation is in the reverse order of removal.



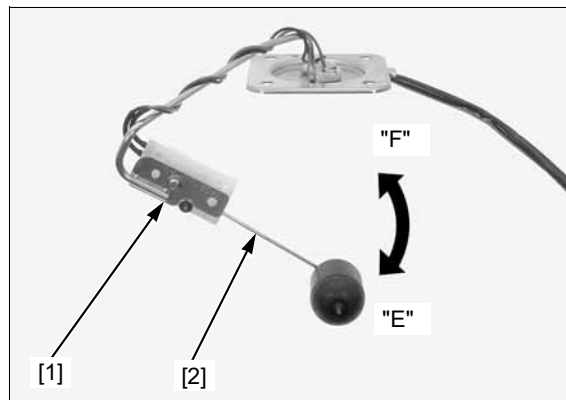
LIGHTS/METERS/SWITCHES

INSPECTION

Check the fuel level sensor [1] and arm [2] for damage.

Measure the resistance at the fuel level sensor 2P (Black) connector terminal with moving the float at the top "F" and bottom "E" position.

	TOP "F"	BOTTOM "E"
Resistance	6 – 10 Ω	384 – 396 Ω



IGNITION SWITCH

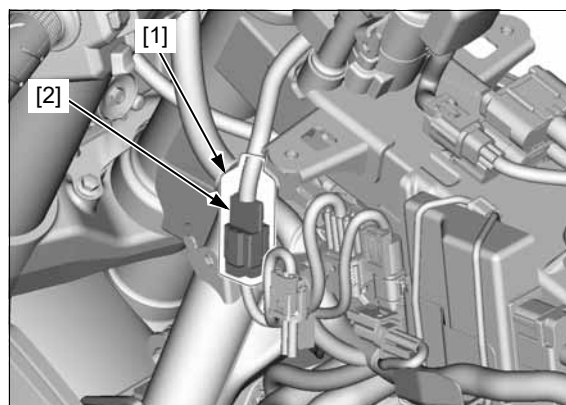
INSPECTION

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

Remove the dust cover [1] and disconnect the ignition switch 2P (Brown) connector [2].

Check for continuity between the wire terminals of the ignition switch connector in each switch position.

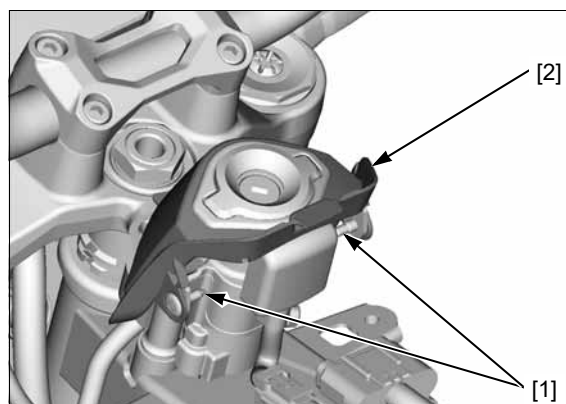
Refer to the wiring diagram for the terminals and switch status (page 23-3).



REMOVAL/INSTALLATION

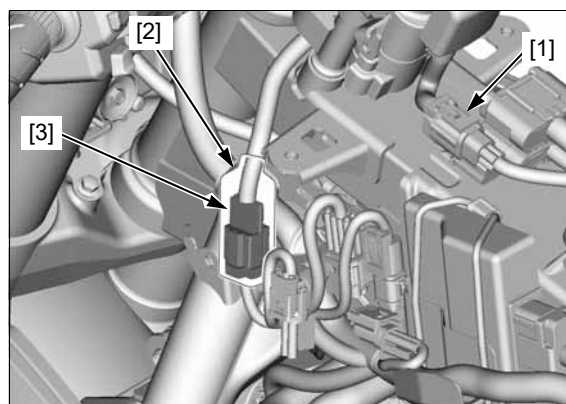
Lift and support the fuel tank (page 3-4).

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 following:

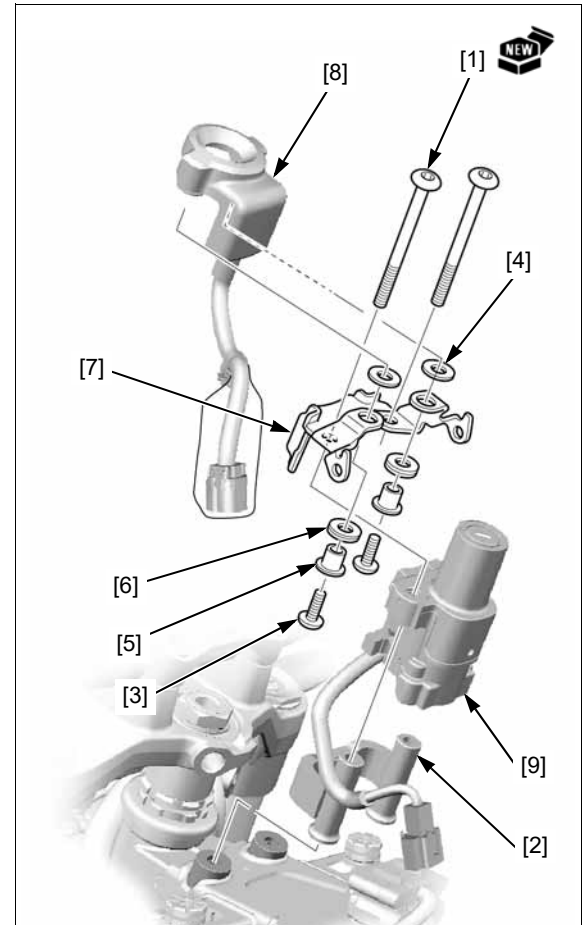
- Two socket bolts [1]
- Ignition switch mount stay [2]
- Two bolts [3]
- Two washers [4]
- Two collars [5]
- Two grommets [6]
- Immobilizer receiver mount stay [7]
- Immobilizer receiver [8]
- Ignition switch [9]

Route the wires properly (page 1-24)

Install the removed parts in the reverse order of removal.

NOTE:

- If the ignition switch is replaced, perform the key registration procedures (page 22-3).
- Replace the Ignition switch bolts with new ones.



LEFT HANDLEBAR SWITCHES

REMOVAL/INSTALLATION

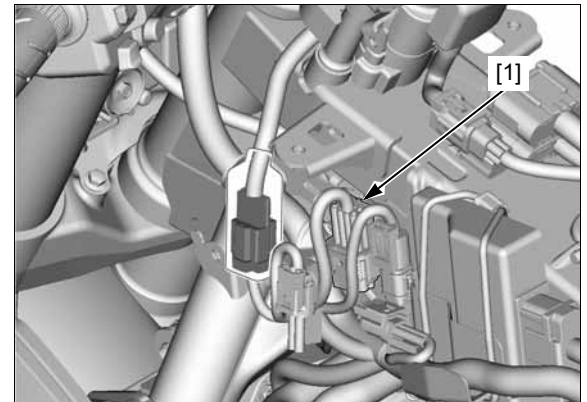
Lift and support the fuel tank (page 3-4).

Remove the headlight (page 21-3).

Disconnect the Left handlebar switch 8P (Black) connector [1].

NOTE:

- Route the wire properly (page 1-24).



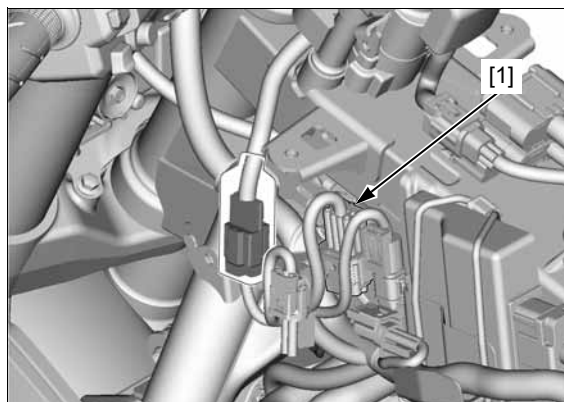
INSPECTION

NOTE:

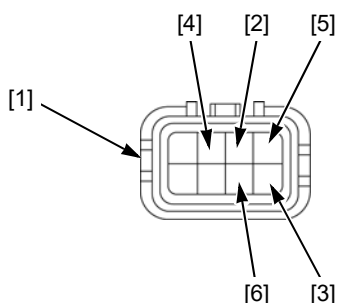
- Before inspection, check that there is no DTCs.

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

Disconnect the left handlebar switch 8P (Black) connector [1].



Measure the resistance between the switch side 8P (Black) connector [1] terminals when each switch is operated.



CONNECTION:	STANDARD (at 25°C/77°F):	
White [2] – Green/blue [3]	Headlight dimmer switch:	90 – 110 Ω
	Passing light control switch:	340 – 380 Ω
White/black [4] – Green/blue [3]	MODE switch:	90 – 110 Ω
	Sel up switch:	330 – 380 Ω
	Sel down switch:	730 – 820 Ω
White/green [5] – Green/blue [3]	Horn switch:	90 – 110 Ω
	Fn switch:	330 – 380 Ω
	Sel left switch:	730 – 820 Ω
	Sel right switch:	1.6 – 1.8 kΩ
White/yellow [6] – Green/blue [3]	Turn signal left switch:	730 – 820 Ω
	Turn signal right switch:	1.6 – 1.8 kΩ
	Turn signal cancel switch:	330 – 380 Ω
	Hazard switch	90 – 110 Ω

Replace the left handlebar switch if any switch resistance are not standard value.

RIGHT HANDLEBAR SWITCH

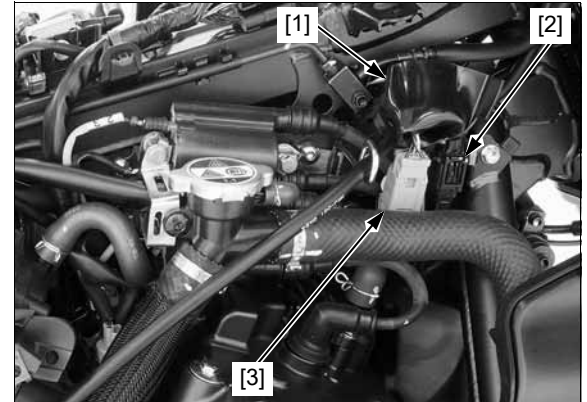
Lift and support the fuel tank (page 3-4).

Disconnect the following:

- Dust cover [1]
- Right handlebar switch 6P (Black) connector [2]
- Right handlebar switch 6P (Blue) connector [3]

Check for continuity between the wire terminals of the handlebar switch connector in each switch position.

Refer to the wiring diagram for the terminals and switch status (page 23-3).



HSVCs (Honda Smartphone Voice Control system)

HSVCs SCREEN TRANSITION

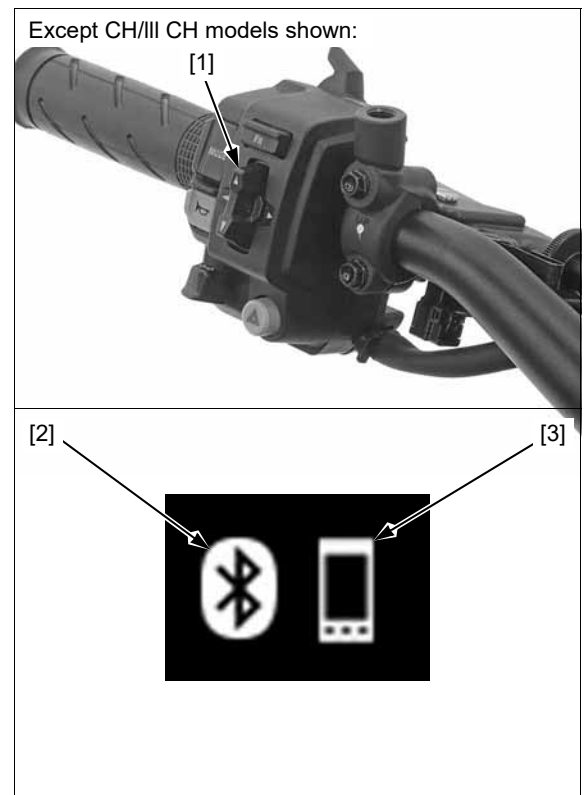
Turn the ignition switch ON.

Push and hold the Sel switch [1] to the left until the HSVCs main screen is displayed.

Make sure the Bluetooth indicator [2] and smartphone indicator [3] are appeared.

If the HSVCs main screen is not displayed or the indicators are not appeared, check the following items:

- DTC (CAN communication line) (page 4-57)
- Left handlebar switch resistance (page 21-21)
- Initialization/pairing connection (page 21-22)
- Combination meter (page 21-8)
- BCU (page 21-28)



INITIALIZATION/PAIRING CONNECTION

Turn the ignition switch ON.

1. Push and hold the Sel switch [1] to the right until the SETTING mode is displayed.
2. Press the down side of the Sel switch to select the GENERAL menu, and press the Sel switch to the right.
3. Press the down side of the Sel switch to select the BLUETOOTH PAIRING RESET menu, then press the Sel switch to the right.

The "RESET" pop-up screen is displayed.

