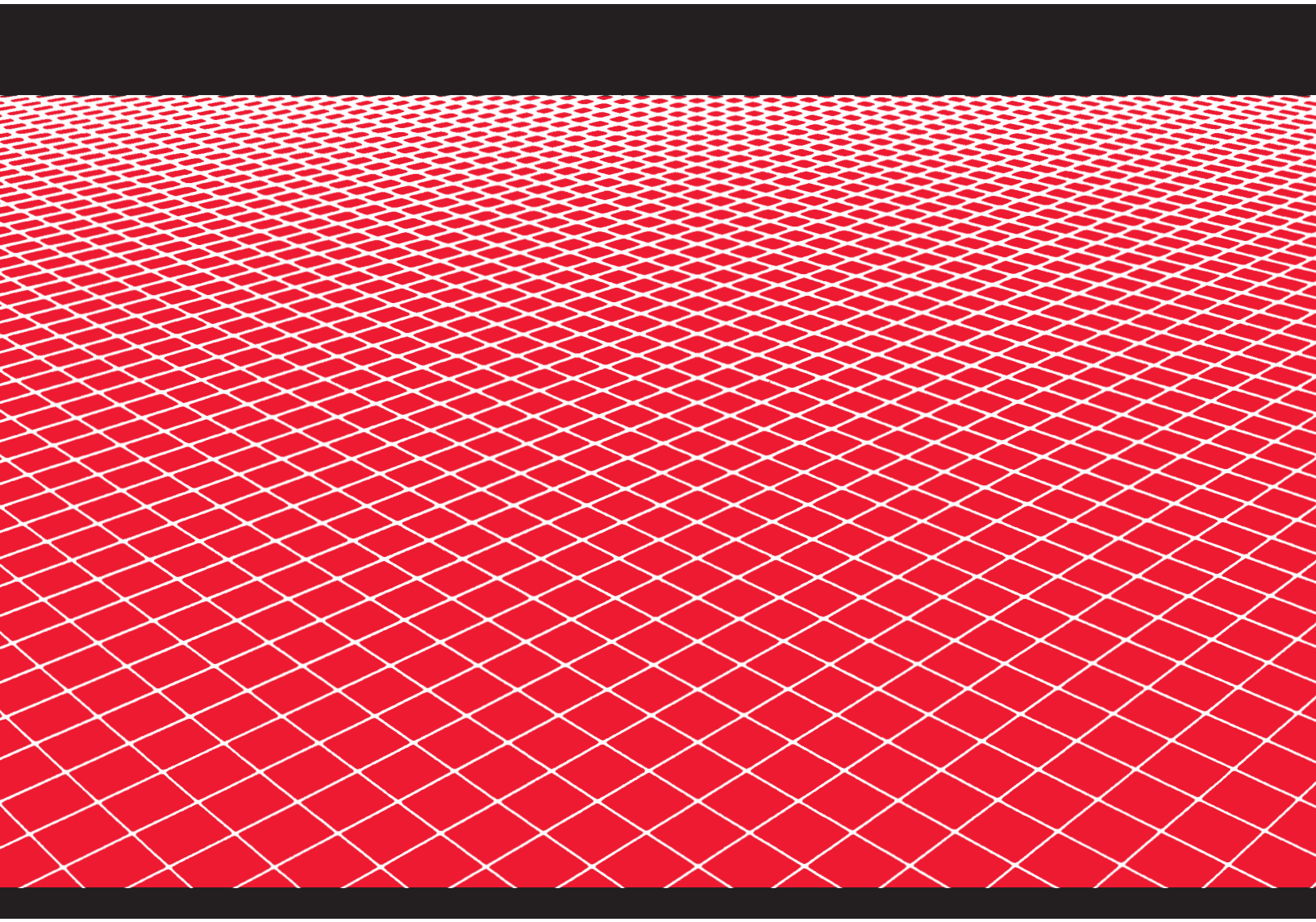
HONDA

SHOP MANUAL

CB750A



A Few Words About Safety

Service Information

The service and repair information contained in this manual is intended for use by qualified, professional technicians.

Attempting service or repairs without the proper training, tools, and equipment could cause injury to you or others. It could also damage the vehicle or create an unsafe condition.

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

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

For Your Customer's Safety

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

⚠WARNING

Improper service or repairs can create an unsafe condition that can cause your customer 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 CB750A.

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.

SERVICE PUBLICATION OFFICE

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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.

CONTENTS

MEMO

1. 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 1-21).
9. Do not bend or twist control cables. Damaged control cables will not operates smoothly and may stick or bind.

ABBREVIATION

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

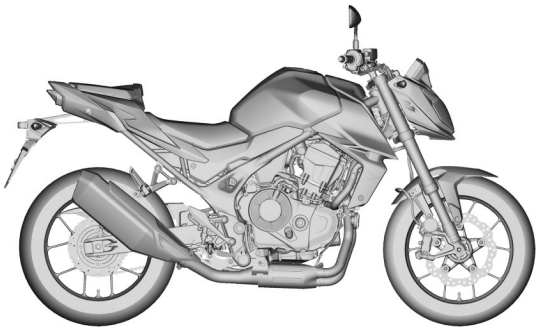
Abbrev. term	Full term
ABS	Anti-lock Brake System
APS	Accelerator Position Sensor
A/F sensor	Air/Fuel sensor
BCU	Body Control Unit
CKP sensor	Crankshaft Position sensor
DLC	Data Link Connector
DTC	Diagnostic Trouble Code
ECM	Engine Control Module
ECT sensor	Engine Coolant Temperature sensor
EEPROM	Electrically Erasable Programmable Read Only Memory
EOP switch	Engine Oil Pressure switch
ESS	Emergency Stop Signal
EVAP	Evaporative Emission
GP sensor	Gear Position sensor
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
MID	Multi information display
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, III ED, IV ED	European direct sales
KO, II KO	Korea
GS, II GS	Gulf Countries
U	Australia, New Zealand
MA, II MA	Malaysia
TH	Thailand
HK, II HK	Hong Kong
CH	China
FO, II FO	Taiwan

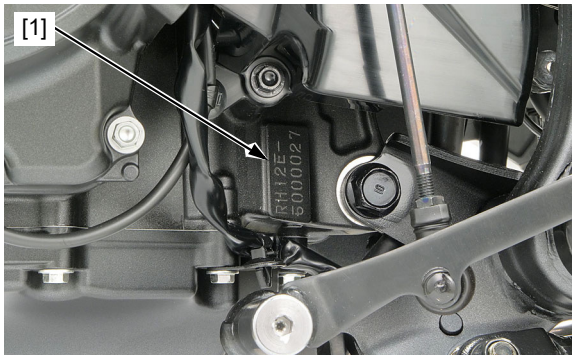
MODEL IDENTIFICATION



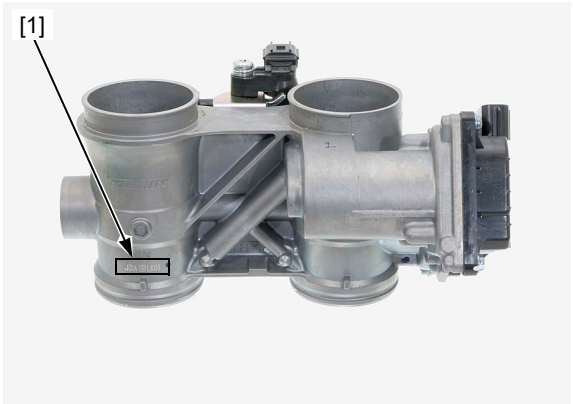
SERIAL NUMBERS/LABELS

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 left side of the crankcase.

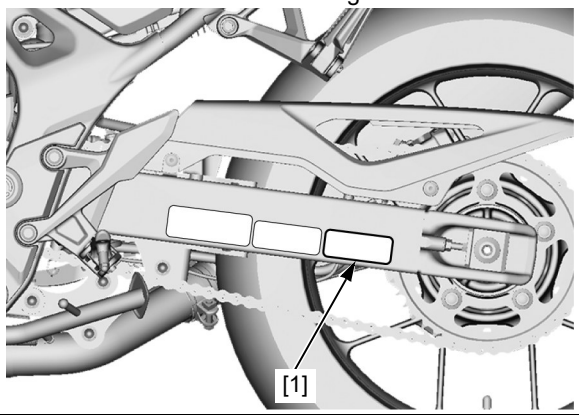


The throttle body identification number [1] are stamped on the front lower surfaces of the throttle body.



The color label [1] (ED, CH, KO, HK, U models) is attached on the frame.

The emission control information label [1] (KO model) is attached on the left side of the swingarm.



GENERAL INFORMATION

TYPES

Destination code	OBD2	35 kW conversion	35 kW full power	ESS	HSTC	HSVCS
ED, III ED	○	○	○	○	○	○
II ED, IV ED	○	○	–	○	○	○
KO, II KO	○	–	–	○	○	○
GS, II GS	–	–	–	○	○	○
U	–	–	–	○	○	–
MA, II MA	–	–	–	○	○	○
TH	–	–	–	○	○	○
HK, II HK	○	–	–	○	○	○
CH	–	–	–	–	○	–
FO, II FO	–	–	–	○	○	○

SPECIFICATIONS

GENERAL SPECIFICATIONS

ITEM				SPECIFICATIONS
DIMENSIONS	Overall length			2,090 mm (82.3 in)
	Overall width			780 mm (30.7 in)
	Overall height			1,085 mm (42.7 in)
	Wheelbase			1,420 mm (55.9 in)
	Seat height			795 mm (31.3 in)
	Footpeg height			320 mm (12.6 in)
	Ground clearance			140 mm (5.5 in)
	Curb weight			190 kg (419 lbs)
	Maximum weight capacity		Except KO model	180 kg (397 lbs)
			KO model	160 kg (353 lbs)
FRAME	Frame type			Diamond type
	Front suspension			Telescopic fork
	Front axle travel			118 mm (4.6 in)
	Rear suspension			Swingarm
	Rear axle travel			130 mm (5.1 in)
	Front tire size			120/70ZR17 M/C (58W)
	Rear tire size			160/60ZR17 M/C (69W)
	Front tire brand		Except GS model	ROAD5 (MICHELIN) ROADSPORT2 L (DUNLOP)
			GS model	ROADSPORT2 L (DUNLOP)
	Rear tire brand		Except GS model	ROAD5 (MICHELIN) ROADSPORT2 L (DUNLOP)
			GS model	ROADSPORT2 L (DUNLOP)
	Front brake			Hydraulic double disc
	Rear brake			Hydraulic single disc
	Caster angle			25°
	Trail length			99 mm (3.9 in)
	Fuel tank capacity			15.2 liters (4.02 US gal, 3.34 Imp gal)
ENGINE	Cylinder arrangement			2 cylinders in-line, inclined 24.5° from vertical
	Bore and stroke			87.0 x 63.5 mm (3.43 x 2.50 in)
	Displacement			755 cm^3 (46.1 cu-in)
	Compression ratio			11 : 1
	Valve train			Chain driven, SOHC
	Intake valve	opens	at 1 mm (0.04 in) lift	5° BTDC
		closes	at 1 mm (0.04 in) lift	45° ABDC
	Exhaust valve	opens	at 1 mm (0.04 in) lift	46° BBDC
		closes	at 1 mm (0.04 in) lift	0° ATDC
	Lubrication system			Forced pressure and wet sump
	Oil pump type			Trochoid
	Cooling system			Liquid cooled
	Air filtration			Viscous paper element
	Engine dry weight			58.9 kg (129.9 lbs)
	Emission control system			Crankcase emission control system Secondary air supply system Three-way catalytic converter Evaporative emission control system
	Firing order			1 - 2
	Cylinder number			Left 1 - 2
FUEL DELIVERY SYSTEM	Type			PGM-FI
	Throttle bore			46 mm (1.8 in)

GENERAL INFORMATION

ITEM			SPECIFICATIONS
DRIVE TRAIN	Clutch system		Multi-plate, wet
	Clutch operation system		Cable operating
	Transmission		Constant mesh, 6-speeds
	Primary reduction		1.777 (80/45)
	Final reduction		2.812 (45/16)
	Gear ratio	1st	3.000 (39/13)
		2nd	2.187 (35/16)
		3rd	1.650 (33/20)
		4th	1.320 (33/25)
		5th	1.096 (34/31)
		6th	0.939 (31/33)
	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
ECT sensor resistance (at 40°C/104°F)	1.0 – 1.3 kΩ
IAT sensor resistance (at 40°C/104°F)	1.0 – 1.3 kΩ
Fuel injector resistance (at 24°C /75°F)	11 – 13 Ω
PAIR control solenoid valve resistance (at 20°C/68°F)	24 – 28 Ω
EVAP purge control solenoid valve resistance (at 20°C/68°F)	30 – 34 Ω
A/F sensor heater resistance (20°C/68°F)	3.6 – 5.2 Ω

IGNITION SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Spark plug	(NGK) SILMAR8A9S
Spark plug gap	0.8 – 0.9 mm (0.03 – 0.04 in)
Ignition coil peak voltage	100 V minimum
Ignition timing	8° BTDC at idle

FUEL SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Throttle body identification number	GNJ3A
Idle speed	1,300 ± 100 min^{-1} (rpm)
Fuel pressure at idle	412 – 518 kPa (4.2 – 5.3 kgf/cm^2, 60 – 75 psi)
Fuel pump flow (at 12 V)	200 cm^3 (6.8 US oz, 7.0 Imp oz) minimum/10 seconds

COOLING SYSTEM SPECIFICATIONS

ITEM			SPECIFICATIONS
Coolant capacity	Radiator and engine		1.53 liters (1.62 US qt, 1.35 Imp qt)
	Reserve tank		0.145 liters (0.153 US qt, 0.128 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 MA, TH, HK, CH models	High quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors
		MA, TH, HK, CH models	Honda PRE-MIX Coolant
Standard coolant concentration		Except MA, TH, HK, CH models	1:1 mixture with distilled water

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	3.3 liters (3.5 US qt, 2.9 Imp qt)	–
	After oil filter change	3.5 liters (3.7 US qt, 3.1 Imp qt)	–
	After disassembly	3.8 liters (4.0 US qt, 3.3 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 oil filter cartridge)		500 kPa (5.1 kgf/cm^2, 73 psi) at 5,000 min-1 (rpm)/(80°C/176°F)	–
Oil pump	Tip clearance	0.15 (0.006)	0.20 (0.008)

CYLINDER HEAD/VALVE/CAMSHAFT SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,393 kPa (14.2 kgf/cm^2, 202 psi) at 600 min^{-1} (rpm)	–
Cylinder head warpage			–	0.10 (0.004)
Valve clearance		IN	0.16 ± 0.03 (0.006 ± 0.001)	–
		EX	0.24 ± 0.02 (0.009 ± 0.001)	–
Camshaft	Cam lobe height	IN	37.58 – 37.74 (1.480 – 1.486)	37.55 (1.478)
		EX	37.38 – 37.54 (1.472 – 1.478)	37.35 (1.470)
	Oil clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
Valve lifter	Valve lifter O.D.		28.978 – 28.993 (1.1409 – 1.1415)	28.968 (1.1405)
	Valve lifter bore I.D.		29.010 – 29.026 (1.1421 – 1.1428)	29.036 (1.1431)
Rocker arm, rocker arm shaft	Shaft O.D.		11.977 – 11.990 (0.4715 – 0.4720)	–
	Arm I.D.		12.000 – 12.018 (0.4724 – 0.4731)	12.058 (0.4747)
Valve, valve guide	Valve stem O.D.	IN	5.475 – 5.490 (0.2156 – 0.2161)	5.465 (0.2152)
		EX	5.465 – 5.480 (0.2152 – 0.2157)	5.455 (0.2148)
	Valve guide I.D.		5.500 – 5.512 (0.2165 – 0.2170)	5.542 (0.2182)
	Valve guide projection above cylinder head	IN	19.7 – 20.0 (0.78 – 0.79)	–
		EX	17.9 – 18.2 (0.70 – 0.72)	–
	Valve seat width	IN	1.0 – 1.2 (0.04 – 0.05)	1.5 (0.06)
		EX	1.3 – 1.5 (0.05 – 0.06)	1.9 (0.07)
Valve spring free length		IN	45.56 (1.794)	44.65 (1.758)
		EX (Outer)	40.43 (1.592)	39.62 (1.560)
		EX (Inner)	40.12 (1.580)	39.32 (1.548)

GENERAL INFORMATION

ALTERNATOR/STARTER CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Starter driven gear boss	I.D.	42.000 – 42.025 (1.6535 – 1.6545)	–
	O.D.	57.749 – 57.768 (2.2736 – 2.2743)	–

CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch lever freeplay		10 – 20 (0.4 – 0.8)	–
Clutch	Spring free length	43.3 (1.70)	42.3 (1.67)
	Disc thickness	2.92 – 3.08 (0.115 – 0.121)	2.7 (0.11)
	Plate warpage	–	0.20 (0.008)
Clutch outer guide	I.D.	25.000 – 25.021 (0.9843 – 0.9851)	–
	O.D.	34.984 – 35.000 (1.3773 – 1.3780)	–
Mainshaft O.D. at clutch outer guide		24.977 – 24.990 (0.9833 – 0.9839)	–

CRANKCASE/TRANSMISSION/BALANCER SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Shift fork	I.D.		12.000 – 12.018 (0.4724 – 0.4731)	–
	Fork shaft O.D.		11.957 – 11.968 (0.4707 – 0.4712)	–
	Claw thickness		5.93 – 6.00 (0.233 – 0.236)	5.83 (0.230)
Transmission	Gear I.D.	M5, M6	28.000 – 28.021 (1.1024 – 1.1032)	–
		C2, C3, C4	31.000 – 31.025 (1.2205 – 1.2215)	–
	Gear bushing O.D.	M5,M6	27.959 – 27.980 (1.1007 – 1.1016)	–
		C2	30.955 – 30.980 (1.2187 – 1.2197)	–
		C3, C4	30.950 – 30.975 (1.2185 – 1.2195)	–
	Gear bushing I.D.	M5	25.000 – 25.021 (0.9843 – 0.9851)	–
		C2	27.985 – 28.006 (1.1018 – 1.1026)	–
	Mainshaft O.D.	at M5	24.967 – 24.980 (0.9830 – 0.9835)	–
	Countershaft O.D.	at C2	27.967 – 27.980 (1.1011 – 1.1016)	–
Front balancer shaft	Runout		–	0.03 (0.001)
	Oil clearance		0.013 – 0.043 (0.0005 – 0.0017)	0.043 (0.0017)

CRANKSHAFT/PISTON/CYLINDER SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Connecting rod	Side clearance		0.05 – 0.25 (0.002 – 0.010)	0.35 (0.014)
	Crankpin oil clearance		0.025 – 0.049 (0.0010 – 0.0019)	0.05 (0.002)
Crankshaft	Main journal bearing oil clearance		0.020 – 0.038 (0.0008 – 0.0015)	0.05 (0.002)
	Runout		–	0.03 (0.001)
Piston, piston rings	Piston O.D. at 11 (0.4) from bottom		86.965 – 86.985 (3.4238 – 3.4246)	86.885 (3.4207)
	Piston pin bore I.D.		22.002 – 22.008 (0.8662 – 0.8665)	22.02 (0.867)
	Piston pin O.D.		21.994 – 22.000 (0.8659 – 0.8661)	21.98 (0.865)
	Piston ring end gap	Top	0.185 – 0.235 (0.0073 – 0.0093)	0.335 (0.0132)
		Second	0.525 – 0.675 (0.0207 – 0.0266)	0.775 (0.0305)
		Oil (side rail)	0.10 – 0.35 (0.004 – 0.014)	0.55 (0.022)
	Piston ring-to-ring groove clearance	Top	0.015 – 0.045 (0.0006 – 0.0018)	–
		Second	0.015 – 0.050 (0.0006 – 0.0020)	–
Cylinder	I.D.		87.000 – 87.015 (3.4252 – 3.4258)	87.1 (3.43)
	Warpage		–	0.10 (0.004)
Connecting rod small end I.D.			22.026 – 22.040 (0.8672 – 0.8677)	22.05 (0.868)

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	Right	259.9 (10.23)	254.7 (10.03)
		Left	320.8 (12.63)	314.4 (12.38)
	Recommended fork fluid		Fork Fluid (viscosity: 10W)	–
	Fluid level	Right	75 (3.0)	–
		Left	128 (5.0)	–
	Fluid capacity	Right	520 ± 2.5 cm^3 (17.6 ± 0.08 US oz, 18.3 ± 0.09 Imp oz)	–
		Left	530 ± 2.5 cm^3 (17.9 ± 0.08 US oz, 18.7 ± 0.09 Imp oz)	–

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			25 – 35 (1.0 – 1.4)	50 (2.0)
Drive chain size/link		RK	RK520KZOZ2-120LJ	–
		DID	DID520VM5-120ZB	–
Shock absorber	Spring pre-load adjuster standard position		4 position from softest position	–

HYDRAULIC BRAKE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Front	Specified brake fluid	DOT 4 brake fluid	–
	Brake disc thickness	4.0 (0.16)	3.5 (0.14)
	Brake disc warpage	–	0.15 (0.006)
	Master cylinder diameter	12.7 (0.50)	–
	Caliper cylinder diameter	25.4 (1.00)	–
Rear	Specified brake fluid	DOT 4 brake fluid	–
	Brake disc thickness	5.0 (0.20)	4.0 (0.16)
	Brake disc warpage	–	0.25 (0.010)
	Brake pedal height	71 – 73 (2.8 – 2.9)	–
	Master cylinder diameter	12.7 (0.50)	–
	Caliper cylinder diameter	38.1 (1.50)	–

GENERAL INFORMATION

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Type		YTZ10S
	Capacity		12 V-8.6 Ah (10 HR) / 12 V-9.1 Ah (20 HR)
	Voltage (at 20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.4 V
	Charging current	Normal	0.9 A/5 – 10 h
		Quick	4.5 A/1 h
Current leakage			0.17 mA max.
Alternator	Capacity		0.44 kW/5,000 min^{-1} (rpm)
	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
	Turn signal light		LED
	Brake/taillight		LED
	License light		12 V - 5 W
	Instrument light		LED
	Turn signal indicator		LED
	Neutral indicator		LED
	MIL		LED
	HISS indicator		LED
	ABS indicator		LED
	HSTC indicator		LED
	HSTC off indicator		LED
Fuse	Main fuse		30 A
	Sub fuse		30 A x 2, 15 A x 2, 10 A x 8

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)
		6 mm flange bolt (Include NSHF) and nut	12 (1.2, 9)
8 mm bolt and nut	22 (2.2, 16)		
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
Sidestand pivot bolt	1	10	10 (1.0, 7)	See page 2-21
Sidestand pivot nut	1	10	39 (4.0, 29)	Self-lock nut, See page 2-21
Front reflector mounting nut	2	6	1.8 (0.2, 1.3)	Self-lock nut
Muffler band bolt	1	8	20 (2.0, 15)	
Muffler mounting nut	1	8	20 (2.0, 15)	
Muffler cover bolt	1	6	12 (1.2, 9)	
Main step bracket bolt	4	8	32 (3.3, 24)	
Exhaust pipe joint nut	4	8	20 (2.0, 15)	
Exhaust pipe stud bolt	4	8	–	See page 2-21
Exhaust pipe mounting bolt	1	8	20 (2.0, 15)	
Rear reflector mounting nut	1	5	1.8 (0.2, 1.3)	Self-lock nut
Rear fender B mounting bolt	2	10	25 (2.5, 18)	
Pillion step bracket bolt	4	8	32 (3.3, 24)	
Rearview mirror adaptor bolt	2	10	20 (2.0, 15)	
Rearview mirror nut	2	10	20 (2.0, 15)	
Clutch lever pivot bolt	1	6	3.3 (0.3, 2.4)	
Clutch lever pivot nut	1	6	6.5 (0.7, 4.8)	Self-lock nut

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Spark plug	2	10	16 (1.6, 12)	
Timing hole cap	1	45	17.5 (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 3-12
Oil filter cartridge	1	20	26 (2.7, 19)	Apply engine oil to the threads and O-ring.
Drive sprocket bolt	1	10	54 (5.5, 40)	
Driven sprocket nut	5	12	128 (13.1, 94)	Self-lock nut
Valve adjust screw lock nut	4	5	10 (1.0, 7)	Apply engine oil to the threads.
Drive chain adjuster lock nut	2	8	27 (2.8, 20)	
Rear axle nut	1	16	88 (9.0, 65)	Self-lock nut
Air cleaner cover screw	9	4	0.8 (0.1, 0.6)	
Air cleaner element screw	4	5	1.2 (0.1, 0.9)	

GENERAL INFORMATION

PGM-FI SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
ECT sensor	1	12	10 (1.0, 7)	
A/F sensor	1	12	24.5 (2.5, 18)	
IAT sensor mounting screw	2	5	1.1 (0.1, 0.8)	
MAP sensor mounting screw	1	6	4.9 (0.5, 3.6)	
GP sensor mounting bolt	1	6	12 (1.2, 9)	
Shift spindle switch	1	10	12 (1.2, 9)	
CKP sensor mounting bolt	1	6	12 (1.2, 9)	

ELECTRIC STARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Starter motor terminal nut	1	6	11 (1.1, 8)	
Starter motor setting bolt	2	5	4.9 (0.5, 3.6)	
Negative brush mounting screw	1	5	3.7 (0.4, 2.7)	
Starter motor cable terminal nut/ washer	1	6	10 (1.0, 7)	

FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel pump mounting nut	6	6	12 (1.2, 9)	See page 7-8
Fuel tank mounting nut (Rear side)	1	6	12 (1.2, 9)	Self-lock nut
Fuel fill cap socket bolt	3	4	1.8 (0.2, 1.3)	
Fuel tank mounting bolt (Front side)	2	6	10 (1.0, 7)	
Air cleaner housing joint screw	2	4	1.5 (0.2, 1.1)	

COOLING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fan motor mounting screw	3	5	5.2 (0.5, 3.8)	
Fan motor shroud mounting bolt/ washer	4	6	8.5 (0.9, 6.3)	
Cooling fan mounting nut	1	5	2.7 (0.3, 2.0)	Apply locking agent to the threads.
Thermostat cover bolt	2	6	12 (1.2, 9)	

LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Engine oil filter cartridge	1	20	26 (2.7, 19)	Apply engine oil to the threads.
Oil jet bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads. Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) except 2.0 ± 1.0 mm (0.08 ± 0.04 in) from tip

CYLINDER HEAD/VALVE/CAMSHAFT

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head cover bolt	3	6	10 (1.0, 7)	
Rocker arm shaft bolt	1	6	12 (1.2, 9)	
Cam chain tensioner pivot bolt	1	8	12 (1.2, 9)	Apply locking agent to the threads. Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) except 2.0 ± 1.0 mm (0.08 ± 0.04 in) from tip
Camshaft holder bolt	6	6	12 (1.2, 9)	Apply engine oil to the threads.
Cylinder head bolt/washer	6	12	30 (3.1, 22) + 115°	Apply molybdenum oil solution to the threads and seating surface.
Left engine hanger plate nut	2	10	44 (4.5, 32)	
Right engine hanger plate nut	2	10	44 (4.5, 32)	
Left engine hanger bolt	1	12	59 (6.0, 44)	
Right engine hanger bolt	1	12	59 (6.0, 44)	
Throttle body insulator bolt	4	6	12 (1.2, 9)	

ALTERNATOR/STARTER CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Stator bolt	5	6	12 (1.2, 9)	Apply locking agent to the threads. Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) except 2.0 ± 1.0 mm (0.08 ± 0.04 in) from tip
Alternator wire clamper bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads. Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) except 2.0 ± 1.0 mm (0.08 ± 0.04 in) from tip
Flywheel mounting bolt	1	12	157 (16.0, 116)	Left hand thread Apply engine oil to the threads and seating surface. Stake.
Starter clutch torx bolt	6	8	29 (3.0, 21)	Apply locking agent to the threads. Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) from tip

CLUTCH/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch center lock nut	1	22	147 (15.0, 108)	Apply engine oil to the threads.
Clutch set plate bolt	3	6	12 (1.2, 9)	
Pulser plate bolt	1	10	103 (10.5, 76)	Apply engine oil to the threads.
Shift drum stopper arm pivot bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads. Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) except 2.0 ± 1.0 mm (0.08 ± 0.04 in) from tip
Shift drum center bolt	1	8	23 (2.3, 17)	Apply locking agent to the threads. Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) from tip
Gearshift spindle set plate bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads. Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) except 2.0 ± 1.0 mm (0.08 ± 0.04 in) from tip
Gearshift pedal pivot bolt	1	8	27 (2.8, 20)	Apply grease to sliding area.
Gearshift pedal adjust nut	1	6	10 (1.0, 7)	Left hand threads
Gearshift pedal adjust lock nut	1	6	10 (1.0, 7)	

GENERAL INFORMATION

CRANKCASE/TRANSMISSION/BALANCER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Main journal bolt	6	12	20 (2.0, 15) + 65°	Apply molybdenum oil solution to the threads.
Crankcase 8 x 55 bolt	1	8	24 (2.4, 18)	
Crankcase 10 x 70 bolt	1	10	39 (4.0, 29)	
Balancer journal 8 x 45 bolts	2	8	18 (1.8, 13)	Apply molybdenum oil solution to the threads.
Balancer journal 8 x 75 bolts	4	8	17.5 (1.8, 13)	Apply molybdenum oil solution to the threads.
Crankcase 6 x 90 bolt	2	6	14 (1.4, 10)	
Baffle plate bolt	4	6	12 (1.2, 9)	Apply locking agent to the threads. Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) except 2.0 ± 1.0 mm (0.08 ± 0.04 in) from tip
Rear balancer shaft bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads. Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) except 2.0 ± 1.0 mm (0.08 ± 0.04 in) from tip
Mainshaft bearing set plate bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads. Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) except 2.0 ± 1.0 mm (0.08 ± 0.04 in) from tip
Shift drum bearing setting bolt/ washer	2	6	12 (1.2, 9)	Apply locking agent to the threads. Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) except 2.0 ± 1.0 mm (0.08 ± 0.04 in) from tip
Lower crankcase 20 mm cap	1	20	23 (2.3, 17)	Apply grease to the thread.

CRANKSHAFT/PISTON/CYLINDER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Crankpin bearing cap bolt (new)	4	8	27 (2.8, 20) + 120°	Apply engine oil to the threads and seating surface.
Main journal bolt	6	12	20 (2.0, 15) + 65°	Apply molybdenum oil solution to the threads.
Crankpin bearing cap bolt (reuse)	4	8	27 (2.8, 20) + 90°	Apply engine oil to the threads and seating surface.

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear lower engine hanger nut	1	12	64 (6.5, 47)	
Rear upper engine hanger nut	1	10	44 (4.5, 32)	
Left engine hanger plate nut	2	10	44 (4.5, 32)	
Right engine hanger plate nut	2	10	44 (4.5, 32)	
Left engine hanger bolt	1	12	59 (6.0, 44)	
Right engine hanger bolt	1	12	59 (6.0, 44)	
Drive sprocket bolt	1	10	54 (5.5, 40)	
EOP terminal screw	1	4	2.0 (0.2, 1.5)	
Starter motor terminal nut	1	6	10 (1.0, 7)	

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 upper holder bolt	4	8	27 (2.8, 20)	
Handlebar lower holder nut	2	8	27 (2.8, 20)	Self-lock nut
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 pulser ring torx bolt	5	5	7.0 (0.7, 5.2)	Replace with new ones.
Front brake disc bolt	10	6	20 (2.0, 15)	Replace with new ones.
Front axle	1	16	59 (6.0, 44)	
Front axle pinch bolt	2	8	22 (2.2, 16)	
Front brake caliper mounting bolt	4	10	45 (4.6, 33)	Replace with new ones.
Fork rod lock nut	1	9	18 (1.8, 13)	
Piston rod lock nut	1	9	18 (1.8, 13)	
Fork cap	2	44.5	35 (3.6, 26)	
Bottom bridge pinch bolt	4	10	32 (3.3, 24)	
Steering stem adjusting nut	1	26	23 (2.3, 17)	See page 16-32 Engine oil or grease
Steering stem adjusting lock nut	1	26	–	See page 16-32
APS mounting screw	4	4	2.0 (0.2, 1.5)	

REAR WHEEL/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear axle nut	1	16	88 (9.0, 65)	Self-lock nut
Rear brake disc bolt	4	8	42 (4.3, 31)	Replace with a new one.
Driven sprocket nut	5	12	128 (13.1, 94)	Self-lock nut
Shock absorber upper mounting nut	1	10	54 (5.5, 40)	Self-lock nut
Shock absorber lower mounting nut	1	10	44 (4.5, 32)	Self-lock nut
Swingarm pivot nut	1	16	88 (9.0, 65)	Self-lock nut
Drive chain slider screw	1	5	5.0 (0.5, 3.7)	Replace with a new one.
Cushion connecting rod plate nut	2	10	44 (4.5, 32)	Self-lock nut
Cushion arm nut (frame side)	1	10	54 (5.5, 40)	Self-lock nut Apply engine oil to the threads.

GENERAL INFORMATION

HYDRAULIC BRAKE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front brake caliper bleed valve	2	8	5.4 (0.6, 4.0)	
Rear brake caliper bleed valve	1	8	5.4 (0.6, 4.0)	
Front brake caliper mounting bolt	4	10	45 (4.6, 33)	Replace with new ones.
Rear brake caliper mounting bolt	1	8	22 (2.2, 16)	Replace with new ones.
Front brake caliper pad pin	2	10	17 (1.7, 13)	
Rear brake caliper pad pin	1	10	17 (1.7, 13)	
Brake hose oil bolt	5	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	5.9 (0.6, 4.4)	
Front brake light switch screw	1	4	1.2 (0.1, 0.9)	
Rear master cylinder push rod joint nut	1	8	17 (1.7, 13)	
Rear master cylinder mounting bolt	2	6	12 (1.2, 9)	
Rear brake caliper pin bolt	1	12	27 (2.8, 20)	
Rear master cylinder reservoir hose joint screw	1	4	1.5 (0.2, 1.1)	Apply a locking agent to the threads.
Front master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Rear master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Front brake caliper assembly bolt	4	10	37 (3.8, 27)	Replace with new ones.

ANTI-LOCK BRAKE SYSTEM (ABS)

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

LIGHTS/METERS/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Meter mounting screw	3	5	1.3 (0.1, 1.0)	
EOP switch	1	PT 1/8	12 (1.2, 9)	Apply sealant to the threads.
EOP switch wire terminal bolt/ washer	1	4	2.0 (0.2, 1.5)	
Ignition switch mounting bolt	2	8	24 (2.4, 18)	Replace with a new one.
Neutral switch	1	10	12 (1.2, 9)	
Neutral switch wire terminal nut	1	4	1.7 (0.2, 1.3)	
Sidestand switch mounting bolt	1	6	10 (1.0, 7)	Replace with a new one.
License light cover screw	2	5	1.0 (0.1, 0.7)	
Headlight mounting bolt	4	6	8.5 (0.9, 6.3)	
USB charger stay screw	2	5	1.0 (0.1, 0.7)	
APS mounting screw	4	4	2.0 (0.2, 1.5)	
Left handlebar switch housing screw	2	5	2.5 (0.3, 1.8)	
Right handlebar switch housing screw	2	5	2.5 (0.3, 1.8)	
Clutch switch screw	1	3	0.8 (0.1, 0.6)	

OTHERS

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear brake caliper pin bolt	1	12	27 (2.8, 20)	
Right crankcase cover plate bolt	4	6	12 (1.2, 9)	Apply locking agent to the threads. Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) except 3.0 - 4.0 mm (0.12 - 0.16 in) from tip

LUBRICATION & SEAL POINTS

ENGINE

MATERIAL	LOCATION	REMARKS
Liquid sealant (Three Bond 1207B or equivalent)	Crankcase mating surface	See page 13-5
	Alternator cover mating surface	See page 11-4
	Alternator wire grommet mating surface	See page 11-5
	Right crankcase cover mating surface	See page 12-6
	EOP switch threads	See page 21-13
Liquid sealant (Three Bond 5211C or KE45 or equivalent)	Cylinder head cover packing	See page 10-5
Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	Main journal bearing surface	
	Connecting rod bearing surface	
	Connecting rod small end inner surface	
	Crankshaft thrust surface	
	Crankshaft bearing surface	
	Camshaft lobes, journals and thrust surface	
	Valve stem (valve guide sliding surface)	
	Valve stem seal inside surface	
	Clutch outer/primary driven gear sliding surface	
	Clutch outer guide sliding surface	
	Clutch judder spring surface	
	M3/4, C5, C6 shifter gear (shift fork grooves)	
	Starter reduction gear shaft outer surface	
	Starter idle gear shaft outer surface	
	Front balancer shaft thrust surface	
	Front balancer shaft bearing surface	
	Rocker arm sliding area and thrust surface	
	Rocker arm shaft outer surface	
	Transmission collar/needle bearing inner and outer surface	
	Transmission spline bushing outer surface	
	Shift fork shaft outer surface	
	Rear balancer shaft outer surface	
	Rear balancer washer sliding surface	
Engine oil	Piston and piston ring sliding surface	
	Oil strainer packing whole surface	
	Oil pump packing whole surface	
	Cylinder head bolt washer seating surface	
	Clutch disc whole surface	
	Starter one-way clutch sliding surface	
	Each gear teeth and rotating surface	
	Each bearing rolling surface	
	Each O-ring whole surface	
	Other rotating area and sliding surface	
	Cam chain tensioner slit end surface	0.5 cm^3 (0.02 US oz, 0.02 Imp oz)
	Tappet adjust screw/nut threads and seating surface	
Multi-purpose grease	Lower crankcase 20 mm cap threads	
	Right crankcase cover 45 mm cap threads	
	Each oil seal lips	
Locking agent	Oil filter boss threads (stud side)	Coating width: 6.5 ± 1 mm

GENERAL INFORMATION

FRAME

MATERIAL	LOCATION	REMARKS
Multi-purpose grease	Sidestand pivot sliding area	
	Clutch lever pivot bolt sliding surface	
	Gearshift pedal link tie-rod ball joints	
	Gearshift pedal pivot sliding area	
	Rear brake pedal pivot sliding area	
	Wheel dust seal lips	
	Throttle grip and APS contacting surface	See page 16-8
	Main step pivot sliding surface	
	Pillion step pivot sliding surface	
	Driven flange O-ring	
Urea based multi-purpose extreme pressure grease NLGI #2	Upper and lower steering head bearing	3 – 5 g (0.1 – 0.2 oz)
	Steering head dust seal lips	3 – 5 g (0.1 – 0.2 oz)
	Steering stem adjust nut	
Engine oil	Steering head bearing adjusting nut threads	
	Swingarm pivot nut	
Honda bond A or equivalent	Handlebar grip rubber inside	
	Rear brake caliper bracket pad retainer	
Silicone grease	Brake caliper main and sub slide pin sliding surfaces	0.4 g (0.016 oz)
	Brake pad pin stopper ring	
	Front brake lever pivot bolt sliding surface and adjuster	0.1 g (0.004 oz)
	Front brake lever-to-master piston contact area	
	Rear master cylinder push rod-to-master piston contact area	
	Rear master cylinder push rod boot inside	0.1 g (0.004 oz)
	Brake caliper dust seals	
	Rear brake caliper sleeve	0.4 g (0.016 oz)
DOT 4 brake fluid	Master cylinder inside	
	Brake master pistons and cups	
	Brake caliper pistons and piston seals	
	Brake pipe threads	
Fork fluid	Fork cap O-ring	
	Fork dust seal and oil seal lips	
Locking agent	Front brake caliper assembly bolts	
	Rear master cylinder reservoir hose joint screw	
Drive chain lubricant designed specifically for O-ring chains or SAE #80 - 90 gear oil	Drive chain whole surface	
Molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent).	Cushion arm dust seal lips	
	Cushion arm needle bearings	
	Swingarm pivot dust seal lips	
	Swingarm pivot needle bearings	

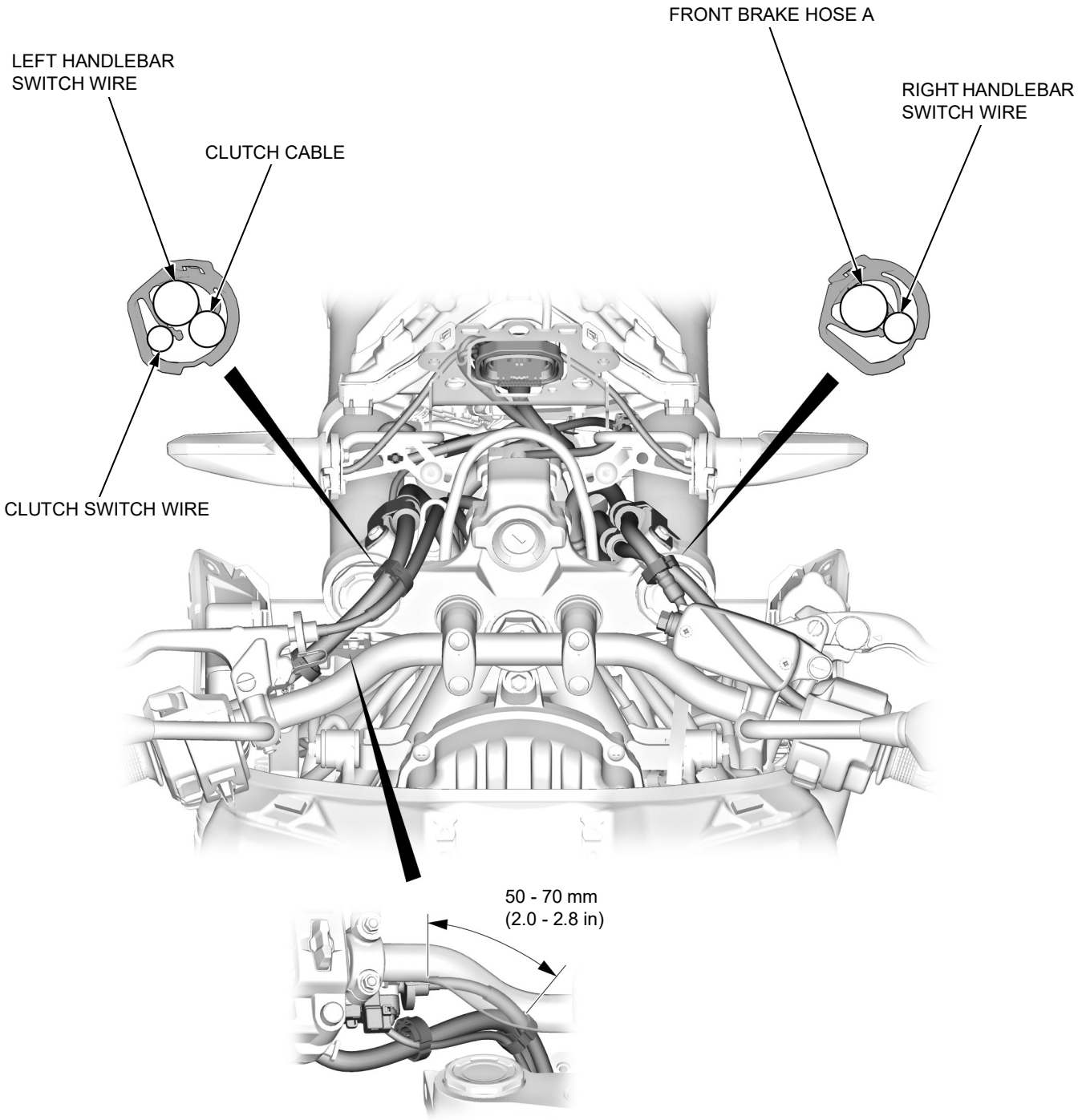
SPECIAL TOOL LIST

TITLE	TOOL No	TOOL NAME
MAINTENANCE	07708-0030400	Valve Adjusting Wrench (□3)
	07HAA-PJ70101	Oil Filter Wrench
	07HMH-MR10105	Chain Tool Set
PGM-FI SYSTEM	070MZ-0010300	SCS short connector
	07ZAJ-RDJA110	Male Pin Prove
IGNITION SYSTEM	07HGJ-0020100	Peak Voltage Adaptor
	07ZAJ-RDJA110	Male Pin Prove
FUEL SYSTEM	07406-0040004	Fuel Pressure Gauge Set
	070MJ-K260100	Fuel Pressure Gauge Attachment Set
	07ZAJ-S5A0130	Hose Fuel Attachment B
	07ZAJ-S7C0100	Fuel Hose Attachment
	07ZAJ-S7C0200	Fuel Joint Attachment
	07ZAJ-S5A0150	Joint Fuel Attachment B
LUBRICATION SYSTEM	070MJ-0010101	Attachment Oil Pressure
	07HAA-PJ70101	Oil Filter Wrench
	07506-3000001	Oil Pressure Gauge
	07406-0030000	Oil Pressure Gauge Attachment
CYLINDER HEAD/VALVE/CAMSHAFT	070MG-0010100	Stopper Tensioner
	07999-4220000	Tappet Hole Protector 26 x 28
	07757-0010000	Valve Spring Compressor Set
	07742-0010100	Valve Guide Driver 5.35 x 9.7 mm
	07743-0020000	Valve Guide Driver Adjustable Type
	07984-2000001	Valve Guide Reamer, 5.510
	07781-0010101	Cutter Holder 5.5 mm
	07780-0010500	Seat Cutter 40 mm
	07780-0010800	Seat Cutter 33 mm
	07780-0012400	Flat Cutter 38.5 mm
	07780-0012900	Flat Cutter 33 mm
	07780-0014100	Interior Cutter 37.5 mm
	07780-0014700	Interior Cutter 34 mm
ALTERNATOR/STARTER CLUTCH	07725-0040001	Holder Flywheel
	07733-0020001	Outside Screw Puller
CLUTCH/GEARSHIFT LINKAGE	07724-0050002	Clutch Center Holder P.D. 48-135
	07724-0010100	Gear Holder M2.5 mm
CRANKCASE/TRANSMISSION/BALANCER	07936-3710100	Remover Handle
	07936-3710600	Bearing Remover Shaft Set, 20 mm
	07741-0010201	Weight, Remover
	07949-3710001	Driver Handle 15 x 280L
	07746-0010300	Attachment, 42 x 47 mm
	07746-0040500	Pilot 20 mm
FRONT WHEEL/SUSPENSION/STEERING	07746-0050500	Remover Head 17 mm
	07746-0050100	Bearing Remover Shaft 9 x 200L
	07749-0010000	Driver Handle, 15 x 135L
	07746-0010200	Attachment, 37 x 40 mm
	07746-0040400	Pilot 17 mm
	070MA-MGP0100	Fork Bolt Wrench
	07RMD-MW40100	Fork Seal Driver Attachment 41.3
	07KMD-KZ30100	Fork Seal Driver, 45.2
	07916-3710101	Locknut Wrench 5.7 x 50
	07953-MJ10000	Ball Race Remover Set
	07953-MJ10100	Remover Attachment 40
	07953-MJ10200	Handle 370
	07946-3710500	Ball Race Remover 44.5
	07946-MB00000	Driver, 30 mm I.D.
	07746-0010300	Attachment, 42 x 47 mm
	07746-0010400	Attachment, 52 x 55 mm

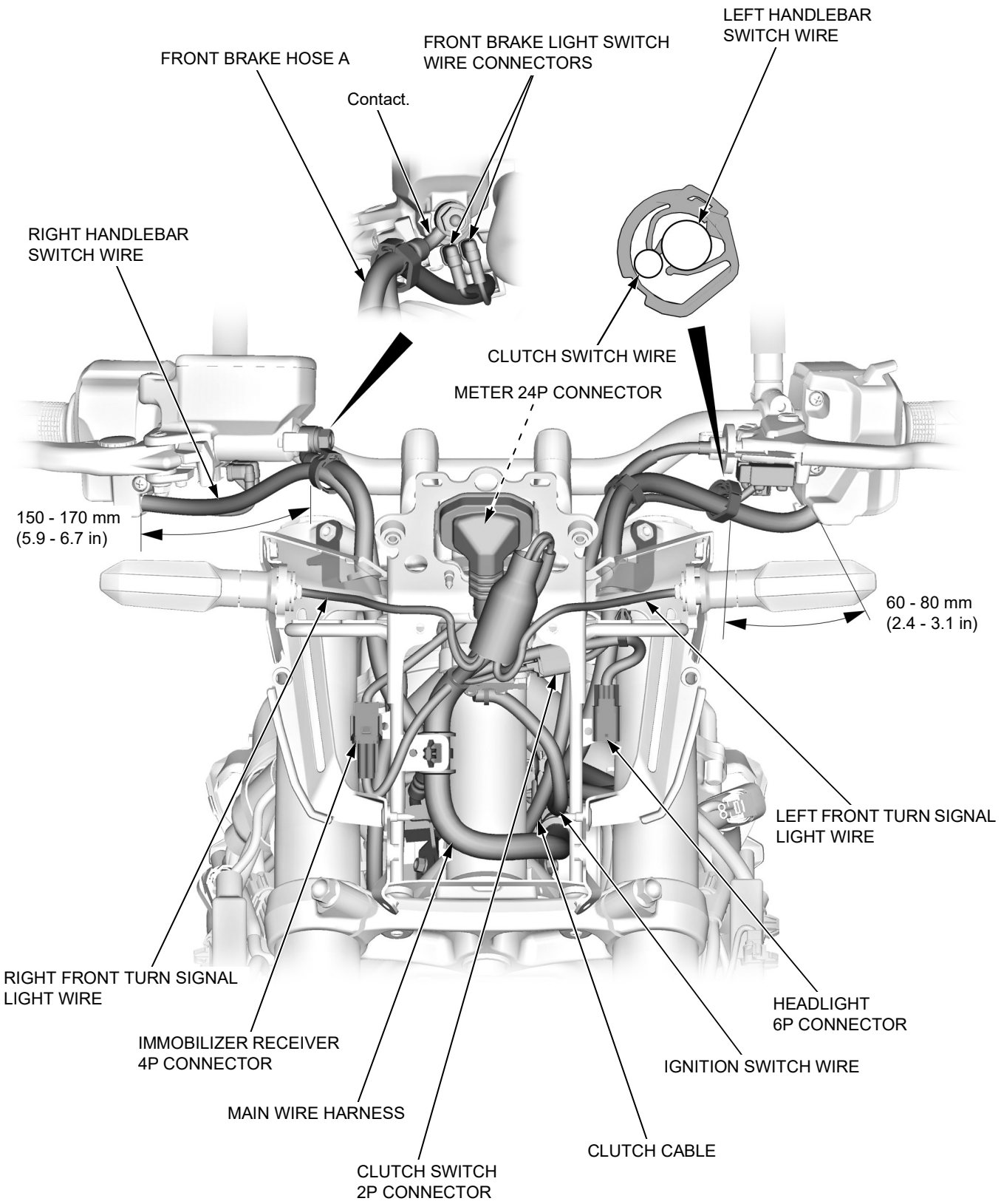
GENERAL INFORMATION

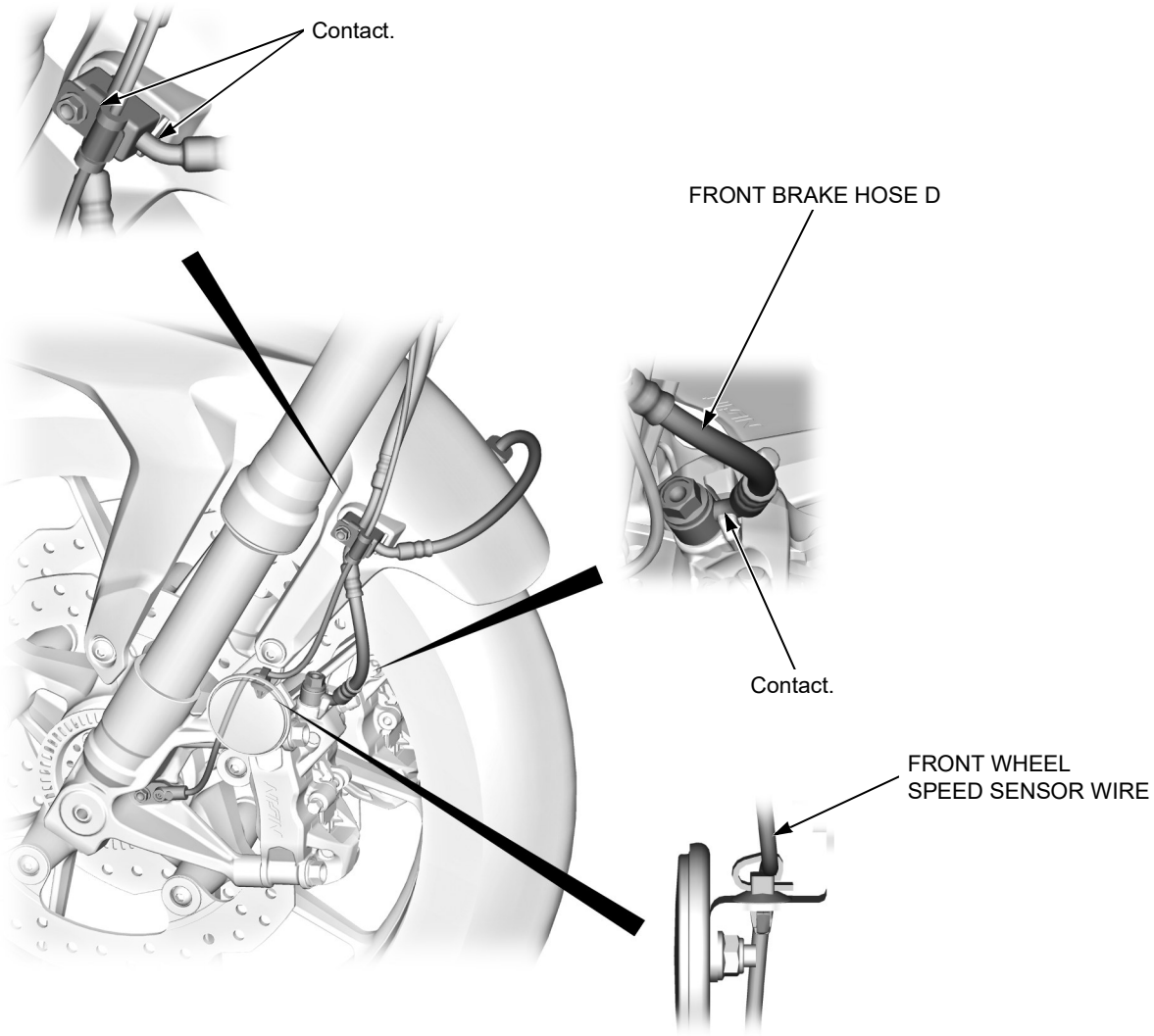
TITLE	TOOL No	TOOL NAME
REAR WHEEL/SUSPENSION	07746-0050500	Remover Head 17 mm
	07746-0050100	Bearing Remover Shaft 9 x 200L
	07749-0010000	Driver Handle, 15 x 135L
	07746-0010300	Attachment, 42 x 47 mm
	07746-0040400	Pilot 17 mm
	07946-1870100	Bearing Driver Attachment, 28 x 30
	07746-0010800	Attachment, 22 x 24 mm
	07936-3710300	Bearing Remover Shaft Set, 17 mm
	07936-3710100	Remover Handle
	07741-0010201	Weight, Remover
	07LMC-KV30200	Needle Bearing Remover Attachment 24
	07946-MJ00100	Shaft 15 x 325L
	07746-0010100	Attachment, 32 x 35 mm
	07746-0040600	Pilot 25 mm
	07949-3710001	Driver Handle, 15 x 280L
ANTI-LOCK BRAKE SYSTEM (ABS)	07ZAJ-RDJA110	Male Pin Prove
LIGHT/METERS/SWITCHES	07ZAJ-RDJA110	Male Pin Prove
IMMOBILIZER SYSTEM (HISS)	070MZ-0010300	SCS short connector
	07ZAJ-RDJA110	Male Pin Prove

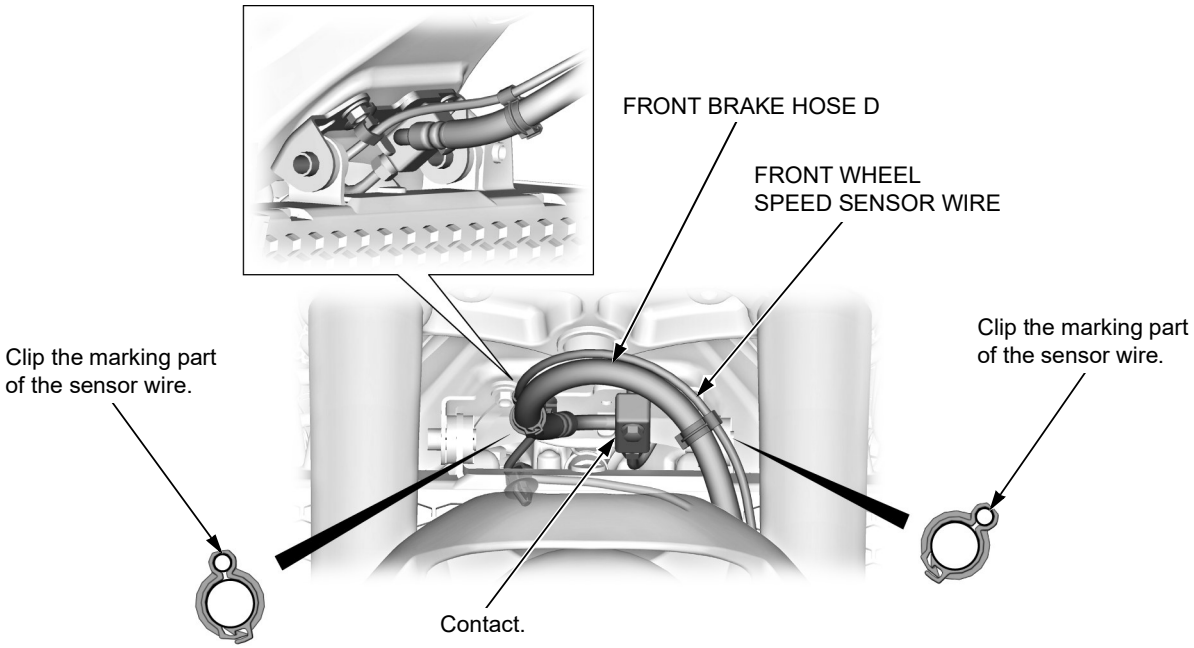
CABLE & HARNESS ROUTING

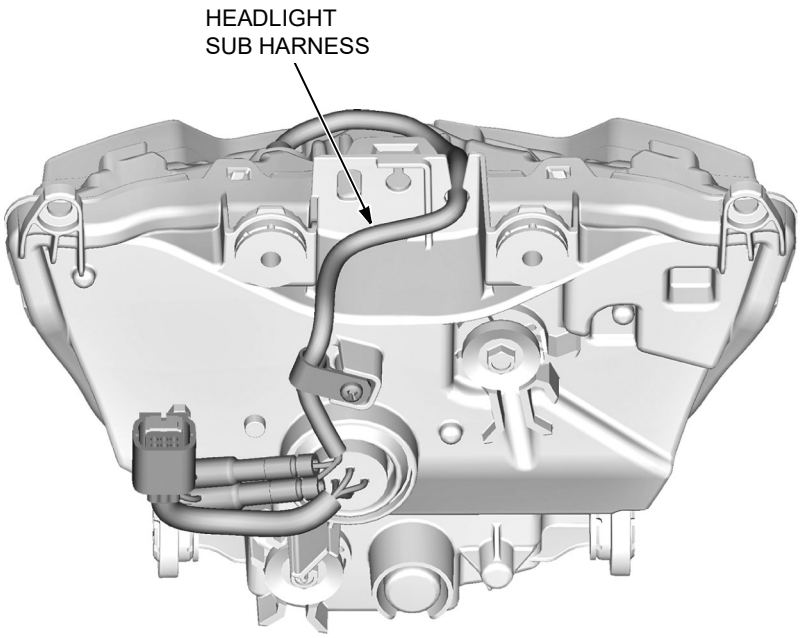


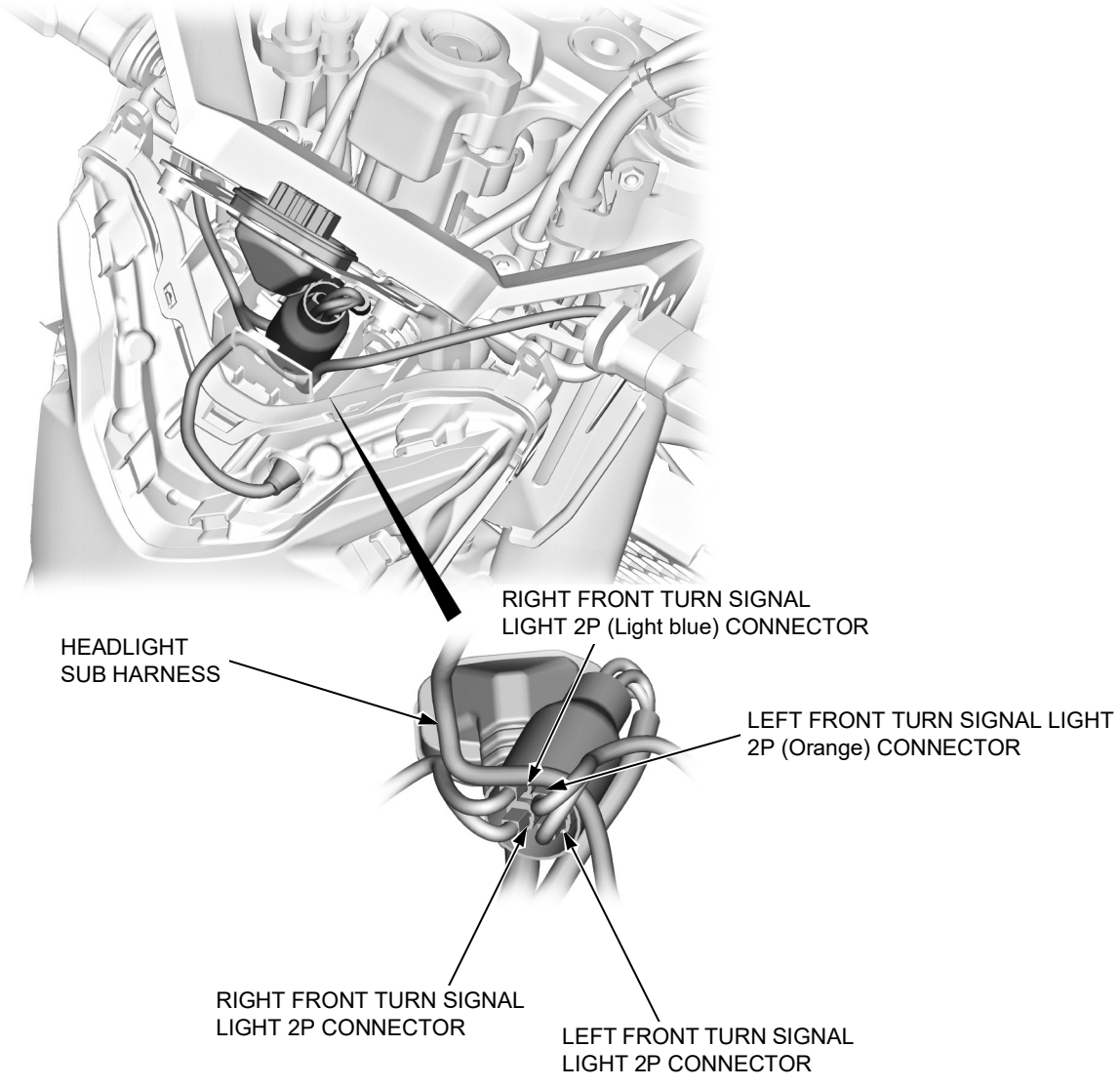
GENERAL INFORMATION

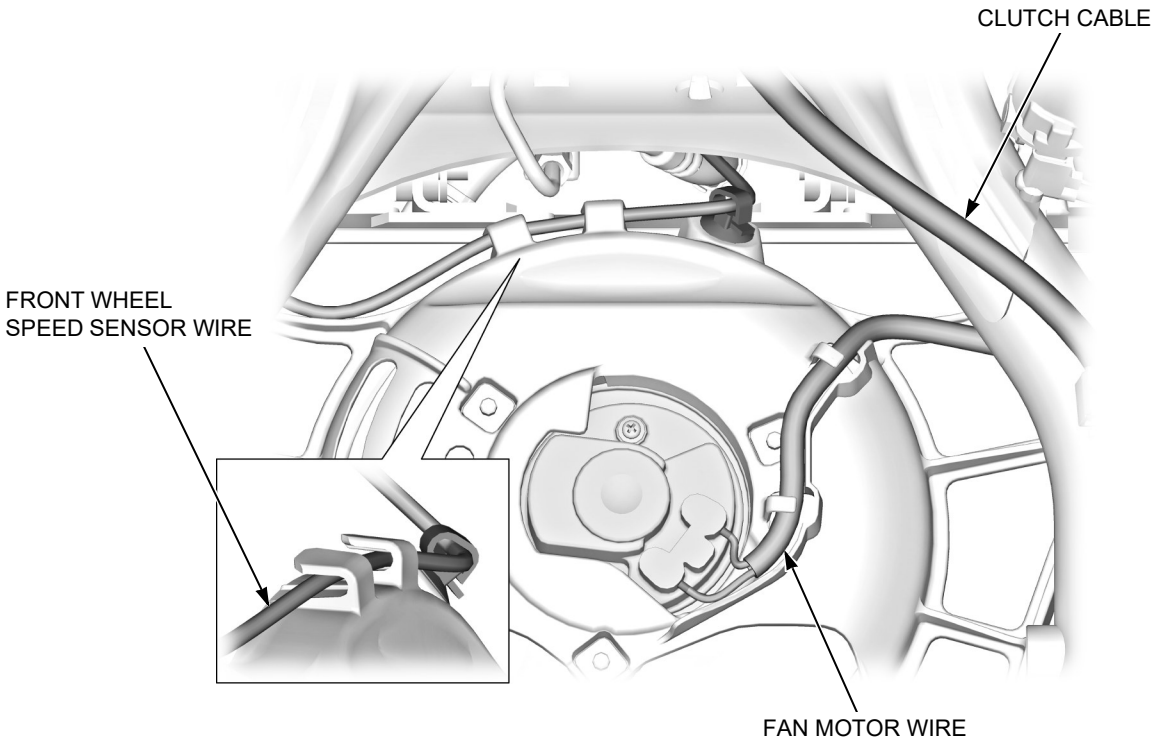


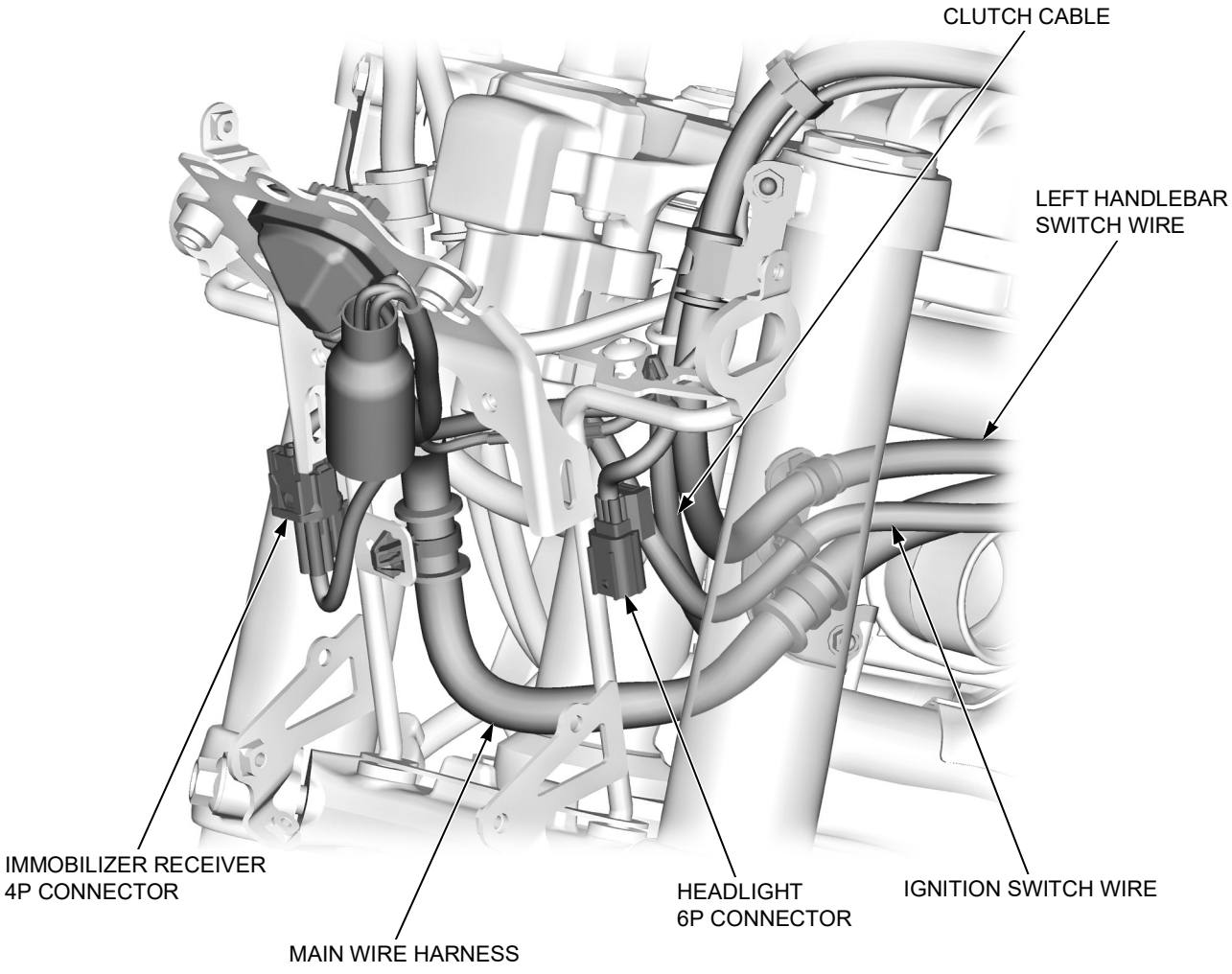

Contact.
FRONT BRAKE HOSE D
Contact.
FRONT WHEEL
SPEED SENSOR WIRE

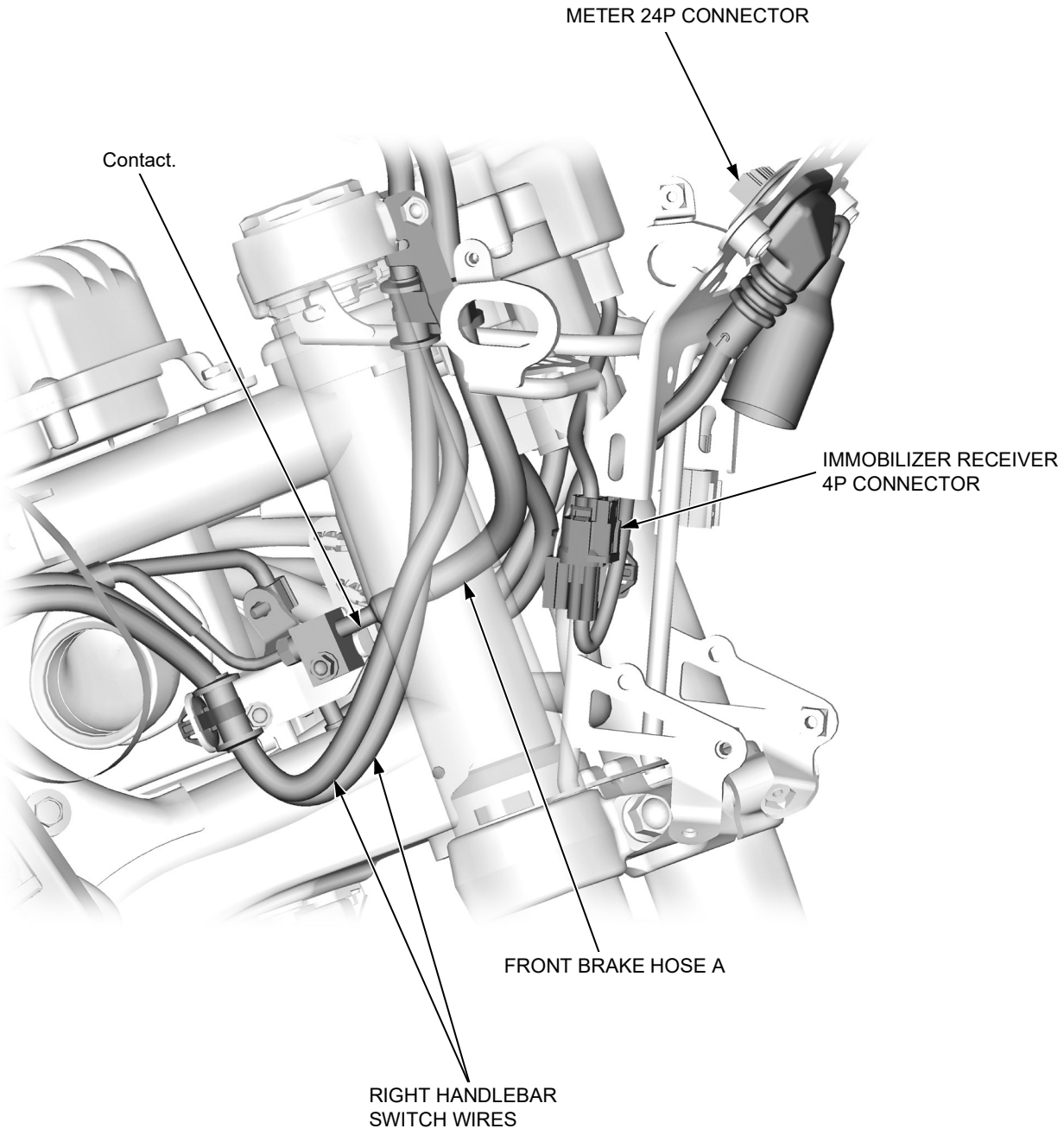

FRONT BRAKE HOSE D
FRONT WHEEL
SPEED SENSOR WIRE
Clip the marking part
of the sensor wire.
Clip the marking part
of the sensor wire.
Contact.

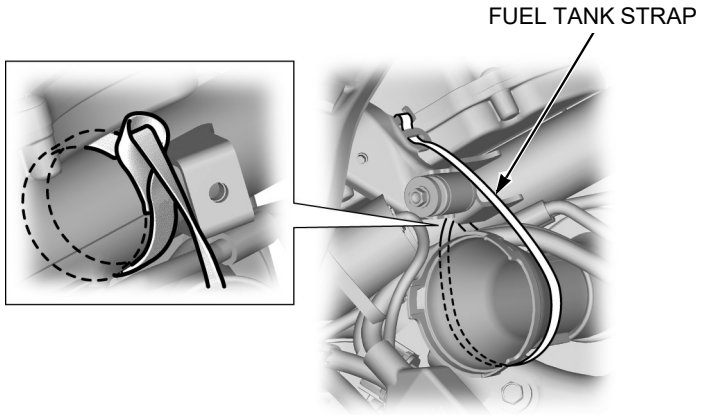

HEADLIGHT
SUB HARNESS

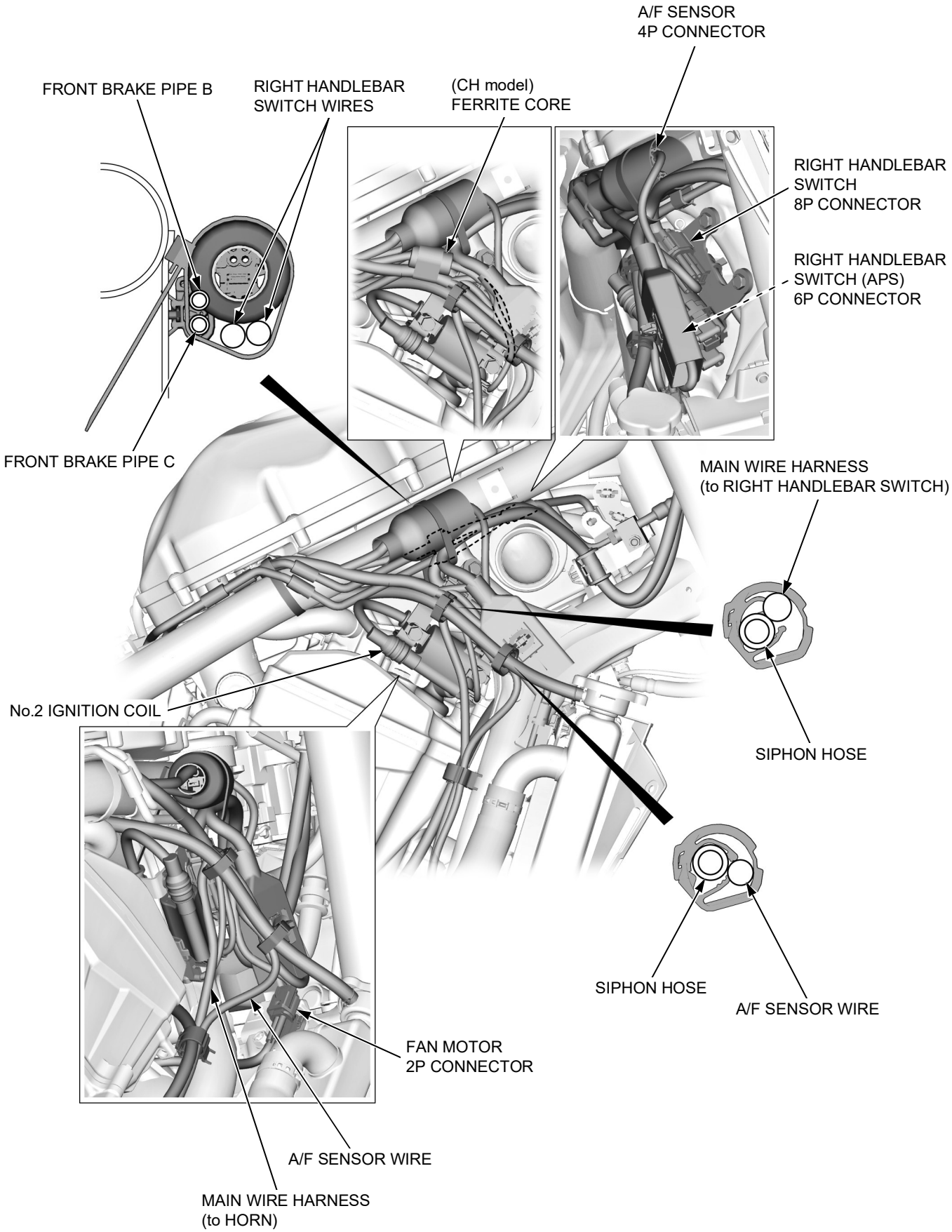

RIGHT FRONT TURN SIGNAL
LIGHT 2P (Light blue) CONNECTOR
HEADLIGHT
SUB HARNESS
LEFT FRONT TURN SIGNAL LIGHT
2P (Orange) CONNECTOR
RIGHT FRONT TURN SIGNAL
LIGHT 2P CONNECTOR
LEFT FRONT TURN SIGNAL
LIGHT 2P CONNECTOR


CLUTCH CABLE
FRONT WHEEL
SPEED SENSOR WIRE
FAN MOTOR WIRE

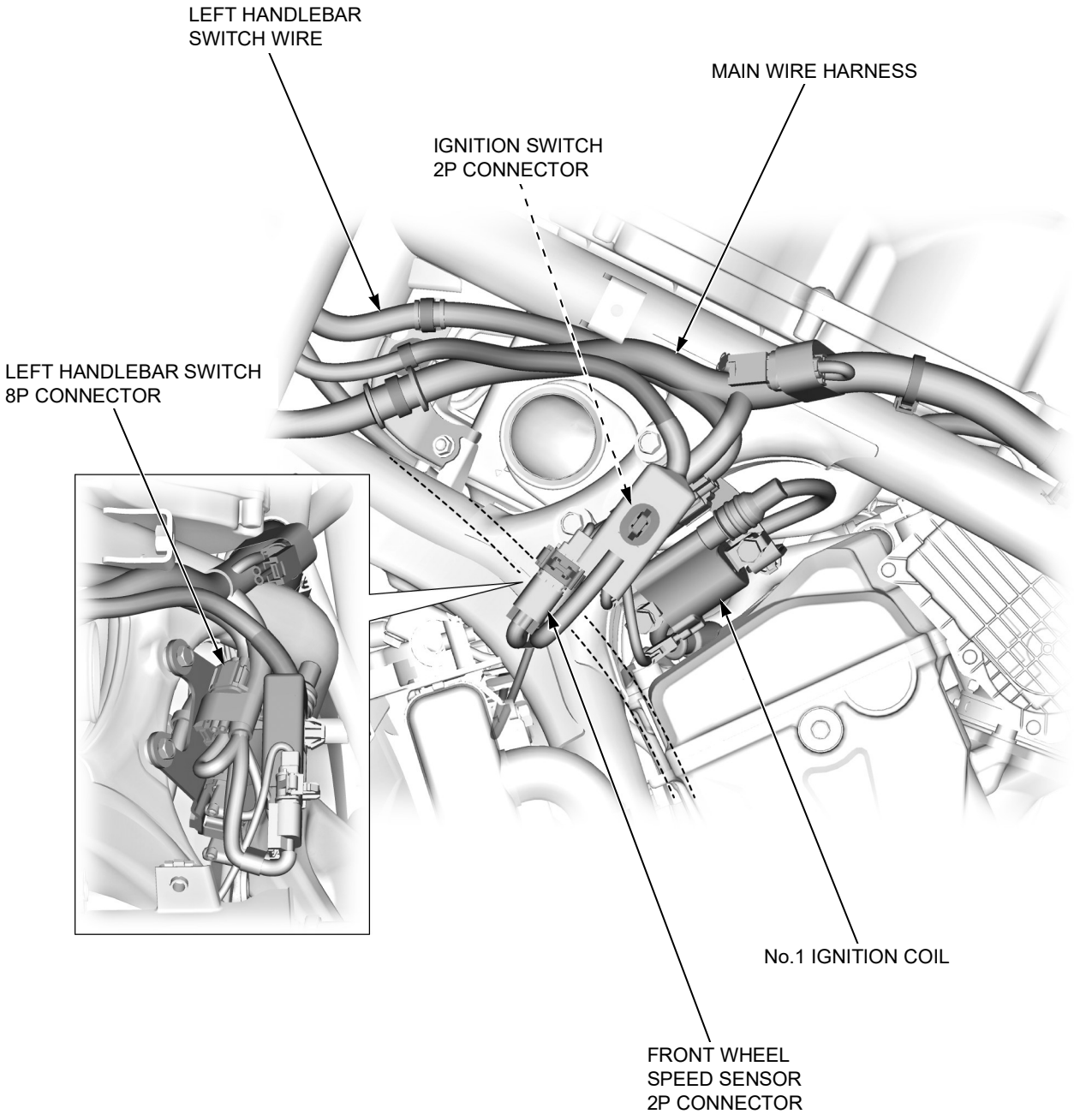

CLUTCH CABLE
LEFT HANDLEBAR
SWITCH WIRE
IMMOBILIZER RECEIVER
4P CONNECTOR
MAIN WIRE HARNESS
HEADLIGHT
6P CONNECTOR
IGNITION SWITCH WIRE


METER 24P CONNECTOR
Contact.
IMMOBILIZER RECEIVER
4P CONNECTOR
FRONT BRAKE HOSE A
RIGHT HANDLEBAR
SWITCH WIRES

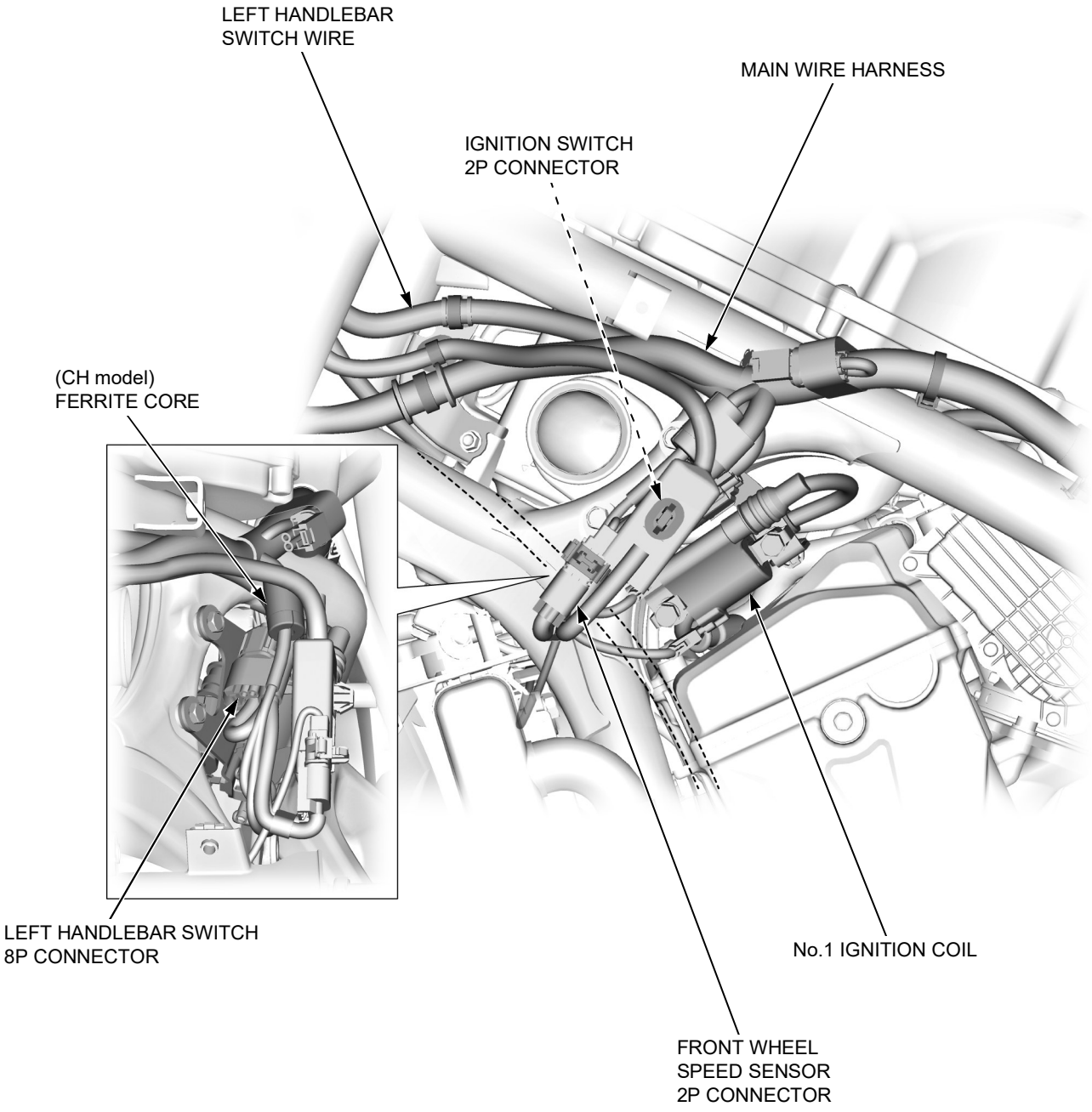

FUEL TANK STRAP

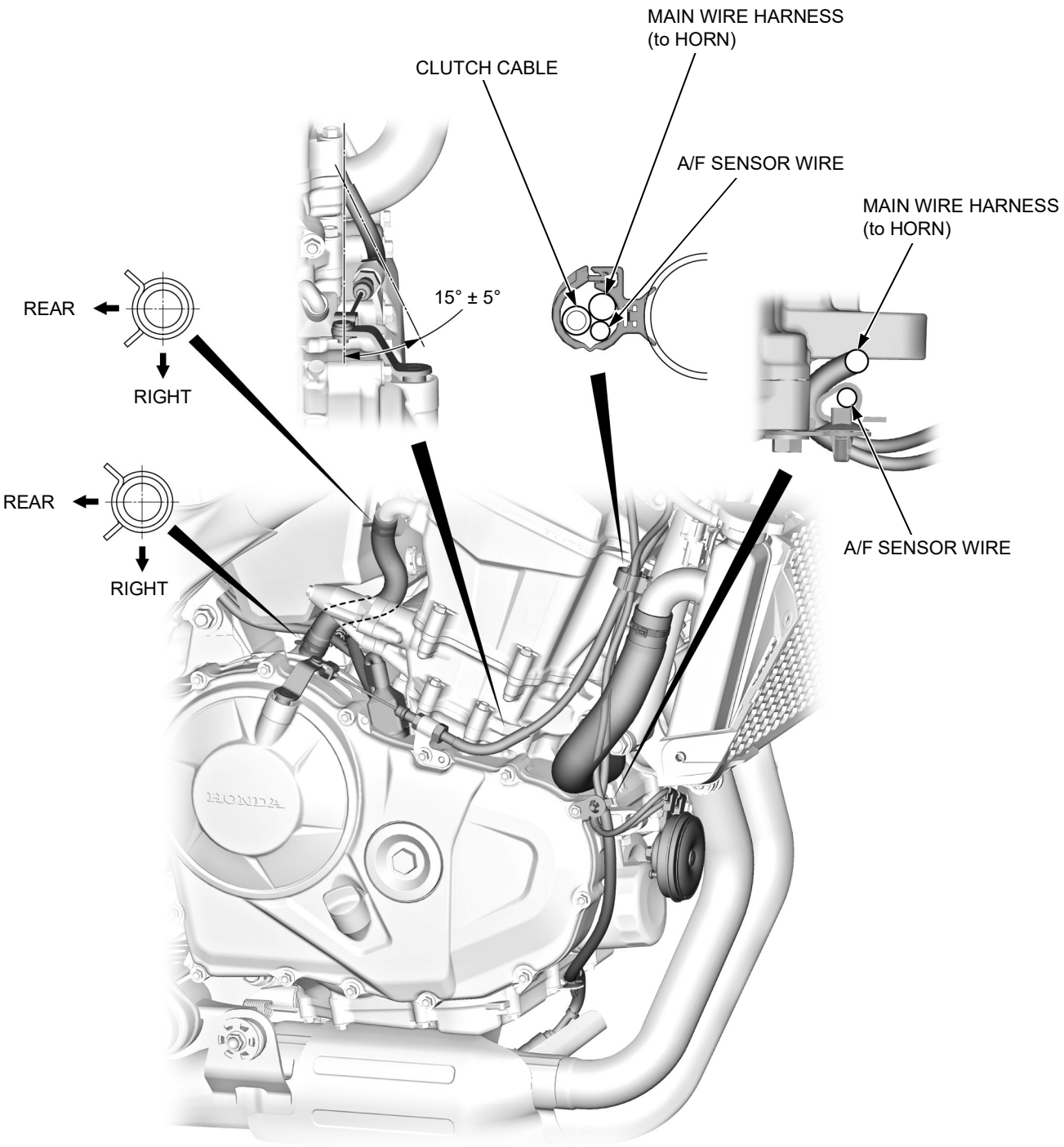

A/F SENSOR
4P CONNECTOR
FRONT BRAKE PIPE B
RIGHT HANDLEBAR
SWITCH WIRES
(CH model)
FERRITE CORE
RIGHT HANDLEBAR
SWITCH
8P CONNECTOR
RIGHT HANDLEBAR
SWITCH (APS)
6P CONNECTOR
FRONT BRAKE PIPE C
MAIN WIRE HARNESS
(to RIGHT HANDLEBAR SWITCH)
No.2 IGNITION COIL
SIPHON HOSE
SIPHON HOSE
A/F SENSOR WIRE
FAN MOTOR
2P CONNECTOR
A/F SENSOR WIRE
MAIN WIRE HARNESS
(to HORN)

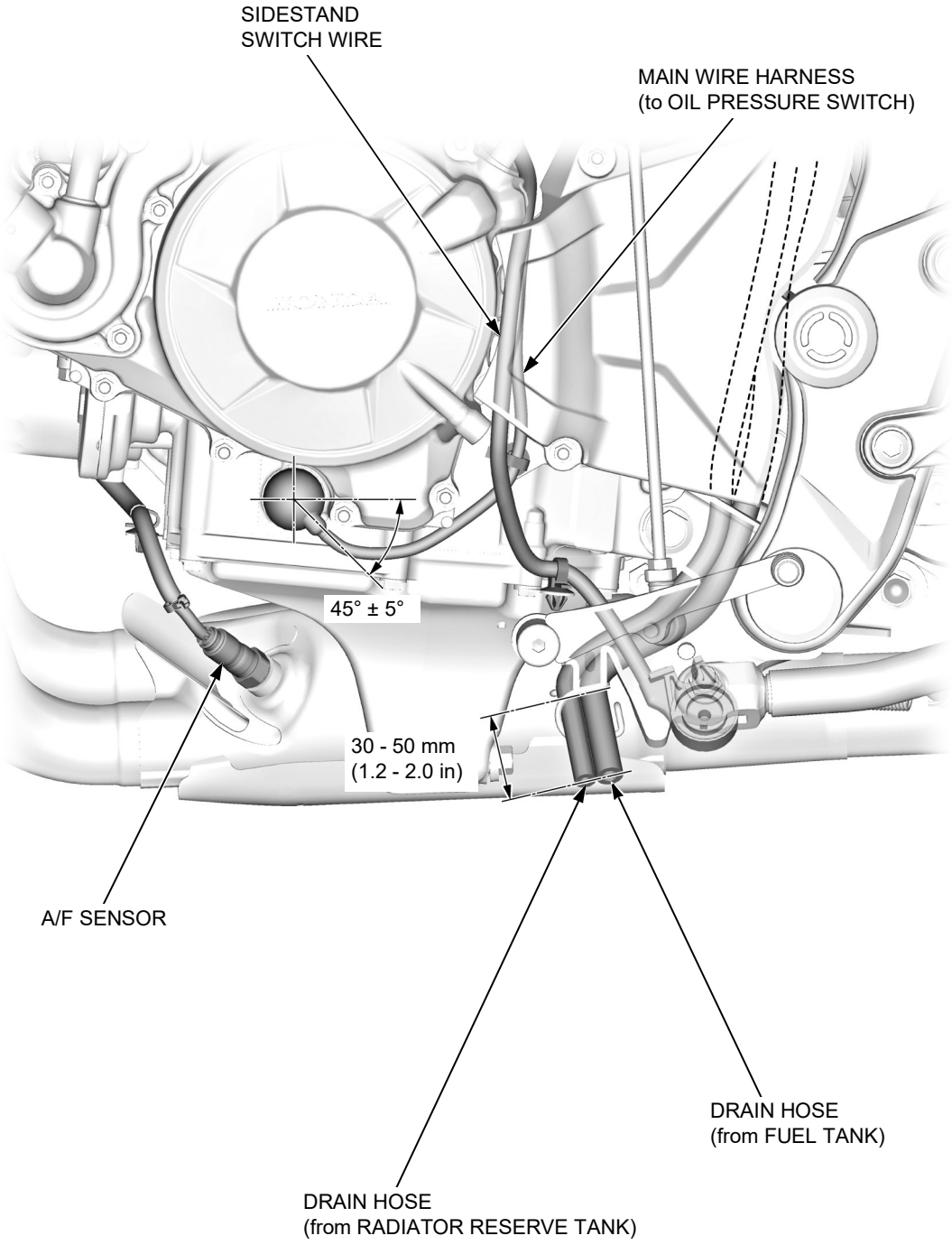
Except CH model:

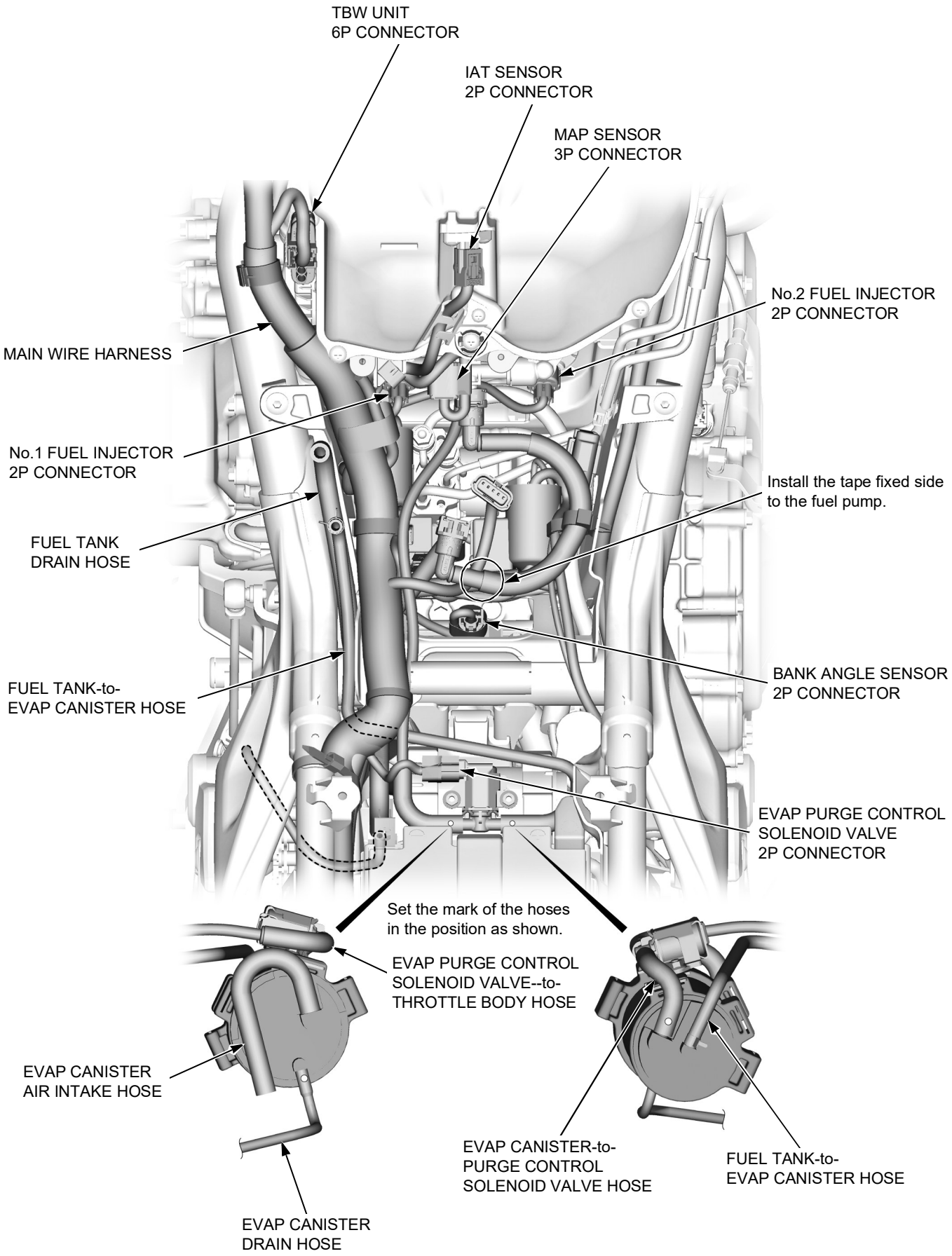


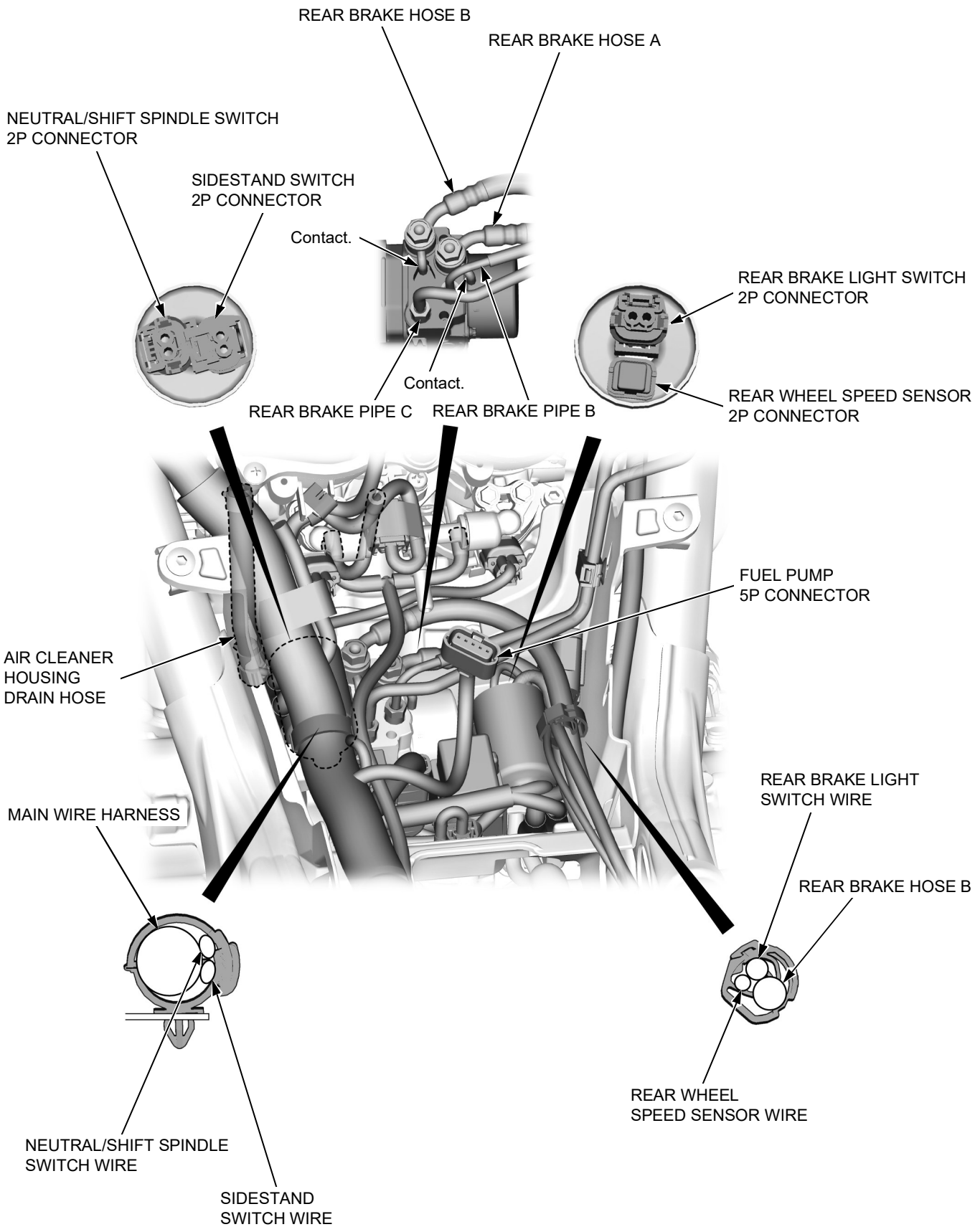
CH model:

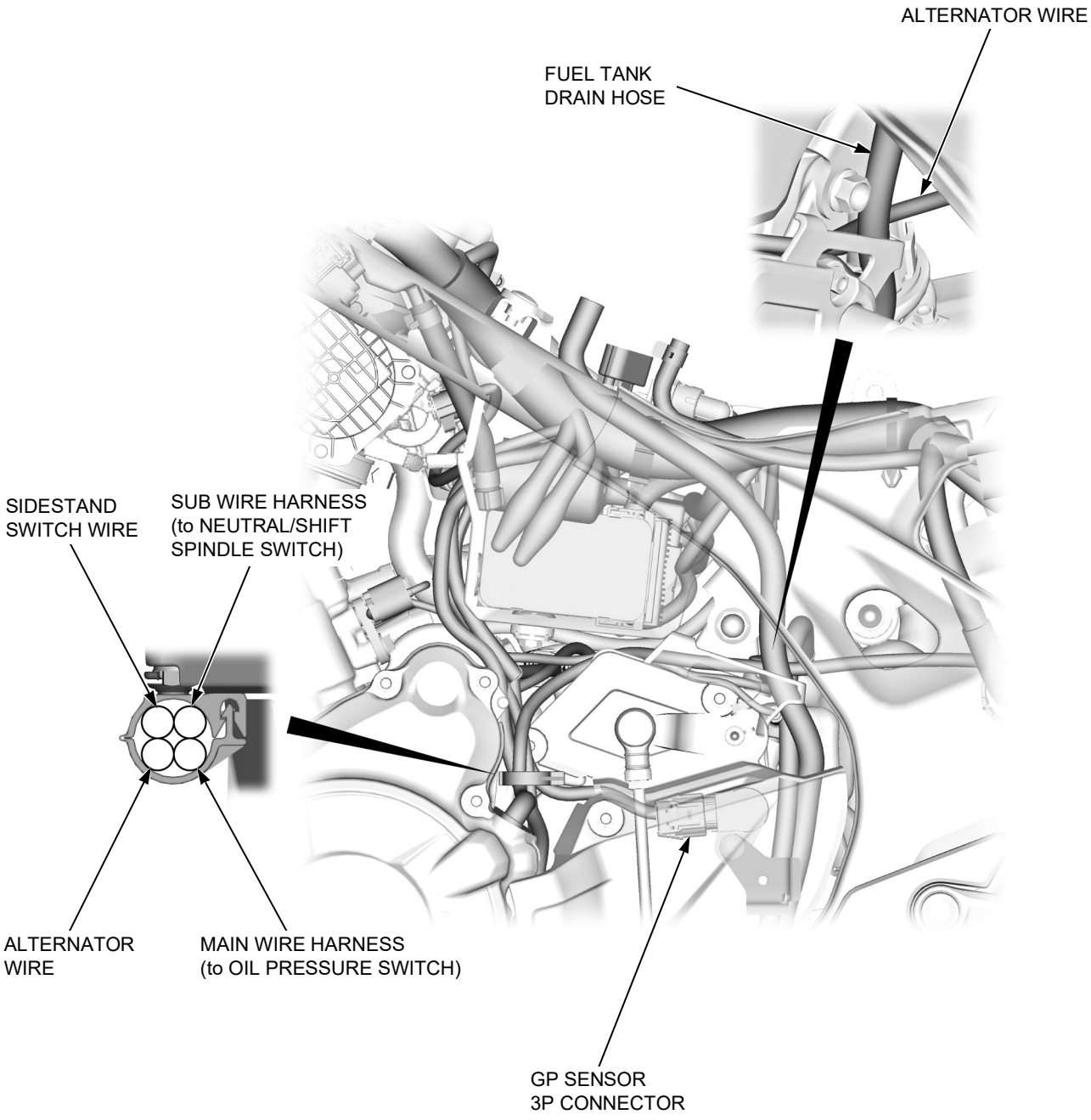

LEFT HANDLEBAR
SWITCH WIRE
MAIN WIRE HARNESS
IGNITION SWITCH
2P CONNECTOR
(CH model)
FERRITE CORE
LEFT HANDLEBAR SWITCH
8P CONNECTOR
No.1 IGNITION COIL
FRONT WHEEL
SPEED SENSOR
2P CONNECTOR

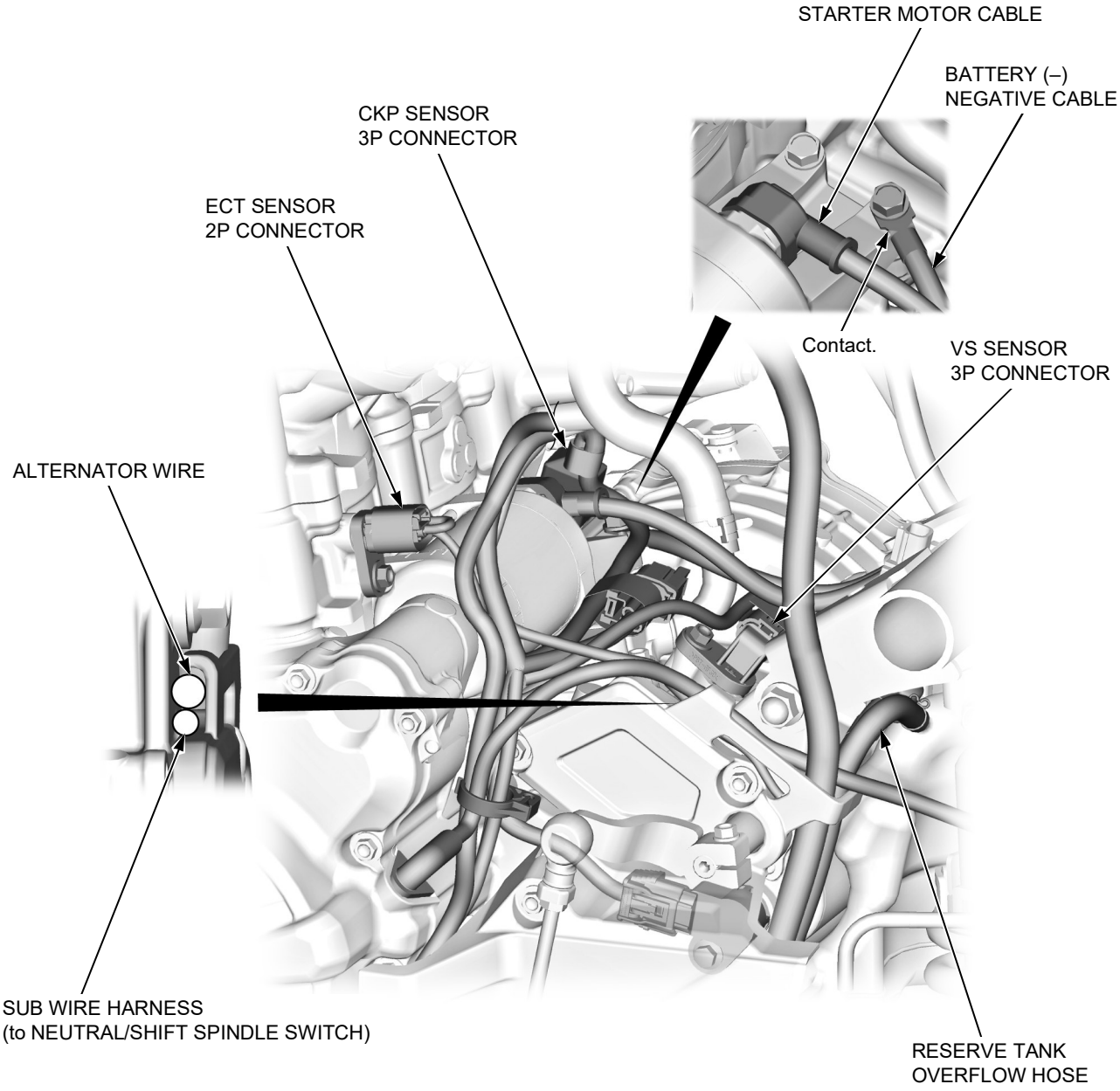

MAIN WIRE HARNESS
(to HORN)
CLUTCH CABLE
A/F SENSOR WIRE
MAIN WIRE HARNESS
(to HORN)
15° ± 5°
REAR
RIGHT
REAR
RIGHT
A/F SENSOR WIRE

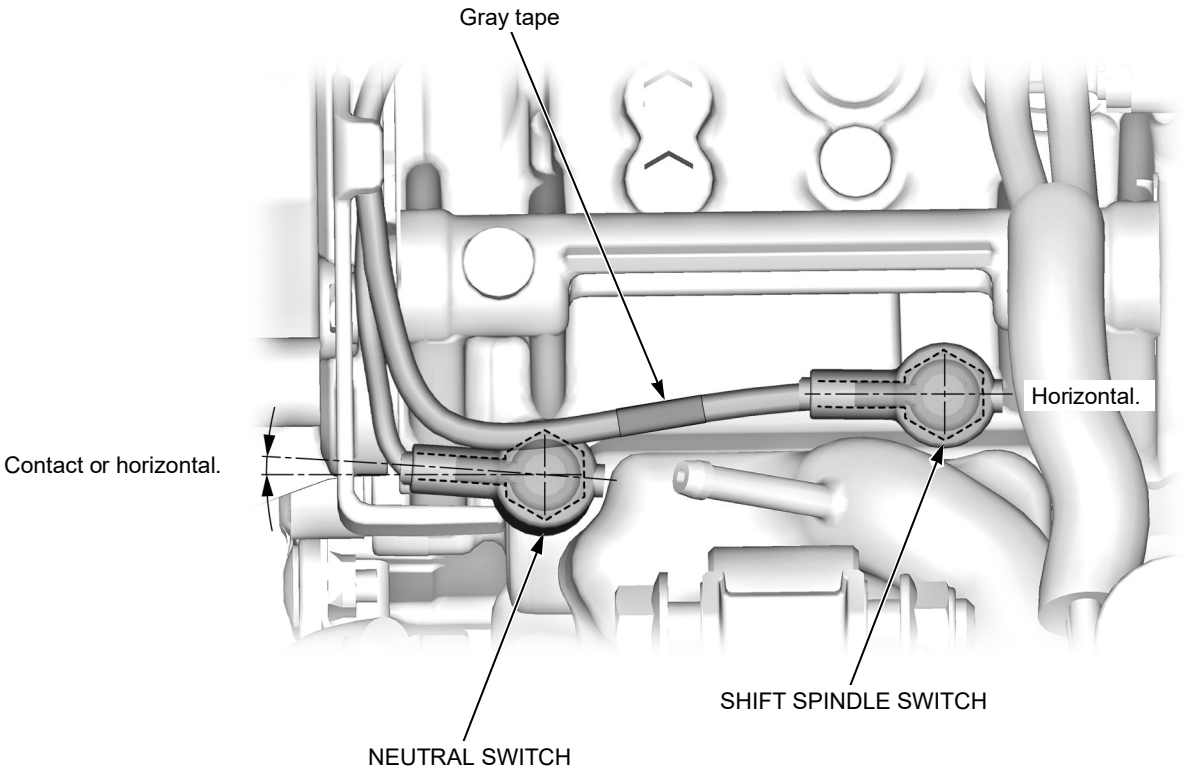

SIDESTAND
SWITCH WIRE
MAIN WIRE HARNESS
(to OIL PRESSURE SWITCH)
45° ± 5°
30 - 50 mm
(1.2 - 2.0 in)
A/F SENSOR
DRAIN HOSE
(from FUEL TANK)
DRAIN HOSE
(from RADIATOR RESERVE TANK)

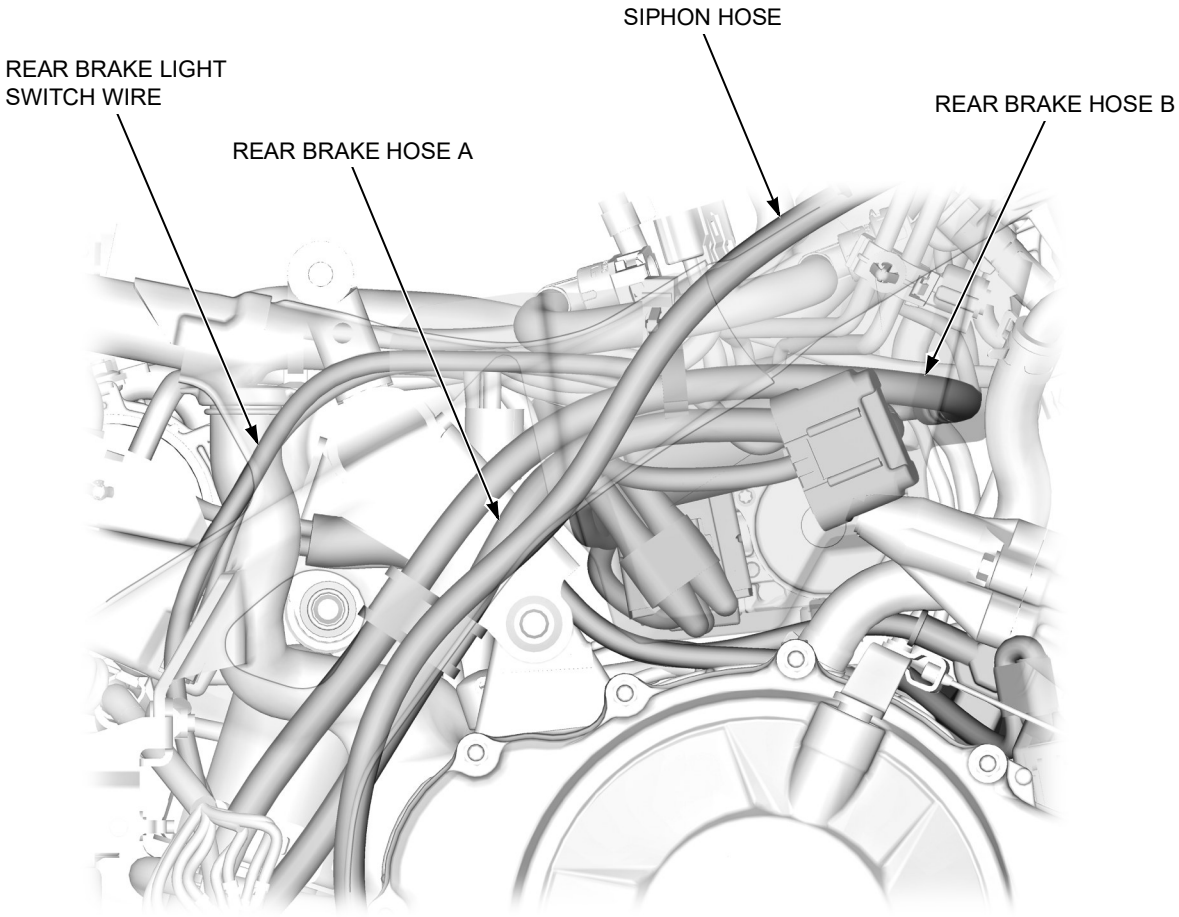

TBW UNIT
6P CONNECTOR
IAT SENSOR
2P CONNECTOR
MAP SENSOR
3P CONNECTOR
No.2 FUEL INJECTOR
2P CONNECTOR
MAIN WIRE HARNESS
No.1 FUEL INJECTOR
2P CONNECTOR
Install the tape fixed side
to the fuel pump.
FUEL TANK
DRAIN HOSE
BANK ANGLE SENSOR
2P CONNECTOR
FUEL TANK-to-
EVAP CANISTER HOSE
EVAP PURGE CONTROL
SOLENOID VALVE
2P CONNECTOR
Set the mark of the hoses
in the position as shown.
EVAP PURGE CONTROL
SOLENOID VALVE--to-
THROTTLE BODY HOSE
EVAP CANISTER
AIR INTAKE HOSE
EVAP CANISTER-to-
PURGE CONTROL
SOLENOID VALVE HOSE
FUEL TANK-to-
EVAP CANISTER HOSE
EVAP CANISTER
DRAIN HOSE

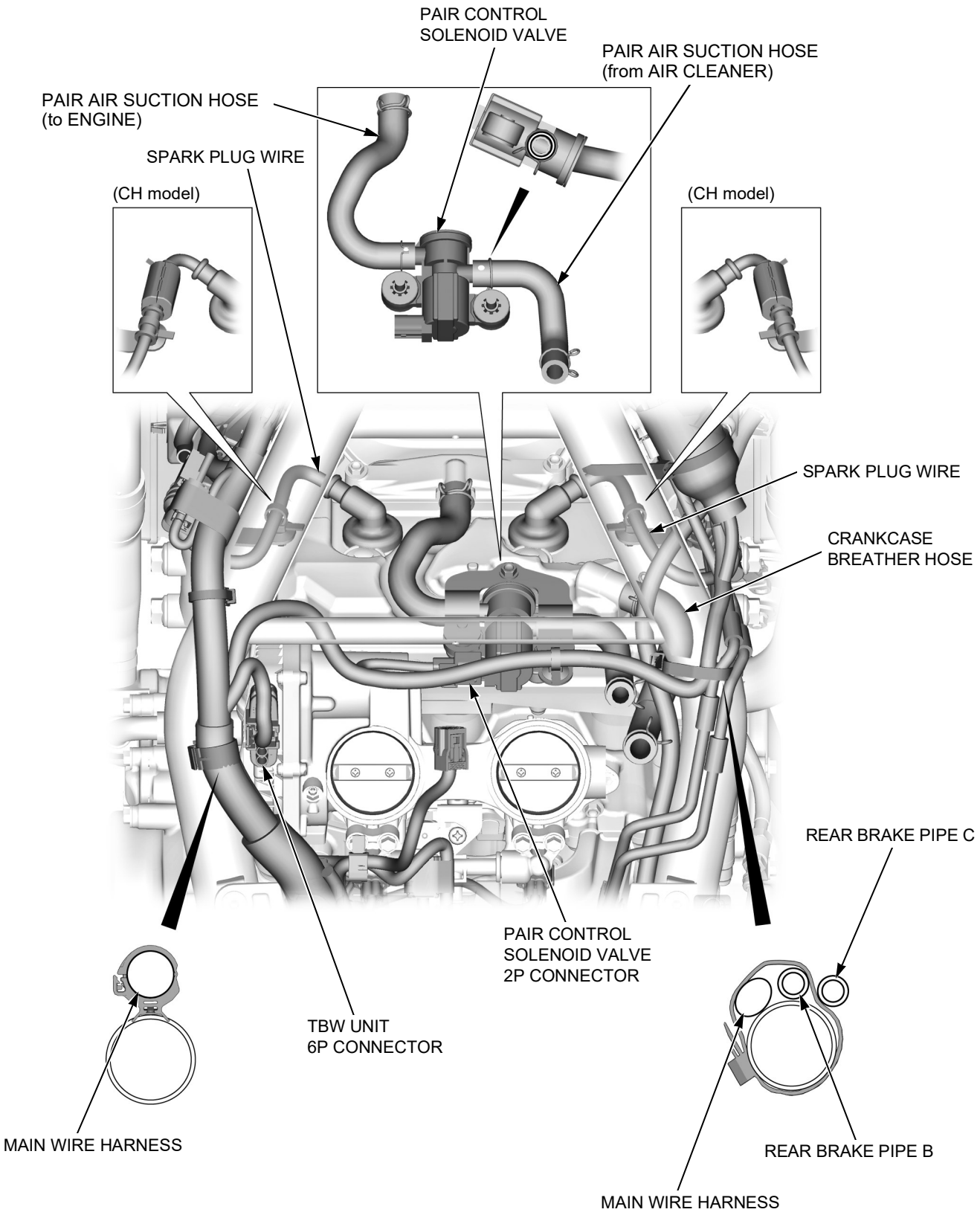

REAR BRAKE HOSE B
REAR BRAKE HOSE A
NEUTRAL/SHIFT SPINDLE SWITCH 2P CONNECTOR
SIDESTAND SWITCH 2P CONNECTOR
Contact.
REAR BRAKE LIGHT SWITCH 2P CONNECTOR
Contact.
REAR WHEEL SPEED SENSOR 2P CONNECTOR
REAR BRAKE PIPE C
REAR BRAKE PIPE B
FUEL PUMP 5P CONNECTOR
AIR CLEANER HOUSING DRAIN HOSE
REAR BRAKE LIGHT SWITCH WIRE
MAIN WIRE HARNESS
REAR BRAKE HOSE B
REAR WHEEL SPEED SENSOR WIRE
NEUTRAL/SHIFT SPINDLE SWITCH WIRE
SIDESTAND SWITCH WIRE

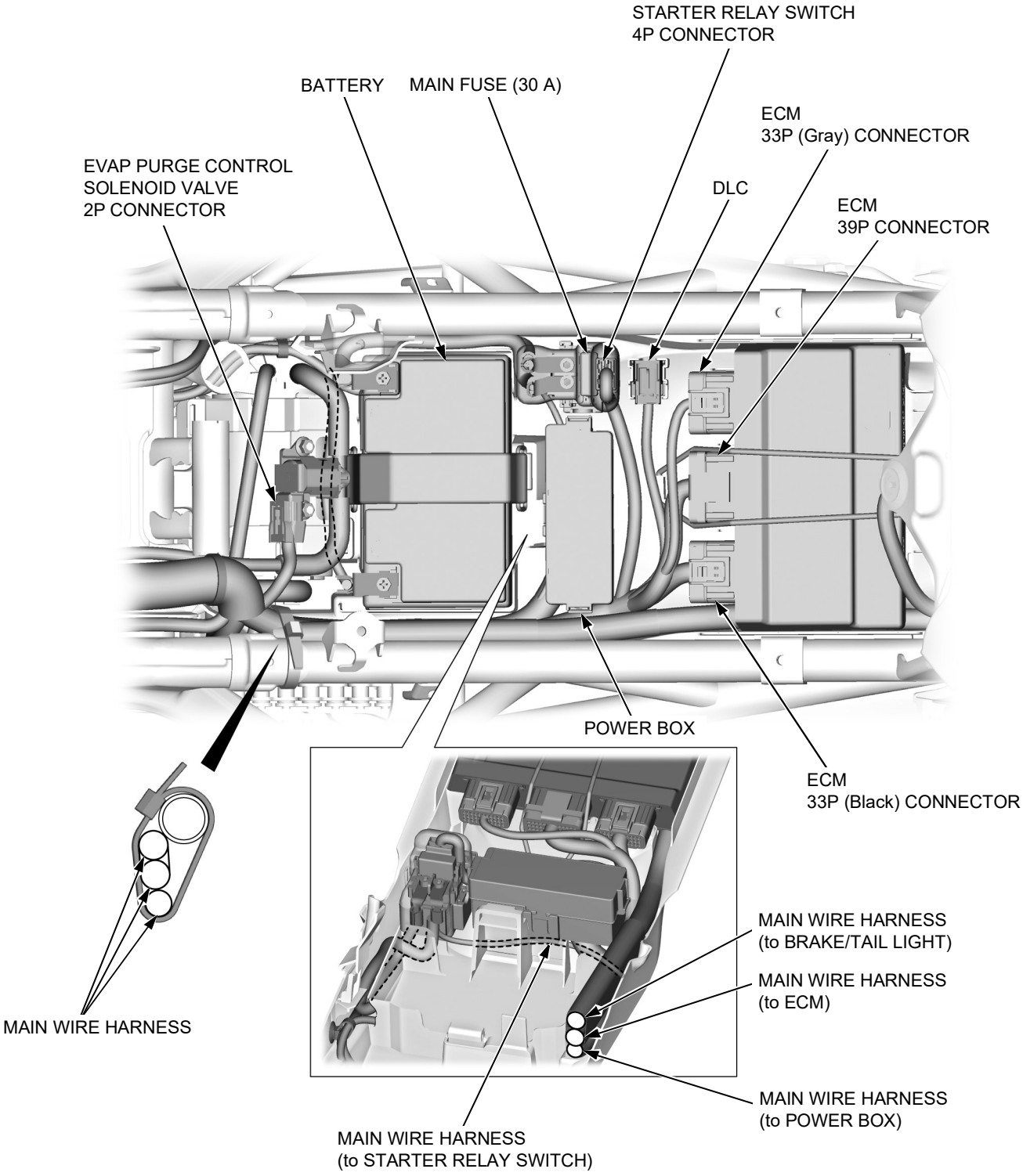

ALTERNATOR WIRE
FUEL TANK
DRAIN HOSE
SIDESTAND
SWITCH WIRE
SUB WIRE HARNESS
(to NEUTRAL/SHIFT
SPINDLE SWITCH)
ALTERNATOR
WIRE
MAIN WIRE HARNESS
(to OIL PRESSURE SWITCH)
GP SENSOR
3P CONNECTOR

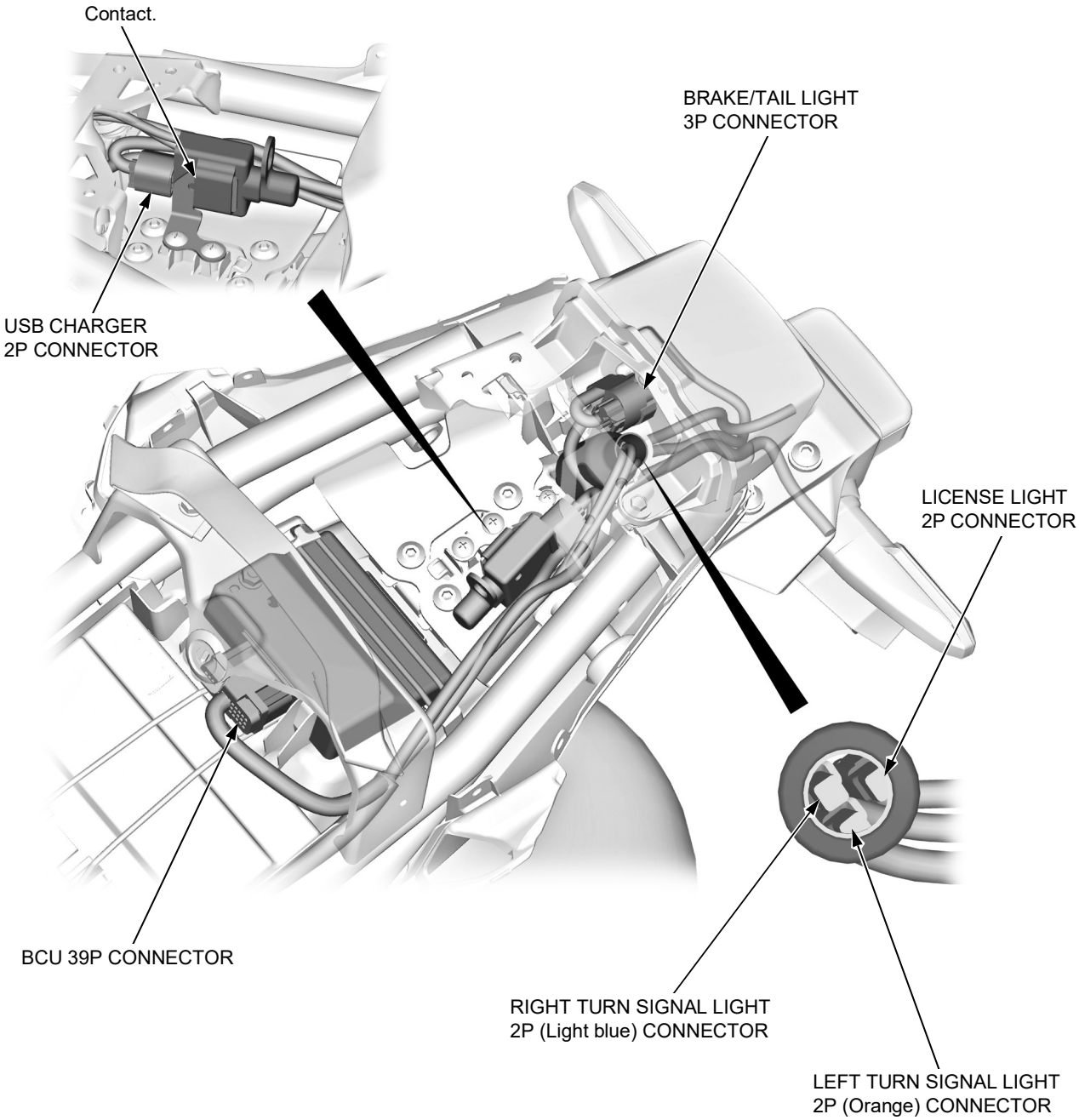

STARTER MOTOR CABLE
BATTERY (–)
NEGATIVE CABLE
CKP SENSOR
3P CONNECTOR
ECT SENSOR
2P CONNECTOR
Contact.
VS SENSOR
3P CONNECTOR
ALTERNATOR WIRE
SUB WIRE HARNESS
(to NEUTRAL/SHIFT SPINDLE SWITCH)
RESERVE TANK
OVERFLOW HOSE

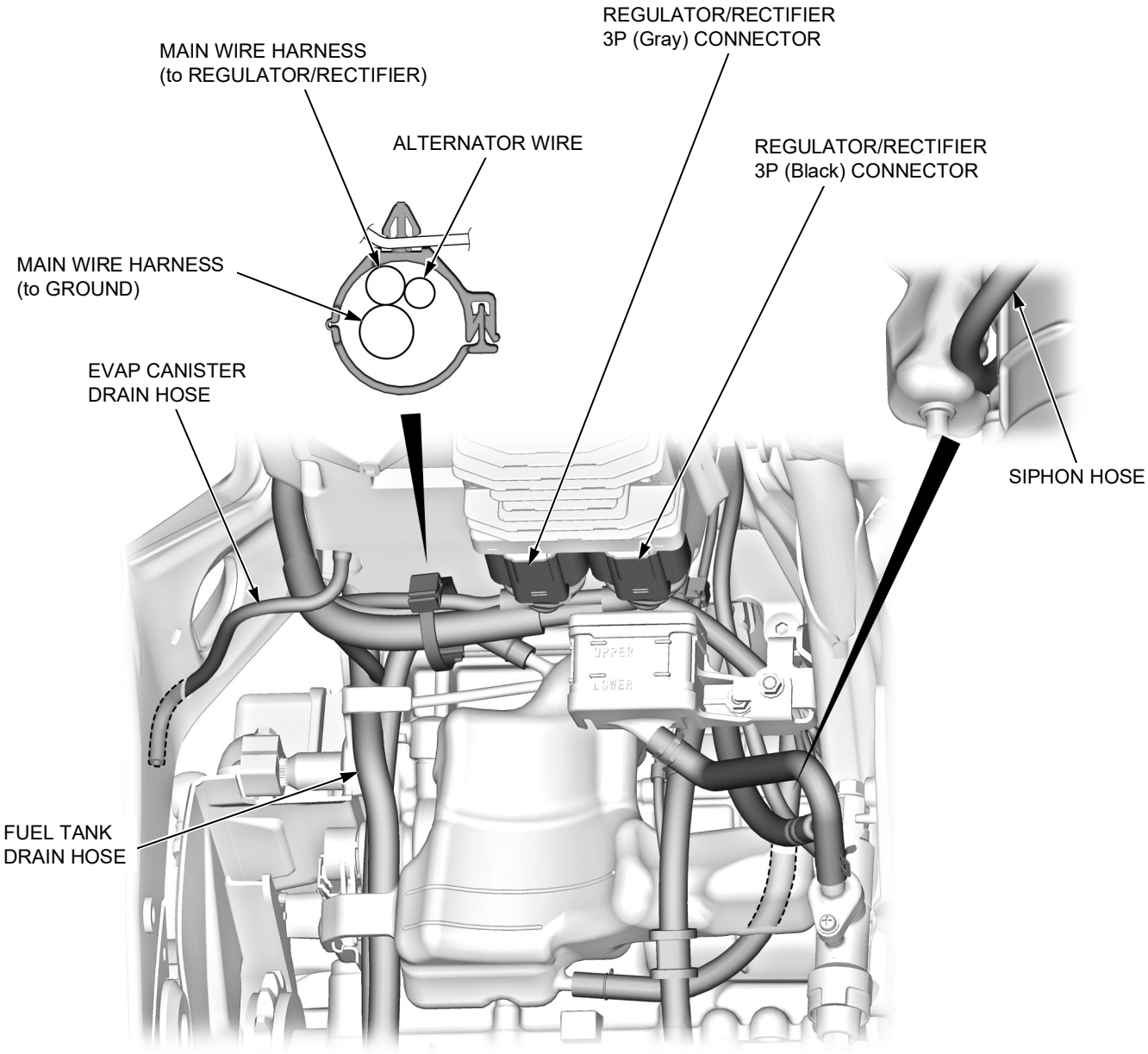

Gray tape
Horizontal.
Contact or horizontal.
SHIFT SPINDLE SWITCH
NEUTRAL SWITCH

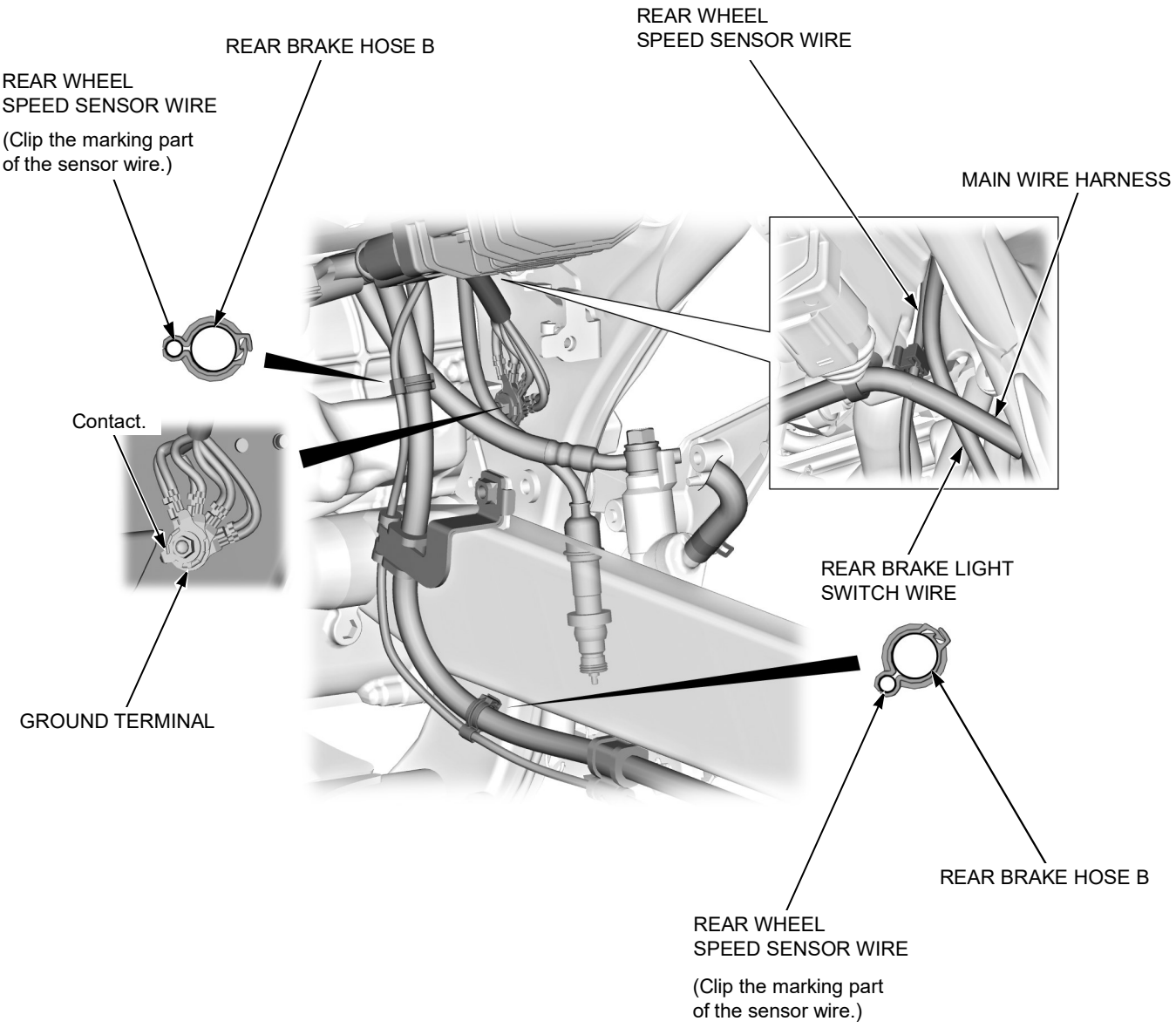

SIPHON HOSE
REAR BRAKE LIGHT
SWITCH WIRE
REAR BRAKE HOSE B
REAR BRAKE HOSE A

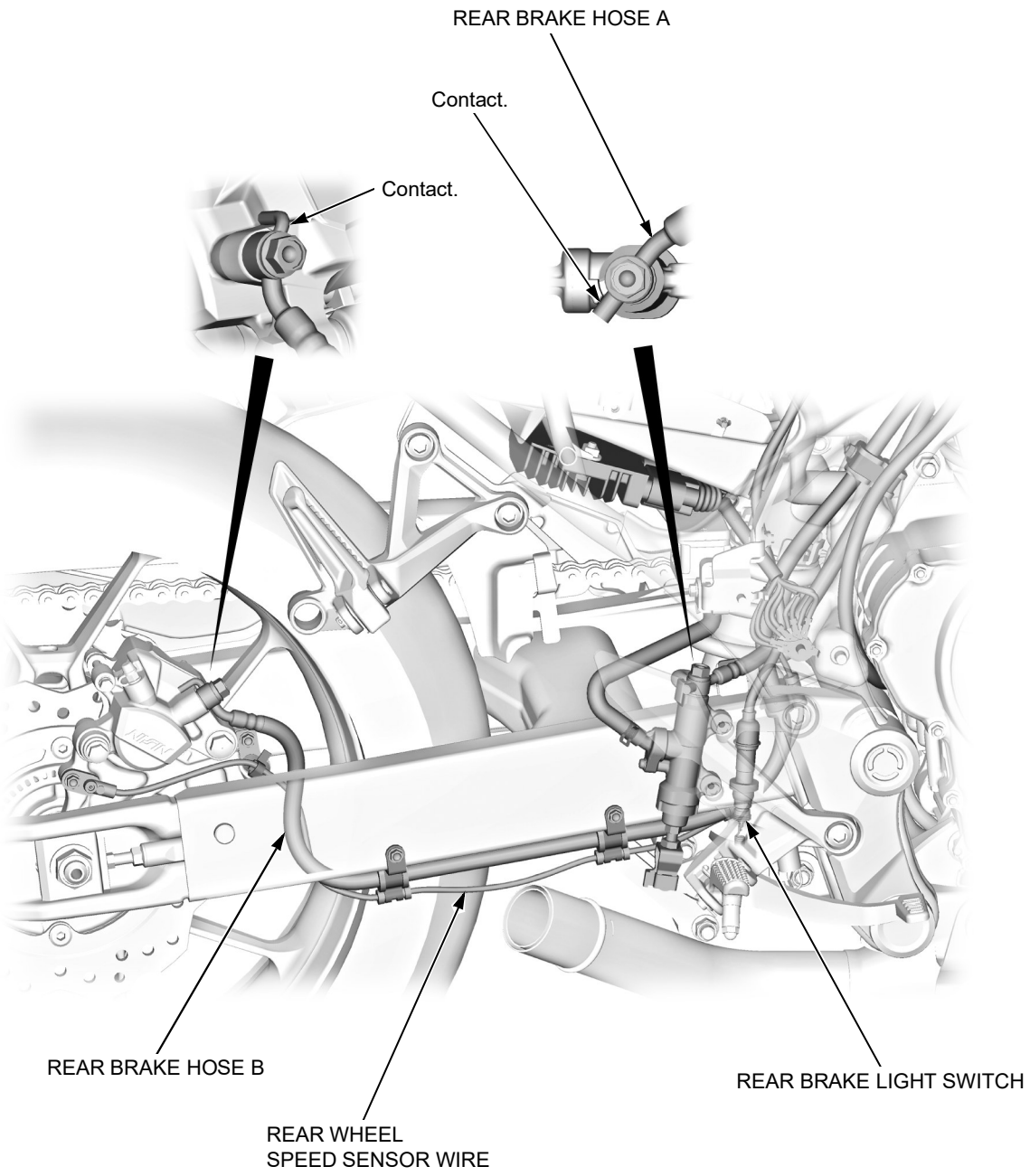

PAIR CONTROL SOLENOID VALVE
PAIR AIR SUCTION HOSE (from AIR CLEANER)
PAIR AIR SUCTION HOSE (to ENGINE)
SPARK PLUG WIRE
(CH model)
(CH model)
SPARK PLUG WIRE
CRANKCASE BREATHER HOSE
REAR BRAKE PIPE C
PAIR CONTROL SOLENOID VALVE 2P CONNECTOR
TBW UNIT 6P CONNECTOR
MAIN WIRE HARNESS
REAR BRAKE PIPE B
MAIN WIRE HARNESS

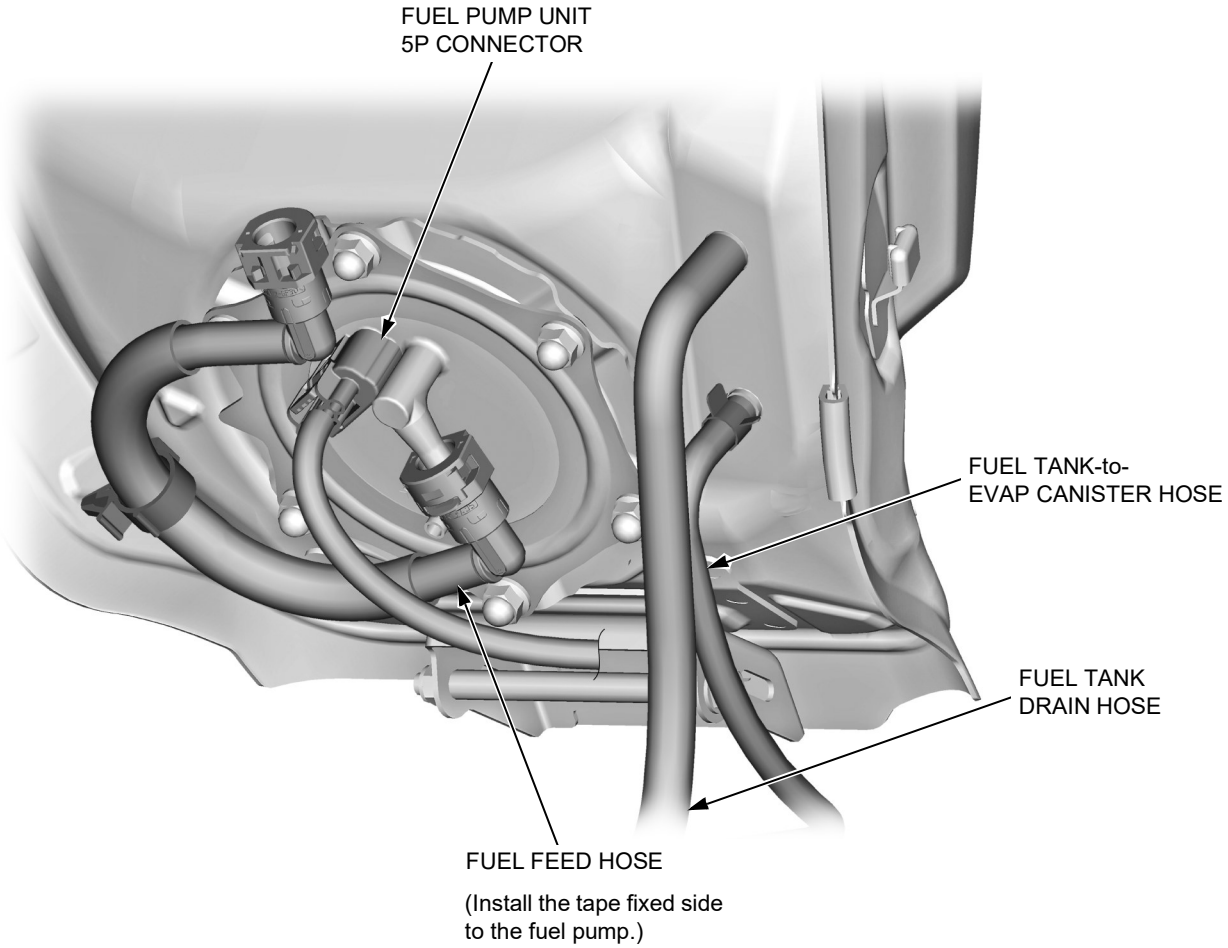

STARTER RELAY SWITCH
4P CONNECTOR
BATTERY
MAIN FUSE (30 A)
ECM
33P (Gray) CONNECTOR
EVAP PURGE CONTROL
SOLENOID VALVE
2P CONNECTOR
DLC
ECM
39P CONNECTOR
POWER BOX
ECM
33P (Black) CONNECTOR
MAIN WIRE HARNESS
MAIN WIRE HARNESS
(to BRAKE/TAIL LIGHT)
MAIN WIRE HARNESS
(to ECM)
MAIN WIRE HARNESS
(to POWER BOX)
MAIN WIRE HARNESS
(to STARTER RELAY SWITCH)

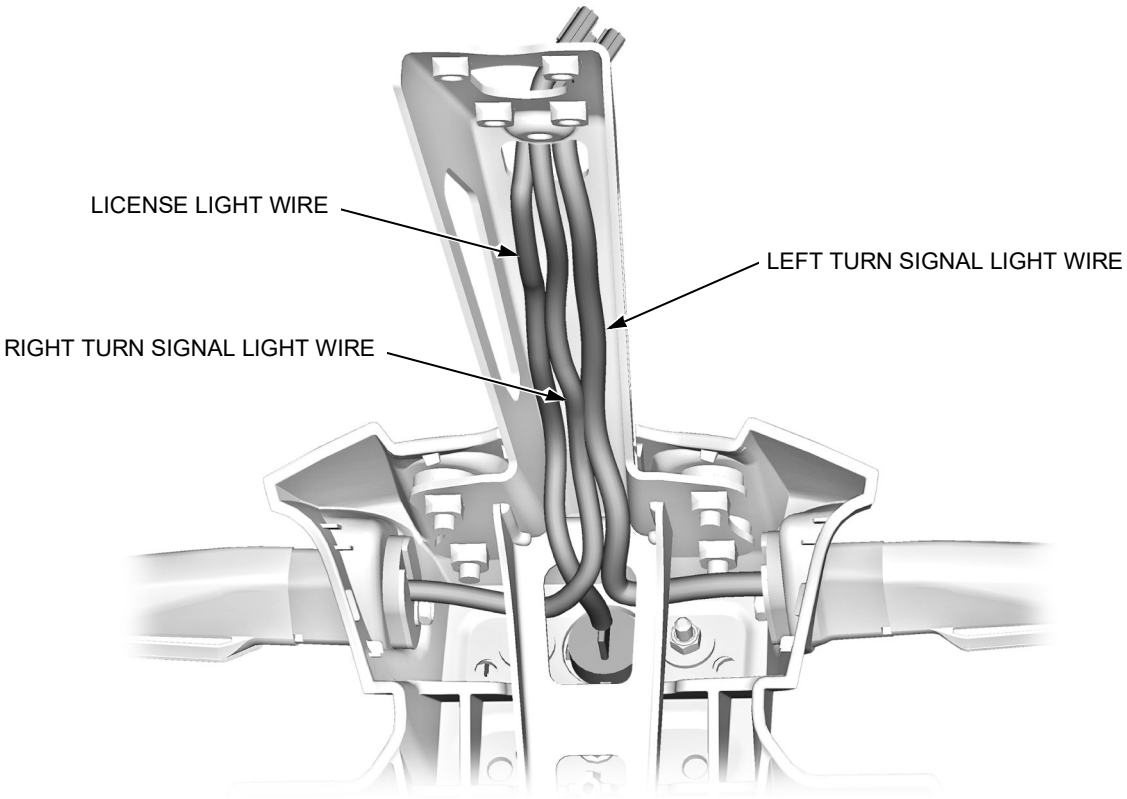

Contact.
BRAKE/TAIL LIGHT
3P CONNECTOR
USB CHARGER
2P CONNECTOR
LICENSE LIGHT
2P CONNECTOR
BCU 39P CONNECTOR
RIGHT TURN SIGNAL LIGHT
2P (Light blue) CONNECTOR
LEFT TURN SIGNAL LIGHT
2P (Orange) CONNECTOR

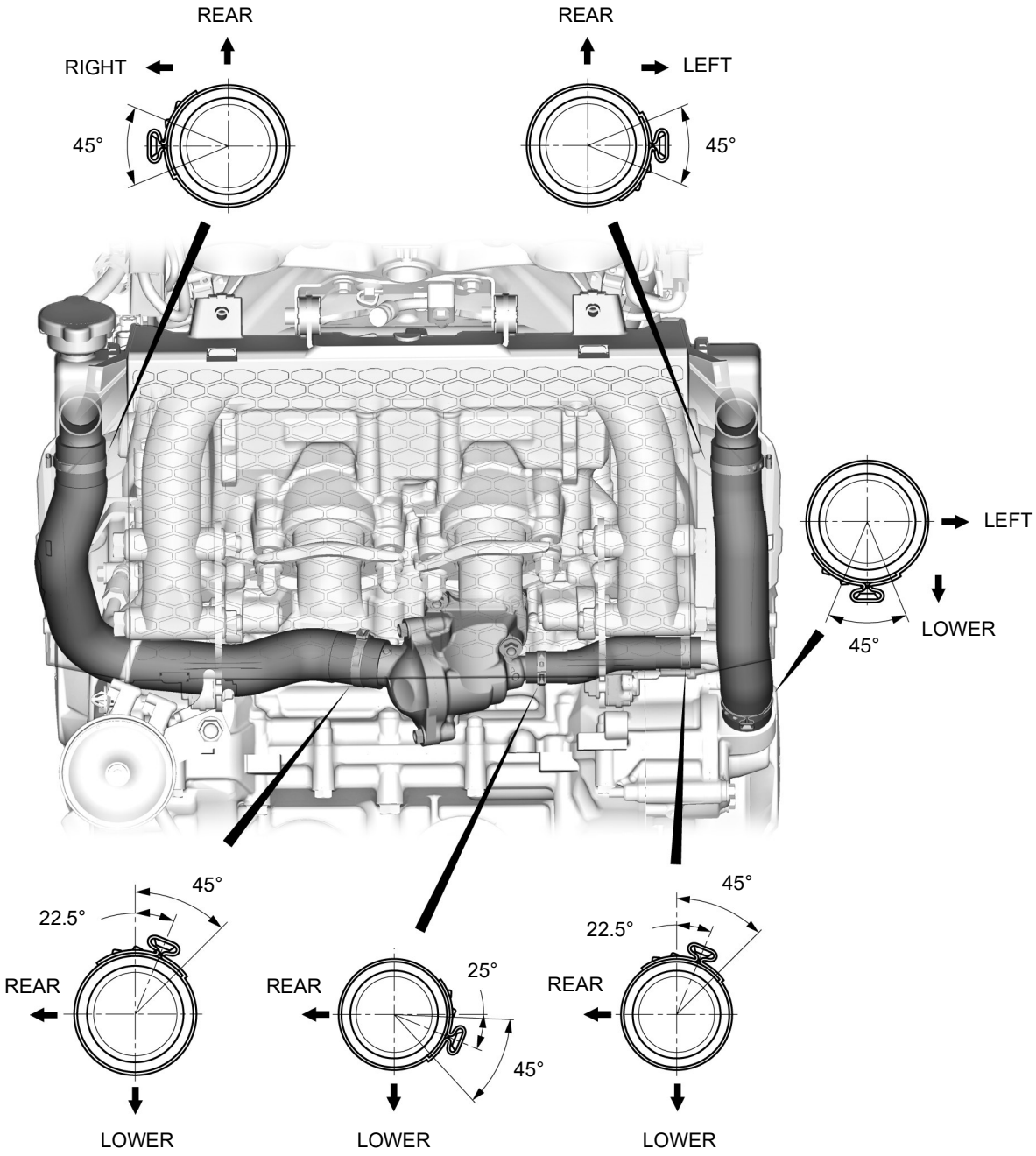

REGULATOR/RECTIFIER
3P (Gray) CONNECTOR
MAIN WIRE HARNESS
(to REGULATOR/RECTIFIER)
ALTERNATOR WIRE
REGULATOR/RECTIFIER
3P (Black) CONNECTOR
MAIN WIRE HARNESS
(to GROUND)
EVAP CANISTER
DRAIN HOSE
SIPHON HOSE
FUEL TANK
DRAIN HOSE

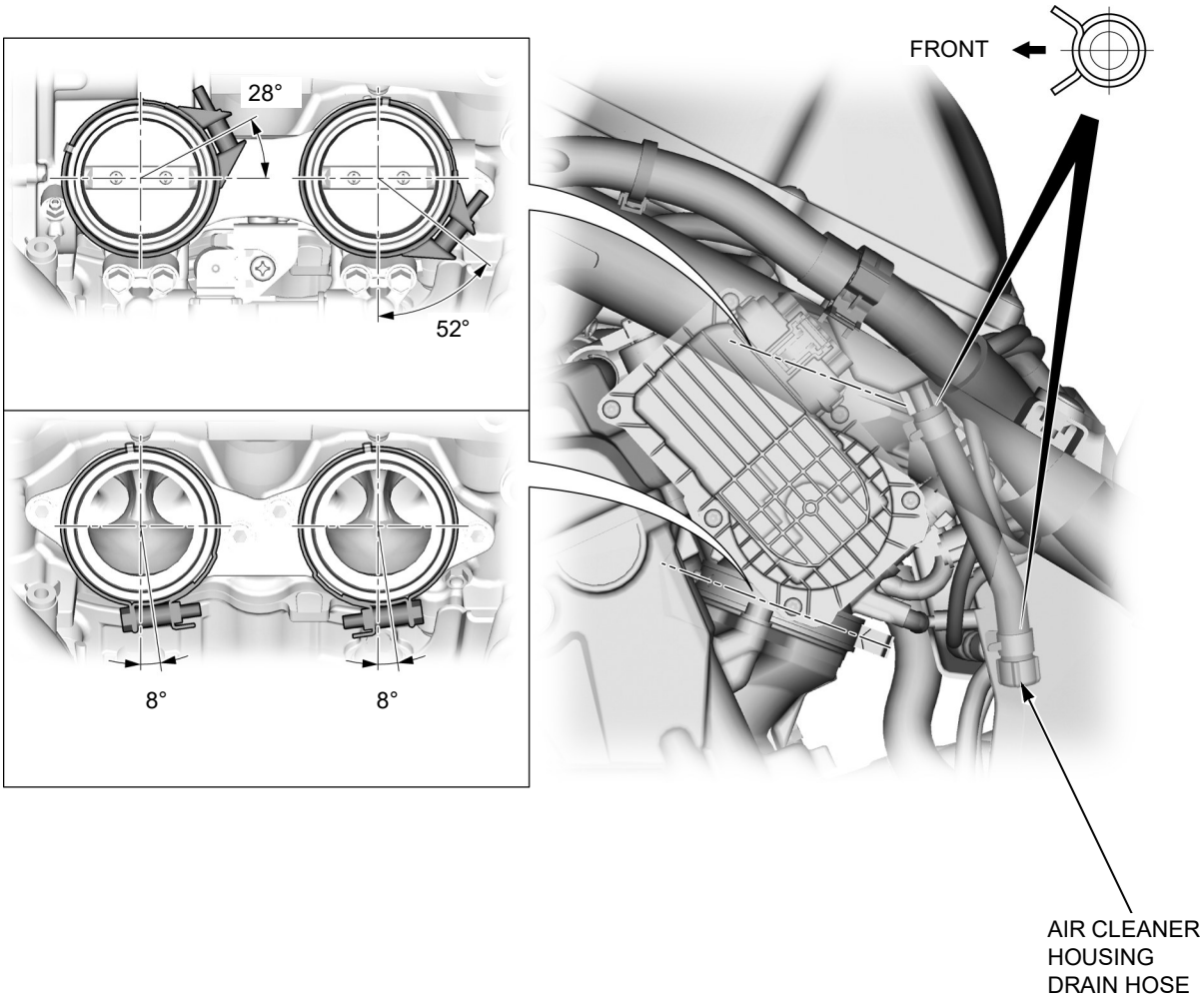

REAR WHEEL
SPEED SENSOR WIRE
REAR BRAKE HOSE B
REAR WHEEL
SPEED SENSOR WIRE
(Clip the marking part
of the sensor wire.)
MAIN WIRE HARNESS
Contact.
REAR BRAKE LIGHT
SWITCH WIRE
GROUND TERMINAL
REAR BRAKE HOSE B
REAR WHEEL
SPEED SENSOR WIRE
(Clip the marking part
of the sensor wire.)


REAR BRAKE HOSE A
Contact.
Contact.
REAR BRAKE HOSE B
REAR WHEEL
SPEED SENSOR WIRE
REAR BRAKE LIGHT SWITCH


FUEL PUMP UNIT
5P CONNECTOR
FUEL TANK-to-
EVAP CANISTER HOSE
FUEL TANK
DRAIN HOSE
FUEL FEED HOSE
(Install the tape fixed side
to the fuel pump.)


LICENSE LIGHT WIRE
LEFT TURN SIGNAL LIGHT WIRE
RIGHT TURN SIGNAL LIGHT WIRE


REAR
RIGHT
45°
REAR
LEFT
45°
LEFT
LOWER
45°
45°
22.5°
REAR
LOWER
REAR
25°
45°
LOWER
45°
22.5°
REAR
LOWER


28°
52°
8°
8°
FRONT
AIR CLEANER
HOUSING
DRAIN HOSE

EMISSION CONTROL SYSTEMS

SOURCE OF EMISSIONS

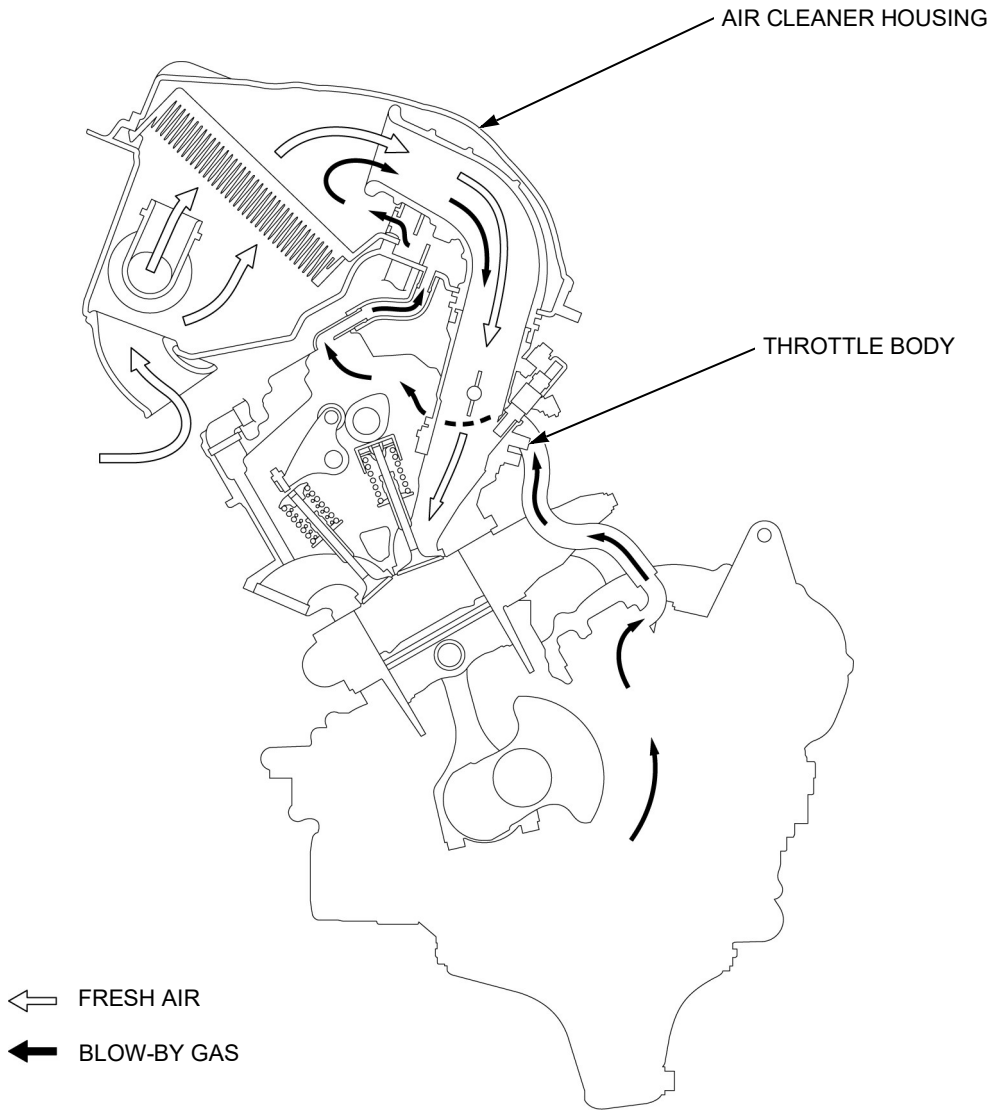
The combustion process produces carbon monoxide (CO), oxides of nitrogen (NO_x) and hydrocarbons (HC). Control of carbon monoxide, oxides of nitrogen and hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subject to sunlight. Carbon monoxide does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

Honda Motor Co., Ltd. utilizes various system 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.

