2017–2019

HONDA

SERVICE MANUAL

CMX500/A
Rebel 500

How To Use This Manual

This manual describes the service procedures for the CMX500/A.

Sections 1 and 3 apply to the whole motorcycle. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections.
Section 4 through 21 describe parts of the motorcycle, grouped according to location.

Follow the Maintenance Schedule recommendations to ensure that the motorcycle is in peak operating condition.
Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period.

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

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

Refer to the troubleshooting in each section according to the malfunction or symptom. In case of an each 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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A Few Words About Safety

Service Information

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

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

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

For Your Customer's Safety

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

⚠WARNING

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

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

For Your Safety

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

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

⚠WARNING

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

Follow the procedures and precautions in this manual carefully.

Important Safety Precautions

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

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

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

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

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

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

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 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 genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown in the Cable and Harness Routing (page 1-23).
9. Do not bend or twist control cables. Damaged control cables will not operate smoothly and may stick or bind.

ABBREVIATION

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

Abbrev. term	Full term
ABS	Anti-lock Brake System
CKP sensor	Crankshaft Position sensor
DLC	Data Link Connector
DTC	Diagnostic Trouble Code
ECM	Engine Control Module
ECT sensor	Engine Coolant Temperature sensor
EEPROM	Electrically Erasable Programmable Read Only Memory
EOP switch	Engine Oil Pressure switch
EVAP	Evaporative Emission
HISS	Honda Ignition Security System
IACV	Idle Air Control Valve
IAT sensor	Intake Air Temperature sensor
MAP sensor	Manifold Absolute Pressure sensor
MCS	Motorcycle Communication System
MIL	Malfunction Indicator Lamp
O_2 sensor	Oxygen sensor
PAIR	Pulse Secondary Air Injection
PGM-FI	Programmed Fuel Injection
SCS short connector	Service Check Signal Short connector
TP sensor	Throttle Position sensor
VS sensor	Vehicle Speed sensor

DESTINATION CODE

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

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

MODEL IDENTIFICATION

This manual covers following types of CMX500/A models:

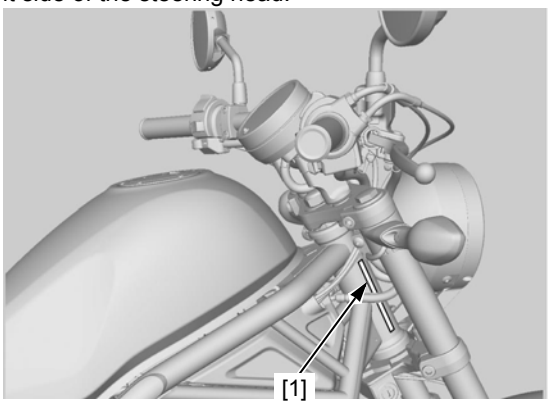
CM model shown:

TYPES

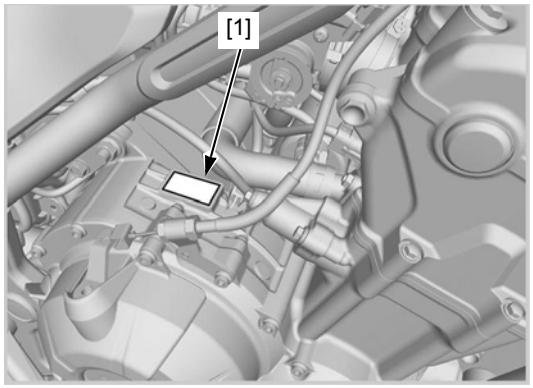
TYPE CODE	DESTINATION CODE	Anti-lock Brake System	EVAP canister	Passenger seat
CMX500	A	–	–	–
	AC	–	○	–
	CM	–	–	○
CMX500A	AC	○	○	–
	CM	○	–	○

SERIAL NUMBERS

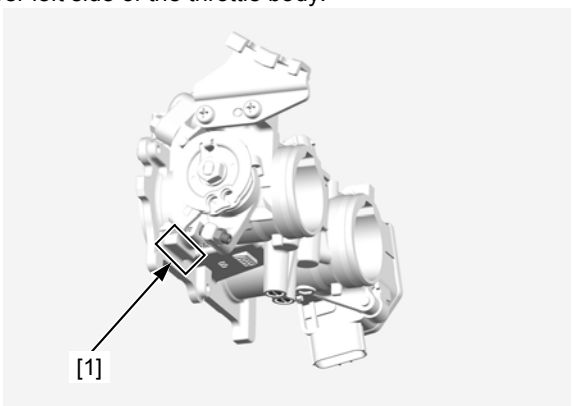
The Vehicle Identification Number (VIN) [1] is stamped on the right side of the steering head.



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

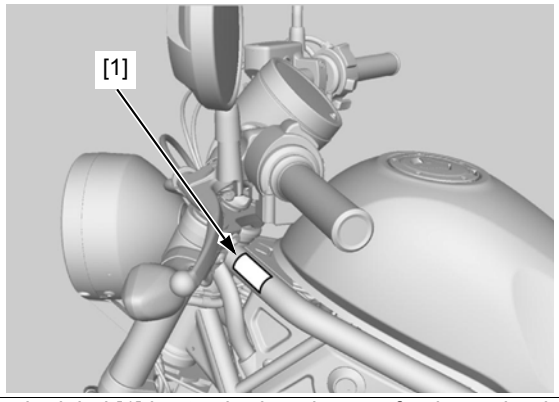


The throttle body identification number [1] is stamped on the lower left side of the throttle body.

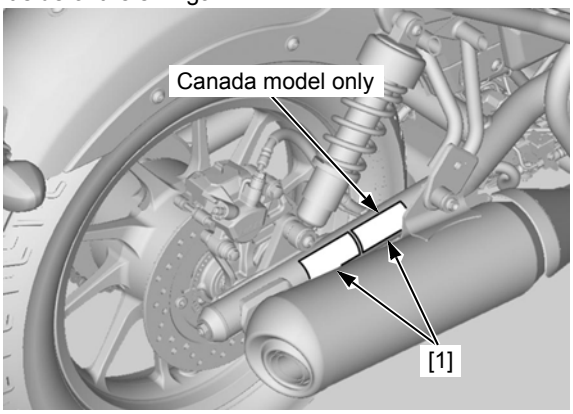


LABEL

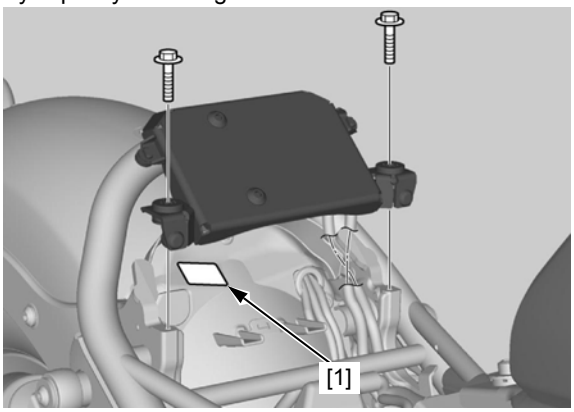
The Safety Certification Label [1] is attached on the left front side of the frame.



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



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



SPECIFICATIONS

GENERAL SPECIFICATIONS

CMX500

ITEM				SPECIFICATION
DIMENSIONS	Overall length			2,190 mm (86.2 in)
	Overall width			820 mm (32.3 in)
	Overall height			1,090 mm (42.9 in)
	Wheelbase			1,490 mm (58.7 in)
	Seat height			690 mm (27.2 in)
	Footpeg height			268 mm (10.6 in)
	Ground clearance			135 mm (5.3 in)
	Curb weight		A model	185 kg (408 lbs)
			AC model	186 kg (410 lbs)
			CM model	187 kg (412 lbs)
	Maximum weight capacity			157 kg (346 lbs)
FRAME	Frame type			Diamond type
	Front suspension			Telescopic fork
	Front axle travel			121 mm (4.8 in)
	Rear suspension			Swingarm
	Rear axle travel			95 mm (3.7 in)
	Tire size		Front	130/90-16M/C 67H
			Rear	150/80-16 M/C 71H
	Tire brand		Front	D404F Q (DUNLOP)
			Rear	D404 Q (DUNLOP)
	Front brake			Hydraulic single disc
	Rear brake			Hydraulic single disc
	Caster angle			28° 00’
	Trail length			110 mm (4.3 in)
	Fuel tank capacity			11.2 liters (2.96 US gal, 2.46 Imp gal)
ENGINE	Cylinder arrangement			2 cylinders in-line, inclined 20° from vertical
	Bore and stroke			67.0 x 66.8 mm (2.64 x 2.63 in)
	Displacement			471 cm^3 (28.7 cu-in)
	Compression ratio			10.7:1
	Valve train			Chain driven DOHC with rocker arm
	Intake valve	opens	at 1.0 mm lift	10° BTDC
		closes	at 1.0 mm lift	20° ABDC
	Exhaust valve	opens	at 1.0 mm lift	33° BBDC
		closes	at 1.0 mm lift	- 13° ATDC
	Lubrication system			Forced pressure and wet sump
	Oil pump type			Trochoid
	Cooling system			Liquid cooled
	Air filtration			Viscous paper filter
	Engine dry weight			52.7 kg (116.2 lbs)
	Firing order			1 – 2
	Cylinder number			Left: 1, Right: 2
FUEL DELIVERY SYSTEM	Type			PGM-FI
	Throttle bore			34 mm (1.3 in)
DRIVE TRAIN	Clutch system			Multi-plate, wet
	Clutch operation system			Cable operating
	Transmission			Constant mesh, 6 speeds
	Primary reduction			2.029 (69/34)
	Final reduction			2.667 (40/15)
	Gear ratio		1st	3.285 (46/14)
			2nd	2.105 (40/19)
			3rd	1.600 (32/20)
			4th	1.300 (26/20)
			5th	1.150 (23/20)
			6th	1.043 (24/23)
	Gearshift pattern			Left foot operated return system 1 - N - 2 - 3 - 4 - 5 - 6

ITEM		SPECIFICATION
ELECTRICAL	Ignition system	Computer-controlled digital transistorized with electric advance
	Starting system	Electric starter motor
	Charging system	Triple phase output alternator
	Regulator/rectifier	FET shorted/triple phase full wave rectification
	Lighting system	Battery

CMX500A

ITEM			SPECIFICATION
DIMENSIONS	Overall length		2,190 mm (86.2 in)
	Overall width		820 mm (32.3 in)
	Overall height		1,090 mm (42.9 in)
	Wheelbase		1,490 mm (58.7 in)
	Seat height		690 mm (27.2 in)
	Footpeg height		268 mm (10.6 in)
	Ground clearance		135 mm (5.3 in)
	Curb weight	AC model	188 kg (414 lbs)
		CM model	189 kg (417 lbs)
	Maximum weight capacity		157 kg (346 lbs)
FRAME	Frame type		Diamond type
	Front suspension		Telescopic fork
	Front axle travel		121 mm (4.8 in)
	Rear suspension		Swingarm
	Rear axle travel		95 mm (3.7 in)
	Tire size	Front	130/90-16M/C 67H
		Rear	150/80-16 M/C 71H
	Tire brand	Front	D404F Q (DUNLOP)
		Rear	D404 Q (DUNLOP)
	Front brake		Hydraulic single disc
	Rear brake		Hydraulic single disc
	Caster angle		28° 00’
	Trail length		110 mm (4.3 in)
	Fuel tank capacity		11.2 liters (2.96 US gal, 2.46 Imp gal)
ENGINE	Cylinder arrangement		2 cylinders in-line, inclined 20° from vertical
	Bore and stroke		67.0 x 66.8 mm (2.64 x 2.63 in)
	Displacement		471 cm^3 (28.7 cu-in)
	Compression ratio		10.7:1
	Valve train		Chain driven DOHC with rocker arm
	Intake valve	opens at 1.0 mm lift	10° BTDC
		closes at 1.0 mm lift	20° ABDC
	Exhaust valve	opens at 1.0 mm lift	33° BBDC
		closes at 1.0 mm lift	- 13° ATDC
	Lubrication system		Forced pressure and wet sump
	Oil pump type		Trochoid
	Cooling system		Liquid cooled
	Air filtration		Viscous paper filter
	Engine dry weight		52.7 kg (116.2 lbs)
	Firing order		1 – 2
	Cylinder number		Left: 1, Right: 2
FUEL DELIVERY SYSTEM	Type		PGM-FI
	Throttle bore		34 mm (1.3 in)

ITEM			SPECIFICATION
DRIVE TRAIN	Clutch system		Multi-plate, wet
	Clutch operation system		Cable operating
	Transmission		Constant mesh, 6 speeds
	Primary reduction		2.029 (69/34)
	Final reduction		2.667 (40/15)
	Gear ratio	1st	3.285 (46/14)
		2nd	2.105 (40/19)
		3rd	1.600 (32/20)
		4th	1.300 (26/20)
		5th	1.150 (23/20)
		6th	1.043 (24/23)
	Gearshift pattern		Left foot operated return system 1 - N - 2 - 3 - 4 - 5 - 6
ELECTRICAL	Ignition system		Computer-controlled digital transistorized with electric advance
	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 (40°C/104°F)	1.0 – 1.3 kΩ
Fuel injector resistance (20°C/68°F)	11 – 13 Ω
IAT sensor resistance (20°C/68°F)	1 – 4 kΩ
O_2 sensor heater resistance (20°C/68°F)	10 – 40 Ω
IACV resistance (25°C/77°F)	110 – 150 Ω

IGNITION SYSTEM SPECIFICATIONS

ITEM	SPECIFICATION
Spark plug	CPR8EA-9 (NGK)
Spark plug gap	0.8 - 0.9 mm (0.031 – 0.035 in)
Ignition coil peak voltage	100 V minimum
CKP sensor peak voltage	0.7 V minimum
Ignition timing ("F" mark)	6° BTDC at idle

FUEL SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Throttle body identification number	AC	GQBUA
	A/CM	GQBSB
Engine idle speed		1,200 ± 100 rpm
Throttle grip freeplay		2 – 6 mm (1/16 – 1/4 in)
Fuel pressure at idle		343 kPa (3.5 kgf/cm^2, 50 psi)
Fuel pump flow (at 12 V)		319 cm^3 (10.8 US oz, 11.2 Imp oz) minimum/10 seconds
PAIR control solenoid valve resistance (20°C/68°F)		24 – 28 Ω
EVAP purge control solenoid valve resistance (20°C/68°F)	AC	30 – 34 Ω

COOLING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	1.62 liters (1.71 US qt, 1.43 Imp qt)
	At draining	1.35 liter (1.43 US qt, 1.19 Imp qt)
	Reserve tank	0.145 liter (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	81 – 84°C (178 – 183°F)
	Fully open	95°C (203°F)
	Valve lift	8 mm (0.3 in) minimum
Recommended antifreeze		Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors
Standard coolant concentration		1:1 mixture with distilled water

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	2.5 liters (2.6 US qt, 2.2 Imp qt)	–
	At oil filter change	2.7 liters (2.9 US qt, 2.4 Imp qt)	–
	At disassembly	3.2 liters (3.4 US qt, 2.8 Imp qt)	–
Recommended engine oil		Pro Honda GN4 4-stroke oil (U.S.A. & Canada) or equivalent motorcycle oil API service classification: SG or higher (except oils labeled as energy conserving on the circular API service label) JASO T903 standard: MA Viscosity: SAE 10W-30	–
Oil pressure at EOP switch		93 kPa (0.9 kgf/cm^2, 13 psi) at 1,200 rpm/80°C (176°F)	–
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)

CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression at 450 rpm			1,393 kPa (14.2 kgf/cm^2, 202 psi)	–
Valve clearance		IN	0.16 ± 0.03 (0.006 ± 0.001)	–
		EX	0.27 ± 0.03 (0.011 ± 0.001)	–
Rocker arm, rocker arm shaft	Arm I.D.	IN/EX	10.000 – 10.015 (0.3937 – 0.3943)	10.10 (0.398)
	Shaft O.D.	IN/EX	9.972 – 9.987 (0.3926 – 0.3932)	–
Camshaft	Cam lobe height	IN	30.3955 – 30.6355 (1.19667 – 1.20612)	30.365 (1.1955)
		EX	30.1424 – 30.3824 (1.18671 – 1.19616)	30.112 (1.1855)
	Oil clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
Valve, valve guide	Valve stem O.D.	IN	4.470 – 4.495 (0.1760 – 0.1770)	4.460 (0.1756)
		EX	4.460 – 4.485 (0.1756 – 0.1766)	4.450 (0.1752)
	Valve guide I.D.	IN/EX	4.500 – 4.512 (0.1772 – 0.1776)	4.54 (0.179)
	Valve guide height	IN/EX	14.10 – 14.30 (0.555 – 0.563)	–
	Valve seat width	IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length		Inner (IN/EX)	29.78 (1.172)	29.18 (1.149)
		Outer (IN/EX)	39.98 (1.574)	39.18 (1.543)
Cylinder head warpage			–	0.10 (0.004)

CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch lever freeplay		10 – 20 (3/8 – 13/16)	–
Clutch	Spring free length	43.2 (1.70)	42.2 (1.66)
	Disc thickness	2.30 – 2.50 (0.091 – 0.098)	2.27 (0.089)
	Plate warpage	–	0.30 (0.012)
Clutch outer guide	I.D.	22.000 – 22.021 (0.8661 – 0.8670)	–
	O.D.	27.987 – 28.000 (1.1018 – 1.1024)	–
Mainshaft O.D. at clutch outer guide		21.967 – 21.980 (0.8648 – 0.8654)	–

ALTERNATOR/STARTER CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear boss O.D.	51.705 – 51.718 (2.0356 – 2.0361)	–
Starter clutch outer I.D.	68.362 – 68.392 (2.6914 – 2.6926)	–

CRANKCASE/TRANSMISSION SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Transmission	Gear I.D.	M5	28.000 – 28.021 (1.1024 – 1.1032)	–
		C1	24.007 – 24.028 (0.9452 – 0.9460)	–
		C2	31.000 – 31.025 (1.2205 – 1.2215)	–
	Bushing O.D.	M5, M6	27.959 – 27.980 (1.1007 – 1.1016)	–
		C2	30.970 – 30.995 (1.2193 – 1.2203)	–
		C3, C4	30.950 – 30.975 (1.2185 – 1.2195)	–
	Bushing I.D.	M5	25.000 – 25.021 (0.9843 – 0.9851)	–
		C2	28.000 – 28.021 (1.1024 – 1.1032)	–
	Mainshaft O.D.	at M5 bushing	24.967 – 24.980 (0.9830 – 0.9835)	–
		at C2 bushing	27.967 – 27.980 (1.1011 – 1.1016)	–
Shift fork, fork shaft	Shift fork shaft O.D.		11.957 – 11.968 (0.4707 – 0.4712)	–
	Shift fork I.D.		12.000 – 12.018 (0.4724 – 0.4731)	–
	Shift fork claw thickness		5.93 – 6.00 (0.233 – 0.236)	5.83 (0.230)

CRANKSHAFT/PISTON/CYLINDER/BALANCER SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod big end side clearance		0.05 – 0.20 (0.002 – 0.008)	0.30 (0.012)
	Crankpin bearing oil clearance		0.030 – 0.052 (0.0012 – 0.0020)	0.072 (0.003)
	Main journal bearing oil clearance		0.017 – 0.035 (0.0007 – 0.0014)	0.05 (0.002)
	Runout		–	0.05 (0.002)
Cylinder	I.D.		67.000 – 67.015 (2.6378 – 2.6384)	67.10 (2.642)
	Warpage		–	0.10 (0.004)
Piston, piston pin, piston ring	Piston O.D. at 7 mm (0.3 in) from bottom		66.970 – 66.990 (2.6366 – 2.6374)	66.905 (2.6340)
	Piston pin hole I.D.		16.002 – 16.008 (0.6300 – 0.6302)	16.03 (0.631)
	Piston pin O.D.		15.994 – 16.000 (0.6297 – 0.6299)	15.98 (0.629)
	Piston ring end gap	Top	0.10 – 0.20 (0.004 – 0.008)	0.3 (0.01)
		Second	0.21 – 0.31 (0.008 – 0.012)	0.4 (0.02)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)	0.9 (0.04)
	Piston ring-to-ring groove clearance	Top	0.030 – 0.060 (0.0012 – 0.0024)	–
		Second	0.015 – 0.050 (0.0006 – 0.0020)	–
Connecting rod small end I.D.			16.030 – 16.044 (0.6311 – 0.6317)	16.05 (0.632)

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Cold tire pressure	Driver only	200 kPa (2.00 kgf/cm^2, 29 psi)	–
	Driver and passenger	200 kPa (2.00 kgf/cm^2, 29 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel balancer weight		–	60 g max.
Fork	Spring free length	391.3 (15.41)	383.4(15.094)
	Recommended fork fluid	Pro Honda Suspension Fluid SS-8 (10W)	–
	Fluid level	165 (6.5)	–
	Fluid capacity	432 ± 2.5 cm^3 (14.6 ± 0.08 US oz, 15.2 ± 0.09 Imp oz)	–
Steering head bearing pre-load		16.5 – 25.3 N (1.7 – 2.6 kgf, 3.7 – 5.7 lbf)	–

REAR WHEEL/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cold tire pressure	Driver only		200 kPa (2.00 kgf/cm^2, 29 psi)	–
	Driver and passenger		200 kPa (2.00 kgf/cm^2, 29 psi)	–
Axle runout			–	0.2 (0.01)
Wheel rim runout	Radial		–	2.0 (0.08)
	Axial		–	2.0 (0.08)
Wheel balancer weight			–	60 g max.
Drive chain	Size/link	DID	DID520VF-112LE	–
		RK	RK520KLO2-112LE	–
	Slack		25 – 35 (1 – 1-3/8)	–
Shock absorber pre-load adjuster standard position			2nd position from minimum	–

HYDRAULIC BRAKE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Front	Specified brake fluid	DOT 4	–
	Brake pad wear indicator	–	To groove
	Brake disc thickness	4.8 – 5.15 (0.19 – 0.203)	4.0 (0.16)
	Brake disc warpage	–	0.3 (0.01)
	Master cylinder I.D.	11.000 – 11.043 (0.4331 – 0.4348)	–
	Master piston O.D.	10.957 – 10.984 (0.4314 – 0.4324)	–
	Caliper cylinder I.D.	27.000 – 27.050 (1.0630 – 1.0650)	–
	Caliper piston O.D.	26.918 – 26.968 (1.0598 – 1.0617)	–
Rear	Specified brake fluid	DOT 4	–
	Brake pad wear indicator	–	To groove
	Brake disc thickness	4.8 – 5.2 (0.19 – 0.20)	4.0 (0.16)
	Brake disc warpage	–	0.3 (0.01)
	Master cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	–
	Master piston O.D.	12.657 – 12.684 (0.4893 – 0.4994)	–
	Caliper cylinder I.D.	38.18 – 38.23 (1.503 – 1.505)	–
	Caliper piston O.D.	38.08 – 38.13 (1.499 – 1.501)	–
	Brake pedal height	64.0 – 66.0 (2.52 – 2.60)	–

ANTI-LOCK BRAKE SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		SPECIFICATIONS
Air gap (between the caliper bracket and pulser ring)	Front	0.67 – 1.26 (0.026 - 0.050)
	Rear	0.72 – 1.31 (0.028 - 0.052)

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Type		YTZ8V
	Capacity		12 V – 7 Ah (10HR)
	Current leakage		0.62 mA max.
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	0.7 A/5 – 10 h
		Quick	3.5 A/1 h
Alternator	Capacity		0.402 kW/5,000 rpm
	Charging coil resistance (20°C/68°F)		0.1 – 1.0 Ω

LIGHTS/METERS/SWITCHES SPECIFICATIONS

ITEM			SPECIFICATION
Bulbs	Headlight		12 V - 60/55 W
	Brake/tail light		12 V - 21/5 W
	Front turn signal light		12 V - 21/5 W x 2
	Rear turn signal light		12 V - 21 W x 2
	Instrument light		LED
	Turn signal indicator		LED
	High beam indicator		LED
	Engine oil pressure indicator		LED
	Neutral indicator		LED
	MIL		LED
	ABS indicator (CMX500A)		LED
Fuse	Main fuse		30 A
	Sub fuse	CMX500A	30 A x 1, 15 A x2, 7.5 A x 3
		CMX500	15 A x 3, 7.5 A x 4
Fuel level sensor resistance		Full	6 – 10 Ω
		Empty	265.5 – 274.5 Ω
ECT senor resistance		40°C (104°F)	1.0 – 1.3 kΩ
		100°C (212°F)	0.1 – 0.2 kΩ

TORQUE VALUES

STANDARD TORQUE VALUES

FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm bolt and nut	5.2 (0.5, 3.8)	5 mm screw	4.2 (0.4, 3.1)
6 mm bolt and nut (Includes SH flange bolt)	10 (1.0, 7)	6 mm screw	9.0 (0.9, 6.6)
		6 mm flange bolt and nut (Include NSHF)	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

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

FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rearview mirror adaptor	2	10	19 (1.9, 14)	
Rearview mirror lock nut	2	10	19 (1.9, 14)	
Front reflector mounting nut	2	6	1.5 (0.2, 1.1)	
Drive sprocket cover bolt	2	6	12 (1.2, 9)	
PAIR control solenoid valve nut	1	6	8.5 (0.9, 6.3)	
Throttle cable adjuster lock nut (throttle body side)	1	6	3.0 (0.3, 2.2)	
Clutch cable holder bolt	1	6	12 (1.2, 9)	
Sidestand pivot bolt	1	10	–	See page 2-11
Sidestand pivot nut	1	10	30 (3.1, 22)	Self-lock nut.
Passenger footpeg bracket bolt	4	8	33 (3.4, 24)	
Exhaust pipe joint nut	4	8	18 (1.8, 13)	
Muffler band bolt	1	8	22.5 (2.3, 17)	
Seat rail mounting bolt	4	10	54 (5.5, 40)	

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Throttle cable A adjuster lock nut (throttle grip side)	1	7	3.8 (0.4, 2.8)	
Throttle cable adjuster lock nut (throttle body side)	1	6	3.0 (0.3, 2.2)	
Air cleaner cover screw	3	5	1.1 (0.1, 0.8)	
Spark plug	2	10	16 (1.6, 12)	
Crankshaft hole cap	1	45	18 (1.8, 13)	Apply grease to the threads.
Rocker arm shaft stopper bolt	2	12	15 (1.5, 11)	Apply engine oil to the threads.
Engine oil drain bolt	1	12	30 (3.1, 22)	
Engine oil filter boss	1	20	18 (1.8, 13)	See page 3-11 Apply locking agent to the threads.
Engine oil filter cartridge	1	20	26 (2.7, 19)	Apply engine oil to the threads.
Drive chain adjuster lock nut	2	10	21 (2.1, 15)	Self-lock nut.
Rear axle nut	1	16	88 (9.0, 65)	Self-lock nut.
Drive sprocket bolt	1	10	54 (5.5, 40)	
Driven sprocket self-lock nut	5	12	108 (11.0, 80)	Self-lock nut.
Front master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Rear brake reservoir cap screw	2	4	1.5 (0.2, 1.1)	

PGM-FI SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Sensor unit torx screw	3	5	3.4 (0.3, 2.5)	
ECT sensor	1	10	12 (1.2, 9)	
VS sensor bolt	1	6	12 (1.2, 9)	
O_2 sensor	1	12	25 (2.5, 18)	
Bank angle sensor nut	2	6	8.5 (0.9, 6.3)	

IGNITION SYSTEM

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

ELECTRIC STARTER

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

FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel pump mounting nut	6	6	12 (1.2, 9)	See page 7-10
PAIR check valve cover bolt	2	6	12 (1.2, 9)	
Fuel filler cap mount bolt	3	4	1.8 (0.2, 1.3)	
Throttle cable holder screw	2	5	3.4 (0.3, 2.5)	
IACV body screw	3	5	3.4 (0.3, 2.5)	
IACV setting plate torx screw	2	4	2.1 (0.2, 1.5)	
Fuel injector joint bolt	4	5	5.1 (0.5, 3.8)	

COOLING SYSTEM

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

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head bolt	6	9	47 (4.8, 35)	Washer; apply engine oil. Threads; apply molybdenum oil solution (a mixture of engine oil and molybdenum disulfide grease in a ratio of 1:1).
Camshaft holder bolt	12	6	12 (1.2, 9)	Apply engine oil to the threads and seating surface.
Rocker arm shaft stopper bolt	2	12	15 (1.5, 11)	Apply engine oil to the threads.
Cylinder head cover bolt	4	6	10 (1.0, 7)	
Cam chain tensioner pivot bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads.

CLUTCH/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rider footpeg bracket bolt	2	8	37 (3.8, 27)	
Oil pump driven sprocket bolt	1	6	15 (1.5, 11)	Apply locking agent to the threads.
Clutch center lock nut	1	18	128 (13.1, 94)	Lock nut; replace with a new one and stake. Apply engine oil to the threads and seating surface.
Primary drive gear bolt	1	10	103 (10.5, 76)	Apply engine oil to the threads and seating surface.
Shift drum stopper arm bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads.
Shift drum center socket bolt	1	8	23 (2.3, 17)	Apply locking agent to the threads.
Clutch lifter plate bolt	4	6	12 (1.2, 9)	
Gearshift spindle setting plate bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads.
Gearshift spindle oil seal setting plate bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads.
Gearshift pedal pivot socket bolt	1	8	27 (2.8, 20)	
Right crankcase cover socket bolt	14	6	12 (1.2, 9)	

ALTERNATOR/STARTER CLUTCH

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

CRANKCASE/TRANSMISSION

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

CRANKSHAFT/PISTON/CYLINDER/BALANCER

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

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Right engine hanger mounting bolt	2	10	39 (4.0, 29)	
Front engine hanger bolt	2	10	45 (4.6, 33)	See page 15-8
Engine hanger plate bolt	2	10	45 (4.6, 33)	See page 15-8
Engine hanger plate nut	2	10	45 (4.6, 33)	See page 15-8
Rear upper engine hanger nut	1	10	55 (5.6, 41)	See page 15-8
Rear lower engine hanger nut	1	10	55 (5.6, 41)	See page 15-8
Drive sprocket bolt	1	10	54 (5.5, 40)	
Right crankcase cover bolt	1	6	12 (1.2, 9)	
Rider footpeg bracket bolt	4	8	37 (3.8, 27)	
EOP switch terminal screw	1	4	2.0 (0.2, 1.5)	

FRONT WHEEL/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Upper handlebar holder socket bolt	4	8	27 (2.8, 20)	
Lower handlebar holder mounting nut	2	8	27 (2.8, 20)	Self-lock nut.
Handlebar switch housing screw	4	5	2.5 (0.3, 1.8)	
Throttle cable A joint nut (at switch housing)	1	10	1.5 (0.2, 1.1)	
Throttle cable B joint nut (at switch housing)	1	12	1.5 (0.2, 1.1)	
Front master cylinder holder socket bolt	2	6	12 (1.2, 9)	
Front brake disc bolt	5	8	42 (4.3, 31)	ALOC bolt; replace with a new one.
Front pulser ring mounting torx bolt	5	5	10 (10, 74)	ALOC bolt; replace with a new one.
Front axle bolt	1	14	51 (5.2, 38)	
Front axle pinch socket bolt	4	8	22 (2.2, 16)	
Fork socket bolt	2	8	20 (2.0, 15)	Apply locking agent to the threads.
Fork cap	2	37	22 (2.2, 16)	
Top bridge pinch socket bolt	2	8	27 (2.8, 20)	
Bottom bridge pinch socket bolt	2	10	32 (3.3, 24)	
Front brake caliper mounting bolt	2	8	30 (3.1, 22)	ALOC bolt; replace with a new one.
Steering bearing adjustment nut	1	26	23 (2.3, 17)	See page 16-22 Apply engine oil to the threads.
Steering bearing adjustment lock nut	1	26	–	See page 16-22
Steering stem nut	1	24	103 (10.5, 76)	

REAR WHEEL/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear brake disc bolt	4	8	42 (4.3, 31)	ALOC bolt; replace with a new one.
Driven sprocket nut	5	12	108 (11.0, 80)	Self-lock nut.
Rear axle nut	1	16	88 (9.0, 65)	Self-lock nut.
Shock absorber upper mounting socket bolt	2	6	9 (0.9, 6.6)	
Shock absorber lower mounting socket bolt	2	8	21 (2.1, 15)	
Swingarm pivot nut	1	14	74 (7.5, 55)	Apply engine oil to the threads and seating surface. Self-lock nut.
Swingarm pivot adjust bolt	1	26	10 (10, 7)	
Swingarm pivot lock nut	1	26	–	See page 17-11
Brake hose oil bolt	4	10	34 (3.5, 25)	

HYDRAULIC BRAKE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake hose oil bolt	4	10	34 (3.5, 25)	
Brake caliper bleed valve	2	8	5.4 (0.6, 4.0)	
Brake caliper pad pin	2	10	17 (1.7, 13)	
Front master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Front brake lever pivot bolt	1	6	1.0 (0.1, 0.7)	
Front brake lever pivot nut	1	6	5.9 (0.6, 4.4)	
Front brake light switch screw	1	4	1.2 (0.1, 0.9)	
Front master cylinder holder socket bolt	2	6	12 (1.2, 9)	
Front brake caliper pin	1	8	22 (2.2, 16)	Apply locking agent to the threads.
Front brake caliper mounting bolt	2	8	30 (3.1, 22)	ALOC bolt; replace with a new one.
Rear brake reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Rear master cylinder push rod joint nut	1	8	17 (1.7, 13)	
Rear master cylinder mounting bolt	2	6	12 (1.2, 9)	
Rear brake caliper pin bolt	1	12	27 (2.8, 20)	
Rear brake caliper bolt	1	8	22 (2.2, 16)	ALOC bolt; replace with a new one.
Rider footpeg bracket bolt	2	8	37 (3.8, 27)	

ANTI-LOCK BRAKE SYSTEM

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.
Front brake caliper mounting bolt	2	8	30 (3.1, 22)	ALOC bolt; replace with a new one.

LIGHTS/METERS/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Headlight adjusting stay mounting screw	2	4	0.9 (0.1, 0.7)	
Headlight cover mounting screw	2	5	0.9 (0.1, 0.7)	
Speedometer mounting screw	3	5	1.1 (0.1, 0.8)	
EOP switch	1	PT 1/8	12 (1.2, 9)	Apply liquid sealant to the threads.
EOP switch terminal screw	1	4	2.0 (0.2, 1.5)	
Neutral switch	1	10	12 (1.2, 9)	
Neutral switch terminal nut	1	4	1.0 (0.1, 0.7)	
Sidestand switch bolt	1	6	12 (1.2, 9)	ALOC bolt; replace with a new one.

OTHERS

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Gearshift spindle return spring pin	1	8	23 (2.3, 17)	Apply locking agent to the threads.
Crankcase 10 mm socket sealing bolt	1	10	18 (1.8, 13)	Apply locking agent to the threads.
Clutch lever pivot bolt	1	6	1.0 (0.1, 0.7)	
Clutch lever pivot nut	1	6	5.9 (0.6, 4.4)	
Turn signal light stud stay screw	4	6	2.5 (0.3, 1.8)	
Tail reflex reflector nut	1	5	1.5 (0.2, 1.1)	Self-lock nut.
Step rubber set bolt	2	6	10 (1.0, 7.4)	

LUBRICATION & SEAL POINTS

ENGINE

MATERIAL	LOCATION	REMARKS
Sealant (TB1207B manufactured by ThreeBond or an equivalent)	Crankcase mating surface	See page 13-6
	Crankcase mating areas (left side)	See page 12-3
	Crankcase cover mating areas (left side)	See page 12-3
	Crankcase mating areas (right side)	See page 11-5
	Crankcase cover mating areas (right side)	See page 11-5
	Oil pan mating areas	See page 9-8
	Oil pressure switch	
Sealant (TB5211 manufactured by ThreeBond, KE45T manufactured by Shin-Etsu Silicone or an equivalent)	Cylinder head semi-circular edges	See page 10-6
Engine oil (without molybdenum additives)	Engine oil filter cartridge threads	
	Cam chain	
	Camshaft holder bolt threads and seating surface	
	Rocker arm shaft stopper bolt threads	
	Valve stem seal fitting area	
	Piston sliding surface and ring grooves	
	Piston pin hole inner surface	
	Piston ring entire surface	
	Gearshift spindle shaft outer surface	
	Clutch disc and plate entire surface	
	Clutch center lock nut threads and seating surface	
	Primary drive gear bolt threads and seating surface	
	Starter one-way clutch contacting surface	
	Flywheel bolt threads and seating surface	
	Connecting rod bearing cap nut threads and seating surface	
	Each gear teeth and rotating surface	
	Each bearing rotating area	
	Each O-ring	Except sensor unit, IACV and water passage O-rings
	Other rotating and sliding areas	
Multi-purpose grease	Crankshaft hole cap threads	
	Each oil seal lips	
Molybdenum oil solution (a mixture of engine oil and molybdenum disulfide grease in a ratio of 1:1)	Valve stem end and sliding surface	
	Camshaft journals, lobes and thrust surfaces	
	Rocker arm shaft outer surface	
	Rocker arm sliding areas and thrust surfaces	
	Clutch outer guide entire surface	
	Starter reduction gear shaft outer surface	
	Transmission gear bushing entire surface (M5, C2)	
	Transmission gear spline bushing outer surface (M6, C3, C4)	
	Transmission gear shifter groove (M3/4, C5, C6)	
	Transmission needle bearing rotating area (C1)	
	Shift fork guide area and guide pin	
	Shift fork shaft outer surface	
	Balancer driven sub-gear and washer sliding surfaces	
	Primary drive gear and sub-gear sliding surfaces	
	Crankshaft thrust surfaces	
	Crankshaft main journal bearing sliding surface	
	Crankpin bearing sliding surface	
	Connecting rod small end inner surface	
	Piston pin outer surface	
Locking agent	Shift drum center socket bolt	Coating width: 6.5 mm (0.26 in) from tip