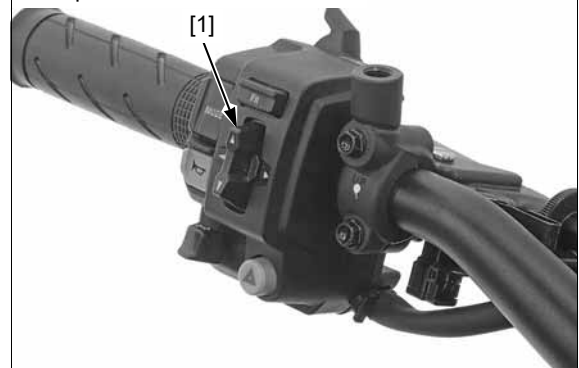
Press and hold the Sel switch to the right until "FINISHED" is displayed.

Press the Sel switch to the left or right to return to the BLUETOOTH PAIRING RESET menu.

NOTE:

- After resetting, the combination meter waits for pairing connection for about 2 minutes and the Bluetooth indicator blinks.
- Depending on the connected smartphone, if you do not dismiss the pairing information on the smartphone side, it may not be successful in the waiting state for pairing connection for about 2 minutes. (Due to smartphone specifications)
- The Bluetooth and smartphone indicators are appeared when the pairing connection is successful.

Except CH/III CH models shown:

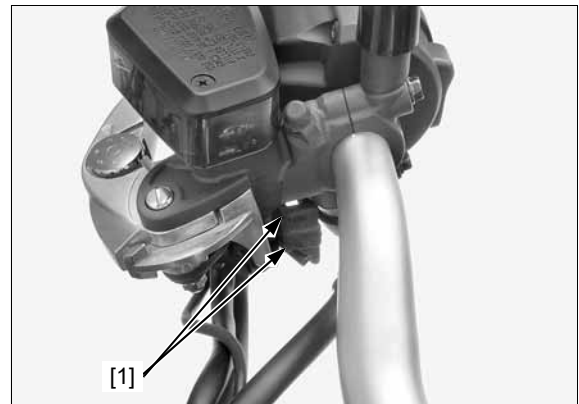


BRAKE LIGHT SWITCH

FRONT

Disconnect the wire connectors [1] from the front brake light switch and check for continuity between the switch terminals.

There should be continuity with the brake lever squeezed, and there should be no continuity with the brake lever is released.



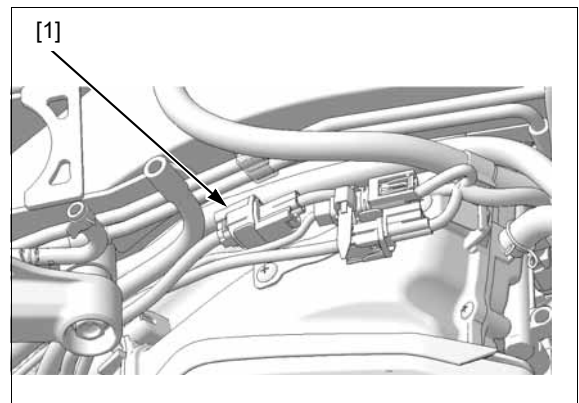
REAR

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

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 there should be no continuity with the brake pedal is released.



CLUTCH SWITCH

REMOVAL/INSTALLATION

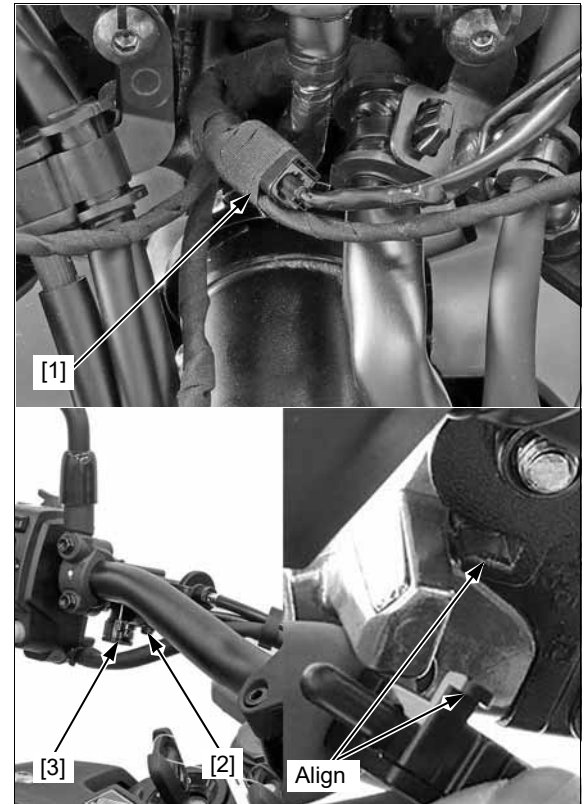
Disconnect the clutch switch 2P (Black) connector [1].

Remove the screw [2] and the clutch switch [3].

Installation is in the reverse order of removal.

NOTE:

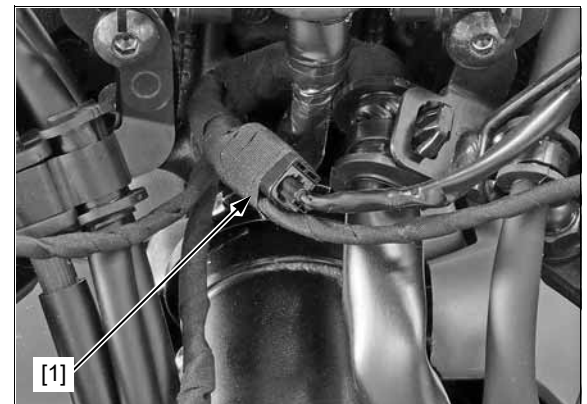
- Align the clutch switch hook with clutch lever holder cut-out.



INSPECTION

Disconnect the clutch switch 2P (Black) connector [1] from the clutch switch and check for continuity between the switch terminals.

There should be continuity with the clutch lever squeezed, and there should be no continuity with the clutch lever is released.



NEUTRAL SWITCH

REMOVAL/INSTALLATION

Remove the engine (page 15-4).

Remove the dust cover [1] and terminal nut [2], then disconnect the neutral switch terminal eyelet [3] from the switch.

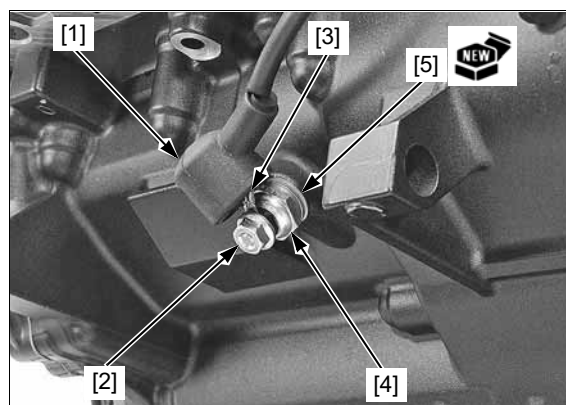
Remove the neutral switch [4] and sealing washer [5].

Install the neutral switch with a new sealing washer. Tighten the neutral switch to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the neutral switch connector to the switch.

Install the engine (page 15-7).



INSPECTION

Remove the dust cover, terminal nut and disconnect the neutral switch terminal eyelet from the neutral switch.

Shift the transmission into neutral and check for continuity between the neutral switch terminal and ground.

There should be continuity with the transmission is in neutral, and no continuity when the transmission is into gear.

SIDESTAND SWITCH

INSPECTION

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

Disconnect the sidestand switch 2P (Black) connector [1].

Check for continuity between the switch side 2P (Green) connector terminals.

Continuity should exist only when the sidestand is retracted.

Connect the 2P (Black) connector.

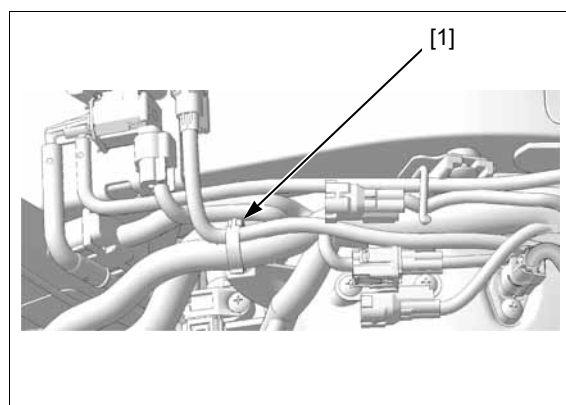
Lower the fuel tank (page 3-4).



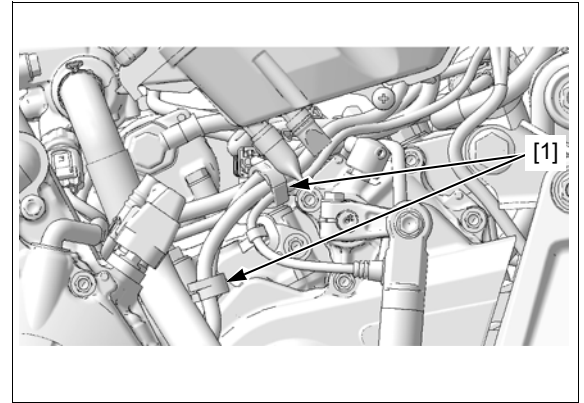
REMOVAL/INSTALLATION

Disconnect the sidestand switch 2P (Black) connector (page 21-24).

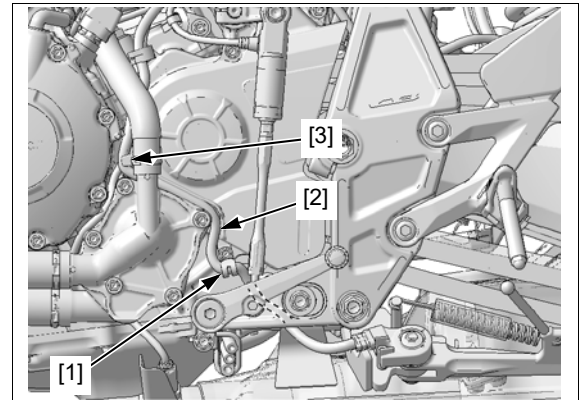
Remove the wire band [1].



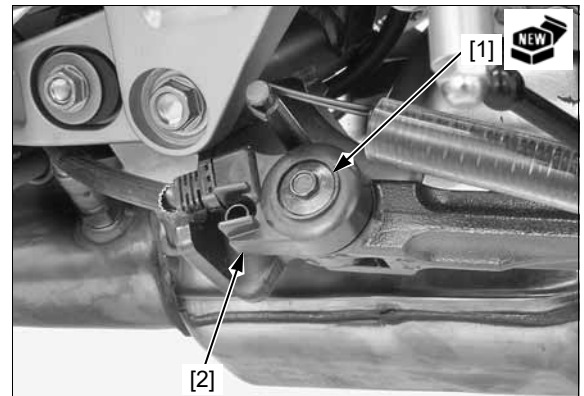
Remove the wire bands [1].



Release the sidestand switch wire [1] from the wire band [2] and the guide [3].



Remove the mounting bolt [1] and sidestand switch [2].



Install the sidestand switch by aligning the switch pin with the sidestand hole and the switch groove with the holding pin.

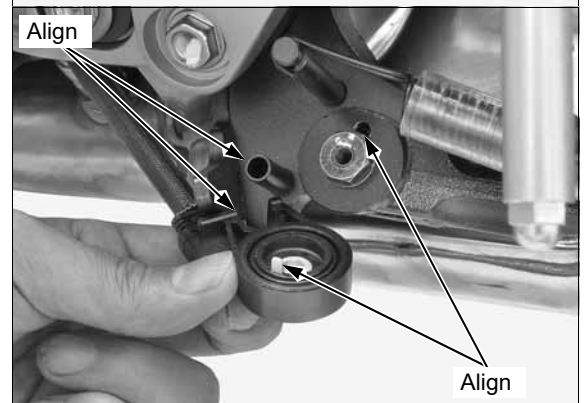
Secure the sidestand switch with a new bolt.

Installation is in the reverse order of removal.

TORQUE:

Sidestand switch mounting bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)

Route the wire properly (page 1-24).



HORN

INSPECTION

Disconnect the wire connectors [1] from the horn [2].

Connect a 12 V battery to the horn terminals directly.

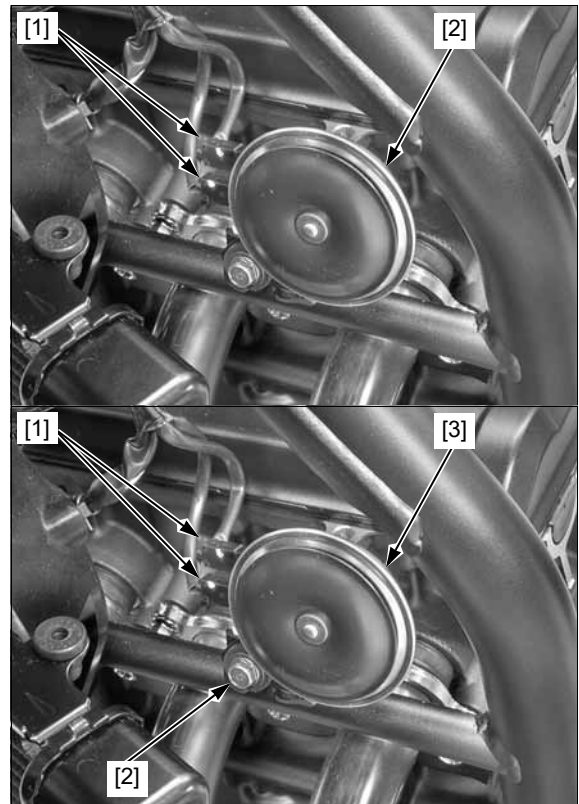
The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.