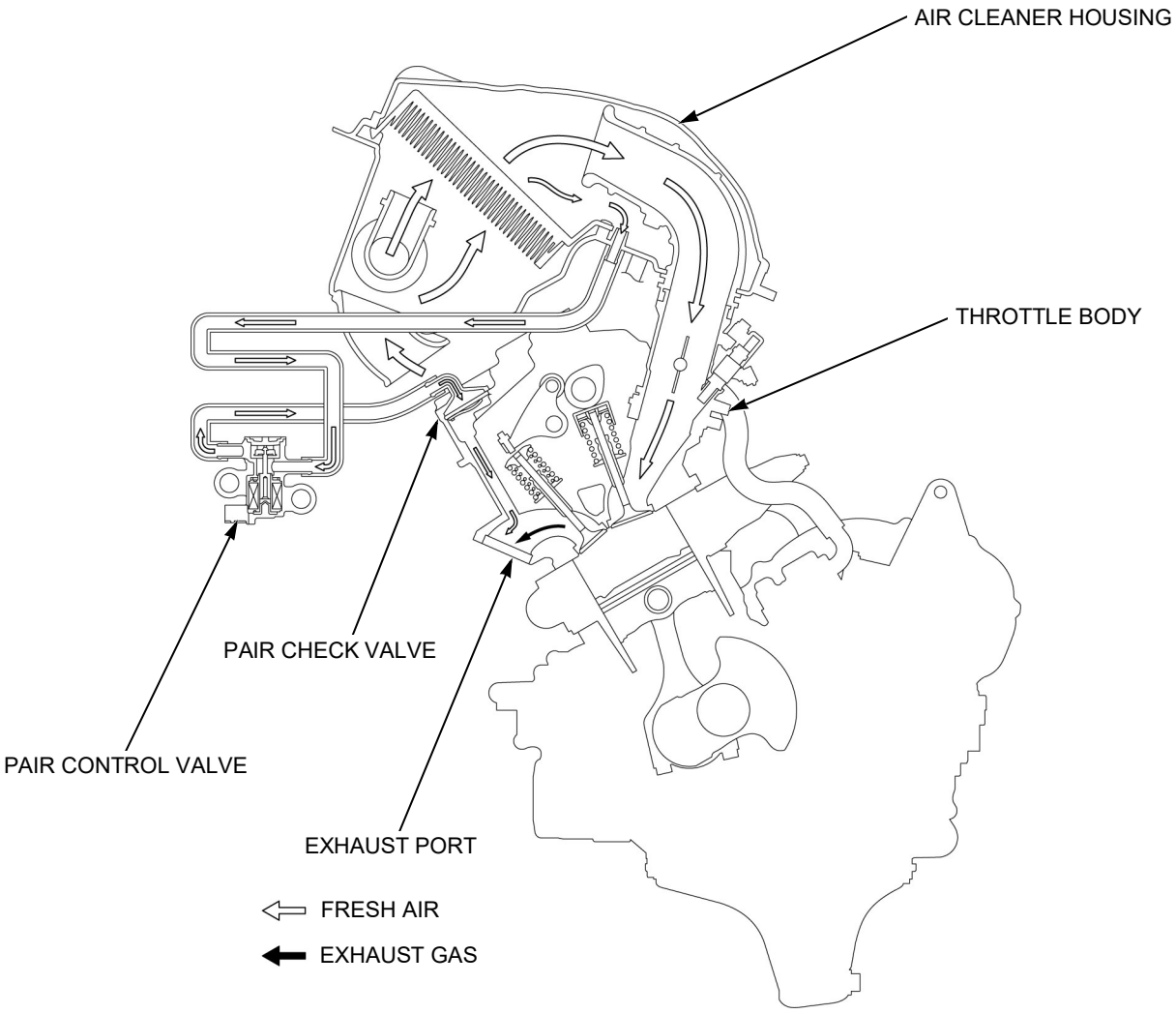
SECONDARY AIR SUPPLY SYSTEM

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.

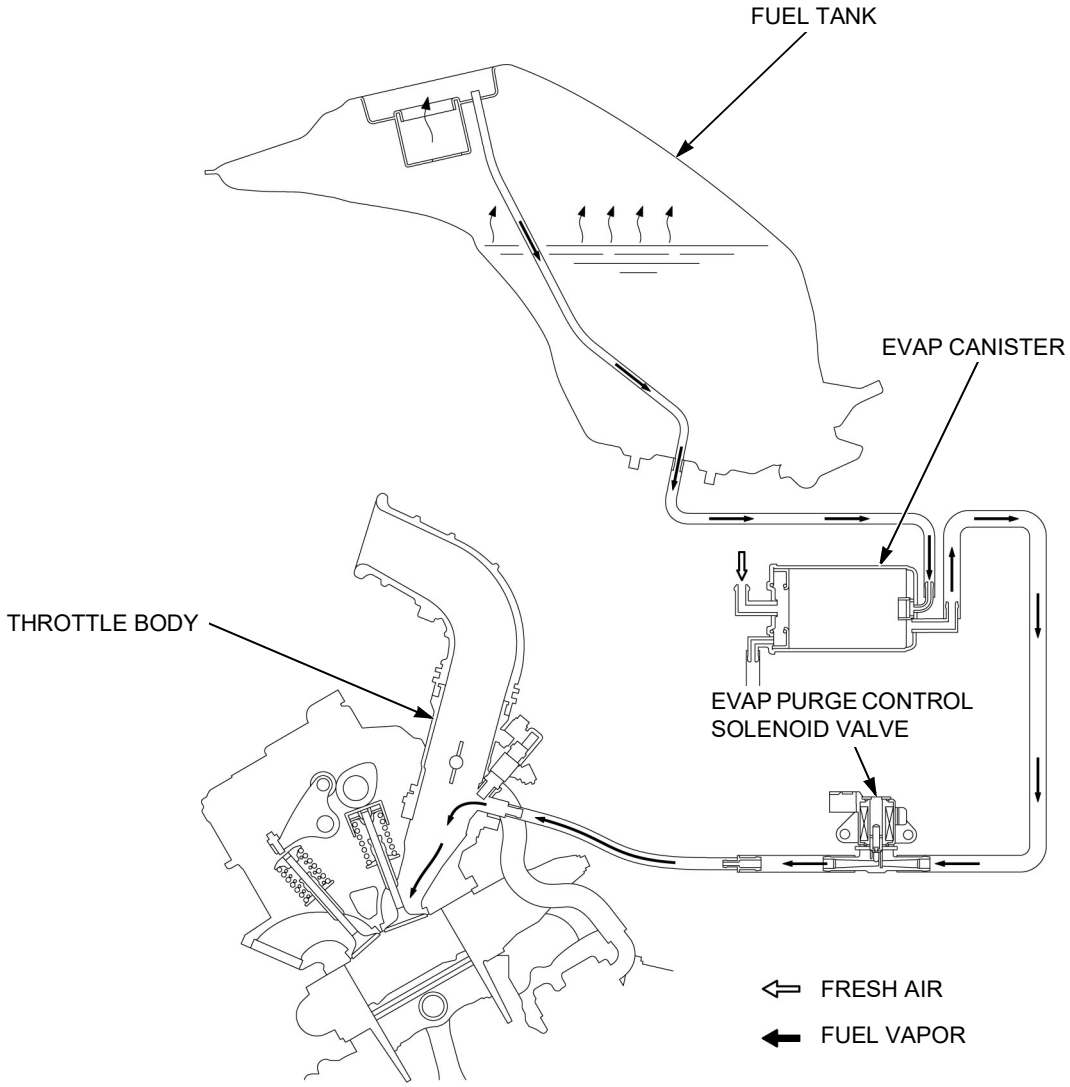
The three-way catalytic converter is in the exhaust system. Through chemical reactions, it converts HC, CO and NO_X in the engine's exhaust to carbon dioxide (CO_2), nitrogen (N_2), and water vapor.

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.

2. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION

GENERAL

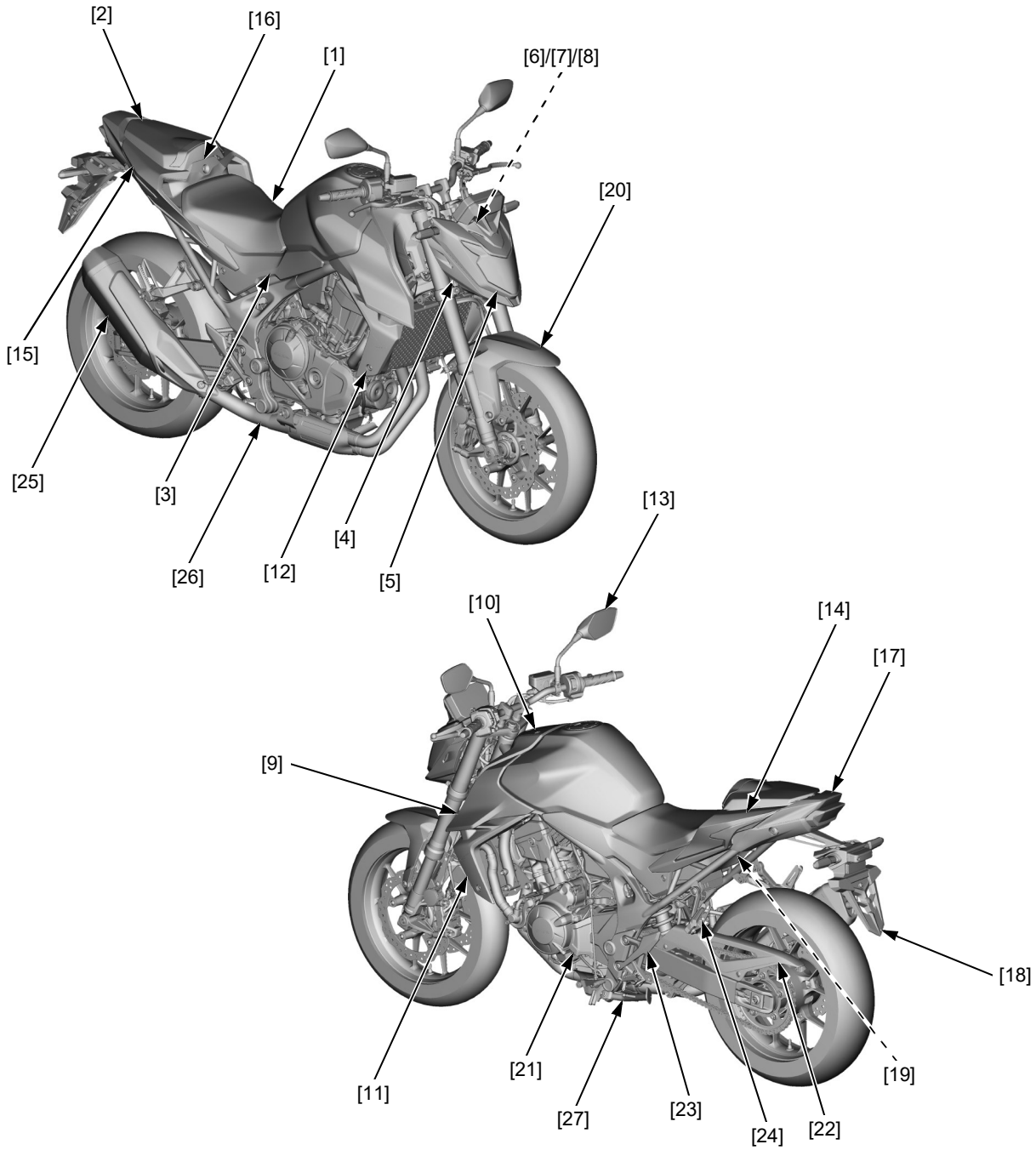
- This section covers removal and installation of the body panels and exhaust system.
- When disassembling, mark and store the mounting fasteners to ensure that they are reinstalled in their original locations.
- When installing the covers, make sure the mating areas are aligned properly before tightening the fasteners.
- Always replace the gaskets with new ones after removing the exhaust system.
- When installing the exhaust system, loosely install all of the fasteners. Always tighten the exhaust pipe joint nuts first, then tighten the mounting bolt.
- Always inspect the exhaust system for leaks after installation.

TROUBLESHOOTING

Excessive exhaust noise
- Broken exhaust system
- Exhaust gas leak

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

BODY PANEL LOCATIONS



[1]	Front seat	page 2-4	[15]	Rear cowl B	page 2-11
[2]	Rear seat	page 2-4	[16]	Seat center cowl	page 2-11
[3]	Side cover	page 2-5	[17]	Rear center cowl	page 2-13
[4]	Headlight side cowl	page 2-5	[18]	Rear fender A	page 2-13
[5]	Headlight cowl	page 2-6	[19]	Rear fender B	page 2-15
[6]	Headlight inner cover	page 2-6	[20]	Front fender	page 2-16
[7]	Headlight stay	page 2-7	[21]	Drive sprocket cover	page 2-17
[8]	Headlight upper stay	page 2-8	[22]	Drive chain cover	page 2-17
[9]	Shroud A	page 2-8	[23]	Main step bracket	page 2-18
[10]	Front shell	page 2-9	[24]	Pillion step bracket	page 2-18
[11]	Shroud B	page 2-9	[25]	Muffler	page 2-19
[12]	Radiator grill	page 2-10	[26]	Exhaust pipe	page 2-20
[13]	Rearview mirror	page 2-11	[27]	Sidestand	page 2-21
[14]	Rear cowl A	page 2-11			

SEAT

REMOVAL/INSTALLATION

FRONT SEAT

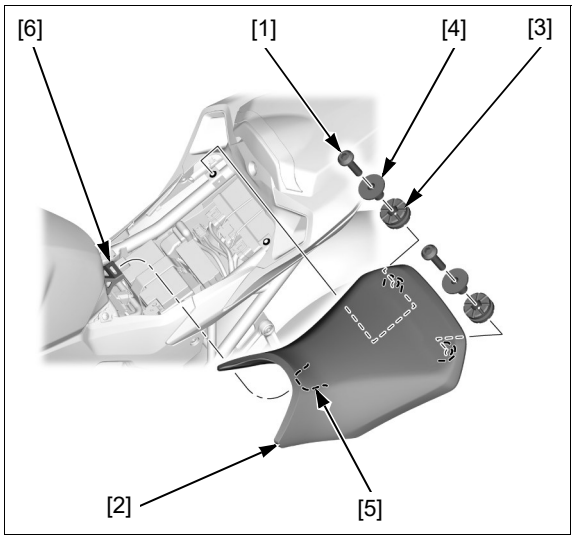
Remove the socket bolts [1] and front seat [2] by pulling it rearward.

Remove the grommets [3] and collars [4] if necessary.

Installation is in the reverse order of removal.

NOTE:

- Install the front seat by inserting the prong [5] into the fuel tank lug [6].



REAR SEAT

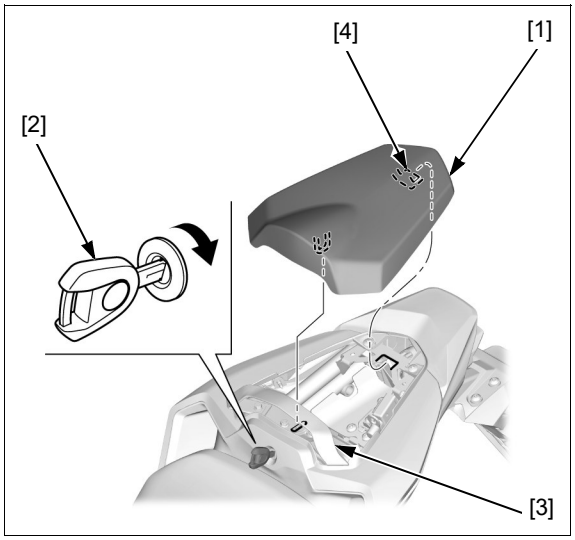
Unhook the rear seat [1] using the ignition key [2].

Slide the seat belt [3] forward and remove the rear seat by pulling it forward.

Installation is in the reverse order of removal.

NOTE:

- Install the rear seat by inserting the prong [4] under the frame, and push the front of the seat down to lock it.



SEAT BELT

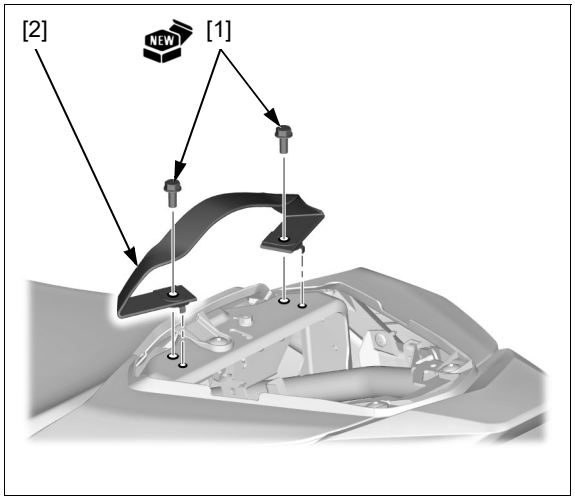
Remove the rear seat (page 2-4).

Remove the bolts [1] and seat belt [2].

Installation is in the reverse order of removal.

NOTE:

- Replace the bolts with a new one.



SIDE COVER

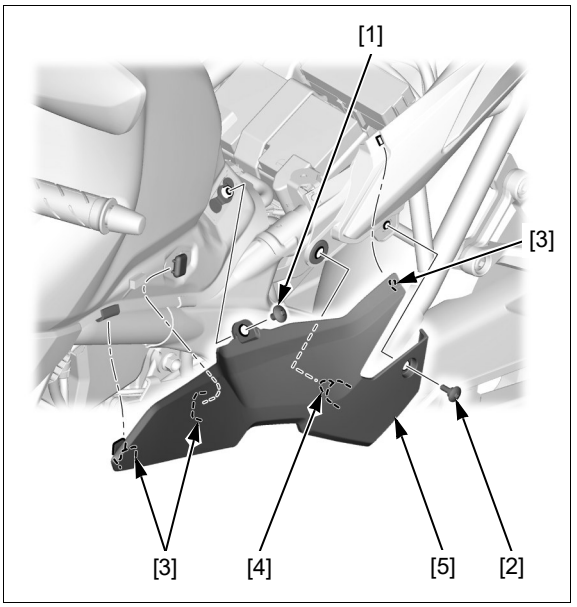
REMOVAL/INSTALLATION

Remove the following:

– Front seat (page 2-4)
– Socket bolts [1], [2]

Release the tabs [3], boss [4] from the grommet and remove the side cover [5].

Installation is in the reverse order of removal.

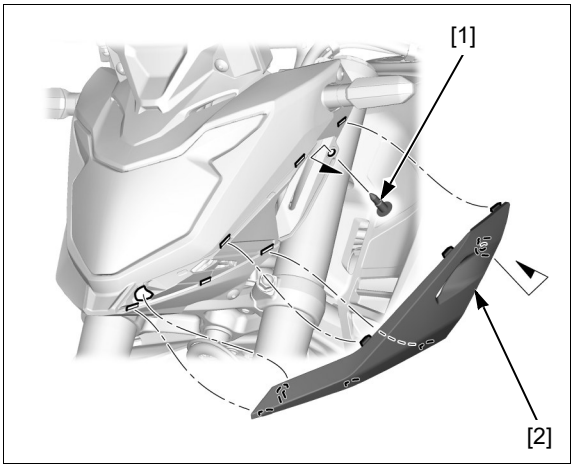


HEADLIGHT SIDE COWL

REMOVAL/INSTALLATION

Remove the clip [1] and headlight side cowl [2].

Installation is in the reverse order of removal.



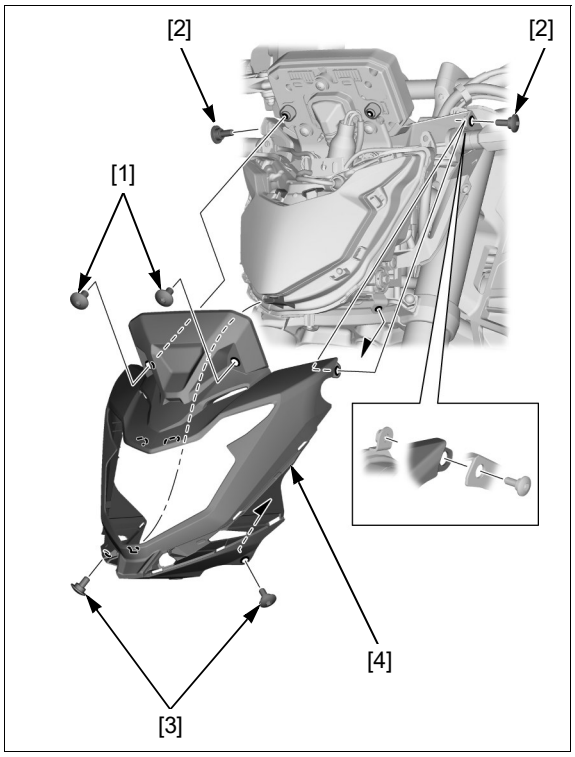
HEADLIGHT COWL

REMOVAL/INSTALLATION

Remove the headlight side cowls (page 2-5).

Remove the socket bolts [1], [2], [3] and headlight cowl [4].

Installation is in the reverse order of removal.



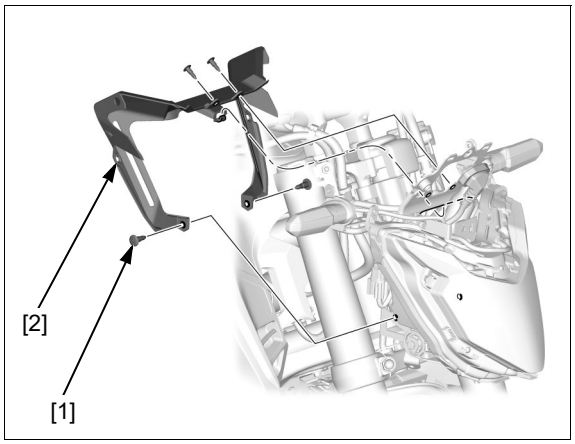
HEADLGHT INNER COVER

REMOVAL/INSTALLATION

Remove the meter (page 21-8).

Remove the clips [1] and headlight inner cover [2].

Installation is in the reverse order of removal.



HEADLIGHT STAY

REMOVAL/INSTALLATION

Remove the following:

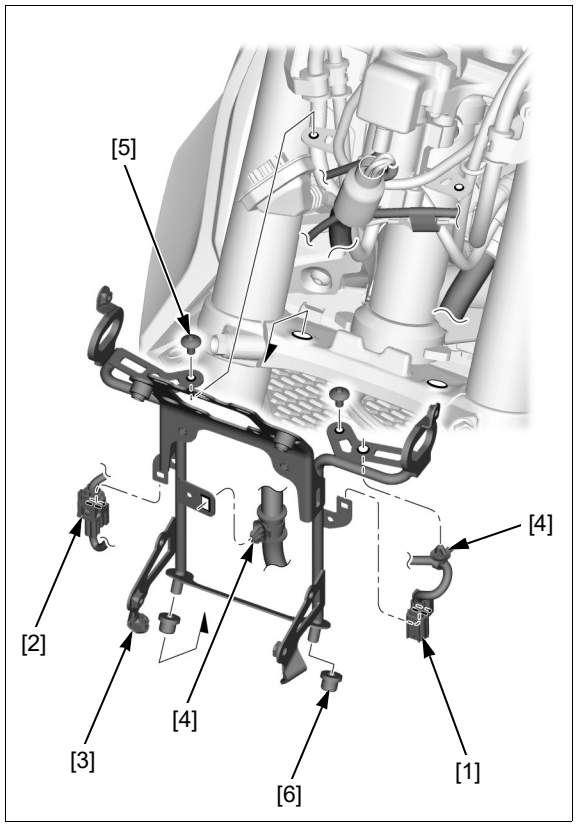
– Headlight (page 21-3)
– Left/right turn signal light (page 21-5)

Remove the headlight 4P (Gray) connector [1] and immobilizer receiver 4P connector [2] from the headlight stay [3].

Remove the harness clips [4], socket bolts [5], headlight stay and mount rubbers [6].

Installation is in the reverse order of removal.

Route the wires properly (page 1-21).



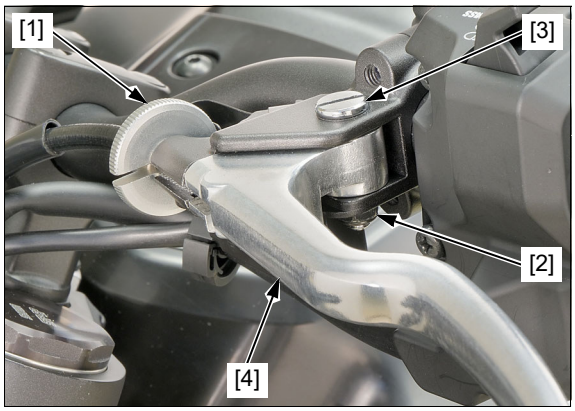
HEADLIGHT UPPER STAY

REMOVAL/INSTALLATION

Remove the headlight stay (page 2-7).

Turn the clutch adjust bolt [1] and align the slits to disconnect the clutch cable.

Remove the pivot nut [2], pivot bolt [3] and clutch lever [4].



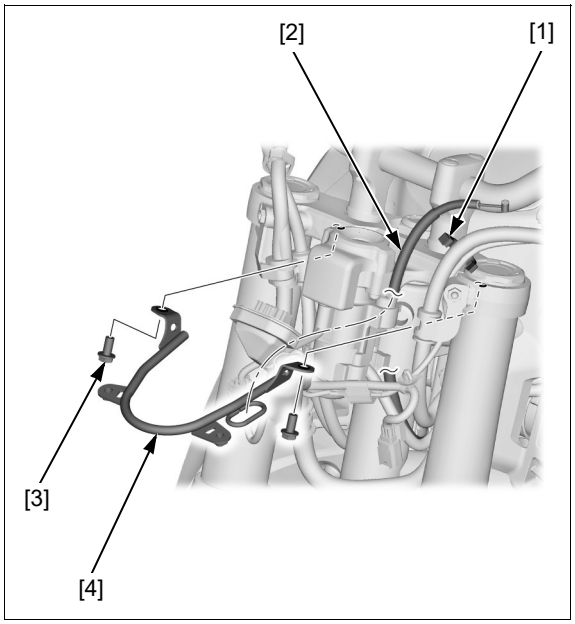
Open the harness clip [1] and remove the clutch cable [2].

Remove the bolts [3] and headlight upper stay [4].

Installation is in the reverse order of removal.

TORQUE:
Clutch lever pivot bolt:
3.3 N·m (0.3 kgf·m, 2.4 lbf·ft)
Clutch lever pivot nut:
6.5 N·m (0.7 kgf·m, 4.8 lbf·ft)

Route the wires properly (page 1-21).



SHROUD A

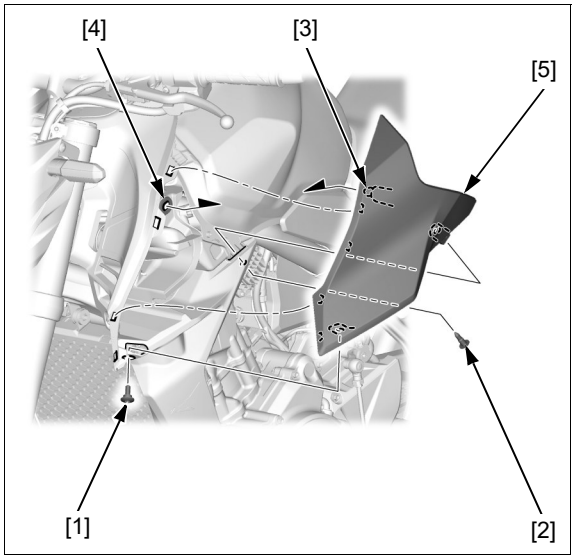
REMOVAL/INSTALLATION

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

Release the boss [3] from the grommet [4].

Remove the shroud A [5].

Installation is in the reverse order of removal.



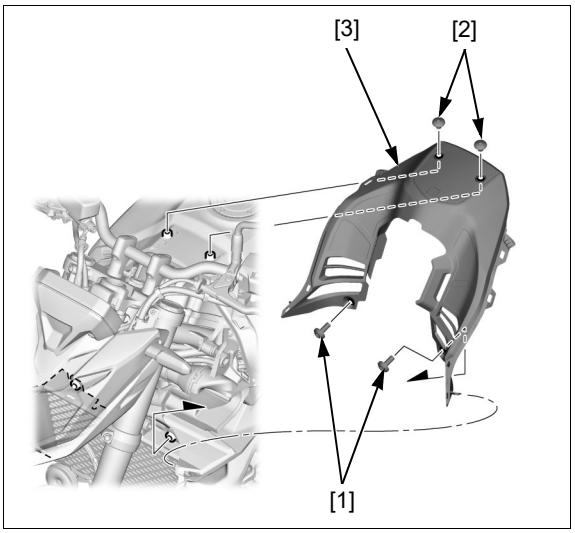
FRONT SHELL

REMOVAL/INSTALLATION

Remove the shroud A (page 2-8).

Remove the socket bolts [1], [2] and front shell [3].

Installation is in the reverse order of removal.



SHROUD B

REMOVAL/INSTALLATION

LEFT SIDE

Remove the following:

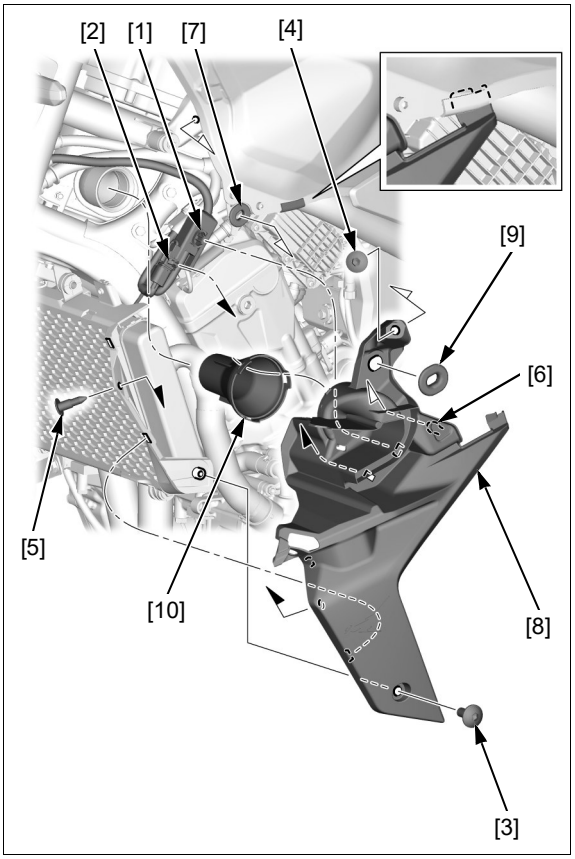
- Front shell (page 2-9)
- Ignition switch connector clip [1]
- Front wheel speed sensor clip [2]
- Socket bolt [3]
- Socket bolt [4]
- Clip [5]

Release the boss [6] from the grommet [7].

Remove the shroud B [8], grommet [9] and joint duct [10].

Installation is in the reverse order of removal.

Route the wires properly (page 1-21).



RIGHT SIDE

Remove the following:

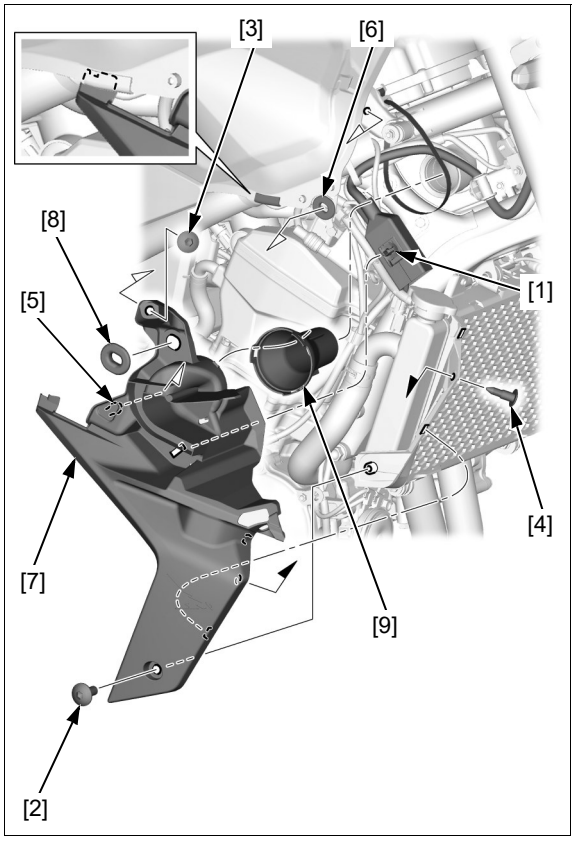
– Right handlebar switch connector clip [1]
– Socket bolt [2]
– Socket bolt [3]
– Clip [4]

Release the boss [5] from the grommet [6].

Remove the shroud B [7], grommet [8] and joint duct [9].

Installation is in the reverse order of removal.

Route the wires properly (page 1-21).



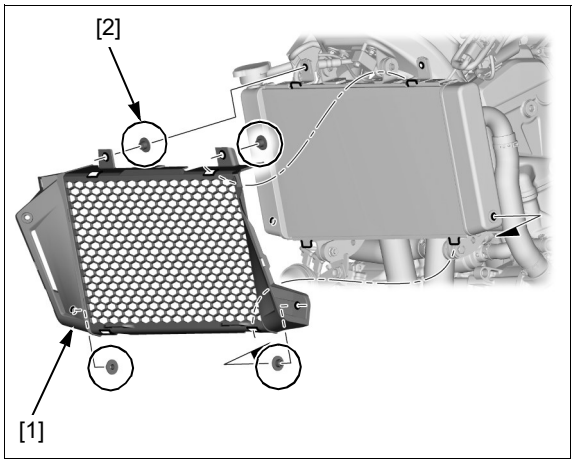
RADIATOR GRILL

REMOVAL/INSTALLATION

Remove the shroud B (page 2-9).

Remove the radiator grill [1] and collars [2]

Installation is in the reverse order of removal.



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].

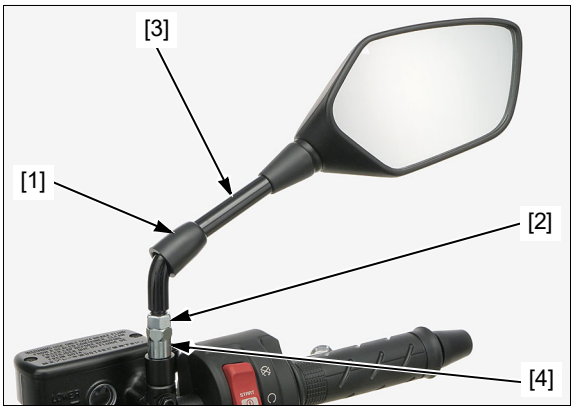
Remove the mirror adaptor [4].

Installation is in the reverse order of removal.

TORQUE:

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

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



REAR COWL A/REAR COWL B/SEAT CENTER COWL

REMOVAL/INSTALLATION

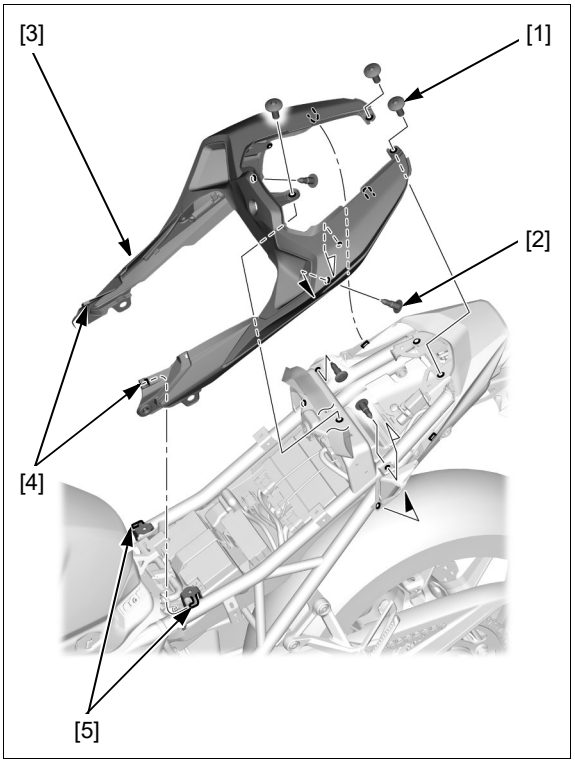
Remove the following:

– Front seat (page 2-4)
– Rear seat (page 2-4)
– Socket bolts [1]
– Clips [2]
– Rear cowl A/rear cowl B/seat center cowl [3]

Installation is in the reverse order of removal.

NOTE:

• Install the rear cowl A/rear cowl B/seat center cowl by inserting the cowl slit [4] to the frame tab [5].

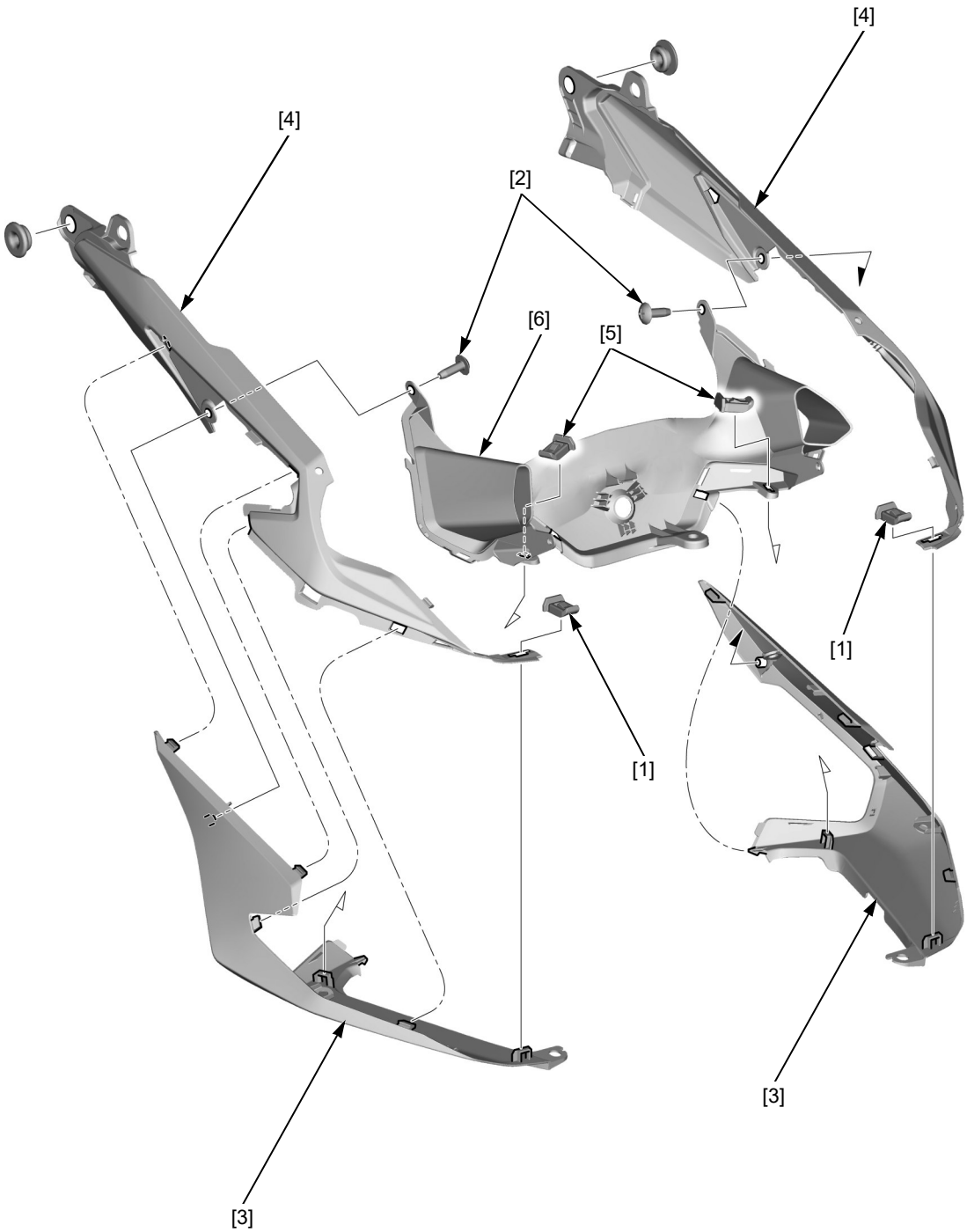


DISASSEMBLY/ASSEMBLY

Remove the clips [1], screws [2] and rear cowl B [3] from the rear cowl A [4].

Remove the clips [5] and rear cowl A from the seat center cowl [6].

Assembly is in the reverse order of disassembly.



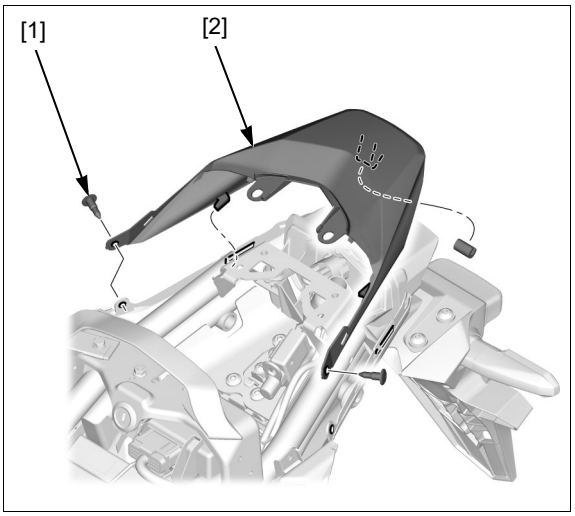
REAR CENTER COWL

REMOVAL/INSTALLATION

Remove the rear cowl A/rear cowl B/seat center cowl (page 2-11).

Remove the clips [1] and rear center cowl [2].

Installation is in the reverse order of removal.



REAR FENDER A

REMOVAL/INSTALLATION

Remove the rear seat (page 2-4).

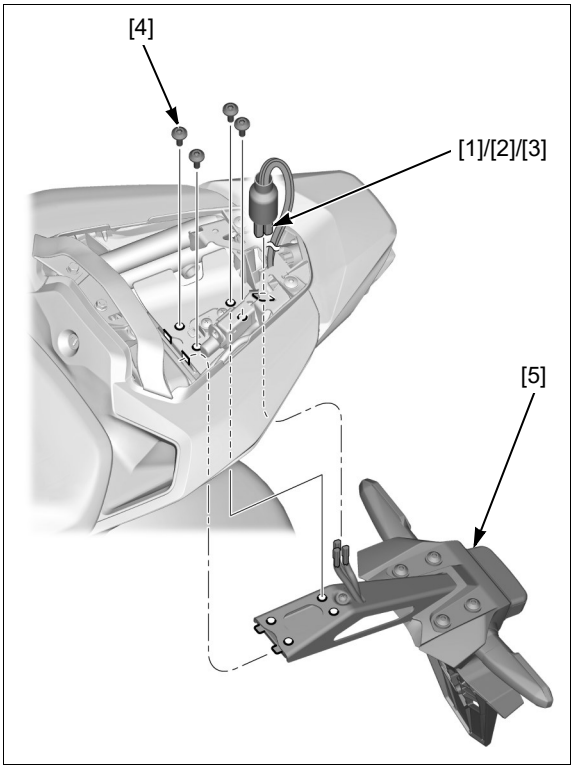
Disconnect the following connectors:

– Right turn signal 2P (Orange) [1]
– Left turn signal 2P (Light blue) [2]
– License light 2P (White) [3]

Remove the socket bolts [4] and rear fender A [5].

Installation is in the reverse order of removal.

Route the wires properly (page 1-21).



DISASSEMBLY/ASSEMBLY

Remove the tapping screws [1] and rear fender cover [2].

Remove the socket bolts [3], collars [4], mount rubbers [5], socket bolt [6], collar [7], mount rubber [8] and rear fender stay [9] from the rear fender A [10].

Remove the bolts/washers [11], collars [12], mount rubbers [13], left turn signal light [14] and right turn signal light [15].

Remove the nut [16] and reflector [17].

Remove the nut [18], license light [19], collars [20] and mount rubbers [21].

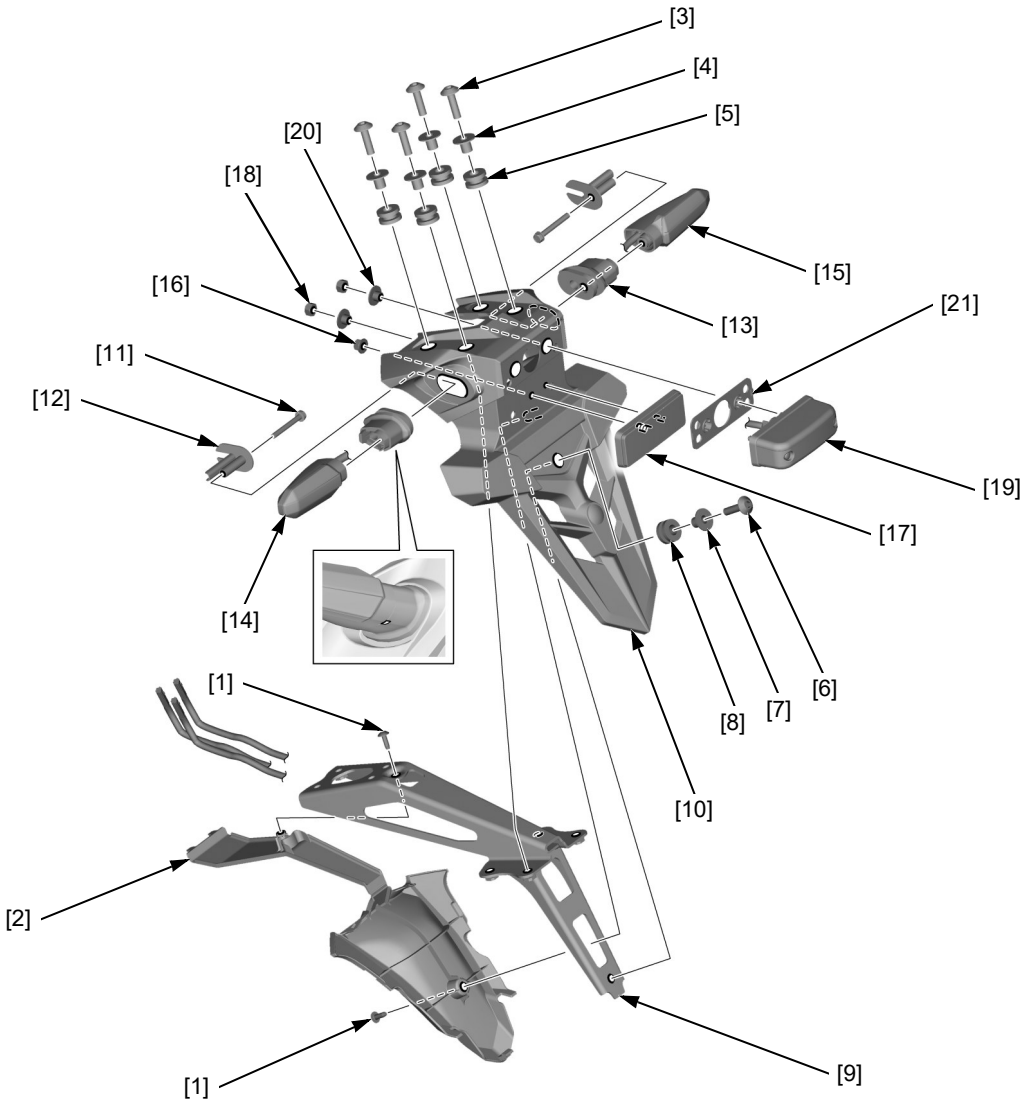
Assembly is in the reverse order of disassembly.

TORQUE:

Rear reflector mounting nut:
1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)

NOTE:

- Install the mount rubber water drain hole to the facing down.
- Route the wires properly (page 1-21).

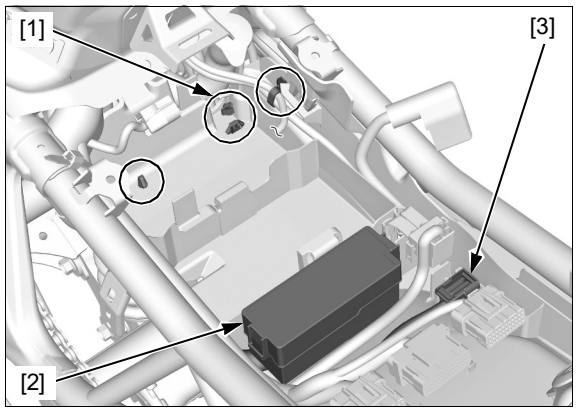


REAR FENDER B

REMOVAL/INSTALLATION

Remove the following:

- Brake/tail light (page 21-7)
- BCU (page 21-26)
- USB charger (page 21-25)
- ECM (page 4-58)
- Starter relay switch (page 6-8)
- EVAP canister (page 7-20)
- Regulator/rectifier (page 20-7)
- Wire clips [1]
- Power box [2]
- DLC [3]

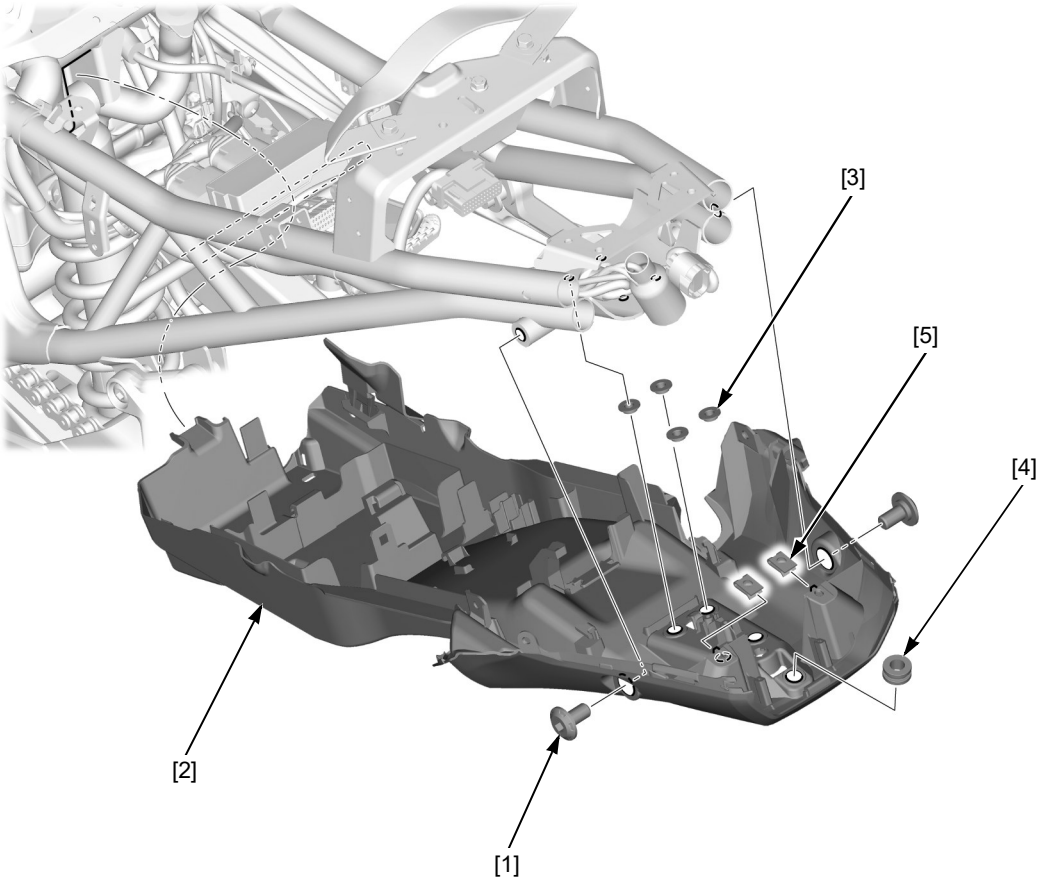


- Socket bolts [1]
- Rear fender B [2]
- Collars [3]
- Grommet [4]
- Clip nuts [5]

Installation is in the reverse order of removal.

TORQUE:
Rear fender B mounting bolt:
25 N·m (2.5 kgf·m, 18 lbf·ft)

Route the wires properly (page 1-21).



FRONT FENDER

REMOVAL/INSTALLATION

Remove the following:

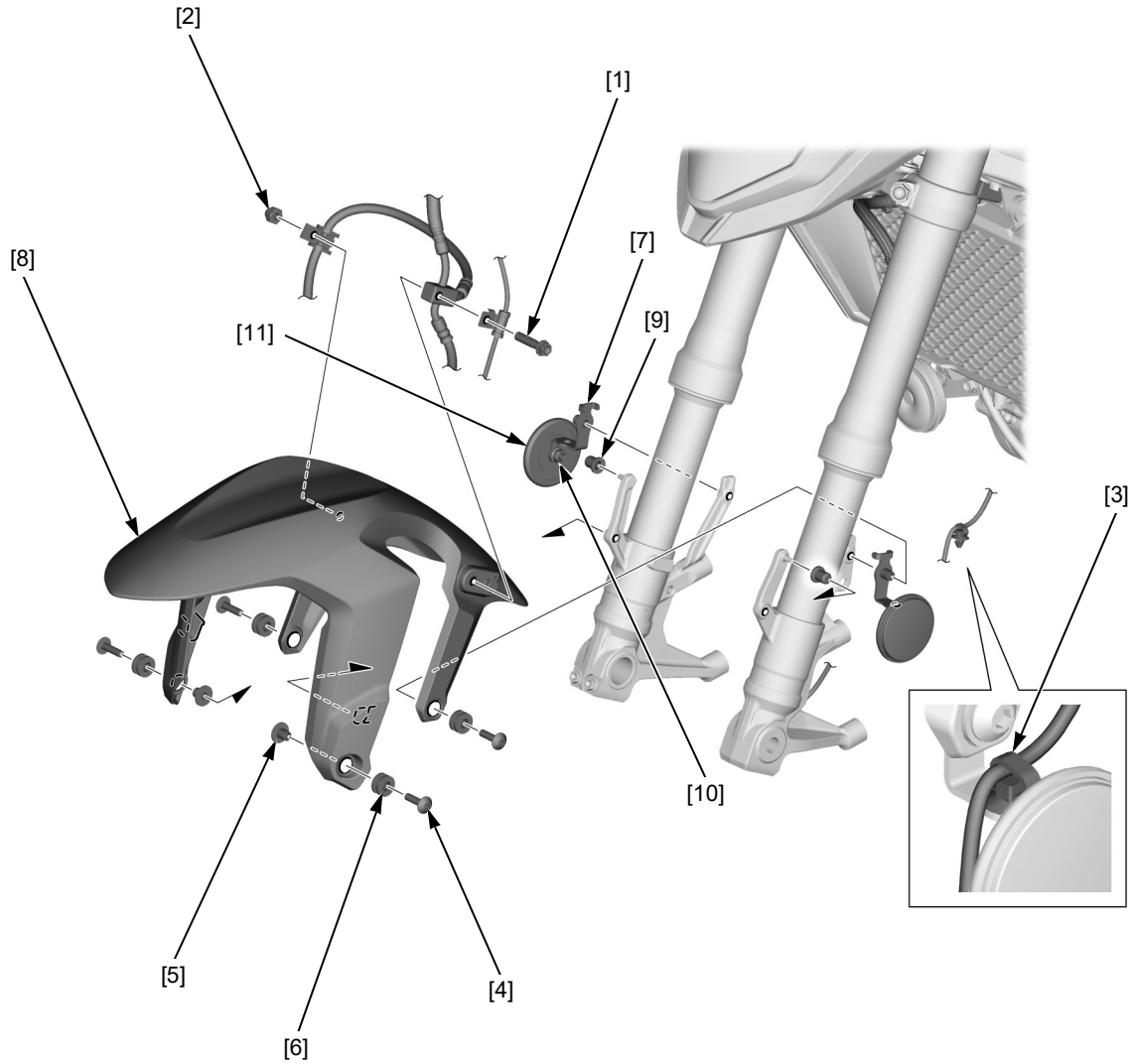
- Front wheel (page 16-10)
- Brake hose joint bolt [1]
- Brake hose clamp cap nut [2]
- Wire clip [3]
- Socket bolts [4]
- Collars [5]
- Grommets [6]
- Reflectors/stays [7]
- Front fender [8]
- Boots [9]

Remove the nuts [10] and reflectors [11] from the stay if necessary.

Installation is in the reverse order of removal.

TORQUE:
Reflector mounting nut:
1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)

Route the wires properly (page 1-21).



DRIVE SPROCKET COVER

REMOVAL/INSTALLATION

Remove the pinch bolt [1] and gearshift arm [2].

Release the wire band [3].

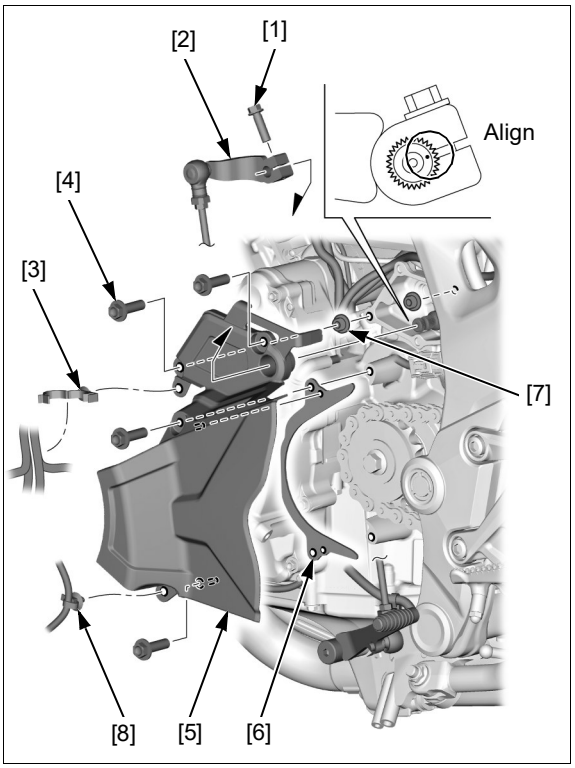
Remove the bolts [4], drive sprocket cover [5], drive chain guide [6], collars [7] and wire clip [8], if necessary remove the wire band.

Installation is in the reverse order of removal.

Route the wires properly (page 1-21).

NOTE:

- Align the slit in the gearshift arm with the punch mark on the spindle.



DRIVE CHAIN COVER

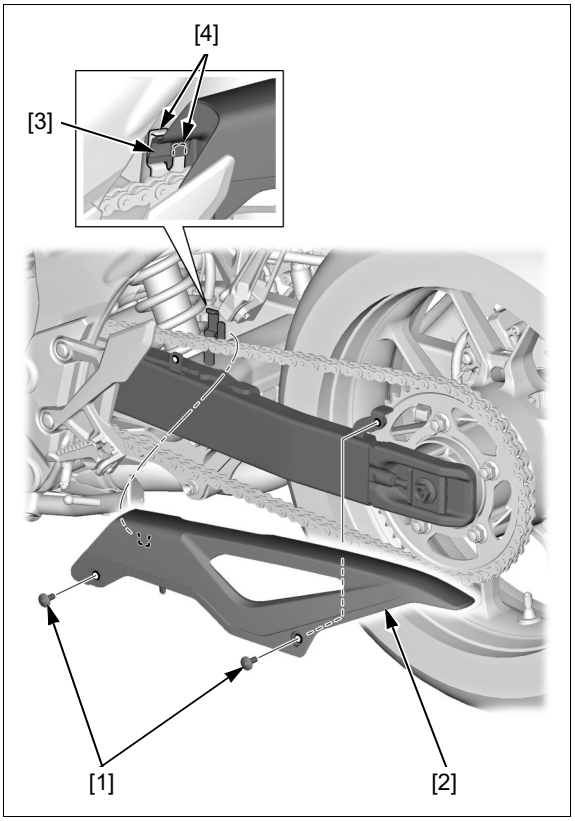
REMOVAL/INSTALLATION

Remove the socket bolts [1] and drive chain cover [2].

Installation is in the reverse order of removal.

NOTE:

- Install the drive chain cover tab [3] to the swingarm slit [4].



MAIN STEP BRACKET

REMOVAL/INSTALLATION

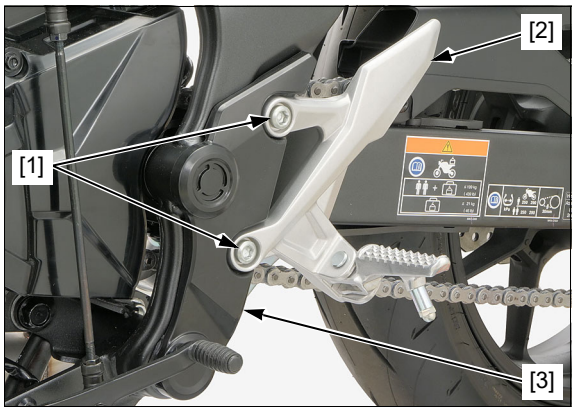
NOTE:

- For right main step bracket removal/installation, refer to following:
  - Brake pedal (page 18-22)
  - Rear master cylinder (page 18-16)

Remove the socket bolts [1], left main step bracket [2] and cover [3].

Installation is in the reverse order of removal.

TORQUE:
Main step bracket bolt:
32 N·m (3.3 kgf·m, 24 lbf·ft)



PILLION STEP BRACKET

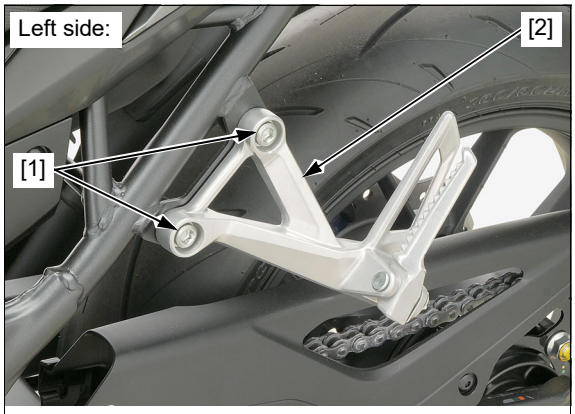
REMOVAL/INSTALLATION

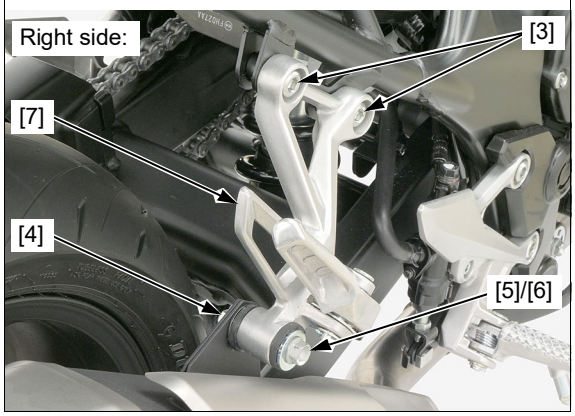
Left side: Remove the socket bolts [1] and left pillion step bracket [2].

Right side: Remove the socket bolts [3], nut [4], bolt [5], washer [6] and right pillion step bracket [7].

Installation is in the reverse order of removal.

TORQUE:
Pillion step bracket bolt:
32 N·m (3.3 kgf·m, 24 lbf·ft)





MUFFLER

REMOVAL/INSTALLATION

Loosen the muffler band bolt [1].

Remove the following:

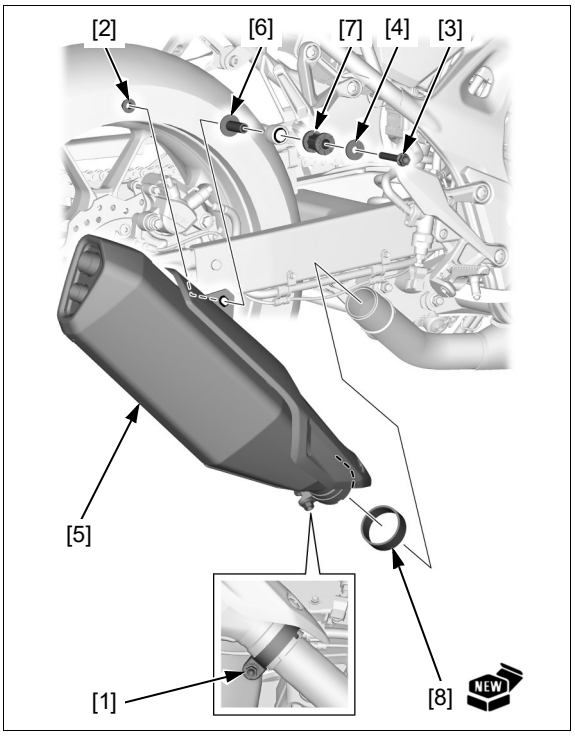
– Nut [2]
– Bolt [3]
– Washer [4]
– Muffler [5]
– Collar [6]
– Grommet [7]
– Gasket [8]

Installation is in the reverse order of removal.

NOTE:

- Replace the gasket with a new one.
- Be sure that the muffler band tab is aligned with the muffler groove in position.

TORQUE:
Muffler band bolt: 20 N·m (2.0 kgf·m, 15 lbf·ft)
Muffler mounting nut: 20 N·m (2.0 kgf·m, 15 lbf·ft)



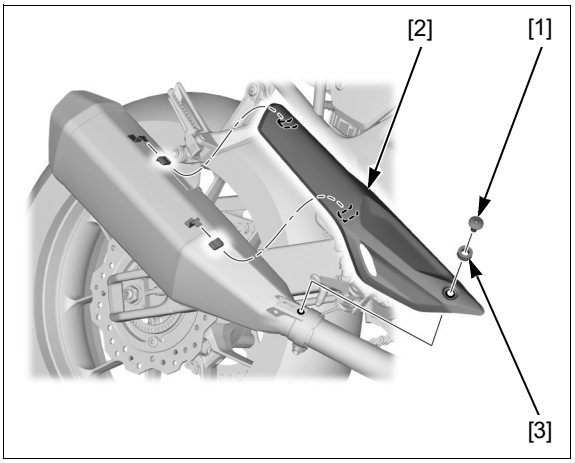
MUFFLER COVER

Remove the following:

– Socket bolt [1]
– Muffler cover [2]
– Mount rubber [3]

Installation is in the reverse order of removal.

TORQUE:
Muffler cover bolt: 12 N·m (1.2 kgf·m, 9 lbf·ft)

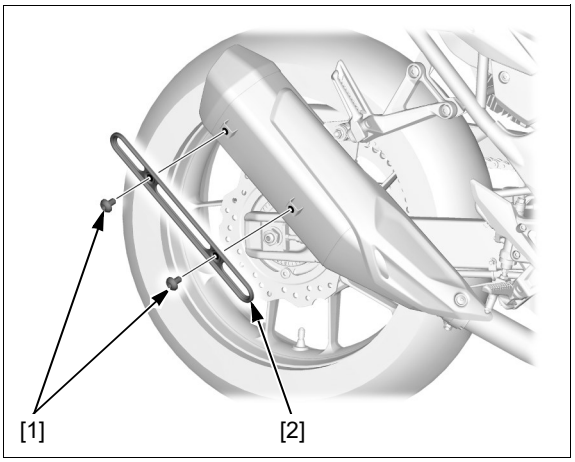


MUFFLER HEAT GUARD (FO model)

Remove the following:

– Socket bolts [1]
– Muffler heat guard [2]

Installation is in the reverse order of removal.



EXHAUST PIPE

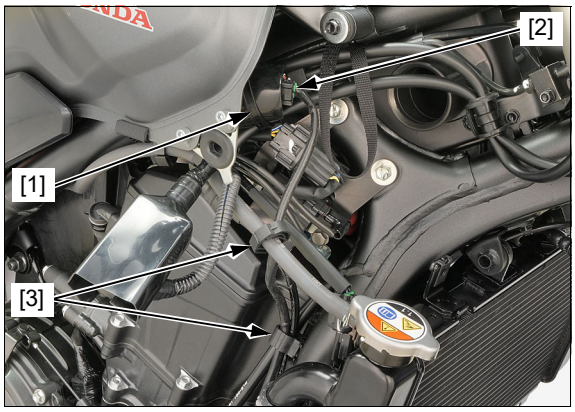
REMOVAL/INSTALLATION

Remove the following:

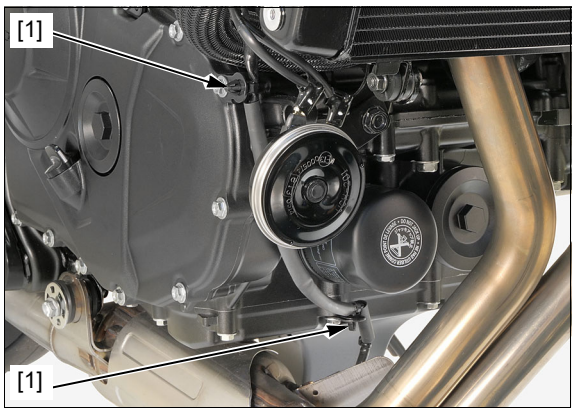
– Right shroud B (page 2-9)
– Muffler (page 2-19)

Remove the wire band [1] and disconnect the A/F sensor 4P (Black) connector[2].

Remove the wire bands [3].



Remove the wire clips [1].



Remove the following:

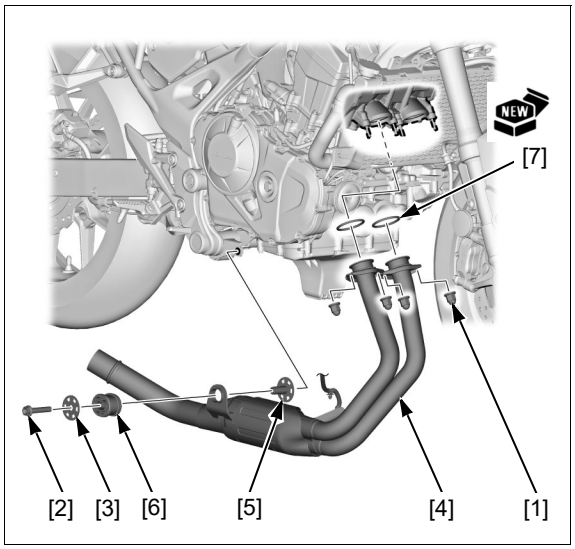
– Joint nuts [1]
– Mounting bolt [2]
– Washer [3]
– Exhaust pipe [4]
– Collar [5]
– Grommet [6]
– Gaskets [7]

Installation is in the reverse order of removal.

NOTE:

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

TORQUE:
Exhaust pipe joint nut:
20 N·m (2.0 kgf·m, 15 lbf·ft)
Exhaust pipe mounting bolt:
20 N·m (2.0 kgf·m, 15 lbf·ft)



STUD BOLT REPLACEMENT

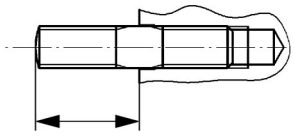
Remove the exhaust pipe (page 2-20).

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

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

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

Install the exhaust pipe (page 2-20).



22.5 – 23.5 mm
(0.89 – 0.93 in)

SIDESTAND

REMOVAL/INSTALLATION

Support the motorcycle in an upright position.

Remove the sidestand switch (page 21-22).

NOTE:

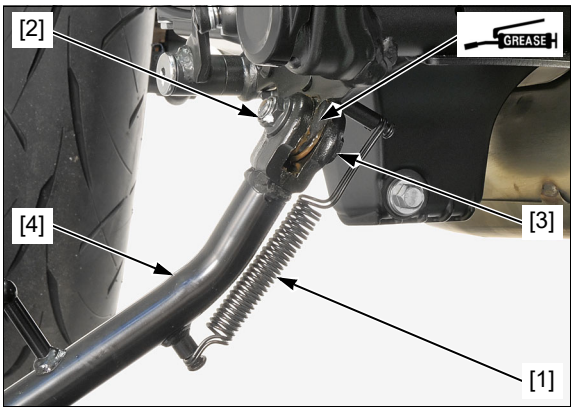
- It is not necessary to disconnect the sidestand switch connector.

Remove the return springs [1].

Remove the pivot nut [2] by holding the pivot bolt [3].

Remove the pivot bolt and sidestand [4].

Installation is in the reverse order of removal.



NOTE:

- Apply grease to the sidestand pivot.
- Install the return spring as shown.
- When tighten the sidestand pivot nut, hold the sidestand pivot bolt.

TORQUE:

Pivot bolt: 10 N·m (1.0 kgf·m, 7 lbf·ft)
Pivot nut: 39 N·m (4.0 kgf·m, 29 lbf·ft)

MEMO

3. MAINTENANCE

SERVICE INFORMATION

GENERAL

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

MAINTENANCE SCHEDULE

ED, U, KO, FO

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			
**	HONDA DIAGNOSTIC SYSTEM			I	I	I	I	I			3-4
*	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			3-6
*	SPARK PLUG					I		R			3-6
*	VALVE CLEARANCE					I		I			3-7
	ENGINE OIL			R	R	R	R	R	R		3-11
	ENGINE OIL FILTER			R		R		R			3-12
*	ENGINE IDLE SPEED				I	I	I	I	I		3-13
	RADIATOR COOLANT	NOTE 4			I	I	I	I	I	3 years	3-14
*	COOLING SYSTEM				I	I	I	I	I		3-14
*	SECONDARY AIR SUPPLY SYSTEM					I		I			3-14
*	EVAPORATIVE EMISSION CONTROL SYSTEM					I		I			3-15
	DRIVE CHAIN		EVERY 1,000 km (600 mi) I, L								3-16
	DRIVE CHAIN SLIDER				I	I	I	I			3-19
	BRAKE FLUID	NOTE 4			I	I	I	I	I	2 years	3-19
	BRAKE PADS WEAR				I	I	I	I	I		3-20
	BRAKE SYSTEM				I	I	I	I	I		3-20
	BRAKE LIGHT SWITCH				I	I	I	I	I		3-21
	HEADLIGHT AIM				I	I	I	I	I		3-21
	CLUTCH SYSTEM				I	I	I	I	I		3-22
	SIDESTAND				I	I	I	I	I		3-22
*	SUSPENSION				I	I	I	I	I		3-23
*	NUTS, BOLTS, FASTENERS				I	I	I	I	I		3-24
**	WHEELS/TIRES				I	I	I	I	I		3-24
**	STEERING HEAD BEARINGS				I	I	I	I	I		3-24

* 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:

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

GS, MA, TH, HK, CH

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			
**	HONDA DIAGNOSTIC SYSTEM			I	I	I	I	I	I	I			3-4
*	FUEL LINE					I		I		I	I		3-4
*	THROTTLE OPERATION					I		I		I	I		3-4
**	THROTTLE BODY	NOTE 5				C		C		C			3-5
*	AIR CLEANER	NOTE 2					R			R			3-5
	CRANKCASE BREATHER	NOTE 3			C	C	C	C	C	C			3-6
*	SPARK PLUG		EVERY 24,000 km (16,000 mi) I, EVERY 48,000 km (24,000 mi) R										3-6
*	VALVE CLEARANCE							I					3-7
	ENGINE OIL			R		R		R		R	R		3-11
	ENGINE OIL FILTER			R				R					3-12
*	ENGINE IDLE SPEED					I		I		I	I		3-13
	RADIATOR COOLANT	NOTE 4				I		I		I	I	3 years	3-14
*	COOLING SYSTEM					I		I		I	I		3-14
*	SECONDARY AIR SUPPLY SYSTEM							I					3-14
*	EVAPORATIVE EMISSION CONTROL SYSTEM							I					3-15
	DRIVE CHAIN		EVERY 1,000 km (600 mi) I, L										3-16
	DRIVE CHAIN SLIDER					I		I		I			3-19
	BRAKE FLUID	NOTE 4			I	I	I	I	I	I	I	2 years	3-19
	BRAKE PADS WEAR				I	I	I	I	I	I	I		3-20
	BRAKE SYSTEM					I		I		I	I		3-20
	BRAKE LIGHT SWITCH					I		I		I	I		3-21
	HEADLIGHT AIM					I		I		I	I		3-21
	CLUTCH SYSTEM				I	I	I	I	I	I	I		3-22
	SIDESTAND					I		I		I	I		3-22
*	SUSPENSION					I		I		I	I		3-23
*	NUTS, BOLTS, FASTENERS					I		I		I	I		3-24
**	WHEELS/TIRES					I		I		I	I		3-24
**	STEERING HEAD BEARINGS					I		I		I	I		3-24

* 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:

1. At higher odometer readings, repeat at the frequency interval established here.
2. Service more frequently when riding in unusually wet or dusty areas.
3. Service more frequently when riding in rain or at full throttle.
4. Replacement requires mechanical skill.
5. CH model only.

HONDA DIAGNOSTIC SYSTEM

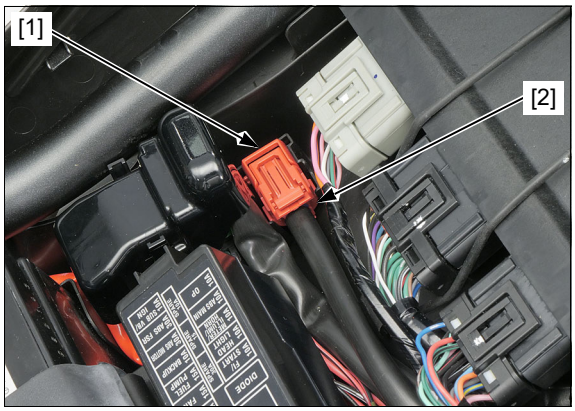
SYSTEM INSPECTION

Check the Honda diagnostic system as follows:

1. Remove the front seat (page 2-4).
2. Turn the ignition switch OFF.
3. Remove the dummy connector [1] from the DLC [2].

   Connect the MCS or GST (General Scan Tool) to the DLC.

   GST connection needs adapter harness applicable for GST.
4. Perform the DTC readout and check for abnormalities (page 4-5).
5. Turn the ignition switch OFF and disconnect the MCS or GST.
6. Install the front seat (page 2-4).



FUEL LINE

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

Check the fuel feed hose [1] for deterioration, damage or leakage.

Also check the hose fittings for leakage.

Install the removed parts in the reverse order of removal.

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 right handlebar switch if the throttle operation is not smooth (page 21-17).

THROTTLE BODY (CH model only)

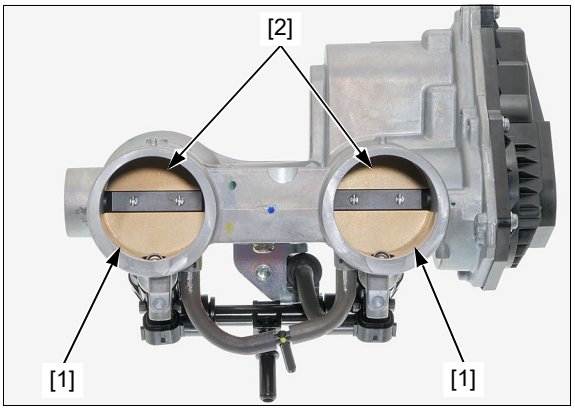
Remove the throttle body (page 7-14).

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

NOTE:

- 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).



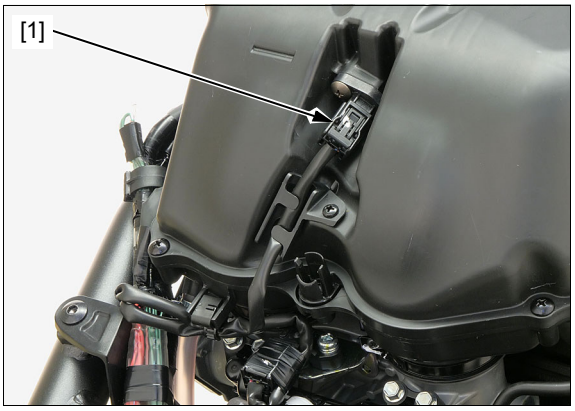
AIR CLEANER

NOTE:

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

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

Disconnect the IAT sensor 2P connector [1] and remove the sensor wire from the air cleaner cover.



Remove the screws [1] and air cleaner cover [2].

If necessary, remove and replace the seal rubber [3].

Remove the air cleaner element mounting screws [4], air cleaner element [5].

If necessary, remove and replace the seal rubber [6].

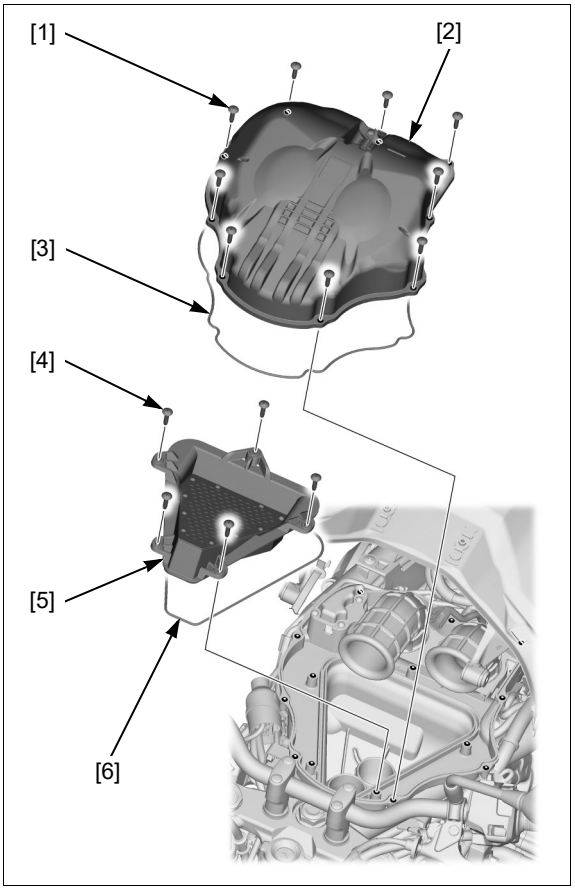
Replace the air cleaner element in accordance with the MAINTENANCE SCHEDULE (page 3-2).

Also replace the air cleaner element any time if it is excessively dirty or damaged.

Installation is in the reverse order of removal.

TORQUE:

Air cleaner cover screw:
0.8 N·m (0.1 kgf·m, 0.6 lbf·ft)
Air cleaner element screw:
1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)



CRANKCASE BREATHER

Check the air cleaner housing drain hose [1].

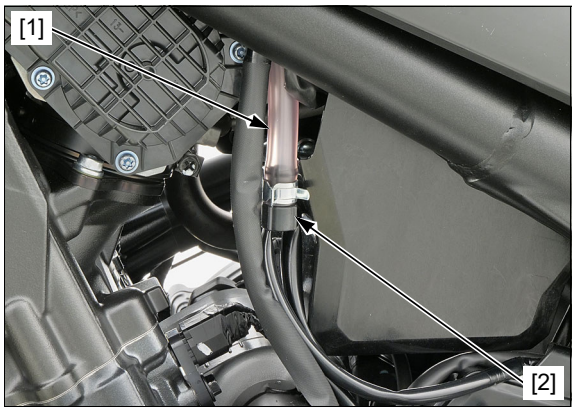
NOTE:

- Service if the deposits level can be seen in the drain hose.

If necessary, remove the drain plug [2] from the drain hose and drain the deposits into a suitable container.

Reinstall the plug securely.

Route the hose properly (page 1-21).



SPARK PLUG

REMOVAL/INSTALLATION

NOTE:

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

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

Disconnect the spark plug cap [1].

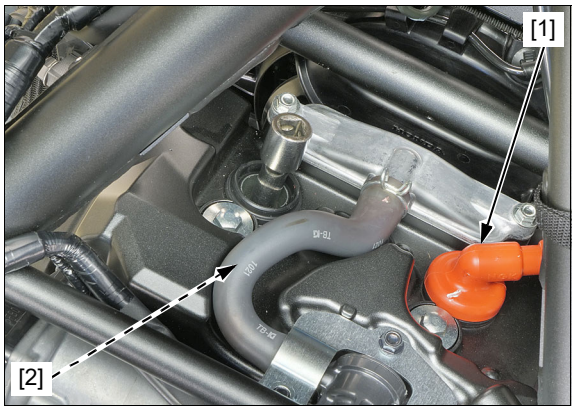
Remove the spark plug [2] using the commercially available spark plug wrench.

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

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

TORQUE:
Spark plug:
16 N·m (1.6 kgf·m, 12 lbf·ft)

Installation is in the reverse order of removal.



INSPECTION

Check the following and replace the spark plug if necessary.

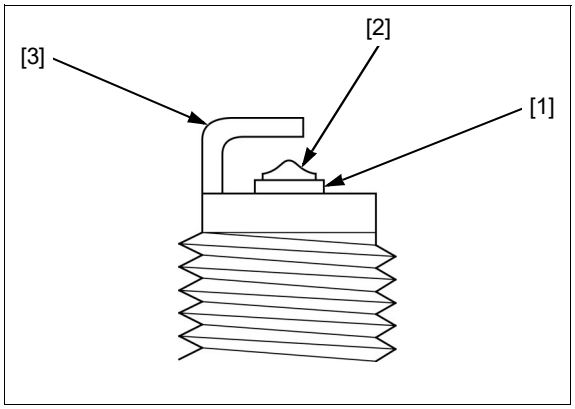
– Insulator [1] for damage
– Center electrode [2] and side electrode [3] for wear
– Coloration or burning condition

NOTE:

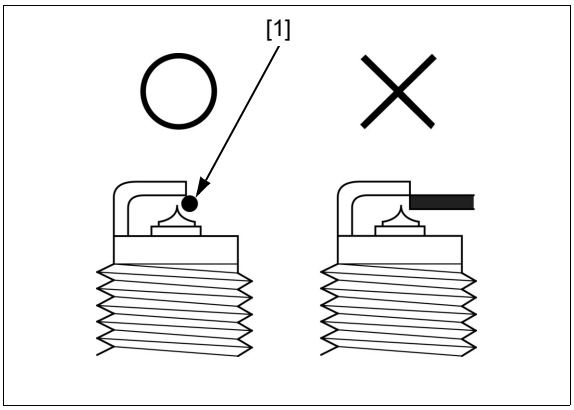
- This motorcycle's spark plugs are equipped with an iridium center electrode. Do not clean the electrodes.

If the electrodes are contaminated with accumulated objects or dirt, replace the spark plug.

SPECIFIED SPARK PLUG: SILMAR8A9S (NGK)



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



NOTE:

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

Make sure that the Φ 1.0 mm (0.04 in) plug gauge can not be inserted between the gap.

NOTE:

- Do not adjust the spark plug gap. If the gap is out of specification, replace it with a new one.

VALVE CLEARANCE

NOTE:

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

INSPECTION

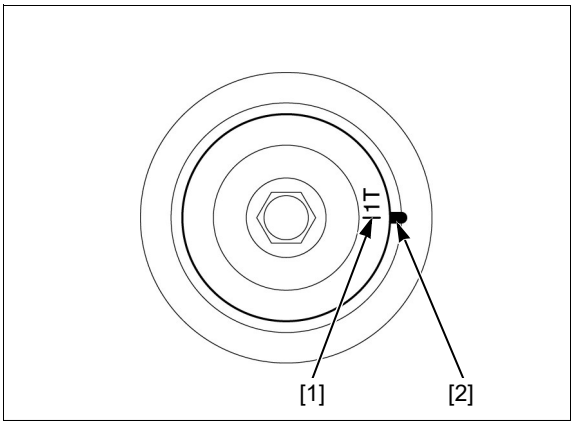
Remove the cylinder head cover (page 10-4).

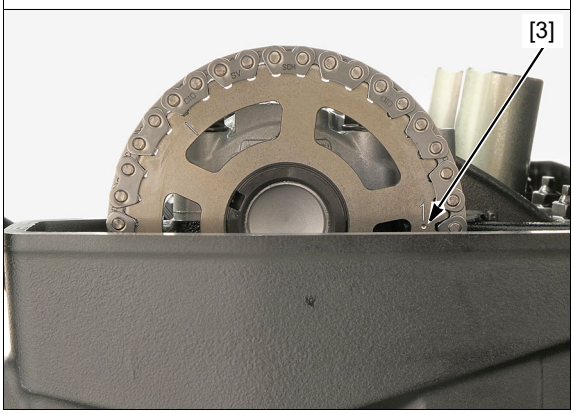
Remove the timing hole cap [1].

Rotate the crankshaft clockwise and align the "1T"mark [1] on the pulser plate with the index mark [2] of the right crankcase cover.

Make sure that the "1" punch mark [3] on the cam sprocket align with the upper surface of the cylinder head and "1" is visible as shown.

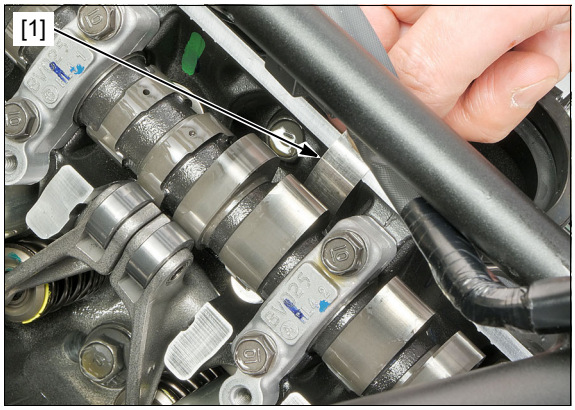
If the punch mark is positioned in the opposite side, rotate the crankshaft clockwise one full turn (360°) and realign the "1T" mark with the index mark.





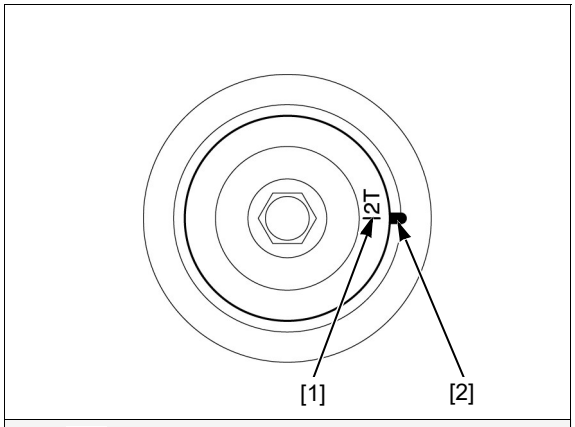
Check the No.1 cylinder intake valve clearances by inserting a feeler gauge [1] between the valve lifter and cam lobe.

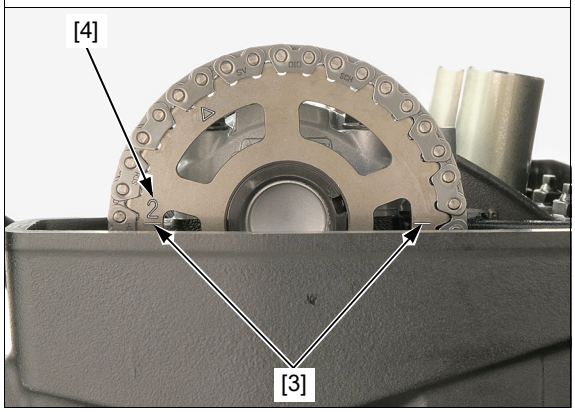
Adjust the valve clearance by changing the valve lifter shim (page 3-10).



Rotate the crankshaft clockwise and align the "2T"mark [1] on the pulser plate with the index mark [2] of the right crankcase cover.

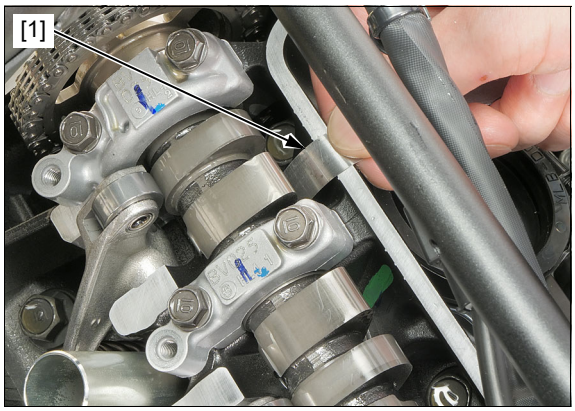
Make sure that the index lines [3] on the cam sprocket aligns with the upper surface of the cylinder head and "2" [4] is visible as shown.



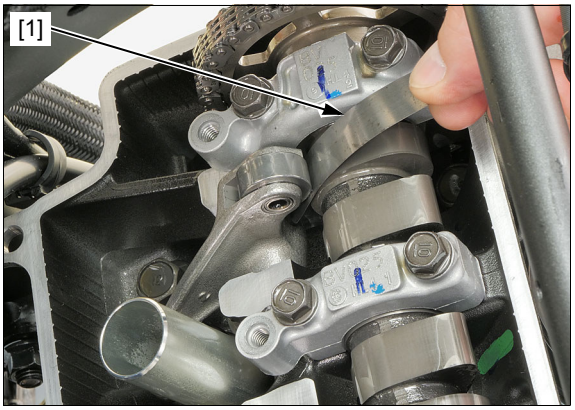


Check the No.2 cylinder intake valve clearances by inserting a feeler gauge [1] between the valve lifter and cam lobe.

Adjust the valve clearance by changing the valve lifter shim (page 3-10).



Check the No.2 cylinder exhaust valve clearances by inserting a feeler gauge [1] between the rocker arm roller and cam lobe.



Adjust the No.2 cylinder exhaust valve clearance by loosening the lock nut [1] and turning the adjusting screw [2] until there is a slight drag on the feeler gauge [3].

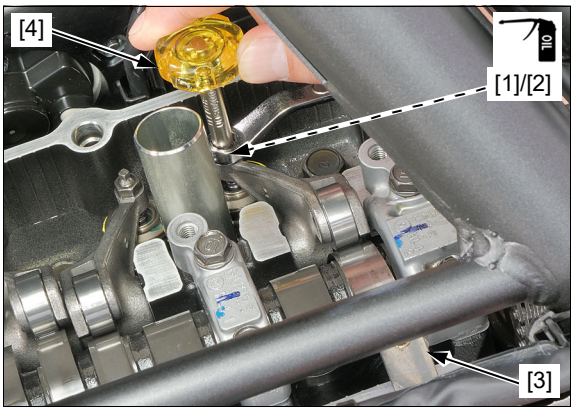
TOOL:
Valve Adjusting Wrench (□3) [4] 07708-0030400

Apply engine oil to the adjusting screw and lock nut threads and seating surface.

Hold the adjusting screw and tighten the lock nut.

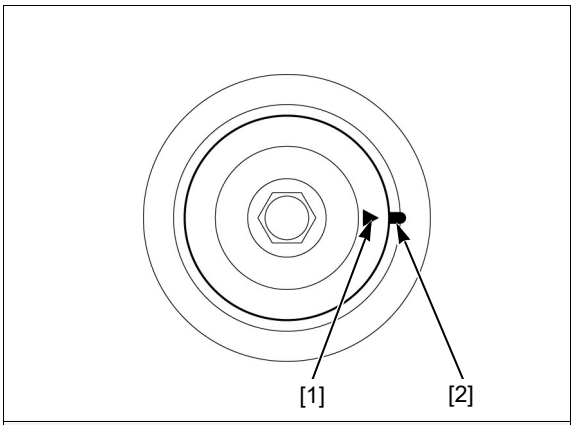
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

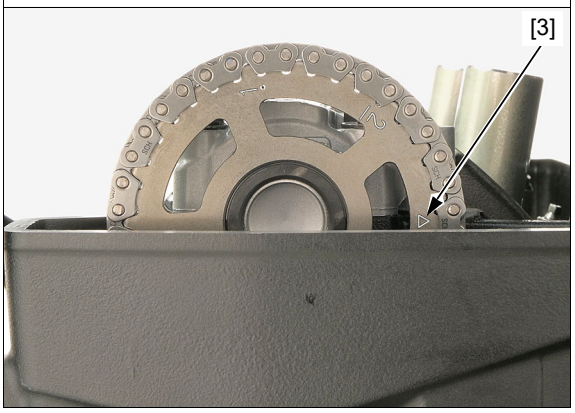
After tightening the lock nut, recheck the valve clearance.



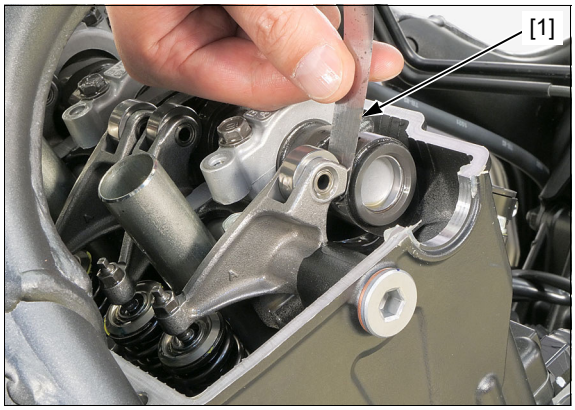
Rotate the crankshaft clockwise approximately 252.5° and align the "△" mark [1] on the pulser plate with the index mark [2] of the right crankcase cover.

Make sure that the "△" mark [3] on the cam sprocket align with the upper surface of the cylinder head as shown.





Check the No.1 cylinder exhaust valve clearances by inserting a feeler gauge [1] between the locker arm roller and cam lobe.



Adjust the No.1 cylinder exhaust valve clearance by loosening the lock nut [1] and turning the adjusting screw [2] until there is a slight drag on the feeler gauge [3].

TOOL:
Valve Adjusting Wrench (□3) [4] 07708-0030400

Apply engine oil to the adjusting screw and lock nut threads and seating surface.

Hold the adjusting screw and tighten the lock nut.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

After tightening the lock nut, recheck the valve clearance.

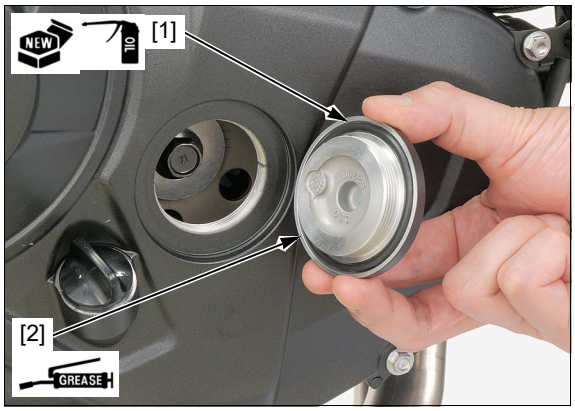
Coat a new O-ring [1] with engine oil and install it into the timing hole cap [2].

Apply grease to the threads of the timing hole cap.

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

TORQUE: 17.5 N·m (1.8 kgf·m, 13 lbf·ft)

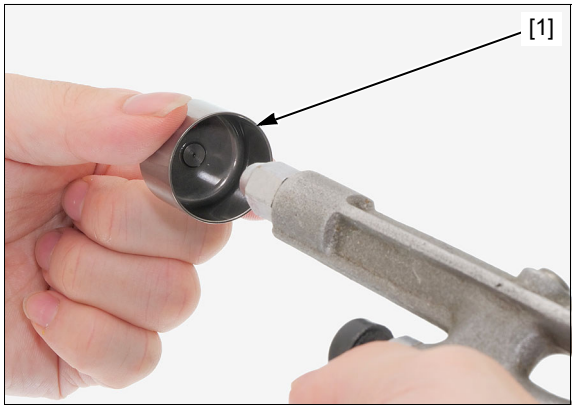
Install the cylinder head cover (page 10-5).



ADJUSTMENT

Remove the valve lifter and shim (page 10-10).

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

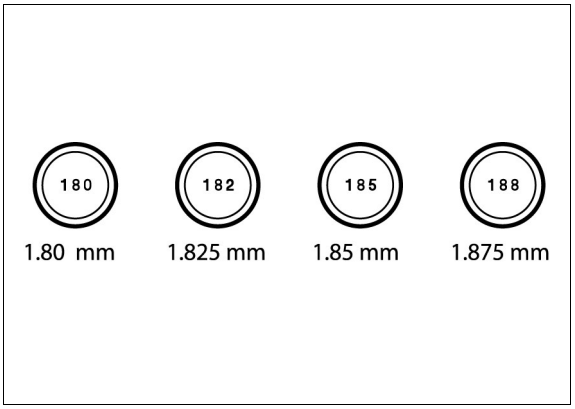


Measure the shim [1] thickness and record it.

NOTE:

- Fifty-one different shim thicknesses are available in increments of 0.025 mm (from 1.200 mm to 2.450 mm).

Calculate the new shim thickness using the equation below.
A = (B – C) + D
A: New shim thickness
B: Recorded valve clearance
C: Specified valve clearance
D: Old shim thickness



NOTE:

- Make sure of the correct shim thickness by measuring the shim with the micrometer.
- Reface the valve seat if carbon deposits result in a calculated dimension of over 2.450 mm.

Install newly selected shims on the valve spring retainers.

Install the valve lifter and camshaft (page 10-12).

Rotate the crankshaft clockwise several times and recheck the valve clearances.

ENGINE OIL

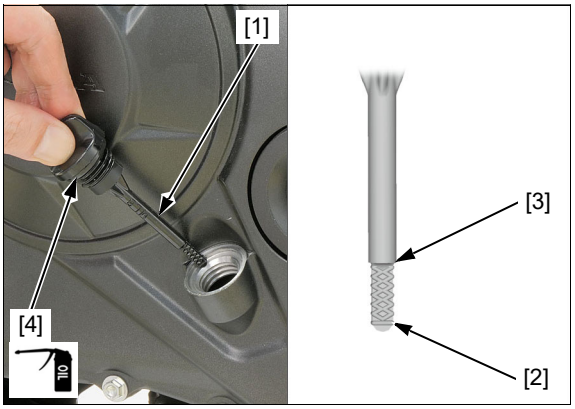
OIL LEVEL INSPECTION

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.

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



Insert the oil filler cap/dipstick until it seats, but do not screw it in.

Check that the oil level is between the upper and lower level lines on the dipstick.

If the level is below the lower level [2], on the dipstick, add the recommended engine oil to the upper level [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/dipstick.

ENGINE OIL CHANGE

Warm up the engine.

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

Place an oil pan under the engine to catch the engine oil, then remove the engine oil drain bolt [1] and sealing washer [2].

Drain the engine oil completely.

Clean the drain bolt and install new sealing washer onto the drain bolt.

Install and tighten the drain bolt to the specified torque.

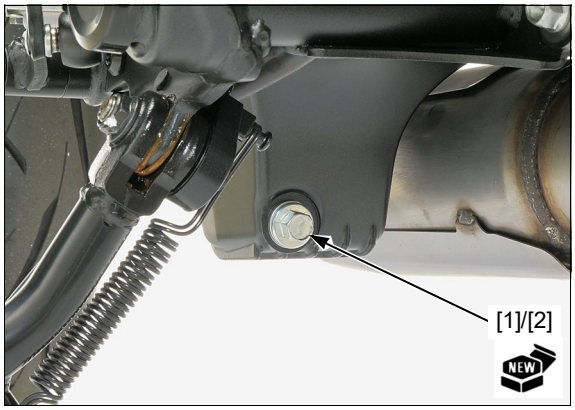
TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

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

ENGINE OIL CAPACITY:
3.3 liters (3.5 US qt, 2.9 Imp qt) at draining
3.5 liters (3.7 US qt, 3.1 Imp qt) at oil filter change
3.8 liters (4.0 US qt, 3.3 Imp qt) at disassembly

Check the engine oil level (page 3-11).

Make sure that there are no oil leaks.

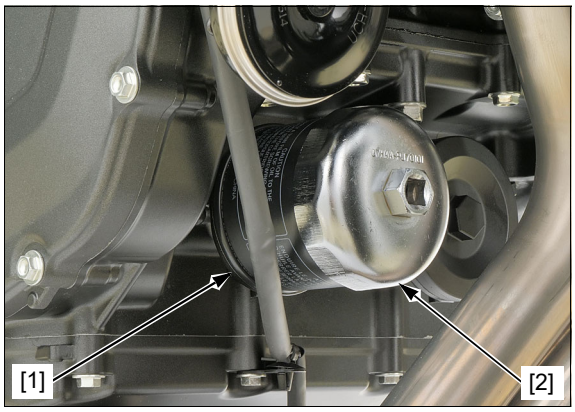


ENGINE OIL FILTER

Drain the engine oil (page 3-12).

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

TOOL:
Oil Filter Wrench [2] 07HAA-PJ70101

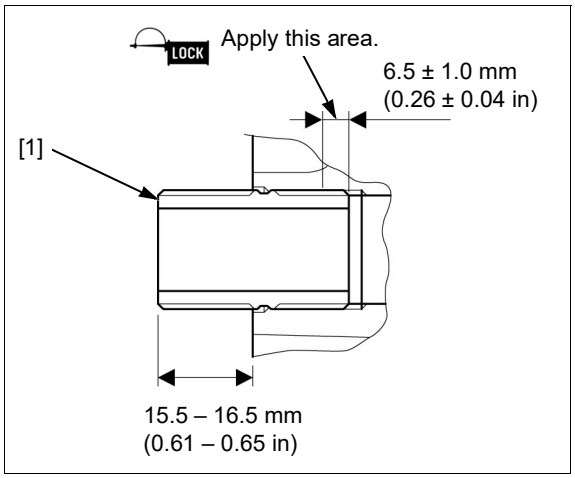


Check the oil filter boss [1] protrusion from the crankcase is within the specified length as shown.

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

NOTE:

- If the oil filter boss is removed, apply locking agent to the oil filter boss threads as shown and install it.



Clean the oil filter attaching surface of the crankcase.

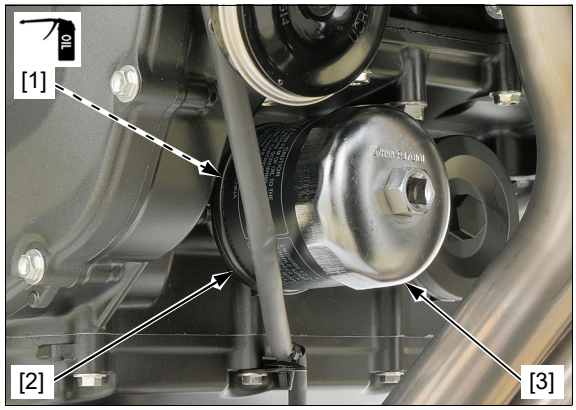
Apply engine oil to new oil filter cartridge threads and O-ring [1].

Install and tighten the oil filter cartridge [2] to the specified torque using the special tool.

TOOL:
Oil Filter Wrench [3] 07HAA-PJ70101

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)

Fill the engine with the recommended engine oil and check that there are no oil leaks (page 3-12).



ENGINE IDLE SPEED

IDLE SPEED INSPECTION

- 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 until the coolant temperature rises to 80°C (176°F).

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

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

ENGINE IDLE SPEED:
1,300 ± 100 min^{-1} (rpm)

If the idle speed is out of the specification, check the intake air leak or engine top-end problem (page 10-2).

RADIATOR COOLANT

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

The level should be between the "UPPER" [1] and "LOWER" [2] level lines.

If necessary, add the recommended coolant (page 1-7).

Remove the front seat (page 2-4).

Remove the reserve tank cap [1] and add the coolant to the "UPPER" level line.

Reinstall the cap.

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

If the reserve tank becomes completely empty, there is a possibility of air getting into the cooling system.

Be sure to remove any air from the cooling system (page 8-5).

Install the front seat (page 2-4).

COOLING SYSTEM

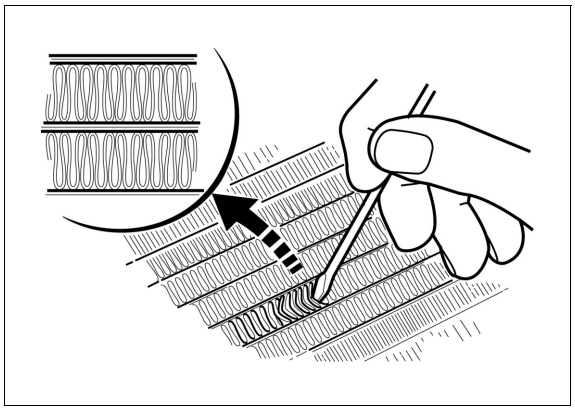
Check the radiator air passages for clogging or damage.

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

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

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

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

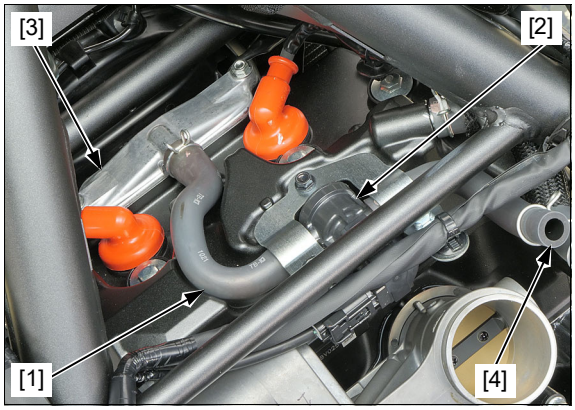
Check the following for deterioration, damage or loose connections.

– Air supply hose (to engine) [1] between the PAIR control solenoid valve [2] and PAIR check valve cover [3]
– Air supply hose (from air cleaner) [4] between the air cleaner housing and PAIR control solenoid valve)

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

If the hoses show any signs of heat damage, inspect the PAIR reed valves (page 7-18).

For secondary air supply system inspection (page 7-16).



EVAPORATIVE EMISSION CONTROL SYSTEM

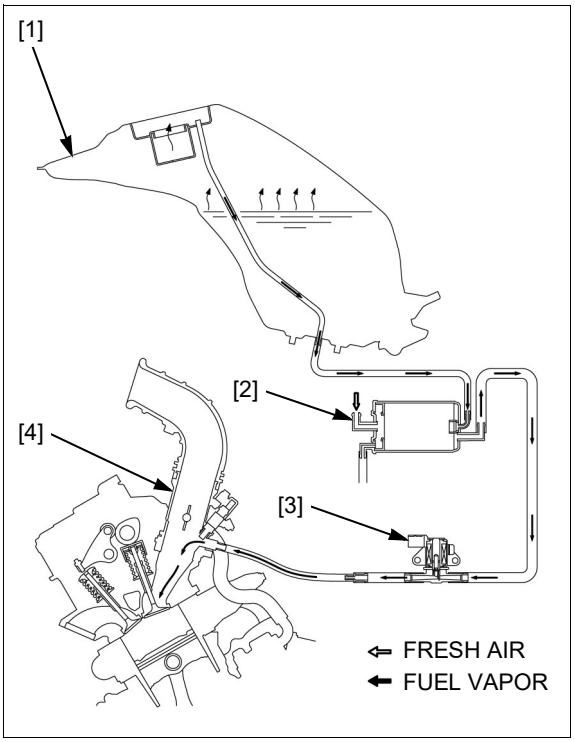
Lift and support the fuel tank (page 7-6).

Check the hoses between the fuel tank [1], EVAP canister [2], EVAP purge control solenoid valve [3] and throttle body [4] for deterioration, damage or loose connection.

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

Check the EVAP canister for cracks or other damage.

Route the hoses properly (page 1-21).

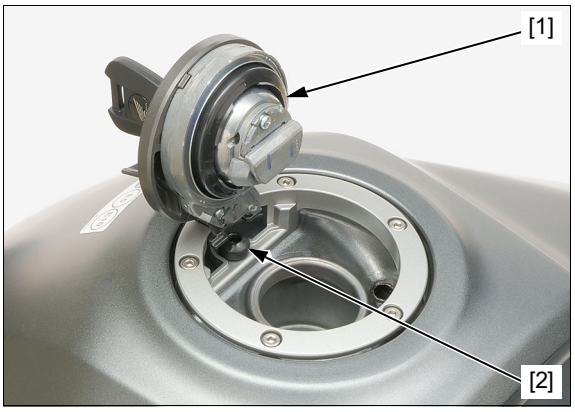


Open the fuel filler cap [1].

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

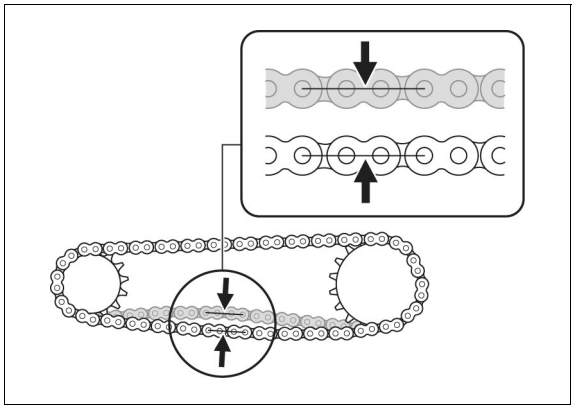
Amputation hazard. Never inspect or adjust the drive chain while the engine is running.

SLACK INSPECTION

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

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

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



NOTICE

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

ADJUSTMENT

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

Turn the drive chain adjusting bolts [3] on both sides an equal number of turns until the correct drive chain slack is obtained.

NOTE:

- Make sure that the adjusting plate index marks [4] are in the same position on both sides.

Tighten the rear axle nut to the specified torque.

TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)

Seat the drive chain adjusting bolts snugly against the adjusting plate [5].

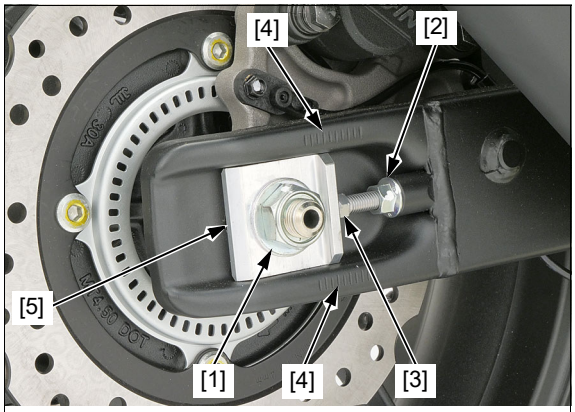
Tighten the drive chain adjuster lock nuts to the specified torque while holding the drive chain adjusting bolts.

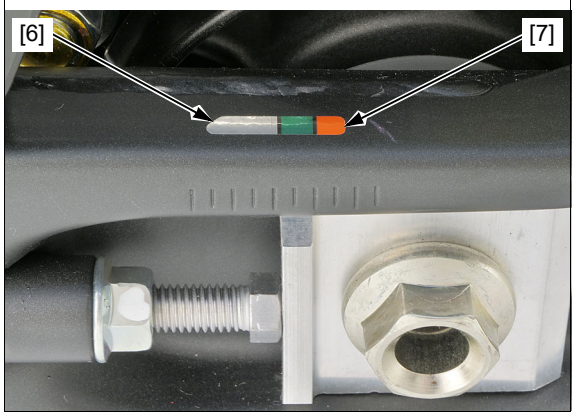
TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Recheck the drive chain slack and free wheel rotation (page 3-16).

Check the drive chain wear indicator label [6] attached on the left swingarm.

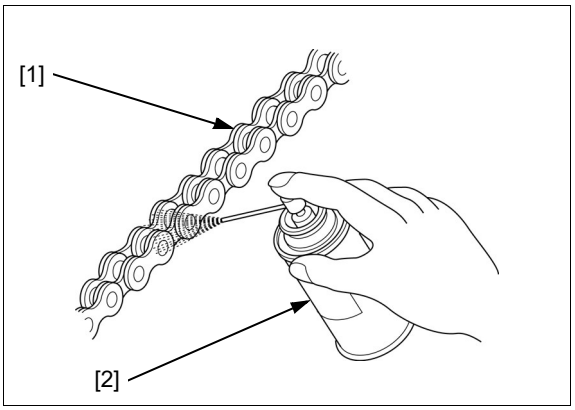
If the adjusting plate index mark reaches red zone [7] of the indicator label, replace the drive chain with a new one (page 3-18).





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:

Dive 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 drive sprocket cover (page 2-17).

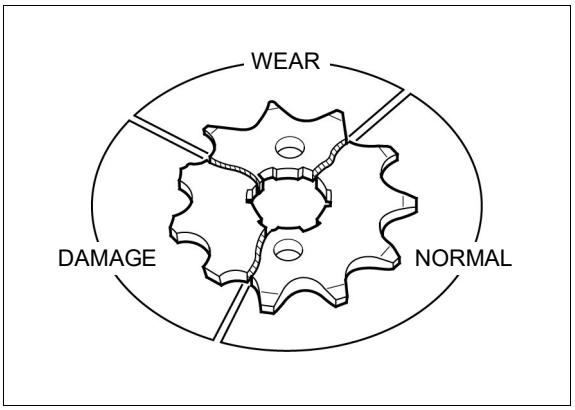
Inspect the drive and driven sprocket teeth for wear or damage, replace if necessary.

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.

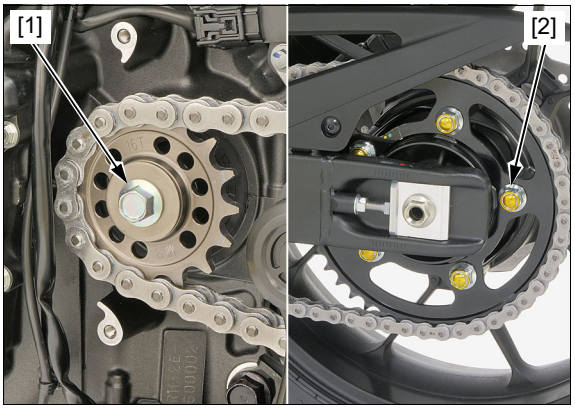
NOTE:

- Do not change the drive and driven sprockets number of teeth, HSTC does not operate properly.



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:
128 N·m (13.1 kgf·m, 94 lbf·ft)

Install the drive sprocket cover (page 2-17).

REPLACEMENT

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

Fully slacken the drive chain (page 3-16).

Remove the drive chain using the special tool.

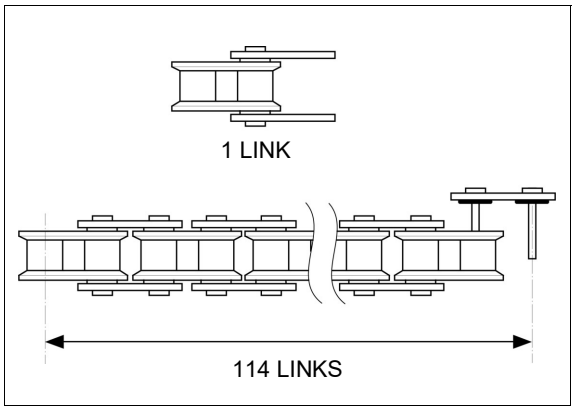
NOTE:

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

TOOL:
Chain Tool Set 07HMH-MR10105

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

STANDARD LINKS: 114 LINKS



REPLACEMENT CHAIN
DID: 520VM5-120ZB
RK: 520KZOZ2-120LJ

Insert a new master link [1] with new O-rings [2] from the inside of the drive chain.

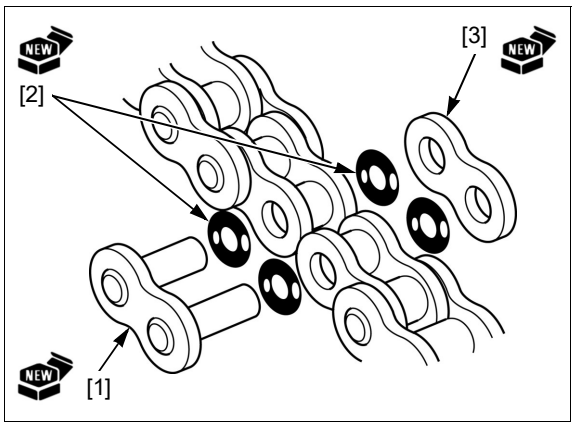
Install a new plate [3] and O-rings with the identification mark facing the outside.

Assemble the master link, O-rings and plate.

TOOL:
Chain Tool Set 07HMH-MR10105

NOTE:

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

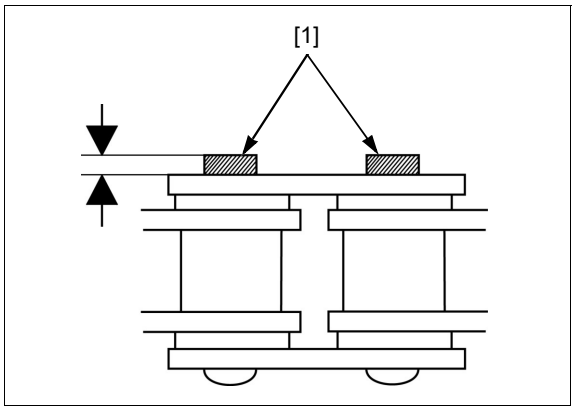


Make sure that the master link pins [1] are installed properly.

Measure the master link pin length projected from the plate.

STANDARD LENGTH: 1.3 – 1.5 mm (0.05 – 0.06 in)

Stake the master link pins.

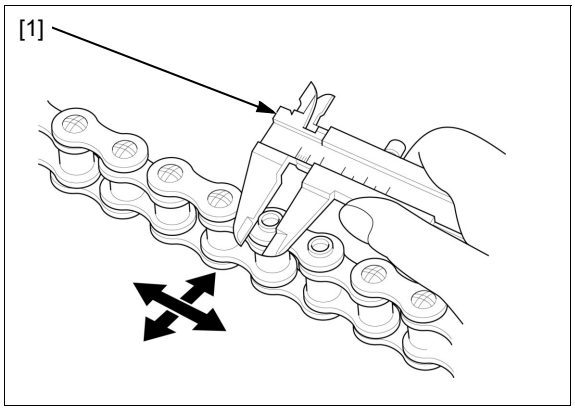


Make sure that the pins are staked properly by measuring the diameter of the staked area using a slide caliper [1].

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

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

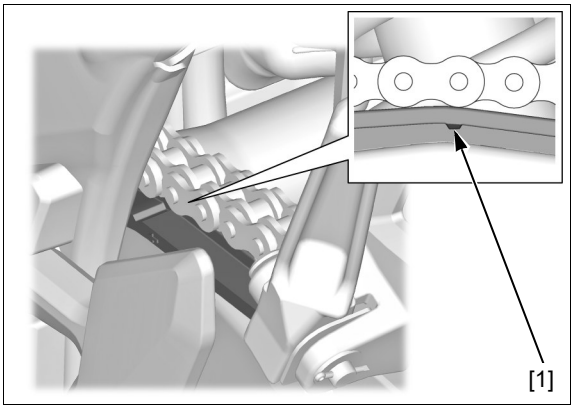
If there is any cracking, replace the master link, O-rings and plate.



DRIVE CHAIN SLIDER

Check the drive chain slider for wear or damage.

The drive chain slider must be replaced if it is worn to the wear limit indicator [1] (page 17-11).



BRAKE FLUID

NOTICE

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

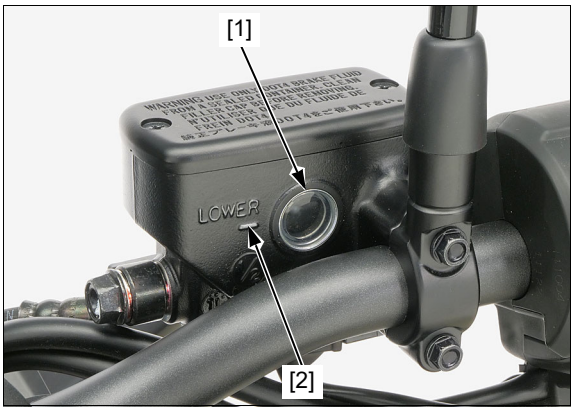
NOTE:

- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.
- A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper piston is pushed out, and this accounts for a low reservoir level. If the brake pads are not worn and the fluid level is low, check entire system for leaks (page 3-20).

FRONT BRAKE

Turn the handlebar so that the reservoir is level and check the front brake fluid reservoir level through the sight glass [1].

If the level is near the lower level line [2], check the brake pad wear (page 3-20).



REAR BRAKE

Place the motorcycle on a level surface, and support it in an upright position.

Check the rear brake fluid reservoir level.

If the level is near the lower level line [1], check the brake pad wear (page 3-20).

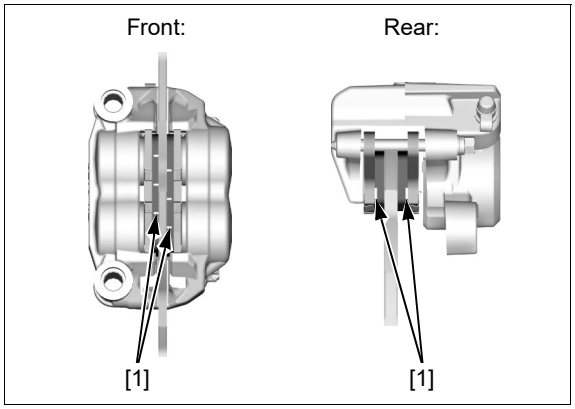
BRAKE PADS WEAR

INSPECTION

Check the brake pads for wear.

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

Refer to pad replacement (page 18-11).



BRAKE SYSTEM

INSPECTION

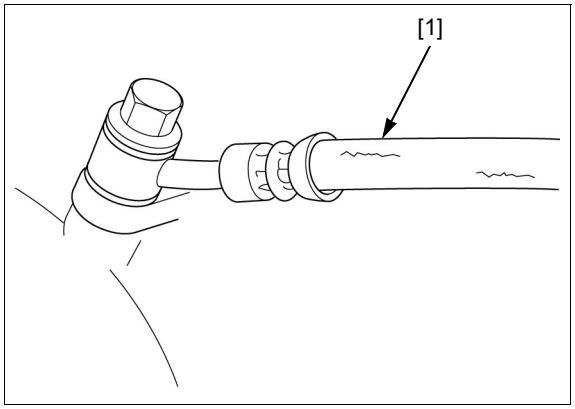
Firmly apply the brake lever or pedal, and check that no air has entered the system.

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

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

Tighten any loose fittings.

Replace hoses and fittings as required.



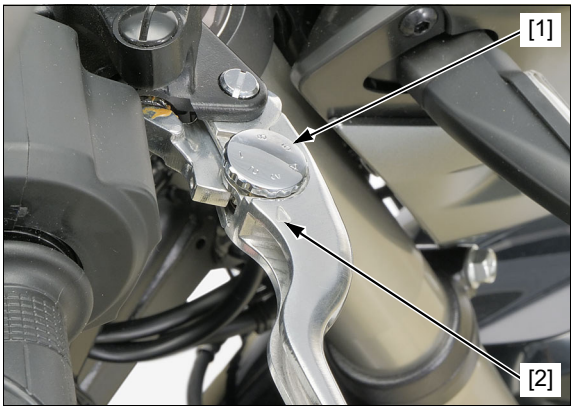
BRAKE LEVER ADJUSTMENT

Turn the adjuster [1] until the numbers align with the index mark [2] while pushing the lever forward in the desired position.

After adjustment, check that the lever operates correctly before riding.

NOTE:

- Do not turn the adjuster beyond its natural limit.



BRAKE LIGHT SWITCH

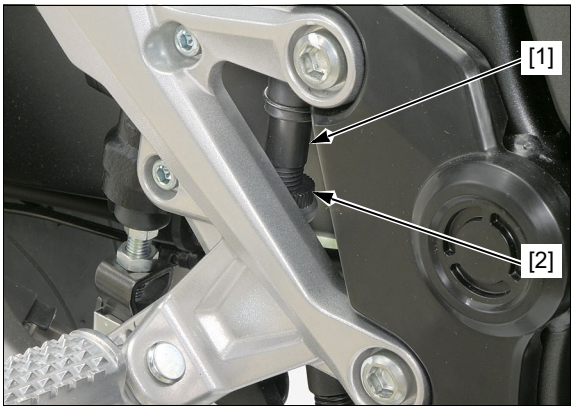
Adjust the rear brake light switch [1] so that the brake light comes on just prior to the brake actually being engaged.

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

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

NOTE:

- The front brake switch does not require adjustment.



HEADLIGHT AIM

HEADLIGHT AIM

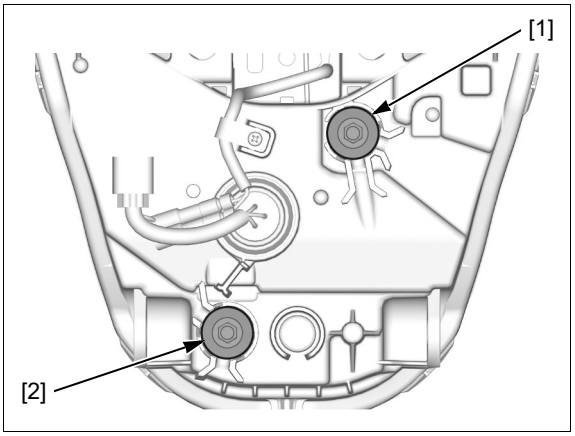
Place the motorcycle on a level surface.

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

Adjust the headlight beams horizontally by turning the horizontal beam adjust bolt [2].

NOTE:

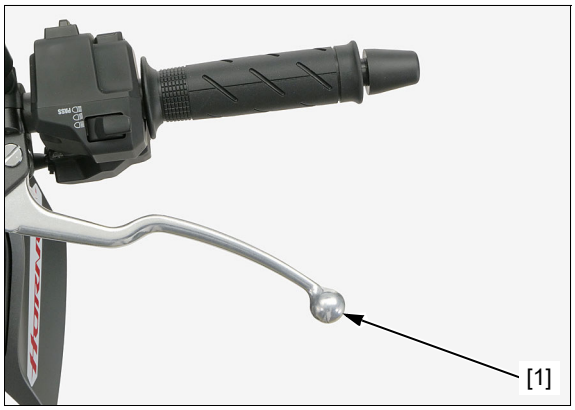
- Adjust the headlight beam as specified by local laws and regulations.



CLUTCH SYSTEM

Measure the clutch lever freeplay at the end of the clutch lever [1].

FREEPLAY:10 – 20 mm (0.4 – 0.8 in)



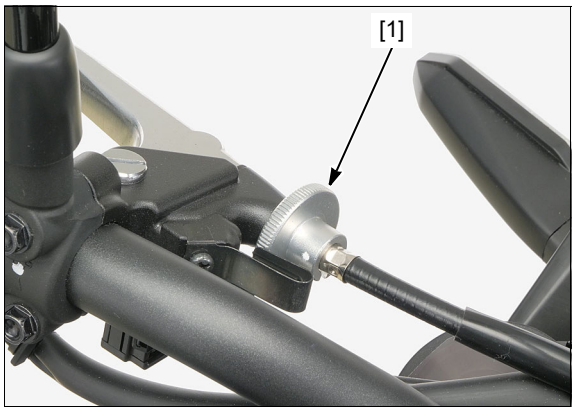
Minor adjustment is made with the upper adjuster [1] at the clutch lever side.

NOTE:

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

Turn the adjuster to adjust the freeplay.

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.

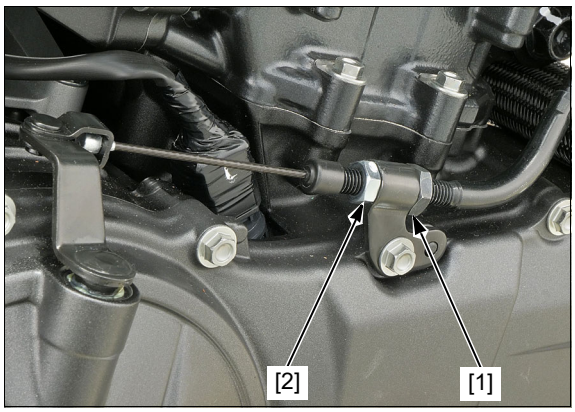


Major adjustment is made with the lower adjusting nut [1] at the clutch lifter arm side.

Loosen the lock nut [2] and turn the adjusting nut 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, remove and inspect the clutch (page 12-7).



SIDESTAND

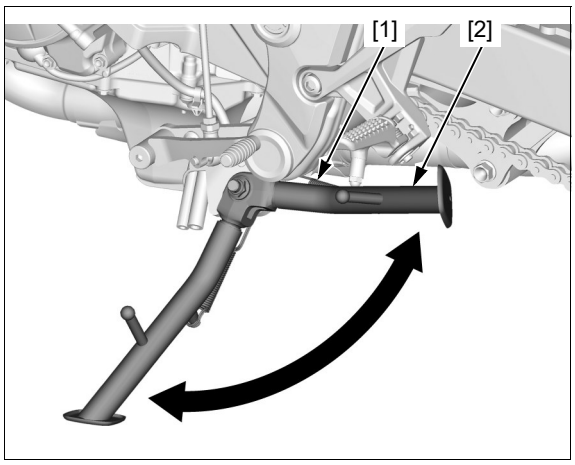
Check the sidestand spring [1] for damage or loss of tension.

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

Check the sidestand ignition cut-off system:

– Sit astride on the motorcycle and raise the sidestand.
– Start the engine with the transmission in neutral, then, shift the transmission into gear with squeezing the clutch lever.
– 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 21-22).



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.

Replace the damaged components which cannot be repaired.

NOTE:

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

Tighten all nuts and bolts.

Refer to the fork service (page 16-15).

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.

Replace damaged components which can not be repaired.

NOTE:

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

Tighten all nuts and bolts.

Refer to shock absorber service (page 17-10).

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

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

Replace the bearings if looseness is felt.

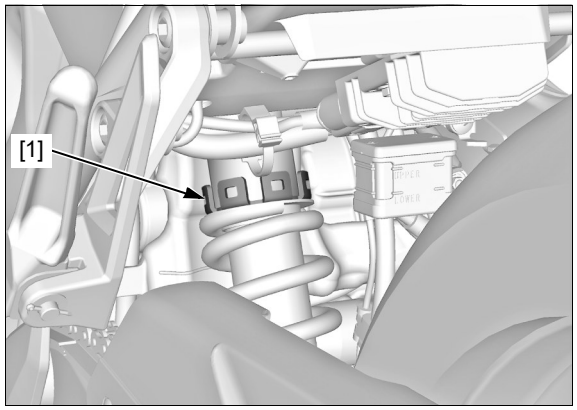
Refer to swingarm service (page 17-11).

REAR SUSPENSION ADJUSTMENT

SPRING PRE-LOAD ADJUSTER

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

PRE-LOAD ADJUSTER ADJUSTABLE RANGE:
7 positions
PRE-LOAD ADJUSTER STANDARD POSITION:
4 position from softest position



NUTS, BOLTS, FASTENERS

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

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 front fork leg and move the front wheel sideways forcefully to see if the wheel bearings are worn.

For front wheel service (page 16-10).

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 moves and the driven flange bearing is worn.

For rear wheel service (page 17-4).

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

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

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 control cables do not interfere with the handlebar rotation.

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 16-32).

4. PGM-FI SYSTEM

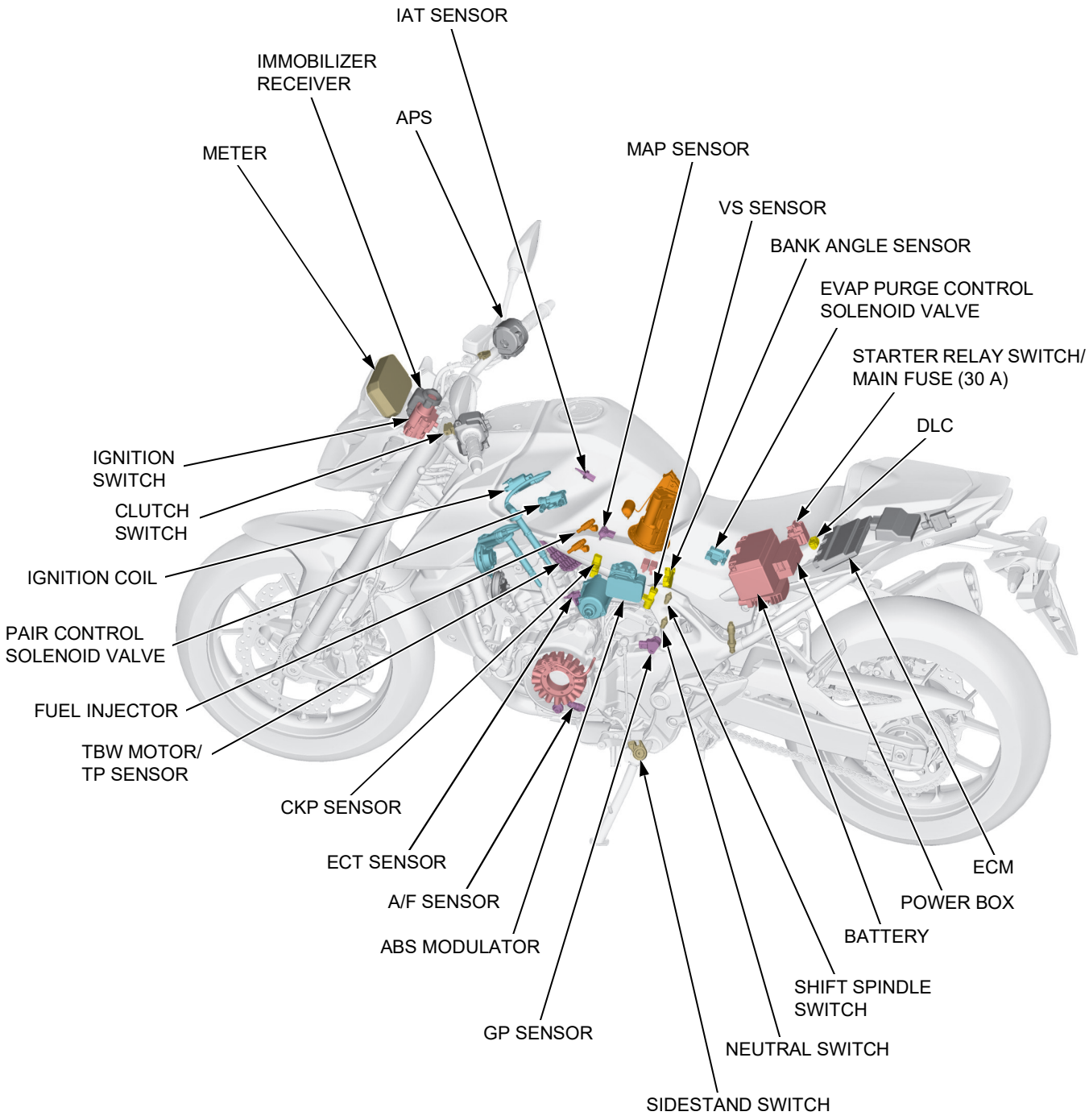
SERVICE INFORMATION

GENERAL

- This section covers electrical system service of the PGM-FI system. For other service and fuel supply system, see Fuel System section (page 7-2).
- 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.
- 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).
- For PGM-FI system diagrams (page 23-2).
- Use a digital tester for PGM-FI system inspection.
- The following color codes are used throughout this section.

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

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 4-7).

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-programed 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 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 front seat (page 2-4).

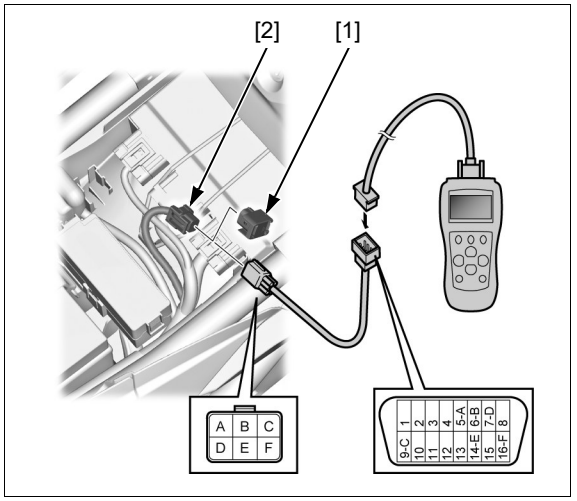
Remove the dummy connector [1] from the DLC [2].

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 or connect the MCS to the DLC (page 4-5). Read the DTC, stored data and follow the DTC index (page 4-8).

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

Reading DTC with the MIL

Turn the ignition switch OFF.

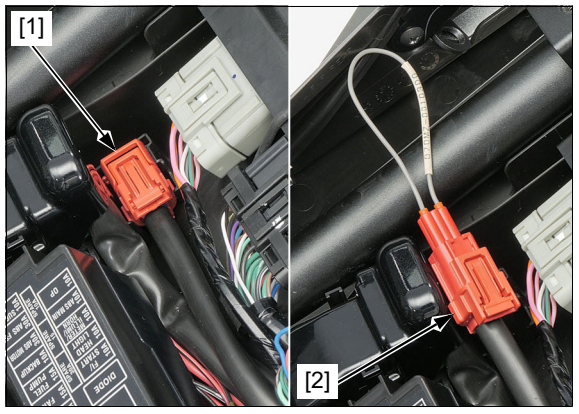
Remove the front seat (page 2-4).

Remove the dummy connector [1] from the DLC.

Short the DLC terminals using a special tool.

TOOL:
SCS short connector [2] **070MZ-0010300**

Turn the ignition switch ON, read, note the MIL blinks and refer to the DTC index (page 4-8).



Reading current DTC with the 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 4-8).

ERASING STORED DTC

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

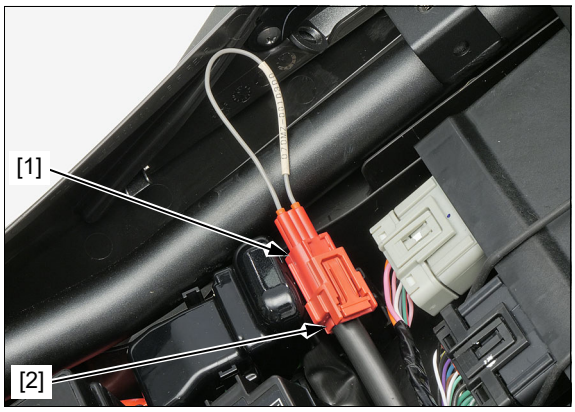
To erase the DTC without GST or MCS, refer to the following procedure.

How to erase 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.

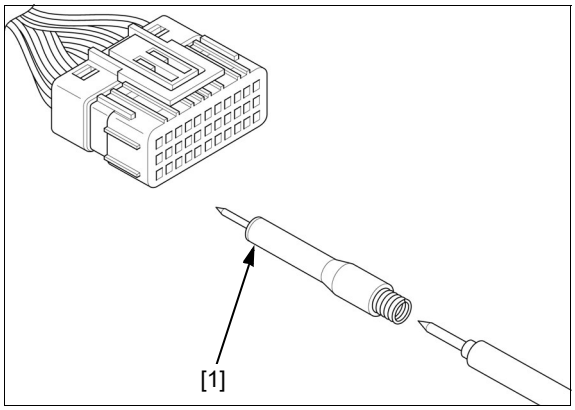


CIRCUIT INSPECTION

- 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 male pin prove [1]. Insert the male pin prove into the connector terminal, then attach the digital multimeter probe to the male pin prove.

TOOL:

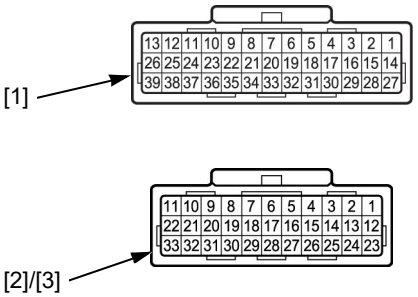
Male Pin Prove	**07ZAJ-RDJA110**



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 the MIL lighting, refer to the DTC (page 4-8). 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 lighting)	1. Check the spark plug condition (page 3-6). 2. Inspect the ignition system (page 5-6). 3. Check the cylinder compression (page 10-4). 4. Check the fuel pump (page 7-8).	• No fuel to fuel injector – Clogged fuel filter – Pinched or clogged fuel feed hose – Pinched or clogged fuel tank breather hose • Intake air leak • Contaminated/deteriorated fuel • Faulty fuel injector
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 7-8).	
Engine stalls, hard to start, rough idling	1. Check the idle speed (page 3-13). 2. Inspect the fuel supply system (page 7-4).	• Contaminated/deteriorated fuel • Faulty ignition system
Idle speed is below specifications or fast idle too low (No DTC and MIL lighting)	1. Check the idle speed (page 3-13).	
Idle speed is above specifications or fast idle too high (No DTC and MIL lighting)	1. Check the idle speed (page 3-13). 2. Check the throttle operation (page 3-4).	• Faulty ignition system • Air cleaner condition
Afterburn when engine braking is used	1. Inspect the secondary air supply system (page 7-16).	• Faulty ignition system
Backfiring or misfiring during acceleration	Inspect the ignition system (page 5-6).	
Poor performance (driveability) and poor fuel economy	1. Inspect the fuel supply system (page 7-4). 2. Inspect the air cleaner element (page 3-5).	• Faulty pressure regulator • Faulty fuel injector • Faulty ignition system
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 then refer to DTC index.
- Follow the prior diagnosis notes before performing the troubleshooting, refer to the PRIOR DIAGNOSIS (page 4-11).

DTC	Meter display/ MIL blinks	Detected D/C (Driving Cycle)	DTC name	Refer to page
P0031	38	1	A/F Sensor Heater Circuit Low (A/F Sensor Heater Circuit Low Voltage)	4-12
P0032	38	1	A/F Sensor Heater Circuit High (A/F Sensor Heater Circuit High Voltage)	
P00D1	38	1	A/F Sensor Heater Control Circuit Performance Problem (A/F Sensor Heater Control Circuit Range/performance)	4-13
P0105	1	2	MAP Sensor Circuit (MAP Sensor Stuck)	4-13
P0106	1	2	MAP Sensor Circuit Range Problem (MAP Sensor Circuit Range/performance)	4-14
P0107	1	1	MAP Sensor Circuit Low (MAP Sensor Circuit Low Voltage)	4-14
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)	4-15
P0112	9	1	IAT Sensor Circuit Low (IAT Sensor Circuit Low Voltage)	4-16
P0113	9	1	IAT Sensor Circuit High (IAT Sensor Circuit High Voltage)	
P0115	7	2	ECT Sensor Circuit (ECT Sensor Stuck)	4-17
P0117	7	1	ECT Sensor Circuit Low (ECT Sensor Circuit Low Voltage)	4-17
P0118	7	1	ECT Sensor Circuit High (ECT Sensor Circuit High Voltage)	
P011B	132	2	ECT Sensor Intake Air Temperature Correlation (Engine Coolant and Intake Air Temperature Correlation)	4-19
P0121	71	1	TP Sensor 1 Circuit Range Problem (TP Sensor 1 Circuit Range/performance)	4-19
P0122	71	1	TP Sensor Circuit Low (TP Sensor 1 Low Voltage)	4-20
P0123	71	1	TP Sensor Circuit High (TP Sensor 1 High Voltage)	
P0125	7	2	Insufficient Coolant Temperature for Closed Loop Fuel Control	4-21
P0131	36	1	O2/AF Sensor Circuit Low Voltage (A/F Sensor Circuit Low Voltage)	4-22
P0132	36	1	O2/AF Sensor Circuit High Voltage (A/F Sensor Circuit High Voltage)	
P0133	36	2	O2/AF Sensor Circuit No Activity Detected (A/F Sensor Circuit Slow Response)	4-23
P0134	36	1	O2/AF Sensor Circuit No Activity Detected (A/F Sensor Circuit No Activity Detected)	
P0201	12	1	Cylinder 1 Injector Circuit (No.1 Fuel Injector Circuit Malfunction)	4-24
P0202	13	1	Cylinder 2 Injector Circuit (No.2 Fuel Injector Circuit Malfunction)	
P0221	72	1	TP Sensor 2 Circuit Range Problem (TP Sensor 2 Circuit Range/performance)	4-25
P0222	72	1	TP Sensor 2 Circuit Low (TP Sensor 2 Low Voltage)	4-26
P0223	72	1	TP Sensor 2 Circuit High (TP Sensor 2 High Voltage)	

DTC	Meter display/ MIL blinks	Detected D/C (Driving Cycle)	DTC name	Refer to page
P0300	133	1	Random/multiple Cylinder Misfire Detected (Random/multiple Cylinder Misfire Detected A) (When the MIL is blinking)	4-27
	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)	4-28
P0335	19	1	CKP Sensor Circuit (CKP Sensor No Signal)	4-29
P0351	91	1	Ignition Coil 1 Primary Control Circuit Open (No.1 Ignition Coil Primary Circuit Malfunction)	4-30
P0352	92	1	Ignition Coil 2 Primary Control Circuit Open (No.2 Ignition Coil Primary Circuit Malfunction)	
P0412	89	1	AIR System Switching Valve Circuit (PAIR Control Solenoid Valve Circuit Malfunction)	4-31
P0443	88	1	EVAP System Purge Control Valve Circuit (EVAP Purge Control Solenoid Valve Circuit Malfunction)	4-33
P0500	67	1	VSP Sensor 1 Malfunction (Front Wheel Speed Sensor Malfunction)	4-34
P0562	126	1	System Voltage (Sub VB Relay Circuit Low Voltage)	4-35
P0606	84	1	Control Module Processor (CPU in the ECM Malfunction)	4-36
P062F	33	1	ECM EEPROM Error (ECM EEPROM Malfunction)	4-37
P064D	131	1	ICM O2 Sensor CPU Performance Problem (A/F Sensor IC Circuit Abnormal)	4-37
P0686	126	1	ECM/PCM Power Relay Control Circuit Low (Sub VB Relay Stuck OFF)	4-35
P0687	126	1	ECM/PCM Power Relay Control Circuit High (Sub VB 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)	4-41
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))	
P1684	77	1	TBW Switch Malfunction (TBW Return Spring Malfunction)	4-43
P1702	41	1	GP/TR sensor Circuit Low (GP sensor Low Voltage)	4-45
P1703	41	1	GP/TR sensor Circuit High (GP sensor High Voltage)	
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)	
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)	

DTC	Meter display/ MIL blinks	Detected D/C (Driving Cycle)	DTC name	Refer to page
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)	4-53
P2158	66	1	VSP Sensor 2 Malfunction (Rear Wheel Speed Sensor Malfunction)	4-54
P2195	36	2	O2/AF Sensor Signal Biased/stuck Lean (A/F Sensor Signal Biased/stuck Lean)	4-55
P2196	36	2	O2/AF Sensor Signal Biased/stuck Rich (A/F Sensor Signal Biased/stuck Rich)	
P2A00	36	2	O2/AF Sensor Circuit Range Problem (A/F Sensor Circuit Range/performance)	4-55
U0001	103	1	CAN Communication Malfunction	4-56
U0155	103	1	CAN Communication Malfunction (TCM-GCM) (Meter CAN Communication Malfunction)	4-57

PGM-FI SYSTEM DTC TROUBLESHOOTING

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 male pin prove when inspecting at the ECM, ABS modulator, and BCU connectors.

  TOOL:
  Male Pin Prove **07ZAJ-RDJA110**

- If the ECM is replaced, perform the following:
  – CKP sensor initialize learning procedure (page 4-65)
  – Key Registration Procedure (page 22-4)
- 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 min^{-1} (rpm)**
Throttle opening angle:	**14 degrees or more**

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

DTC P0031/P0032

Probable cause:

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

Symptom/Fail-safe function:

- Fuel consumption deterioration
- Detected value feedback stops

1. A/F Sensor Heater Line Open Circuit Inspection

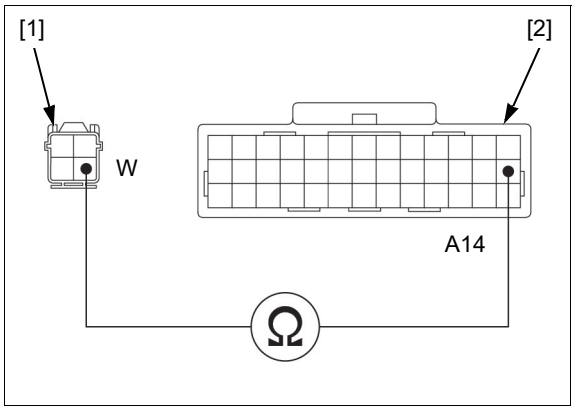
Disconnect the ECM 39P connector (page 4-58).
Disconnect the A/F sensor 4P connector (page 4-63).
Check for continuity between the wire harness side A/F sensor 4P connector [1] and ECM 39P connector [2].

CONNECTION: White – A14

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

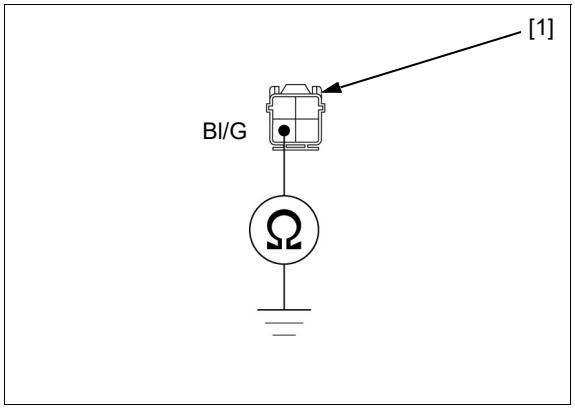
Check for continuity between the wire harness side A/F sensor 4P connector [1] and ground.

CONNECTION: Black/green – Ground

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Black/green wire



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

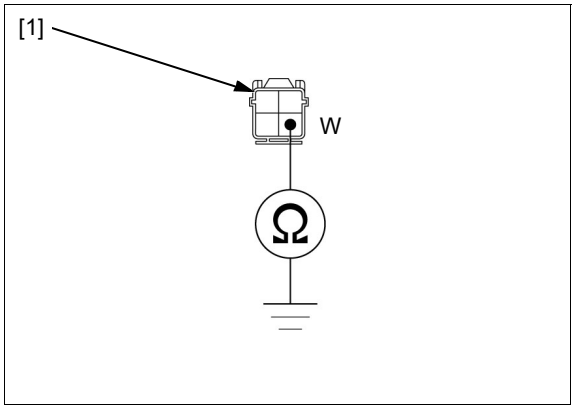
Check for continuity between the wire harness side A/F sensor 4P connector [1] and ground.

CONNECTION: White – Ground

Is there continuity?

YES – Short circuit in the White wire

NO – GO TO STEP 4.



4. **A/F Sensor Inspection**

   Replace the A/F sensor with a new one (page 4-63).
   Connect the disconnected connector(s).
   Erase the DTC (page 4-6).
   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 (page 4-58), and recheck.

   NO – Faulty original A/F sensor

DTC P00D1

Probable cause:

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

Symptom/Fail-safe function:

- Fuel consumption deterioration
- Detected value feedback stops

1. **A/F Sensor Inspection**

   Replace the A/F sensor with a new one (page 4-63).
   Erase the DTC (page 4-6).
   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 (page 4-58), 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 (page 4-61).
   Erase the DTC (page 4-6).
   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 (page 4-58), 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 (page 4-61).
Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original MAP sensor

DTC P0107/P0108

Probable cause:

- Faulty MAP sensor or its related circuit
- Faulty ECM

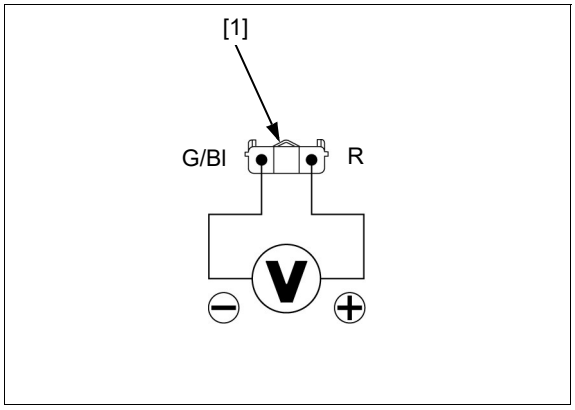
Symptom/Fail-safe function:

- Rough idling

1. MAP Sensor Input Voltage Inspection

Disconnect the MAP sensor 3P connector (page 4-61).
Temporarily connect the IAT sensor 2P connector.
Turn the ignition switch ON.
Measure the voltage at the wire harness side MAP sensor 3P connector [1].

CONNECTION: Red (+) – Green/black (–)



Is the voltage within 4.75 – 5.25 V?

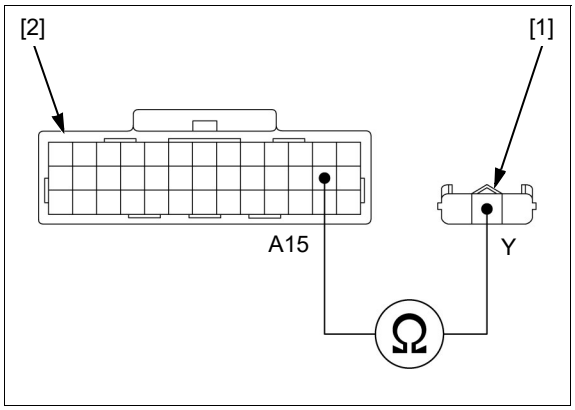
YES – GO TO STEP 2.

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 (page 4-58), 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 3P 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

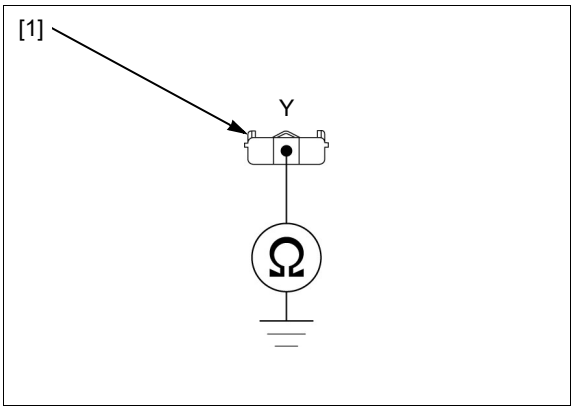
Check for continuity between the wire harness side MAP sensor 3P connector [1] and ground.

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 (page 4-61).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
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 (page 4-58), 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 (page 4-61).
Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original IAT sensor

DTC P0112/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

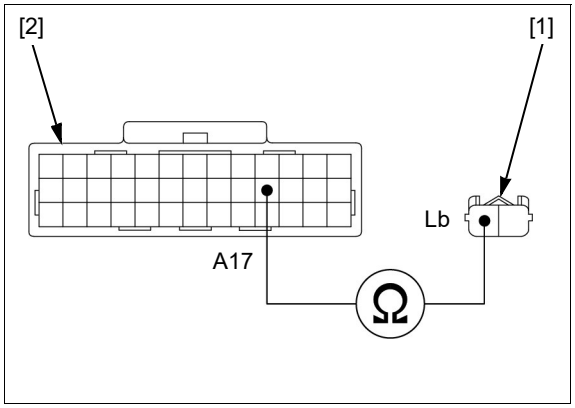
Disconnect the ECM 39P connector (page 4-58).
Disconnect the IAT sensor 2P connector (page 4-61).
Check for continuity between the wire harness side IAT sensor 2P connector [1] and ECM 39P connector [2].

CONNECTION: Light blue – A17

Is there continuity?

YES – GO TO STEP 2.

NO – Open circuit in the Light blue wire



2. IAT Sensor Output Line Short Circuit Inspection

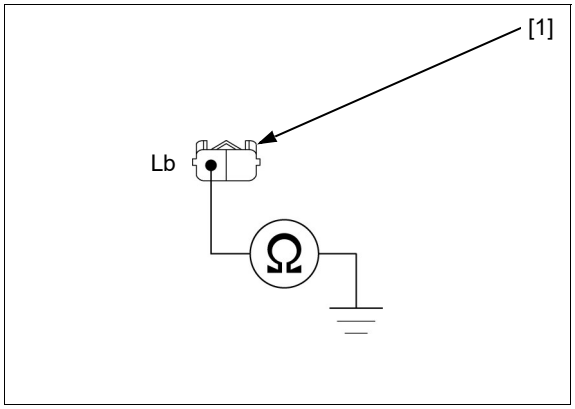
Check for continuity between the wire harness side IAT sensor 2P connector [1] and ground.

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

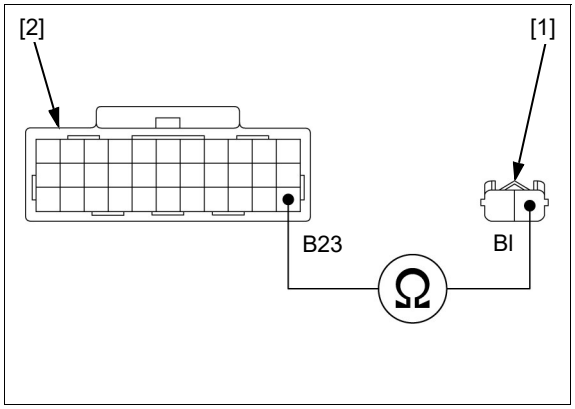
Disconnect the ECM 33P (Black) connector (page 4-58).
Check for continuity between the wire harness side IAT sensor 2P connector [1] and ECM 33P connector [2].

CONNECTION: Black – B23

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Black and Green wire



4. IAT Sensor Inspection

Replace the IAT sensor with a new one (page 4-61).
Erase the DTC (page 4-6).
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 (page 4-58), 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 (page 4-62).
Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original ECT sensor

DTC P0117/P0118

Probable cause:

- Faulty ECT sensor or its related circuit
- Faulty ECM

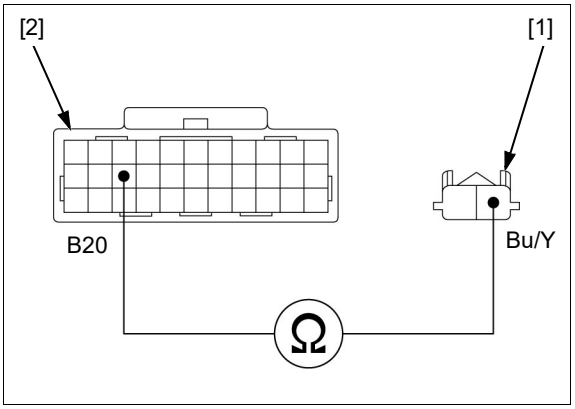
Symptom/Fail-safe function:

- Hard to start at a low temperature
- Driveability deterioration

1. ECT Sensor Output Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-58).
Disconnect the ECT sensor 2P connector (page 4-62).
Check for continuity between the wire harness side ECT sensor 2P connector [1] and ECM 33P connector [2].

CONNECTION: Blue/yellow – B20



Is there continuity?