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

FRAME

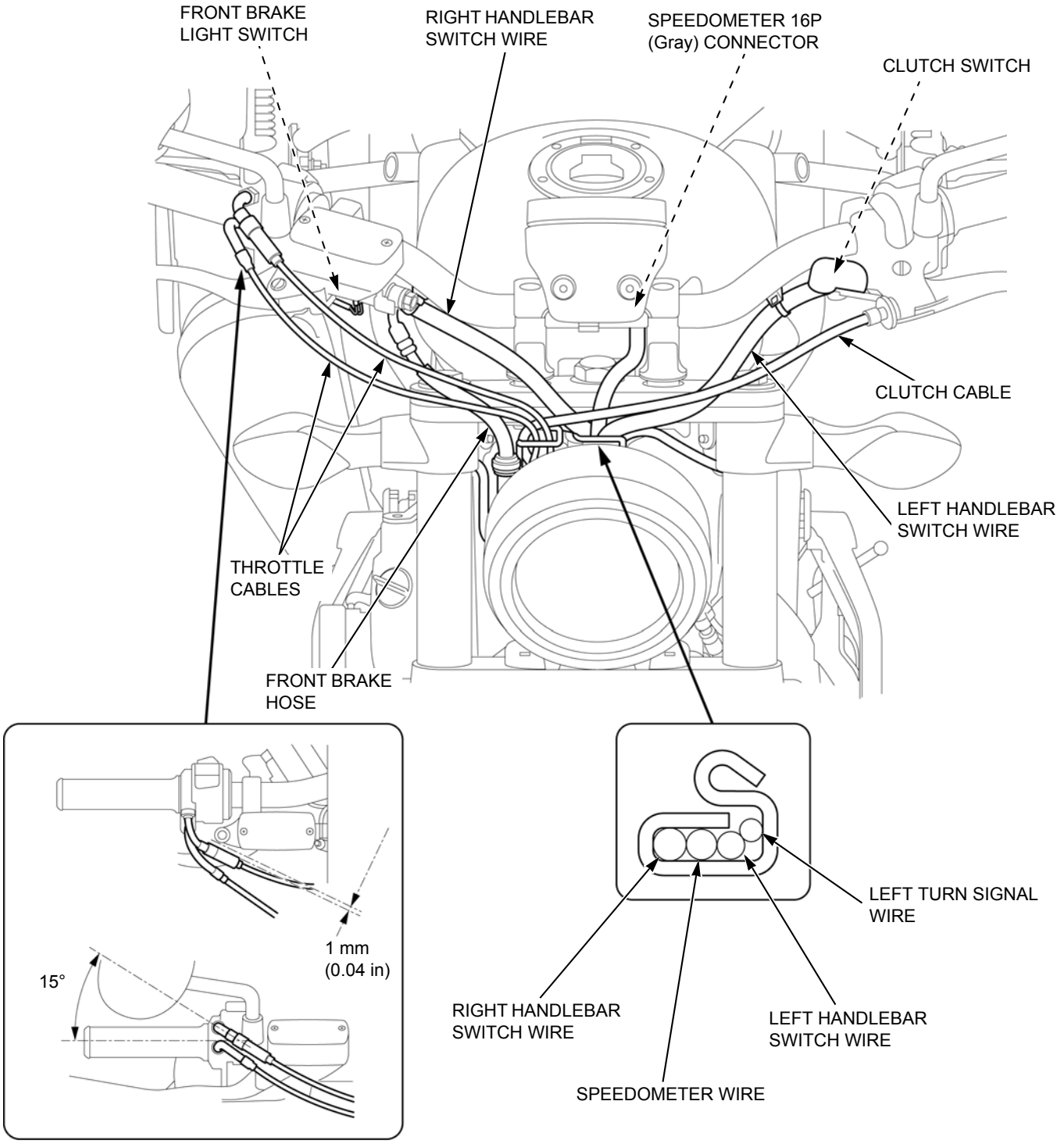
MATERIAL	LOCATION	REMARKS
Urea based multi-purpose extreme pressure grease NLGI #2 (EXCELITE EP2 manufactured by KYODO YUSHI CO., LTD., STAMINA EP2 manufactured by Shell or equivalent)	Steering bearing race sliding surface	3 – 5 g (0.1 – 0.2 oz) per each bearing
	Steering bearing dust seal lips	
Multi-purpose grease	Sidestand pivot sliding area	
	Throttle grip cable groove and roll-up area	
	Clutch lever pivot sliding area	
	Front wheel dust seal lips	
	Rear wheel dust seal lips	
	Rear wheel hub O-ring	
	Final driven flange O-ring	
	Swingarm needle bearing rotating area	
	Swingarm dust seal lips	
	Brake pedal pivot sliding area (grease groove)	
	Gearshift pedal pivot sliding area (grease groove)	
	Footpeg pivot sliding area	
	Passenger footpeg pivot sliding area	
	Footpeg spring sliding area	
	Passenger footpeg spring sliding area	
Engine oil	Steering bearing adjustment nut threads	
	Swingarm pivot nut threads and seating surface	
Silicone grease	Front brake lever pivot sliding area	0.10 g (0.004 oz)
	Front brake lever-to-master piston contacting area	0.10 g (0.004 oz)
	Rear master cylinder push rod-to-master piston contacting area	0.4 g (0.01 oz)
	Rear master cylinder boot push rod fitting area	0.4 g (0.01 oz)
	Front brake caliper pin sliding area	0.4 g (0.01 oz)
	Front brake caliper bracket pin sliding area	0.4 g (0.01 oz)
	Rear brake caliper pin bolt sliding area	0.4 g (0.01 oz)
	Rear brake caliper sleeve sliding area	0.4 g (0.01 oz) (inside of boot)
	Brake caliper dust seal	
	Brake caliper pad pin stopper ring	
DOT 4 brake fluid	Brake master piston and cups	
	Rear master cylinder hose joint O-ring	
	Brake caliper piston seal	
	Brake caliper piston outer surface	
	Brake pipe joint nut threads	
Pro Honda Suspension Fluid SS-8 (10W) or equivalent	Fork oil seal lips	
	Fork dust seal lips	
	Fork cap O-ring	
Honda Bond A or Honda Hand Grip Cement (U.S.A. only)	Left handlebar grip inner surface	
	Air cleaner case-to-connecting hose mating area	
	Brake pad retainer seating surface	
Pro Honda HP Chain Lube or an equivalent	Drive chain entire surface	
Locking agent	Final driven sprocket stud bolt threads (driven flange side)	
	Fork socket bolt threads	
	Front brake caliper pin threads	

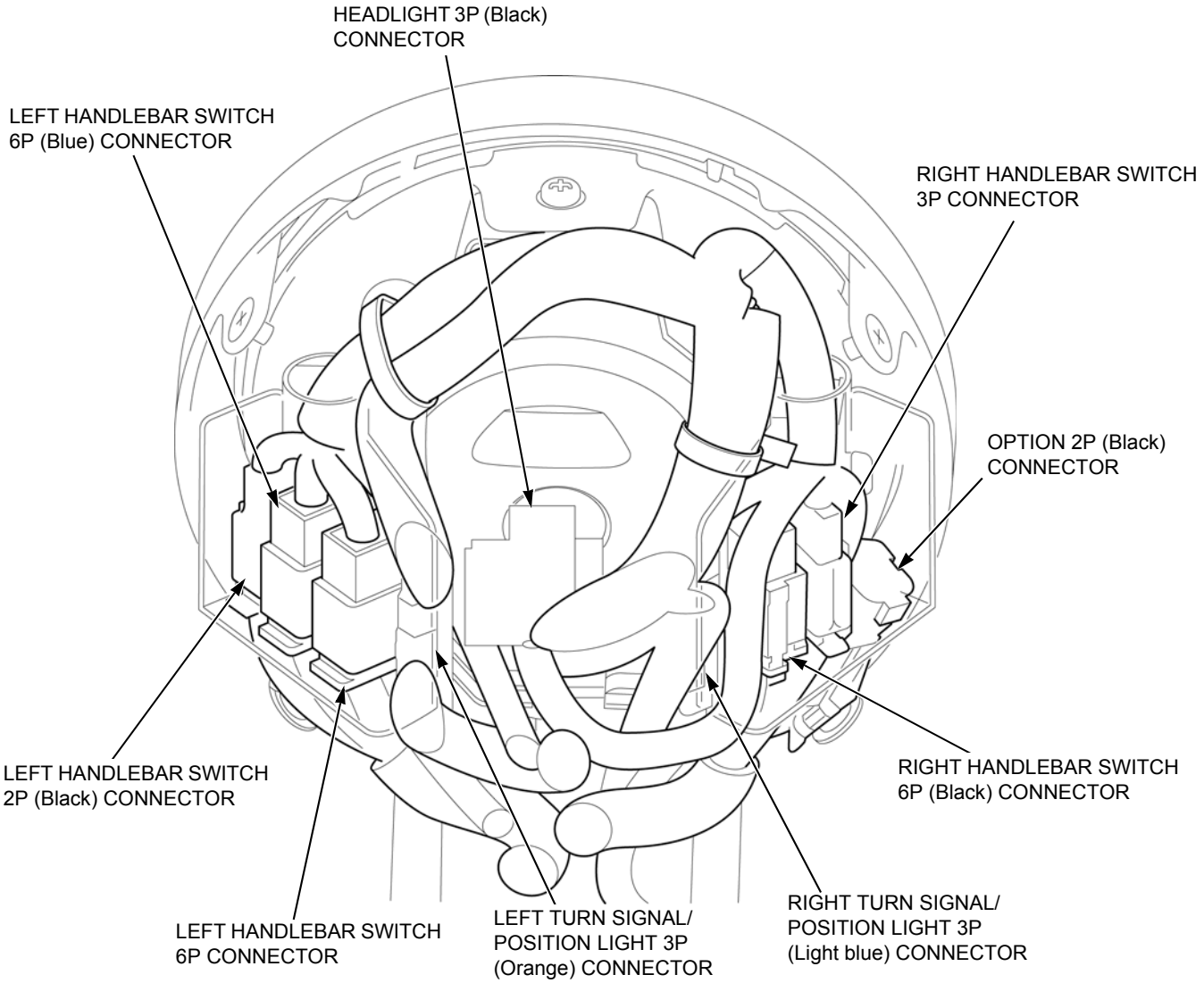
SPECIAL TOOL LIST

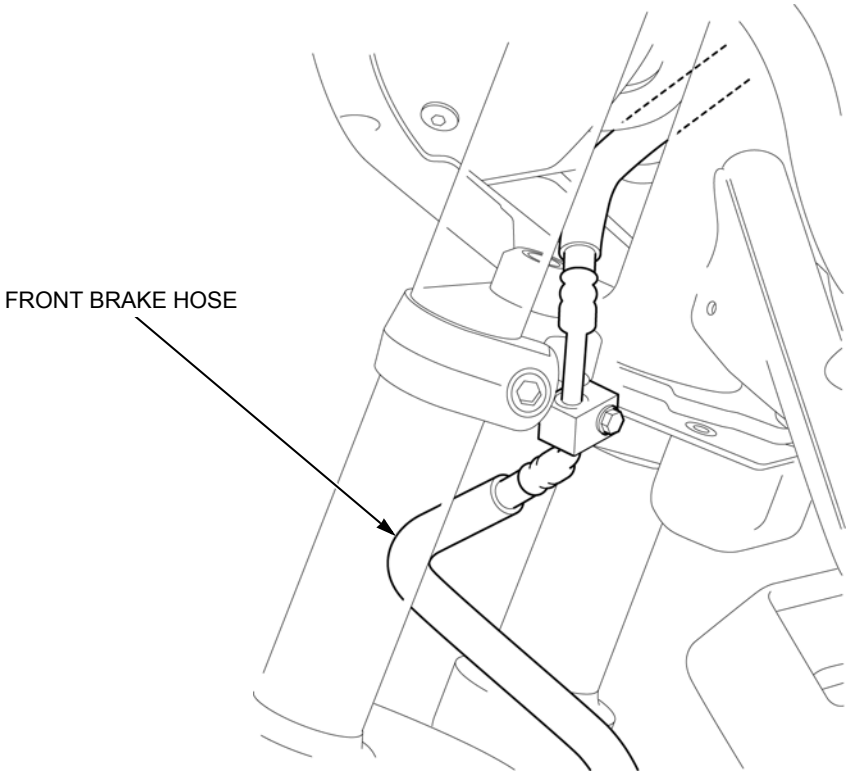
TITLE	TOOL No.	TOOL NAME
MAINTENANCE	07HAA-PJ70101 or 07AMA-MFJA100 (U.S.A. only)	Oil filter wrench
	07HMH-MR10103 or 07HMH-MR1010C (U.S.A. only)	Drive chain tool set
PGM-FI SYSTEM	070PZ-ZY30100	SCS short connector
	07ZAJ-RDJA110	Test probe, 2 pack
IGNITION SYSTEM	07HGJ-0020100	Peak voltage adaptor
	07ZAJ-RDJA110	Test probe, 2 pack
	MTP07-0286 (U.S.A. only)	IgnitionMate peak voltage tester
FUEL SYSTEM	07406-0040004 or 07406-004000C (U.S.A. only) or 07406-004000B (U.S.A. only)	Fuel pressure gauge
	07ZAJ-S5A0111 (not available in U.S.A.)	Pressure gauge manifold
	07ZAJ-S5A0120 (not available in U.S.A.)	Hose attachment, 9 mm/9 mm
	07ZAJ-S7C0100 (not available in U.S.A.)	Hose attachment, 8 mm/9 mm
	07ZAJ-S7C0200 (not available in U.S.A.)	Attachment joint, 8 mm/9 mm
	07AMJ-HW3A100 (U.S.A. only)	Pressure manifold hose
	07AAJ-S6MA300 (U.S.A. only)	Adaptor, male "C"
	07AAJ-S6MA500 (U.S.A. only)	Adaptor, female "C"
LUBRICATION SYSTEM	07506-3000001 or equivalent commercially available in U.S.A.	Oil pressure gauge set
	07406-0030000 or equivalent commercially available in U.S.A.	Oil pressure gauge attachment
CYLINDER HEAD/VALVES	07RMJ-MY50100 or equivalent commercially available in U.S.A.	Compression gauge attachment
	070MG-0010100 or 07AMG-001A100 (U.S.A. only) or 07AMG-MFJA100 (U.S.A. only)	Tensioner stopper
	07757-0010000	Valve spring compressor
	07959-KM30101	Valve spring compressor attachment
	07HMD-ML00101	Valve guide driver, 4.3 mm
	07743-0020000 (not available in U.S.A.)	Valve guide adjusting driver
	07HMH-ML00101 or 07HMH-ML0010B (U.S.A. only)	Valve guide reamer, 4.5 mm
	07781-0010600 or equivalent commercially available in U.S.A.	Cutter holder, 4.5 mm
	07780-0010200 or equivalent commercially available in U.S.A.	Seat cutter, 27.5 mm (IN, 45°)
	07780-0010600 or equivalent commercially available in U.S.A.	Seat cutter, 24 mm (EX, 45°)
	07780-0012100 or equivalent commercially available in U.S.A.	Flat cutter, 28 mm (IN, 32°)
	07780-0012500 or equivalent commercially available in U.S.A.	Flat cutter, 24 mm (EX, 32°)
	07780-0014500 or equivalent commercially available in U.S.A.	Interior cutter, 26 mm (IN, 60°)
	07780-0014202 or equivalent commercially available in U.S.A.	Interior cutter, 22 mm (EX, 60°)
CLUTCH/GEARSHIFT LINKAGE	07JMB-MN50302 or 07HGB-001010B (plate) and 07HGB-001020B (collar) (U.S.A. only) with 6 x 40 mm bolts	Clutch center holder
	07749-0010000	Driver
	07746-0010100	Attachment, 32 x 35 mm
	07746-0041100	Pilot, 28 mm
	07724-0010100 or 07724-001A100 (U.S.A. only)	Gear holder, 2.5
ALTERNATOR/STARTER CLUTCH	07725-0040001	Flywheel holder
	07733-0020001 or 07933-3950000 (U.S.A. only)	Flywheel puller
CRANKCASE/ TRANSMISSION	07949-3710001	Driver
	07746-0010100	Attachment, 32 x 35 mm
CRANKSHAFT/PISTON/ CYLINDER/BALANCER	07949-3710001	Driver
	07746-0010300	Attachment, 42 x 47 mm
	07746-0040500	Pilot, 20 mm

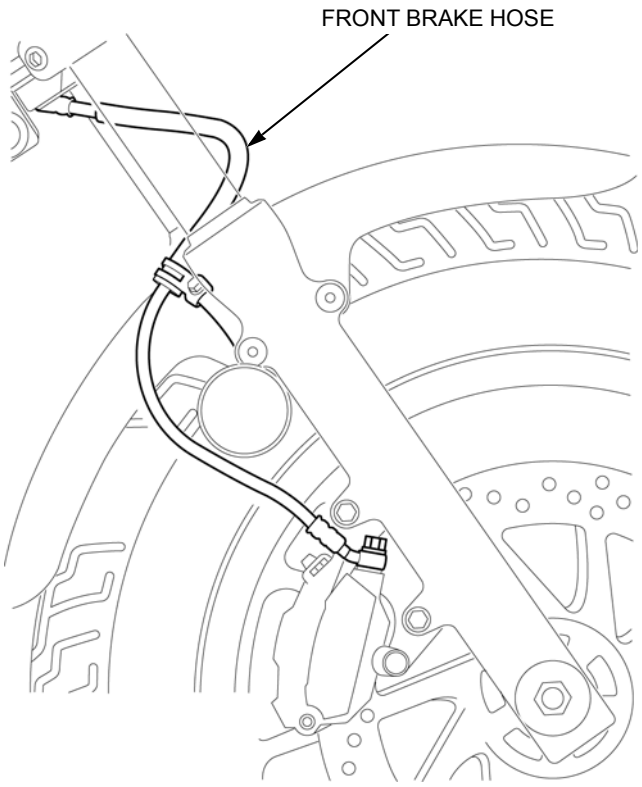
TITLE	TOOL No.	TOOL NAME
FRONT WHEEL/ SUSPENSION/STEERING	07746-0050500	Bearing remover head, 17 mm
	07746-0050100	Bearing remover shaft
	07749-0010000	Driver
	07746-0010200	Attachment, 37 x 40 mm
	07746-0040400	Pilot, 17 mm
	07947-KA50100	Fork seal driver
	07947-KF00100	Fork seal driver attachment, 41 mm
	07953-MJ10000 or 07953-MJ1000B (U.S.A. only)	Ball race remover set
	07953-MJ10100	remover attachment
	07953-MJ10200	remover shaft
	07946-3710500	Bearing remover
	07946-MB00000	Steering stem driver
	07746-0010300	Attachment, 42 x 47 mm
	07746-0010400	Attachment, 52 x 55 mm
	07916-3710101	Steering stem socket
REAR WHEEL/ SUSPENSION	07746-0050500	Bearing remover head, 17 mm
	07746-0050100	Bearing remover shaft
	07749-0010000	Driver
	07746-0010300	Attachment, 42 x 47 mm
	07746-0040400	Pilot, 17 mm
	07946-1870100	Attachment, 28 x 30 mm
	07746-0040500	Pilot, 20 mm
	07946-MJ00100	Driver shaft
	07GMD-KT70200	Remover attachment, 22 mm
	07746-0041000	Pilot, 22 mm
	07746-0010100	Attachment, 32 x 35 mm
	07746-0040300	Pilot, 15 mm
	07GMA-KT70200	Pivot locknut Wrench
ANTI-LOCK BRAKE SYSTEM	070PZ-ZY30100	SCS short connector
	07ZAJ-RDJA110	Test probe, 2 pack
BATTERY/CHARGING SYSTEM	Micro 404XL (U.S.A. only)	Motorcycle battery analyzer
	MC1012/2T (U.S.A. only)	Christie battery charger
LIGHTS/METERS/ SWITCHES	07ZAJ-RDJA110	Test probe, 2 pack

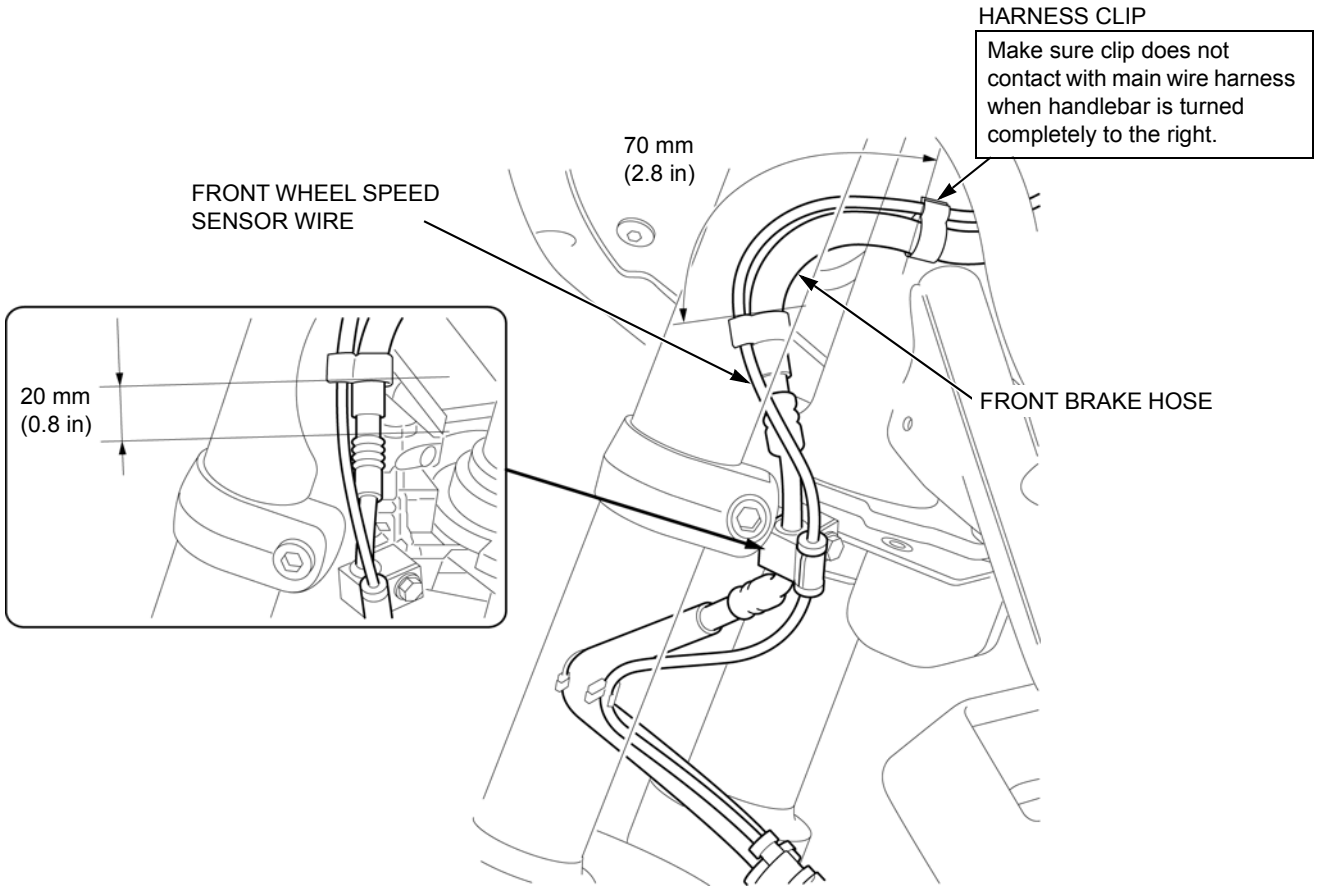
CABLE & HARNESS ROUTING

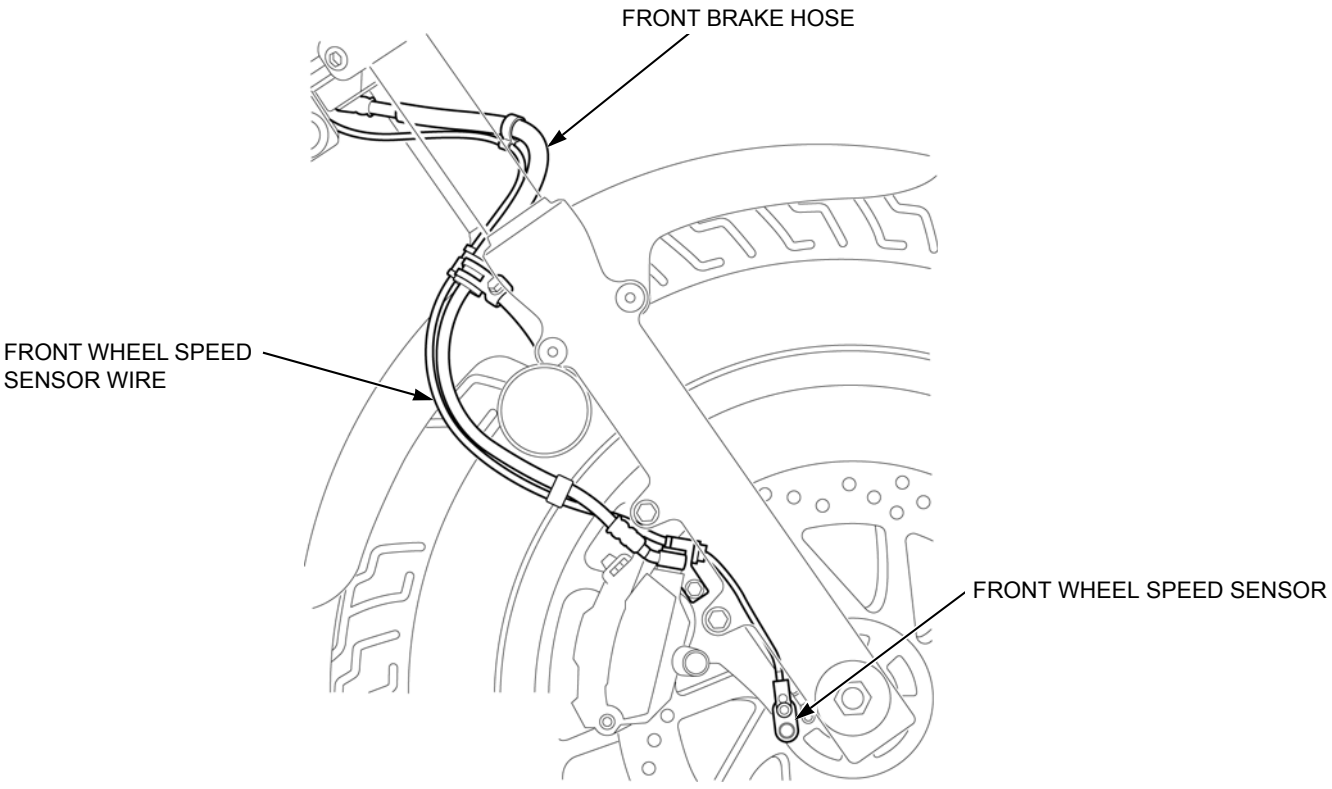


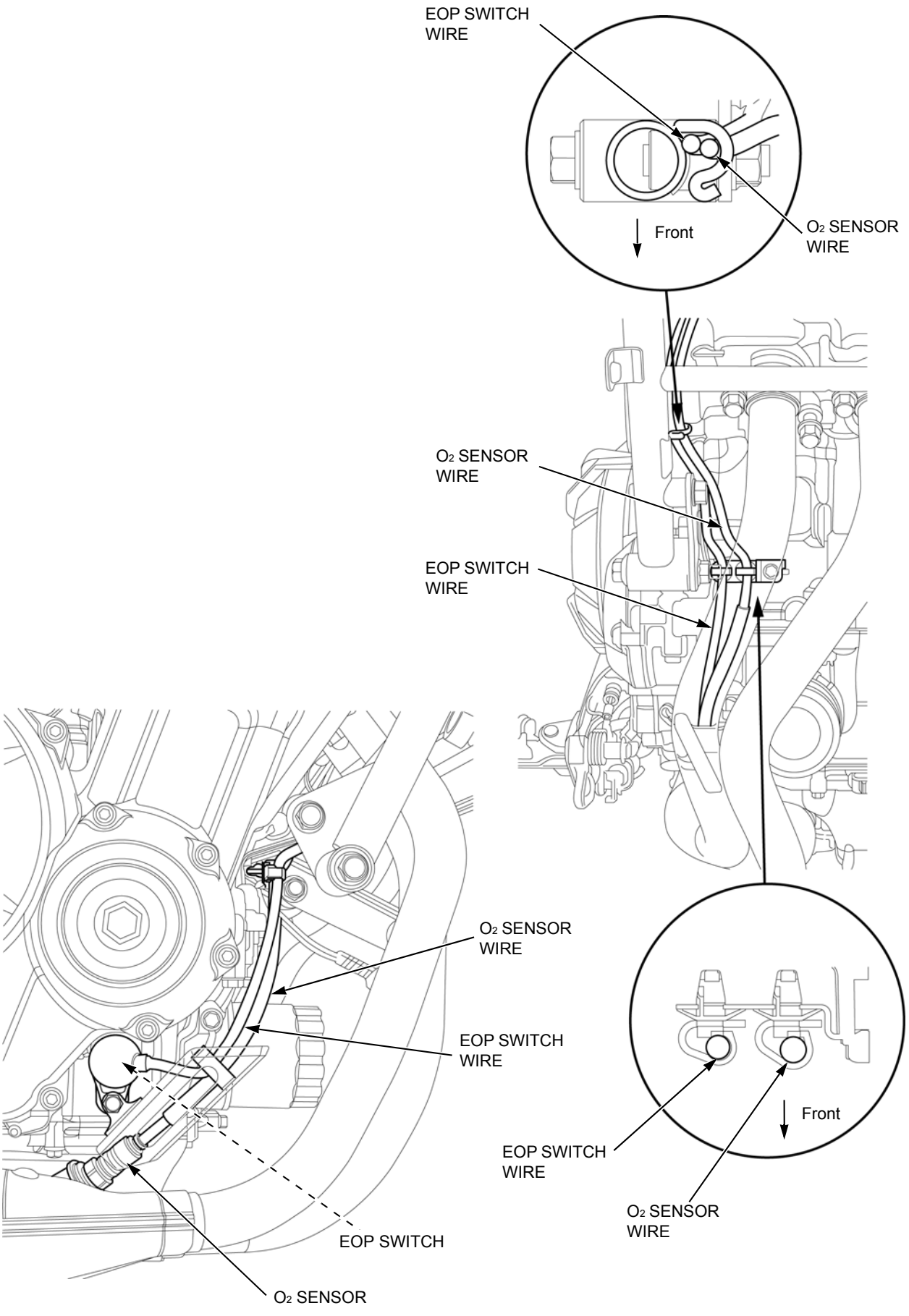

HEADLIGHT 3P (Black) CONNECTOR
LEFT HANDLEBAR SWITCH 6P (Blue) CONNECTOR
RIGHT HANDLEBAR SWITCH 3P CONNECTOR
OPTION 2P (Black) CONNECTOR
LEFT HANDLEBAR SWITCH 2P (Black) CONNECTOR
RIGHT HANDLEBAR SWITCH 6P (Black) CONNECTOR
LEFT HANDLEBAR SWITCH 6P CONNECTOR
LEFT TURN SIGNAL/ POSITION LIGHT 3P (Orange) CONNECTOR
RIGHT TURN SIGNAL/ POSITION LIGHT 3P (Light blue) CONNECTOR

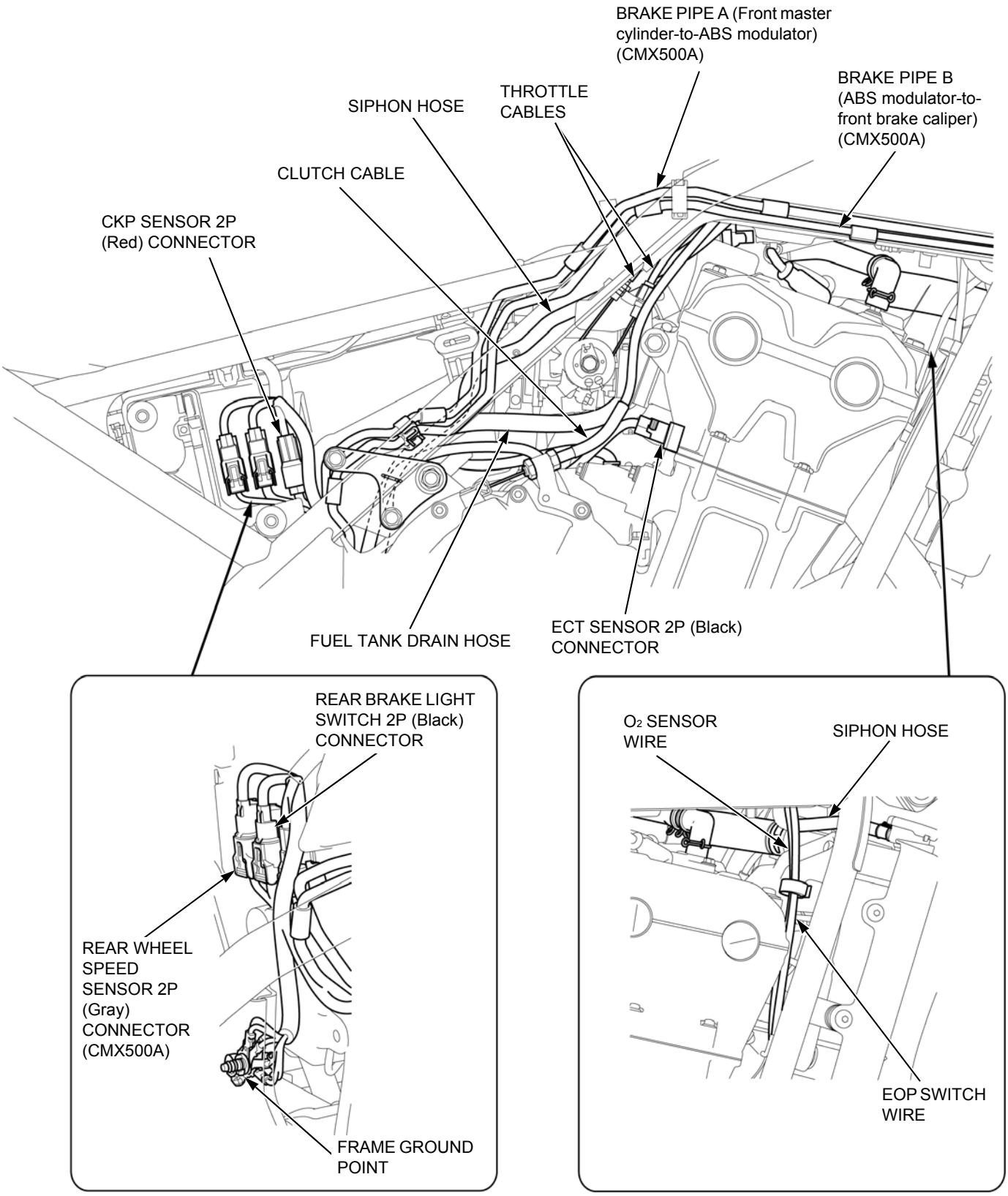

FRONT BRAKE HOSE


FRONT BRAKE HOSE


HARNESS CLIP
Make sure clip does not contact with main wire harness when handlebar is turned completely to the right.
70 mm
(2.8 in)
FRONT WHEEL SPEED SENSOR WIRE
20 mm
(0.8 in)
FRONT BRAKE HOSE

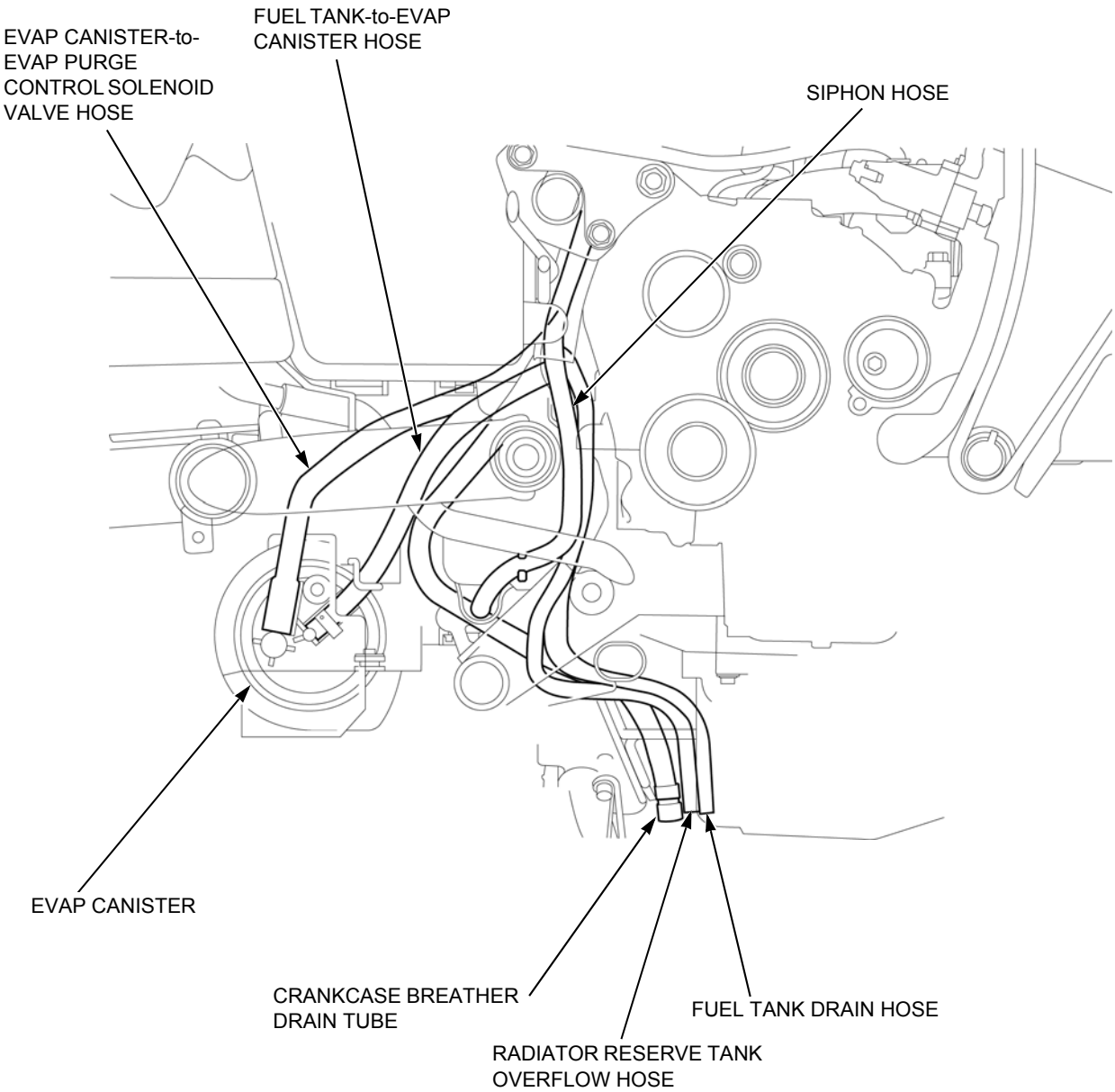

FRONT BRAKE HOSE
FRONT WHEEL SPEED SENSOR WIRE
FRONT WHEEL SPEED SENSOR


EOP SWITCH WIRE
Front
O2 SENSOR WIRE
O2 SENSOR WIRE
EOP SWITCH WIRE
O2 SENSOR WIRE
EOP SWITCH WIRE
EOP SWITCH
O2 SENSOR
Front
EOP SWITCH WIRE
O2 SENSOR WIRE

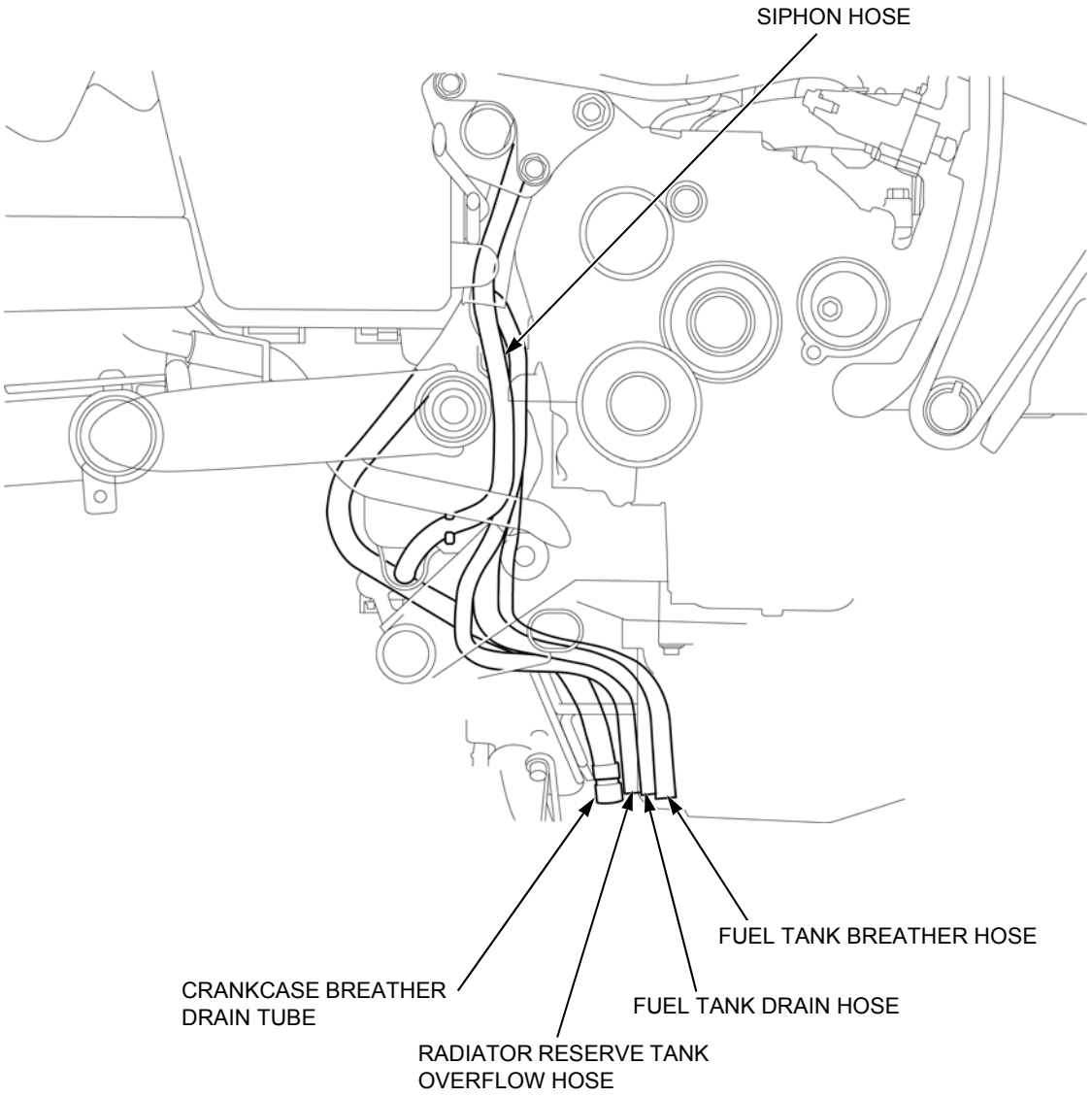

BRAKE PIPE A (Front master cylinder-to-ABS modulator) (CMX500A)
BRAKE PIPE B (ABS modulator-to-front brake caliper) (CMX500A)
THROTTLE CABLES
SIPHON HOSE
CLUTCH CABLE
CKP SENSOR 2P (Red) CONNECTOR
FUEL TANK DRAIN HOSE
ECT SENSOR 2P (Black) CONNECTOR
REAR BRAKE LIGHT SWITCH 2P (Black) CONNECTOR
REAR WHEEL SPEED SENSOR 2P (Gray) CONNECTOR (CMX500A)
FRAME GROUND POINT
O2 SENSOR WIRE
SIPHON HOSE
EOP SWITCH WIRE