REMOVAL/INSTALLATION

Disconnect the horn connectors [1].

Remove the bolt [2] and horn [3].

Installation in the reverse order of removal.



CONTROL RELAY

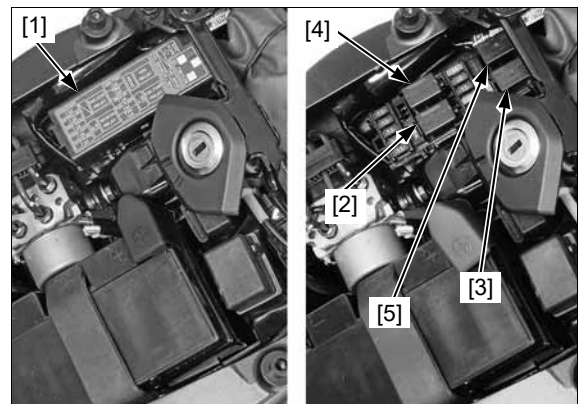
REMOVAL/INSTALLATION

TBW RELAY/FUEL PUMP RELAY/ENGINE STOP RELAY/FAN CONTROL RELAY

Remove the following:

- Main seat (page 2-4)
- Fuse/relay box cover [1]
- Each relay
 - TBW relay [2]
 - Fuel pump relay [3]
 - Engine stop relay [4]
 - IGN relay [5]

Installation is in the reverse order of removal.



RELAY INSPECTION

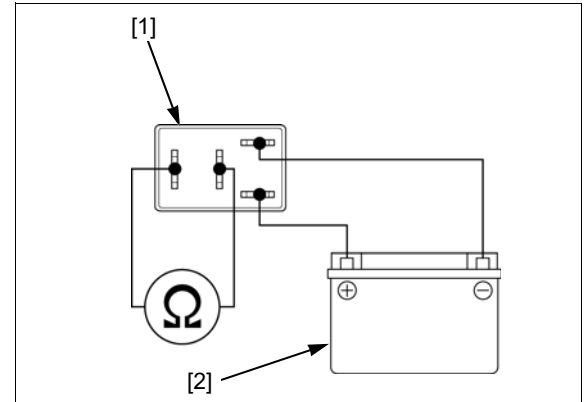
Remove the relay (page 21-26).

Connect an ohmmeter to the relay [1] terminals as shown.

Connect a 12 V battery [2] to the relay terminals as shown.

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

If there is no continuity when the 12 V battery is connected, replace the relay with a new one.



USB CHARGER UNIT

INSPECTION

Disconnect the USB charger unit 2P (Black) connector (page 21-27).

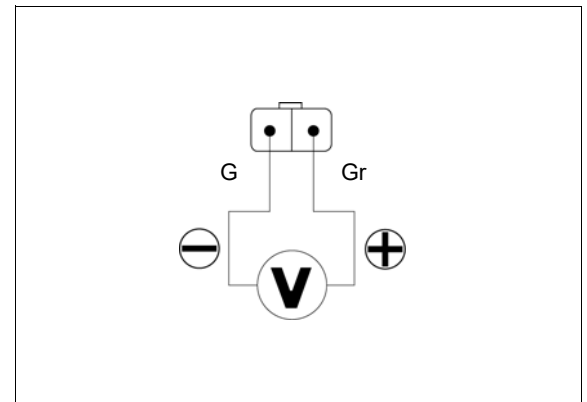
Turn the ignition switch ON.

Measure the voltage between the connector terminals.

CONNECTION: Gray (+) – Green (–)

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

- If there is no voltage, check for blown fuse (OP fuse 10 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 pillion seat (page 2-4).

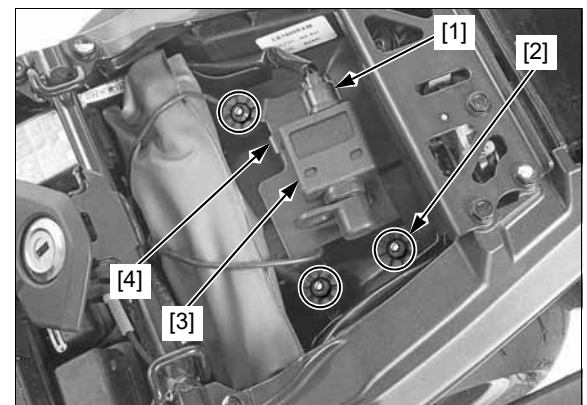
Turn the ignition switch OFF.

Disconnect the USB charger unit 2P (Black) connector [1].

Remove the following:

- socket bolts [2]
- USB charger unit [3] from the stay [4]

Installation is in the reverse order of removal.



BCU

REMOVAL/INSTALLATION

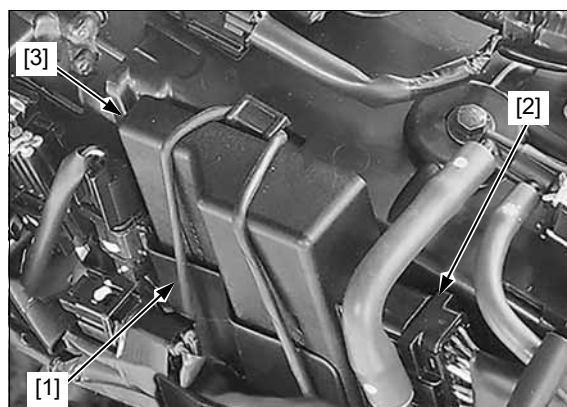
Remove the fuel tank (page 7-6).

Remove the band [1].

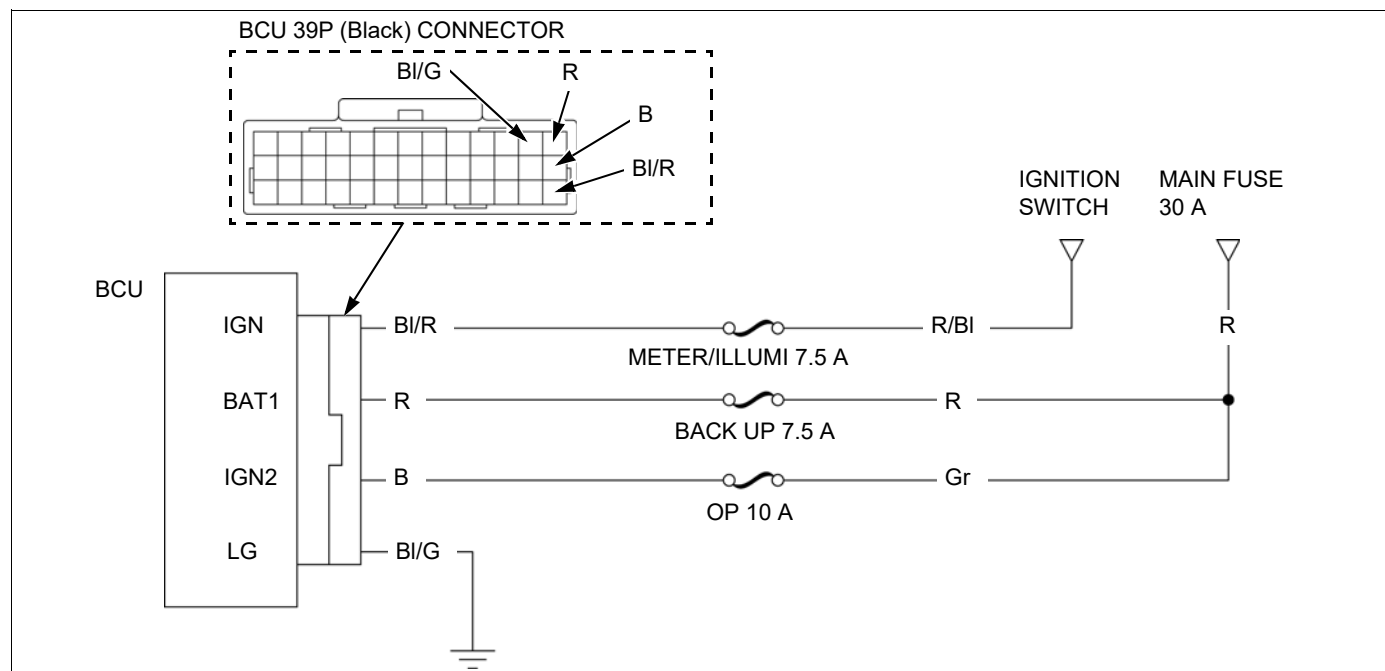
Disconnect the BCU 39P (Black) connector [2].

Remove the BCU [3].

Installation is in the reverse order of removal.



POWER/GROUND LINE INSPECTION



1. BCU Power Input Line Inspection

Disconnect the BCU 39P (Black) connector (page 21-28).

Turn the ignition switch ON.

Measure the voltage between the wire harness side 39P (Black) connector terminal and ground.

TOOL:

Test probe 07ZAJ-RDJA110

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

STANDARD: Battery voltage

Is there battery voltage?

YES – GO TO STEP 2.

NO – • Open circuit in the Black/red wire
• Blown sub fuse METER/ILLUMI 7.5 A

2. BCU Back-up Voltage Line Inspection

Turn the ignition switch OFF.
Measure the voltage between the wire harness side 39P (Black) connector terminal and ground.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION:

Back-up 1: Red (+) – Ground (–)

Back-up 2: Black (+) – Ground (–)

STANDARD: Battery voltage

Is there battery voltage?

YES – GO TO STEP 3.

NO – • Back-up 1 side:
– Open circuit in the Red wire
– Blown sub fuse BACK UP 7.5 A
• Back-up 2 side:
– Open circuit in the Black wire
– Blown sub fuse OP 10 A

3. BCU Ground Line Open Circuit Inspection

Check the continuity between the wire harness side 39P (Black) connector terminal and ground.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION: Green/blue – Ground

Is there continuity?

YES – Faulty BCU

NO – Open circuit in the Black/green wire

BODY CONTROL SYSTEM TROUBLESHOOTING INFORMATION

MCS INFORMATION

Refer to the PGM-FI system (page 4-5).

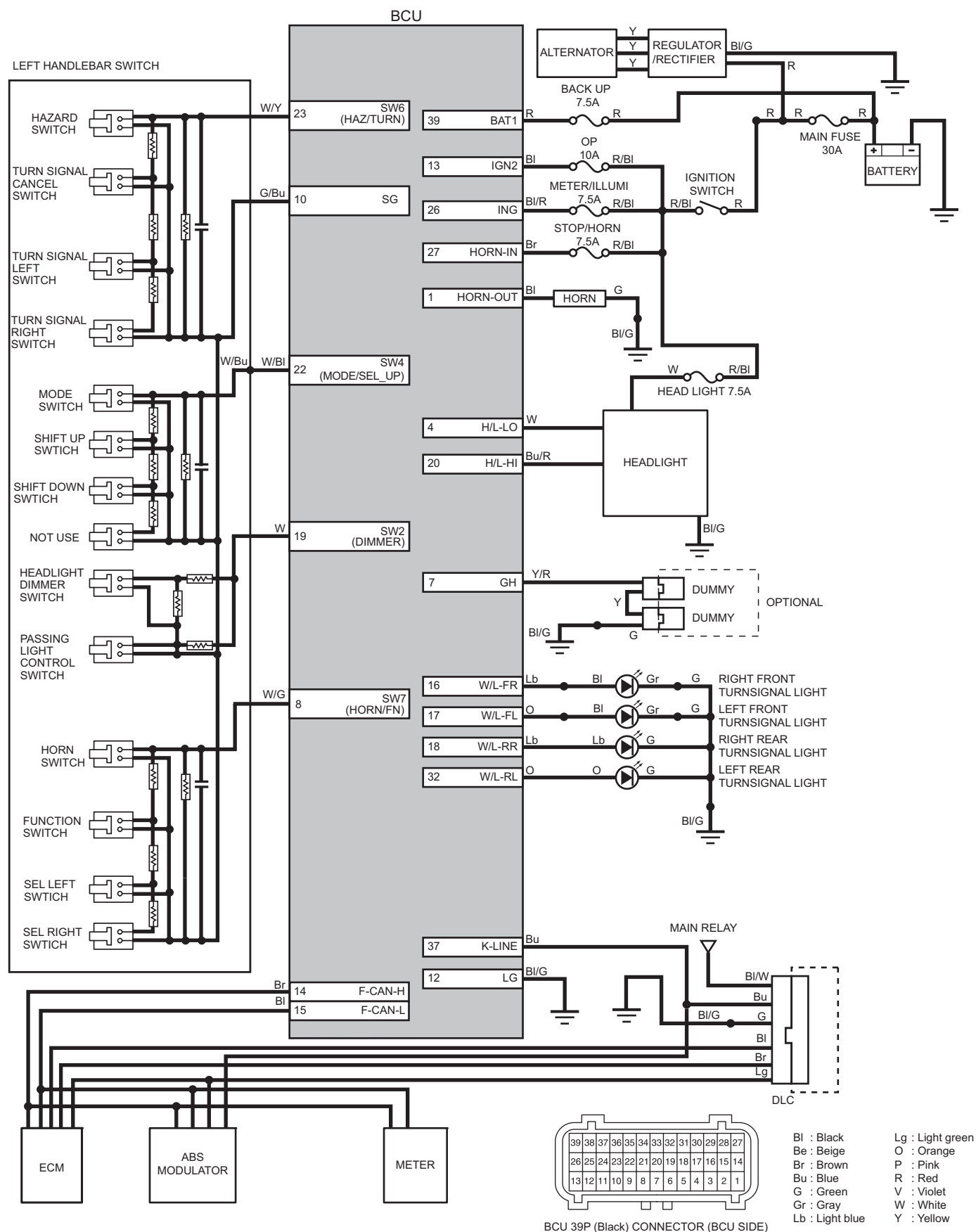
DTC READOUT**NOTE:**

- If the MIL blinks, check the PGM-FI DTC (page 4-5). If there is any problem in the PGM-FI system, troubleshoot it first. Then recheck the body control system after erasing the PGM-FI DTC.