YES – GO TO STEP 2.

NO – Open circuit in the Blue/yellow wire

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

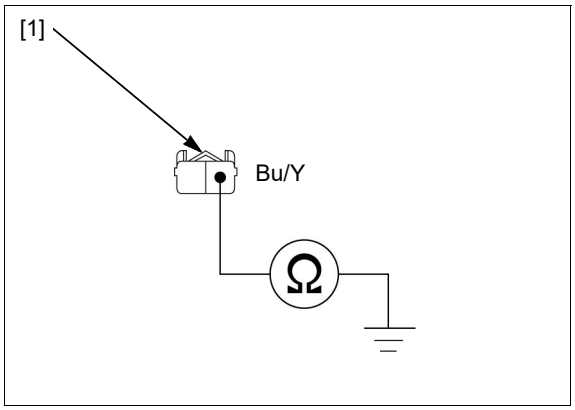
   Check for continuity between the wire harness side ECT sensor 2P connector [1] and ground.

   CONNECTION: Blue/yellow – Ground

   Is there continuity?

   YES – Short circuit in the Blue/yellow wire

   NO – GO TO STEP 3.



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

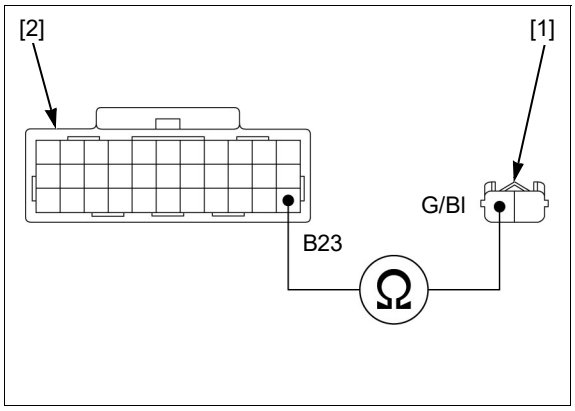
   Check for continuity between the wire harness side ECT sensor 2P connector [1] and ECM 33P connector [2].

   CONNECTION: Green/black – B23

   Is there continuity?

   YES – GO TO STEP 4.

   NO – Open circuit in the Green/black and green wire



4. **ECT Sensor Inspection**

   Replace the ECT sensor with a new one (page 4-62).
   Erase the DTC (page 4-6).
   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 (page 4-58), 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 (page 4-62).
Erase the DTC (page 4-6).
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 (page 4-61).
Erase the DTC (page 4-6).
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 (page 4-58), 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) (page 7-14).
Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original TP Sensor

DTC P0122/P0123

Probable cause:

- Faulty TP sensor or its related circuits
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates at idle speed
- HSTC does not operate

1. TP Sensor 1 Input Voltage Inspection

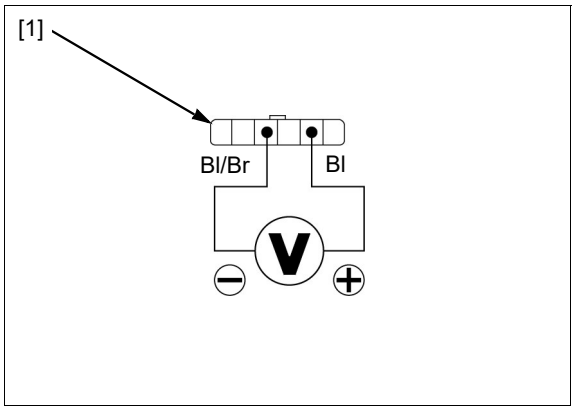
Turn the ignition switch OFF.
Disconnect the TBW unit 6P connector (page 7-14).
Temporarily connect the IAT sensor 2P connector.
Turn the ignition switch ON.
Measure the voltage at the wire harness side TBW unit 6P connector [1].

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 wires are OK, replace the ECM with a new one (page 4-58), and recheck.



2. TP Sensor 1 Output Line Open Circuit Inspection

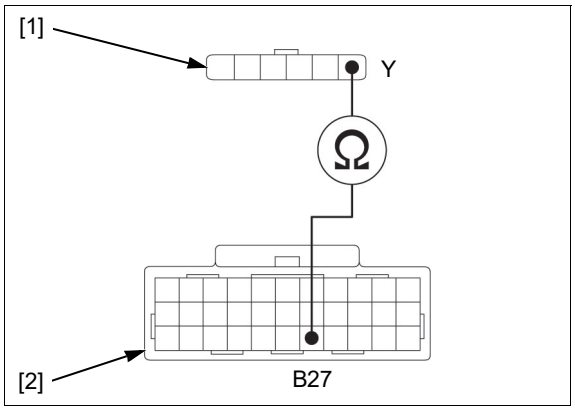
Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) connector (page 4-58).
Check for continuity between the wire harness side TBW unit 6P connector [1] and ECM 33P connector [2].

Connection: Yellow – B27

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Yellow wire



3. TP Sensor 1 Output Line Short Circuit Inspection

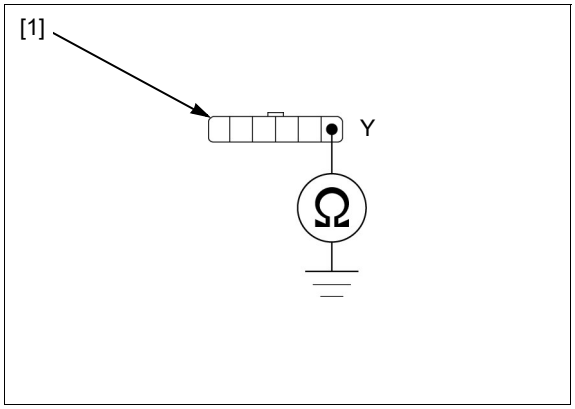
Check for continuity between the wire harness side TBW unit 6P connector [1] and ground.

Connection: Yellow – Ground

Is there continuity?

YES – Short circuit in the Yellow wire

NO – GO TO STEP 4.



4. TP Sensor 1 Inspection

Replace the throttle body (TP sensor) (page 7-14).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
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 (page 4-58), 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 (page 4-62).
Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original ECT sensor

DTC P0131/P0132

Probable cause:

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

Symptom/Fail-safe function:

- Fuel consumption deterioration
- Detected value feedback stops

1. A/F Sensor Output Line Open Circuit Inspection

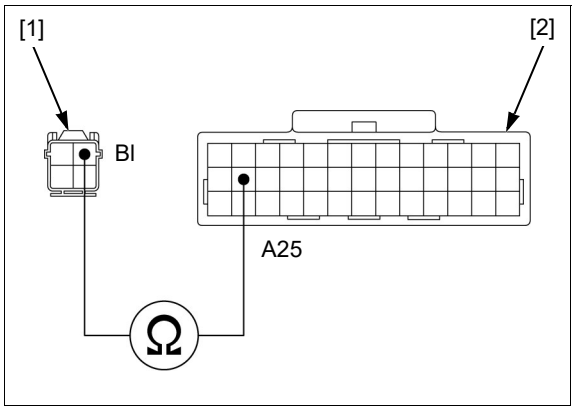
Disconnect the A/F sensor 4P connector (page 4-63).
Disconnect the ECM 39P connector (page 4-58).
Check for continuity between the wire harness side A/F sensor 4P connector [1] and ECM 39P connector [2].

CONNECTION: Black – A25

Is there continuity?

YES – GO TO STEP 2.

NO – Open circuit in the Black wire



2. A/F Sensor Output Line Short Circuit Inspection

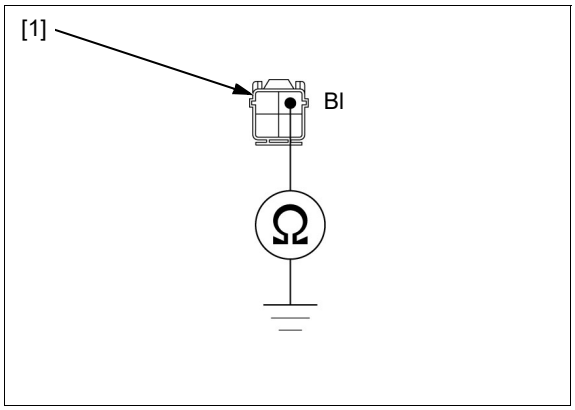
Check for continuity between the wire harness side A/F sensor 4P connector [1] and ground.

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

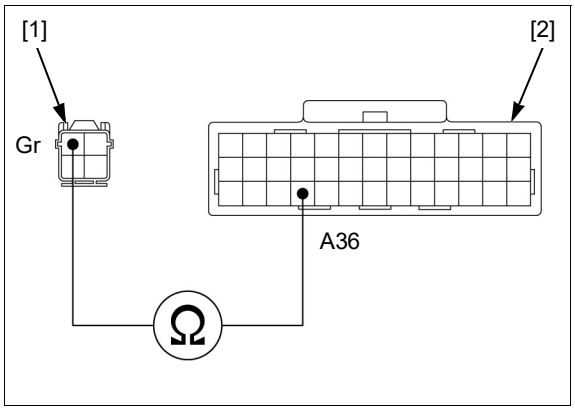
Check for continuity between the wire harness side A/F sensor 4P connector [1] and ECM 39P connector [2].

CONNECTION: Gray – A36

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Gray wire



4. A/F sensor Inspection

Replace the A/F sensor with a new one (page 4-63).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
Start the engine and wait for a minute.
Stop the engine.
Check the DTC with GST or MCS.

Is same DTC indicated?

YES – Replace the ECM with a new one (page 4-58), and recheck.

NO – Faulty original A/F sensor

DTC P0133/P0134

Probable cause:

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

Symptom/Fail-safe function:

- Fuel consumption deterioration
- Exhaust gas too lean or too rich
- Driveability deterioration
- Detected value feedback stops

1. A/F sensor Inspection

Replace the A/F sensor with a new one (page 4-63).
Erase the DTC (page 4-6).
Warm up the engine until the coolant temperature is above 50°C (122°F) and rev the engine over the 2,000 min^{-1} (rpm).
Check the DTC with GST or MCS.

Is same DTC indicated?

YES – Replace the ECM with a new one (page 4-58), and recheck.

NO – Faulty original A/F sensor

DTC P0201/P0202

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

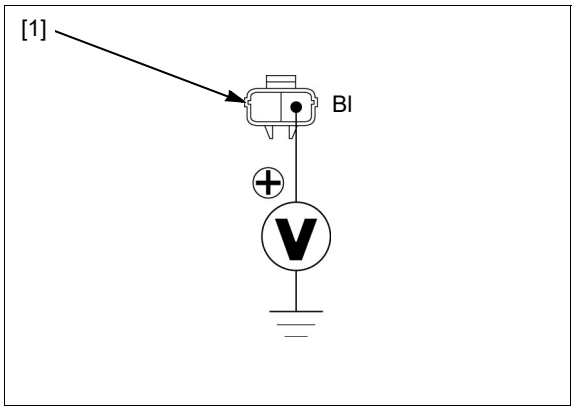
Disconnect the fuel injector 2P connectors (page 7-15).
Turn the ignition switch ON.
Measure the voltage between the wire harness side fuel injector 2P connector [1] and ground.

CONNECTION: Black (+) – Ground (–)

Is there battery voltage?

YES – GO TO STEP 2.

NO – Open circuit in the Black wire



2. Fuel Injector Signal Line Open Circuit Inspection

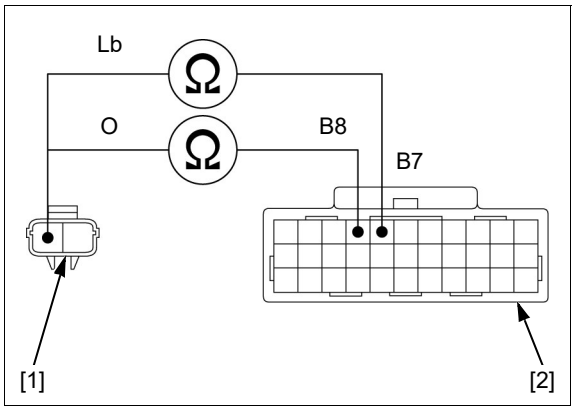
Disconnect the ECM 33P (Black) connectors (page 4-58).
Check for continuity between the wire harness side fuel injector 2P connector [1] and ECM 33P connector [2].

CONNECTION:
No.1: Light blue – B7
No.2: Orange – B8

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



3. Fuel Injector Signal Line Short Circuit Inspection

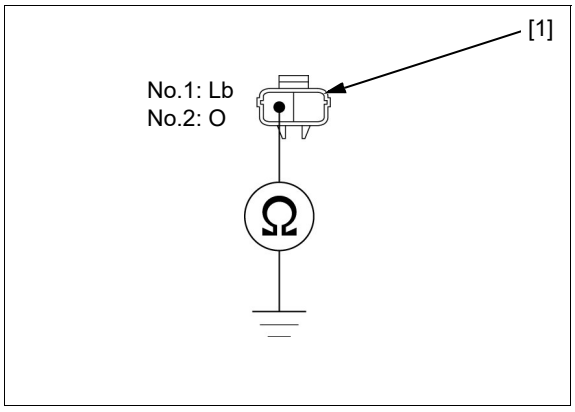
Check for continuity between the wire harness side fuel injector 2P connector [1] and ground.

CONNECTION:
No.1: Light blue – Ground
No.2: Orange – Ground

Is there continuity?

YES – • No.1: Short circuit in the Light blue wire
• No.2: Short circuit in the Orange wire

NO – GO TO STEP 4.



4. Fuel Injector Inspection

Replace the fuel injector with a new one (page 7-15).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
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 (page 4-58), 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) (page 7-14).
Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original TP Sensor

DTC P0222/P0223

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 2 Input Voltage Inspection

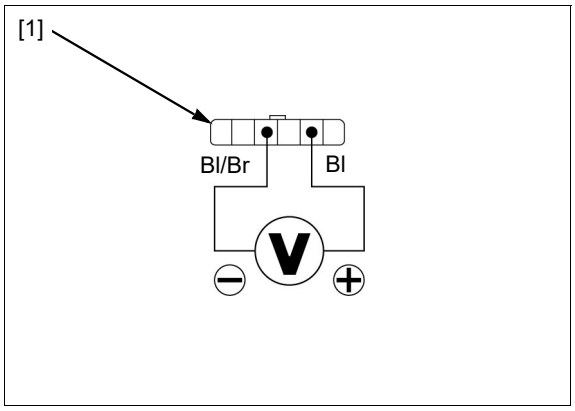
Disconnect the TBW unit 6P connector (page 7-14).
Temporarily connect the IAT sensor 2P connector.
Turn the ignition switch ON.
Measure the voltage at the wire harness side TBW unit 6P connector [1].

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 (page 4-58), and recheck.



2. TP Sensor 2 Output Line Open Circuit Inspection

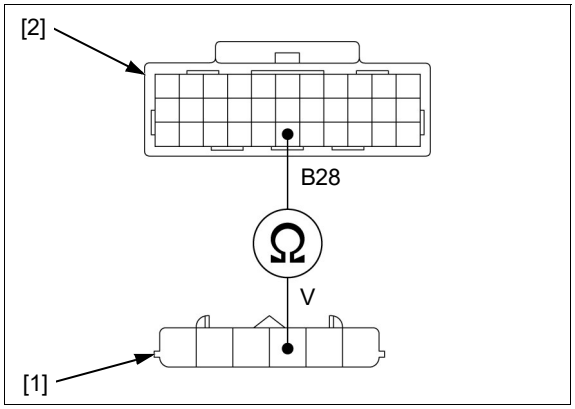
Disconnect the ECM 33P (Black) connector (page 4-58).
Check for continuity between the wire harness side TBW unit 6P connector [1] and ECM 33P connector [2].

CONNECTION: Violet – B28

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Violet wire



3. TP Sensor 2 Output Line Short Circuit Inspection

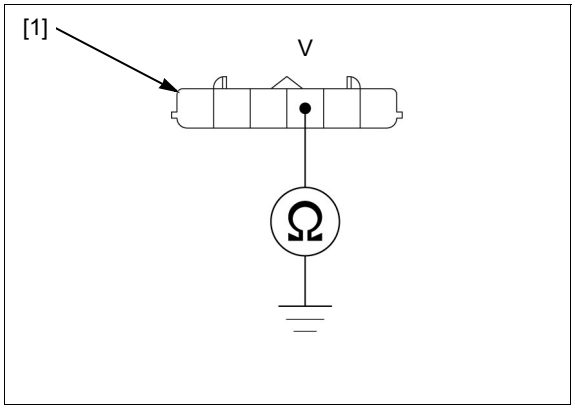
Check for continuity between the wire harness side TBW unit 6P connector [1] and ground.

CONNECTION: Violet – Ground

Is there continuity?

YES – Short circuit in the Violet wire

NO – GO TO STEP 4.



4. TP Sensor 2 Inspection

Replace the throttle body (TP sensor) (page 7-14).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
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 (page 4-58), 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 DTC 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 (page 4-6).
Perform the test ride (page 4-11).
Check the DTC with GST or MCS.

Is same DTC indicated?

YES – Replace the ECM with a new one (page 4-58), 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 Related Parts Inspection

Check the following:

– Iron or other magnetic deposits between the pulser plate and CKP sensor
– Pulser plate for obstruction
– Installation condition of the pulser plate or CKP sensor for looseness
– Pulser plate and CKP sensor tip for deformation or damage

Are the pulser plate and CKP sensor in good condition?

YES – GO TO STEP 2.

NO – Replace abnormal parts

2. Pulse Initialize Learning

Perform the crank pulse learning (page 4-64).

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 (page 4-58), and recheck.

NO – ECM or crank pulse initialization failure

DTC P0335

Probable cause:

- Faulty CKP sensor or its related circuits
- Faulty ECM

Symptom/Fail-safe function:

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

1. CKP Sensor Input Voltage Inspection

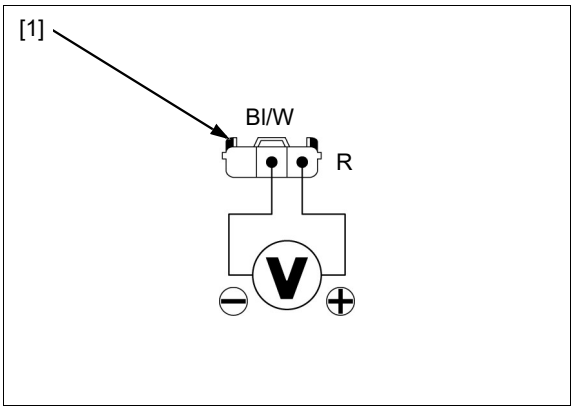
Turn the ignition switch OFF.
Disconnect the CKP sensor 3P connector (page 4-64).
Turn the ignition switch ON.
Measure the voltage at the wire harness side CKP sensor 3P connector [1].

Connection: Red (+) – Black/white (–)

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 2.

NO – • Open circuit in the Red wire
• Open circuit in the Black/white wire
• If the wires are OK, replace the ECM with a new one (page 4-58), and recheck.



2. CKP Sensor Signal Line Open Circuit Inspection

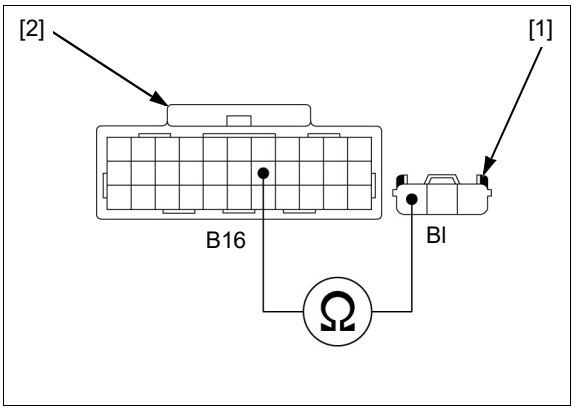
Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) connector (page 4-58).
Check for continuity between the wire harness side CKP sensor 3P connector [1] and ECM 33P connector [2].

Connection: Black – B16

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Black wire



3. CKP Sensor Signal Line Short Circuit Inspection

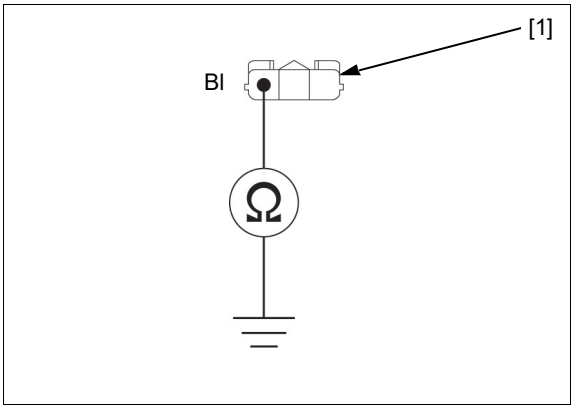
Check for continuity between the wire harness side CKP sensor 3P connector [1] and ground.

Connection: Black – Ground

Is there continuity?

YES – Short circuit in the Black wire

NO – GO TO STEP 4.



4. CKP Sensor Inspection

Replace the CKP sensor with a new one (page 4-64).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
Start the engine and wait for 10 seconds.
Check the DTC with GST or MCS.

Is same DTC indicated?

YES – Replace the ECM with a new one (page 4-58), and recheck.

NO – Faulty original CKP sensor

DTC P0351/P0352

Probable cause:

- Faulty Ignition coil or its related circuit
- Faulty ECM

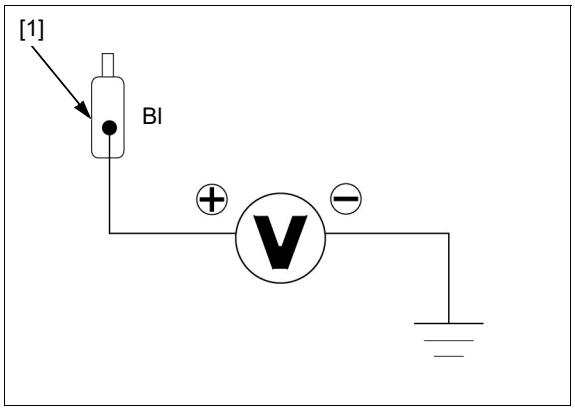
Symptom/Fail-safe function:

- Fuel injector and ignition coil shut down

1. Ignition Coil Primary Coil Input Voltage Inspection

Disconnect the ignition coil wire connector (page 5-8).
Turn the ignition switch ON.
Measure the voltage between the wire harness side ignition coil wire connector [1] and ground.

CONNECTION: Black (+) – Ground (–)



Is there battery voltage?

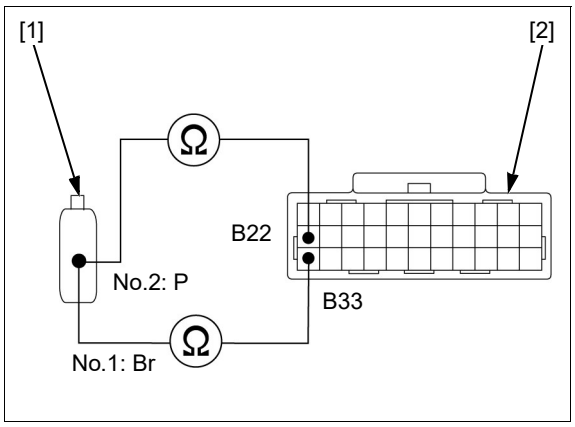
YES – GO TO STEP 2.

NO – Open circuit in the Black 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 connector [2].

CONNECTION:
No.1: Brown – B33
No.2: Pink – B22



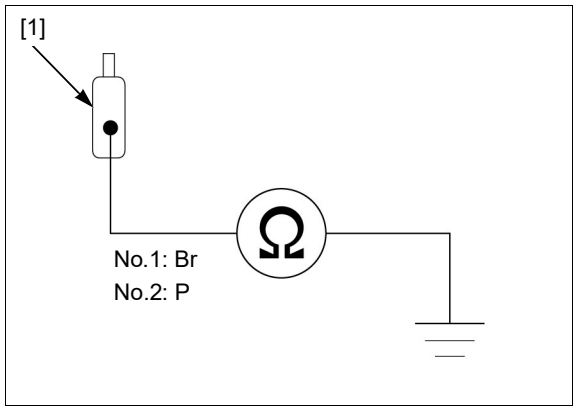
Is there continuity?

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 Inspection

Replace the Ignition coil with a new one (page 5-8).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original ignition coil

DTC P0412

Probable cause:

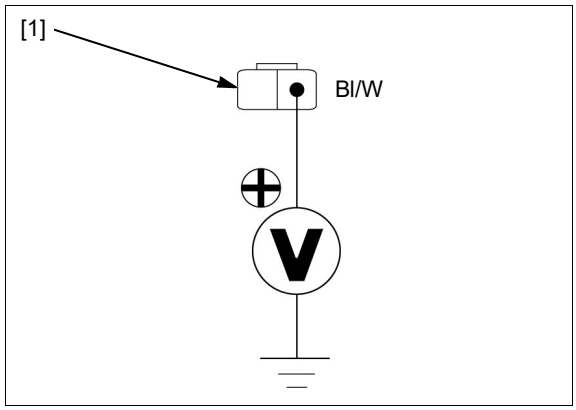
- Faulty PAIR control solenoid valve or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

1. PAIR Control Solenoid Valve Input Voltage Inspection

Disconnect the PAIR control solenoid valve 2P connector (page 7-16).
Temporarily connect the IAT sensor 2P connector.
Turn the ignition switch ON.
Measure the voltage between the wire harness side PAIR control solenoid valve 2P 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

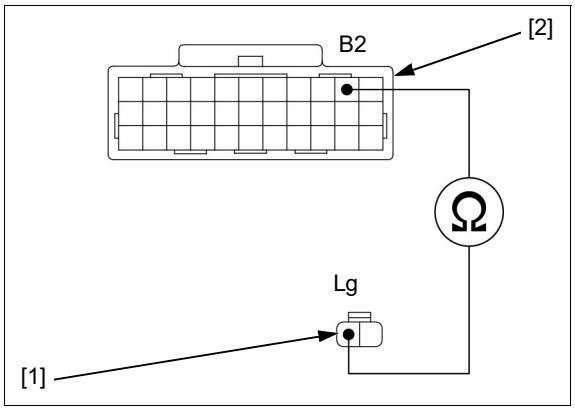
Disconnect the ECM 33P (Black) connector (page 4-58).
Check for continuity between the wire harness side PAIR control solenoid valve connector [1] and ECM 33P connector [2].

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

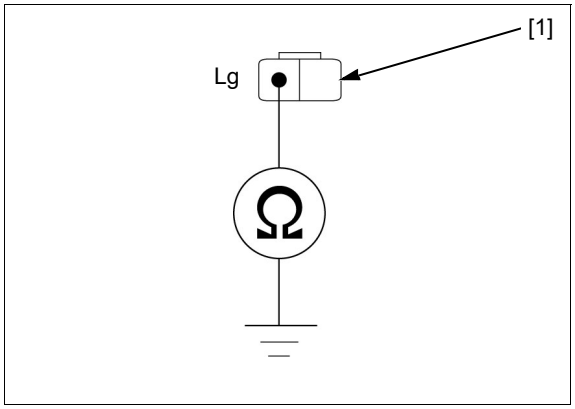
Check for continuity between the wire harness side PAIR control solenoid valve 2P connector [1] and ground.

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 (page 7-16).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original PAIR control solenoid valve

DTC P0443

Probable cause:

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

Symptom/Fail-safe function:

- Engine operates normally

1. EVAP Purge Control Solenoid Valve Input Voltage Inspection

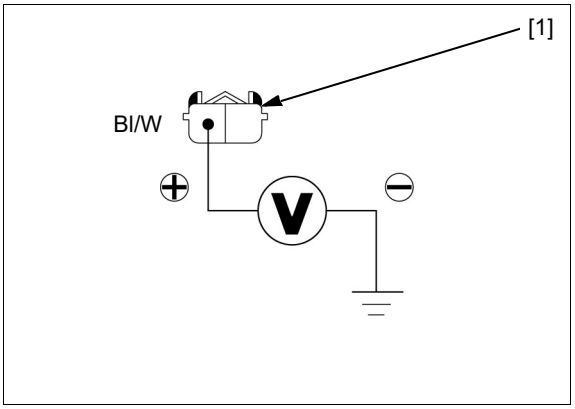
Disconnect the EVAP purge control solenoid valve 2P connector (page 7-19).
Turn the ignition switch ON.
Measure the voltage between the wire harness side EVAP purge control solenoid valve 2P connector [1] and ground.

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

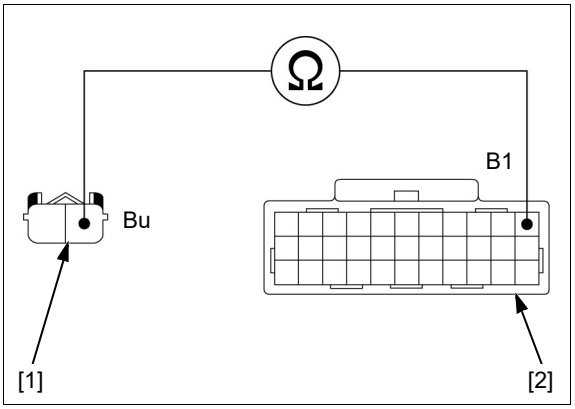
Disconnect the ECM 33P (Black) connector (page 4-58).
Check for continuity between the wire harness side EVAP purge control solenoid valve 2P connector [1] and ECM 33P connector [2].

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

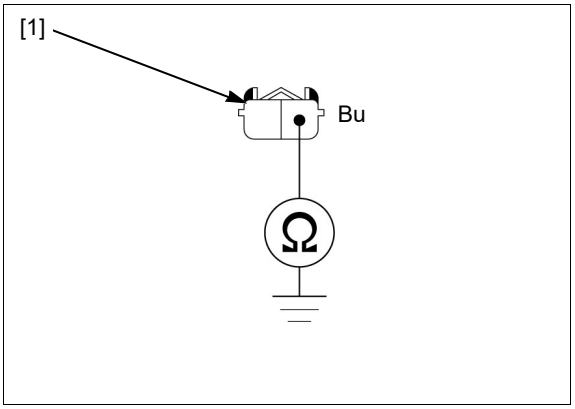
Check for continuity between the wire harness side EVAP purge control solenoid valve 2P connector [1] and ground.

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 (page 7-19).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
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 (page 4-58), 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 DTC P0500, troubleshoot it first.

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

Disconnect the following:

– ABS modulator 18P connector (page 19-24)
– ECM 33P (Black) connector (page 4-58)

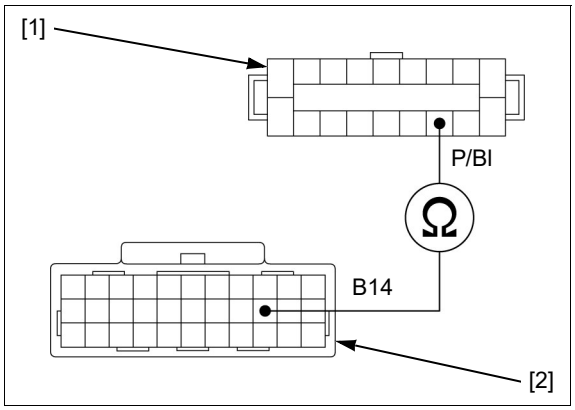
Check for continuity between the wire harness side ABS modulator 18P connector [1] and ECM 33P connector [2].

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

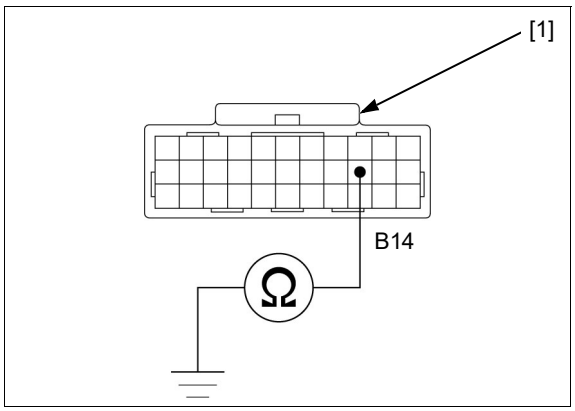
Check for continuity between the wire harness side ECM 33P connector [1] and ground.

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 (page 4-58).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
Perform the test ride (page 4-11).
Check the DTC with GST or MCS.

Is same DTC indicated?

YES – Replace the ABS modulator with a new one (page 19-24), and recheck.

NO – Faulty original ECM

DTC P0562/P0686/P0687

Probable cause:

- Faulty sub VB relay or its related circuit
- Blown fuse SUBVB/IGN (10 A)
- Blown MAIN fuse (30 A)
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

1. Sub VB Relay Power Supply Voltage Inspection

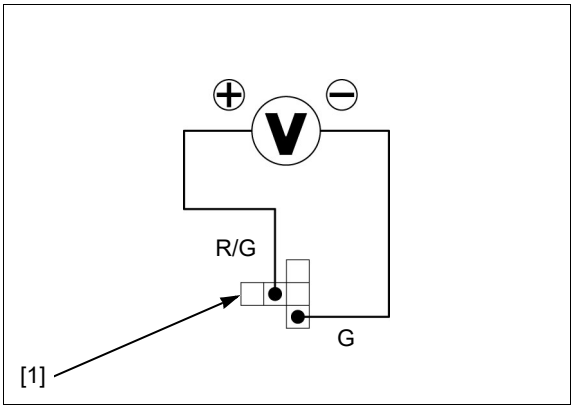
Remove the sub VB relay (page 21-24).
Turn the ignition switch ON.
Measure the voltage at the wire harness (power box) side sub VB relay connector [1].

CONNECTION: Red/green (+) – Green (–)

Is there battery voltage?

YES – GO TO STEP 2.

NO – • Open circuit in the Red/green wire
• Open circuit in the Green wire



2. Sub VB Relay Coil Line Open Circuit Inspection

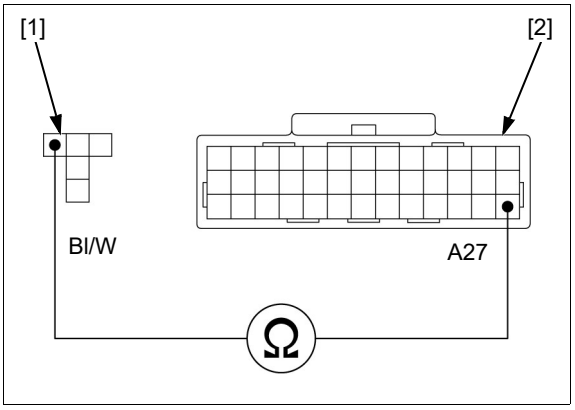
Turn the ignition switch OFF.
Disconnect the ECM 39P (Black) connector (page 4-58).
Check for continuity between the wire harness side sub VB relay connector [1] and ECM 39P connector [2].

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**

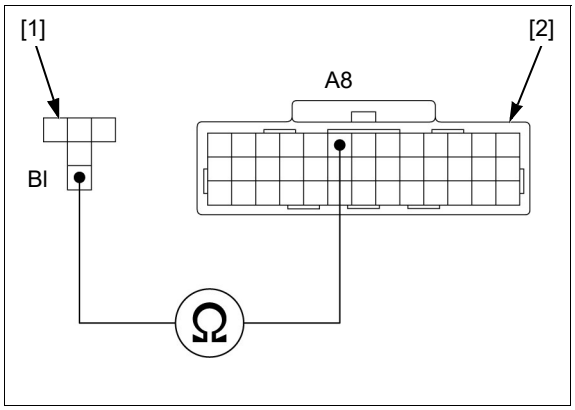
Check for continuity between the wire harness side sub VB relay connector [1] and ECM 39P connector [2].

CONNECTION: Black – A8

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Black wire



4. **Sub VB Relay Inspection**

Replace the sub VB relay with a new one (page 21-24).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
Turn the ignition switch ON and wait for 10 seconds.
Check the DTC with GST or MCS.

Is same DTC indicated?

YES – Faulty ECM

NO – Faulty original sub VB relay

DTC P0606

Probable cause:

- Faulty ECM

Symptom/Fail-safe function:

- Hard to start

1. **DTC Recheck**

Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Intermittent failure

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).

1. DTC Recheck

Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Intermittent failure

DTC P064D

Probable cause:

- Faulty A/F sensor
- 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 (page 4-63).
Erase the DTC (page 4-6).
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 (page 4-58), 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

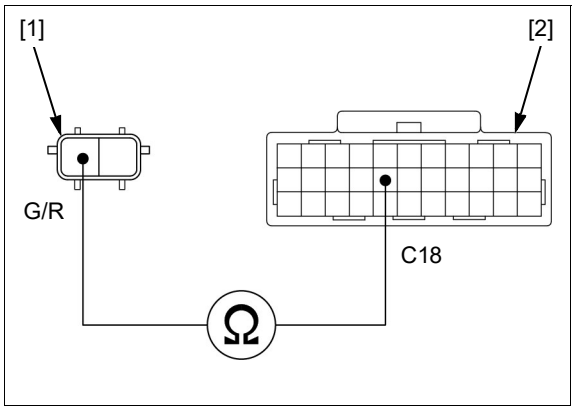
Disconnect the clutch switch 2P connector (page 21-20).
Disconnect the ECM 33P (Gray) connector (page 4-58).
Check for continuity between the wire harness side clutch switch 2P connector [1] and ECM 33P connector [2].

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

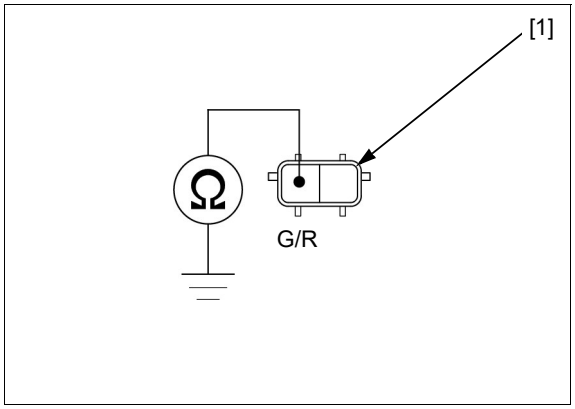
Check for continuity between the wire harness side clutch switch 2P connector [1] and ground.

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 (page 21-20).
Erase the DTC (page 4-6).
Perform the test ride (page 4-11).
Check the DTC with GST or MCS.

Is same DTC indicated?

YES – Replace the ECM with a new one (page 4-58), 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

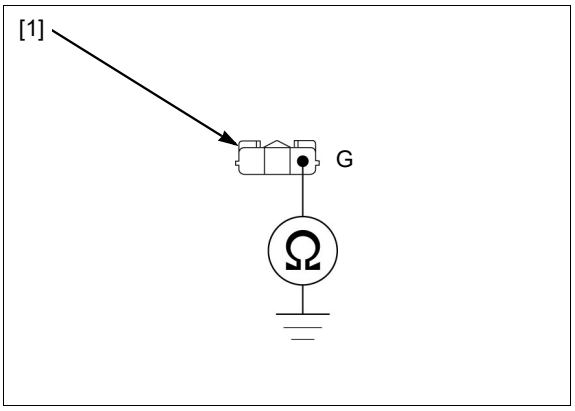
Disconnect the VS sensor 3P connector (page 4-60).
Check for continuity between the wire harness side VS sensor 3P connector [1] and ground.

CONNECTION: Green – Ground

Is there continuity?

YES – GO TO STEP 2.

NO – Open circuit in the Green and Black/green wire



2. VS Sensor Input Line Open Circuit Inspection

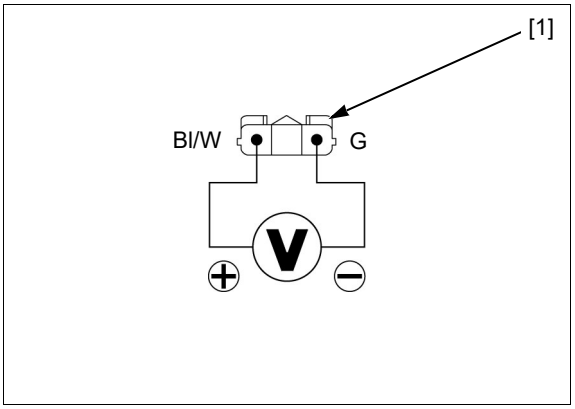
Temporarily install the removed electrical parts in the reverse order of removal.
Turn the ignition switch ON.
Measure the voltage between the wire harness side VS sensor 3P connector [1] and ground.

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

Is there battery voltage?

YES – GO TO STEP 3.

NO – Open circuit in the Black/white wire or its related circuit



3. VS Sensor Signal Line Short Circuit Inspection

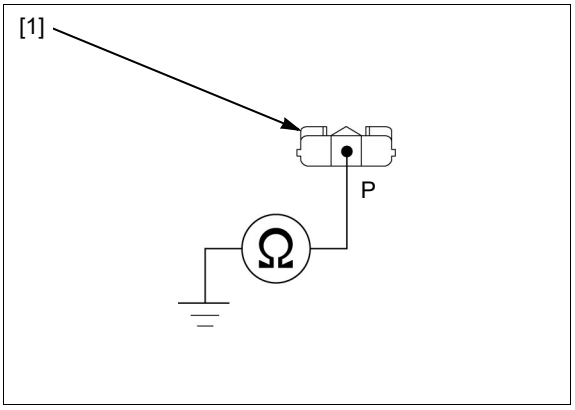
Check for continuity between the wire harness side VS sensor 3P connector [1] and ground.

CONNECTION: Pink – Ground

Is there continuity?

YES – Short circuit in the Pink wire

NO – GO TO STEP 4.



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

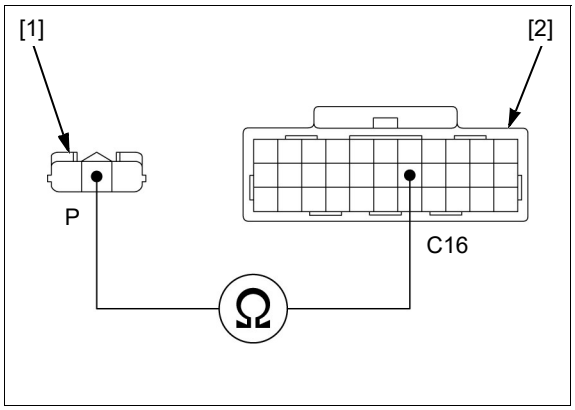
Disconnect the ECM 33P (Gray) connector (page 4-58).
Check for continuity between the wire harness side VS sensor 3P connector [1] and ECM 33P connector [2].

CONNECTION: Pink – C16

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in the Pink wire



5. **VS Sensor Inspection**

Replace the VS sensor with a new one (page 4-60).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
Perform the test ride (page 4-11).
Check the DTC with GST or MCS.

Is same DTC indicated?

YES – Replace the ECM with a new one (page 4-58), 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 and ECM 39P connectors, 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 connector (page 4-62)
– ECM 39P (Black) connector (page 4-58)

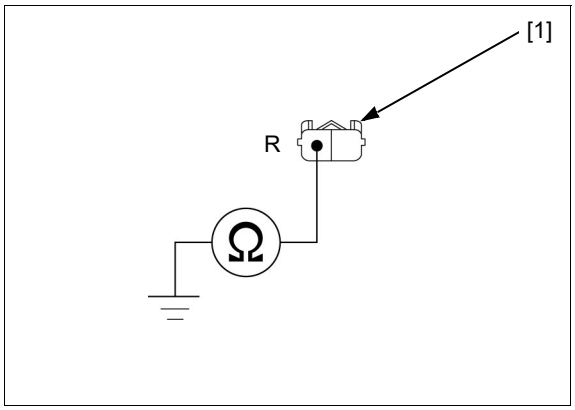
Check for continuity between the wire harness side bank angle sensor 2P connector [1] terminal and ground.

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**

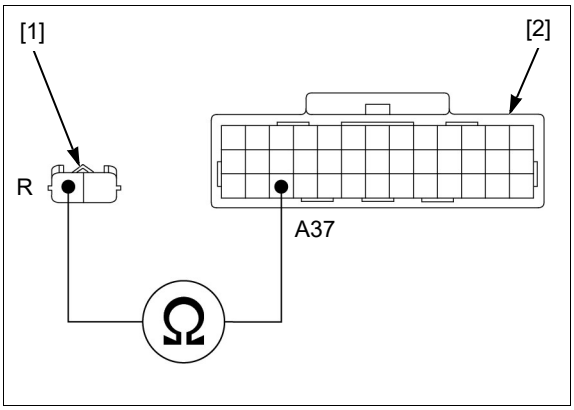
Check for continuity between the wire harness side bank angle sensor 2P connector [1] and ECM 39P connector [2] terminals.

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**

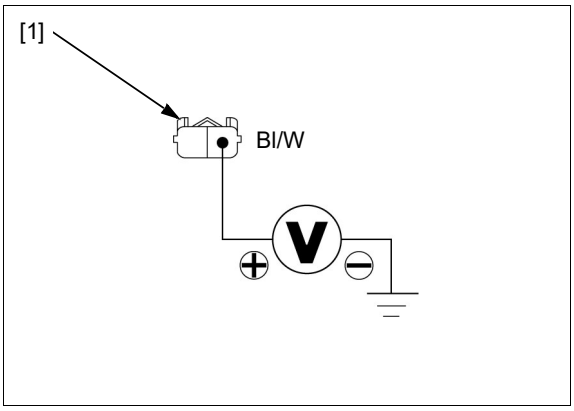
Temporarily install the ECM to the wire harness by connecting the 39P connector.
Turn the ignition switch ON with the engine stop switch "".
Measure the voltage between the wire harness side bank angle sensor 2P connector [1] terminal and ground.

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 4-62).

Is the bank angle sensor normal?

YES – Replace the ECM with a known good one (page 4-58), 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 4-62).
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 (page 4-58), and recheck.

NO – Faulty original bank angle sensor

DTC P1658/P1659

Probable cause:

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

Symptom/Fail-safe function:

- Motorcycle speed is limited: approximately 120 km/h (75 mph) (for DTC P1658)
- Engine operates at idle speed (for DTC P1659)

1. TBW Relay Input Voltage Inspection

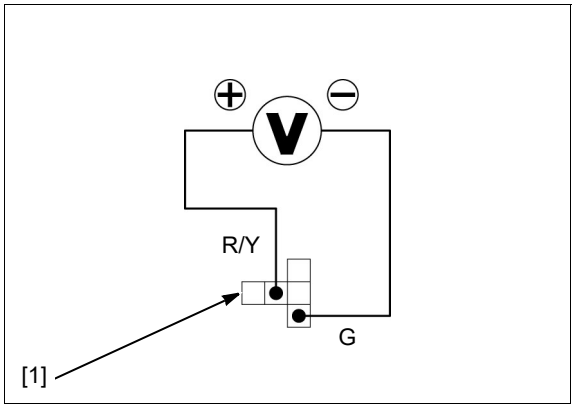
Remove the TBW relay (page 21-24).
Measure the voltage at the wire harness (power box) side TBW relay connector [1].

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

Is there battery voltage?

YES – GO TO STEP 2.

NO – • Open circuit in the Red/yellow wire
• Open circuit in the Green wire



2. TBW Relay Line Open Circuit Inspection

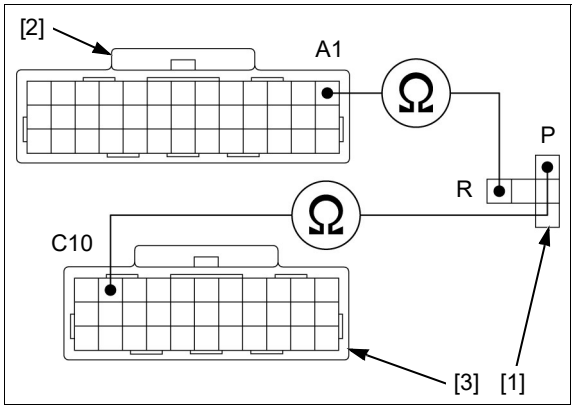
Disconnect the ECM 39P and ECM 33P (Gray) connectors (page 4-58).
Check for continuity between the wire harness side TBW relay connector [1] and ECM 39P connector [2]/ECM 33P connectors [3].

CONNECTION:
Red – A1
Pink – C10

Is there continuity?

YES – GO TO STEP 3.

NO – • Open circuit in the Red wire
• Open circuit in the Pink wire



3. TBW Relay Line Short Circuit Inspection

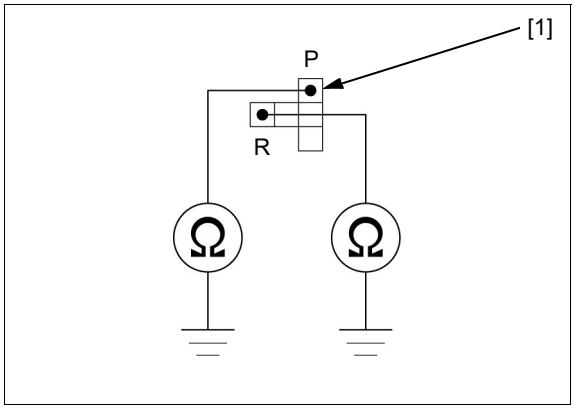
Check for continuity between the wire harness side TBW relay connector [1] and ground.

CONNECTION:
Red – Ground
Pink – Ground

Is there continuity?

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

NO – GO TO STEP 4.



4. TBW Relay Inspection

Replace the TBW relay with a new one (page 21-24).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
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 (page 4-58), 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

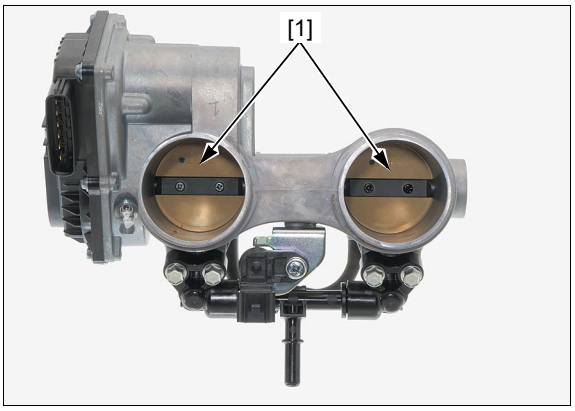
- Be careful not to damage the throttle valves.
- The return spring cannot be replaced. If the return spring is faulty, replace the throttle body.

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)



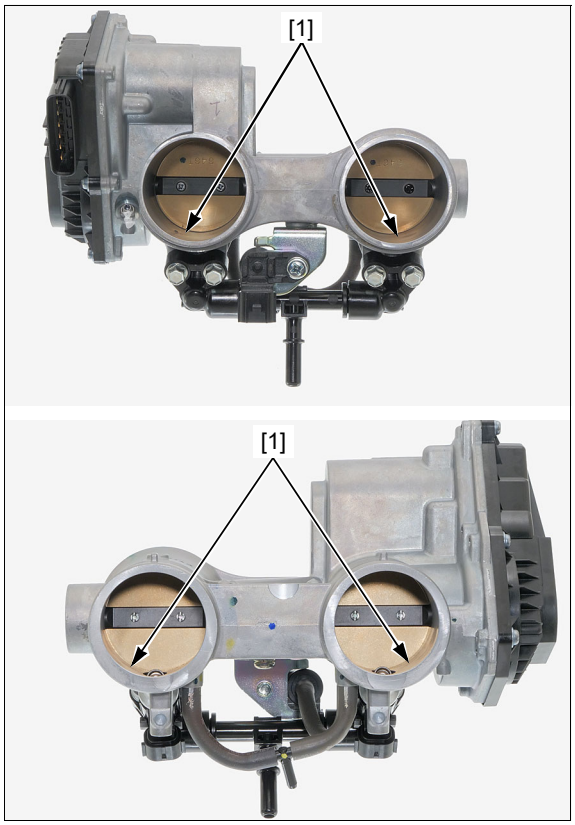
2. Throttle Body Inspection

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 (page 7-14).
Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original throttle body

DTC P1702/P1703

Probable cause:

- Faulty GP sensor or its related circuit
- Faulty ECM

Symptom/Fail-safe function:

- Engine operates normally

1. GP Sensor Input Voltage Inspection

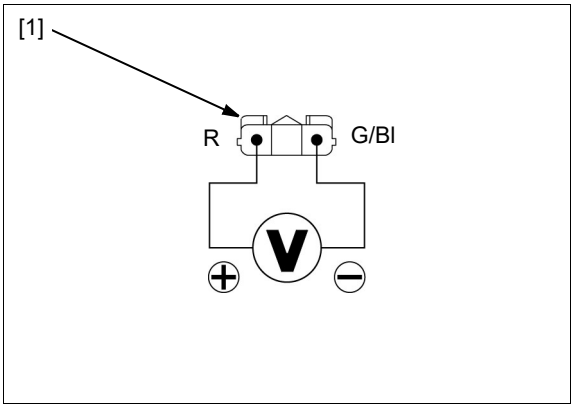
Disconnect the GP sensor 3P connector (page 4-60).
Turn the ignition switch ON.
Measure the voltage at the wire harness side GP sensor 3P connector [1].

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 wires are OK, replace the ECM with a new one (page 4-58), and recheck.



2. GP Sensor Signal Line Open Circuit Inspection

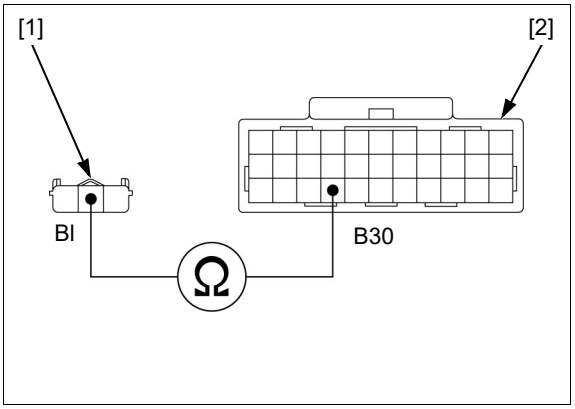
Disconnect the ECM 33P (Black) connector (page 4-58).
Check for continuity between the wire harness side GP sensor 3P connector [1] and ECM 33P connector [2].

CONNECTION: Black – B30

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Black wire



3. GP Sensor Output Line Short Circuit Inspection

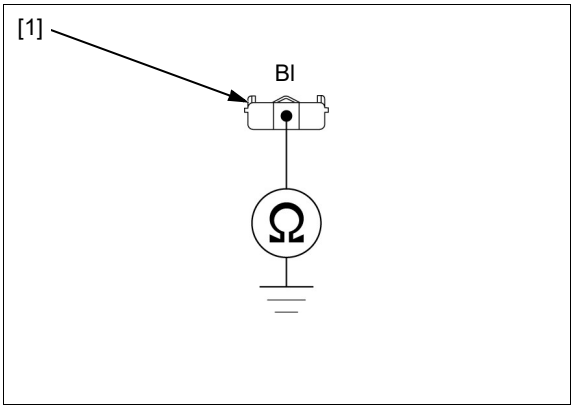
Check for continuity between the wire harness side GP sensor 3P connector [1] and ground.

CONNECTION: Black – Ground

Is there continuity?

YES – Short circuit in the Black wire

NO – GO TO STEP 4.



4. GP Sensor Inspection

Replace the GP sensor with a new one (page 4-60).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original GP sensor

DTC P1708/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 4-61).
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

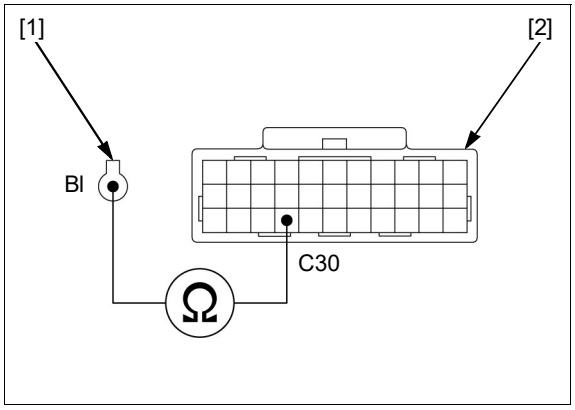
Check for continuity between the wire harness side shift spindle switch terminal [1] and ECM 33P connector [2].

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 (page 4-61).
Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original shift spindle switch

DTC P170D/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

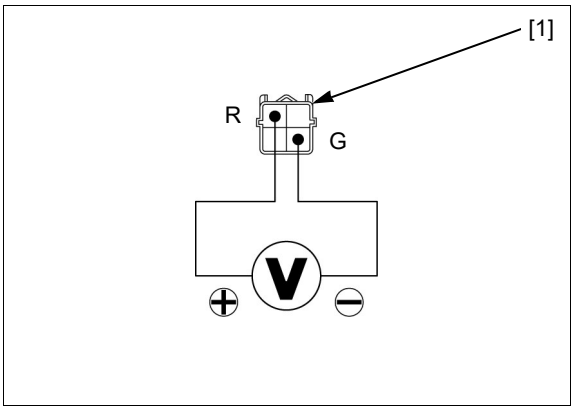
Disconnect the shift stroke sensor (option) 4P connector.
Turn the ignition switch ON.
Measure the voltage at the wire harness side shift stroke sensor 4P connector [1].

CONNECTION: Red (+) – Green (–)

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 wire
• If the wire is OK, replace the ECM with a new one (page 4-58), and recheck.



2. Shift Stroke Sensor Output Line Open Circuit Inspection

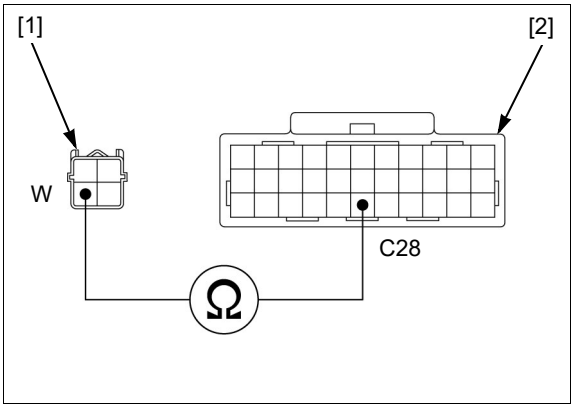
Disconnect the ECM 33P (Gray) connector (page 4-58).
Check for continuity between the wire harness side shift stroke sensor 4P connector [1] and ECM 33P connector [2].

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

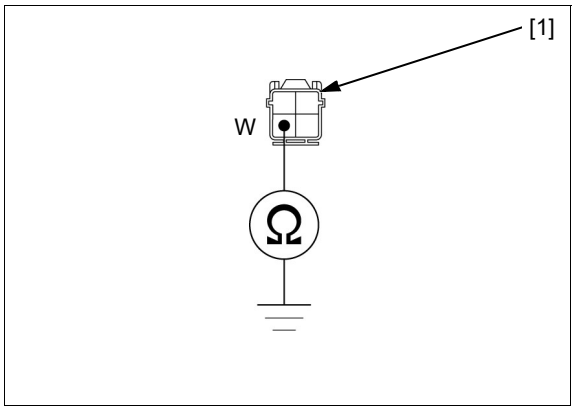
Check for continuity between the wire harness side shift stroke sensor 4P connector [1] and ground.

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 (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original shift stroke sensor

DTC P2101/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

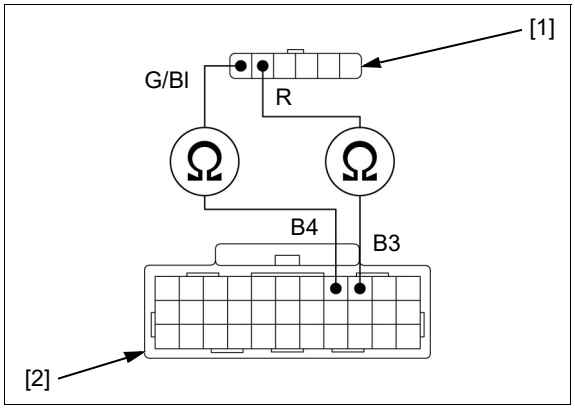
Disconnect the TBW 6P connector (page 7-14).
Disconnect the ECM 33P (Black) connector (page 4-58).
Check for continuity between the wire harness side TBW 6P connector [1] and ECM 33P connector [2].

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

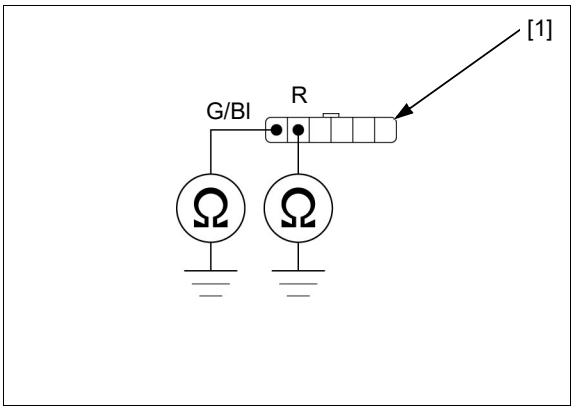
Check for continuity between the wire harness side TBW motor 6P connector [1] and ground.

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) (page 7-14).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original TBW motor

DTC P2121/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 right handlebar switch (APS) with a new one (page 21-17).
Erase the DTC (page 4-6).
Turn the ignition switch ON and wait for 10 seconds.
Check the DTC with GST or MCS.

Is the same DTC indicated?

YES – Replace the ECM with a new one (page 4-58), and recheck.

NO – Faulty original grip APS

DTC P2122/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

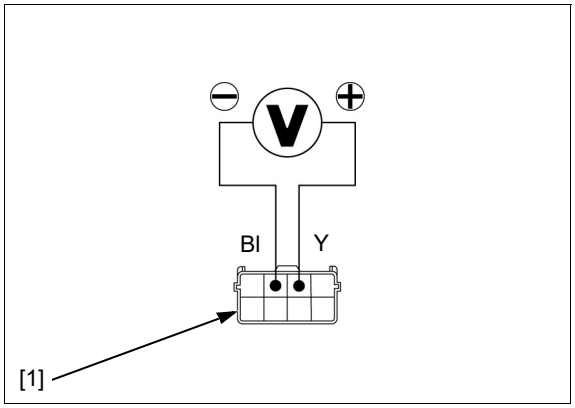
Disconnect the right handlebar switch (APS) 8P connector (page 21-17).
Turn the ignition switch ON.
Measure the voltage at the wire harness side right handlebar switch (APS) 8P connector [1].

CONNECTION: Yellow (+) – Black (–)

Is about 5 V indicated?

YES – GO TO STEP 2.

NO –
- Open circuit in the Yellow wire
- Open circuit in the Black wire
- If the wires are OK, replace the ECM with a new one (page 4-58), and recheck.



2. APS 1 Output Line Open Circuit Inspection

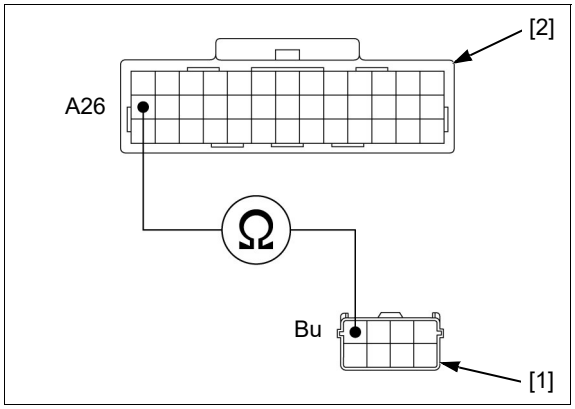
Disconnect the ECM 39P connector (page 4-58).
Check for continuity between the wire harness side right handlebar switch (APS) 8P connector [1] and ECM 39P connector [2].

CONNECTION: Blue – A26

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Blue wire



3. APS 1 Output Line Short Circuit Inspection

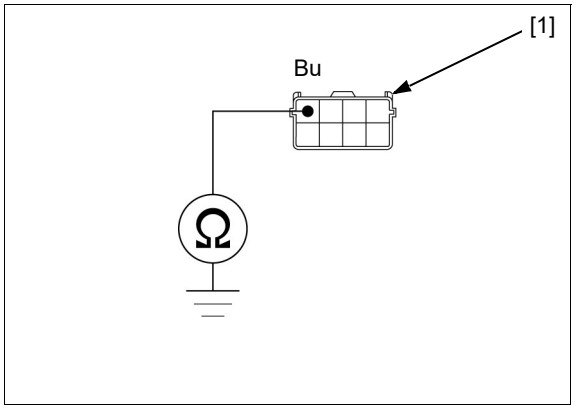
Check for continuity between the wire harness side right handlebar switch (APS) 8P connector [1] and ground.

CONNECTION: Blue – Ground

Is there continuity?

YES – Short circuit in the Blue wire

NO – GO TO STEP 4.



4. APS 1 Inspection

Replace the right handlebar switch (APS) (page 21-17).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original right handlebar switch (APS)

DTC P2127/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

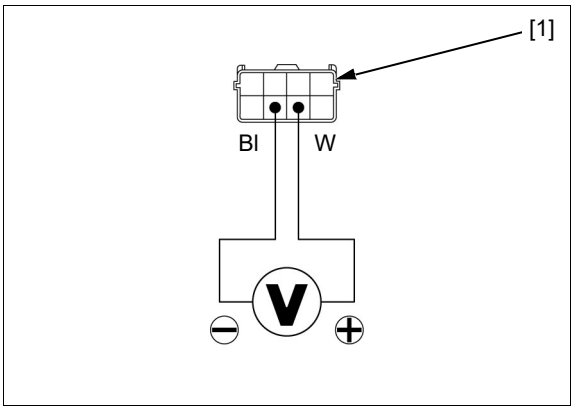
Disconnect the right handlebar switch (APS) 8P connector (page 21-17).
Turn the ignition switch ON.
Measure the voltage at the wire harness side right handlebar switch (APS) 8P connector [1].

CONNECTION: White (+) – Black (–)

Is about 5 V indicated?

YES – GO TO STEP 2.

NO – • Open circuit in the White wire
• Open circuit in the Black wire
• If the wires are OK, replace the ECM with a new one (page 4-58), and recheck.



2. APS 2 Output Line Open Circuit Inspection

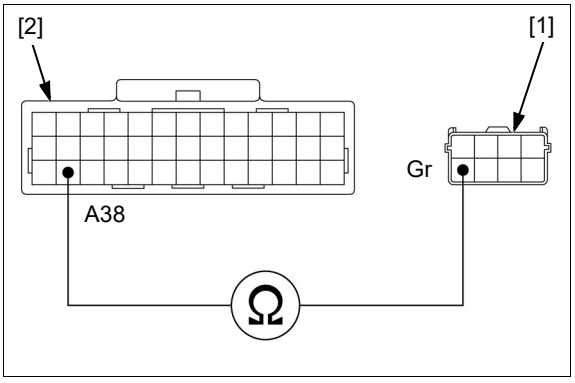
Disconnect the ECM 39P connector (page 4-58).
Check for continuity between the wire harness side right handlebar switch (APS) 8P connector [1] and ECM 39P connector [2].

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

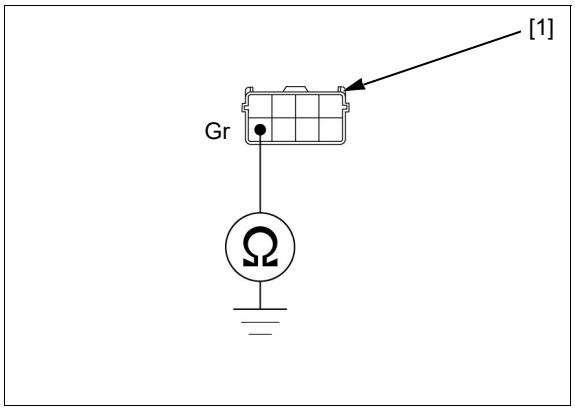
Check for continuity between the wire harness side right handlebar switch (APS) 8P connector [1] and ground.

CONNECTION: Gray – Ground

Is there continuity?

YES – Short circuit in the Gray wire

NO – GO TO STEP 4.



4. APS 2 Inspection

Replace the right handlebar switch (APS) (page 21-17).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original right handlebar switch (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 DTC P2135, troubleshoot it first.
- Clean the throttle bores and valves carefully.

1. TP Sensor Line Short Circuit Inspection

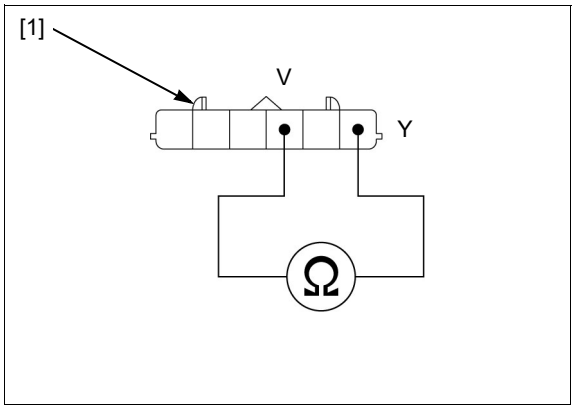
Disconnect the ECM 33P (Black) connector (page 4-58).
Disconnect the TBW 6P connector (page 7-14).
Check for continuity at the wire harness side TBW 6P connector [1].

CONNECTION: Yellow – Violet

Is there continuity?

YES – • Short circuit of the Yellow wire to violet wire

NO – GO TO STEP 2.



2. TP Sensor Inspection

Replace the throttle body (TP sensor) (page 7-14).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
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 (page 4-58), 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

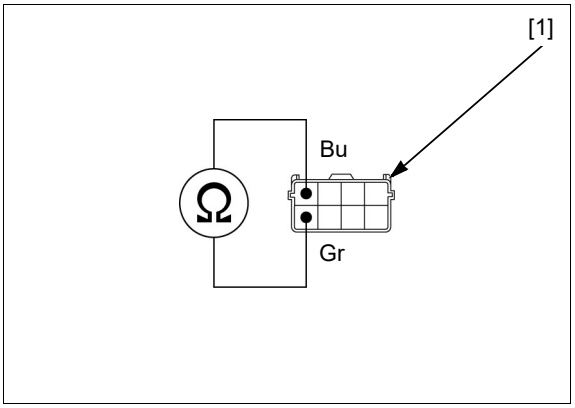
Disconnect the ECM 39P connector (page 4-58).
Disconnect the right handlebar switch (APS) 8P connector (page 21-17).
Check for continuity at the wire harness side right handlebar switch (APS) 8P connector [1].

CONNECTION: Blue – Gray

Is there continuity?

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

NO – GO TO STEP 2.



2. APS Inspection

Replace the right handlebar switch (APS) (page 21-17).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original right handlebar switch (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 18P connector (page 19-24)
– ECM 33P (Black) connector (page 4-58)

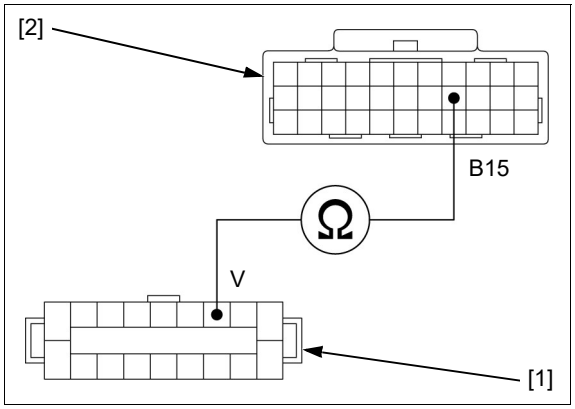
Check for continuity between the wire harness side ABS modulator 18P connector [1] and ECM 33P connector [2].

CONNECTION: Violet – B15

Is there continuity?

YES – GO TO STEP 2.

NO – Open circuit in the Violet wire



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

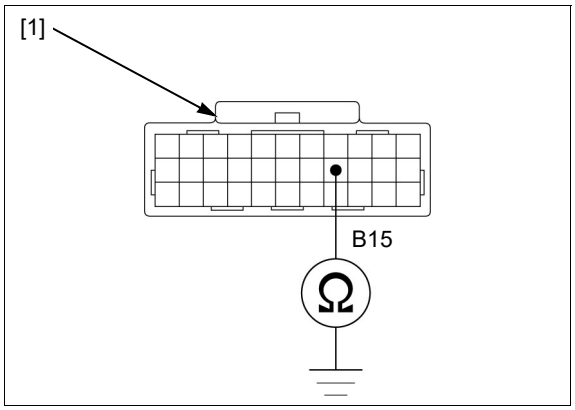
Check for continuity between the wire harness side ECM 33P connector [1] and ground.

CONNECTION: B15 – Ground

Is there continuity?

YES – Short circuit in the Violet wire

NO – GO TO STEP 3.



3. ECM Inspection

Replace the ECM with a new one (page 4-58).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
Perform the test ride (page 4-11).
Check the DTC with GST or MCS.

Is same DTC indicated?

YES – Replace the ABS modulator with a new one (page 19-24), and recheck.

NO – Faulty original ECM

DTC P2195/P2196

Probable cause:

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

Symptom/Fail-safe function:

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

1. **A/F sensor Inspection**

   Replace the A/F sensor with a new one (page 4-63).
   Erase the DTC (page 4-6).
   Check the DTC with GST or MCS.

   Is same DTC indicated?

   YES – Replace the ECM with a new one (page 4-58), and recheck.

   NO – Faulty original A/F sensor

DTC P2A00

Probable cause:

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

Symptom/Fail-safe function:

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

1. **A/F sensor Inspection**

   Replace the A/F sensor with a new one (page 4-63).
   Erase the DTC (page 4-6).
   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 (page 4-58), and recheck.

   NO – Faulty original A/F sensor

DTC U0001

NOTE:

- When other DTC is displayed, together with U0001, troubleshoot the other DTC 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 21-26)

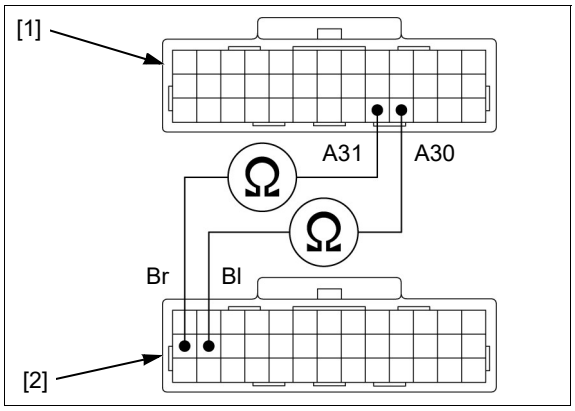
Check the continuity between the wire harness side ECM 39P connector [1] and BCU 39P connector [2].

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

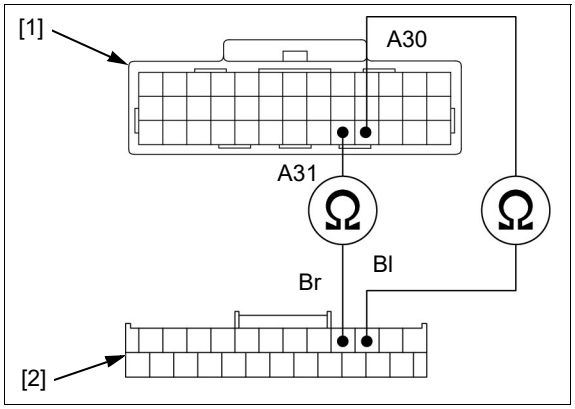
Disconnect the meter 24P connector (page 21-8).
Check the continuity between the wire harness side ECM 39P connector [1] and meter 24P connector [2].

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

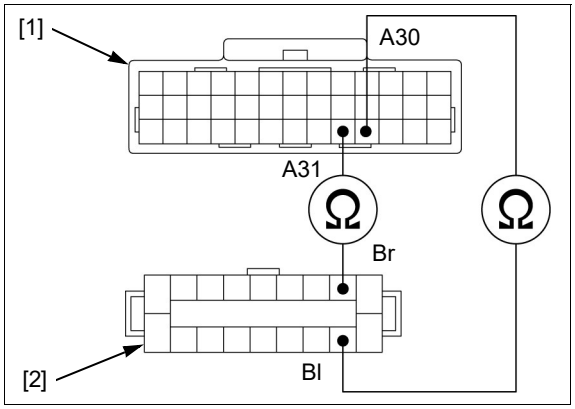
Disconnect the ABS modulator 18P connector (page 19-24).
Check the continuity between the wire harness side ECM 39P connector [1] and ABS modulator 18P connector [2].

CONNECTION:
A31 – Brown
A30 – Black

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

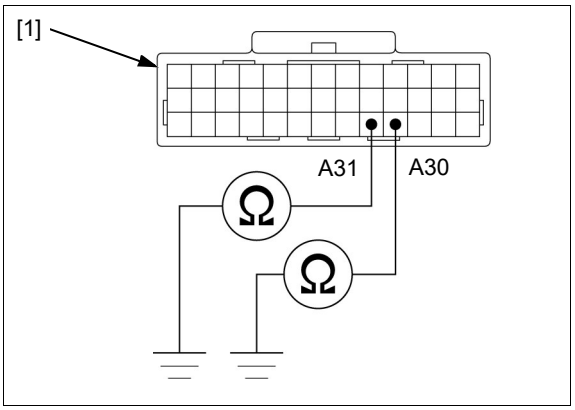
Check for continuity between the wire harness side ECM 39P connector [1] and ground.

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 (page 4-6).
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 (page 4-58), and recheck.

NO – Faulty original part

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 (Black) connector (page 4-58)
– Meter 24P (Gray) connector (page 21-8)

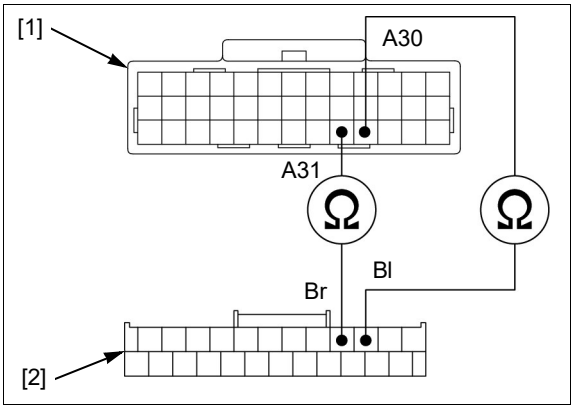
Check the continuity between the wire harness side ECM 39P connector [1] and meter 24P connector [2].

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 (page 21-8).
Connect the disconnected connector(s).
Erase the DTC (page 4-6).
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 (page 4-58), 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).

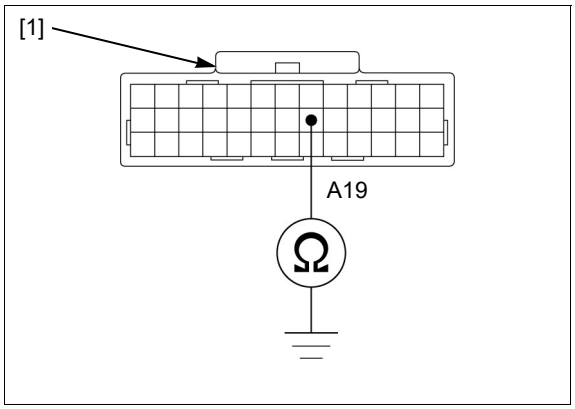
When The Ignition Switch ON, The MIL Does Not Go Off Within A Few Seconds (Engine Starts)

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:
Male Pin Prove **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 (page 4-58), and recheck.



ECM

REMOVAL/INSTALLATION

Remove the rear seat (page 2-4).

Disconnect the following connectors:

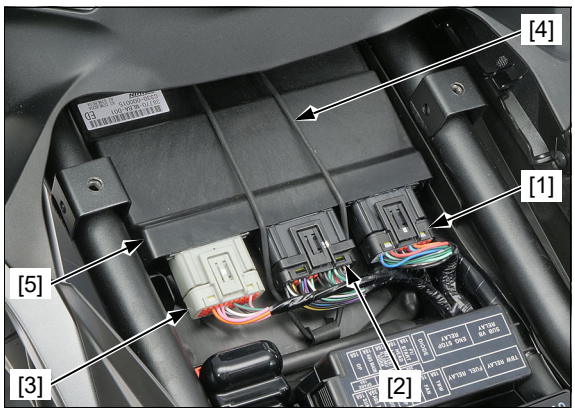
– ECM 39P (Black) [1]
– ECM 33P (Black) [2]
– ECM 33P (Gray) [3]

Unhook the band [4] and remove the ECM [5].

Installation is in the reverse order of removal.

If the ECM is replaced, perform the following procedure:

– Crank pulse initialize learning procedure (page 4-64)
– Key registration procedure (page 22-4)



POWER/GROUND LINE INSPECTION

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

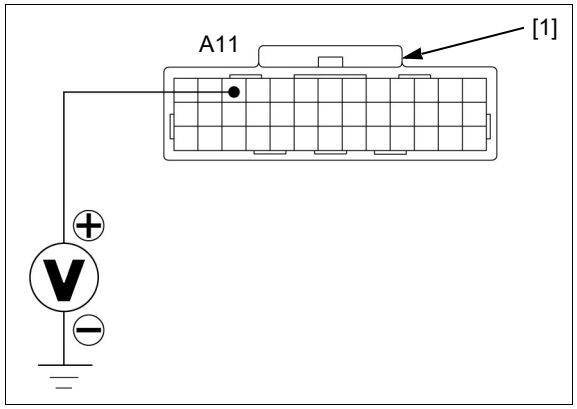
POWER INPUT LINE

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

CONNECTION: A11 (+) – Ground (–)

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

If there is no voltage, check the following:
– Blown FI/START fuse (10 A)
– Open circuit in the Black/white wire related circuit between the ECM and ignition switch



GROUND LINE

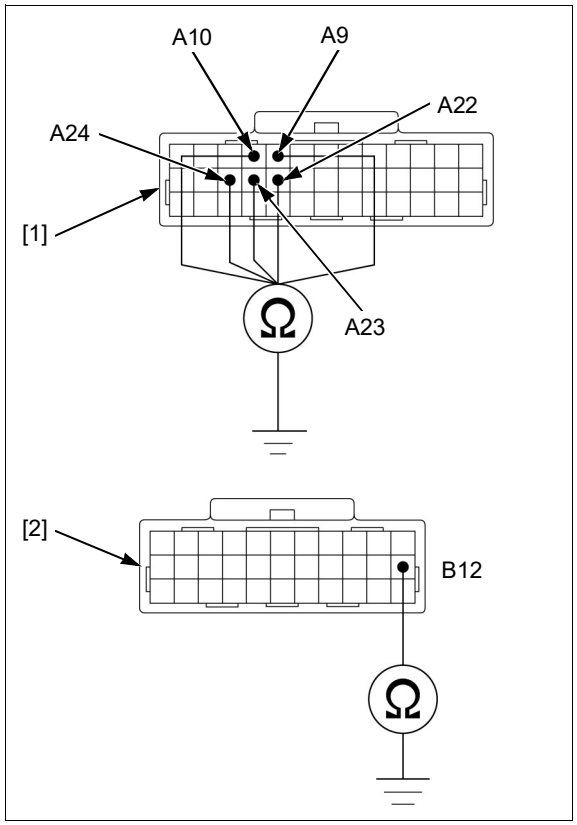
Disconnect the ECM 39P connector and 33P (Black) connector (page 4-58).

Check for continuity between the wire harness side ECM 39P [1] and 33P [2] connectors and ground.

CONNECTION: A9 – Ground
A10 – Ground
A22 – Ground
A23 – Ground
A24 – Ground
B12 – Ground

There should be continuity at all times.

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



VS SENSOR

REMOVAL/INSTALLATION

Remove the bolt [1], VS sensor [2] and O-ring [3].

Disconnect the VS sensor 3P connector [4].

Installation is in the reverse order of removal.

NOTE:

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

GP SENSOR

REMOVAL/INSTALLATION

Remove the drive sprocket cover (page 2-17).

Disconnect the GP sensor 3P connector [1].

Remove the bolt [2] and GP sensor [3].

Installation is in the reverse order of removal.

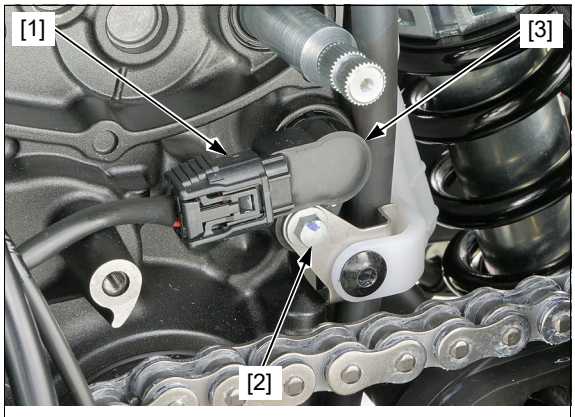
NOTE:

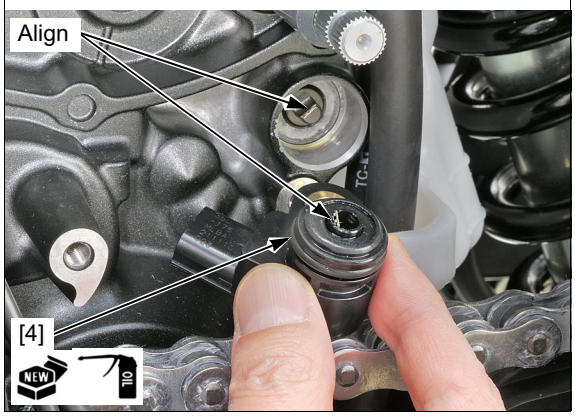
- Replace the O-ring [4] with a new one.
- Apply engine oil to a new O-ring.
- Align the cut out of the shift drum and GP sensor.

TORQUE:

GP sensor bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)





SHIFT SPINDLE SWITCH

REMOVAL/INSTALLATION

Remove the radiator reserve tank (page 8-9).

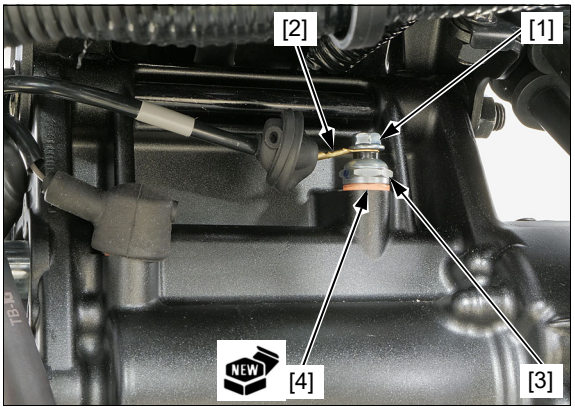
Remove the nut [1], shift spindle switch wire [2], shift spindle switch [3] and sealing washer [4].

Installation is in the reverse order of removal.

TORQUE:
Shift spindle switch:
12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:
- Replace the sealing washer with a new one.

Route the wire properly (page 1-21).



MAP SENSOR

REMOVAL/INSTALLATION

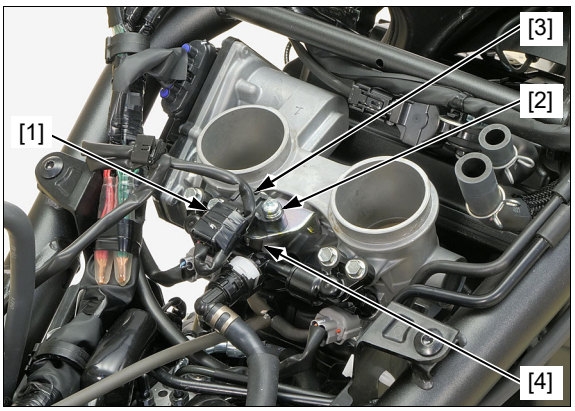
Remove the air cleaner housing (page 7-12).

Disconnect the MAP sensor 3P connector [1].

Remove the screw [2], MAP sensor [3] and hose [4].

Installation is in the reverse order of removal.

TORQUE:
MAP sensor mounting screw:
4.9 N·m (0.5 kgf·m, 3.6 lbf·ft)



IAT SENSOR

REMOVAL/INSTALLATION

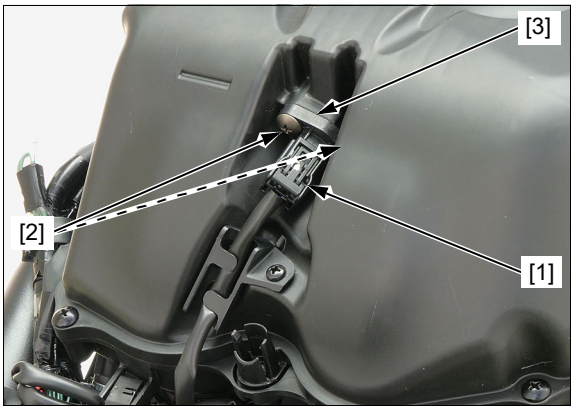
Lift and support the fuel tank (page 7-6).

Disconnect the IAT sensor 2P connector [1].

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

Installation is in the reverse order of removal.

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



ECT SENSOR

REMOVAL/INSTALLATION

Drain the coolant (page 8-5).

Disconnect the ECT sensor 2P connector [1].

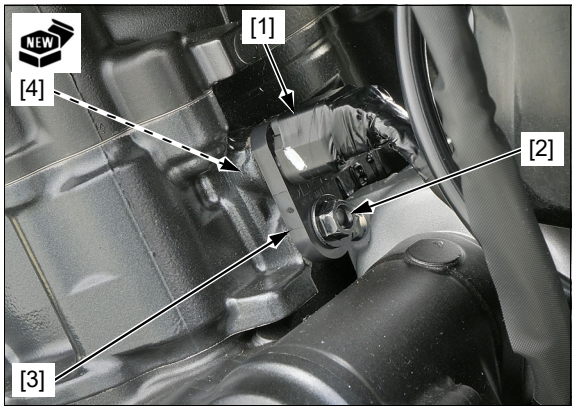
Remove the bolt [2], ECT sensor [3] and O-ring [4].

Installation is in the reverse order of removal.

NOTE:

- Replace the O-ring with a new one.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



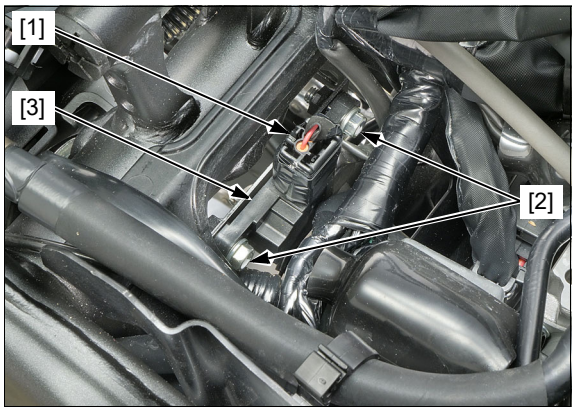
BANK ANGLE SENSOR

REMOVAL/INSTALLATION

Remove the fuel tank (page 7-6).

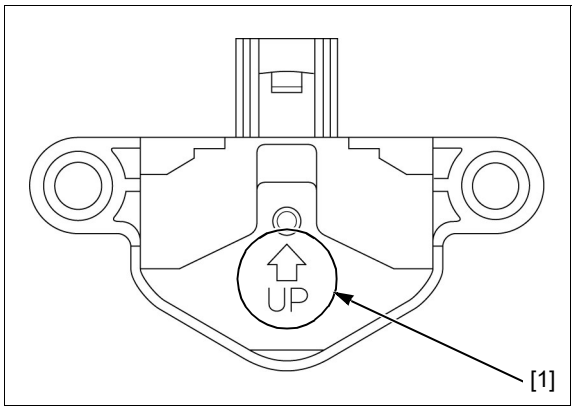
Disconnect the bank angle sensor 2P connector [1].

Remove the bolt [2] and bank angle sensor [3].



Installation is in the reverse order of removal.

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



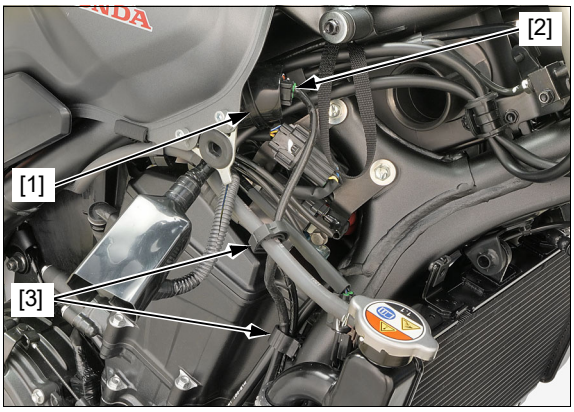
A/F SENSOR

REMOVAL/INSTALLATION

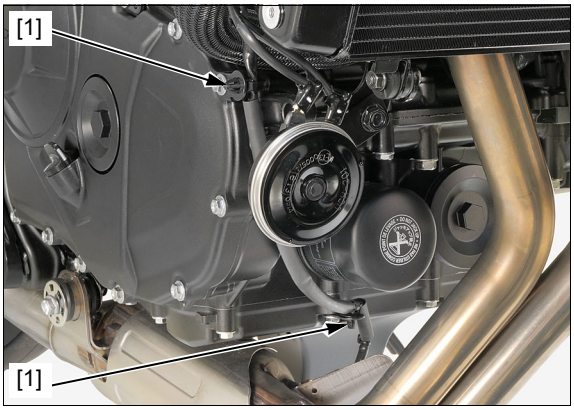
Remove the shroud B (page 2-9).

Remove the wire band [1] and disconnect the A/F sensor 4P connector [2].

Remove the wire bands [3].



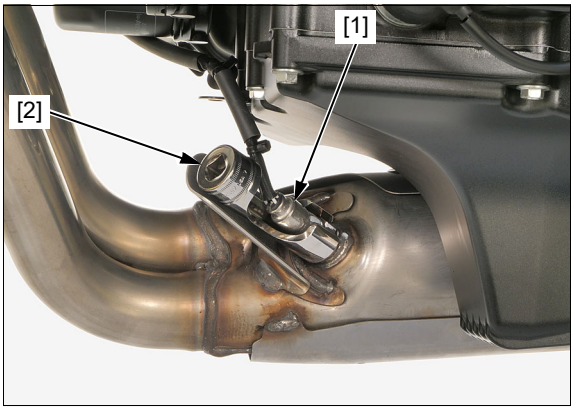
Remove the wire clips [1].



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

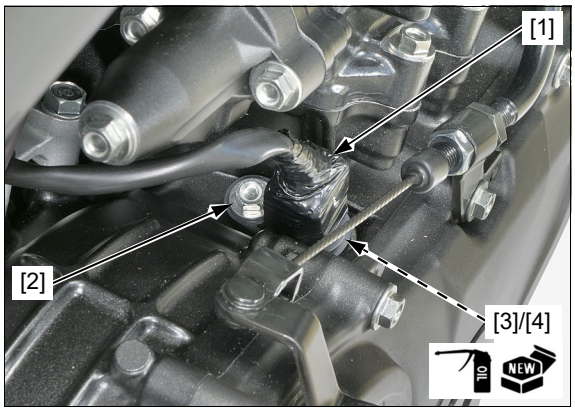
REMOVAL/INSTALLATION

Disconnect the CKP sensor 3P connector [1].

Remove the 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 4-64).

CRANK PULSE LEARNING

NOTE:
- If you done the following works, perform the crank pulse learning reset procedure and crank pulse initialize learning procedure.
  Perform the crank pulse learning reset procedure first, and then the crank pulse initialize learning procedure.
  – CKP sensor removing
  – Pulser plate 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 (engine coolant temperature: 40°C (104°F).

   Repeat the following procedure more than 5 times.

– Rev the engine up to 8,000 min^{-1} (rpm) and higher.
– Close the throttle grip immediately and wait for the engine speed to decrease to the idle speed.

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.

MEMO

5. IGNITION SYSTEM

SERVICE INFORMATION

GENERAL

NOTICE

- *The ECM may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn off the ignition switch before servicing.*
- *Use spark plug of the correct heat range. Using a spark plug with an incorrect heat range can damage the engine.*
- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned ON and current is present.
- A faulty ignition system is often related to poorly connected or corroded connections. Check those connections before proceeding.
- Make sure the battery is adequately charged. Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plug.
- The ignition timing cannot be adjusted since the ECM is factory preset.
- When servicing the ignition system, always follow the steps in the troubleshooting table (page 5-3).
- For following components information, refer to each section.
  - Ignition switch (page 21-15)
  - Engine stop switch/starter switch (page 21-17)
  - Main relay (page 21-24)
  - Bank angle sensor (page 4-62)
  - Sidestand switch (page 21-22)
  - Neutral switch (page 21-21)
  - Clutch switch (page 21-20)
  - CKP sensor (page 4-64)
  - ECM (page 4-58)
- The following color codes are used throughout this section.

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

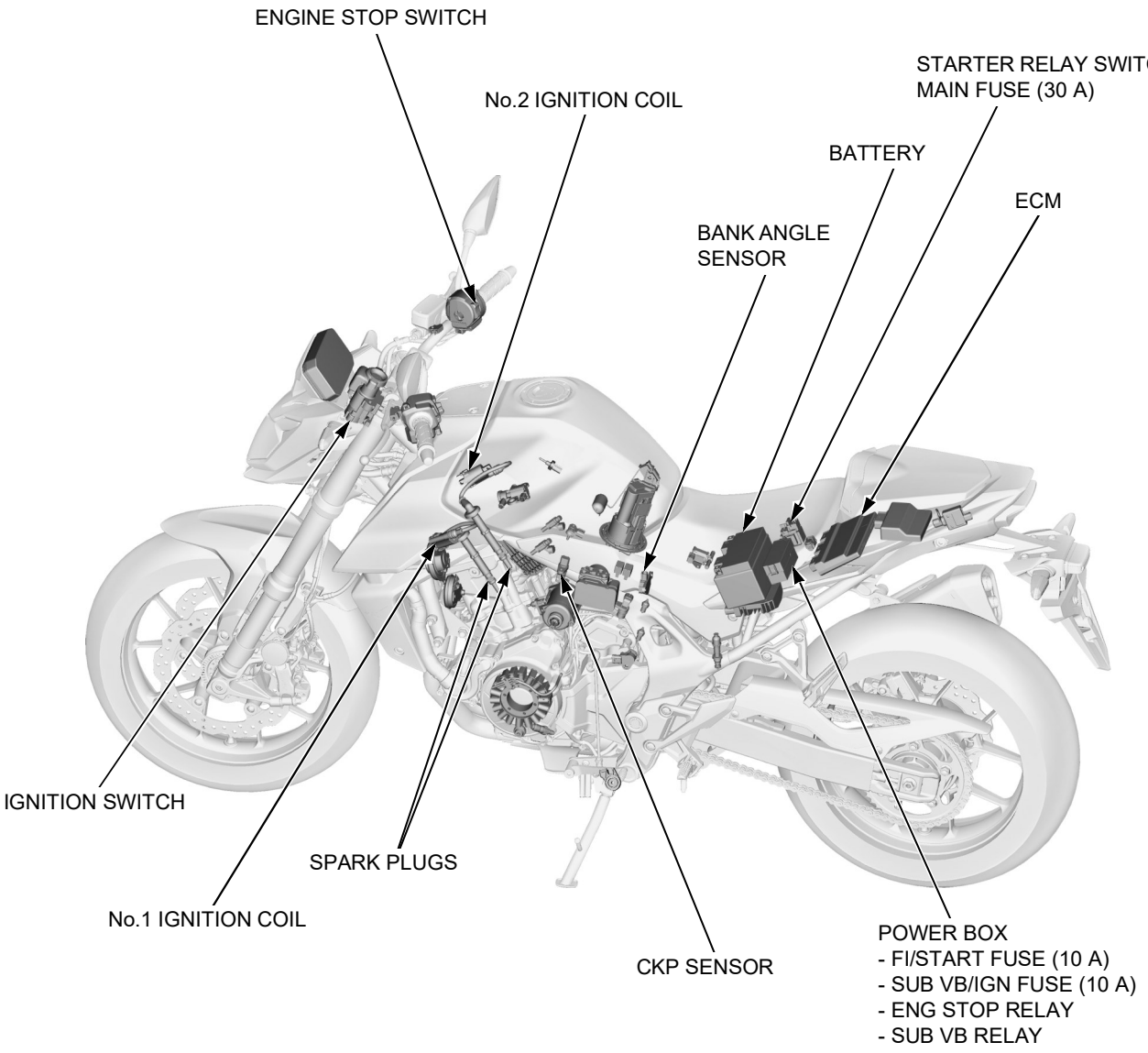
TROUBLESHOOTING

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

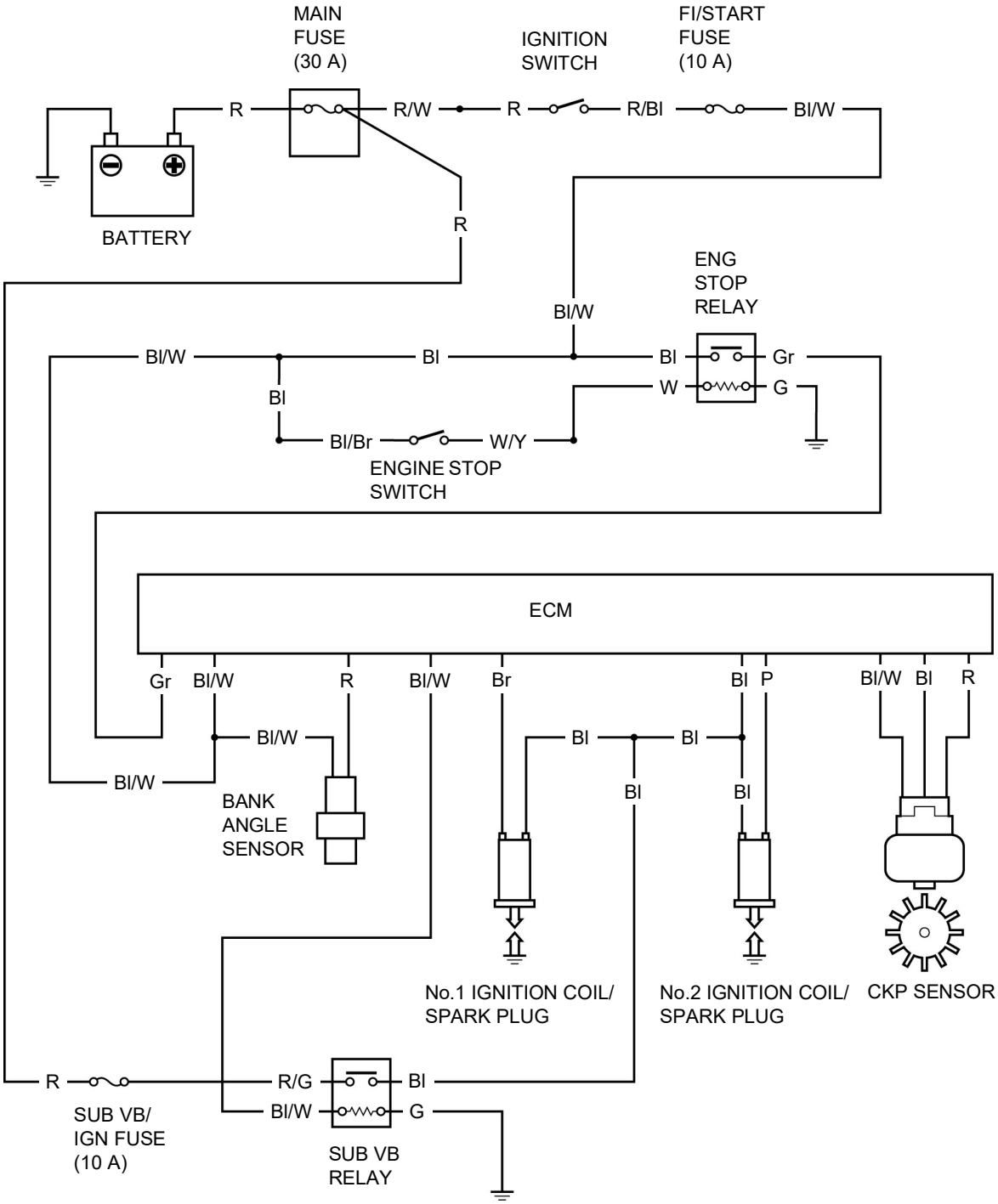
No spark at spark plug

Unusual condition		Probable cause (Check in numerical order)
Ignition coil primary voltage	No initial voltage with the ignition switch turned ON and engine stop switch turned "⟳" (Other electrical components are normal).	1. An open circuit in the Black wire between the SUB VB relay and ignition coil. 2. Faulty SUB VB relay or its related circuits. 3. Loose or poor connection of the primary terminal, or an open circuit in the primary coil. 4. Faulty ECM (in case when the initial voltage is normal with the ECM connector disconnected).
	Initial voltage is normal, but it drops by 2 – 4 V while cranking the engine.	1. Incorrect peak voltage adaptor connections (System is normal if measured voltage is over the specifications with reverse connections). 2. Battery is undercharged (Voltage drops largely when the engine is started). 3. Loose or poor connection or an open circuit in ECM power/ground line wires (page 4-59). 4. An open circuit or loose connection in the Brown or Pink wire between the ignition coil and ECM. 5. Faulty sidestand switch or its related circuits. 6. Faulty CKP sensor or its related circuits. 7. Faulty ECM (in case when above No.1 through 9 are normal).
	Initial voltage is normal, but there is no peak voltage while cranking the engine.	1. Incorrect peak voltage adaptor connections. 2. Faulty peak voltage adaptor. 3. Faulty CKP sensor. 4. Faulty ECM (in case when above No.1 through 3 are normal).
	Initial voltage is normal, but peak voltage is lower than the standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too slow (Battery is undercharged). 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). 4. Faulty ECM (in case when above No.1 through 3 are normal).
	Initial and peak voltages are normal, but no spark jumps.	1. Faulty spark plug or leaking ignition coil secondary current. 2. Faulty ignition coil.

SYSTEM LOCATION



SYSTEM DIAGRAM



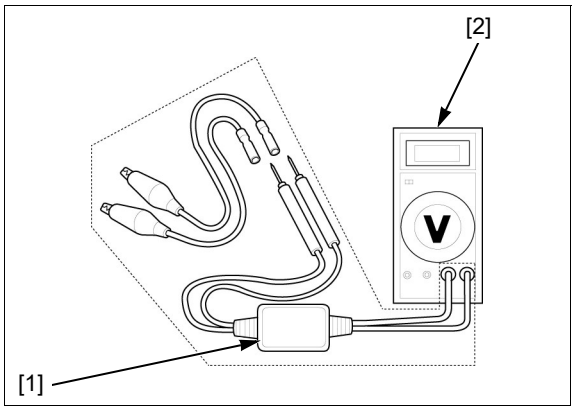
IGNITION SYSTEM INSPECTION

NOTE:

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

Connect the peak voltage adaptor [1] to the digital multimeter [2], or use the Imrie diagnostic tester.

TOOL:
Imrie diagnostic tester (model 625) or
Peak Voltage Adaptor 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 MΩ/DCV minimum)



IGNITION COIL PRIMARY PEAK VOLTAGE

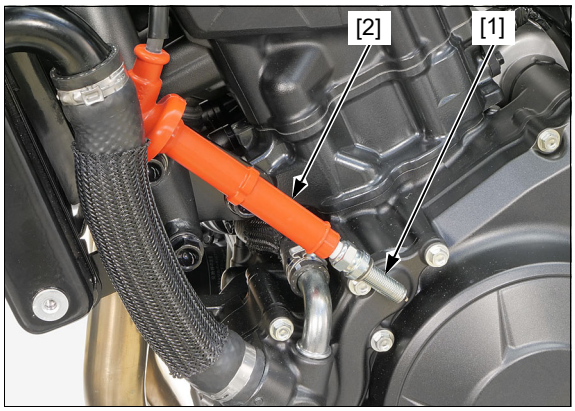
NOTE:

- Check all system connections before performing this inspection. Loose connectors can cause incorrect readings.
- If the system is disconnected, incorrect peak voltage might be measured.
- Check the cylinder compression and check that the spark plugs are installed correctly in the cylinder head.

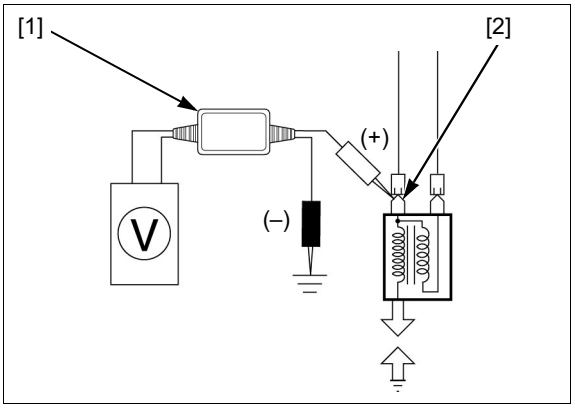
Remove the spark plug caps (page 3-6).

Temporarily connect the IAT sensor 2P connector.

Connect a known good spark plug [1] to the spark plug cap [2] and ground it to the engine as done in a spark test.



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



TOOL:
Imrie diagnostic tester (model 625) or
Peak Voltage Adaptor 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 MΩ/DCV minimum)

CONNECTION:
No.1 ignition coil:
Brown (+) – Ground (–)
No.2 ignition coil:
Pink (+) – Ground (–)

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

Check the initial voltage at this time.

The battery voltage should be measured.

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

Shift the transmission into neutral.

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

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

PEAK VOLTAGE: 100 V minimum

NOTE:

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

If the peak voltage is lower than the standard value, follow the checks described in the troubleshooting table (page 5-3).

Install the removed parts in the reverse order of removal.

IGNITION COIL

REMOVAL/INSTALLATION

Remove the shroud B (page 2-9).

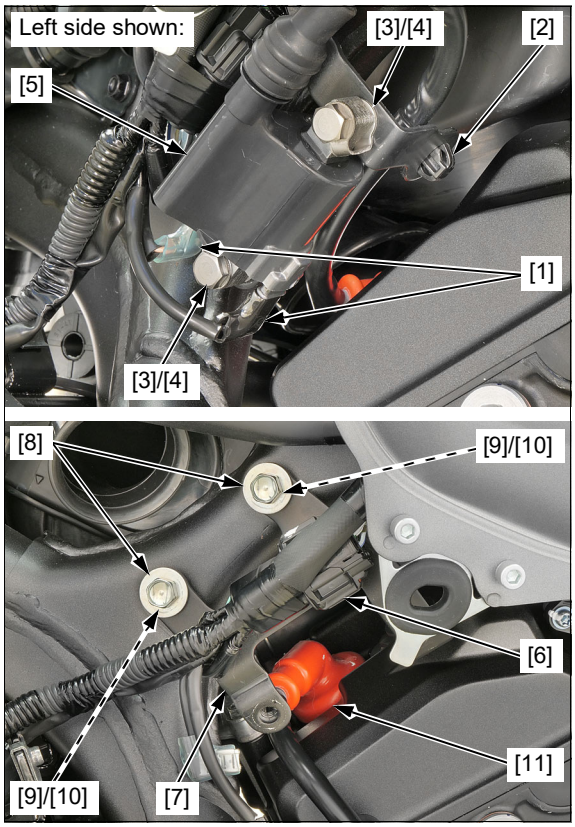
Disconnect the primary wire connectors [1].

Remove the wire clip [2], bolts [3], spacers [4] and ignition coil [5].

Remove the connector [6] from the stay [7].

Remove the bolts [8], stay, collars [9], mount rubber [10] and spark plug cap [11].

Installation is in the reverse order of removal.



6. ELECTRIC STARTER

SERVICE INFORMATION

GENERAL

NOTICE

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

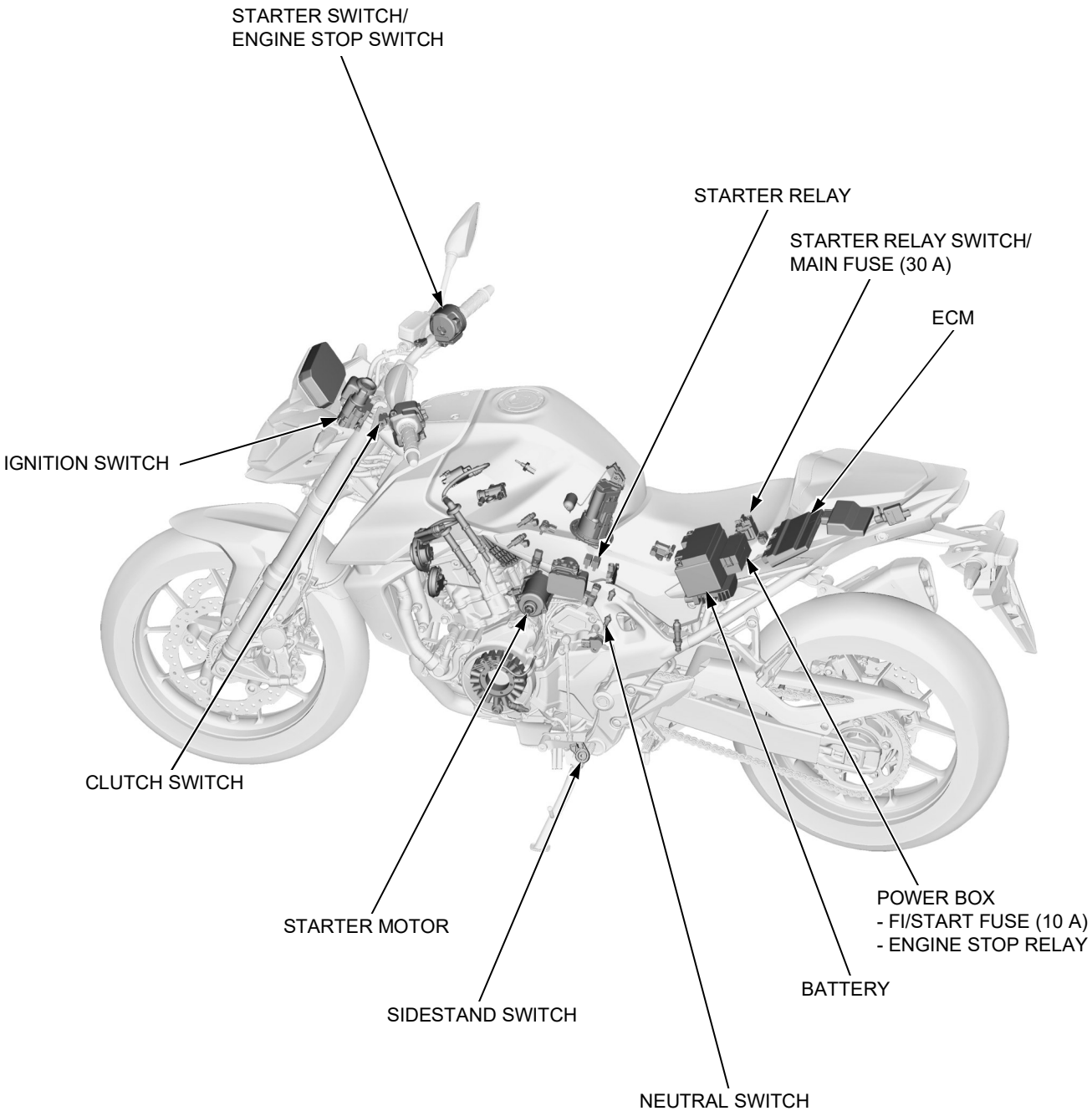
- The starter motor can be serviced with the engine installed in the frame.
- Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- When servicing the starter system, always follow the steps in the troubleshooting table (page 6-2).
- Before starting any troubleshooting, check the DTC.
- Refer to the following components information:
  - Neutral switch (page 21-21)
  - Ignition switch (page 21-15)
  - Starter switch (page 21-17)
  - Engine stop switch (page 21-17)
  - Clutch switch (page 21-20)
  - Sidestand switch (page 21-22)
  - The following color codes are used throughout this section.

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

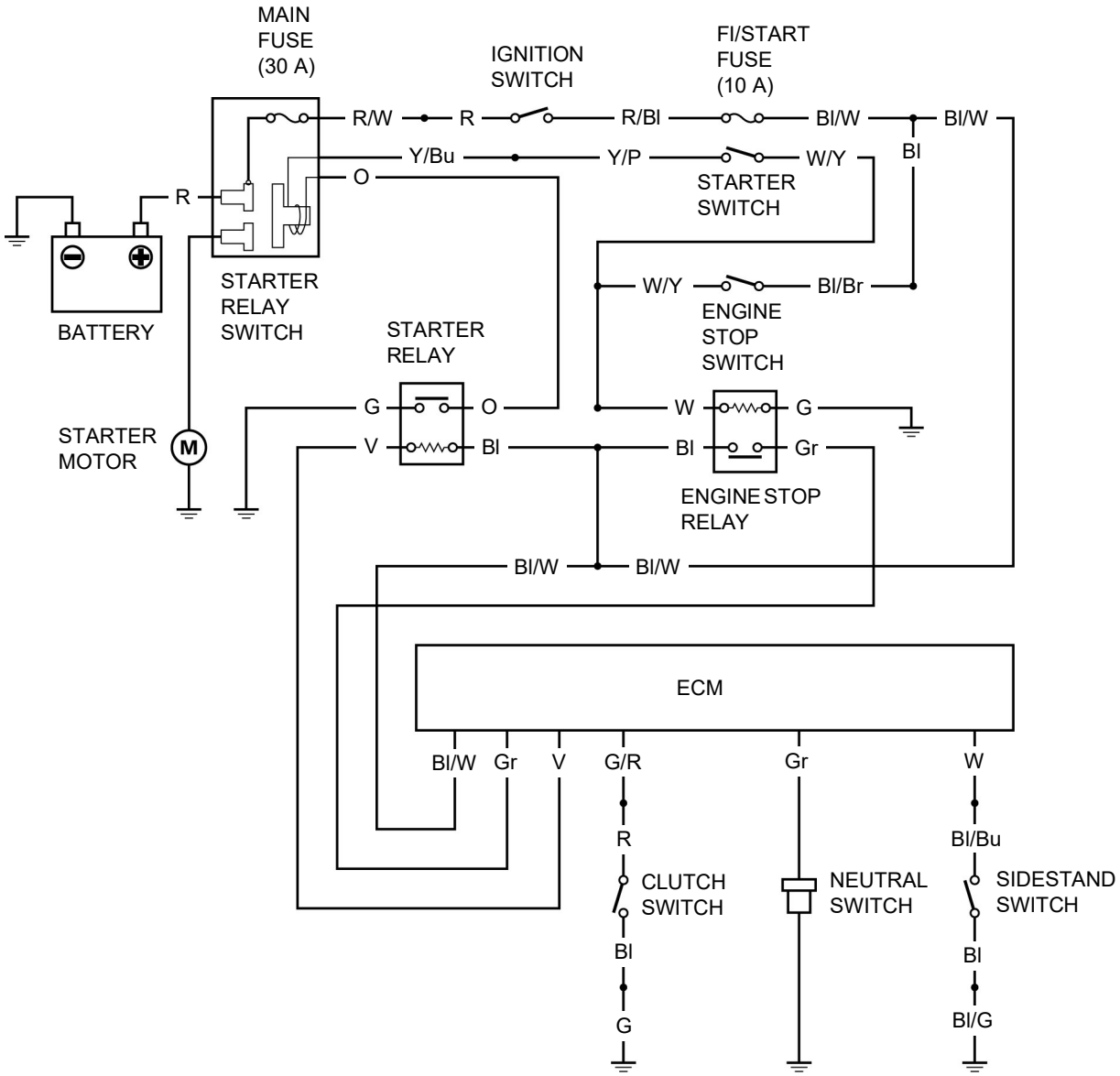
TROUBLESHOOTING

Unusual condition		Probable cause (Check in numerical order)
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. Blown fuse 3. Weak battery 4. Faulty starter relay switch 5. Faulty starter relay or its related circuits 6. Faulty clutch switch or its related circuits 7. Faulty sidestand switch or its related circuits 8. Faulty starter motor or its related circuits 9. Faulty right handlebar switch or its related circuits 10. Faulty ECM (in case when above No.1 through 10 are normal)
	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. Blown fuse 3. Weak battery 4. Faulty starter relay switch 5. Faulty starter relay or its related circuits 6. Faulty neutral switch or its related circuits 7. Faulty starter motor or its related circuits 8. Faulty right handlebar switch or its related circuits 9. Faulty ECM (in case when above No.1 through 8 are normal)
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 pinion gear and/or reduction gears
Starter relay switch "Clicks", but engine does not turn over		1. Crankshaft does not turn due to engine problems

SYSTEM LOCATION



SYSTEM DIAGRAM



STARTER MOTOR

REMOVAL/INSTALLATION

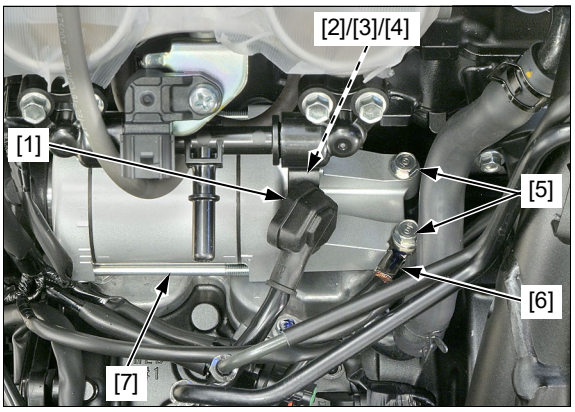
Remove the ABS modulator (page 19-24).

Release the rubber cap [1].

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

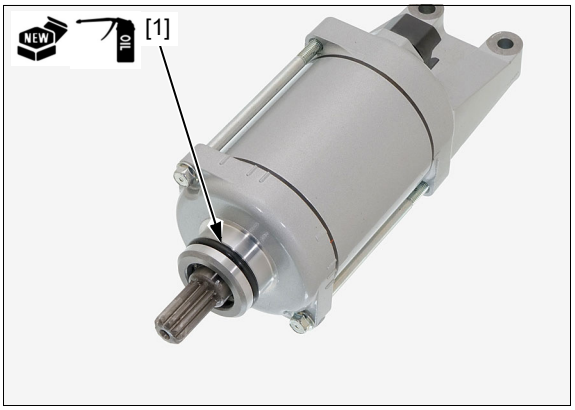
Remove the bolts [5] and disconnect the battery (–) negative cable [6].

Remove the starter motor [7].



Remove the O-ring [1].

Installation is in the reverse order of removal.



TORQUE:

Starter motor cable terminal nut/washer:
10 N·m (1.0 kgf·m, 7 lbf·ft)

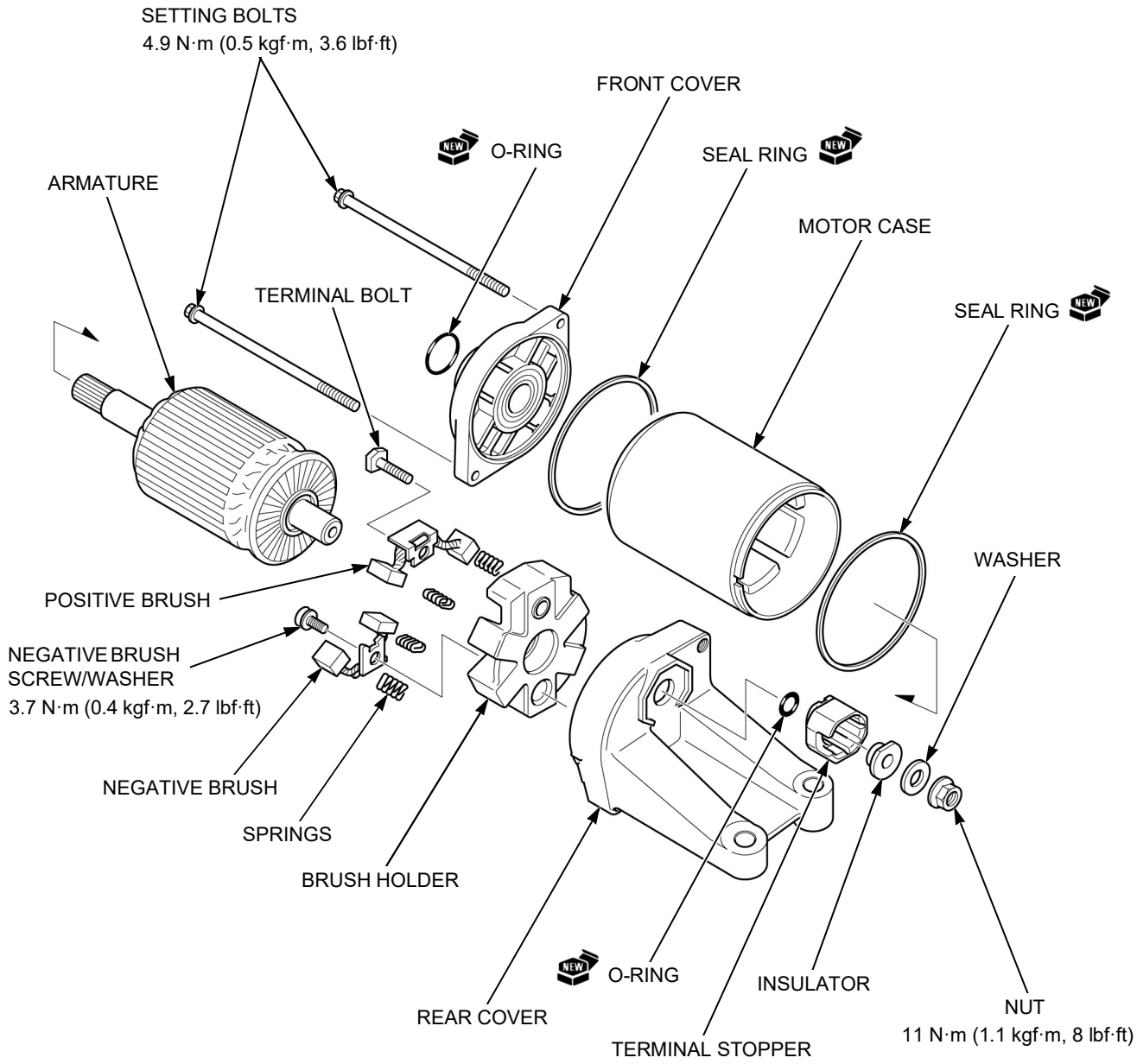
NOTE:

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

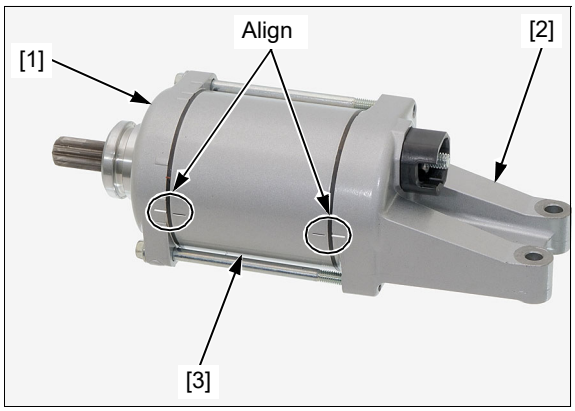
DISASSEMBLY/ASSEMBLY

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

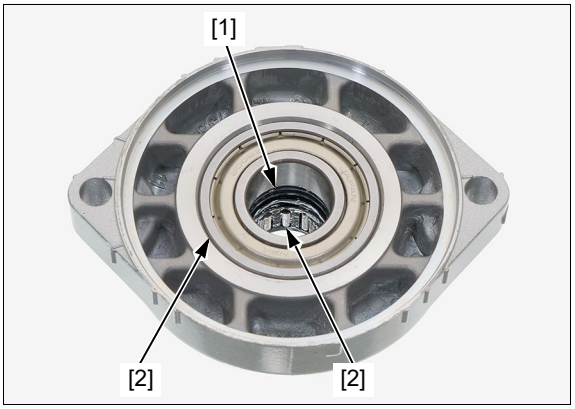
Check the oil seal [1] in the front cover for deterioration, wear, or damage.

Turn the inner race of the bearings [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.

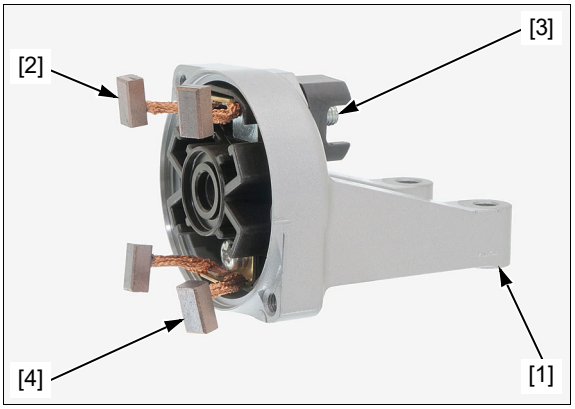
Replace the starter motor as an assembly if necessary.



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

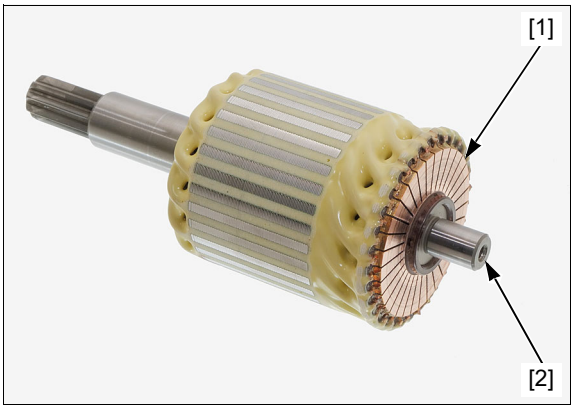
Clean the metallic debris off the commutator bars [1].

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.

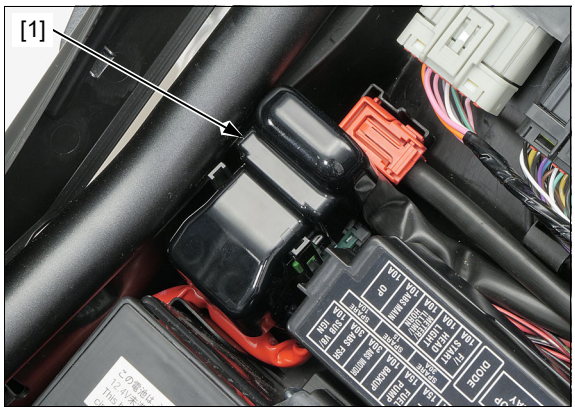


STARTER RELAY SWITCH

REMOVAL/INSTALLATION

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

Remove the starter relay switch cover [1].



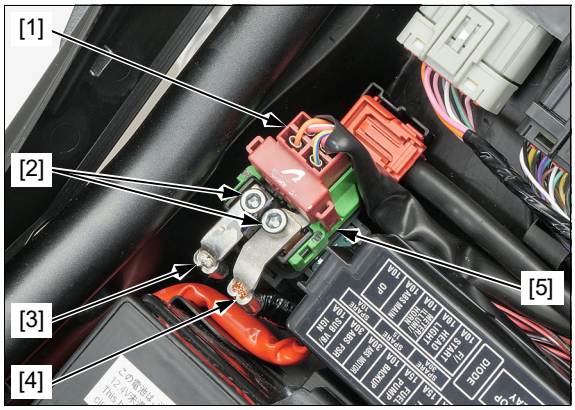
Disconnect the starter relay switch 4P connector [1].

Remove the bolts [2].

Disconnect the starter motor cable [3] and battery positive (+) cable [4].

Release the starter relay switch [5] from the rear fender B.

Installation is in the reverse order of removal.



INSPECTION

Remove the front seat (page 2-4).

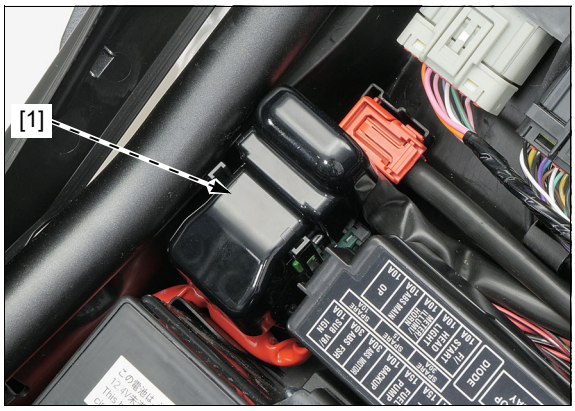
Shift the transmission into neutral.

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

Push the starter switch.

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

If you don't hear the starter relay switch "CLICK", inspect the starter relay switch as follows:

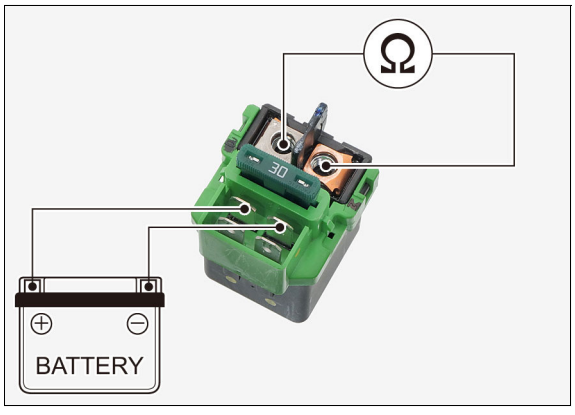


CONTINUITY INSPECTION

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

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

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



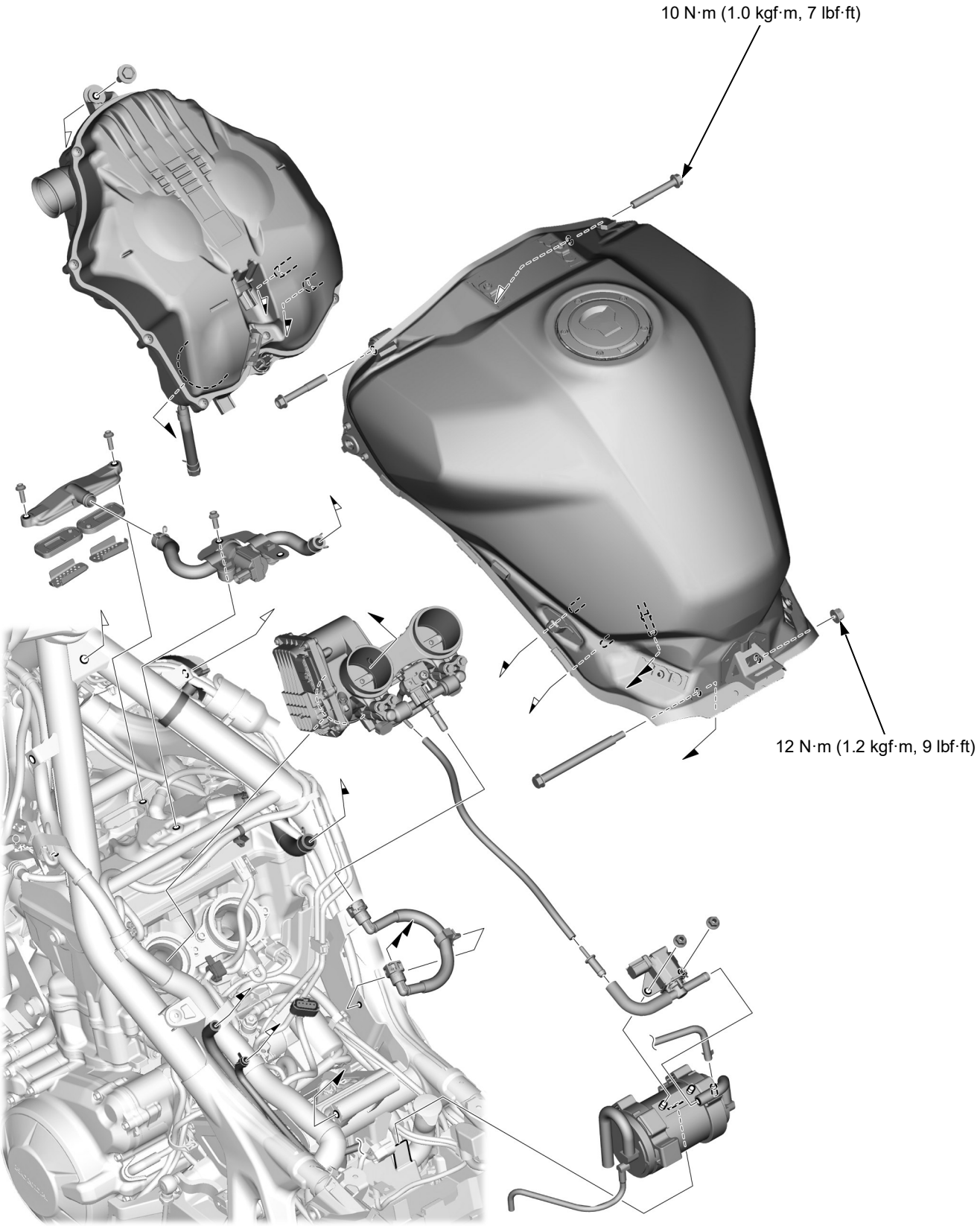
7. FUEL SYSTEM

SERVICE INFORMATION

GENERAL

- Before disconnecting the fuel feed hose, relieve fuel pressure from the system (page 7-4).
- Seal the intake port with a piece of tape or a clean cloth to keep dirt and debris from entering the engine after the throttle body has been removed.
- Do not damage the throttle body. It may cause incorrect throttle valve operation.
- Prevent dirt and debris from entering the throttle bore and air passages after the throttle body has been removed. Clean them using a compressed air if necessary.
- Do not loosen or tighten the white painted nut and screw of the throttle body. Loosening or tightening them can cause throttle valve and idle control failure.
- The parts of the throttle body not shown in this manual should not be disassembled.
- For fuel level sensor inspection (page 21-14).

COMPONENT LOCATION



FUEL LINE INSPECTION

FUEL PRESSURE RELIEVING

NOTE:

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

1. Turn the ignition switch OFF.
2. Lift and support the fuel tank (page 7-6).
3. Disconnect the fuel pump 5P (Black) connector [1].
4. Start the engine, and let it idle until the engine stalls.
5. Turn the ignition switch OFF.

QUICK CONNECT FITTING REMOVAL/ 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 7-4).

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

Push the tab [1] and press down the retainer [2].

Fuel pump unit side: Disconnect the fuel feed hose connector from the fuel pump joint.

Fuel pipe side: Disconnect the fuel feed hose joint from the fuel pipe connector.

NOTE:

- To prevent damage and keep foreign matter out, cover the disconnected connector and pipe end with the plastic bags [3].

Fuel pump unit side: Press the fuel feed hose connector onto the fuel pump joint until the retainer locks with a “CLICK”.

Fuel pipe side: Press the fuel feed hose joint into the fuel pipe connector until the retainer locks with a “CLICK”.

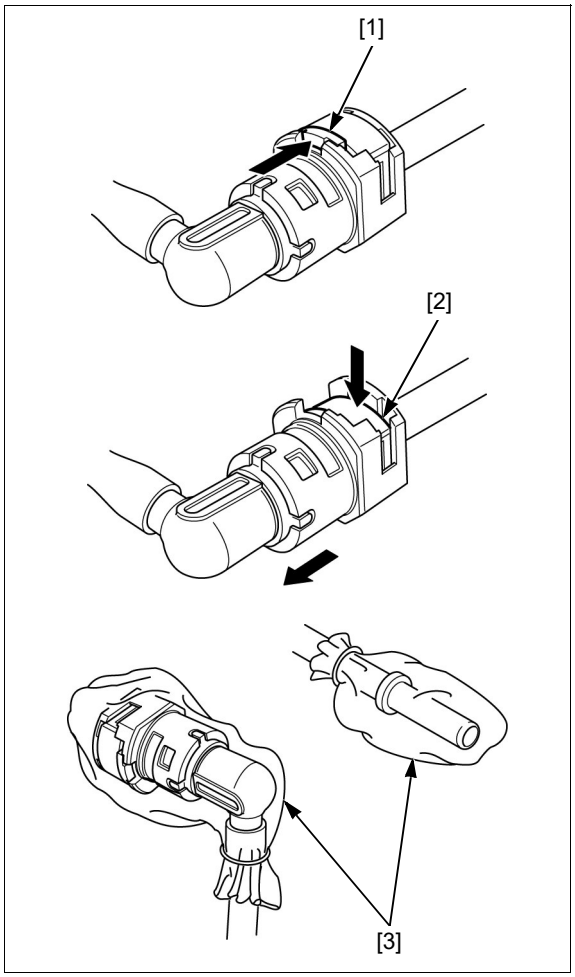
NOTE:

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

Make sure the connection is secure; check visually and by pulling the connector.

Connect the battery negative (–) cable (page 20-5).

Normalize the fuel pressure (page 7-5).



FUEL PRESSURE NORMALIZATION

1. Connect the fuel pump unit 5P (Black) connector [1].
2. Turn the ignition switch ON with the engine stop switch "○".

NOTE:

- Do not start the engine.

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

3. Turn the ignition switch OFF.
4. Repeat steps 2 and 3 two or three times, and check that there is no leakage in the fuel supply system.
5. Install the fuel tank (page 7-6).

FUEL PRESSURE TEST

Disconnect the quick connect fitting from the fuel pump unit side (page 7-4).

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

TOOLS:

[1] Fuel Pressure Gauge Set	**07406-0040004**
[2] Fuel Pressure Gauge Attachment Set	**070MJ-K260100**
[3] Hose Fuel Attachment B	**07ZAJ-S5A0130**
[4] Fuel Hose Attachment	**07ZAJ-S7C0100**
[5] Fuel Joint Attachment	**07ZAJ-S7C0200**
[6] Joint Fuel Attachment B	**07ZAJ-S5A0150**

Temporarily connect the fuel pump 5P connector, fuel tank breather hose and battery negative (–) cable.

Start the engine and let it idle.

Read the fuel pressure.

STANDARD:

412 – 518 kPa (4.2 – 5.3 kgf/cm^2, 60 – 75 psi)

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

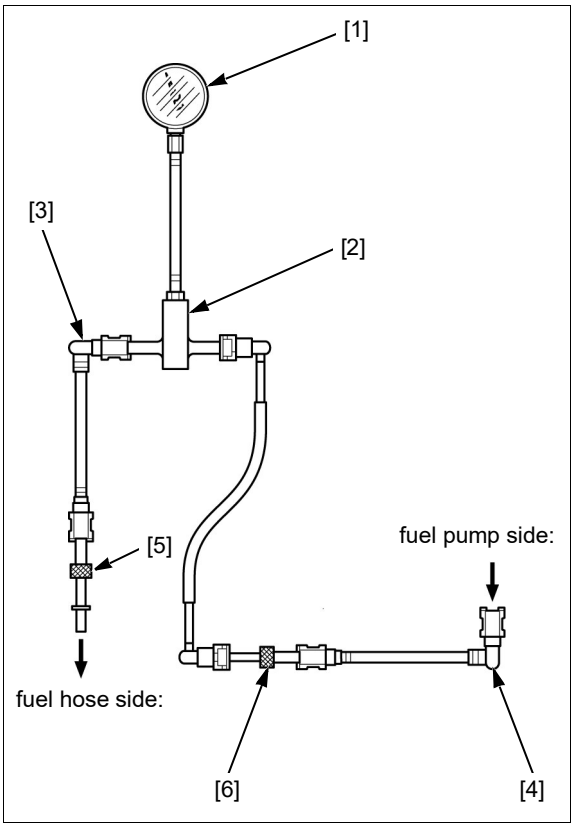
– Fuel line for leakage
– Fuel tank breather hose (tank side) for pinched or clogs
– Fuel filter for clogs
– Fuel pump unit (page 7-8)

After inspection, relieve the fuel pressure (page 7-4).

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

Remove the special tools.

Connect the fuel pump unit side quick connect fitting (page 7-4).



FUEL FLOW INSPECTION

Disconnect the quick connect fitting from the fuel pipe side (page 7-4).

Wipe off spilled out gasoline.

Release the fuel feed hose [1] from the wire band [2] and place the end of the fuel feed hose into an approved gasoline container.

Temporarily connect the fuel pump 5P connector and battery negative (–) cable.

Turn the ignition switch ON with 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:
200 cm³ (6.8 US oz, 7.0 Imp oz) minimum/ 10 seconds at 12 V

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

– Fuel feed hose for clogs
– Fuel tank breather hose (tank side) for pinched or clogs
– Fuel filter for clogs
– Fuel pump unit (page 7-8)

Connect the quick connect fitting (page 7-4).

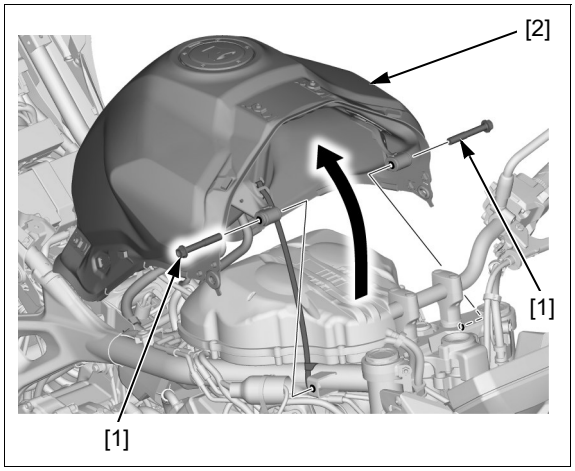
FUEL TANK

LIFT UP

Remove the following:

– Shrouds B (page 2-9)
– Side covers (page 2-5)

Remove the bolts [1] and lift up the fuel tank [2] and support the fuel tank with the suitable support.



Installation is in the reverse order of removal.

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

REMOVAL/INSTALLATION

Disconnect the quick connect fitting from the fuel pump unit side (page 7-4).

Release the strap [1] from the fuel tank.

Disconnect the fuel tank drain hose [2] and fuel tank-to-EVAP canister hose [3].

Remove the nut [4], bolt [5], fuel tank [6].

Remove the following if necessary:

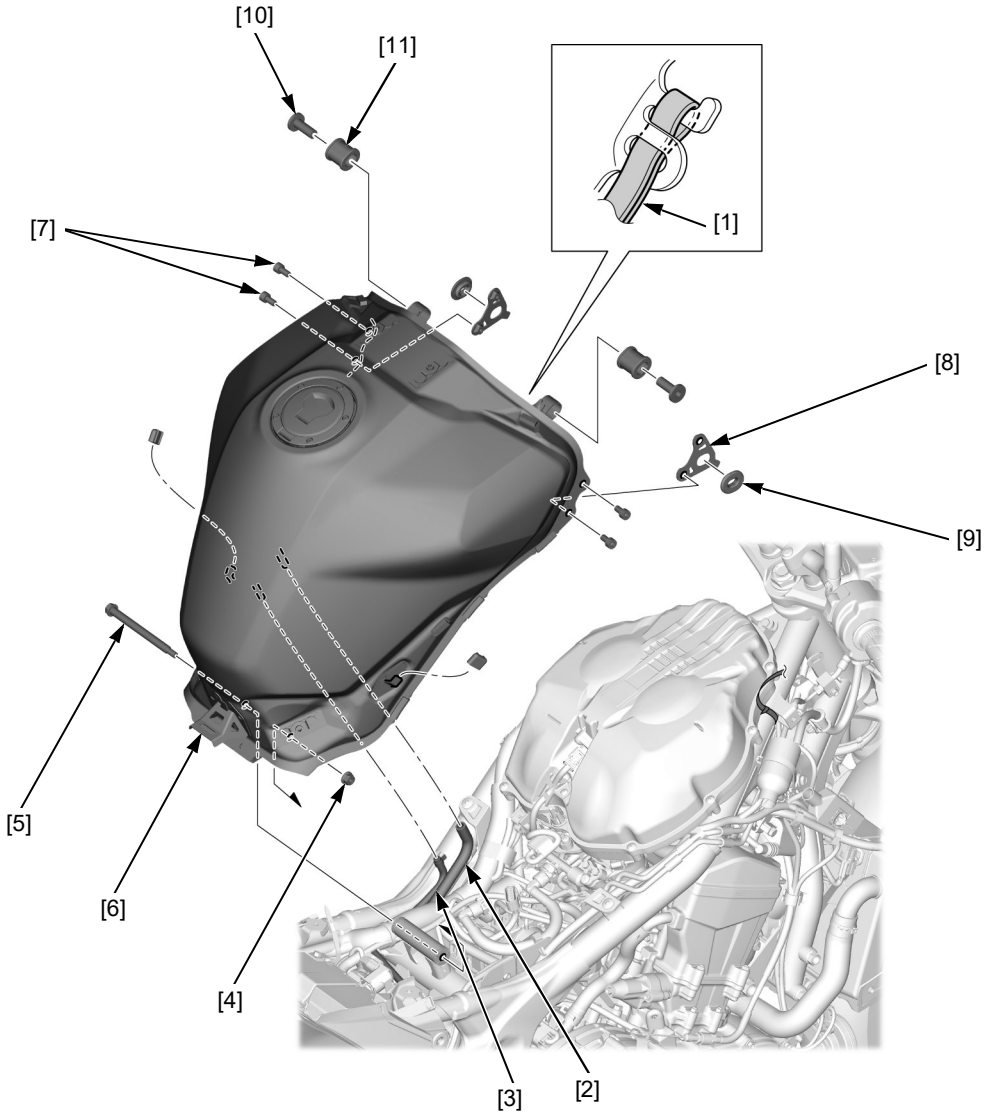
– Socket bolt/washers [7]
– Stay [8]
– Grommet [9]
– Collars [10]
– Grommet [11]

Installation is in the reverse order of removal.

TORQUE:
Fuel tank mounting nut: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the fuel pump unit side quick connect fitting (page 7-4).

Route the wires properly (page 1-21).

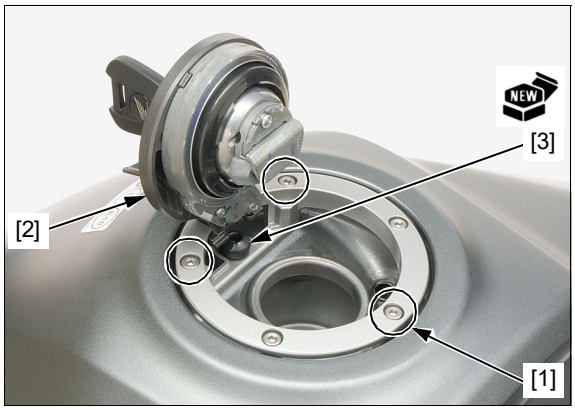


FUEL FILLER CAP

REMOVAL/INSTALLATION

Remove the following:

– Socket bolts [1]
– Fuel filler cap [2]
– Breather seal [3]



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 with a new one.

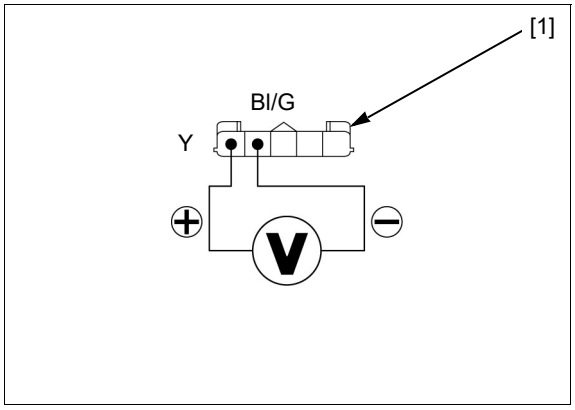
Installation is in the reverse order of removal.

TORQUE:
Fuel filler cap mounting bolt:
1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)

FUEL PUMP UNIT

INSPECTION

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



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

Disconnect the fuel pump 5P connector (page 7-6).

Measure the voltage between the terminals of the wire harness side fuel pump 5P connector [1].

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

There should be battery voltage for 2 seconds.

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

If there is no voltage, inspect the following:

– Open circuit in the Black/green or Yellow wire
– Fuel relay and related circuits (page 21-24)
– ECM (page 4-58)

REMOVAL

Remove the fuel tank (page 7-6).

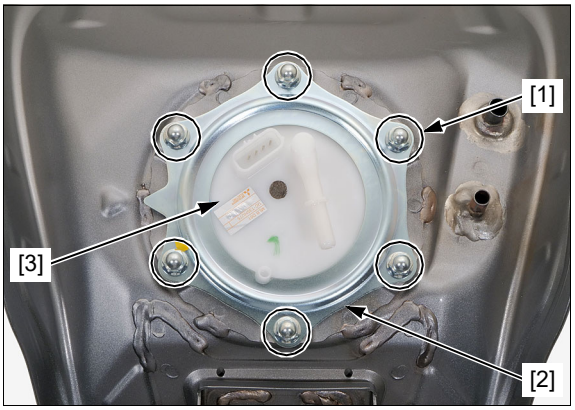
Clean around the fuel pump unit.

Loosen the fuel pump unit mounting nuts [1] in a crisscross pattern in 2 or 3 steps and remove them.

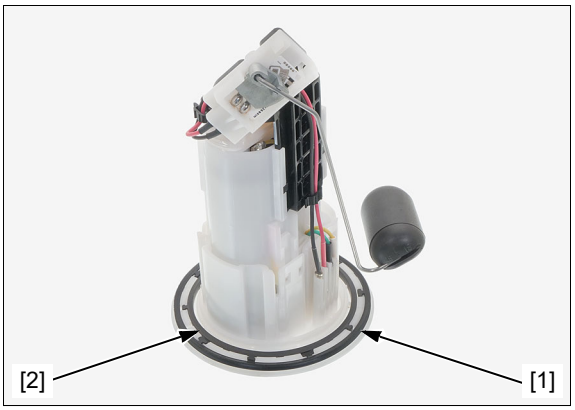
Remove the set plate [2] and fuel pump unit [3].

NOTE:

- Be careful not to damage the fuel level sensor float arm.



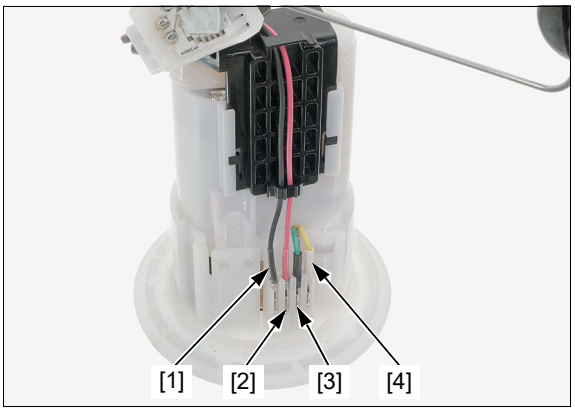
Remove the dust seal [1] and fuel pump gasket [2] from the fuel pump unit.



DISASSEMBLY

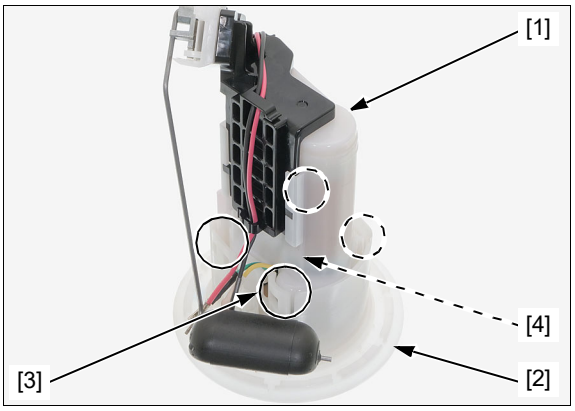
Disconnect the following:

– Black wire connector [1]
– Red wire connector [2]
– Green wire connector [3]
– Yellow wire connector [4]



Remove the fuel filter assembly [1] from the flange [2] by releasing the tabs [3].

Remove the O-ring [4].

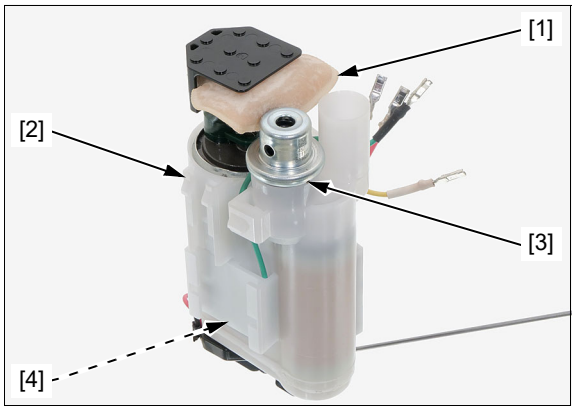


Visually inspect the suction filter [1] for dirt, debris, or clogging.

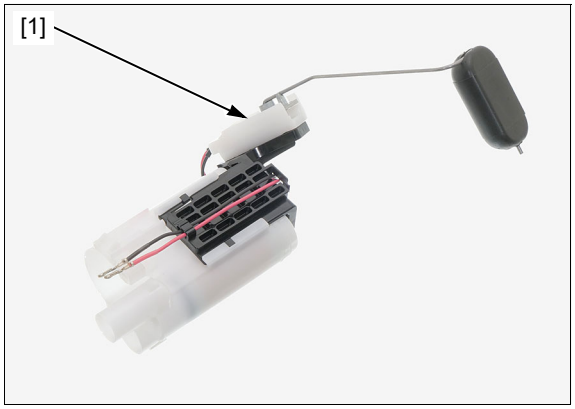
Replace the fuel pump unit if necessary.

Remove the fuel pump [2] and pressure regulator [3].

Remove the O-ring [4] from the fuel pump.

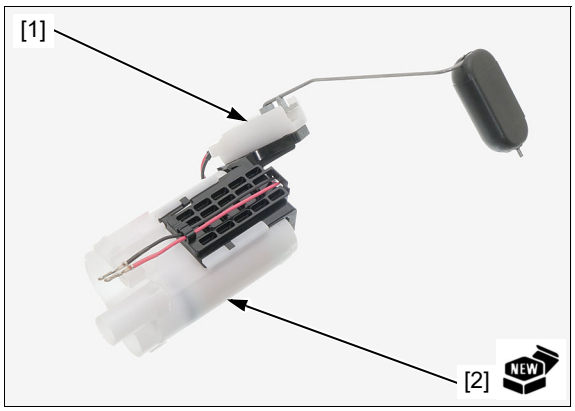


Remove the fuel unit/stay [1].



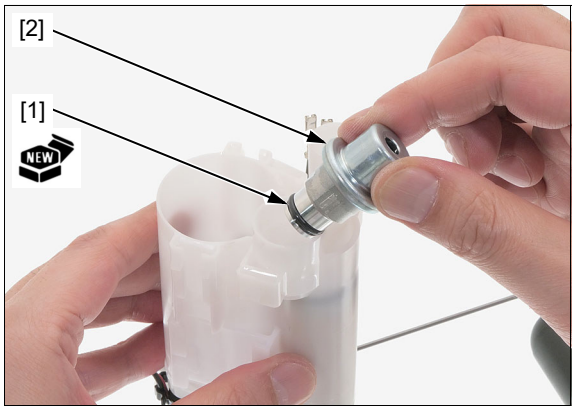
ASSEMBLY

Install the fuel unit/stay [1] onto a new fuel filter [2].



Install a new O-ring [1] onto the pressure regulator [2].

Install the pressure regulator into the fuel filter.

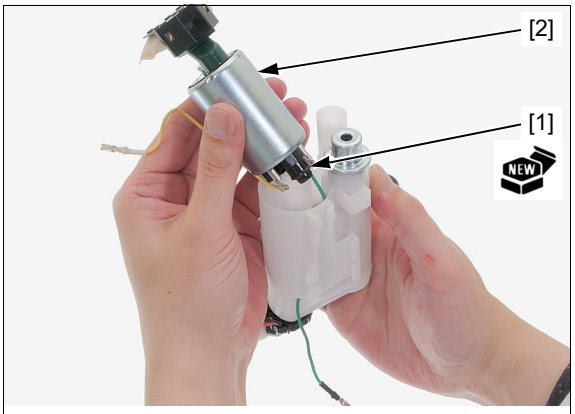


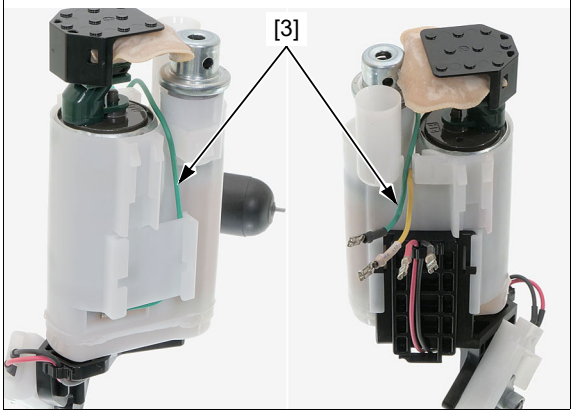
Install a new O-ring [1] onto the fuel pump [2].

Install the fuel pump into the fuel filter.

NOTE:

- Route the green wire [3] as shown.

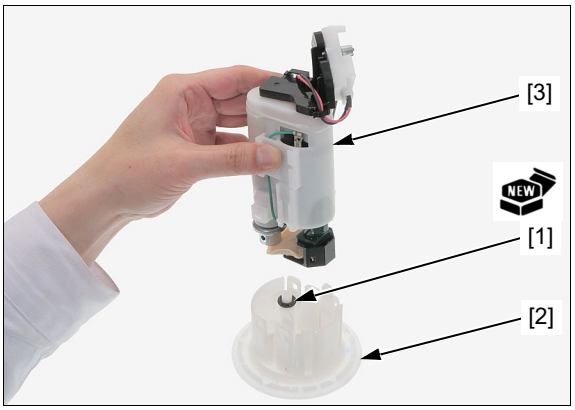




Install a new O-ring [1] onto the flange [2].

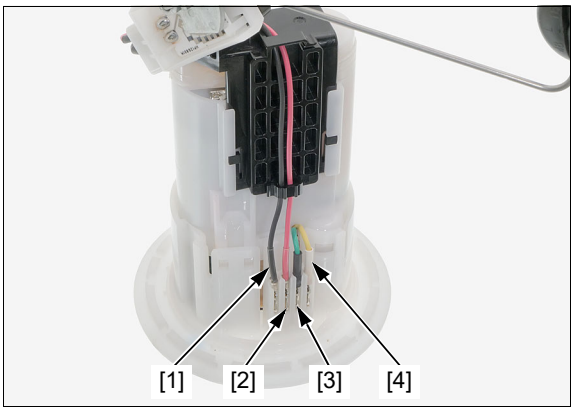
Install the fuel filter assembly [3] into the flange.

Make sure that the tabs of the fuel filter are set into the slots in the flange.



Connect the following:

– Black wire connector [1]
– Red wire connector [2]
– Green wire connector [3]
– Yellow wire connector [4]

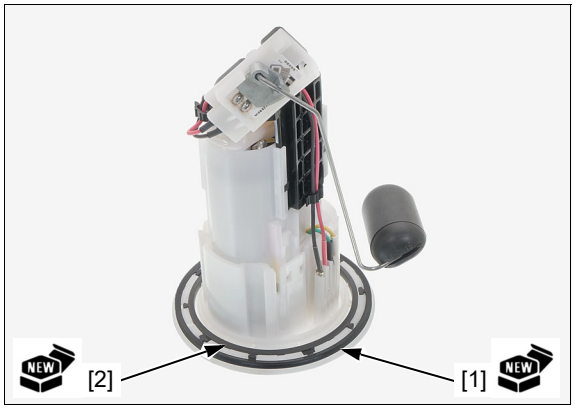


INSTALLATION

Install new dust seal [1] and fuel pump gasket [2] into the fuel pump unit properly.