CMX500

AC model:

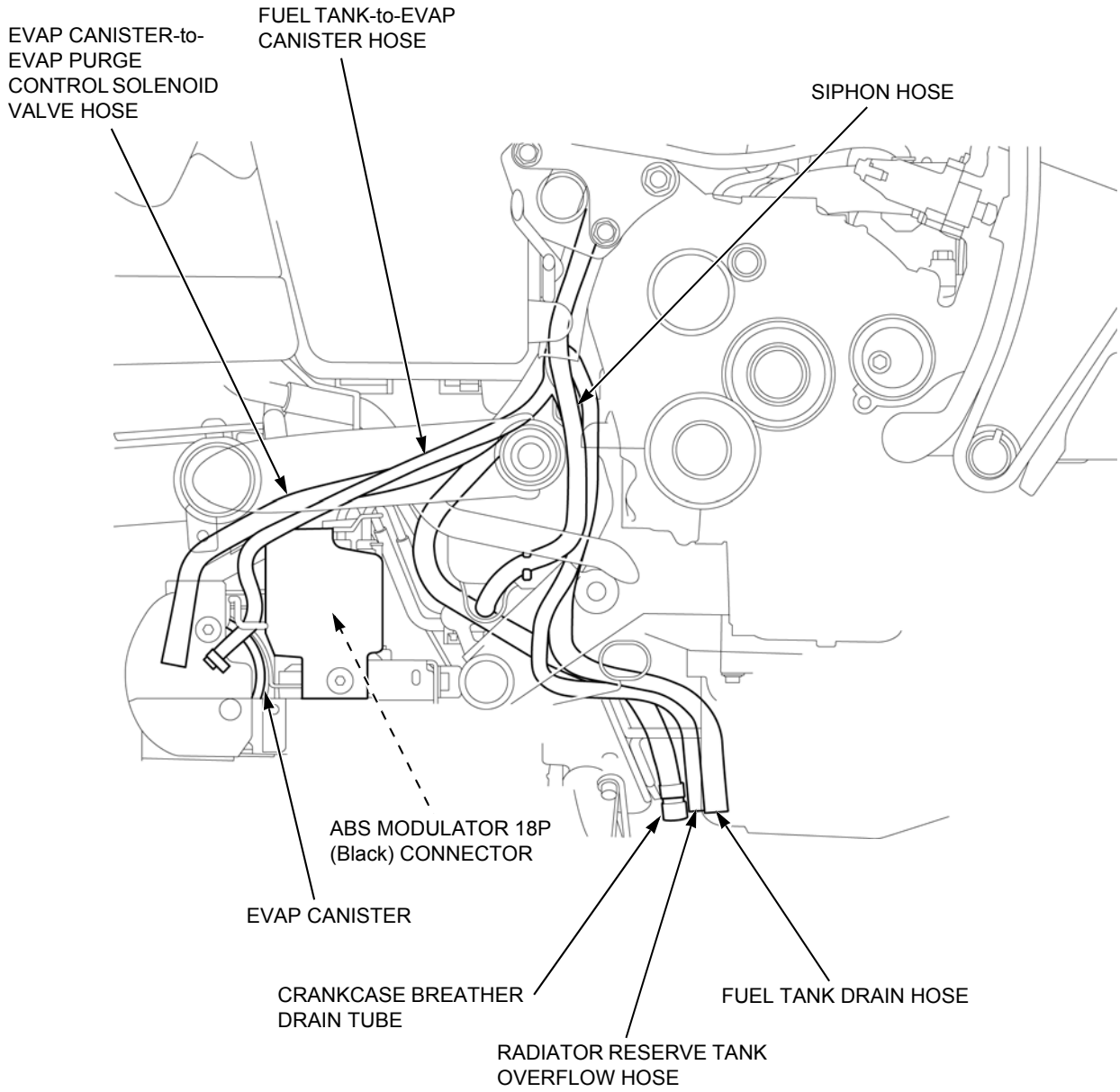


A, CM model:

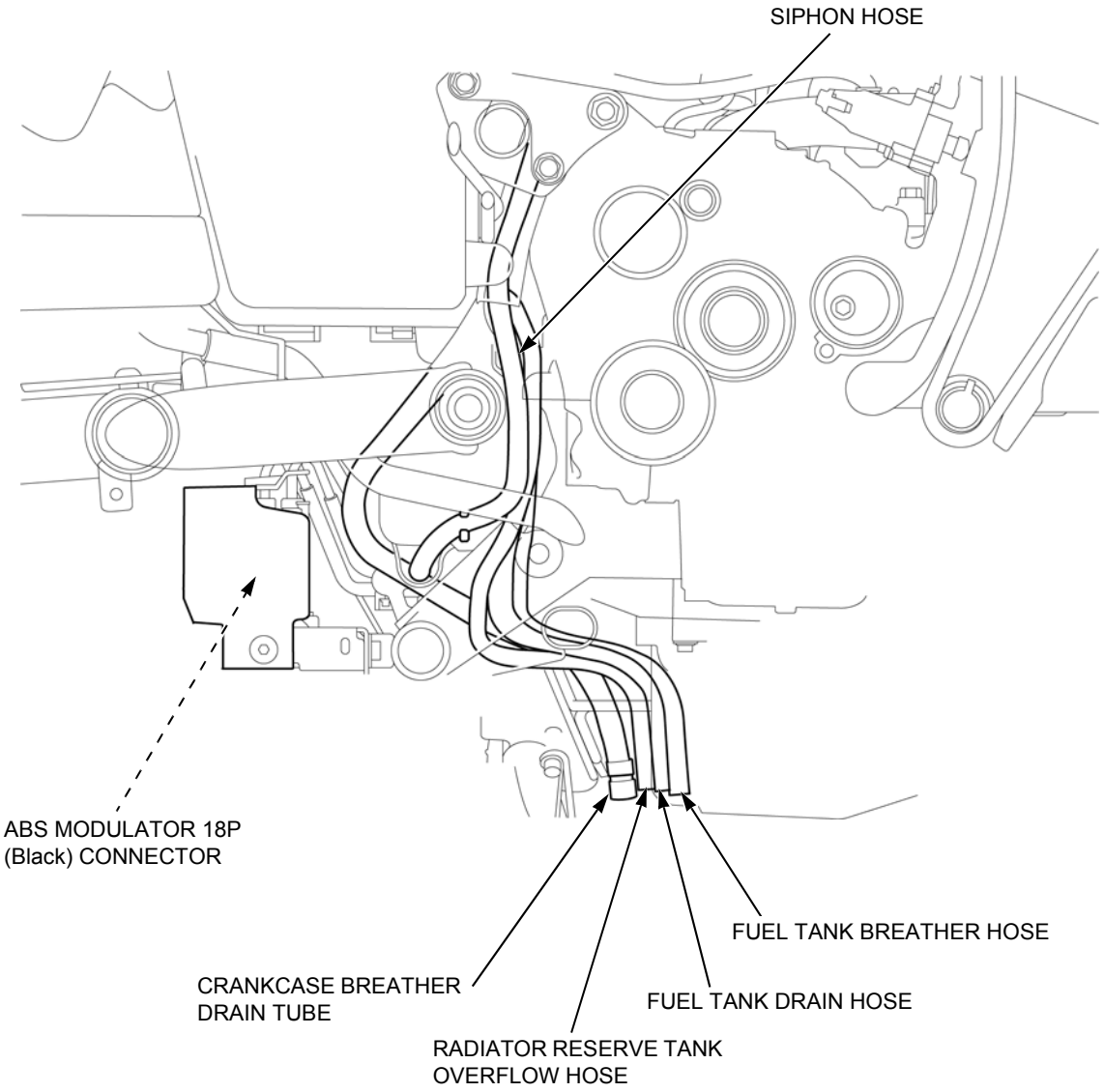

SIPHON HOSE
FUEL TANK BREATHER HOSE
CRANKCASE BREATHER
DRAIN TUBE
FUEL TANK DRAIN HOSE
RADIATOR RESERVE TANK
OVERFLOW HOSE

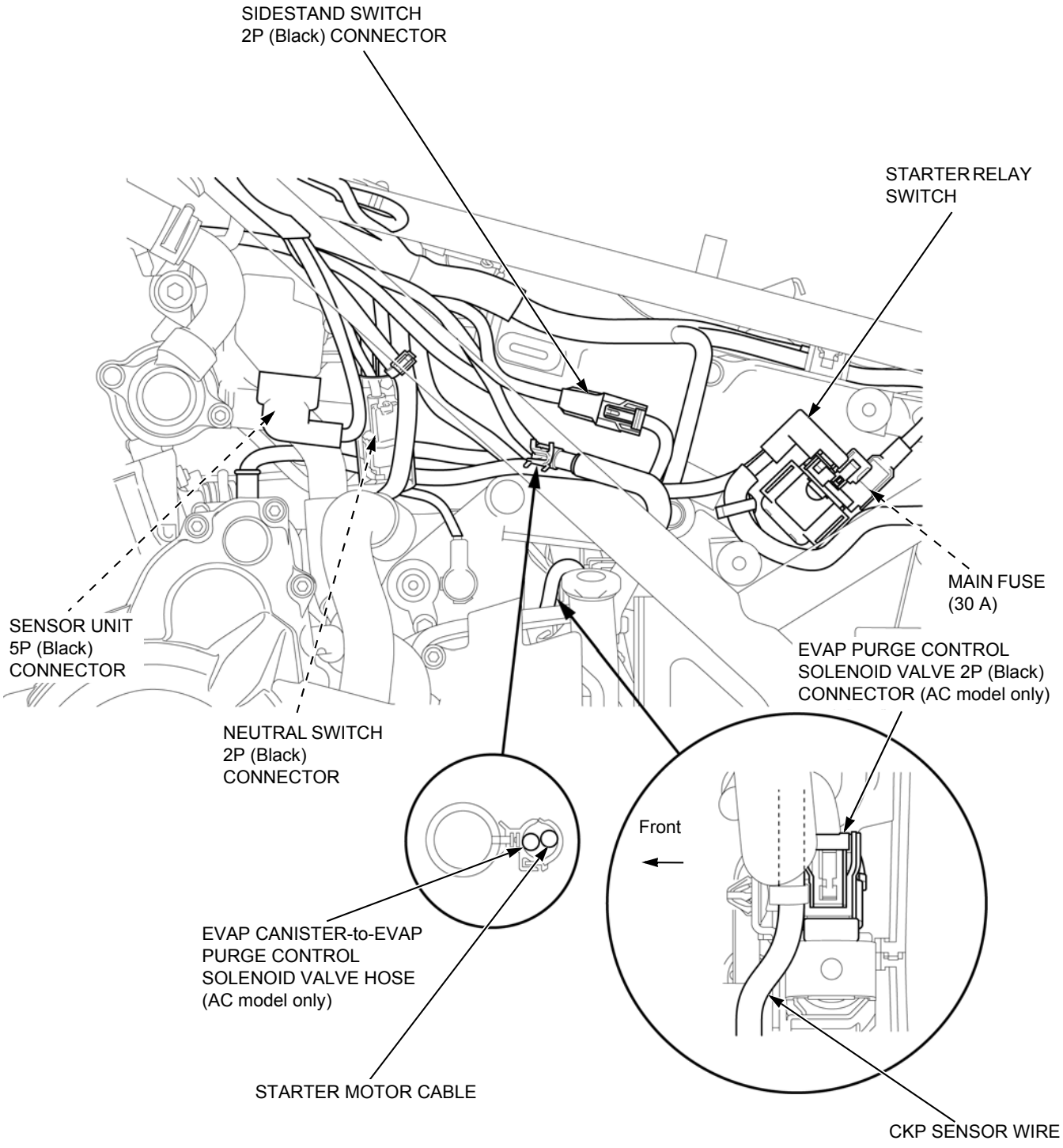
CMX500A

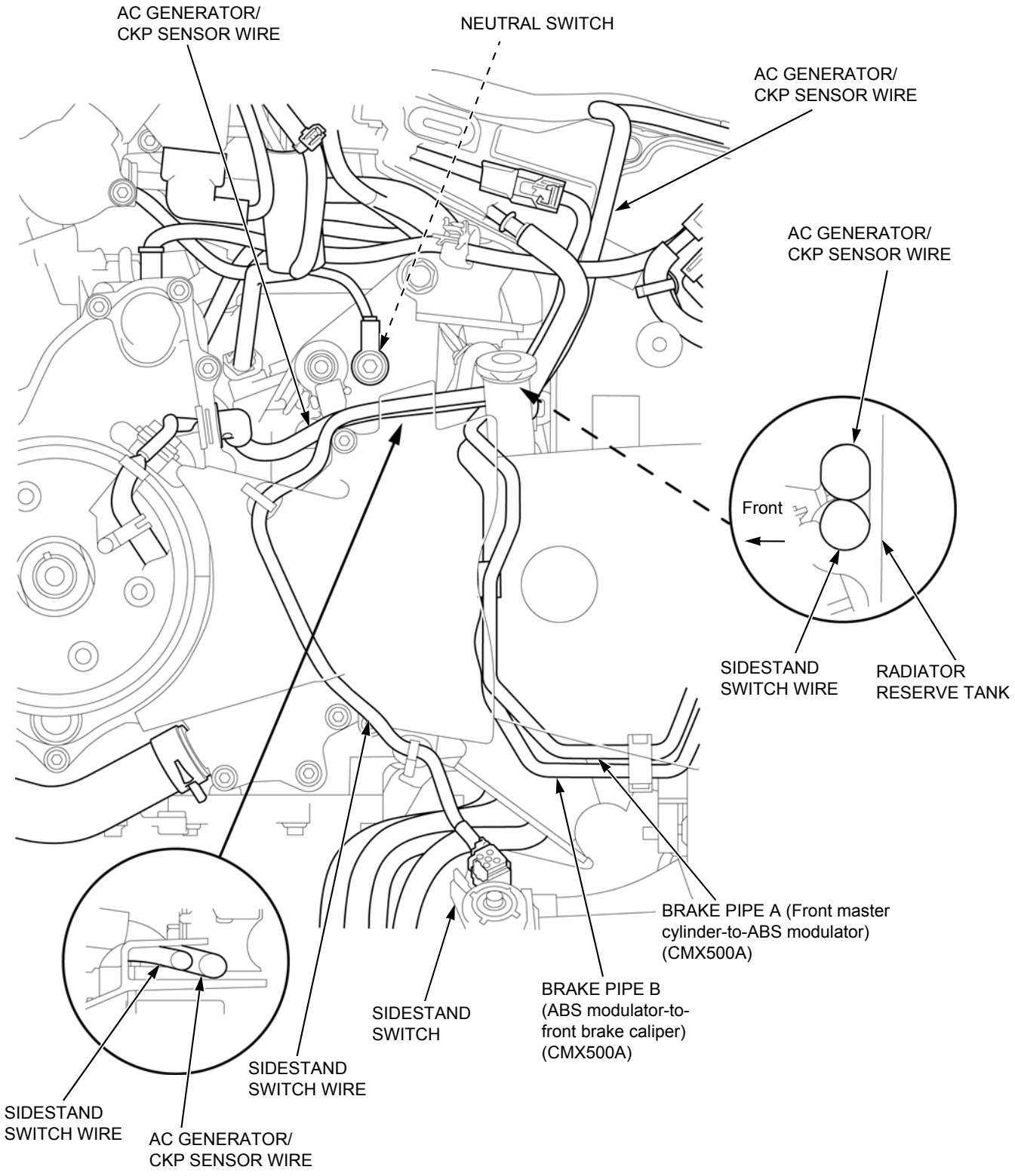
AC model:

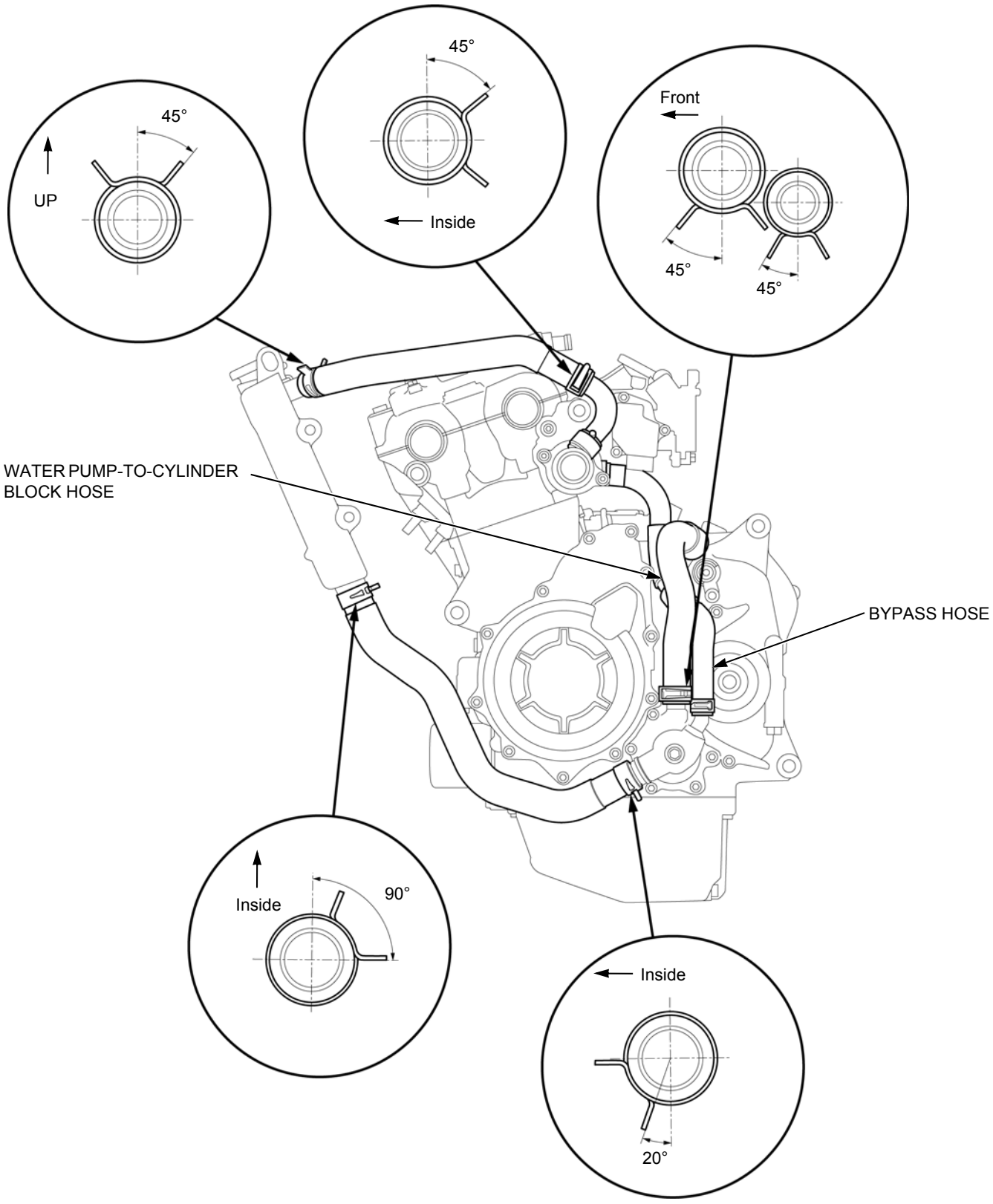


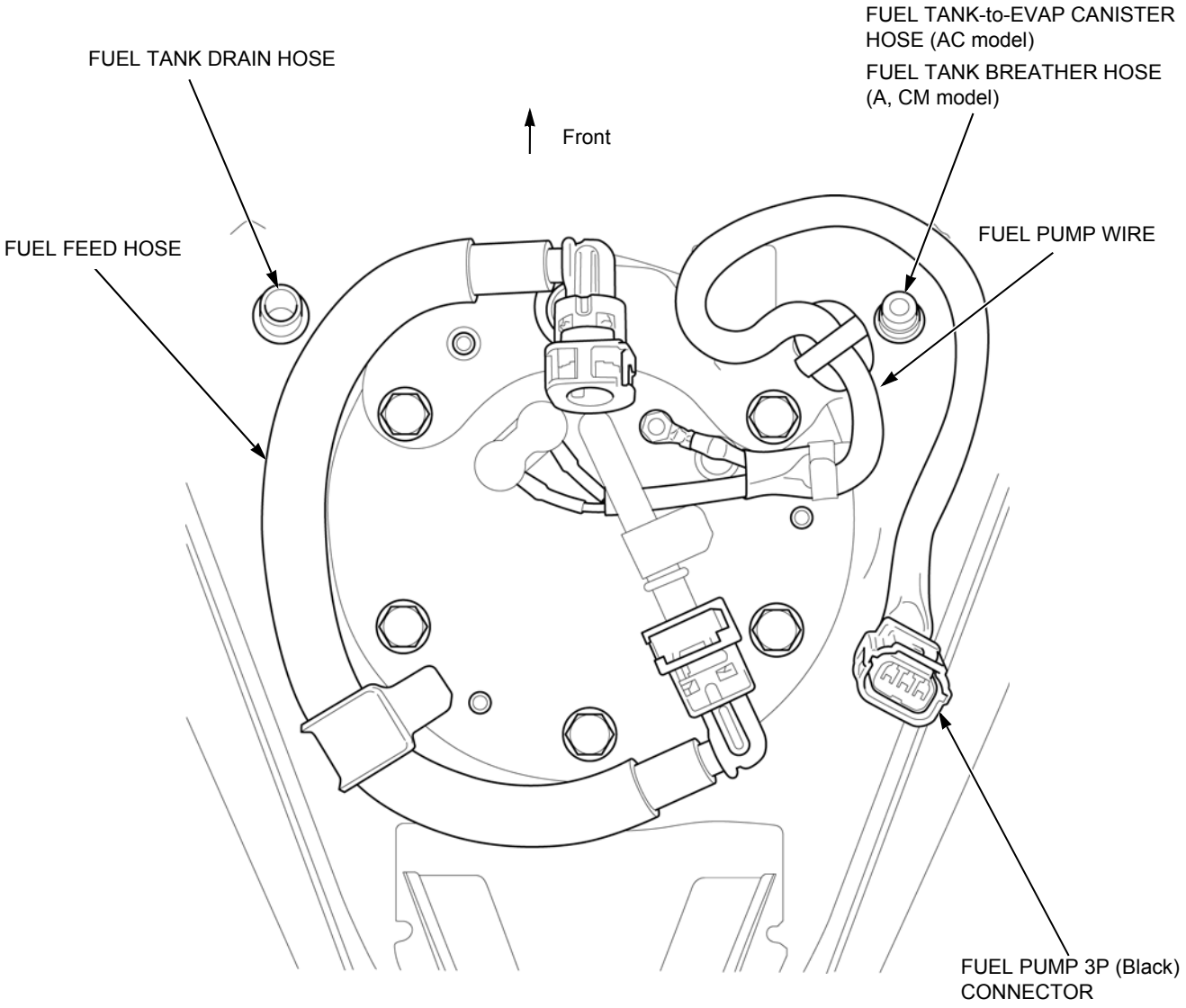
CM model:

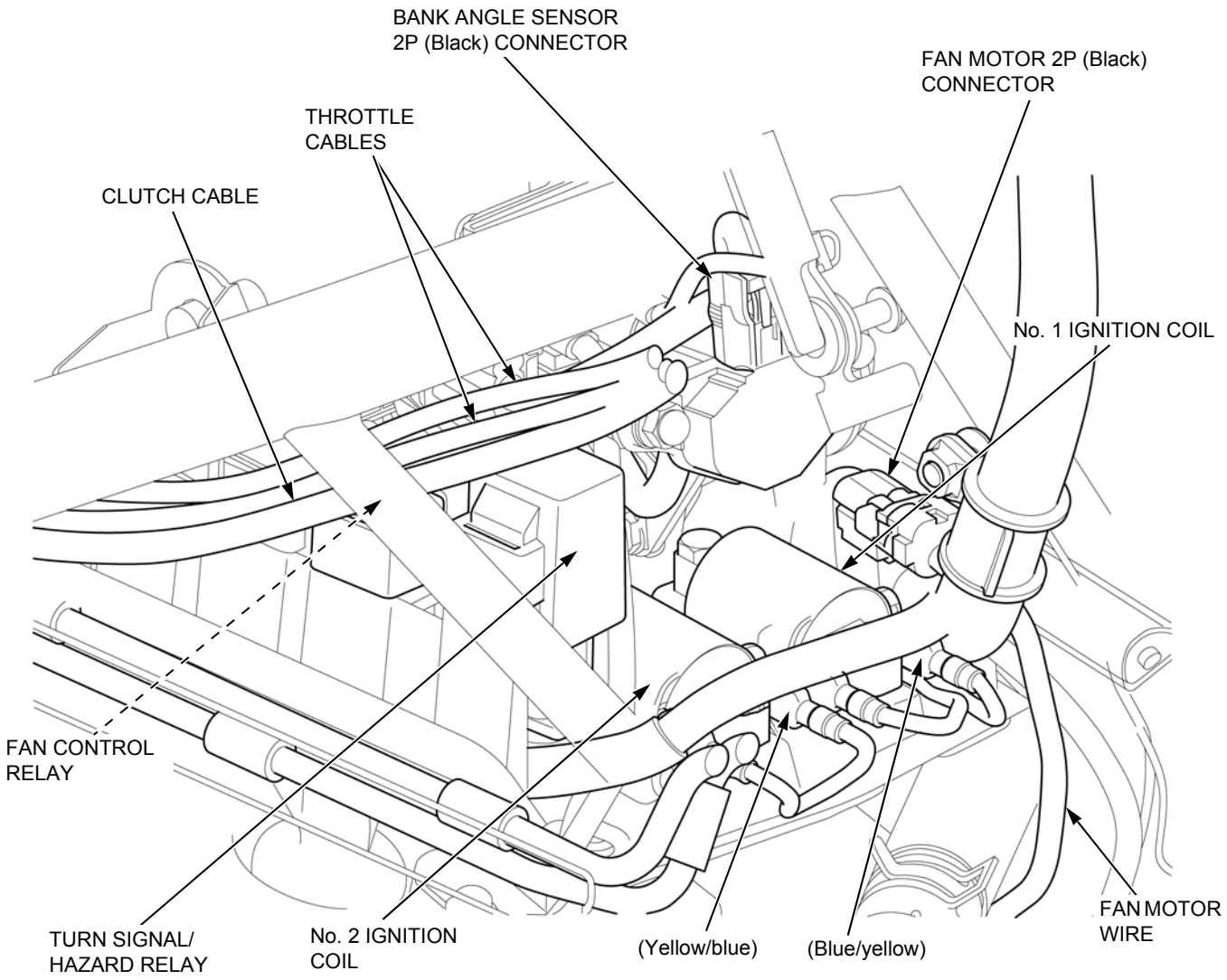

SIPHON HOSE
ABS MODULATOR 18P
(Black) CONNECTOR
FUEL TANK BREATHER HOSE
CRANKCASE BREATHER
DRAIN TUBE
FUEL TANK DRAIN HOSE
RADIATOR RESERVE TANK
OVERFLOW HOSE

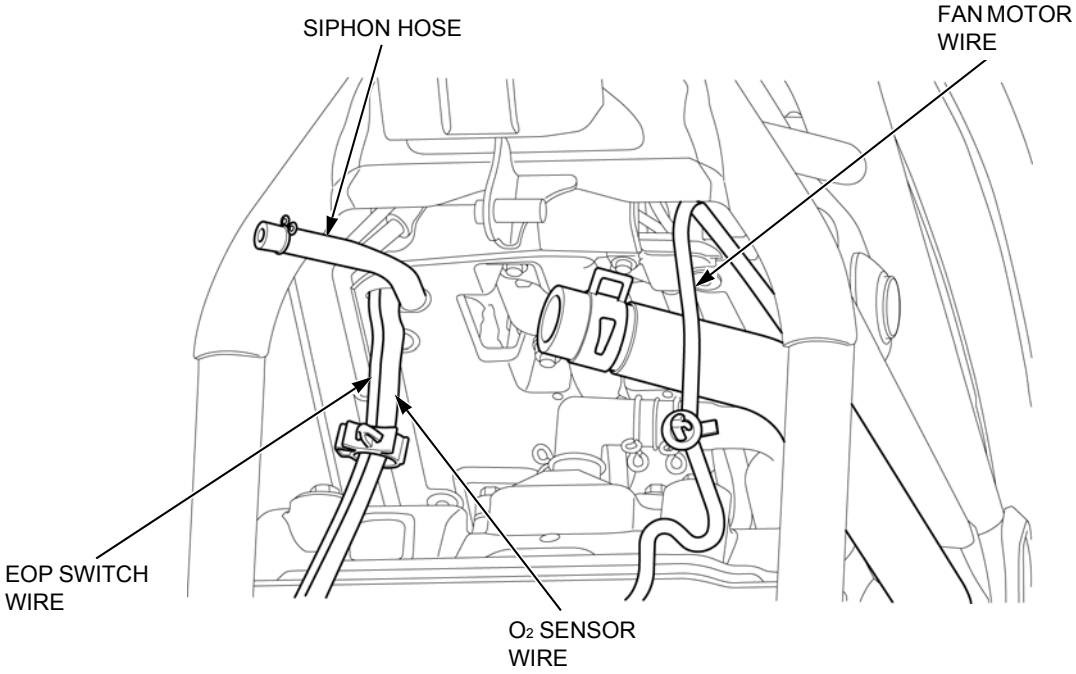

SIDESTAND SWITCH
2P (Black) CONNECTOR
STARTER RELAY
SWITCH
MAIN FUSE
(30 A)
SENSOR UNIT
5P (Black)
CONNECTOR
EVAP PURGE CONTROL
SOLENOID VALVE 2P (Black)
CONNECTOR (AC model only)
NEUTRAL SWITCH
2P (Black)
CONNECTOR
Front
EVAP CANISTER-to-EVAP
PURGE CONTROL
SOLENOID VALVE HOSE
(AC model only)
STARTER MOTOR CABLE
CKP SENSOR WIRE

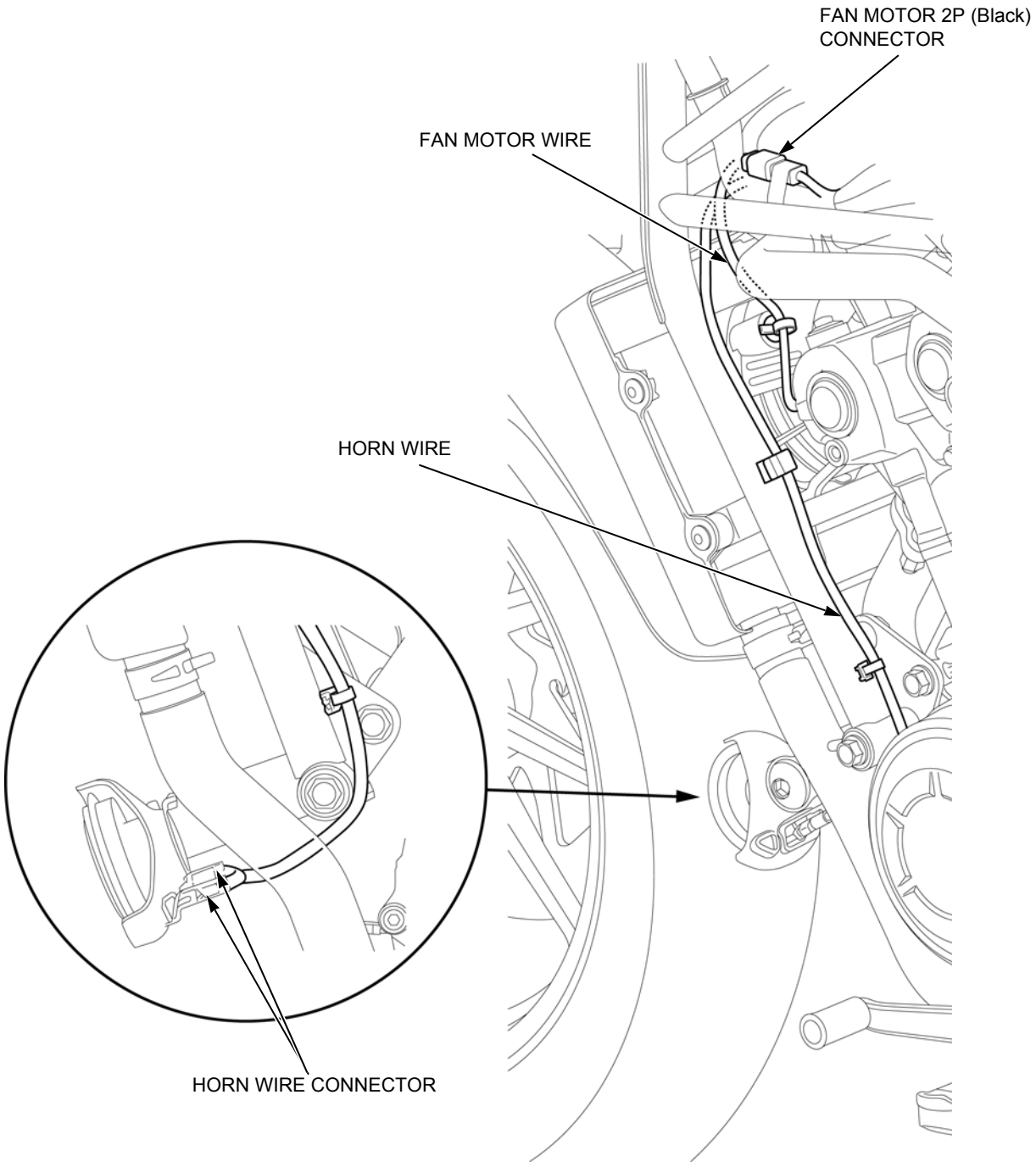

AC GENERATOR/
CKP SENSOR WIRE
NEUTRAL SWITCH
AC GENERATOR/
CKP SENSOR WIRE
AC GENERATOR/
CKP SENSOR WIRE
Front
SIDESTAND
SWITCH WIRE
RADIATOR
RESERVE TANK
BRAKE PIPE A (Front master
cylinder-to-ABS modulator)
(CMX500A)
BRAKE PIPE B
(ABS modulator-to-
front brake caliper)
(CMX500A)
SIDESTAND
SWITCH
SIDESTAND
SWITCH WIRE
SIDESTAND
SWITCH WIRE
AC GENERATOR/
CKP SENSOR WIRE

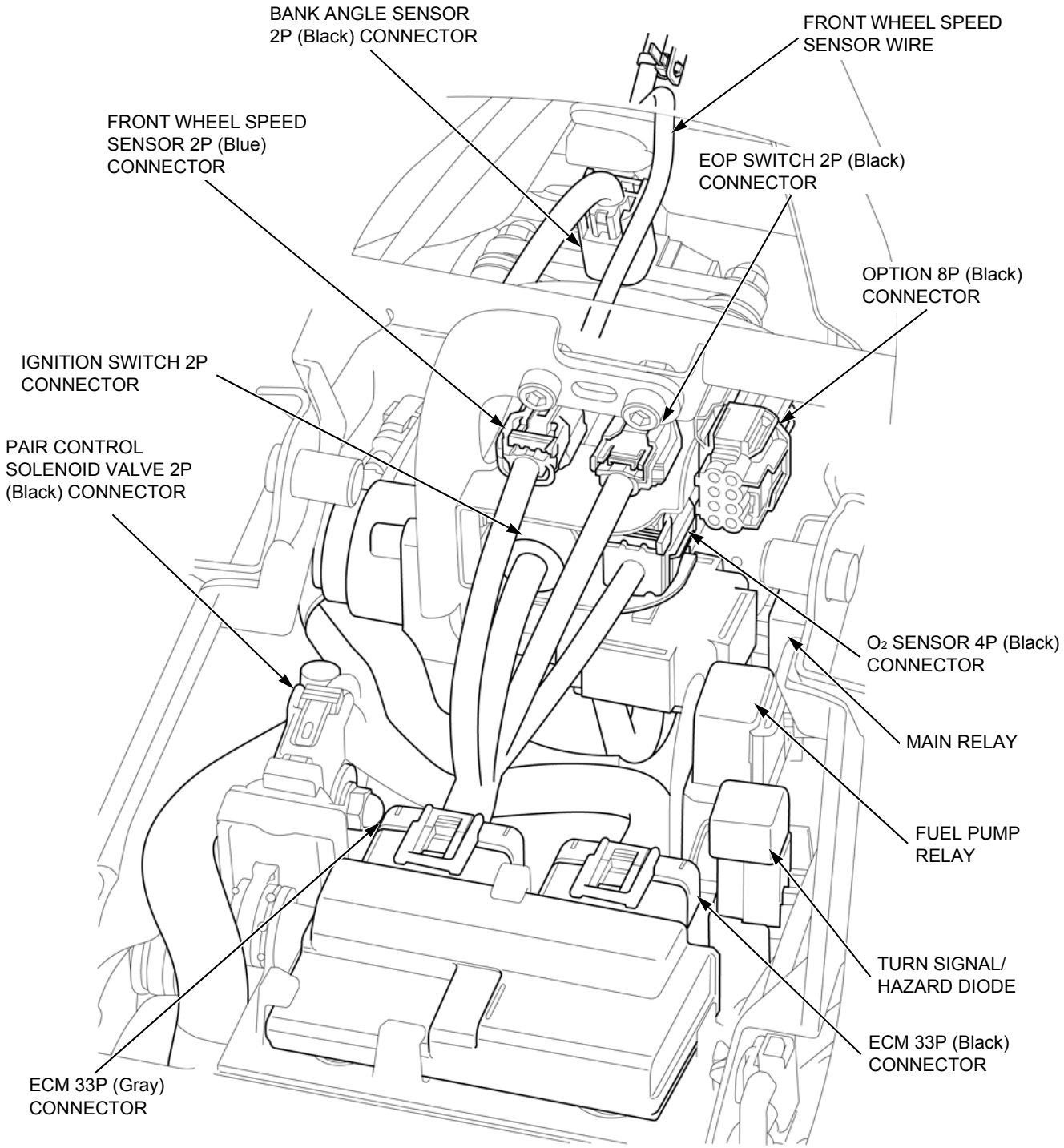

45°
UP
45°
Inside
Front
45°
45°
WATER PUMP-TO-CYLINDER
BLOCK HOSE
BYPASS HOSE
Inside
90°
Inside
20°

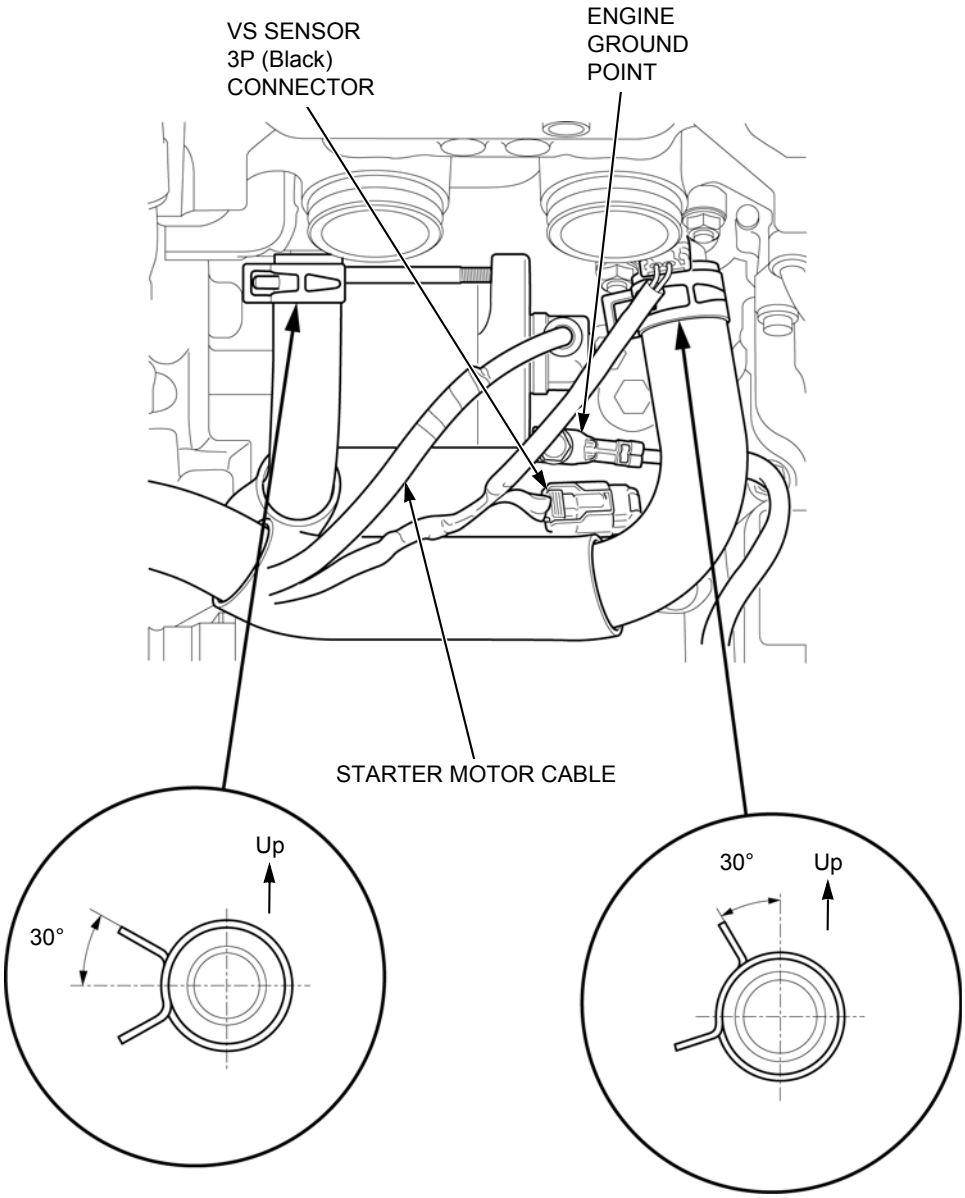

FUEL TANK DRAIN HOSE
FUEL TANK-to-EVAP CANISTER HOSE (AC model)
FUEL TANK BREATHER HOSE (A, CM model)
Front
FUEL FEED HOSE
FUEL PUMP WIRE
FUEL PUMP 3P (Black) CONNECTOR