Test-ride the motorcycle and read the current DTC with the MCS or MID. (Do not turn the ignition switch OFF after test-riding).

Follow the DTC index (page 21-31).

BODY CONTROL SYSTEM DIAGRAM



BODY CONTROL SYSTEM DTC INDEX

NOTE:

- After confirming the MID displays, perform the troubleshooting according to the DTC index.

Honda code	DTC	MIL blinks	DTC name	Refer to page
1-1	—	—	Ignition power failure (low voltage)	21-32
1-2	—	—	Ignition power failure (high voltage)	21-32
3-1	—	—	Back-up 1 failure (low voltage)	21-33
3-2	—	—	Back-up 1 failure (high voltage)	21-33
4-1	—	—	Back-up 2 failure (low voltage)	21-34
4-2	—	—	Back-up 2 failure (high voltage)	21-34
4-3	—	—	Back-up 2 malfunction	21-35
11-1	—	—	Headlight dimmer/passing light control switch failure (low voltage)	21-35
11-2	—	—	Headlight dimmer/passing light control switch failure (high voltage)	21-35
12-1	—	—	Turn signal switch failure (low voltage)	21-37
12-2	—	—	Turn signal switch failure (high voltage)	21-37
21-1	—	—	Right front turn signal light failure (short circuit)	21-39
21-2	—	—	Right front turn signal light failure (open circuit)	21-39
22-1	—	—	Left front turn signal light failure (short circuit)	21-39
22-2	—	—	Left front turn signal light failure (open circuit)	21-39
23-1	—	—	Right rear turn signal light failure (short circuit)	21-39
23-2	—	—	Right rear turn signal light failure (open circuit)	21-39
24-1	—	—	Left rear turn signal light failure (short circuit)	21-39
24-2	—	—	Left rear turn signal light failure (open circuit)	21-39
34-1	—	—	Grip heater load failure (short circuit)	21-41
34-2	—	—	Grip heater load failure (open circuit)	21-41
34-3	—	—	Grip heater load failure (internal circuit malfunction)	21-41
35-1	—	—	Horn relay failure (short circuit)	21-43
35-2	—	—	Horn relay failure (open circuit)	21-43
81-1	—	—	Function switch failure (low voltage)	21-44
81-2	—	—	Function switch failure (high voltage)	21-44
82-1	—	—	Function lever/voice control switch/page switch failure (short circuit)	21-46
82-2	—	—	Function lever/voice control switch/page switch failure (open circuit)	21-46
101-2	—	—	BCU EEPROM malfunction	21-47
103-1	U0001	103	CAN communication malfunction	4-55
103-2				
103-3				

BODY CONTROL SYSTEM DTC TROUBLESHOOTING

NOTE:

- Before starting the troubleshooting, check for loose or poor contact in the BCU related circuit.

DTC 1-1 IGNITION POWER FAILURE (LOW VOLTAGE)

Probable cause:

- Faulty battery or its related circuit
- Blown sub fuse METER/ILLUMI 10 A
- Charging system malfunction
- Faulty BCU or its power/ground line

Symptom/Fail-safe function:

- Body control system works normally

1. Recheck DTC

Read the DTC.

Is the DTC 1-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. BCU power/ground line Inspection

Check the BCU power/ground line (page 21-28).

Is the power/ground line normally?

YES – GO TO STEP 3.

NO – Repair the faulty parts.

3. Charging System Inspection

Check the charging system (page 20-5).

Is the charging system normally?

YES – Faulty BCU

NO – Repair the faulty parts.

DTC 1-2 IGNITION POWER FAILURE (HIGH VOLTAGE)

Probable cause:

- Faulty battery
- Charging system malfunction
- Faulty BCU

Symptom/Fail-safe function:

- Body control system works normally

1. Recheck DTC

Read the DTC.

Is the DTC 1-2 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Charging System Inspection

Check the charging system (page 20-5).

Is the charging system normally?

YES – Faulty BCU

NO – Repair the faulty parts.

DTC 3-1 BACK-UP 1 FAILURE (LOW VOLTAGE)

Probable cause:

- Faulty battery or its related circuit
- Blown sub fuse BACK UP 7.5 A
- Charging system malfunction
- Faulty BCU or its power/ground line

Symptom/Fail-safe function:

- Headlight/turn signal light works normally

1. Recheck DTC

Read the DTC.

Is the DTC 3-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. BCU power/ground line Inspection

Check the BCU power/ground line (page 21-28).

Is the power/ground line normally?

YES – GO TO STEP 3.

NO – Repair the faulty parts.

3. Charging System Inspection

Check the charging system (page 20-5).

Is the charging system normally?

YES – Faulty BCU

NO – Repair the faulty parts.

DTC 3-2 BACK-UP 1 FAILURE (HIGH VOLTAGE)

Probable cause:

- Faulty battery
- Charging system malfunction
- Faulty BCU

Symptom/Fail-safe function:

- Headlight/turn signal light/fog light does not work

1. Recheck DTC

Read the DTC.

Is the DTC 3-2 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Charging System Inspection

Check the charging system (page 20-5).

Is the charging system normally?

YES – Faulty BCU

NO – Repair the faulty parts.

DTC 4-1 BACK-UP 2 FAILURE (LOW VOLTAGE)

Probable cause:

- Faulty battery or its related circuit
- Blown sub fuse OP 10 A
- Charging system malfunction
- Faulty BCU or its power/ground line

Symptom/Fail-safe function:

- Grip heater works normally

1. Recheck DTC

Read the DTC.

Is the DTC 4-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. BCU power/ground line Inspection

Check the BCU power/ground line (page 21-28).

Is the power/ground line normally?

YES – GO TO STEP 3.

NO – Repair the faulty parts.

3. Charging System Inspection

Check the charging system (page 20-5).

Is the charging system normally?

YES – Faulty BCU

NO – Repair the faulty parts.

DTC 4-2 BACK-UP 2 FAILURE (HIGH VOLTAGE)

Probable cause:

- Faulty battery
- Charging system malfunction
- Faulty BCU

Symptom/Fail-safe function:

- Grip heater works normally

1. Recheck DTC

Read the DTC.

Is the DTC 4-2 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Charging System Inspection

Check the charging system (page 20-5).

Is the charging system normally?

YES – Faulty BCU

NO – Repair the faulty parts.

DTC 4-3 BACK-UP 2 FAILURE

Probable cause:

- Faulty battery
- Charging system malfunction
- Faulty BCU

Symptom/Fail-safe function:

- Grip heater does not work

1. Recheck DTC

Read the DTC.

Is the DTC 4-3 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

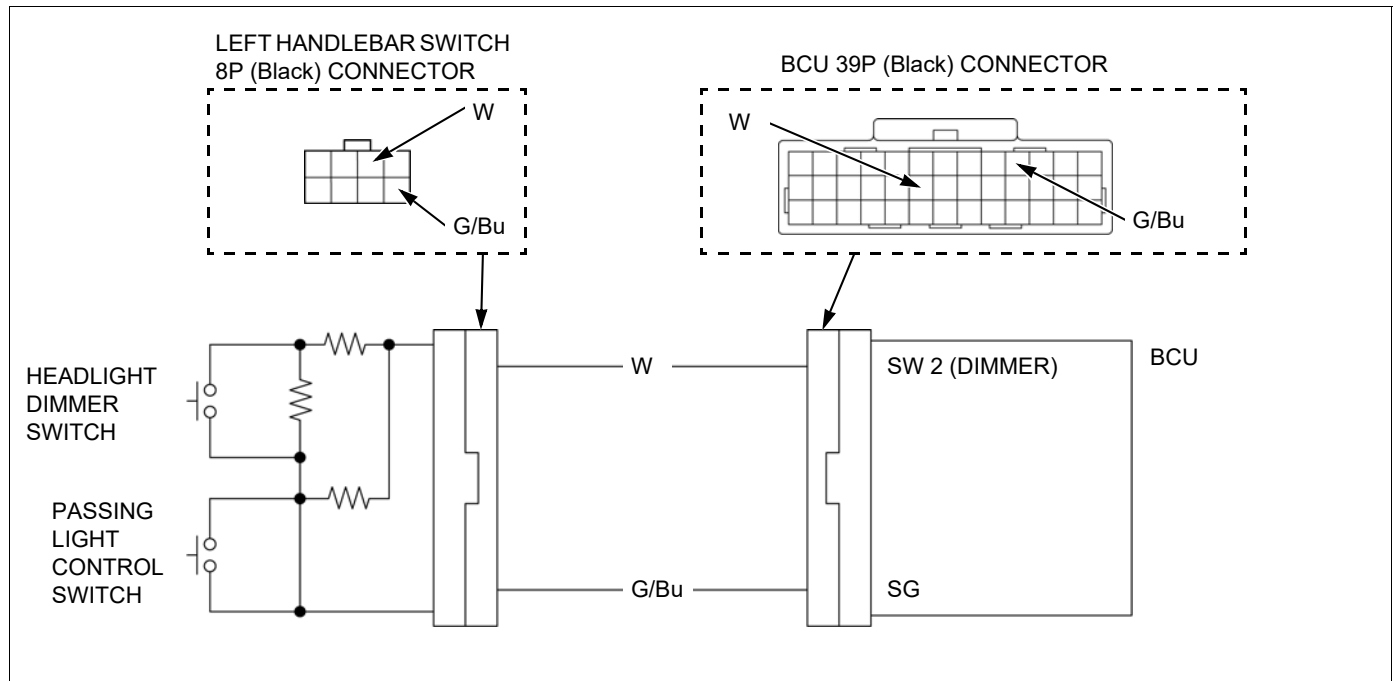
2. Charging System Inspection

Check the charging system (page 20-5).

Is the charging system normally?

YES – Faulty BCU

NO – Repair the faulty parts.

DTC 11-1/11-2/11-3 HEADLIGHT DIMMER/PASSING LIGHT CONTROL SWITCH FAILURE

21-34

NO – Intermittent failure

2. Headlight Dimmer/Passing Light Control Switch Line Open Circuit Inspection

Check for continuity between the BCU 39P (Black) connector and left handlebar switch 8P (Black) connector.

TOOL:

Test probe

07ZAJ-RDJA110

CONNECTION: White – White

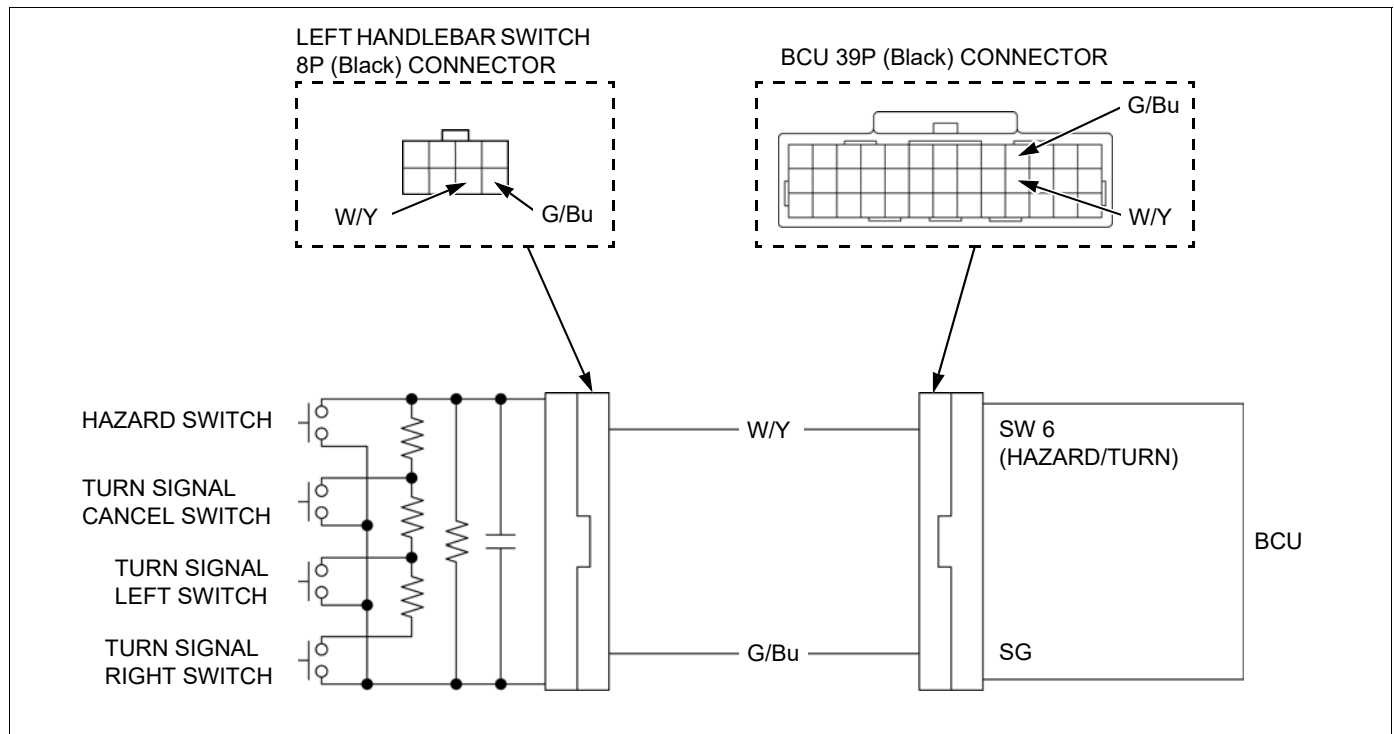
Green/blue – Green/blue

Is there continuity?