NOTE:

- Be careful not to pinch any dirt or debris.

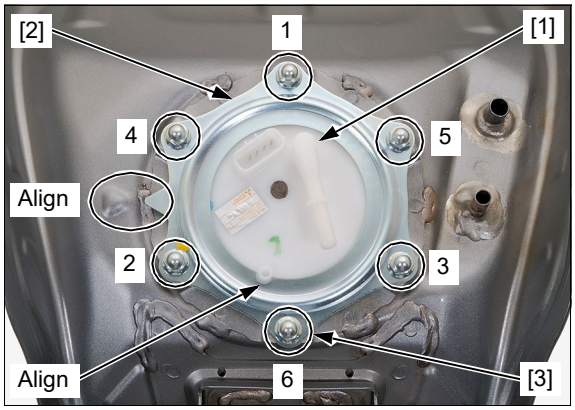


Install the fuel pump unit [1] and set plate [2] as shown.

Install the fuel pump mounting nuts [3] and tighten them to the specified torque in the sequence as shown.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the fuel tank (page 7-6).



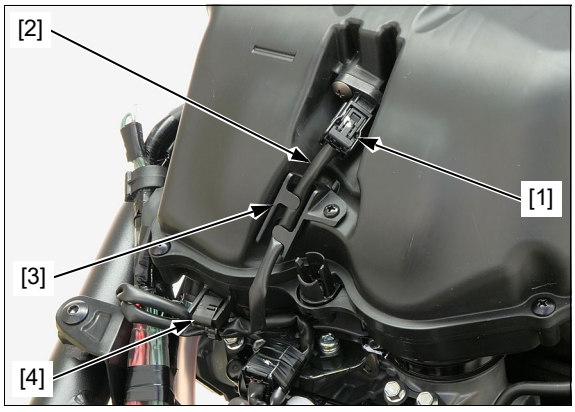
AIR CLEANER HOUSING

REMOVAL/INSTALLATION

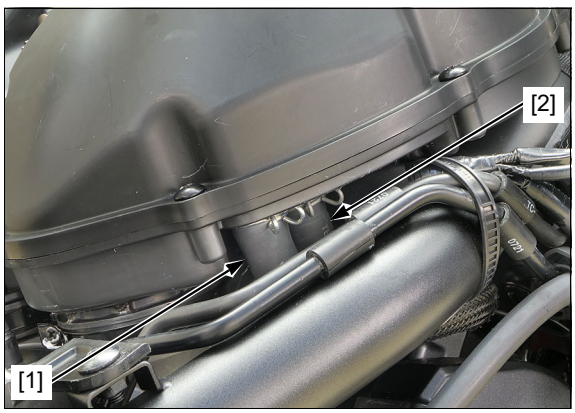
Remove the fuel tank (page 7-6).

Disconnect the IAT sensor 2P connector [1] and remove the sensor wire [2] from air cleaner housing guides [3].

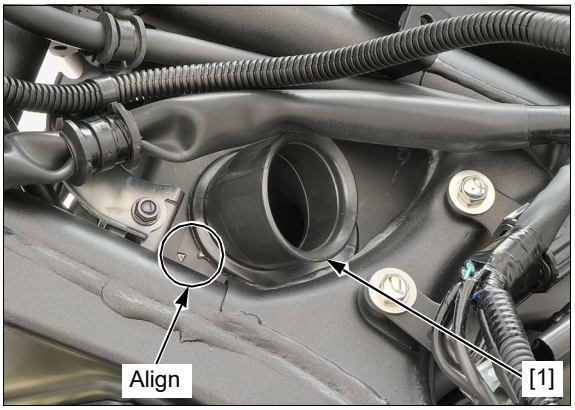
Remove the wire clip [4].



Disconnect the crankcase breather hose [1] and PAIR air suction hose [2].



Remove the left intake duct [1].

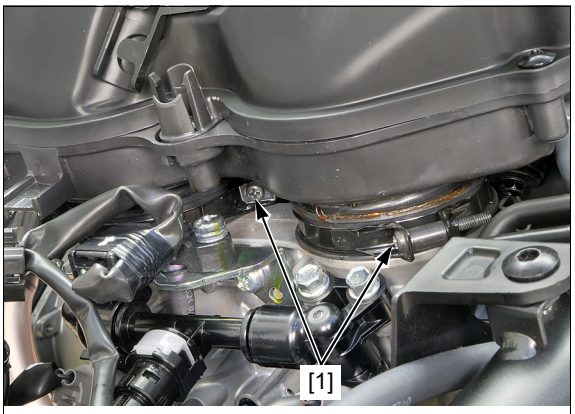


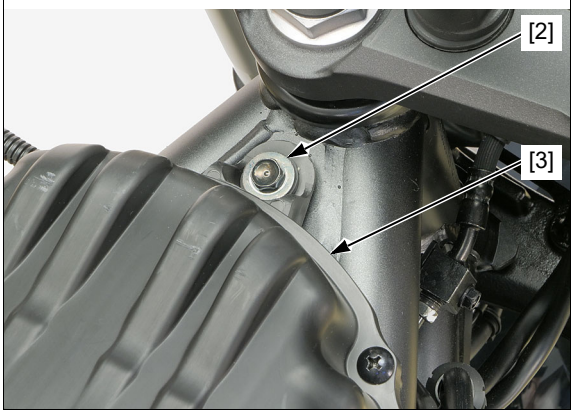
Loosen the air cleaner connecting hose band screws [1].

Remove the bolt/washer [2] and air cleaner housing [3].

Installation is in the reverse order of removal.

TORQUE:
Air cleaner housing joint screw:
1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)





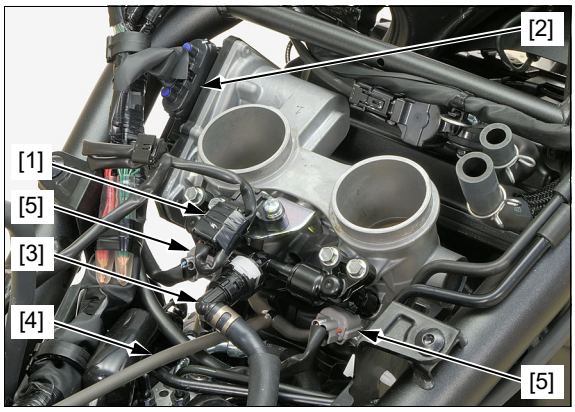
THROTTLE BODY

REMOVAL/INSTALLATION

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

Disconnect the following:

– MAP sensor 3P connector [1]
– TBW 6P connector [2]
– Fuel feed hose [3]
– Hose (EVAP purge control solenoid valve-to-throttle body) [4]
– Fuel injector 2P connectors [5]

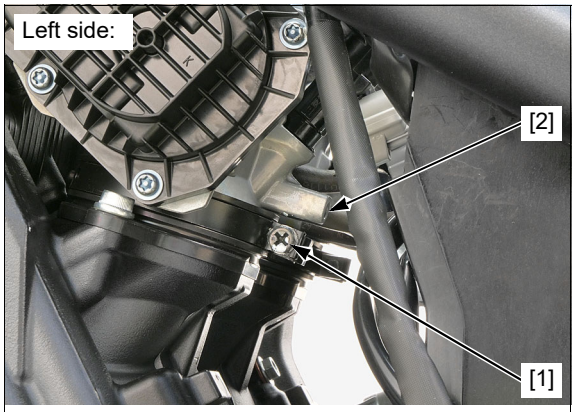


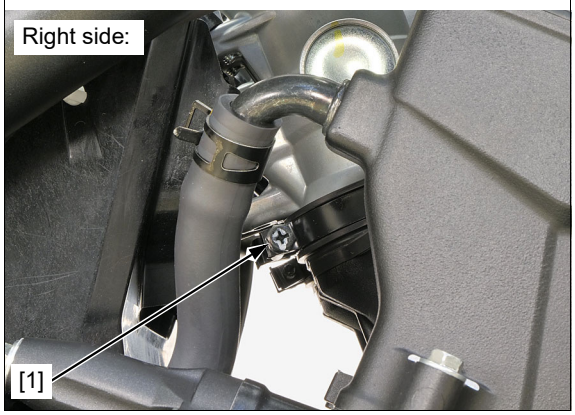
Loosen the insulator band screws [1] and remove the throttle body [2].

Installation is in the reverse order of removal.

NOTE:

• Tighten the insulator band screws until it contact the collar.





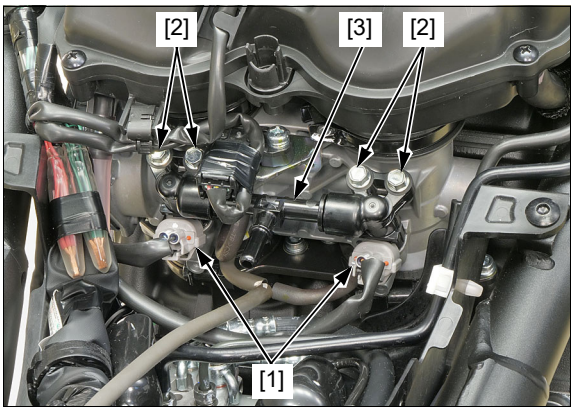
FUEL INJECTOR

REMOVAL/INSTALLATION

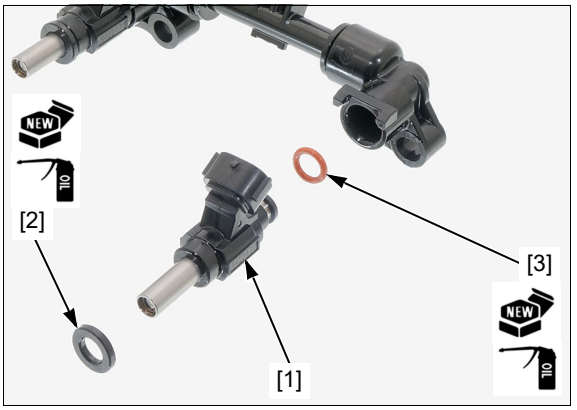
Disconnect the fuel feed hose from the fuel pipe (page 7-4).

Remove the following:

– Fuel injector 2P connectors [1]
– Bolts [2]
– Fuel injector assembly [3]

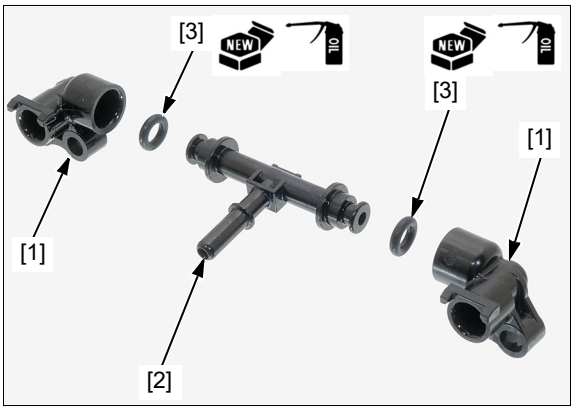


– Fuel injector [1]
– Seal ring [2]
– O-ring [3]



– Injector joints [1]
– Fuel pipe [2]
– O-rings [3]

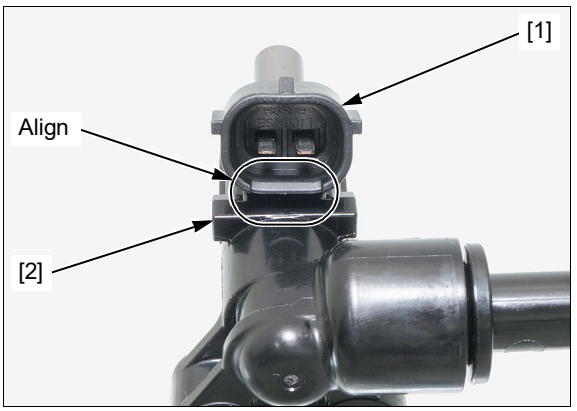
Check each part for wear or damage and replace it if necessary.



Installation is in the reverse order of removal.

NOTE:

- Replace the O-rings and seal rings with new ones and coat them with engine oil.
- When installing the fuel injector, be careful not to damage the O-ring and seal ring.
- Align the injector connectors [1] with the fuel joint tabs [2].



SECONDARY AIR SUPPLY SYSTEM

SYSTEM INSPECTION

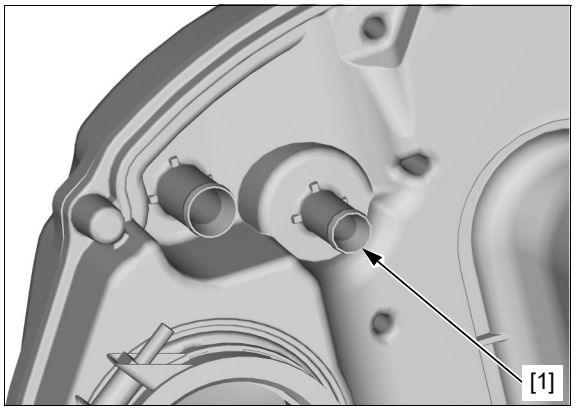
Start the engine and warm it up to normal operating temperature.

Stop the engine.

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

Check that the hose joint (secondary air intake port) [1] of the air cleaner housing is clean and free of carbon deposits.

Check the PAIR check valve if the port is carbon fouled (page 7-18).



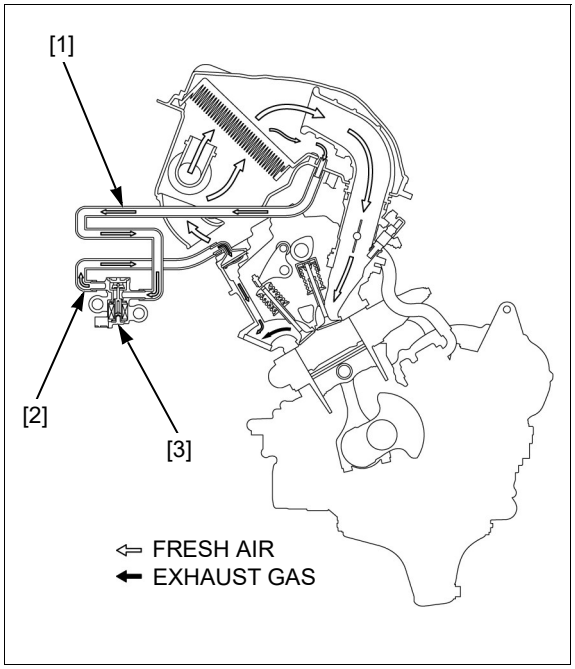
Temporarily install the removed parts.

Lift the fuel tank (page 7-6).

Start the engine and open the throttle slightly to be certain that air is sucked in through the disconnected PAIR air suction hose (from air cleaner) [1].

If the air is not drawn in, check the PAIR air suction hose (to engine) [2] for clogs.

If the hoses are OK, check the PAIR control solenoid valve [3] (page 7-16).



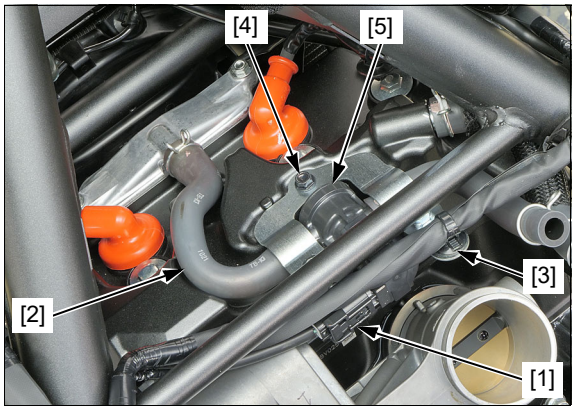
PAIR CONTROL SOLENOID VALVE REMOVAL/INSTALLATION

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

Disconnect the PAIR control solenoid valve 2P connector [1].

Disconnect the PAIR air suction hose [2].

Remove the wire clip [3], bolt [4] and PAIR control solenoid valve [5].



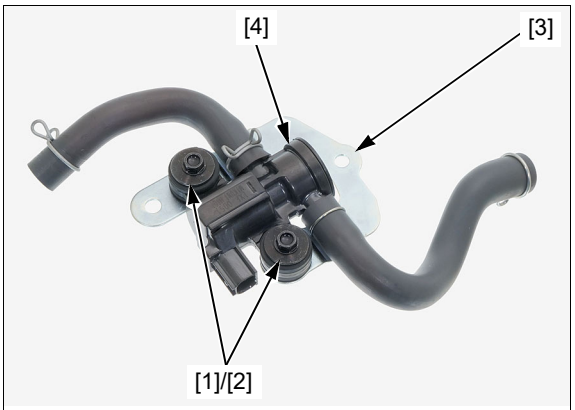
Remove the bolts [1], washers [2], stay [3] and PAIR control solenoid valve [4].

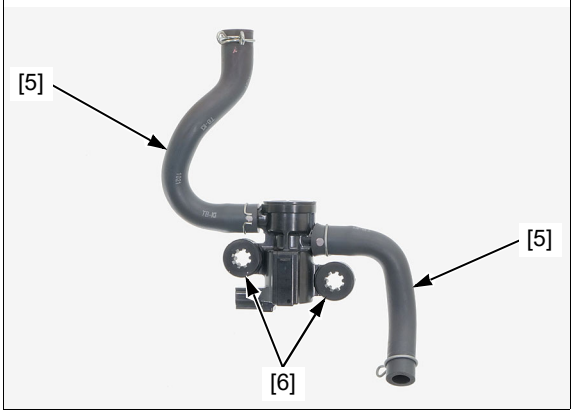
Remove the hoses [5] and grommet [6].

Installation is in the reverse order of removal.

NOTE:

- Install the hoses as shown.





PAIR CONTROL SOLENOID VALVE INSPECTION

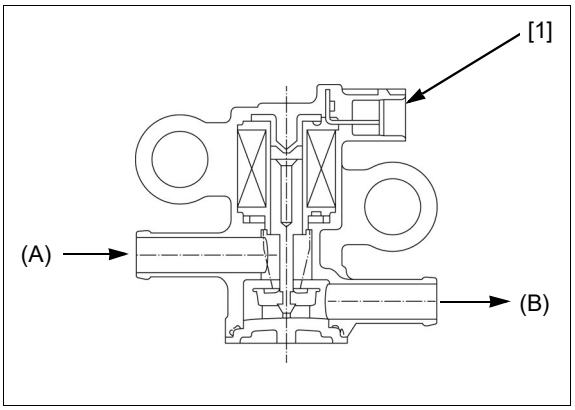
Remove the PAIR control solenoid valve (page 7-16).

Check the air flow through the solenoid valve.

Air should flow from input hose fitting (A) to output hose fitting (B).

Connect a 12 V battery to the 2P connector [1] terminals of the PAIR control solenoid valve.

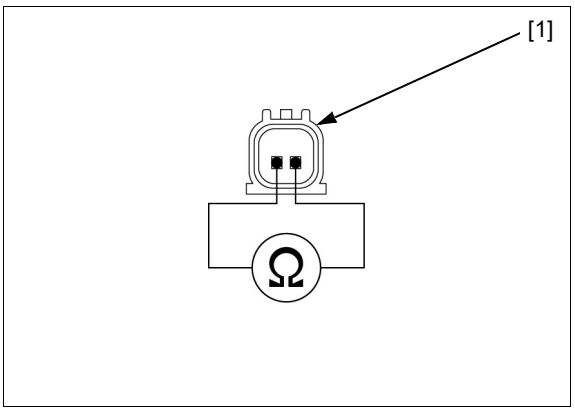
Air should not flow when the battery is connected.



Measure the resistance between the 2P connector [1] terminals of the PAIR control solenoid valve.

STANDARD: 24 – 28 Ω (20°C/68°F)

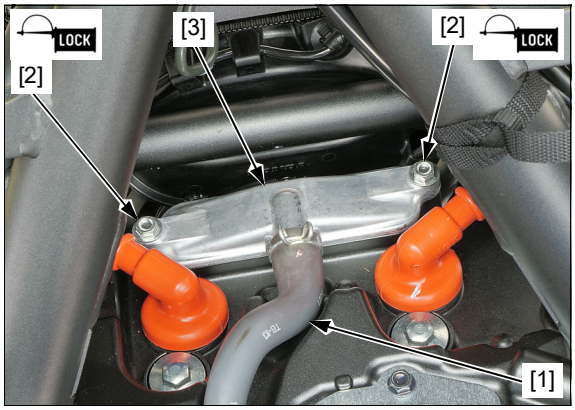
If the resistance is out of the specification, replace the PAIR control solenoid valve.



PAIR CHECK VALVE REMOVAL/ INSTALLATION

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

Remove the PAIR air suction hose [1], bolts [2] and check valve cover [3].

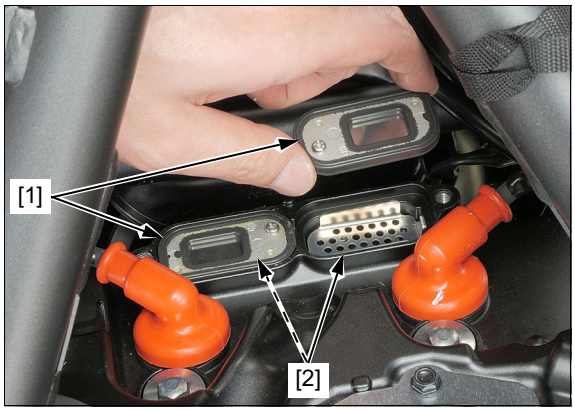


Remove the PAIR check valves [1] and port plates [2].

Installation is in the reverse order of removal.

NOTE:

- Apply locking agent to the threads of the PAIR check valve cover bolt.

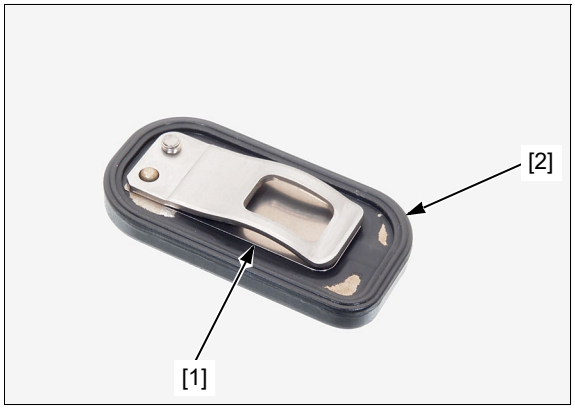


PAIR CHECK VALVE INSPECTION

Remove the PAIR check valves (page 7-18).

Check the reed [1] of the PAIR check valve for damage or fatigue. Replace if necessary.

Replace the PAIR check valve if the rubber seat [2] is cracked, deteriorated or damaged, or if there is clearance between the reed and seat.



EVAP PURGE CONTROL SOLENOID VALVE

REMOVAL/INSTALLATION

Remove the front seat (page 2-4).

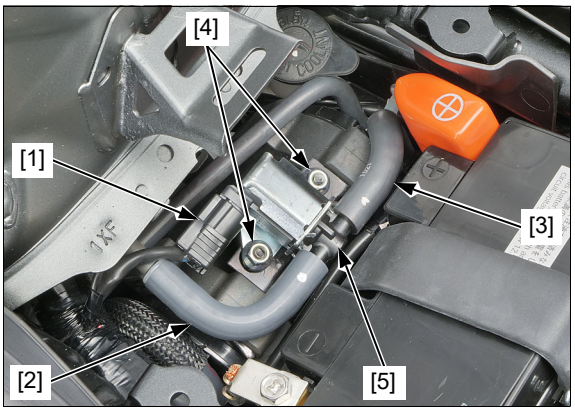
Disconnect the following:

– EVAP purge control solenoid valve 2P connector [1]
– Hose [2] (EVAP purge control solenoid valve-to-throttle body)
– Hose [3] (EVAP canister-to-EVAP purge control solenoid valve)

Remove the following:

– Nuts [4]
– EVAP purge control solenoid valve [5]

Installation is in the reverse order of removal.



INSPECTION

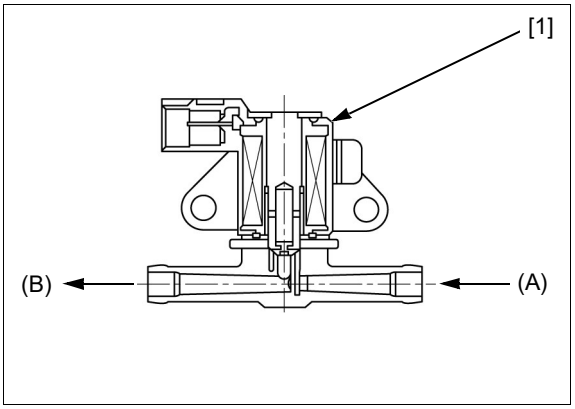
Remove the EVAP purge control solenoid valve (page 7-19).

Check the air flow through the solenoid valve [1].

Air should not flow from input hose fitting (A) to output hose fitting (B).

Connect a 12 V battery to the EVAP purge control solenoid valve 2P connector terminals.

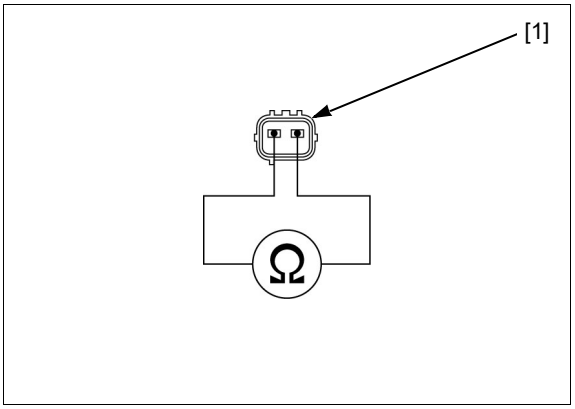
Air should flow when the battery is connected.



Measure the resistance between the EVAP purge control solenoid valve 2P connector [1] terminals.

STANDARD: 30 – 34 Ω (20°C/68°F)

If the resistance is out specification, replace the EVAP purge control solenoid valve.



EVAP CANISTER

REMOVAL/INSTALLATION

Remove the battery (page 20-5).

Remove the EVAP purge control valve (page 7-19).

Remove the EVAP canister drain hose [1] out of the frame.

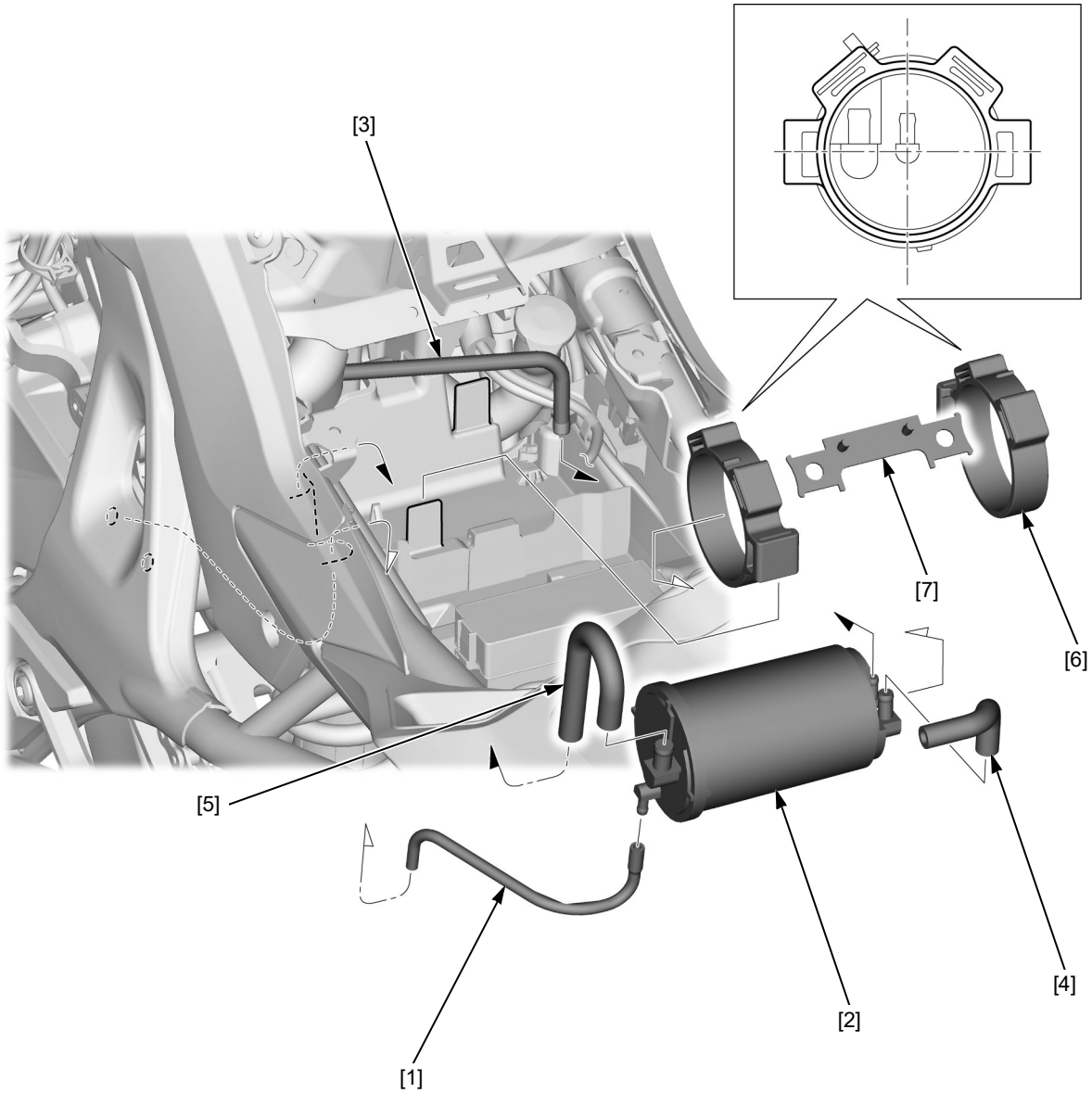
Remove the EVAP canister [2].

Disconnect the following:

- EVAP canister drain hose
- Fuel tank-to-EVAP canister hose [3]
- EVAP canister-to-EVAP purge control solenoid valve hose [4]
- EVAP canister air intake hose [5]
- Mount rubbers [6]
- Stay [7]

Installation is in the reverse order of removal.

Route the hoses properly (page 1-21).



8. COOLING SYSTEM

SERVICE INFORMATION

GENERAL

⚠WARNING

Removing the radiator cap while the engine is hot can allow the coolant to spray out, seriously scalding you.
Always let the engine and radiator cool down before removing the radiator cap.

NOTICE

Using coolant with silicate corrosion inhibitors may cause premature wear of water pump seals or blockage of radiator passages. Using tap water may cause engine damage.

- Add cooling system at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- For fan control relay inspection (page 21-24).

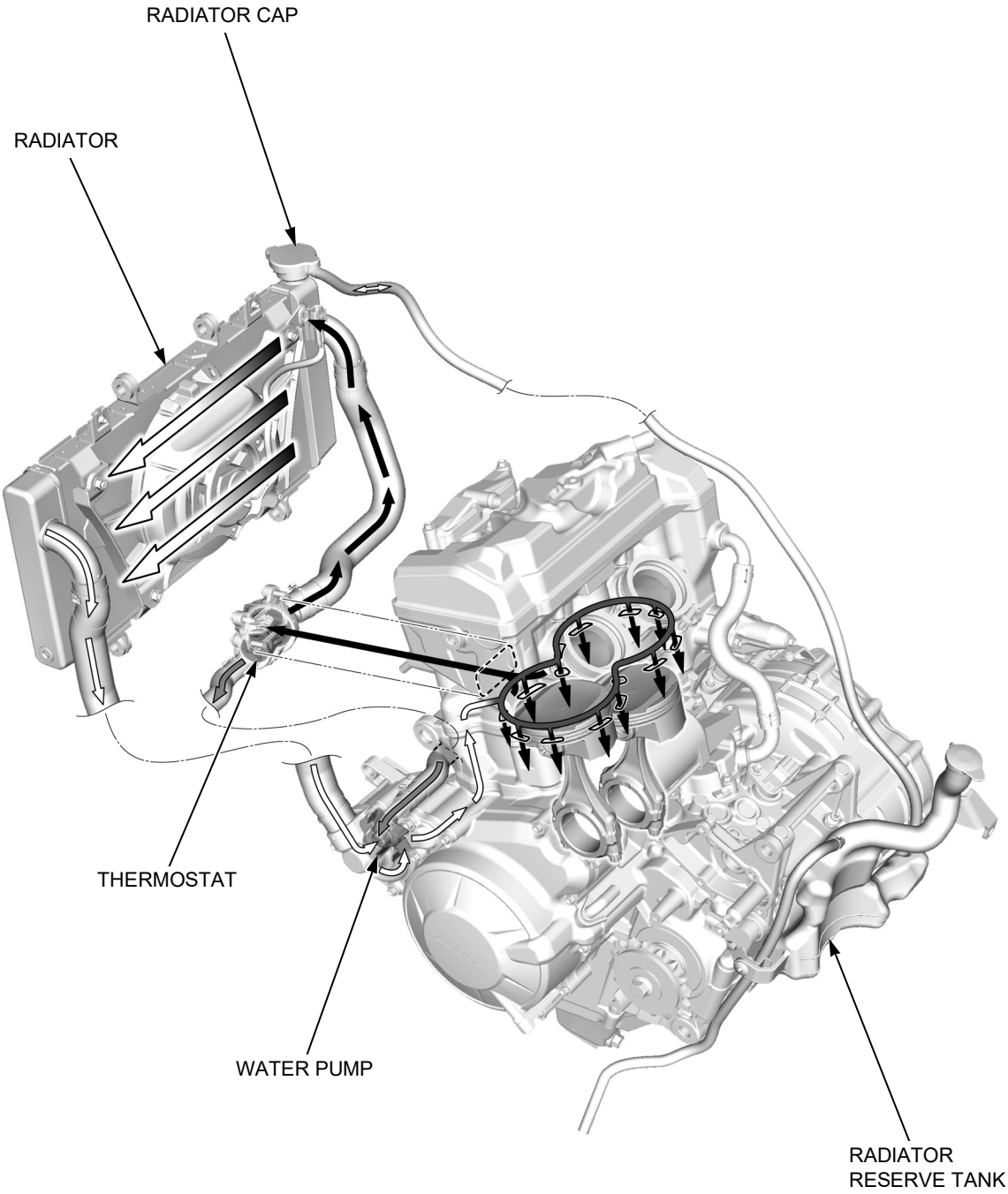
TROUBLESHOOTING

Engine temperature too high
- Faulty meter
- Faulty ECM
- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passage blocked in radiator, hoses or water jacket
- Air in system
- Faulty cooling fan motor
- Faulty fan control relay
- Faulty water pump

Engine temperature too low
- Faulty ECT sensor
- Thermostat stuck open
- Faulty fan control relay

Coolant leak
- Faulty water pump mechanical seal
- Deteriorated O-rings
- Faulty radiator cap
- Damaged or deteriorated cylinder head gasket
- Loose hose connection or clamp
- Damaged or deteriorated hose
- Damaged radiator

SYSTEM FLOW PATTERN

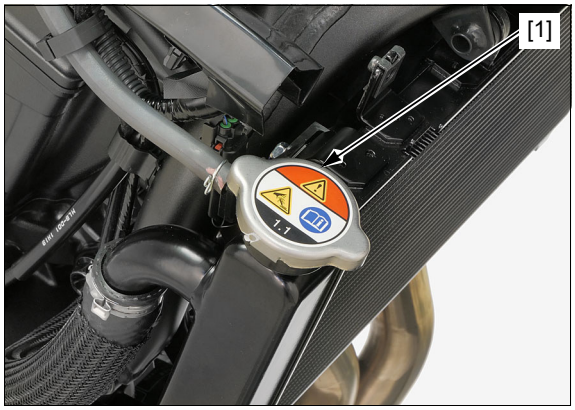


SYSTEM TESTING

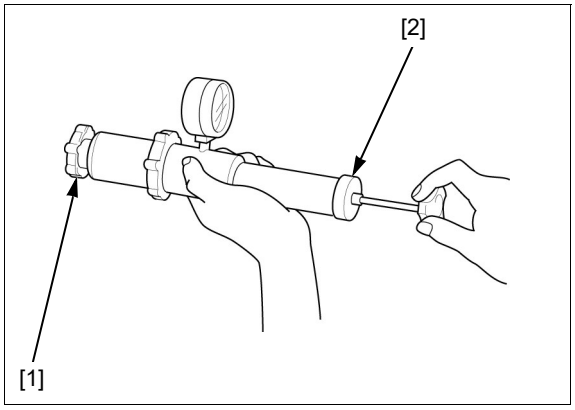
RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Remove the right shroud B (page 2-9).

Remove the radiator cap [1].



Wet the sealing surfaces of the cap [1], then install the cap onto the tester [2].



Pressurize the radiator cap using the tester.

Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low.

The cap must hold the specified pressure for at least 6 seconds.

RADIATOR CAP RELIEF PRESSURE:
108 – 137 kPa (1.1 – 1.4 kgf/cm^2, 16 – 20 psi)

Connect the tester to the radiator.

Pressurize the radiator, engine and hoses using the tester, and check for leaks.

NOTICE

Excessive pressure can damage the cooling system components. Do not exceed 137 kPa (1.4 kgf/cm^2, 20 psi).

Repair or replace components if the system will not hold the specified pressure for at least 6 seconds.

COOLANT REPLACEMENT

REPLACEMENT/AIR BLEEDING

NOTE:

- When filling the system or reserve tank with coolant, or checking the coolant level, place the motorcycle in an upright position on a flat, level surface.

Remove the right shroud B (page 2-9).

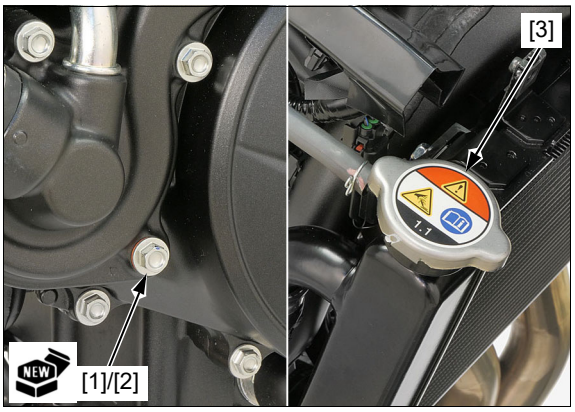
Remove the front seat (page 2-4).

Remove the water pump cover drain bolt [1] and sealing washer [2].

Remove the radiator cap [3] and drain the coolant.

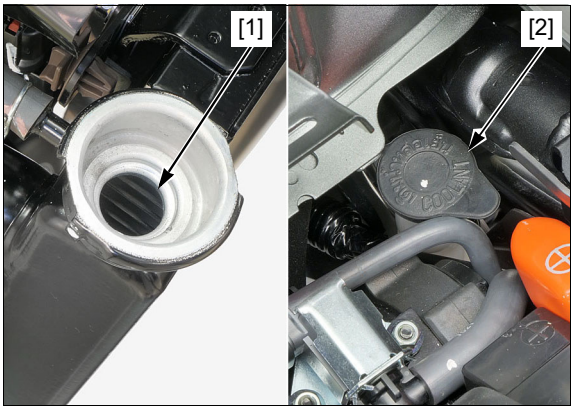
Reinstall the drain bolts with new sealing washers.

Tighten the drain bolts.



Fill the system with the recommended coolant through the filler opening up to filler neck [1].

Remove the radiator reserve tank cap [2] and fill the reserve tank to the upper level line.



Bleed air from the system as follow:

1. Shift the transmission into neutral.
   Start the engine and let it idle for 2 – 3 minutes.
2. Snap the throttle 3 – 4 times to bleed air from the system.
3. Stop the engine and add coolant up to the filler neck if necessary.
4. Install the radiator cap.
5. Check the level of coolant in the reserve tank and fill to the upper level line if it is low (page 3-14).

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.

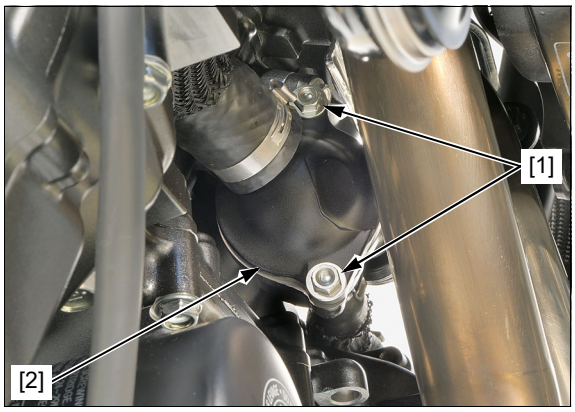
After air bleeding, check that there are no coolant leaks.

THERMOSTAT

REMOVAL/INSTALLATION

Drain the coolant (page 8-5).

Remove the bolts [1] and the thermostat cover [2].



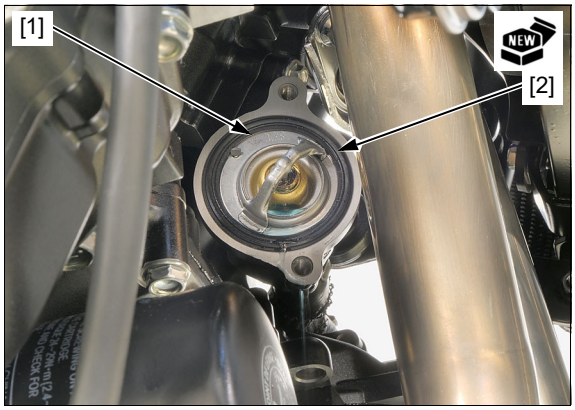
Remove the thermostat [1] from the thermostat housing.

Installation is in the reverse order of removal.

TORQUE:
Thermostat cover bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:
- Replace the thermostat rubber [2] with a new one.

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

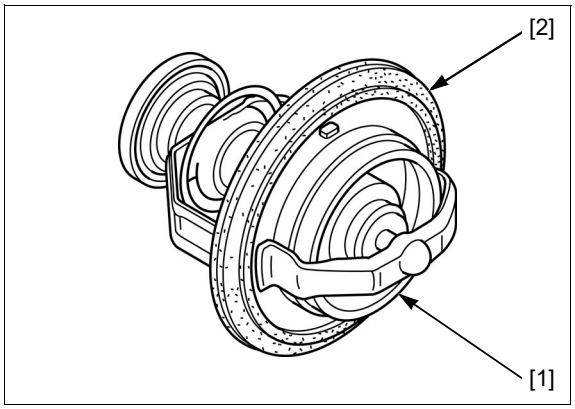


INSPECTION

Visually inspect the thermostat [1] for damage.

Replace the thermostat if the valve stays open at room temperature.

Check the seal ring [2] for damage and replace if necessary.



Wear insulated gloves and adequate eye protection. Keep flammable materials away from the electric heating element. Do not let the thermostat or thermometer [1] touch the pan, or you will get false reading.

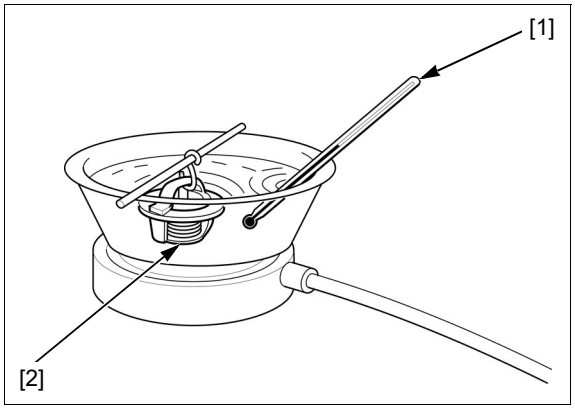
Heat the water with an electric heating element to operating temperature for 5 minutes.

Suspend the thermostat [2] in heated water to check its operation.

THERMOSTAT BEGIN TO OPEN:
80 – 84°C (176 – 183°F)

VALVE LIFT:
8 mm (0.3 in) minimum at 95°C (203°F)

Replace the thermostat if it responds at temperatures other than those specified.



THERMOSTAT HOUSING

REMOVAL/INSTALLATION

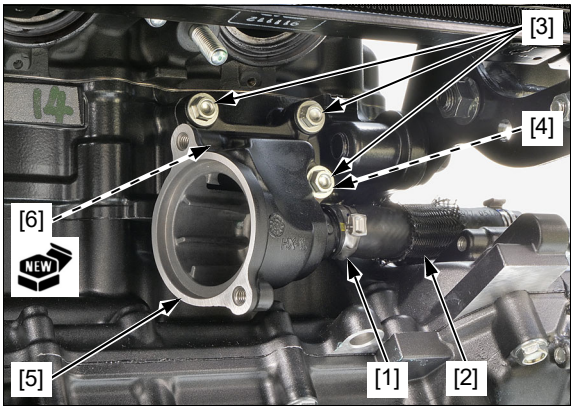
Remove the following.

– Thermostat (page 8-6)
– Hose band [1]
– Bypass hose [2]
– Bolts [3]
– Sealing washer [4]
– Thermostat housing [5]
– O-ring [6]

Installation is in the reverse order of removal.

NOTE:

- Replace the O-ring with a new one.
- Replace the water hose band with new ones.
- For water hose band installation (page 8-11).



RADIATOR/COOLING FAN

REMOVAL/INSTALLATION

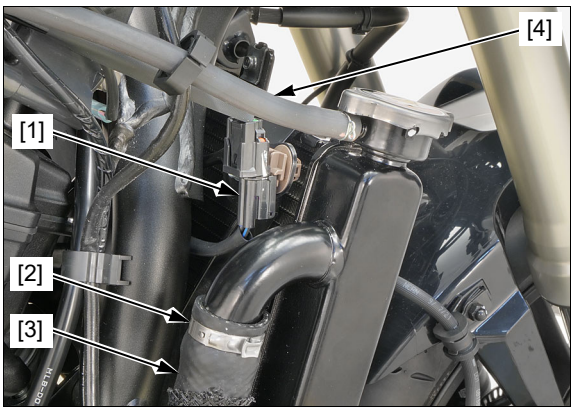
Drain the coolant (page 8-5).

Remove the left shroud B (page 2-9).

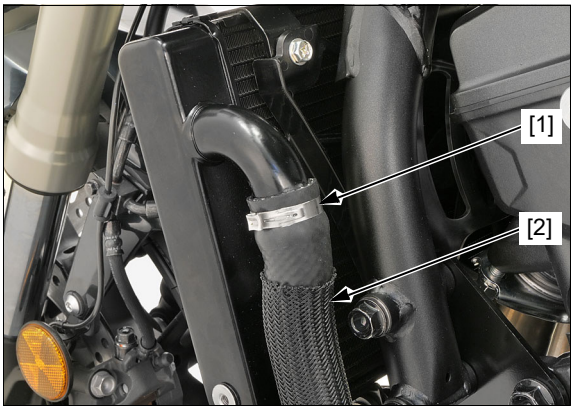
Disconnect the fan motor 2P connector [1].

Remove the hose band [2] and radiator hose [3].

Remove the siphon hose [4].

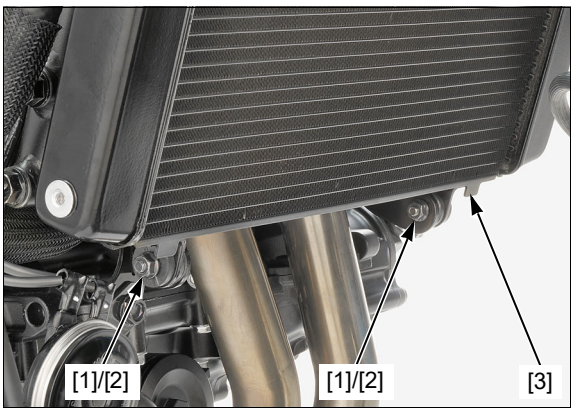


Remove the hose band [1] and radiator hose [2].



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

Pull down the radiator [3].



NOTE:

- Be careful not to damage the radiator fins.

Remove the front wheel speed sensor wire clip [1] and release the wire [2] from the fan motor cover guides [3].

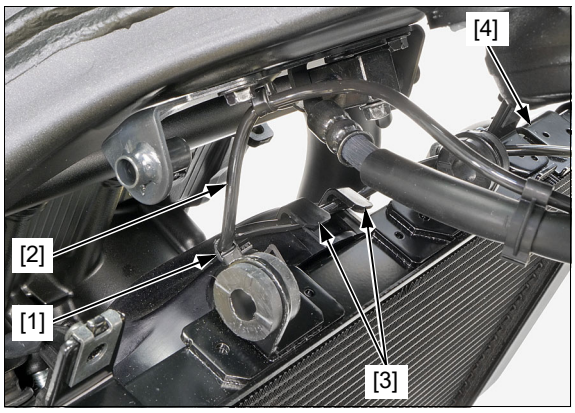
Remove the radiator [4].

Installation is in the reverse order of removal.

NOTE:

- Replace the water hose bands with new ones.
- For water hose band installation (page 8-11).

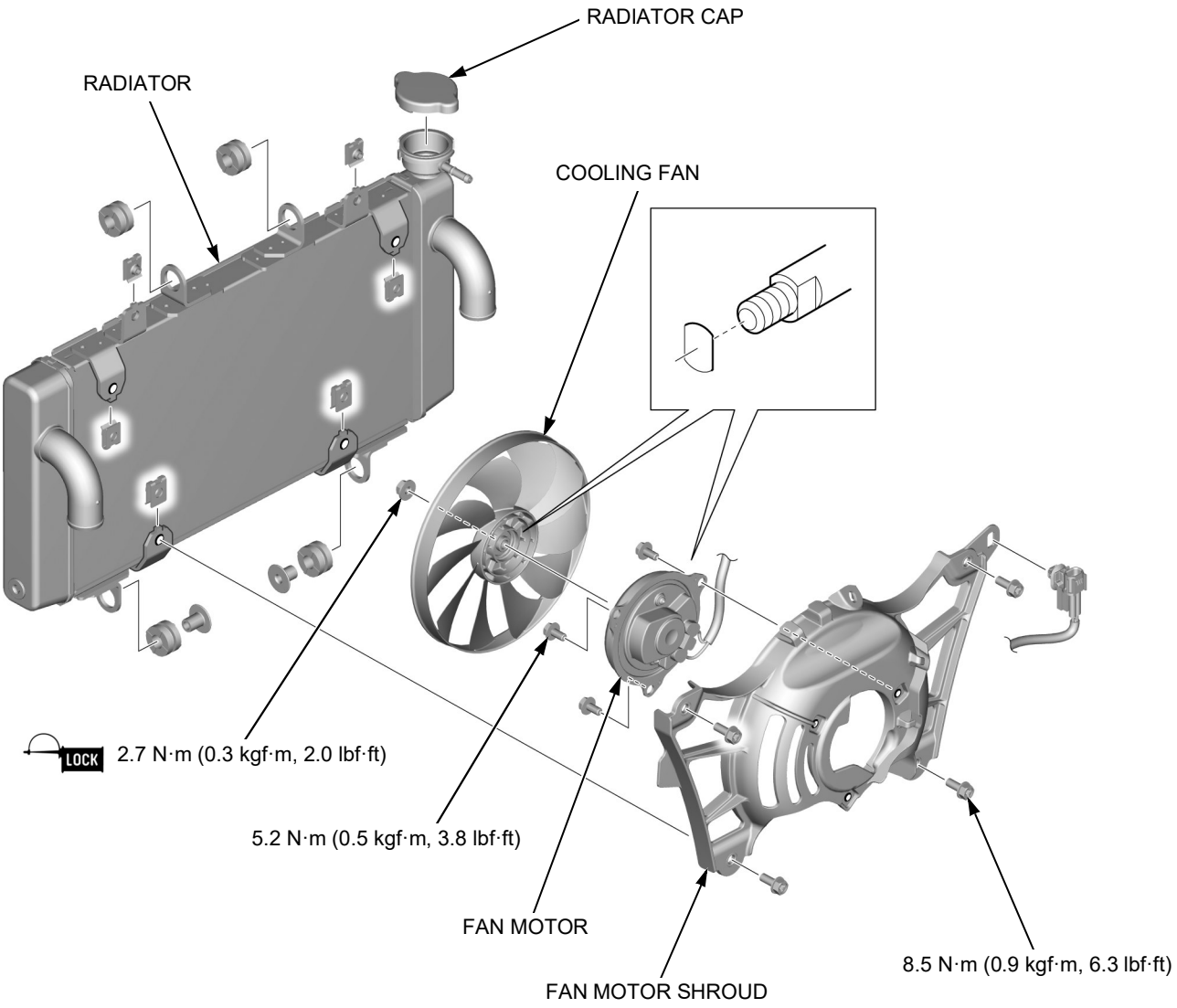
Fill and bleed the cooling system (page 8-5).



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.



RADIATOR RESERVE TANK

REMOVAL/INSTALLATION

Remove the following:

– Front seat (page 2-4)
– Drive sprocket cover (page 2-17)
– Swingarm (page 17-11)

Remove the reserve tank cap [1].

Remove the socket bolts [2], then release the boss of the radiator reserve tank [3] from the hole of frame.

Disconnect the siphon hose [4] and drain the coolant to remove the radiator reserve tank.

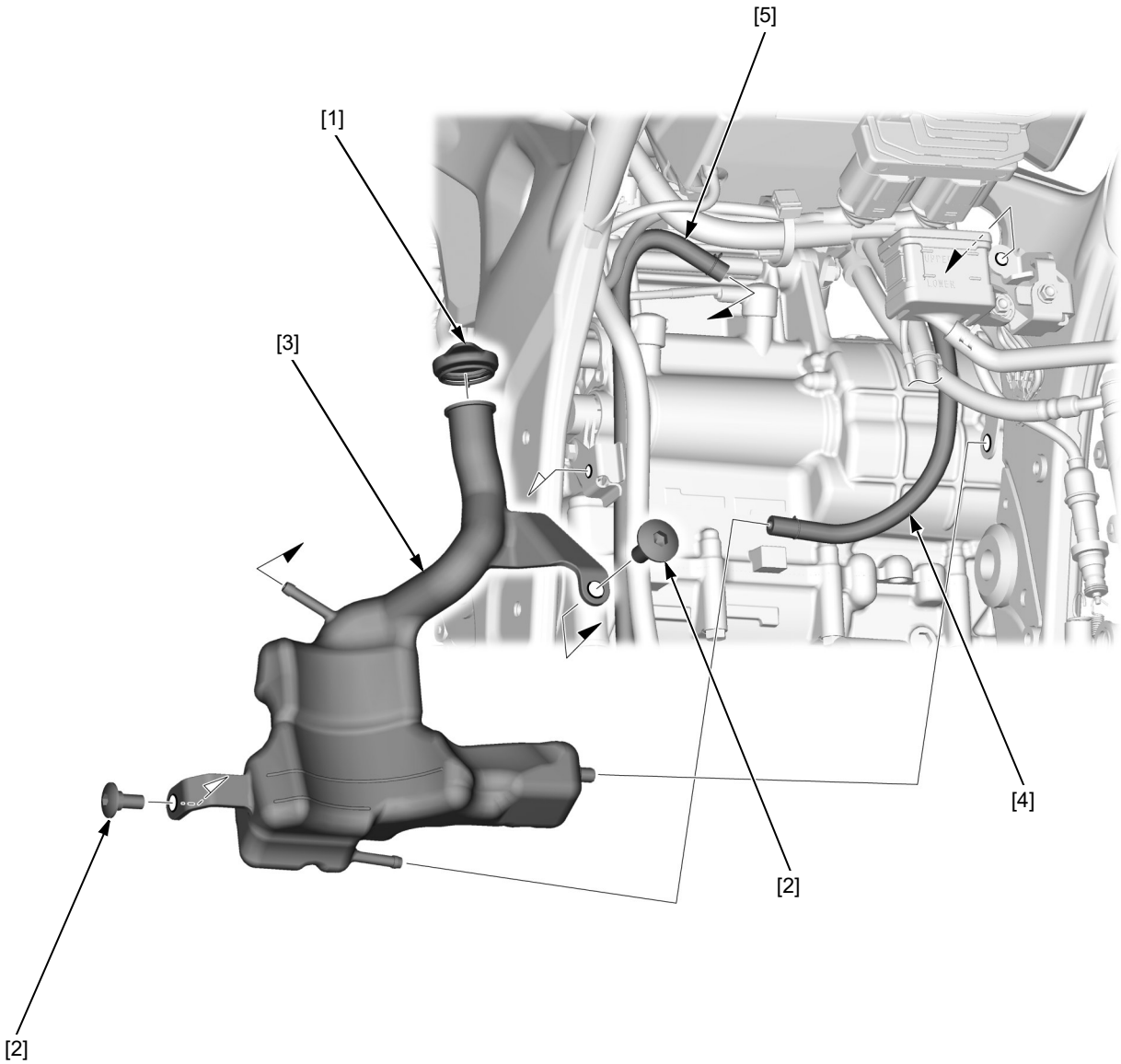
Disconnect the overflow hose [5] and remove the radiator reserve tank.

Installation is in the reverse order of removal.

NOTE:

• Route the hoses properly (page 1-21).

Fill the reserve tank with the recommended coolant (page 1-7).



WATER PUMP

MECHANICAL SEAL INSPECTION

Check the bleed hole [1] of the water pump for signs of coolant leakage.

NOTE:

- A small amount of coolant weeping from the bleed hole is normal.
- Make sure that there are no continuous coolant leakage from the bleed hole while operating the engine.

Replace the alternator cover as an assembly if necessary.

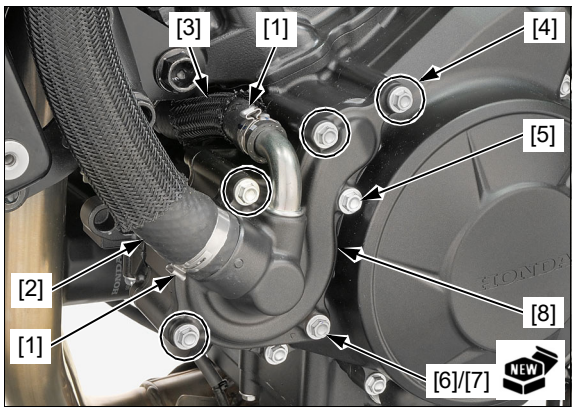
WATER PUMP COVER

REMOVAL/INSTALLATION

Drain the coolant (page 8-5).

Remove the following:

– Hose bands [1]
– Radiator hose [2]
– Bypass hose [3]
– Cover bolts [4]
– Cover bolt [5]
– Cover drain bolt [6]
– Sealing washer [7]
– Water pump cover [8]



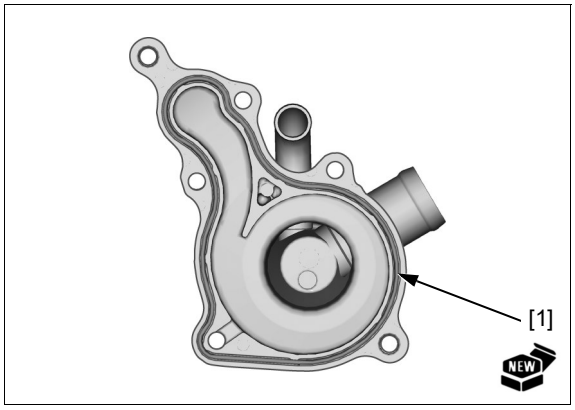
Remove the O-ring [1] from the water pump cover.

Installation is in the reverse order of removal.

NOTE:

- Replace the O-ring with a new one.
- Replace the water hose bands with new ones.
- For water hose band installation (page 8-11).

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



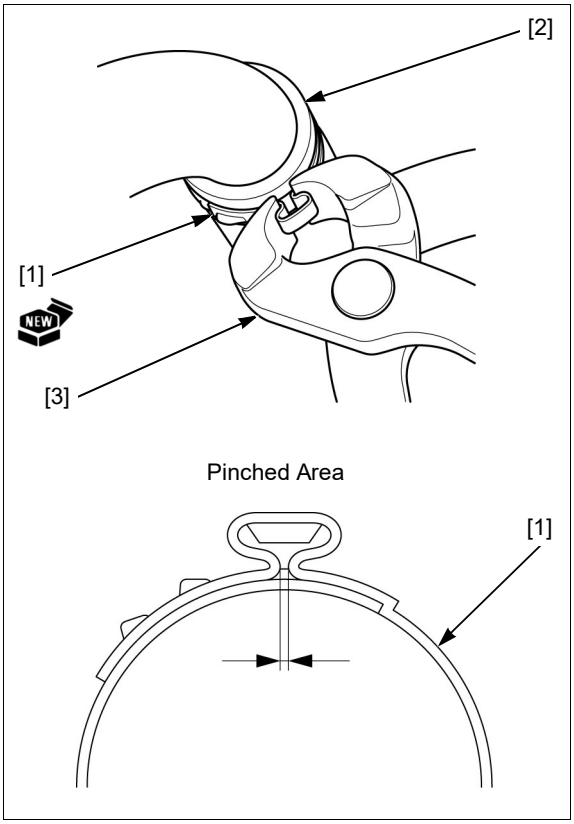
WATER HOSE BAND INSTALLATION

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 as shown to secure water hose.

TOOL:
Pincher [3] Oetiker 1098 or equivalent

Hose diameter 19 mm:
1 mm (0.04 in) maximum
Hose diameter 29.8 mm:
2 mm (0.08 in) maximum



MEMO

9. LUBRICATION SYSTEM

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 strainer.
- The oil pump and oil strainer 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
- Faulty oil pump
- Internal oil leak
- Incorrect oil being used
- Oil pressure relief valve stuck open
- Clogged oil filter

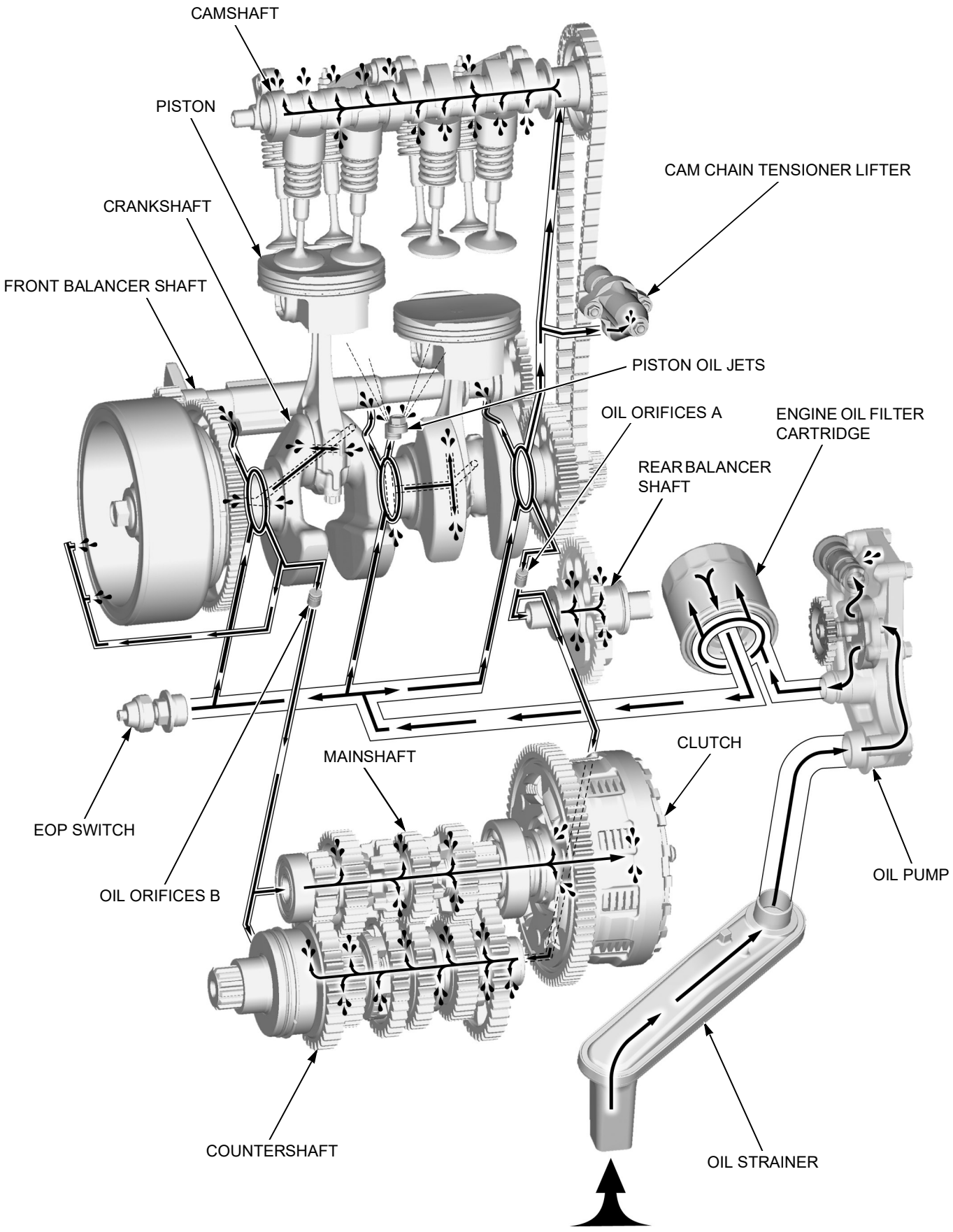
No oil pressure
- Oil level too low
- Oil pressure relief valve stuck open
- Damaged oil pump
- Internal oil leak

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

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

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

LUBRICATION SYSTEM DIAGRAM



OIL PRESSURE INSPECTION

Remove the engine oil filter cartridge (page 3-12).

Apply engine oil to the O-ring and install the attachment oil pressure [1] onto the oil filter boss.

TOOL:

Attachment Oil Pressure	**070MJ-0010101**

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

Install the engine oil filter cartridge [2] onto the oil pressure attachment.

TOOL:

Oil Filter Wrench	**07HAA-PJ70101**

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)

Connect the oil pressure gauge [3] and oil pressure gauge attachment [4] to the attachment oil pressure.

TOOLS:

Oil Pressure Gauge	**07506-3000001 or equivalent commercially available**
Oil Pressure Gauge Attachment	**07406-0030000 or equivalent commercially available**

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

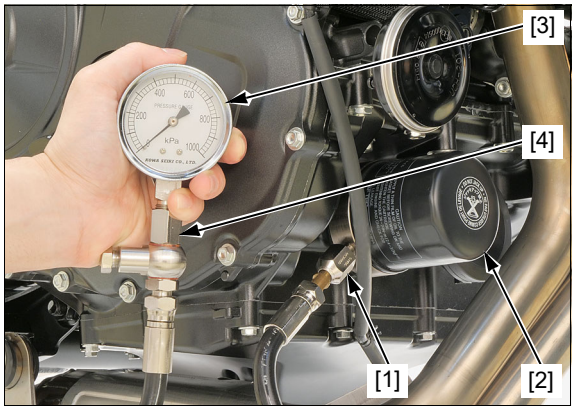
Warm the engine to normal operating temperature (approximately 80°C/176°F) and increase the engine speed to 5,000 min^{-1} (rpm) and read the oil pressure.

STANDARD:

500 kPa (5.1 kgf/cm^2, 73 psi) at 5,000 min^{-1} (rpm)/ (80°C/176°F)

Stop the engine and remove the tools.

Install the engine oil filter cartridge (page 3-12).

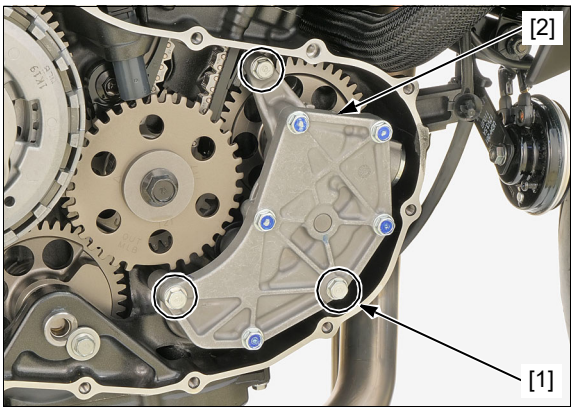


OIL PUMP

REMOVAL/INSTALLATION

Remove the right crankcase cover (page 12-4).

Remove the oil pump mounting bolts [1] and oil pump [2].

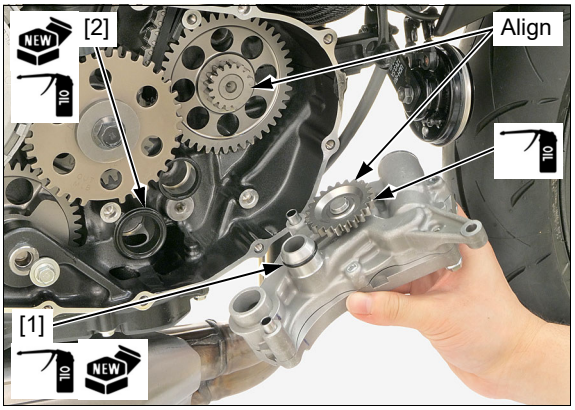


Remove the O-ring [1] and oil pump packing [2].

Installation is in the reverse order of removal.

NOTE:

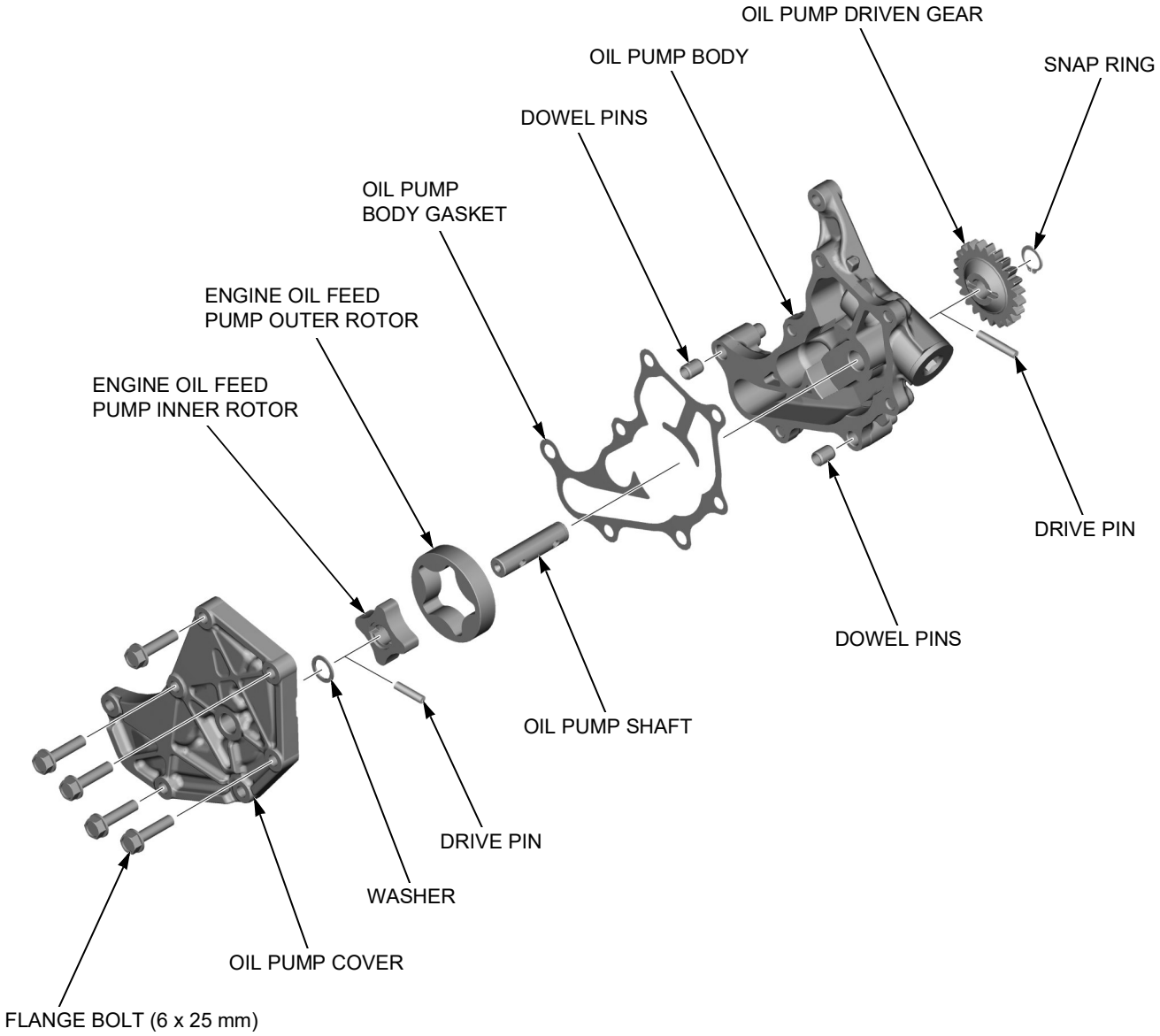
- Apply engine oil to a new oil pump packing, O-ring, and oil pump driven gear teeth.
- Align the teeth of the oil pump driven gear with the teeth of the oil pump drive gear on the front balancer shaft by turning the driven gear with your finger.



DISASSEMBLY/ASSEMBLY

NOTE:

- Dip all parts in clean engine oil.



INSPECTION

OIL PUMP

Inspect the following parts for damage, abnormal wear, deformation, or burning:

– Oil pump shaft
– Drive pin
– Inner rotor
– Outer rotor
– Oil pump body
– Oil pump cover

Measure the oil pump clearances according to LUBRICATION SYSTEM SPECIFICATIONS (page 1-7).

If any of the measurement is out of the service limit, replace the oil pump as an assembly.

OIL STRAINER

REMOVAL

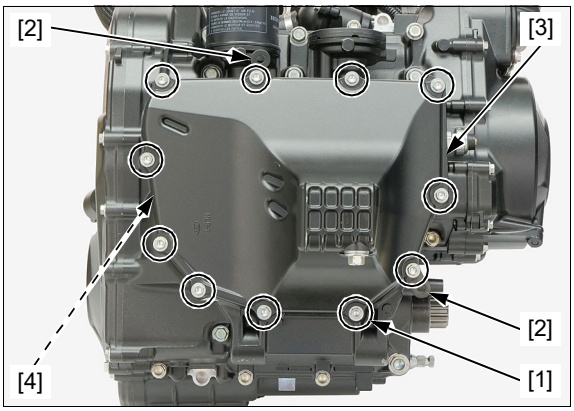
Drain the engine oil (page 3-12).

Remove the exhaust pipe (page 2-20).

Loosen the bolts [1] in a crisscross pattern in 2 or 3 steps.

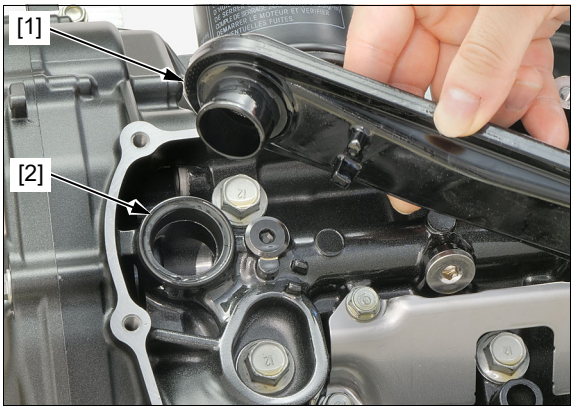
Remove the following:

– Bolts
– Stays [2]
– Oil pan [3]
– Gasket [4]



Remove the oil strainer [1] and oil strainer packing [2].

Clean the oil strainer and check for damage, replace it if necessary.



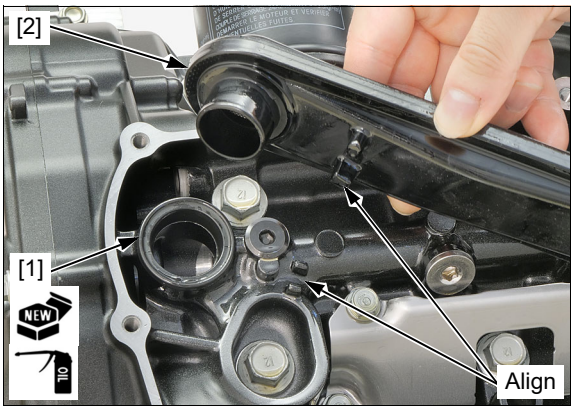
INSTALLATION

Apply engine oil to a new oil strainer packing.

Install the oil strainer packing [1] and oil strainer [2].

NOTE:

- Place the strainer boss between the two bosses of the crankcase.

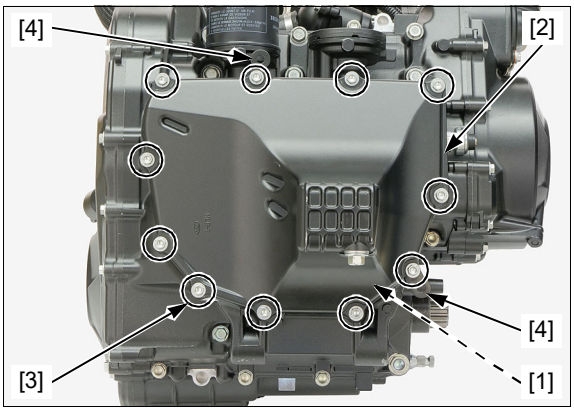


Install the gasket [1] and oil pan [2].

Install and tighten the bolts [3] and stays [4] in a crisscross pattern in 2 or 3 steps.

Install the exhaust pipe (page 2-20).

Fill the engine with the recommended engine oil and check that there are no oil leaks (page 3-12).

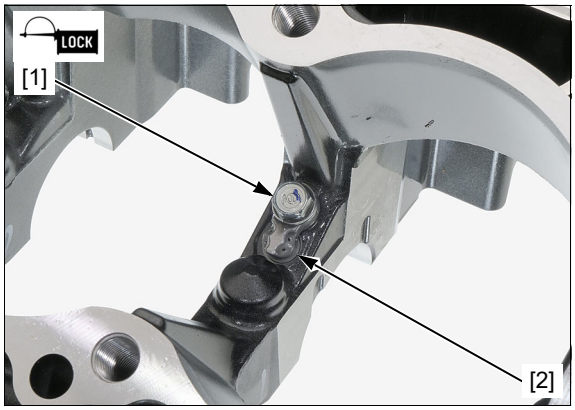


PISTON OIL JET

REMOVAL/INSTALLATION

Remove the cylinder (page 14-12).

Remove the oil jet bolt [1] and piston oil jet [2].



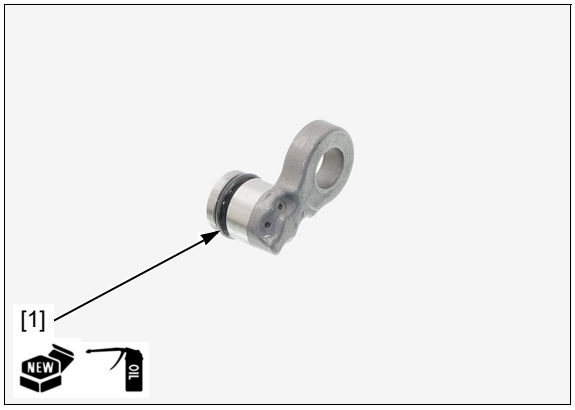
Remove the O-ring [1].

Installation is in the reverse order of removal.

NOTE:

- Replace the O-ring with a new one.
- Apply engine oil to new O-ring.
- Apply locking agent to the oil jet bolt threads

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



10. CYLINDER HEAD/VALVE/CAMSHAFT

SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves, rocker arms and camshaft. These services can be done with the engine installed in the frame.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Rocker arm, valve and camshaft lubricating oil is fed through oil passage in the cylinder head. Clean the oil passage before assembling the 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 can be diagnosed by a compression test, or by tracing noises to the top-end with a sounding rod or stethoscope.
- If the performance is poor at low speeds, check for a white smoke in the crankcase breather hose. If the hose is smoky, check for seized piston ring (page 14-12).

Compression too low, hard starting or poor performance at low speed

- Valves:
  - Incorrect valve clearance
  - Burned or bent valve
  - Incorrect valve timing
  - Broken valve spring
  - Uneven valve seating
  - Valve stuck open
- Cylinder head:
  - Leaking or damaged cylinder head gasket
  - Loose spark plug
  - Warped or cracked cylinder head
- Cylinder/piston problem (page 14-2)

Compression too high, overheating or knocking

- Excessive carbon build-up on piston head or combustion chamber

Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Cylinder/piston problem (page 14-2)

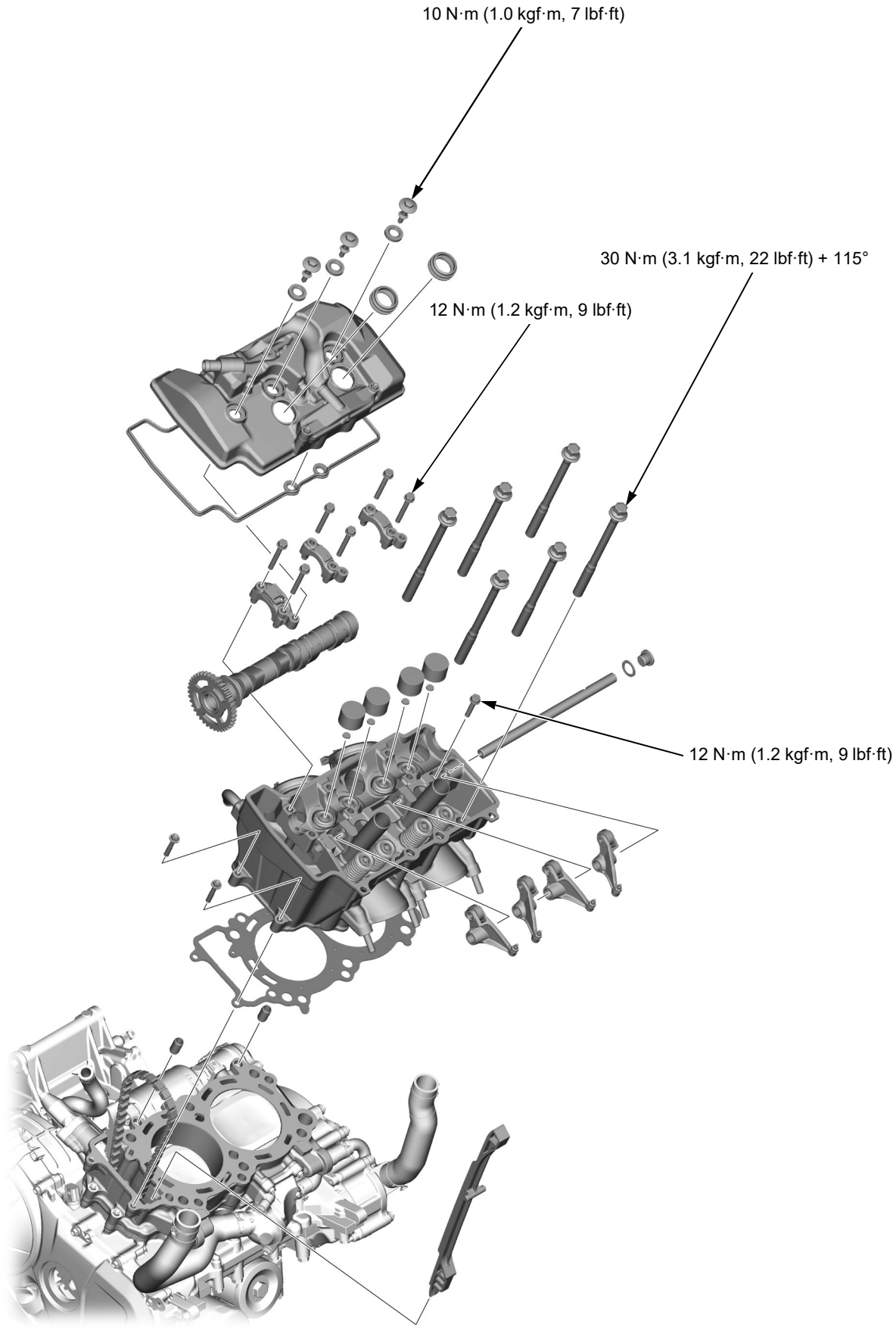
Excessive noise

- Incorrect valve clearance
- Sticking valve or broken valve spring
- Excessively worn valve seat
- Worn or damaged camshaft
- Worn rocker arm and/or shaft
- Worn rocker arm follower or valve stem end
- Loose or worn cam chain
- Worn or damaged cam chain tensioner
- Worn cam sprocket teeth
- Cylinder/piston problem (page 14-2)

Rough idle

- Low cylinder compression

COMPONENT LOCATION



CYLINDER COMPRESSION

Warm up the engine to normal operating temperature. Stop the engine, and remove the spark plugs (page 3-6).

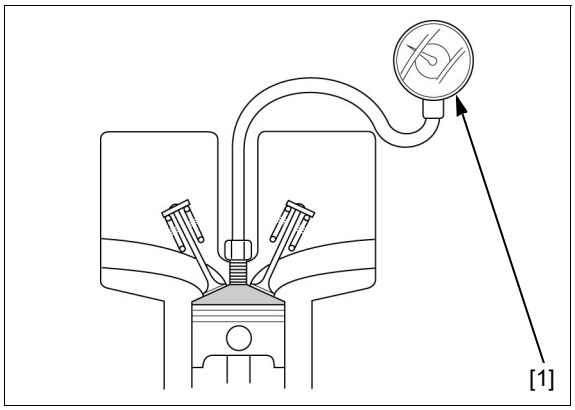
Temporarily connect the IAT sensor 2P connector.

Install the compression gauge [1] into the spark plugs hole.

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

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:
1,393 kPa (14.2 kgf/cm^2, 202 psi)
at 600 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

Erase the DTC (page 4-6).

CYLINDER HEAD COVER

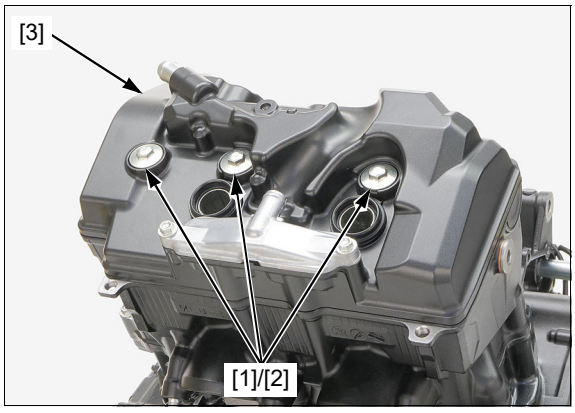
REMOVAL

Remove the following:

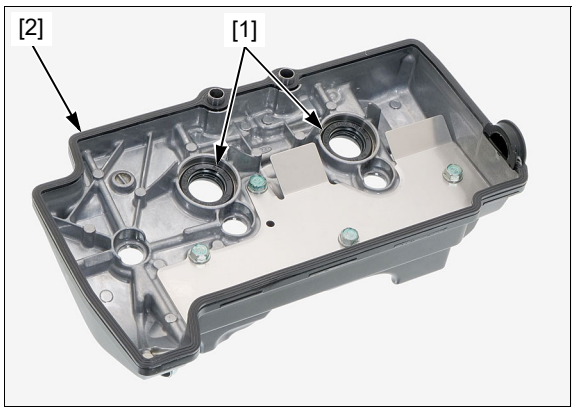
– Throttle body (page 7-14)
– PAIR control solenoid valve (page 7-16)
– Ignition coils (page 5-8)

Remove the cylinder head cover bolts [1] and mounting rubbers [2].

Remove the cylinder head cover [3] from the left side.

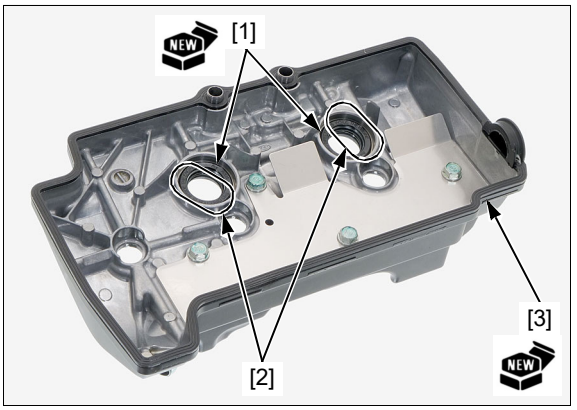


Remove the plug pipe seals [1] and cylinder head cover packing [2] from the cylinder head cover.



INSTALLATION

Install new plug pipe seals [1] to the cylinder head cover.

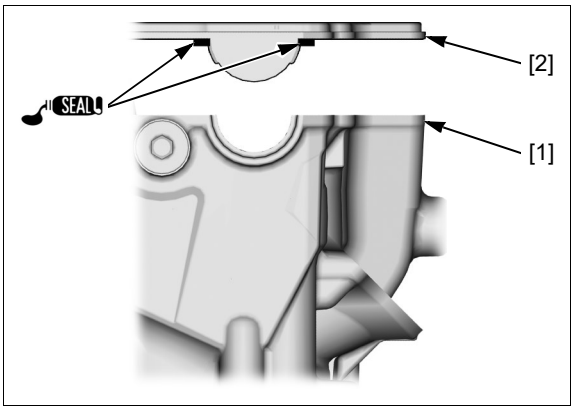


NOTE:

- Install the plug pipe seals with their sentences [2] facing the inside of the engine.

Install a new cylinder head cover packing [3] to the cylinder head cover.

Clean the cylinder head [1] mating surface thoroughly.



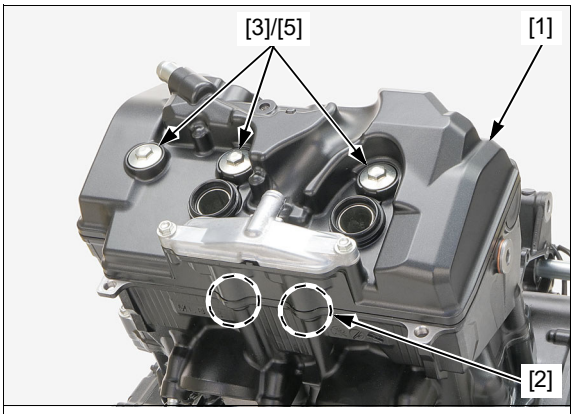
Apply liquid sealant (TB5211C manufactured by ThreeBond, KE45 manufactured by Shin-Etsu Silicone or an equivalent) to the cylinder head cover packing [2] as shown.

NOTE:

- Do not apply more liquid sealant than necessary.

Insert the cylinder head cover from the left side.

Install the cylinder head cover [1] on the cylinder head.

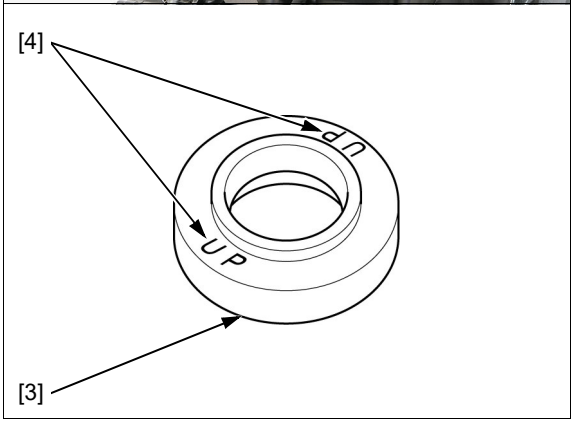


NOTE:

- Be sure to be installed the dowel pins [2] of the cylinder head cover to the cylinder head holes securely.

Check that the mounting rubbers [3] are in good condition, and replace them if necessary.

Install the mounting rubbers.



NOTE:

- Install the mounting rubbers with their "UP" marks [4] facing up.

Install and tighten the cylinder head cover bolts [5] to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the following:

– Ignition coils (page 5-8)
– PAIR control solenoid valve (page 7-16)
– Throttle body (page 7-14)

ROCKER ARM

REMOVAL

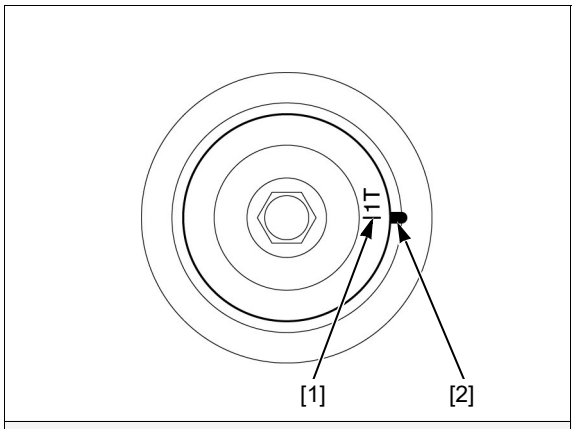
Remove the following:

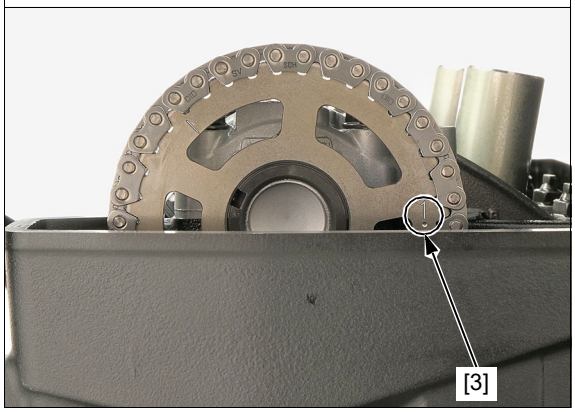
– Cylinder head cover (page 10-4)
– Timing hole cap (page 3-7)

Turn the crankshaft clockwise and align the "1T" mark [1] with the index mark [2] of the right crankcase cover.

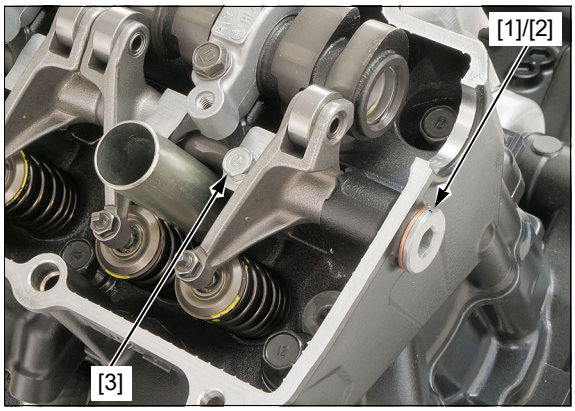
Make sure that the "1" punch mark [3] on the cam sprocket is aligned with the upper surface of the cylinder head and "1" is visible.

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





Remove the rocker arm shaft stopper bolt [1], sealing washer [2] and rocker arm shaft bolt [3].

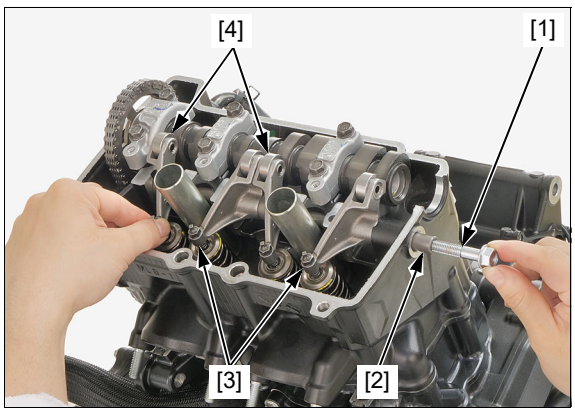


Temporarily install the suitable 8 mm bolt [1] to the rocker arm shaft [2].

Remove the rocker arm shaft by pulling the suitable 8 mm bolt.

Remove the suitable 8 mm bolt from the rocker arm shaft.

Remove the rocker arms A [3] and B [4].



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning.

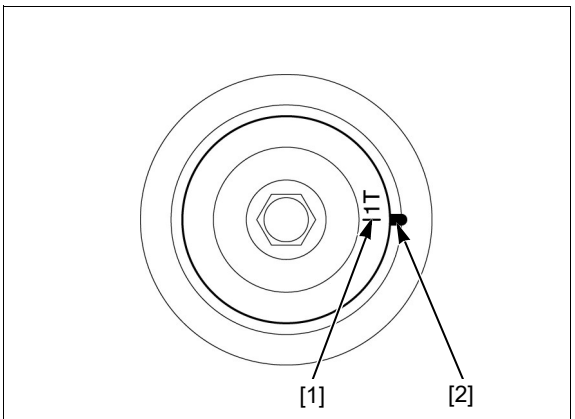
– Rocker arm A
– Rocker arm B
– Rocker arm shaft

Measure each part according to CYLINDER HEAD/VALVE/CAMSHAFT SPECIFICATIONS (page 1-7).

Replace any part if it is out of the service limit.

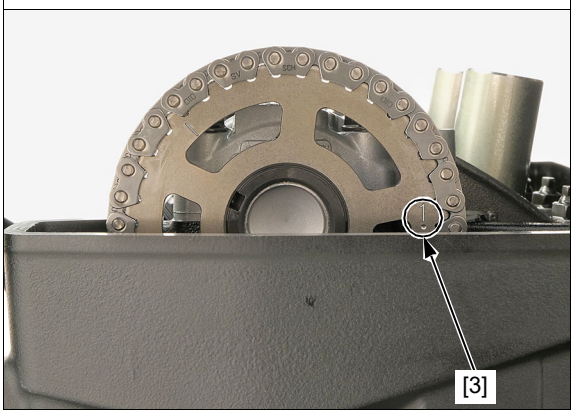
INSTALLATION

Turn the crankshaft clockwise and align the "1T" mark [1] with the index mark [2] of the right crankcase cover.



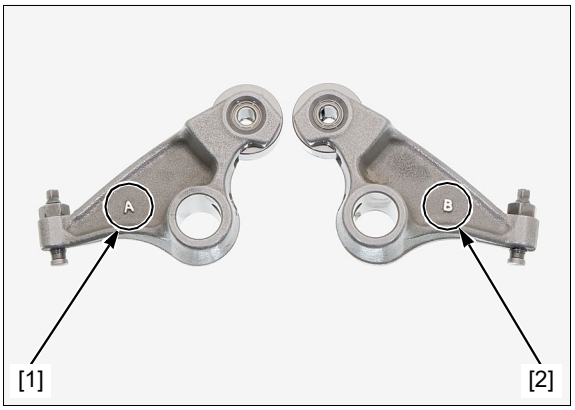
Make sure that the "1" punch mark [3] on the cam sprocket is aligned with the upper surface of the cylinder head and "1" is visible.

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



The rocker arms have the following identification marks:

– "A" mark [1]: rocker arm A
– "B" mark [2]: rocker arm B



Apply molybdenum oil solution to the rocker arm sliding area and thrust surface.

Apply molybdenum oil solution to the rocker arm shaft outer surface.

Temporarily install the suitable 8 mm bolt [1] to the rocker arm shaft [2].

Install the rocker arms A [3] and B [4].

Install the rocker arm shaft.

NOTE:

- Install the rocker arm shaft with aligning its groove with the rocker arm shaft bolt hole of the cylinder head.

Install and tighten the rocker arm shaft bolt [5] to the specified torque.

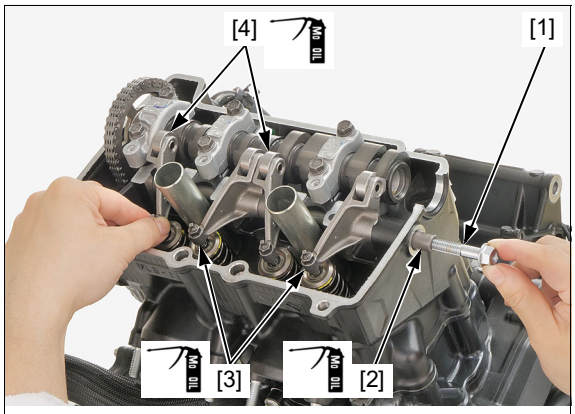
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

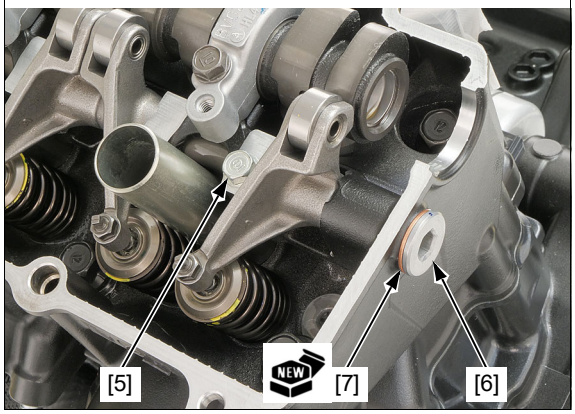
Remove the suitable 8 mm bolt from the rocker arm shaft.

Install the rocker arm shaft stopper bolt [6] and a new sealing washer [7].

Install the following:

– Cylinder head cover (page 10-4)
– Timing hole cap (page 3-7)

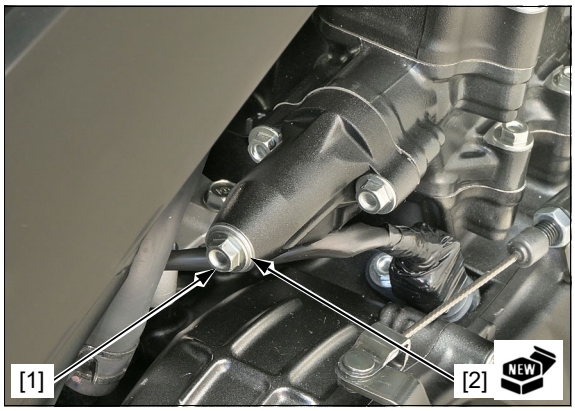




CAM CHAIN TENSIONER/LIFTER

CAM CHAIN TENSIONER LIFTER REMOVAL/INSTALLATION

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

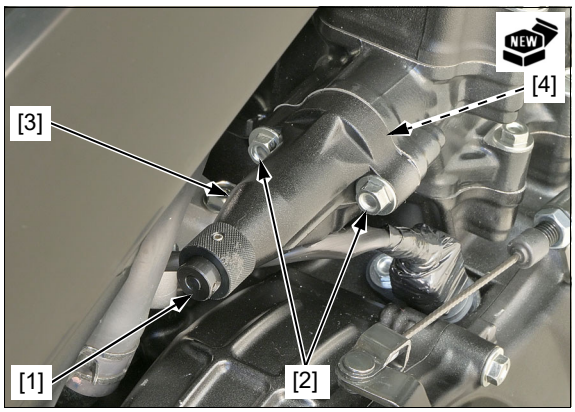


Release the cam chain tension by turning the cam chain tensioner lifter shaft fully in (clockwise) and secure it using the special tool.

TOOL:

Stopper Tensioner [1]	**070MG-0010100**

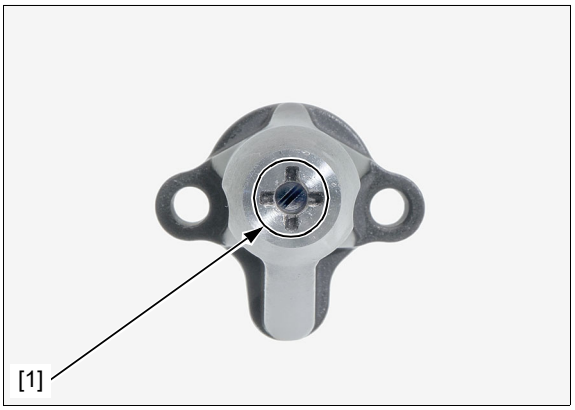
Remove the bolts [2], cam chain tensioner lifter [3] and gasket [4].



Installation is in the reverse order of removal.

NOTE:

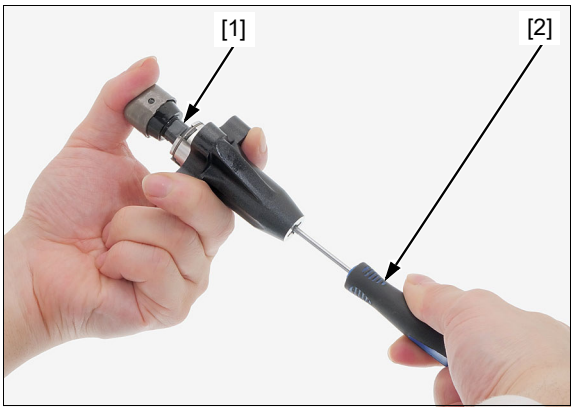
- Apply more than 0.5 cm^3 engine oil to the cam chain tensioner [1] slit end surface of shaft.
- Replace the gasket with a new one.
- Replace the sealing washer with a new one.



INSPECTION

Check the cam chain tensioner lifter operation:

– The cam chain tensioner lifter shaft [1] should not go into the lifter body when it is pushed.
– When it is turned clockwise with the tensioner stopper or a screwdriver [2], the shaft should be pulled into the lifter body. The shaft should spring out of the lifter body as soon as the screwdriver is released.

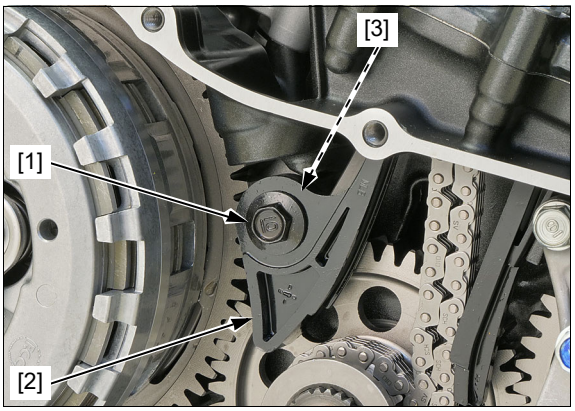


CAM CHAIN TENSIONER REMOVAL

Remove the following:

– Cam chain tensioner lifter (page 10-8)
– Camshaft (page 10-10)
– Pulser plate (page 12-15)

Remove the cam chain tensioner bolt [1], cam chain tensioner [2] and collar [3].



CAM CHAIN TENSIONER INSTALLATION

Apply locking agent to the cam chain tensioner pivot bolt threads.

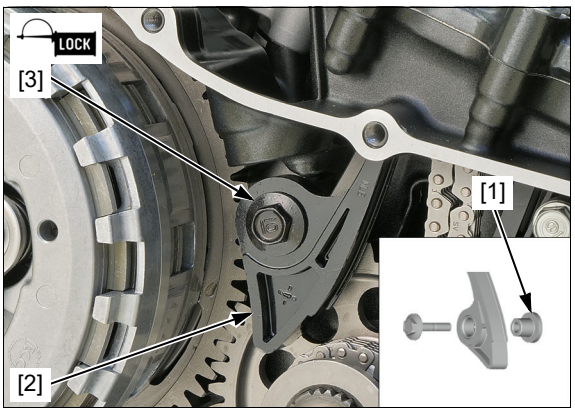
Install the collar [1], cam chain tensioner [2] and cam chain tensioner pivot bolt [3].

Tighten the bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the following:

– Pulser plate (page 12-15)
– Camshaft (page 10-10)
– Cam chain tensioner lifter (page 10-8)



CAMSHAFT

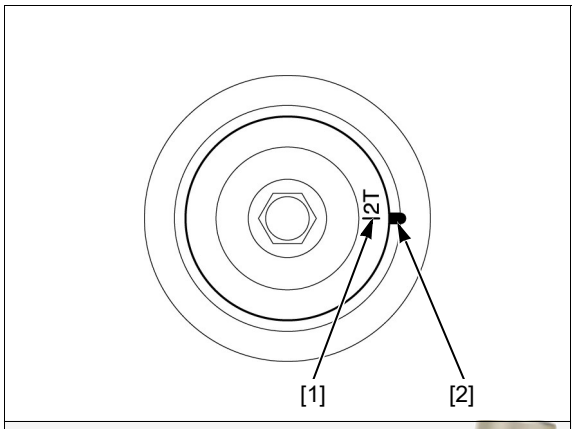
REMOVAL

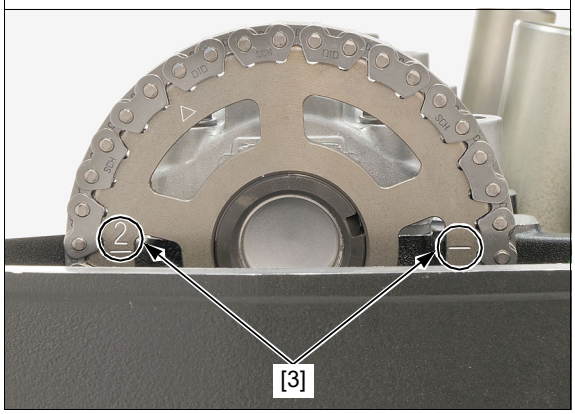
Remove the rocker arms (page 10-6).

Turn the crankshaft clockwise and align the "2T" mark [1] with the index mark [2] of the right crankcase cover.

Make sure that the index lines [3] on the cam sprocket aligns with the upper surface of the cylinder head and "2" is visible.

Retract and hold the cam chain tensioner (page 10-8).





Loosen the camshaft holder bolts [1].

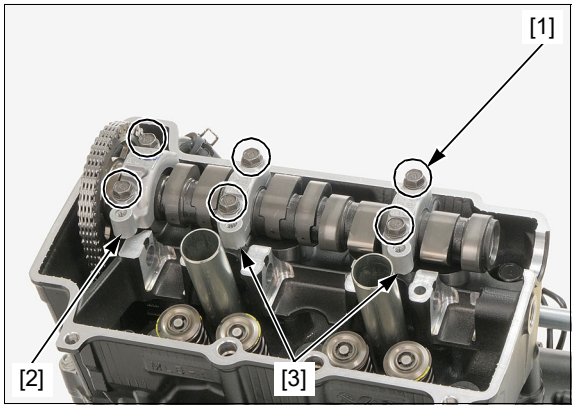
NOTE:

- Loosen the camshaft holder bolts in a crisscross pattern in 2 or 3 steps.

Remove the camshaft holder bolts, camshaft holders A [2] and B [3].

NOTE:

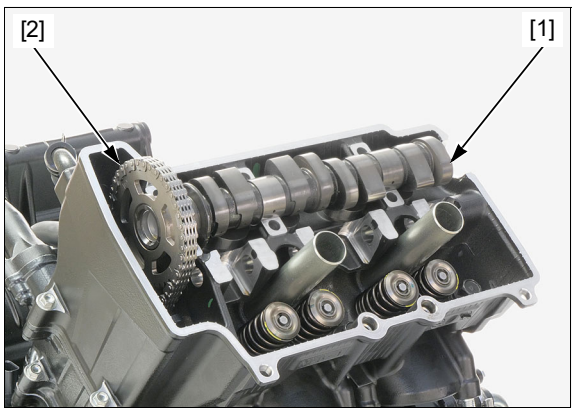
- Be careful not to let the camshaft holder bolts fall into the crankcase.
- Do not forcibly remove the dowel pins from the camshaft holders.



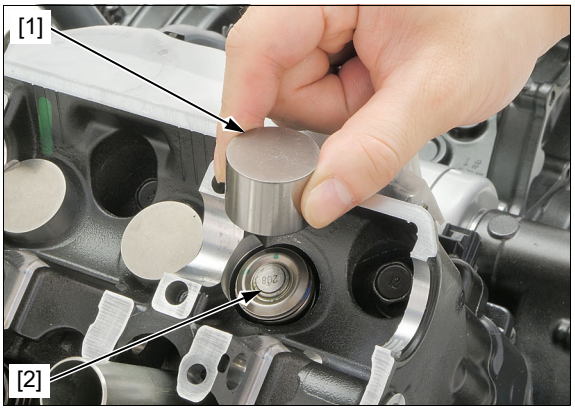
Remove the camshaft [1] by releasing the cam chain [2].

NOTE:

- Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.



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



NOTE:

- 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 shims can be easily removed with tweezers or a magnet.

INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning, or clogs in oil passages.

– Cam sprocket
– Camshaft
– Camshaft holder
– Valve lifter

Measure each part according to CYLINDER HEAD/VALVE/CAMSHAFT SPECIFICATIONS (page 1-7).

Replace any part if it is out of the service limit.

CAMSHAFT OIL CLEARANCE

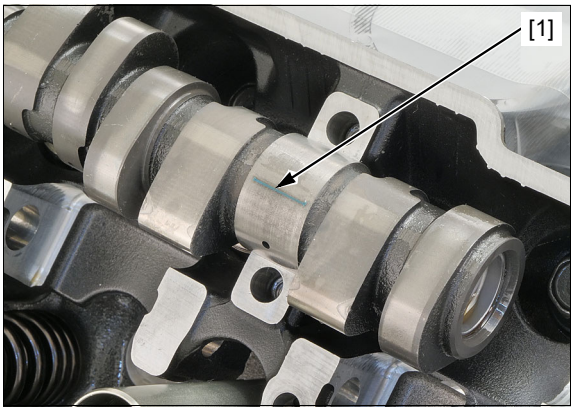
NOTE:

- Do not rotate the camshaft during inspection.

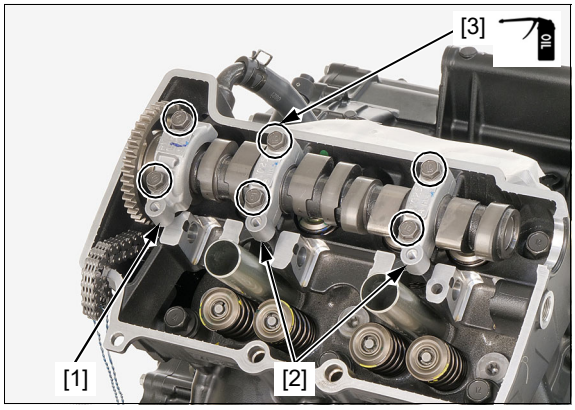
Wipe any oil from the journals of the cylinder head, camshaft and camshaft holder.

Set the camshaft onto the cylinder head without installing the shims, valve lifters and cam chain.

Lay a strip of plastigauge [1] lengthwise on each camshaft journal and be sure to avoid the oil passages.



Install the camshaft holders A [1] and B [2] in the correct locations (page 10-12).



NOTE:

- Be careful not to drop the plastigauge.

Apply engine oil to the threads and seating surfaces of the camshaft holder bolts.

Install and tighten the camshaft holder bolts [3] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:

- Tighten the camshaft holder bolts in a crisscross pattern in 2 or 3 steps.

Loosen the camshaft holder bolts.

NOTE:

- Loosen the camshaft holder bolts in a crisscross pattern in 2 or 3 steps.

Remove the camshaft holder bolts and camshaft holders.

Measure the compressed plastigauge at its widest point on the camshaft to determine the oil clearance.

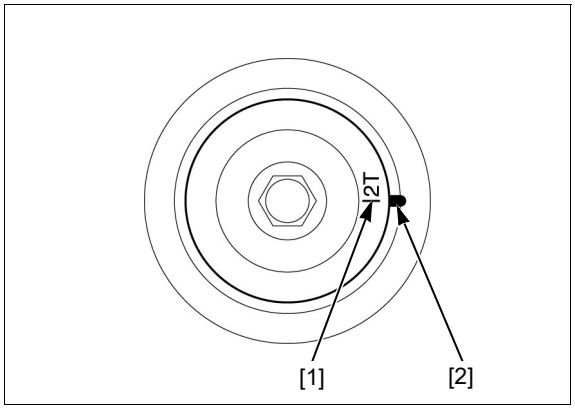
SERVICE LIMIT: 0.10 mm (0.004 in)

If the oil clearance exceeds the service limit, replace the camshaft and recheck the oil clearance.

Replace the cylinder head and camshaft holders as a set if the oil clearance still exceeds the service limit.

INSTALLATION

Turn the crankshaft clockwise and align the "2T" mark [1] with the index mark [2] of the cover.



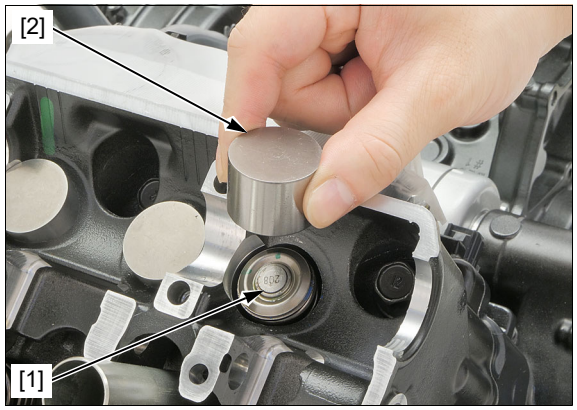
NOTE:

- Be careful not to jam the cam chain and timing sprocket of the crankshaft when rotating the crankshaft.

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

NOTE:

- Do not allow the shims to fall into the crankcase.
- Install all valve lifters and shims in their original locations.



Apply molybdenum oil solution to the camshaft journal [1], cam lobes and thrust surfaces.

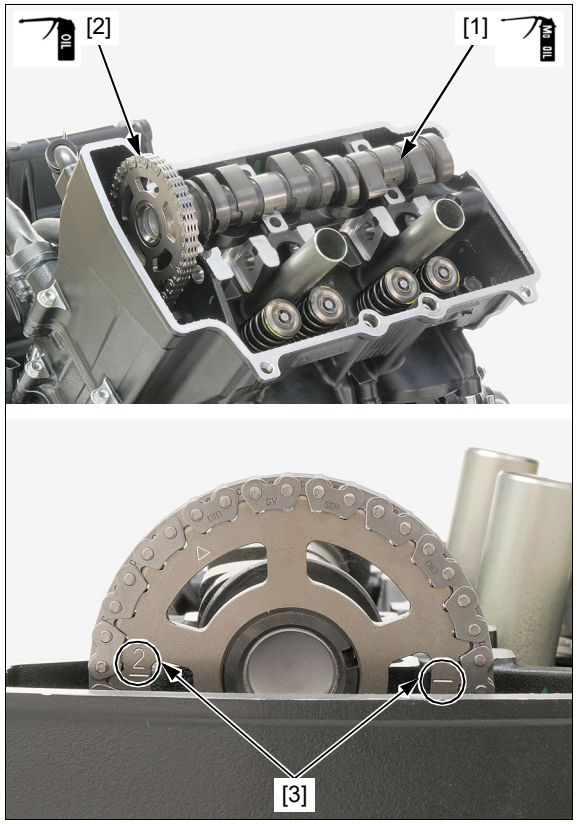
Apply engine oil to the cam chain whole surface.

Install the cam chain [2] over the cam sprocket.

Set the camshaft onto the cylinder head.

NOTE:

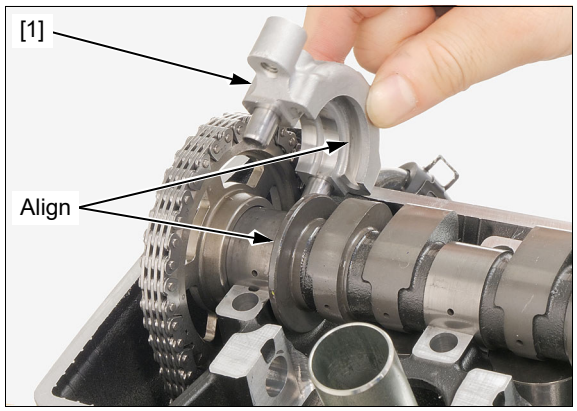
- Make sure that the index lines [3] on the cam sprocket aligns with the upper surface of the cylinder head and "2" is visible.



Install the camshaft holder B [1].

NOTE:

- Align the groove of the camshaft holder B with the guide of the camshaft.



Apply molybdenum oil solution to the left camshaft holder A and right camshaft holder A insides.

Install the left camshaft holder A [1] and right camshaft holder A [2].

NOTE:

- The left camshaft holder A and right camshaft holder A have the following identification marks:
  – "A" mark [3]: left camshaft holder A
  – "B" mark [4]: right camshaft holder A

Apply engine oil to the camshaft holder bolts threads and seating surfaces.

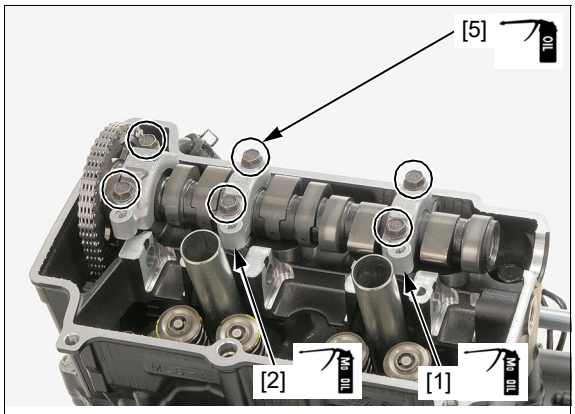
Install and tighten the camshaft holder bolts [5] to the specified torque.

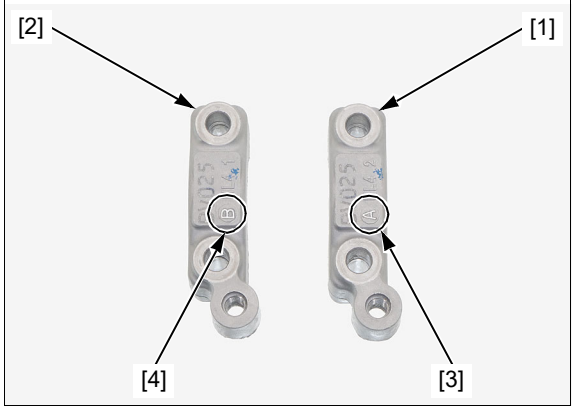
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:

- Tighten the camshaft holder bolts in a crisscross pattern in 2 or 3 steps.

Retract and hold the cam chain tensioner (page 10-8).





CYLINDER HEAD

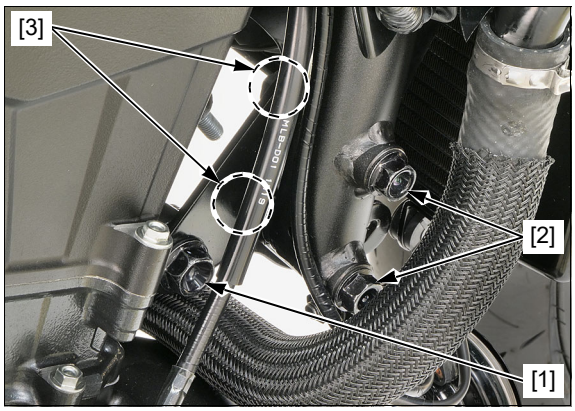
REMOVAL

Remove the following:

– Exhaust pipe (page 2-20)
– Camshaft (page 10-10)

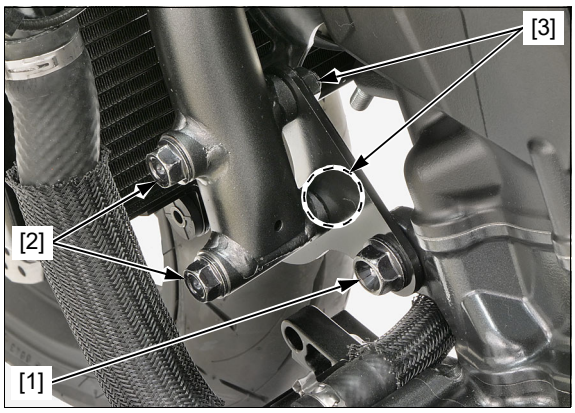
Loosen the right engine hanger bolt [1].

Hold the right engine hanger plate bolts [2] and loosen the nuts [3].



Loosen the left engine hanger bolt [1].

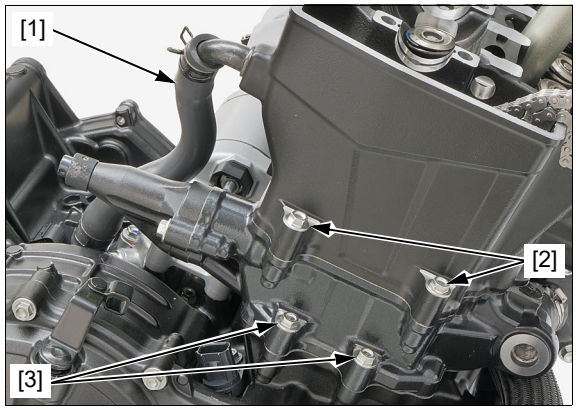
Hold the left engine hanger plate bolts [2] and loosen the nuts [3].



Disconnect the breather hose [1].

Remove the cylinder head bolts [2].

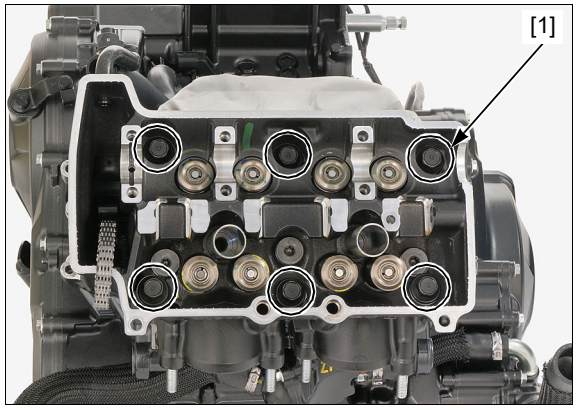
Loosen the cylinder bolts [3].



Loosen the cylinder head bolt/washers [1].

NOTE:

- Loosen the cylinder head bolt/washers in a crisscross pattern in 2 or 3 steps.

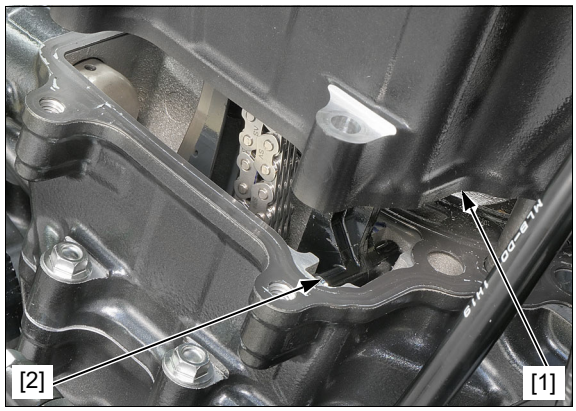


Lift up the cylinder head [1] to get the clearance for cam chain guide [2] removal.

NOTE:

- Do not tap the cylinder head too hard and do not damage the mating surface with a screwdriver.

Remove the cam chain guide.

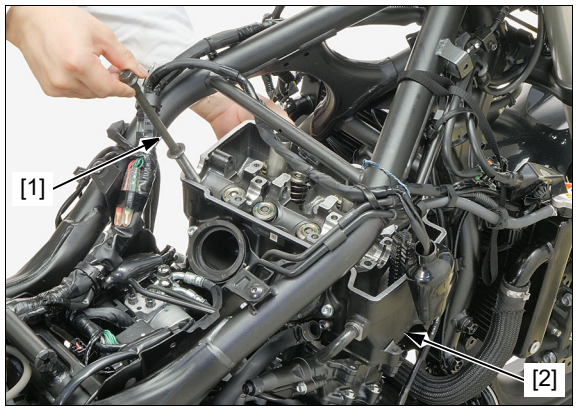


Remove the cylinder head bolt/washers [1].

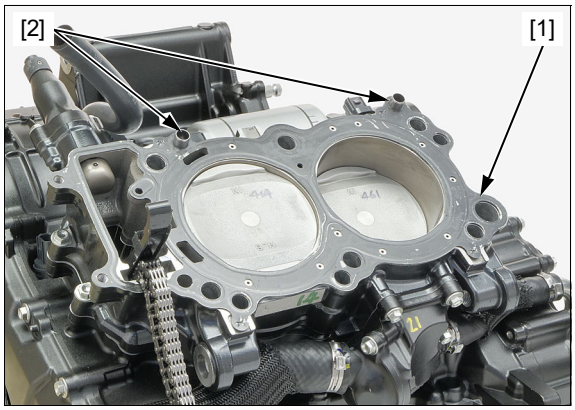
NOTE:

- When removing the left side bolts, move the cylinder head.

Remove the cylinder head [2] from the left side.



Remove the gasket [1] and dowel pins [2].



DISASSEMBLY

Remove the following:

– Insulator (page 10-24)
– Spark plugs (page 3-6)

TOOL:
Tappet Hole Protector 26 x 28 [1] 07999-4220000

Install the tappet hole Protector 26 x 28 into the valve lifter bore.

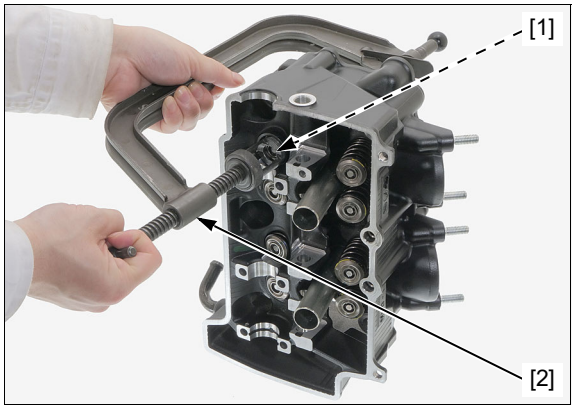
Remove the valve cotters [1] using the special tool as shown.

TOOL:
Valve Spring Compressor Set [2] 07757-0010000

NOTE:

• To prevent loss of tension, do not compress the valve springs more than necessary.

Remove the tappet hole protector.

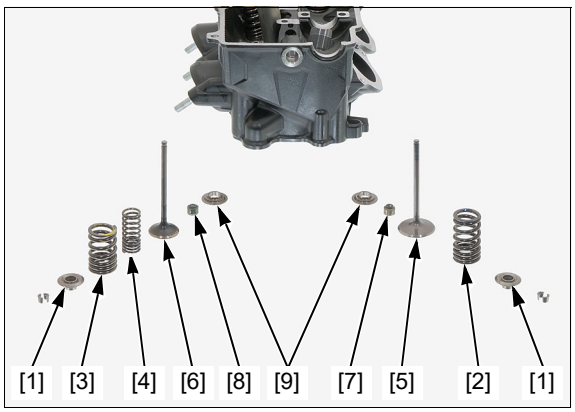


Remove the following:

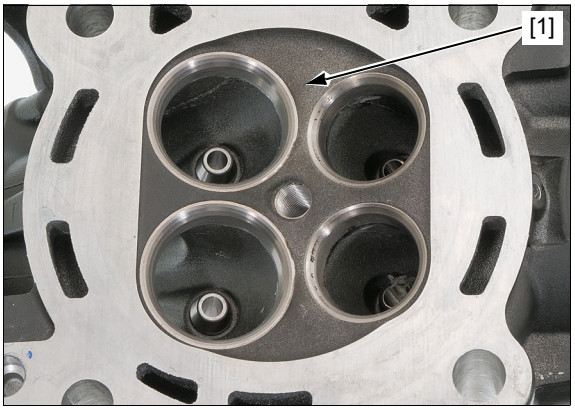
– Spring retainers [1]
– Intake valve springs [2]
– Exhaust valve outer springs [3]
– Exhaust valve inner springs [4]
– Intake valves [5]
– Exhaust valves [6]
– Intake stem seals [7]
– Exhaust stem seals [8]
– Spring seats [9]

NOTE:

• Mark all the parts so they can be placed back in their original location.



Remove carbon deposits from the combustion chamber [1].



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning or clogs in oil passages.

– Cylinder head
– Valve springs
– Valves
– Valve guides
– Cam chain tensioner
– Cam chain guide

Measure each part according to CYLINDER HEAD/VALVE/CAMSHAFT SPECIFICATIONS (page 1-7).

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 10-18).
- Refer to valve seat inspection (page 10-18).

VALVE GUIDE REPLACEMENT

Disassemble the cylinder head (page 10-16).

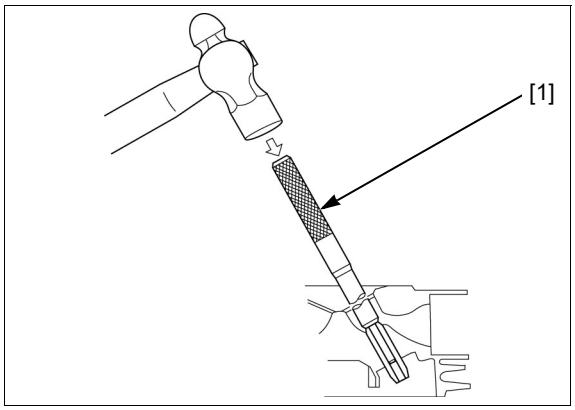
Chill the replacement valve guides in the freezer section of a refrigerator for about an hour.

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.

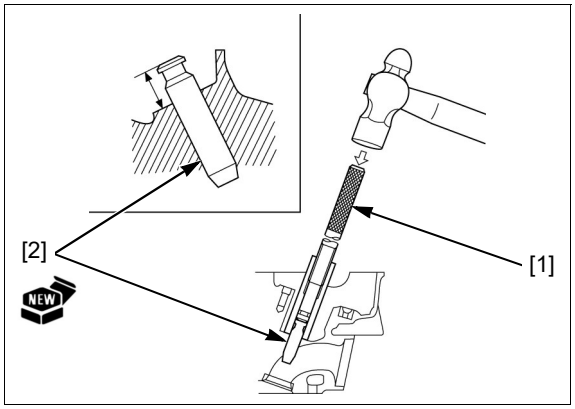
Support the cylinder head and drive out the valve guides from combustion chamber side of the cylinder head.



TOOL:
Valve Guide Driver 07742-0010100
5.35 x 9.7 mm [1]

Adjust the valve guide driver [1] to the specified depth.

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.



SPECIFIED DEPTH:
IN: 19.7 – 20.0 mm (0.78 – 0.79 in)
EX: 17.9 – 18.2 mm (0.70 – 0.72 in)

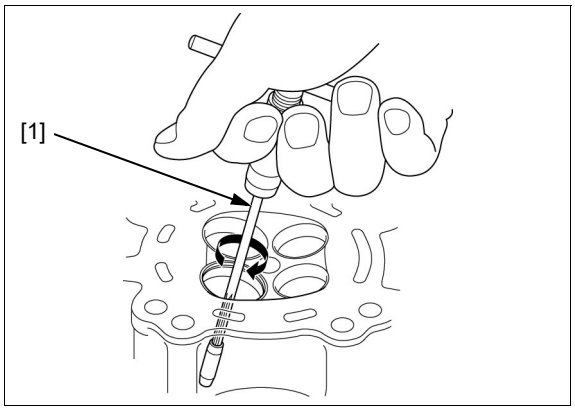
TOOL:
Valve Guide Driver Adjustable Type 07743-0020000

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 cylinder head and always rotate the reamer clockwise.



TOOL:
Valve Guide Reamer 5.510 07984-2000001

NOTE:

- Take care not to tilt or lean the reamer in the guide while reaming.

Clean the cylinder head thoroughly to remove any metal particles.

Inspect the valve seat (page 10-18).

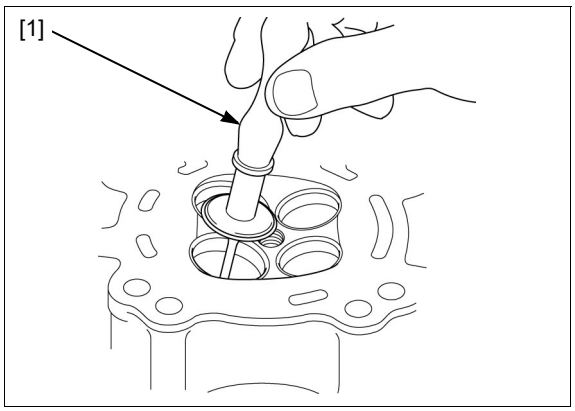
VALVE SEAT INSPECTION

Disassemble the cylinder head (page 10-16).

Clean the intake and exhaust valves thoroughly to remove carbon deposits.

Apply a light coating of Prussian Blue to the valve seats.

Tap the valve against the valve seat without rotating the valve, using a hand-lapping tool [1].



Measure the valve seat width according to CYLINDER HEAD/VALVE/CAMSHAFT SPECIFICATIONS (page 1-7).

Reface the valve seat (page 10-19) in the following cases:

– Valve seat contact area is too wide or too narrow
– Valve seat contact surface is not center
– Damaged valve seat contact face

NOTE:

• The valves cannot be ground. If the valve face is burned, badly worn, or if it contacts the seat unevenly, replace the valve.

If the contact surface of the valve seat is abnormal, the valve is tilted, inspect the valve stem-to-valve guide clearance (page 1-7).

If the valve stem-to-valve guide clearance are normal, replace the valve guide (page 10-18).

VALVE SEAT REFACING

Inspect the valve seat (page 10-18).

Reface the valve seat using the following tools.

TOOLS:

Cutter Holder 5.5 mm	**07781-0010101**
Seat Cutter 40 mm	**07780-0010500**
Seat Cutter 33 mm	**07780-0010800**
Flat Cutter 38.5 mm	**07780-0012400**
Flat Cutter 33 mm	**07780-0012900**
Interior Cutter 37.5 mm	**07780-0014100**
Interior Cutter 34 mm	**07780-0014700**

STANDARD:

IN: 1.0 – 1.2 mm (0.04 – 0.05 in)
EX: 1.3 – 1.5 mm (0.05 – 0.06 in)

SERVICE LIMITS:

IN: 1.5 mm (0.06 in)
EX: 1.9 mm (0.07 in)

NOTE:

• Follow the refacer manufacturer's operating instructions.
• Be careful not to grind the seat more than necessary.

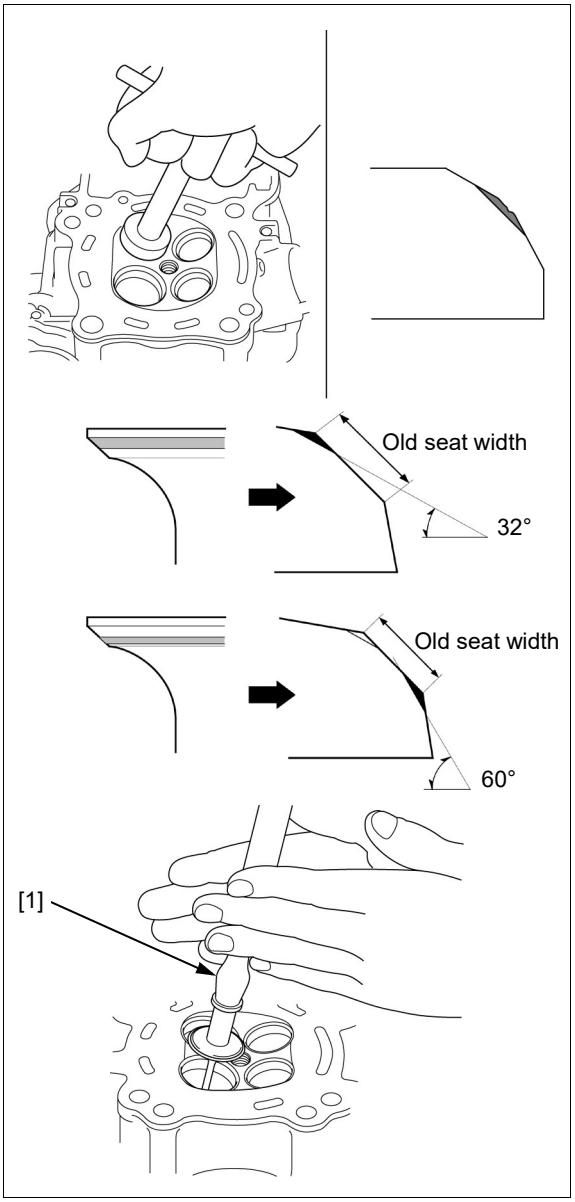
1. Use a 45° seat cutter, remove any roughness or irregularities from the seat.
2. Use a 32° flat cutter, remove the top 1/4 of the existing valve seat material.
3. Use a 60° interior cutter, remove the bottom 1/4 of the existing valve seat material.
4. Using a 45° seat cutter, cut the seat to the proper width.
   Make sure that all pitting and irregularities are removed.
5. After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

NOTE:

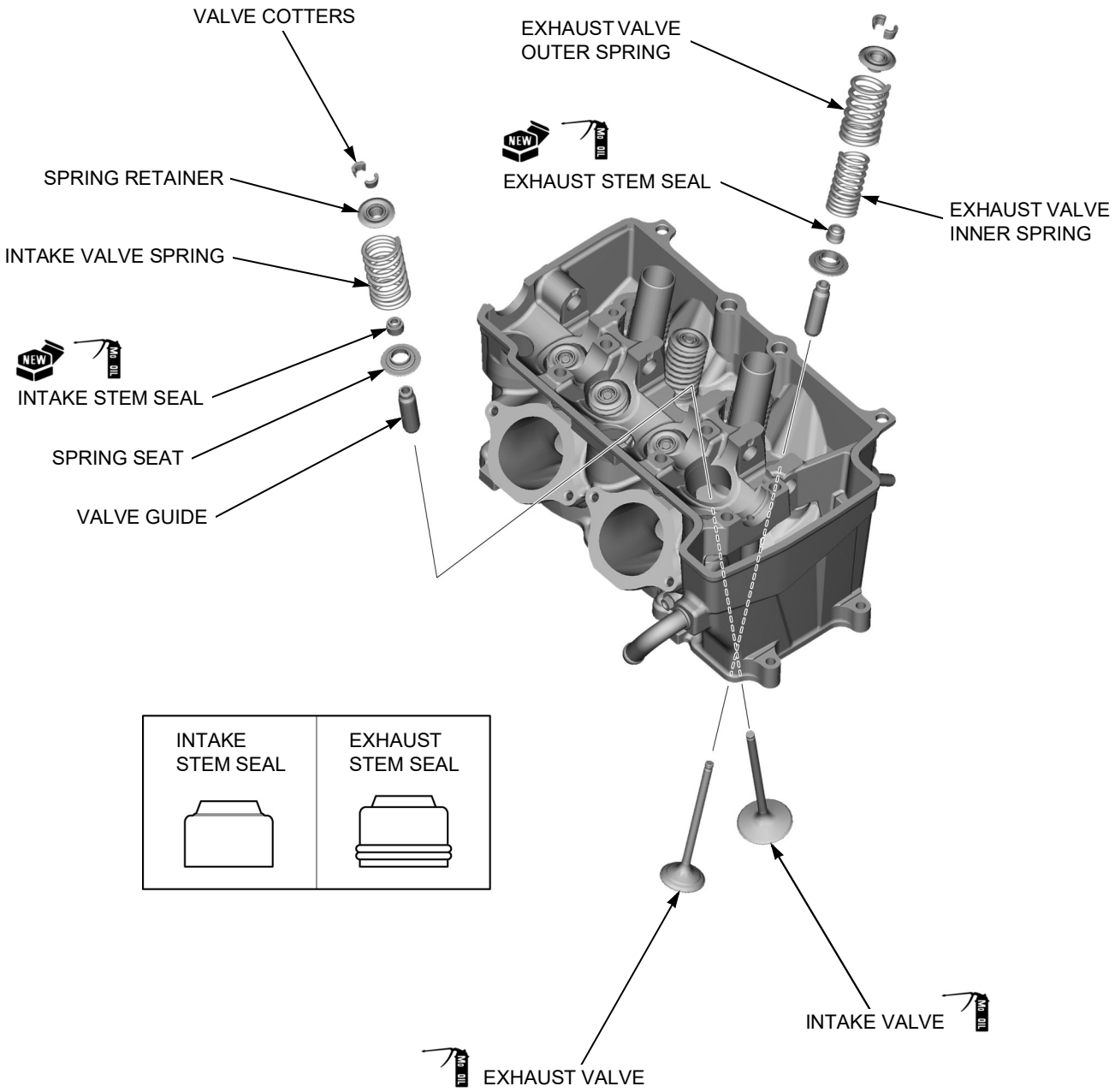
• Excessive lapping pressure may deform or damage the seat.
• Change the angle of lapping tool [1] frequently to prevent uneven seat wear.
• Do not allow any lapping compound to enter the guides.

After lapping, wash any residual compound off the cylinder head and valve and recheck the seat contact.

Assemble the cylinder head (page 10-20).



ASSEMBLY


VALVE COTTERS
EXHAUST VALVE OUTER SPRING
NEW
Mo OIL
SPRING RETAINER
EXHAUST STEM SEAL
EXHAUST VALVE INNER SPRING
INTAKE VALVE SPRING
NEW
Mo OIL
INTAKE STEM SEAL
SPRING SEAT
VALVE GUIDE
INTAKE STEM SEAL
EXHAUST STEM SEAL
INTAKE VALVE
Mo OIL
Mo OIL
EXHAUST VALVE

Blow through the oil passage in the cylinder head with compressed air.

Install the spring seats [1].

Apply molybdenum oil solution to the inside of new stem seals.

Install new intake stem seals [2] and exhaust stem seals [3].

Apply molybdenum oil solution to the valve stem sliding area and stem end.

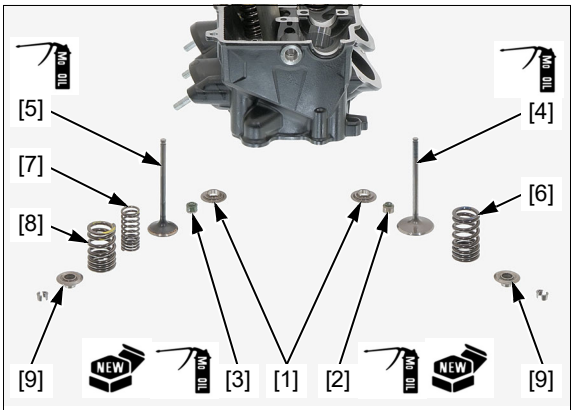
Insert the intake valves [4] and exhaust valves [5] into the valve guide while turning them slowly to avoid damage to the stem seal.

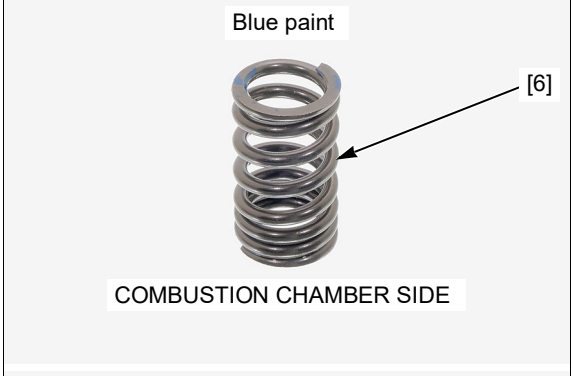
Install the intake valve springs [6], exhaust inner valve springs [7] and exhaust outer valve springs [8] with the tightly wound coils facing the combustion chamber.

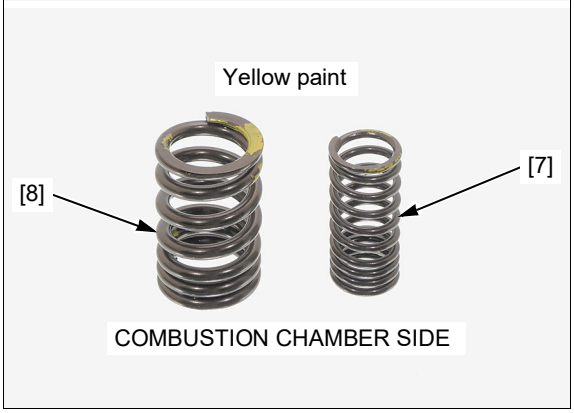
NOTE:

- The valve springs have paint marks:
  – Intake valve spring: Blue paint
  – Exhaust valve springs: Yellow paint

Install the valve spring retainers [9].







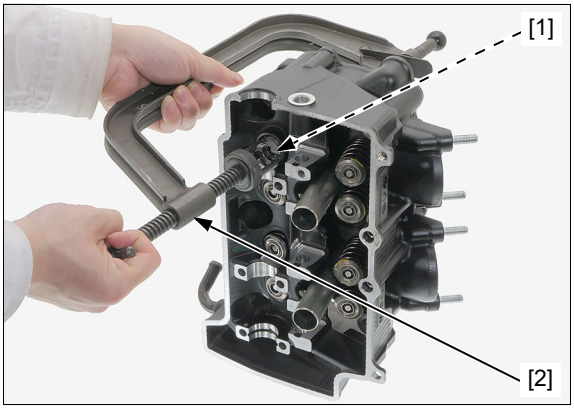
Install the tappet hole protector into the valve lifter bore (page 10-16).

Install the valve cotters [1] using the special tool as shown.

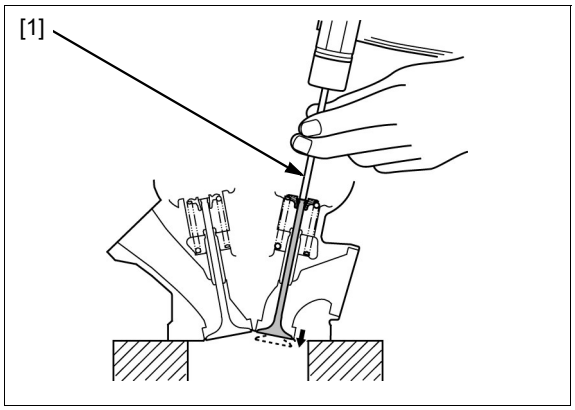
TOOL:
Valve Spring Compressor Set [2] 07757-0010000

NOTE:

- To prevent loss of tension, do not compress the valve springs more than necessary.



Tap the valve stems gently to seat the valve cotters firmly using a hammer and suitable shaft [1].



NOTE:

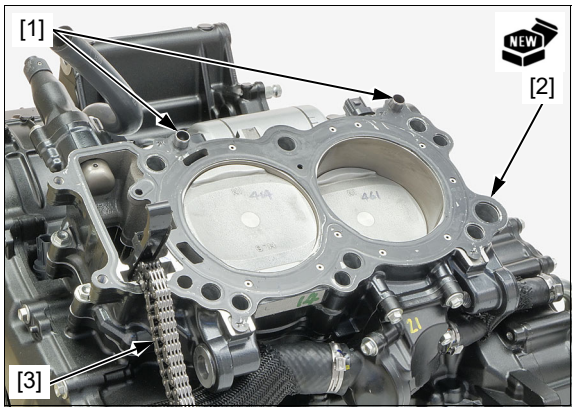
- Support the cylinder head above the work bench surface to prevent valve damage.

Install the following:

– Spark plugs (page 3-6)
– Insulator (page 10-24)

INSTALLATION

Install the dowel pins [1] and a new gasket [2].



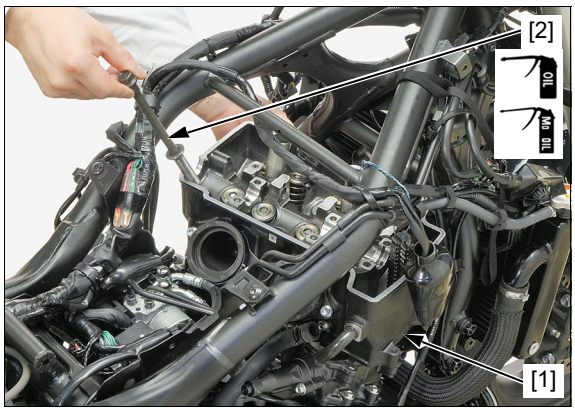
NOTE:

- Route the cam chain [3] through the gasket.

Apply molybdenum oil solution to the cylinder head bolt threads.

Apply engine oil to the washer of cylinder head bolt/ washers.

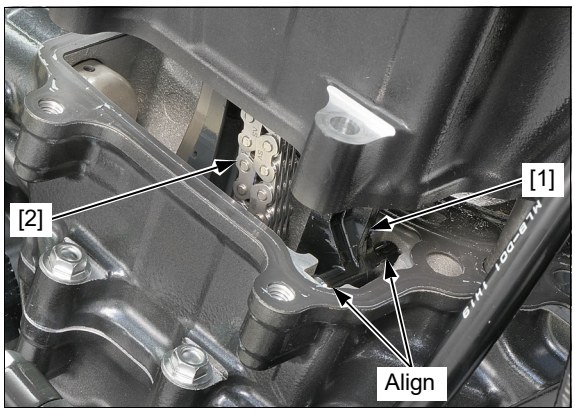
Install the cylinder head [1] to the left side. and install the cylinder head bolts [2].



NOTE:

- When installing the left side bolt/washers, move the cylinder head.

Install the cam chain guide [1].



NOTE:

- Route the cam chain [2] through the cylinder head.
- Align the cam chain guide tabs with the grooves in the cylinder.

Install and tighten the cylinder head bolt/washers [1] to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft) + 115°

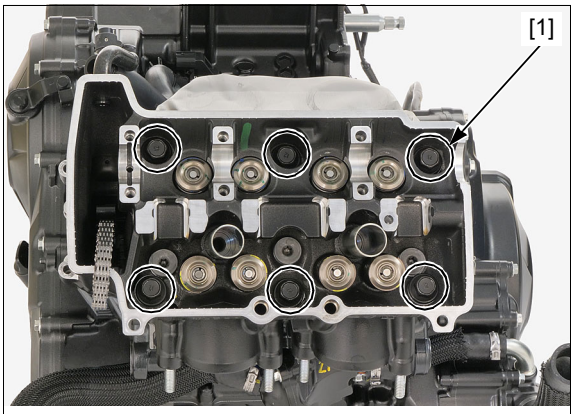
NOTE:

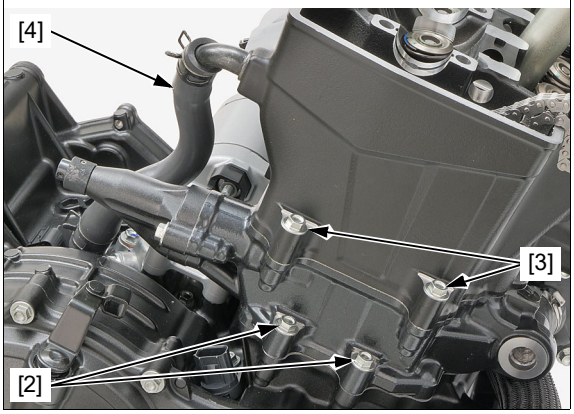
- Tighten the cylinder head bolt/washers in a crisscross pattern in 2 or 3 steps.

Tighten the cylinder bolts [2].

Install and tighten the cylinder head bolts [3] securely.

Connect the breather hose [4].





Hold the left engine hanger plate bolts [1] and tighten the nuts [2] to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)

Hold the right engine hanger plate bolts [3] and tighten the nuts [4] to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)

Tighten the left engine hanger bolts [5] to the specified torque.

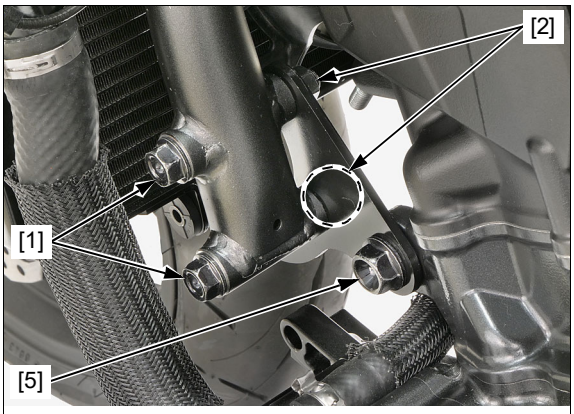
TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)

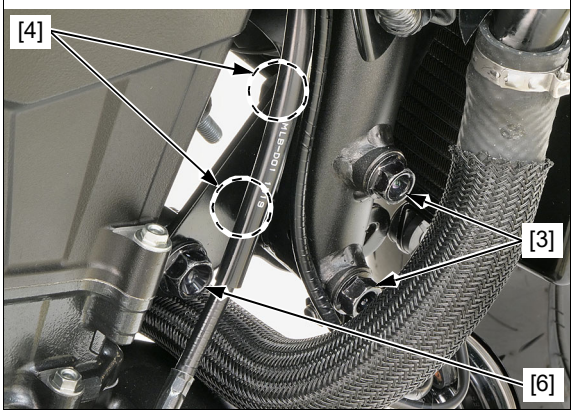
Tighten the right engine hanger bolts [6] to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)

Install the following:

– Camshaft (page 10-10)
– Exhaust pipe (page 2-20)





INSULATOR

REMOVAL/INSTALLATION

Remove the throttle body (page 7-14).

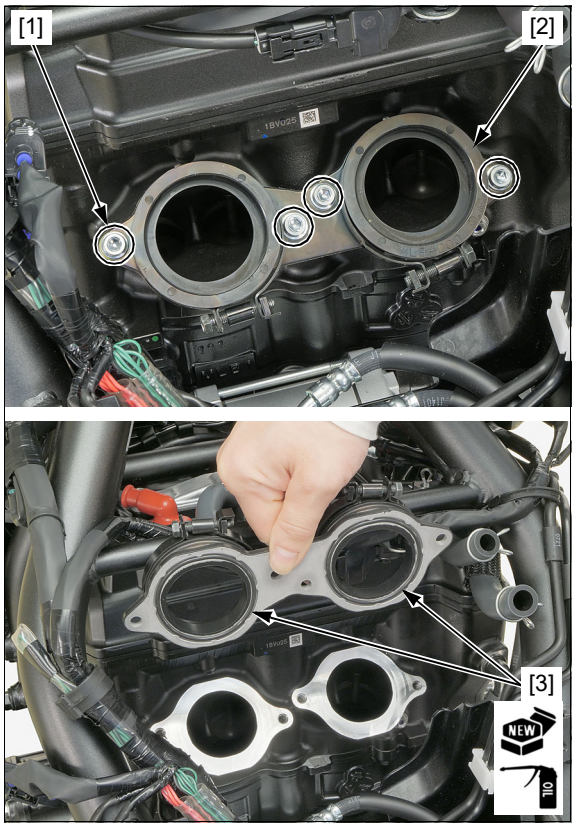
Remove the insulator mounting bolts [1] and insulator [2].

Remove the O-rings [3] from the insulator.

Installation is in the reverse order of removal.

TORQUE:
Insulator mounting bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:
- Replace the O-rings with new ones.
- Apply engine oil to new O-rings.



11. ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION

GENERAL

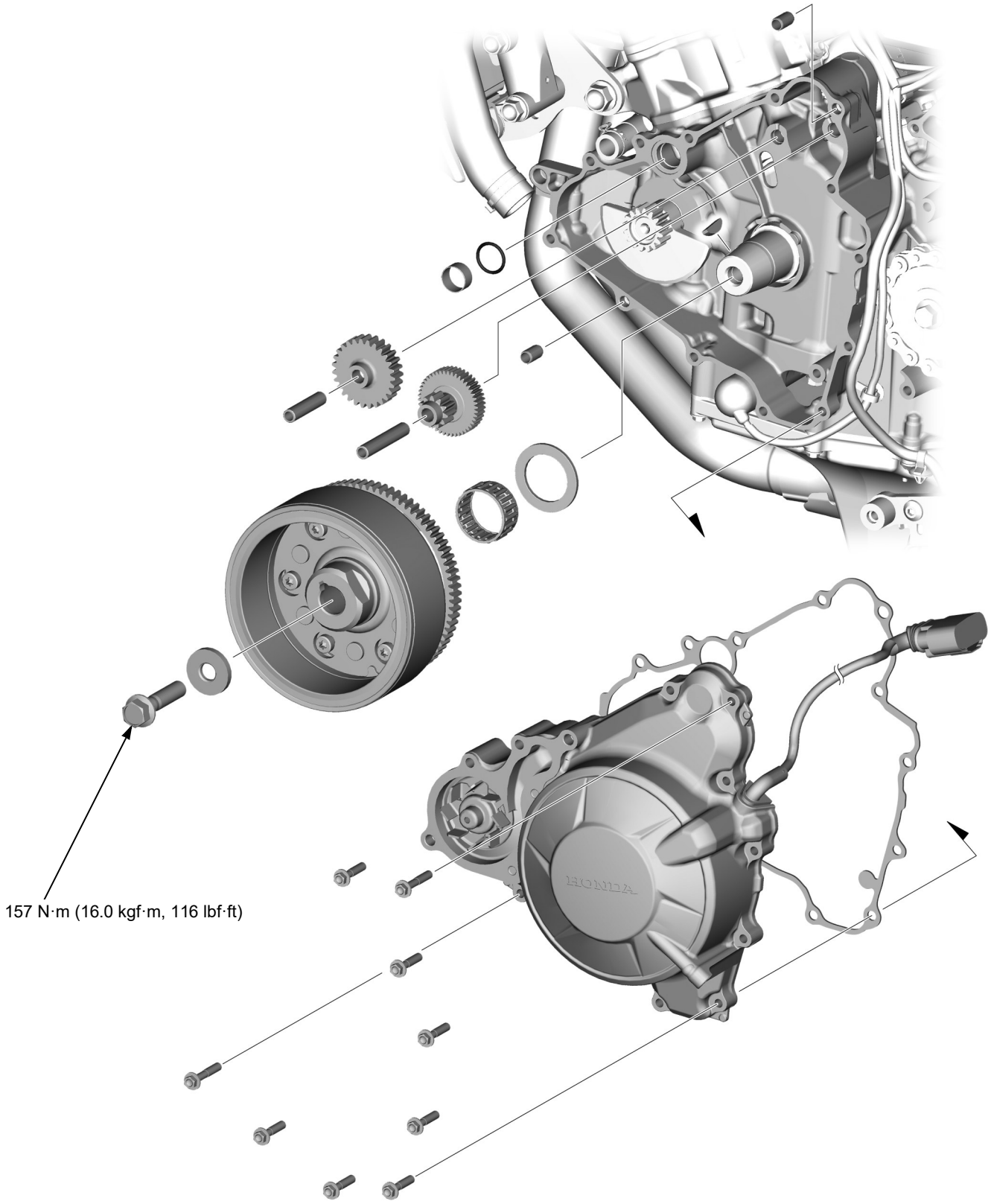
- This section covers service of the alternator and starter clutch. All service can be done with the engine installed in the frame.
- For alternator charging coil inspection (page 20-8)
- For starter motor service (page 6-5)

TROUBLESHOOTING

Starter motor turns, but engine does not turn

- Faulty starter clutch
- Damaged starter reduction gear/shaft
- Damaged starter idle gear/shaft
- Damaged or faulty starter motor pinion gear
- Damaged starter driven gear

COMPONENT LOCATION



ALTERNATOR COVER

REMOVAL/INSTALLATION

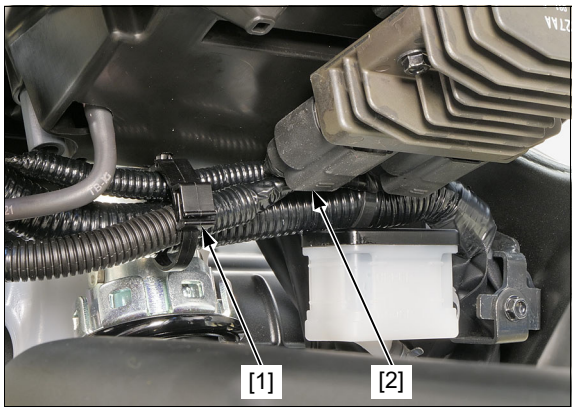
Drain the engine oil (page 3-12).

Remove the following:

– Drive sprocket cover (page 2-17)
– Water pump cover (page 8-10)

Release the wire clip [1].

Disconnect the alternator 3P (Gray) connector [2].



Remove the alternator cover bolt [1].