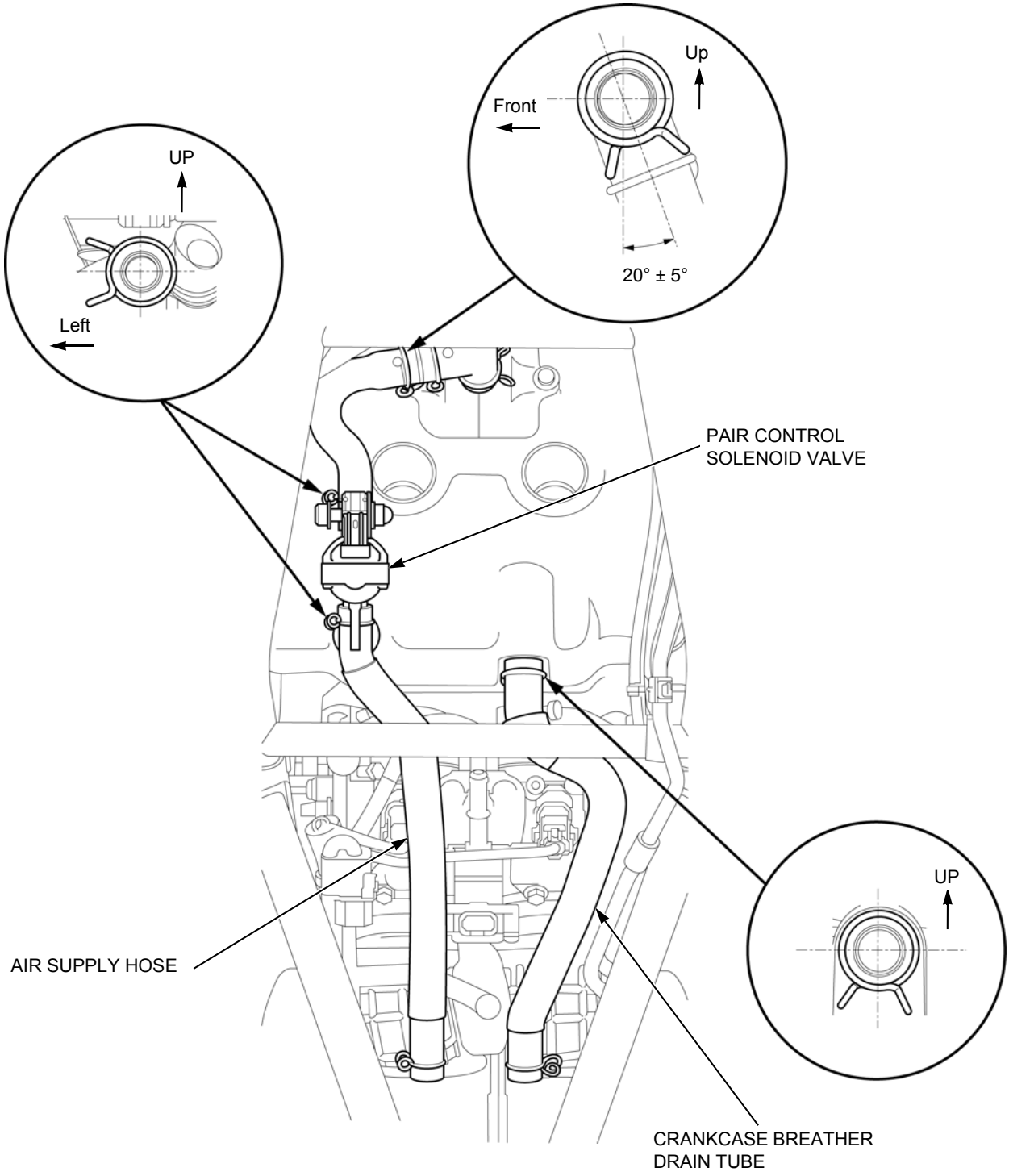

BANK ANGLE SENSOR
2P (Black) CONNECTOR
FAN MOTOR 2P (Black)
CONNECTOR
THROTTLE
CABLES
CLUTCH CABLE
No. 1 IGNITION COIL
FAN CONTROL
RELAY
TURN SIGNAL/
HAZARD RELAY
No. 2 IGNITION
COIL
(Yellow/blue)
(Blue/yellow)
FAN MOTOR
WIRE

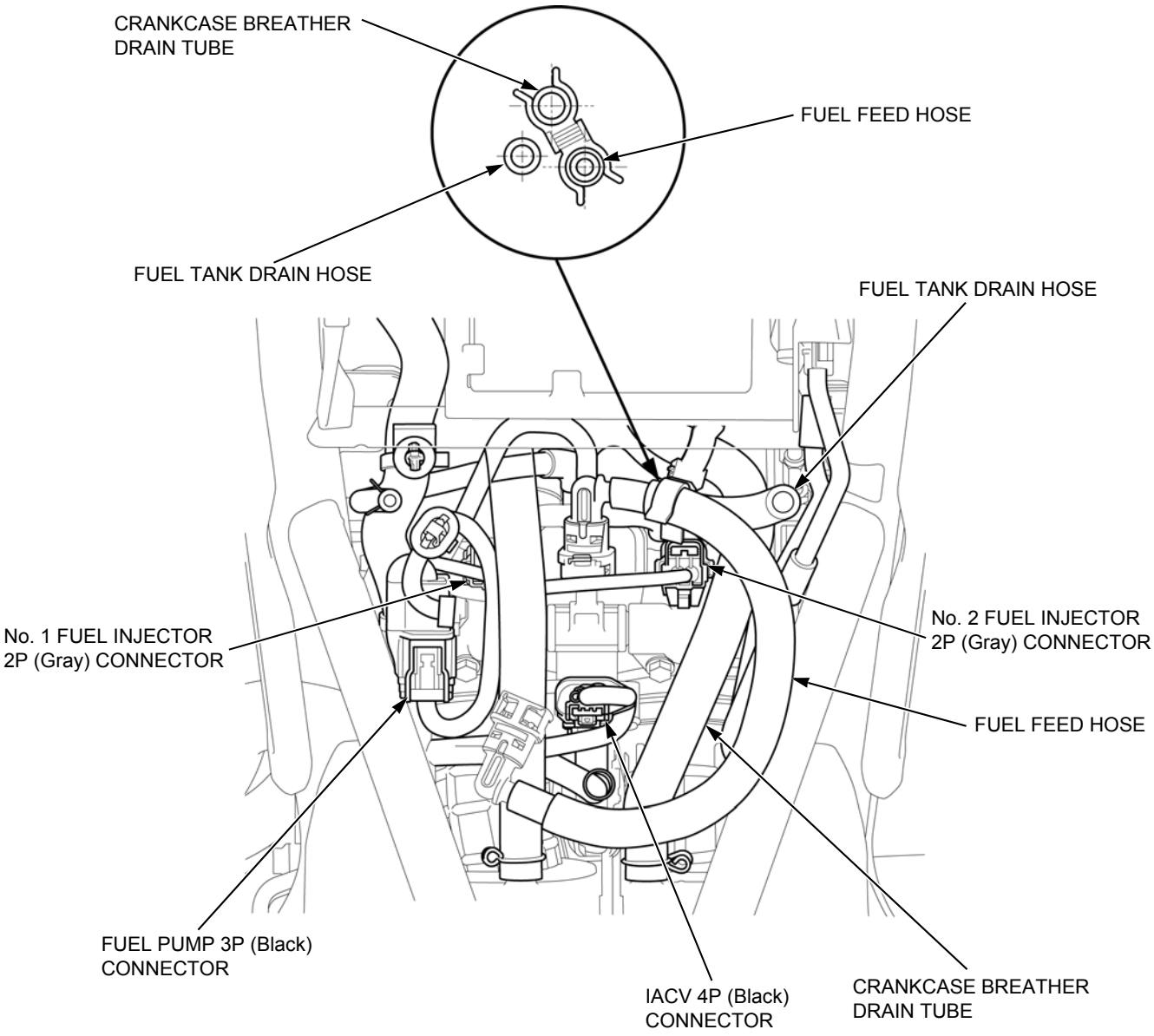

SIPHON HOSE
FAN MOTOR
WIRE
EOP SWITCH
WIRE
O2 SENSOR
WIRE

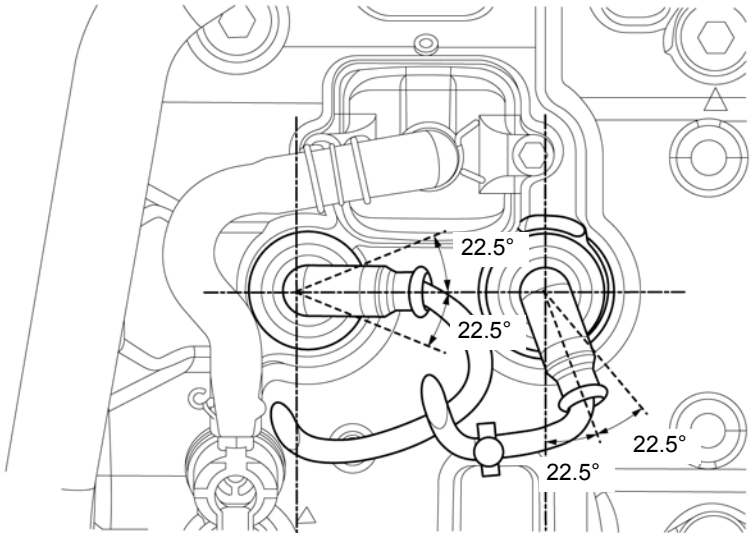

FAN MOTOR 2P (Black)
CONNECTOR
FAN MOTOR WIRE
HORN WIRE
HORN WIRE CONNECTOR

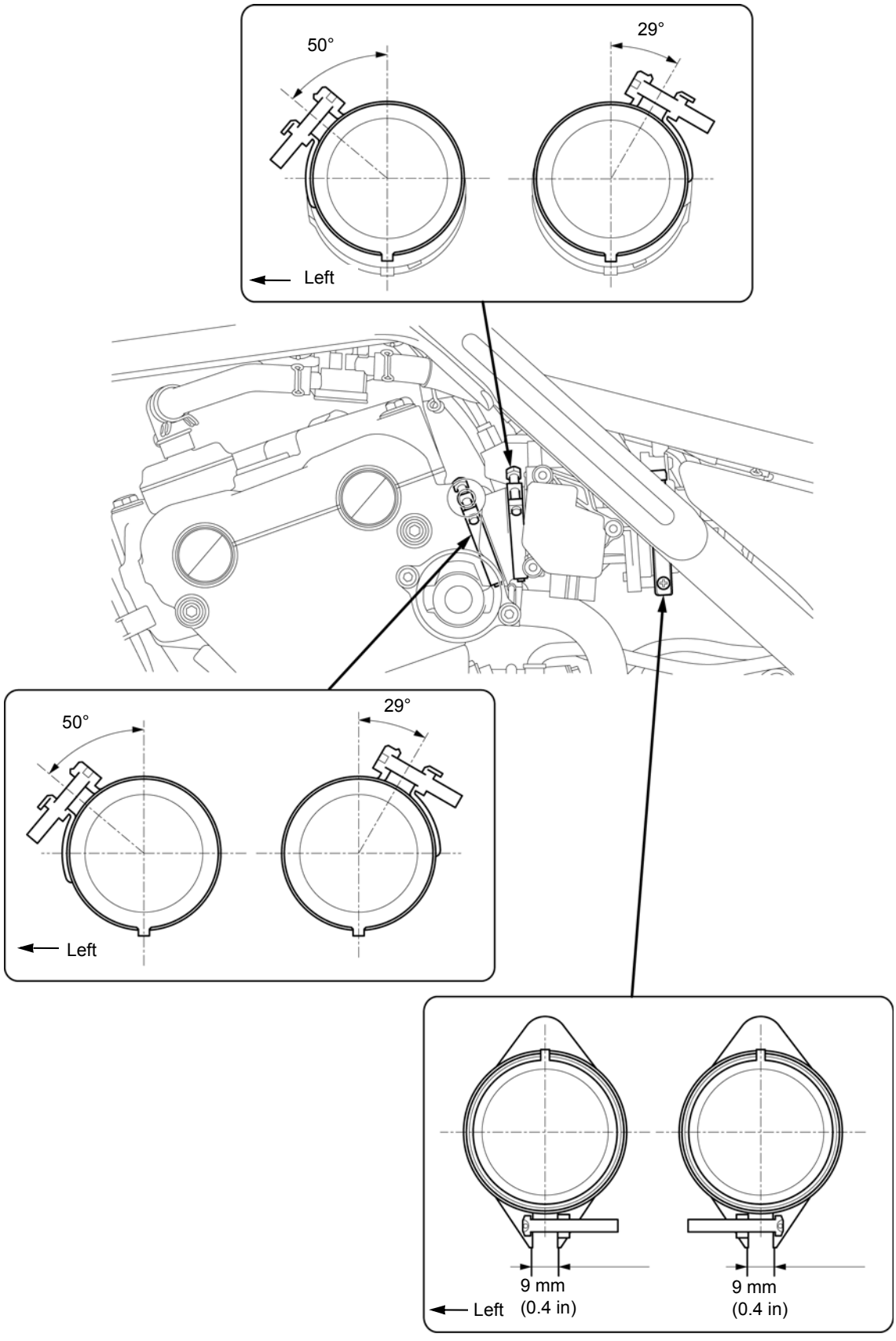

BANK ANGLE SENSOR
2P (Black) CONNECTOR
FRONT WHEEL SPEED
SENSOR WIRE
FRONT WHEEL SPEED
SENSOR 2P (Blue)
CONNECTOR
EOP SWITCH 2P (Black)
CONNECTOR
OPTION 8P (Black)
CONNECTOR
IGNITION SWITCH 2P
CONNECTOR
PAIR CONTROL
SOLENOID VALVE 2P
(Black) CONNECTOR
O2 SENSOR 4P (Black)
CONNECTOR
MAIN RELAY
FUEL PUMP
RELAY
TURN SIGNAL/
HAZARD DIODE
ECM 33P (Black)
CONNECTOR
ECM 33P (Gray)
CONNECTOR

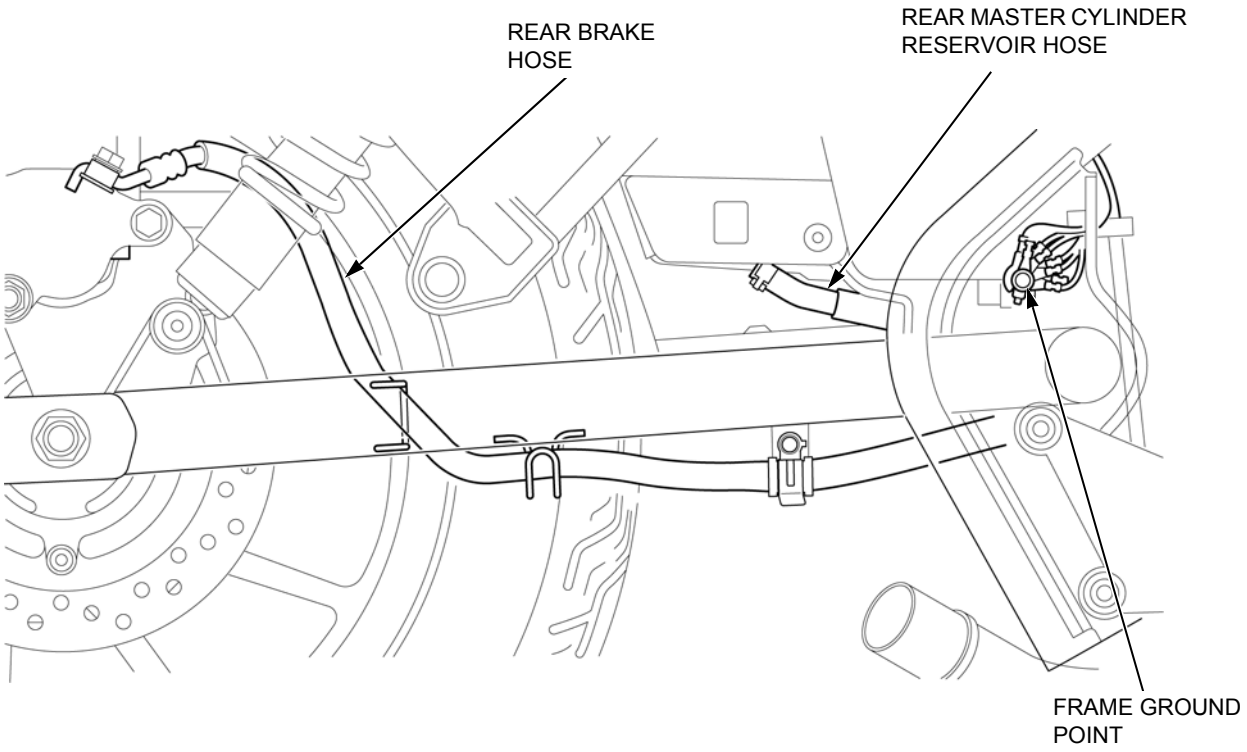

VS SENSOR
3P (Black)
CONNECTOR
ENGINE
GROUND
POINT
STARTER MOTOR CABLE
Up
30°
30°
Up


Up
Front
20° ± 5°
UP
Left
PAIR CONTROL
SOLENOID VALVE
UP
AIR SUPPLY HOSE
CRANKCASE BREATHER
DRAIN TUBE

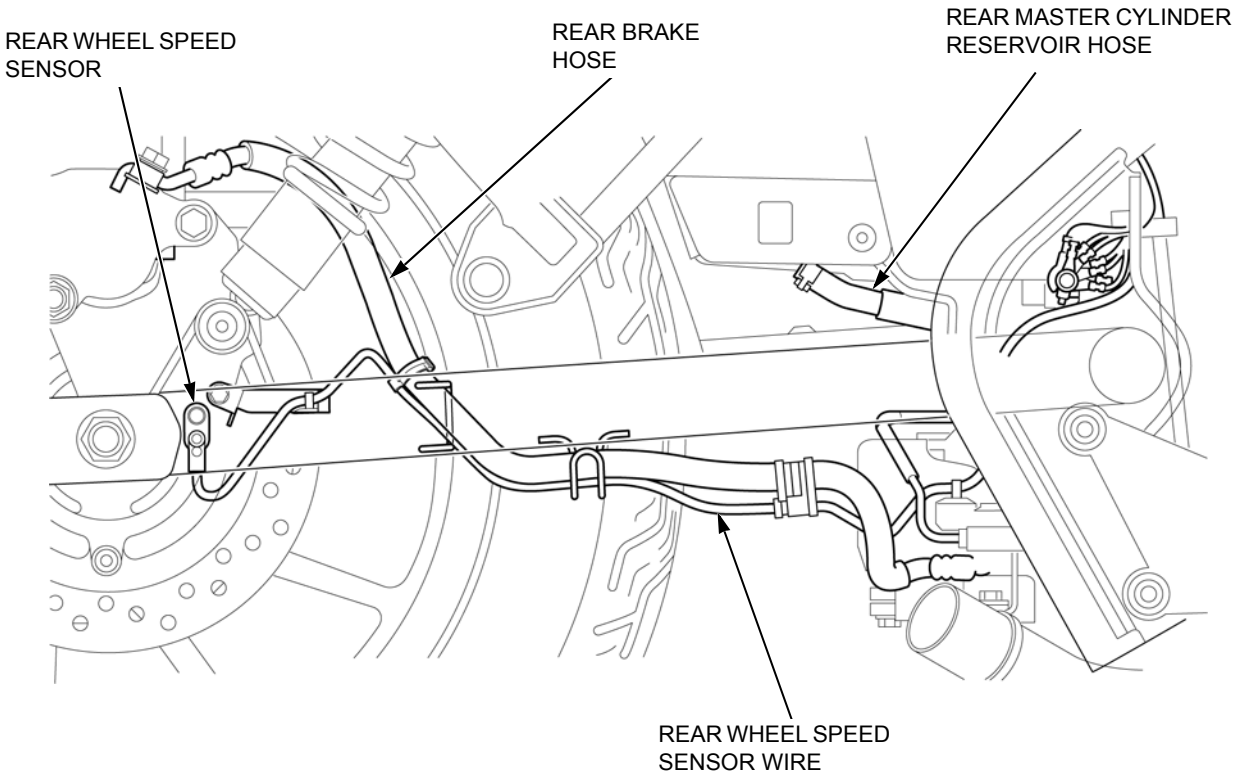

CRANKCASE BREATHER DRAIN TUBE
FUEL FEED HOSE
FUEL TANK DRAIN HOSE
FUEL TANK DRAIN HOSE
No. 1 FUEL INJECTOR 2P (Gray) CONNECTOR
No. 2 FUEL INJECTOR 2P (Gray) CONNECTOR
FUEL FEED HOSE
FUEL PUMP 3P (Black) CONNECTOR
IACV 4P (Black) CONNECTOR
CRANKCASE BREATHER DRAIN TUBE

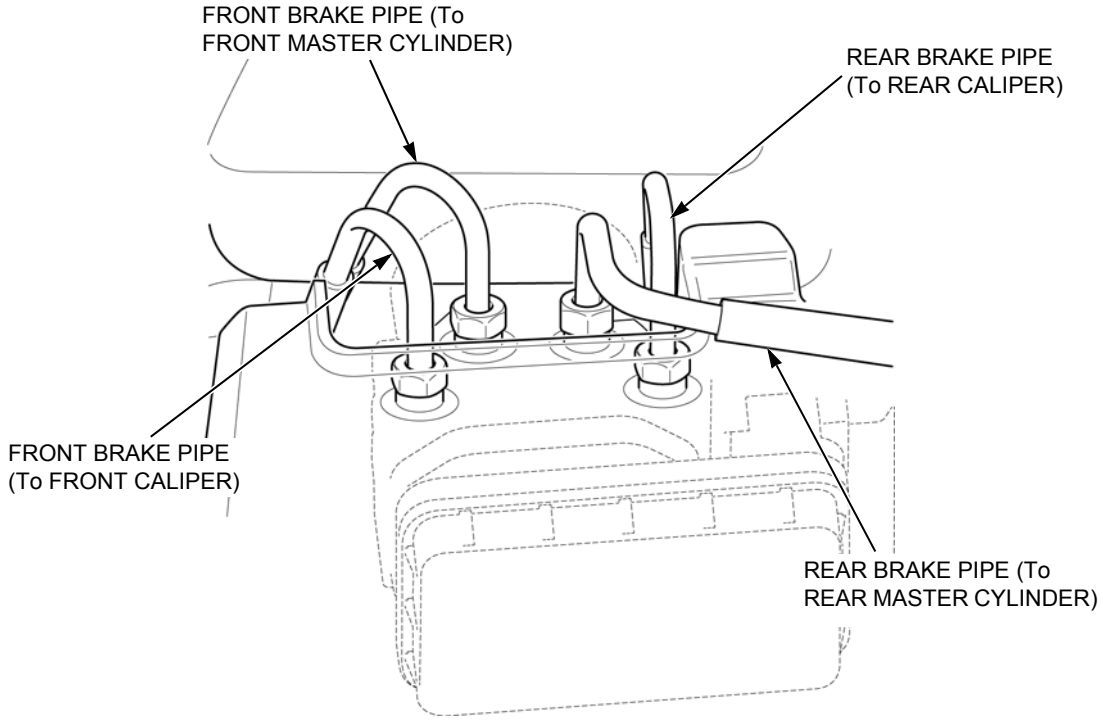

22.5°
22.5°
22.5°
22.5°

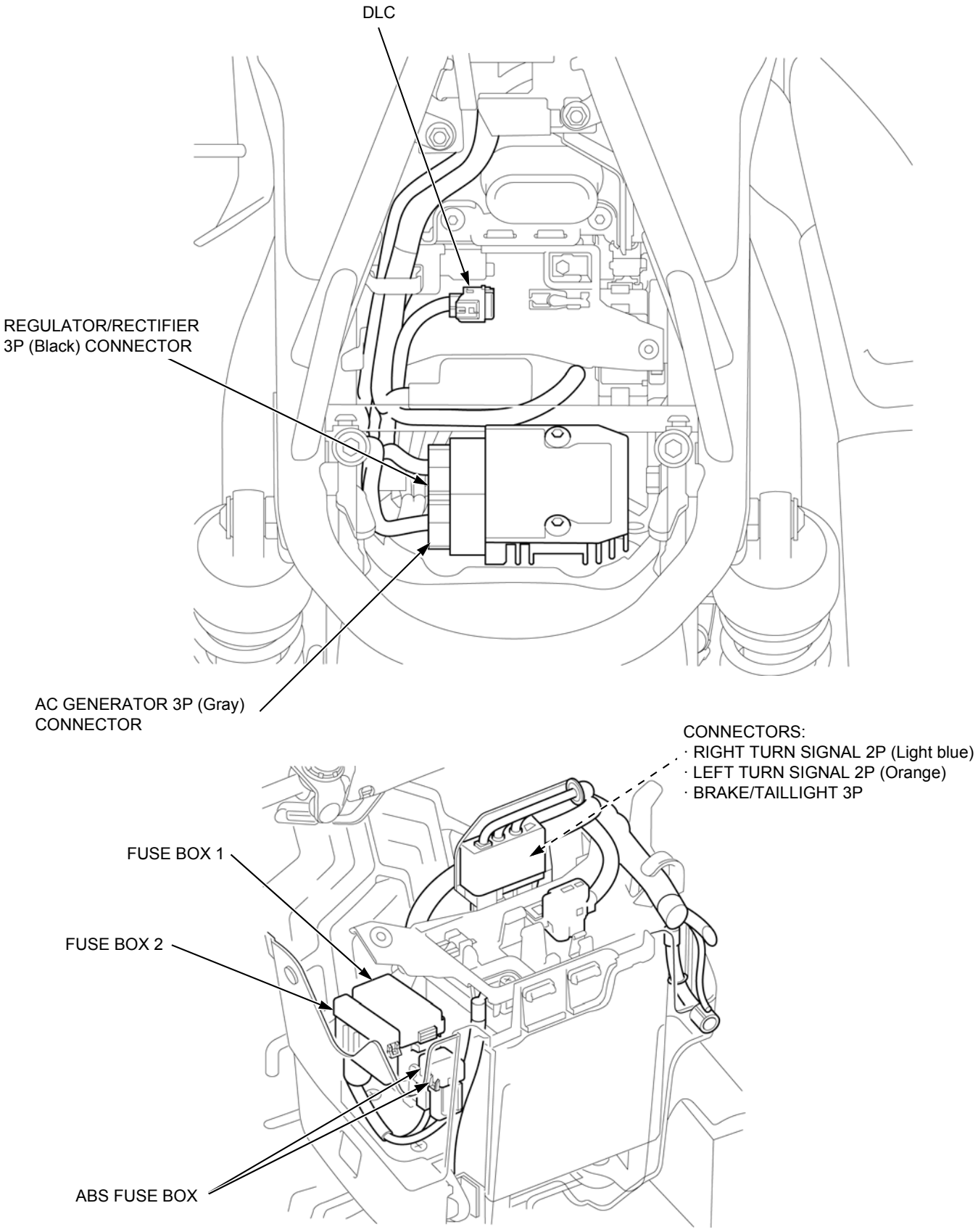

50°
29°
Left
50°
29°
Left
9 mm
(0.4 in)
9 mm
(0.4 in)
Left

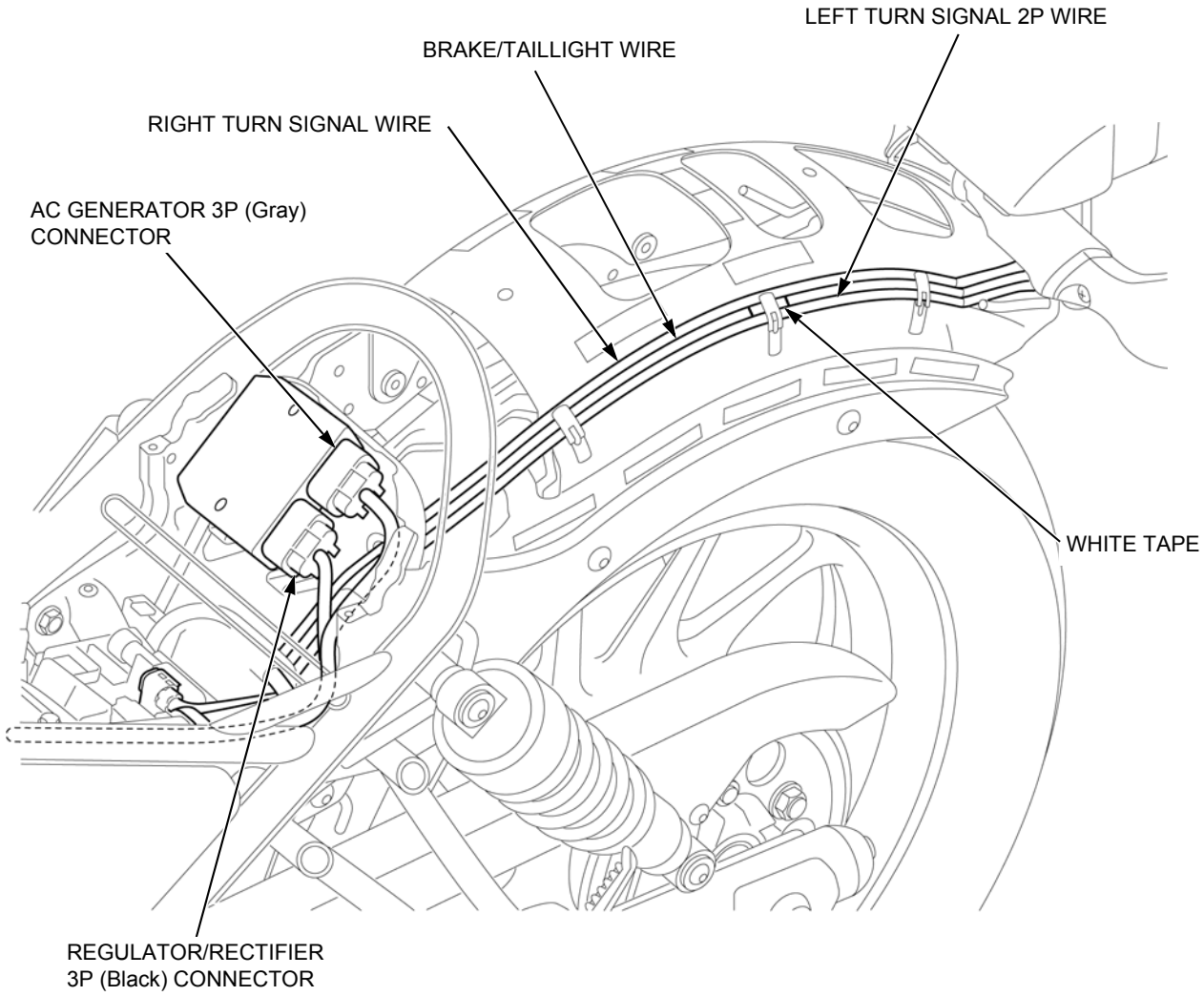

REAR BRAKE HOSE
REAR MASTER CYLINDER RESERVOIR HOSE
FRAME GROUND POINT

CMX500A


REAR WHEEL SPEED SENSOR
REAR BRAKE HOSE
REAR MASTER CYLINDER RESERVOIR HOSE
REAR WHEEL SPEED SENSOR WIRE


FRONT BRAKE PIPE (To FRONT MASTER CYLINDER)
REAR BRAKE PIPE (To REAR CALIPER)
FRONT BRAKE PIPE (To FRONT CALIPER)
REAR BRAKE PIPE (To REAR MASTER CYLINDER)


DLC
REGULATOR/RECTIFIER
3P (Black) CONNECTOR
AC GENERATOR 3P (Gray)
CONNECTOR
CONNECTORS:
· RIGHT TURN SIGNAL 2P (Light blue)
· LEFT TURN SIGNAL 2P (Orange)
· BRAKE/TAILLIGHT 3P
FUSE BOX 1
FUSE BOX 2
ABS FUSE BOX


LEFT TURN SIGNAL 2P WIRE
BRAKE/TAILLIGHT WIRE
RIGHT TURN SIGNAL WIRE
AC GENERATOR 3P (Gray)
CONNECTOR
WHITE TAPE
REGULATOR/RECTIFIER
3P (Black) CONNECTOR

EMISSION CONTROL SYSTEMS

SOURCE OF EMISSIONS

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

NOISE EMISSION REQUIREMENT

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

WARRANTY COMPLIANCE

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

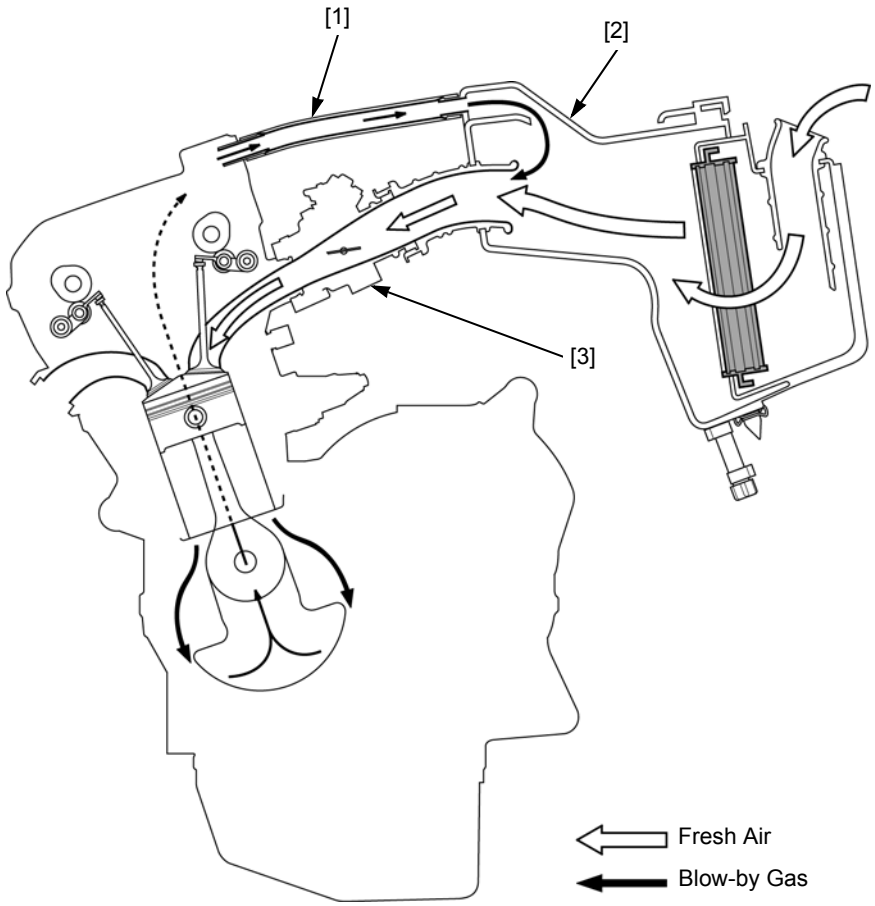
SOURCE OF EMISSIONS

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

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

CRANKCASE EMISSION CONTROL SYSTEM

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



EXHAUST EMISSION CONTROL SYSTEM

The exhaust emission control system is composed of a three-way catalytic converter and PGM-FI system.

The exhaust emission control system is separate from the crankcase emission control system.

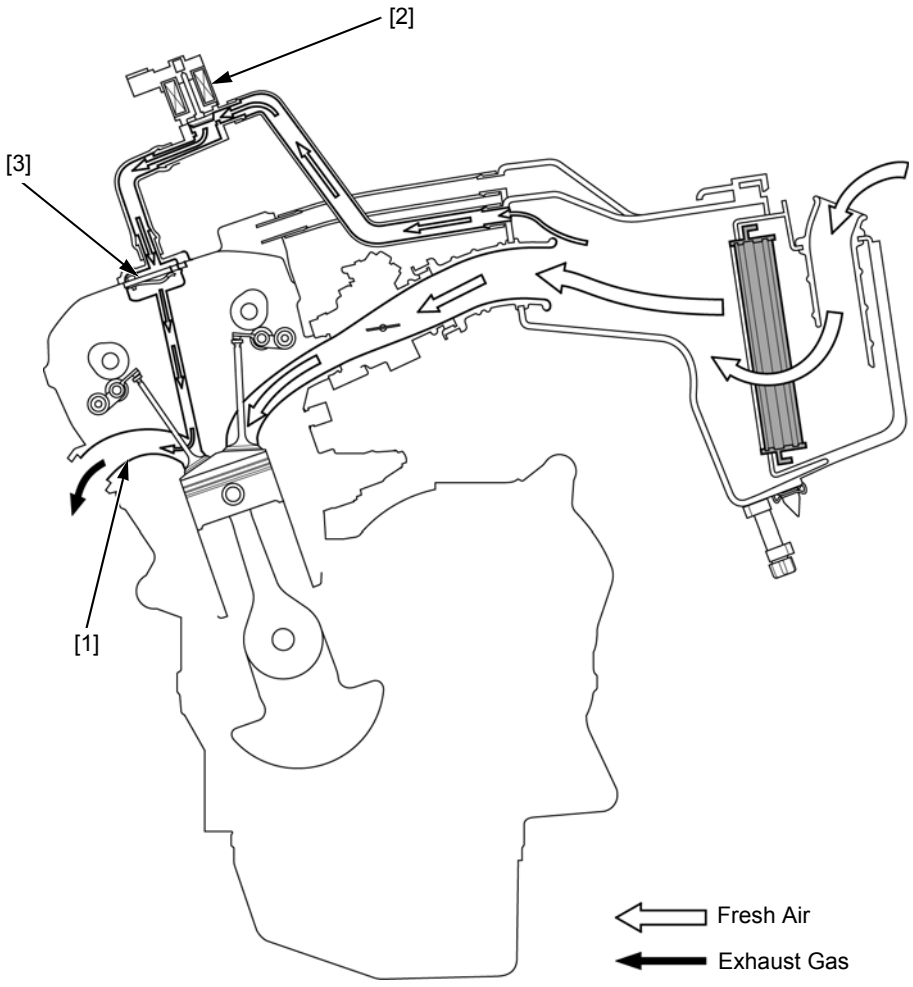
SECONDARY AIR SUPPLY SYSTEM

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

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

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

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



3-WAY CATALYTIC CONVERTER

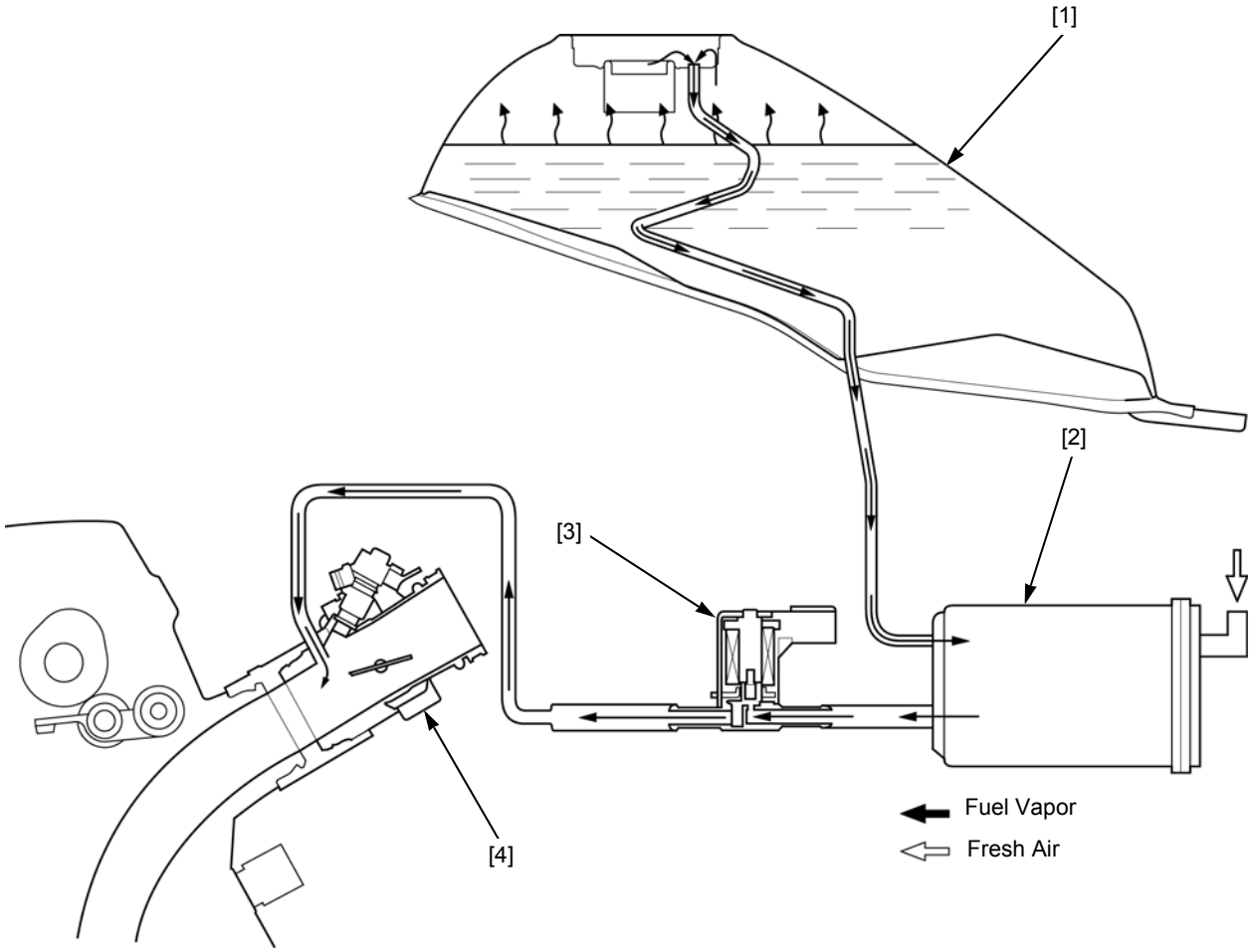
This motorcycle is equipped with a three-way catalytic converter.