YES – • Faulty left handlebar switch (headlight dimmer/passing light control switch)
• Faulty BCU

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

DTC 12-1/12-2 TURN SIGNAL SWITCH FAILURE



DTC 12-1

TURN SIGNAL SWITCH FAILURE (LOW VOLTAGE)

Probable cause:

- Short circuit in the related wire
- Faulty switch
- Faulty BCU

Symptom/Fail-safe function:

- Turn signal light works normally

1. Recheck DTC

Read the DTC.

Is the DTC 12-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Turn Signal Switch Line Short Circuit Inspection

Check for continuity between the BCU 39P (Black) connector and ground.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION: White/yellow – Ground

Is there continuity?

YES – Short circuit in the White/yellow wire

NO – • Faulty left handlebar switch (turn signal left/right switch, turn signal cancel switch, or hazard switch)
• Faulty BCU

DTC 12-2

TURN SIGNAL SWITCH FAILURE (HIGH VOLTAGE)

Probable cause:

- Open circuit in the related wire
- Faulty switch
- Faulty BCU

Symptom/Fail-safe function:

- Turn signal light works normally

1. Recheck DTC

Read the DTC.

Is the DTC 12-2 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Turn Signal Switch Line Open Circuit Inspection

Check for continuity between the BCU 39P (Black) connector and left handlebar switch 8P (Black) connector.

TOOL:

Test probe 07ZAJ-RDJA110

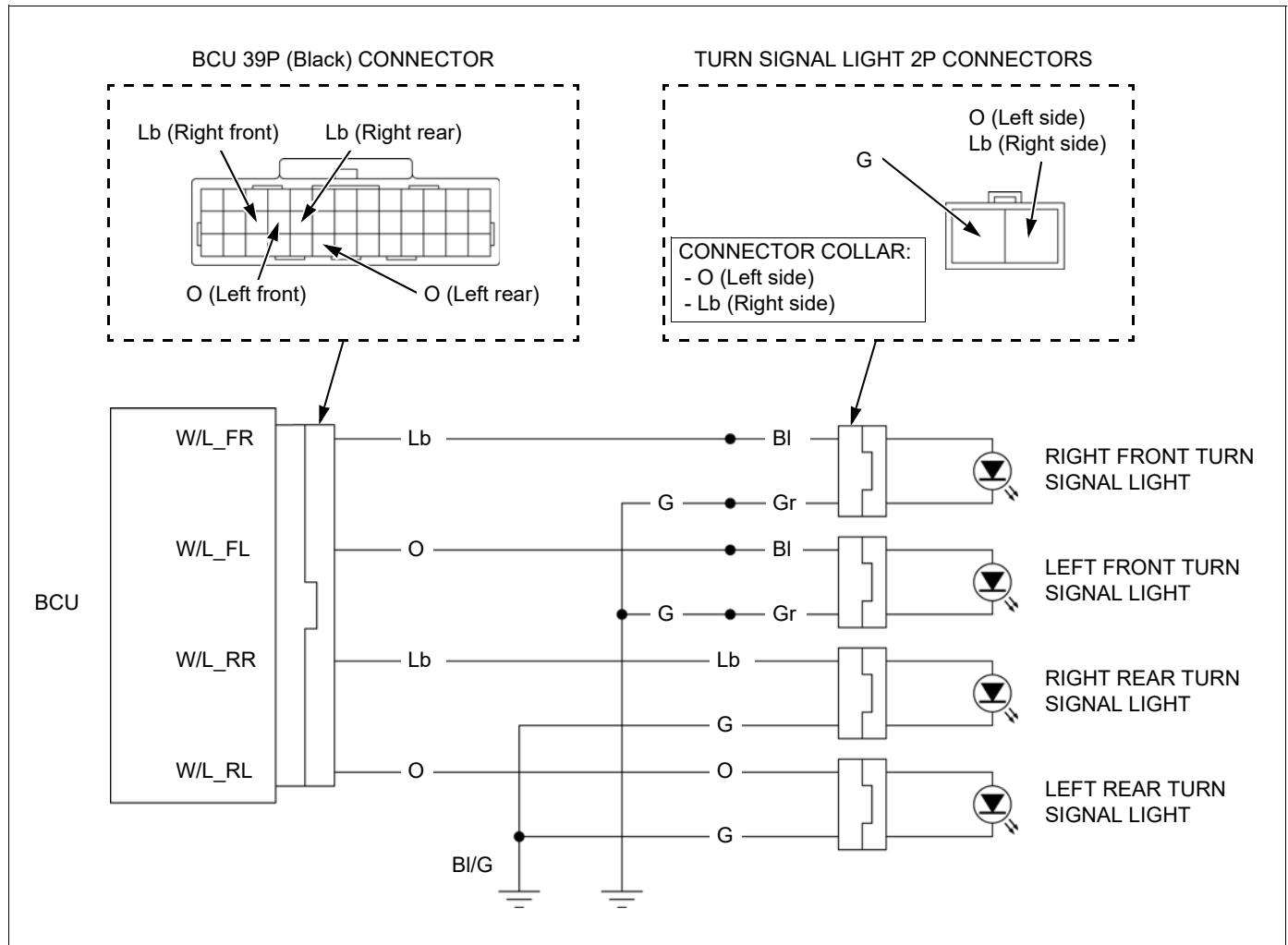
CONNECTION: White/yellow – White/yellow
Green/blue – Green/blue

Is there continuity?

YES – • Faulty left handlebar switch (turn signal left/right switch, turn signal cancel switch, or hazard switch)
• Faulty BCU

NO – Open circuit in the Light green or Gray wire

**DTC 21-1/21-2/22-1/22-2/23-1/23-2/24-1/
24-2
TURN SIGNAL LIGHT FAILURE**



**DTC 21-1/22-1/23-1/24-1
TURN SIGNAL LIGHT FAILURE (SHORT CIRCUIT)**

Probable cause:

- Short circuit in the related wire
- Faulty turn signal light
- Faulty BCU

Symptom/Fail-safe function:

- Turn signal light does not work
- Normal units blink two times faster than usual

1. Recheck DTC

Read the DTC.

Is the DTC 21-1/22-1/23-1/24-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Turn Signal Light Line Short Circuit Inspection

Check for continuity between the BCU 39P (Black) connector and ground.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION:

Left side: Orange – Ground

Right side: Light blue – Ground

Is there continuity?

YES – Short circuit in the Orange or Light blue wire

NO – • Faulty turn signal light
• Faulty BCU

DTC 21-2/22-2/23-2/24-2 TURN SIGNAL LIGHT FAILURE (OPEN CIRCUIT)

Probable cause:

- Open circuit in the related wire
- Faulty turn signal light
- Faulty BCU

Symptom/Fail-safe function:

- Normal units blink two times faster than usual

1. Recheck DTC

Read the DTC.

Is the DTC 21-2/22-2/23-2/24-2 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Turn Signal Light Line Open Circuit Inspection

Check for continuity between the BCU 39P (Black) connector and each turn signal light 2P connector. Check for continuity between each turn signal light 2P connector and ground.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION:

Left side: Orange – Orange

Green – Ground

Right side: Light blue – Light blue

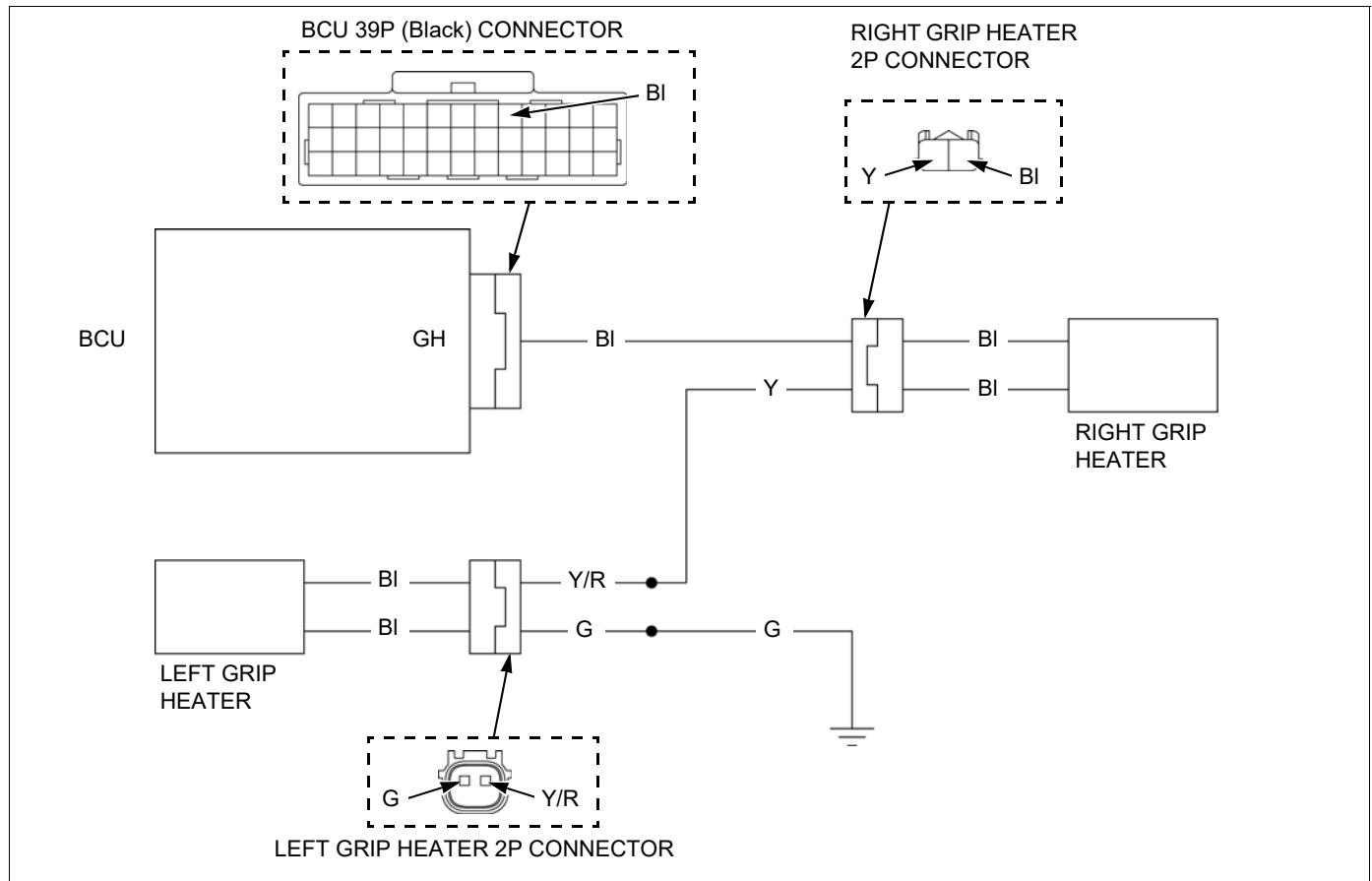
Green – Ground

Is there continuity?

YES – • Faulty turn signal light
• Faulty BCU

NO – Open circuit in the Orange, Light blue, or Green wires

DTC 34-1/34-2/34-3 GRIP HEATER LOAD FAILURE



DTC B34 (34-1) GRIP HEATER LOAD FAILURE (SHORT CIRCUIT)

Probable cause:

- Short circuit in the related wire
- Faulty grip heater
- Faulty BCU

Symptom/Fail-safe function:

- Grip heater does not work

1. Recheck DTC

Read the DTC.

Is the DTC 34-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Grip Heater Line Short Circuit Inspection

Check for short circuit in the following wires:

- Black wire between the BCU 39P (Black) connector and right grip heater 2P connector
- Yellow and Yellow/red wires between the right grip heater 2P connector and left grip heater 2P connector

Are the wires OK?

YES – GO TO STEP 3.

NO – Short circuit in the Black, Yellow, or Yellow/red wire

3. Grip Heater Resistance Inspection

Measure the grip heater resistance.

Is the grip heater OK?

YES – Faulty BCU

NO – Replace the faulty grip heater.

DTC 34-2 GRIP HEATER LOAD FAILURE (OPEN CIRCUIT)

Probable cause:

- Open circuit in the related wire
- Faulty grip heater
- Faulty BCU

Symptom/Fail-safe function:

- Grip heater does not work

1. Recheck DTC

Read the DTC.