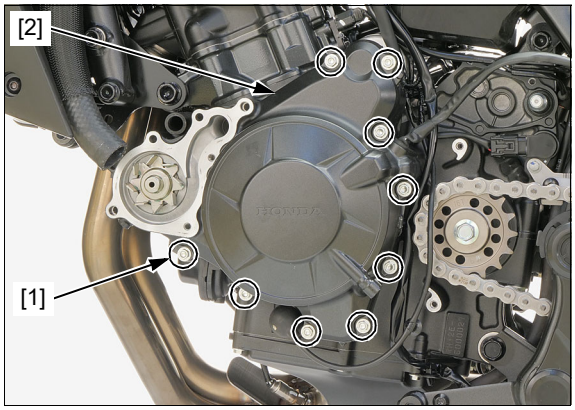
NOTE:

• Loosen the bolts in a crisscross pattern in 2 or 3 steps.

Remove the alternator cover [2].

NOTE:

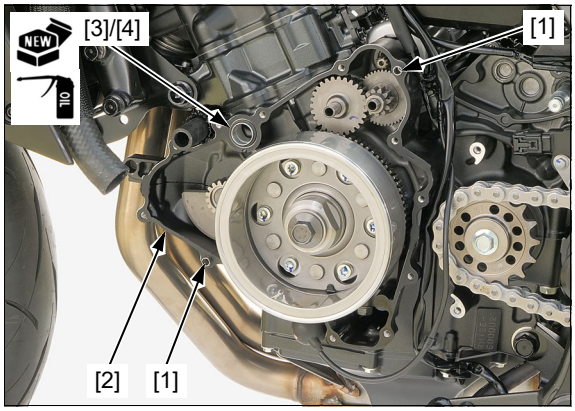
• The alternator cover (stator) is magnetically attracted to the flywheel, be careful during removal and installation.



Remove the following:

– Dowel pins [1]
– Gasket [2]
– Water pump collar [3]
– O-ring [4]

Clean off any sealant from the alternator cover mating surfaces.

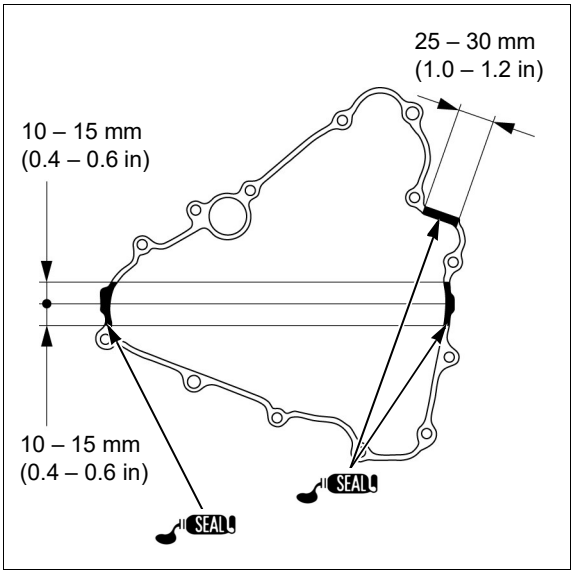


Installation is in the reverse order of removal.

NOTE:

- Clean any oil from the alternator cover thoroughly.
- Apply liquid sealant (TB1207B manufactured by Three bond or equivalent) to the alternator cover mating surface as shown.
- Do not apply more liquid sealant than necessary.
- Route the wires properly (page 1-21).
- Align the teeth of the water pump driven gear with the teeth of the oil pump drive gear on the front balancer shaft by turning the water pump impeller with your finger.

Fill the engine with the recommended engine oil and check that there are no oil leaks (page 3-12).



STATOR

REMOVAL/INSTALLATION

Remove the alternator cover (page 11-4).

Release the wire grommet [1] from the alternator cover groove.

Remove the alternator wire clamper bolt [2] and alternator wire clamper [3].

Remove the stator bolt [4], stator plate [5] and stator [6].

Installation is in the reverse order of removal.

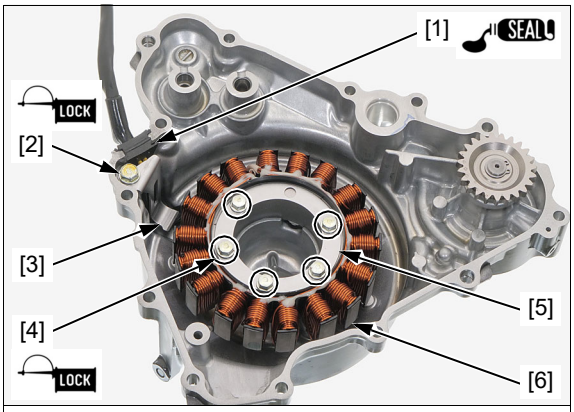
TORQUE:

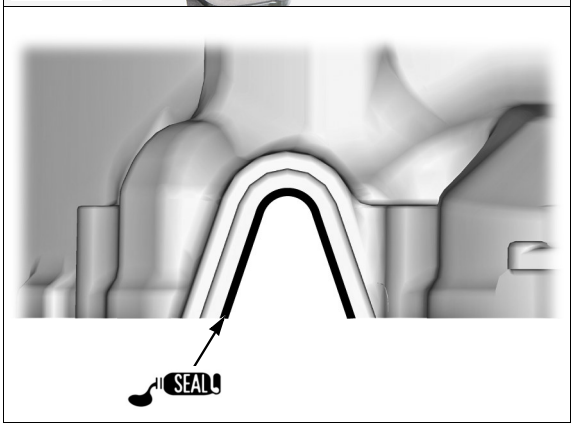
Stator bolts:
12 N·m (1.2 kgf·m, 9 lbf·ft)

Alternator wire clamper bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:

- Apply locking agent to the stator bolts and alternator wire clamper bolt threads.
- Apply liquid sealant (TB1207B manufactured by Three Bond or equivalent) to the alternator wire grommet mating surface of the alternator cover as shown.
- Route the wires properly (page 1-21).





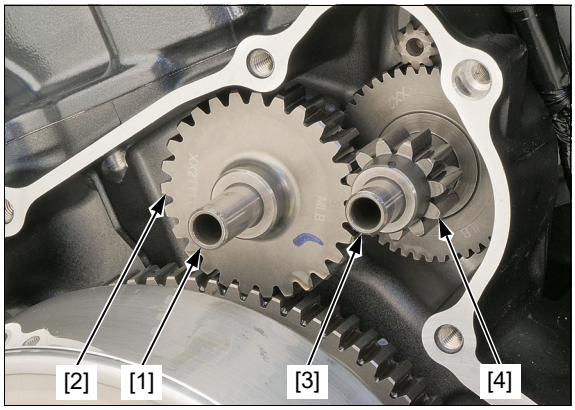
FLYWHEEL

REMOVAL

Remove the alternator cover (page 11-4).

Remove the starter idle gear shaft [1] and starter idle gear [2].

Remove the starter reduction gear shaft [3] and starter reduction gear [4].



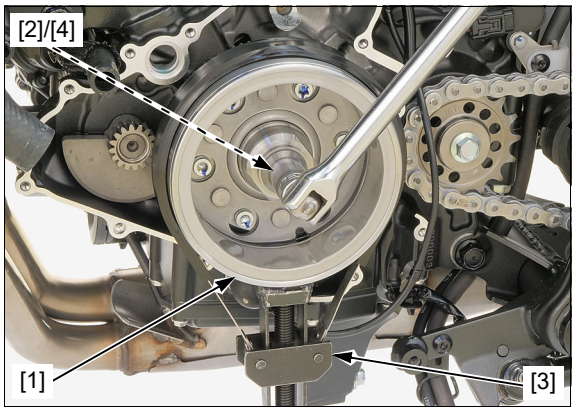
Hold the flywheel [1] using the special tool and loosen the flywheel mounting bolt [2].

TOOL:
Holder Flywheel [3] **07725-0040001**

Remove the flywheel mounting bolt and washer [4].

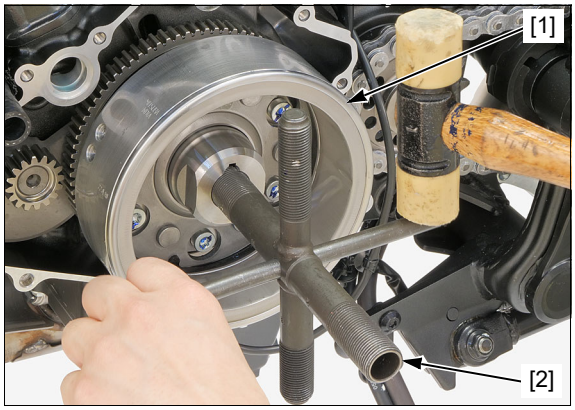
NOTE:

- The flywheel mounting bolt has left hand threads.



Remove the flywheel [1] using the special tool.

TOOL:
Outside Screw Puller [2] **07733-0020001**



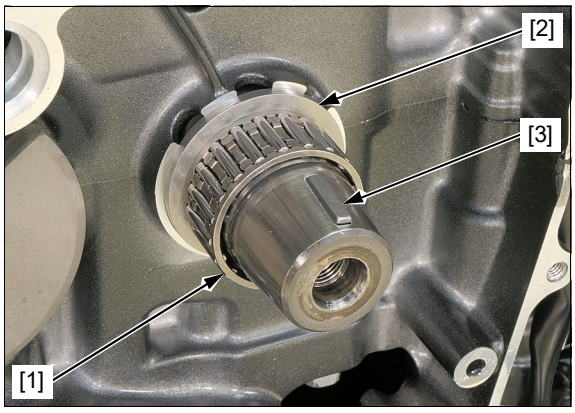
Remove the needle bearing [1].

Remove the washer [2].

Remove the woodruff key [3].

NOTE:

- Be careful not to damage the key groove and crankshaft.



INSPECTION

Inspect the following parts for scratches, damage, abnormal wear, or deformation.

– Starter idle/reduction gear shaft
– Starter idle/reduction gear
– Woodruff key
– Needle bearing

Replace if necessary.

INSTALLATION

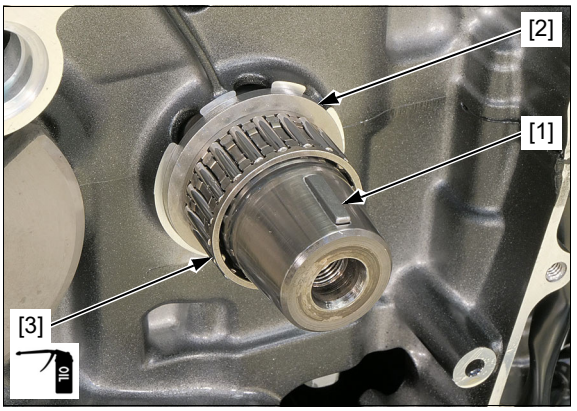
Install the woodruff key [1].

NOTE:
• Be careful not to damage the key groove and crankshaft.

Apply engine oil to the needle bearing rotating area.

Install the washer [2].

Install the needle bearing [3].



Clean any oil from the crankshaft and flywheel tapered areas thoroughly.

Install the flywheel [1] to the crankshaft.

NOTE:
• Align the woodruff key with flywheel keyway.

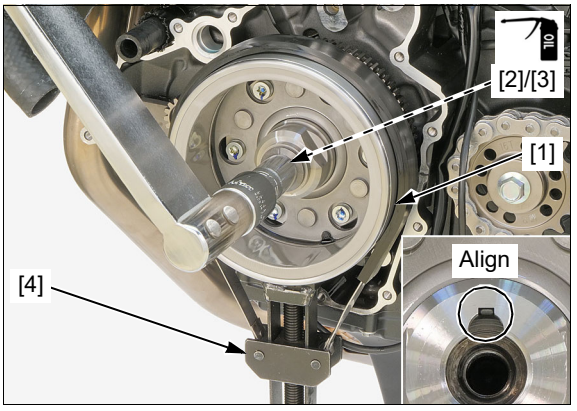
Apply engine oil to the flywheel mounting bolt threads and seating surface.

Install the washer [2] and flywheel mounting bolt [3].

Hold the flywheel using the special tool and tighten the flywheel mounting bolt to the specified torque.

TOOL:
Holder Flywheel [4] **07725-0040001**

TORQUE: 157 N·m (16.0 kgf·m, 116 lbf·ft)



NOTE:
• The flywheel mounting bolt has left hand threads.

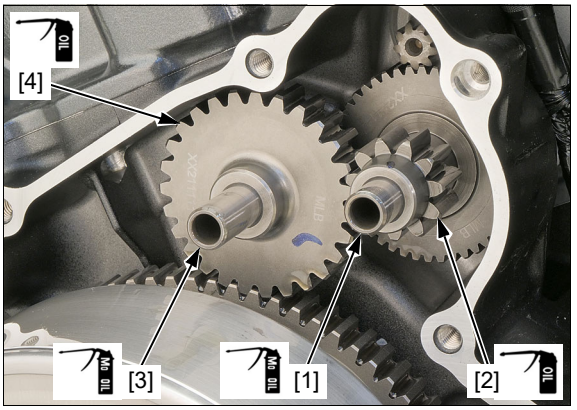
Apply molybdenum oil solution to the starter reduction gear shaft and starter idle gear shaft outer surfaces.

Apply engine oil to the starter reduction gear and starter idle gear outer surfaces.

Install the starter reduction gear shaft [1] and starter reduction gear [2].

Install the starter idle gear shaft [3] and starter idle gear [4].

Install the alternator cover (page 11-4).



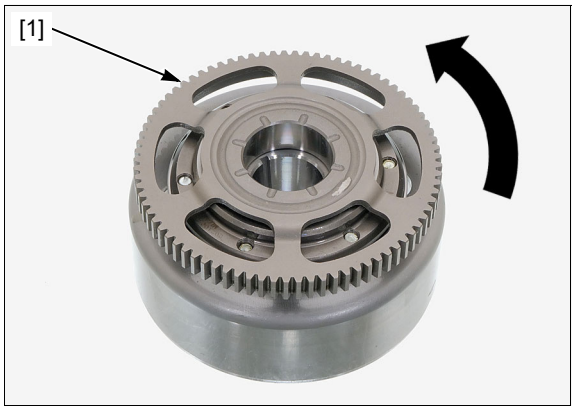
STARTER CLUTCH

REMOVAL

Remove the flywheel (page 11-6).

Make sure that the starter driven gear [1] turns counterclockwise smoothly and does not turn clockwise.

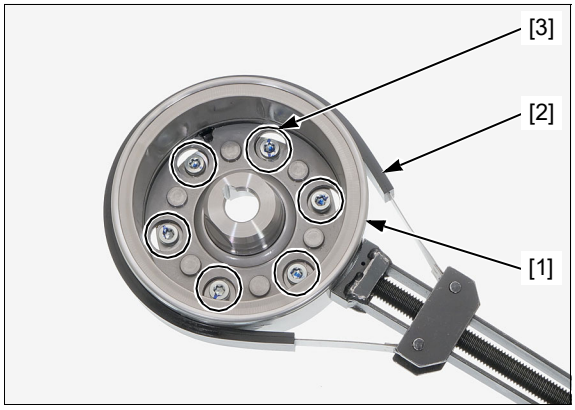
Remove the starter driven gear while turning the starter driven gear counterclockwise.



Hold the flywheel [1] using the special tool.

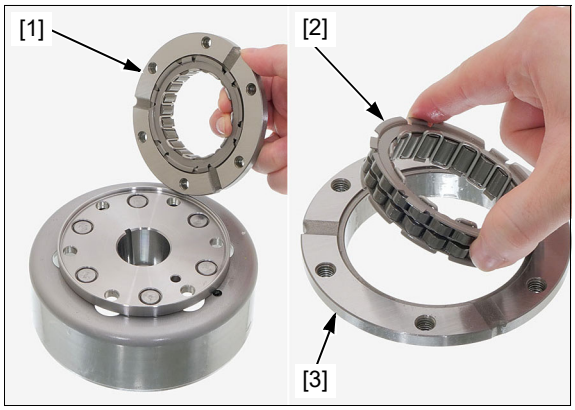
TOOL:
Holder Flywheel [2] **07725-0040001**

Remove the starter clutch torx bolts [3].



Remove the starter clutch assembly [1].

Remove the starter one-way clutch [2] from the starter clutch outer [3].



INSPECTION

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 ALTERNATOR/ STARTER CLUTCH SPECIFICATIONS (page 1-8).

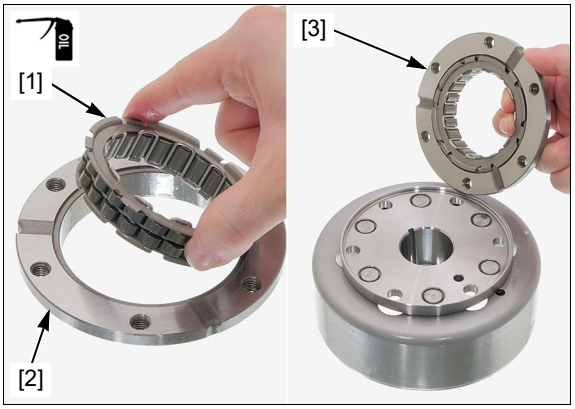
Replace any part if it is out of service limit.

INSTALLATION

Apply engine oil to the starter one-way clutch sliding surface.

Install the starter one-way clutch [1] to the starter clutch outer [2].

Install the starter clutch assembly [3].



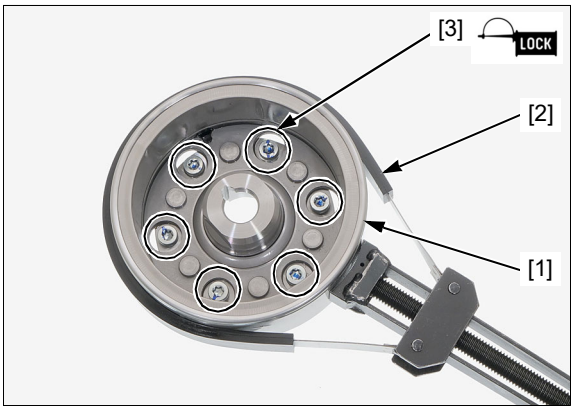
Hold the flywheel [1] using the special tool.

TOOL:
Holder Flywheel [2] 07725-0040001

Apply locking agent to the starter clutch torx bolt threads (page 1-11).

Install and tighten the starter clutch torx bolts [3] to the specified torque.

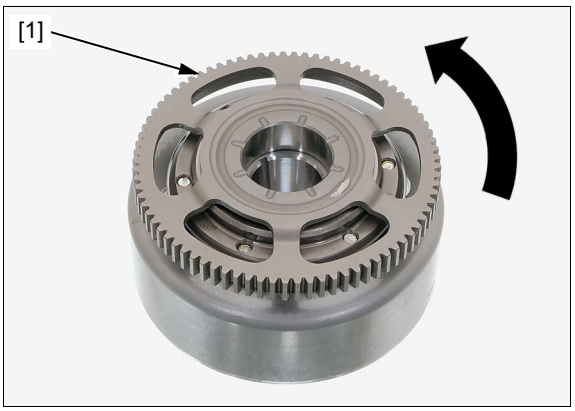
TORQUE: 29 N·m (3.0 kgf·m, 21 lbf·ft)



Install the starter driven gear [1] into the starter clutch outer while turning the starter driven gear counterclockwise.

Recheck the one-way clutch operation (page 11-8).

Install the flywheel (page 11-7).



MEMO

12. CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION

GENERAL

- This section covers service of the clutch and gearshift linkage. All service can be done with the engine installed in the frame.
- Engine oil viscosity and level have an effect on clutch disengagement. When the clutch does not disengage or the motorcycle creeps with clutch disengaged, inspect the engine oil level before servicing the clutch system.
- If the pulsar plate is removed, perform the crank pulse initialize learning procedure (page 4-64).

TROUBLESHOOTING

Clutch lever is too hard to pull in
- Damaged, kinked or dirty clutch cable
- Improperly routed clutch cable
- Damaged clutch lifter mechanism
- Faulty clutch lifter bearing
- Clutch lifter pin installed improperly

Clutch slips when accelerating
- Clutch lifter sticking
- Worn clutch friction discs
- Weak clutch springs
- No clutch lever freeplay
- Engine oil mixed with molybdenum or graphite additive

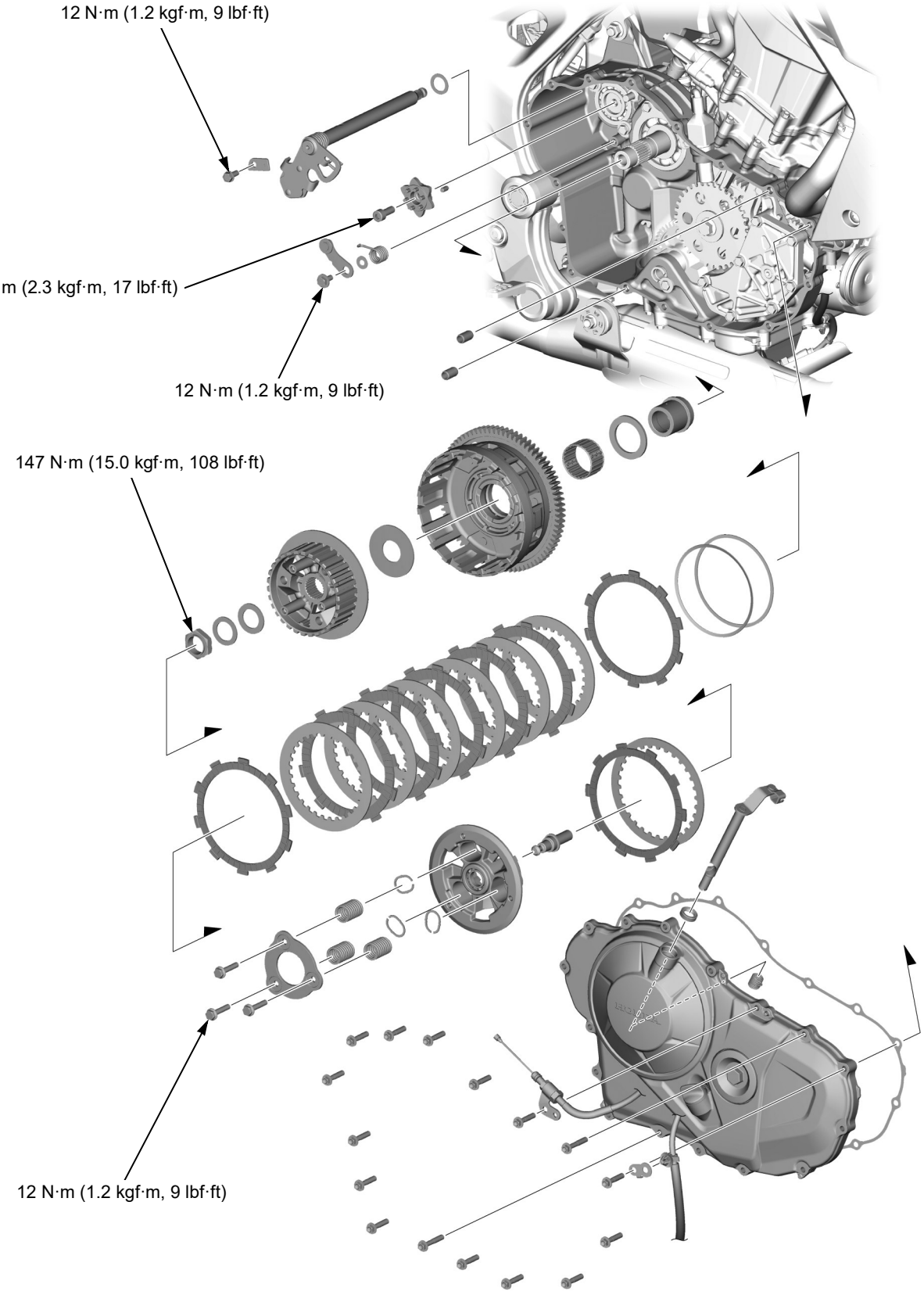
Clutch will not disengage or motorcycle creeps with clutch disengaged
- Excessive clutch lever freeplay (page 3-22)
- Clutch plate warped
- Engine oil level too high, improper engine oil viscosity or additive used
- Loose clutch center lock nut
- Damaged clutch lifter mechanism
- Clutch lifter pin installed improperly
- Worn clutch outer slot and clutch center grooves
- Improper clutch operation

Hard to shift
- Incorrect clutch cable adjustment
- Improper clutch operation
- Improper engine oil viscosity
- Damaged or bent shift forks (page 13-7)
- Bent shift fork shaft (page 13-7)
- Bent shift fork claw (page 13-7)
- Loose shift drum center bolt
- Damaged shift drum center
- Damaged shift drum guide grooves (page 13-7)
- Damaged or bent gearshift spindle
- Damaged clutch cam

Transmission jumps out of gear
- Worn shift drum stopper arm
- Weak or broken shift drum stopper arm return spring
- Loose shift drum center bolt
- Damaged shift drum center
- Bent shift fork shaft (page 13-7)
- Damaged or bent shift forks (page 13-7)
- Worn gear engagement dogs or slots
  - Mainshaft (page 13-8)
  - Countershaft (page 13-7)

Gearshift pedal will not return
- Weak or broken gearshift spindle return spring
- Damaged or bent gearshift spindle

COMPONENT LOCATION



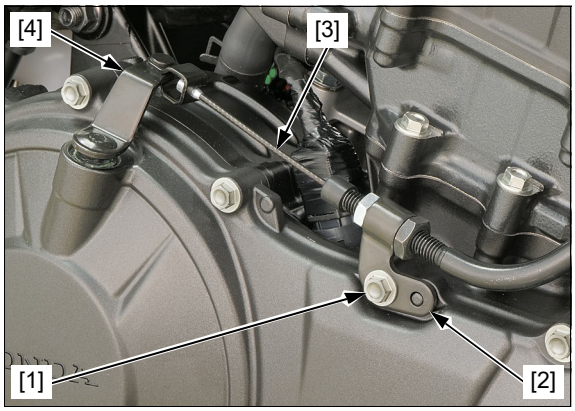
RIGHT CRANKCASE COVER

REMOVAL

Drain the engine oil (page 3-12).

Remove the bolt [1] and clutch cable stay [2].

Disconnect the clutch cable [3] from the clutch lifter lever [4].



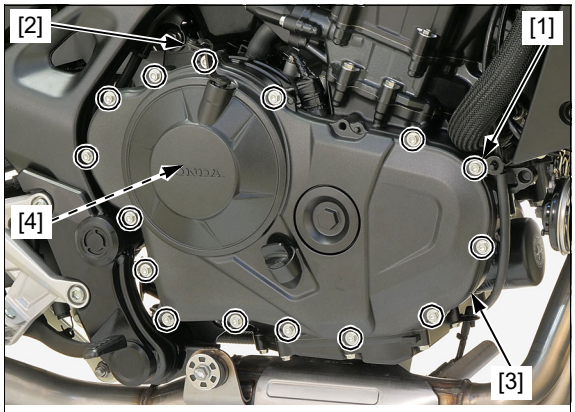
Remove the right crankcase cover bolts [1].

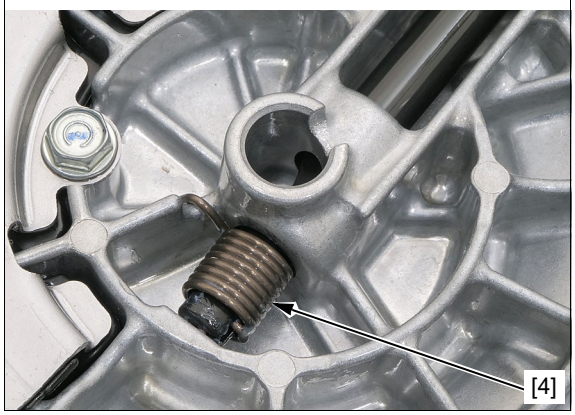
Turn the clutch lifter lever [2] counterclockwise to disengage the lifter lever slit from the clutch lifter pin.

Remove the right crankcase cover [3].

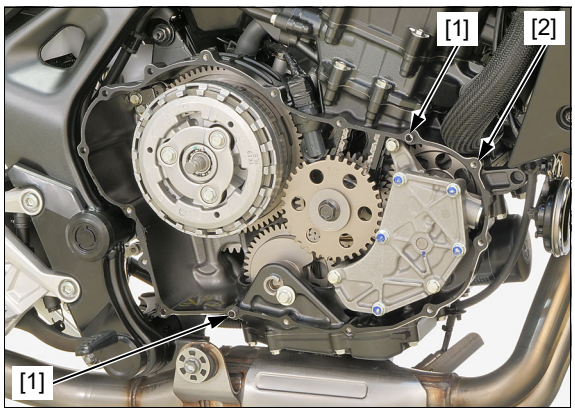
NOTE:

- Be careful not to drop the return spring [4].





Remove the dowel pins [1] and gasket [2].



CLUTCH LIFTER LEVER

REMOVAL/INSTALLATION

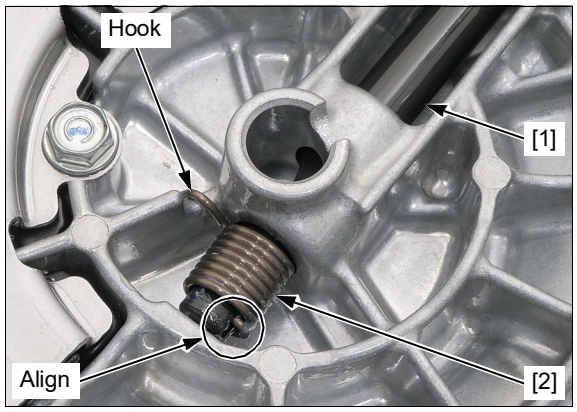
Remove the right crankcase cover (page 12-4).

Remove the clutch lifter lever [1] and return spring [2].

Installation is in the reverse order of removal.

NOTE:

- Align the return spring end with the clutch lifter lever groove.
- Hook the return spring end to the right crankcase cover groove.



OIL SEAL/BEARING REPLACEMENT

Remove the clutch lifter lever (page 12-5).

Remove the oil seal [1].

Remove the needle bearings [2].

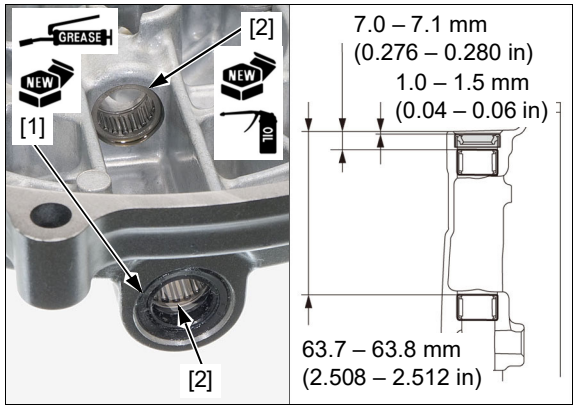
Apply engine oil to new needle bearings.

Install the needle bearings to the specified depth as shown.

Install a new oil seal to the specified depth as shown.

Apply grease to the oil seal lips.

Install the clutch lifter lever (page 12-5).



INSPECTION

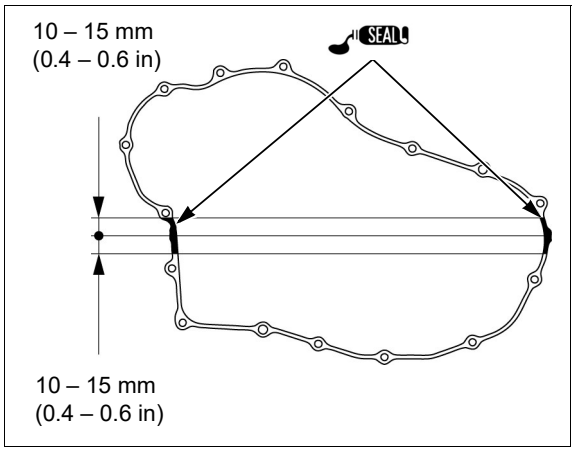
Inspect the following parts for scratches, damage, abnormal wear and deformation. Replace if necessary.

– Clutch lifter lever
– Return spring

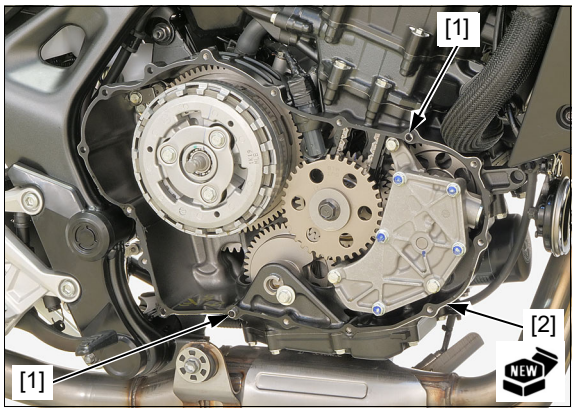
INSTALLATION

Clean the right crankcase cover mating surfaces thoroughly.

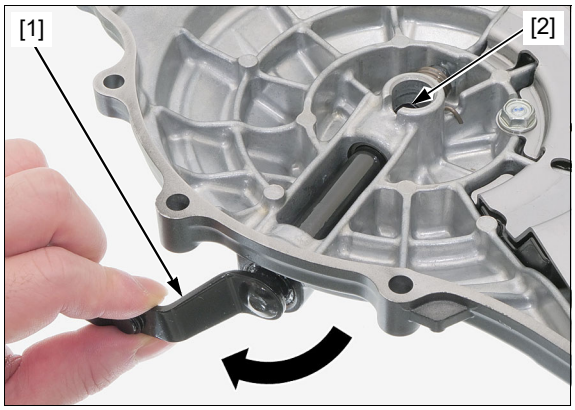
Apply liquid sealant (TB1207B manufactured by Three Bond or equivalent) to the right crankcase cover mating surface as shown.



Install the dowel pins [1] and a new gasket [2].



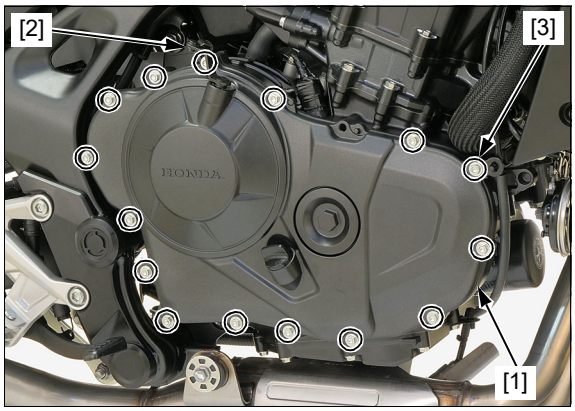
Turn the clutch lifter lever [1] clockwise so that the lever recess [2] is in position as shown.



Install the right crankcase cover [1] while holding the clutch lifter lever [2].

Install the right crankcase cover bolts [3].

Tighten the right crankcase cover bolts in a crisscross pattern in 2 or 3 steps.



Connect the clutch cable [1] to the clutch lifter lever [2].

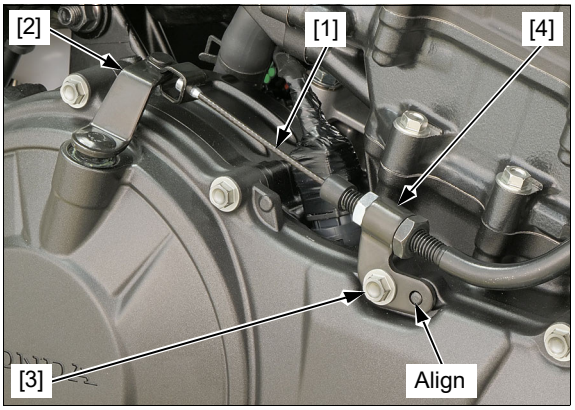
Install the bolt [3] and clutch cable stay [4].

NOTE:

- Align the clutch cable stay hole with the right crankcase cover boss.

Fill the engine with the recommended engine oil and check that there are no oil leaks (page 3-12).

Adjust the clutch cable freeplay (page 3-22).



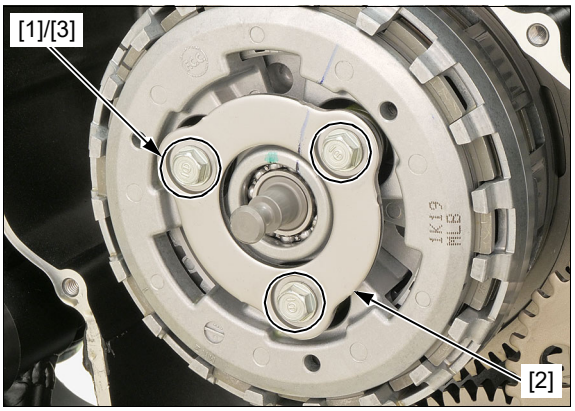
CLUTCH

REMOVAL

Remove the right crankcase cover (page 12-4).

Loosen the clutch set plate bolts [1] in a crisscross pattern in 2 or 3 steps.

Remove the clutch set plate bolts, set plate [2] and clutch springs [3].



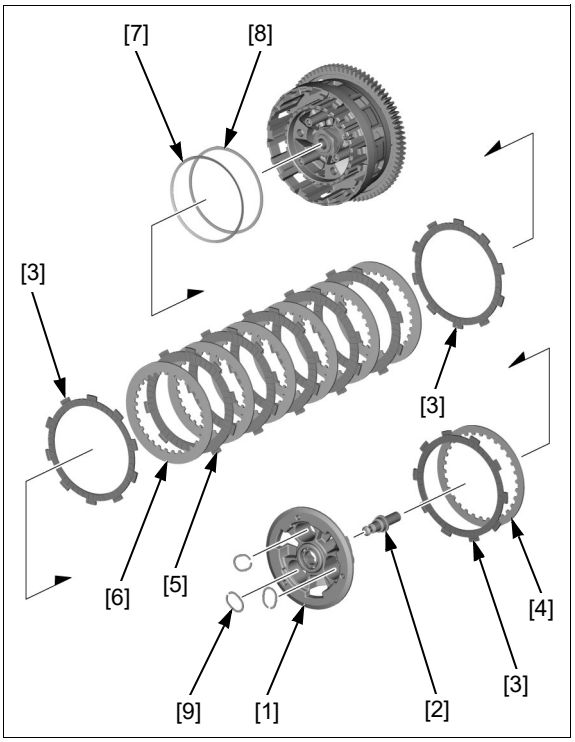
Remove the following:

– Clutch pressure plate [1]
– Clutch lifter pin [2]
– Clutch friction discs B [3] (3 pcs)
– Clutch plate B [4]
– Clutch friction discs A [5] (5 pcs)
– Clutch plates A [6] (6 pcs)
– Judder spring [7]
– Judder spring seat [8]

Remove the clutch spring seats [9] from the clutch pressure plate.

NOTE:

- When removing the clutch friction discs and clutch plates, note the number of them.

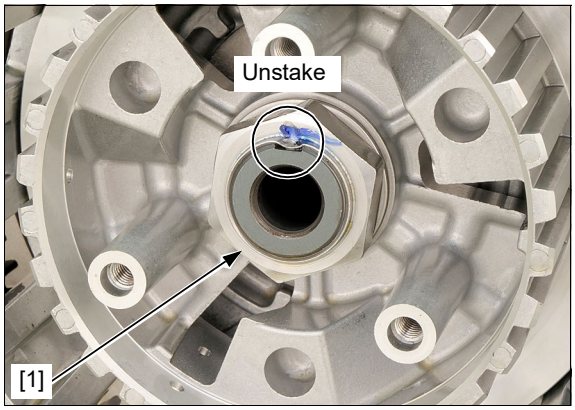


CLUTCH/GEARSHIFT LINKAGE

Unstake the clutch center lock nut [1].

NOTE:

- Be careful not to damage the mainshaft threads.

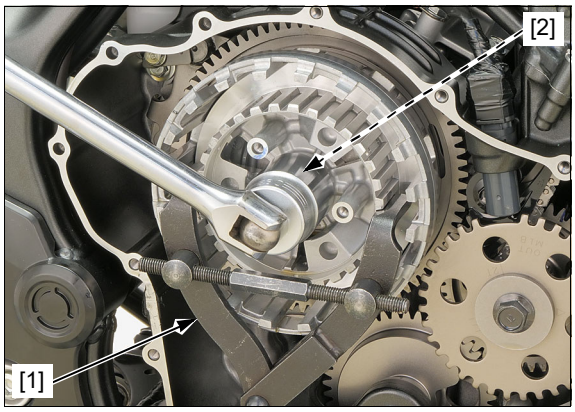


Install special tool.

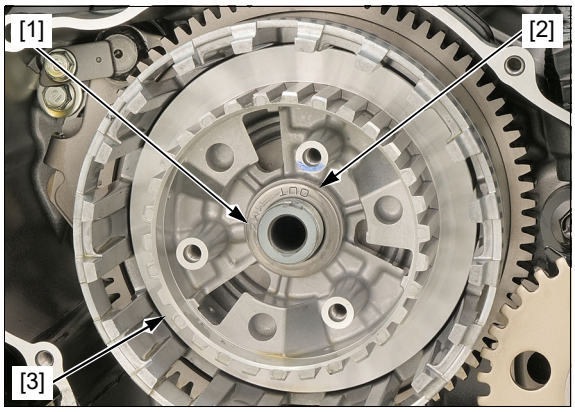
TOOL:
Clutch Center Holder 07724-0050002
P.D. 48-135 [1]

Loosen the clutch center lock nut [2] while holding the clutch center with the special tool.

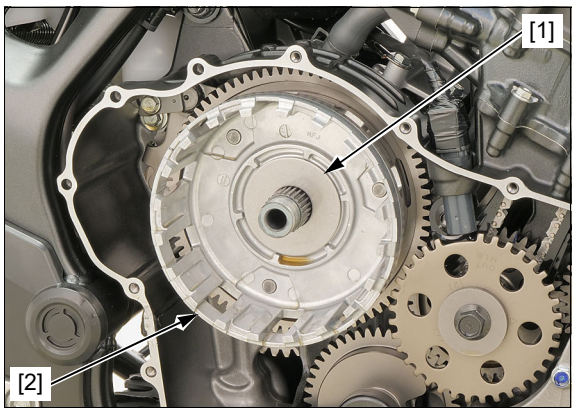
Remove the lock nut.



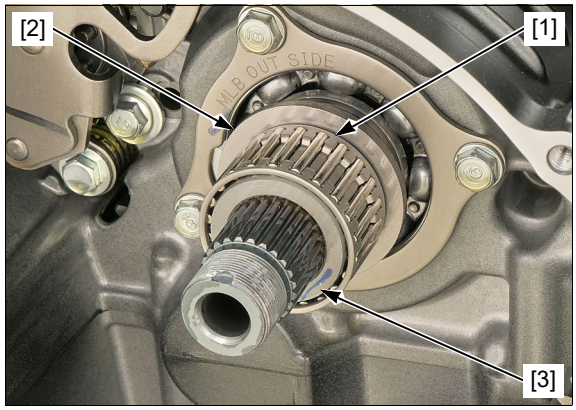
Remove the spring washer [1], thrust washer [2] and clutch center [3].



Remove the washer [1] and clutch outer [2].



Remove the needle bearing [1], washer [2] and clutch outer guide [3].

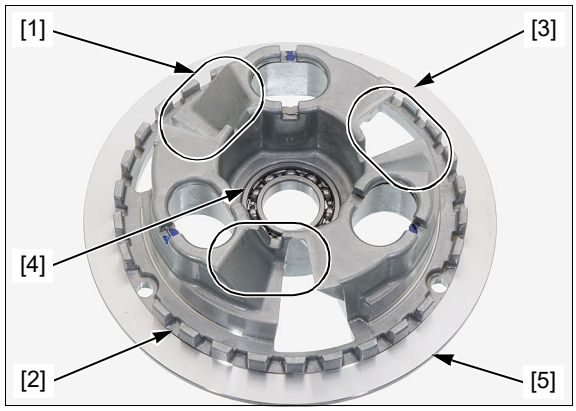


INSPECTION

Check the following for scratches, damage, abnormal wear and deformation:

– Clutch pressure plate cam areas [1]
– Clutch pressure plate grooves [2]
– Clutch pressure plate disc sliding surface [3]
– Clutch pressure plate bearing [4]

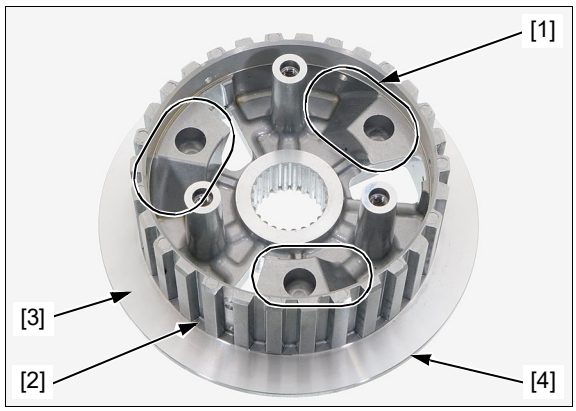
Replace the clutch pressure plate [5] if necessary.



Check the following for scratches, damage, abnormal wear and deformation:

– Clutch center cam areas [1]
– Clutch center grooves [2]
– Clutch center disc sliding surface [3]

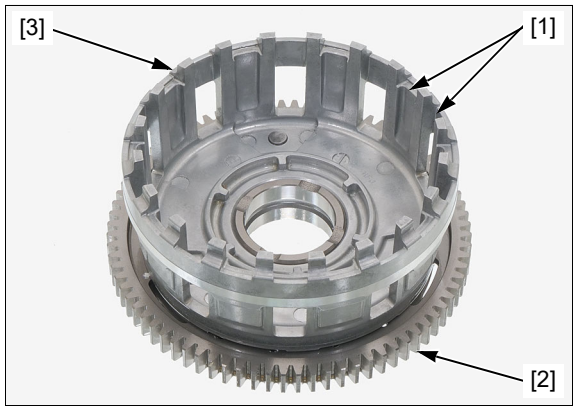
Replace the clutch center [4] if necessary.



Check the following of the for scratches, damage, abnormal wear and deformation:

– Clutch outer grooves [1]
– Primary driven gear [2]

Replace the clutch outer [3] if necessary.



CLUTCH/GEARSHIFT LINKAGE

Inspect the following parts for scratches, damage, abnormal wear and deformation. Replace if necessary.

– Clutch springs
– Clutch spring seats
– Clutch lifter pin
– Clutch friction discs/plates
– Judder spring
– Judder spring seat
– Clutch outer guide
– Needle bearing

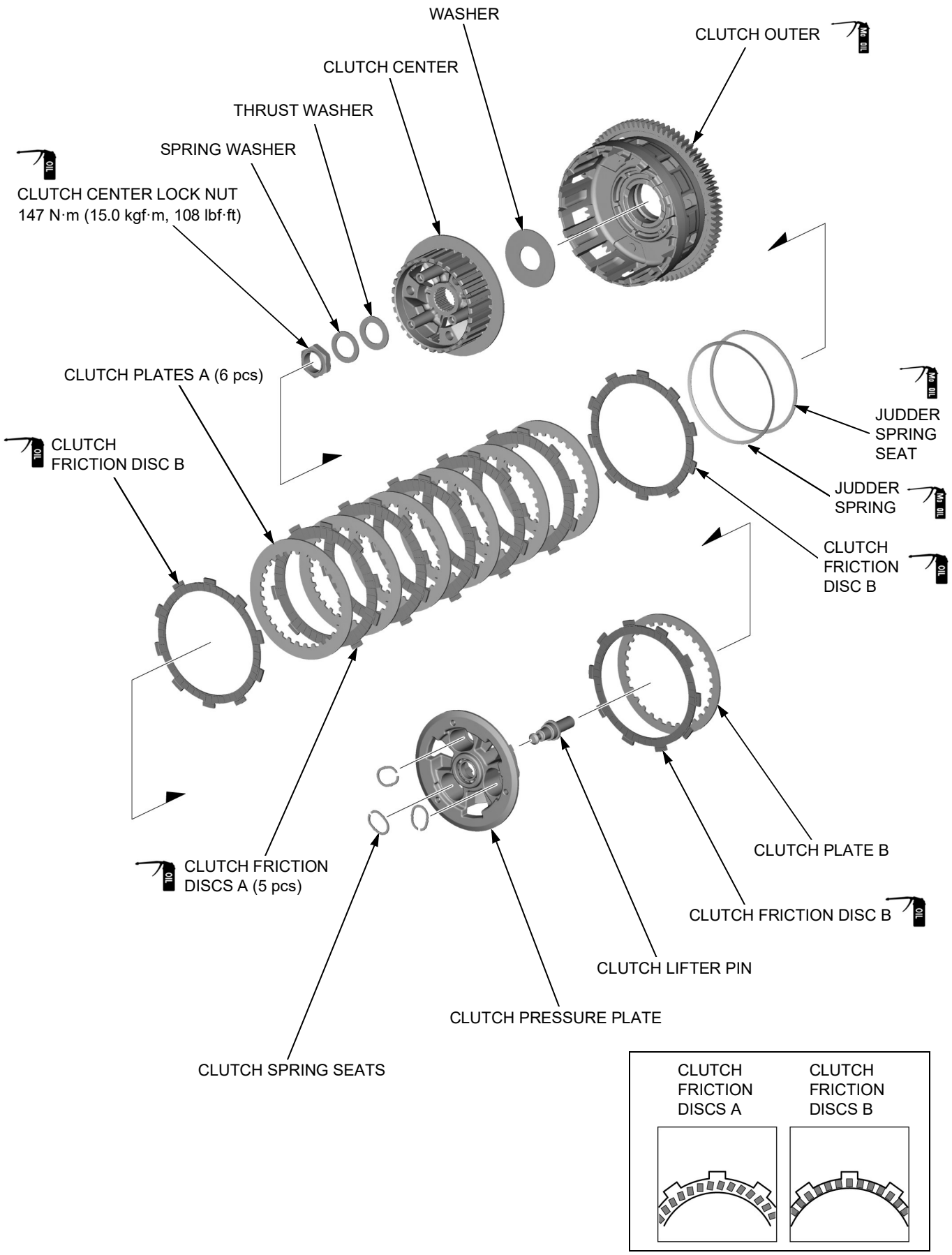
Measure each part according to CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS (page 1-8).

Replace any part if it is out of service limit.

NOTE:

- Replace the clutch springs as a set.
- Replace the clutch friction discs and plates as a set.

INSTALLATION

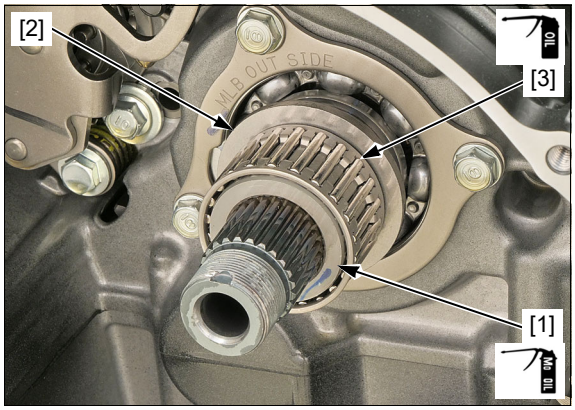


CLUTCH/GEARSHIFT LINKAGE

Apply molybdenum oil solution to the clutch outer guide entire surface.

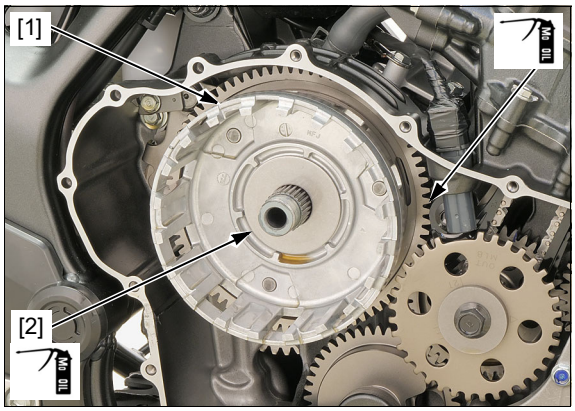
Apply engine oil to the needle bearing.

Install the clutch outer guide [1], washer [2] and needle bearing [3].



Apply molybdenum oil solution to the primary driven gear teeth and clutch outer sliding area.

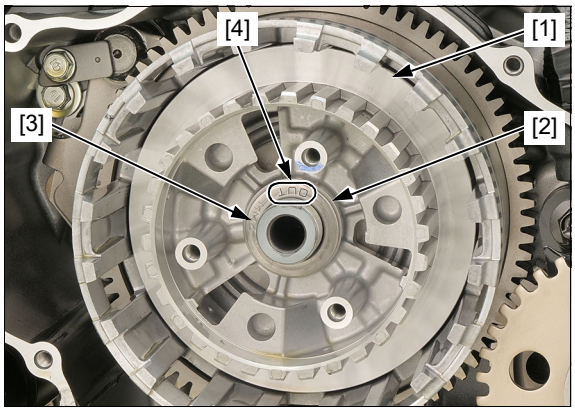
Install the clutch outer [1] and washer [2].



Install the clutch center [1], thrust washer [2] and spring washer [3].

NOTE:

- Install the spring washer with its "OUT" mark [4] facing out.



Apply engine oil to a new clutch center lock nut threads and seating surface.

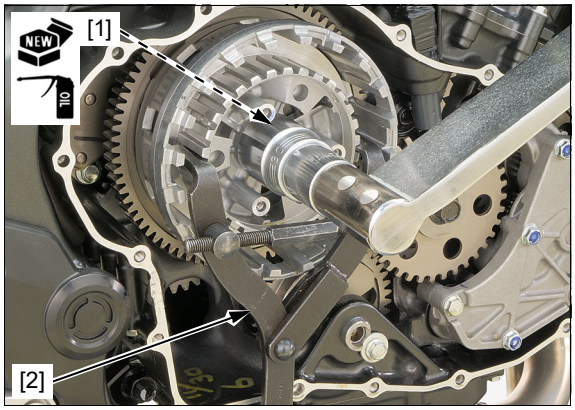
Install the clutch center lock nut [1] onto the mainshaft.

Install special tool.

TOOL:
Clutch Center Holder 07724-0050002
P.D. 48-135 [2]

Tighten the clutch center lock nut to the specified torque by holding the clutch center with the special tool.

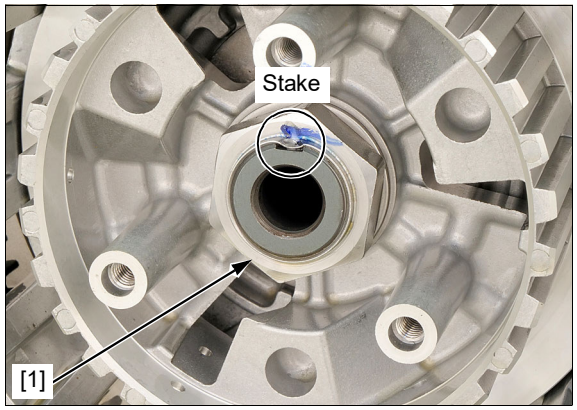
TORQUE: 147 N·m (15.0 kgf·m, 108 lbf·ft)



Stake the clutch center lock nut [1].

NOTE:

- Be careful not to damage the mainshaft threads.



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 friction discs.

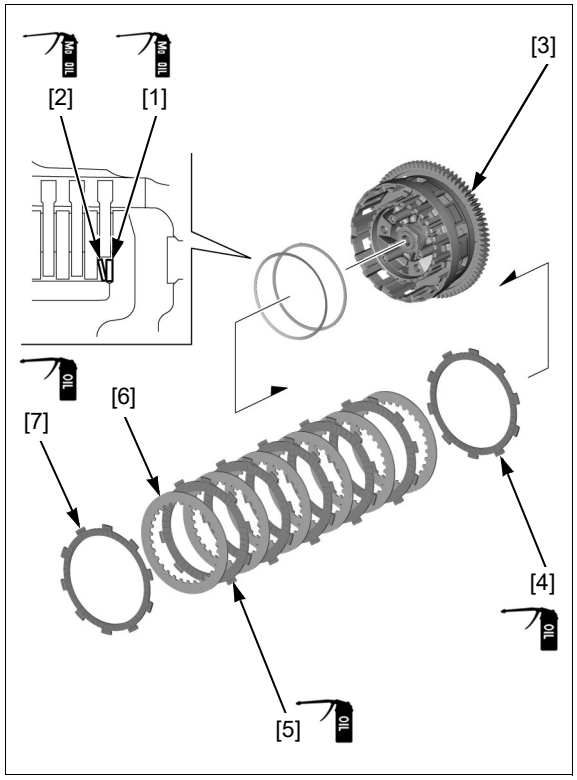
Install the clutch friction disc B [4] onto the clutch center.

Install the clutch friction discs A [5] (5 pcs) and clutch plates A [6] (6 pcs) alternately, starting with the clutch plate A.

Install the clutch friction discs B [7] onto the clutch plate A.

NOTE:

- The lining of the clutch disc A is tilted 15° to the right.

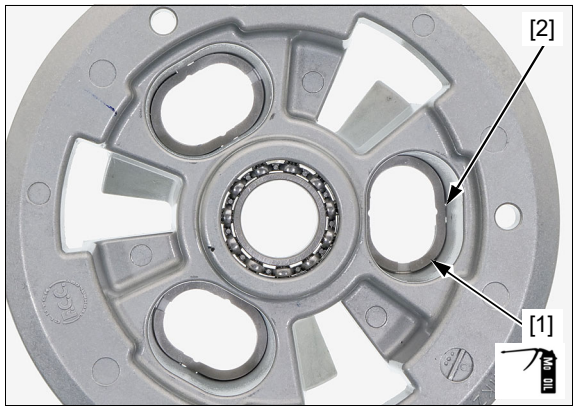


Apply molybdenum oil solution to the spring seats.

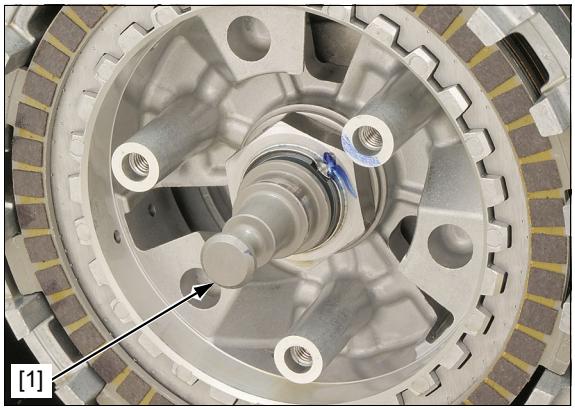
Install the spring seats [1] onto the clutch pressure plate grooves [2].

NOTE:

- Make sure that the spring seats are fully seated in the pressure plate grooves.
- Install the spring seat as shown.



Install the clutch lifter pin [1].



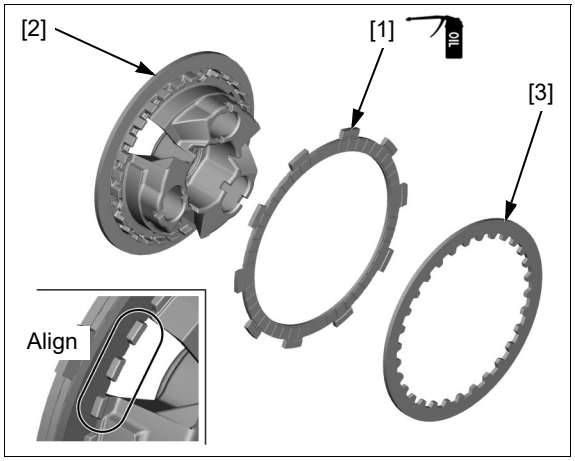
Apply engine oil to the entire surface of clutch friction disc B.

Install the clutch friction disc B [1] onto the clutch pressure plate B [2].

Install the clutch plate B [3] onto the clutch friction disc B.

NOTE:

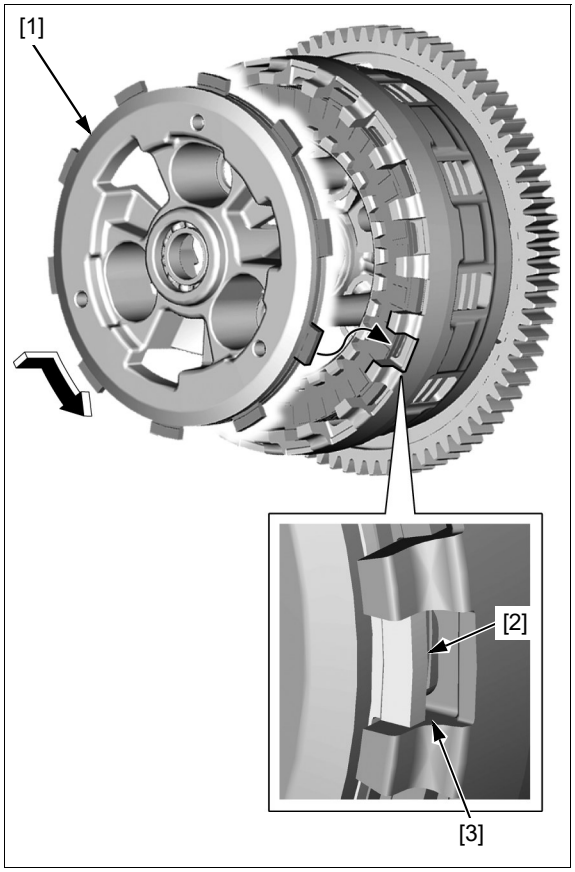
- Align the clutch plate B grooves with the clutch pressure plate lugs.



Install the clutch pressure plate assembly [1] by rotating it counterclockwise.

NOTE:

- Install the clutch disc B tabs [2] into the shallow slots [3] of the clutch outer.



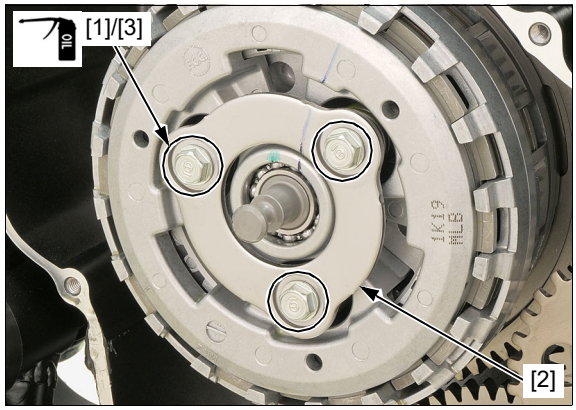
Apply engine oil to the clutch springs.

Install the clutch springs [1], clutch set plate [2] and clutch set plate bolts [3].

Tighten the clutch set plate bolts in a crisscross pattern in 2 or 3 steps to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the right crankcase cover (page 12-6).



PULSER PLATE

REMOVAL

Remove the CKP sensor (page 4-64).

Remove the right crankcase cover (page 12-4).

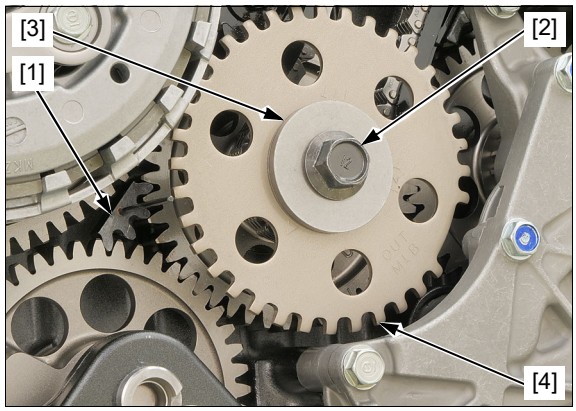
Install the special tool between the primary drive gear and rear balancer driven gear.

TOOL:
Gear Holder M2.5 mm [1] 07724-0010100

Remove the pulser plate bolt [2], washer [3] and pulser plate [4].

Remove the special tool.

Check the pulser plate for damage or deformation, and replace if necessary.

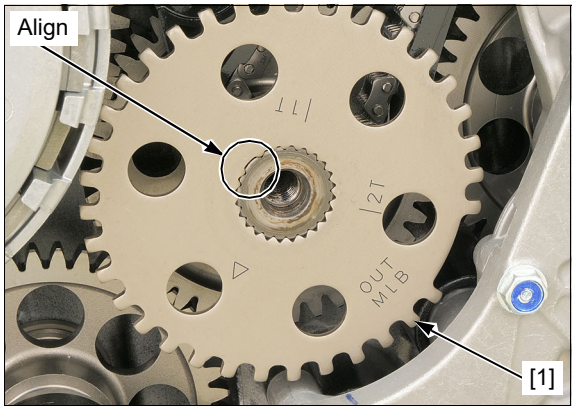


INSTALLATION

Install the pulser plate [1].

NOTE:

- Align the pulser plate wide tooth with the crankshaft wide tooth.



Apply engine oil to the pulser plate bolt threads and seating surface.

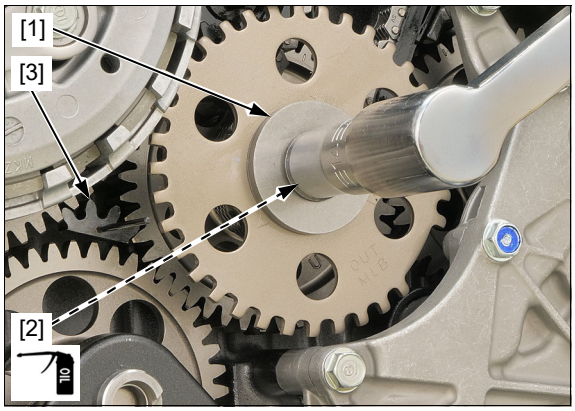
Install the washer [1] and pulser plate bolt [2].

NOTE:

- Install the washer with its identification groove facing inside.

Install the special tool between the primary drive and driven gears.

TOOL:
Gear Holder M2.5 mm [3] 07724-0010100



Tighten the pulser plate bolt to the specified torque.

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

Remove the special tool.

NOTE:

- Install the washer with its identification groove facing inside.
- Preform the crank pulse initialize learning procedure (page 4-64).

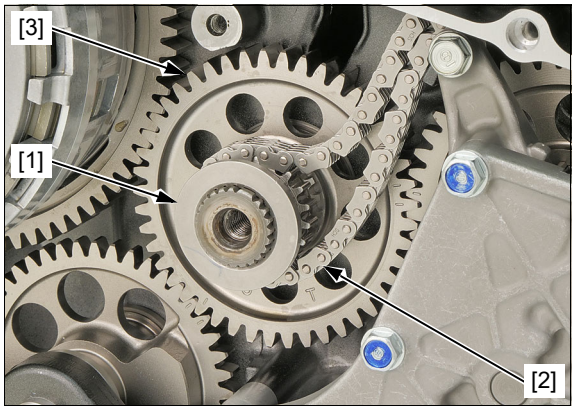
PRIMARY DRIVE GEAR

REMOVAL

Remove the following:

– Remove the cylinder head (page 10-14).
– Cam chain tensioner (page 10-9).

Remove the timing sprocket [1], cam chain [2] and primary drive gear [3].



INSPECTION

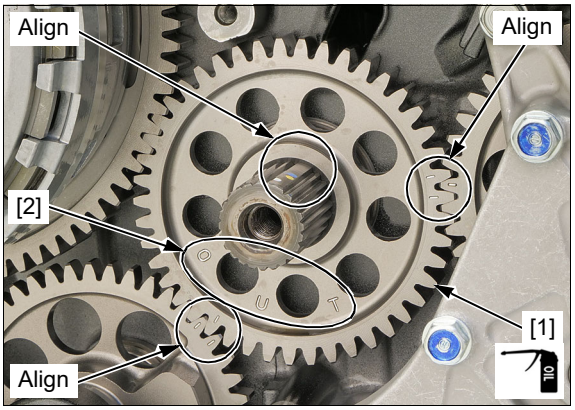
Inspect the following parts for scratches, damage, abnormal wear and deformation. Replace if necessary.

– Primary drive gear
– Timing sprocket

INSTALLATION

Apply engine oil to the primary drive gear teeth.

Install the primary drive gear [1] with its "OUT" mark [2] facing out.

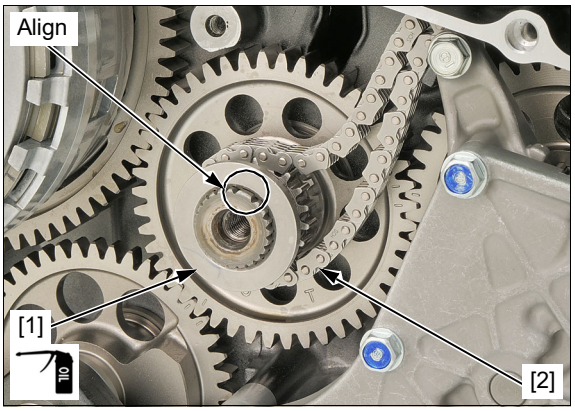


NOTE:

- Align the primary drive gear wide tooth with the crankshaft wide tooth.
- Make sure that the front balancer driven gear index line is positioned between the primary drive gear index lines.
- Make sure that the primary drive gear index line is positioned between the rear balancer driven gear index lines.

Apply engine oil to the timing sprocket teeth.

Install the timing sprocket [1] and cam chain [2].



NOTE:

- Install the timing sprocket with the tooth side facing inside.
- Align the timing sprocket wide tooth with the crankshaft wide tooth.

Install the following:

– Cylinder head (page 10-14).
– Cam chain tensioner (page 10-9).

GEARSHIFT LINKAGE

REMOVAL

Remove the following:

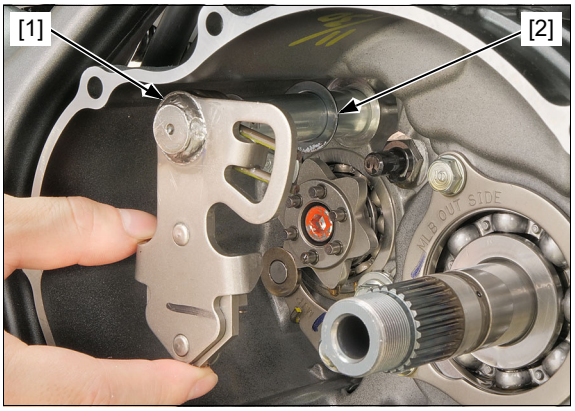
– Clutch (page 12-7)
– Drive sprocket cover (page 2-17)

Remove the gearshift spindle set plate bolt [1] and set plate [2].

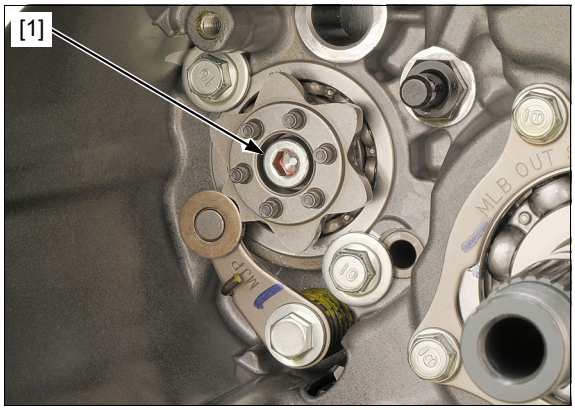
Remove the gearshift spindle assembly [1] and thrust washer [2].

Check the gearshift spindle for bend, wear or damage.

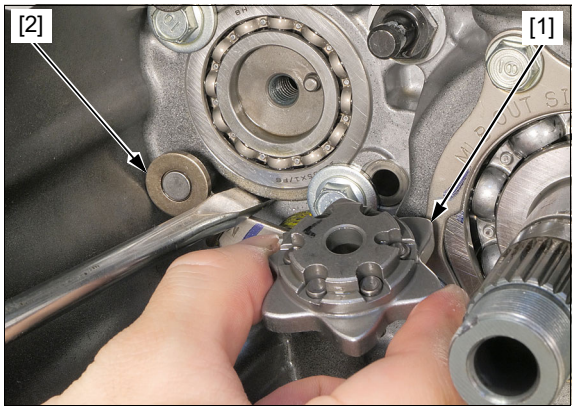
Check the gearshift spindle return spring for fatigue or damage.



Remove the shift drum center bolt [1].

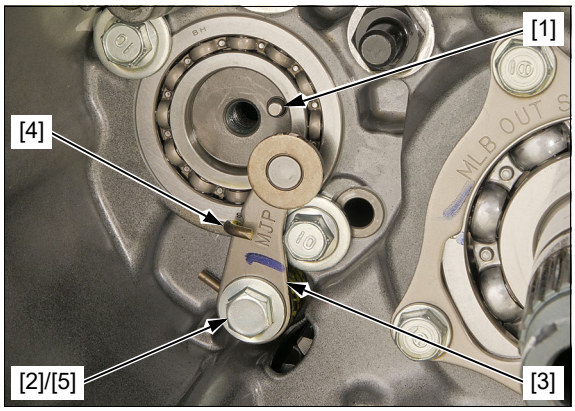


Remove the shift drum center [1] while holding the shift drum stopper arm [2] using a screwdriver as shown.

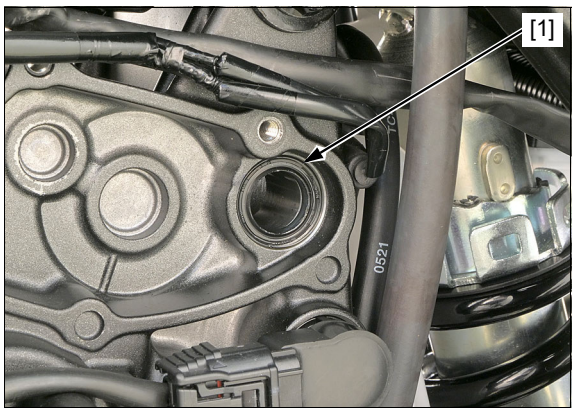


Remove the following:

- Dowel pin [1]
- Shift drum stopper arm pivot bolt [2]
- Shift drum stopper arm [3]
- Shift drum return spring [4]
- Washer [5]



Remove the oil seal [1].



INSPECTION

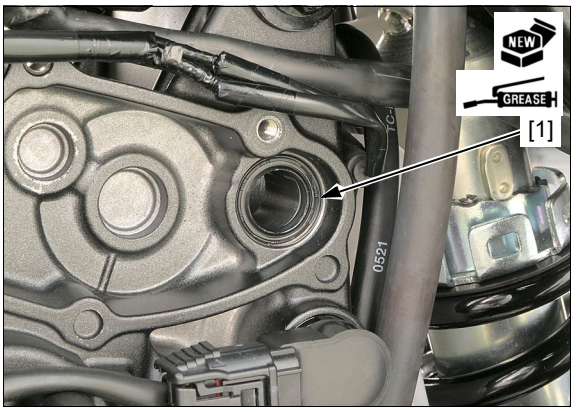
Inspect the following parts for damage, abnormal wear and deformation. Replace if necessary.

– Shift drum center
– Shift drum stopper arm
– Shift drum return spring
– Gearshift spindle

INSTALLATION

Install a new oil seal [1] until it is fully seated.

Apply grease to the oil seal lips.



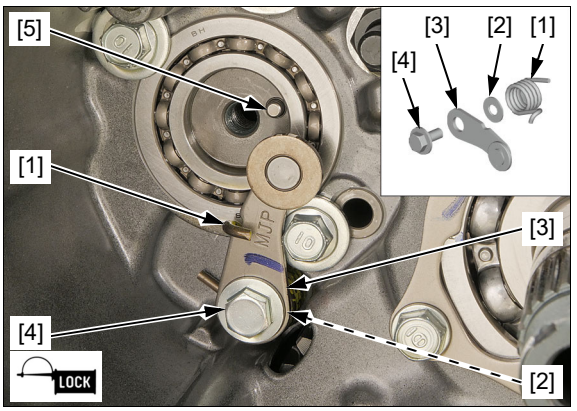
Apply locking agent to the shift drum stopper arm pivot bolt threads (page 1-11).

Install the following:

– Shift drum stopper arm return spring [1]
– Washer [2]
– Shift drum stopper arm [3]
– Shift drum stopper arm pivot bolt [4]

Tighten the shift drum stopper arm pivot bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Check the shift drum stopper arm for proper operation.

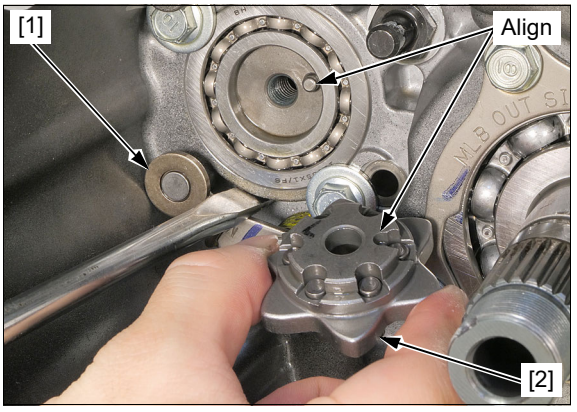
Install the dowel pin [5].

Hold the shift drum stopper arm [1] using a screwdriver.

Install the shift drum center [2].

NOTE:

• Align the shift drum center groove with the dowel pin.

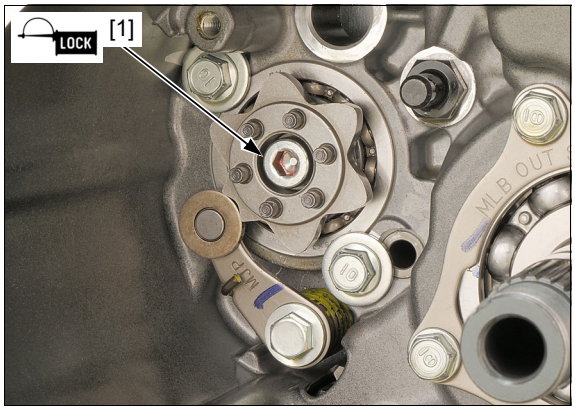


CLUTCH/GEARSHIFT LINKAGE

Apply locking agent to the shift drum center bolt threads (page 1-11).

Install and tighten the shift drum center bolt [1] to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

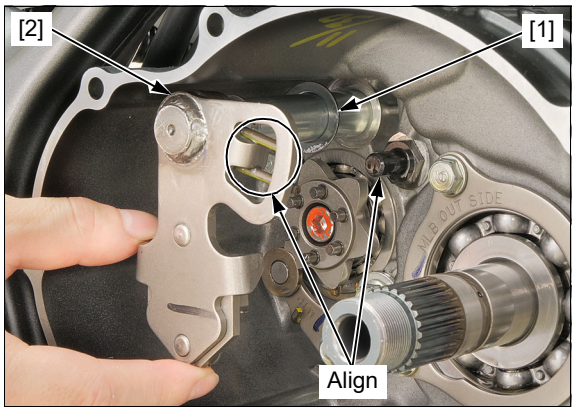


Install the thrust washer [1] onto the gearshift spindle [2].

Install the gearshift spindle into the crankcase.

NOTE:

- Align the gearshift spindle return spring ends with the spring pin.



Apply locking agent to the gearshift spindle set plate bolt threads (page 1-11)

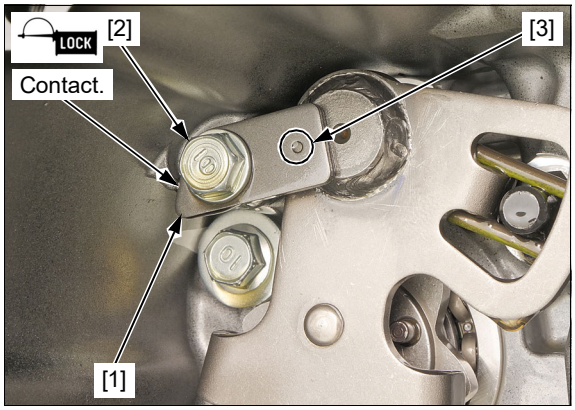
Install the set plate [1] and gearshift spindle set plate bolt [2].

NOTE:

- Install the set plate with its punch mark [3] facing out.

Tighten the gearshift spindle set plate bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



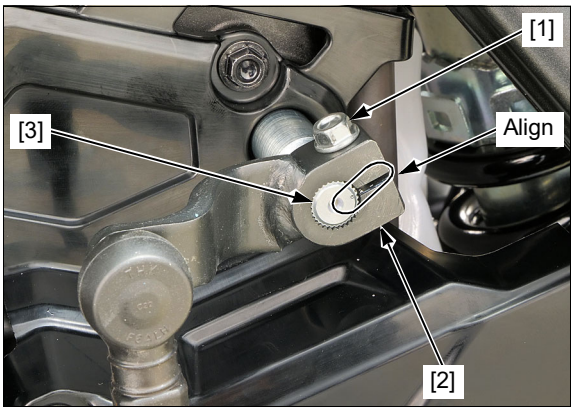
Install the following:

– Clutch (page 12-11)
– Drive sprocket cover (page 2-17)

GEARSHIFT ARM/GEARSHIFT PEDAL

REMOVAL/INSTALLATION

Remove the pinch bolt [1] and gearshift arm [2] from the gearshift spindle [3].

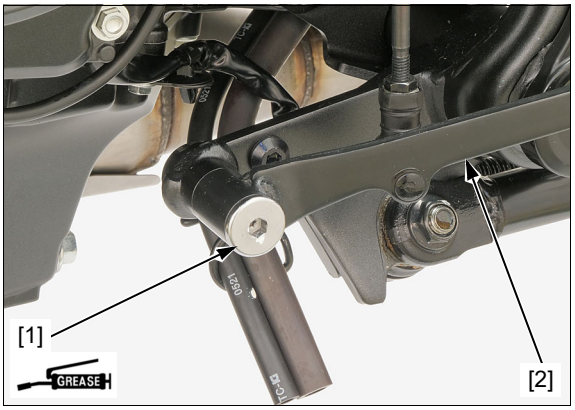


Remove the gearshift pedal pivot bolt [1].

Remove the gearshift pedal [2].

Check the tie-rod ball joint dust cover for deterioration or damage, replace them if necessary.

Installation is in the reverse order of removal.



TORQUE:
Gearshift pedal pivot bolt:
27 N·m (2.8 kgf·m, 20 lbf·ft)

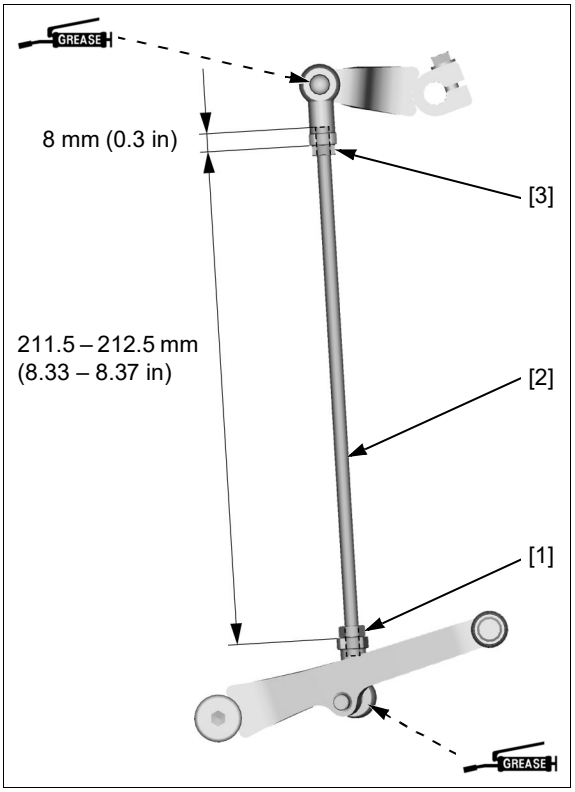
NOTE:
- Apply grease to the gearshift pedal pivot sliding area (grease groove) of the pivot bolt.
- Align the slit of the gearshift arm with the punch mark on the spindle.

Apply grease to the tie-rod ball joint area.

When adjusting the gearshift pedal height, perform the procedure as follows:

Loosen the gearshift pedal adjust lock nuts [1].

Adjust the tie-rod [2] length by turning the gearshift pedal lock nut [3] as shown.



NOTE:
- The gearshift arm side lock nut has left hand threads.

Tighten the adjust nut and lock nut to the specified torque.

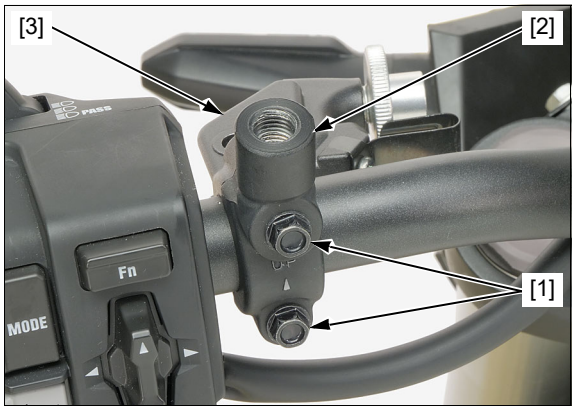
TORQUE:
Gearshift pedal adjust nut:
10 N·m (1.0 kgf·m, 7 lbf·ft)
Gearshift pedal adjust lock nut:
10 N·m (1.0 kgf·m, 7 lbf·ft)

CLUTCH LEVER BRACKET

REMOVAL

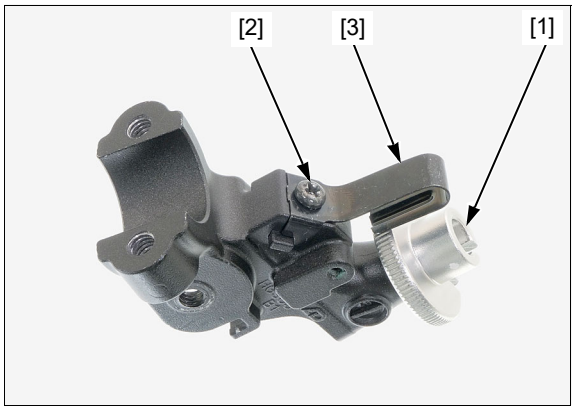
Remove the following:

– Rearview mirror (page 2-11)
– Clutch switch (page 21-20)
– Clutch lever (page 2-8)
– Bolts [1]
– Bracket holder [2]
– Clutch lever bracket [3]



Remove the following:

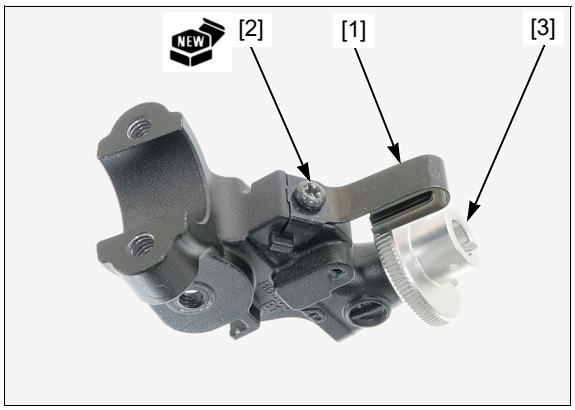
– Adjust bolt [1]
– Screw [2]
– Spring [3]



INSTALLATION

Install the following:

– Spring [1]
– Screw [2]
– Adjust bolt [3]

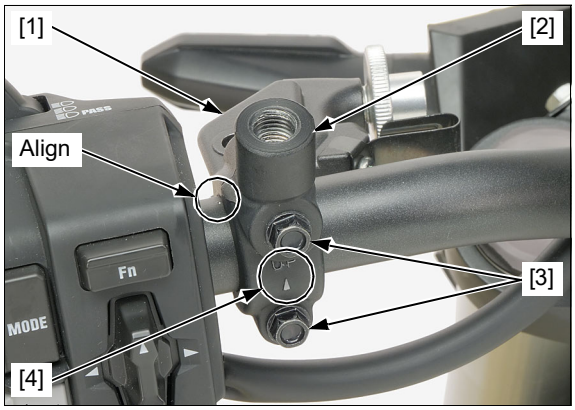


Install the following:

– Clutch lever bracket [1]
– Bracket holder [2]
– Bolts [3]
– Clutch lever (page 2-8)
– Clutch switch (page 21-20)
– Rearview mirror (page 2-11)

NOTE:

- Install the clutch lever bracket by aligning its end with the punch mark on the handlebar.
- Install the holder with its "UP" mark [4] facing up.
- Tighten the upper bolt first, then the lower bolt.



13. CRANKCASE/TRANSMISSION/BALANCER

SERVICE INFORMATION

GENERAL

- Be careful not to damage the crankcase mating surfaces when servicing.
- Clean the oil passages before assembling the crankcase halves.
- Prior to assembling the crankcase halves, apply sealant to their mating surfaces. Wipe off excess sealant thoroughly.
- Mark and store the front balancer shaft bearings to be sure of their correct locations for reassembly.
- The front balancer bearing is select fit and is identified by color codes. Select replacement bearings from the selection table.
- The crankcase must be separated to service the following:
  – Transmission
  – Front balancer
  – Crankshaft (page 14-4)
  – Piston/cylinder (page 14-12)
- The following components must be removed before separating the crankcase:
  – Engine (page 15-4)
  – Gearshift linkage (page 12-17)
  – Rear balancer (page 13-17)
  – Flywheel (page 11-6)
  – Oil pump (page 9-5)
  – Oil strainer (page 9-7)
  – Starter motor (page 6-5)
  – VS sensor (page 4-60)
  – EOP sensor (page 21-13)
  – ECT sensor (page 4-62)
  – CKP sensor (page 4-64)
  – Neutral switch (page 21-21)
  – GP sensor (page 4-60)
  – Cylinder head (page 10-14)
  – Engine oil filter (page 3-12)
  – Lower crankcase 20 mm cap (page 13-18)
  – Shift spindle switch (page 4-61)
  – Thermostat (page 8-6)
- If the pulsar plate is removed, perform the crank pulse initialize learning procedure (page 4-64).

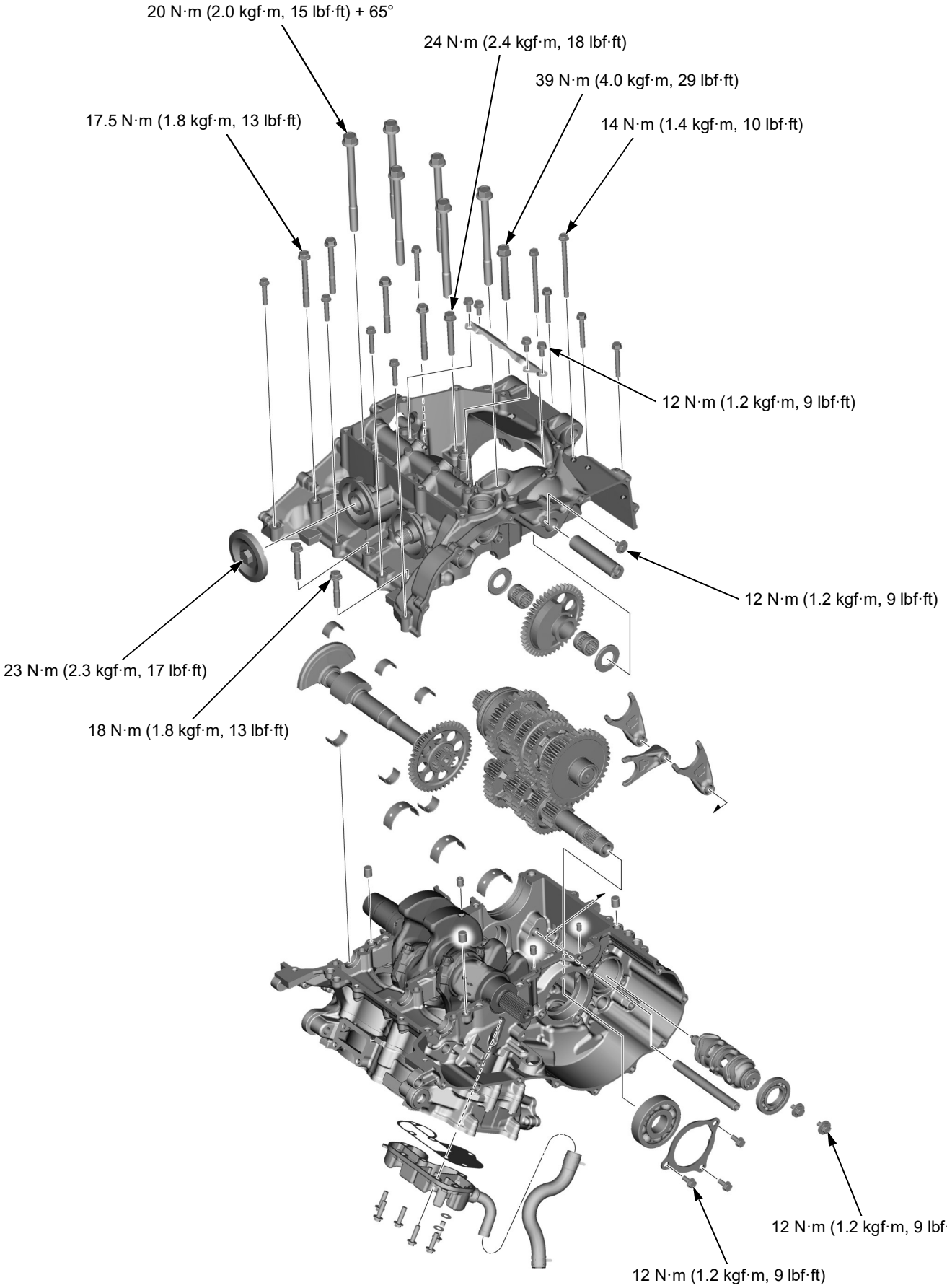
TROUBLESHOOTING

Hard to shift
- Improper clutch operation
- Incorrect engine oil weight
- Bent shift fork
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum groove
- Bent gearshift spindle

Transmission jumps out of gear
- Worn gear dogs
- Worn gearshifter groove
- Bent shift fork shaft
- Worn or bent shift forks
- Broken shift drum stopper arm
- Broken shift drum stopper arm return spring
- Broken gearshift spindle return spring

Excessive engine noise
- Worn or damaged transmission gear
- Worn or damaged transmission bearings
- Worn or damaged front balancer shaft bearings
- Worn or damaged rear balancer needle bearings

COMPONENT LOCATION



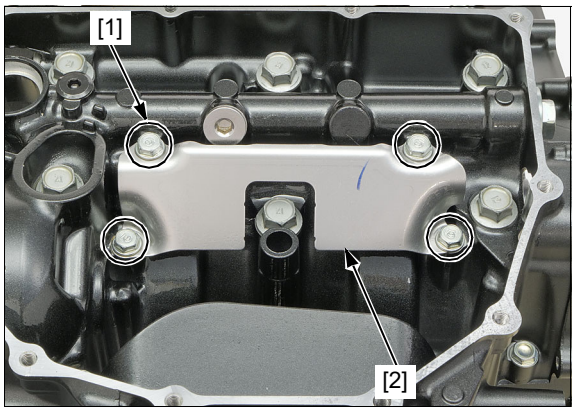
CRANKCASE

SEPARATION

Remove the necessary parts for separating the crankcase by referring to SERVICE INFORMATION (page 13-2).

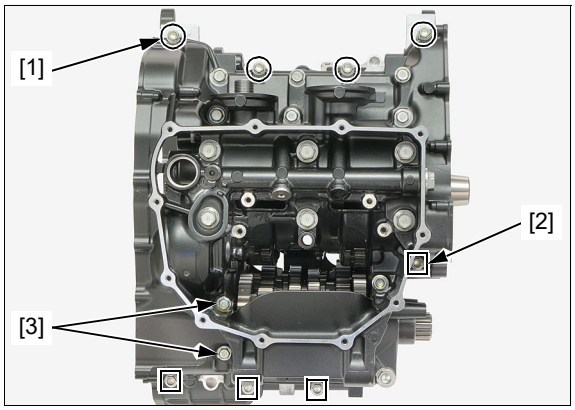
Place the engine upside down.

Remove the baffle plate bolts [1] and baffle plate [2].



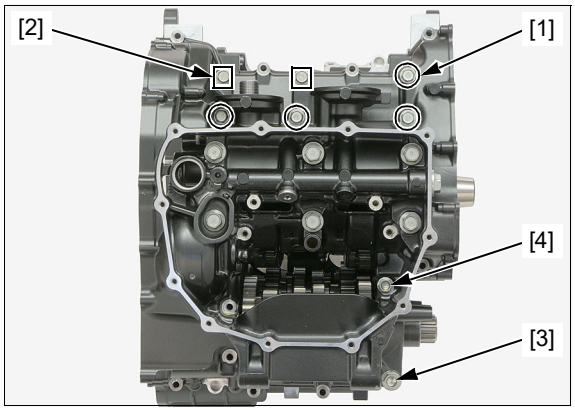
Remove the following:

– Crankcase 6 x 32 bolts [1]
– Crankcase 6 x 45 bolts [2]
– Crankcase 6 x 90 bolts [3]



Remove the following:

– Balancer journal 8 x 75 bolts [1]
– Balancer journal 8 x 45 bolts [2]
– Crankcase 10 x 70 bolt [3]
– Crankcase 8 x 55 bolt [4]

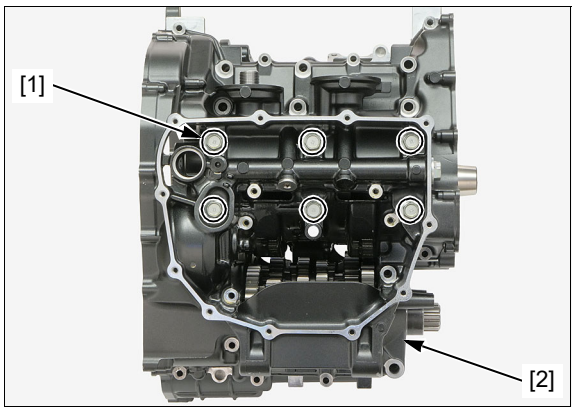


Loosen the main journal bolts [1] in a crisscross pattern in several steps, and remove them.

Separate the lower crankcase [2] from the upper crankcase.

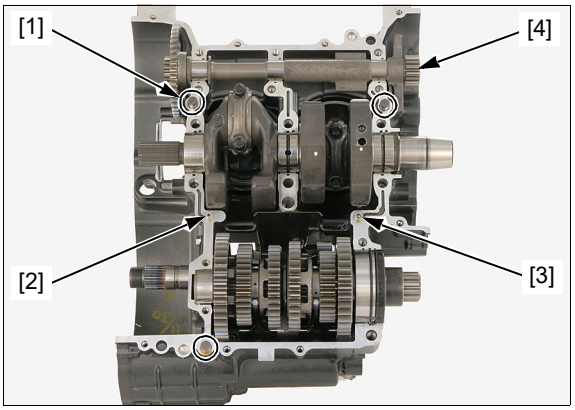
NOTE:

• Do not pry the crankcase halves with a screwdriver.



Remove the following:

– Dowel pins [1]
– Oil orifice A [2]
– Oil orifice B [3]



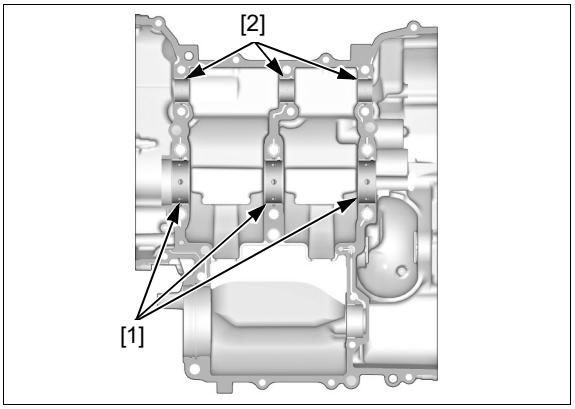
Remove the main journal bearings [1] and front balancer shaft bearings [2] from the lower crankcase if necessary.

NOTE:

- Mark the bearings to ensure correct reassembly in their original locations.

NOTICE

- *Do not interchange the bearings. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.*



ASSEMBLY

Clean the upper and lower crankcase mating surfaces thoroughly, being careful not to damage them.

Check the crankcase oil passages for clogs, and clean them if necessary.

Apply liquid sealant (TB1207B manufactured by Three Bond or equivalent) to the crankcase mating surface as shown.

NOTE:

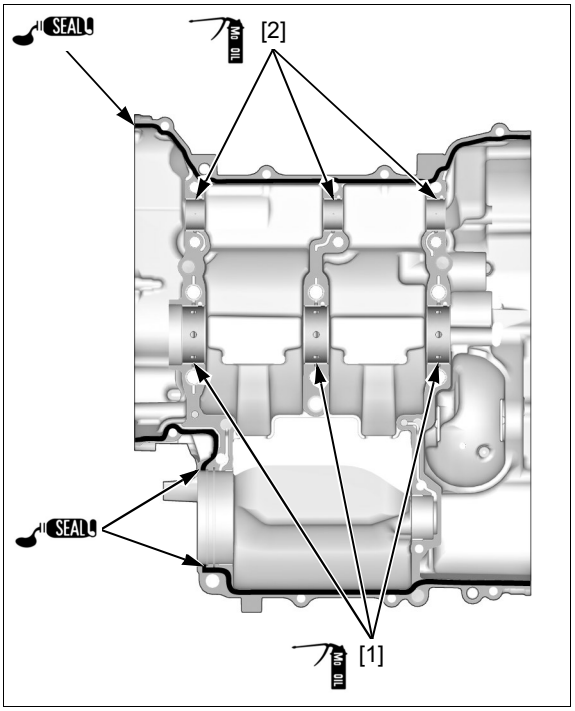
- Do not apply more liquid sealant than necessary.
- Do not apply more liquid sealant to the crankcase main journal bolts area and oil passage area.

Apply molybdenum oil solution to the main journal and front balancer shaft bearing surfaces.

Install the main journal bearings [1] and front balancer shaft bearings [2] by aligning each tab with each groove of the crankcase bearing supports.

NOTE:

- Install the bearings in the original locations.

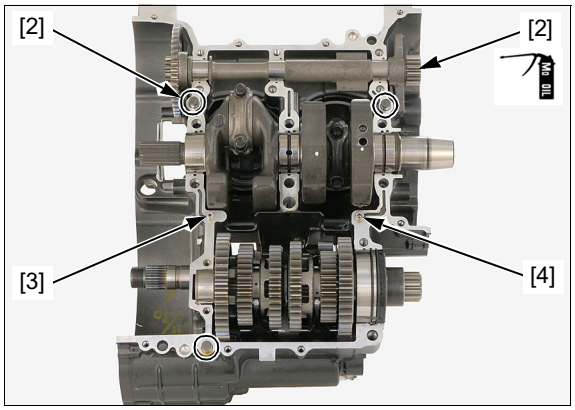


Apply molybdenum oil solution to the front balancer shaft [1] bearing and thrust surfaces.

Install the dowel pins [2], oil orifice A [3] and oil orifice B [4], onto the upper crankcase.

NOTE:

- Install the oil orifice A and B with their narrow hole side facing the upper crankcase.



Install the lower crankcase onto the upper crankcase.

NOTE:

- Make sure the upper and lower crankcase are seated securely.

Apply molybdenum oil solution to the main journal bolt [1] threads.

Apply molybdenum oil solution to the front balancer shaft journal bolt [2] threads.

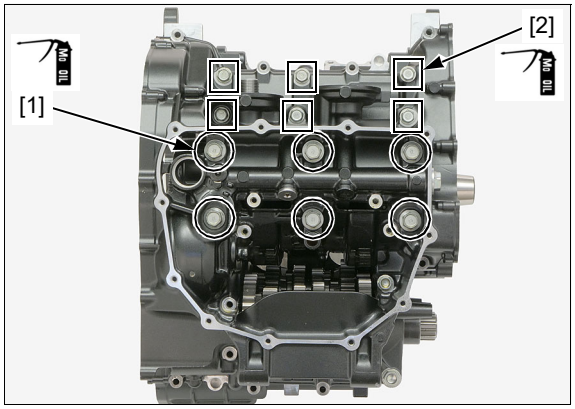
Loosely install all the crankcase mounting bolts.

Tighten the main journal bolts to the specified torque:

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft) + 65°

NOTE:

- Tighten the main journal bolts in a criss cross pattern in 2 or 3 steps.



Tighten the crankcase 10 x 70 bolt [1] to the specified torque.

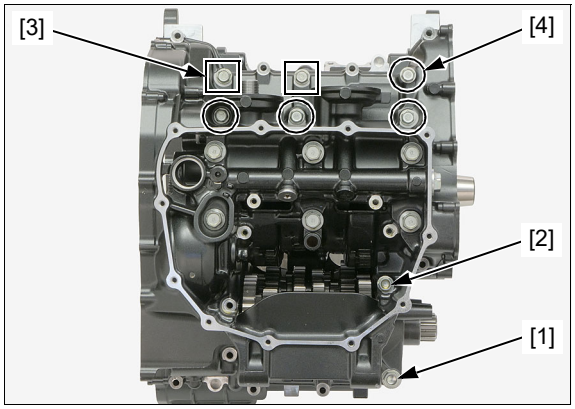
TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

Tighten the crankcase 8 x 55 bolt [2] to the specified torque.

TORQUE: 24 N·m (2.4 kgf·m, 18 lbf·ft)

Tighten the front balancer shaft journal bolts in a crisscross pattern in 2 or 3 steps to the specified torque.

TORQUE:
Front balancer shaft journal 8 x 45 bolts [3]:
18 N·m (1.8 kgf·m, 13 lbf·ft)
Front balancer shaft journal 8 x 75 bolts [4]:
17.5 N·m (1.8 kgf·m, 13 lbf·ft)

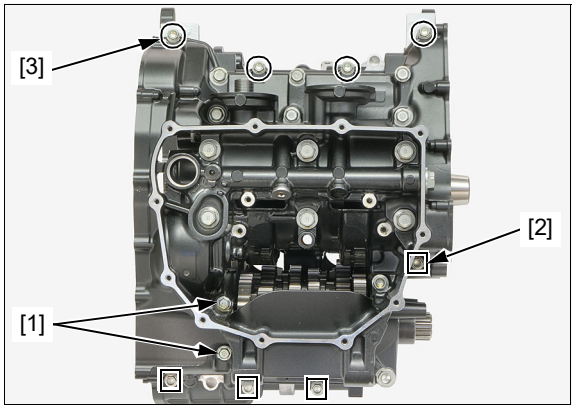


Tighten the crankcase 6 x 90 bolts [1] to the specified torque:

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)

Tighten the following:

– Crankcase 6 x 45 bolts [2]
– Crankcase 6 x 32 bolts [3]



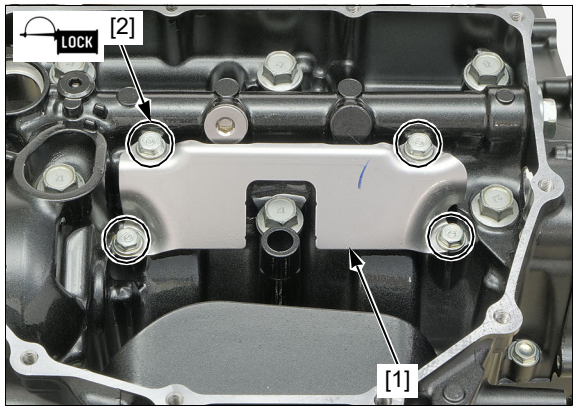
Apply locking agent to the baffle plate bolts threads (page 1-11).

Install the baffle plate [1] and baffle plate bolts [2].

Tighten the baffle plate bolts to the specified torque:

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the removed parts to the crankcase by referring to Service Information (page 13-2).



TRANSMISSION

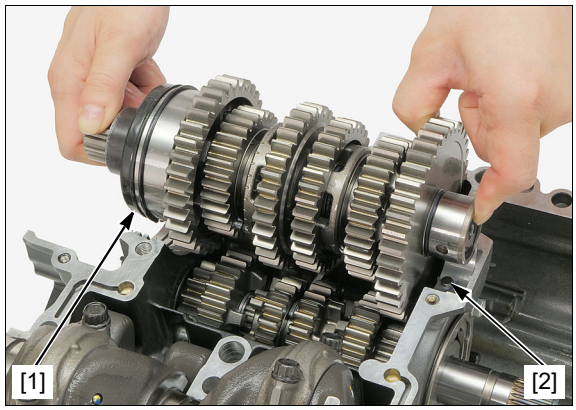
REMOVAL

COUNTERSHAFT

Separate the crankcase halves (page 13-4).

Remove the countershaft assembly [1].

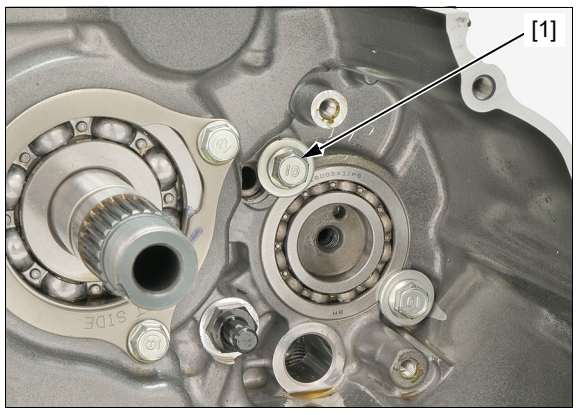
Remove the dowel pin [2].



SHIFT FORK/SHIFT DRUM

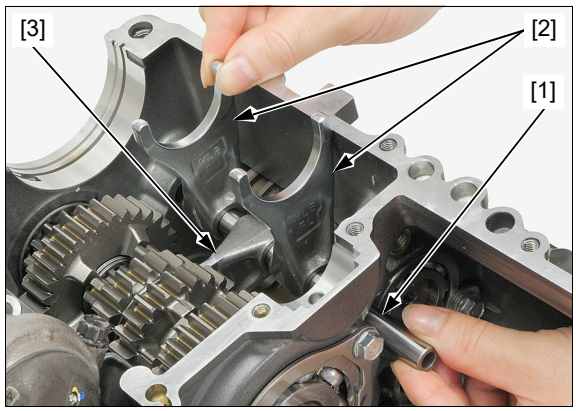
Remove the countershaft (page 13-7).

Remove the shift drum bearing setting bolt/washer [1].

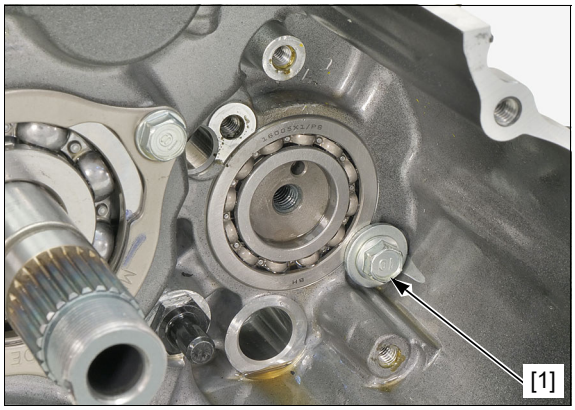


Remove the following:

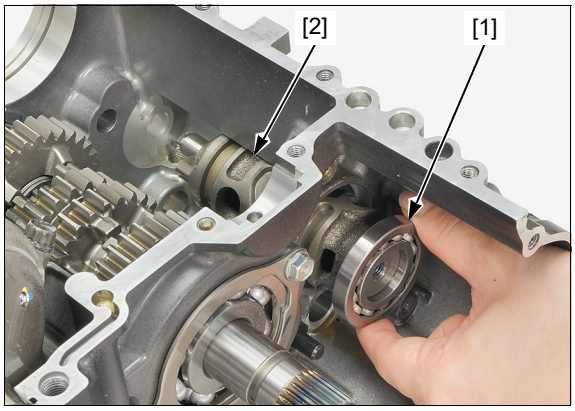
– Shift fork shaft [1]
– Countershaft shift forks [2]
– Mainshaft shift fork [3]



Remove the shift drum bearing setting bolt/washer [1].



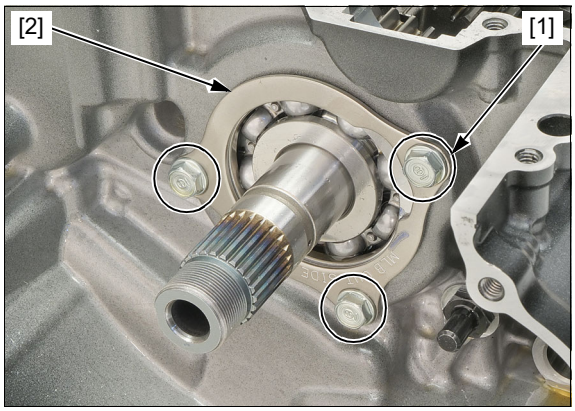
Remove the shift drum bearing [1] and shift drum [2].



MAINSHAFT

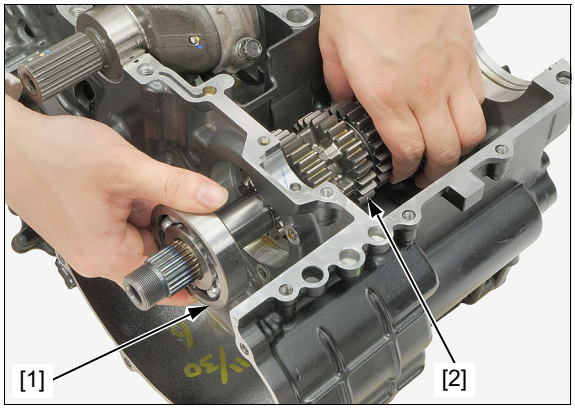
Remove the shift forks/shift drum (page 13-7).

Remove the mainshaft bearing set plate bolts [1] and set plate [2].



Remove the mainshaft bearing [1] by moving the mainshaft assembly [2].

Remove the mainshaft assembly.



DISASSEMBLY/ASSEMBLY

Clean all disassembled parts in solvent thoroughly.

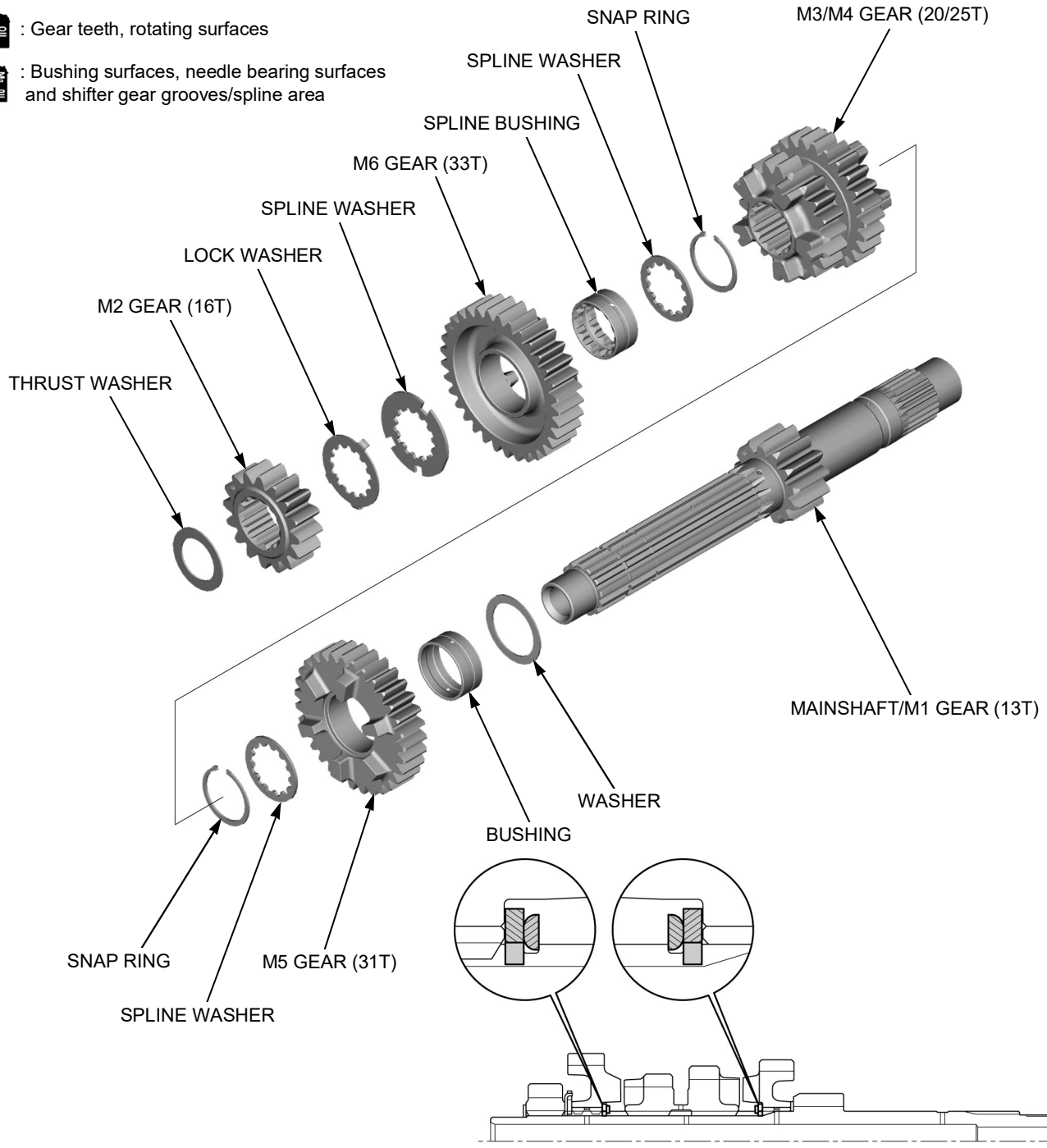
NOTE:

- Do not expand the snap ring more than necessary for removal. To remove a snap ring, expand the snap ring and pull it off using the gear behind it.
- Keep track of the disassembled parts (gears, bushings, washers and snap rings) by sliding them onto a tool or a piece of wire.
- Apply engine oil to the gear teeth, rotating surface and bearing.
- Apply molybdenum oil solution to the spline bushing outer surface, bushing inner and outer surface, shift fork grooves.

MAINSHAFT

: Gear teeth, rotating surfaces

: Bushing surfaces, needle bearing surfaces and shifter gear grooves/spline area

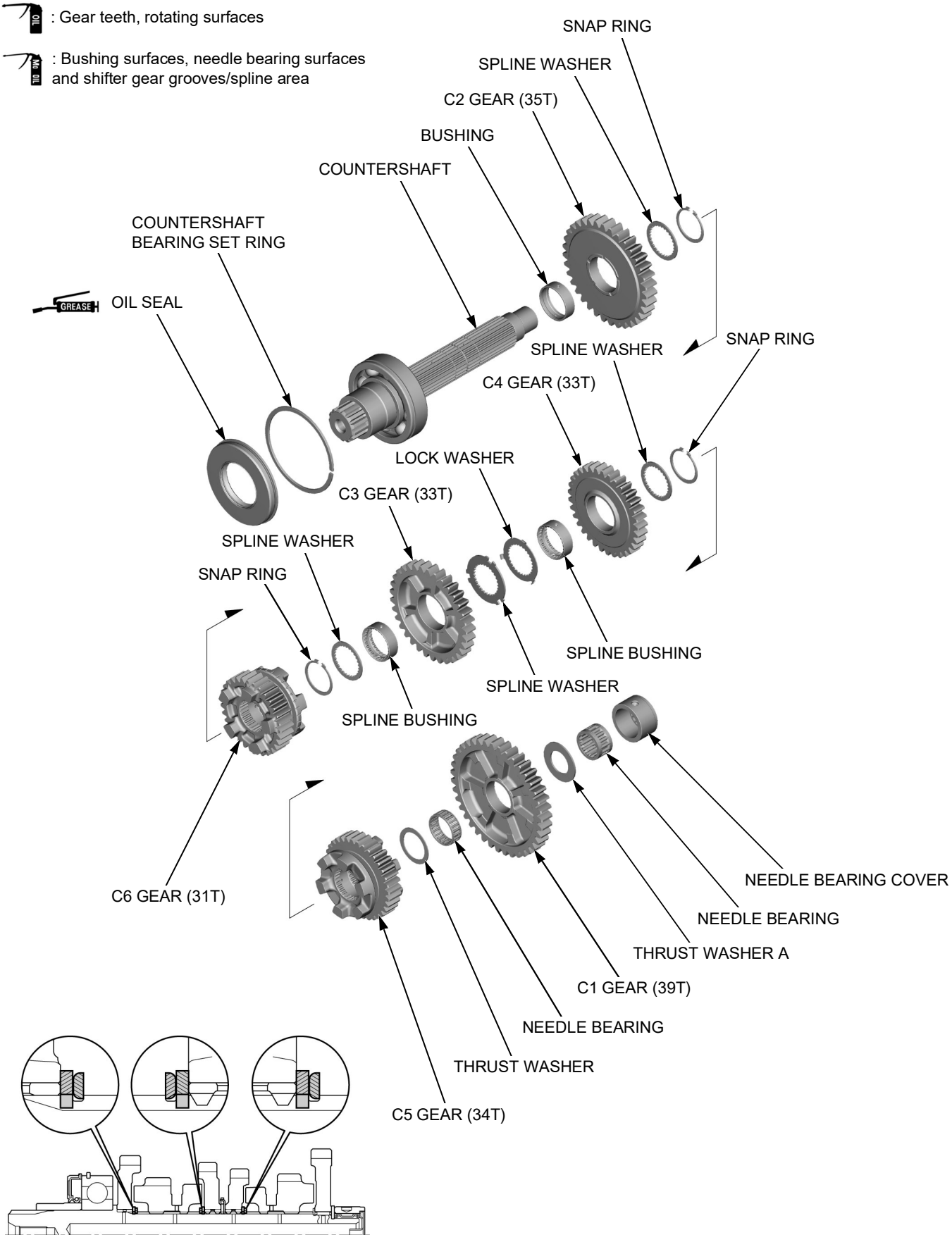


CRANKCASE/TRANSMISSION/BALANCER

COUNTERSHAFT

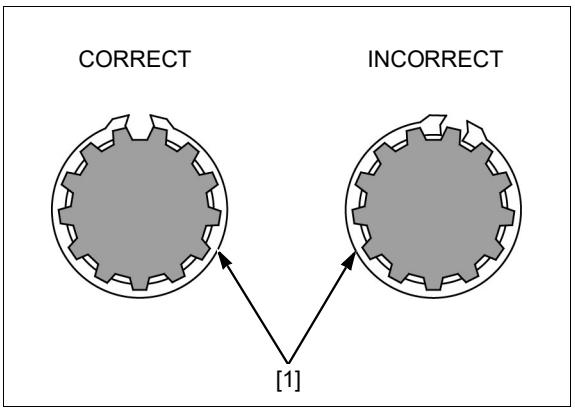
OIL : Gear teeth, rotating surfaces

MO OIL : Bushing surfaces, needle bearing surfaces and shifter gear grooves/spline area



NOTE:

- Align the lock washer tabs with the spline washer grooves.
- Always install the thrust washers and snap rings with the chamfered (rolled) edge facing away from the thrust load.
- Install the snap rings [1] so that the end gap aligns with the groove of the splines.
- Make sure that the snap rings are fully seated in the shaft groove after installing them.



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

Measure each part according to CRANKCASE/TRANSMISSION/BALANCER SPECIFICATIONS (page 1-8).

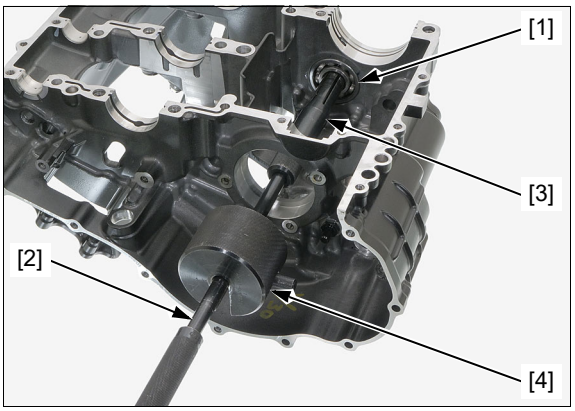
Replace any part if it is out of service limit.

LEFT MAINSHAFT BEARING REPLACEMENT

Remove the following:

– Front balancer shaft (page 13-14)
– Transmission (page 13-7)
– Crankshaft (page 14-4)
– Piston (page 14-12)

Remove the left mainshaft bearing [1] using the special tools.

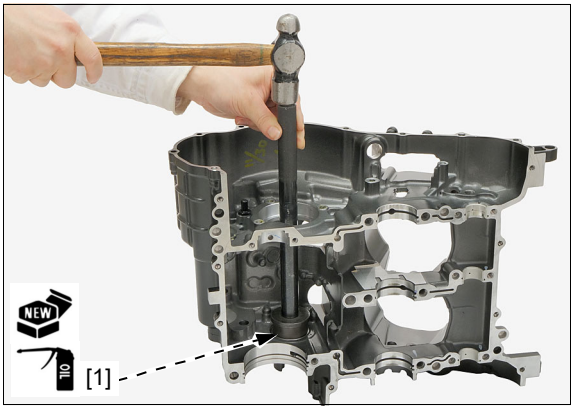


TOOLS:

Remover Handle [2]	**07936-3710100**
Bearing Remover Shaft Set, 20 mm [3]	**07936-3710600**
Weight, Remover [4]	**07741-0010201**

Apply engine oil to a new left mainshaft bearing.

Drive in the left mainshaft bearing [1] until it is fully seated using the special tools.



TOOLS:

Driver Handle 15 x 280L	**07949-3710001**
Attachment, 42 x 47 mm	**07746-0010300**
Pilot 20 mm	**07746-0040500**

NOTE:

- Drive in a new bearing squarely with the marked side facing in.

Install the removed parts in the reverse order of removal.

INSTALLATION

MAINSHAFT

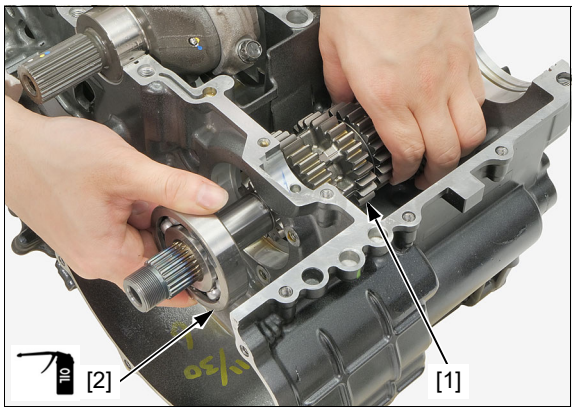
Install the mainshaft assembly [1] into the upper crankcase.

Apply engine oil to the right mainshaft bearing.

Install the right mainshaft bearing [2] into the upper crankcase.

NOTE:

- Install the bearing into the crankcase with the marked side facing out.

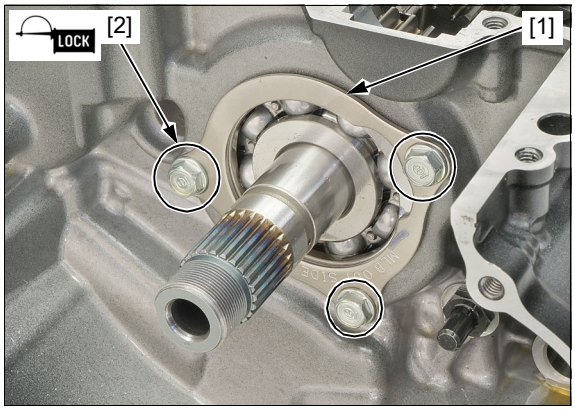


Apply locking agent to the mainshaft bearing set plate bolts threads (page 1-11).

Install the mainshaft bearing set plate [1].

Install and tighten the mainshaft bearing set plate bolts [2] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



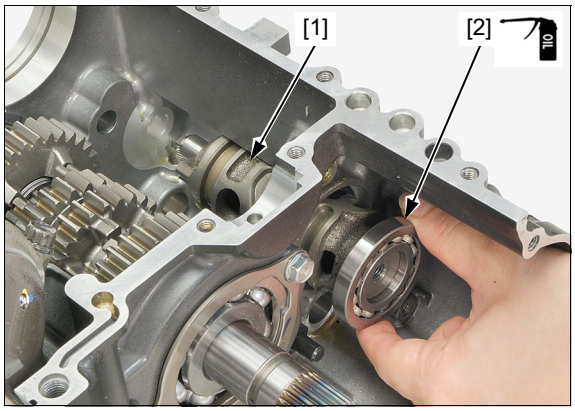
SHIFT DRUM/SHIFT FORK

Apply engine oil to the shift drum bearing.

Install the shift drum [1] and shift drum bearing [2] into the upper crankcase.

NOTE:

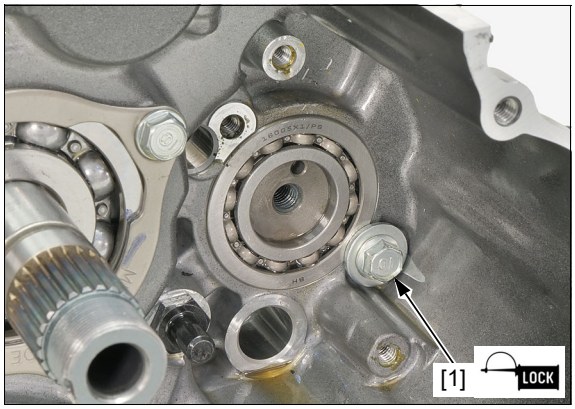
- Install the bearing into the crankcase with the marked side facing out.



Apply locking agent to the shift drum bearing setting bolt/washer threads (page 1-11).

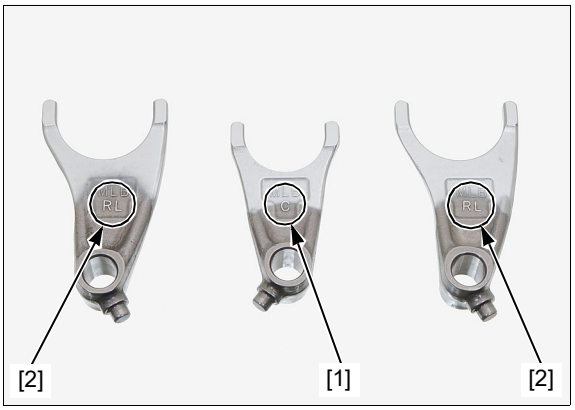
Install and tighten the shift drum bearing setting bolt/washer [1] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



The shift forks have the following identification marks:

– "C" mark [1]: mainshaft shift fork
– "RL" mark [2]: left/right countershaft shift fork



Apply molybdenum oil solution to the shift fork shaft outer surface.

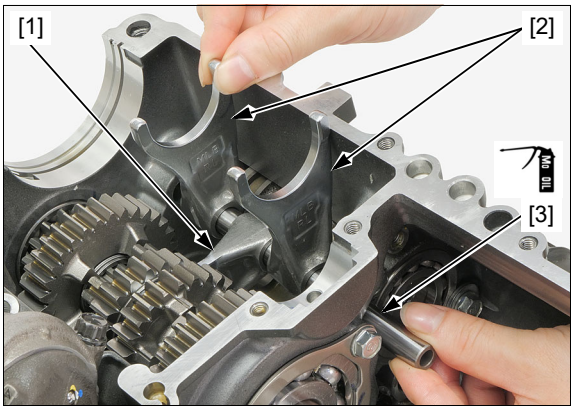
Install the mainshaft shift fork [1] into the M3/M4 gear with the identification marks facing toward the right side of the engine.

Install the countershaft shift forks [2] with the identification marks facing toward the right side of the engine.

Insert the shift fork shaft [3].

NOTE:

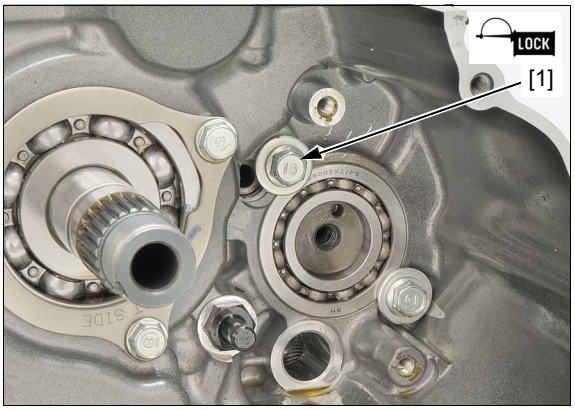
- Make sure that each shift fork guide pin is positioned in the correct guide grooves of the shift drum.



Apply locking agent to the shift drum bearing setting bolt/washer threads (page 1-11).

Install and tighten the shift drum bearing setting bolt/washer [1] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



COUNTERSHAFT

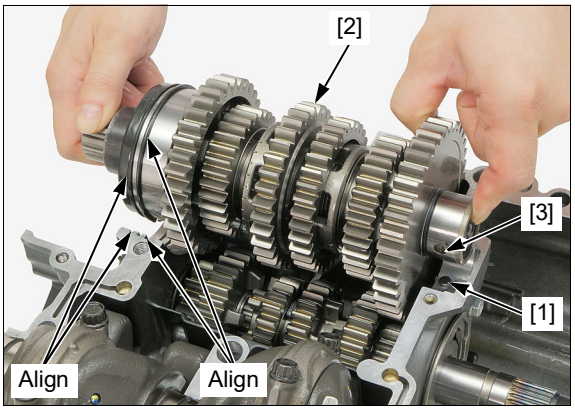
Install the dowel pin [1] onto the upper crankcase hole.

Install the countershaft assembly [2].

NOTE:

- Align the needle bearing cap hole [3] with the dowel pin.
- Align the set ring with the upper crankcase groove.
- Align the oil seal flange with the upper crankcase groove.

Assemble the crankcase halves (page 13-5).



FRONT BALANCER SHAFT

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.*

REMOVAL/INSTALLATION

Separate the crankcase halves (page 13-4).

Remove the front balancer shaft [1].

Remove the bearings [2] if necessary.

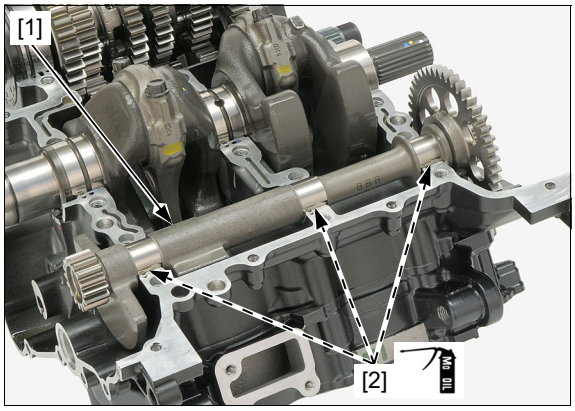
NOTE:

- Mark the bearings to ensure correct reassembly in their original locations.
- Install the bearings by aligning each tab with each groove of the crankcase bearing supports.

Installation is in the reverse order of removal.

NOTE:

- Apply molybdenum oil solution to the front balancer shaft bearing surface.
- Install the bearings in their original locations.



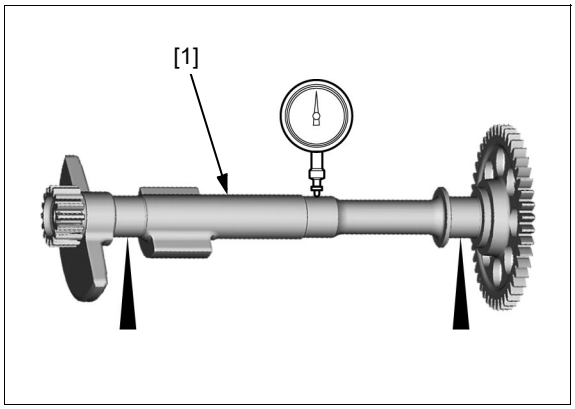
INSPECTION

Support the front balancer shaft [1] on both end journals.

Set a dial gauge on the balancer shaft.

Rotate the balancer shaft two revolutions (720°) and read the runout.

SERVICE LIMIT: 0.03 mm (0.001 in)

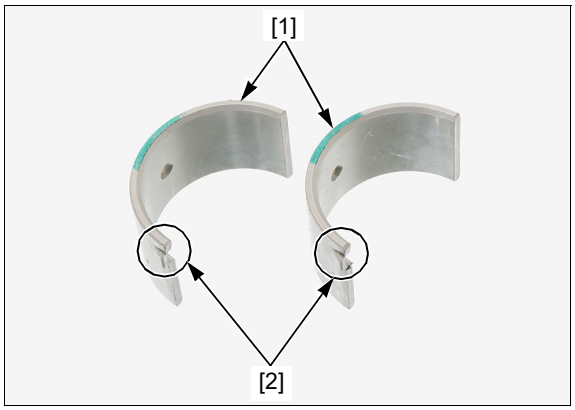


BEARING INSPECTION

Check the balancer bearings [1] for unusual wear or peeling.

Check the bearing tabs [2] for damage.

If the balancer bearing damaged, select a correct replacement bearing (page 13-16).



OIL CLEARANCE INSPECTION

NOTE:

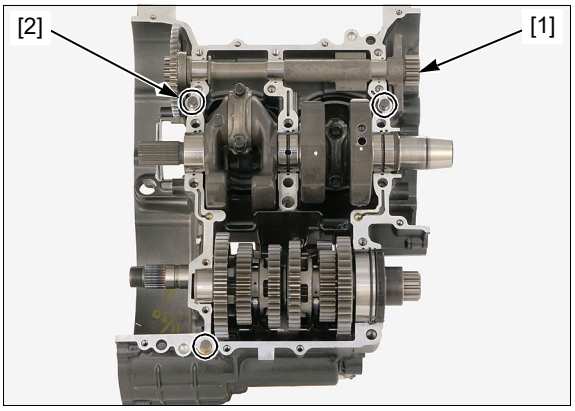
- Do not rotate the front balancer shaft during inspection.

Clean the journal surface of the front balancer shaft with solvent and blow them with compressed air.

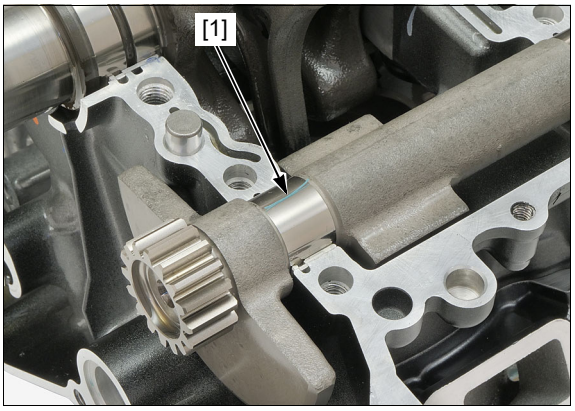
Clean off any oil from the bearing inserts and balancer journal.

Set the front balancer shaft [1] onto the upper crankcase.

Install the dowel pins [2].



Put a strip of plastigauge [1] lengthwise on each balancer journal avoiding the oil hole.



Install the lower crankcase [1] onto the upper crankcase.

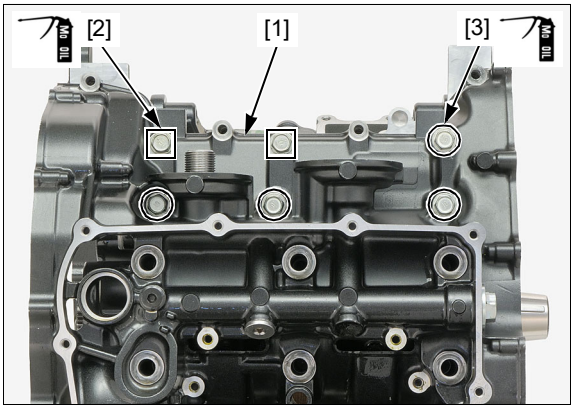
NOTE:

- Make sure the upper and lower crankcase are seated securely.

Clean the balancer journal bolts in solvent, and dry them thoroughly.

Apply molybdenum oil solution to the front balancer shaft journal bolt threads.

Install and tighten the front balancer shaft journal bolts to the specified torque.



TORQUE:

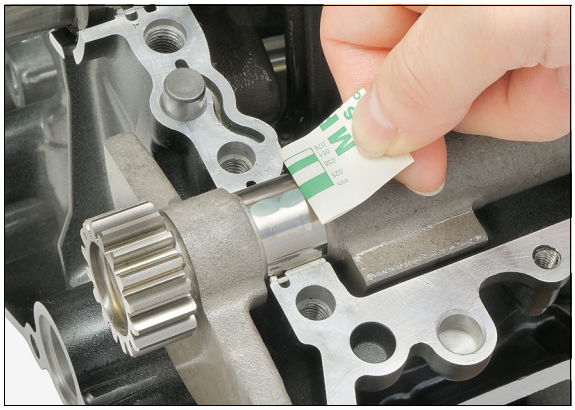
Front balancer shaft journal 8 x 45 bolt [2]:
18 N·m (1.8 kgf·m, 13 lbf·ft)

Front balancer shaft journal 8 x 75 bolt [3]:
17.5 N·m (1.8 kgf·m, 13 lbf·ft)

NOTE:

- Tighten the front balancer shaft journal bolts in a crisscross pattern in 2 or 3 steps.

Measure the compressed plastigauge at its widest point on the balancer journal to determine the oil clearance.



SERVICE LIMIT: 0.043 mm (0.0017 in)

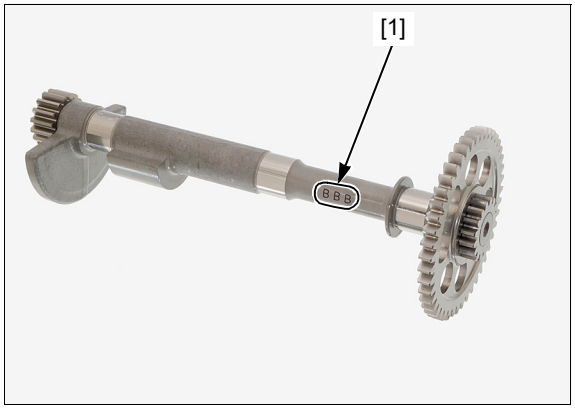
If the oil clearance exceeds the service limit, select a correct replacement bearing (page 13-16).

BEARING SELECTION

Letters (A, B, or C) on the balancer are the balancer O.D. codes.

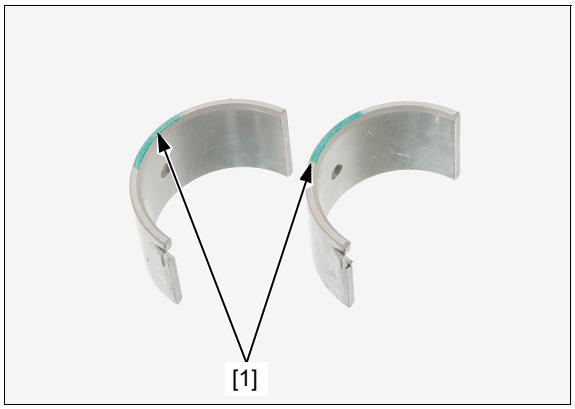
If you are replacing the balancer, record the corresponding balancer O.D. code letter [1].

- Left side number is the No.1 cylinder side balancer O.D.



If you are reusing the balancer, measure the balancer O.D. with a micrometer.

Determine the color [1] of the replacement bearing from the O.D. code or measured O.D.



Refer to the front balancer shaft bearing selection table for bearing selection (page 13-16).

BEARING THICKNESS:

C: Brown: thickest
D: Green: ↕
E: Yellow: thinnest

FRONT BALANCER SHAFT BEARING SELECTION TABLE:

			FRONT BALANCER SHAFT O.D. CODE		
			A	B	C
			21.998 – 21.992 mm (0.8661 – 0.8658 in)	21.992– 21.986 mm (0.8658 – 0.8656 in)	21.986 – 21.980 mm (0.8656 – 0.8654 in)
BEARUBG SUPPORT I.D.	1	25.000 – 25.018 mm (0.9843 – 0.9850 in)	E (Yellow)	D (Green)	C (Brown)

NOTICE

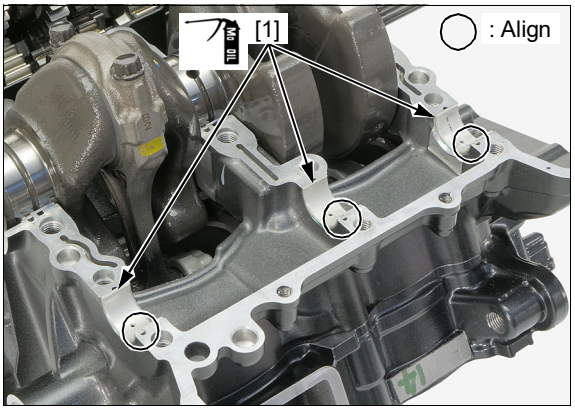
After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

BEARING INSTALLATION

Clean the bearing outer surfaces and crankcase bearing supports.

Apply molybdenum oil solution to the front balancer shaft bearing sliding surfaces.

Install the balancer bearing inserts [1] aligning each tab with each groove of the crankcase bearing supports.



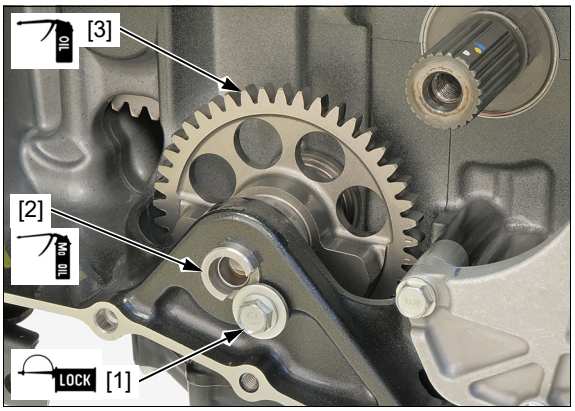
REAR BALANCER

REMOVAL/INSTALLATION

Remove the following:

– Primary drive gear (page 12-16)
– Clutch (page 12-7)

Remove the rear balancer shaft bolt/washer [1], rear balancer shaft [2] and rear balancer gear [3].



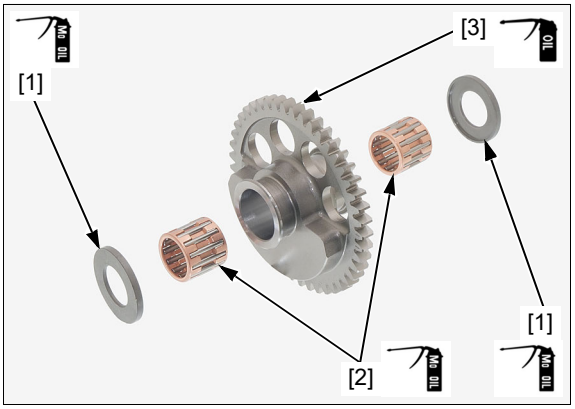
Remove the side washers [1] and needle bearing [2] from the rear balancer gear [3].

Installation is in the reverse order of removal.

TORQUE:
Rear balancer shaft bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:

- Install the side washers in the direction shown.
- Apply molybdenum oil solution to the rear balancer shaft outer surface and side washer sliding surface.
- Apply engine oil to the rear balancer gear teeth.
- Install the rear balancer shaft with the cut-out facing out.
- Apply locking agent to the rear balancer shaft bolt/ washer threads (page 1-11).



BREATHER COVER

REMOVAL/INSTALLATION

Remove the starter motor (page 6-5).

Disconnect the breather hose [1].

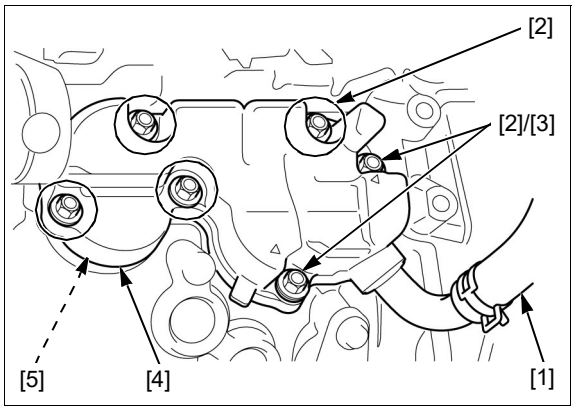
Remove the following:

– Bolts [2]
– Washers [3]
– Breather cover [4]
– Gasket [5]

Installation is in the reverse order of removal.

NOTE:

• Replace the gasket with a new one.



LOWER CRANKCASE 20 MM CAP

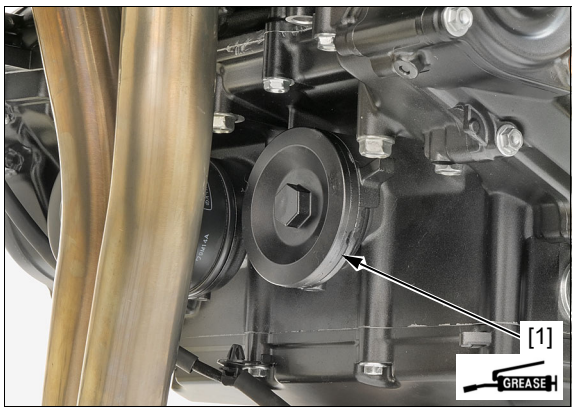
REMOVAL/INSTALLATION

Remove the lower crankcase 20 mm cap [1].

Apply grease to the lower crankcase 20 mm cap threads.

Install and tighten the lower crankcase 20 mm cap to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



14. CRANKSHAFT/PISTON/CYLINDER

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the crankshaft, cylinder and piston/connecting rod.
- Mark and store the connecting rods, crankpin bearing caps, crankpin bearings and main journal bearings to be sure of their correct locations for reassembly.
- The crankpin bearing and main journal bearing are select fit and are identified by color codes. Select replacement bearings from the selection tables.

TROUBLESHOOTING

Cylinder compression is too low, hard to starting or poor performance at low speed
- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston

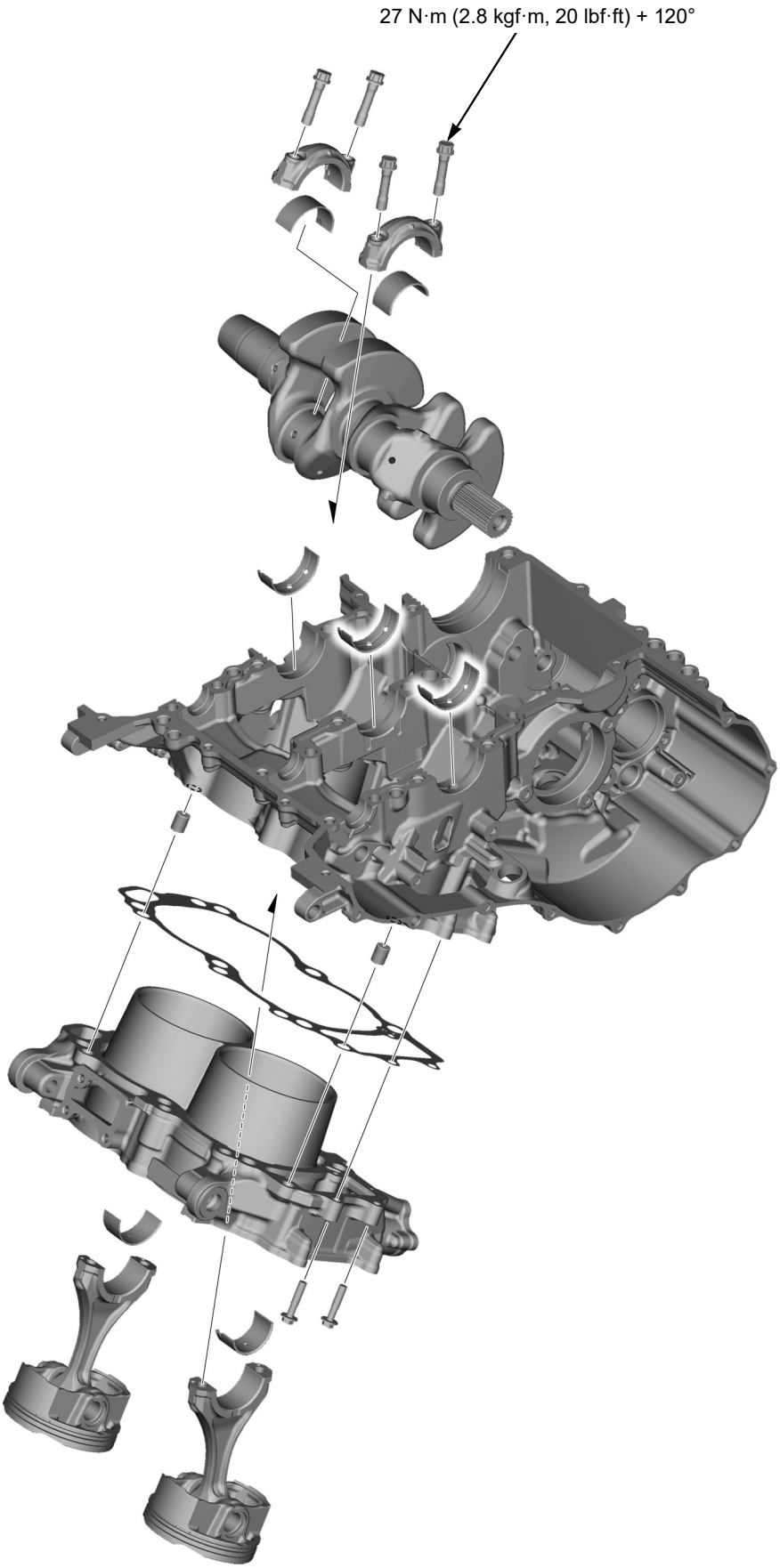
Cylinder compression too high, overheating or knocking
- Excessive carbon built-up on piston head or combustion chamber

Excessive smoke
- Worn cylinder, piston or piston ring
- Improper installation of piston rings
- Scored or scratched piston or cylinder inner surface

Abnormal noise
- Worn piston pin or piston pin hole
- Worn connecting rod small end
- Bent connecting rod
- Worn cylinder, piston or piston rings
- Worn main journal bearings
- Worn crankpin bearings

Engine vibration
- Excessive crankshaft runout

COMPONENT LOCATION



CRANKSHAFT

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.*

SIDE CLEARANCE INSPECTION

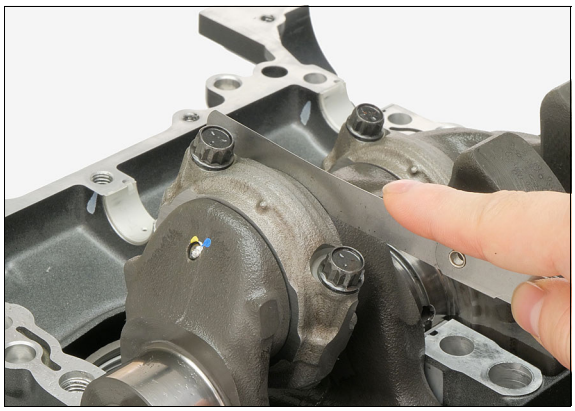
Separate the crankcase halves (page 13-4).

Measure the connecting rod side clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)

If the clearance exceeds the service limit, replace the connecting rod.

Recheck and if still out of limit, replace the crankshaft.



REMOVAL

Separate the crankcase halves (page 13-4).

Remove the front balancer shaft (page 13-14).

Remove the crankpin bearing cap bolts [1] and bearing caps [2].

NOTE:

- Mark the bearing caps to ensure correct reassembly in their original locations.

Remove the bearings [3] if necessary.

NOTE:

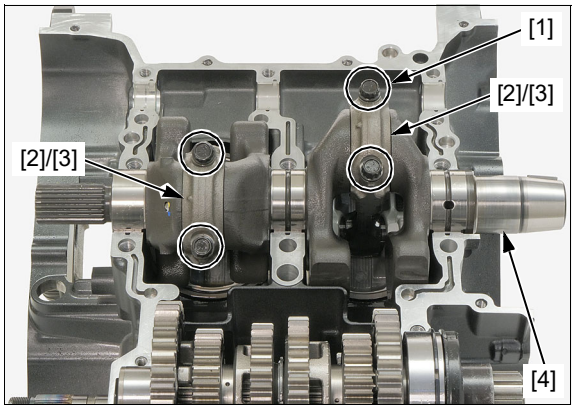
- Mark the bearings to ensure correct reassembly in their original locations.

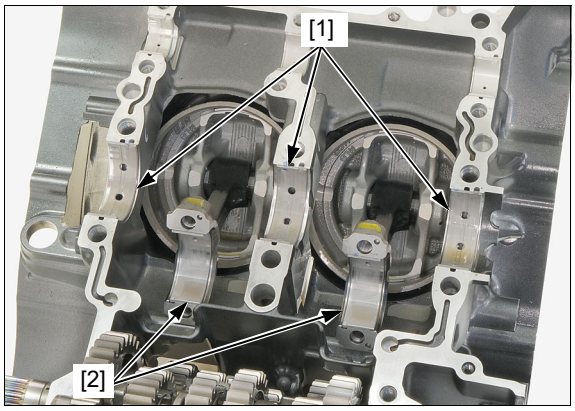
Remove the crankshaft [3].

Remove the main journal bearings [1] and crankpin bearings [2] if necessary.

NOTE:

- Mark the bearing caps and bearings to ensure correct reassembly in their original locations.





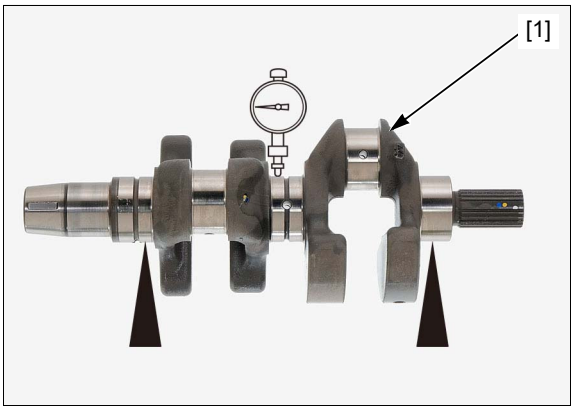
INSPECTION

Support the crankshaft [1] on both end journals.

Set a dial gauge on the crankshaft.

Rotate the crankshaft two revolutions (720°) and read the runout.

SERVICE LIMIT: 0.03 mm (0.001 in)

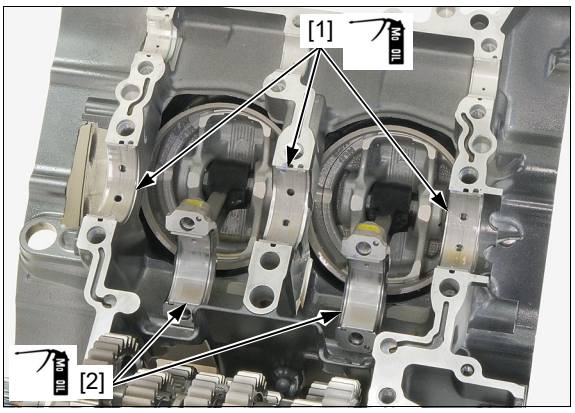


INSTALLATION

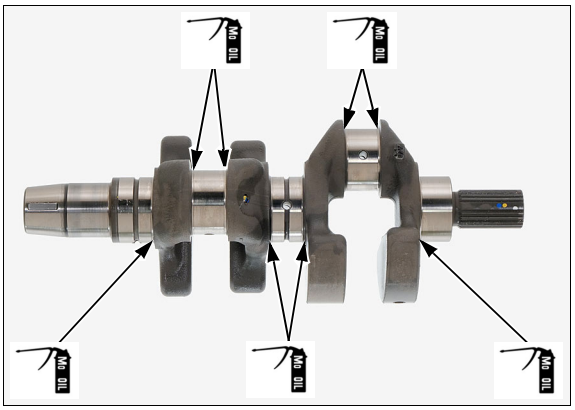
The bearing tabs should be aligned with the grooves in the crankcase.

Apply molybdenum oil solution to the main journal bearing surfaces on the upper crankcase and crankpin bearing surfaces.

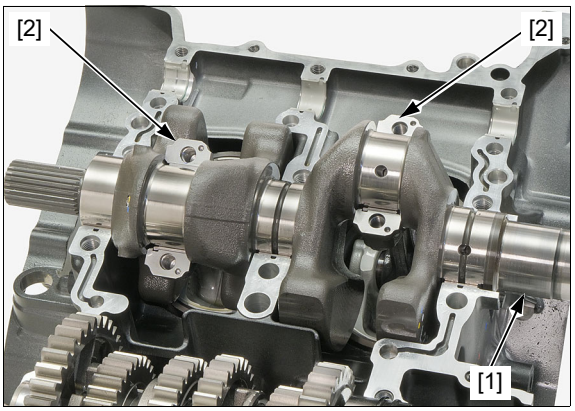
Install the main journal bearings [1] and crankpin bearings [2] in their original locations.



Apply molybdenum oil solution to the thrust surfaces of the crankshaft as shown.



Install the crankshaft [1] onto the upper crankcase and set the connecting rods [2] onto the crankpins.



Install the crankpin bearings [1].

NOTE:

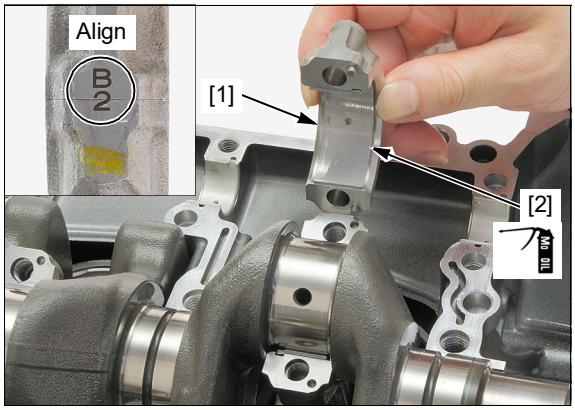
- Install the bearings in their original locations.

Apply molybdenum oil solution to the crankpin bearing surface on the crankpin bearing caps [2].

Install the crankpin bearing caps.

NOTE:

- Align the I.D. code number on the crankpin bearing caps and connecting rods.



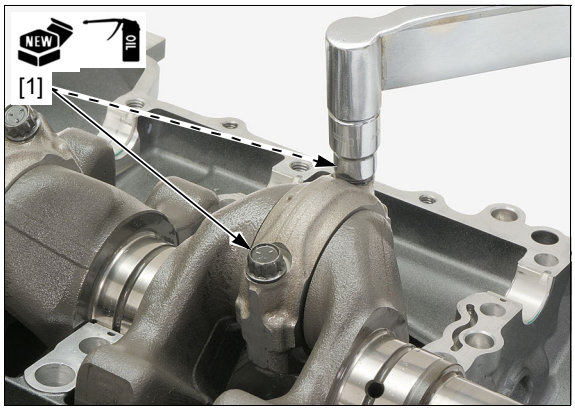
Apply engine oil to new crankpin bearing cap bolt threads and seating surfaces.

Install and tighten the crankpin bearing cap bolts [1] to the specified torque in 2 or 3 steps alternately.

Further tighten the bolts 90°.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft) + 120°

Assemble the crankcase halves (page 13-5).



MAIN JOURNAL BEARING

NOTICE

Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

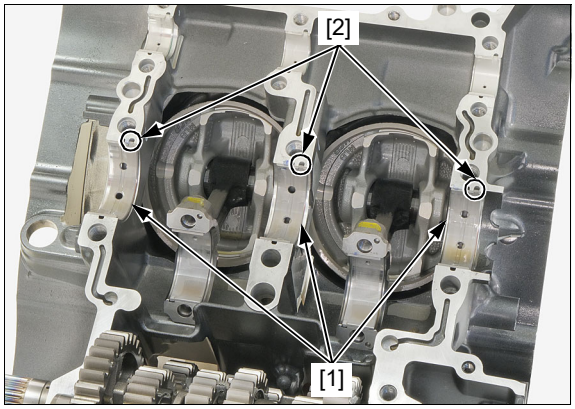
BEARING INSPECTION

Remove the crankshaft (page 14-4).