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

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

EVAPORATIVE EMISSION CONTROL SYSTEM (AC model)

Fuel vapor from the fuel tank [1] is routed into the EVAP canister [2] where is it absorbed and stored while the engine is stopped. When the engine is running and the EVAP purge control solenoid valve [3] is open, fuel vapor in the EVAP canister is drawn into the engine through the throttle body [4].



NOISE EMISSION CONTROL SYSTEM

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

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

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

FUEL PERMEATION EMISSION CONTROL SYSTEM

This motorcycle complies with the Fuel Permeation Emission Control regulations of the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (CARB), and Environment Canada (EC). The fuel tank, fuel hoses, and fuel vapor charge hoses used on this motorcycle incorporate fuel permeation control technologies. Tampering with the fuel tank, fuel hoses, or fuel vapor charge hoses to reduce or defeat the effectiveness of the fuel permeation technologies is prohibited by federal regulations.

2. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the body panels and exhaust system.
- Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.
- Always replace the exhaust pipe gasket with new ones after removing the exhaust pipe from the engine.
- When installing the exhaust system, loosely install all of the exhaust pipe fasteners. Always tighten the exhaust pipe joint nuts first, then tighten the mounting bolts.
- Always inspect the exhaust system for leaks after installation.

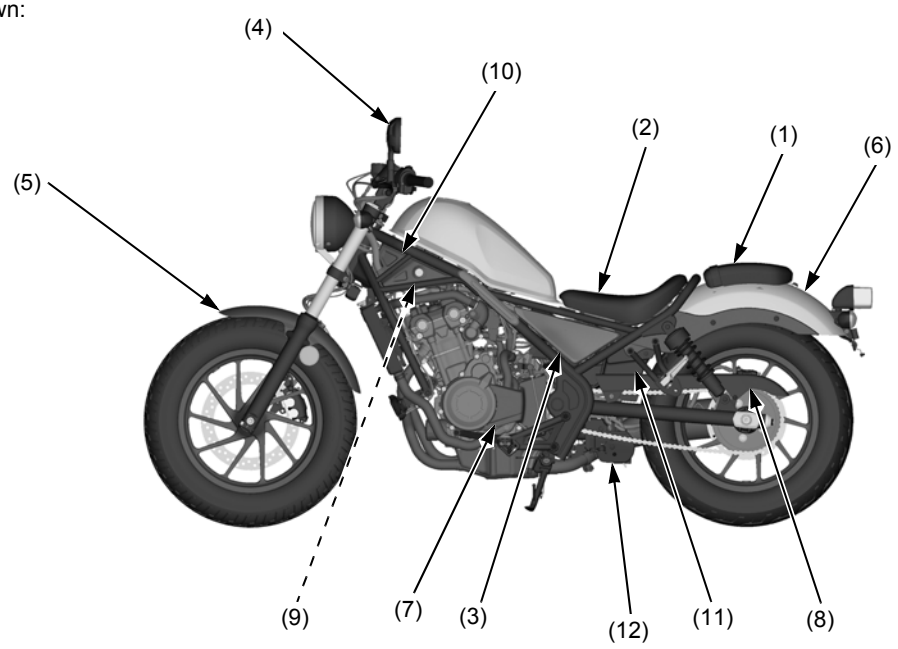
TROUBLESHOOTING

Excessive exhaust noise
- Broken exhaust system
- Exhaust gas leak

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

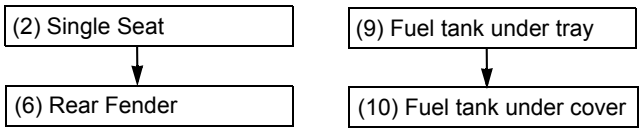
BODY PANEL LOCATIONS

CM model shown:



(1) Passenger Seat (CM model) (page 2-4)
(2) Single Seat (page 2-4)
(3) Side Cover (page 2-4)
(4) Rearview Mirror (page 2-5)
(5) Front Fender (page 2-5)
(6) Rear Fender (page 2-6)
(7) Drive Sprocket Cover (page 2-7)
(8) Drive Chain Cover (page 2-7)
(9) Fuel tank under tray (page 2-8)
(10) Fuel tank under cover (page 2-9)
(11) Battery case (page 2-11)
(12) ABS Modulator Cover (CMX500A) (page 19-24)

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



PASSENGER SEAT (CM model)

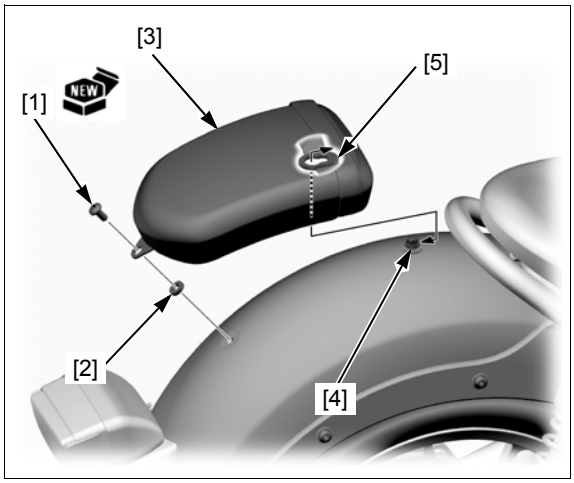
REMOVAL/INSTALLATION

Remove the mounting bolt [1] and collar [2].
Remove the passenger seat [3] by pulling it frontward.

Install the passenger seat by inserting the boss [4] into the seat retainer [5].

Install and tighten the mounting bolt securely.

- Replace the passenger seat mounting bolt with a new one.



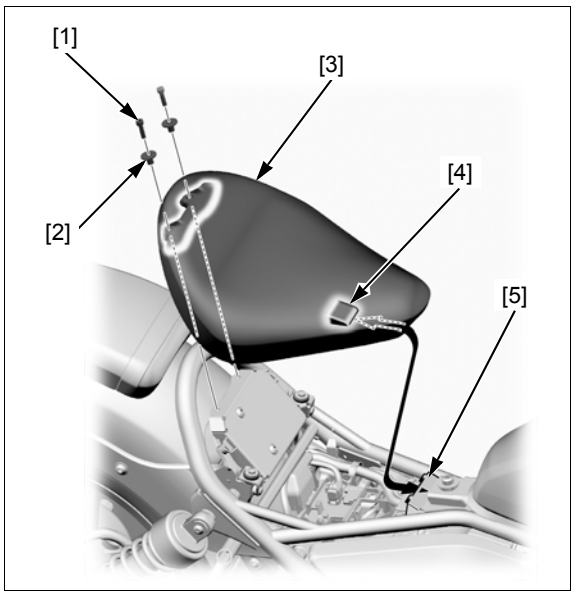
SINGLE SEAT

REMOVAL/INSTALLATION

Remove the mounting socket bolts [1] and collars [2].
Remove the single seat [3] by pulling it rearward.

Install the single seat by inserting its hook [4] into the seat bracket [5] under the fuel tank.

Install and tighten the mounting socket bolts securely.



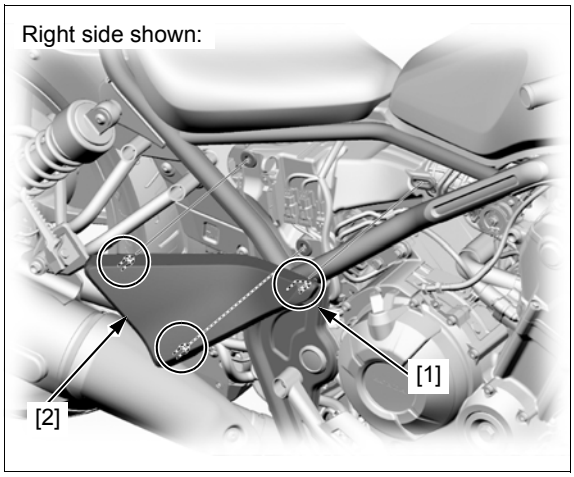
SIDE COVER

REMOVAL/INSTALLATION

Release the bosses [1].

Remove the side cover [2].

Install the side cover in the reverse order of removal.



REARVIEW MIRROR

REMOVAL/INSTALLATION

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

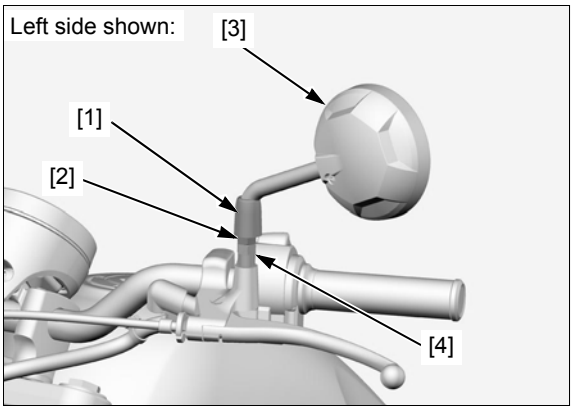
Loosen the lock nut (left-hand threads) and remove the rearview mirror [3].

Remove the mirror adaptor [4].

Installation is in the reverse order of removal.

TORQUE:

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



FRONT FENDER

REMOVAL/INSTALLATION

Remove the front wheel (page 16-10).

Remove the self-lock nuts [1], washers [2], collars [3] and reflectors [4].

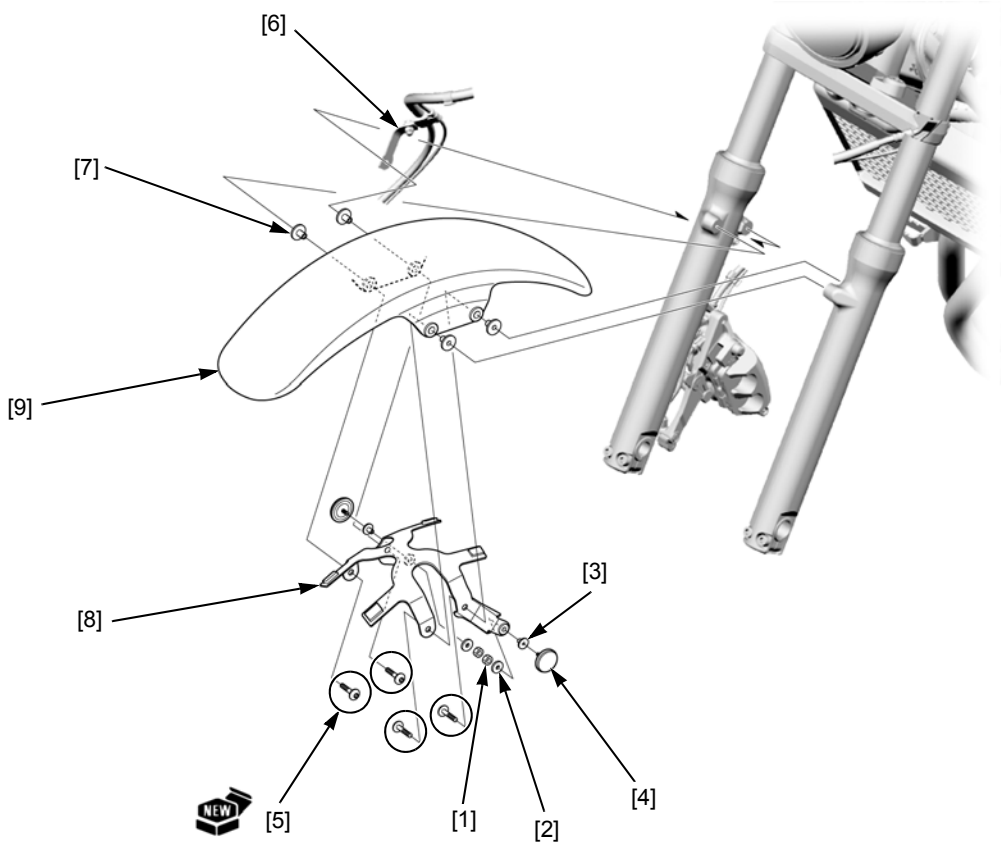
Remove the bolts [5], hose guide [6], collars [7], fender stay [8] and front fender [9] from the fork legs.

Install the front fender in the reverse order of removal.

TORQUE:

Front reflector mounting nut:
1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)

- Replace the fender mounting bolts with a new one.



REAR FENDER

REMOVAL/INSTALLATION

Remove the single seat (page 2-4).

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

– turn signal 2P (Light blue)
– turn signal 2P (Orange)
– brake/taillight 3P

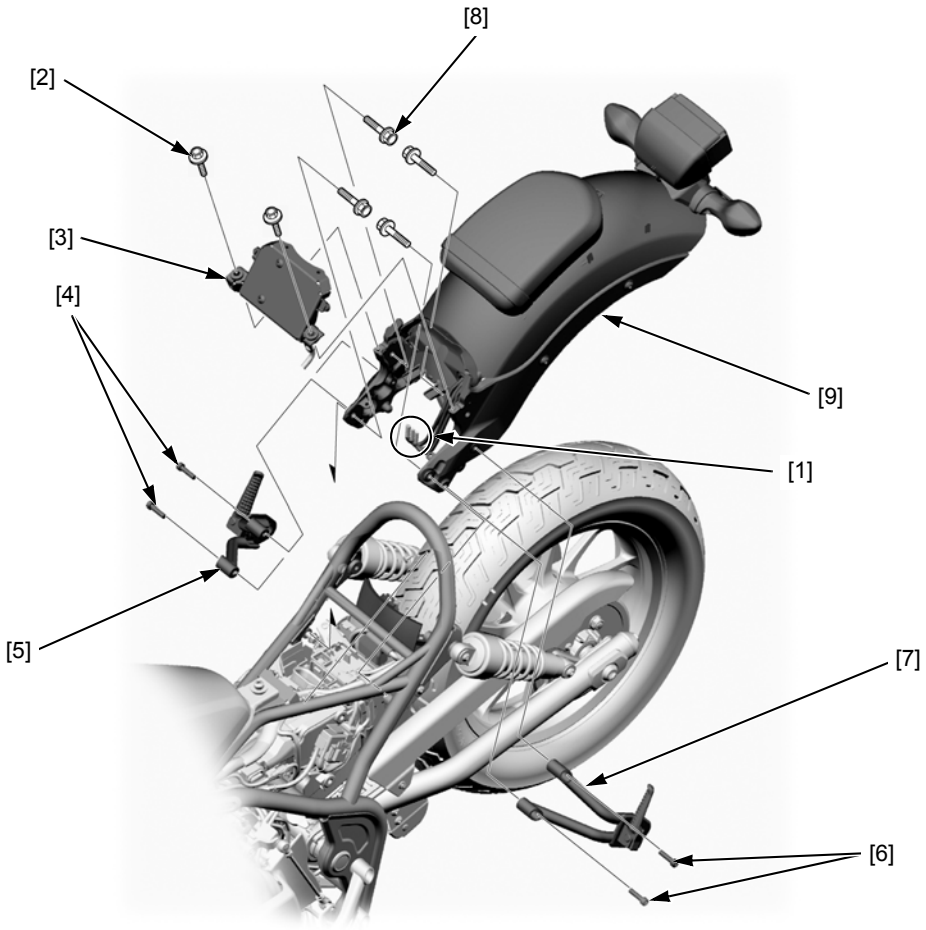
Remove the following:

– two bolt/washers [2]
– regulator/rectifier stay [3]
– two socket bolts (right side) [4]
– passenger footpeg bracket (right side) [5]
– two socket bolts (left side) (CM model) [6]
– passenger footpeg bracket (left side) (CM model) [7]
– four bolts [8]
– rear fender [9]

Install the front fender in the reverse order of removal.

TORQUE:
Seat rail mounting bolt:
54 N·m (5.5 kgf·m, 40 lbf·ft)
passenger footpeg bracket socket bolt:
33 N·m (3.4 kgf·m, 24 lbf·ft)

CM model shown:



DRIVE SPROCKET COVER

REMOVAL/INSTALLATION

Remove the following:

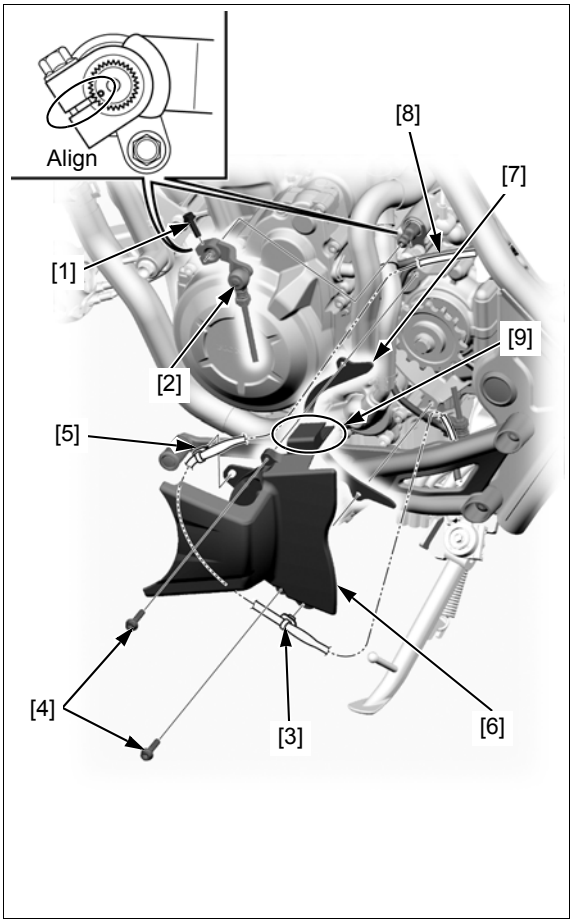
– pinch bolt [1]
– gearshift arm [2]
– band clip (lower side) [3]
– two bolts [4]
– band clip (front side) [5]
– drive sprocket cover [6]
– drive chain guide [7]

Installation is in the reverse order of removal.

NOTE:

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

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

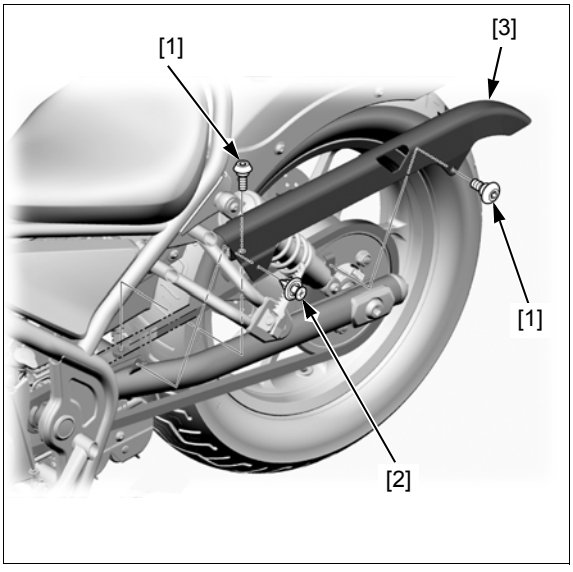


DRIVE CHAIN COVER

REMOVAL/INSTALLATION

Remove the bolts [1], trim clip [2] and drive chain cover [3].

Install the drive chain cover in the reverse order of removal.

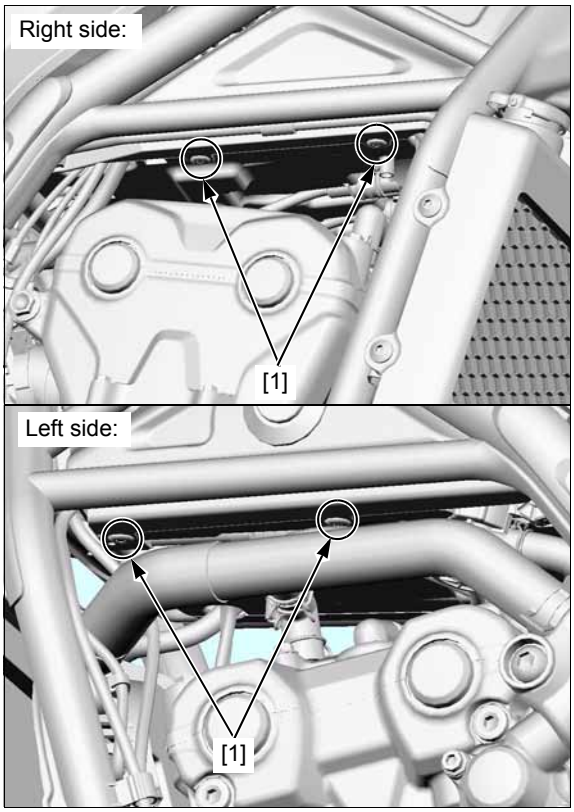


FUEL TANK UNDER TRAY

REMOVAL/INSTALLATION

Remove the following:

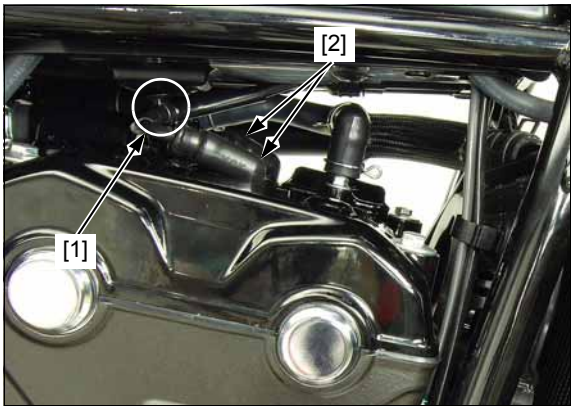
– fuel tank (page 7-9)
– ignition switch stay (page 21-14)
– ECM (page 4-31)
– four trim clips [1]



No.2 spark plug wire only.

Remove the trim clips [1].

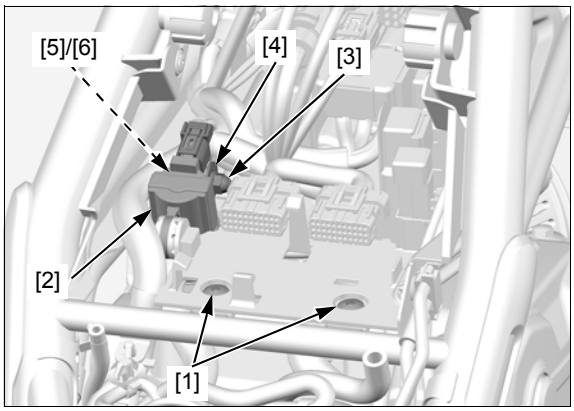
Disconnect the spark plug caps [2].



Remove the two bolts [1].

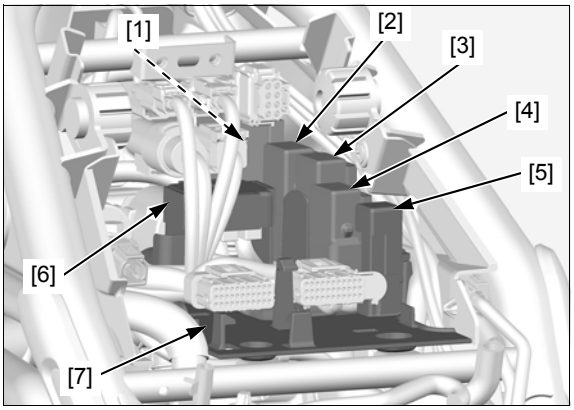
Remove the following and release the PAIR control solenoid valve [2] from the stay.

– nut [3]
– collar [4]
– washer [5]
– socket bolts [6]



Remove the following:

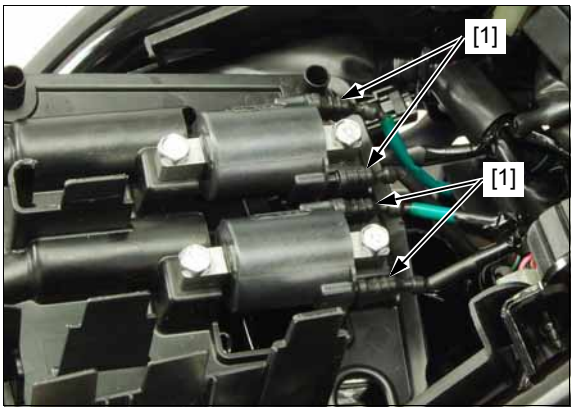
– turn signal/hazard relay [1]
– fan control relay [2]
– main relay [3]
– fuel pump relay [4]
– turn signal/hazard diode [5]
– wire junction [6]
– fuel tank under tray [7]



Disconnect the ignition coil connectors [1].

Installation is in the reverse order of removal.

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

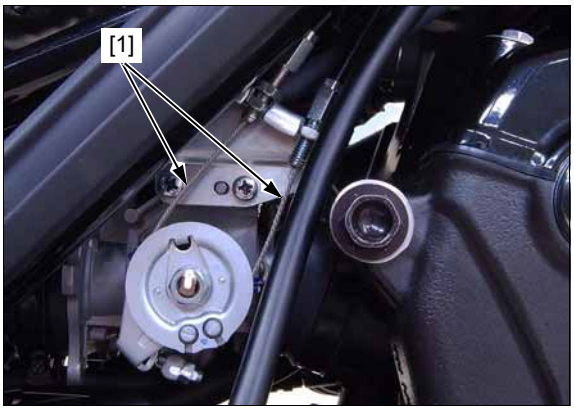


FUEL TANK UNDER COVER

REMOVAL/INSTALLATION

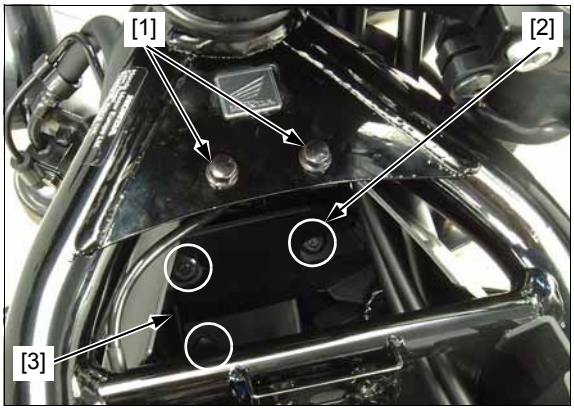
Remove the fuel tank under tray (page 2-8).

Disconnect the throttle cables [1] (remove from the cable holder and disconnect from the throttle drum).



Disconnect the clutch cable [1] (remove from the cable holder and disconnect from the clutch lifter arm).

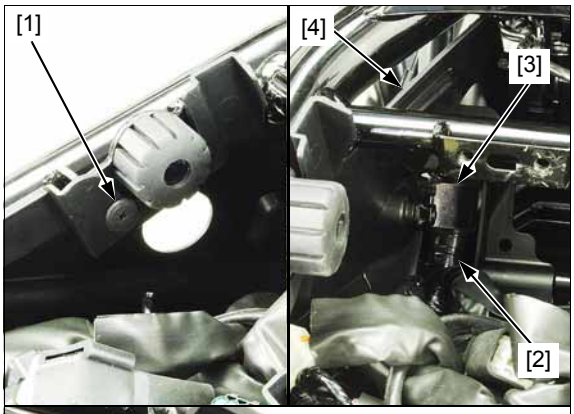
Remove the bolts [1], trim clips [2] and center cover [3].



Remove the trim clip [1].

Release the main wire harness [2] from wire stay [3].

Remove the left fuel tank under cover [4].

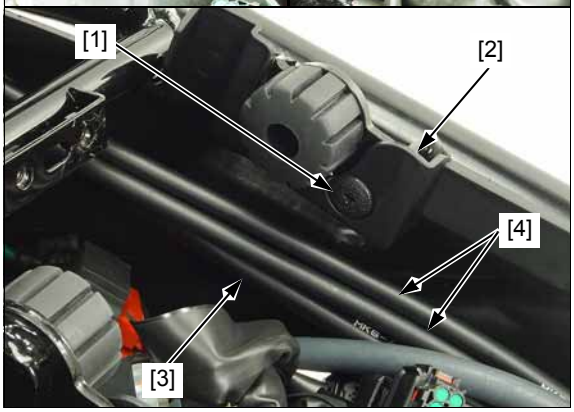


Remove the trim clip [1].

Remove the right fuel tank under cover [2].

Release the clutch cable [3] and throttle cables [4] off of the cable guide.

Installation is in the reverse order of removal.



TORQUE:

Throttle cable adjuster lock nut (throttle body side):
3.0 N·m (0.3 kgf·m, 2.2 lbf·ft)

Adjust the following:

– throttle grip freeplay (page 3-4)
– clutch lever freeplay (page 3-21)

BATTERY CASE

REMOVAL/INSTALLATION

Remove the following:

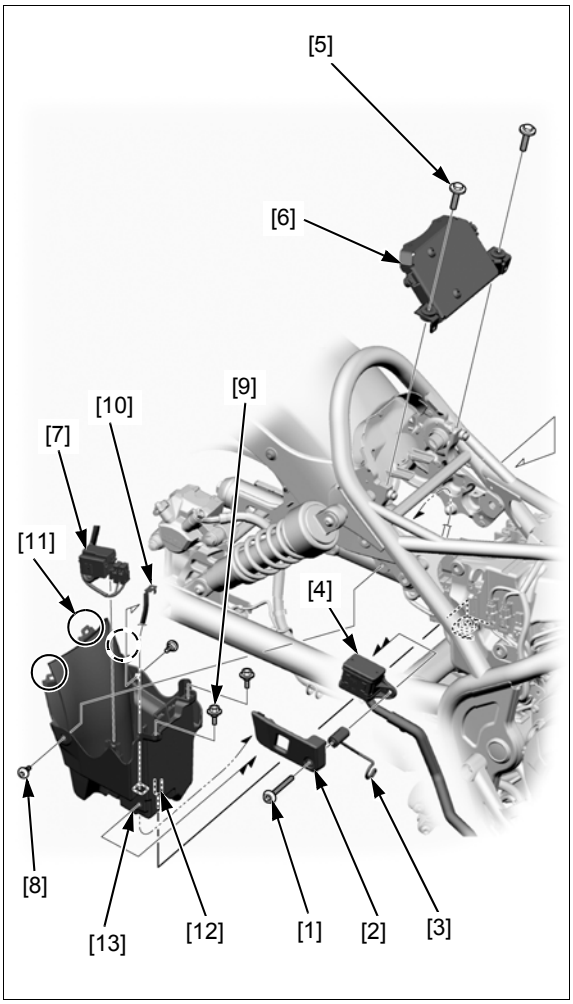
– rear wheel (page 17-5)
– battery (page 20-5)
– reservoir mounting bolt [1]
– reservoir cover [2]
– brake hose stay [3]
– reservoir [4]
– two bolt/washers [5]
– regulator/rectifier stay [6]
– fuse box [7]
– two bolts [8]
– two special bolts [9]

Release the negative (–) cable [10] off of the cable guide.

Release the grooves [11] and boss [12].

Remove the battery case [13].

Installation is in the reverse order of removal.



SIDESTAND

REMOVAL/INSTALLATION

Remove the sidestand switch from the sidestand pivot (page 21-17).

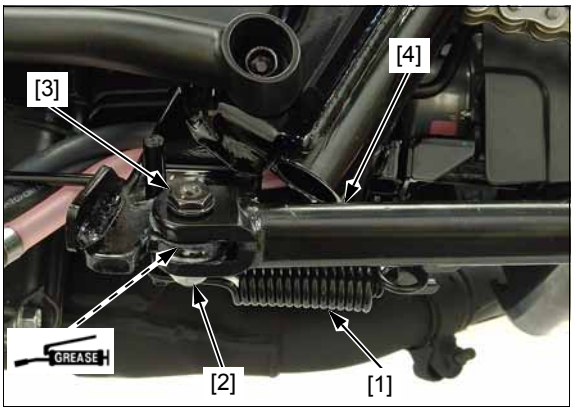
Retract the sidestand and remove the following:

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

Installation is in the reverse order of removal.

NOTE:

- Apply grease to the pivot area.
- After tightening the pivot bolt to the specified torque, turn it 45 – 90 ° counterclockwise.
- When tightening the pivot nut, hold the pivot bolt securely.
- The spring is installed in the direction as shown.



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

MUFFLER

REMOVAL/INSTALLATION

Loosen the muffler band bolt [1].

Remove the following:

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

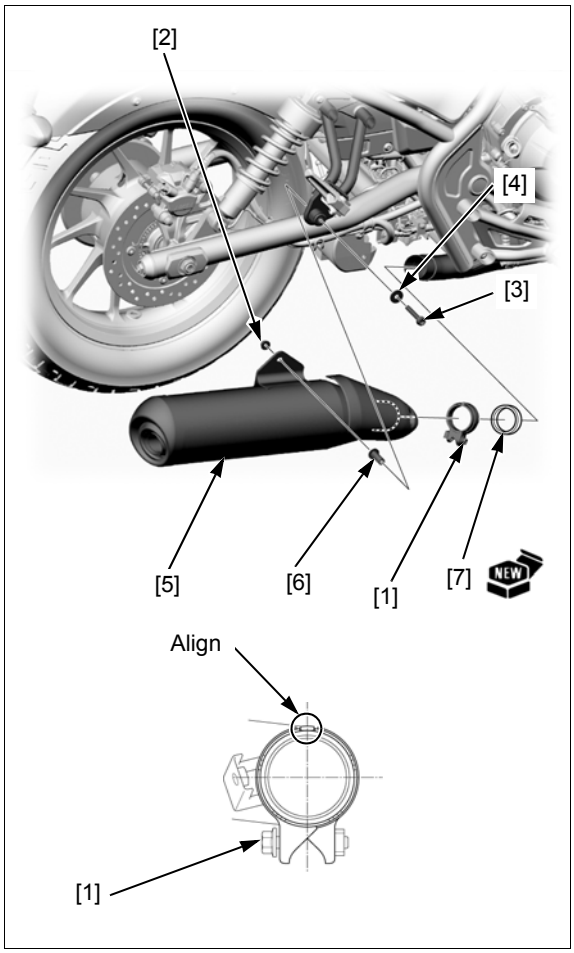
Be sure that the muffler band tab is aligned with the muffler groove in position.

Install a new gasket and the collar.

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

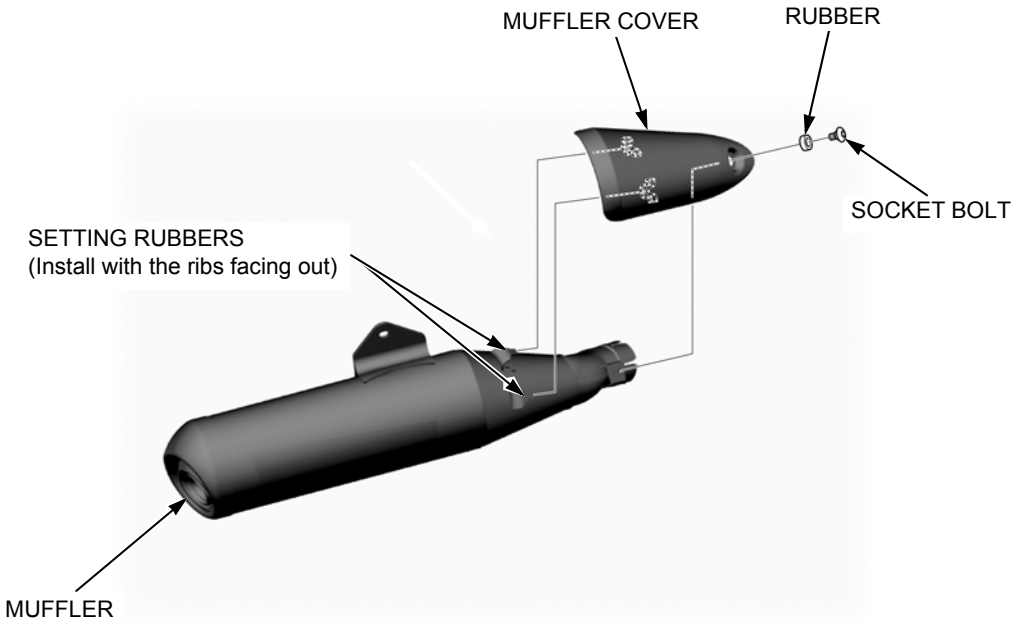
Tighten the muffler band bolt first, then tighten the mounting nut to the specified torque.

TORQUE:
Muffler band bolt: 22.5 N·m (2.3 kgf·m, 17 lbf·ft)



DISASSEMBLY/ASSEMBLY

Disassemble and assemble the muffler components as shown in the following illustration.



EXHAUST PIPE

REMOVAL/INSTALLATION

Disconnect the O_2 sensor 4P (Black) connector and remove the O_2 sensor wire out of the frame (page 4-35).

Remove the following:

- muffler (page 2-12)
- four joint nuts [1]
- mounting bolt [2]
- exhaust pipe [3]
- collar [4]
- mounting rubbers [5]
- gaskets [6]

Be sure to verify the length from the stud bolt head to the cylinder head surface (page 2-14).

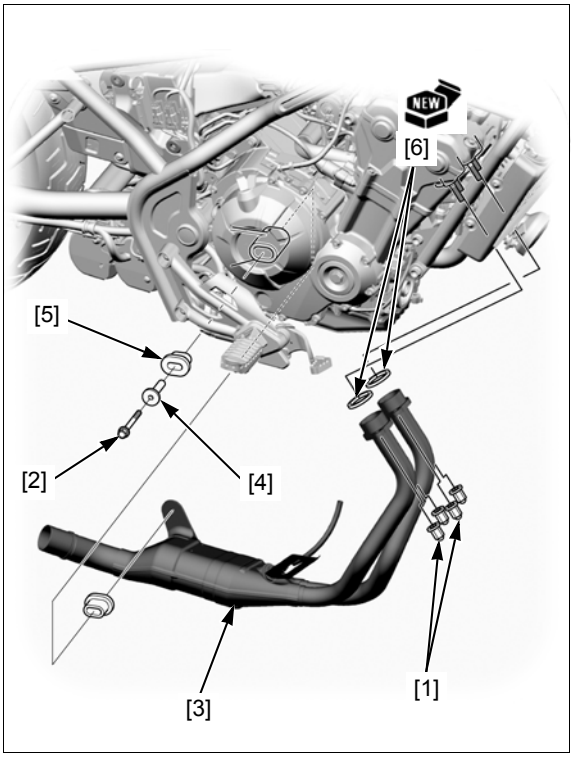
Install new gaskets and the collar.

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

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

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

Install the removed parts in the reverse order of removal.



STUD BOLT REPLACEMENT

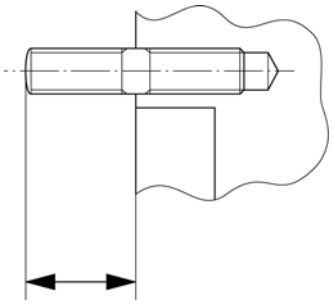
Remove the exhaust pipe (page 2-13).

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

Install new stud bolts into the cylinder head as shown.

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

Install the exhaust pipe (page 2-13).