Is the DTC 34-2 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Grip Heater Line Open Circuit Inspection

Check for open circuit in the following wires:

- Black wire between the BCU 39P (Black) connector and right grip heater 2P connector
- Yellow and Yellow/red wires between the right grip heater 2P connector and left grip heater 2P connector
- Green wire between the left handlebar switch 12P connector and ground

TOOL:

Test probe 07ZAJ-RDJA110

Are the wires OK?

YES – GO TO STEP 3.

NO – Open circuit in the Black, Yellow, Yellow/red, or Green wire

3. Grip Heater Resistance Inspection

Measure the grip heater resistance.

Is the grip heater OK?

YES – Faulty BCU

NO – Replace the faulty grip heater.

**DTC 34-3 GRIP HEATER LOAD FAILURE
(INTERNAL CIRCUIT MALFUNCTION)**

Probable cause:

- Faulty grip heater
- Faulty BCU

Symptom/Fail-safe function:

- Grip heater does not turn OFF

1. Recheck DTC

Read the DTC.

Is the DTC 34-3 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Grip Heater Resistance Inspection

Measure the grip heater resistance.

Is the grip heater OK?

YES – Faulty BCU

NO – Replace the faulty grip heater.

**DTC 35-1 HORN RELAY LOAD
FAILURE (SHORT CIRCUIT)**

Probable cause:

- Faulty horn
- Faulty BCU

Symptom/Fail-safe function:

- Horn does not turn OFF

1. Horn Inspection

Replace the horn with a known good one and recheck.

Is the DTC 35-1 indicated?

YES – Faulty BCU

NO – Faulty original horn

**DTC 35-2 HORN RELAY LOAD
FAILURE (OPEN CIRCUIT)**

Probable cause:

- Faulty BCU

Symptom/Fail-safe function:

- Horn does not work

1. Recheck DTC

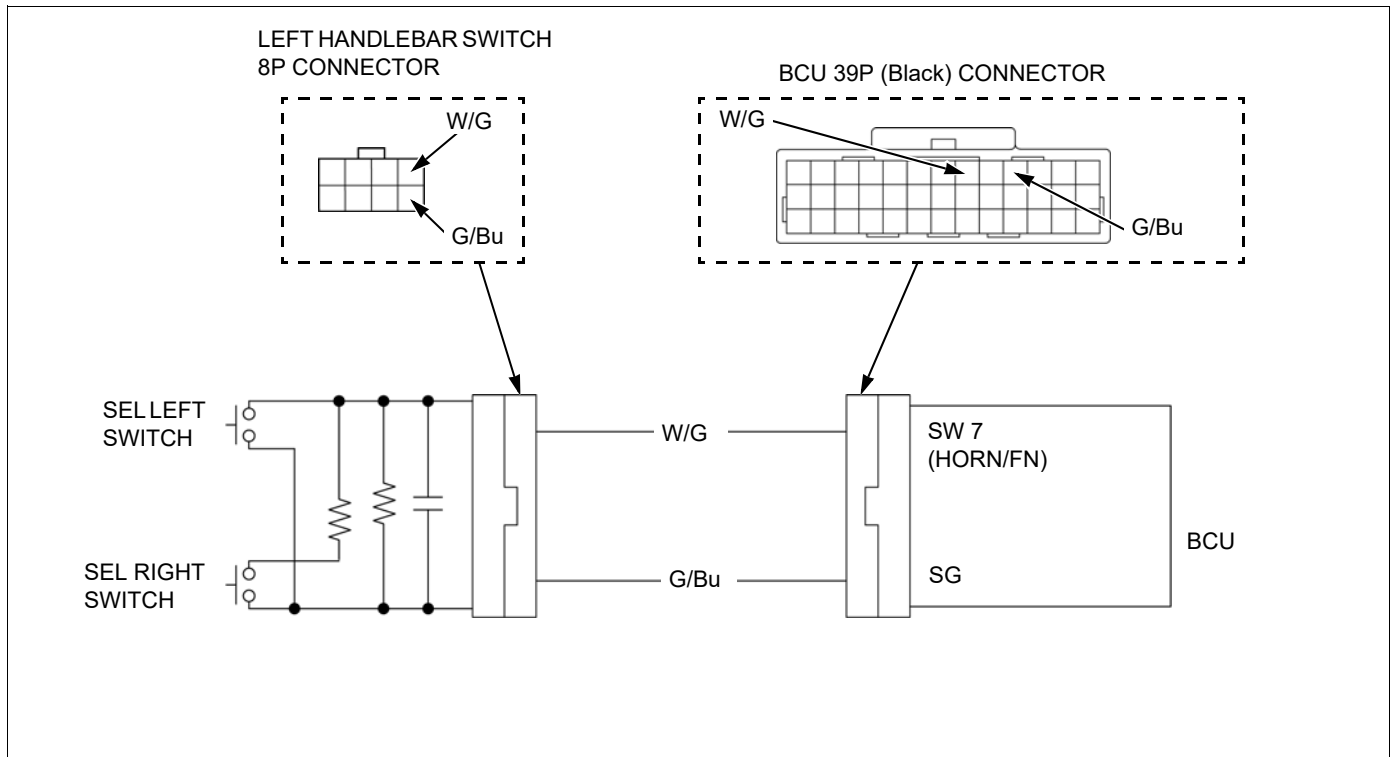
Read the DTC.

Is the DTC 35-2 indicated?

YES – Faulty BCU

NO – Intermittent failure

DTC 81-1/81-2 SEL LEFT/RIGHT SWITCH FAILURE



DTC 81-1 SEL LEFT/RIGHT SWITCH FAILURE (SHORT CIRCUIT)

Probable cause:

- Short circuit in the related wire
- Faulty switch
- Faulty BCU

Symptom/Fail-safe function:

- Grip heater (option) does not work

1. Recheck DTC

Read the DTC.

Is the DTC 81-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. SEL LEFT/RIGHT Switch Line Short Circuit Inspection

Check for continuity between the BCU 39P (Black) connector and ground.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION: White/green – Ground
Green/blue – Ground

Is there continuity?

YES – Short circuit in the White/green or Green/blue wire

NO –

- Faulty left handlebar switch (function switch)
- Faulty BCU

**DTC 81-2 SEL LEFT/RIGHT SWITCH FAILURE
(OPEN CIRCUIT)**

Probable cause:

- Open circuit in the related wire
- Faulty switch
- Faulty BCU

Symptom/Fail-safe function:

- Grip heater (option) does not work

1. Recheck DTC

Read the DTC.

Is the DTC 81-2 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. SEL LEFT/RIGHT Switch Line Open Circuit inspection

Check for continuity between the BCU 39P (Black) connector and left handlebar switch 8P connector.

TOOL:

Test probe **07ZAJ-RDJA110**

CONNECTION:

Signal line: White/green – White/green

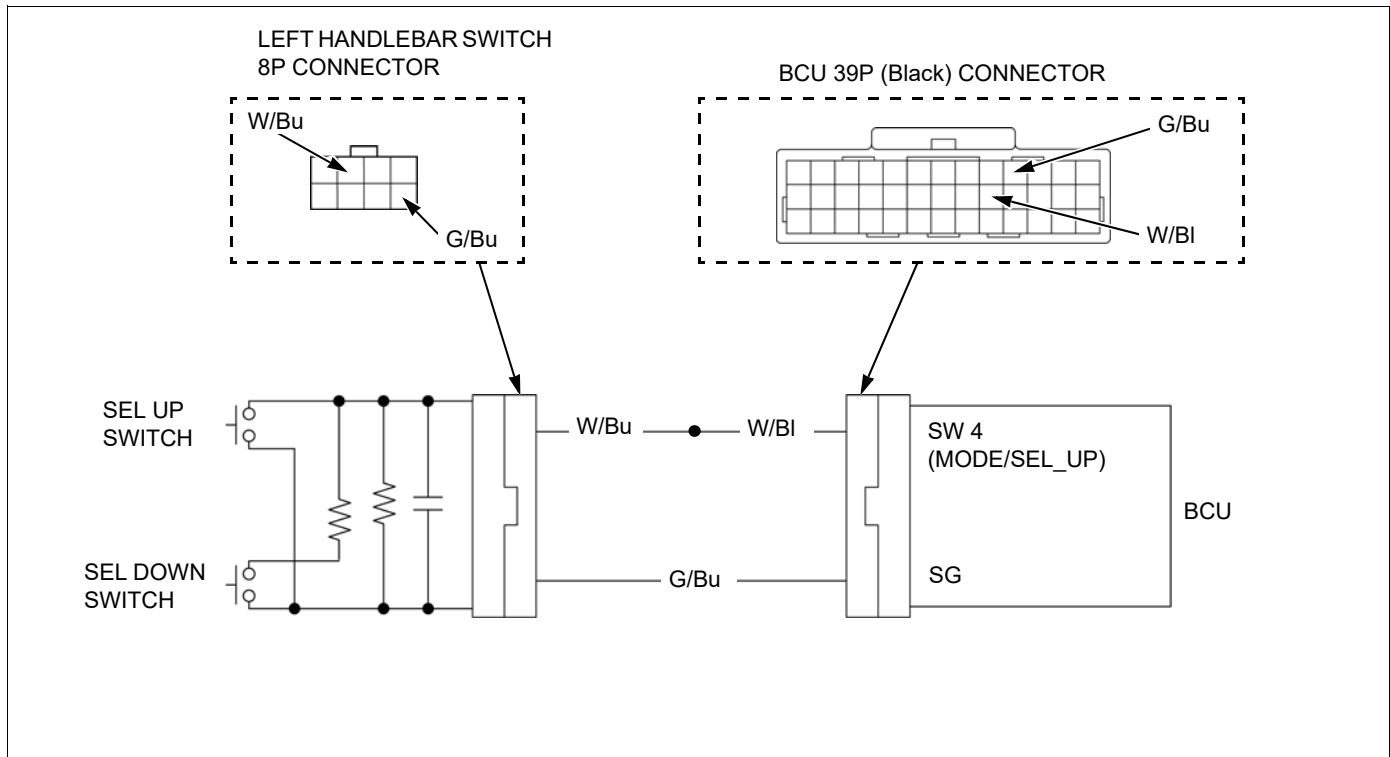
Ground line: Green/blue – Green/blue

Is there continuity?

YES – • Faulty left handlebar switch (function switch)
• Faulty BCU

NO – Open circuit in the White/green or Green/blue wire

DTC 82-1/82-2 SEL UP/DOWN SWITCH FAILURE



DTC 82-1 SEL UP DOWN FAILURE (SHORT CIRCUIT)

Probable cause:

- Short circuit in the related wire
- Faulty switch
- Faulty BCU

Symptom/Fail-safe function:

- Grip heater (option) does not work

1. Recheck DTC

Read the DTC.

Is the DTC 82-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. SEL UP/DOWN Switch Line Short Circuit Inspection

Check for continuity between the BCU 39P (Black) connector and ground.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION:

White/blue – Ground

White/black – Ground

Is there continuity?

YES – Short circuit in the White/black or White/blue wire

NO –

- Faulty left handlebar switch (SEL UP/DOWN switch)
- Faulty BCU

DTC 82-2 SEL UP/DOWN SWITCH FAILURE (OPEN CIRCUIT)

Probable cause:

- Open circuit in the related wire
- Faulty switch
- Faulty BCU

Symptom/Fail-safe function:

- Grip heater (option) does not work

1. Recheck DTC

Read the DTC.

Is the DTC 82-2 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. SEL UP/DOWN Switch Line Open Circuit Inspection

Check for continuity between the BCU 39P (Black) connector and left handlebar switch 8P connector.

TOOL:

Test probe **07ZAJ-RDJA110**

CONNECTION: White/blue – White/blue
White/black – White/black
Green/blue – Green/blue

Is there continuity?

YES – • Faulty left handlebar switch (SEL UP/DOWN switch)
• Faulty BCU

NO – Open circuit in the White/blue, White/black or Green/blue wire

DTC 101-2 BCU EEPROM MALFUNCTION

Probable cause:

- Faulty BCU

Symptom/Fail-safe function:

- Body control system works normally

1. Recheck DTC

Read the DTC.

Is the DTC 101-2 indicated?

YES – Faulty BCU

NO – Intermittent failure

MEMO

22. IMMOBILIZER SYSTEM (HISS)

SERVICE INFORMATION	22-2	DIAGNOSTIC CODE INDICATION	22-6
SYSTEM LOCATION	22-2	TROUBLESHOOTING	22-7
SYSTEM DIAGRAM	22-3	HISS INDICATOR	22-9
KEY REGISTRATION PROCEDURES	22-3	IMMOBILIZER RECEIVER	22-9

IMMOBILIZER SYSTEM (HISS)

SERVICE INFORMATION

GENERAL

- When checking the HISS, follow the steps in the troubleshooting flow chart (page 22-7).
- Keep the immobilizer key away from the other motorcycle'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 HISS.
- The ECM can store up to four key codes. (The four keys can be registered.)
- If the ECM is replaced, perform the following procedure.
 - Key Registration Procedure (page 22-3)
- Do not modify the HISS as it can cause the system failure. (The engine cannot be started.)
- Refer to the ignition system inspection (page 5-5).
- Refer to the ignition switch servicing (page 21-17).
- The following color codes are used throughout this section.