Check the main journal bearing inserts [1] for unusual wear or peeling.

Check the bearing tabs [2] for damage.

If the main journal bearing damaged, select a replacement bearing (page 14-8).



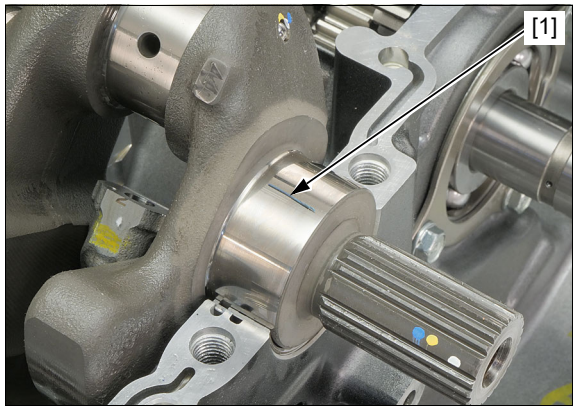
OIL CLEARANCE INSPECTION

Clean off any oil from the bearing inserts and main journals.

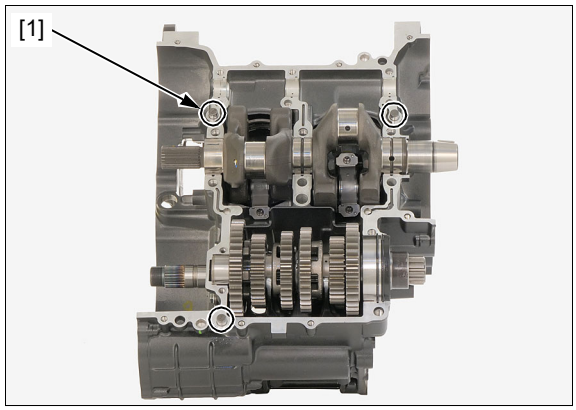
Install the crankshaft onto the upper crankcase.

Do not rotate the crankshaft during inspection.

Put a strip of plastigauge [1] lengthwise on each main journal avoiding the oil hole.



Install the dowel pins [1] into the upper crankcase.



Install the lower crankcase [1] onto the upper crankcase.

NOTE:

- Make sure the upper and lower crankcase are seated securely.

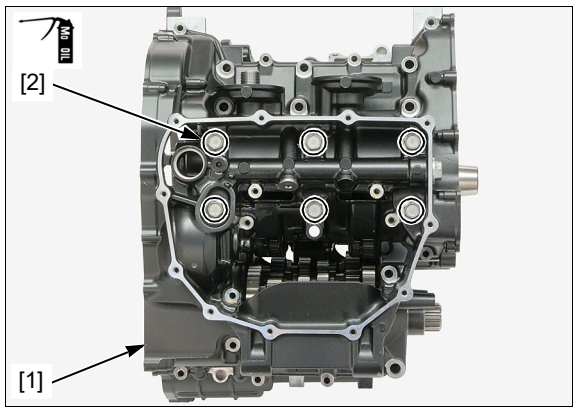
Clean the main journal bolts in solvent, and dry them thoroughly.

Apply molybdenum oil solution to the main journal bolts threads.

Install the bolts [2].

Tighten the main journal bolts in numerical order as shown in a crisscross pattern in several steps.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft) + 65°

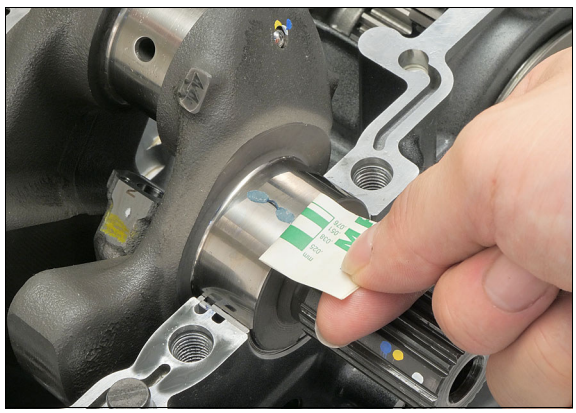


Remove the bolts and lower crankcase.

Measure the compressed plastigauge at its widest point on each main journal to determine the oil clearance.

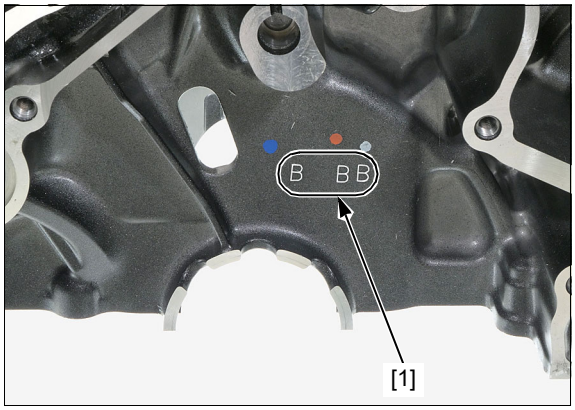
SERVICE LIMIT:
0.05 mm (0.002 in)

If the oil clearance exceeds the service limit, select the correct replacement bearings



MAIN JOURNAL BEARING SELECTION

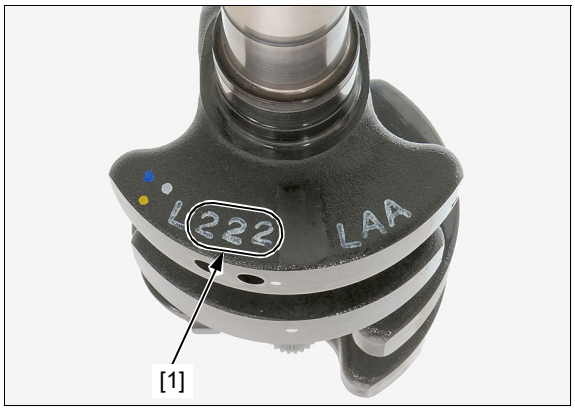
Record the crankcase bearing support I.D. code letters [1] from left side of the upper crankcase as shown.



NOTE:

- Letters (A, B or C) on the left side of upper crankcase are bearing support I.D. codes from left to right.

If you are replacing the crankshaft, record the corresponding main journal O.D. code numbers [1] from the crank weight.

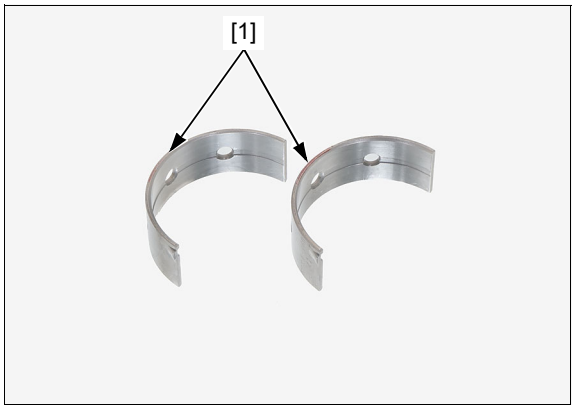


NOTE:

- Numbers (1, 2 or 3) on the crank weight are main journal O.D. codes from left to right.

If you are reusing the crankshaft, measure the main journal O.D. with a micrometer.

Determine the replacement bearing color code [1] with the main journal O.D. code number or the measured main journal O.D., and the crankcase bearing support I.D. code.



Refer to the main journal bearing selection table below for bearing selection.

MAIN JOURNAL BEARING THICKNESS:

A: Blue: Thickest
B: Black:
C: Brown: ↕
D: Green:
E: Yellow: Thinnest

MAIN JOURNAL BEARING SELECTION TABLE:

			BEARING SUPPORT I.D. CODE		
			A	B	C
			45.000 – 45.006 mm (1.7717 – 1.7719 in)	45.006 – 45.012 mm (1.7719 – 1.7721 in)	45.012 – 45.018 mm (1.7721 – 1.7724 in)
MAIN JOURNAL O.D. CODE NUMBER	1	42.010 – 42.016 mm (1.6539 – 1.6542 in)	E (Yellow)	D (Green)	C (Brown)
	2	42.004 – 42.010 mm (1.6537 – 1.6539 in)	D (Green)	C (Brown)	B (Black)
	3	41.998 – 42.004 mm (1.6535 – 1.6537 in)	C (Brown)	B (Black)	A (Blue)

NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

BEARING INSTALLATION

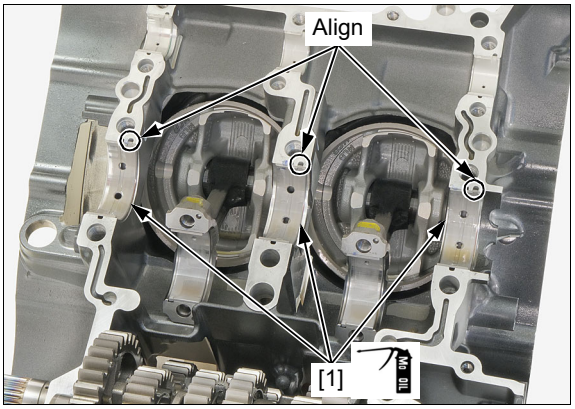
Clean the main journal bearing outer surfaces and crankcase bearing inserts.

Apply molybdenum oil solution to the main journal bearing sliding surfaces.

Install the main journal bearings [1].

NOTE:

- Install the main journal bearing by aligning each tab with each groove.



CRANKPIN BEARING

NOTICE

Do not interchange the crankpin bearings. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in severe engine damage.

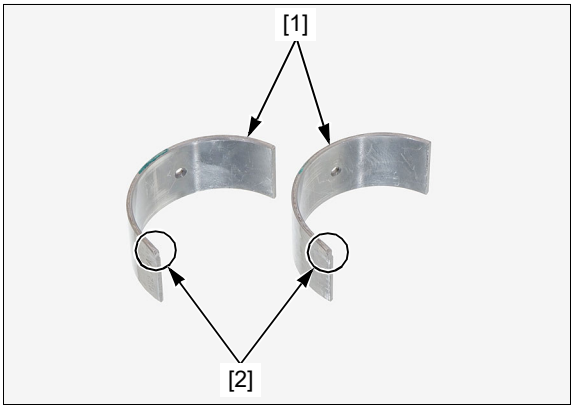
Remove the crankshaft (page 14-4).

BEARING INSPECTION

Check the crankpin bearing inserts [1] for unusual wear or peeling.

Check the bearing tabs [2] for damage.

If the crankpin bearing damaged, select a replacement bearing (page 14-10).



OIL CLEARANCE INSPECTION

NOTE:

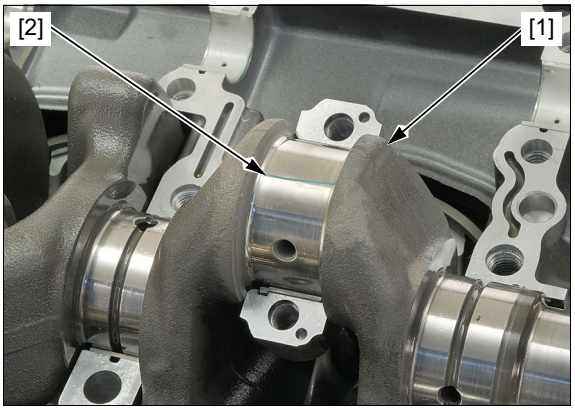
- Do not rotate the crankshaft during inspection.

Clean off any oil from the crankpin bearings and crankpins.

Carefully install the crankshaft [1] onto the upper crankcase.

Set the connecting rods onto the crankpins.

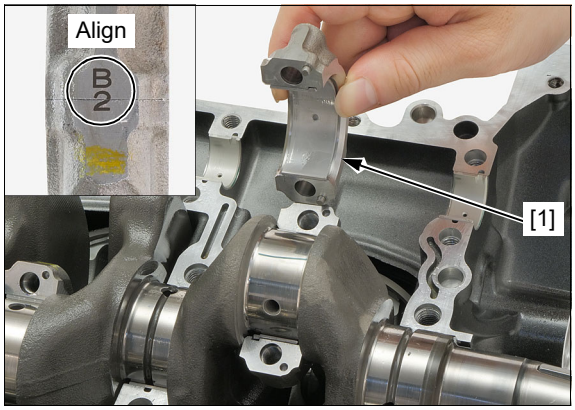
Lay a strip of plastigauge [2] lengthwise on each crankpin and be sure to avoid the oil holes.



Install the crankpin bearing caps [1].

NOTE:

- Align the I.D. code number on the crankpin bearing caps and connecting rods.



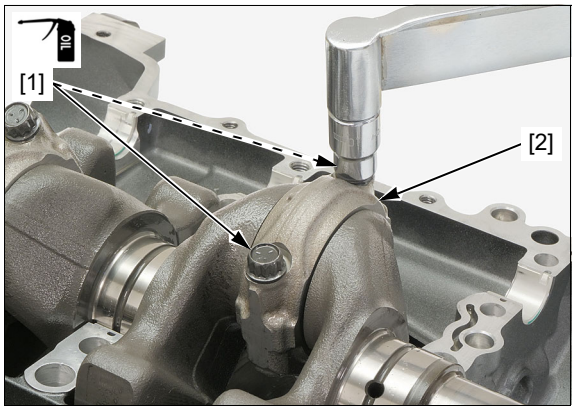
Apply engine oil to the crankpin bearing cap bolt (reuse) threads and seating surfaces.

Install and tighten the crankpin bearing cap bolts [1] to the specified torque in 2 or 3 steps alternately.

Further tighten the bolts 90°.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft) + 90°

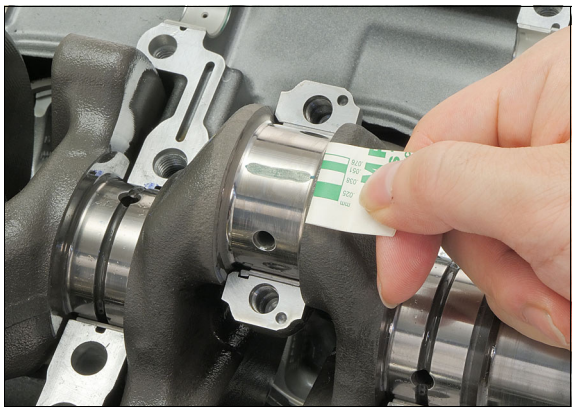
Remove the crankpin bearing cap bolts and crankpin bearing caps [2].



Measure the compressed plastigauge at its widest point on each crankpin to determine the oil clearance.

SERVICE LIMIT: 0.05 mm (0.002 in)

If the oil clearance exceeds the service limit, select the correct replacement bearings (page 14-10).

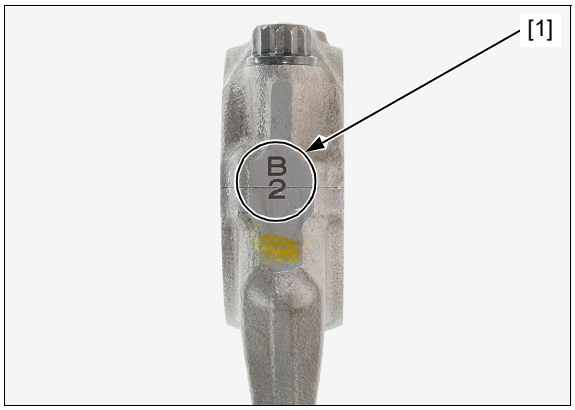


BEARING SELECTION

Record the connecting rod I.D. code number [1] or measure the connecting rod I.D.

NOTE:

- Numbers (1, 2, or 3) on the connecting rods are the connecting rod I.D. codes.
- When measure the connecting rod I.D., install the crankpin bearing cap without installing the crankpin bearing.



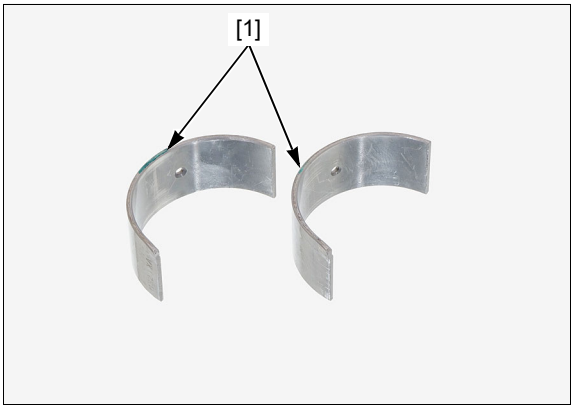
If you are replacing the crankshaft, record the corresponding crankpin O.D. code letter [1].

NOTE:

- Letters (A, B, or C) on the crank weight are the crankpin O.D. codes from left to right.

If you are reusing the crankshaft, measure the crankpin O.D. with a micrometer.

Determine the replacement bearing color code [1] with the connecting rod I.D. code number or the measured connecting rod I.D., and the crankpin O.D. code letter or measured crankpin O.D.



Refer to the crankpin bearing selection table below for bearing selection.

CRANKPIN BEARING THICKNESS:

Y: Blue: Thickest
Z: Black:
A: Brown: ↕
B: Green:
C: Yellow: Thinnest

CRANKPIN BEARING SELECTION TABLE:

			CONNECTING ROD I.D. CODE		
			1	2	3
			43.000 – 43.008 mm (1.6929 – 1.6932 in)	43.008 – 43.016 mm (1.6932 – 1.6935 in)	43.016 – 43.024 mm (1.6935 – 1.6939 in)
CRANKPIN O.D. CODE	A	39.995 – 40.003 mm (1.5746 – 1.5749 in)	C (Yellow)	B (Green)	A (Brown)
	B	39.987 – 39.995 mm (1.5743 – 1.5746 in)	B (Green)	A (Brown)	Z (Black)
	C	39.979 – 39.987 mm (1.5740 – 1.5743 in)	A (Brown)	Z (Black)	Y (Blue)

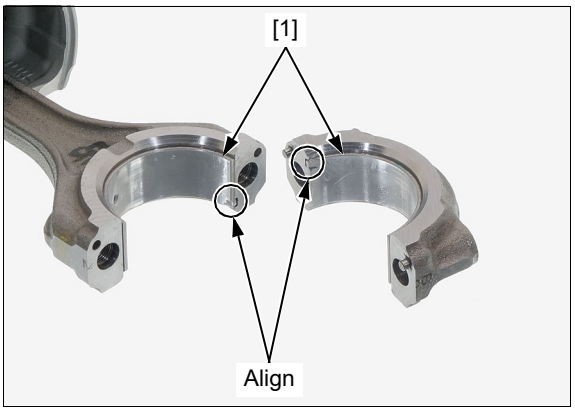
NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

BEARING INSTALLATION

Clean the crankpin bearing outer surfaces, crankpin bearing cap and connecting rod.

Install the crankpin bearings [1] onto the crankpin bearing cap and connecting rod.



NOTE:

- Install the crankpin bearings by aligning each tab with each groove.

PISTON/CYLINDER

PISTON/CONNECTING ROD/ CYLINDER REMOVAL

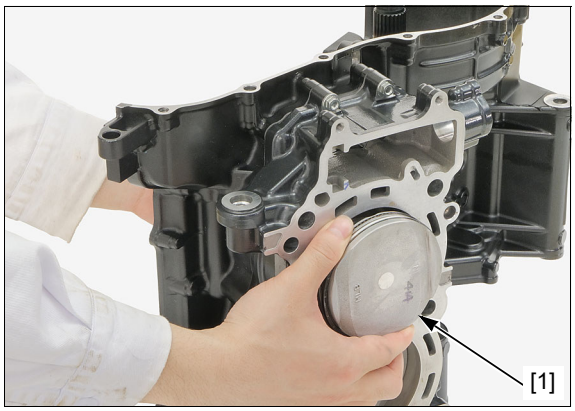
NOTICE

- *Before piston removal, place a clean shop towel around the connecting rod to prevent damaging the cylinder sleeve.*
- *Do not try to remove the piston/connecting rod assembly from bottom of the cylinder.*
- *Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.*

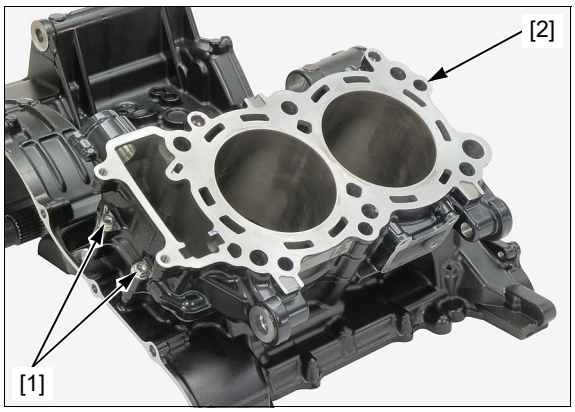
Remove the following:

– Front balancer shaft (page 13-14)
– Crankshaft (page 14-4)
– Countershaft (page 13-7)

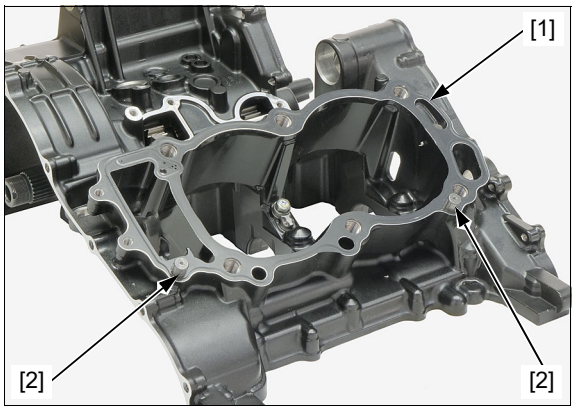
Remove the piston/connecting rod assembly [1] from the top of the cylinder.



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



Remove the gasket [1] and dowel pins [2].

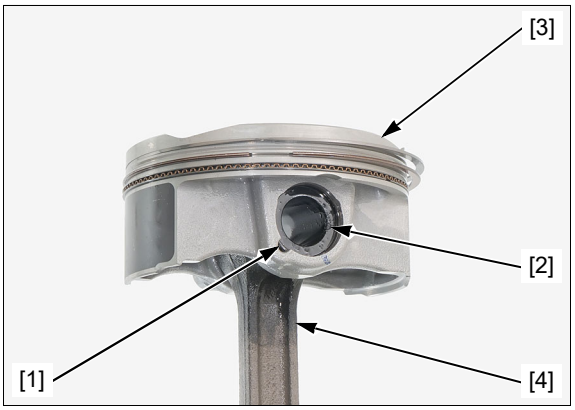


PISTON REMOVAL

Remove the piston pin clips [1].

Push the piston pin [2] out of the piston [3] and connecting rod [4].

Remove the piston.



PISTON RING REMOVAL

Spread each piston ring ends and remove them by lifting up at a point opposite the gap.

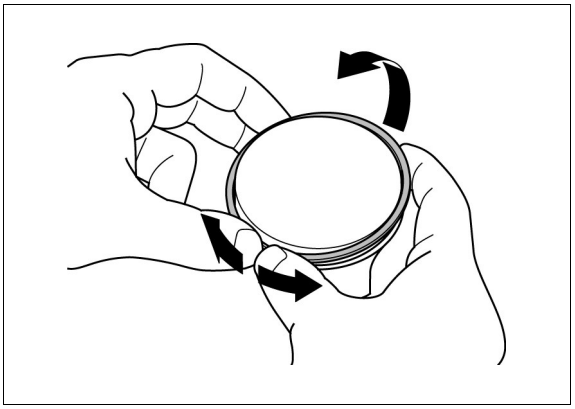
NOTE:

- Be careful not to damage the piston ring by spreading the ends too far.

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 1-8).

Replace any part if it is out of service limit.

PISTON RING INSTALLATION

Clean the piston ring grooves thoroughly.

Install the piston rings.

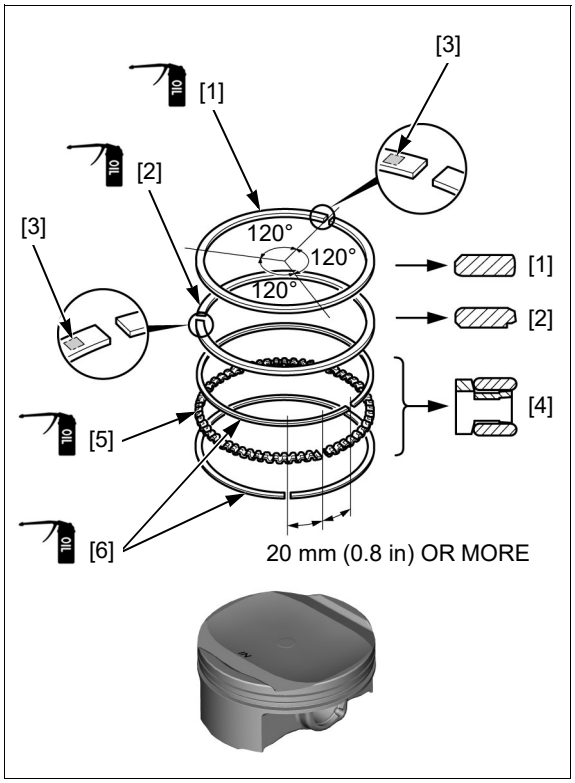
NOTE:

- Apply engine oil to the piston ring entire surfaces and piston ring grooves.
- Avoid piston and piston ring damage during installation.
- Install the top ring [1] and second ring [2] with their marks [3] facing up.
- To install the oil ring [4], install the spacer [5] first, then install the side rails [6].

After installation, the rings should rotate freely in the ring groove.

Stagger the piston ring end gaps 120° apart from each other.

Stagger the side rail end gaps as shown.

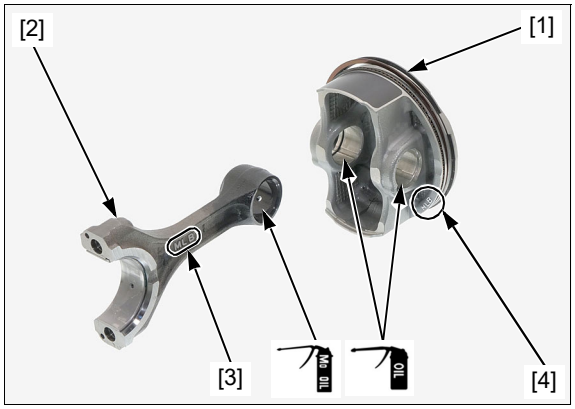


PISTON INSTALLATION

Apply engine oil to the piston pin hole inner surface and piston pin clip groove.

Apply molybdenum oil solution to the connecting rod small end inner surface.

Assemble the piston [1] and connecting rod [2] with the connecting rod "MLB" mark [3] facing to the piston "MLB" mark [4] side.



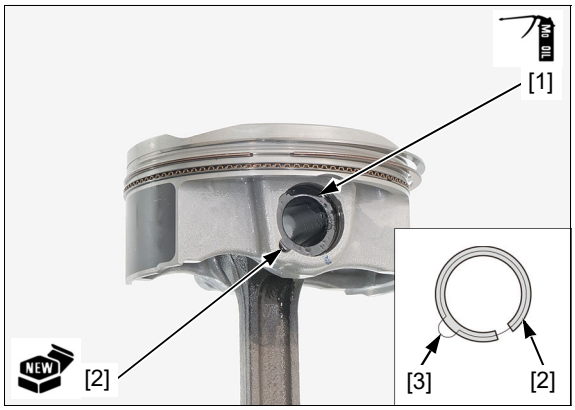
Apply molybdenum oil solution to the piston pin outer surface.

Install the piston pin [1].

Secure the piston pin using new piston pin clips [2].

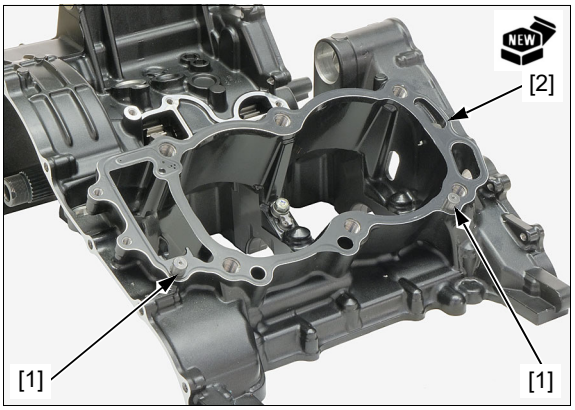
NOTE:

- Make sure that the piston pin clips are seated securely.
- Do not align the piston pin clip end gap with the piston cut-out [3] as shown.

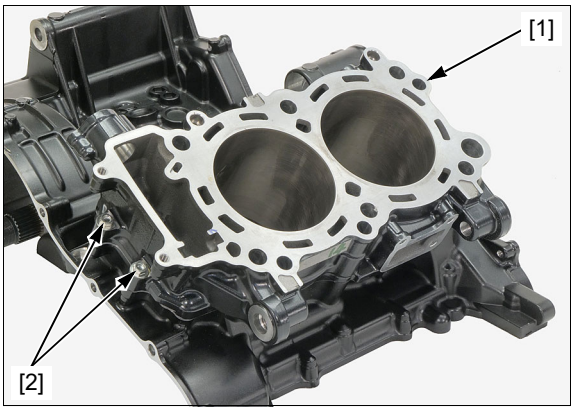


PISTON /CONNECTING ROD/ CYLINDER INSTALLTION

Install the dowel pins [1] and a new gasket [2].



Install the cylinder [1] and bolts [2].

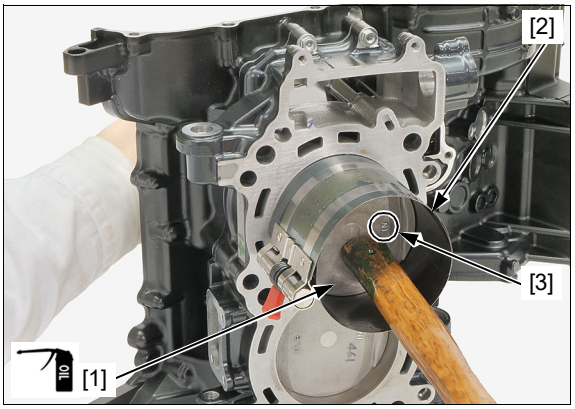


Apply engine oil to the piston and cylinder inner surface.

Install the piston/connecting rod assemblies [1] into the cylinders using a commercially available piston ring compressor tool [2].

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 inner surface with the connecting rod.*



NOTE:

- When reusing the connecting rods, they must be installed in their original locations.
- Install the piston/connecting rod assembly with the "IN" mark [3] facing the intake side.
- Make sure the piston ring compressor tool sits flush on the top surface of the cylinder.

Use the handle of a plastic hammer or equivalent tool to tap the piston into the cylinder.

Install the following:

– Shift fork (page 13-12)
– Crankshaft (page 14-4)

MEMO

15. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

GENERAL

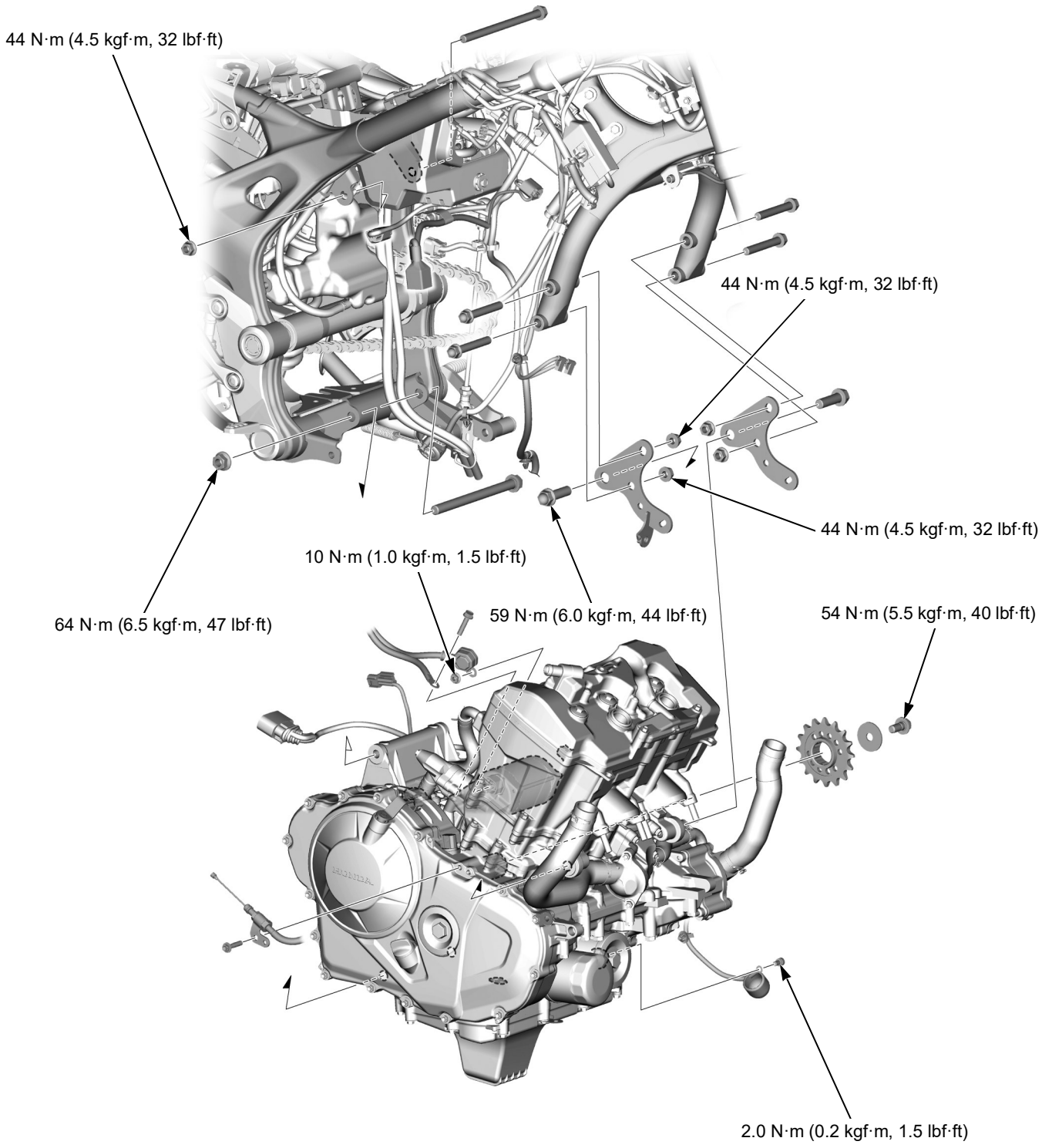
- A hoist or equivalent is required to support the motorcycle when removing and installing the engine.
- A floor jack or other adjustable support is required to support and maneuver the engine.

NOTICE

Do not use the oil filter as a jacking point.

- When removing/installing the engine, tape the frame around the engine beforehand for frame protection.
- When installing the engine, be sure to tighten the engine mounting fasteners to the specified torque in the specified sequence. If you mistake the torque or sequence, loosen all mounting fasteners, then tighten them again to the specified torque in the correct sequence.
- The following components can be serviced with the engine installed in the frame.
  - Starter motor (page 6-5)
  - Throttle body (page 7-14)
  - Air cleaner housing (page 7-12)
  - Water pump (page 8-10)
  - Oil pump (page 9-5)
  - Oil strainer (page 9-5)
  - Camshaft (page 10-10)
  - Rocker arm (page 10-6)
  - Cam chain tensioner lifter (page 10-8)
  - Clutch (page 12-7)
  - Primary drive gear (page 12-16)
  - Gearshift linkage (page 12-17)
  - Stator (page 11-5)
  - Flywheel (page 11-6)
  - Starter clutch (page 11-8)
  - Rear balancer (page 13-17)
- The following components require engine removal for service.
  - Front balancer shaft (page 13-4)
  - Transmission (page 13-7)
  - Crankshaft (page 14-4)
  - Piston/cylinder (page 14-12)

COMPONENT LOCATION



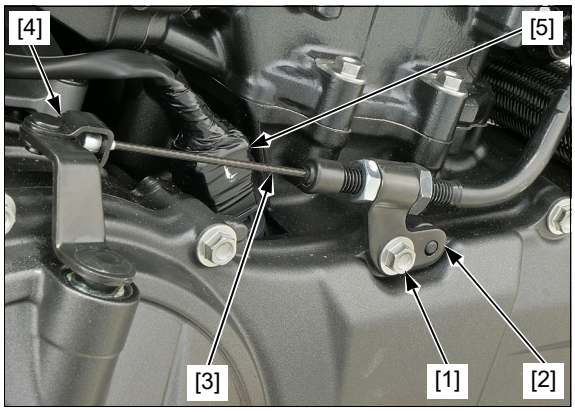
ENGINE REMOVAL

Drain the engine oil (page 3-12).

Fully slacken the drive chain (page 3-16).

Remove the following:

– Throttle body (page 7-14)
– Ignition coil (page 5-8)
– PAIR control solenoid valve (page 7-16).
– Horn (page 21-23)
– Radiator (page 8-7)
– Exhaust pipe (page 2-20)
– GP sensor (page 4-60)
– Bolt [1]
– Clutch cable stay [2]



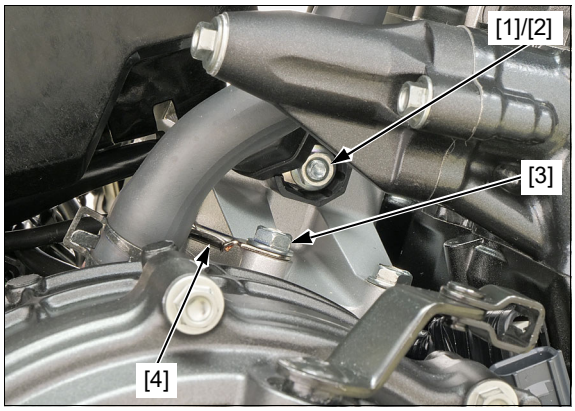
Disconnect the clutch cable [3] from the clutch lifter lever [4].

Disconnect the CKP sensor 3P connector [5].

Disconnect the VS sensor 3P connector [1].

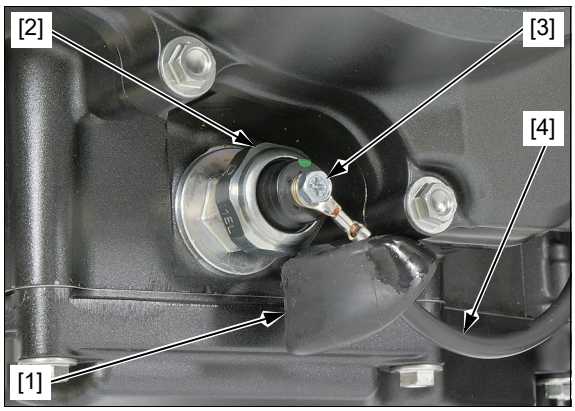
Remove the following:

– Starter motor terminal nut [1]
– Starter motor cable [2]
– Bolt [3]
– Battery (–) negative cable [4]

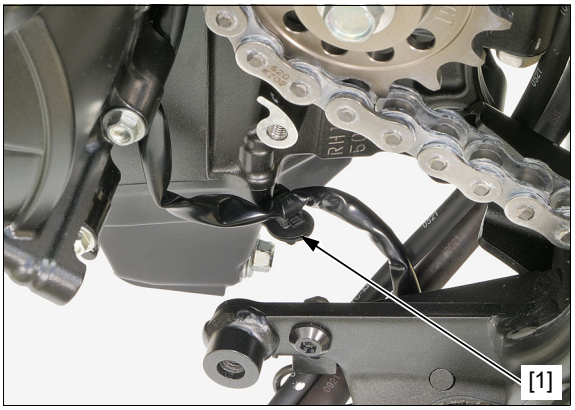


Release the rubber cap [1] from the EOP switch [2].

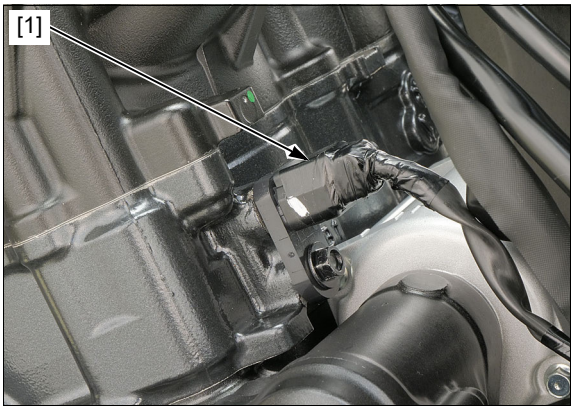
Remove the EOP terminal screw [3] and disconnect the switch wire [4].



Remove the sidestand switch wire clip [1].

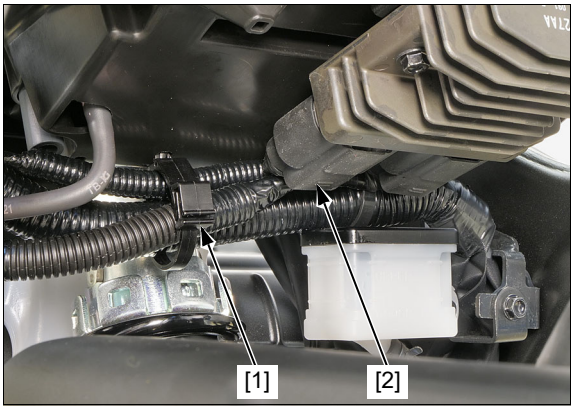


Disconnect the ECT sensor 2P connector [1].

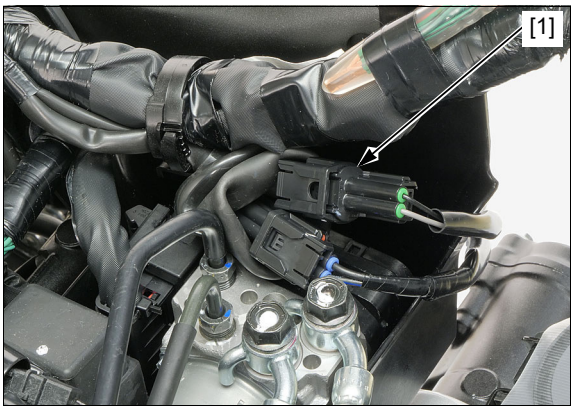


Remove the wire clip [1].

Disconnect the alternator 3P (Gray) connector [2].



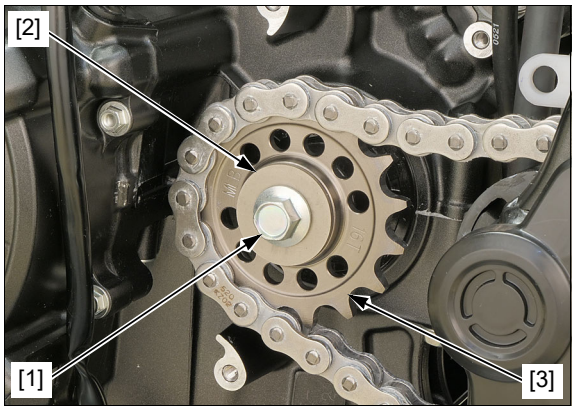
Disconnect the shift spindle/neutral switch 2P connector [1].



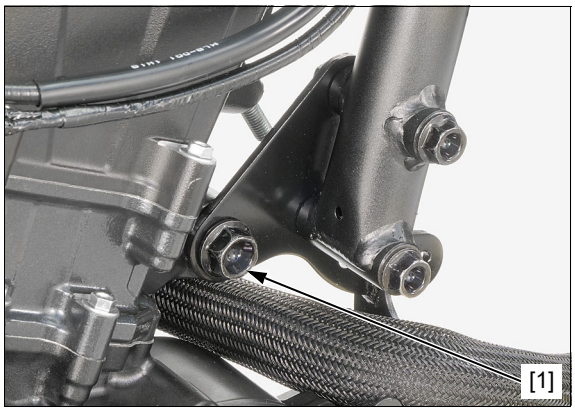
ENGINE REMOVAL/INSTALLATION

Remove the following:

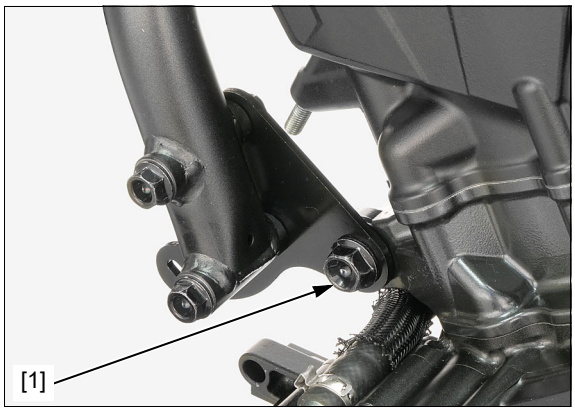
– Drive sprocket bolt [1]
– Washer [2]
– Drive sprocket [3]



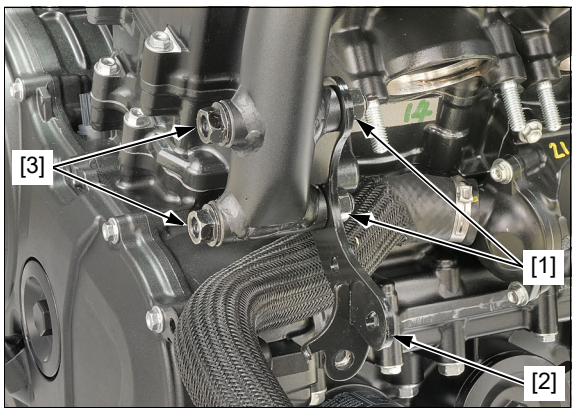
Remove the right engine hanger bolt [1].



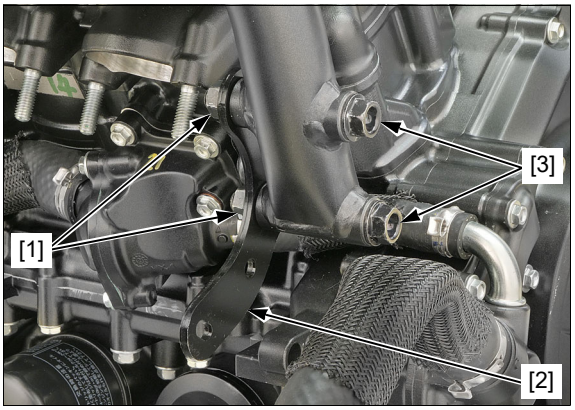
Remove the left engine hanger bolt [1].



Remove the right engine hanger plate nuts [1], right engine hanger plate [2] and bolts [3].



Remove the left engine hanger plate nuts [1], left engine hanger plate [2] and bolts [3].



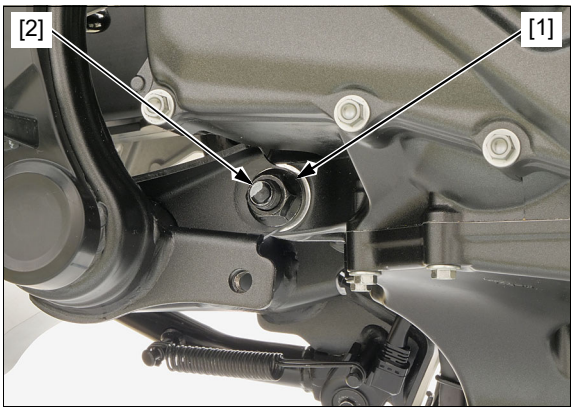
Remove the nut [1] and rear upper engine hanger bolt [2].

Remove the nut [1] and rear lower engine hanger bolt [2].

Carefully maneuver the engine and remove it out of the frame to the right.

NOTE:

- During engine removal, hold the engine securely and be careful not to damage the frame and engine.



ENGINE INSTALLATION

Place the engine in the frame, then loosely install all the bolts, hanger plates and nuts by referring to COMPONENT LOCATION (page 15-3).

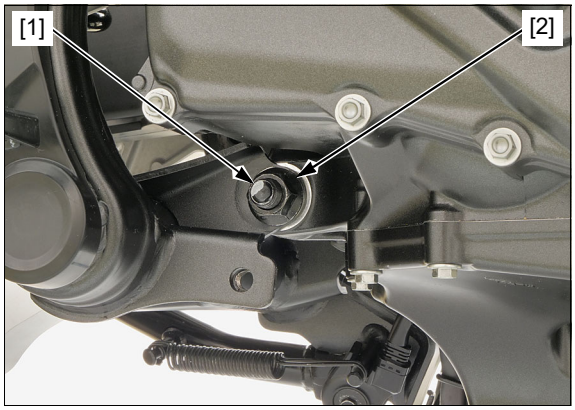
NOTE:

- 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, radiator hoses, wires and cables (page 1-21).

Install the rear lower engine hanger bolt [1] and nut [2].

Tighten the nut to the specified torque.

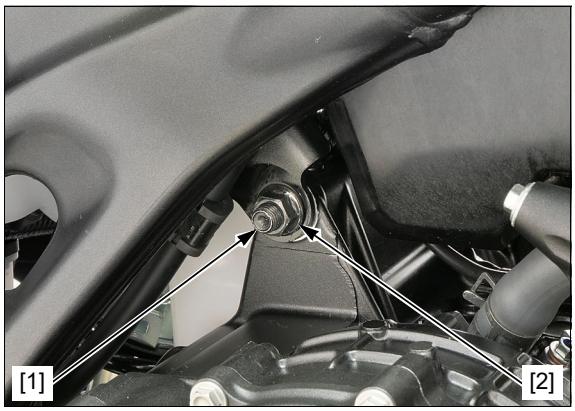
TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)



Install the rear upper engine hanger bolt [1] and nut [2].

Tighten the nut to the specified torque.

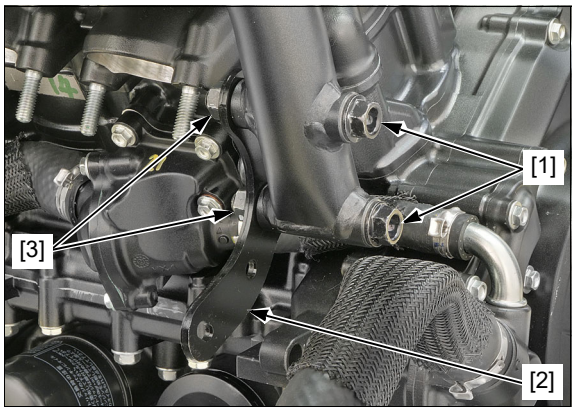
TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)



Install the left engine hanger plate bolts [1], left engine hanger plate [2] and nuts [3].

Tighten the nuts to the specified torque.

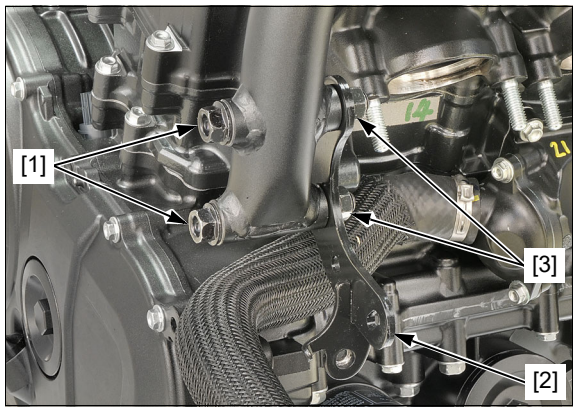
TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)



Install the right engine hanger plate bolts [1], right engine hanger plate [2] and nuts [3].

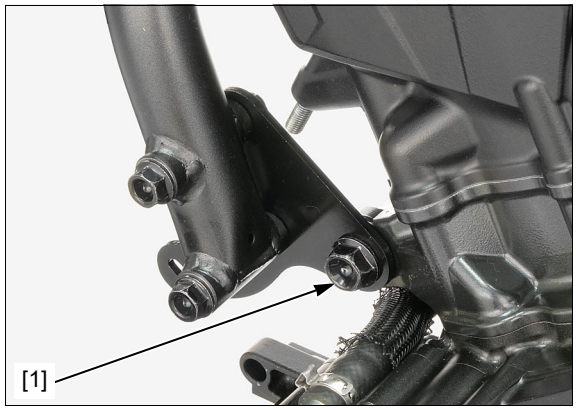
Tighten the nuts to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)



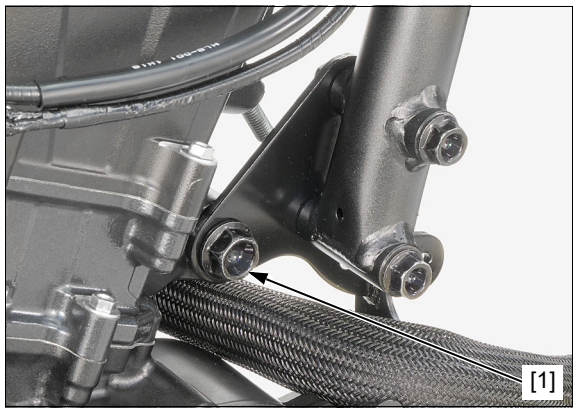
Install and tighten the left engine hanger bolt [1] to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)



Install and tighten the right engine hanger bolt [1] to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)



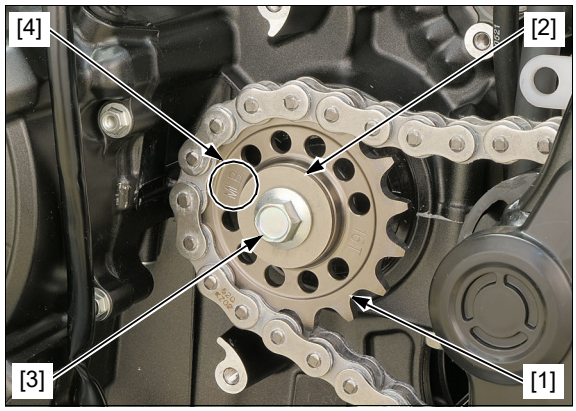
Install the drive sprocket [1], washer [2] and drive sprocket bolt [3].

NOTE:

- Install the drive sprocket with their "MLB" mark [4] outside.

Tighten the bolt to the specified torque.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

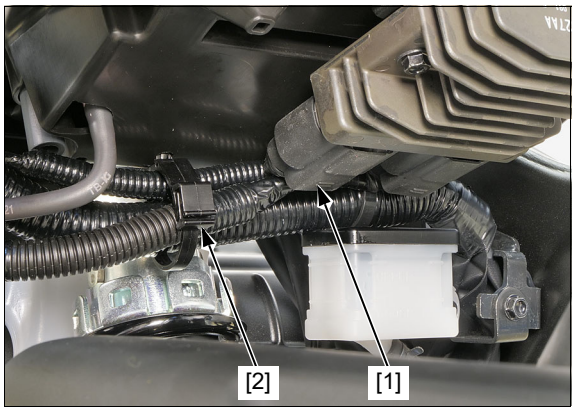


ENGINE REMOVAL/INSTALLATION

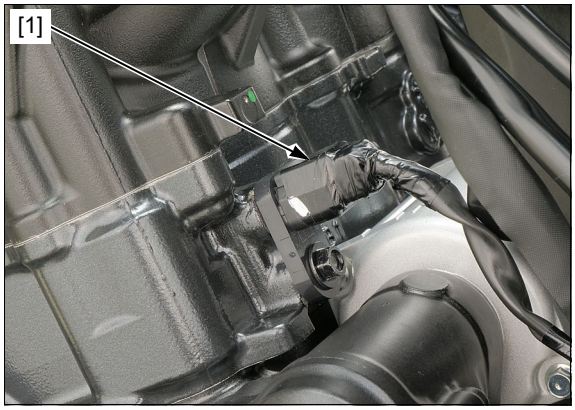
Connect the shift spindle/neutral switch 2P connector [1].

Connect the alternator 3P (Gray) connector [1].

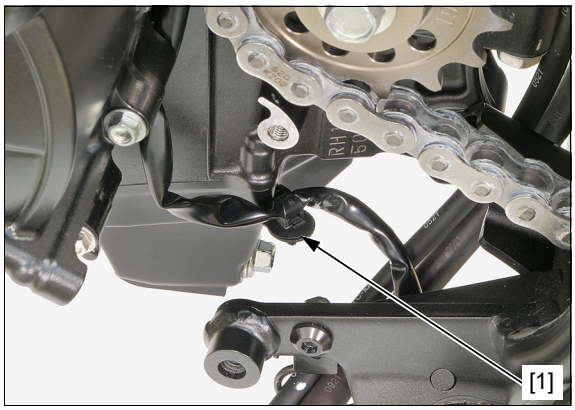
Install the wire clip [2] as shown.



Connect the ECT sensor 2P connector [1].



Install the sidestand switch wire clip [1].

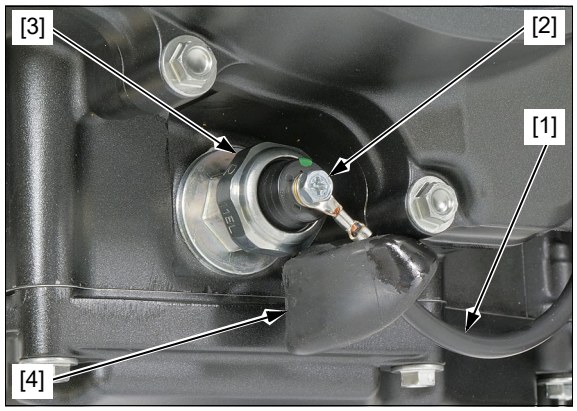


Install the switch wire [1] and terminal screw [2] to the EOP switch [3].

Tighten the screw to the specified torque.

TORQUE: 2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)

Install the rubber cap [4].

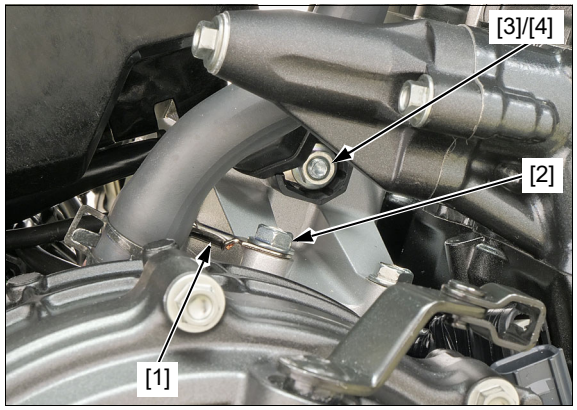


Install the following:

– Battery (–) negative cable [1]
– Bolt [2]
– Starter motor cable [3]
– Starter motor terminal nut [4]

Tighten the nut to the to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



Connect the VS sensor 3P connector [1].

Connect the CKP sensor 3P connector [1].

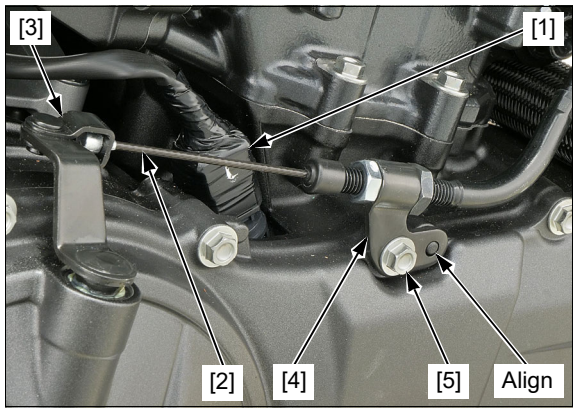
Connect the clutch cable [2] to the clutch lifter lever [3].

Install the following:

– Clutch cable stay [4]
– Bolt [5]
– GP sensor (page 4-60)
– Exhaust pipe (page 2-20)
– Radiator (page 8-7)
– Horn (page 21-23)
– PAIR control solenoid valve (page 7-16).
– Ignition coil (page 5-8)
– Throttle body (page 7-14)

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

Check the exhaust system and cooling system for leaks.



MEMO

16. FRONT WHEEL/SUSPENSION/STEERING

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.
- Do not operate the brake lever after removing the front wheel.
- After the front wheel installation, check the brake operation by applying the brake lever.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "TUBELESS TIRE APPLICABLE".
- For brake system information (page 18-2).

TROUBLESHOOTING

Hard steering
- Steering stem adjustment nut too tight
- Worn or damaged steering bearings
- Bent steering stem
- Insufficient tire pressure
- Faulty tire

Steers to one side or does not track straight
- Damaged or loose steering bearing
- Bent fork
- Bent axle
- Damaged frame
- Worn or damaged wheel bearing

Front wheel wobbles
- Bent rim
- Worn or damaged wheel bearing
- Faulty tire
- Unbalanced tire and wheel

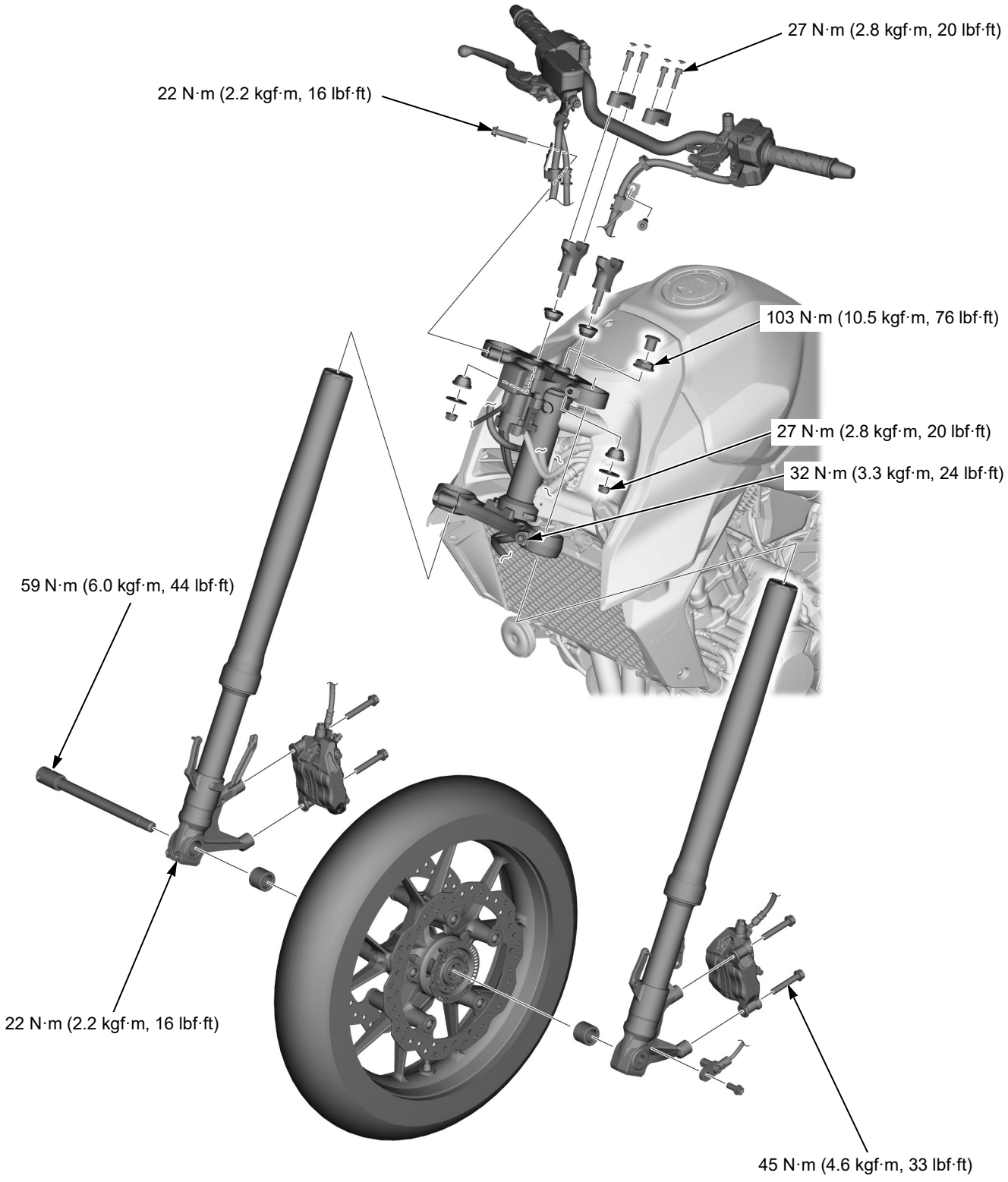
Wheel hard to turn
- Faulty wheel bearing
- Bent axle
- Brake drag

Soft suspension
- Insufficient fork fluid
- Incorrect fork fluid viscosity
- Weak fork spring
- Insufficient tire pressure

Hard suspension
- Bent outer tubes or slide pipes
- Too much fluid in fork
- Incorrect fork fluid weight
- Clogged fork fluid passage

Front suspension noise
- Insufficient fluid in fork
- Loose fork fasteners
- Bent slide pipe

COMPONENT LOCATION

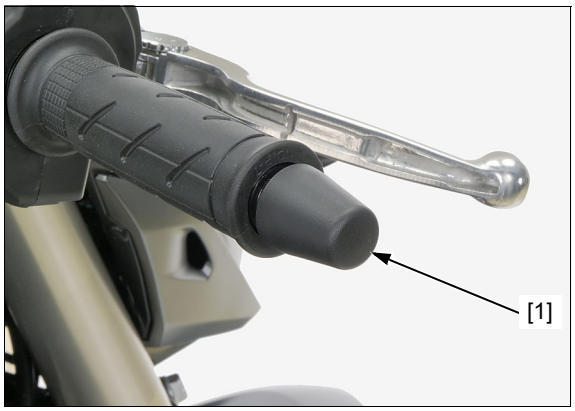


HANDLEBAR

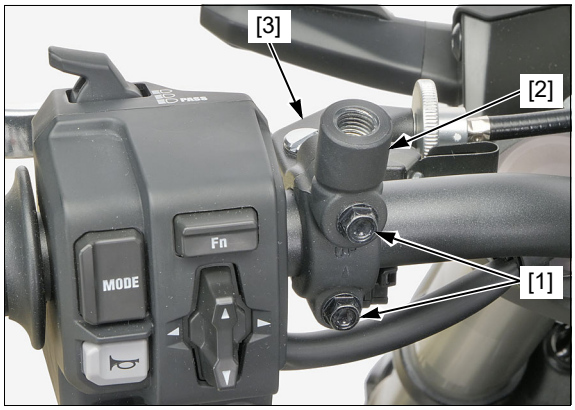
REMOVAL

Remove the following:

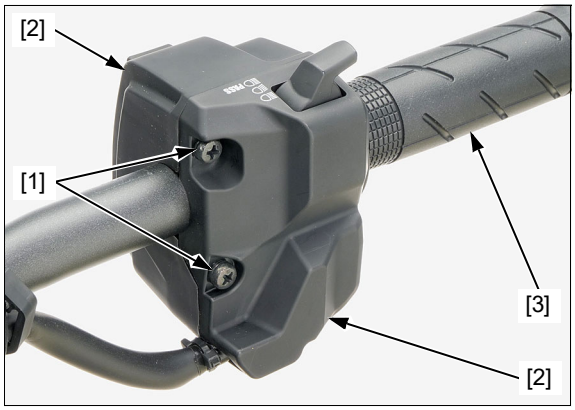
- Rearview mirrors (page 2-11)
- Handle ends [1]



- Bolts [1]
- Bracket holder [2]
- Clutch lever bracket [3]

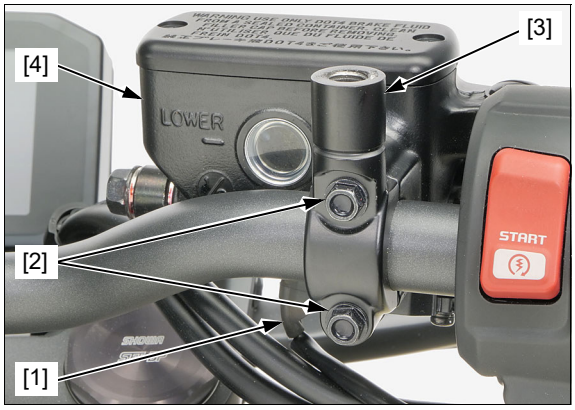


- Screws [1]
- Left handlebar switch housings [2]
- Left grip [3]

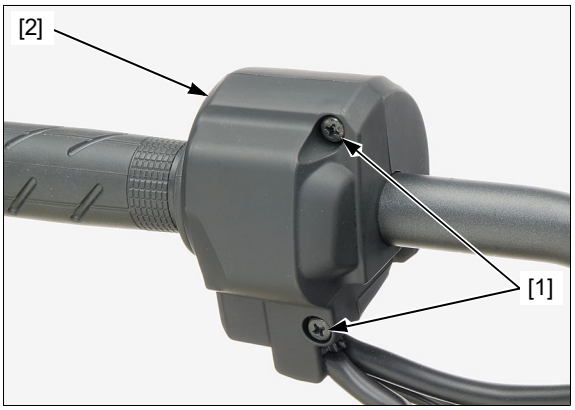


Keep the reservoir upright to prevent air from entering the hydraulic system.

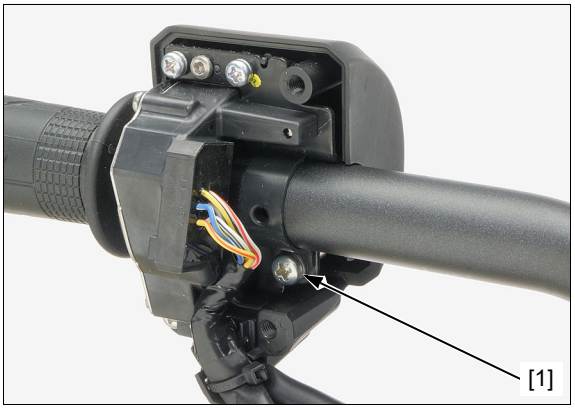
- Brake light switch connectors [1]
- Bolts [2]
- Master cylinder holder [3]
- Front master cylinder [4]



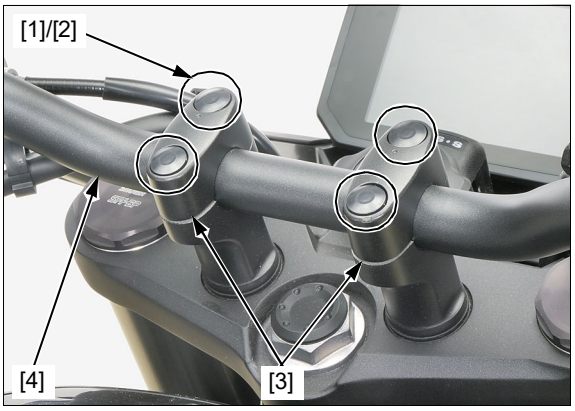
– Screws [1]
– Right handlebar switch housing [2]



– Screw [1]



– Caps [1]
– Socket bolts [2]
– Handlebar upper holders [3]
– Handlebar [4] (from the throttle grip/right handlebar switch)



INSTALLATION

Clean the inside surface of the handlebar grip [1] and outside surface of the handlebar [2].

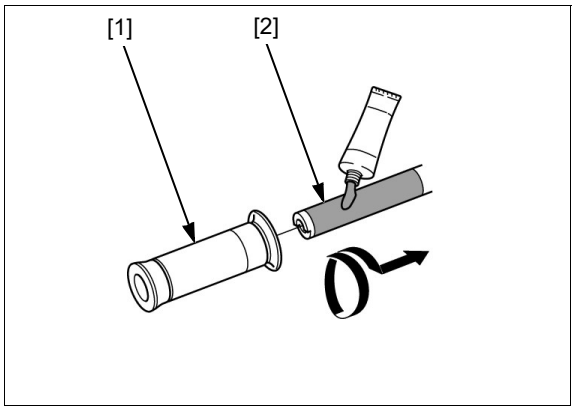
Apply Honda bond A or equivalent to the inside surface of the grip.

Wait 3 – 5 minutes and install the grip.

Rotate the grips for even application of the adhesive.

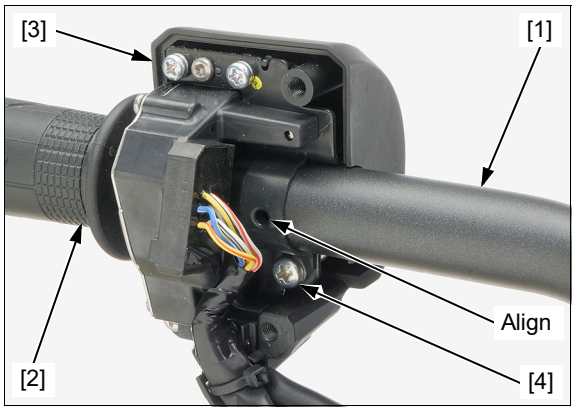
NOTE:

- Allow the adhesive to dry for 1 hour before using.



Install the handlebar [1] into the throttle grip [2] through the right handlebar switch [3].

Align the setting plate boss with the handlebar hole. Install and tighten the screw [4].



Place the handlebar [1] on the lower holders.

NOTE:

- Align the punch mark on the handlebar with the edge of the lower holder.

Install the handlebar upper holders [2].

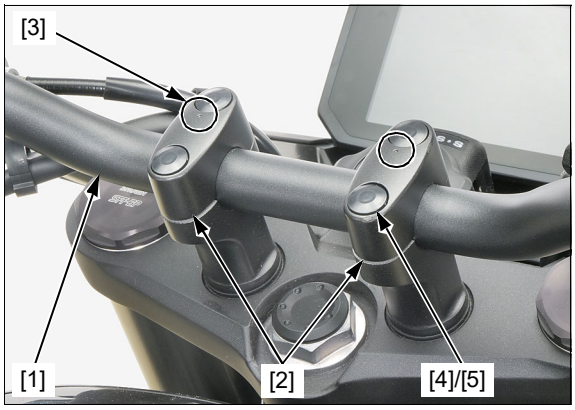
NOTE:

- Install the handlebar upper holder with the punch mark [3] facing front.

Install the handlebar upper holder bolts [4].

Tighten the front side holder bolts first, then the rear side bolts to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

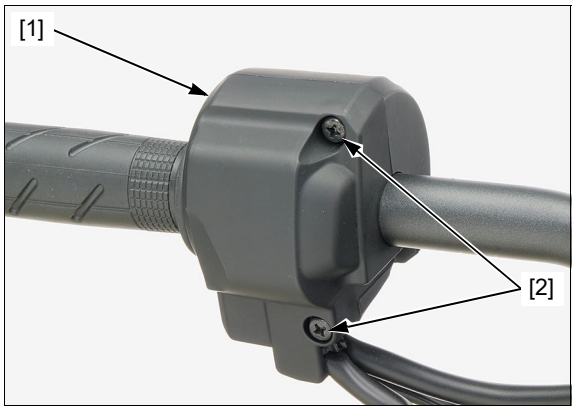


Install the caps [5].

Install the right handlebar switch housing [1] and screws [2].

Tighten the screw to the specified torque.

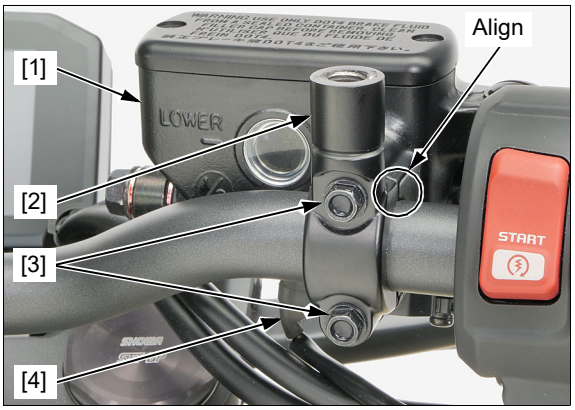
TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)



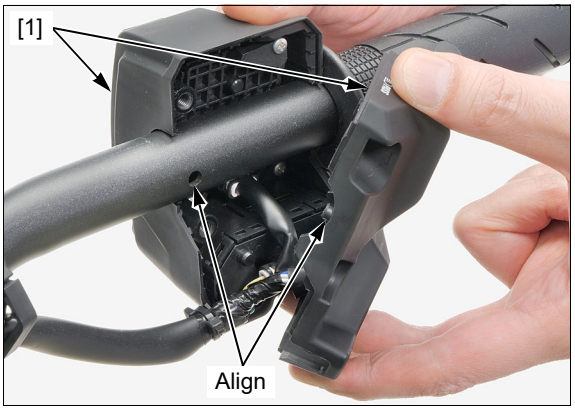
Install the front brake master cylinder [1], holder [2] and bolts [3].

Align the end of the master cylinder with the punch mark on the handlebar and tighten the upper bolt first, then the lower bolt.

Connect the front brake light switch wire connectors [4].

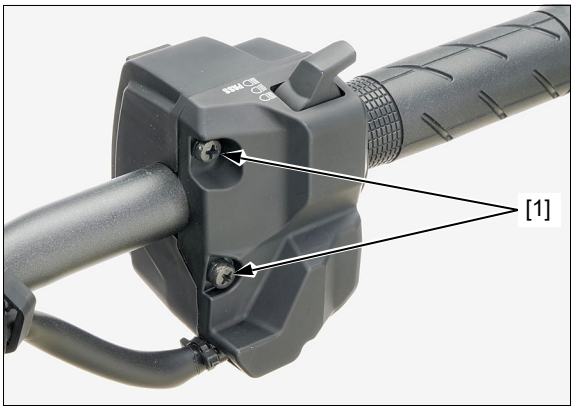


Install the left handlebar switch housings [1] by aligning the locating pin with the handlebar hole.



Install and tighten the screws [1] to the specified torque.

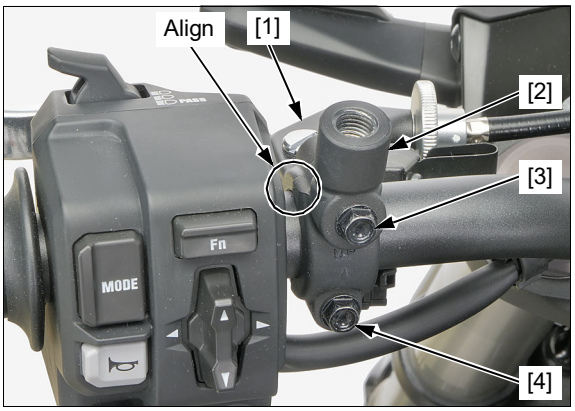
TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)



Align the edge of the bracket with the punch mark on the handlebar.

Install the clutch lever bracket [1] and holder [2].

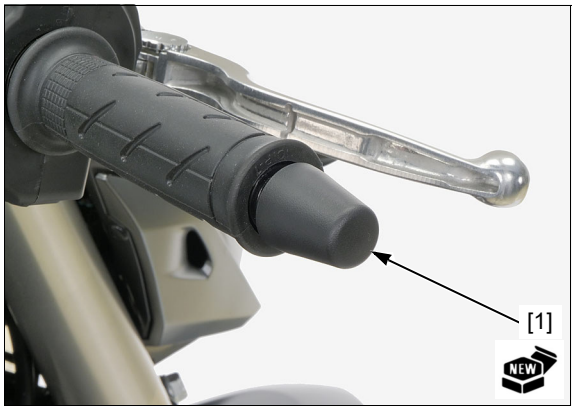
Install and tighten the upper bolt [3] first, then the lower bolt [4].



Install a new handle ends [1].

Install the rearview mirrors (page 2-11).

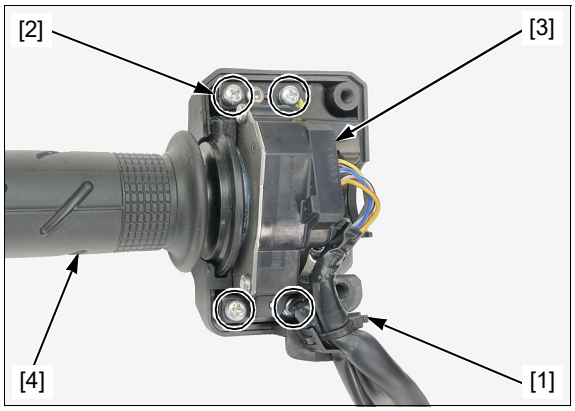
Check the clutch lever freeplay (page 3-22).



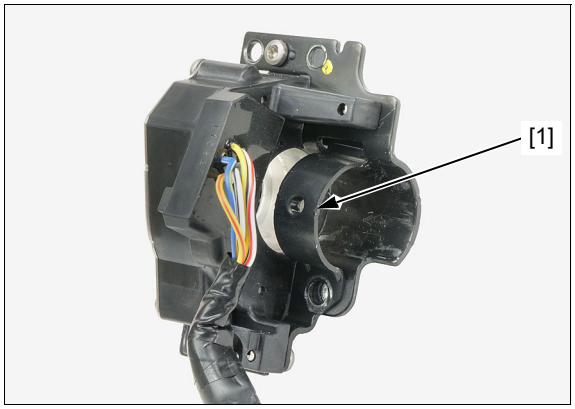
THROTTLE GRIP REMOVAL/ INSTALLATION

Remove the handlebar (page 16-4).

Remove the wire band [1], screws [2], APS [3] and throttle grip [4].



Remove the holder [1].

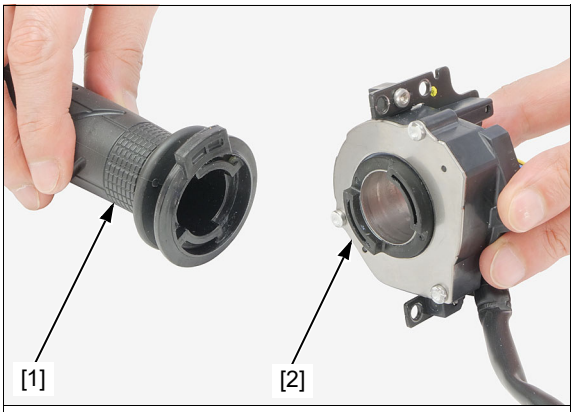


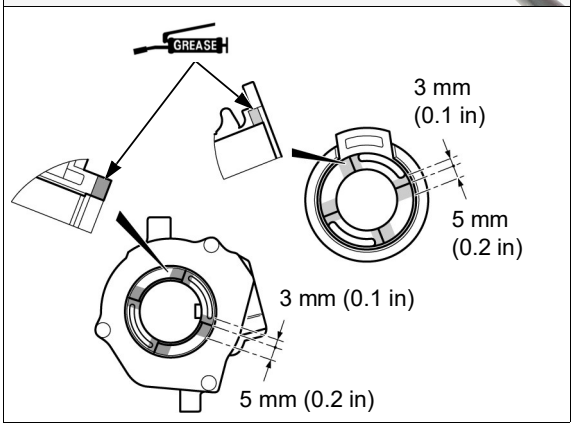
Installation is in the reverse order of removal.

NOTE:

- Apply grease to the throttle grip [1] and APS [2] contacting surfaces as shown.

TORQUE: 2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)





HANDLEBAR LOWER HOLDER REMOVAL/INSTALLATION

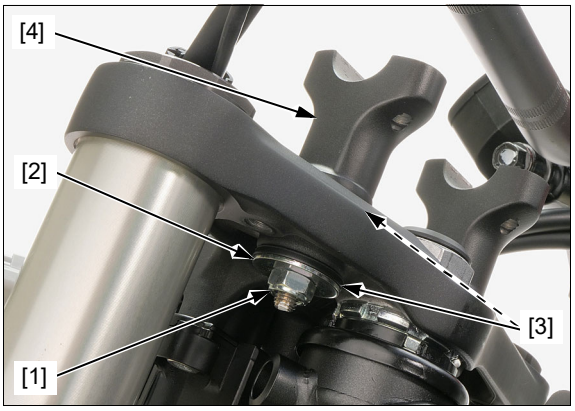
Remove the following.

– Headlight upper stay (page 2-8)
– Handlebar (page 16-4)
– Lower holder nuts [1]
– Washers [2]
– Cushion rubbers [3]
– Lower holders [4]

Installation is in the reverse order of removal.

After installing the handlebar, tighten the lower holder nuts to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



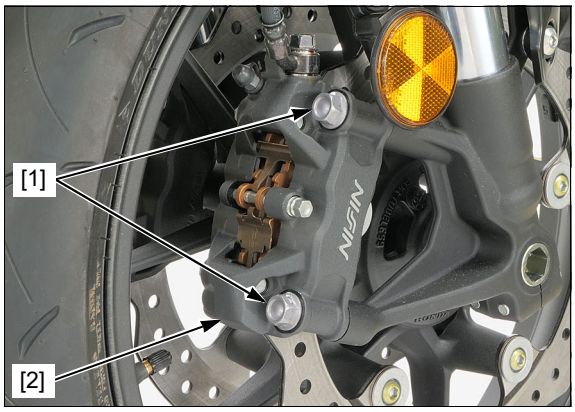
FRONT WHEEL

REMOVAL

Remove the bolts [1] and both brake calipers [2].

NOTE:

- 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.
- Do not operate the brake lever after the brake caliper is removed.



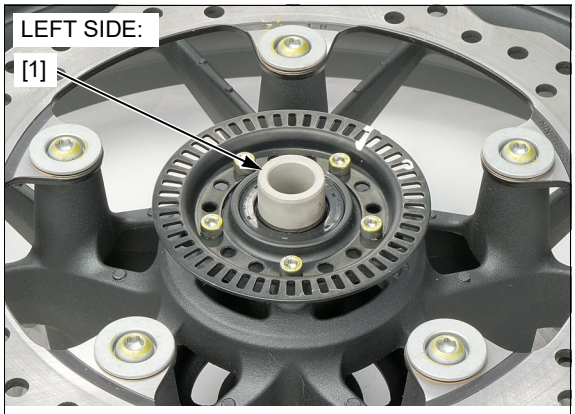
Loosen the axle holder bolts [1].

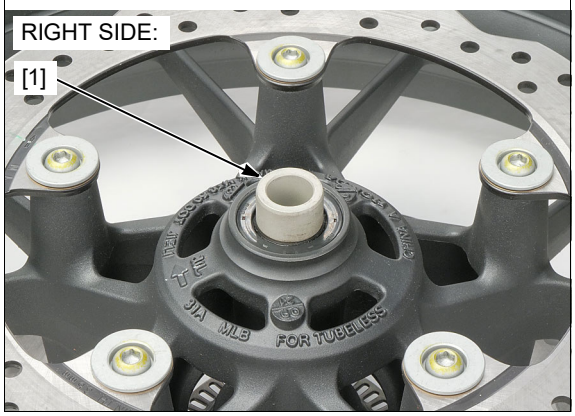
Support the motorcycle securely using a hoist or equivalent and raise the front wheel off the ground.

Be careful not to damage the pulser ring.

Remove the axle [2] and front wheel.

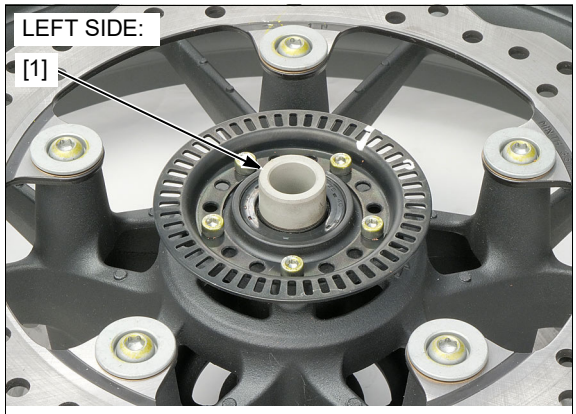
Remove the right and left side collars [1].

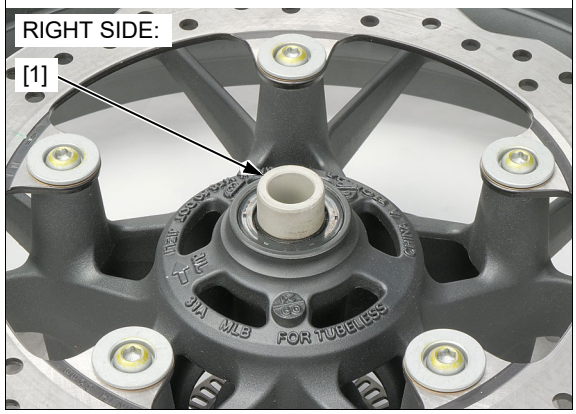




INSTALLATION

Install the right and left side collars [1].





Apply a thin coat of grease to the front axle outer surface.

NOTE:

- Do not apply grease to the threads of the front axle and contacting surface of the axle holder.

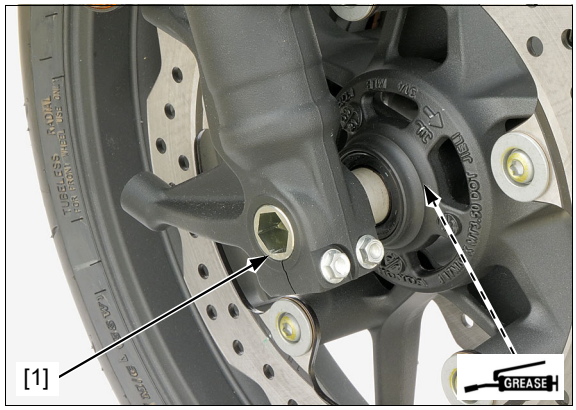
Be careful not to damage the pulser ring.

Install the front wheel between the fork legs.

Install the front axle [1] from the right side.

Tighten the axle to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)



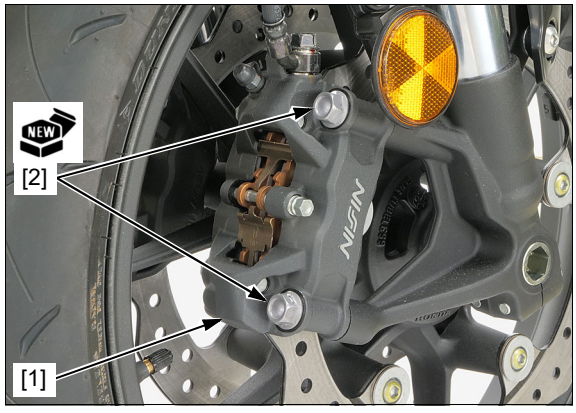
Install the brake caliper [1] onto the fork leg.

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.

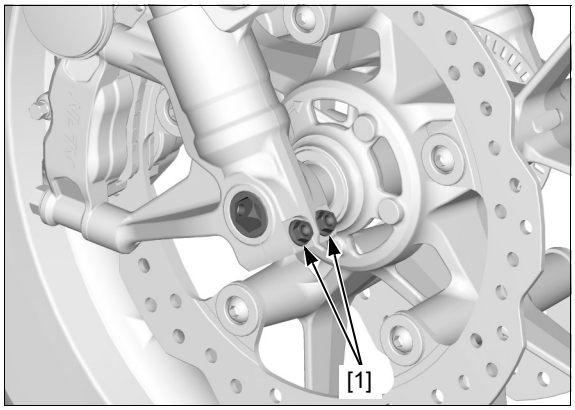
With the front brake applied, pump the forks up and down several times to seat the axle and check the brake operation.



Tighten the axle pinch bolts [1] to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Check the air gap between the front wheel speed sensor bracket and pulser ring (page 19-21).



INSPECTION

Turn the inner race of each bearing with your finger.

The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

Replace the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub.

Inspect the following parts for damage, abnormal wear, deformation or bend.

– Front axle
– Wheel rim

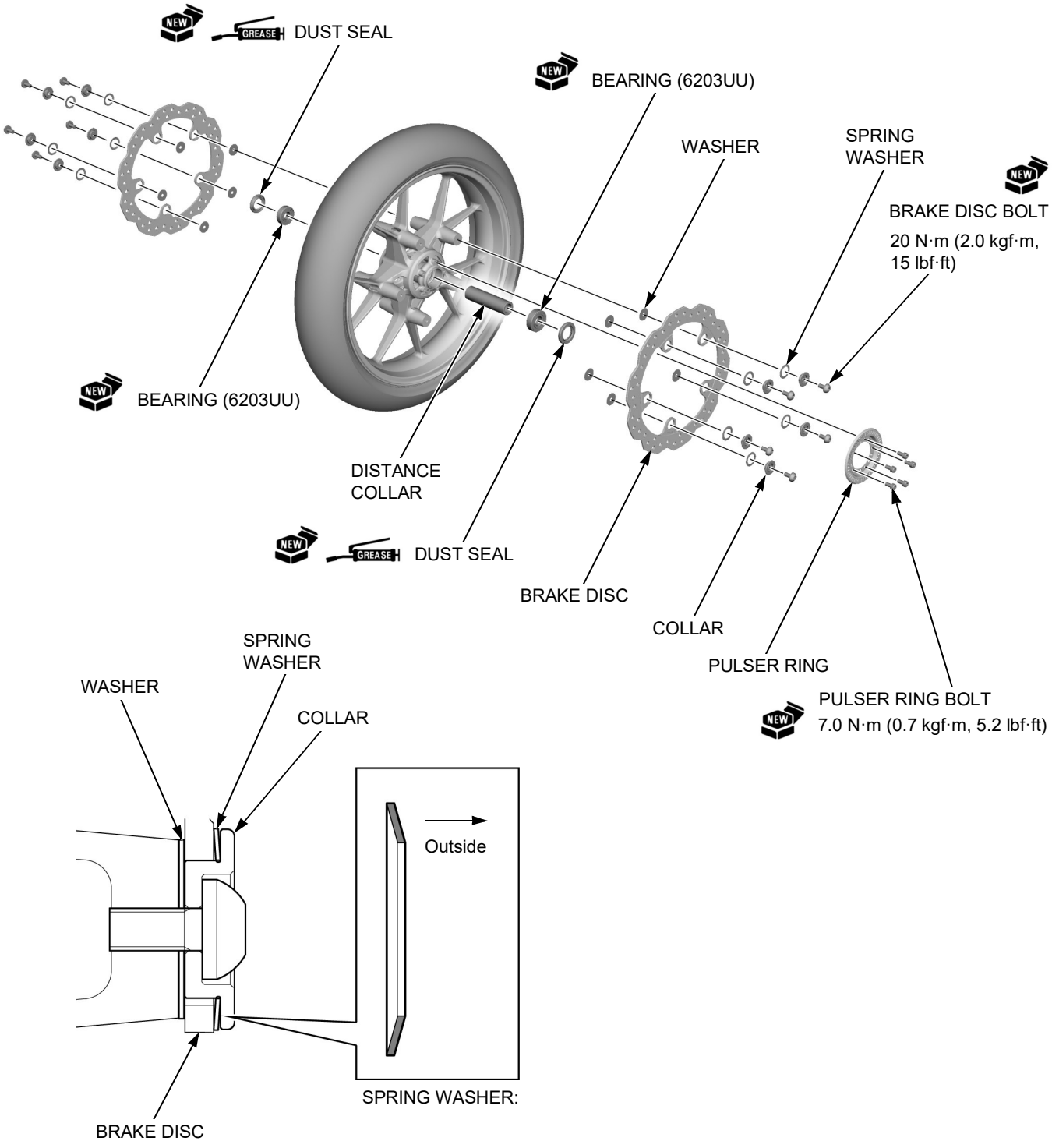
Measure each part according to FRONT WHEEL/ SUSPENSION/STEERING SPECIFICATIONS (page 1-9).

Replace any part if it is out of service limit.

DISASSEMBLY/ASSEMBLY

NOTE:

- Install each dust seal with the flat side facing out so that it is flush with the wheel hub.
- Align the front wheel rotation mark with brake disc rotation mark.
- Install the brake disc spring washer as shown in the illustration.



FRONT WHEEL/SUSPENSION/STEERING

WHEEL BEARING REPLACEMENT

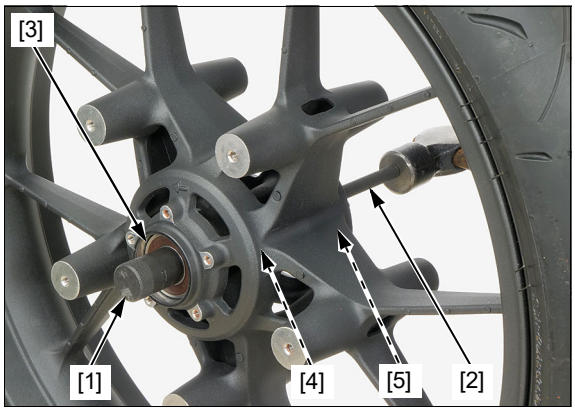
Install the remover head [1] into the bearing.

From the opposite side of the wheel, install the bearing remover shaft [2] and drive the bearing [3] out of the wheel hub.

TOOLS:

Remover Head 17 mm	**07746-0050500**
Bearing Remover Shaft 9 x 200L	**07746-0050100**

Remove the distance collar [4] and drive out the other bearing [5].



Drive in a new left side bearing [1] squarely with the marked side facing up until it is fully seated.

Install the distance collar.

Drive in a new right side bearing squarely with the marked side facing up until it is fully seated on the distance collar.

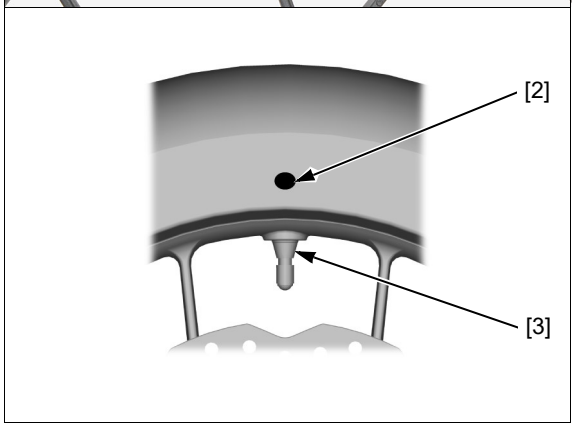
TOOLS:

Driver Handle, 15 x 135L [2]	**07749-0010000**
Attachment, 37 x 40 mm [3]	**07746-0010200**
Pilot 17 mm [4]	**07746-0040400**

WHEEL BALANCE

NOTE:

- Mount the tire with the arrow mark [1] facing in the direction of rotation.
- For optimum balance, the tire balance mark [2] (light mass point: a paint dot on the side wall) must be located next to the valve stem [3]. Remount the tire if necessary.
- The wheel balance must be checked when the front tire is remounted.
- Stick-type balance weights should be used on this motorcycle. Use Honda genuine balance weights.
  - Before installing the weights, remove any adhesive from the rim thoroughly and clean the area where new weights are to be placed with degreasing agent. Take care not to scratch the rim surface.
  - Do not touch the adhesive surface of the weight with your bare hands when installing.
  - The balance weights are always replaced with new ones whenever they are removed. Do not reuse them.

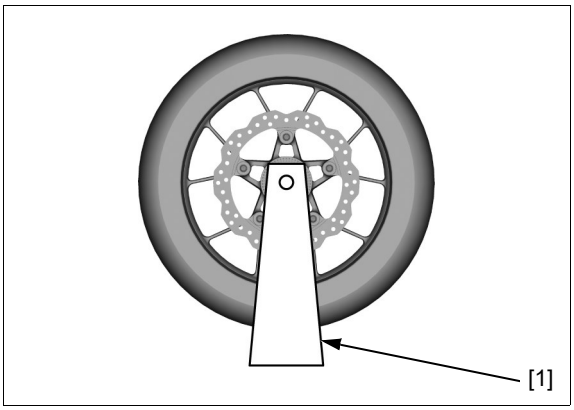


Mount the wheel, tire and brake discs assembly on an inspection stand [1].

Spin the wheel, allow it to stop, and mark the lowest (heaviest) part of the wheel with chalk.

Do this two or three times to verify the heaviest area.

If the wheel is balanced, it will not stop consistently in the same position.

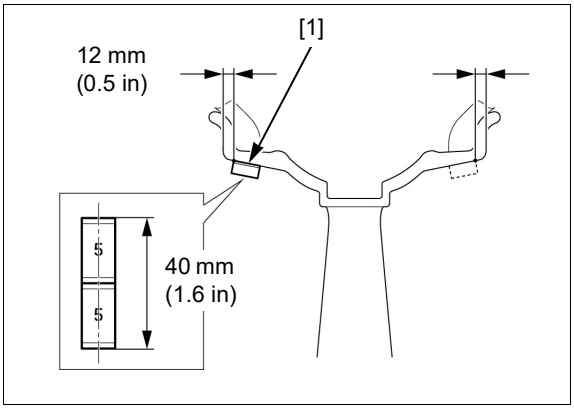


To balance the wheel, install the wheel weights [1] on the highest side of the rim, on the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun.
Do not add more than 60 g (2.1 oz) to the wheel.

Press the weights by your hands firmly and make sure they are not come off the rim.

NOTE:

- The weights are attached to the position at 12 mm (0.5 in) from the side surface of the rim in the direction as shown.
- If the weight exceeds 10 g (0.4 oz), install same amount of the balance weights on the right and left symmetrical position.



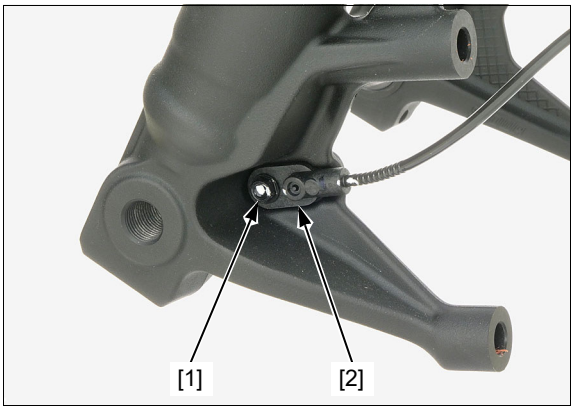
FORK

REMOVAL

Remove the following:

– Front wheel (page 16-10)
– Front fender (page 2-16)

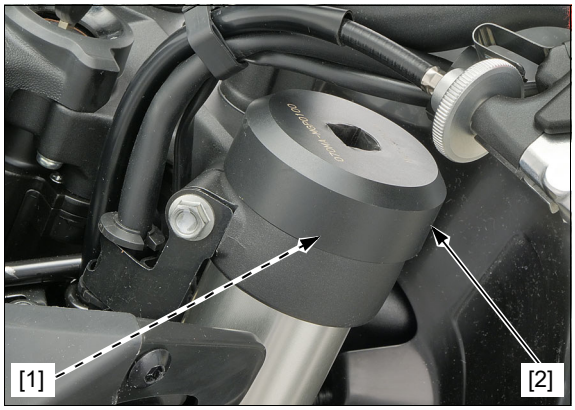
Left fork only: Remove the bolt [1] and front wheel speed sensor [2].



Loosen the top bridge pinch bolt [1].

When the fork will be disassembled, loosen the fork cap [1], but do not remove it yet.

TOOL:
Fork Bolt Wrench [2] **070MA-MGP0100**



While holding the fork leg [1], loosen the bottom bridge pinch bolt [2]. Pull the fork leg down and remove it out of the top and bottom bridges.

INSTALLATION

When the fork is disassembled:

Insert the fork leg [1] through the bottom bridge and top bridge.

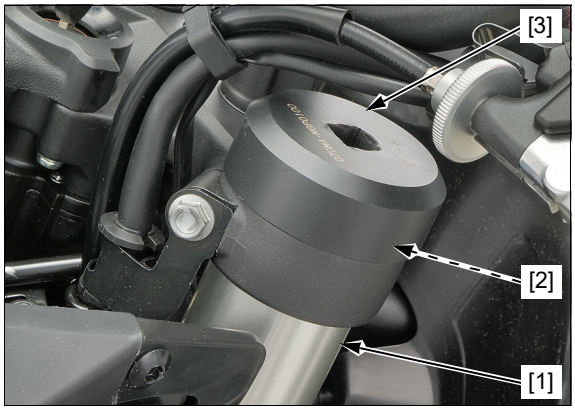
Temporarily tighten the bottom bridge pinch bolt.

Tighten the fork cap [2] to the specified torque using the special tool.

TOOL:
Fork Bolt Wrench [3] **070MA-MGP0100**

TORQUE: 35 N·m (3.6 kgf·m, 26 lbf·ft)

Loosen the bottom bridge pinch bolt and align the top end of the fork outer tube with the upper surface of the top bridge.



Route the wires, cables and hoses properly (page 1-21).

Install the fork leg [1] through the bottom bridge and top bridge.

Align the top end of the fork outer tube with the upper surface of the top bridge and parallel the fork cap 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 bolt [2] to the specified torque.

TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

Tighten the top bridge pinch bolt [3] to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

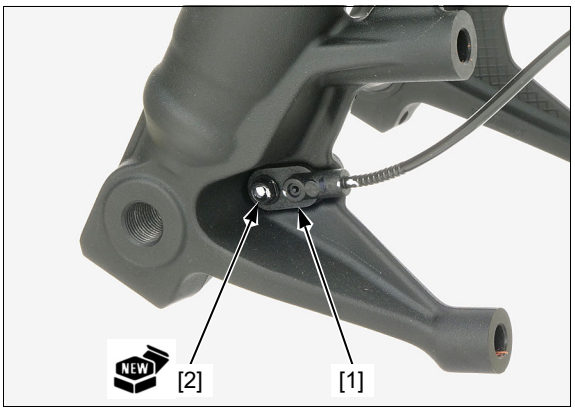
Install the front wheel speed sensor [1] with new mounting bolt [2].

NOTE:

- Always replace the front wheel speed sensor mounting bolt with a new one.

Install the following:

– Front fender (page 2-16)
– Front wheel (page 16-10)



DISASSEMBLY

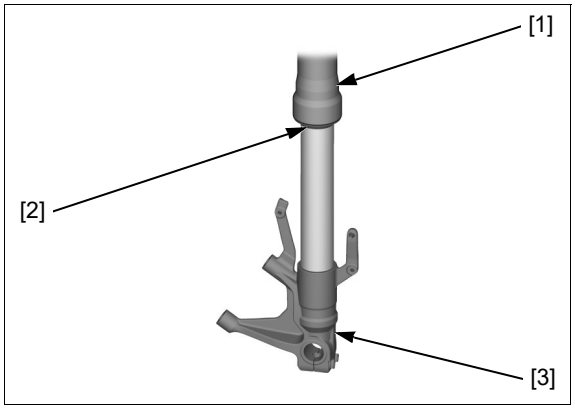
RIGHT SIDE

Take care not to scratch the cap head.

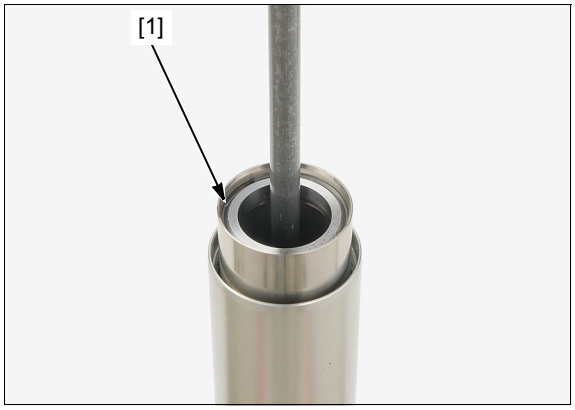
Remove the fork cap [1] with the special tool.

TOOL:
Fork Bolt Wrench 070MA-MGP0100

Push the outer tube [1] slowly down, and gently seat the dust seal [2] onto the axle holder [3].



Remove the stopper ring [1] from the groove in the slide pipe.



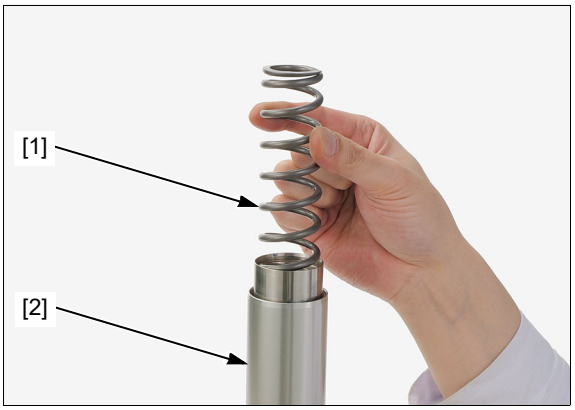
Pull up and remove the piston rod assembly [1].

NOTE:

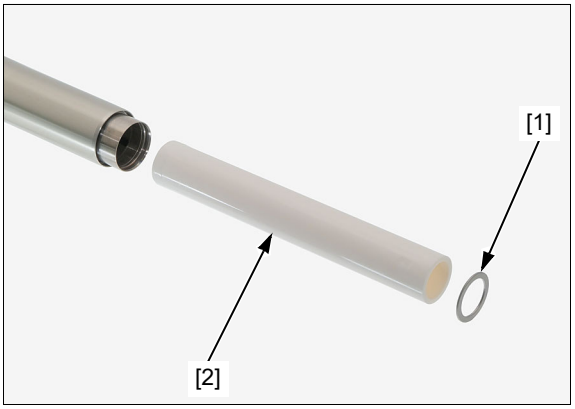
- If the piston rod assembly (rod guide case) is hard to remove from the fork slider, loosen the lock nut and remove the fork cap (page 16-20).
  Extend the outer tube to obtain enough strokes. Moving the outer tube up and down quickly several times at the stroke of approx. 150 mm (5.9 in) becomes a little easy to remove the fork rod assembly (rod guide case).

Remove the fork spring [1].

Pour out the fork fluid by pumping the outer tube [2] several times.



Remove the spring joint [1] and spring collar [2].



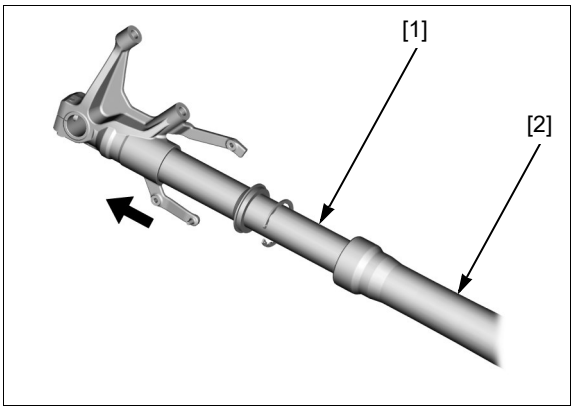
Remove the dust seal [1].

Be careful not to scratch the slide pipe sliding surface.

Remove the stopper ring [2].

Pull the slide pipe assembly [1] out until you feel resistance from the slider bushing. Then move it in and out, tapping the bushing lightly until the outer tube [2] separates from the slide pipe assembly.

The guide bushing will be forced out by the slider bushing.

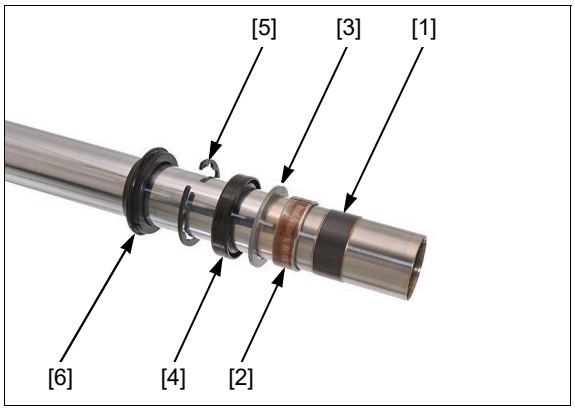


Do not damage the slider bushing, especially the sliding surface. To prevent loss of tension, do not open the slider bushing more than necessary.

Carefully remove the slider bushing [1] by prying the slot with a screwdriver until the slider bushing can be pulled off by hand.

Remove the following:

– Guide bushing [2]
– Back-up ring [3]
– Oil seal [4]
– Stopper ring [5]
– Dust seal [6]

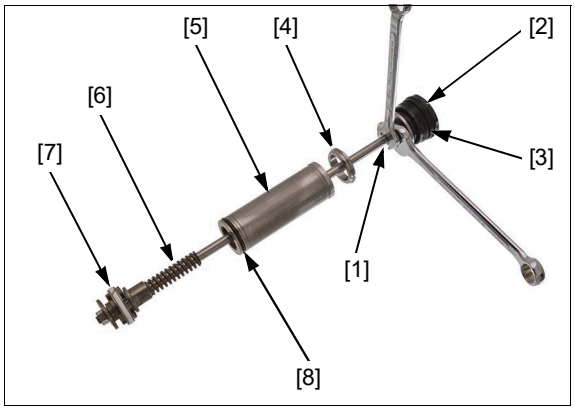


Loosen the lock nut [1] while holding the fork cap [2], then remove the fork cap.

Remove the O-ring [3] from the fork cap groove.

Remove the stopper seat [4], rod guide case [5], rebound spring [6] and piston ring [7].

Remove the O-ring [8] from the rod guide case.

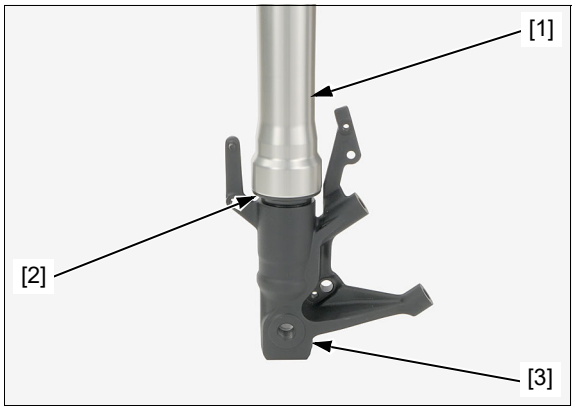


LEFT SIDE

Remove the fork cap [1] with the special tool.

TOOL:
Fork Bolt Wrench **070MA-MGP0100**

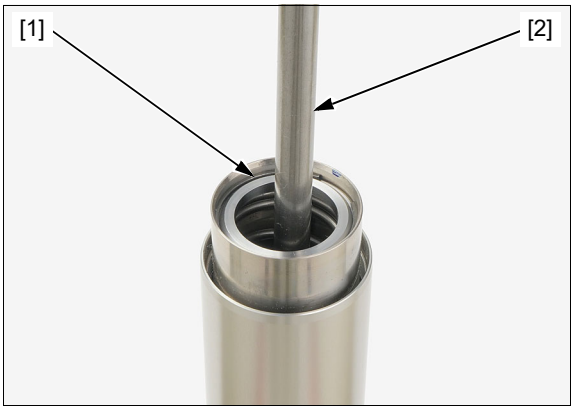
Push the outer tube [1] slowly down, and gently seat the dust seal [2] onto the axle holder [3].



Pour out the fork fluid by pumping the outer tube [1] up and down several times.

Push the fork cap down to compress the fork spring, then remove the stopper ring [1] from the groove in the slide pipe.

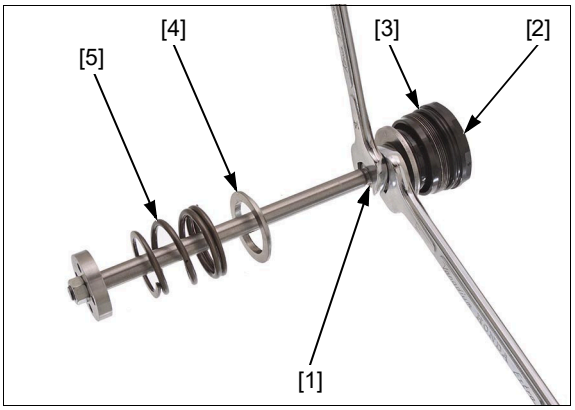
Remove the fork rod assembly [2].



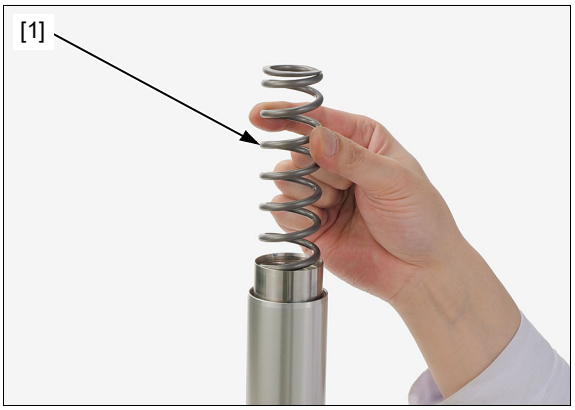
Loosen the lock nut [1] while holding the fork cap [2], then remove the fork cap.

Remove the O-ring [3] from the fork cap groove.

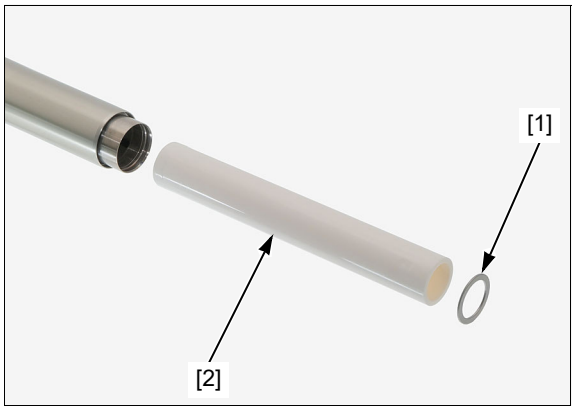
Remove the stopper seat [4] and rebound spring [5].



Remove the fork spring [1].



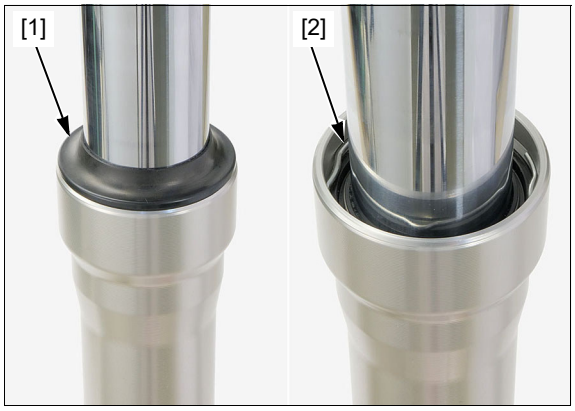
Remove the spring joint [1] and spring collar [2].



Remove the dust seal [1].

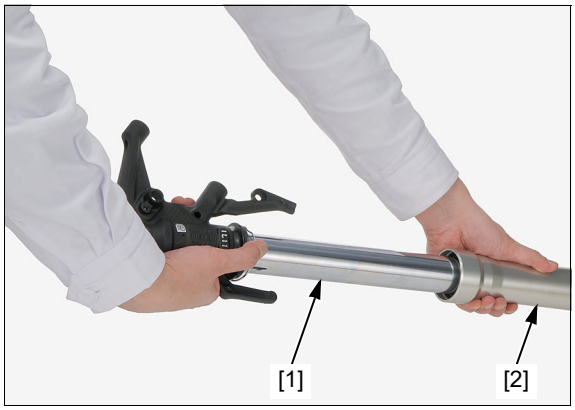
Be careful not to scratch the slide pipe sliding surface.

Remove the oil seal stopper ring [2].



Pull the slide pipe assembly [1] out until you feel resistance from the slider bushing. Then move it in and out, tapping the bushing lightly until the outer tube [2] separates from the slide pipe assembly.

The guide bushing will be forced out by the slider bushing.

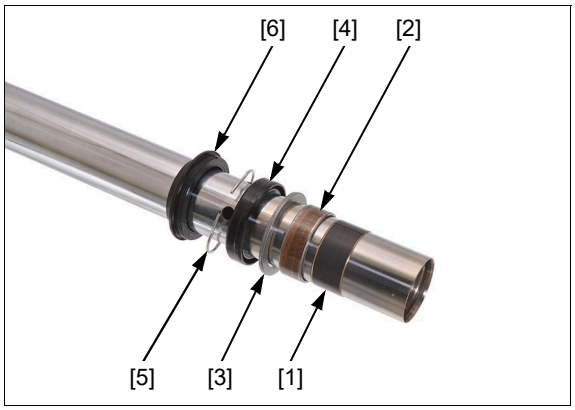


Do not damage the slider bushing, especially the sliding surface. To prevent loss of tension, do not open the slider bushing more than necessary.

Carefully remove the slider bushing [1] by prying the slot with a screwdriver until the slider bushing can be pulled off by hand.

Remove the following:

– guide bushing [2]
– back-up ring [3]
– oil seal [4]
– stopper ring [5]
– dust seal [6]



INSPECTION

Inspect the following parts for damage, abnormal wear, bend, deformation, scoring and teflon coating wear.

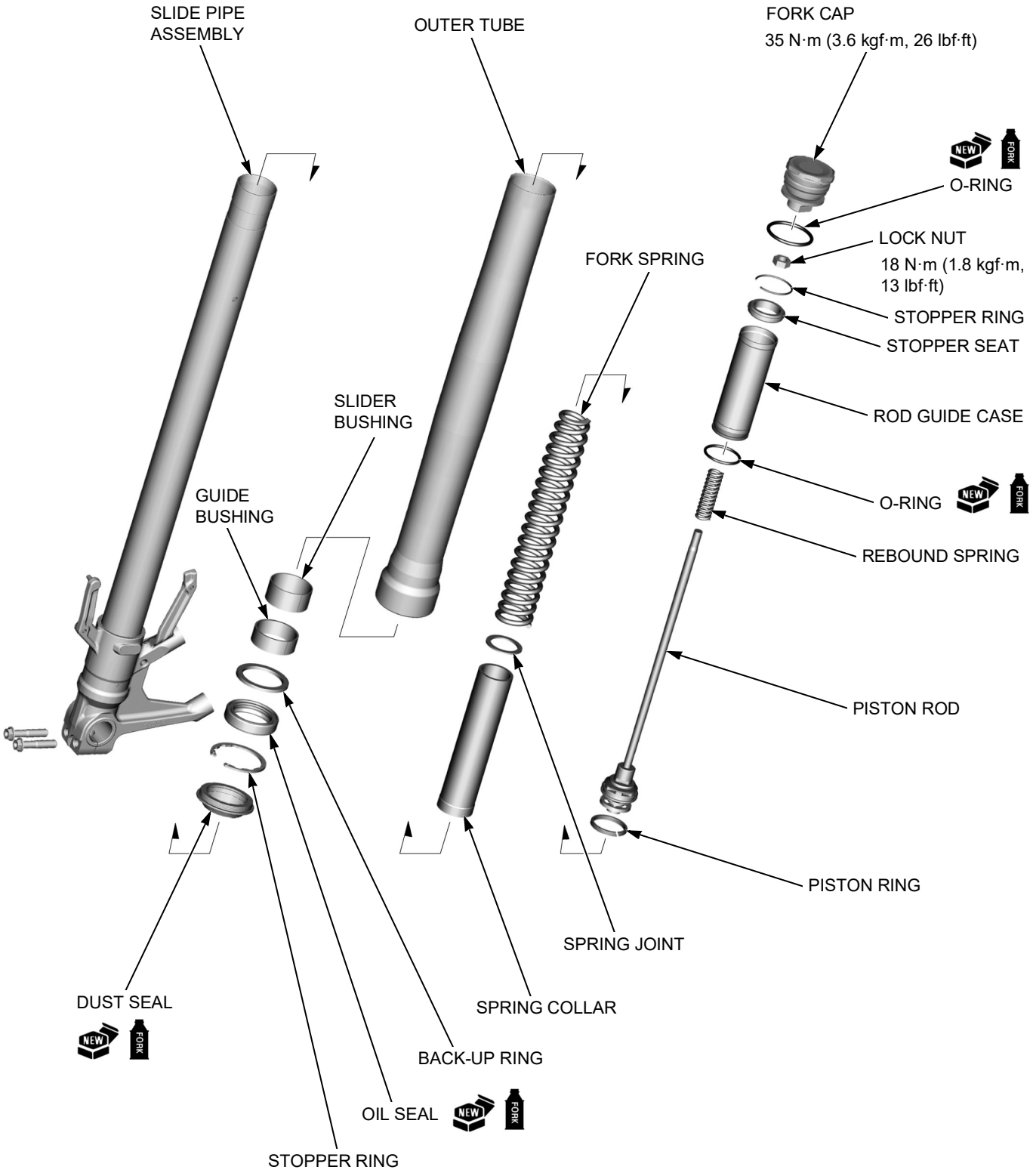
- Outer tube
- Slide pipe
- Fork spring
- Rebound spring
- Piston rod (right fork only)
- Rod guide case (right fork only)
- Piston ring (right fork only)
- Spring collar
- Spring joint
- Fork rod (left fork only)
- Guide bushing
- Slider bushing
- Back-up ring

Measure the each part according to FRONT WHEEL/ SUSPENSION/STEERING SPECIFICATIONS (page 1-9).

Replace any part if it is out of service limit.

ASSEMBLY

RIGHT SIDE



When installing the fork dust seal and oil seal, wrap the edge, groove and oil holes of the slide pipe with tapes [1].

Apply fork fluid to new dust seal lips and oil seal lips.

Install the oil seal with its marked side facing toward the axle holder.

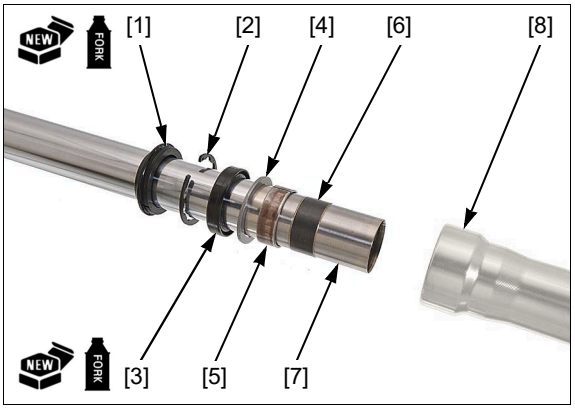
Install the dust seal [1], stopper ring [2] and oil seal [3].

Install the back-up ring [4], guide bushing [5] and slider bushing [6].

NOTE:

- Remove any burrs from the bushing mating surface, being careful not to peel off the coating.
- Do not open the slider bushing slit more than necessary.

Install the slide pipe assembly [7] into the outer tube [8].

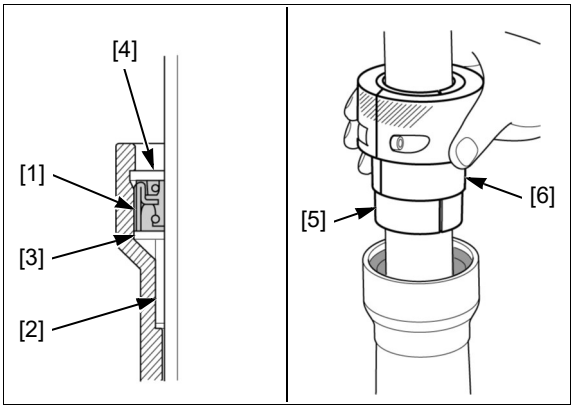


Drive the oil seal [1] with the guide bushing [2] and back-up ring [3] into the outer tube until the stopper ring groove [4] is visible using the special tools.

TOOLS:

Fork Seal Driver Attachment 41.3 [5] **07RMD-MW40100**

Fork Seal Driver, 45.2 [6] **07KMD-KZ30100**



Do not scratch the slide pipe surface.

Install the stopper ring [1] into the groove in securely.

Install the dust seal [2].

Install a new O-ring [1] to the rod guide case [2].

Install the piston ring [3], rebound spring [4] and rod guide case to the piston rod [5].

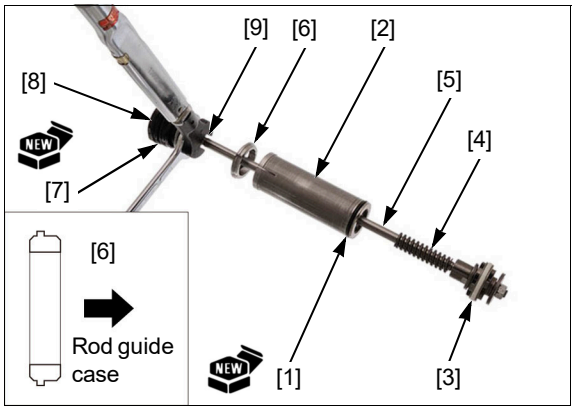
Install the stopper seat [6] in the direction shown.

Install a new O-ring [7] to the fork cap [8].

Install the fork cap to the piston rod and tighten it until it stops.

Hold the fork cap then tighten the piston rod lock nut [9] to the specified torque.

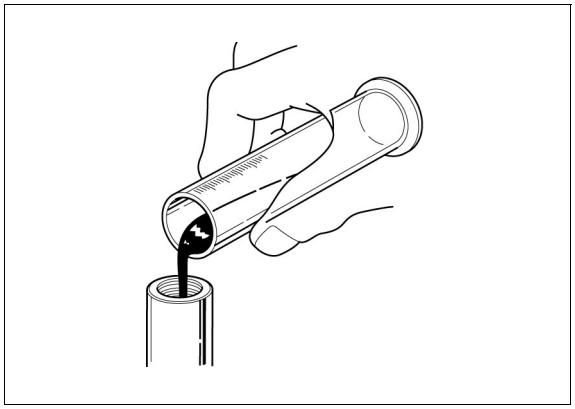
TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



Pour the specified amount of recommended fork fluid.

RECOMMENDED FORK FLUID:
Fork fluid (viscosity: 10 W)

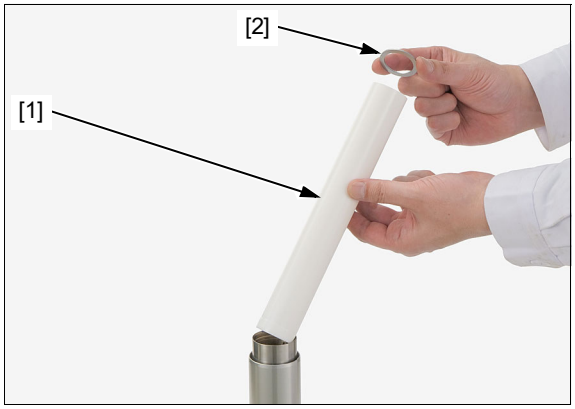
FORK FLUID CAPACITY:
520 ± 2.5 cm³ (17.6 ± 0.08 US oz, 18.3 ± 0.09 Imp oz)



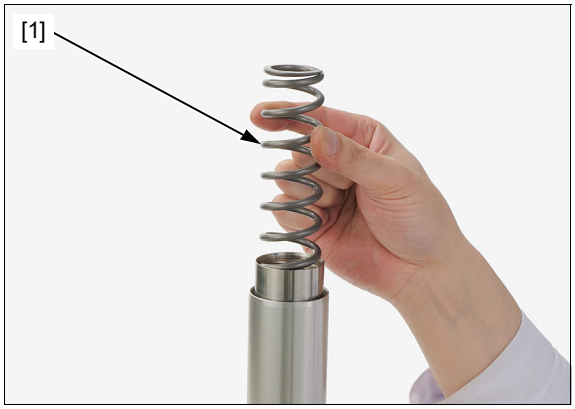
Install the spring collar [1] and spring joint [2].

NOTE:

- Install the spring collar into the slide pipe assembly with the stepped side facing down.

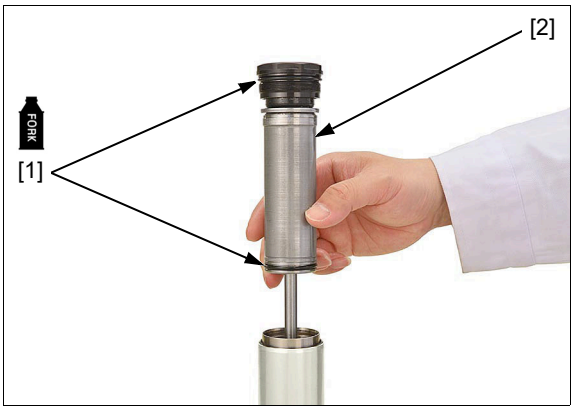


Install the fork spring [1] into the slide pipe assembly with the tightly wound side facing up.

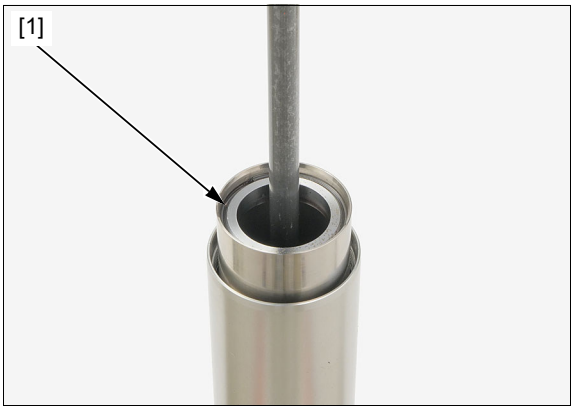


Apply fork fluid to the O-rings [1].

Install the piston rod assembly by pushing the rod guide case [2] into the slide pipe assembly.



Install the stopper ring [1] into the groove in the slide pipe.

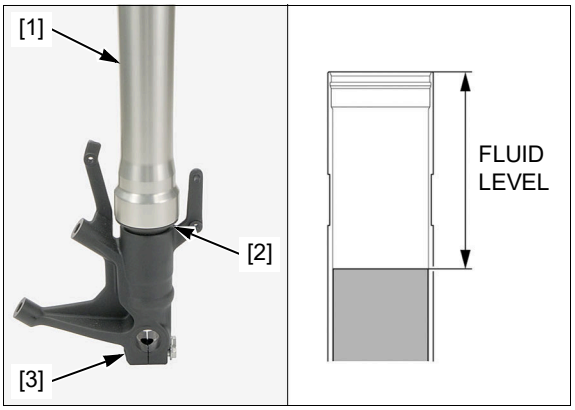


Slowly push the outer tube [1] and pump the slide pipe several times to remove the trapped air from the lower portion of the slide pipe.

Leave it for 5 minutes to remove air bubbles from the fluid.

Gently seat the dust seal [2] onto the axle holder [3], and measure the oil level from the top of the slide pipe.

FLUID LEVEL: 75 mm (3.0 in)



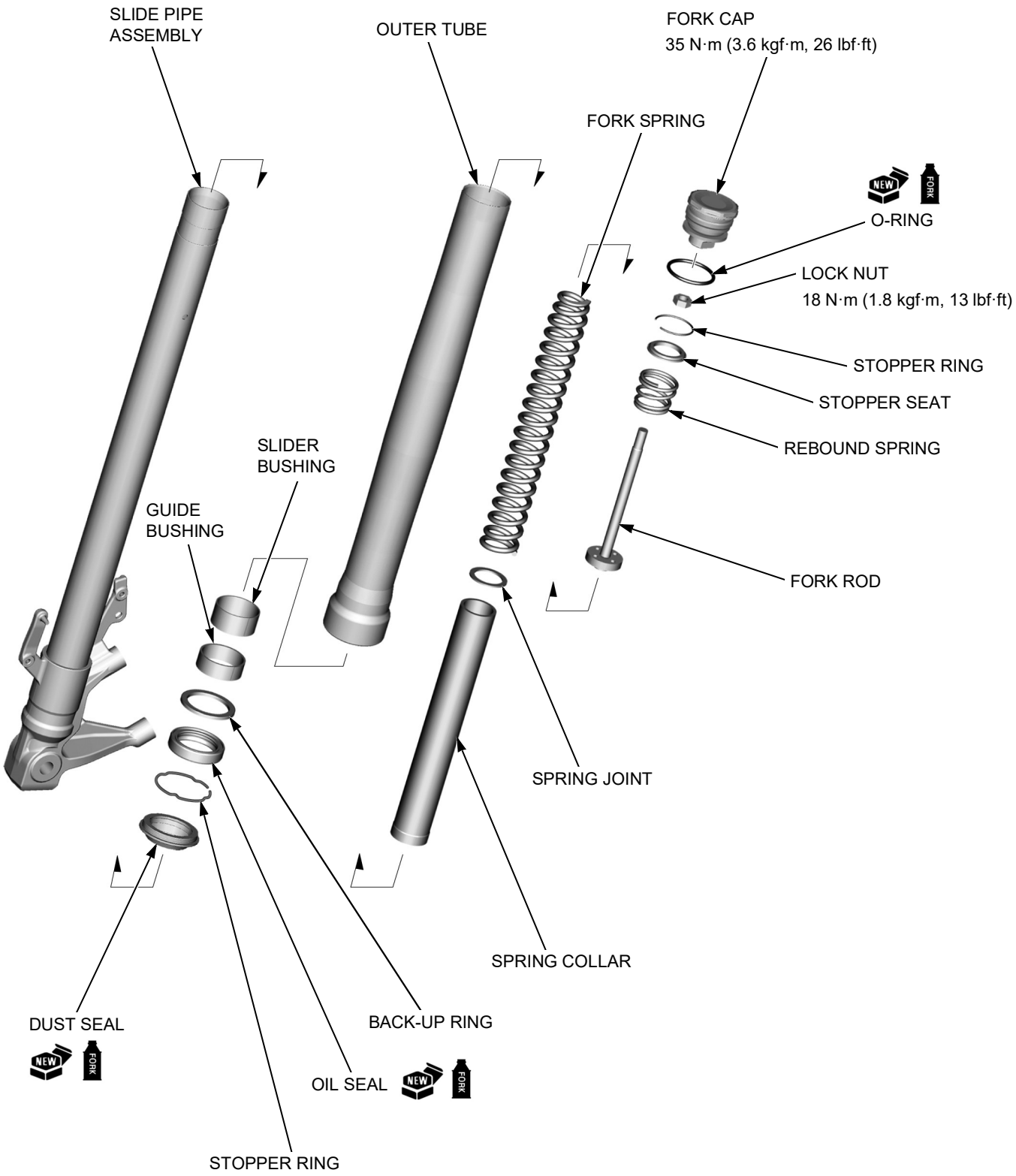
Completely extend the outer tube.

Install and tighten the fork cap [1] into the outer tube.

TOOL:
Fork Bolt Wrench **070MA-MGP0100**

Tighten the fork cap to the specified torque after installing the fork leg into the steering stem (page 16-16).

LEFT SIDE


SLIDE PIPE ASSEMBLY
OUTER TUBE
FORK CAP
35 N·m (3.6 kgf·m, 26 lbf·ft)
FORK SPRING
NEW
FORK
O-RING
LOCK NUT
18 N·m (1.8 kgf·m, 13 lbf·ft)
STOPPER RING
STOPPER SEAT
REBOUND SPRING
SLIDER BUSHING
GUIDE BUSHING
FORK ROD
SPRING JOINT
SPRING COLLAR
DUST SEAL
NEW
FORK
BACK-UP RING
OIL SEAL
NEW
FORK
STOPPER RING

When installing the fork dust seal and oil seal, wrap the edge, groove and oil holes of the slide pipe with tapes [1].

Apply fork fluid to new dust seal lips and oil seal lips.

Install the oil seal with its marked side facing toward the axle holder.

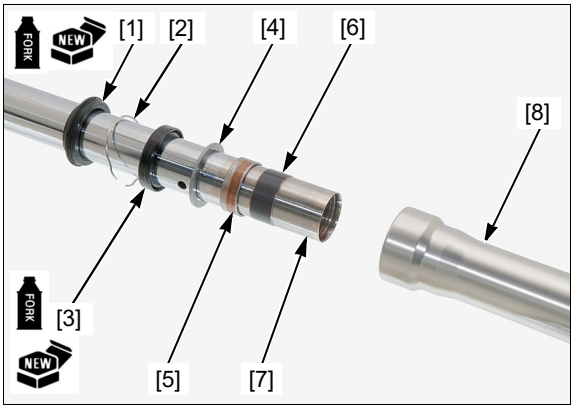
Install the dust seal [1], stopper ring [2] and oil seal [3].

Install the back-up ring [4], guide bushing [5] and slider bushing [6].

NOTE:

- Remove any burrs from the bushing mating surface, being careful not to peel off the coating.
- Do not open the slider bushing slit more than necessary.

Install the slide pipe assembly [7] into the outer tube [8].

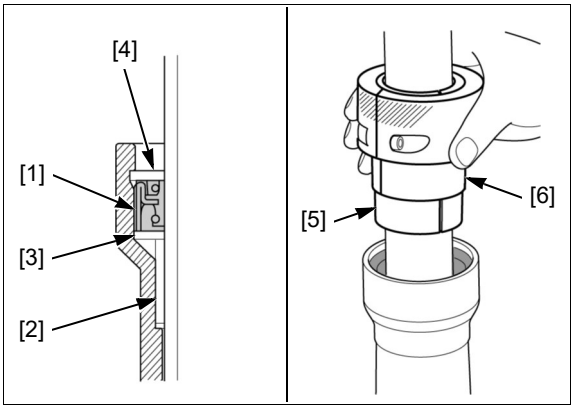


Drive the oil seal [1] with the guide bushing [2] and back-up ring [3] into the outer tube until the stopper ring groove [4] is visible using the special tools.

TOOLS:

Fork Seal Driver Attachment 41.3 [5] **07RMD-MW40100**

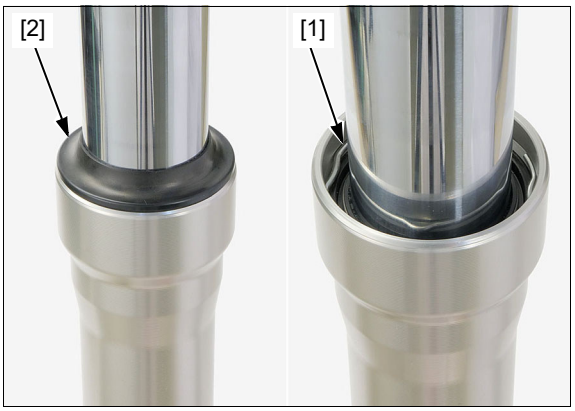
Fork Seal Driver, 45.2 [6] **07KMD-KZ30100**



Do not scratch the slide pipe surface.

Install the stopper ring [1] into the groove securely.

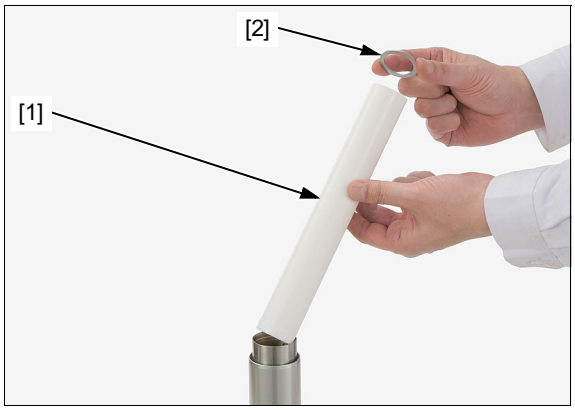
Install the dust seal [2].



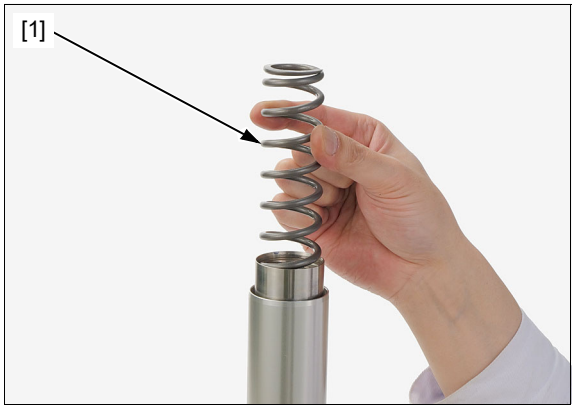
Install the spring collar [1] and spring joint [2].

NOTE:

- Install the spring collar into the slide pipe assembly with the stepped side facing down.



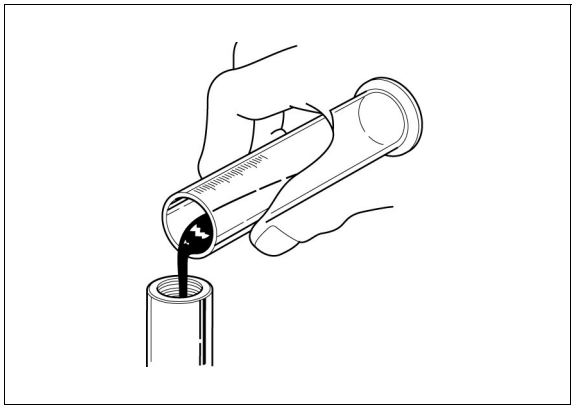
Install the fork spring [1] into the slide pipe assembly with the tightly wound side facing up.



Pour the specified amount of recommended fork fluid.

RECOMMENDED FORK FLUID:
Fork fluid (viscosity: 10 W)

FORK FLUID CAPACITY:
530 ± 2.5 cm^3 (17.9 ± 0.08 US oz, 18.7 ± 0.09 Imp oz)

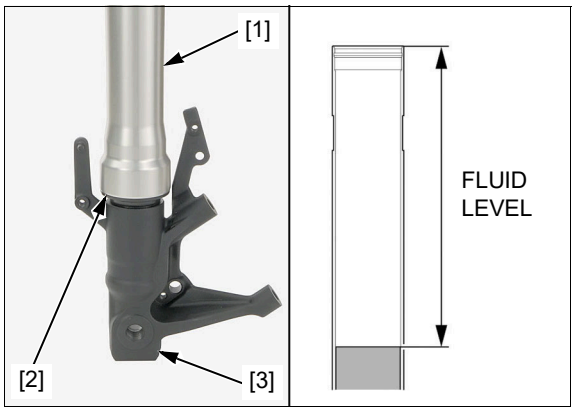


Slowly push the outer tube [1] and pump the slide pipe several times to remove the trapped air from the lower portion of the slide pipe.

Leave it for 5 minutes to remove air bubbles from the fluid.

Gently seat the dust seal [2] onto the axle holder [3], and measure the oil level from the top of the slide pipe.

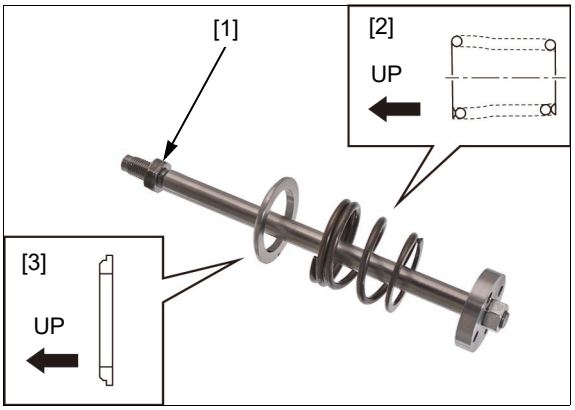
FLUID LEVEL: 128 mm (5.0 in)



Tighten the lock nut [1] until it stops.

Install the rebound spring [2] to the fork rod with large I.D. side facing up.

Install the stopper seat [3] in the direction shown.

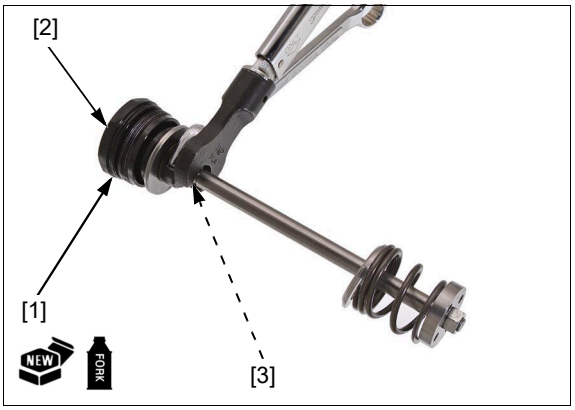


Apply recommended fork oil to a new O-ring [1], and install it to the fork cap [2].

Install the fork cap to the fork rod and tighten it until it stops.

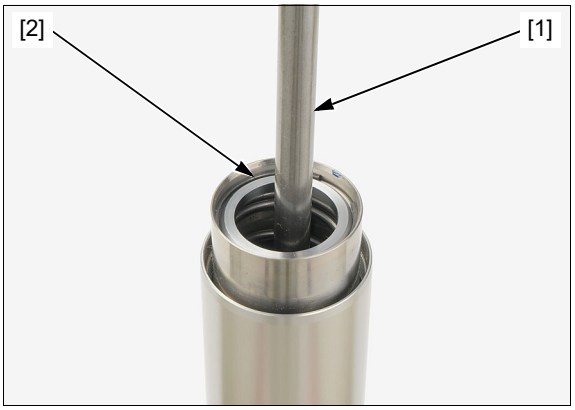
Hold the fork cap then tighten the fork rod lock nut [3] to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



Install the fork rod assembly [1] into the slide pipe assembly.

Push the fork cap down and compress the fork spring, then install the stopper ring [2] into the groove in the slide pipe.



Completely extend the outer tube.

Install and tighten the fork cap [1] into the outer tube.

TOOL:
Fork Bolt Wrench **070MA-MGP0100**

Tighten the fork cap to the specified torque after installing the fork leg into the steering stem (page 16-16).

STEERING STEM

REMOVAL

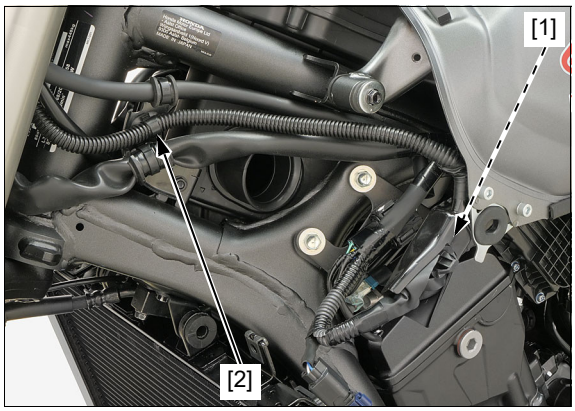
Remove the following:

– Shroud B (page 2-9)
– Headlight upper stay (page 2-8)
– Handlebar (page 16-4)

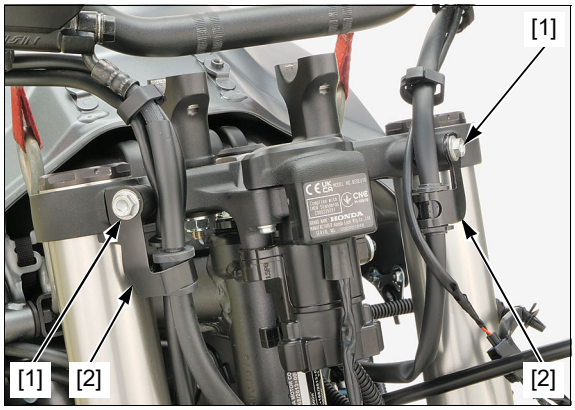
Disconnect the immobilizer receiver 4P connector (page 22-10).

Disconnect the ignition switch 2P connector [1].

Remove the wire clamp [2].



Remove the pinch bolts [1] and clamps [2].

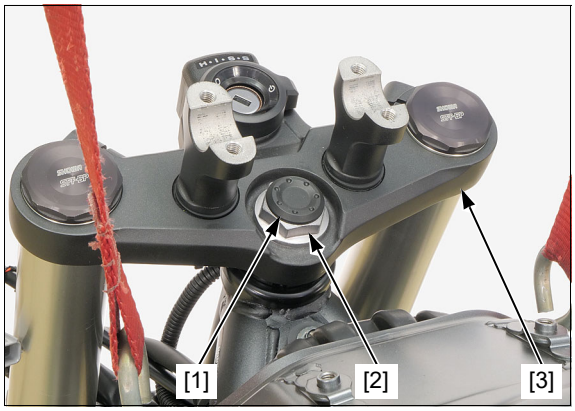


Remove the stem cap [1].

Loosen the steering stem nut [2].

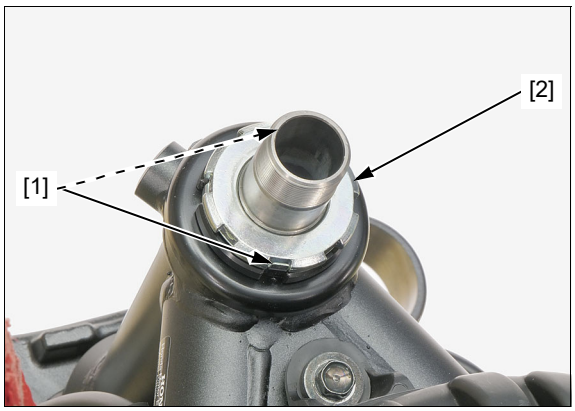
Remove the following:

– Fork legs (page 16-15)
– Stem nut
– Top bridge [3]



Straighten the lock washer tabs [1].

Remove the lock nut [2] and lock washer.



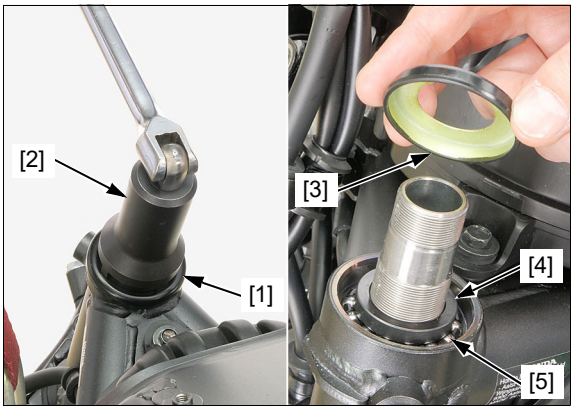
Loosen the steering bearing adjusting nut [1] using the special tool.

TOOL:
Locknut Wrench 5.7 x 50 [2] 07916-3710101

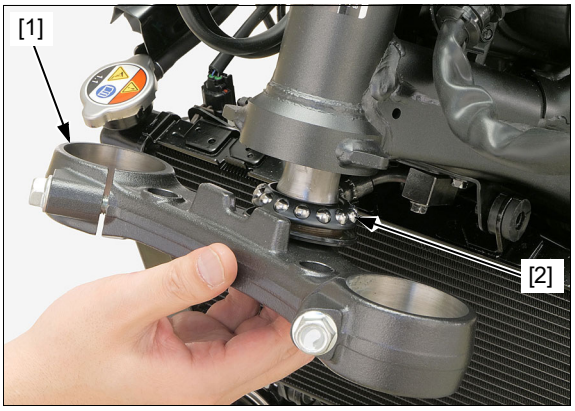
While holding the steering stem, remove the adjusting nut and upper dust seal [3].

Remove the following:

– Upper inner race [4]
– Upper steering bearing [5]



– Steering stem [1]
– Lower steering bearing [2]

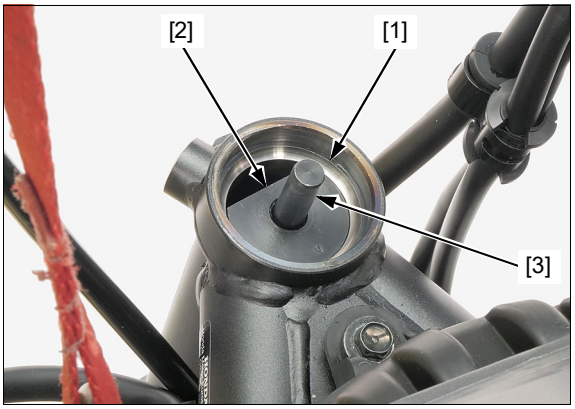


BEARING REPLACEMENT

Always replace the bearing and races as a set.

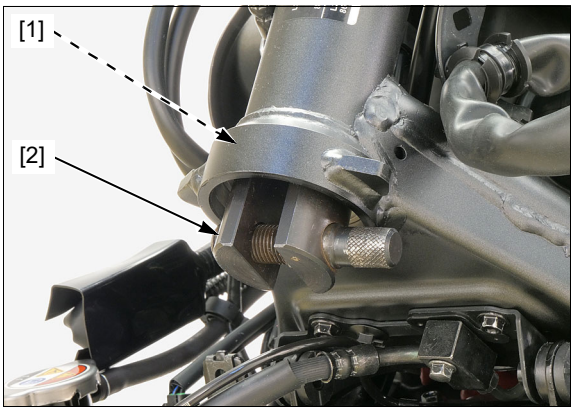
Remove the upper outer race [1] using the special tools.

TOOLS:
Ball Race Remover Set 07953-MJ10000
– Remover Attachment 40 [2] 07953-MJ10100
– Handle 370 [3] 07953-MJ10200



Remove the lower outer race [1] using the special tool and a suitable shaft.

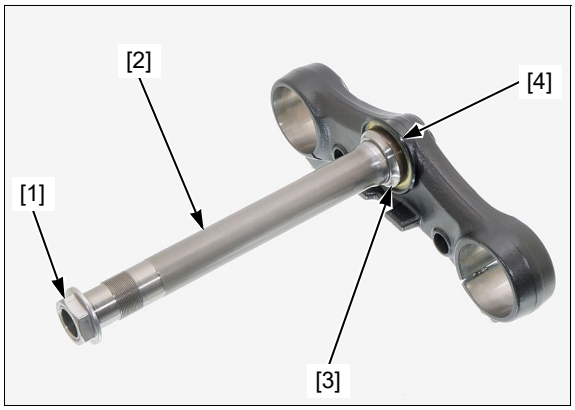
TOOLS:
Ball Race Remover 44.5 [2] 07946-3710500



Install the stem nut [1] onto the steering stem [2] to prevent the threads from being damaged when removing the lower inner race [3].

Remove the lower inner race with a chisel or equivalent tool, being careful not to damage the stem.

Remove the lower dust seal [4].

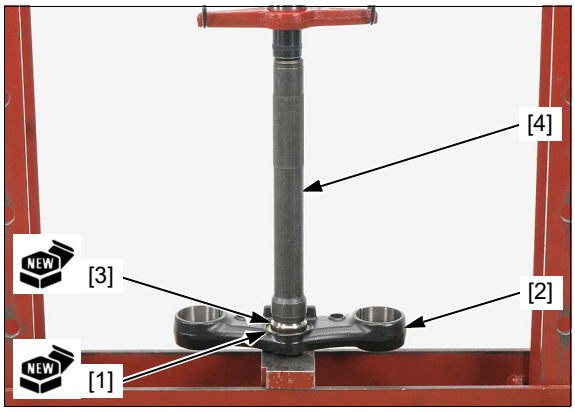


Install a new lower dust seal [1] onto the steering stem [2].

Press a new lower inner race [3] using the special tool.

TOOL:

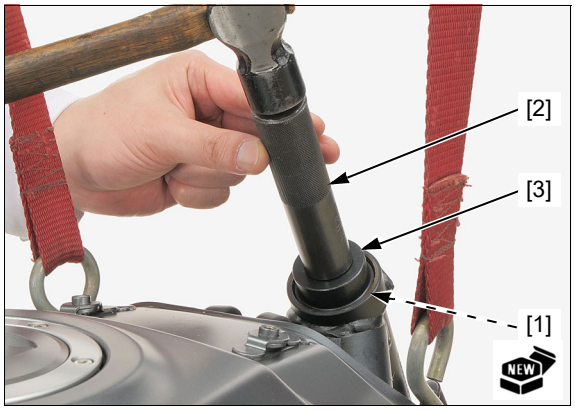
Driver, 30 mm I.D. [4]	**07946-MB00000**



Drive in a new upper outer race [1] into the steering head pipe using the special tool.

TOOLS:

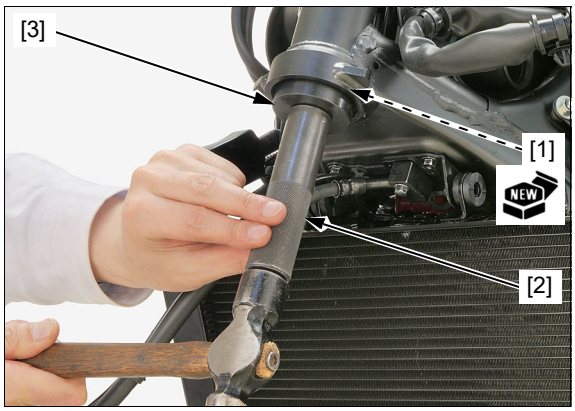
Driver Handle, 15 x 135L [2]	**07749-0010000**
Attachment, 42 x 47 mm [3]	**07746-0010300**



Drive in a new lower outer race [1].

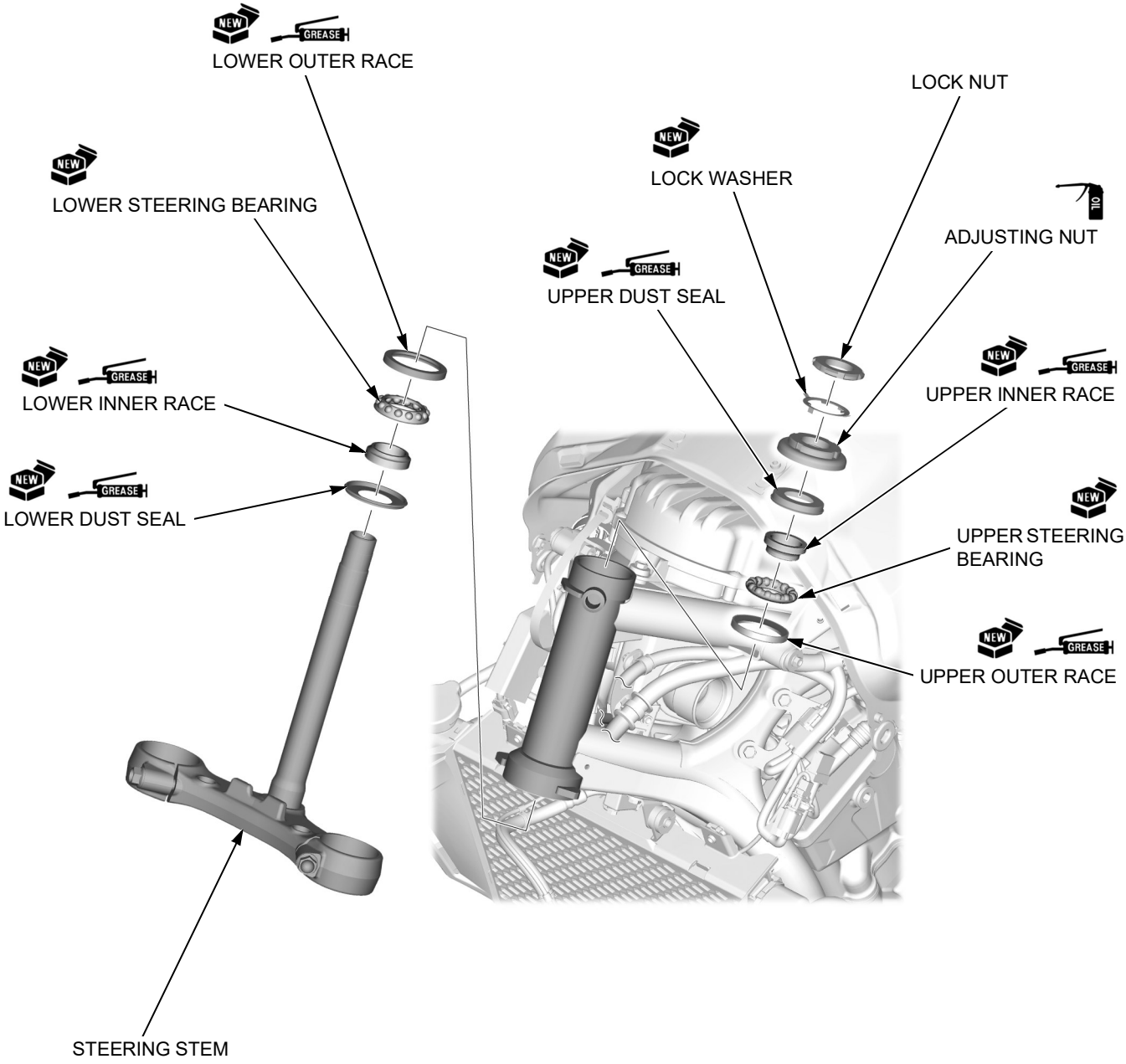
TOOLS:

Driver Handle, 15 x 135L [2]	**07749-0010000**
Attachment, 52 x 55 mm [3]	**07746-0010400**



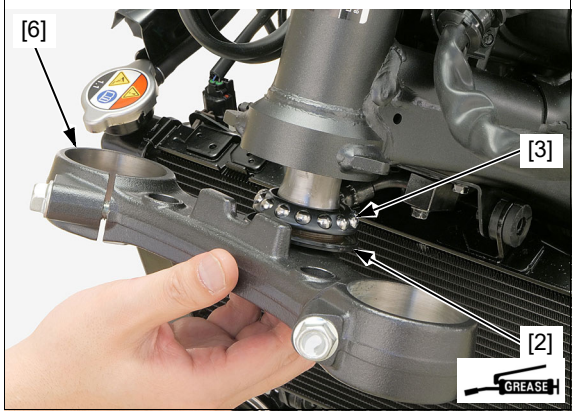
INSTALLATION

Apply specified grease to the upper and lower bearings and bearing races (page 1-18).