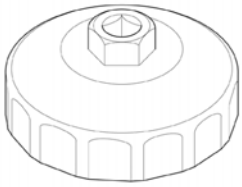
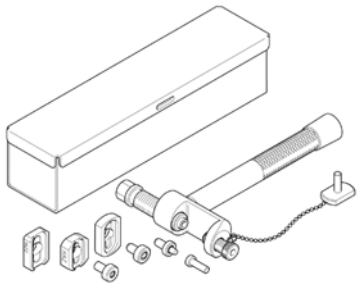
19.5 – 20.5 mm
(0.77 – 0.81 in)

SERVICE INFORMATION

GENERAL

- Place the motorcycle on level surface before starting any work.
- Gasoline is extremely flammable and is explosive under certain conditions.
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where the gasoline is stored can cause a fire or explosion.
- The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

TOOLS

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

MAINTENANCE SCHEDULE

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

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

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

		FREQUENCY / ITEMS	NOTE	ODOMETER READING (NOTE 1)								REGULAR REPLACE	REFER TO PAGE
				x 1,000 mi	0.6	4	8	12	16	20	24		
				x 1,000 km	1.0	6.4	12.8	19.2	25.6	32.0	38.4		
EMISSION RELATED ITEMS	*	FUEL LINE					I		I		I		3-4
	*	THROTTLE OPERATION					I		I		I		3-4
		AIR CLEANER	NOTE 2					R			R		3-5
		CRANKCASE BREATHER	NOTE 3			C	C	C	C	C	C		3-6
	**	SPARK PLUG							R				3-6
	**	VALVE CLEARANCE							I				3-7
		ENGINE OIL			R		R		R		R	1 year	3-10
		ENGINE OIL FILTER			R				R				3-11
	*	ENGINE IDLE SPEED					I		I		I		3-12
		RADIATOR COOLANT	NOTE 5				I		I		I	3 years	3-12
	*	COOLING SYSTEM					I		I		I		3-13
	*	SECONDARY AIR SUPPLY SYSTEM							I				3-13
	*	EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE 4						I				3-13
NON-EMISSION RELATED ITEMS		DRIVE CHAIN					Every 600 mi (1,000 km) I, L						3-14
		BRAKE FLUID	NOTE 5			I	I	I	I	I	I	2 years	3-17
		BRAKE PAD WEAR				I	I	I	I	I	I		3-18
		BRAKE SYSTEM					I		I		I		3-19
		BRAKE LIGHT SWITCH					I		I		I		3-20
		HEADLIGHT AIM					I		I		I		3-20
		CLUTCH SYSTEM				I	I	I	I	I	I		3-20
		SIDESTAND					I		I		I		3-21
	*	SUSPENSION					I		I		I		3-22
	*	NUTS, BOLTS, FASTENERS					I		I		I		3-22
	**	WHEELS/TIRES					I		I		I		3-23
	**	STEERING HEAD BEARINGS					I		I		I		3-23

* 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. 50-State (meets California)
5. Replacement requires mechanical skill.

FUEL LINE

FUEL TANK LIFTING/LOWERING

Remove the single seat (page 2-4).

Remove the fuel tank mounting bolt [1] and washer [2].

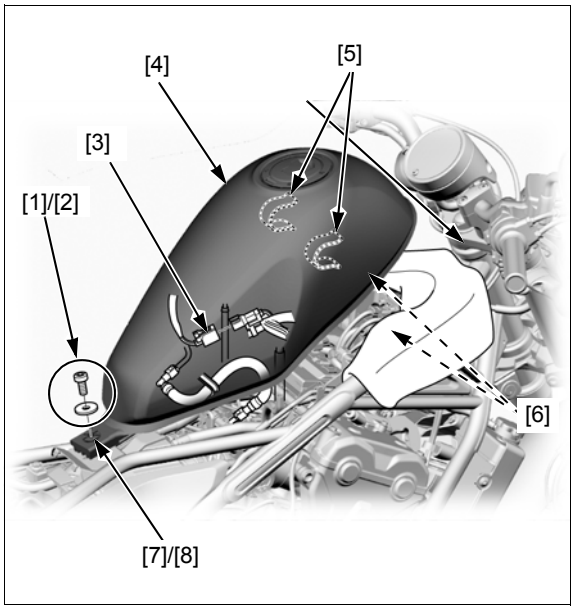
Disconnect the fuel pump 3P (Black) connector [3].

Lift the fuel tank [4] by releasing its grooves [5] from the mounting rubbers [6].

Put the grooves onto the mounting rubbers and install the fuel tank grommet [7] into the frame boss [8].
Temporarily install the bolt and washer.

Support the fuel tank using a suitable support.

Install the removed parts in the reverse order of removal.



INSPECTION

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

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

Also, check the hose fittings for damage or looseness.

Replace the fuel feed hose if necessary.

THROTTLE OPERATION

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

If the throttle grip does not return properly, lubricate and overhaul the throttle grip housing (page 16-7).

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

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

Measure the throttle grip freeplay at the throttle grip flange.

FREEPLAY: 2 – 6 mm (1/16 – 1/4 in)

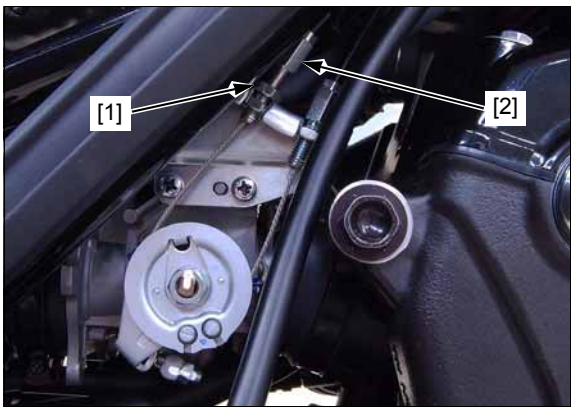
Throttle grip freeplay can be adjusted at either end of the throttle cable.

Major adjustment is made with the lower adjuster nut at the throttle body.

Loosen the lock nut [1] and turn the adjuster [2].
Tighten the lock nut to the specified torque while holding the adjuster.

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

Recheck the throttle operation.



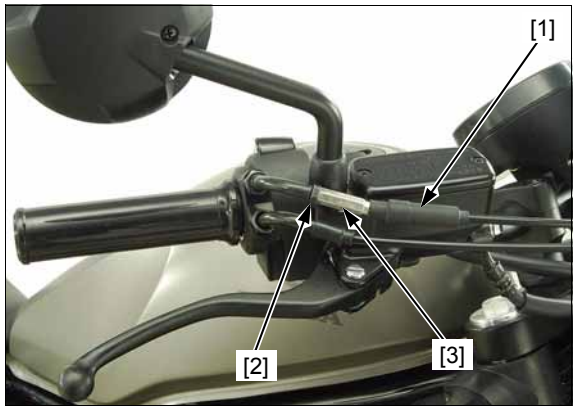
Minor adjustment is made with the upper adjuster at throttle housing adjuster.

Slide the dust cover [1] from the adjuster.
Loosen the lock nut [2] and turning the adjuster [3].

Tighten the lock nut to the specified torque while holding the adjuster and reposition the dust cover properly on the adjuster.

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

Recheck the throttle operation.



AIR CLEANER

REMOVAL/INSTALLATION

NOTE:

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

Remove the left side cover (page 2-4).

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

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

Remove the following:

– wire harness band clip [2]
– starter relay switch [3]
– three tapping screws [4]
– air cleaner cover [5]
– air cleaner element [6]

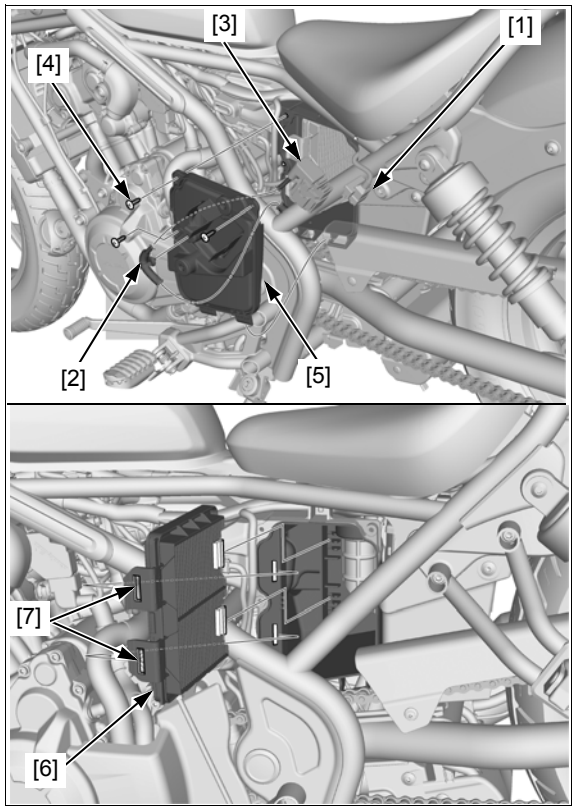
Replace the air cleaner element in accordance with the maintenance schedule (page 3-3) or any time it is excessively dirty or damaged.

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

Installation is in the reverse order of removal.

NOTE:

- Secure the air cleaner element by hooking its slots [7] with the tabs on the air cleaner housing.



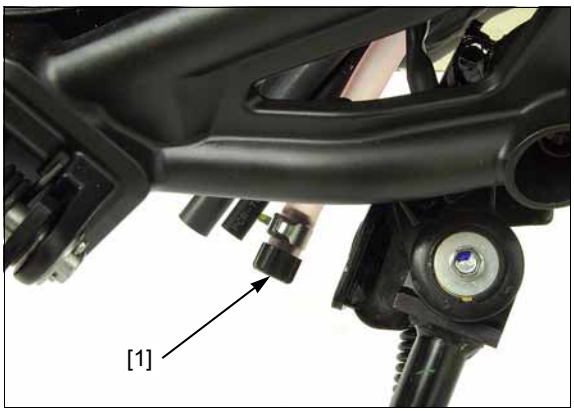
TORQUE:
Air cleaner cover screw:
1.1 N·m (0.1 kgf·m, 0.8 lbf·ft)

CRANKCASE BREATHER

NOTE:

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

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



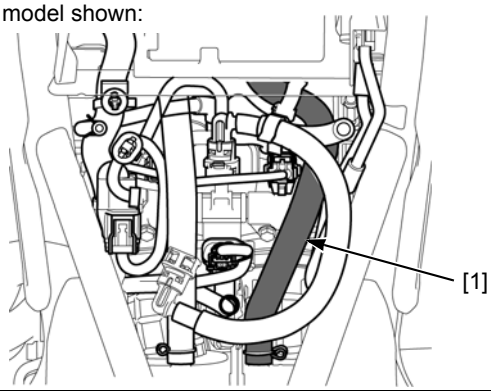
Lift the fuel tank and support it (page 3-4).

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

Replace the breather hose if necessary.

Install the fuel tank (page 3-4).

AC model shown:



SPARK PLUG

REMOVAL/INSTALLATION

No.2 spark plug wire only.

Remove the wire band clip [1].

Disconnect the spark plug cap [2].

Remove the spark plug [3].

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

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

SPECIFIED SPARK PLUG: CPR8EA-9 (NGK)

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

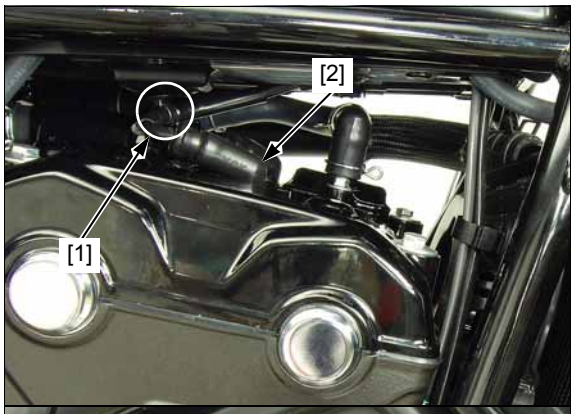
Check the gap between the center and side electrodes with a wire-type feeler gauge.

SPARK PLUG GAP: 0.8 – 0.9 mm (0.031 – 0.035 in)

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

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

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)



VALVE CLEARANCE

INSPECTION

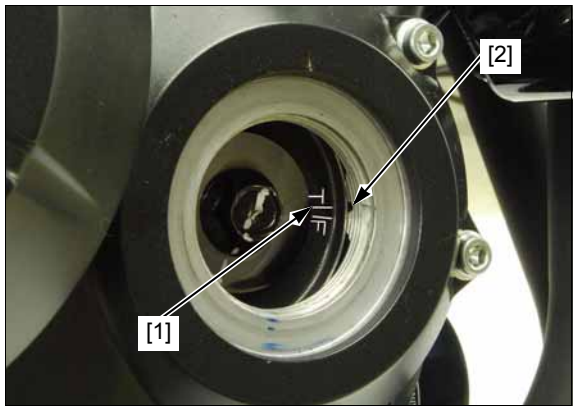
NOTE:

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

Remove the following:

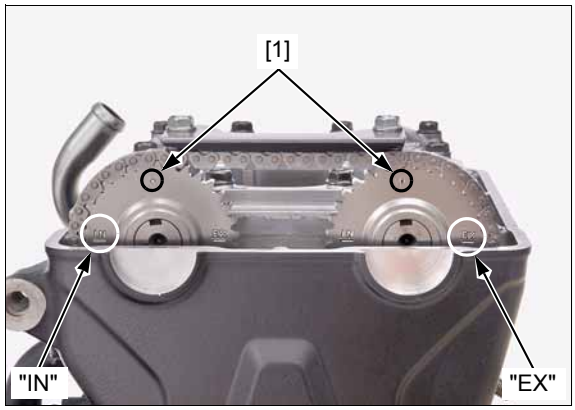
– cylinder head cover (page 10-6)
– crankshaft hole cap and O-ring

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



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

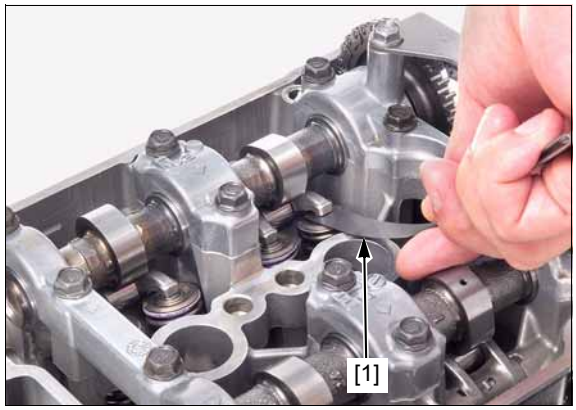
If the marks are not in this position, turn the crankshaft clockwise one full turn (360°) and realign the "T" mark with the index notch.



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

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

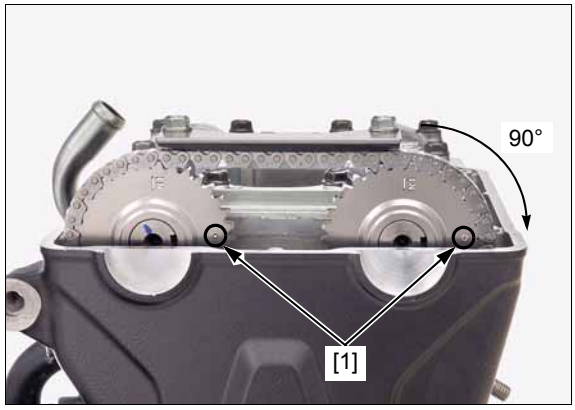
VALVE CLEARANCE:
EX: 0.27 ± 0.03 mm (0.011 ± 0.001 in)



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

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

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



ADJUSTMENT

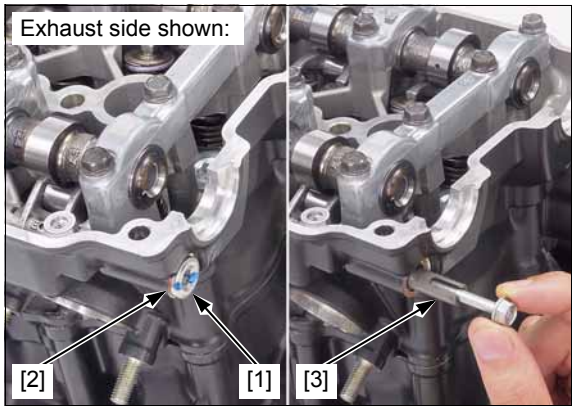
NOTE:

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

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

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

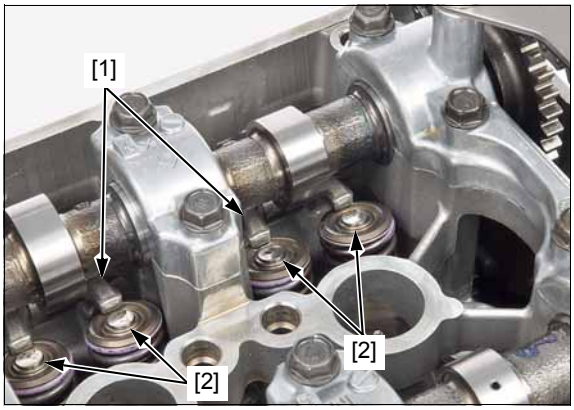
Remove the rocker arm shaft [3] using a 6 mm bolt while holding the rocker arms.



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

NOTE:

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



Measure the shim [1] thickness and record it.

NOTE:

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

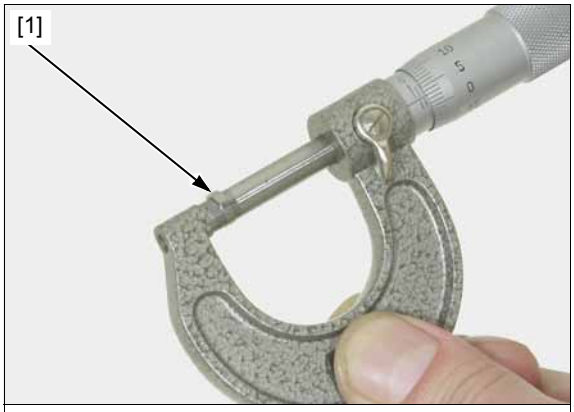
Calculate the new shim thickness using the equation below.

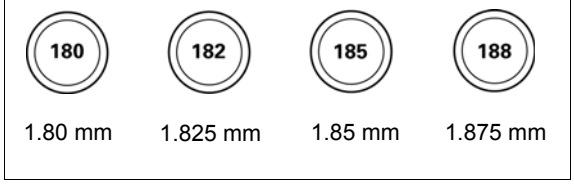
A = (B – C) + D

A: New shim thickness
B: Recorded valve clearance
C: Specified valve clearance
D: Old shim thickness

NOTE:

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





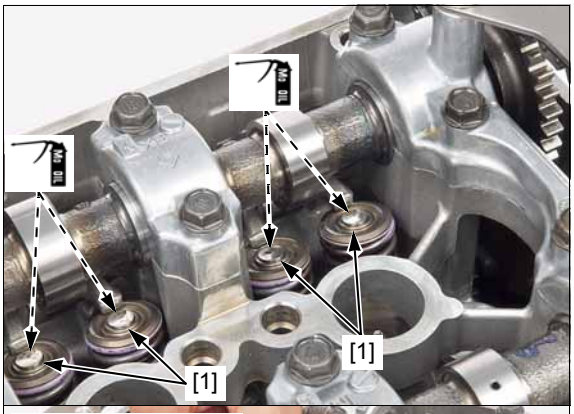
Apply molybdenum oil solution to the stem ends.

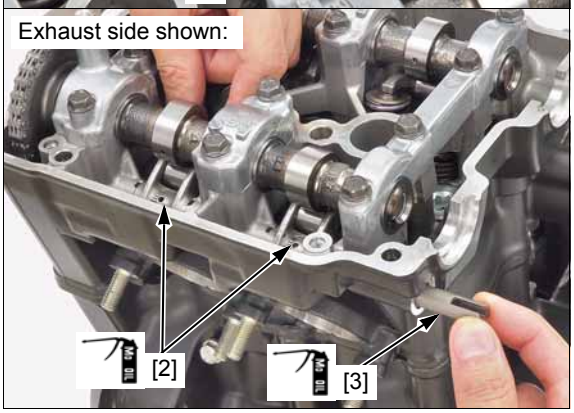
Install the newly selected shims [1] into the valve spring retainers.

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

Set the rocker arms [2] into place.

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





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

Tighten the stopper bolt to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

Rotate the camshafts by rotating the crankshaft clockwise several times.

Recheck the valve clearance.

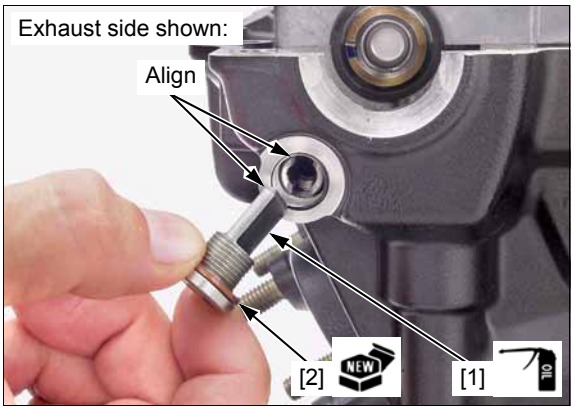
Coat a new O-ring with engine oil and install it into the groove in the crankshaft hole cap.

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

Tighten the crankshaft hole cap to the specified torque.

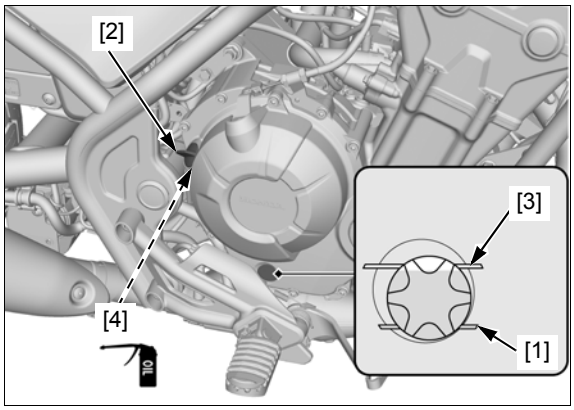
TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

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



ENGINE OIL

OIL LEVEL CHECK



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

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

Check the oil level through the inspection window.

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

RECOMMENDED ENGINE OIL:

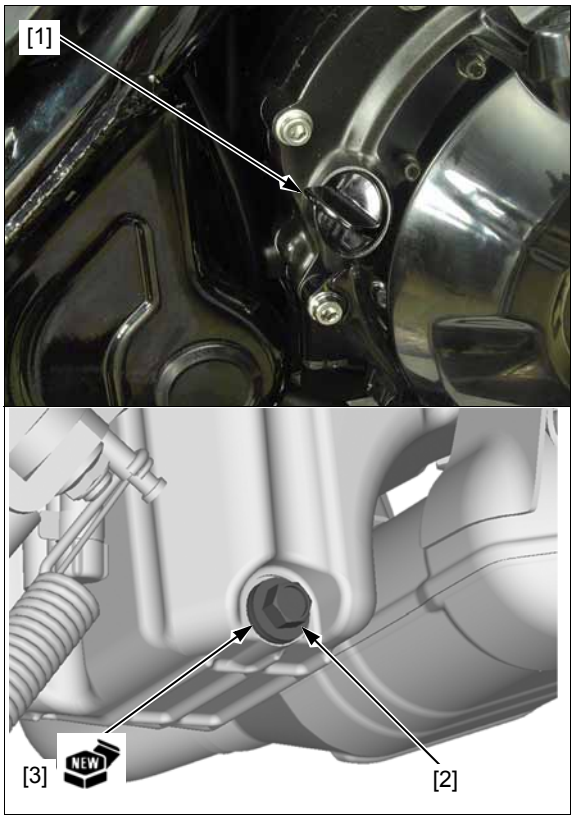
Pro Honda GN4 4-stroke oil (U.S.A. & Canada) or equivalent motorcycle oil
API service classification: SG or higher (except oils labeled as energy conserving on the circular API service label)
JASO T903 standard: MA
Viscosity: SAE 10W-30

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

Apply engine oil to the O-ring.

Install the filler cap.

OIL CHANGE



Warm up the engine.

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

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

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

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

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

ENGINE OIL CAPACITY:

2.5 liters (2.6 US qt, 2.2 Imp qt) at draining
2.7 liters (2.9 US qt, 2.4 Imp qt) at oil filter change
3.2 liters (3.4 US qt, 2.8 Imp qt) at disassembly

Check the oil level (page 3-10).

Make sure there are no oil leaks.

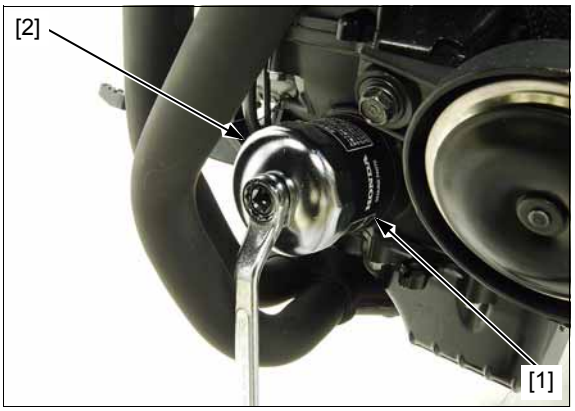
ENGINE OIL FILTER

Drain the engine oil (page 3-10).

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

TOOL:

[2] Oil filter wrench	**07HAA-PJ70101 or 07AMA-MFJA100 (U.S.A. only)**



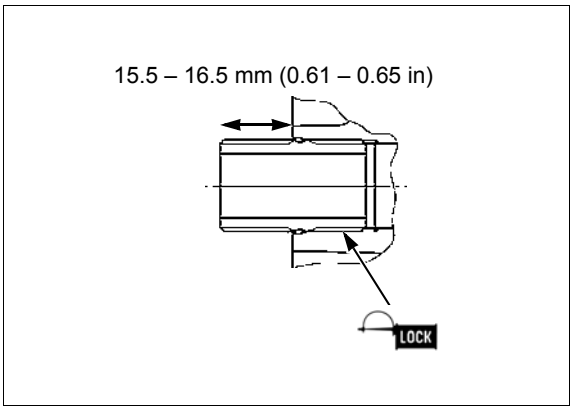
Check that the oil filter boss protrusion from the crankcase is specified length as shown.

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

NOTE:

- If the oil filter boss is removed, apply locking agent to the oil filter boss threads and install it (page 1-18).

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



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

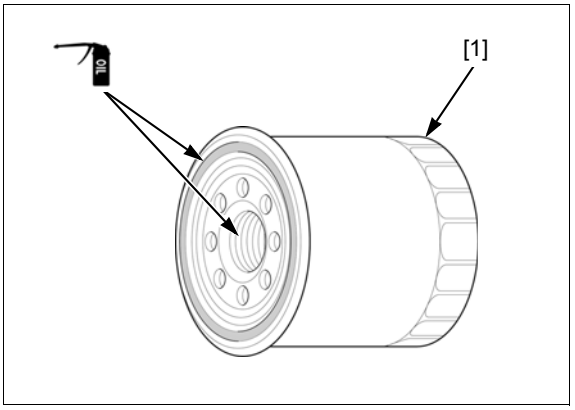
Install the oil filter cartridge and tighten it to the specified torque.

TOOL:

[1] Oil filter wrench	**07HAA-PJ70101 or 07AMA-MFJA100 (U.S.A. only)**

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)

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



ENGINE IDLE SPEED

NOTE:

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

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

Check the idle speed.

IDLE SPEED: 1,200 ± 100 rpm

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

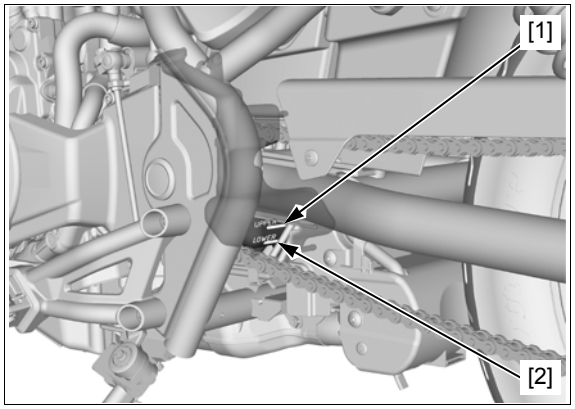
– intake air leak or engine top-end problem (page 10-4)
– IACV operation (page 7-17)

RADIATOR COOLANT

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

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

If the level is low, fill as follows.



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

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

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

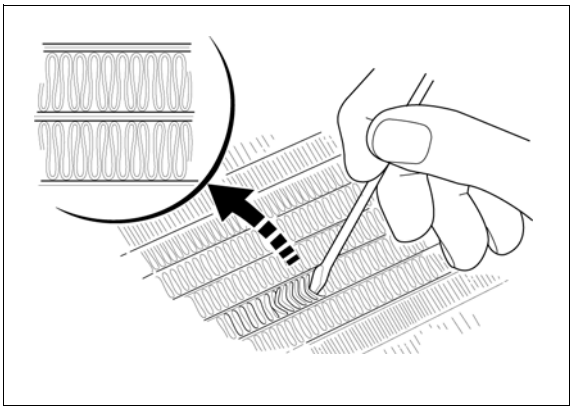
If the reserve tank becomes completely empty, there is a possibility of air getting into the cooling system.
Be sure to remove any air from the cooling system (page 8-5).

Install the reserve tank cap.

COOLING SYSTEM

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

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



SECONDARY AIR SUPPLY SYSTEM

Remove the fuel tank under tray (page 2-8).

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

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

If the air supply hose show any signs of heat damage, inspect the PAIR check valves (page 7-20).

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

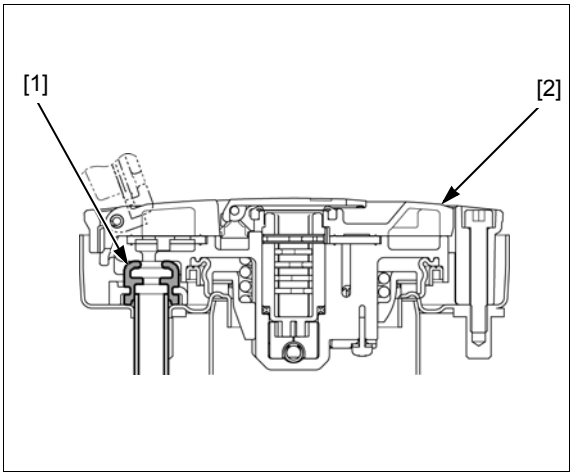
EVAPORATIVE EMISSION CONTROL SYSTEM (AC model)

Open the fuel filler cap.

Check the breather seal [1] in the fuel filler cap [2] 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.



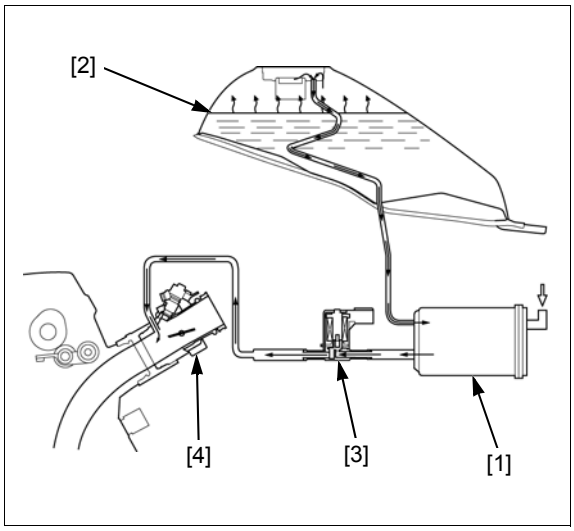
Remove the fuel tank under tray (page 2-8).

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

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

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

Refer to the Cable & Harness Routing for hose connections and routing (page 1-23).



DRIVE CHAIN

DRIVE CHAIN SLACK INSPECTION

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

Turn the ignition switch OFF.

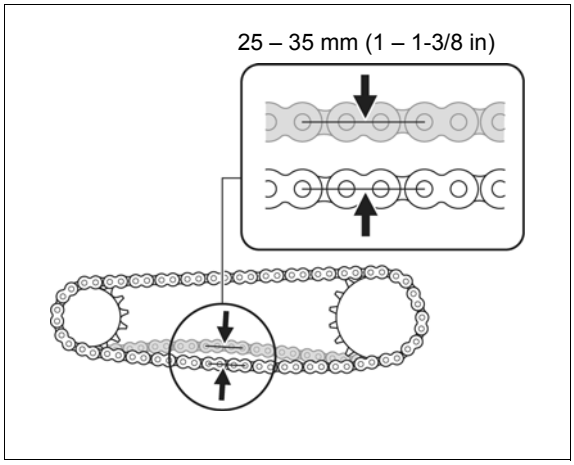
Place the motorcycle on its sidestand and shift the transmission into neutral.

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

DRIVE CHAIN SLACK: 25 – 35 mm (1 – 1-3/8 in)

NOTICE

Excessive chain slack, 50 mm (1-15/16 in) or more, may damage the frame.



ADJUSTMENT

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

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

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

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

TORQUE: 21 N·m (2.1 kgf·m, 15 lbf·ft)

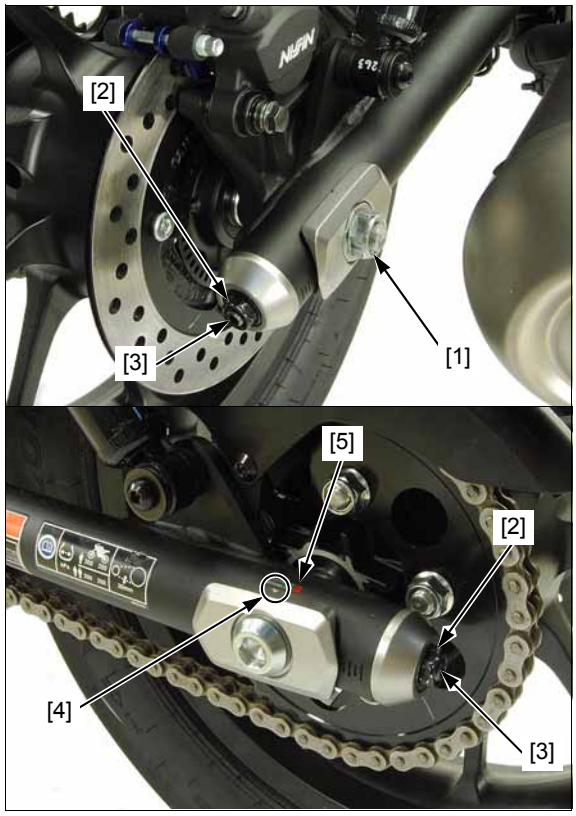
Tighten the axle nut to the specified torque.

TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)

Recheck the drive chain slack and free wheel rotation.

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

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



CLEANING AND LUBRICATION

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

NOTICE

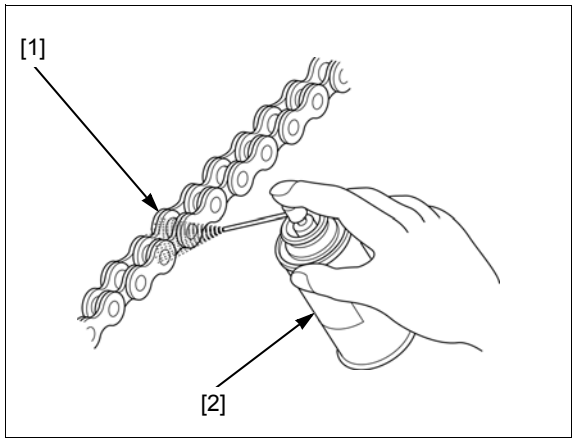
Do not use a steam cleaner, high pressure cleaner, wire brush, volatile solvent such as gasoline and benzene, abrasive cleaner or a chain cleaner NOT designed specifically for O-ring chains to clean the drive chain.

Inspect the drive chain for possible damage or wear.

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

Be sure the drive chain has dried completely before lubricating.

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



NOTICE

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

Wipe off the excess oil or drive chain lubricant.

SPROCKET INSPECTION

Remove the drive sprocket cover (page 2-7).

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

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

Check the attaching bolt [1] and self-lock nuts [2] on the drive and driven sprockets.

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

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

Install the drive sprocket cover (page 2-7).

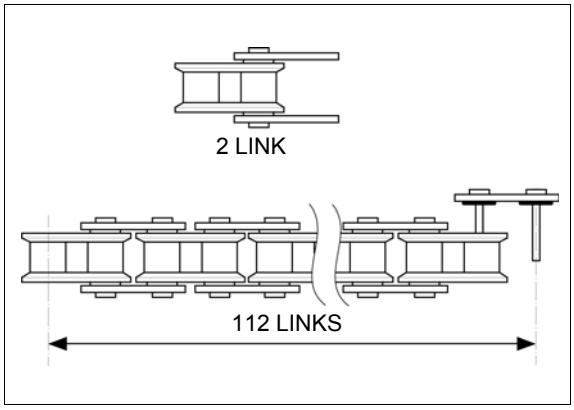
REPLACEMENT

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

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

Remove the drive chain using the special tool.

TOOL:
Drive chain tool set **07HMH-MR10103 or 07HMH-MR1010C (U.S.A. only)**



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

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

SPECIFIED LINKS: 112 LINKS

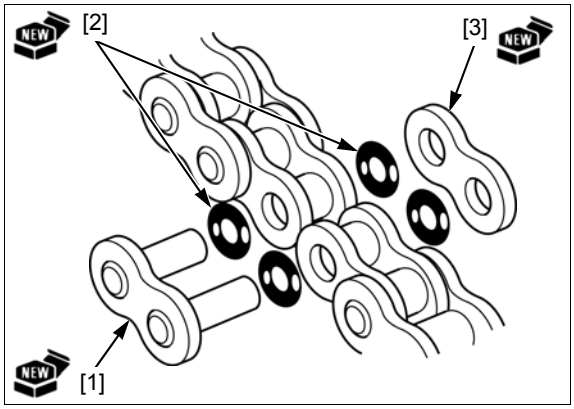
REPLACEMENT CHAIN:
RK520KLO2 (RK)
DID520VF (DID)

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

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

Assemble the master link, O-rings and plate.

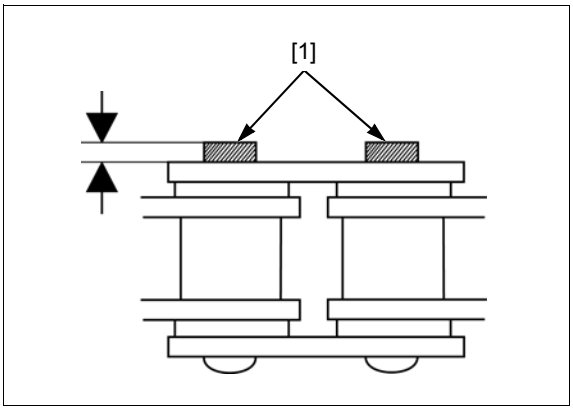
TOOL:
Drive chain tool set **07HMH-MR10103 or 07HMH-MR1010C (U.S.A. only)**



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

STANDARD LENGTH: Approx. 1.3 mm (0.05 in)

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

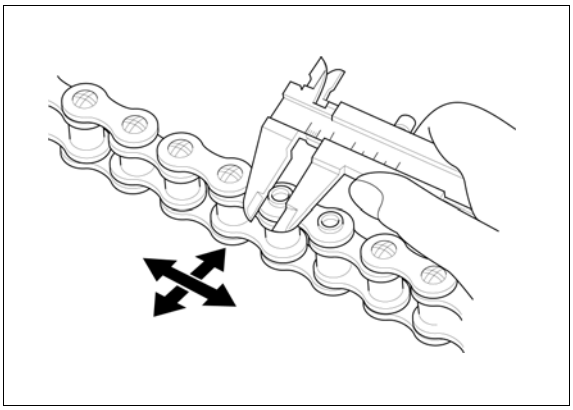


Make sure the pins are staked properly by measuring the diameter of the staked area.

DIAMETER OF STAKED AREA:
5.40 – 5.60 mm (0.213 – 0.220 in)

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

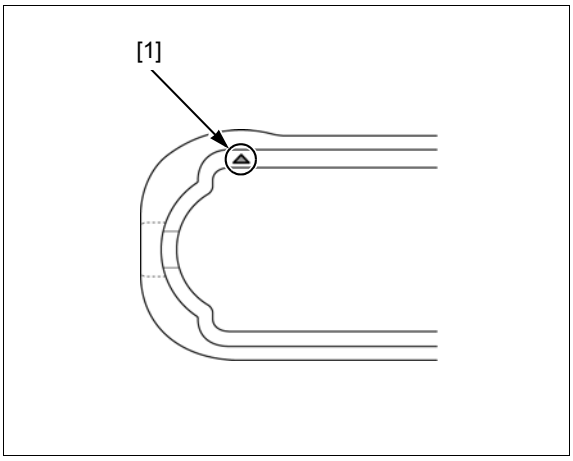
If there is any cracking, replace the master link, O-rings and plate.



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 indicators [1] (page 17-8).