Be = Beige
Lb = Light blue
W = White

Bl = Black
Lg = Light green
Y = Yellow

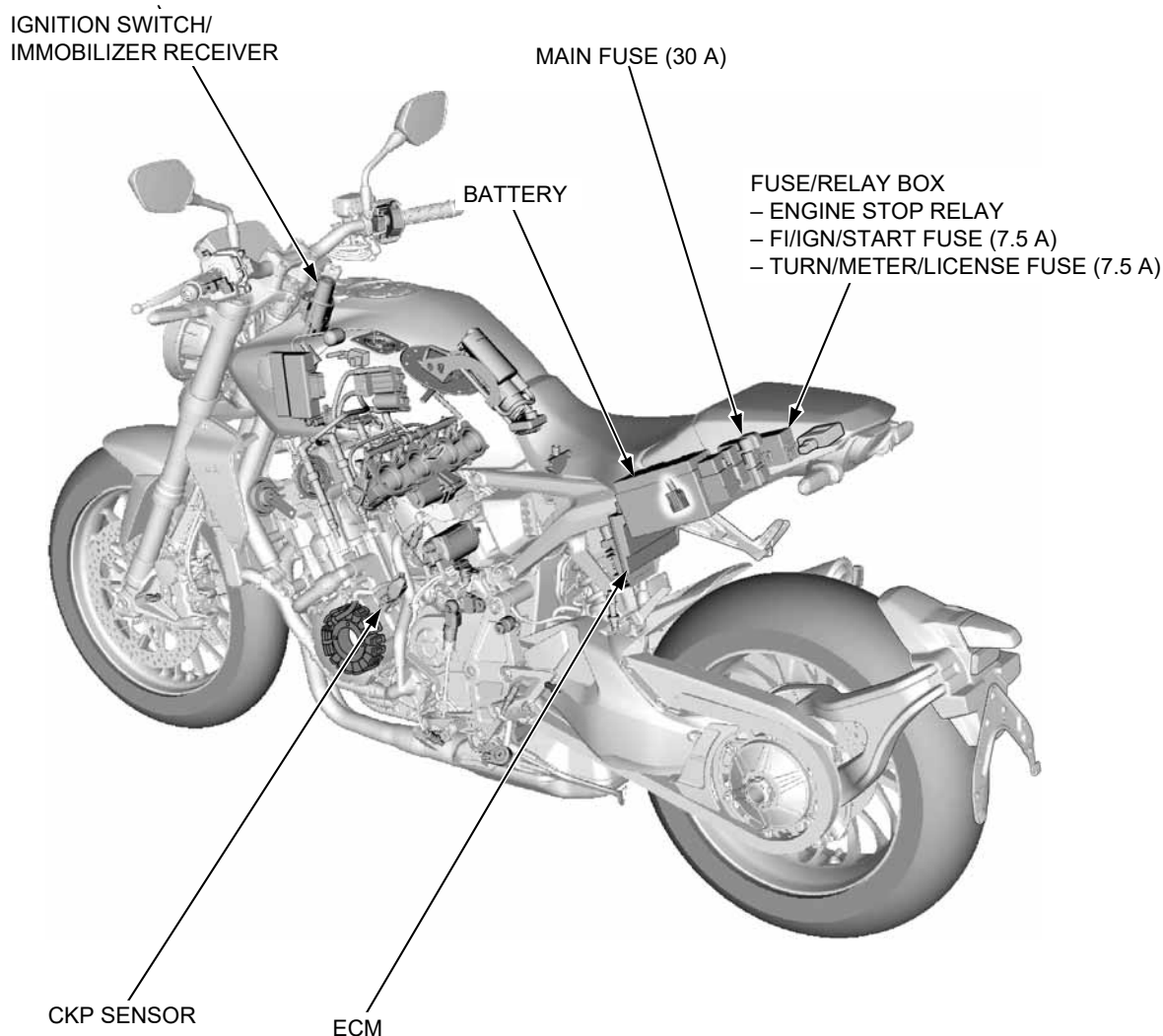
Br = Brown
O = Orange

Bu = Blue
P = Pink

G = Green
R = Red

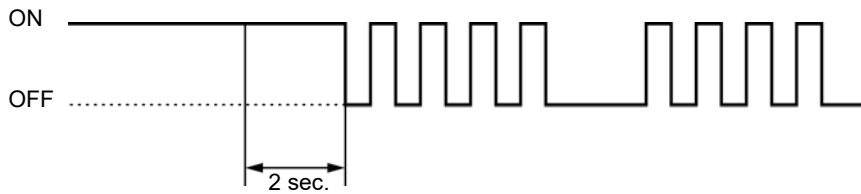
Gr = Gray
V = Violet

SYSTEM LOCATION



IMMOBILIZER SYSTEM (HISS)

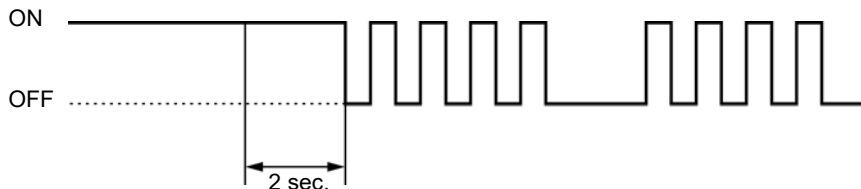
9. Turn the ignition switch OFF and remove the key. Completely close the throttle grip.
10. Open the throttle grip 5 ° to 60 ° and hold.
11. Turn the ignition switch ON with a new key or the spare key (Never use the key registered in previous steps). The indicator comes on for two seconds then it blinks 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 22-6).
 - 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 10 and 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. Turn the ignition switch OFF, then completely close the throttle grip. 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.

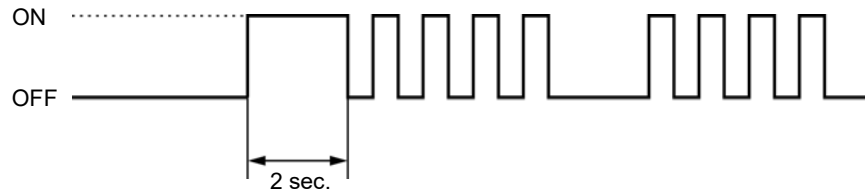
When the ignition switch is faulty:

1. Obtain a new ignition switch assembly.
2. Remove the ignition switch (page 21-17).
3. Connect the SCS short connector to the DLC (page 22-6).
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 it.
6. 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 22-6).
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 21-17).
 12. Open the throttle grip 5 ° to 60 ° and hold it.

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 22-6).
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 it.
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 22-6).
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 4 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 it.
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 22-6).
 - Keep the other transponder key away from the immobilizer receiver more than 50 mm (2.0 in).
25. Repeat the steps 22 through 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.

IMMOBILIZER SYSTEM (HISS)

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 21-17).
3. Replace the ECM with a new one (page 4-58).
4. Turn 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 22-6).
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 22-6).
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 22-3).
8. Check that the engine can be started using all registered keys.
9. Replace the remaining key set parts.

DIAGNOSTIC CODE INDICATION

Turn the ignition switch OFF.

Remove the main seat (page 2-4).

Remove the dummy connector [1] from the DLC.

Short the DLC terminals using a special tool.

CONNECTION: Blue – Green

TOOL:

SCS short connector [2] 070MZ-0010300

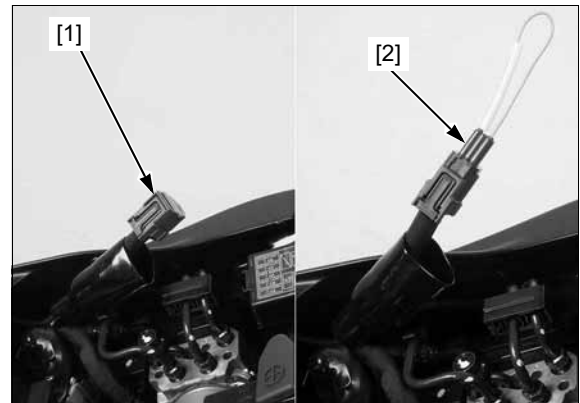
Open the throttle grip 5 ° to 60 ° and hold it.

Turn 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.

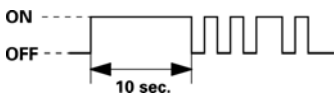
The blinking frequency is repeated.

The HISS indicator remains on when the system is normal (The system is in the normal mode and the diagnostic code does not appear).

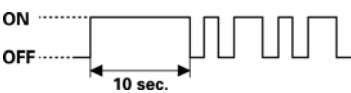


DIAGNOSTIC CODE

When the system (ECM) enters the diagnostic mode from the normal mode:

BLINKING PATTERN	SYMPTOM	PROBLEM	PROCEDURE
	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 22-8).
	Identification code is disagree.	Jamming by the other transponder	Keep the other vehicle's transponder key away from the immobilizer receiver more than 50 mm (2.0 in).
	Secret code is disagree.		

When the system (ECM) enters the diagnostic mode from the registration mode:

BLINKING PATTERN	SYMPTOM	PROBLEM	PROCEDURE
	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 22-8).
	Registration is impossible.	The key is already registered on the other system.	Use a new key.

TROUBLESHOOTING

The HISS indicator comes on for approx. two seconds then it goes off, when the ignition switch is turned ON with the properly registered key and the HISS functions normally. If there is any problem or the properly registered key is not used, the indicator will remain on.

HISS indicator does not come on when the ignition switch is turned ON

1. Fuse Inspection

Check the METER/ILLUMI fuse (7.5 A).

Is the fuse blow?

YES – Replace the fuse.

NO – GO TO STEP 2.

IMMOBILIZER SYSTEM (HISS)

2. Combination Meter Inspection

Check the combination meter initial operation (page 21-8).

Does the meter display initial operation?

YES – GO TO STEP 3.

NO – Check the combination meter power and ground lines (page 21-8)

3. CAN Line Inspection

Check that the ECM stores the DTC U0001 (103-1) (page 4-55).

Is the DTC U0155 (103-2) stored?

YES – Troubleshoot the DTC U0001 (103-1) (page 4-55).

NO – Check the ECM power/ground lines (page 4-59).

HISS indicator remains on with the ignition switch turned ON

1. Immobilizer Receiver Jamming Inspection

Check that there is any metal obstruction or the other motorcycle 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 HISS indicator. The indicator should come on for 2 seconds then go off.

Is 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 22-6).
Check that the HISS indicator comes on then it starts blinking.

Is the indicator blinks or stay lit?

Brinks– Read the diagnostic code (page 22-6).

Stay lit– GO TO STEP 4.

4. PGM-FI DTC Inspection

Check the MIL indicated.

Does the MIL indicated?

YES – Check the PGM-FI DTC (page 4-9).

NO – Faulty ECM

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 22-9).

Is the input line normal?

NO – Open or short circuit in the Red wire

YES – GO TO STEP 2.

2. Immobilizer Receiver Ground Line Inspection

Check the immobilizer receiver ground line (page 22-10).

Is the ground line normal?

YES – GO TO STEP 3.

NO – Open circuit in the Green/black wire

3. Immobilizer Receiver Signal Line Inspection

Check the immobilizer receiver signal lines (page 22-10).

Are the signal lines normal?

YES – GO TO STEP 4.

NO – • Open or short circuit in the Pink wire
• Open or short circuit in the Orange/blue wire

4. Immobilizer Receiver Inspection

Replace the immobilizer receiver with a know good one (page 22-11).
Perform the diagnostic code indication procedure (page 22-6).

Is the Diagnostic code  indicated?

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

NO – Faulty original immobilizer receiver

HISS INDICATOR

POWER INPUT LINE INSPECTION

Inspect the combination meter power/ground line (page 21-8)

HISS INDICATOR LINE INSPECTION

Check that the ECM stores the DTC U0001 (103-1) (page 4-55).

If the ECM stores DTC, follow the DTC troubleshooting (page 4-4).

IMMOBILIZER RECEIVER

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

Disconnect the immobilizer receiver 4P (Black) connector [1].

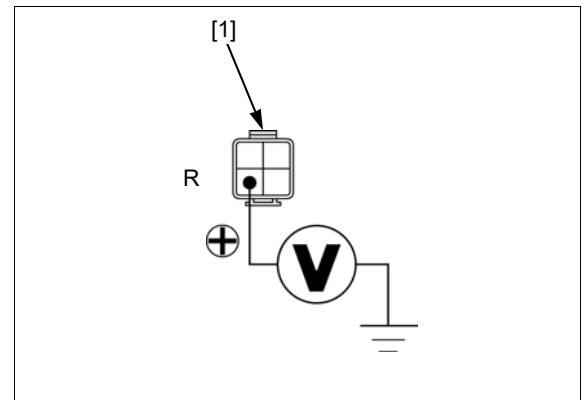


POWER INPUT LINE INSPECTION

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

Connection: Red (+) – Ground (–)

There should be approx. 5 V.



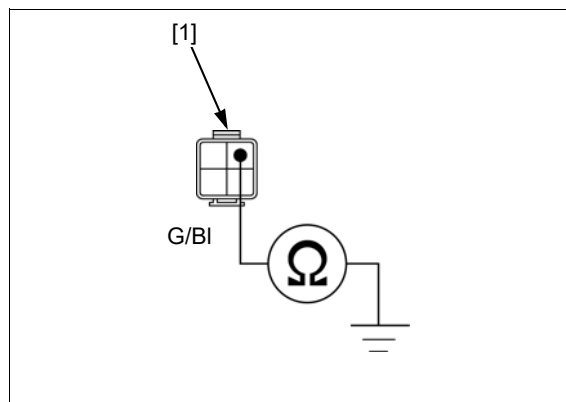
IMMOBILIZER SYSTEM (HISS)

GROUND LINE INSPECTION

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

Connection: Green/black – Ground

There should be continuity at all times.