Install the following:

– Lower steering bearing [3]
– Upper steering bearing [4]
– Upper inner race [5]
– Steering stem [6]
– Upper dust seal

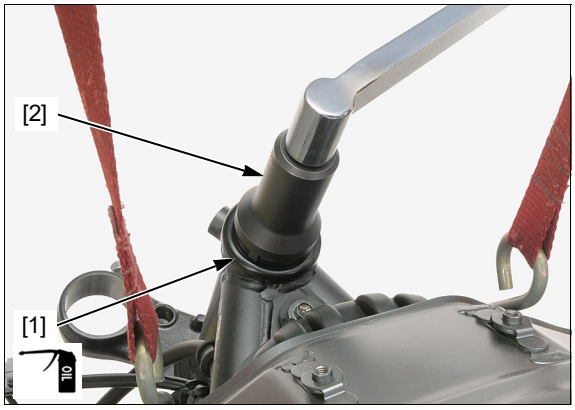


Apply engine oil or grease to the threads of the adjusting nut [1].

Tighten the adjusting nut to the specified torque using the special tool.

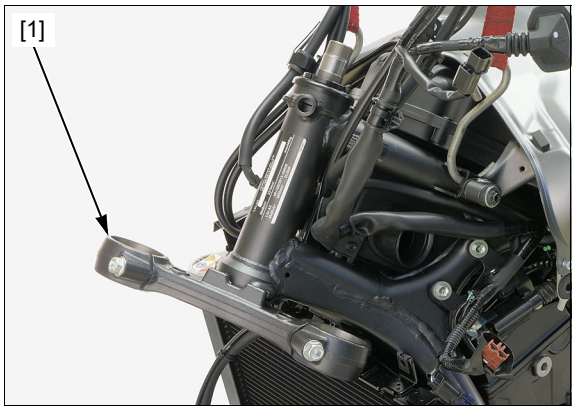
TOOL:
Locknut Wrench 5.7 x 50 [2] 07916-3710101

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



Turn the steering stem [1] left and right, lock-to-lock at least five times to seat the bearings.

Retighten the adjustment nut to the same torque.



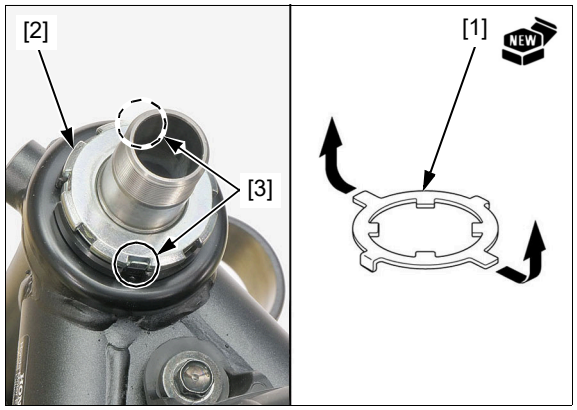
Install a new lock washer [1], aligning its bent tabs with the grooves in the adjusting nut.

Install the lock nut [2] until it contacts with the lock washer.

Do not over-tighten the lock nut, this will flatten the lock washer.

Further tighten the lock nut, within 90°, to align its grooves with the tabs of the lock washer.

Bend the lock washer tabs [3] up into the grooves in the lock nut.



Clean the threads of the stem with a degreasing agent.

Install the following:

– Top bridge [1]
– Steering stem nut [2]

Do not tighten the top bridge pinch bolts.

Temporarily install the fork legs into the bottom and top bridges by tightening the bottom bridge pinch bolts.

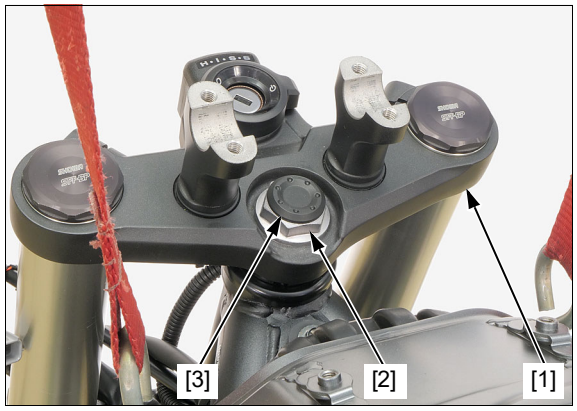
Tighten the stem nut to the specified torque.

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

Make sure the steering stem moves smoothly, without play or binding.

Install the following:

– Stem cap [3]
– Fork legs (page 16-16)



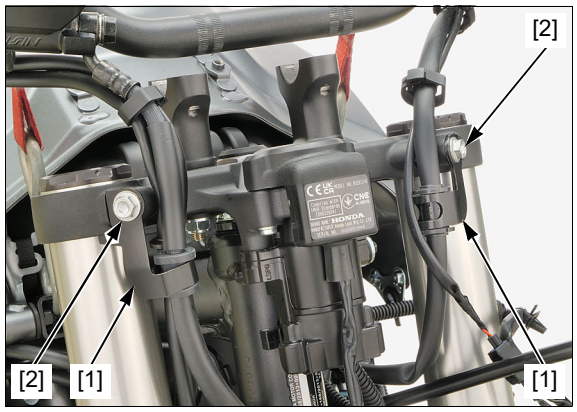
Install the following:

– Clamps [1]
– Pinch bolts [2]
– Handlebar (page 16-6)

Tighten the top bridge pinch bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

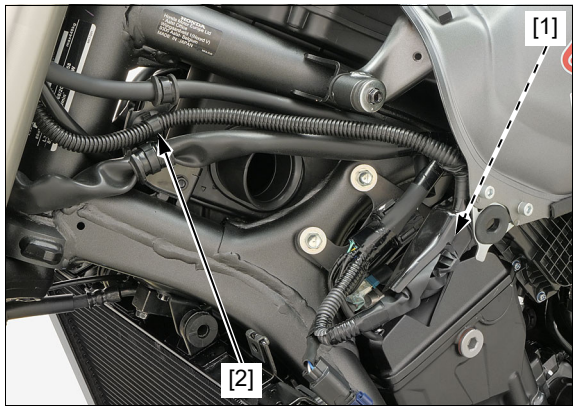
Connect the immobilizer receiver 4P connector (page 22-10).



Connect the ignition switch 2P connector [1].

Install the following:

– Wire clamp [2]
– Headlight upper stay (page 2-8)
– Shroud B (page 2-9)



MEMO

17. REAR WHEEL/SUSPENSION

SERVICE INFORMATION

GENERAL

- When servicing the rear wheel and suspension, 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 rear wheel installation, check the brake operation by applying the brake pedal.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "TUBELESS TIRE APPLICABLE".
- Use Honda genuine replacement bolts and nuts for all suspension pivot and mounting point.
- After the rear wheel installation, check the brake operation by applying the brake pedal.
- For brake system information (page 18-2).
- For wheel balance inspection (page 16-12)
- For driven sprocket inspection (page 3-17)

TROUBLESHOOTING

Steers to one side or does not track straight
- Drive chain adjusters not adjusted equally
- Bent axle
- Damaged frame
- Worn swingarm pivot components

Rear wheel wobbling
- Bent rim
- Unbalanced tire and wheel
- Faulty tire
- Worn or damaged wheel bearing
- Worn or damaged driven flange bearing
- Insufficient tire pressure
- Damaged suspension or swingarm pivot bearings
- Axle not tightened properly
- Worn or damaged swingarm pivot bearing
- Suspension fasteners not tightened properly

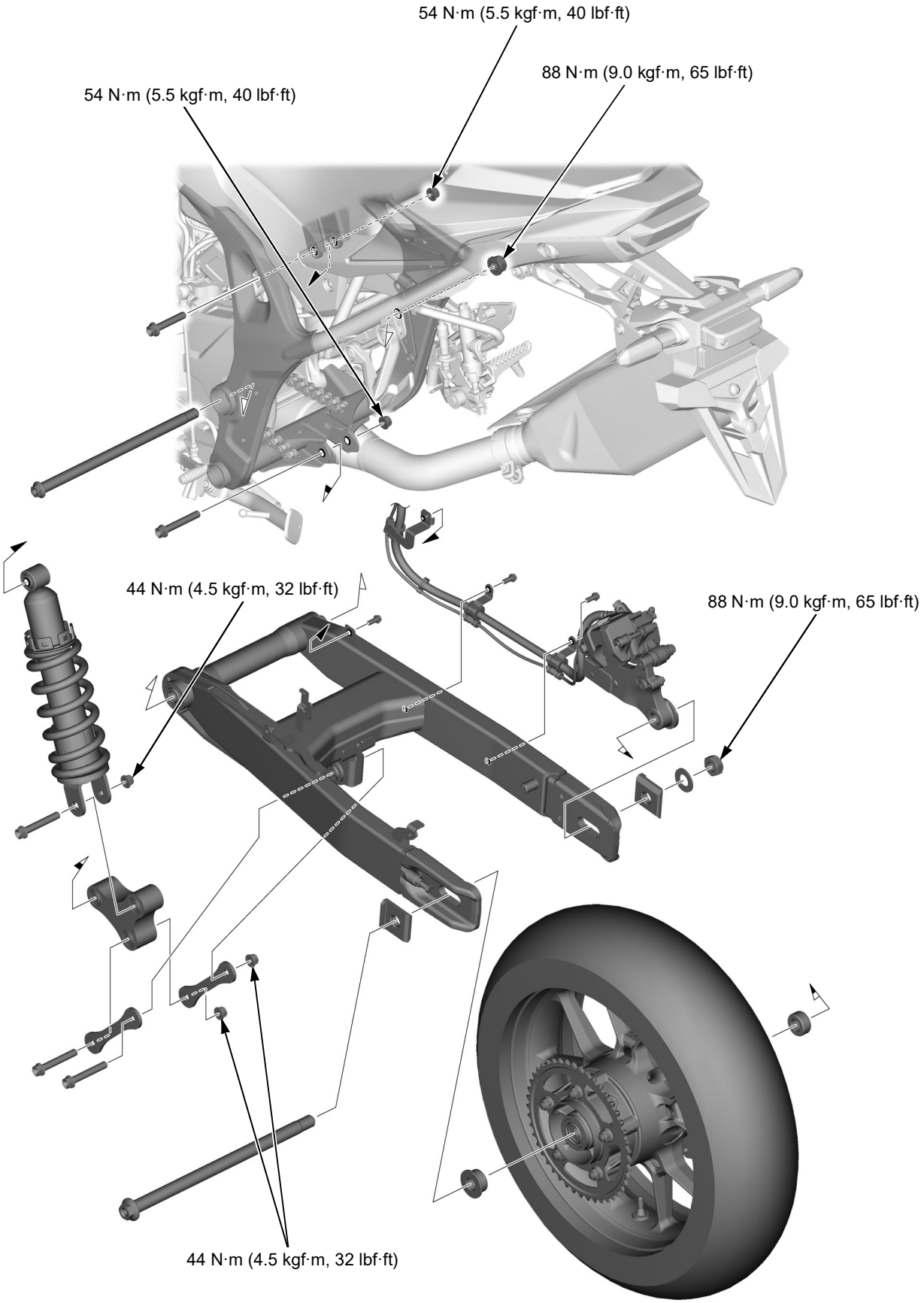
Wheel hard to turn
- Faulty wheel bearing
- Faulty driven flange bearing
- Bent axle
- Brake drag
- Drive chain too tight

Soft suspension
- Improper shock absorber spring preload
- Weak shock absorber spring
- Incorrect suspension adjustment
- Oil leakage from damper unit
- Low tire pressure

Stiff suspension
- Improper shock absorber spring preload
- Bent shock absorber damper rod
- Damaged suspension or swingarm pivot bearing
- Bent swingarm pivot or frame
- High tire pressure
- Faulty suspension linkage

Rear suspension noise
- Loose suspension fastener
- Worn or damaged suspension pivot bearing
- Faulty shock absorber

COMPONENT LOCATION



REAR WHEEL

REMOVAL/INSTALLATION

Loosen the axle nut [1].

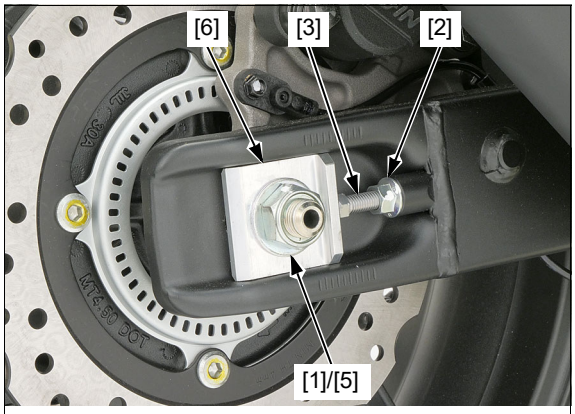
Support the motorcycle using a hoist or equivalent and raise the rear wheel off the ground.

Turning the lock nuts [2] and adjusting bolts [3] so the wheel can be moved forward all the way.

Push the rear wheel forward and derail the drive chain [4] from the driven sprocket.

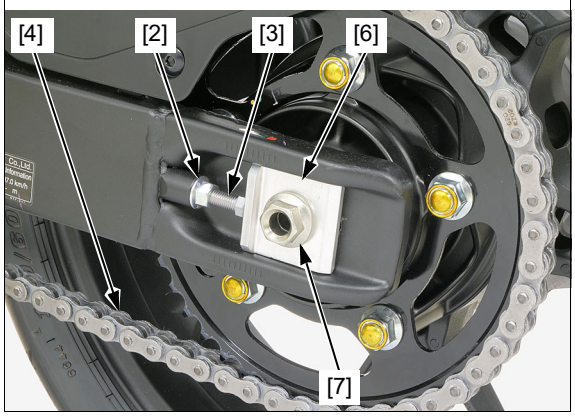
Remove the following:

– Axle nut
– Washer [5]
– Setting plates [6]
– Rear axle [7]
– Rear wheel



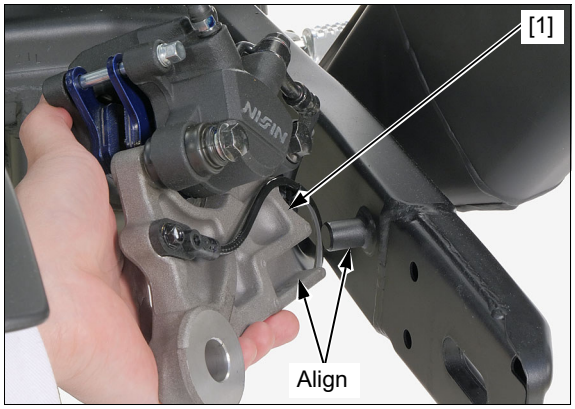
NOTE:

• Do not operate the brake pedal after removing the wheel.



Support the caliper so it does not hang from the brake hose. Do not twist the brake hose

– Rear brake caliper bracket [1]



Remove the following:

– Left side collar [1]
– Right side collar [2]

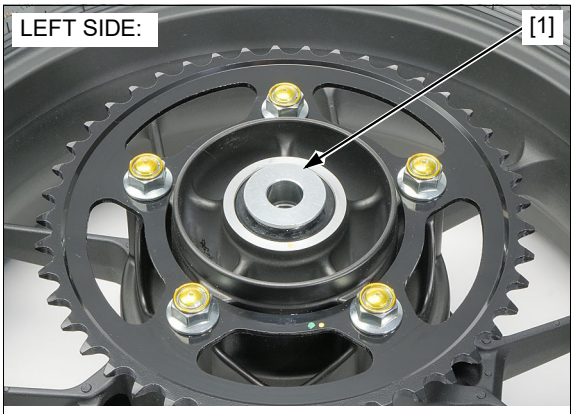
Installation is in the reverse order of removal.

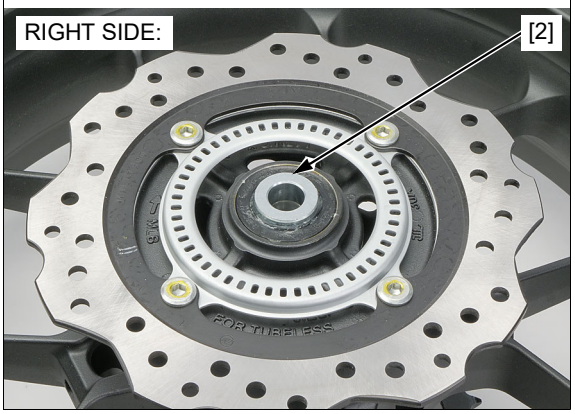
TORQUE:
Rear axle nut:
88 N·m (9.0 kgf·m, 65 lbf·ft)

NOTE:

• When installing the wheel, take care not to let the caliper bracket come off the swingarm boss and not to damage the brake pads.

Adjust the drive chain (page 3-16).





INSPECTION

Turn the inner race of each bearing with your finger.

The bearings should turn smoothly and quietly.

Also check that the bearing outer race fits tightly in the hub.

Replace the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub.

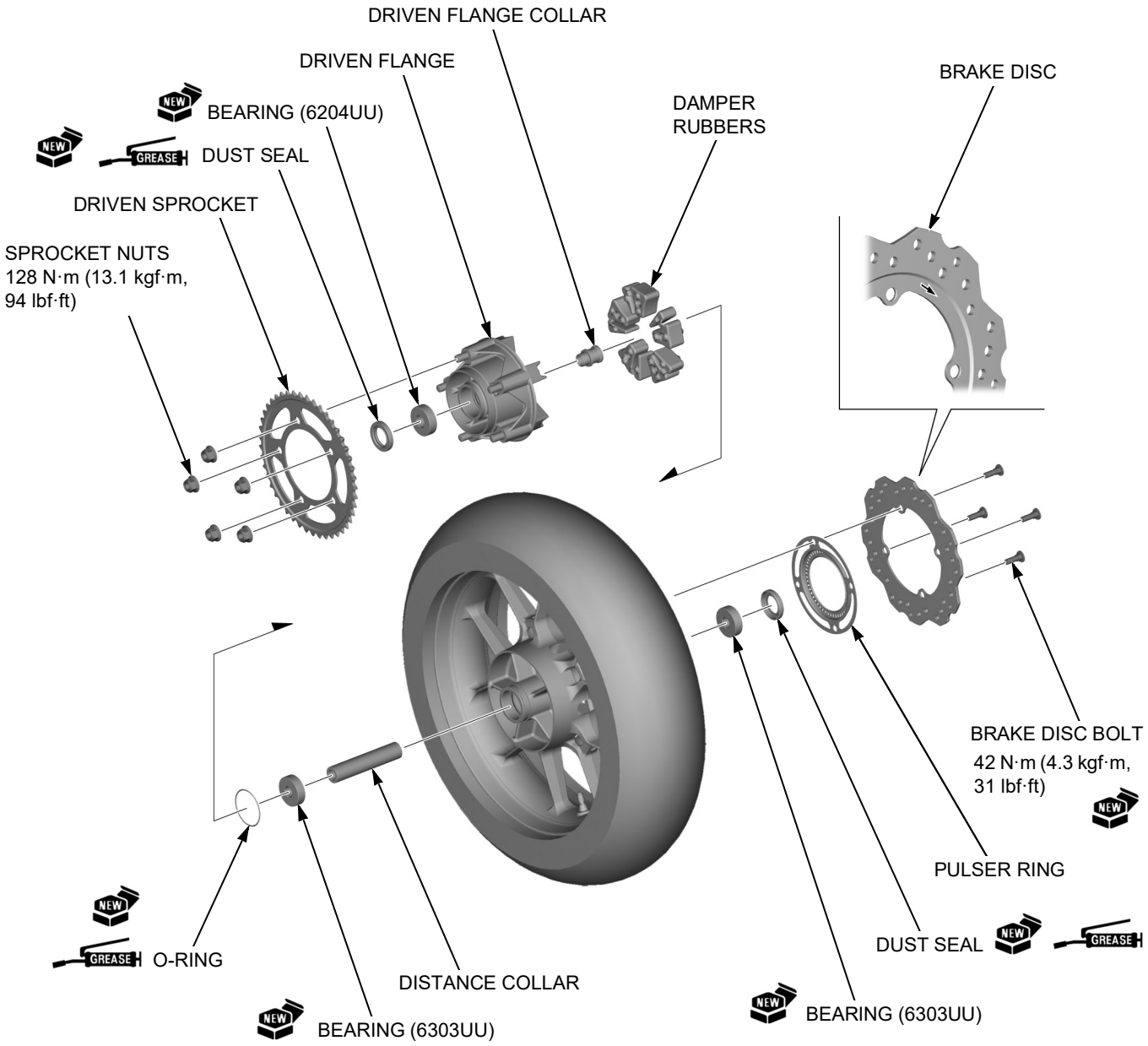
Inspect the following parts for damage, abnormal wear, deformation or bend.

– Rear axle
– Rear wheel

Measure each part according to REAR WHEEL/ SUSPENSION SPECIFICATIONS (page 1-9).

Replace any part if it is out of service limit.

DISASSEMBLY/ASSEMBLY



BEARING REPLACEMENT

WHEEL BEARING

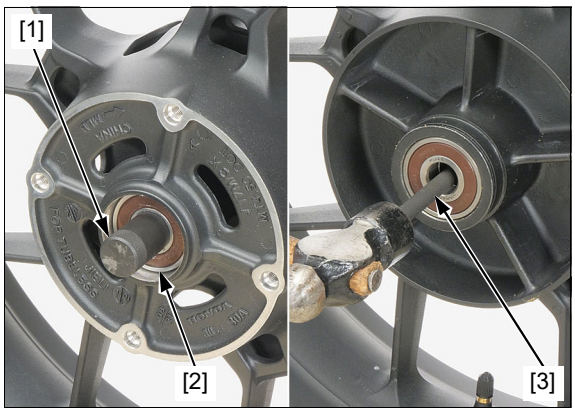
Install the bearing remover head [1] into the bearing [2].

From the opposite side of the wheel, install the bearing remover shaft [3] and drive the bearing out of the wheel hub.

TOOLS:

Remover Head 17 mm	**07746-0050500**
Bearing Remover Shaft 9 x 200L	**07746-0050100**

Remove the distance collar and drive out the other bearing.



Drive in a new right side bearing (brake disc side) squarely with the marked side facing up until it is fully seated.

Install the distance collar.

Drive in a new left side bearing squarely with the marked side facing up until it is fully seated on the distance collar.

TOOLS:

Driver Handle, 15 x 135L [1]	**07749-0010000**
Attachment, 42 x 47 mm [2]	**07746-0010300**
Pilot 17 mm [3]	**07746-0040400**

DRIVEN FLANGE BEARING

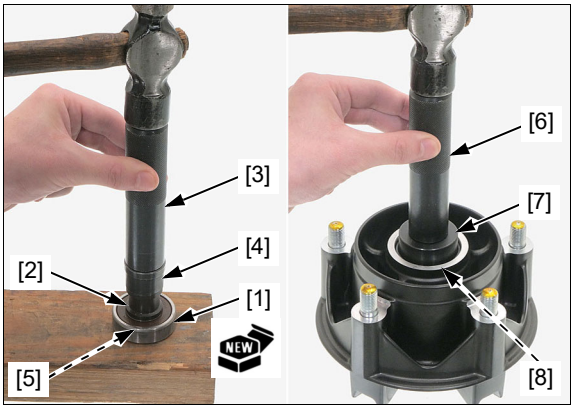
Drive out the driven flange collar [1] and the bearing [2].

Place a new bearing [1] with the marked side facing down. Install the driven flange collar [2] into the bearing until it is fully seated.

TOOLS:

Driver Handle, 15 x 135L [3]	**07749-0010000**
Bearing Driver Attachment, 28 x 30 [4]	**07946-1870100**
Pilot 17 mm [5]	**07746-0040400**

Drive in the driven flange bearing/collar squarely with the collar side facing down until it is fully seated.



TOOLS:

Driver Handle, 15 x 135L [6]	**07749-0010000**
Attachment, 42 x 47 mm [7]	**07746-0010300**
Pilot 17 mm [8]	**07746-0040400**

WHEEL BALANCE

Refer to front wheel (page 16-14).

CUSHION LINKAGE

REMOVAL/INSTALLATION

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

Remove the following:

– Nuts [1]
– Bolts [2]
– Cushion connecting rod plates [3]
– Cushion arm [4]

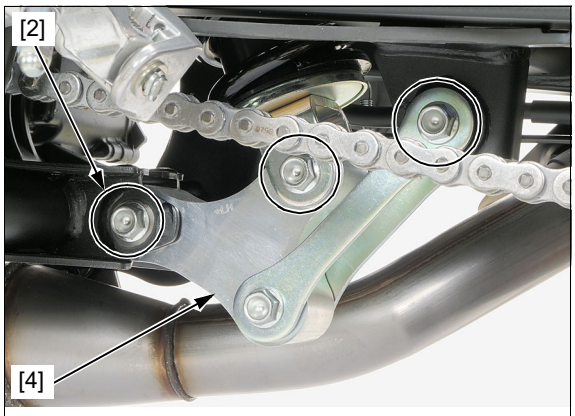
Installation is in the reverse order of removal.

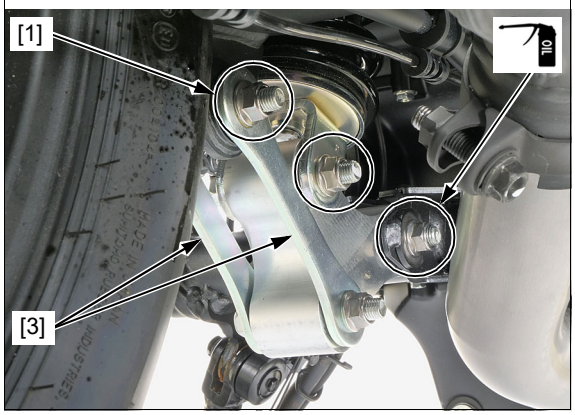
NOTE:

• Apply oil to the cushion arm bolt (front frame side) threads.

TORQUE:

Cushion arm nut:
54 N·m (5.5 kgf·m, 40 lbf·ft)
Shock absorber lower mounting nut:
44 N·m (4.5 kgf·m, 32 lbf·ft)
Cushion connecting rod plate nut:
44 N·m (4.5 kgf·m, 32 lbf·ft)

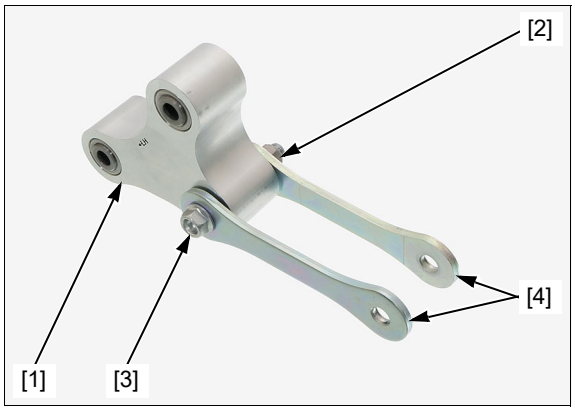




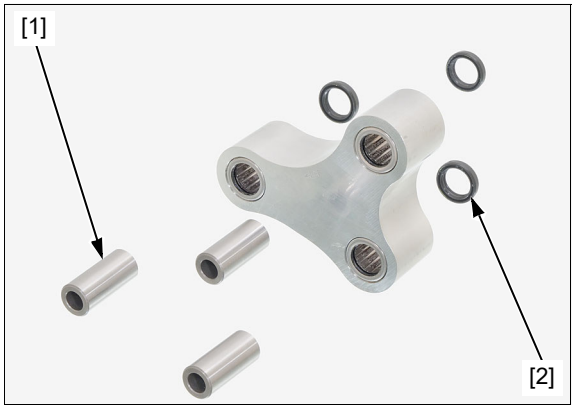
DISASSEMBLY

Remove the following from the cushion arm [1]:

– Nut [2]
– Bolt [3]
– Cushion connecting rod plates [4]

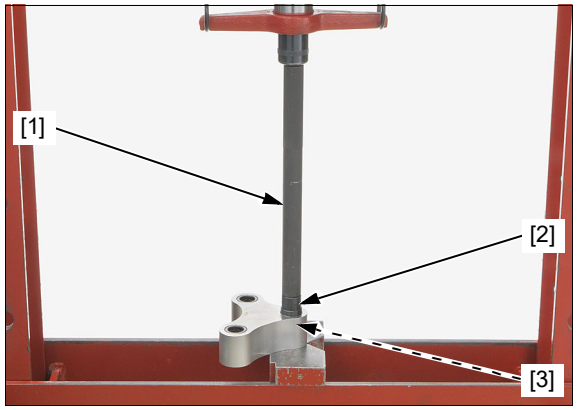


– Pivot collars [1]
– Dust seals [2]



BEARING REPLACEMENT

Press the needle bearings out of the cushion arm using the special tools.

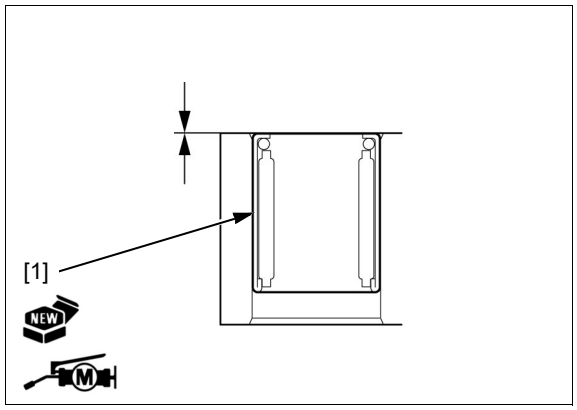


TOOLS:

Driver Handle 15 x 280L [1]	**07949-3710001**
Attachment, 22 x 24 mm [2]	**07746-0010800**
Pilot 17 mm [3]	**07746-0040400**

Apply molybdenum disulfide grease to new needle bearing rolling areas.

Press in each needle bearing [1] with its marked side facing the left side, until it is flush with the cushion arm surface, using the special tools and a hydraulic press.



TOOLS:

Driver Handle 15 x 280L	**07949-3710001**
Attachment, 22 x 24 mm	**07746-0010800**
Pilot 17 mm	**07746-0040400**

ASSEMBLY

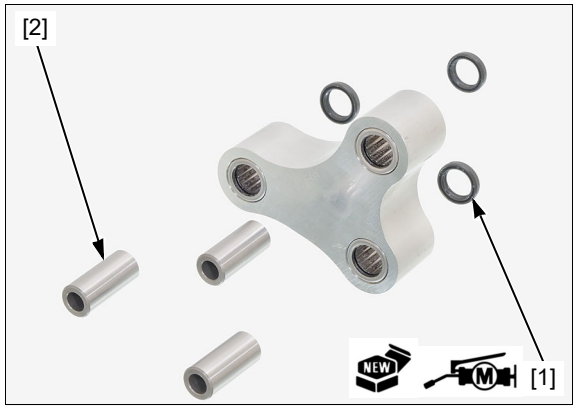
Apply molybdenum disulfide grease to a new dust seal [1] lips.

Install each dust seal with the flat side facing out so that it is flush with the end surface.

NOTE:

- Install the cushion arm dust seals to the right side.

Install the pivot collars [2].



Install the following:

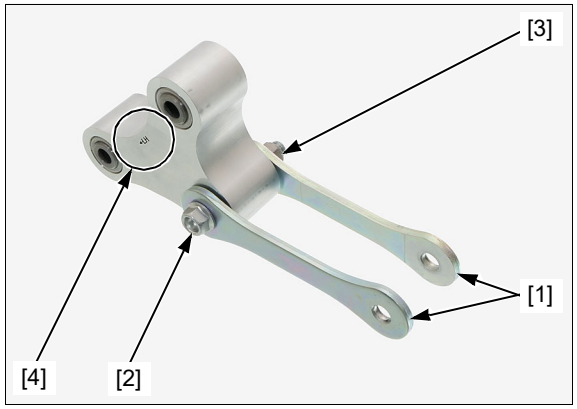
– Connecting rod plates [1]
– Bolt [2]
– Nut [3]

NOTE:

- Assemble with the "LH" mark [4] facing as shown.

Tighten the cushion connecting rod plate nut to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)



SHOCK ABSORBER

REMOVAL/INSTALLATION

Remove the following:

– Cushion linkage (page 17-8)
– Nut [1]
– Bolt [2]
– Shock absorber [3]

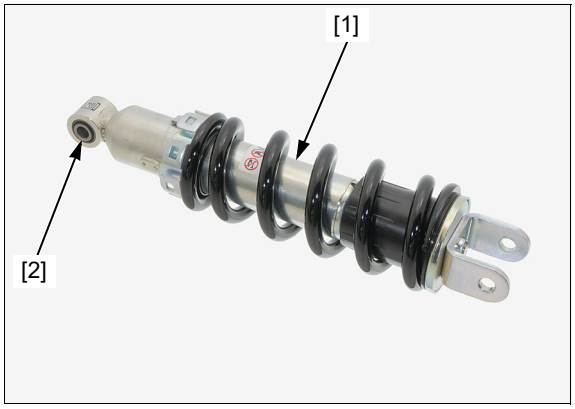
Installation is in the reverse order of removal.

TORQUE:
Shock absorber upper mounting nut:
54 N·m (5.5 kgf·m, 40 lbf·ft)

INSPECTION

Inspect the following parts of the shock absorber for damage, abnormal wear, oil leakage or bend.

– Damper unit [1]
– Pivot bushing [2]

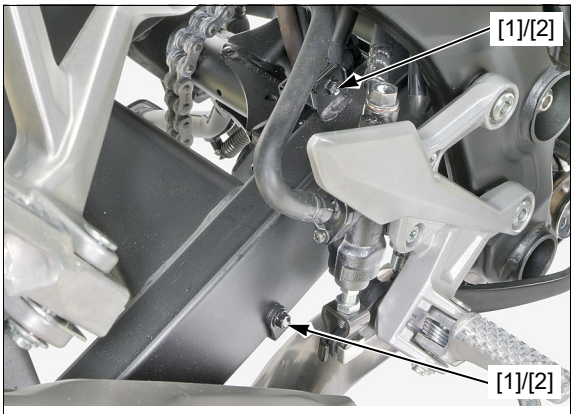


SWINGARM

REMOVAL/INSTALLATION

Remove the following:

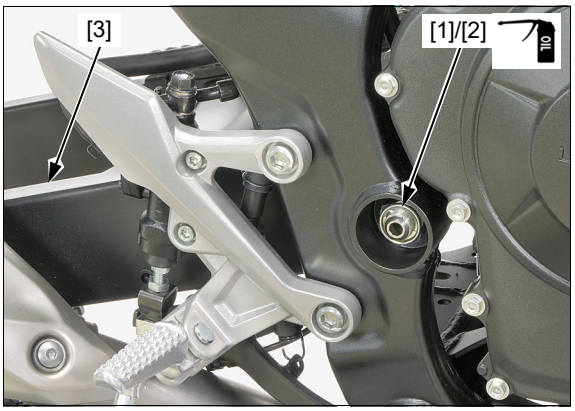
– Drive chain cover (page 2-17)
– Rear wheel (page 17-4)
– Shock absorber (page 17-10)
– Left pivot cover (page 2-18)
– Right pivot cover (page 18-22) (Temporarily install the right rider footpeg bracket assembly.)
– Bolts [1]
– Brake hose clamps [2]



Remove the pivot nut [1] and the bolt [2].

Move the brake hose, rear brake light switch wire, speed sensor wire and drive chain out of the way and remove the swingarm [3] from the frame.

Installation is in the reverse order of removal.

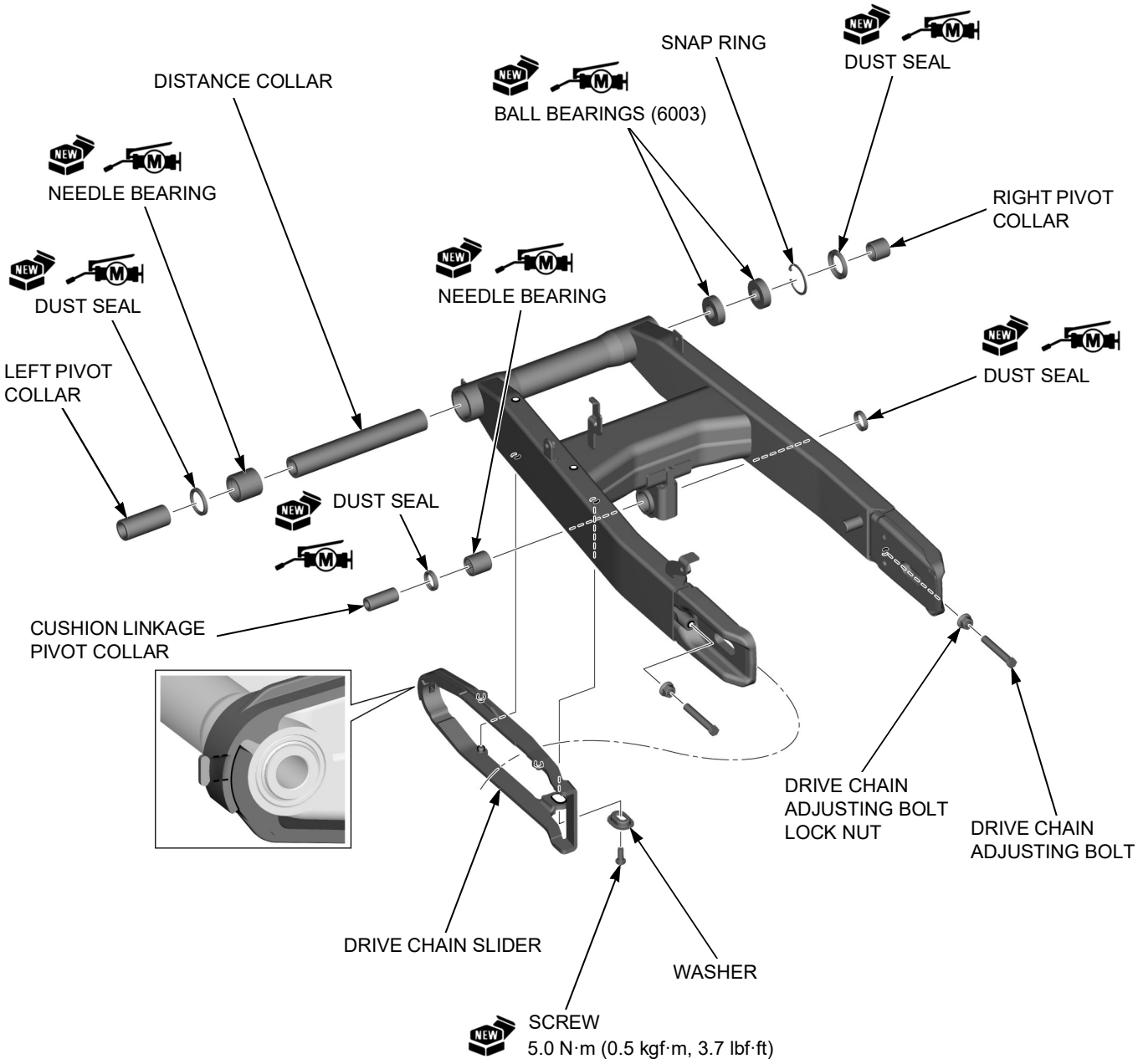


NOTE:

- Do not suspend the brake caliper/bracket assembly from the brake hose. Do not twist the brake hose.
- Apply engine oil to the threads and seating surface of the pivot nut.

TORQUE:
Swingarm pivot nut:
88 N·m (9.0 kgf·m, 65 lbf·ft)

DISASSEMBLY/ASSEMBLY



INSPECTION

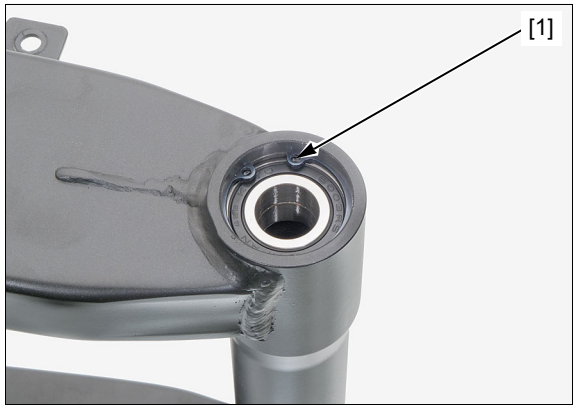
Inspect the following parts for damage, abnormal wear, deformation.

- Swingarm
- Pivot collars
- Bearings
- Drive chain slider

BEARING REPLACEMENT

SWINGARM PIVOT BEARING

Remove the snap ring [1].

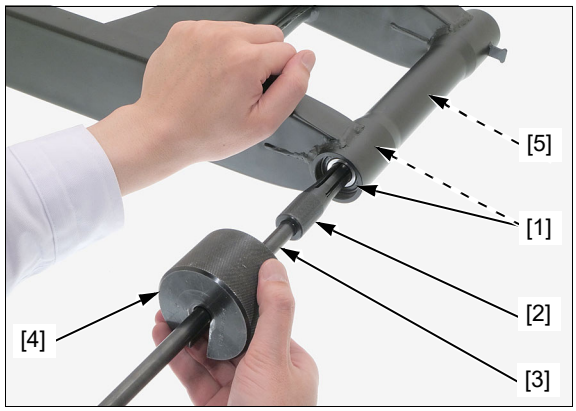


Remove the ball bearings [1] using the special tools.

TOOLS:

Bearing Remover Shaft Set, 17 mm [2]	**07936-3710300**
Remover Handle [3]	**07936-3710100**
Weight, Remover [4]	**07741-0010201**

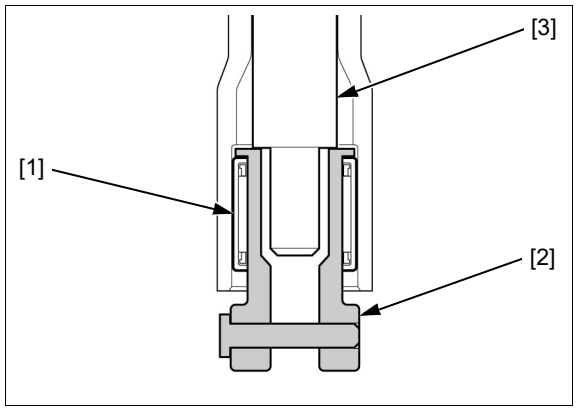
Remove the distance collar [5].



Press the needle bearing [1] out of the swingarm using the special tools.

TOOLS:

Needle Bearing Remover Attachment 24 [2]	**07LMC-KV30200**
Shaft 15 x 325L [3]	**07946-MJ00100**

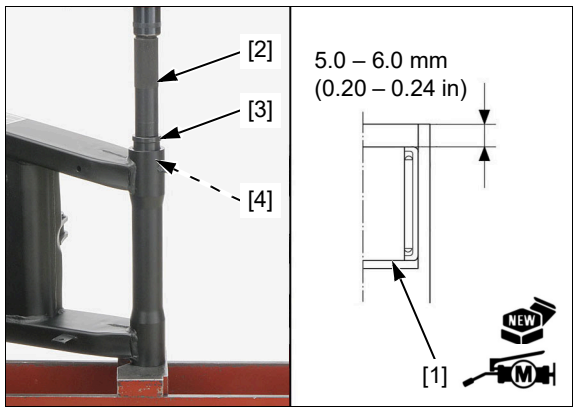


Apply molybdenum disulfide grease to the rotating area of a new needle bearing [1].

Carefully press the bearing in the left pivot with the marked side facing up until the depth from the pivot end surface is 5.0 – 6.0 mm (0.20 – 0.24 in), using the special tools.

TOOLS:

Driver Handle, 15 x 135L [2]	**07749-0010000**
Attachment, 32 x 35 mm [3]	**07746-0010100**
Pilot 25 mm [4]	**07746-0040600**



Apply grease to the rotating areas 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.

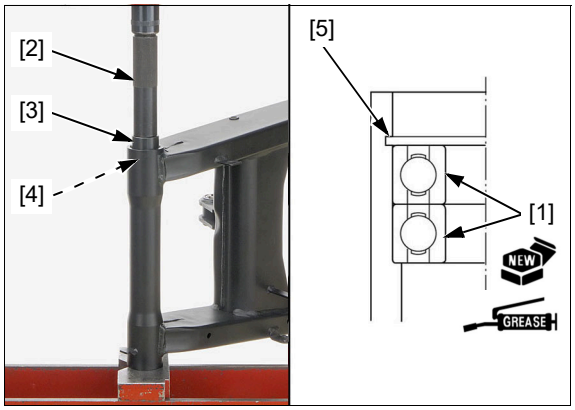
TOOLS:

Driver Handle, 15 x 135L [2]	**07749-0010000**
Attachment, 32 x 35 mm [3]	**07746-0010100**
Pilot 17 mm [4]	**07746-0040400**

Install the snap ring [5] into the groove with the chamfered edge facing in.

NOTE:

- Be certain the snap ring is firmly seated in the groove. Do not reuse it which could easily spin in the groove.



CUSHION LINKAGE BEARING

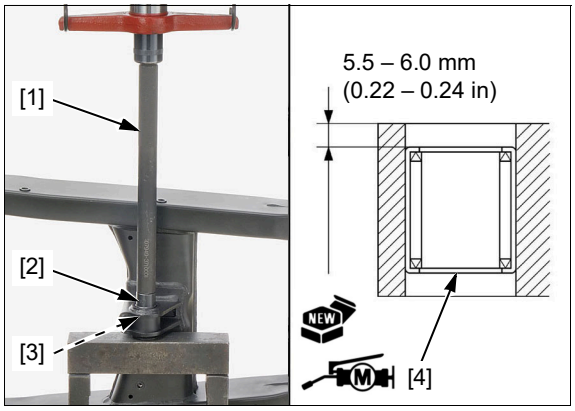
Press the needle bearing out of the swingarm using the special tools.

TOOLS:

Driver Handle 15 x 280L [1]	**07949-3710001**
Attachment, 22 x 24 mm [2]	**07746-0010800**
Pilot 17 mm [3]	**07746-0040400**

Apply molybdenum disulfide grease to the rotating area of a new needle bearing [4].

Carefully press in the bearing with the marked side facing up until the depth from the pivot end surface is 5.5 – 6.0 mm (0.22 – 0.24 in), using the same tools.



18. HYDRAULIC BRAKE

SERVICE INFORMATION

GENERAL

⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

NOTICE

Spilling brake fluid will severely damage instrument lenses and painted surface. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the front reservoir is horizontal first.

- This section covers service of the conventional brake components of the brake system.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Check the brake system by applying the brake lever or pedal after the air bleeding.
- Never allow contaminates (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always 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.
- Always check brake operation before riding the motorcycle.

TROUBLESHOOTING

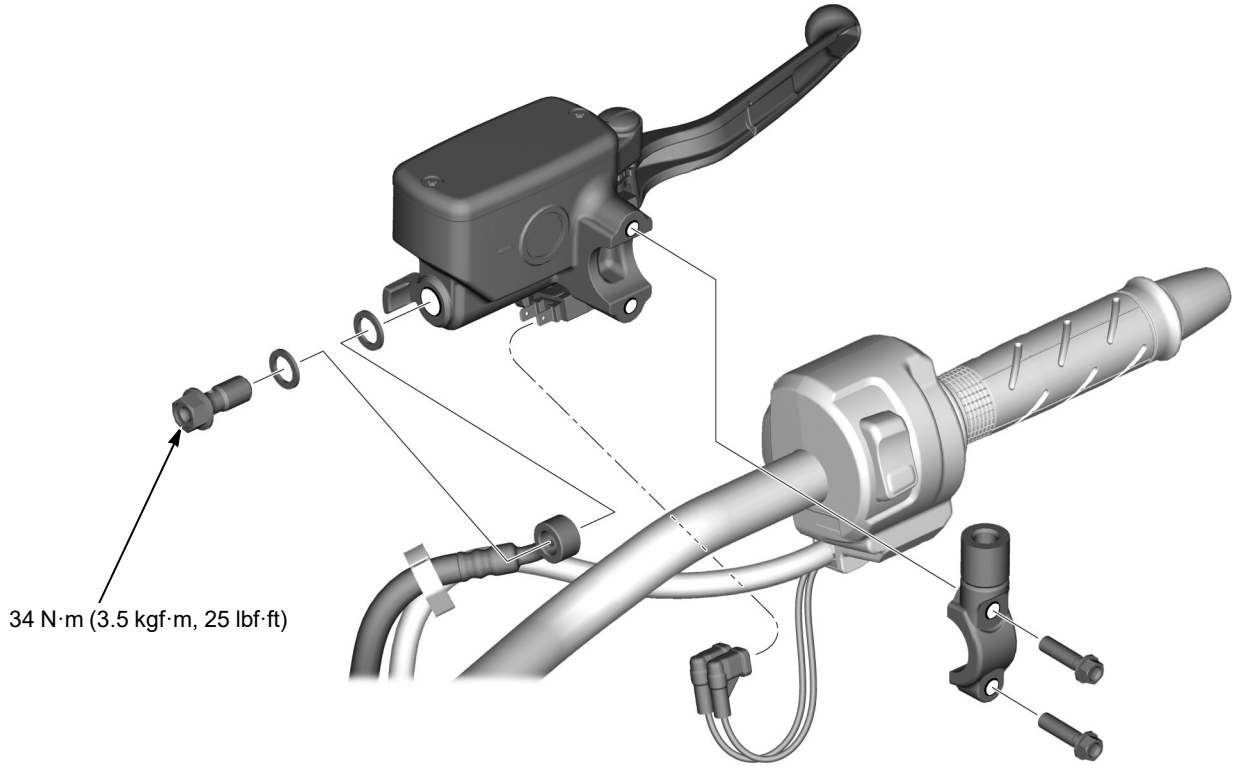
Brake lever/pedal soft or spongy
- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master piston cups
- Worn brake pad/disc
- Contaminated caliper
- Contaminated master cylinder
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master piston
- Bent brake lever/pedal

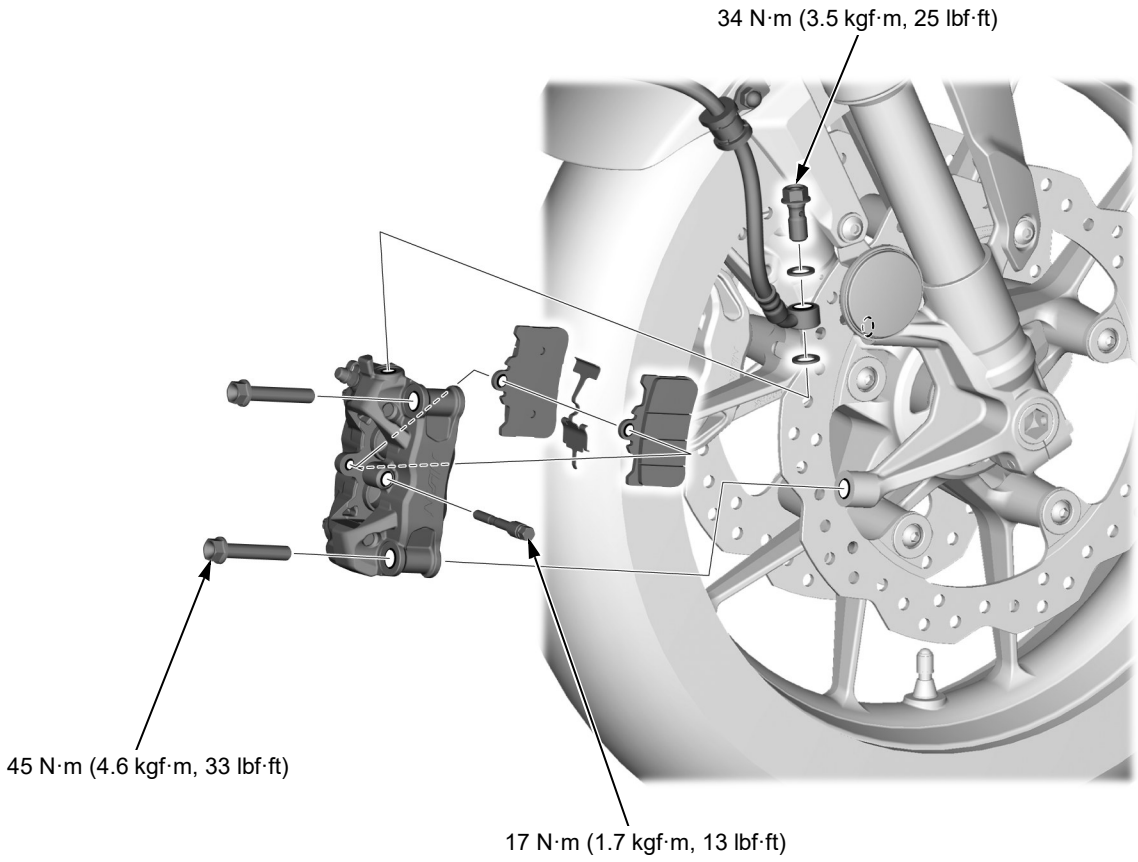
Brake lever/pedal hard
- Clogged/restricted fluid passage
- Sticking/worn caliper piston
- Caliper not sliding properly
- Worn caliper piston seal
- Sticking/worn master piston
- Bent brake lever/pedal

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
- Clogged master cylinder port
- Sticking master cylinder piston

COMPONENT LOCATION

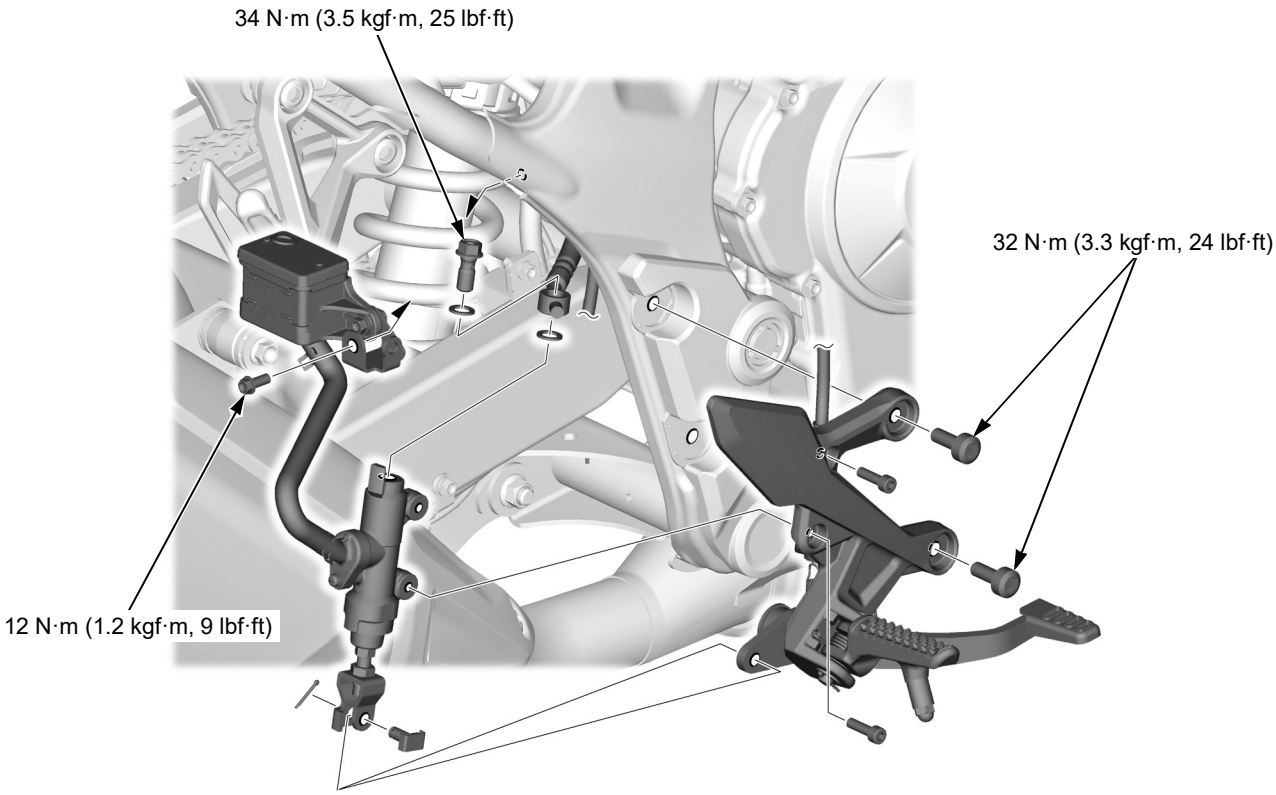
FRONT:

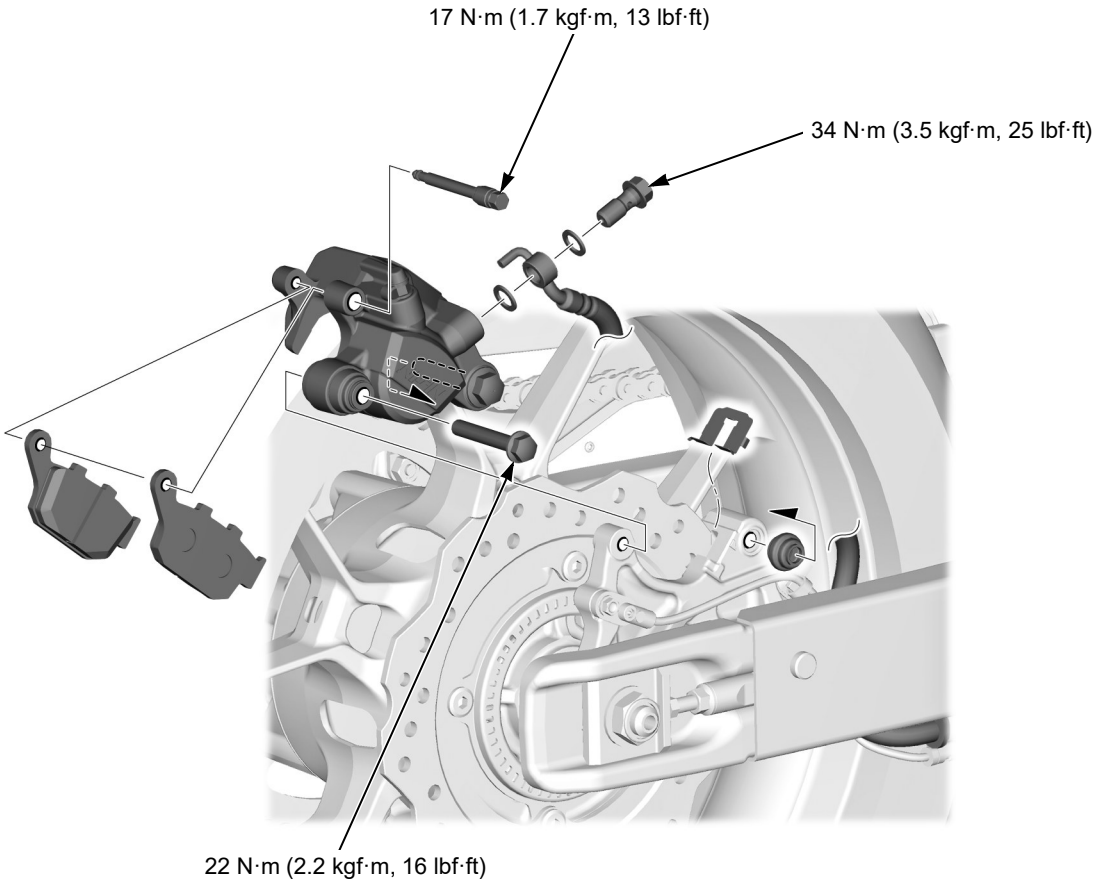




HYDRAULIC BRAKE

REAR:





BRAKE FLUID REPLACEMENT/AIR BLEEDING

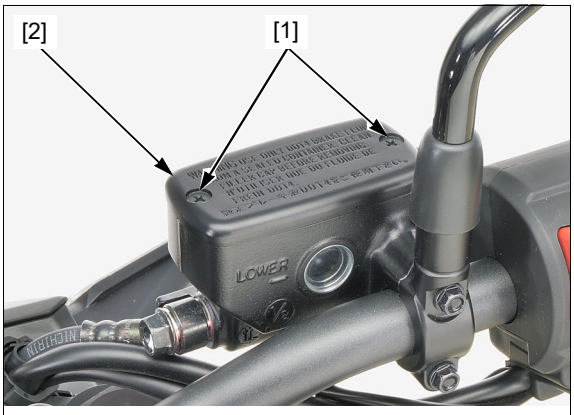
BRAKE FLUID DRAINING

FRONT

Turn the handlebar so the reservoir is level.

Remove the following:

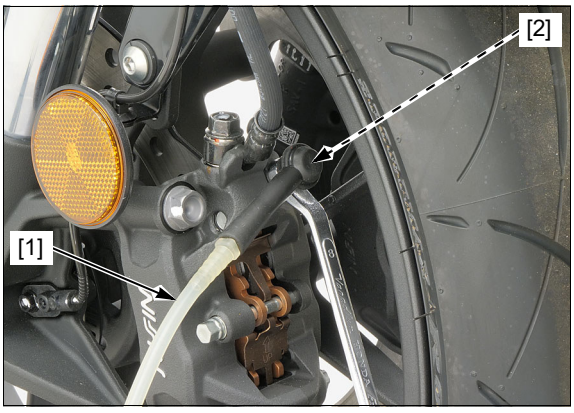
– Screws [1]
– Reservoir cap [2]
– Set plate [3]
– Diaphragm [4]



Connect a bleed hose [1] to the caliper bleed valve [2].

Loosen the bleed valve and pump the brake lever until no more fluid flows out of the bleed valve.

Close the bleed valve.

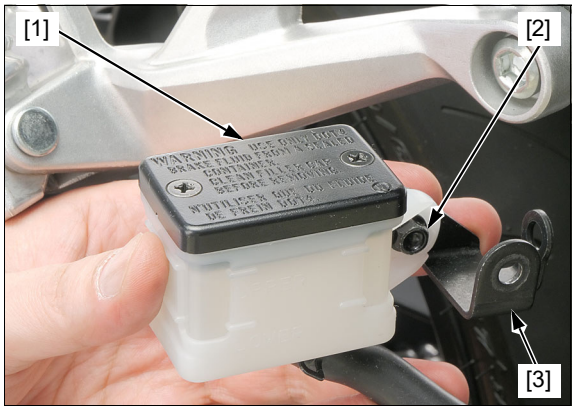


HYDRAULIC BRAKE

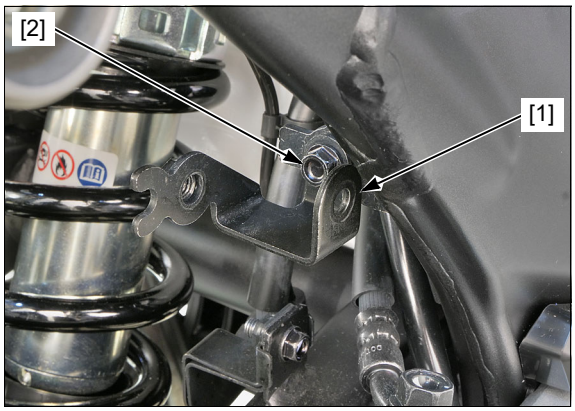
REAR

Remove the reservoir stay mounting bolt [1].

Hold the reservoir [1] and remove the reservoir mounting bolt [2] and reservoir stay [3].

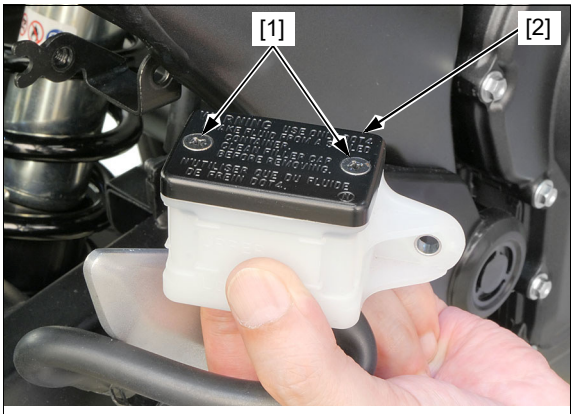


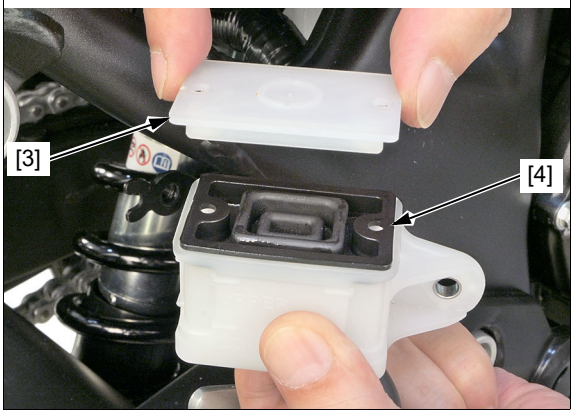
Temporarily install the reservoir stay [1] with the mounting bolt [2] as shown.



Remove the following:

– Screws [1]
– Reservoir cap [2]
– Set plate [3]
– Diaphragm [4]





Temporarily install the reservoir [1] onto the stay [2] with the mounting bolt [3].

Connect a bleed hose [1] to the caliper bleed valve [2].

Loosen the bleed valve and pump the brake pedal until no more fluid flows out of the bleed valve.

Close the bleed valve.

BRAKE FLUID FILLING/AIR BLEEDING

Fill the reservoir to the upper level line [1] with DOT 4 brake fluid from a sealed container.

Connect a commercially available brake bleeder to the bleed valve.

Operate the brake bleeder and loosen the bleed valve.

Check the fluid level often while bleeding to prevent air from being pumped into the system.

If an automatic refill system is not used, add fluid when the fluid level in the reservoir is low.

Perform the bleeding procedure until the system is completely flushed/bled.

Close the bleed valve and operate the brake lever or pedal. If it still feels spongy, bleed the system again.

If the brake bleeder is not available, use the following procedure.

Connect a bleed hose to the bleed valve.

Pump up the system pressure with the brake lever/pedal until the lever/pedal resistance is felt.

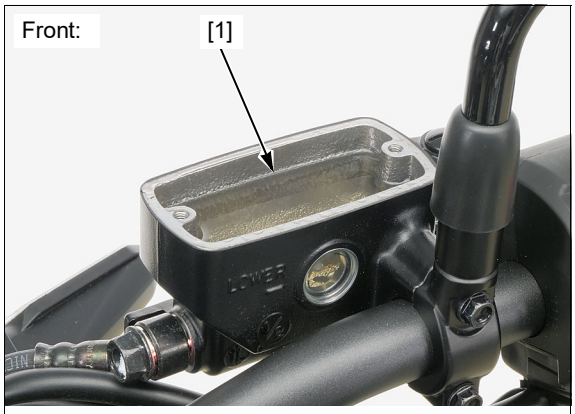
Do not release the brake lever or pedal until the bleed valve has been closed.

1. Squeeze the brake lever or depress the brake pedal all the way, and loosen the bleed valve 1/4 of a turn. Wait several seconds and then close it.
2. Release the brake lever/pedal slowly and wait several seconds after it reaches the end of its travel.
3. Repeat the steps 1 and 2 until there are no air bubbles in the bleed hose.

After bleeding the system completely, tighten the bleed valve to the specified torque.

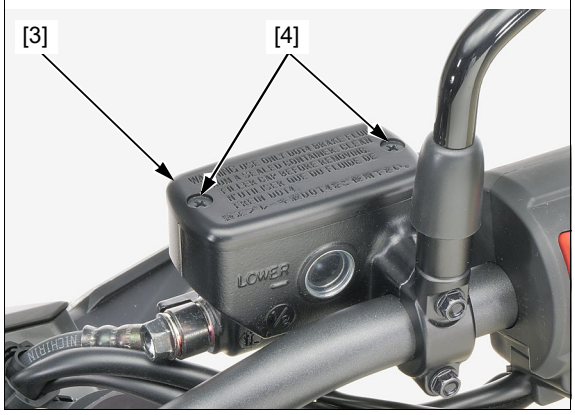
TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

Fill the reservoir to the upper level line with DOT 4 brake fluid.



For front brake: Install the diaphragm [1], set plate [2], reservoir cap [3] and tighten the screws [4] to the specified torque.

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

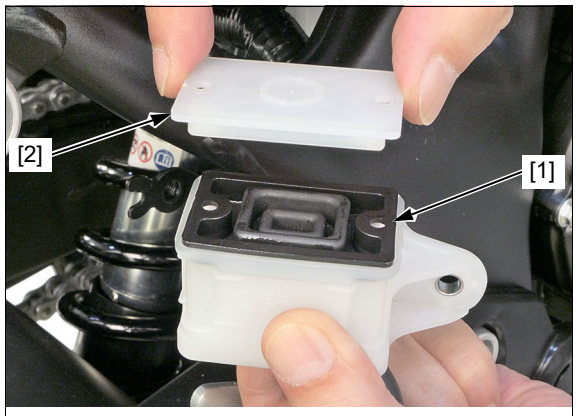


For rear brake: Remove the reservoir mounting bolt [1] and reservoir [2].

Install the diaphragm [1], set plate [2], reservoir cap [3] and tighten the screws [4] to the specified torque.

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

Install the reservoir and tighten the mounting bolt.



Remove the reservoir stay mounting bolt [1] and reservoir stay [2].

Install the reservoir stay [1] and reservoir mounting bolt [2] to the reservoir [3] as shown.

Install and tighten the reservoir stay mounting bolt [1].

BRAKE PAD/DISC

BRAKE PAD REPLACEMENT

NOTE:

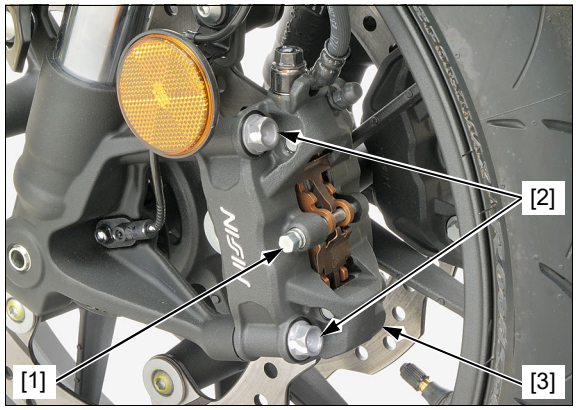
- Always replace the brake pads in pairs to ensure even disc pressure.
- Check the fluid level in the reservoir as this operation causes the fluid level to rise.

FRONT

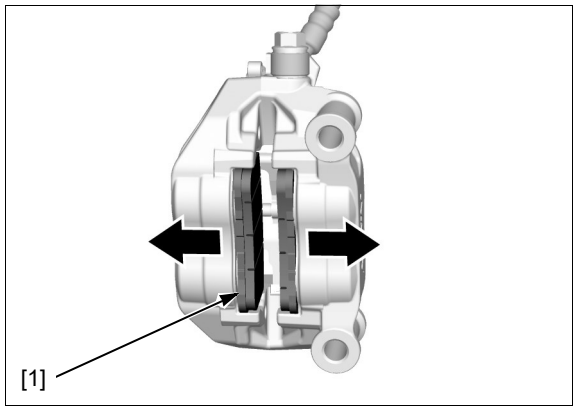
Loosen the brake pad pin [1].

Do not operate the brake lever after removing the brake caliper.

Remove the brake caliper mounting bolts [2] and brake caliper [3].



Push the caliper pistons all the way in to allow installation of new brake pads by pushing the brake pads [1] with a screwdriver or equivalent.



HYDRAULIC BRAKE

Remove the brake pad pin [1], then remove the brake pads [2] and pad spring [3].

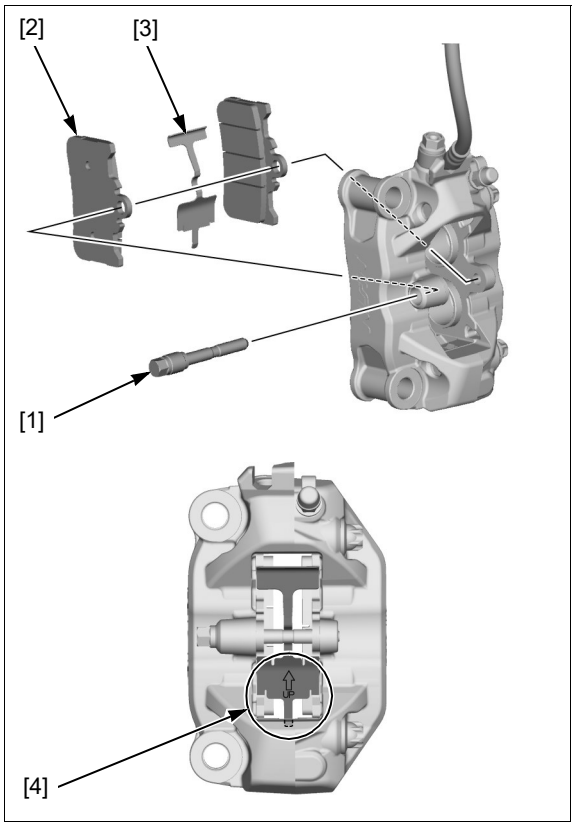
Clean the inside of the caliper body especially around the caliper pistons.

Install new brake pads into the caliper body.

Set the pad spring and install the pad pin.

NOTE:

- Do not tighten the pad pin yet.
- Install the pad spring with its arrow marks [4] facing up.



Install the brake caliper to the fork leg so that the disc is positioned between the pads.

Install the brake caliper with new mounting bolts [1].

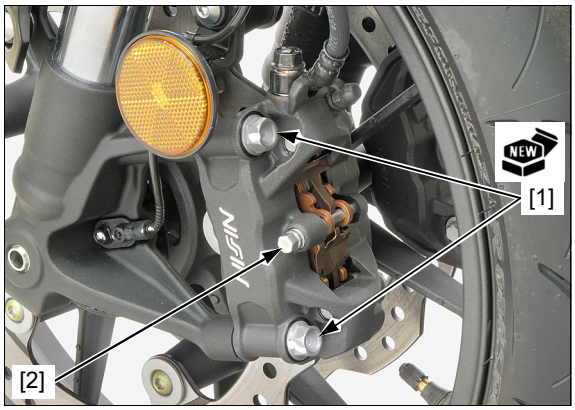
Tighten the caliper mounting bolts to the specified torque.

TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)

Tighten the pad pin [2] to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

Operate the brake lever to seat the caliper pistons against the pads.



REAR

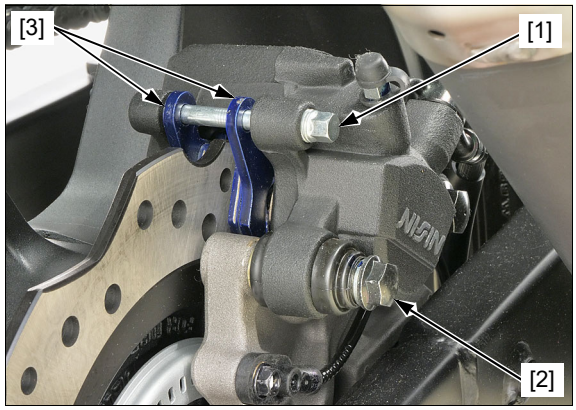
Loosen the pad pin [1] and remove the caliper bolt [2].

Do not operate the brake pedal after removing the pads.

Pivot the caliper body up, and remove the pad pin and brake pads [3].

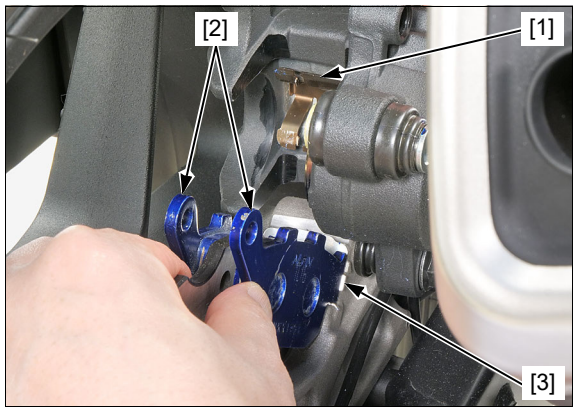
NOTE:

- If the pad spring was removed, apply Honda Bond A or equivalent to the retainer seating surface.



Make sure the pad spring [1] is installed in position.

Install the brake pads [2] so that their ends are rest on the pad retainer [3] properly.



Lower the caliper body and loosely install a new caliper bolt [1].

Be sure the stopper ring [2] on the pad pin [3] is in good condition, and replace it with a new one if necessary.

Coat the stopper ring with silicone grease.

Install the pad pin by pushing the pads [4] against the pad spring to align the pad pin holes in the pads and caliper body.

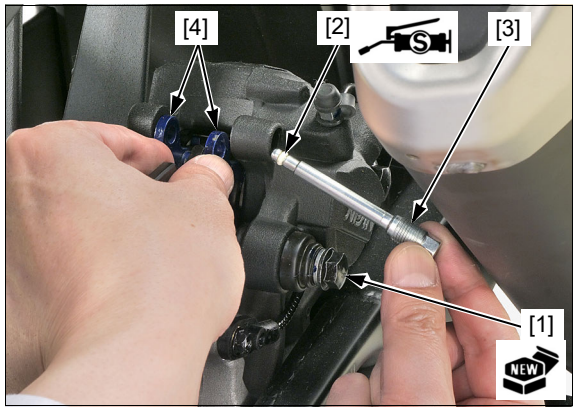
Tighten the caliper bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Tighten the pad pin to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

Operate the brake pedal to seat the caliper piston against the pads.



BRAKE DISC INSPECTION

Visually inspect the brake disc for damage or cracks.

Measure the brake disc according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-9) and replace if necessary.

FRONT MASTER CYLINDER

REMOVAL/INSTALLATION

Drain the brake fluid from the front brake hydraulic system (page 18-5).

When removing the oil bolt, cover the end of the brake hose to prevent contamination.

Remove the following:

– Right rearview mirror (page 2-11)
– Brake light switch connectors [1]
– Oil bolt [2]
– Sealing washers [3]
– Brake hose [4]
– Bolts [5]
– Master cylinder holder [6]
– Master cylinder [7]

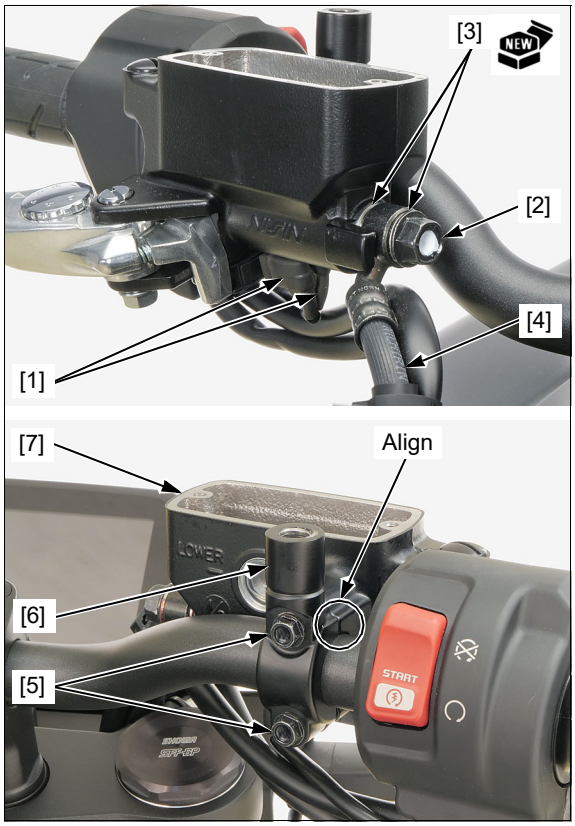
Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washers with new ones.
- Align the edge of the master cylinder with the punch mark on the handlebar, and tighten the upper bolt first then tighten the lower bolt.
- Be sure to rest the eyelet joint against the master cylinder stopper when tightening the brake hose oil bolt.

TORQUE:
Oil bolt:
34 N·m (3.5 kgf·m, 25 lbf·ft)

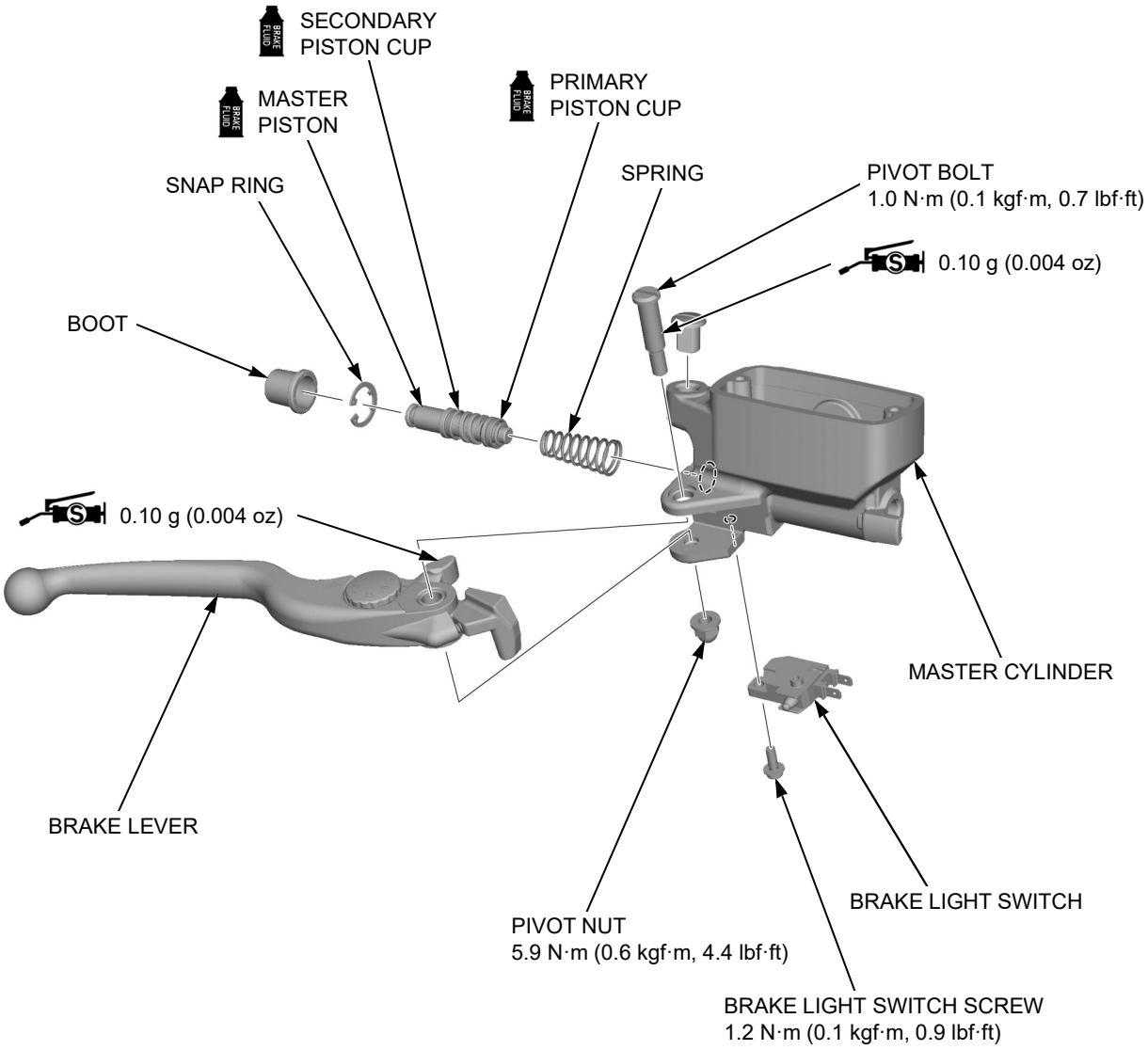
Fill and bleed the front brake hydraulic system (page 18-8).



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.



INSPECTION

Check the following parts for scoring, scratches, deterioration or damage. Replace if necessary.

– master cylinder
– master piston
– piston cups
– spring
– boot

REAR MASTER CYLINDER

REMOVAL/INSTALLATION

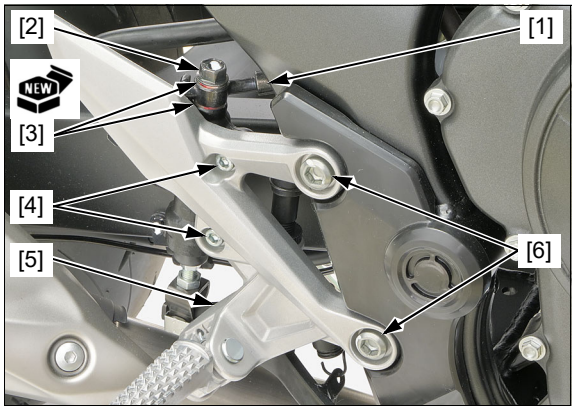
Drain the brake fluid from the rear brake hydraulic system (page 18-5).

When removing the oil bolt, cover the end of the brake hose to prevent contamination.

Disconnect the brake hose [1] by removing the oil bolt [2] and sealing washers [3].

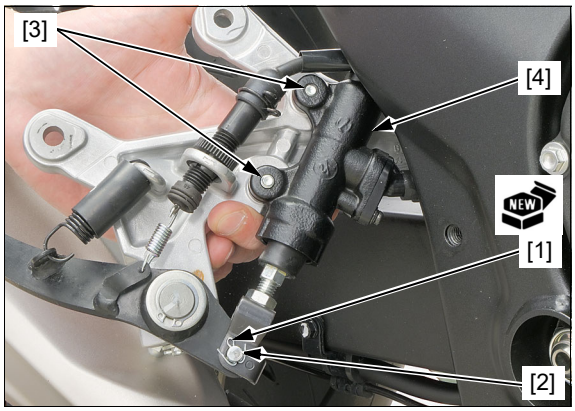
Loosen the master cylinder mounting bolts [4].

Support the right rider footpeg bracket [5] securely and remove the bracket bolts [6].



Remove the following.

– Cotter pin [1]
– Joint pin [2]
– Mounting bolts [3]
– Master cylinder [4]



Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washers and cotter pin with new ones.
- Be sure to rest the eyelet joint stopper pin against the master cylinder stopper when tightening the brake hose oil bolt.

TORQUE:

Main step mounting socket bolt:
32 N·m (3.3 kgf·m, 24 lbf·ft)

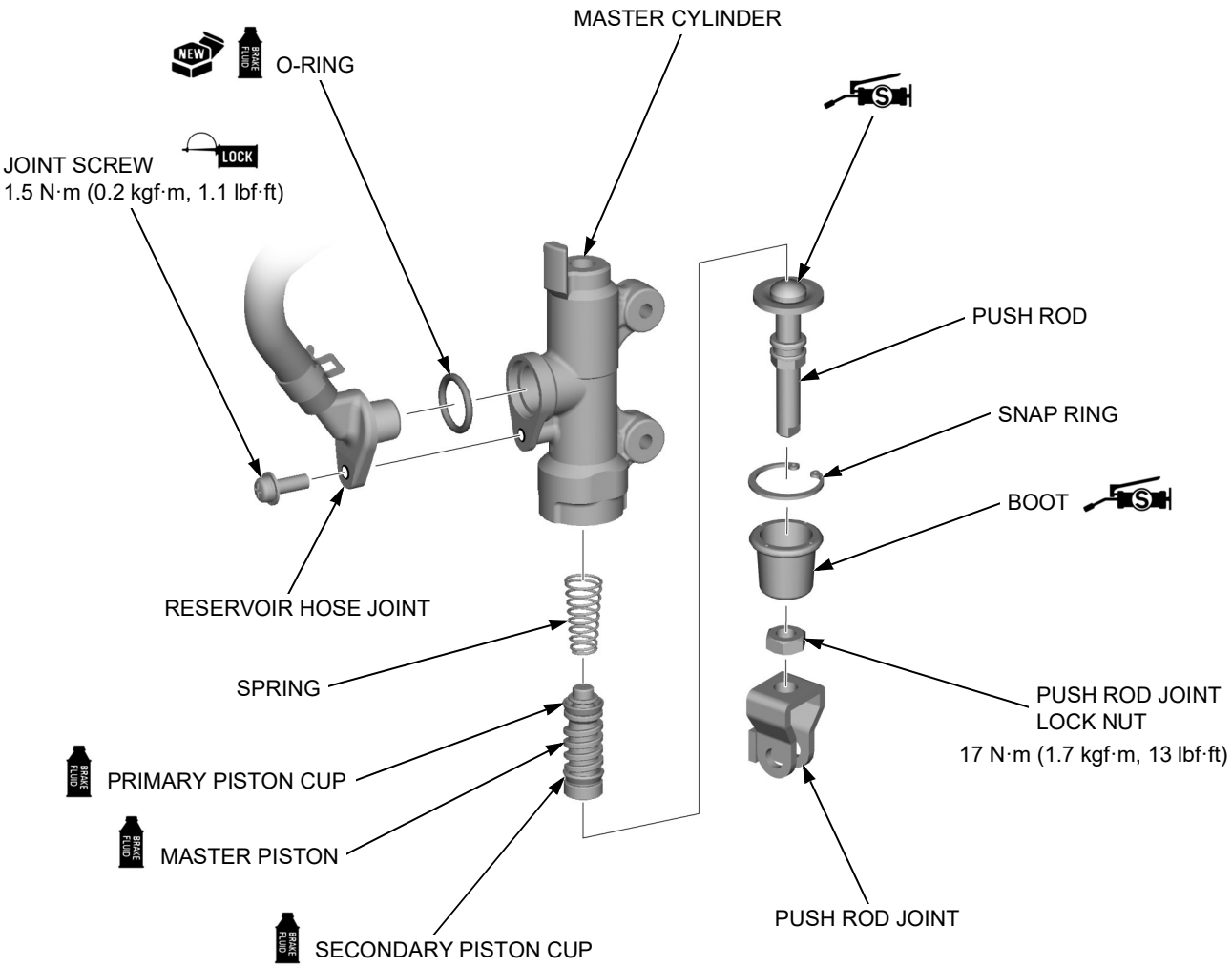
Rear master cylinder mounting bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

Oil bolt:
34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the rear brake hydraulic system (page 18-8).

DISASSEMBLY/ASSEMBLY

- Do not allow the piston cup lips to turn inside out.
- Install the snap ring with the chamfered edge facing the thrust load side and be certain it is firmly seated in the groove. Do not reuse the snap ring which could easily spin in the groove.

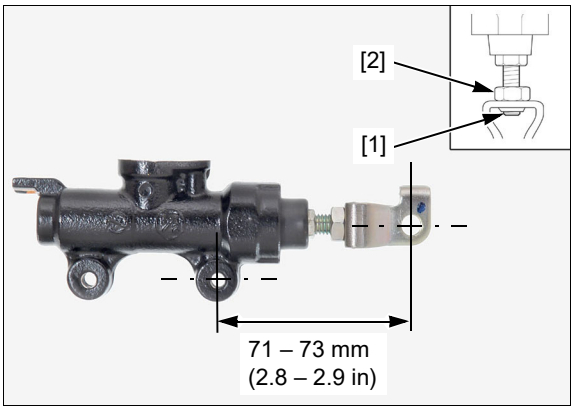


When the push rod has been disassembled, adjust the push rod length so that the distance from the center of the master cylinder lower mounting bolt hole to the center of the joint pin hole is standard length as shown.

If the length is adjusted to the longer position, make sure that the lower end of the push rod thread [1] is visible inside the joint.

After adjustment, tighten the joint nut [2] to the specified torque.

TORQUE:
Rear master cylinder push rod joint nut:
17 N·m (1.7 kgf·m, 13 lbf·ft)



INSPECTION

Check the following parts for scoring, scratches, deterioration or damage. Replace if necessary.

– Master cylinder
– Master piston
– Piston cups
– Spring
– Boot

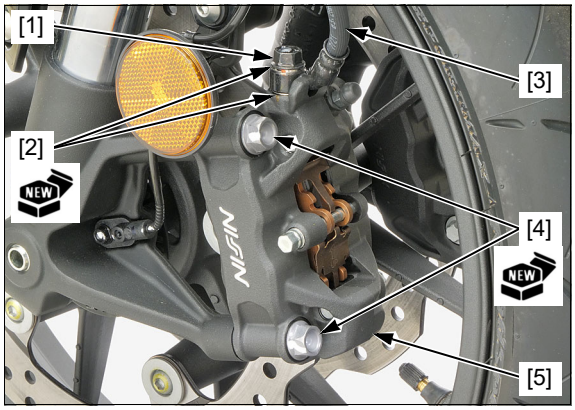
FRONT BRAKE CALIPER

REMOVAL/INSTALLATION

Drain the brake fluid from the front brake hydraulic system (page 18-5).

Remove the following:

– Brake hose oil bolt [1]
– Sealing washers [2]
– Brake hose [3]
– Caliper mounting bolts [4]
– Brake caliper [5]



Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washers and brake caliper mounting bolts with new ones.
- Be sure to set the eyelet joint into the groove when connecting the brake hose.

TORQUE:

Front brake caliper mounting bolt:
45 N·m (4.6 kgf·m, 33 lbf·ft)

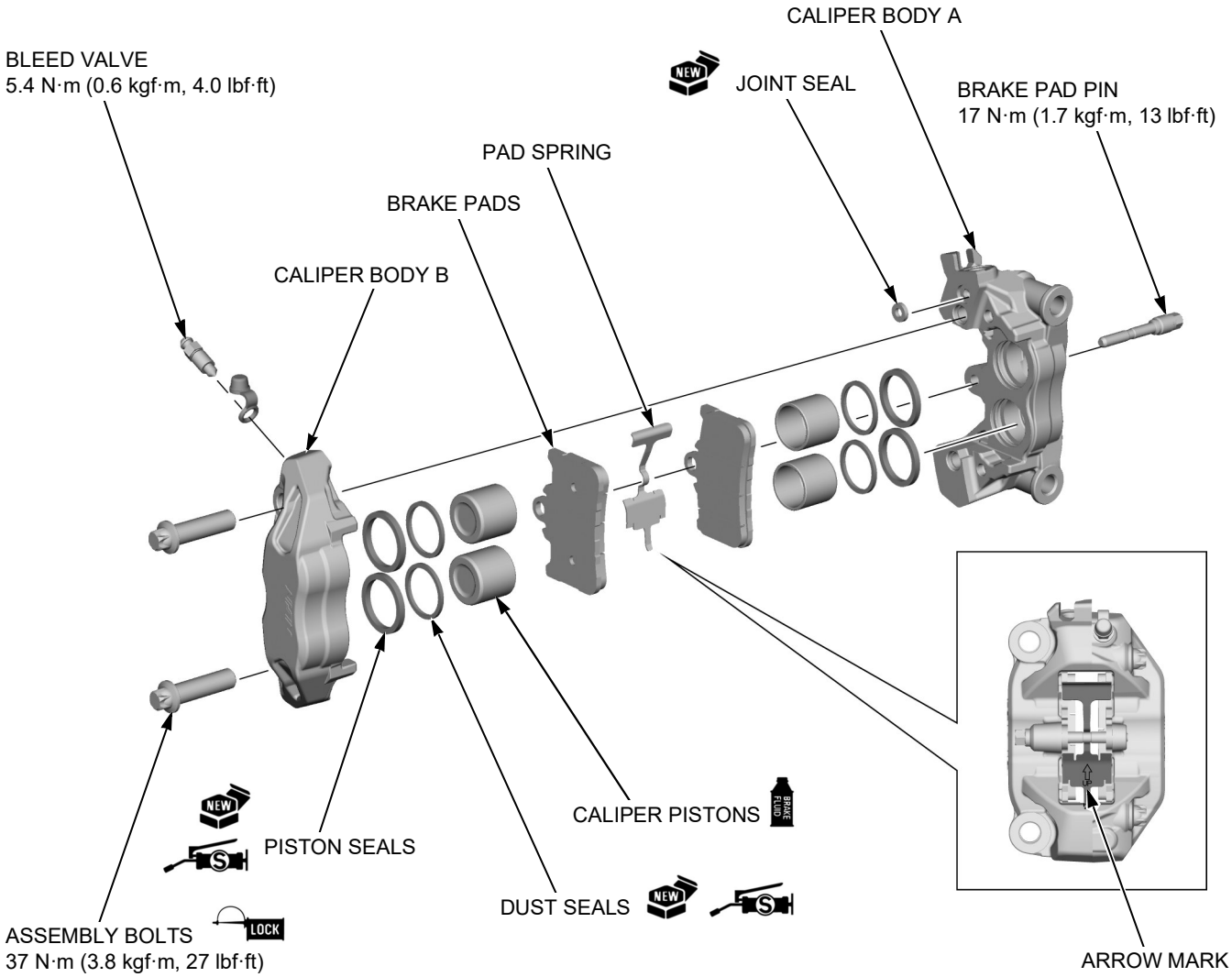
Brake hose oil bolt:
34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the front brake hydraulic system (page 18-8).

DISASSEMBLY/ASSEMBLY

For brake pad removal/installation (page 18-11).

- The caliper piston removal/installation can be done without disassembling the caliper body.
- 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.
- Be careful not to damage each piston.



INSPECTION

Check the following parts for scoring, scratches, deterioration or damage. Replace if necessary.

– Caliper cylinders
– Caliper pistons

REAR BRAKE CALIPER

REMOVAL/INSTALLATION

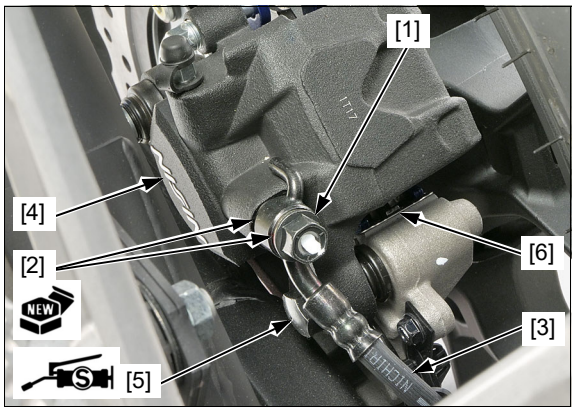
Drain the brake fluid from the rear brake hydraulic system (page 18-5).

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 pads (page 18-13)

Pivot the rear caliper [4] up, then remove the caliper pin [5] from the bracket and remove the caliper.



Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washers with new ones.
- Apply 0.4 g (0.01 oz) of silicone grease to the sliding area of the caliper pin bolt.
- Be sure to rest the eyelet stopper pin against the caliper body when tightening the oil bolt.

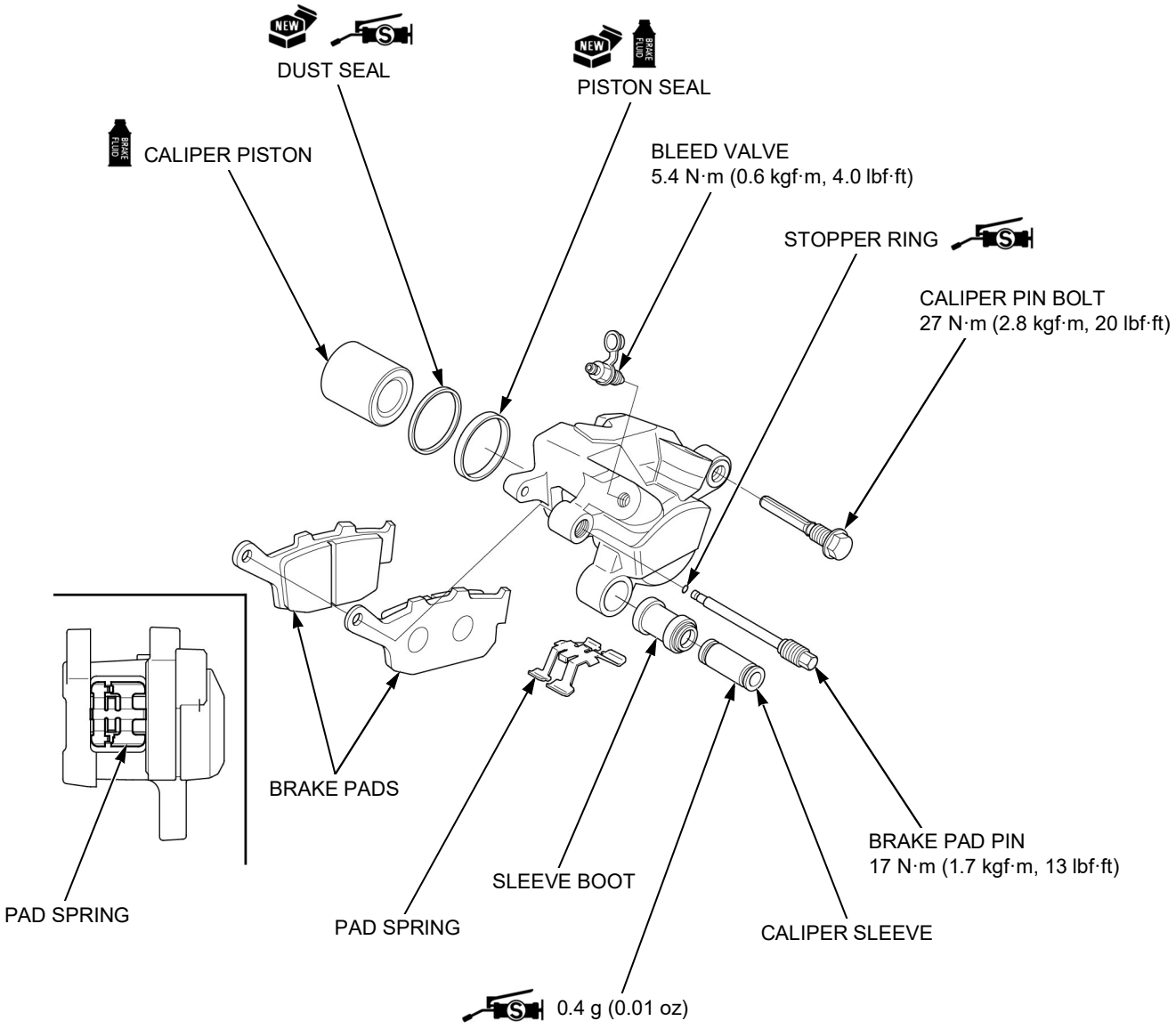
TORQUE: Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the rear brake hydraulic system (page 18-8).

DISASSEMBLY/ASSEMBLY

NOTE:

- When removing the caliper piston with compressed air, place a shop towel over the piston to prevent damaging the piston and caliper body. Do not use high pressure or bring the nozzle too close to the fluid inlet.
- Install the piston with the opening toward the pads.



INSPECTION

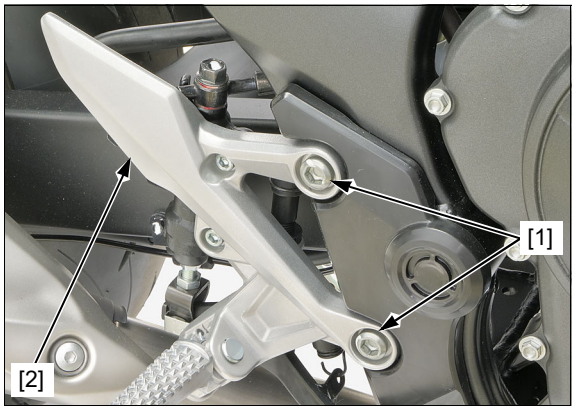
Check the following parts for scoring, scratches, deterioration or damage. Replace if necessary.

– Caliper cylinder
– Caliper piston

BRAKE PEDAL

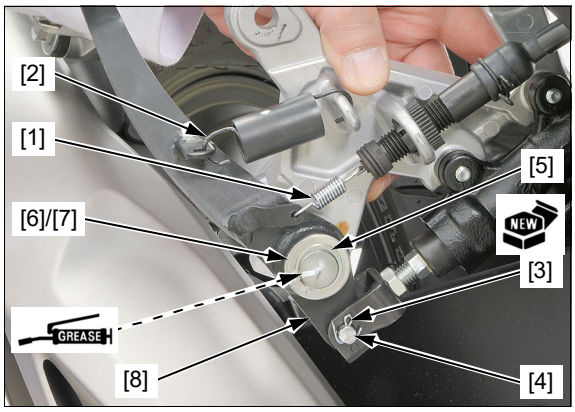
REMOVAL/INSTALLATION

Remove the socket bolts [1] and right rider footpeg bracket assembly [2].



Remove the following:

- Switch spring [1]
- Return spring [2]
- Cotter pin [3]
- Joint pin [4]
- Snap ring [5]
- Washer [6]
- Wave washer [7]
- Brake pedal [8]



Installation is in the reverse order of removal.

NOTE:

- Apply grease to the pedal pivot sliding area.
- Install the snap ring with the chamfered edge facing the thrust load side and be certain it is firmly seated in the groove. Do not reuse the snap ring which could easily spin in the groove.
- Replace the cotter pin with a new one.
- Install the each spring in the direction as shown.

TORQUE:

Main step bracket bolt:

32 N·m (3.3 kgf·m, 24 lbf·ft)

19. ANTI-LOCK BRAKE SYSTEM (ABS)

SERVICE INFORMATION

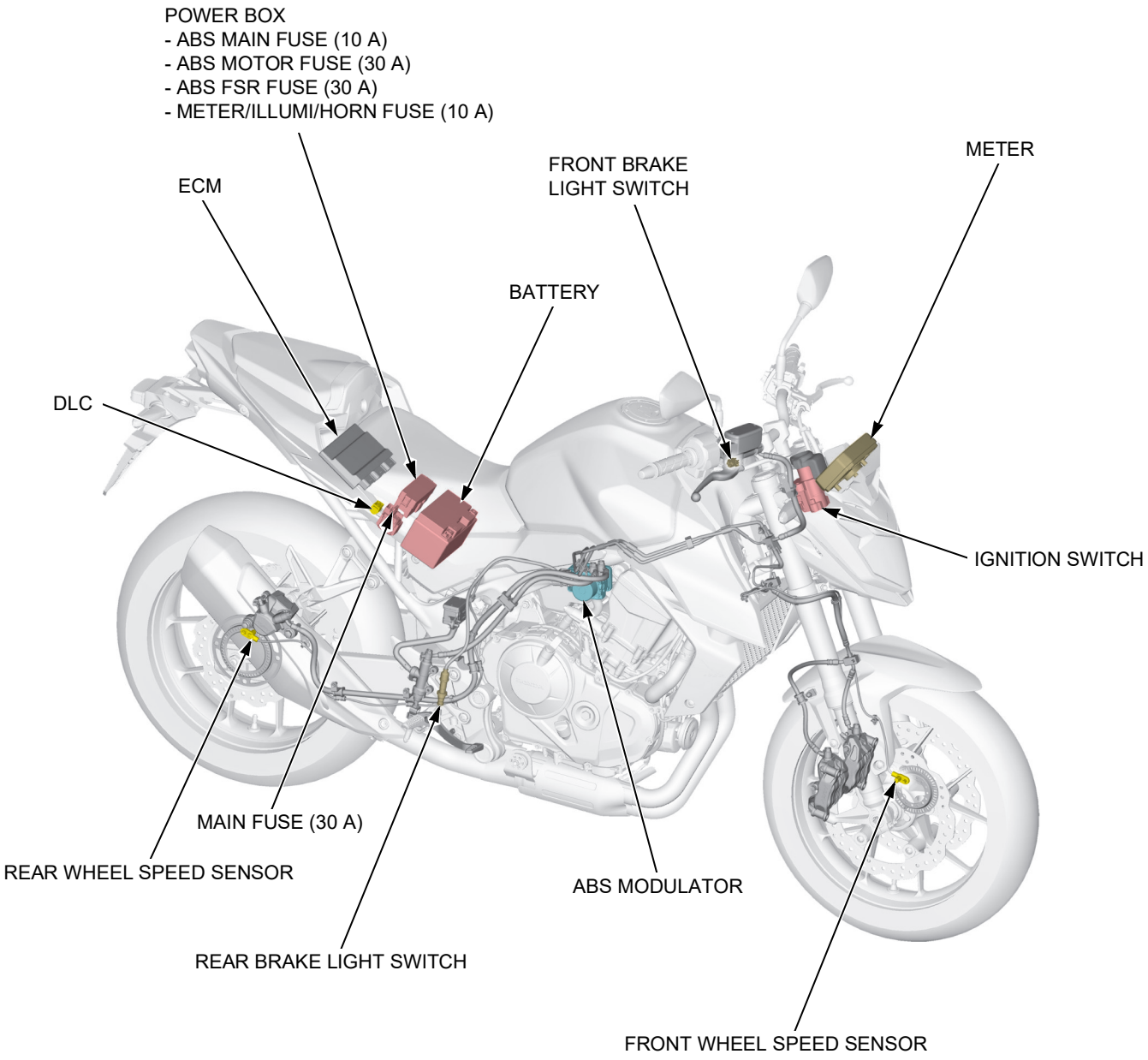
GENERAL

NOTICE

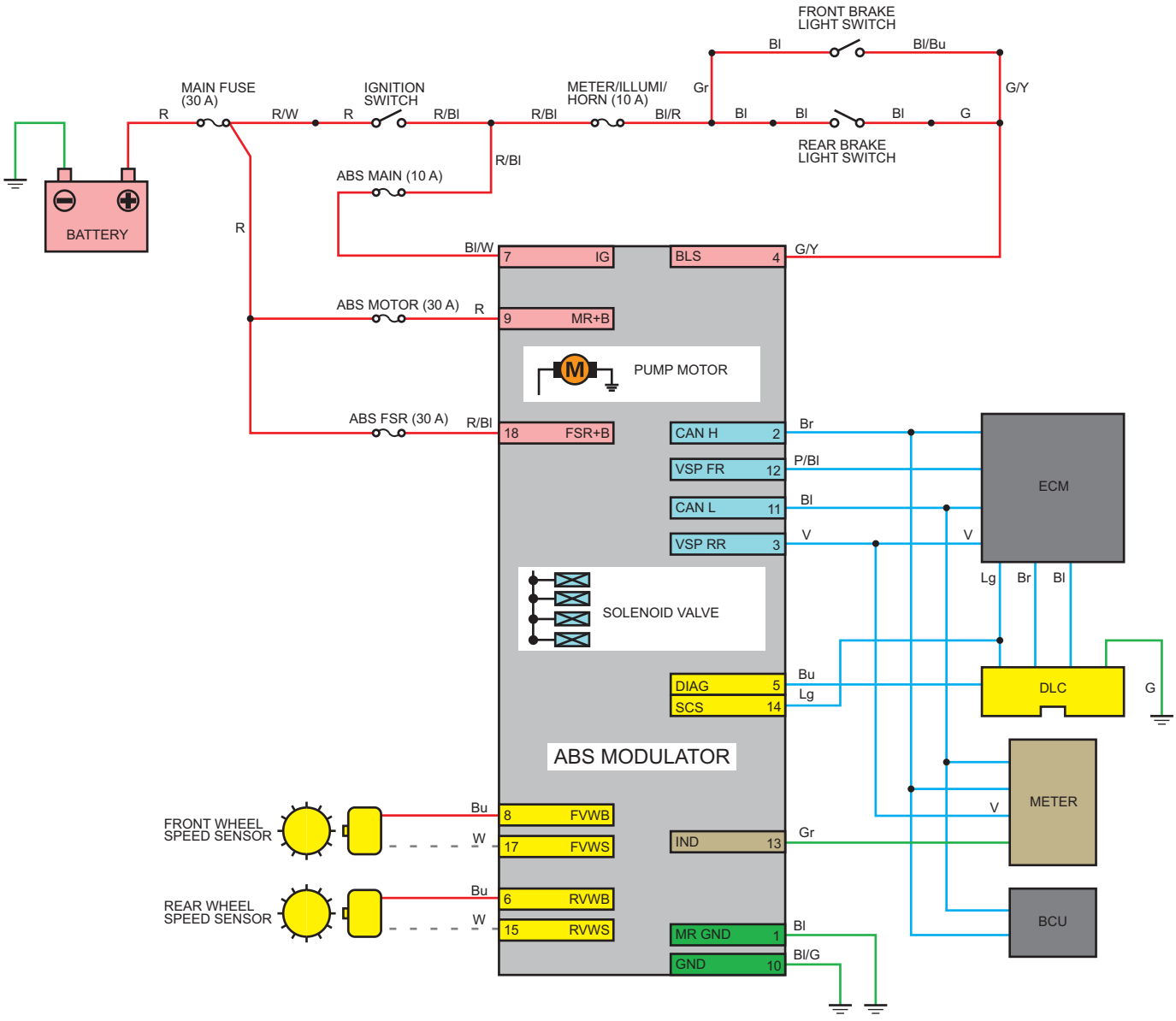
- *The ABS modulator may be damaged if dropped. Also if a connector is disconnected when current is flowing, the excessive voltage may damage the control unit. Always turn off the ignition switch before servicing.*
- *Spilling brake fluid will severely damage plastic parts and painted surfaces. It is 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 the it is faulty.
- The ABS control unit performs pre-start self-diagnosis to check whether the ABS functions normally until the vehicle speed reaches 10 km/h (6 mph). After pre-start self-diagnosis, the ABS control unit monitors the ABS functions and vehicle running condition constantly until the ignition switch is turned OFF (ordinary self-diagnosis).
- When the ABS control unit detects a problem, it stops the ABS function and switches back to the conventional brake operation, and the ABS indicator blinks or stays on. Take care during the test-ride.
- Read "ABS Troubleshooting Information" carefully, inspect and troubleshoot the ABS system according to the troubleshooting flow chart. Observe each step of the procedures one by one. Write down the DTC and probable faulty part before starting diagnosis and troubleshooting.
- Use a fully charged battery. Do not diagnose with a charger connected to the battery.
- After troubleshooting, erase the DTC and perform the pre-start self-diagnosis to be sure that the ABS indicator is operating normally (page 19-5).
- Troubles not resulting from a faulty ABS (e.g. brake disc squeak, unevenly worn brake pad) cannot be recognized by the ABS diagnosis system.
- When the wheel speed sensor and/or pulser ring is replaced, be sure to check the air gap (page 19-21).
- The following color codes are used throughout this section.

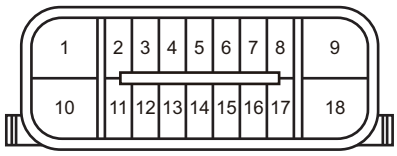
Bl = Black	Bu = Blue	P = Pink	W = White	V = Violet	Gr = Gray
Br = Brown	G = Green	R = Red	Y = Yellow	Lg = Light green	

SYSTEM LOCATION



SYSTEM DIAGRAM





ABS MODULATOR 18P CONNECTOR (MODULATOR SIDE)

ABS TROUBLESHOOTING INFORMATION

SYSTEM DESCRIPTION

SUMMARY OF ABS PRE-START SELF-DIAGNOSIS SYSTEM

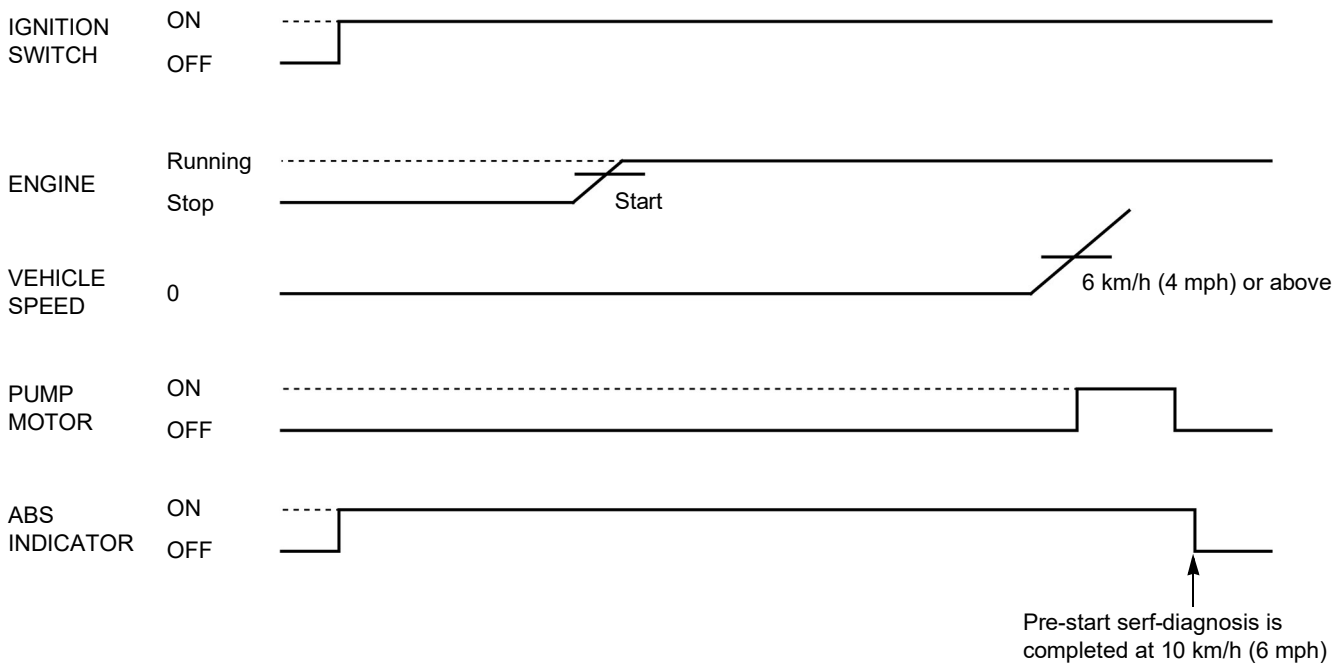
The ABS pre-start self-diagnosis system diagnoses the electrical system as well as the operating status of the modulator. When there is any abnormality, the problem and the associated part can be detected by reading the DTC.

When the motorcycle is running, pulse signals generated at the front and rear wheel speed sensors are sent to the ABS control unit. When the vehicle speed reaches approximately 6 km/h (4 mph), the ABS control unit operates the pump motor to check it. When the vehicle speed reaches 10 km/h (6 mph), the ABS control unit turns off the ABS indicator if the system is normal and the pre-start self-diagnosis is completed.

If any problem is detected, the ABS indicator blinks or comes on and stays on to notify the rider of the problem. The self-diagnosis is also made while the motorcycle is running, and the ABS indicator blinks when a problem is detected.
When the ABS indicator blinks, the cause of the problem can be identified by reading the DTC (page 19-6).

If the ABS indicator does not come on when the ignition switch is turned ON, or the ABS indicator stays on after the pre-start self-diagnosis is completed although the ABS system is normal, the ABS indicator circuit may be faulty. Follow the troubleshooting (page 19-10).

Pre-start serf-diagnosis when the system is normal:



PRE-START SELF-DIAGNOSIS PROCEDURE (Daily check)

1. Turn the ignition switch ON with the engine stop switch "○".
2. Make sure the ABS indicator comes on.
3. Start the engine.
4. Ride the motorcycle and increase the vehicle speed to approximately 10 km/h (6 mph).
5. The ABS is normal if the ABS indicator goes off.

MCS INFORMATION

Refer to the PGM-FI system (page 4-5).

ANTI-LOCK BRAKE SYSTEM (ABS)

DTC READOUT

NOTE:

- The DTC is not erased by turning the ignition switch OFF while the DTC is being output. Note that turning the ignition switch ON again does not indicate the DTC. To show the DTC again, repeat the DTC readout procedures from the beginning.
- Be sure to record the indicated DTC(s).
- After diagnostic troubleshooting, erase the DTC and perform the pre-start self-diagnosis procedure to be sure that there is no problem in the ABS (page 19-5).
- Do not apply the brake during DTC readout.

Connect the MCS to the DLC (page 4-5).

Read the DTC and follow the DTC index (page 19-8).

- 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 4-5).
2. Turn the ignition switch ON.

   The ABS indicator should come on 2 seconds (start signal) (then goes off 3.6 seconds) and starts DTC indication.

   The DTC is indicated by the number of the times of the ABS indicator blinking.

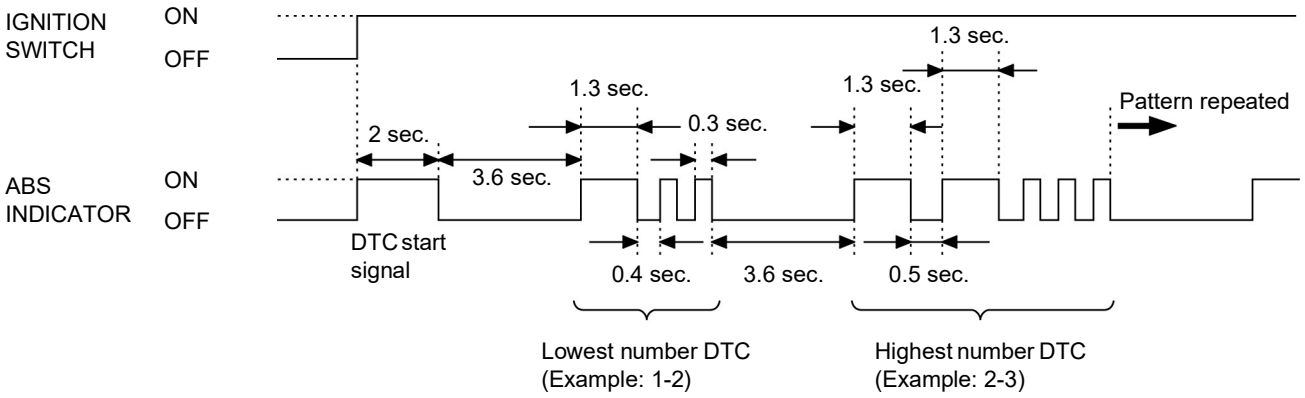
   If the DTC is not stored, the ABS indicator stays on.
3. Turn the ignition switch OFF and disconnect the SCS short connector.

   Install the removed parts in the reverse order of removal.

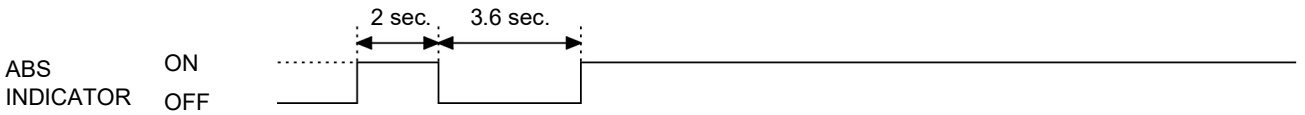
DTC INDICATION PATTERN

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:



Reading current DTC with the meter

Refer to the PGM-FI system (page 4-5).

Read the current DTC(s) and follow the DTC index (page 19-8).

Reading stored DTC with the meter

Refer to the PGM-FI system (page 4-5).

Read the stored DTC(s) and follow the DTC index (page 19-8).

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 4-5).

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

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

How to erase the DTC without MCS

1. Connect the SCS short connector to the DLC (page 4-5).
2. Turn the ignition switch ON while squeezing either brake lever. 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 short connector.

   Install the removed parts in the reverse order of removal.

CIRCUIT INSPECTION

INSPECTION AT ABS MODULATOR CONNECTOR

Refer to ABS modulator removal (page 19-24).

Disconnecting procedure:

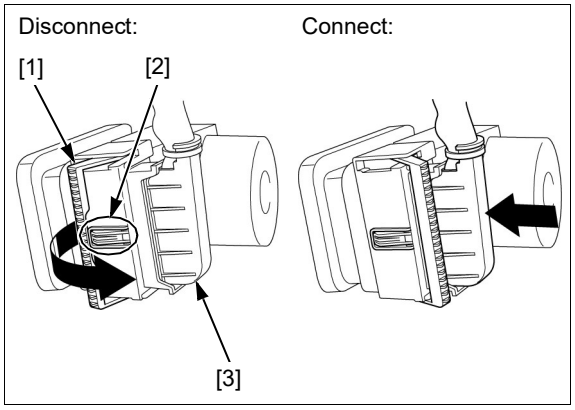
Turn the lock lever [1] to this side while pressing the lock tab [2] to release it.

Be sure the lock lever is turned all the way and disconnect the ABS modulator 18P connector [3].

Connecting procedure:

Be sure to seat the lock lever against the wire side of the connector fully. Connect the ABS modulator 18P connector by pressing it straight with turning the lock lever until the lock tab clicks.

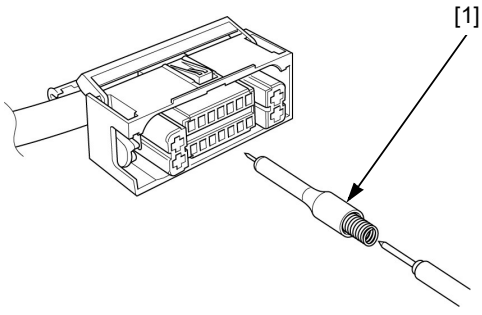
Make sure the connector is locked securely.



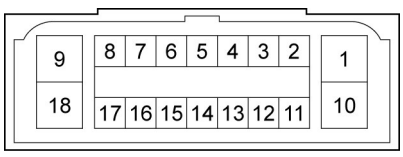
- Always clean around and keep any foreign material away from the connector before disconnecting it.
- A faulty ABS is often related to poorly connected or corroded connections. Check those connections before proceeding.
- In testing at ABS modulator 18P connector terminals (wire harness side; except No.1, No. 9, No.10 and No.18 terminals), always use the male pin prove [1]. Insert the male pin prove into the connector terminal, then connect the digital multimeter probe to the male pin prove.

TOOL:

Male Pin Prove	**07ZAJ-RDJA110**



TERMINAL LAYOUT:



(Terminal side of the wire harness)

ABS SYSTEM DTC INDEX

NOTE:

- The ABS indicator might blink in the following cases. Correct the faulty part.
  – Incorrect tire pressure.
  – Tires not recommended for the motorcycle were installed (incorrect tire size).
  – Deformation of the wheel or tire.
- The ABS indicator might blink while riding under the following conditions. This is temporary failure. Be sure to erase the DTC (page 19-7).
  Then, test-ride the motorcycle above 10 km/h (6 mph) and check the DTC (page 19-6). Ask the rider for the riding conditions in detail when the motorcycle is brought in for inspection.
  – The motorcycle has continuously run bumpy roads.
  – The front wheel leaves the ground for a long time when riding (wheelie).
  – Only either the front or rear wheel rotates.
  – The ABS operates continuously.
  – The ABS control unit has been disrupted by an extremely powerful radio wave (electromagnetic interference).

DTC	Function failure	Detection		Symptom/Fail-safe function	Refer to
		A	B		
–	ABS indicator malfunction • ABS modulator voltage input line • Indicator related wires • Meter • ABS modulator • ABS MAIN fuse (10 A)			• ABS indicator never comes ON at all	19-10
				• ABS indicator stays ON at all	19-10
1-1	Front wheel speed sensor circuit malfunction • Wheel speed sensor or related wires	○	○	• Stops ABS operation	19-12
1-2	Front wheel speed sensor malfunction • Wheel speed sensor, pulser ring or related wires • Electromagnetic interference		○	• Stops ABS operation	
1-3	Rear wheel speed sensor circuit malfunction • Wheel speed sensor or related wires	○	○	• Stops ABS operation	19-14
1-4	Rear wheel speed sensor malfunction • Wheel speed sensor, pulser ring or related wires • Electromagnetic interference		○	• Stops ABS operation	
2-1	Front pulser ring • Pulser ring or related wires		○	• Stops ABS operation	19-12
2-3	Rear pulser ring • Pulser ring or related wires		○	• Stops ABS operation	19-14
3-1	Solenoid valve malfunction (ABS modulator)	○	○	• Stops ABS operation	19-16
3-2					
3-3					
3-4					
4-1	Front wheel lock • Riding condition		○	• Stops ABS operation	19-12
4-2	Front wheel lock (Wheelie) • Riding condition		○		
4-3	Rear wheel lock • Riding condition		○	• Stops ABS operation	19-14
5-1	Pump motor lock • Pump motor (ABS modulator) or related wires • ABS MOTOR fuse (30 A)	○	○	• Stops ABS operation	19-17
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 FSR fuse (30 A)	○	○	• Stops ABS operation	19-18

DTC	Function failure	Detection		Symptom/Fail-safe function	Refer to
		A	B		
6-1	Power circuit under voltage • Input voltage (too low) • ABS MAIN fuse (10 A)	○	○	• Stops ABS operation	19-19
6-2	Power circuit over voltage • Input voltage (too high)	○	○	• Stops ABS operation	
7-1	Tire malfunction • Tire size		○	• Stops ABS operation	19-20
8-1	ABS control unit • ABS control unit malfunction (ABS modulator)	○	○	• Stops ABS operation	19-20
8-6	CAN communication malfunction	○	○	• Stops ABS operation	19-20

(A) Pre-start self-diagnosis (page 19-5).

(B) Ordinary self-diagnosis: diagnoses while the vehicle 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 meter (page 21-8).

1. Indicator Operation Inspection

Turn the ignition switch OFF.
Disconnect the ABS modulator 18P connector (page 19-24).
Turn the ignition switch ON.
Check the ABS indicator.

Does the ABS indicator come on?

YES – Faulty ABS modulator

NO – GO TO STEP 2.

2. Indicator Signal Line Short Circuit Inspection

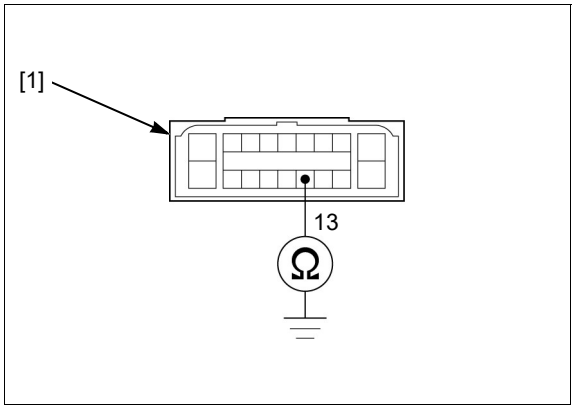
Turn the ignition switch OFF.
Check for continuity between the wire harness side ABS modulator 18P connector [1] terminal and ground.

CONNECTION: 13 – Ground

Is there continuity?

YES – Short circuit in the Gray wire

NO – Faulty meter



ABS INDICATOR STAYS ON (Indicator does not go off when the motorcycle is running)

1. Service Check Line Short Circuit Inspection

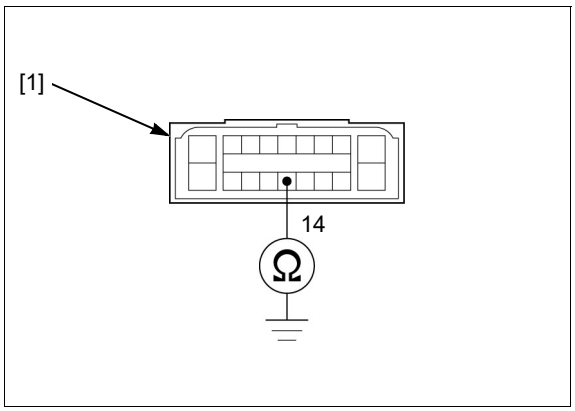
Turn the ignition switch OFF.
Disconnect the ABS modulator 18P connector (page 19-24).
Check for continuity between the wire harness side ABS modulator 18P connector [1] terminal and ground.

CONNECTION: 14 – Ground

Is there continuity?

YES – Short circuit in the Light green wire

NO – GO TO STEP 2.



2. Indicator Signal Line Open Circuit Inspection

Short the wire harness side ABS modulator 18P connector [1] terminal to the ground with a jumper wire [2].

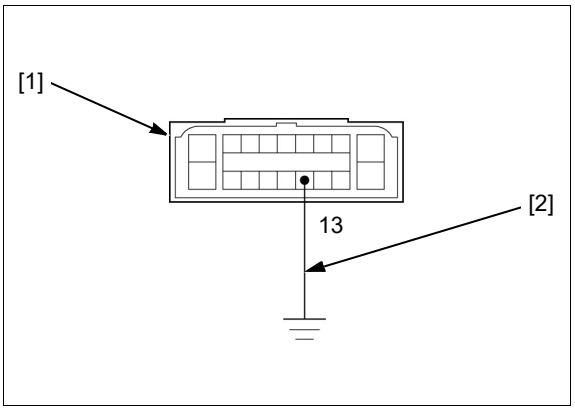
CONNECTION: 13 – Ground

Turn the ignition switch ON with the engine stop switch "".
Check the ABS indicator.

Does it go off?

YES – GO TO STEP 3.

NO – • Open circuit in the Gray wire
• Faulty meter (if the Gray wire is OK)



3. Modulator Ground Line Open Circuit Inspection

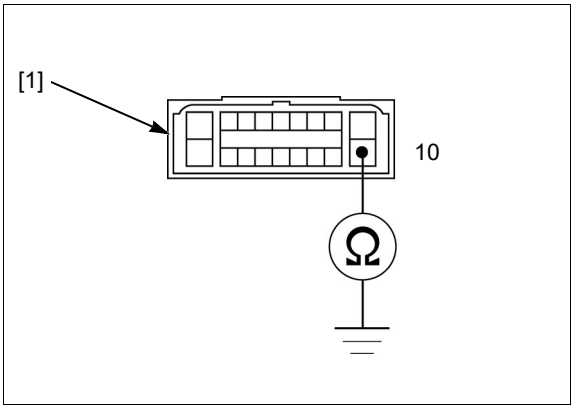
Turn the ignition switch OFF.
Check for continuity between the wire harness side ABS modulator 18P connector [1] terminal and ground.

CONNECTION: 10 – Ground

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Black/green wire



4. Fuse Inspection

Remove the power box cover (page 21-24).

Check the ABS MAIN fuse (10 A) [2] for blown.

Is the fuse blown?

YES – GO TO STEP 5.

NO – GO TO STEP 6.

5. Power Input Line Short Circuit Inspection

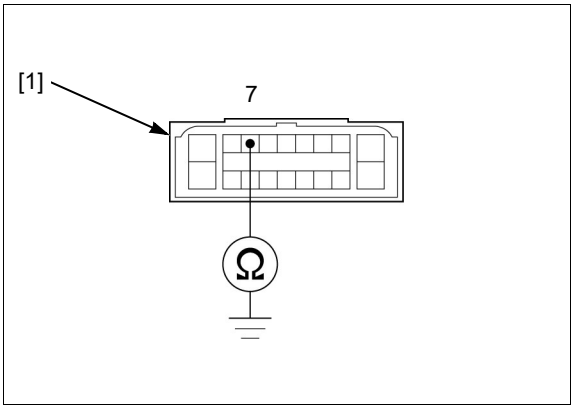
With the ABS MAIN fuse (10 A) removed, check for continuity between the wire harness side ABS modulator 18P connector [1] and ground.

CONNECTION: 7 – Ground

Is there continuity?

YES – Short circuit in Black/white wire

NO – Intermittent failure. Replace the ABS MAIN fuse (10 A) with a new one (page 21-24), and recheck.



6. Power Input Line Open Circuit Inspection

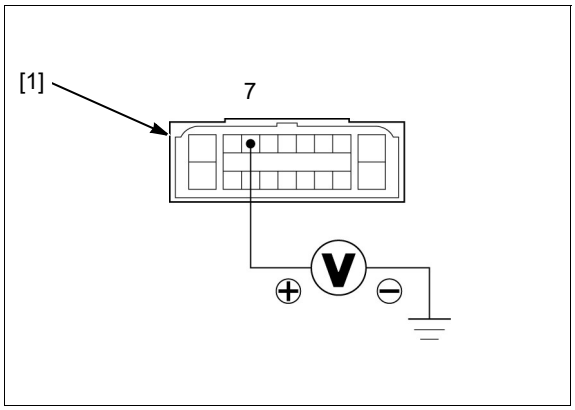
Install the ABS MAIN fuse (10 A).
Turn the ignition switch ON.
Measure the voltage between the wire harness side ABS modulator 18P connector [1] terminal and ground.

CONNECTION: 7 (+) – Ground (–)

Is there battery voltage?

YES – Faulty ABS modulator

NO – Open circuit in Black/white wire



ABS 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.
- When the ABS modulator assembly is detected to be faulty, recheck the wire harness and connector connections closely before replacing it.
- After diagnostic troubleshooting, erase the DTC (page 19-7)
  Then, test-ride the motorcycle to check that the ABS indicator operates normally during pre-start self-diagnosis (page 19-5).

DTC 1-1/1-2/2-1/4-1/4-2 (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 19-8). This is temporary failure.
  Erase the DTC (page 19-7).
  Then, test-ride the motorcycle above 30 km/h (19 mph) check that the ABS indicator operates normally (page 19-5).
- If the DTC 4-1 is indicated, check the front brake for drag.

1. Front Wheel Speed Sensor Air Gap Inspection

Measure the air gap between the axle holder and pulser ring (page 19-21).

Is the air gap correct?

YES – GO TO STEP 2.

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

2. Front Wheel 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 and wheel speed sensor, 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?

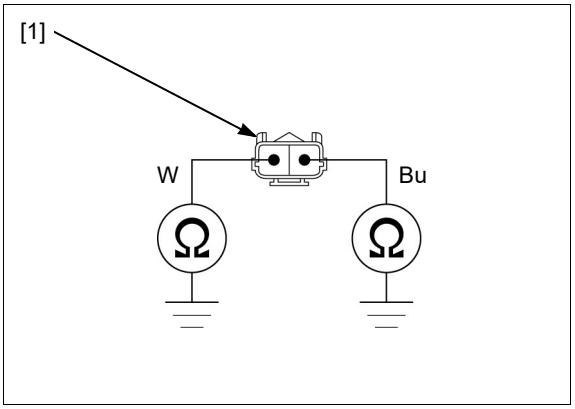
YES – GO TO STEP 3.

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 connector (page 19-21).
Check for continuity between each terminal of the sensor side front wheel speed sensor 2P connector [1] and ground.

CONNECTION: White – Ground
Blue – Ground



Is there continuity?

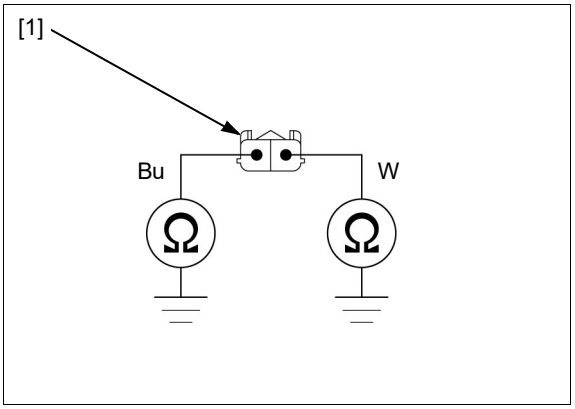
YES – Faulty front wheel speed sensor

NO – GO TO STEP 4.

4. Front Wheel Speed Sensor Line Short Circuit Inspection

Disconnect the ABS modulator 18P connector (page 19-24).
Check for continuity between each terminal of the wire harness side front wheel speed sensor 2P 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 ABS modulator 18P connector [1] terminals with a jumper wire [2].

   CONNECTION: 8 – 17

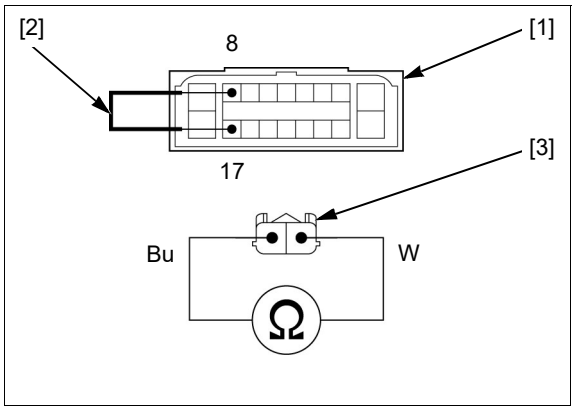
   Check for continuity between the wire harness side front wheel speed sensor 2P connector [3] terminals.

   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 Front Wheel Speed Sensor**

   Replace the front wheel speed sensor with a new one (page 19-21).
   Connect the ABS modulator 18P and front wheel speed sensor 2P connectors.
   Erase the DTC (page 19-7).
   Test-ride the motorcycle above 30 km/h (19 mph).
   Recheck the DTC (page 19-6).

   Is the DTC 1-1, 1-2, 2-1, 4-1 or 4-2 indicated?

   YES – Faulty ABS modulator

   NO – Faulty original front wheel speed sensor

DTC 1-3/1-4/2-3/4-3 (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 19-8). This is temporary failure.
  Erase the DTC (page 19-7).
  Then test-ride the motorcycle above 30 km/h (19 mph) and check that the ABS indicator operates normally (page 19-5).
- If the DTC 4-3 is indicated, check the front brake for drag.

1. **Rear Wheel Speed Sensor Air Gap Inspection**

   Measure the air gap between the rear brake caliper bracket and rear pulser ring (page 19-23).

   Is the air gap correct?

   YES – GO TO STEP 2.

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

2. Rear Wheel Speed Sensor Condition Inspection

Inspect the area around the rear wheel speed sensor:
Check that there is no iron or other magnetic deposits between the rear pulser ring and rear wheel speed sensor, and the rear pulser ring slots for obstructions.
Check the installation condition of the rear pulser ring or rear wheel speed sensor for looseness.
Check the rear pulser ring and rear wheel speed sensor tip for deformation or damage (e.g., chipped pulser ring teeth).

Are the sensor and pulser ring in good condition?

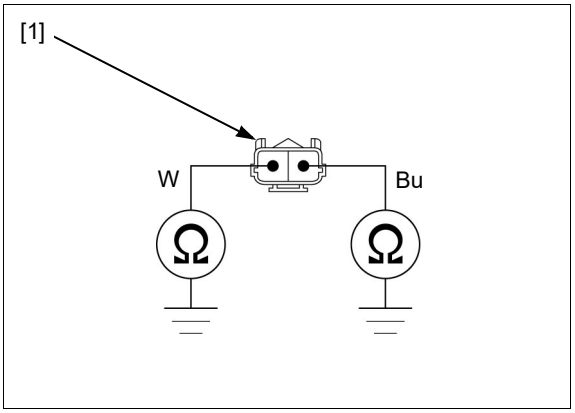
YES – GO TO STEP 3.

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 connector (page 19-23).
Check for continuity between each terminal of the sensor side rear wheel speed sensor 2P connector [1] and ground.

CONNECTION: White – Ground
Blue – Ground



Is there continuity?

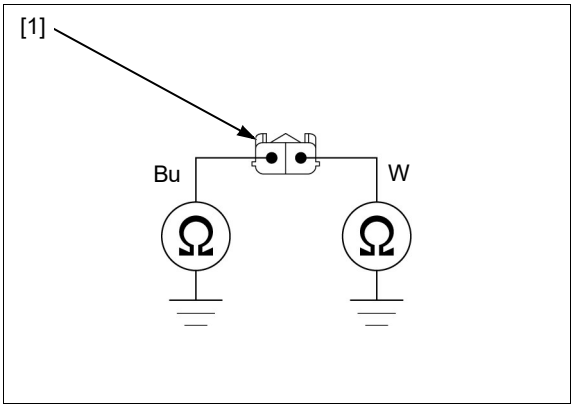
YES – Faulty rear wheel speed sensor

NO – GO TO STEP 4.

4. Rear Wheel Speed Sensor Line Short Circuit Inspection

Disconnect the ABS modulator 18P connector (page 19-24).
Check for continuity between each terminal of the wire harness side rear wheel speed sensor 2P connector [1] and ground.

CONNECTION: White – Ground
Blue – Ground



Is there continuity?

YES – • Short circuit in the White wire
• Short circuit in the Blue wire

NO – GO TO STEP 5.

5. Rear Wheel Speed Sensor Line Open Circuit Inspection

Short the wire harness side ABS modulator 18P connector [1] terminals with a jumper wire [2].

CONNECTION: 6 – 15

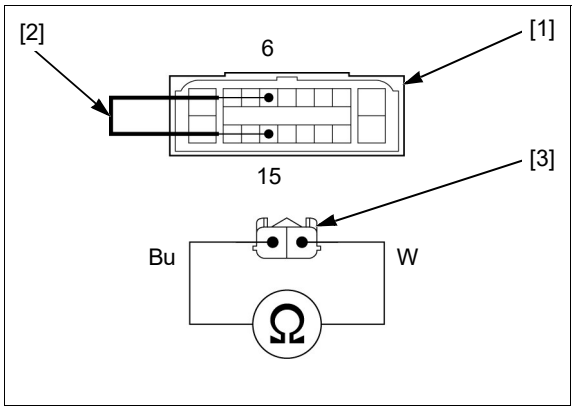
Check for continuity between the wire harness side rear wheel speed sensor 2P connector [3] terminals.

CONNECTION: White – Blue

Is there continuity?

YES – GO TO STEP 6.

NO – • Open circuit in White wire
• Open circuit in Blue wire



6. Failure Reproduction with a New Speed Sensor

Replace the rear wheel speed sensor with a new one (page 19-23).
Connect the ABS modulator 18P and rear wheel speed sensor 2P connectors.
Erase the DTC (page 19-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-6).

Is the DTC 1-3, 1-4, 2-3, or 4-3 indicated?

YES – Faulty ABS modulator

NO – Faulty original rear wheel speed sensor

DTC 3-1/3-2/3-3/3-4 (Solenoid Valve)

1. Failure Reproduction

Erase the DTC (page 19-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-6).

Is the DTC 3-1, 3-2, 3-3 or 3-4 indicated?

YES – Faulty ABS modulator

NO – Solenoid valve is normal (intermittent failure).

DTC 5-1/5-2/5-3 (Pump Motor)

1. Fuse Inspection

Turn the ignition switch OFF.
Remove the power box cover (page 21-24).
Check the ABS MOTOR fuse (30 A) for blown.

Is the fuse blown?

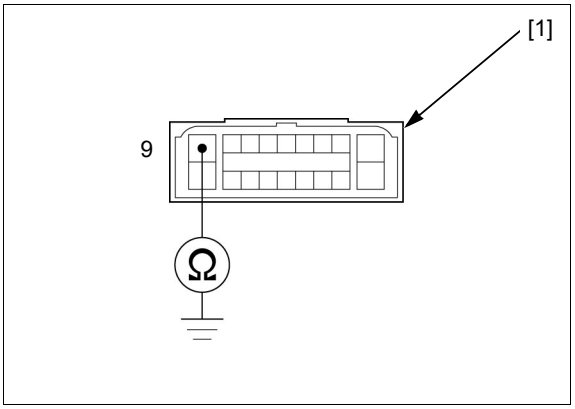
YES – GO TO STEP 2.

NO – GO TO STEP 3.

2. Motor Power Input Line Short Circuit Inspection

Disconnect the ABS modulator 18P connector (page 19-24).
With the ABS MOTOR fuse (30 A) removed, check for continuity between the wire harness side ABS modulator 18P connector [1] terminal and ground.

CONNECTION: 9 – Ground



Is there continuity?

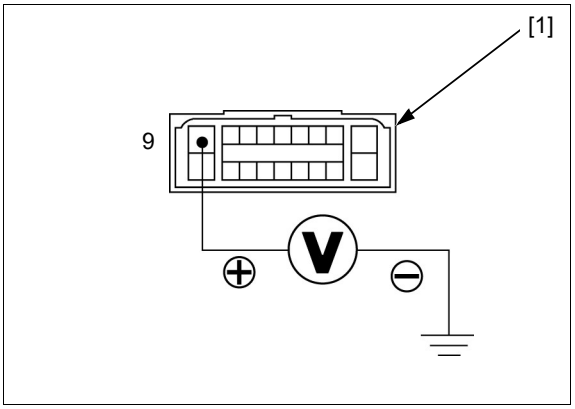
YES – Short circuit in the Red wire between the power box and ABS modulator 18P connector

NO – Intermittent failure. Replace the ABS MOTOR fuse (30 A) with a new one (page 21-24), and recheck.

3. Motor Power Input Line Open Circuit Inspection

Install the ABS MOTOR fuse (30 A).
Disconnect the ABS modulator 18P connector (page 19-24).
Measure the voltage between the wire harness side ABS modulator 18P connector [1] terminal and ground.

CONNECTION: 9 (+) – Ground (–)



Is there battery voltage?

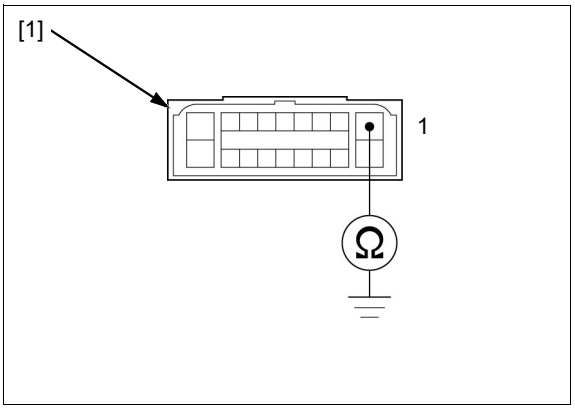
YES – GO TO STEP 4.

NO – Open circuit in the Red wire between the battery and ABS modulator 18P connector

4. Motor Power Ground Line Open Circuit Inspection

Turn the ignition switch OFF.
Check for continuity between the wire harness side ABS modulator 18P connector [1] terminal and ground.

CONNECTION: 1 – Ground



Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in the Black wire

5. Failure Reproduction

Turn the ignition switch OFF.
Connect the ABS modulator 18P connector.
Erase the DTC (page 19-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-6).

Is the DTC 5-1, 5-2 or 5-3 indicated?

YES – Faulty ABS modulator

NO – Pump motor is normal (intermittent failure).

DTC 5-4 (Fail Safe Relay)

1. Fuse Inspection

Turn the ignition switch OFF.

Remove the power box cover (page 21-24).
Check the ABS FSR fuse (30 A) for blown.

Is the fuse blown?

YES – GO TO STEP 2.

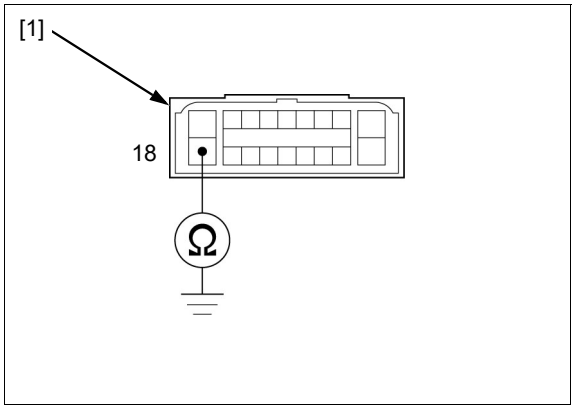
NO – GO TO STEP 3.

2. Relay Input Line Short Circuit Inspection

Disconnect the ABS modulator 18P connector (page 19-24).

With the ABS FSR fuse (30 A) removed, check for continuity between the wire harness side ABS modulator 18P connector [1] terminal and ground.

CONNECTION: 18 – Ground



Is there continuity?

YES – Short circuit in the Red/black wire between the power box and ABS modulator 18P connector

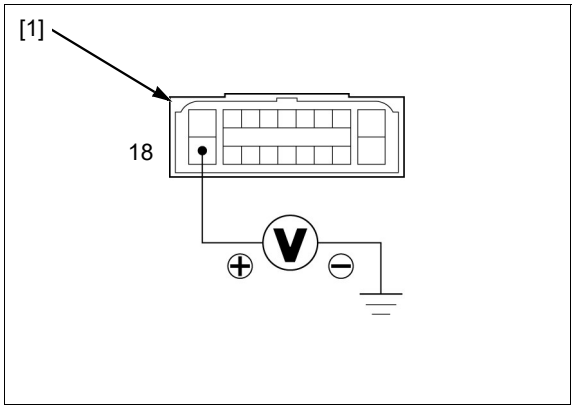
NO – Intermittent failure. Replace the ABS FSR fuse (30 A) with a new one (page 21-24), and recheck.

3. Relay Power Input Line Open Circuit Inspection

Install the ABS FSR fuse (30 A).

Measure the voltage between the wire harness side ABS modulator 18P connector [1] terminal and ground.

CONNECTION: 18 (+) – Ground (–)



Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in the Red/black wire between the battery and ABS modulator 18P connector

4. Failure Reproduction

Turn the ignition switch OFF.

Connect the ABS modulator 18P connector.

Erase the DTC (page 19-7).

Test-ride the vehicle above 30 km/h (19 mph).
Recheck the DTC (page 19-6).

Is the DTC 5-4 indicated?

YES – Faulty ABS modulator

NO – Fail safe relay is normal (intermittent failure).

DTC 6-1/6-2 (Power Circuit)

1. Fuse Inspection

Turn the ignition switch OFF.
Remove the power box cover (page 21-24).
Check the ABS MAIN fuse (10 A) for blown.

Is the fuse blown?

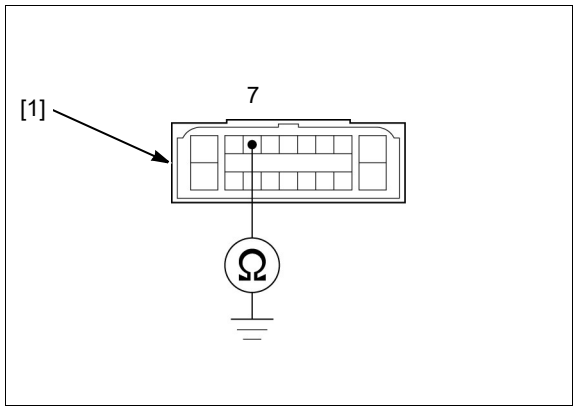
YES – GO TO STEP 2.

NO – GO TO STEP 3.

2. Power Input Line Short Circuit Inspection

Disconnect the ABS modulator 18P connector (page 19-24).
With the ABS MAIN fuse (10 A) removed, check for continuity between the wire harness side ABS modulator 18P connector [1] and ground.

CONNECTION: 7 – Ground



Is there continuity?

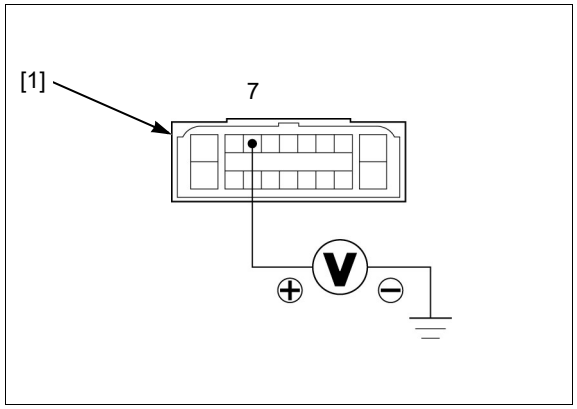
YES – Short circuit in Black/white wire

NO – Intermittent failure. Replace the ABS MAIN fuse (10 A) with a new one (page 21-24), and recheck.

3. Power Input Line Open Circuit Inspection

Install the ABS MAIN fuse (10 A).
Turn the ignition switch ON.
Measure the voltage between the wire harness side ABS modulator 18P connector [1] terminal and ground.

CONNECTION: 7 (+) – Ground (–)



Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in Black/white wire

4. **Failure Reproduction**

   Turn the ignition switch OFF.
   Connect the ABS modulator 18P connector.
   Erase the DTC (page 19-7).
   Test-ride the motorcycle above 30 km/h (19 mph).
   Recheck the DTC (page 19-6).

   Is the DTC 6-1 or 6-2 indicated?

   YES – Faulty ABS modulator

   NO – Power circuit is normal (intermittent failure)

DTC 7-1 (Tire)

NOTE:

- Check the following and correct the faulty part.
  – Incorrect tire pressure.
  – Tires not recommended for the motorcycle were installed (incorrect tire size).
  – Deformation of the wheel or tire.

1. **Failure Reproduction**

   If the above items are normal, recheck the DTC indication:
   Erase the DTC (page 19-7).
   Test-ride the motorcycle above 30 km/h (19 mph).
   Recheck the DTC (page 19-6).

   Is the DTC 7-1 indicated?

   YES – Faulty ABS modulator

   NO – Tire size is normal (intermittent failure)

DTC 8-1 (ABS Control Unit)

1. **Failure Reproduction**

   Erase the DTC (page 19-7).
   Test-ride the motorcycle above 30 km/h (19 mph).
   Recheck the DTC (page 19-6).

   Is the DTC 8-1 indicated?

   YES – Faulty ABS modulator

   NO – ABS control unit is normal (intermittent failure)

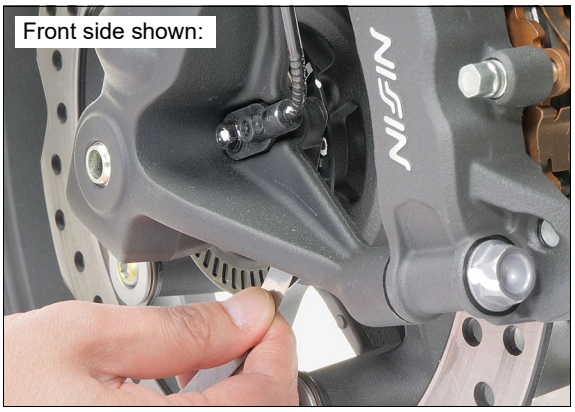
DTC 8-6 (CAN COMMUNICATION)

Refer to PGM-FI troubleshooting:

– DTC U0001: page 4-56

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 between the caliper bracket and pulser ring at several points by turning the wheel slowly.

It must be within specification.

STANDARD:
Front: 0.68 – 1.07 mm (0.027 – 0.042 in)
Rear: 0.53 – 1.12 mm (0.021 – 0.044 in)

The air gap cannot be adjusted.

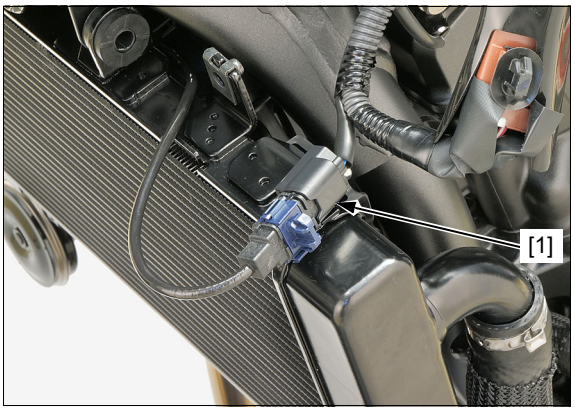
If it is not within specification, check each part for deformation, looseness or damage.

Check the caliper bracket for damage, and replace if necessary.

Check the pulser ring for deformation or damage, and replace if necessary.

– Front pulser ring (page 16-13)
– Rear pulser ring (page 17-6)

FRONT WHEEL SPEED SENSOR REMOVAL/INSTALLATION



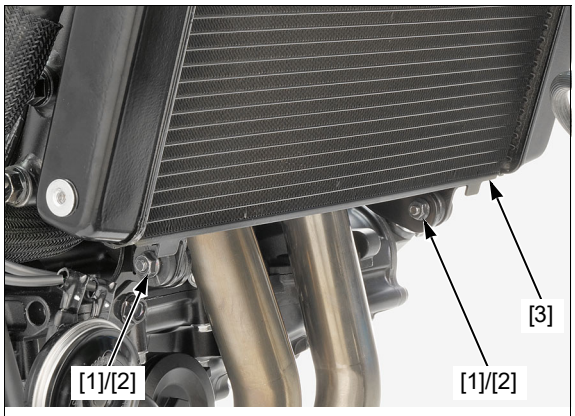
Remove the shrouds B (page 2-9).

Disconnect the front wheel speed sensor 2P connector [1].

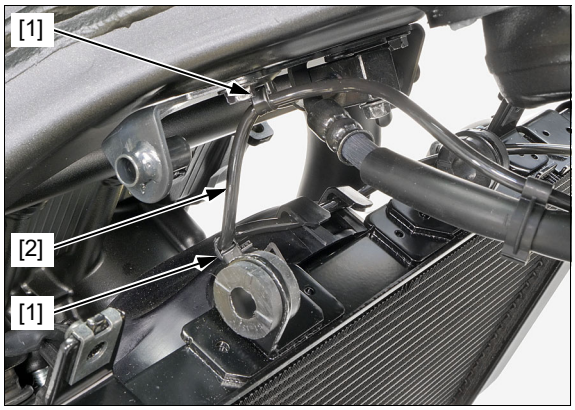
Remove the nuts [1] and radiator mount bolts [2].

Remove the radiator [3] from the stay [4].

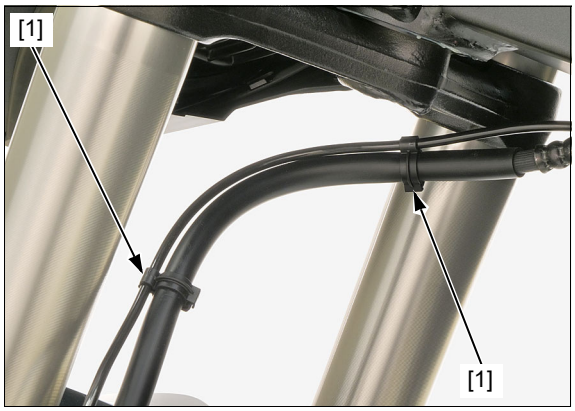
Pull down the radiator.



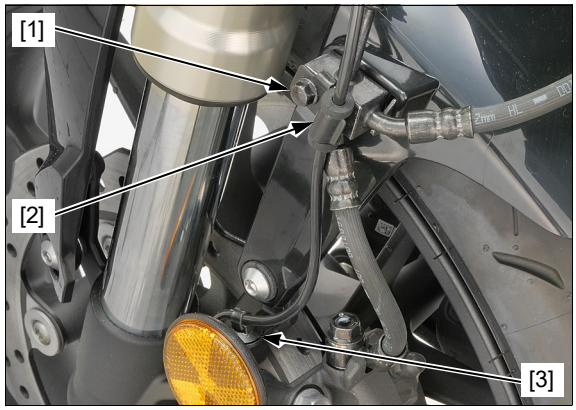
Remove the harness clips [1] and sensor wire [2] from the fan cover.



Release the sensor wire clamps [1].



Remove the bolt [1], wire clamp [2] and harness clip [3].