BRAKE FLUID

NOTICE

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

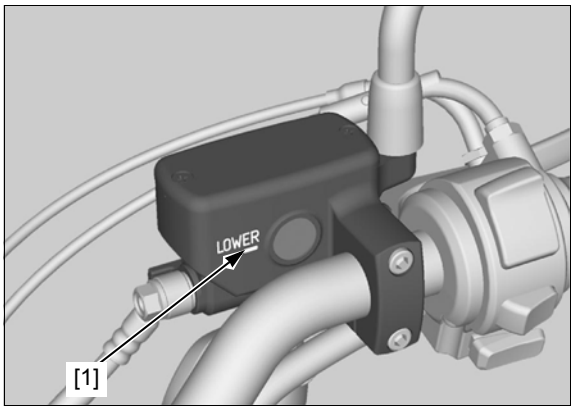
NOTE:

- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.
- When the fluid level is low, check the brake pads for wear (page 3-19).
- A low fluid level may be due to wear of the brake pads. If the brake pads are worn and caliper pistons are pushed out, this accounts for a low fluid level. If the brake pads are not worn and fluid level is low, check the entire system for leaks (page 3-20).

FRONT BRAKE

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

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



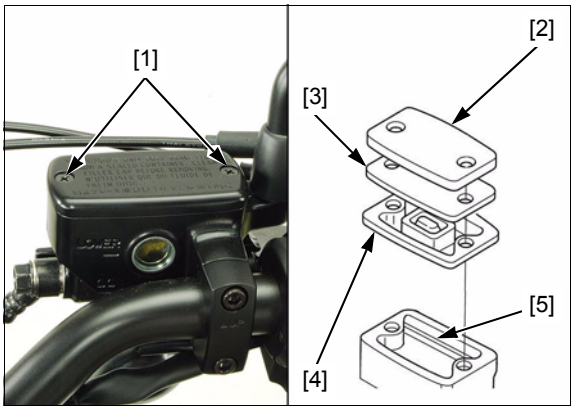
Remove the following:

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

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

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

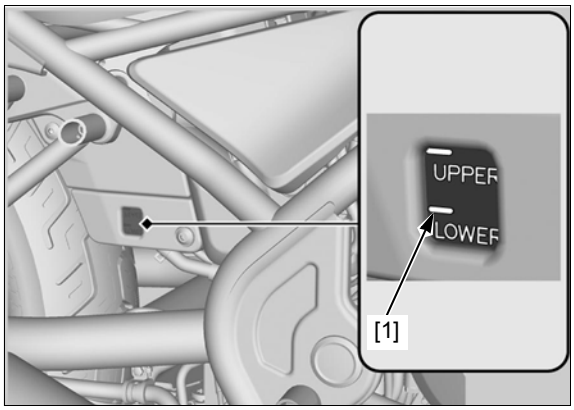
TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)



REAR BRAKE

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

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



Take care not to spill the fluid out of the reservoir.

Remove the following:

– reservoir mounting bolt [1]
– reservoir cover [2]
– brake hose stay [3]
– two screws [4]
– reservoir cap [5]
– set plate [6]
– diaphragm [7]

Temporarily install the reservoir onto the battery case with the mounting bolt secure it so the reservoir is level.

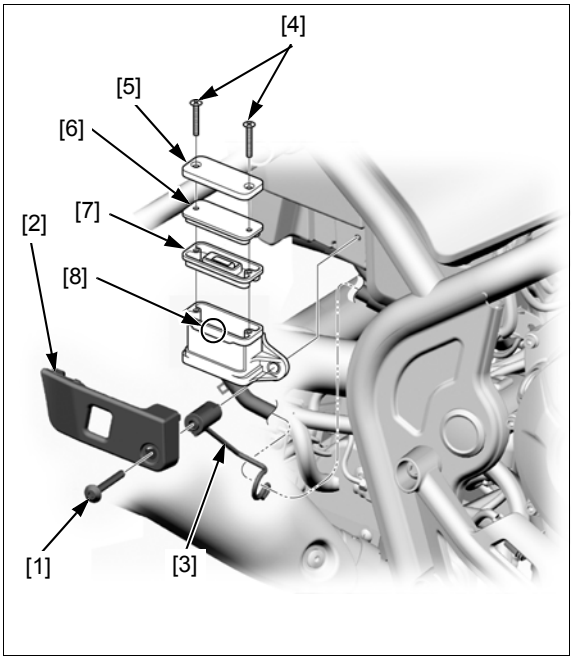
Fill the reservoir with DOT 4 brake fluid from a sealed container to the upper level line [8].

Carefully remove the reservoir from the battery case by removing the mounting bolt.

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

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

Install the reservoir and tighten the mounting bolt.



BRAKE PADS WEAR

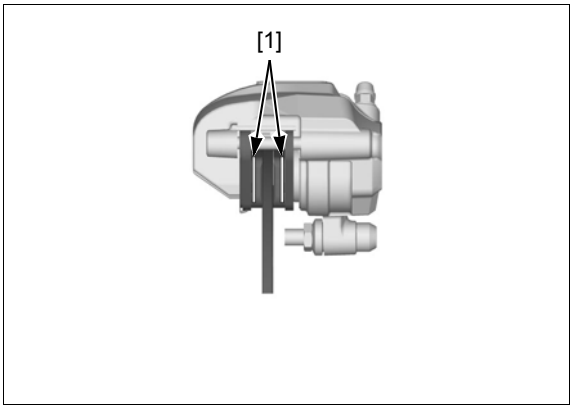
FRONT BRAKE PADS

Check the brake pads for wear.

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

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

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



REAR BRAKE PADS

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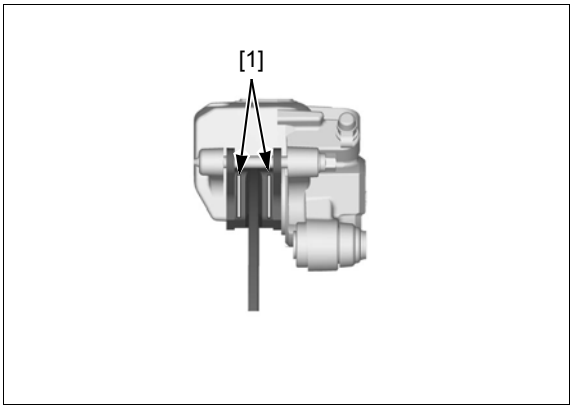
For brake pad removal/installation (page 18-7).



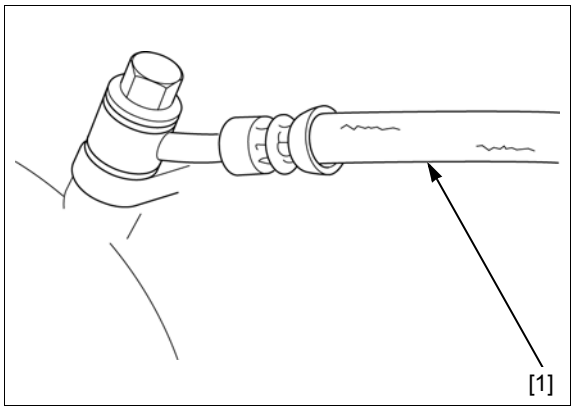
BRAKE SYSTEM

INSPECTION

Firmly apply the brake lever or pedal, and check that no air has entered the system.
If the lever or pedal feels soft or spongy when operated, bleed the air from the system.

For brake air bleeding:(page 18-6)

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 LIGHT SWITCH

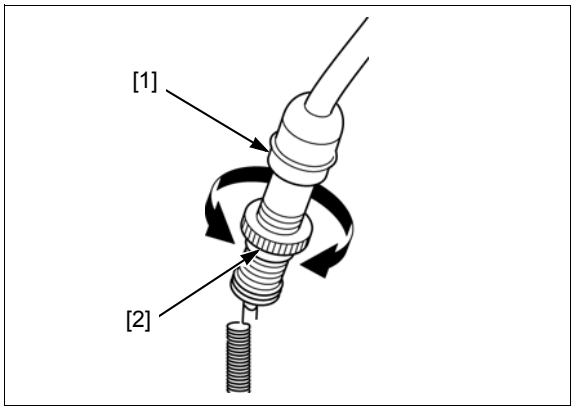
NOTE:

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

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

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

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



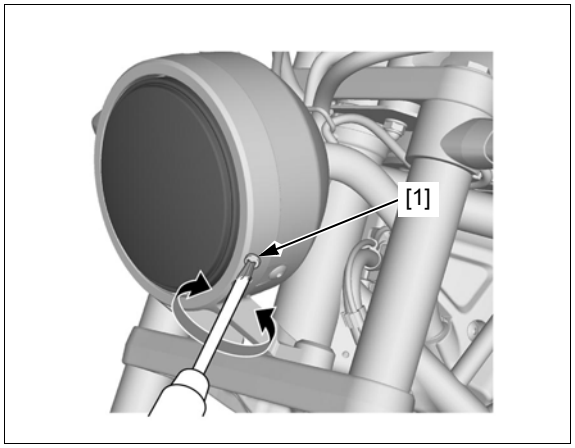
HEADLIGHT AIM

NOTE:

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

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

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

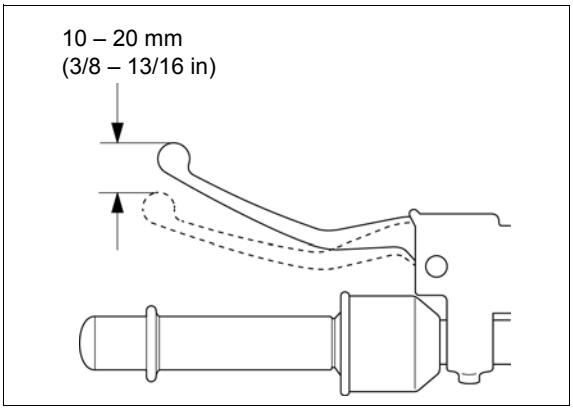


CLUTCH SYSTEM

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

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

FREEPLAY: 10 – 20 mm (3/8 – 13/16 in)

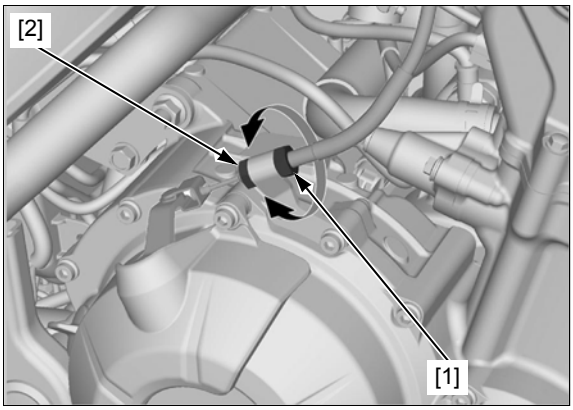


Major adjustment is made with the lower adjusting nut [1] at the clutch lifter arm.

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

Tighten the lock nut while holding the adjusting nut.

If the proper freeplay cannot be obtained, or the clutch slips during test-ride, disassemble and inspect the clutch (page 11-7).



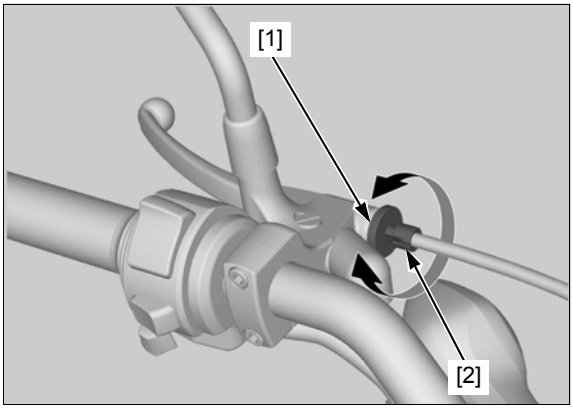
Minor adjustment is made with the upper adjuster at the clutch lever.

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

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

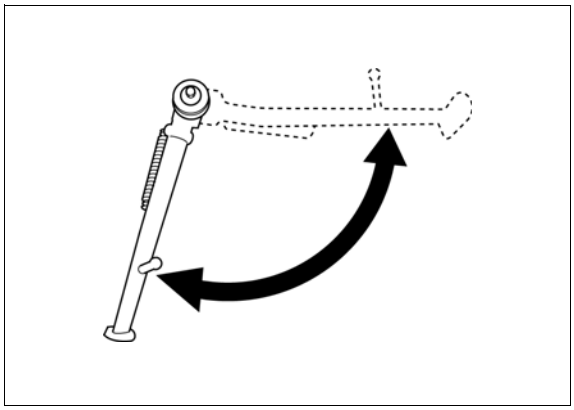
Tighten the lock nut while holding the adjuster.

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



SIDESTAND

INSPECTION



Support the motorcycle using a safety stand or hoist.

Check the sidestand spring for damage or loss of tension.

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

For sidestand removal/installation (page 2-11).

Check the sidestand ignition cut-off system:

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

If there is a problem with the system, check the sidestand switch (page 21-17).

SUSPENSION

FRONT SUSPENSION INSPECTION

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

Replace damaged components which cannot be repaired.

Tighten all fasteners.

For fork service (page 16-14).

REAR SUSPENSION INSPECTION

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

Replace damaged components which cannot be repaired.

Tighten all fasteners.

For shock absorber service (page 17-8).

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

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

Replace the bearings if any looseness to noted.

For swingarm service (page 17-8).

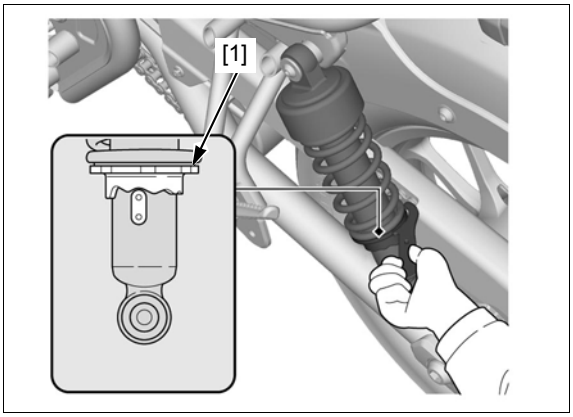
REAR SUSPENSION ADJUSTMENT

SPRING PRE-LOAD ADJUSTER

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

STANDARD POSITION:
2nd position from minimum

ADJUSTABLE RANGE: 5 positions



NUTS, BOLTS, FASTENERS

Check that all chassis nuts, screws and bolts are tightened to their correct torque values (page 1-23).
Check that all cotter pins, safety clips, hose clamps and cable stays are in place and properly secured.

WHEELS/TIRES

Support the motorcycle using a safety stand or hoist, raise the front wheel off the ground.

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

For front wheel service (page 16-10).

Support the motorcycle using a safety stand or hoist, raise the rear wheel off the ground.

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

For rear wheel service (page 17-5).

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

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

STEERING HEAD BEARINGS

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

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

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

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering bearings (page 16-19).

MEMO

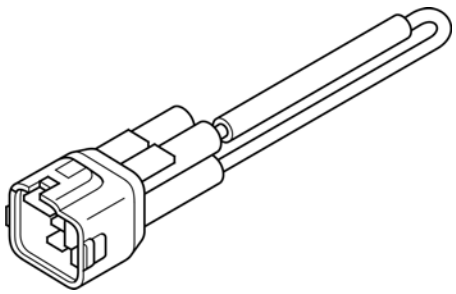
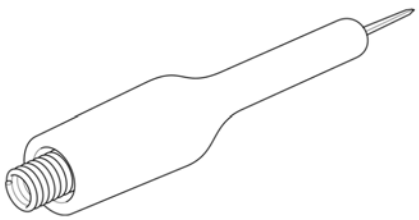
SERVICE INFORMATION

GENERAL

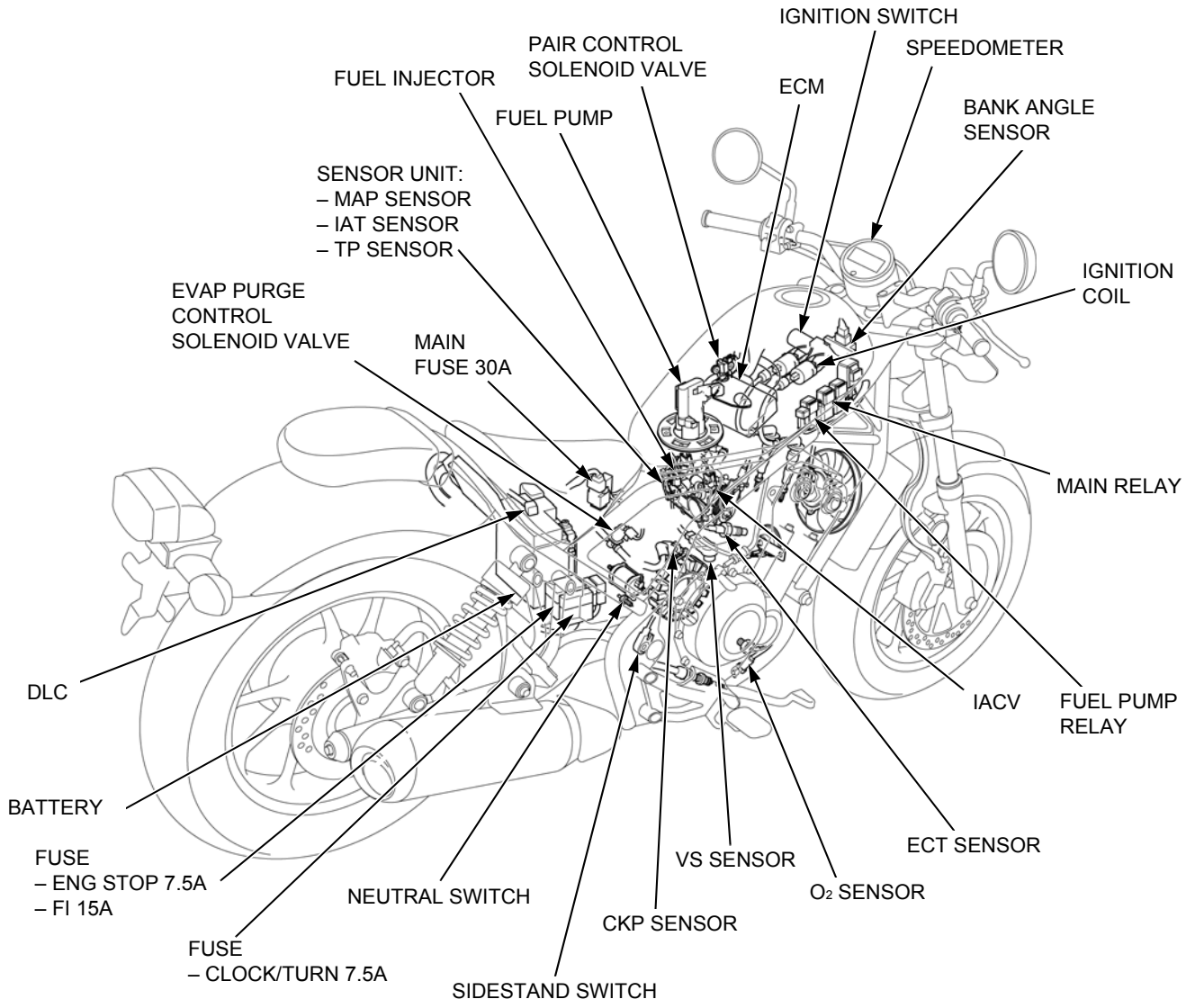
- This section covers electrical system service of the PGM-FI system. For other service and fuel supply system, see Fuel System section (page 7-2).
- The PGM-FI system is equipped with the self-diagnostic system. When performing the troubleshooting, read "PGM-FI Troubleshooting Information" carefully (page 4-5), and inspect and troubleshoot according to the DTC.
- A faulty PGM-FI system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- Use a digital tester for PGM-FI system inspection.
- The following color codes used are indicated through out this section.
- Refer to following components information
  – Fuel level sensor inspection (page 21-13)
  – TP sensor reset procedure (page 4-33)

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

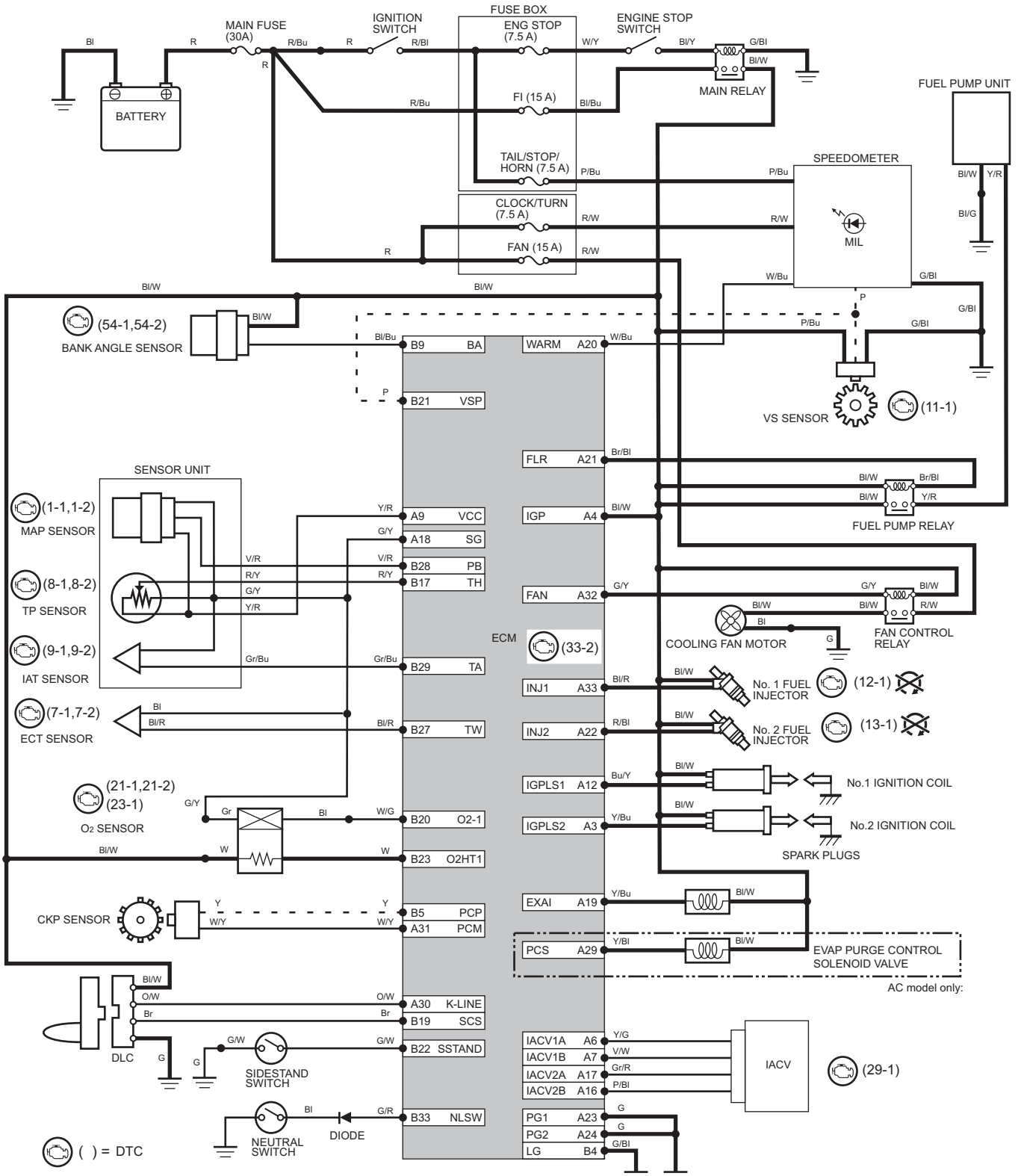
TOOLS

SCS short connector 070PZ-ZY30100	Test probe, 2 pack 07ZAJ-RDJA110
	

PGM-FI SYSTEM LOCATION



PGM-FI SYSTEM DIAGRAM



PGM-FI TROUBLESHOOTING INFORMATION

GENERAL TROUBLESHOOTING

Intermittent Failure

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

Opens and Shorts

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

If the MIL has come on

Refer to DTC READOUT (page 4-6).

If the MIL did not stay on

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

SYSTEM DESCRIPTION

SELF-DIAGNOSIS SYSTEM

The PGM-FI system is equipped with the self-diagnostic system. When any abnormality occurs in the system, the ECM turns on the MIL and stores a DTC in its erasable memory.

FAIL-SAFE FUNCTION

The PGM-FI system is provided with a fail-safe function to secure a minimum running capability even when there is trouble in the system. When any abnormality is detected by the self-diagnosis function, running capability is maintained by pre-programed value in the simulated program map. When any abnormality is detected in the injector, the fail-safe function stops the engine to protect it from damage.

DTC

- The DTC is composed of a main code and a sub code and it is displayed as a hyphenated number when retrieved from the ECM with the MCS.
  The digits in front of the hyphen are the main code, they indicate the component of function failure.
  The digits behind the hyphen are the sub code, they detail the specific symptom of the component or function failure.
  For example, in the case of the TP sensor:
  – DTC 08-1 = (TP sensor voltage) – (lower than the specified value)
  – DTC 08-2 = (TP sensor voltage) – (higher than the specified value)
- The MAP, ECT, TP and IAT sensor diagnosis will be made according to the voltage output of the affected sensor.
  If a failure occurs, the ECM determines the Function Failure, compares the sensor voltage output to the standard value, and then outputs the corresponding DTC to the MCS.
  For example:
  – If the output voltage line on the MAP sensor is opened, the ECM detects the output voltage is about 5 V, then the DTC 1-2 (MAP sensor circuit high voltage) will be displayed.
  – If the input voltage line on the TP sensor is opened, the ECM detects the output voltage is 0 V, then the DTC 8-1 (TP sensor circuit low voltage) will be displayed.

MIL BLINK PATTERN

- If the MCS is not available, DTC can be read from the ECM memory by the MIL blink pattern.
- The number of MIL blinks is the equivalent to the main code of the DTC (the sub code cannot be displayed by the MIL).
- The MIL will blink the current DTC by shorting SCS circuit (reading DTC with DLC connector).
- The MIL has two types of blinks, a long blink and short blink. The long blinking lasts for 1.3 seconds, the short blinking lasts for 0.3 seconds. One long blink is the equivalent of ten short blinks. For example, when two long blinks are followed by nine short blinks, the DTC is 29 (two long blinks = 20 blinks, plus nine short blinks).
- When the ECM stores more than one DTC, the MIL will indicate them by blinking in the order from the lowest number to highest number.

MIL CHECK

When the ignition switch is turned ON with the engine stop switch "○", the MIL will stay on for a few seconds, then go off. If the MIL does not come on or stays on, inspect the MIL circuit (page 4-30).

CURRENT DTC/FREEZE DTC

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

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

MCS INFORMATION

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

How to connect the MCS

Remove the single seat (page 2-4).

Turn the ignition switch OFF.

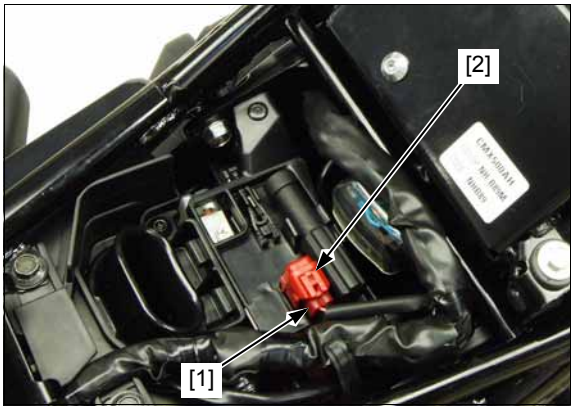
Remove the DLC [1] from the dummy connector [2].

Connect the MCS to the DLC.

Turn the ignition switch ON with the engine stop switch "○" and check the DTC and freeze data.

NOTE:

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



DTC READOUT

Current DTC

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

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

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

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

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

Reading stored DTC with the MIL

Remove the single seat (page 2-4).

Turn the ignition switch OFF.

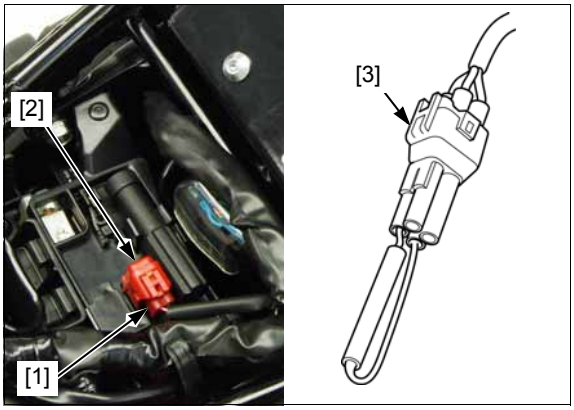
Remove the DLC [1] from the dummy connector [2] and short the DLC terminals using the special tool.

TOOL:
[3] SCS short connector 070PZ-ZY30100

CONNECTION: Brown – Green

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

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



ERASING STORED DTC

NOTE:

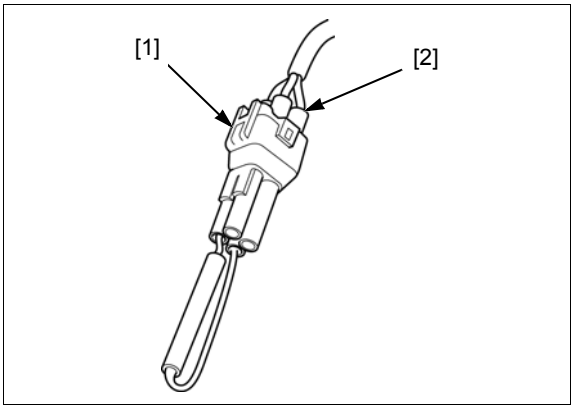
- The stored DTC can not be erased by simply disconnecting the battery negative cable.

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

How to erase the DTC without MCS

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

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



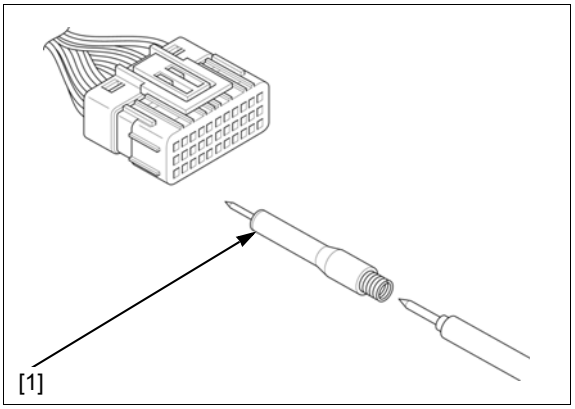
CIRCUIT INSPECTION

INSPECTION AT ECM CONNECTOR

- Always clean around and keep any foreign material away from the ECM 33P connector before disconnecting it.
- A faulty PGM-FI system is often related to poorly connected or corroded terminals. Check those connections before proceeding.
- In testing at ECM 33P connector (including IACV 4P connector) terminal (wire harness side), always use the test probe. Insert the test probe into the connector terminal, then attach the digital multimeter probe to the test probe.

TOOL:

[1] Test probe, 2 pack 07ZAJ-RDJA110



PGM-FI SYMPTOM TROUBLESHOOTING

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

Symptom	Diagnosis procedure	Also check for
Engine cranks but won't start (MIL not blinking)	1. Crank the engine for more than ten seconds and check the MIL (page 4-6) and execute the troubleshooting according to the DTC. 2. Inspect the ignition system (page 5-3). 3. Inspect the fuel supply system (page 7-5). 4. Check the spark plug condition (page 3-6). 5. Check the cylinder compression (page 10-6).	• No fuel to fuel injector – Clogged fuel filter – Pinched or clogged fuel tank breather hose (except AC model) or fuel tank-to-EVAP canister hose (AC model) – Pinched or clogged fuel feed hose – Faulty fuel pump – Faulty fuel pump circuits • Intake air leak • Contaminated/deteriorated fuel • Faulty fuel injector • IACV stuck
Engine cranks but won't start (No fuel pump operation sound when turning the ignition ON)	1. ECM power/ground circuits malfunction (page 4-31). 2. Inspect the fuel pump system (page 7-5).	• Open circuit in the power input and/or ground line of the ECM • Short circuit in sensor unit line • Faulty main relay and related circuit
Engine stalls, hard to start, rough idling	1. Check the idle speed (page 3-12). 2. Check the IACV (page 7-17). 3. Inspect the fuel supply system (page 7-5).	• Restricted fuel feed hose • Contaminated/deteriorated fuel • Restricted fuel tank breather hose (except AC model) or fuel tank-to-EVAP canister hose (AC model) • Intake air leak • Faulty ignition system
Afterburn when engine braking is used	1. Inspect the secondary air supply system (page 7-18). 2. Inspect the ignition system (page 5-3).	
Backfiring or misfiring during acceleration	Inspect the ignition system (page 5-3).	
Poor performance (driveability) and poor fuel economy	Inspect the fuel supply system (page 7-5).	• Air cleaner element contaminated • Pinched or clogged fuel feed hose • Faulty pressure regulator (fuel pump) • Faulty fuel injector • Faulty ignition system
Idle speed is below specifications or fast idle too low (MIL not blinking)	1. Check the idle speed (page 3-12). 2. Check the IACV (page 7-17).	• Faulty fuel supply system • Faulty ignition system
Idle speed is above specifications or fast idle too high (MIL not blinking)	1. Check the idle speed (page 3-12). 2. Check the throttle operation and freeplay (page 3-4). 3. Check the IACV (page 7-17).	• Faulty ignition system • Intake air leak • Engine top-end problem • Air cleaner condition
MIL stays ON, or MIL never comes ON at all	Inspect the MIL circuit (page 4-30).	

DTC INDEX

NOTE:
- If the MCS is not used, perform all of the inspection on the corresponding main code (digits in front of hyphen) of the DTC.
- The main code of Honda code (the number in front of hyphen) can be indicated as MIL blinking.

DTC	Function Failure	Symptom/Fail-safe function	Refer to
1-1	MAP sensor circuit low voltage (less than 0.029 V) • MAP sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 60 kPa (450 mmHg)	4-10
1-2	MAP sensor circuit high voltage (more than 3.809 V) • Loose or poor contact of the sensor unit connector • MAP sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 60 kPa (450 mmHg)	4-11
7-1	ECT sensor circuit low voltage (less than 0.049 V) • ECT sensor or its circuit malfunction	• Hard start at a low temperature • Pre-program value: 110°C/230°F	4-13
7-2	ECT sensor circuit high voltage (more than 4.946 V) • Loose or poor contact of the ECT sensor connector • ECT sensor or its circuit malfunction	• Hard start at a low temperature • Pre-program value: 110°C/230°F	4-13
8-1	TP sensor circuit low voltage (less than 0.122 V) • Loose or poor contact of the sensor unit connector • TP sensor or its circuit malfunction	• Poor engine acceleration • Pre-program value: 0°	4-15
8-2	TP sensor circuit high voltage (more than 4.966 V) • TP sensor or its circuit malfunction	• Poor engine acceleration • Pre-program value: 0°	4-17
9-1	IAT sensor circuit low voltage (less than 0.049 V) • IAT sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 35°C/95°F	4-18
9-2	IAT sensor circuit high voltage (more than 4.946 V) • Loose or poor contact of the sensor unit connector • IAT sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 35°C/95°F	4-19
11-1	VS sensor malfunction • Loose or poor contact of the VS sensor connector • VS sensor or its circuit malfunction	• Engine operates normally	4-20
12-1	No. 1 (left) fuel injector malfunction • Loose or poor contact of the fuel injector connector • Fuel injector or its circuit malfunction	• Engine does not start • Fuel injector, fuel pump and ignition coil shut down	4-21
13-1	No. 2 (right) fuel injector malfunction • Loose or poor contact of the fuel injector connector • Fuel injector or its circuit malfunction	• Engine does not start • Fuel injector, fuel pump and ignition coil shut down	4-21
21-1	O_2 sensor circuit low voltage • O_2 sensor or its circuit malfunction	• Engine operates normally	4-23
21-2	O_2 sensor circuit high voltage • Loose or poor contact of the O_2 sensor connector • O_2 sensor or its circuit malfunction	• Engine operates normally	4-24
23-1	O_2 sensor heater malfunction • Loose or poor contact of the O_2 sensor connector • O_2 sensor or its circuit malfunction	• Engine operates normally	4-25
29-1	IACV malfunction • Loose or poor contact of the IACV connector • IACV or its circuit malfunction	• Engine operates normally	4-26
33-2	ECM EEPROM malfunction	• Rough idling • Does not hold the self-diagnosis data	4-28
54-1	Bank angle sensor circuit low voltage (less than 0.020 V) • Loose or poor contact of the bank angle sensor connector • Bank angle sensor or its circuit malfunction	• Engine operates normally • Engine stop function does not operate	4-28
54-2	Bank angle sensor circuit high voltage (more than 4.986 V) • Bank angle sensor or its circuit malfunction	• Engine operates normally • Engine stop function does not operate	4-29

DTC TROUBLESHOOTING

DTC 1-1 (MAP SENSOR LOW VOLTAGE)

1. MAP sensor system inspection

Check the MAP sensor with the MCS.

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Sensor Unit Input Voltage Inspection

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

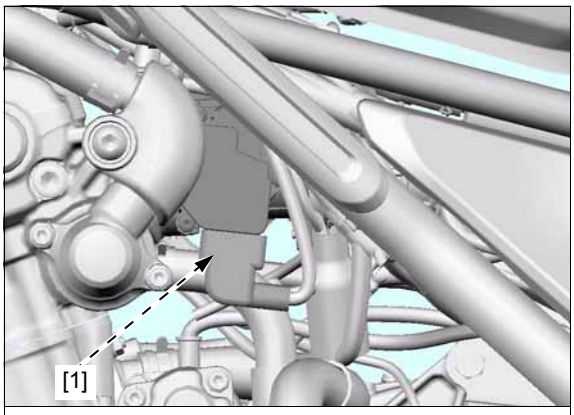
CONNECTION: Yellow/red (+) – Green/yellow (–)

STANDARD: 4.75 – 5.25 V

Is the voltage within standard value?

YES – GO TO STEP 4.

NO – GO TO STEP 3.



3. Sensor Unit Input Line Open Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) connector (page 4-31).
Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] and ECM 33P (Black) connector [2] terminals.

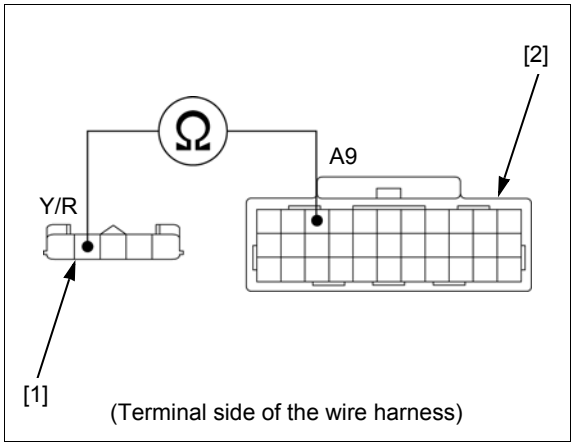
TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

CONNECTION: Yellow/red – A9

Is there continuity?

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

NO – Open circuit in Yellow/red wire



4. MAP Sensor Signal Line Short Circuit Inspection

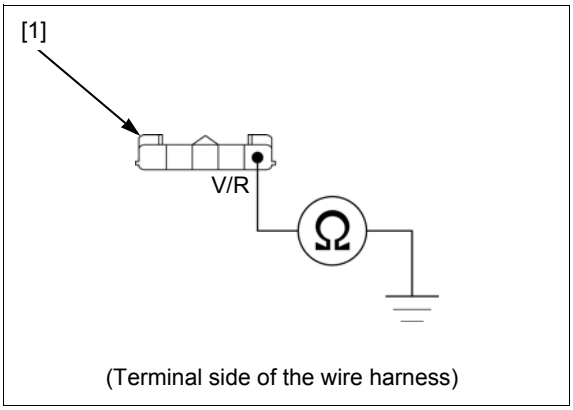
Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) connector (page 4-31).
Check for continuity between sensor unit 5P (Black) connector [1] terminal and ground.

CONNECTION: Violet/red – Ground

Is there continuity?

YES – Short circuit in Violet/red wire

NO – GO TO STEP 5.



(Terminal side of the wire harness)

5. MAP Sensor Inspection

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

Is DTC 1-1 indicated?

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

NO – Faulty original sensor unit (MAP sensor)

DTC 1-2 (MAP SENSOR HIGH VOLTAGE)

NOTE:

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

1. MAP sensor system inspection

Check the MAP sensor with the MCS.