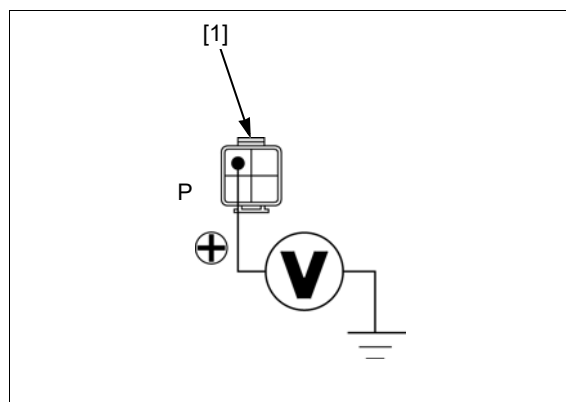
SIGNAL LINE INSPECTION

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

Measure the voltage between the wire harness side 4P (Black) connector [1] and ground.

Connection: Pink (+) – Ground (-)

There should be approx. 5 V.



Turn the ignition switch OFF.

Disconnect the ECM 33P (Gray) connector (page 4-58).

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

TOOL:

Test probe

07ZAJ-RDJA110

Connection: C14 – Orange/blue

There should be continuity.

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

Connection: Orange/blue – Ground

There should be no continuity.

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

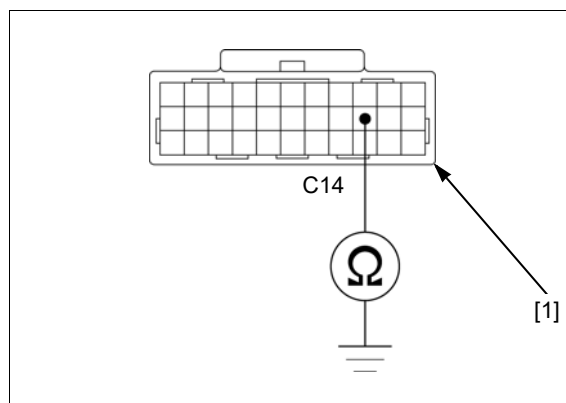
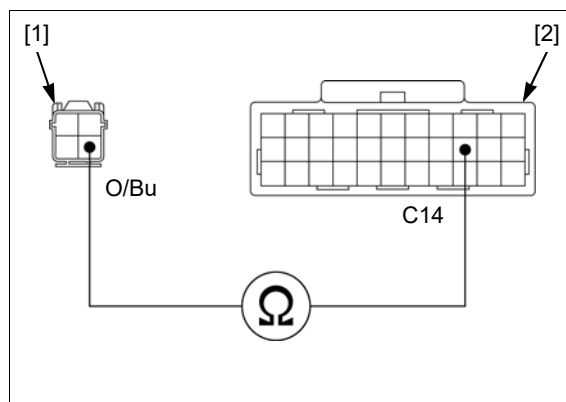
TOOL:

Test probe

07ZAJ-RDJA110

CONNECTION: C14 – Ground

There should be no continuity.



REMOVAL/INSTALLATION

For removal/installation, (page 21-17).

REPLACEMENT PARTS FOR PROBLEM

Problem	Replacement parts				
	Transponder Key	Immobilizer receiver	ECM	Ignition switch	*Accessory lock and key
One Key has been lost, or additional spare key is required.	○				
All key have been lost, or ECM is faulty.	○		○		
Immobilizer receiver is faulty.		○			
Ignition switch is faulty.	○			○	
*Accessory lock is faulty.					○

*Accessory lock means the seat lock or fuel fill cap.

MEMO

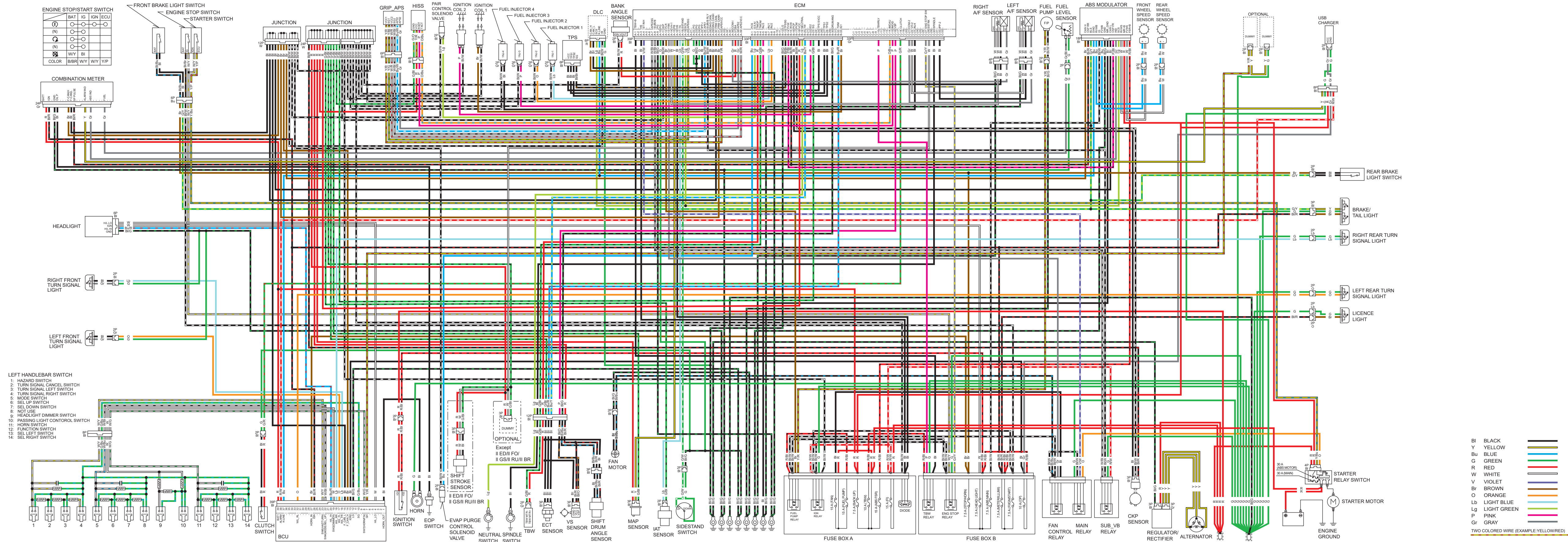
23. WIRING DIAGRAM

WIRING DIAGRAM
(Except CH, III CH models) 23-2

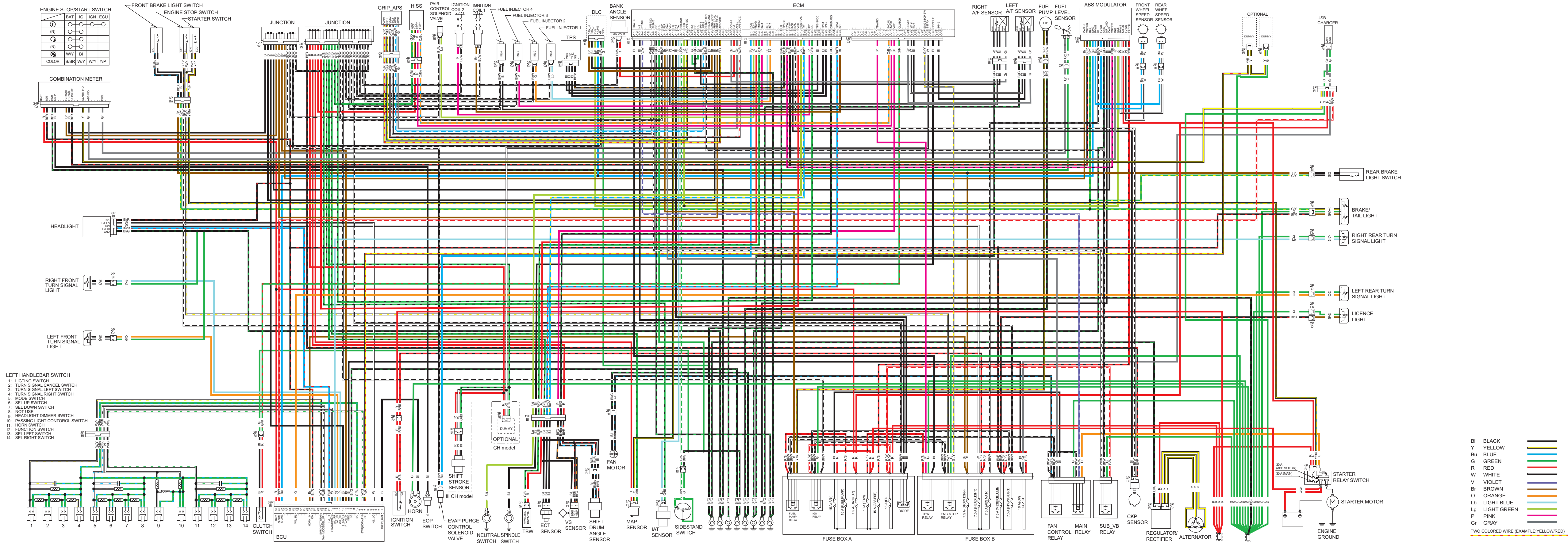
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PGM-FI SISYTEM DIAGRAM 23-4

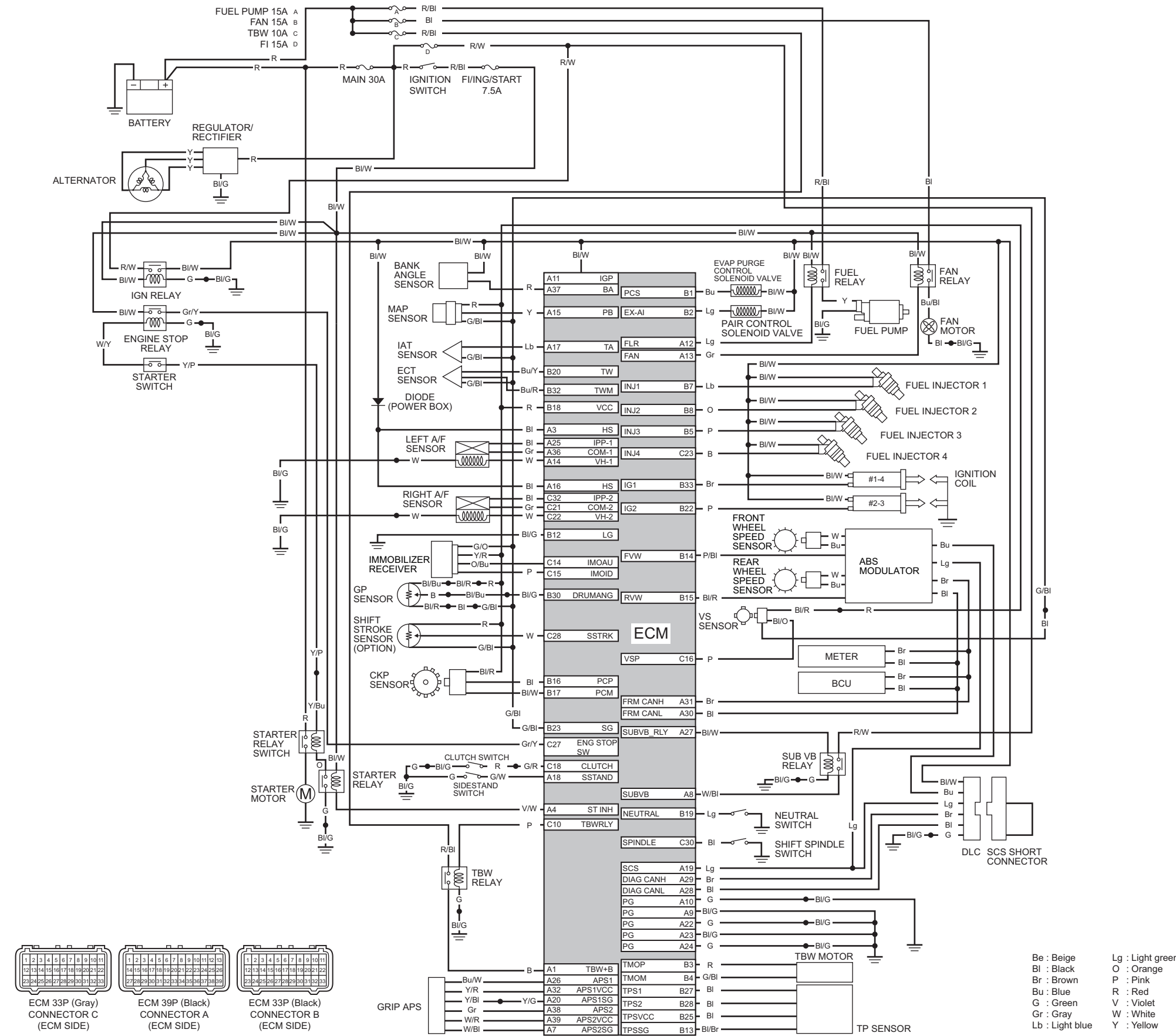
WIRING DIAGRAM (Except CH, III CH models)



WIRING DIAGRAM (CH, III CH models)



PGM-FI SISYTEM DIAGRAM



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HONDA

The Power of Dreams