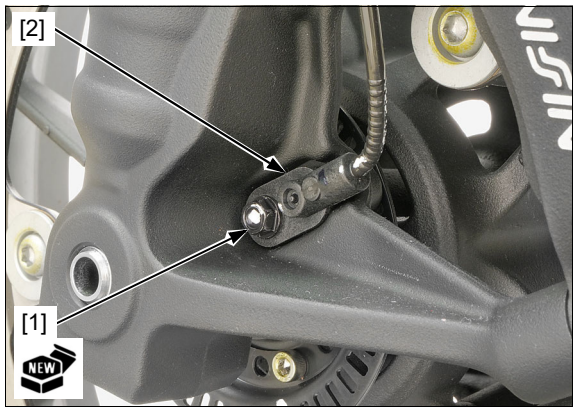


Remove the mounting bolt [1] and front wheel speed sensor [2].

Installation is in the reverse order of removal.

NOTE:

- Clean the sensor tip and sensor installation area (caliper bracket of the fork slider) thoroughly, and be sure that no foreign materials are allowed.
- Replace the front wheel speed sensor mounting bolt with a new one.
- Check the clearance between the caliper bracket and pulser ring is specified air gap (page 19-21).

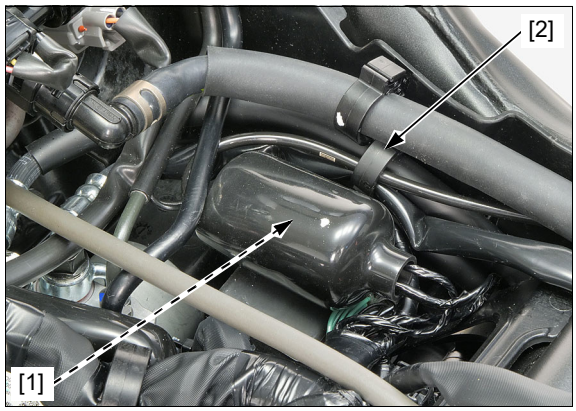


REAR WHEEL SPEED SENSOR REMOVAL/INSTALLATION

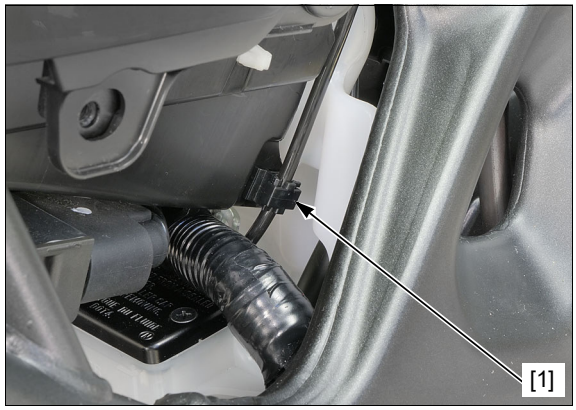
Lift and support the fuel tank (page 7-6).

Disconnect the rear wheel speed sensor 2P connector [1].

Remove the harness clip [2].



Remove the harness clip [1].



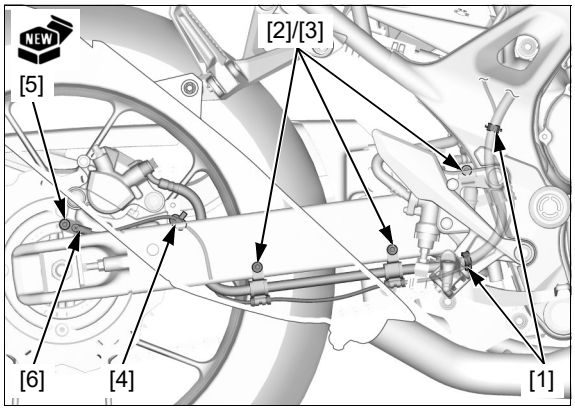
Remove the following:

– Wire clamps [1]
– Bolts [2]
– Clamps [3]
– Wire clip [4]
– Rear wheel speed sensor mounting bolt [5]
– Rear wheel speed sensor [6]

Installation is in the reverse order of removal.

NOTE:

- Route the wire properly (page 1-21).
- Clean the sensor tip and sensor installation area (caliper bracket) thoroughly, and be sure that no foreign materials are allowed.
- Always replace the rear wheel speed sensor mounting bolt with a new one.
- After installation, check the air gap (page 19-21).



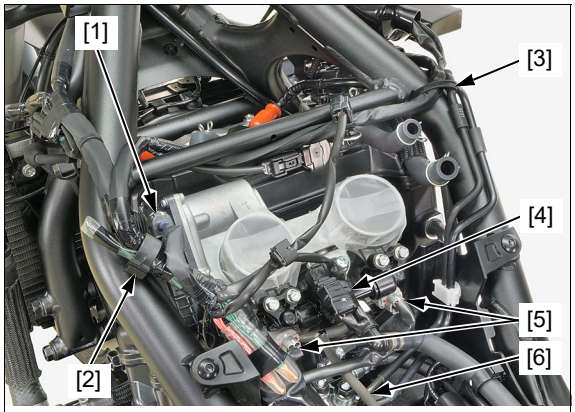
ABS MODULATOR

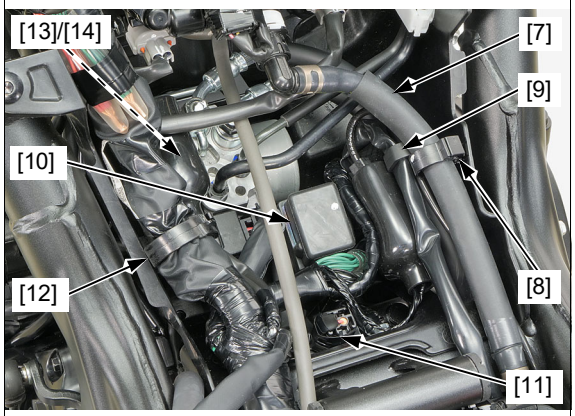
REMOVAL/INSTALLATION

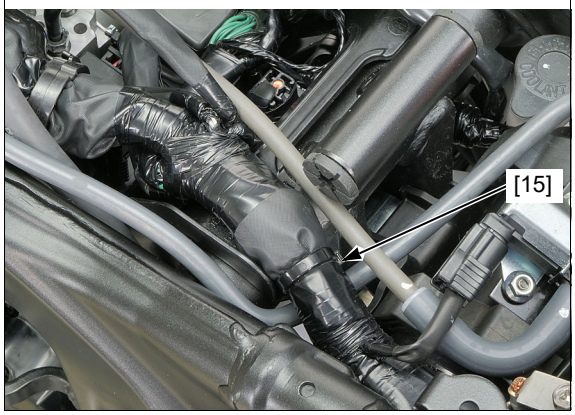
Drain the brake fluid from the brake hydraulic systems (page 18-5).

Remove/disconnect the following:

– Air cleaner housing (page 7-12).
– TBW 6P connector [1]
– Wire clamp [2]
– Wire band [3]
– MAP sensor 3P connector [4]
– Fuel injector 2P connectors [5]
– Hose (EVAP purge control solenoid valve to throttle body) [6]
– Fuel hose [7]
– Fuel hose clip [8]
– Clip [9]
– Relay box [10]
– Bank angle sensor 2P connector [11]
– Wire harness clip [12]
– Sidestand switch 2P connector [13]
– Neutral/shift spindle switch 2P connector [14]
– Wire harness clip [15]







Remove the oil bolts [1], brake hoses [2] and sealing washers [3].

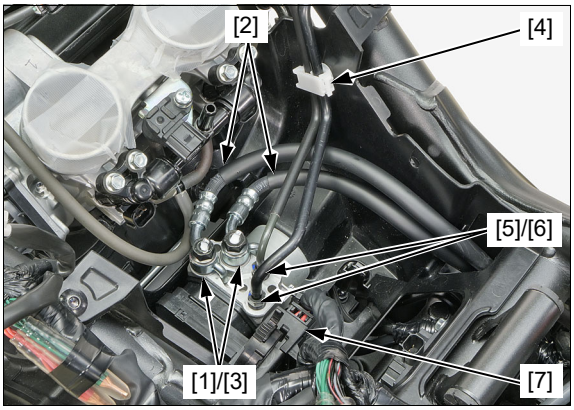
Remove the brake pipe clamp [4].

Loosen the brake pipe joint nuts [5] to disconnect the brake pipes [6].

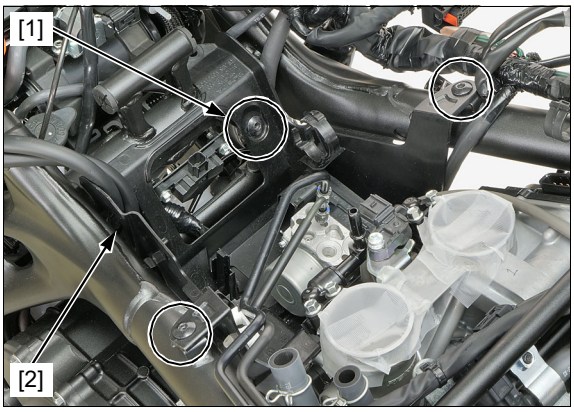
NOTE:

- When disconnecting, cover the end of the brake hoses and pipes to prevent contamination.

Disconnect the ABS modulator 18P connector [7] and remove it.



Remove the socket bolts [1] and ABS modulator with the stay [2].



Remove the two mounting bolt/washers [1] and the ABS modulator [2] from the stay [3].

Remove the collars [4] and grommets [5].

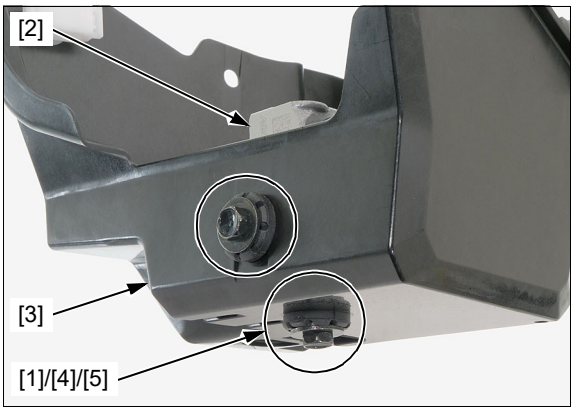
Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washers with new ones.
- Apply brake fluid to the threads of the brake pipe joint nuts.
- When connecting the brake hoses, set the eyelet stopper pin to the ABS modulator body.

TORQUE:

Brake pipe joint nut: 14 N·m (1.4 kgf·m, 10 lbf·ft)
Brake hose oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)



Fill and bleed the front and rear brake hydraulic systems (page 18-8).

MEMO

20. BATTERY/CHARGING SYSTEM

SERVICE INFORMATION

GENERAL

⚠WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
  – If electrolyte gets on your skin, flush with water.
  – If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
  – If swallowed, drink large quantities of water or milk and call your local Poison Control Center or a 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 a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.
- The maintenance free battery must be replaced when it reaches the end of its service life.
- The battery can be damaged if overcharged or undercharged, or if left to discharge for a long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2 – 3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and tail light ON for long periods of time without riding the motorcycle.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every 2 weeks to prevent sulfation from occurring.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 20-3).
- For alternator service (page 11-2).
- The following color codes used are indicated through out this section.

Bl = Black G = Green R = Red Y = Yellow

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 battery tester's Operation Manual for the recommended battery testing procedure.

The recommended battery tester puts a "load" on the battery so the actual battery condition of the load 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 20-6).

Is the current leakage below 0.17 mA?

YES – GO TO STEP 4.

NO – GO TO STEP 6.

3. ALTERNATOR CHARGING COIL INSPECTION

Check the alternator charging coil (page 20-8).

Is the alternator charging coil resistance within 0.1 – 0.5 Ω (20°C/68°F)?

YES – GO TO STEP 4.

NO – Faulty charging coil

4. CHARGING VOLTAGE INSPECTION

Measure and record the battery voltage using a digital multimeter (page 20-5).
Start the engine.
Measure the charging voltage (page 20-6).
Compare the measurements to the results of the following calculation.

STANDARD:
Measured BV < Measured CV < 15.5 V
- **BV = Battery Voltage**
- **CV = Charging Voltage**

Do the battery and charging voltages satisfy the calculation?

YES – Faulty battery

NO – GO TO STEP 5.

5. 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

6. CURRENT LEAKAGE TEST WITHOUT REGULATOR/RECTIFIER CONNECTOR

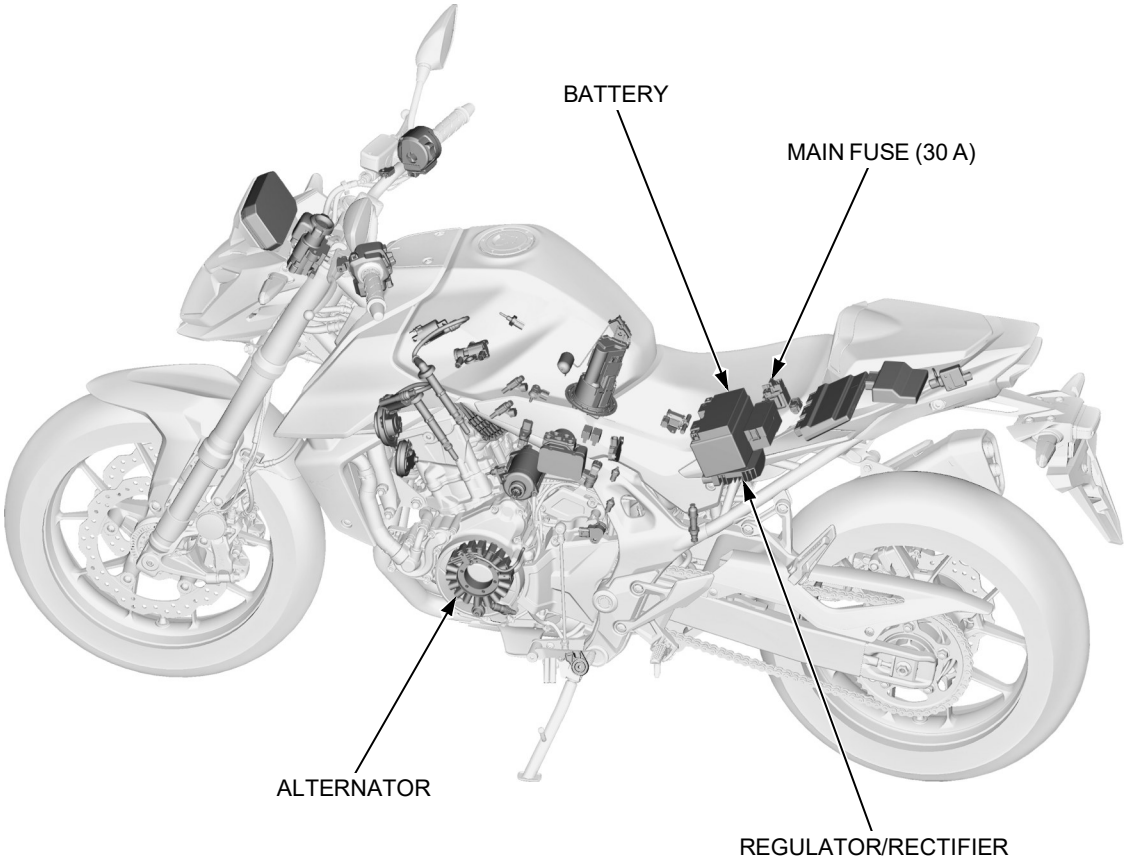
Disconnect the regulator/rectifier 3P (Black) connector and recheck the battery current leakage.

Is the current leakage below 0.17 mA?

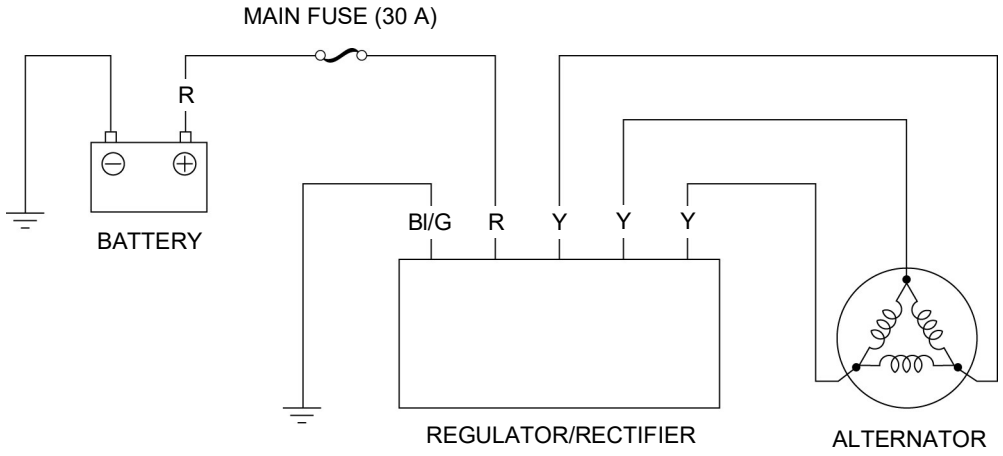
YES – Faulty regulator/rectifier

NO –
- Shorted wire harness

SYSTEM LOCATION



SYSTEM DIAGRAM



BATTERY

REMOVAL/INSTALLATION

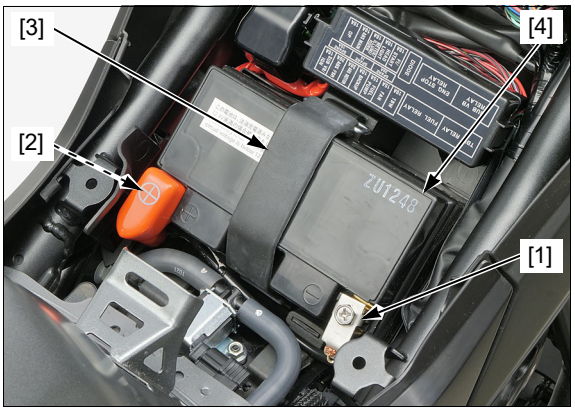
Remove the front seat (page 2-4).

Turn the ignition switch OFF.

Disconnect the negative (–) cable [1] first and then disconnect the positive (+) cable [2] by removing the terminal bolts.

Remove the rubber strap [3] and the battery [4].

Installation is in the reverse order of removal.



NOTE:

- Connect the positive (+) cable first, then connect the negative (–) cable.
- For digital clock setting procedure (page 21-11).

VOLTAGE INSPECTION

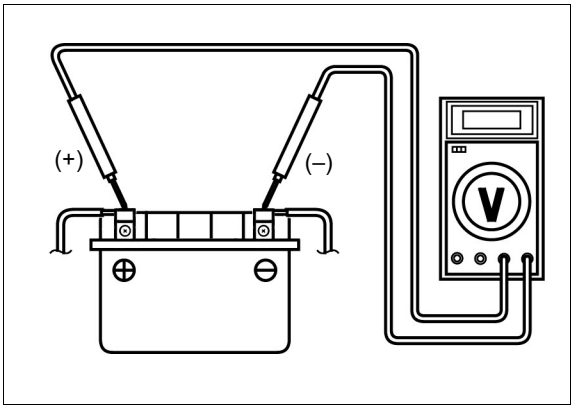
Remove the front seat (page 2-4).

Measure the battery voltage using a digital multimeter.

VOLTAGE (20°C/68°F):

Fully charged: 13.0 – 13.2 V

Needs charging: Below 12.4 V



NOTE:

- When measuring the battery voltage after charging, leave it for least 30 minutes, or the accurate results cannot be obtained because the battery voltage fluctuates just after charging.

BATTERY TESTING

Remove the battery (page 20-5).

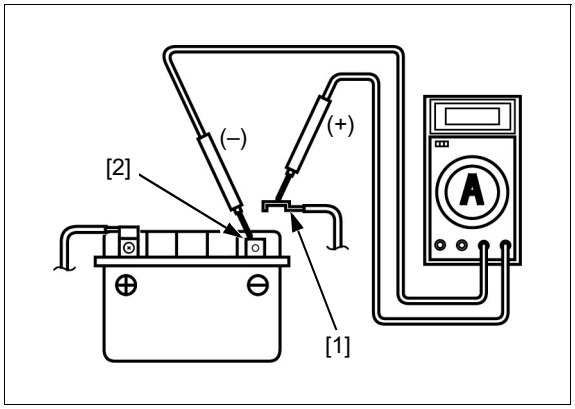
Refer to the instructions that are appropriate to the battery testing equipment available to you.

TOOL:

Battery tester BM-210 or BATTERY MATE or equivalent

CHARGING SYSTEM INSPECTION

CURRENT LEAKAGE TEST



Remove the front 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:

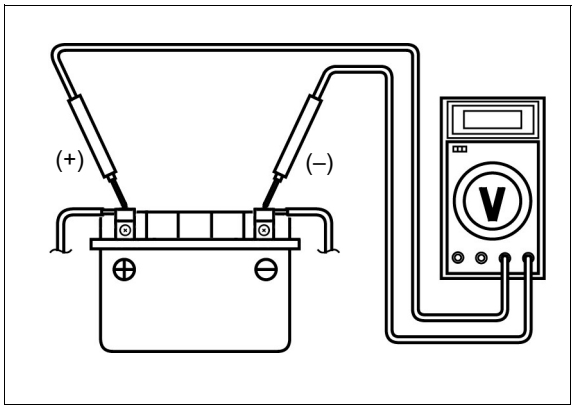
- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition switch ON. A sudden surge of current may blow out the fuse in the tester.

SPECIFIED CURRENT LEAKAGE: 0.17 mA max.

If current leakage exceeds the specified value, a shorted circuit is likely.

Locate the short by disconnecting connections one by one and measuring the current.

CHARGING VOLTAGE INSPECTION



NOTE:

- Be sure the battery is in good condition before performing this test.
- Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.

Warm up the engine to normal operating temperature. Stop the engine.

Remove the front seat (page 2-4).

To prevent a short, make absolutely certain which are the positive (+) and negative (–) terminals or cables.

Connect the multimeter between the battery positive (+) terminal and negative (–) terminal of the battery.

With the headlight on high beam, restart the engine.

Measure the voltage on the multimeter when the engine runs at 5,000 min^{-1} (rpm).

STANDARD:

Measured BV < Measured CV < 15.5 V

- **BV = Battery Voltage (page 20-5)**
- **CV = Charging Voltage**

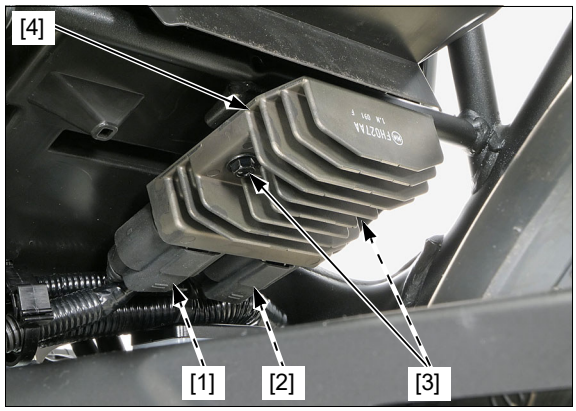
REGULATOR/RECTIFIER

REMOVAL/INSTALLATION

Disconnect the alternator 3P (Gray) [1] and regulator/rectifier 3P (Black) [2] connectors.

Remove the bolts [3] and regulator/rectifier [4].

Installation is in the reverse order of removal.



SYSTEM INSPECTION

Check connectors for loose contact or corroded terminals.

Inspect the following items:

– Battery charging line (page 20-7)
– Ground line (page 20-7)
– Charging coil (page 20-8)

If all components of the charging system are normal and there are no loose connections at the regulator/rectifier connectors, replace the regulator/rectifier.

BATTERY CHARGING LINE INSPECTION

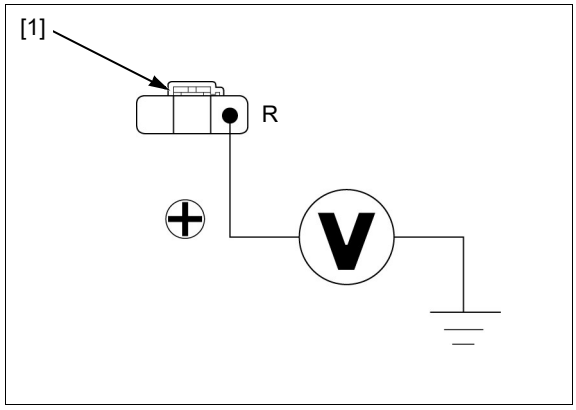
Turn the ignition switch OFF.

Disconnect the regulator/rectifier 3P (Black) connector [1] (page 20-7).

Measure the voltage between the regulator/rectifier 3P (Black) connector terminal at the wire side and ground.

CONNECTION: Red (+) – Ground (–)
STANDARD: Battery voltage

There should be battery voltage at all times.



GROUND LINE INSPECTION

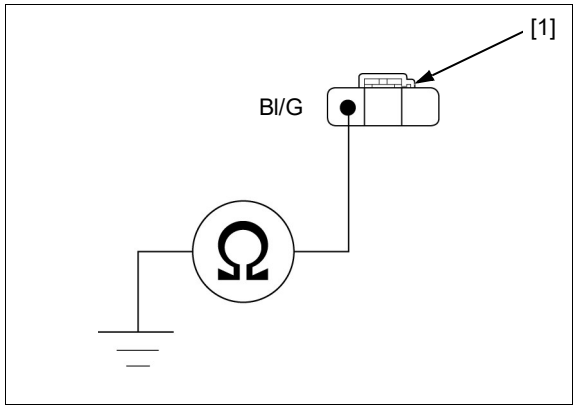
Turn the ignition switch OFF.

Disconnect the regulator/rectifier 3P (Black) connector (page 20-7).

Check for continuity between the regulator/rectifier 3P (Black) connector [1] at the wire side and ground.

CONNECTION: Black/green – Ground

There should be continuity at all times.



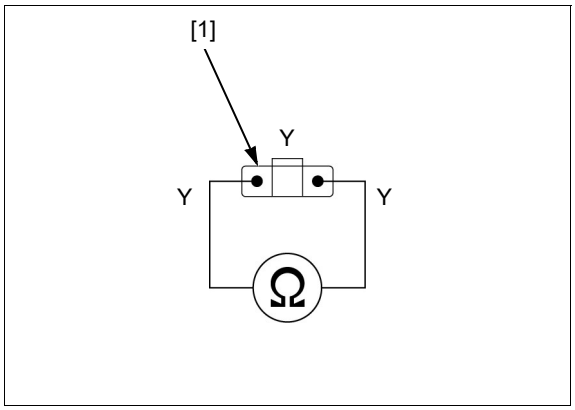
ALTERNATOR CHARGING COIL

CHARGING COIL INSPECTION

Disconnect the alternator 3P (Gray) connector (page 20-7).

Measure the resistance between the wire harness side alternator 3P (Gray) connector [1] terminals.

CONNECTION: Yellow – Yellow
STANDARD: 0.1 – 0.5 Ω (20°C/68°F)

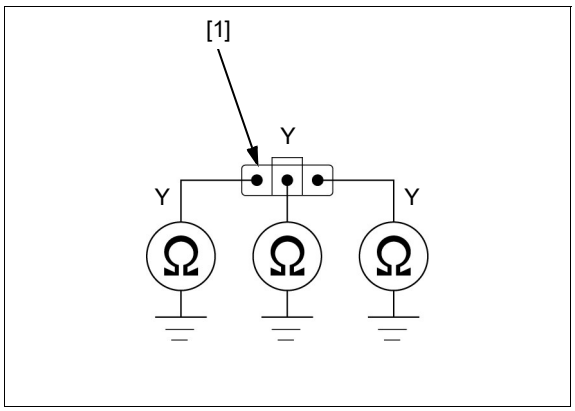


Check for continuity between the wire harness side alternator 3P (Gray) connector [1] terminals and ground.

CONNECTION: Yellow – Ground
STANDARD: No continuity

Replace the stator if the resistance is out of specification, or if any wire has continuity to ground.

For alternator/starter replacement (page 11-4).



21. LIGHTS/METERS/SWITCHES

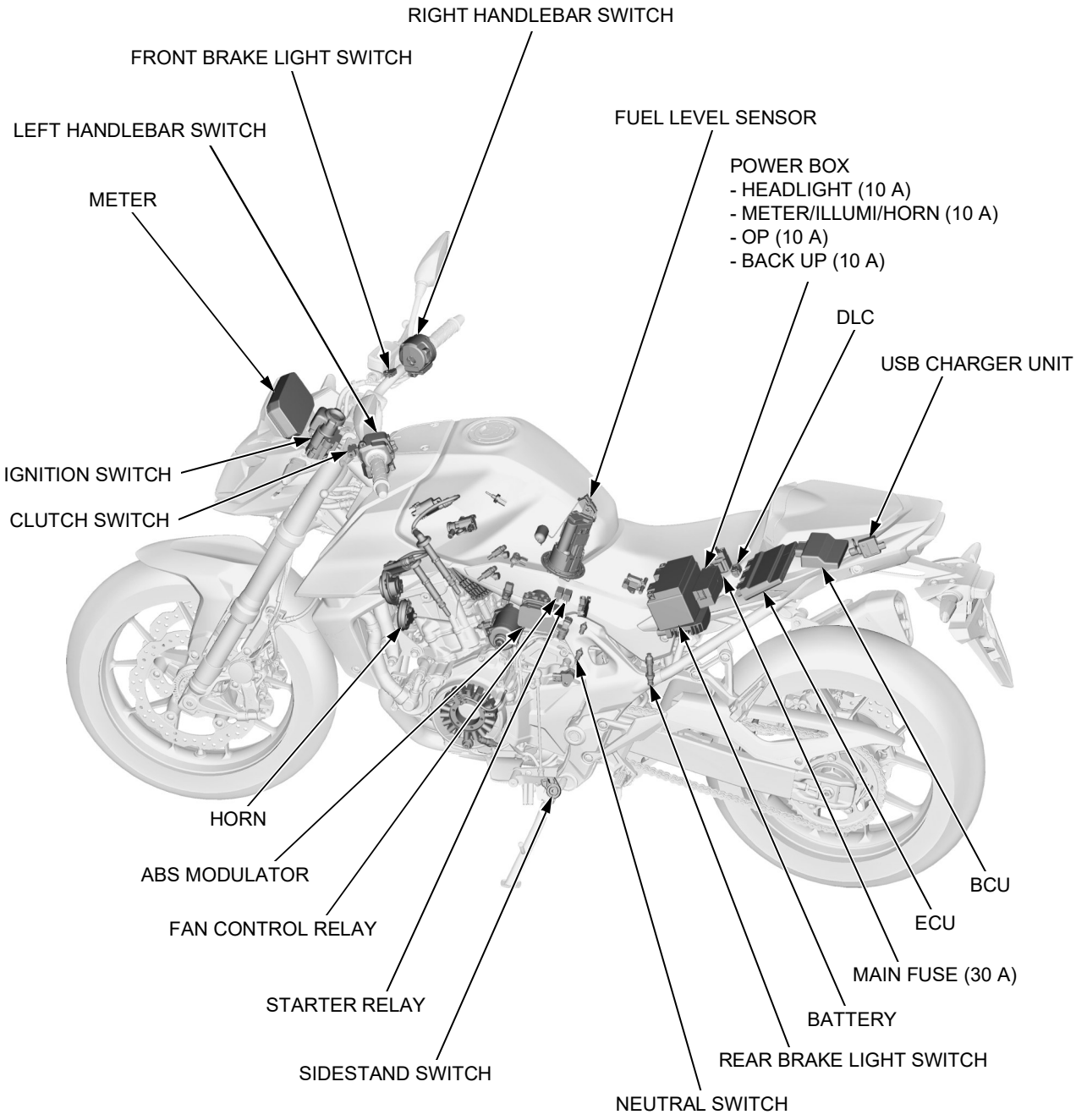
SERVICE INFORMATION

GENERAL

- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.
- The following color codes are used throughout this section.

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

SYSTEM LOCATION



HEADLIGHT

REMOVAL/INSTALLATION

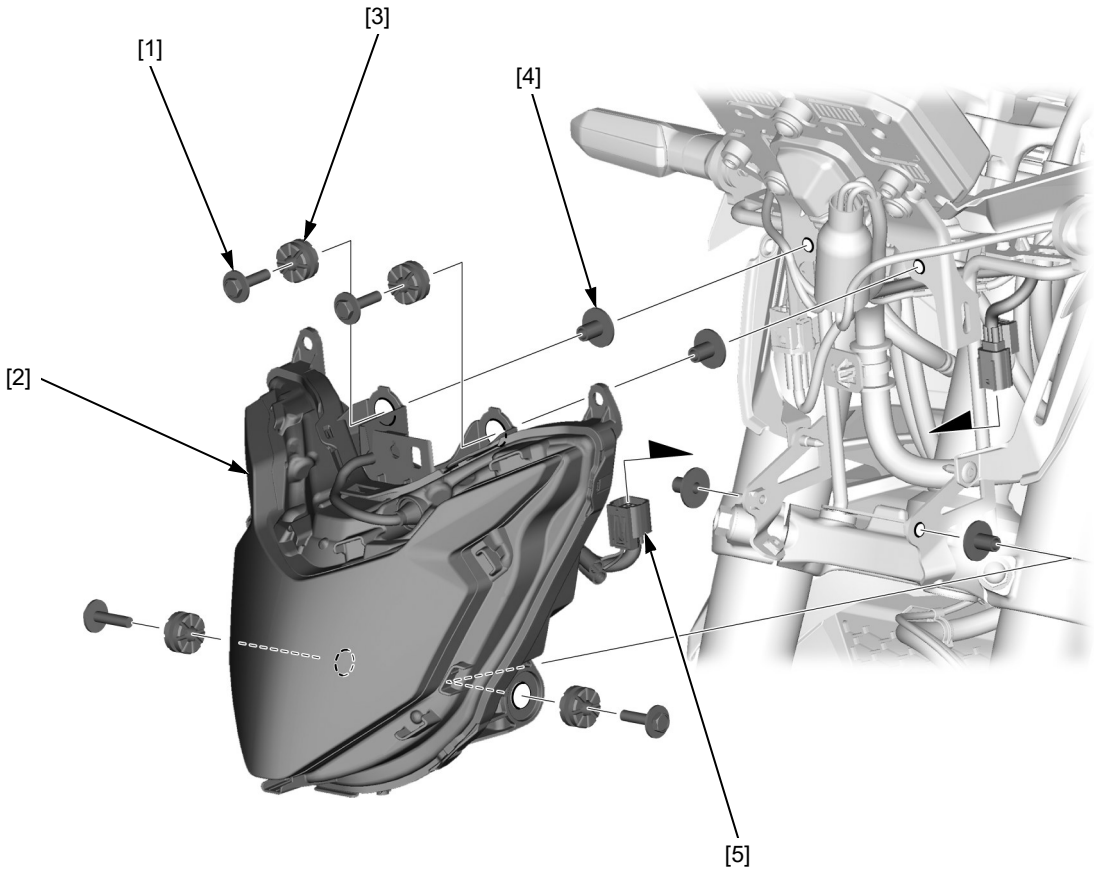
Remove the following:

- Headlight cowl (page 2-6)
- Bolt/washers [1]
- headlight [2]
- Grommets [3]
- Collars [4]

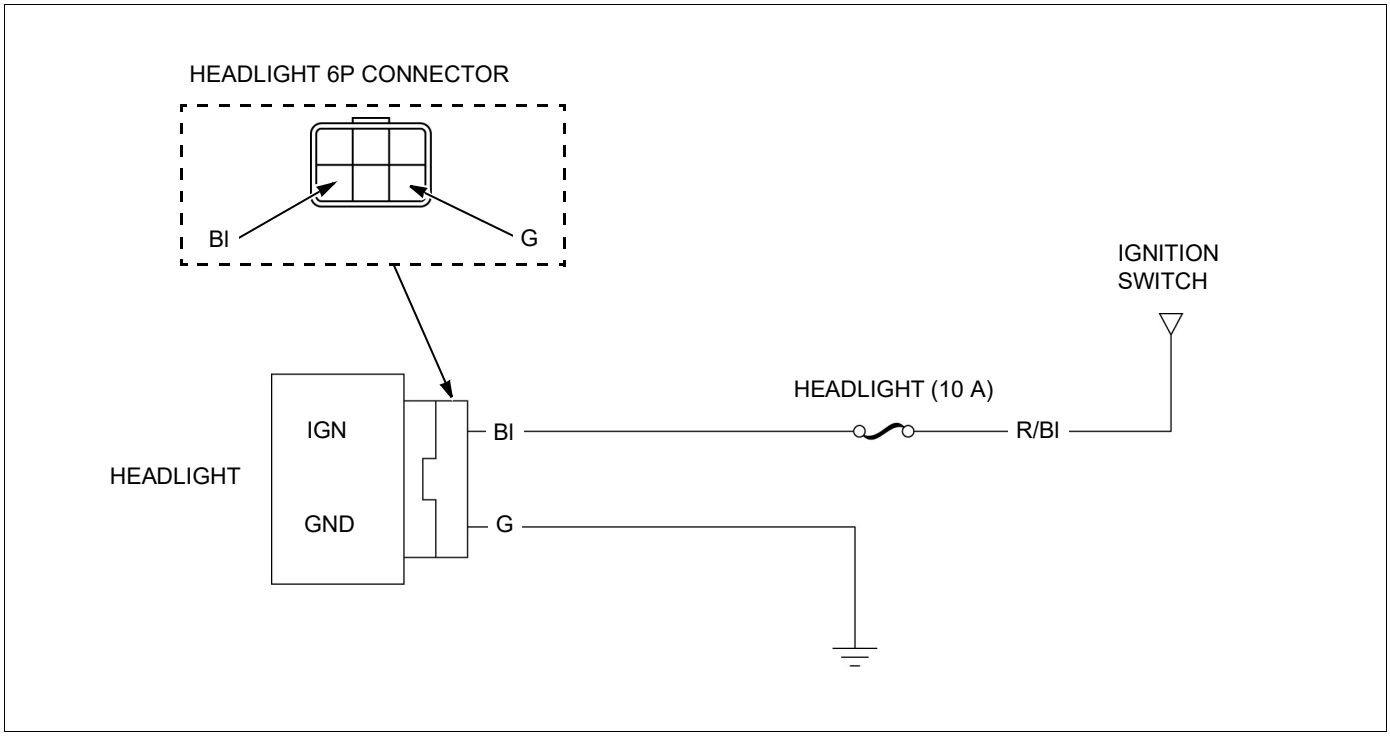
Disconnect the headlight 6P connector [5].

Installation is in the reverse order of removal.

TORQUE: 8.5 N·m (0.9 kgf·m, 6.3 lbf·ft)



POWER/GROUND LINE INSPECTION



1. **Headlight Power Input Line Inspection**

   Disconnect the headlight 6P connector (page 21-3).
   Turn the ignition switch ON.
   Measure the voltage at the wire harness side 6P connector terminal and ground.

   CONNECTION: Black (+) – Ground (–)
   STANDARD: Battery voltage

   Is there battery voltage?

   YES – GO TO STEP 2.

   NO – • Open circuit in the Black or Red/black wire
   • Blown fuse HEADLIGHT (10 A)

2. **Headlight Ground Line Open Circuit Inspection**

   Check the continuity between the wire harness side 6P connector terminal and ground.

   CONNECTION: Green – Ground

   Is there continuity?

   YES – Faulty headlight unit

   NO – Open circuit in the Green wire

TURN SIGNAL LIGHT

TURN SIGNAL LIGHT REMOVAL/ INSTALLATION

FRONT

Remove the headlight inner cover (page 2-6).

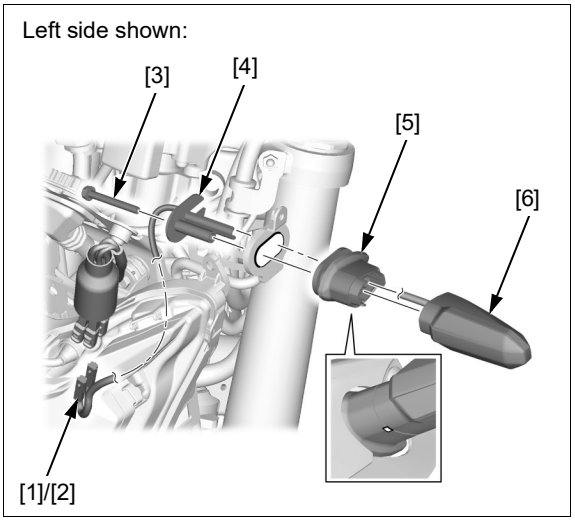
Disconnect the following:

– Left turn signal light 2P (Orange) connector [1]
– Left turn signal light 2P (White) connector [2]
– Right turn signal light 2P (Light blue) connector
– Right turn signal light 2P (White) connector

Remove the following:

– Bolt/washer [3]
– Collar [4]
– Turn signal mount rubber [5]
– Front turn signal unit [6]

Installation is in the reverse order of removal.



REAR

Refer to rear fender A (page 2-13).

ESS SYSTEM INSPECTION

NOTE:
• While the hazard system is operating, the ESS system will not operate.

Check the following:

– DTC indicated
– Turn signal lights
– Brake light switch and related circuit

NOTE:
• Even if any turn signal lights are abnormal, other normal turn signal lights will work with the ESS system.
• If the ESS system operates at all times, replace the ABS modulator and/or BCU with a new one.

To forcibly activate the ESS system, perform the following:

1. Connect the SCS short connector to the DLC (page 4-5).
2. Turn the ignition switch ON.
3. Apply the front or rear brake and check the turn signal lights operation.

   The turn signal lights should be blinking with the brake lever and/or pedal applied and turn off with the brake lever and pedal released.

LICENSE LIGHT

REMOVAL/INSTALLATION

Refer to rear fender A (page 2-13).

BULB REPLACEMENT

Remove the screws [1] and license light cover [2].

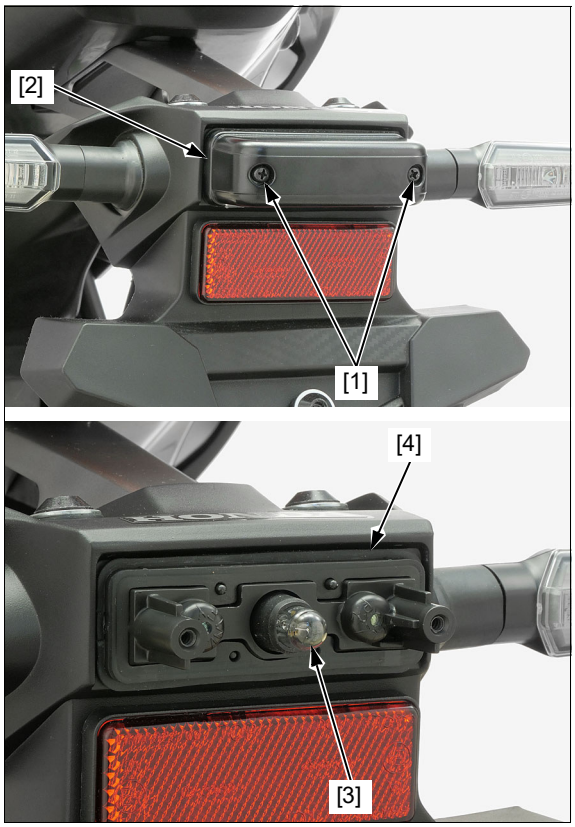
Pull out the license light bulb [3] and replace it with a new one.

Check the packing [4] is installed in position and is in good condition, replace it with a new one if necessary.

Installation is in the reverse order of removal.

TORQUE:

License light cover screw:
1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)



BRAKE/TAILLIGHT

REMOVAL/INSTALLATION

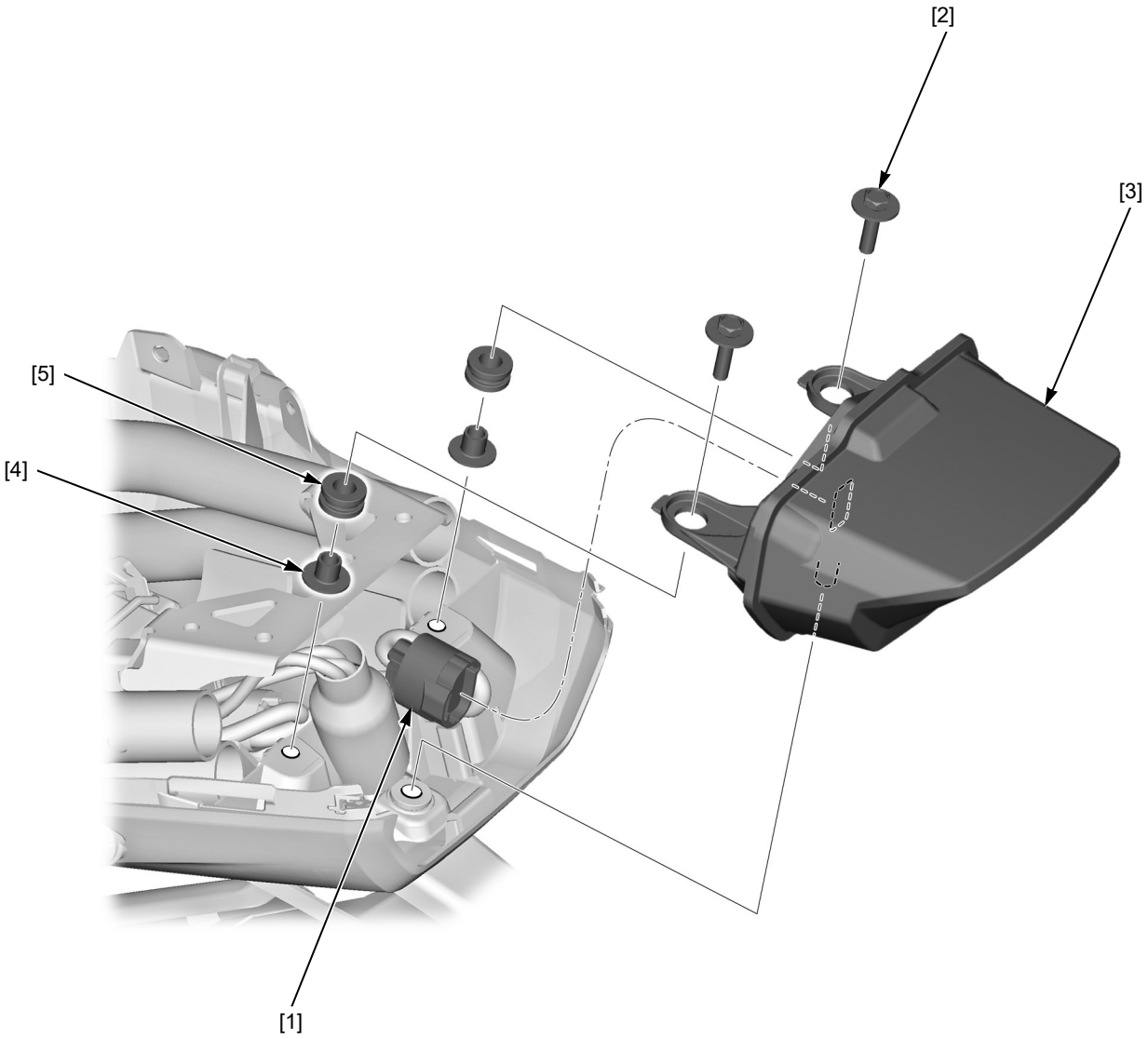
Remove the rear center cowl (page 2-13).

Disconnect the brake/taillight 3P (Black) connector [1].

Remove the following:

– Bolt/washers [2]
– Brake/taillight [3]
– Collars [4]
– Grommets [5]

Installation is in the reverse order of removal.



METER

INITIAL OPERATION CHECK

When the ignition switch is turned ON, the meter will show opening display.

If the meter does not show opening display, check the meter power/ground line (page 21-10).

If the power/ground lines are normal, replace the TFT module/circuit board assembly (page 21-9).

REMOVAL/INSTALLATION

Remove the headlight cowl (page 2-6).

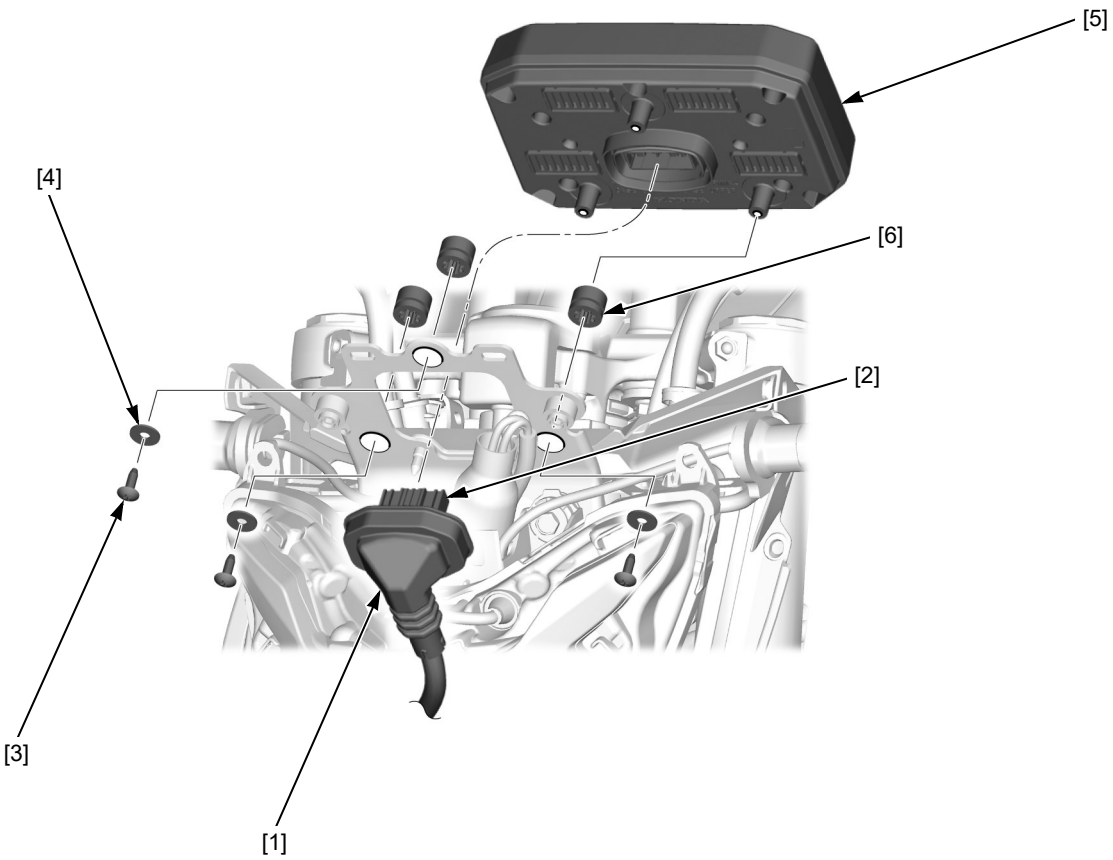
Slide the dust cover [1] and disconnect the meter 24P connector [2].

Remove the following:

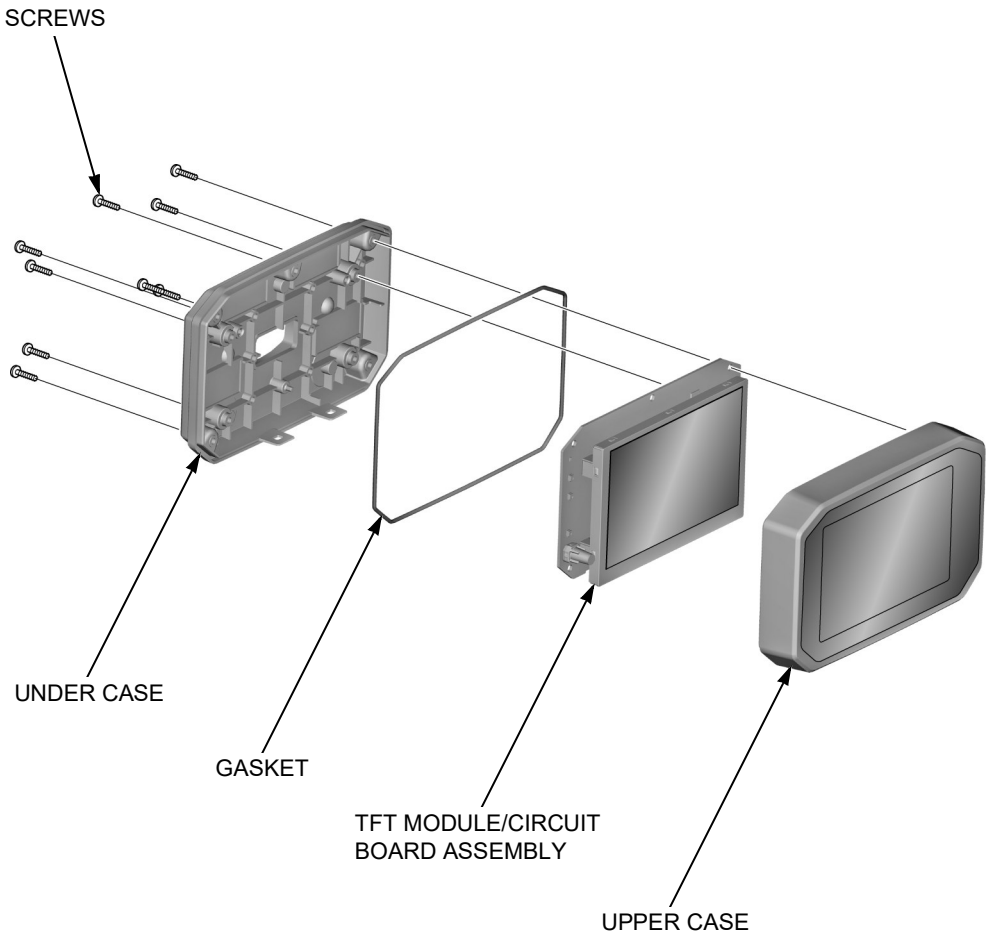
– Screws [3]
– Washers [4]
– Meter [5]
– Grommets [6]

Installation is in the reverse order of removal.

TORQUE:
Meter mounting screw:
1.3 N·m (0.1 kgf·m, 1.0 lbf·ft)



DISASSEMBLY/ASSEMBLY



POWER/GROUND LINE INSPECTION

POWER INPUT LINE

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

Measure the voltage between the wire harness side meter 24P connector [1] and ground.

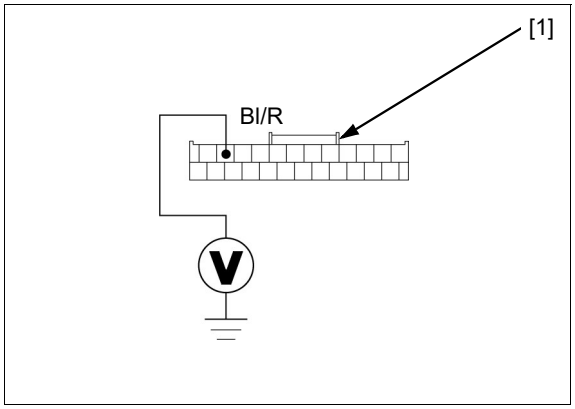
TOOL:
Male Pin Prove 07ZAJ-RDJA110

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
– Blown METER/ILLUMI/HORN fuse (10 A)



BACK-UP LINE

Measure the voltage between the wire harness side meter 24P connector [1] and ground.

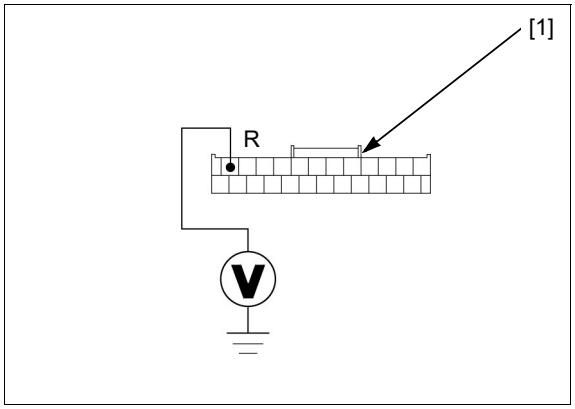
TOOL:
Male Pin Prove 07ZAJ-RDJA110

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
– Blown BACK UP fuse (10 A)



GROUND LINE

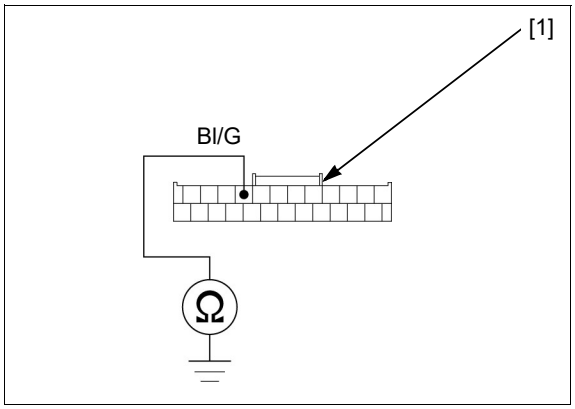
Check for continuity between the wire harness side meter 24P connector [1] and ground.

TOOL:
Male Pin Prove 07ZAJ-RDJA110

Connection: Black/green – Ground

There should be continuity at all times.

If there is no continuity, check for open circuit in the Black/green wire.



DATE & TIME SETTING PROCEDURE

Turn the ignition switch ON.

1. Push the select switch [1] to the right and hold it until the “SETTING” mode screen is displayed.

2. Press the select switch to the down to select the "GENERAL" menu, and press the select switch right.

3. Press the select switch to the down to select the DATE & TIME menu, and push the select switch to the down.

4. Push the select switch to the right.
   Press the select switch to the up or down to select the "12" or "24".

NOTE:

- When "24/12" is set to "24", "am/pm" menu is disable.

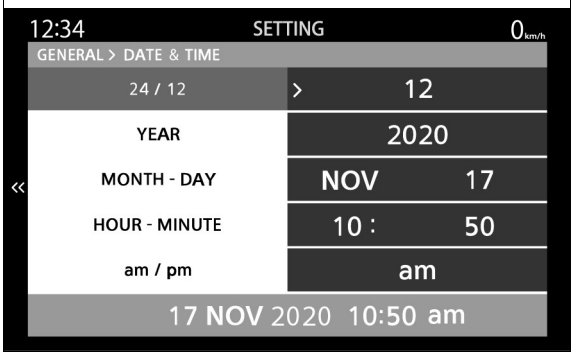
  Push the select switch to the left.

5. Select the YEAR menu, and push the select switch to the right.
   Set the desired year using the select switch to the up or down.

6. Select the MONTH-DAY menu, and set the desired month in the same manner as step 5.
   Push the select switch to the right.
   Set the desired day in the same manner as step 5.
   Push the select switch to the left 2 times.

7. Select the HOUR-MINUTE menu, and set the desired hour and minute in the same manner as step 6.

8. Select the "am/pm" menu, and select the "am" or "pm" in the same manner as step 4.
   Push and hold the select switch to the left to return the DATE & TIME menu.



HSVCS

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 and smartphone indicator 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 21-17)
- Initialization/pairing connection (page 21-12)
- Combination meter (page 21-8)
- BCU (page 21-26)

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.

ENGINE OIL PRESSURE INDICATOR/ EOP SWITCH

REMOVAL/INSTALLATION

Drain the engine oil (page 3-12).

Remove the following:

– Dust cover [1]
– Bolt/washer [2]
– Wire terminal [3]
– Oil pressure switch [4]

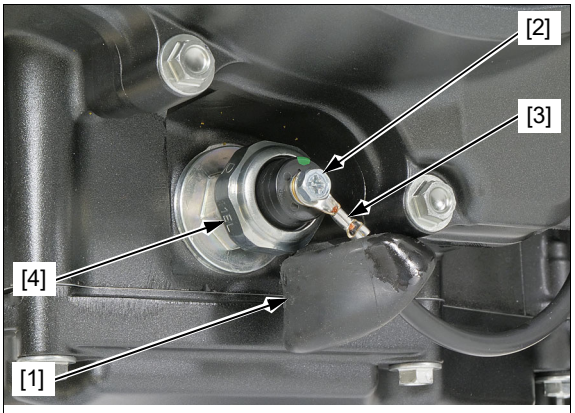
Installation is in the reverse order of removal.

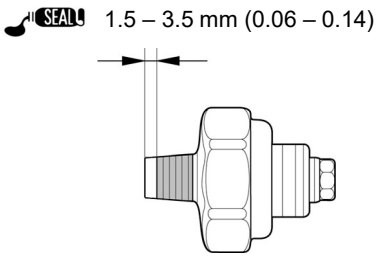
NOTE:

• Apply sealant (TB1207B manufactured by ThreeBond or equivalent) to the EOP switch threads.

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)

Fill the engine oil with the recommended engine oil (page 1-7).





SYSTEM INSPECTION

The engine oil pressure indicator comes on when the ignition switch is turned ON, then goes off when the engine starts.

If the engine oil pressure indicator does not come on with the ignition switch turned ON, check the meter initial operation (page 21-8).

The engine oil pressure indicator does not go out when the engine running, check the following:

– Engine oil level (page 3-11)
– Engine oil pressure (page 9-4)
– EOP switch line short circuit (page 21-13)

If the above items are OK, replace the meter circuit board (page 21-9).

EOP SWITCH LINE SHORT CIRCUIT INSPECTION

Disconnect the EOP switch wire terminal (page 21-13).

Check for continuity between the EOP switch wire terminal and ground.

– If there is continuity, the Black wire has a short circuit.
– If there is no continuity, replace the EOP switch with a known good one (page 21-13), and recheck.

FUEL LEVEL SENSOR

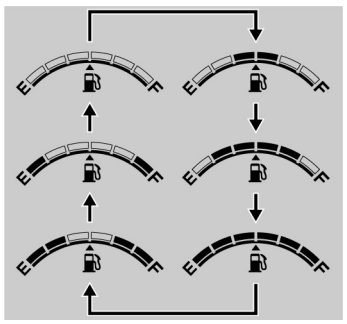
FUEL METER INSPECTION

If the fuel meter displays the circuit faulty pattern as shown with ignition switch is ON, check for open or short circuit in the Blue wire between the meter and fuel pump unit.

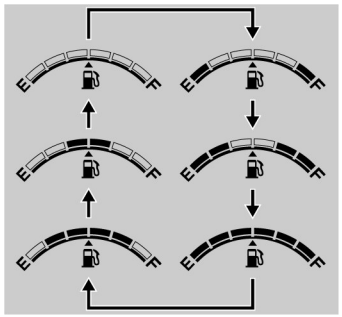
If the Blue wire is OK, check the fuel level sensor (page 21-14).

If the fuel level sensor is OK, replace the meter (page 21-8).

Open circuit



Short circuit



FUEL LEVEL SENSOR INSPECTION

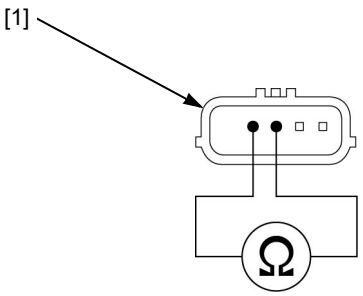
Remove the fuel pump unit (page 7-8).

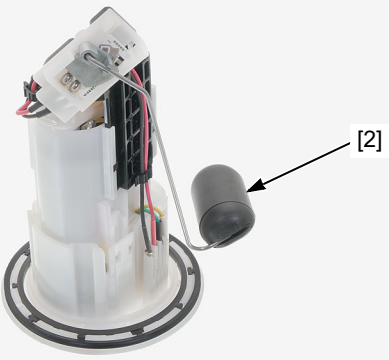
Connect an ohmmeter to the fuel pump unit 5P connector [1] terminals.

Measure the resistance with the float [2] at the full and empty positions.

	FULL	EMPTY
Resistance	7 – 11 Ω	384 – 396 Ω

If it is out of specification, replace the fuel pump unit.





IGNITION SWITCH

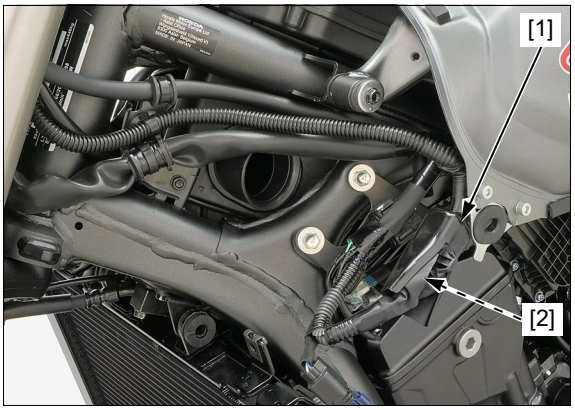
INSPECTION

Remove the shrouds B (page 2-9).

Remove the dust cover [1] and disconnect the ignition switch 2P 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 23-2).



REMOVAL/INSTALLATION

Remove the following:

– Top bridge (page 16-32)
– Ignition switch mount bolts [1]
– Ignition switch [2]

Installation is in the reverse order of removal.

NOTE:

- Use a drill or an equivalent tool when removing the ignition switch mounting bolts.
- Replace the Ignition switch bolts with new ones.

TORQUE: 24 N·m (2.4 kgf·m, 18 lbf·ft)

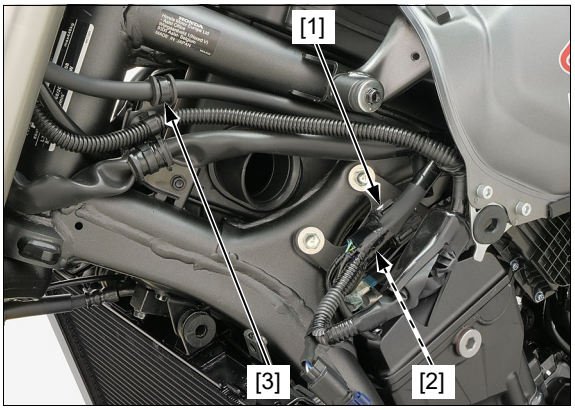
LEFT HANDLEBAR SWITCHES

REMOVAL/INSTALLATION

Remove the shroud B (page 2-9).

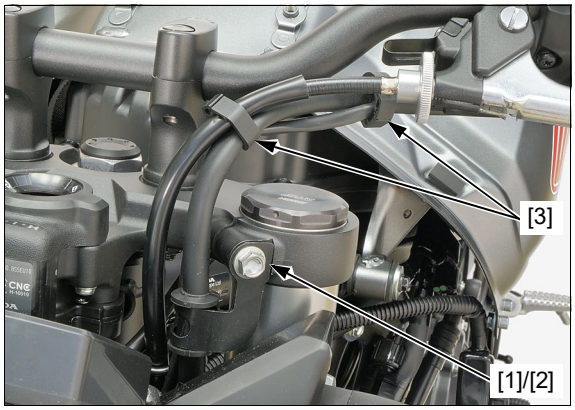
Disconnect the left handlebar switch 8P connector [1].

Remove the harness clip [2] and wire clip [3].



Remove the top bridge pinch bolt [1] and clamp [2].

Remove the harness clips [3].



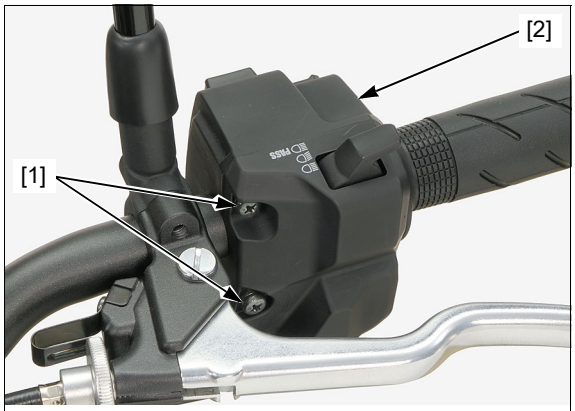
Remove the screws [1] and left handlebar switch [2].

Installation is in the reverse order of removal.

NOTE:

- Install the left handlebar switch housings by aligning the locating pin with the handlebar hole.
- Route the wire properly (page 1-21).

TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)



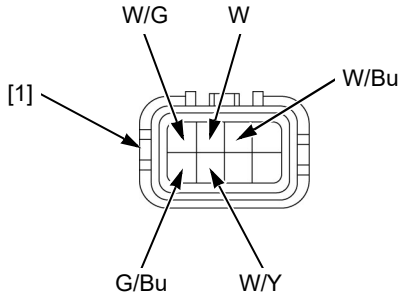
INSPECTION

NOTE:

- Before inspection, check that there is no DTCs.

Disconnect the left handlebar switch 8P connector (page 21-15).

Measure the resistance between the switch side 8P connector [1] terminals when each switch is operated.



CONNECTION:	STANDARD (at 25°C/77°F):	
White – Green/blue	Headlight dimmer switch:	95 – 105 Ω
	Passing light control switch:	342 – 379 Ω
White/blue – Green/blue	MODE switch:	95 – 105 Ω
	SEL up switch:	338 – 375 Ω
	SEL down switch:	736 – 814 Ω
White/green – Green/blue	Horn switch:	95 – 105 Ω
	Function switch:	338 – 375 Ω
	SEL left switch:	736 – 814 Ω
	SEL right switch:	1.6 – 1.8 kΩ
White/yellow – Green/blue	Turn signal left switch:	736 – 814 Ω
	Turn signal right switch:	1.6 – 1.8 kΩ
	Turn signal cancel switch:	339 – 375 Ω
	Hazard/Lighting switch	95 – 105 Ω

Replace the left handlebar switch if any switch resistance are not standard value.

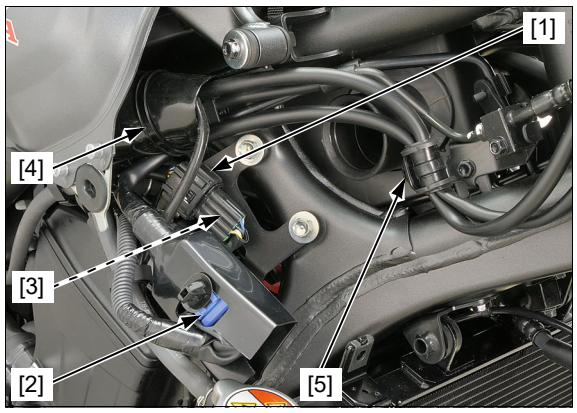
RIGHT HANDLEBAR SWITCH

REMOVAL/INSTALLATION

Remove the shroud B (page 2-9).

Disconnect the right handlebar switch 8P [1] and 6P [2] connectors.

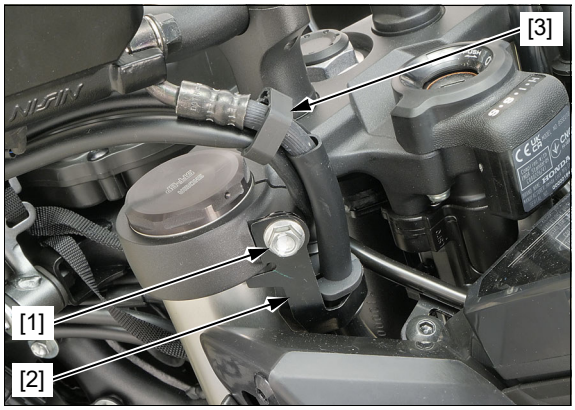
Remove the harness clip [3], wire band [4] and wire clip [5].



Remove the top bridge pinch bolt [1] and clamp [2].

Remove the wire band [3].

Remove the front master cylinder (page 18-14).



Remove the screws [1] and right handlebar switch housing cover [2].

Remove the screw [3] and right handlebar switch [4].

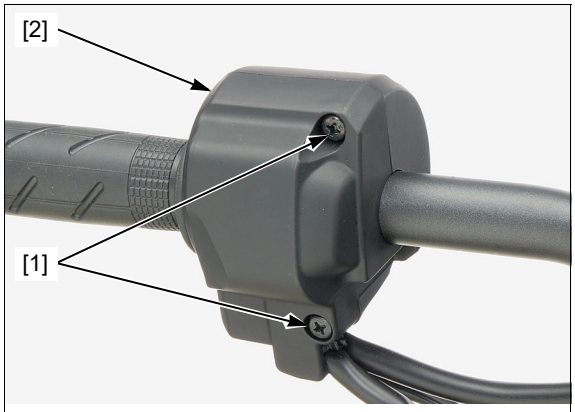
Installation is in the reverse order of removal.

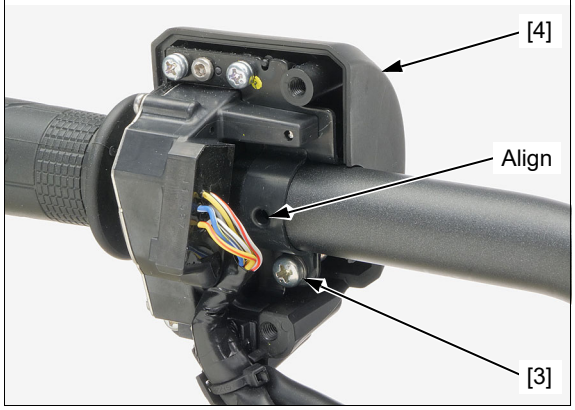
NOTE:

- Install the right handlebar switch housings by aligning the locating pin with the handlebar hole.
- Route the wire properly (page 1-21).

TORQUE:

Right handlebar switch housing screw:
2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)





INSPECTION

Disconnect the right handlebar switch 6P connector (page 21-17).

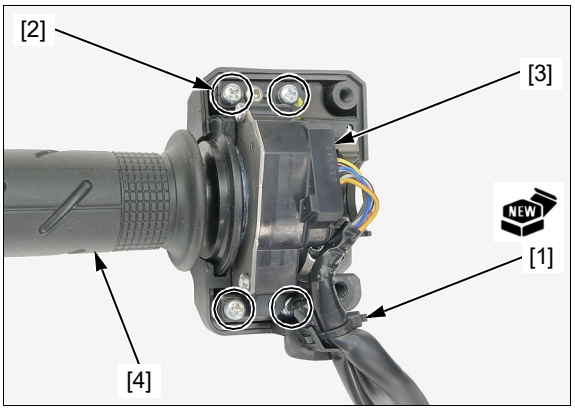
Check for continuity between the right handlebar switch 6P connector terminals in each switch position.

Refer to the wiring diagram for the terminals and switch status (page 23-2).

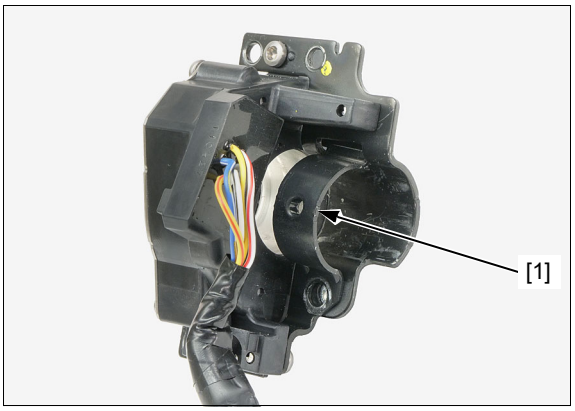
DISASSEMBLY/ASSEMBLY

Remove the right handlebar switch (page 21-17).

Remove the wire band [1], screws [2], APS [3] and throttle grip [4].



Remove the holder [1].

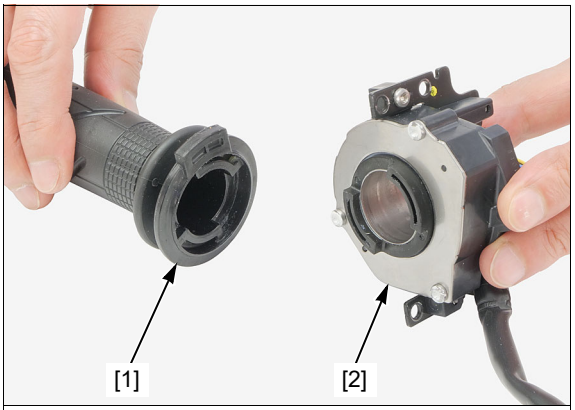


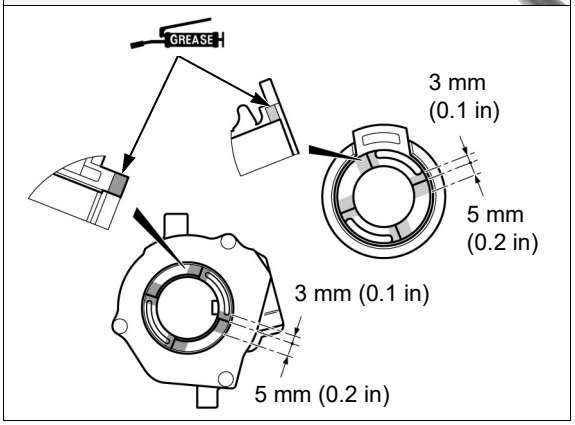
Installation is in the reverse order of removal.

NOTE:

- Apply grease to the throttle grip [1] and APS [2] contacting surfaces as shown.

TORQUE: 2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)





BRAKE LIGHT SWITCH

INSPECTION

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.

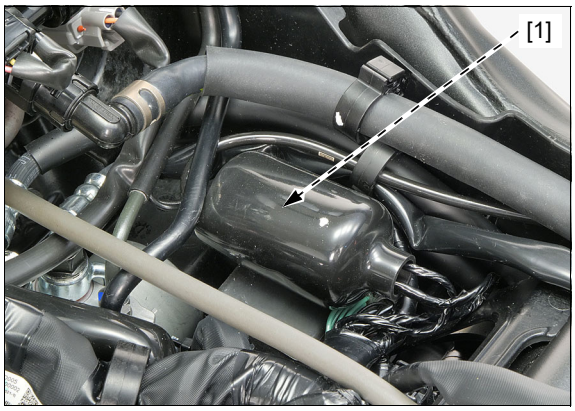
REAR

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

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.

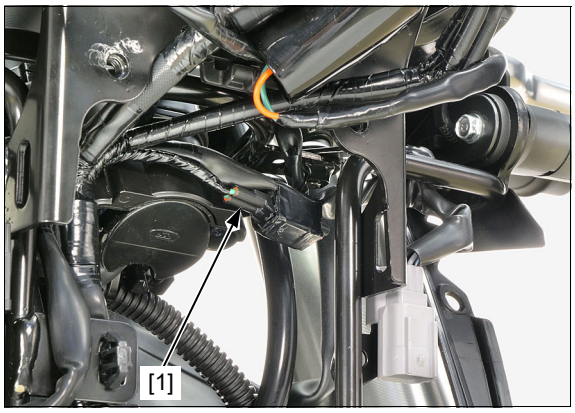


CLUTCH SWITCH

REMOVAL/INSTALLATION

Remove the headlight (page 21-3).

Disconnect the clutch switch 2P connector [1].



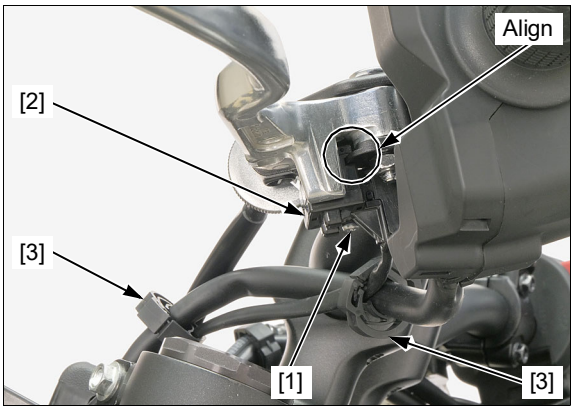
Remove the screw [1], clutch switch [2] and wire bands [3].

Installation is in the reverse order of removal.

NOTE:

- Align the clutch switch hook with clutch lever holder cut-out.

TORQUE:
Clutch switch screw:
0.8 N·m (0.1 kgf·m, 0.6 lbf·ft)



INSPECTION

Disconnect the clutch switch 2P connector (page 21-20).

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 radiator reserve tank (page 8-9).

Remove the dust cover [1], terminal nut [2] and wire terminal [3] from the neutral switch [4].

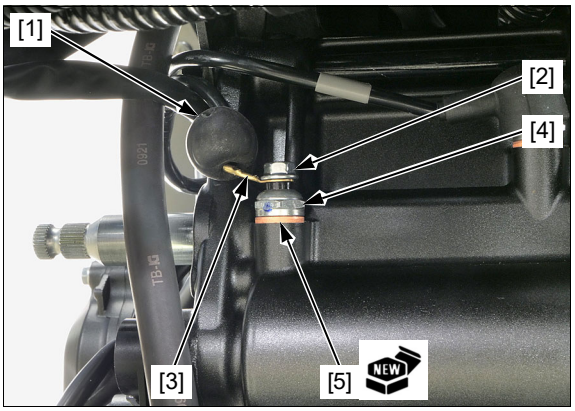
Remove the neutral switch and sealing washer [5].

Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washer with a new one.

TORQUE:
Neutral switch:
12 N·m (1.2 kgf·m, 9 lbf·ft)
Neutral switch wire terminal nut:
1.7 N·m (0.2 kgf·m, 1.3 lbf·ft)



INSPECTION

Remove the neutral switch wire terminal (page 21-21).

Shift the transmission into neutral.

Check for continuity between the neutral switch terminal and ground.

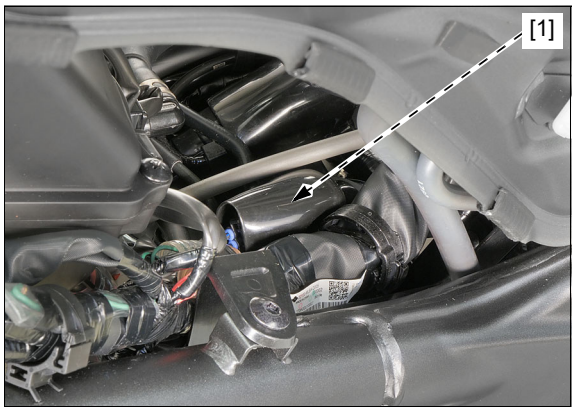
There should be continuity with the transmission is in neutral, and no continuity when the transmission is into gear.

SIDESTAND SWITCH

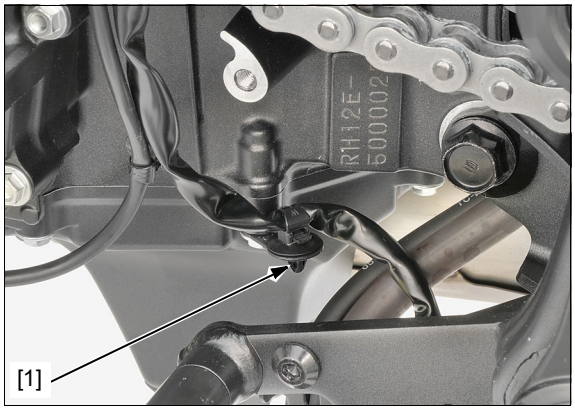
REMOVAL/INSTALLATION

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

Disconnect the sidestand switch 2P connector [1].



Remove the wire clip [1].



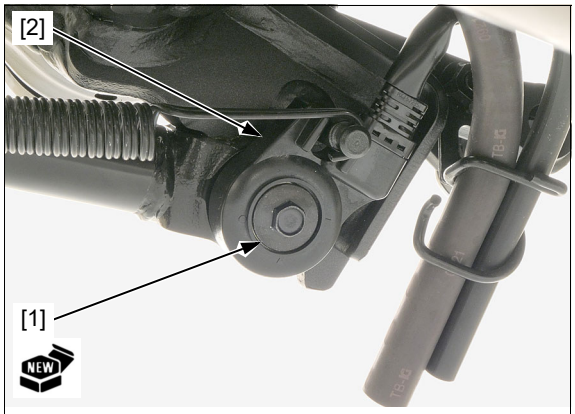
Remove the mounting bolt [1] and sidestand switch [2].

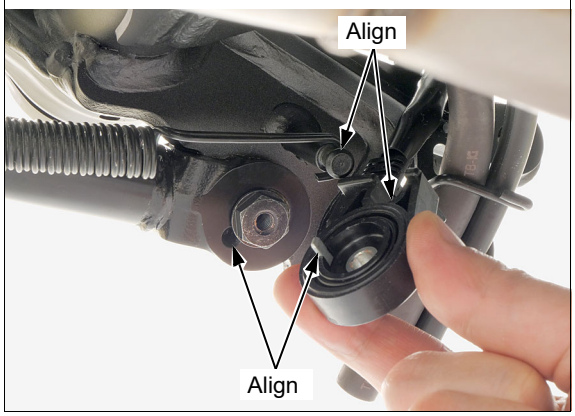
Installation is in the reverse order of removal.

TORQUE:
Sidestand switch mounting bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)

NOTE:

- Route the wire properly (page 1-21).
- 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.





INSPECTION

Disconnect the sidestand switch 2P connector (page 21-22).

Check for continuity between the switch side 2P connector terminals.

There should be continuity only when the sidestand is retracted.

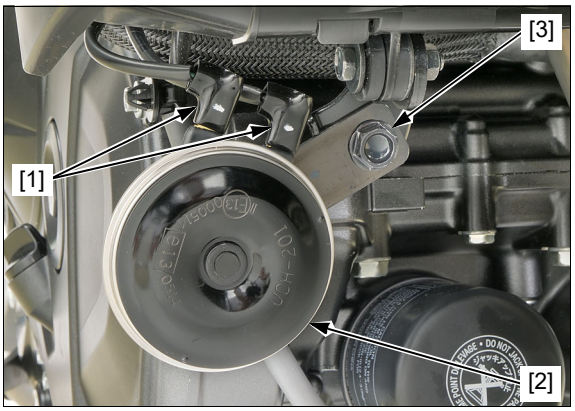
HORN

REMOVAL/INSTALLATION

Disconnect the horn connectors [1].

Remove the bolt [2] and horn [3].

Installation in the reverse order of removal.



INSPECTION

Disconnect the horn connectors.

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.

CONTROL RELAY

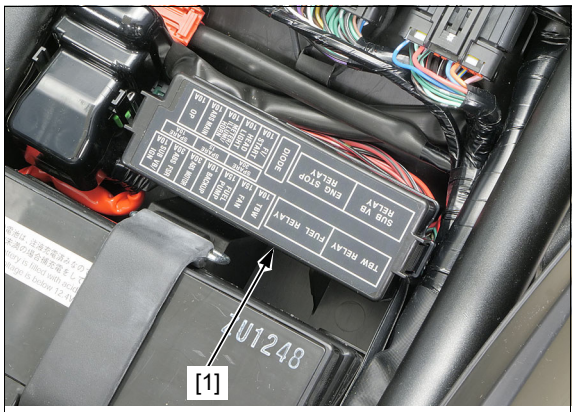
REMOVAL/INSTALLATION

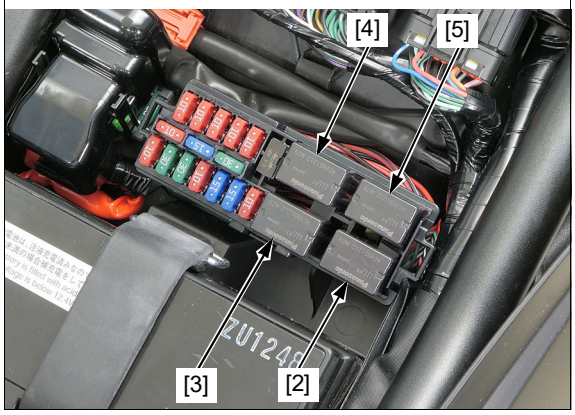
TBW RELAY/FUEL RELAY/ENG STOP RELAY/SUB VB RELAY

Remove the following:

- Front seat (page 2-4)
- Power box cover [1]
- TBW relay [2]
- Fuel relay [3]
- Eng stop relay [4]
- SUB VB relay [5]

Installation is in the reverse order of removal.





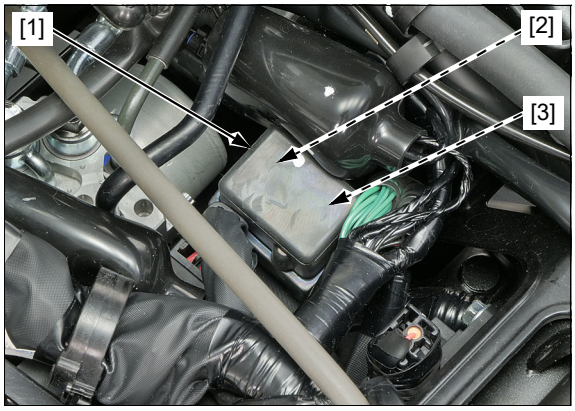
STARTER RELAY/FAN CONTROL RELAY

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

Remove the following:

- Relay box cover [1]
- Fan control relay [2]
- Starter relay [3]

Installation is in the reverse order of removal.



RELAY INSPECTION

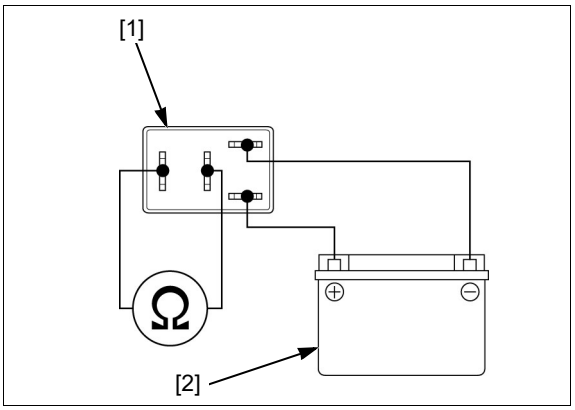
Remove the relay (page 21-24).

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

REMOVAL/INSTALLATION

Remove the rear seat (page 2-4).

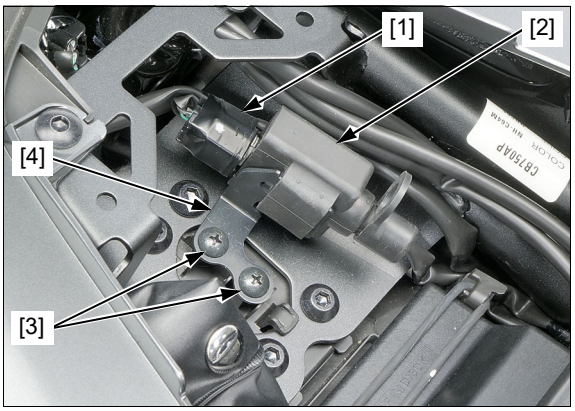
Turn the ignition switch OFF.

Disconnect the USB charger unit 2P connector [1] and USB charger unit [2].

Remove the screws [3] and stay [4].

Installation is in the reverse order of removal.

TORQUE: 1.0 N·m (0.11 kgf·m, 0.7 lbf·ft)



INSPECTION

Disconnect the USB charger unit 2P connector (page 21-25).

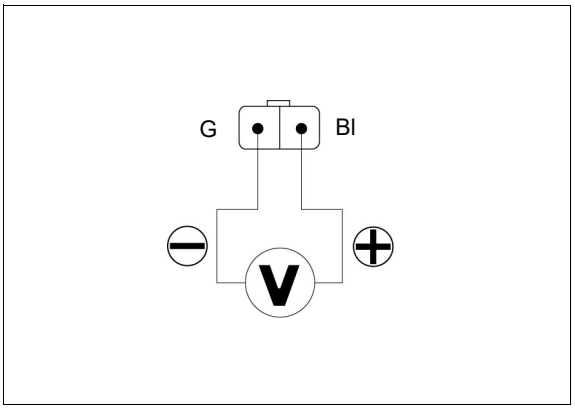
Turn the ignition switch ON.

Measure the voltage between the connector terminals.

CONNECTION: Black (+) – Green (–)

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

- If there is no voltage, check for blown fuse (METER/ ILLUMI/HORN 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.



BCU

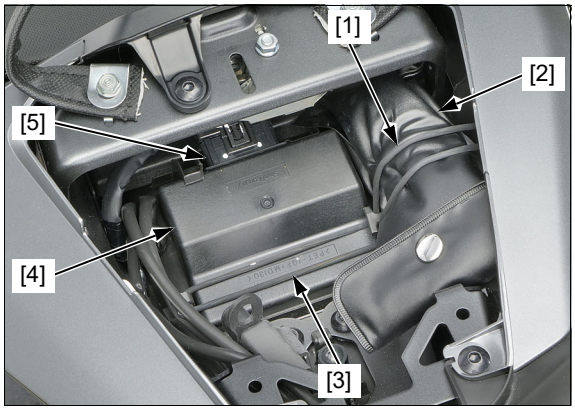
REMOVAL/INSTALLATION

Remove the following:

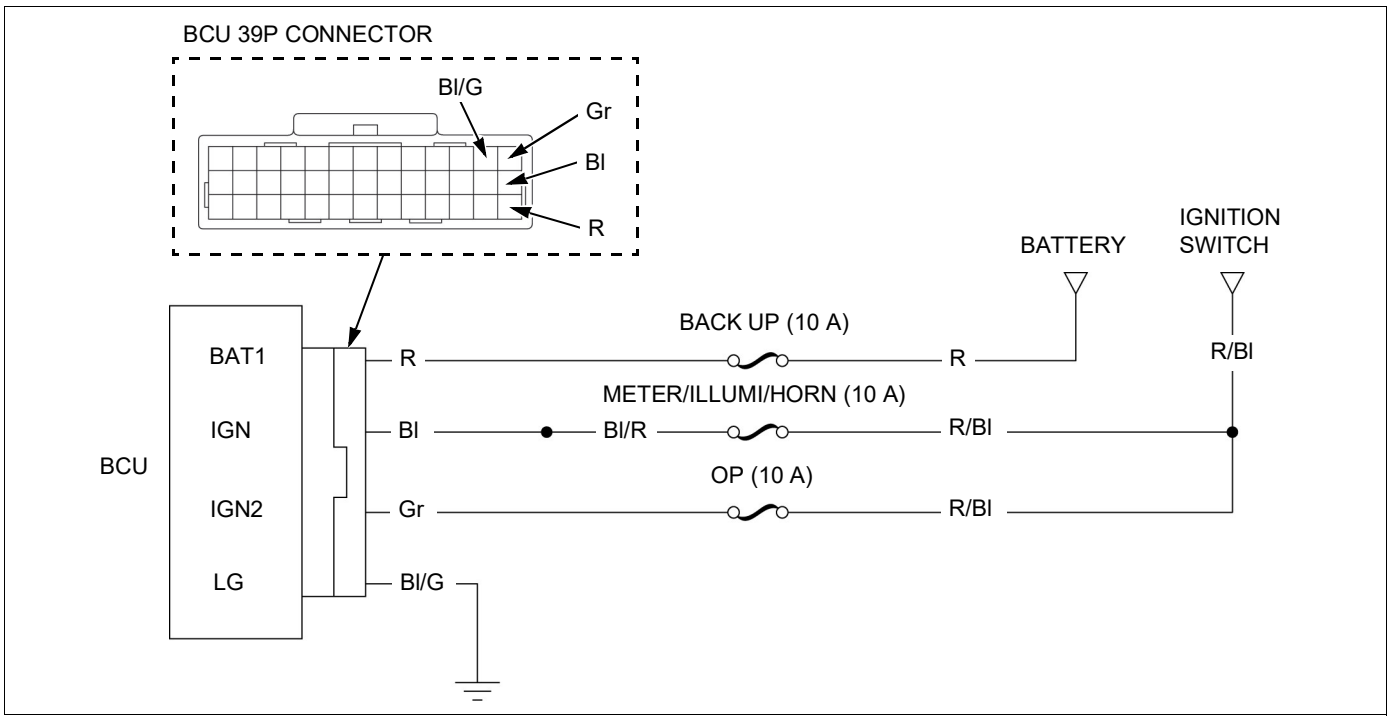
– Rear seat (page 2-4)
– Band [1]
– Tool bag [2]
– Band [3]
– BCU [4]

Disconnect the BCU 39P connector [5].

Installation is in the reverse order of removal.



POWER/GROUND LINE INSPECTION



1. BCU Power Input Line Inspection

Disconnect the BCU 39P connector (page 21-26).
Turn the ignition switch ON.
Measure the voltage between the wire harness side 39P connector terminal and ground.

TOOL:
Male Pin Prove **07ZAJ-RDJA110**

CONNECTION: Black (+) – Ground (–)
STANDARD: Battery voltage

Is there battery voltage?

YES – GO TO STEP 2.

NO – • Open circuit in the Black or Black/red wire
• Blown fuse METER/ILLUMI/HORN (10 A)

2. BCU Back-up Voltage Line Inspection

Turn the ignition switch OFF.
Measure the voltage between the wire harness side 39P connector terminal and ground.

TOOL:
Male Pin Prove 07ZAJ-RDJA110

CONNECTION:
Back-up 1 (BAT1): Red (+) – Ground (–)
Back-up 2 (IGN 2): Gray (+) – Ground (–)
STANDARD: Battery voltage

Is there battery voltage?

YES – GO TO STEP 3.

NO –
- Back-up 1 (BAT1) side:
  – Open circuit in the Red wire
  – Blown fuse BACK UP (10 A)
- Back-up 2 (IGN2) side:
  – Open circuit in the Gray wire
  – Blown fuse OP (10 A)

3. BCU Ground Line Open Circuit Inspection

Check the continuity between the wire harness side 39P connector terminal and ground.

TOOL:
Male Pin Prove 07ZAJ-RDJA110

CONNECTION: Black/green – 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).

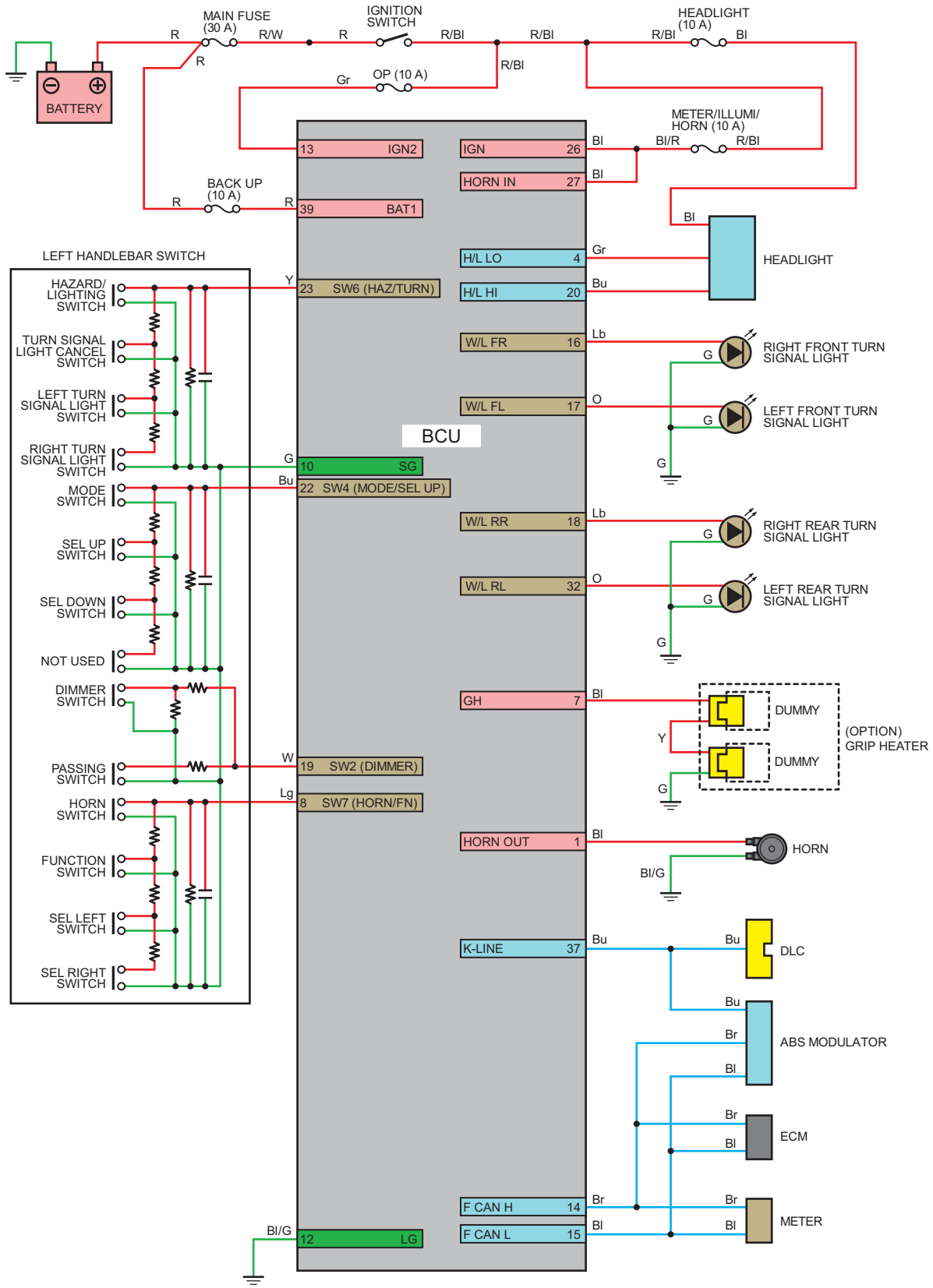
DTC READOUT

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. (Do not turn the ignition switch OFF after test-riding).

Follow the BCU DTC index (page 21-29).

BODY CONTROL SYSTEM DIAGRAM



BODY CONTROL SYSTEM DTC INDEX

NOTE:

- After confirming the MID displays, perform the troubleshooting according to the DTC index.

Meter displays	Honda code	DTC	MIL blinks	DTC name	Refer to page
B1	1-1	–	–	Ignition power failure (low voltage)	21-30
	1-2	–	–	Ignition power failure (high voltage)	21-30
B3	3-1	–	–	Back-up 1 failure (low voltage)	21-31
	3-2	–	–	Back-up 1 failure (high voltage)	21-31
B4	4-1	–	–	Back-up 2 failure (low voltage)	21-32
	4-2	–	–	Back-up 2 failure (high voltage)	21-32
	4-3	–	–	Back-up 2 failure	21-33
B11	11-1	–	–	Dimmer/passing switch failure (low voltage)	21-34
	11-2	–	–	Dimmer/passing switch failure (high voltage)	21-35
B12	12-1	–	–	Turn signal switch failure (low voltage)	21-36
	12-2	–	–	Turn signal switch failure (high voltage)	21-37
B21	21-1	–	–	Right front turn signal light failure (short circuit)	21-38
	21-2	–	–	Right front turn signal light failure (open circuit)	21-39
B22	22-1	–	–	Left front turn signal light failure (short circuit)	21-38
	22-2	–	–	Left front turn signal light failure (open circuit)	21-39
B23	23-1	–	–	Right rear turn signal light failure (short circuit)	21-38
	23-2	–	–	Right rear turn signal light failure (open circuit)	21-39
B24	24-1	–	–	Left rear turn signal light failure (short circuit)	21-38
	24-2	–	–	Left rear turn signal light failure (open circuit)	21-39
B35	35-1	–	–	Horn relay failure (short circuit)	21-40
	35-2	–	–	Horn relay failure (open circuit)	21-40
B81	81-1	–	–	Horn/Fn/sel left/sel right switch failure (short circuit)	21-41
	81-2	–	–	Horn/Fn/sel left/sel right switch failure (open circuit)	21-42
B82	82-1	–	–	Mode/sel up/sel down switch failure (short circuit)	21-43
	82-2	–	–	Mode/sel up/sel down switch failure (open circuit)	21-44
B91	101-2	–	–	BCU EEPROM malfunction	21-44
B93	103-1	U0001	103	CAN communication malfunction	4-56
	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 B1 (1-1) IGNITION POWER FAILURE (LOW VOLTAGE)

Probable cause:

- Faulty battery or its related circuit
- Blown fuse METER/ILLUMI/HORN (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 B1 (1-1) indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **BCU power/ground line Inspection**

   Check the BCU power/ground line (page 21-26).

   Is the power/ground line normal?

   YES – GO TO STEP 3.

   NO – Repair the faulty parts.

3. **Charging System Inspection**

   Check the charging system (page 20-3).

   Is the charging system normal?

   YES – Faulty BCU

   NO – Repair the faulty parts.

DTC B1 (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 B1 (1-2) indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **Charging System Inspection**

   Check the charging system (page 20-3).

   Is the charging system normal?

   YES – Faulty BCU

   NO – Repair the faulty parts.

DTC B3 (3-1) BACK-UP 1 FAILURE (LOW VOLTAGE)

Probable cause:

- Faulty battery or its related circuit
- Blown fuse BACK UP (10 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 B3 (3-1) indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **BCU power/ground line Inspection**

   Check the BCU power/ground line (page 21-26).

   Is the power/ground line normal?

   YES – GO TO STEP 3.

   NO – Repair the faulty parts.

3. **Charging System Inspection**

   Check the charging system (page 20-3).

   Is the charging system normal?

   YES – Faulty BCU

   NO – Repair the faulty parts.

DTC B3 (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 does not work

1. **Recheck DTC**

   Read the DTC.

   Is the DTC B3 (3-2) indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **Charging System Inspection**

   Check the charging system (page 20-3).

   Is the charging system normal?

   YES – Faulty BCU

   NO – Repair the faulty parts.

DTC B4 (4-1) BACK-UP 2 FAILURE (LOW VOLTAGE)

Probable cause:

- Faulty battery or its related circuit
- Blown 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 B4 (4-1) indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **BCU power/ground line Inspection**

   Check the BCU power/ground line (page 21-26).

   Is the power/ground line normal?

   YES – GO TO STEP 3.

   NO – Repair the faulty parts.

3. **Charging System Inspection**

   Check the charging system (page 20-3).

   Is the charging system normal?

   YES – Faulty BCU

   NO – Repair the faulty parts.

DTC B4 (4-2) BACK-UP 2 FAILURE (HIGH VOLTAGE)

Probable cause:

- Faulty battery
- Charging system malfunction
- Faulty BCU

1. **Recheck DTC**

   Read the DTC.

   Is the DTC B4 (4-2) indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **Charging System Inspection**

   Check the charging system (page 20-3).

   Is the charging system normal?

   YES – Faulty BCU

   NO – Repair the faulty parts.

DTC B4 (4-3) BACK-UP 2 FAILURE

Probable cause:

- Faulty battery
- Charging system malfunction
- Faulty BCU

1. **Recheck DTC**

   Read the DTC.

   Is the DTC B4 (4-3) indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **Charging System Inspection**

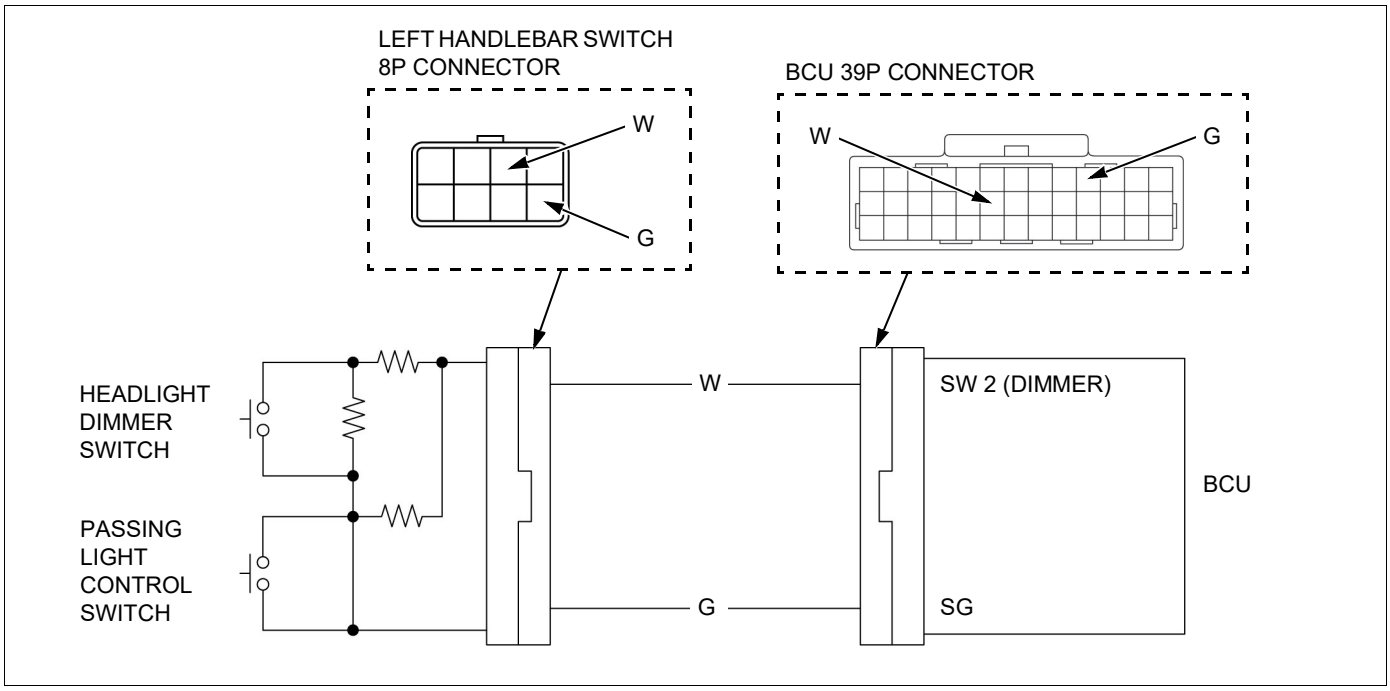
   Check the charging system (page 20-3).

   Is the charging system normal?

   YES – Faulty BCU

   NO – Repair the faulty parts.

DTC B11 HEADLIGHT DIMMER/ PASSING LIGHT CONTROL SWITCH FAILURE



DTC B11 (11-1)
HEADLIGHT DIMMER/PASSING LIGHT CONTROL SWITCH FAILURE (LOW VOLTAGE)

Probable cause:

- Short circuit in the related wire
- Faulty switch
- Faulty BCU

Symptom/Fail-safe function:

- Headlight works normally

1. **Recheck DTC**

   Read the DTC.

   Is the DTC B11 (11-1) indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **Headlight Dimmer/Passing Light Control Switch Line Short Circuit Inspection**

   Check for continuity between the BCU 39P connector and ground.

   TOOL:
   Male Pin Prove **07ZAJ-RDJA110**

   CONNECTION: White – Ground

   Is there continuity?

   YES – Short circuit in the White wire

   NO – • Faulty left handlebar switch
   • Faulty BCU

DTC B11 (11-2)
HEADLIGHT DIMMER/PASSING LIGHT CONTROL SWITCH FAILURE (HIGH VOLTAGE)

Probable cause:

- Open circuit in the related wire
- Faulty switch
- Faulty BCU

Symptom/Fail-safe function:

- Headlight works normally

1. **Recheck DTC**

   Read the DTC.

   Is the DTC B11 (11-2) indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **Headlight Dimmer/Passing Light Control Switch Line Open Circuit Inspection**

   Check for continuity between the BCU 39P connector and left handlebar switch 8P connector.

   TOOL:
   Male Pin Prove **07ZAJ-RDJA110**

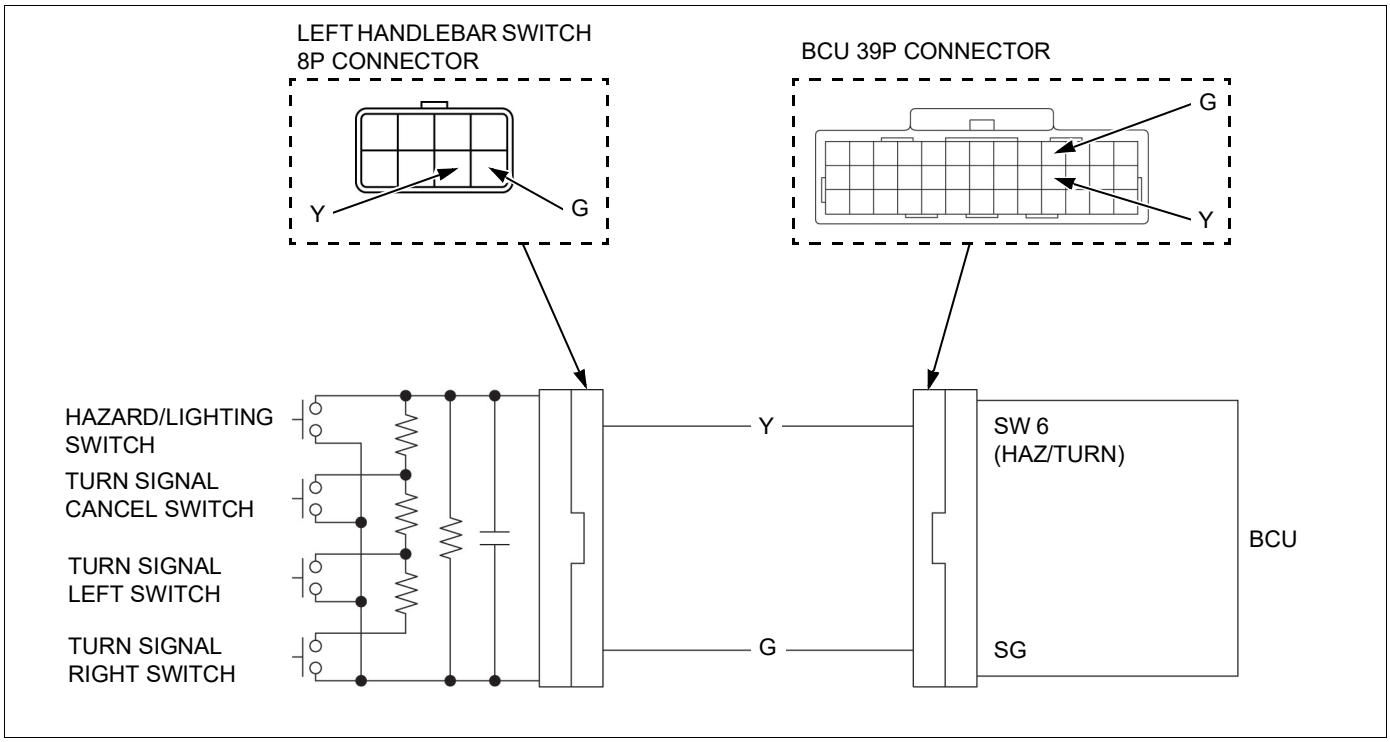
   CONNECTION: White – White
   Green – Green

   Is there continuity?

   YES – • Faulty left handlebar switch
   • Faulty BCU

   NO – Open circuit in the White or Green wire

DTC B12 TURN SIGNAL SWITCH FAILURE



DTC B12 (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 B12 (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 connector and ground.

   TOOL:
   Male Pin Prove **07ZAJ-RDJA110**

   CONNECTION: Yellow – Ground

   Is there continuity?

   YES – Short circuit in the Yellow wire

   NO – • Faulty left handlebar switch
   • Faulty BCU

DTC B12 (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 B12 (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 connector and left handlebar switch 8P connector.

TOOL:
Male Pin Prove **07ZAJ-RDJA110**

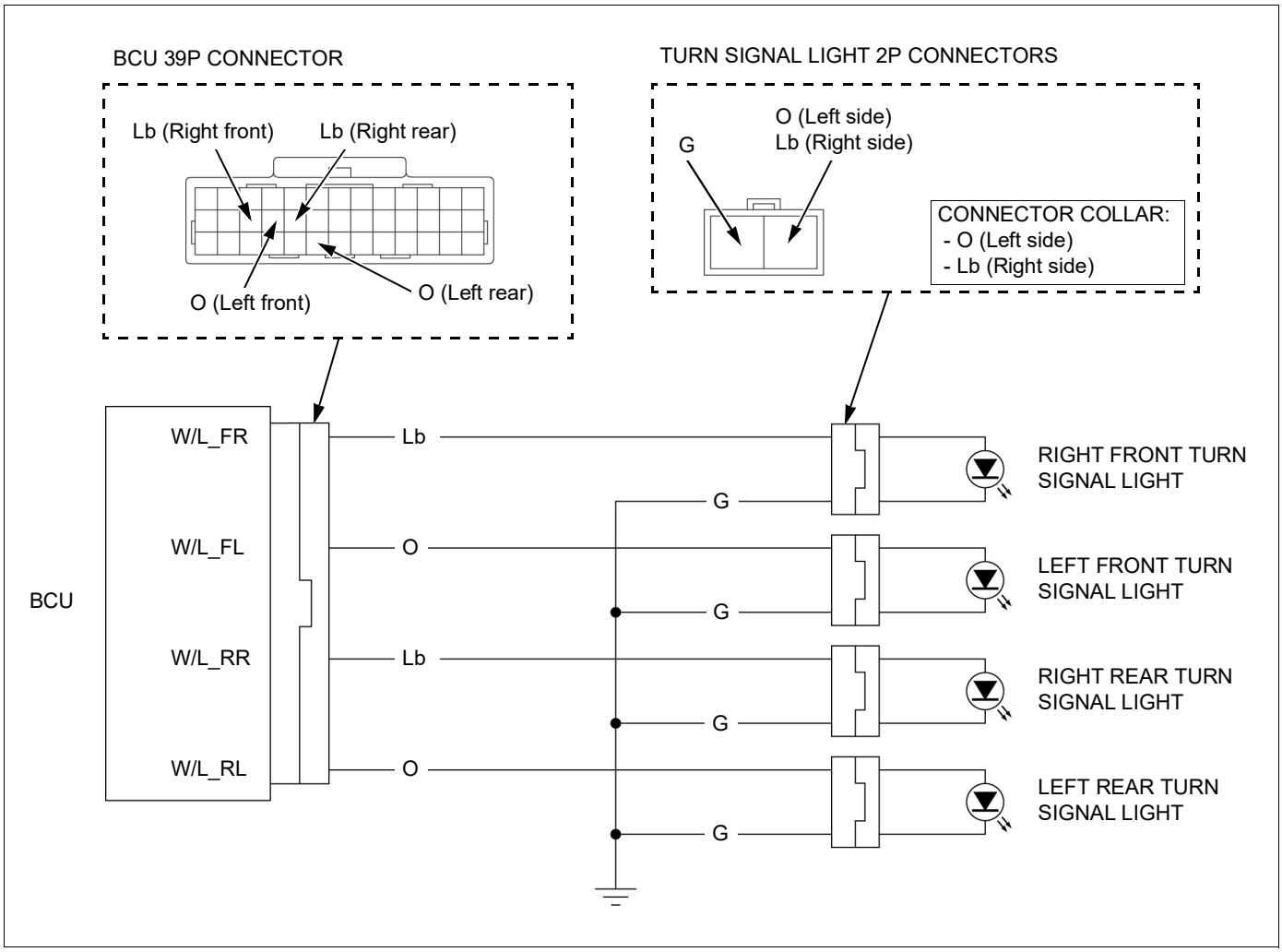
CONNECTION: Yellow – Yellow
Green – Green

Is there continuity?

YES – • Faulty left handlebar switch
• Faulty BCU

NO – Open circuit in the Yellow or Green wire

DTC B21/B22/B23/B24
TURN SIGNAL LIGHT FAILURE



DTC B21 (21-1)/B22 (22-1)/B23 (23-1)/B24 (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 B21 (21-1)/B22 (22-1)/B23 (23-1)/B24 (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 connector and ground.

TOOL:
Male Pin Prove 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 B21 (21-2)/B22 (22-2)/B23 (23-2)/B24 (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 B21 (21-2)/B22 (22-2)/B23 (23-2)/B24 (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 connector and each turn signal light 2P connector.
Check for continuity between each turn signal light 2P connector and ground.

TOOL:
Male Pin Prove 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 B35 (35-1) HORN RELAY 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 B35 (35-1) indicated?

   YES – Faulty BCU

   NO – Faulty original horn

DTC B35 (35-2) HORN RELAY FAILURE (OPEN CIRCUIT)

Probable cause:

- Faulty BCU

Symptom/Fail-safe function:

- Horn does not work

1. **Recheck DTC**

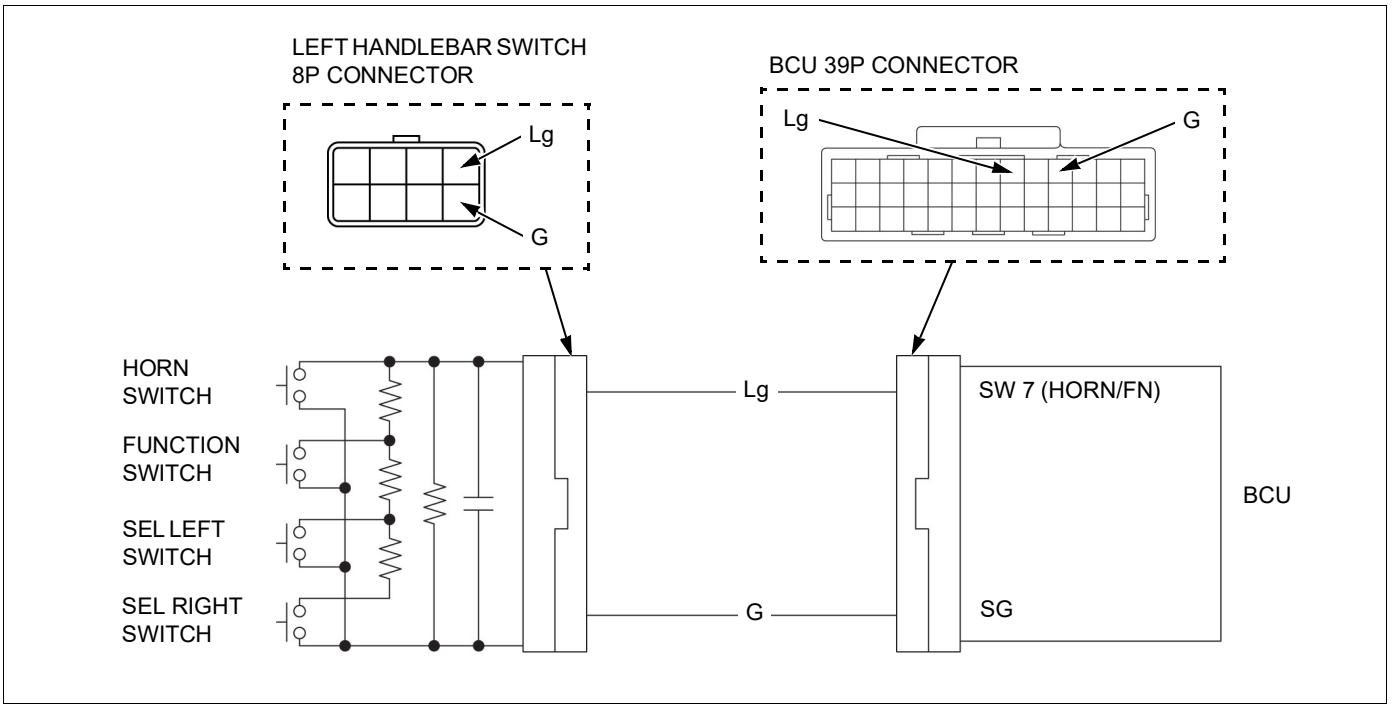
   Read the DTC.

   Is the DTC B35 (35-2) indicated?

   YES – Faulty BCU

   NO – Intermittent failure

DTC B81 HORN/FUNCTION/SEL LEFT/ SEL RIGHT SWITCH FAILURE



DTC B81 (81-1) HORN/FUNCTION/SEL LEFT/SEL RIGHT SWITCH FAILURE (SHORT CIRCUIT)

Probable cause:

- Short circuit in the related wire
- Faulty switch
- Faulty BCU

1. **Recheck DTC**

   Read the DTC.

   Is the DTC B81 (81-1) indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **Horn/Function/Sel Left/Sel Right Switch Line Short Circuit Inspection**

   Check for continuity between the BCU 39P connector and ground.

   TOOL:
   Male Pin Prove **07ZAJ-RDJA110**

   CONNECTION: Light green – Ground
   Green – Ground

   Is there continuity?

   YES – Short circuit in the Light green or Green wire

   NO – • Faulty left handlebar switch
   • Faulty BCU

DTC B81 (81-2) HORN/FUNCTION/SEL LEFT/SEL RIGHT SWITCH FAILURE (OPEN CIRCUIT)

Probable cause:

- Open circuit in the related wire
- Faulty switch
- Faulty BCU

1. Recheck DTC

Read the DTC.

Is the DTC B81 (81-2) indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Horn/FUNCTION/Sel Left/Sel Right Switch Line Open Circuit inspection

Check for continuity between the BCU 39P connector and left handlebar switch 8P connector.

TOOL:
Male Pin Prove 07ZAJ-RDJA110

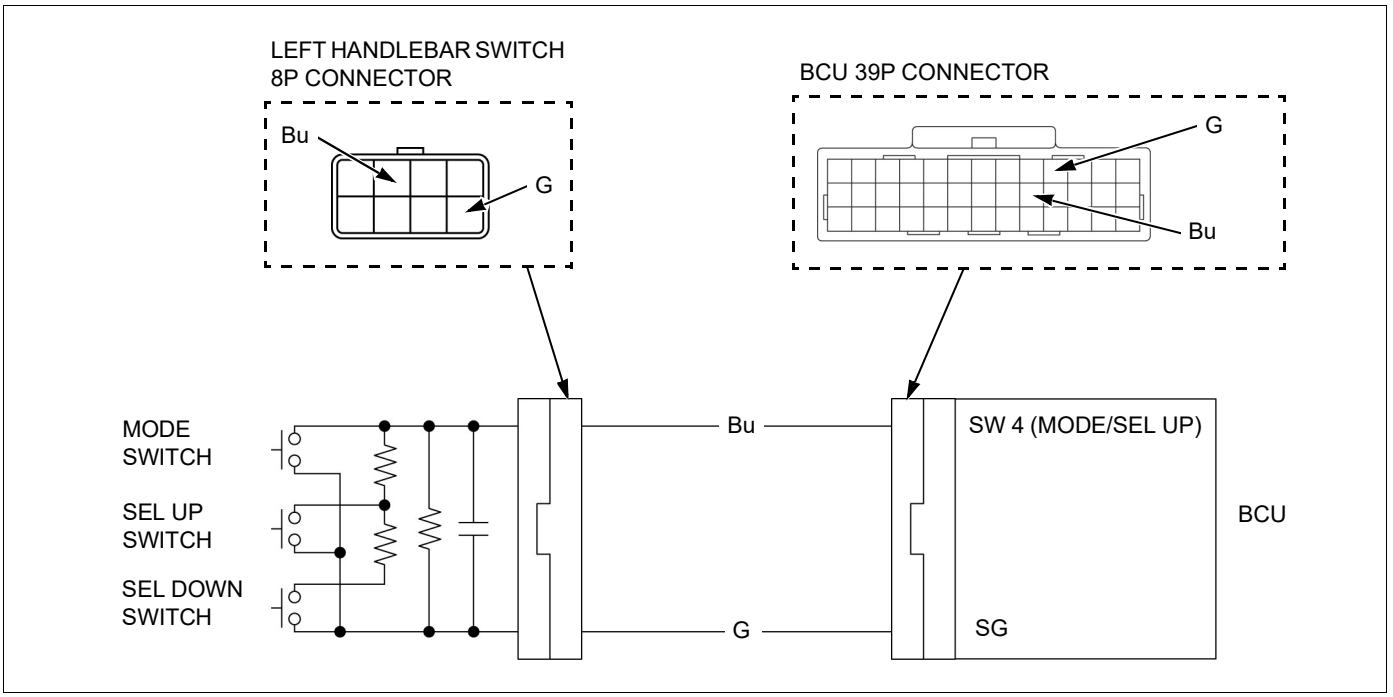
CONNECTION:
Signal line: Light green – Light green
Ground line: Green – Green

Is there continuity?

YES – • Faulty left handlebar switch
• Faulty BCU

NO – Open circuit in the Light green or Green wire

DTC B82 MODE/SEL UP/SEL DOWN SWITCH FAILURE



DTC B82 (82-1) MODE/SEL UP/SEL DOWN SWITCH FAILURE (SHORT CIRCUIT)

Probable cause:

- Short circuit in the related wire
- Faulty switch
- Faulty BCU

1. **Recheck DTC**

   Read the DTC.

   Is the DTC B82 (82-1) indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **Mode/Sel Up/Sel Down Switch Line Short Circuit Inspection**

   Check for continuity between the BCU 39P connector and ground.

   TOOL:
   Male Pin Prove **07ZAJ-RDJA110**

   CONNECTION:
   Blue – Ground
   Green – Ground

   Is there continuity?

   YES – Short circuit in the Blue or Green wire

   NO – • Faulty left handlebar switch
   • Faulty BCU

DTC B82 (82-2) MODE/SEL UP/SEL DOWN SWITCH FAILURE (OPEN CIRCUIT)

Probable cause:

- Open circuit in the related wire
- Faulty switch
- Faulty BCU

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 connector and left handlebar switch 8P connector.

   TOOL:
   Male Pin Prove **07ZAJ-RDJA110**

   CONNECTION: Blue – Blue
   Green – Green

   Is there continuity?

   YES – • Faulty left handlebar switch
   • Faulty BCU

   NO – Open circuit in the Blue or Green wire

DTC B91 (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 B91 (101-2) indicated?

   YES – Faulty BCU

   NO – Intermittent failure

22. IMMOBILIZER SYSTEM (HISS)

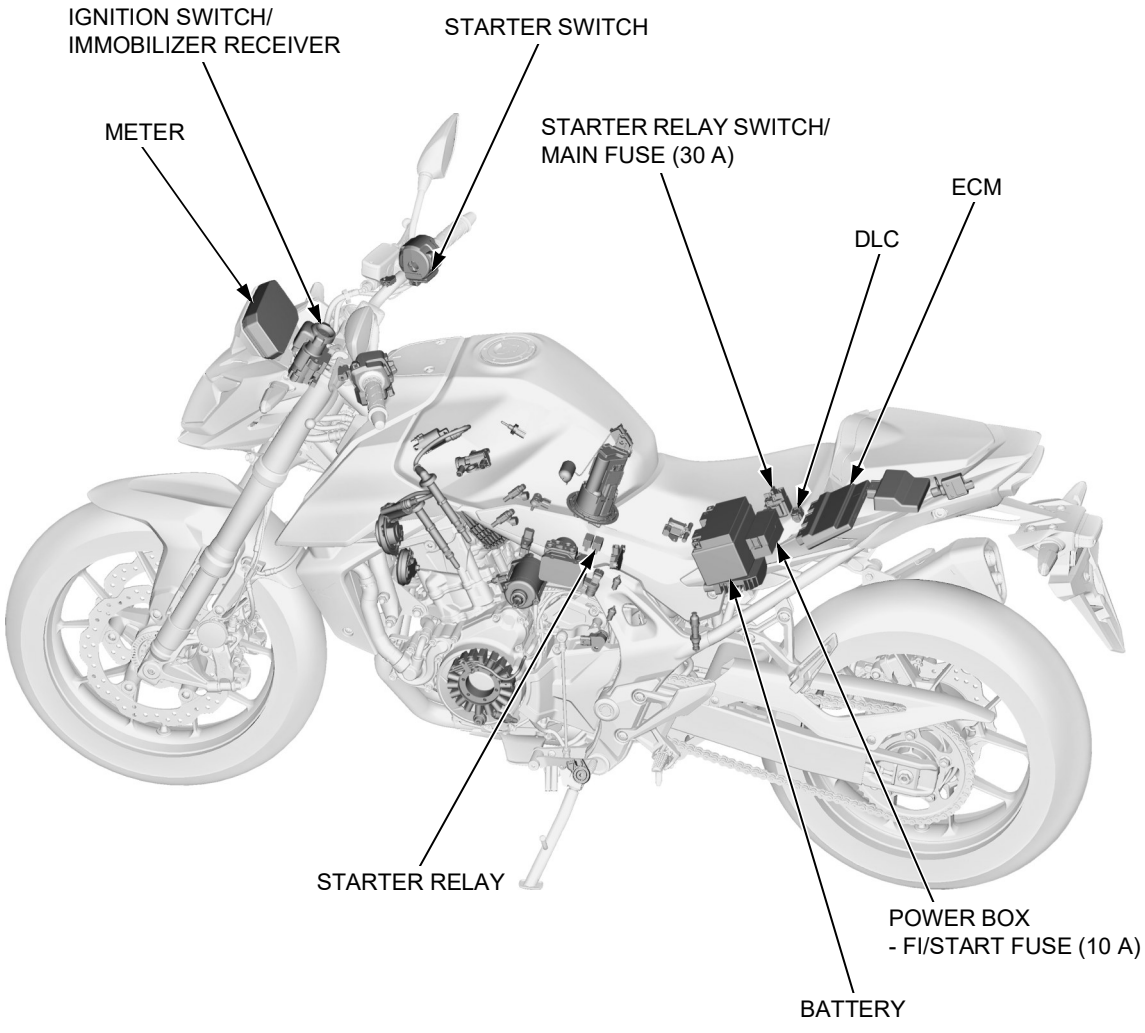
SERVICE INFORMATION

GENERAL

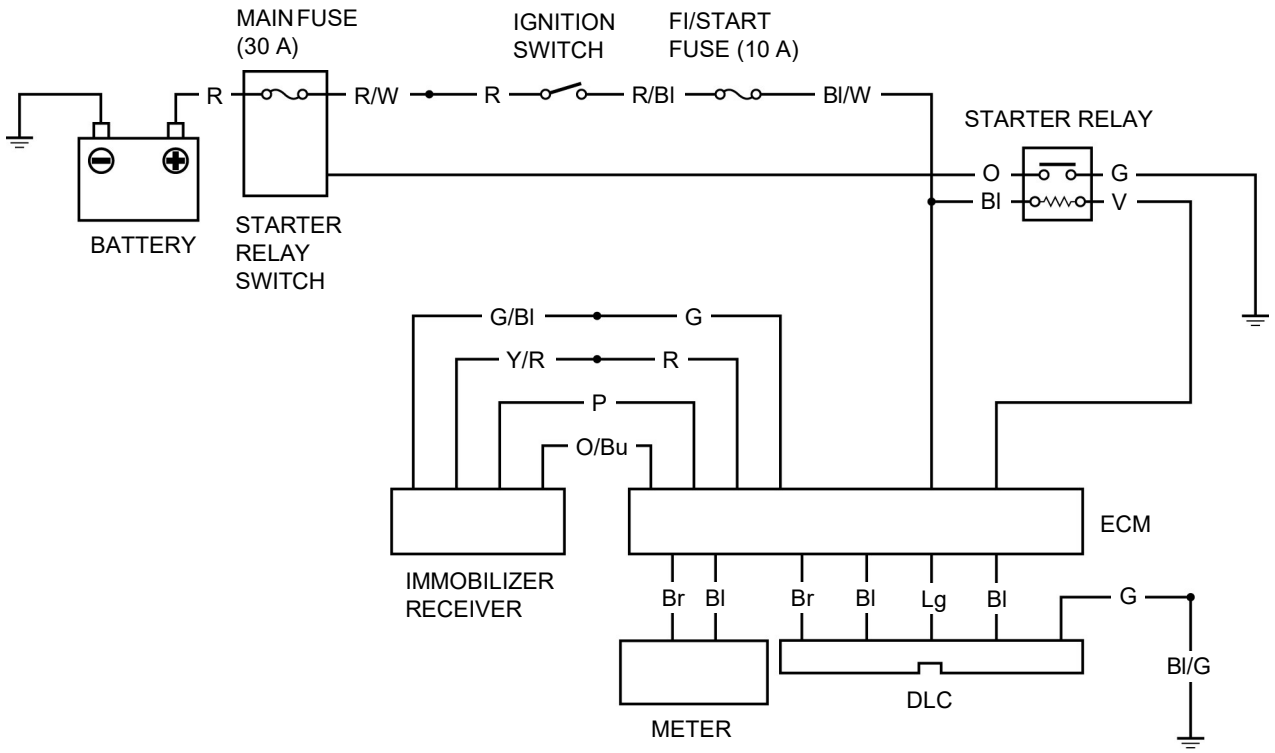
- When checking the immobilizer system (HISS), follow the steps in the troubleshooting flow chart (page 22-9).
- Keep the immobilizer key away from the other vehicle's immobilizer key when using it. The jamming of the key code signal may occur and the proper operation of the system will be obstructed.
- The key has built-in electronic part (transponder). Do not drop and strike the key against a hard material object, and do not leave the key on the dashboard in the car, etc. where the temperature will rise. Do not leave the key in the water for a prolonged time such as by washing the clothes.
- The ECM as well as the transponder keys must be replaced if all transponder keys have been lost.
- The system does not function with a duplicated key unless the code is registered into the transponder with the immobilizer system (HISS).
- The ECM can store up to four key codes (The four keys can be registered).
- Do not modify the immobilizer system as it can cause the system failure (The engine cannot be started).
- For ignition system inspection (page 5-3).
- For ignition switch inspection (page 21-15).
- For engine stop switch inspection (page 21-18).
- If the ECM is replaced, perform the following procedure.
  – Key Registration Procedures (page 22-4)
  – Crank pulse initialize learning procedure (page 4-64)
- The following color codes are used throughout this section.

Bl = Black	G = Green	R = Red	V = Violet	Br = Brown
O = Orange	Bu = Blue	P = Pink	W = White	Lg = Light green

SYSTEM LOCATION



SYSTEM DIAGRAM



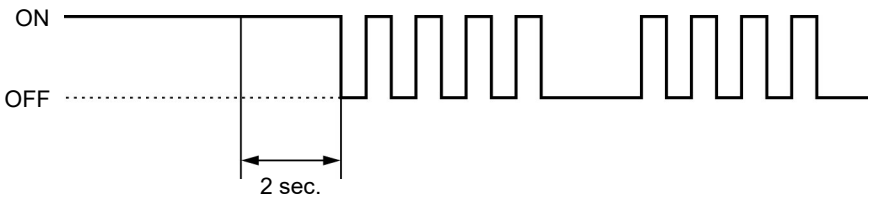
KEY REGISTRATION PROCEDURES

When the key has been lost, or additional spare key is required:

1. Obtain a new transponder key.
2. Grind the key in accordance with the shape of the original key.
3. Connect the SCS short connector to the DLC (page 22-7).
4. Open the throttle grip 5 ° to 60 ° and hold.
5. Turn the engine stop switch "○" and the ignition switch ON with the original key. The HISS indicator comes on and it remains on.

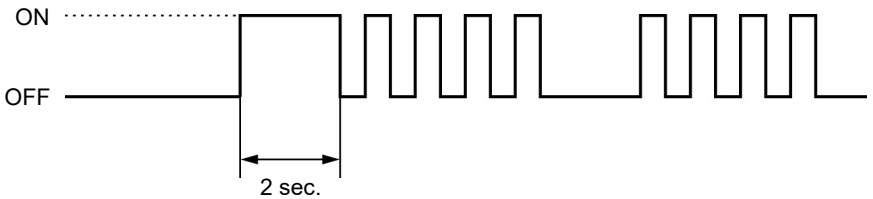
- The code of the original key recognized by the ECM.
- If there is any problem in the immobilizer system (HISS), the system will enter the diagnostic mode and the indicator will remain on for approx. ten seconds, then it will indicate the diagnostic code (page 22-8).

6. Wait two seconds or more, then completely close the throttle grip.
7. Wait two seconds or more, then open the throttle grip fully and hold.
8. Wait two seconds or more, then the indicator remains on for approx. two seconds, then it blinks four times repeatedly.



- The immobilizer system (HISS) enters the registration mode. Registrations of all key except the original key inserted in the ignition switch are cancelled (Registration of the lost key or spare key is cancelled).
  The spare key must be registered again.
- Complete the procedure 5 through 7 within 25 seconds. If 25 seconds or more have passed, restart from the step 4.

9. Turn the ignition switch OFF and remove the key. Completely close the throttle grip.
10. Open the throttle grip 5 ° to 60 ° and hold.
11. Turn the ignition switch ON with a new key or the spare key (Never use the key registered in previous steps). The indicator comes on for two seconds then it blinks four times repeatedly.



- The new key or spare key is registered in the ECM.
- If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-8).
- Keep the other transponder key away from the immobilizer receiver more than 50 mm (2.0 in).

12. Turn the ignition switch OFF and remove the key. Completely close the throttle grip.
13. Repeat the steps 9 through 11 when you continuously register the other new key.

    The ECM can store up to four key codes (The four keys can be registered).

14. Disconnect the SCS short connector.
15. Turn the ignition switch ON with the registered key.

- The immobilizer system (HISS) returns to the normal mode.

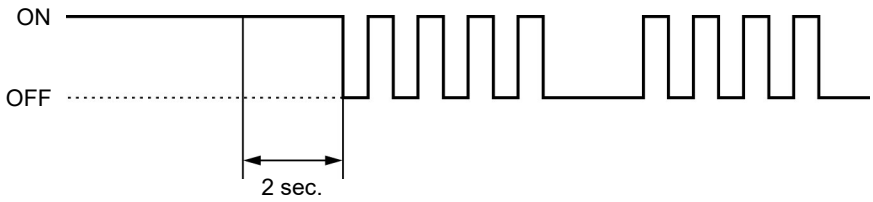
16. Check that the engine can be started using all registered keys.

When the ignition switch is faulty:

1. Obtain a new ignition switch assembly.
2. Remove the ignition switch (page 21-15).
3. Connect the SCS short connector to the DLC (page 22-7).
4. Set the original (registered) key near the immobilizer receiver so that the transponder in the key can communicate with the receiver.
5. Open the throttle grip 5 ° to 60 ° and hold.
6. Turn the engine stop switch "○". Connect a new ignition switch to the wire harness and turn it to ON with a new transponder key (keep the ignition switch away from the receiver). The HISS indicator comes on and it remains on.

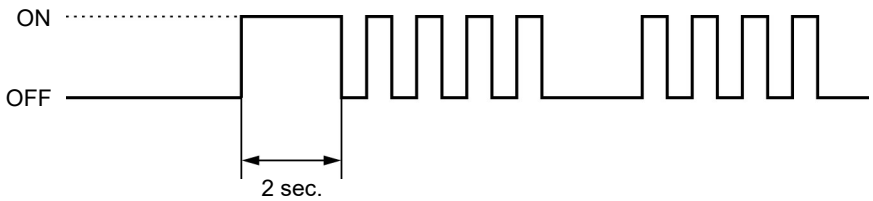
- The code of the original key is recognized by the ECM.
- If there is any problem in the immobilizer system (HISS), the system will enter the diagnostic mode and the indicator will remain on for approx. ten seconds, then it will indicate the diagnostic code (page 22-8).

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 21-15).
12. Open the throttle grip 5 ° to 60 ° and hold.
13. Turn the ignition switch ON with a first new key. The indicator comes on for two seconds then it blinks four times repeatedly.



- The first new key is registered in the ECM.
- If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-8).

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.
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 22-8).

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.

IMMOBILIZER SYSTEM (HISS)

21. Wait two seconds or more, then the indicator remains on for approx. two seconds, then it blinks four times repeatedly.

- The immobilizer system (HISS) enters the registration mode. Registration of the original key used in step 5 is cancelled.
- Complete the procedure 18 through 20 within 25 seconds. If 25 seconds or more have passed, restart from the step 17.

22. Turn the ignition switch OFF and remove the key. Completely close the throttle grip.

23. Open the throttle grip 5 ° to 60 ° and hold.

24. Turn the ignition switch ON with a second new key (Never use the key registered in previous step). The indicator comes on for two seconds then it blinks four times repeatedly.

- The second new key is registered in the ECM.
- If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-8).
- Keep the other transponder key away from the immobilizer receiver more than 50 mm (2.0 in).

25. Repeat the steps 22 and 24 when you continuously register the other new key.

    The ECM can store up to four key codes (The four keys can be registered).

26. Turn the ignition switch OFF, then completely close the throttle grip. Disconnect the SCS short connector.

27. Turn the ignition switch ON with the registered key.

- The immobilizer system (HISS) returns to the normal mode.

28. Check that the engine can be started using all registered keys.

When all keys have been lost:

1. Obtain a new ECM and new key set.
2. Replace the ignition switch with a new one (page 21-15).
3. Replace the ECM with a new one (page 4-58).
4. Turn the engine stop switch "○" and the ignition switch ON with a first new key. The HISS indicator comes on for two seconds, then it blinks four times repeatedly.

- The first new key is registered in the ECM.
- If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-8).

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 22-8).

7. Turn the ignition switch OFF and remove the second new key.

- The system will not enter the normal mode unless the two keys are registered in ECM.
- The third new key cannot be continuously registered. When it is necessary to register the third key, follow the procedures "When the key has been lost, or additional key is required" (page 22-4).

8. Check that the engine can be started using all registered keys.
9. Replace the remaining key set parts.

When the ECM is faulty:

1. Obtain a new ECM and two new transponder keys.
2. Grind the keys in accordance with the shape of the original key.
3. Replace the ECM with a new one (page 4-58).
4. Turn the engine stop switch "○" and the ignition switch ON with a first new key. The HISS indicator comes on for two seconds, then it blinks four times repeatedly.

- The first new key is registered in the ECM.
- If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-8).

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 22-8).

7. Turn the ignition switch OFF and remove the second new key.

- The system will not enter the normal mode unless the two keys are registered in ECM.
- The third new key cannot be continuously registered. When it is necessary to register the third key, follow the procedures "When the key has been lost, or additional key is required" (page 22-4).

8. Check that the engine can be started using all registered keys.

DIAGNOSTIC CODE INDICATION

Turn the ignition switch OFF.

Remove the front seat (page 2-4).

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

TOOL:
SCS short connector [3] 070MZ-0010300

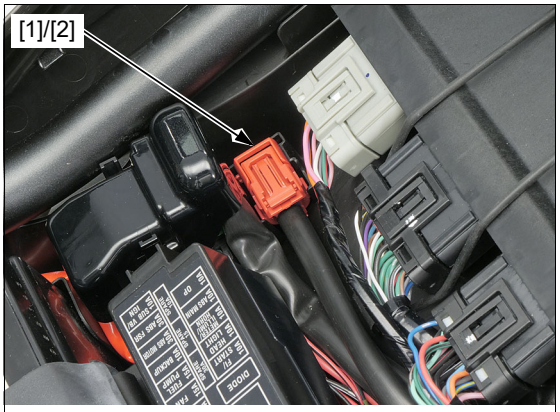
Open the throttle grip 5 ° to 60 ° and hold.

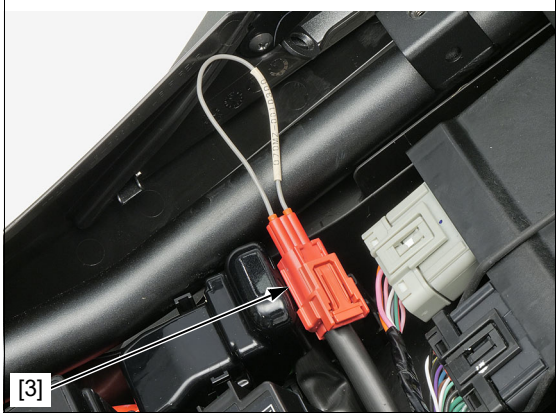
Turn the engine stop switch "○" and the ignition switch ON with the properly registered key.

The HISS indicator will come on for approx. ten seconds then it will start blinking to indicate the diagnostic code if the system is abnormal.

The blinking frequency is repeated.

The HISS indicator remains on when the system is normal (The system is in the normal mode and the diagnostic code does not appear).

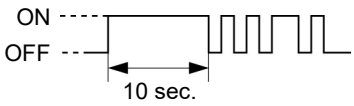




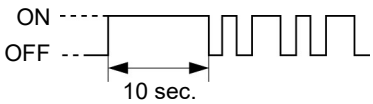
IMMOBILIZER SYSTEM (HISS)

DIAGNOSTIC CODE

When the system (ECM) enters the diagnostic mode from the normal mode:

BLINKING PATTERN	SYMPTOM	PROBLEM	PROCEDURE
	ECM data is abnormal.	Faulty ECM	Replace the ECM.
	Code signals cannot send or receive.	Faulty immobilizer receiver or wire harness	Follow the troubleshooting (page 22-9).
	Identification code is disagree.	Jamming by the other transponder	Keep the other vehicle's transponder key away from the immobilizer receiver more than 50 mm (2.0 in).
	Secret code is disagree.		

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 22-9).
	Registration is impossible.	The key is already registered on the other system.	Use a new key.

TROUBLESHOOTING

The immobilizer indicator comes on for approx. two seconds then it goes off, when the ignition switch is turned ON with the properly registered key with the engine stop switch turned "" and the immobilizer system (HISS) functions normally. If there is any problem or the properly registered key is not used, the indicator will remains on.

HISS indicator does not operate properly

1. **Meter Inspection**

   Check the meter initial operation (page 21-8).

   Is the initial operation displayed?

   YES – GO TO STEP 2.

   NO – Check the meter power/ground line (page 21-10).

2. **CAN Line Inspection**

   Check that the ECM stores the DTC U0155 (page 4-56).

   Is the DTC U0155 stored?

   YES – Troubleshoot the DTC U0155 (page 4-56).

   NO – • Check the HISS ON/OFF function (MID)
   • Faulty meter
   • Faulty ECM

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 vehicle‘s transponder key near the immobilizer receiver and key.

   Is there any metal obstruction or the other transponder key?

   YES – Remove it and recheck.

   NO – GO TO STEP 2.

2. **First Transponder Key Inspection**

   Turn the ignition switch ON with the spare transponder key and check the HISS indicator.
   The indicator should come on for 2 seconds then go off.

   Does the indicator go off?

   YES – Faulty first transponder key

   NO – GO TO STEP 3.

3. **Diagnostic Code Inspection**

   Perform the diagnostic code indication procedure (page 22-7).
   Check that the HISS indicator comes on then it starts blinking.

   Does the indicator blink or stay lit?

   BLINKS– Read the diagnostic code (page 22-8).

   STAYS 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 4-8).

   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 22-11).

   Is the input line normal?

   YES – GO TO STEP 2.

   NO – Open or short circuit in the Red wire

2. **Immobilizer Receiver Ground Line Inspection**

   Check the immobilizer receiver ground line (page 22-11).

   Is the ground line normal?

   YES – GO TO STEP 3.

   NO – Open circuit in the Green/Black or Green wire

3. **Immobilizer Receiver Signal Line Inspection**

   Check the immobilizer receiver signal lines (page 22-11).

   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 known good one (page 22-10).
   Perform the diagnostic code indication procedure (page 22-7).

   Is the diagnostic code indicated?

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

   NO – Faulty original immobilizer receiver.

IMMOBILIZER RECEIVER

REMOVAL/INSTALLATION

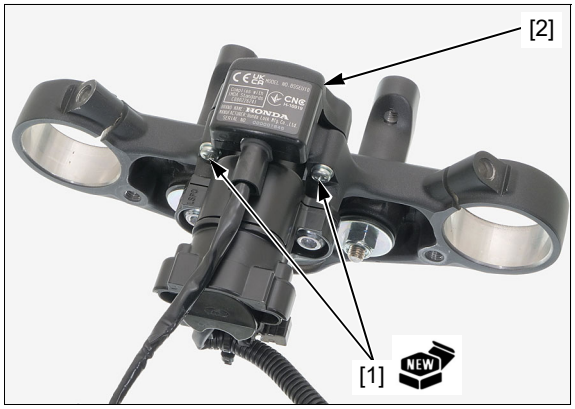
Remove the following:

– Top bridge (page 16-32)
– Screws [1]
– Immobilizer receiver [2]

Installation is in the reverse order of removal.

NOTE:

• Always replace the immobilizer receiver mounting screws with new ones.



INSPECTION

Remove the headlight (page 21-3).

Remove the immobilizer receiver 4P connector [1] from the stay and disconnect it.

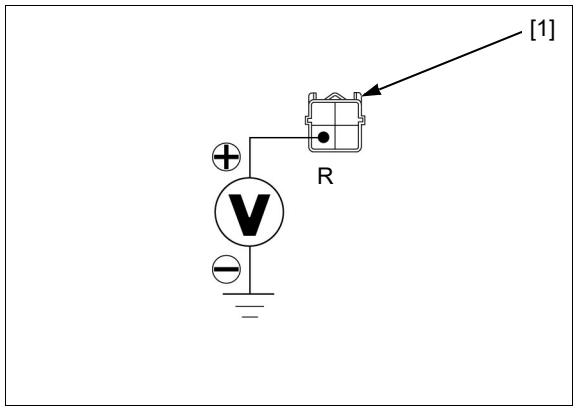
POWER INPUT LINE INSPECTION

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

Measure the voltage between the immobilizer receiver 4P connector [1] terminal of the wire harness side and ground.

CONNECTION: Red (+) – Ground (–)

There should be approx. 5 V.

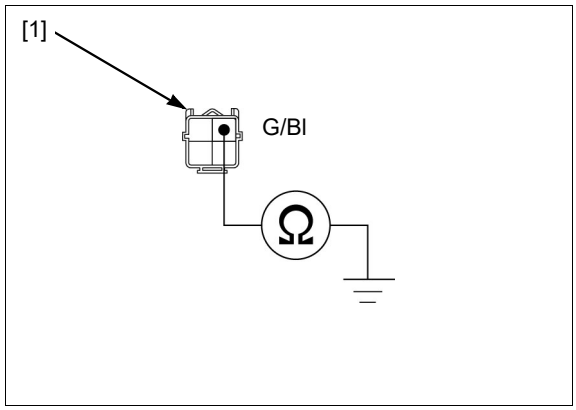


GROUND LINE INSPECTION

Check for continuity between the immobilizer receiver 4P connector [1] terminal of the wire harness side and ground.

CONNECTION: Green/black – Ground

There should be continuity at all times.



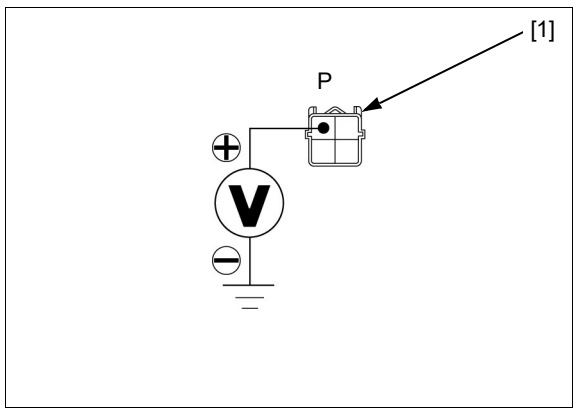
SIGNAL LINE INSPECTION

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

Measure the voltage between the immobilizer receiver 4P connector [1] terminal of the wire harness side and ground.

CONNECTION: Pink (+) – Ground (–)

There should be approx. 5 V.

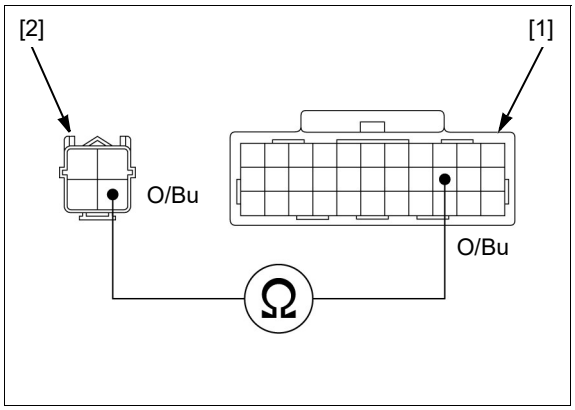


Disconnect the ECM 33P (Gray) connector (page 4-58).

Check for continuity between the ECM 33P connector [1] and immobilizer receiver 4P connector [2] terminals of the wire harness side.

CONNECTION: Orange/blue – Orange/blue

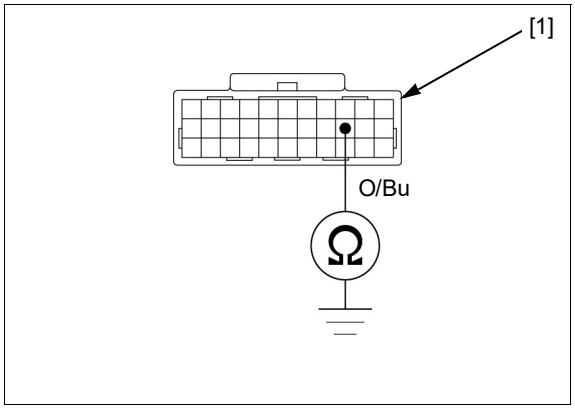
There should be continuity.



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

CONNECTION: Orange/blue – Ground

There should be no continuity.



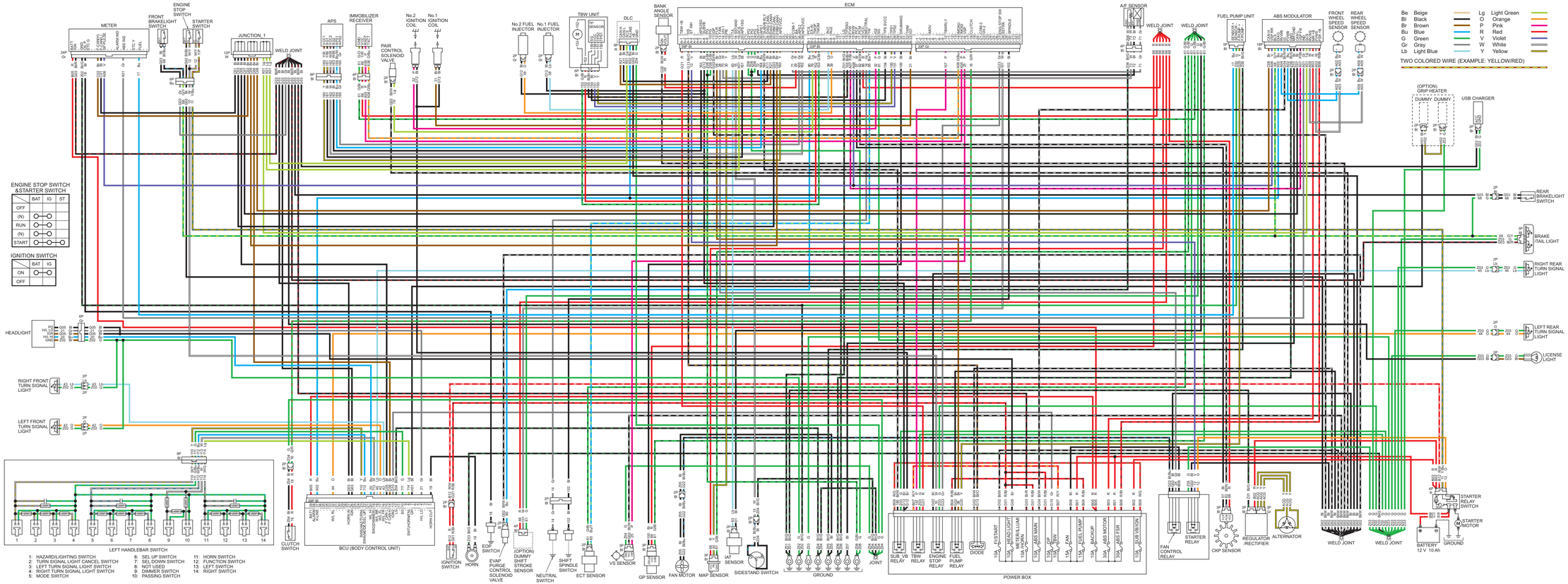
REPLACEMENT PARTS FOR PROBLEM

Problem	Replacement Parts					
	Transponder Key	Immobilizer receiver	ECM	Ignition switch assembly	Key set	*Accessory lock and key
One key has been lost, or additional spare key is required	○					
All keys have been lost			○		○	
ECM is faulty	○		○			
Immobilizer receiver is faulty		○				
Ignition switch is faulty				○		
*Accessory lock is faulty						○

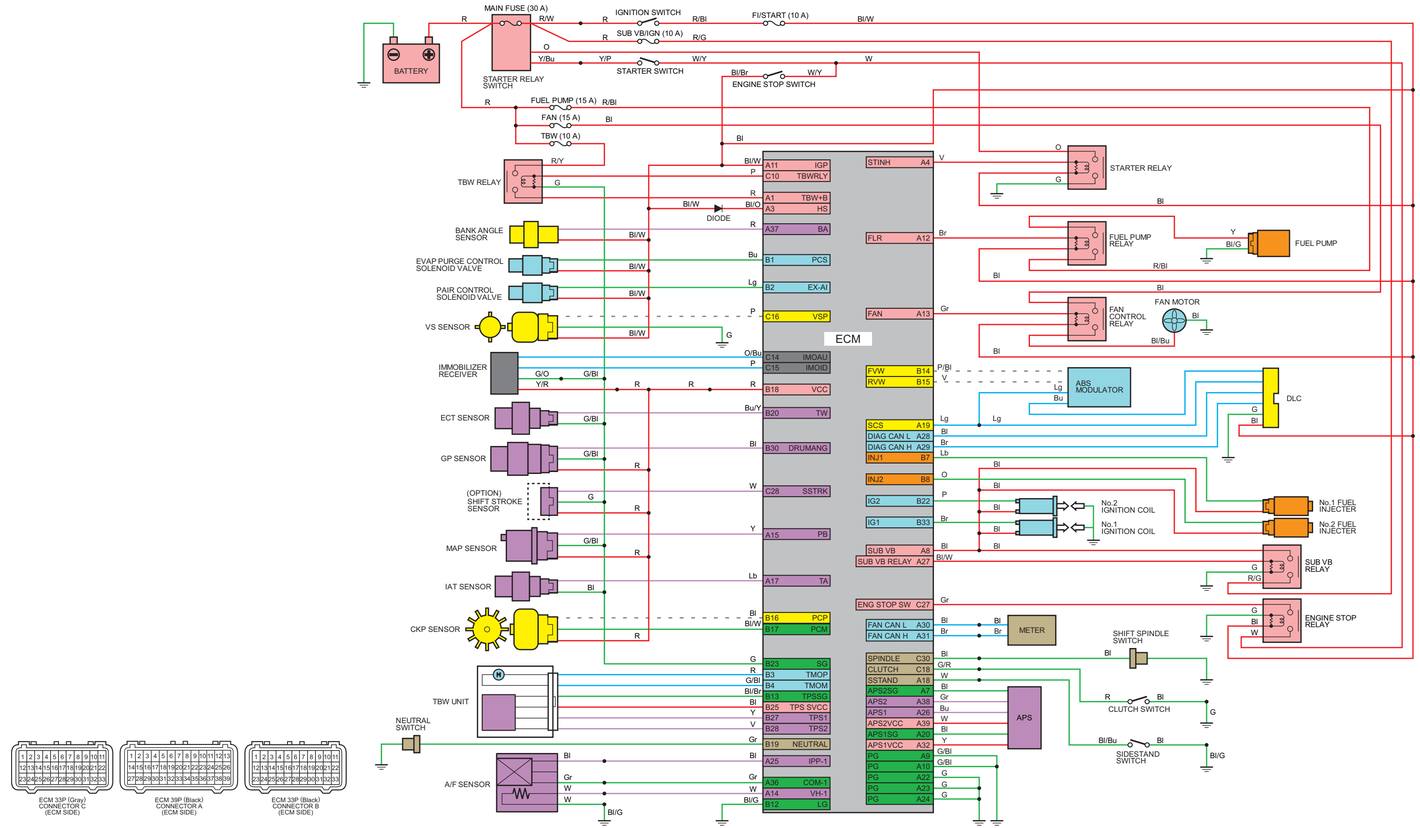
*Accessory lock means the fuel fill cap and seat lock.

23. WIRING DIAGRAM

WIRING DIAGRAM



PGM-FI SYSTEM DIAGRAM



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