Is about 5 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Sensor Unit Input Voltage Inspection

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

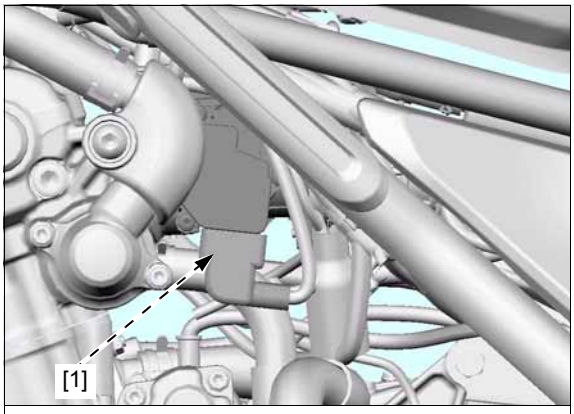
CONNECTION: Yellow/red (+) – Green/yellow (–)

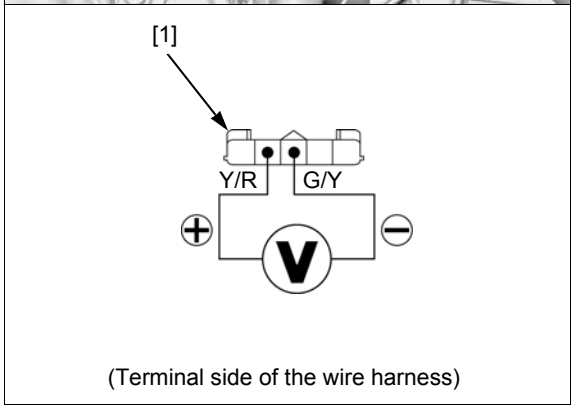
STANDARD: 4.75 – 5.25 V

Is the voltage within standard value?

YES – GO TO STEP 3.

NO – Open circuit in Green/yellow wire





(Terminal side of the wire harness)

3. MAP Sensor System Inspection with Jumper Wire

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

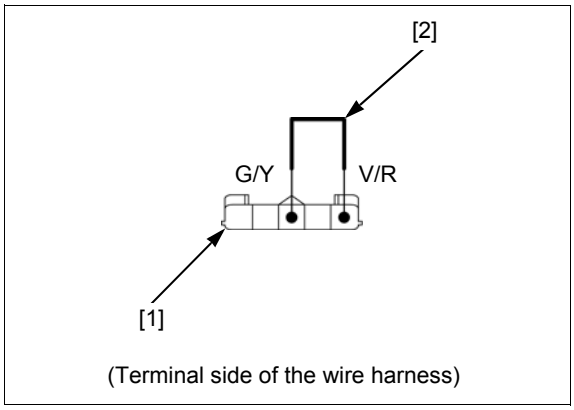
CONNECTION: Violet/red – Green/yellow

Check the MAP sensor with the MCS.

Is about 0 V indicated?

YES – Faulty sensor unit (MAP sensor)

NO – GO TO STEP 4.



(Terminal side of the wire harness)

4. MAP Sensor Signal Line Open Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P (Gray) connector (page 4-31).
Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] and ECM 33P (Gray) connector [2] terminals.

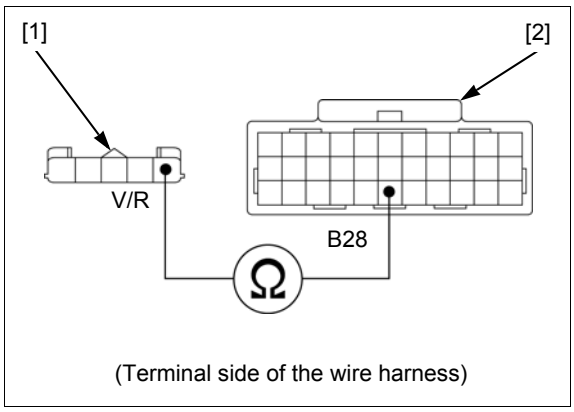
TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

CONNECTION: Violet/red – B28

Is there continuity?

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

NO – Open circuit in Violet/red wire



(Terminal side of the wire harness)

DTC 7-1 (ECT SENSOR LOW VOLTAGE)

1. ECT Sensor System Inspection

Check the ECT sensor with the MCS.

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

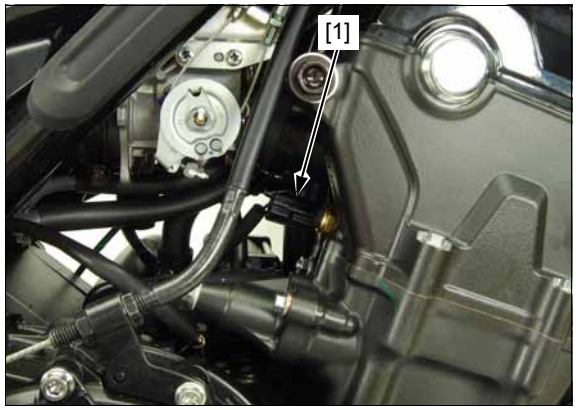
2. ECT Sensor System Inspection with Connector Disconnected

Turn the ignition switch OFF.
Disconnect the ECT sensor 2P (Black) connector [1].
Check the ECT sensor with the MCS.

Is about 0 V indicated?

YES – GO TO STEP 3.

NO – Faulty ECT sensor



3. ECT Sensor Output Line Short Circuit Inspection

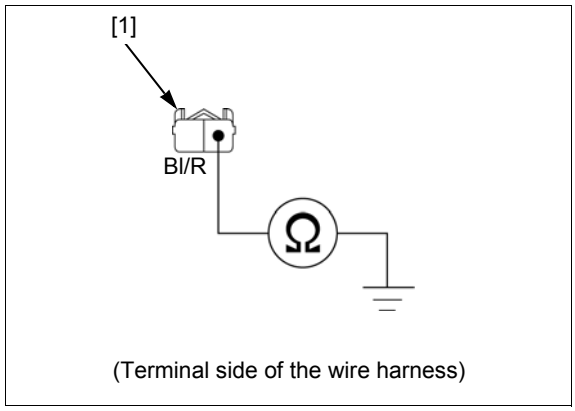
Turn the ignition switch OFF.
Disconnect the ECM 33P (Gray) connector (page 4-31).
Check for continuity between the wire harness side ECT sensor 2P (Black) connector [1] terminal and ground.

CONNECTION: Black/red – Ground

Is there continuity?

YES – Short circuit in Black/red wire

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



(Terminal side of the wire harness)

DTC 7-2 (ECT SENSOR HIGH VOLTAGE)

NOTE:

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

1. ECT Sensor System Inspection

Check the ECT sensor with the MCS.

Is about 5 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. ECT Sensor System Inspection with Jumper Wire

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

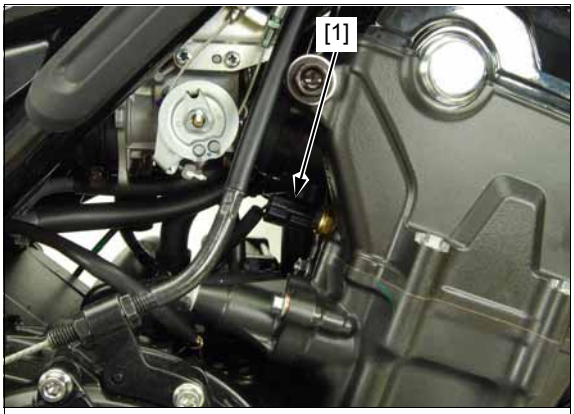
CONNECTION: Black/red – Black

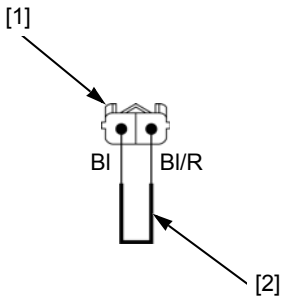
Check the ECT sensor with the MCS.

Is about 0 V indicated?

YES – GO TO STEP 4.

NO – GO TO STEP 3.





(Terminal side of the wire harness)

3. ECT Sensor Line Open Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P connectors (page 4-31).
Check for continuity between the wire harness side ECT sensor 2P (Black) connector [1] and ECM 33P (Black) connector [2] terminal and ECM 33P (Gray) connector [3] terminal.

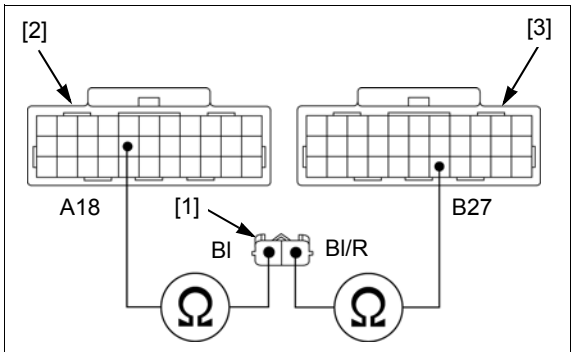
TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

CONNECTION:
Black – A18
Black/red – B27

Is there continuity?

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

NO – • Open circuit in Black/red wire
• Open circuit in Black or Green/yellow wire



(Terminal side of the wire harness)

4. ECT Sensor Resistance Inspection

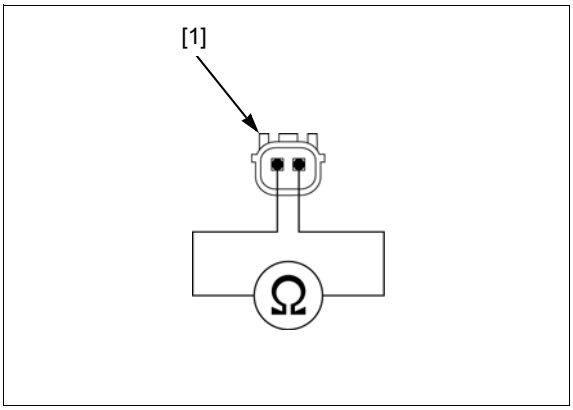
Turn the ignition switch OFF.
Remove the ECT sensor (page 4-34).
Measure the resistance between the 2P connector terminals of the ECT sensor [1].

STANDARD: 1.0 – 1.3 kΩ (40°C/104°F)

Is the resistance within standard value?

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

NO – Faulty ECT sensor



DTC 8-1 (TP SENSOR LOW VOLTAGE)

NOTE:

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

1. TP Sensor System Inspection

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

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Sensor Unit Input Voltage Inspection

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

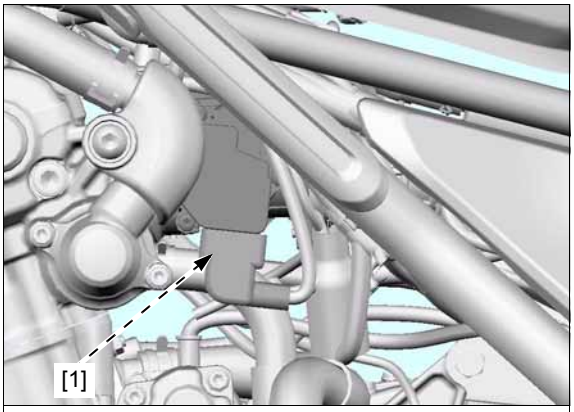
CONNECTION: Yellow/red (+) – Green/yellow (–)

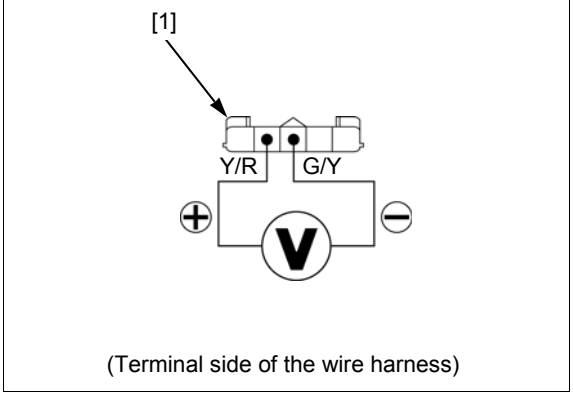
STANDARD: 4.75 – 5.25 V

Is the voltage within standard value?

YES – GO TO STEP 4.

NO – GO TO STEP 3.





(Terminal side of the wire harness)

3. Sensor Unit Input Line Open Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) connector (page 4-31).
Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] and ECM 33P (Black) connector [2] terminals.

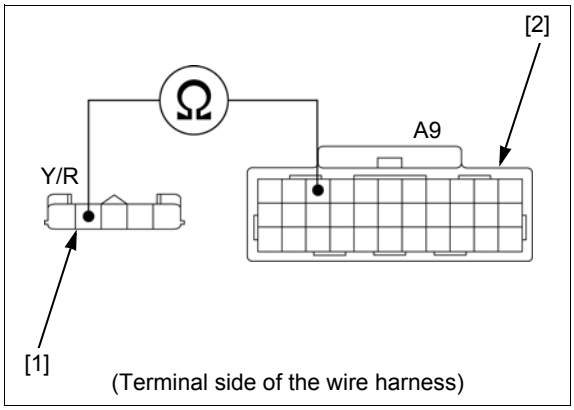
TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

CONNECTION: Yellow/red – A9

Is there continuity?

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

NO – Open circuit in Yellow/red wire



(Terminal side of the wire harness)

4. TP Sensor Signal Line Open Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P (Gray) connector (page 4-31).
Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] and ECM 33P (Gray) connector [2] terminals.

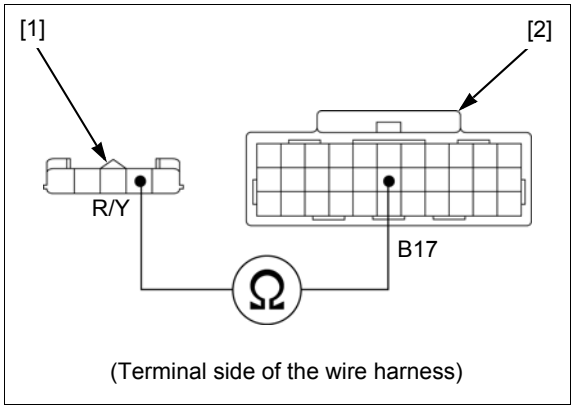
TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

CONNECTION: Red/yellow – B17

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in Red/yellow wire



(Terminal side of the wire harness)

5. TP Sensor Signal Line Short Circuit Inspection

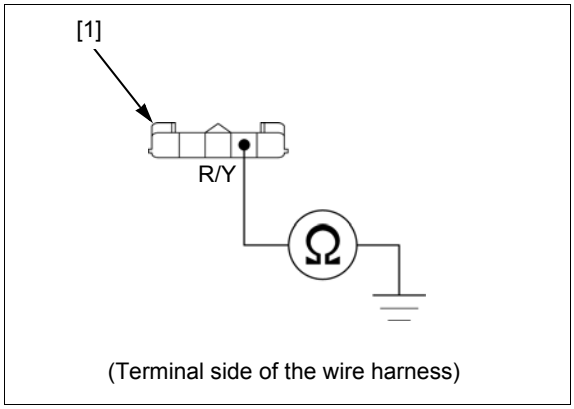
Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] terminal and ground.

CONNECTION: Red/yellow – Ground

Is there continuity?

YES – Short circuit in Red/yellow wire

NO – GO TO STEP 6.



(Terminal side of the wire harness)

6. TP Sensor Inspection

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

Is DTC 8-1 indicated?

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

NO – Faulty original sensor unit (TP sensor)

DTC 8-2 (TP SENSOR HIGH VOLTAGE)

1. TP Sensor System Inspection

Check the TP sensor with the MCS.

Is about 5 V indicated?

YES – GO TO STEP 3.

NO – GO TO STEP 2.

2. TP Sensor System Inspection with throttle operated

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

Is the voltage increase continuously?

YES – Intermittent failure

NO – Faulty sensor unit (TP sensor)

3. Sensor Unit Input Voltage Inspection

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

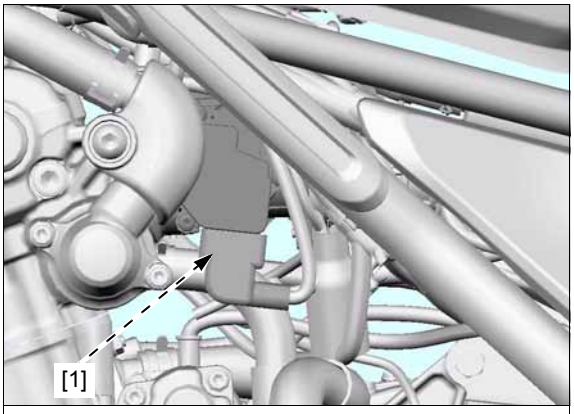
CONNECTION: Yellow/red (+) – Green/yellow (–)

STANDARD: 4.75 – 5.25 V

Is the voltage within standard value?

YES – GO TO STEP 4.

NO – Open circuit in Green/yellow wire



(Terminal side of the wire harness)

4. TP Sensor Line Short Circuit Inspection

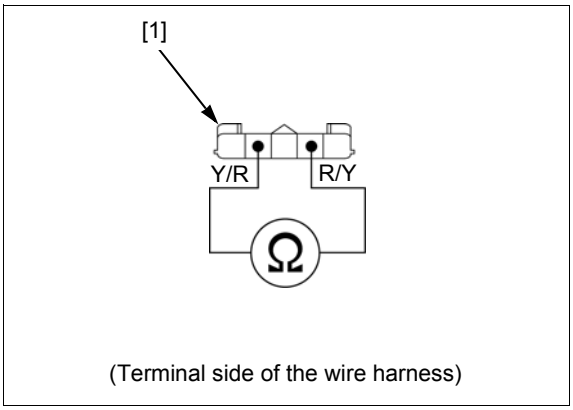
Turn the ignition switch OFF.
Disconnect the ECM 33P connectors (page 4-31).
Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] terminals.

CONNECTION: Yellow/red – Red/yellow

Is there continuity?

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

NO – GO TO STEP 5.



(Terminal side of the wire harness)

5. TP Sensor Inspection

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

Is DTC 8-2 indicated?

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

NO – Faulty original sensor unit (TP sensor)

DTC 9-1 (IAT SENSOR LOW VOLTAGE)

1. IAT Sensor System Inspection

Check the IAT sensor with the MCS.

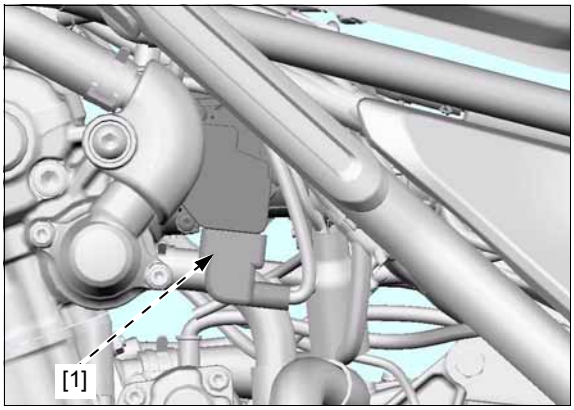
Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. IAT Sensor System Inspection with Connector Disconnected

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



Is about 0 V indicated?

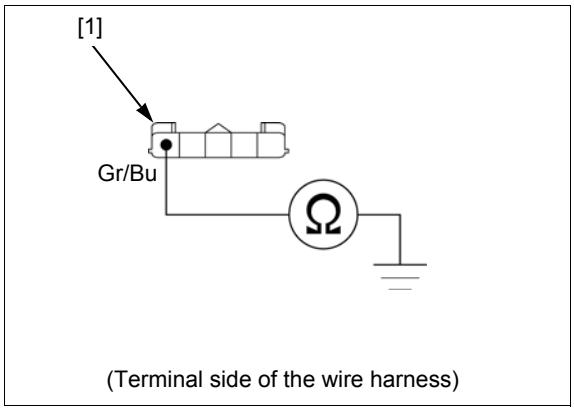
YES – GO TO STEP 3.

NO – Faulty sensor unit (IAT sensor)

3. IAT Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P connectors (page 4-31).
Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] terminal and ground.

CONNECTION: Gray/blue – Ground



Is there continuity?

YES – Short circuit in Gray/blue wire

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

DTC 9-2 (IAT SENSOR HIGH VOLTAGE)

NOTE:

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

1. IAT Sensor System Inspection

Check the IAT sensor with the MCS.

Is about 5 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. IAT Sensor System Inspection with Jumper Wire

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

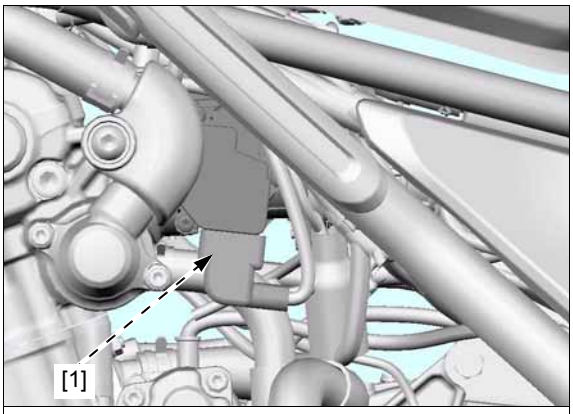
CONNECTION: Gray/blue – Green/yellow

Check the IAT sensor with the MCS.

Is about 0 V indicated?

YES – Faulty sensor unit (IAT sensor)

NO – GO TO STEP 3.



3. IAT Sensor Line Open Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P connectors (page 4-31).
Check for continuity between the wire harness side sensor unit 5P (Black) connector [1] and ECM 33P (Black) connector [2] terminal and ECM 33P (Gray) connector [2] terminal.

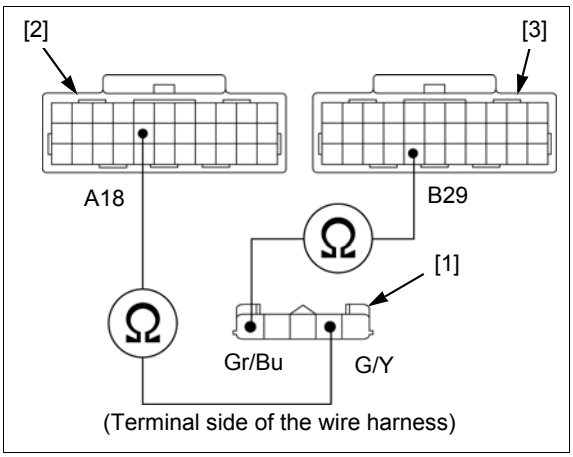
TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

CONNECTION:
Green/yellow – A18
Gray/blue – B29

Is there continuity?

YES – GO TO STEP 4.

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



4. IAT Sensor Resistance Inspection

Connect the sensor unit 5P (Black) connector.
Measure the resistance between the wire harness side ECM 33P (Black) connector [1] terminal and ECM 33P (Gray) connector [2] terminal.

TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

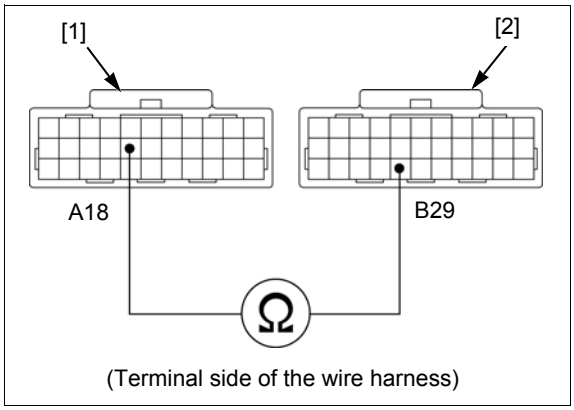
CONNECTION: A18 – B29

STANDARD: 1 – 4 kΩ (20°C/68°F)

Is the resistance within standard value?

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

NO – Faulty sensor unit (IAT sensor)



(Terminal side of the wire harness)

DTC 11-1 (VS SENSOR)

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

1. Recheck DTC

Erase the DTC (page 4-7).
Test-ride the motorcycle above 3,100 rpm.
Stop the engine.
Check the VS sensor with the MCS.

Is DTC 11-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. VS Sensor Input Voltage Inspection

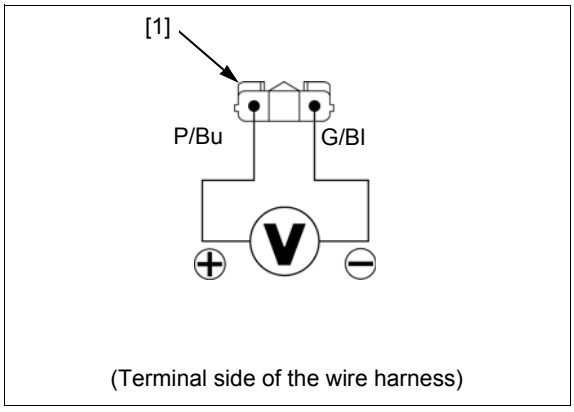
Turn the ignition switch OFF.
Disconnect the VS sensor 3P (Black) connector (page 4-35).
Turn the ignition switch ON with the engine stop switch "○".
Measure the voltage between the wire harness side VS sensor 3P (Black) connector [1] terminals.

CONNECTION: Pink/blue (+) – Green/black (–)

Is there battery voltage?

YES – GO TO STEP 3.

NO – • Open circuit in Pink/blue wire
• Open circuit in Green/black wire



(Terminal side of the wire harness)

3. VS Sensor Signal Line Short Circuit Inspection

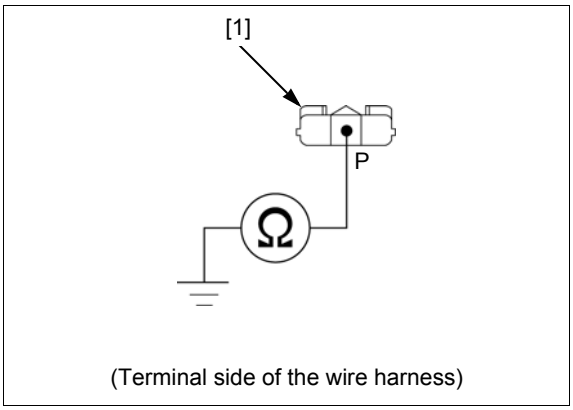
Turn the ignition switch OFF.
Check for continuity between the wire harness side VS sensor 3P (Black) connector [1] terminal and ground.

CONNECTION: Pink – Ground

Is there continuity?

YES – Short circuit in Pink wire

NO – GO TO STEP 4.



(Terminal side of the wire harness)

4. VS Sensor Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Gray) connector as the speedometer power/ground line inspection (page 21-7).
Check for continuity between the wire harness side VS sensor 3P (Black) connector [1] and ECM 33P (Gray) connector [2] terminals.

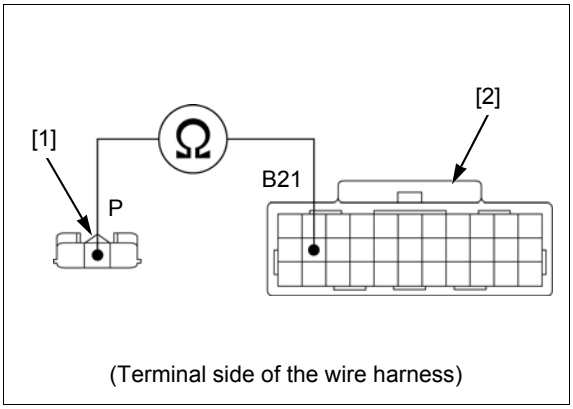
TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

CONNECTION: Pink – B21

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in Pink wire



(Terminal side of the wire harness)

5. VS Sensor Inspection

Replace the VS sensor with a known good one (page 21-11).
Connect the ECM 33P (Gray) connector.
Erase the DTC (page 4-7).
Test-ride the motorcycle above 3,100 rpm.
Stop the engine.
Check the DTC with the MCS.

Is DTC 11-1 indicated?

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

NO – Faulty original VS sensor

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

NOTE:

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

1. Recheck DTC

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

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

YES – GO TO STEP 2.

NO – Intermittent failure

2. Fuel Injector Input Voltage Inspection

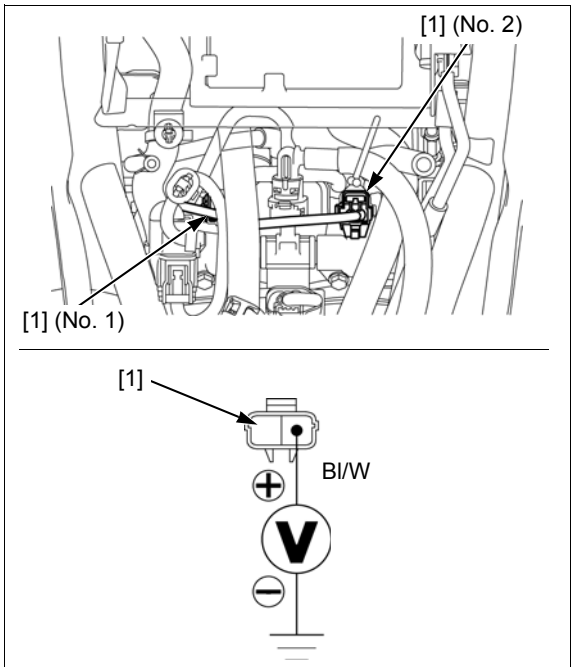
Turn the ignition switch OFF.
Lift the fuel tank and support it (page 3-4).
Disconnect the fuel injector 2P (Gray) connector [1].
Turn the ignition switch ON with the engine stop switch "".
Measure the voltage between the wire harness side fuel injector 2P (Gray) connector terminal and ground.

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

Is there battery voltage?

YES – GO TO STEP 3.

NO – Open circuit in Black/white wire



(Terminal side of the wire harness)

3. Fuel Injector Resistance Inspection

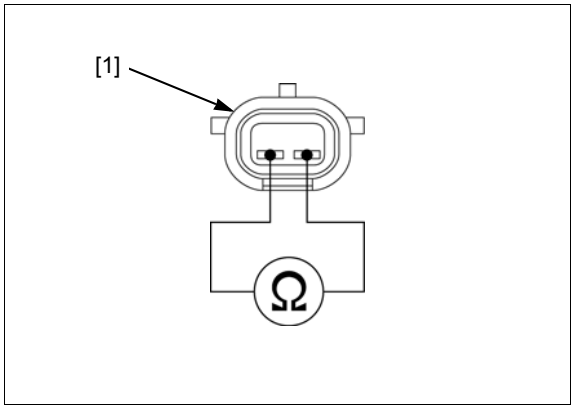
Turn the ignition switch OFF.
Measure the resistance between the 2P connector terminals of the fuel injector [1].

STANDARD: 11 – 13 Ω (20°C/68°F)

Is the resistance within standard value?

YES – GO TO STEP 4.

NO – Faulty fuel injector



4. Fuel Injector Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-31).
Check for continuity between the wire harness side fuel injector 2P (Gray) connector [1] and ECM 33P (Black) connector [2] terminals.

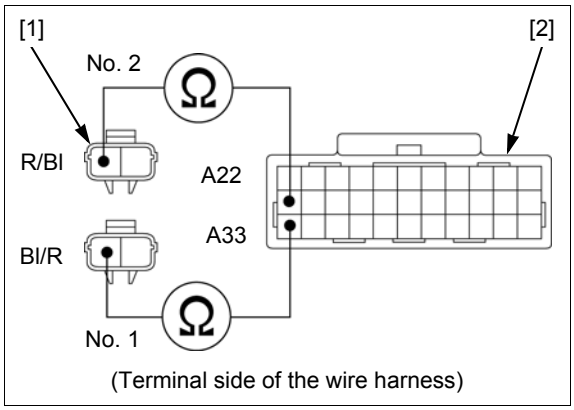
TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

CONNECTION:
No. 1: Black/red – A33
No. 2: Red/black – A22

Is there continuity?

YES – GO TO STEP 5.

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



(Terminal side of the wire harness)

5. Fuel Injector Signal Line Short Circuit Inspection

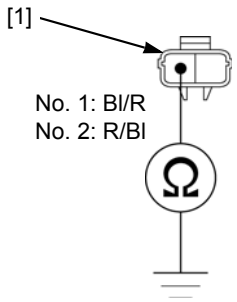
Check for continuity between the wire harness side fuel injector 2P (Gray) connector [1] terminal and ground.

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

Is there continuity?

YES – • Short circuit in Black/red wire
• Short circuit in Red/black wire

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



(Terminal side of the wire harness)

DTC 21-1 (O_2 SENSOR LOW VOLTAGE)

1. Recheck DTC

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

Is the DTC 21-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. O_2 Sensor Output Line Short Circuit Inspection

Disconnect the ECM 33P connectors (page 4-31).

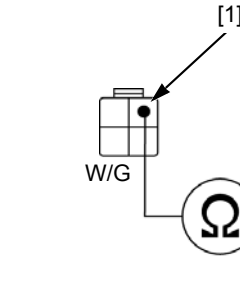
Check the continuity between the wire harness side O_2 sensor 4P (Black) connector [1] terminal and ground.

CONNECTION: White/green – Ground

Is there continuity?

YES – Short circuit in White/green wire

NO – GO TO STEP 3.



(Terminal side of the wire harness)

3. O_2 Sensor Inspection

Replace the O_2 sensor with a known good one (page 4-35).
Connect the ECM 33P connectors.
Erase the DTC (page 4-7).
Start the engine and warm it up until the coolant temperature is 80°C (176°F).
Stop the engine.
Check the O_2 sensor with the MCS.

Is the DTC 21-1 indicated?

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

NO – Faulty original O_2 sensor

DTC 21-2 (O_2 SENSOR HIGH VOLTAGE)

NOTE:

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

1. Recheck DTC

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

Is the DTC 21-2 indicated?

YES – GO TO STEP 2.

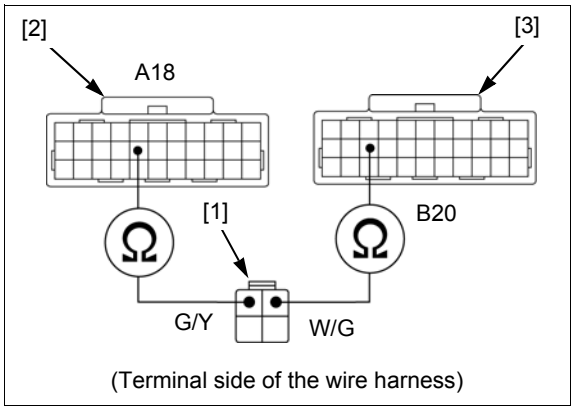
NO – Intermittent failure

2. O_2 Sensor Line Open Circuit Inspection

Turn the ignition switch OFF.
Disconnect the O_2 sensor 4P (Black) connector (page 4-35).
Disconnect the ECM 33P connectors (page 4-31).
Check for continuity between the wire harness side O_2 sensor 4P (Black) connector [1] and ECM 33P (Black) connector [2] terminal and ECM 33P (Gray) connector [3] terminal.

TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

CONNECTION:
White/green – B20
Green/yellow – A18



(Terminal side of the wire harness)

Is there continuity?

YES – GO TO STEP 3.

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

3. O_2 Sensor Inspection

Replace the O_2 sensor with a known good one (page 4-35).
Connect the ECM 33P connectors.
Erase the DTC (page 4-7).
Start the engine and warm it up until the coolant temperature is 80°C (176°F).
Stop the engine.
Check the O_2 sensor with the MCS.

Is the DTC 21-2 indicated?

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

NO – Faulty original O_2 sensor

DTC 23-1 (O_2 SENSOR HEATER)

NOTE:

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

1. Recheck DTC

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

Is DTC 23-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. O_2 Sensor Heater Resistance Inspection

Turn the ignition switch OFF.
Disconnect the O_2 sensor 4P (Black) connector (page 4-35).
Measure the resistance between the sensor side O_2 sensor 4P (Black) connector [1] terminals.

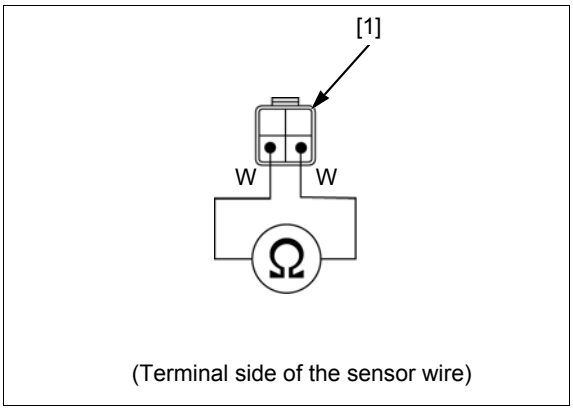
CONNECTION: White – White

STANDARD: 10 – 40 Ω (20°C/68°F)

Is the resistance within standard value?

YES – GO TO STEP 3.

NO – Faulty O_2 sensor



(Terminal side of the sensor wire)

3. O_2 Sensor Heater Input Voltage Inspection

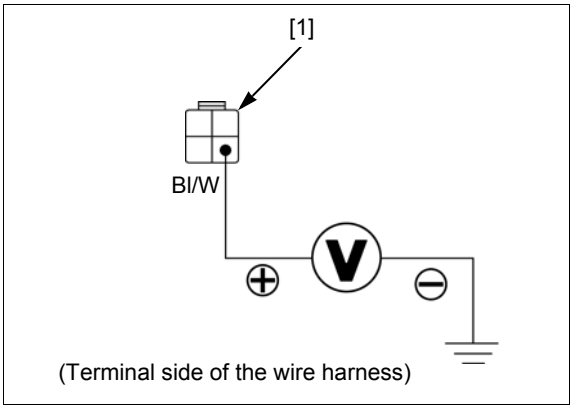
Turn the ignition switch ON with the engine stop switch "".
Measure the voltage between the wire harness side O_2 sensor 4P (Black) connector [1] and ground.

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

Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in Black/white wire



(Terminal side of the wire harness)

4. O_2 Sensor Heater Line Open Circuit Inspection

Disconnect the ECM 33P (Gray) connector (page 4-31).
Check the continuity between the wire harness side O_2 sensor 4P (Black) connector [1] and ECM 33P (Gray) connector [2] terminals.

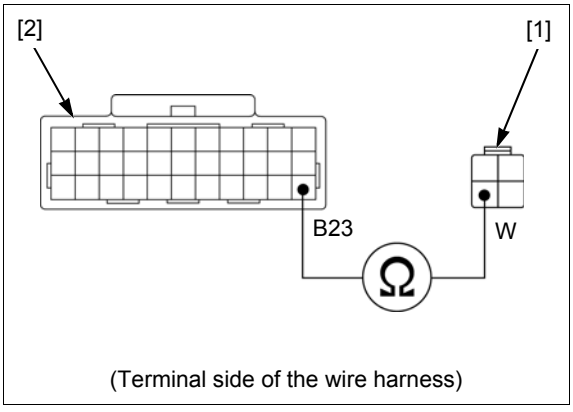
TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

CONNECTION: White – B23

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in White wire



(Terminal side of the wire harness)

5. O_2 Sensor Heater Line Short Circuit Inspection

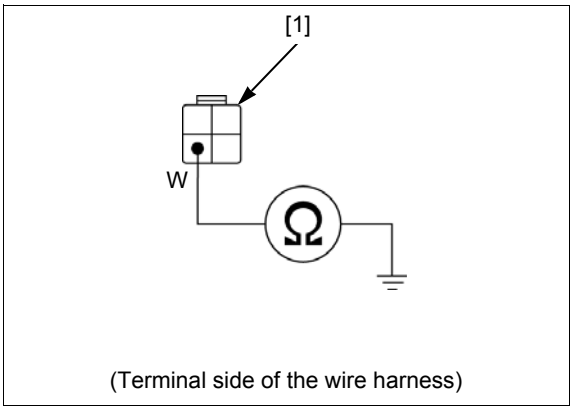
Check the continuity between the wire harness side O_2 sensor 4P (Black) connector [1] terminal and ground.

CONNECTION: White – ground

Is there continuity?

YES – Short circuit in White wire

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



(Terminal side of the wire harness)

DTC 29-1 (IACV)

NOTE:

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

1. Recheck DTC

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

Is the DTC 29-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. IACV Resistance Inspection

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

TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

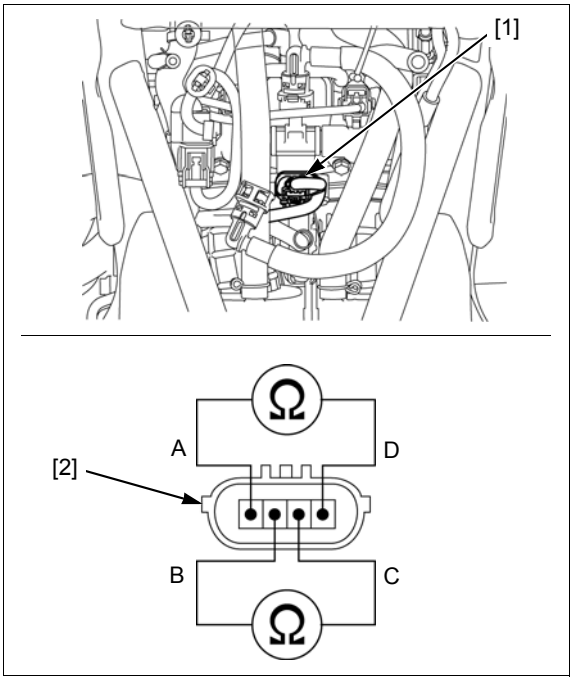
CONNECTION: A – D
B – C

STANDARD: 110 – 150 Ω (25°C/77°F)

Is the resistance within standard value?

YES – GO TO STEP 3.

NO – Faulty IACV



3. IACV Internal Short Circuit Inspection

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

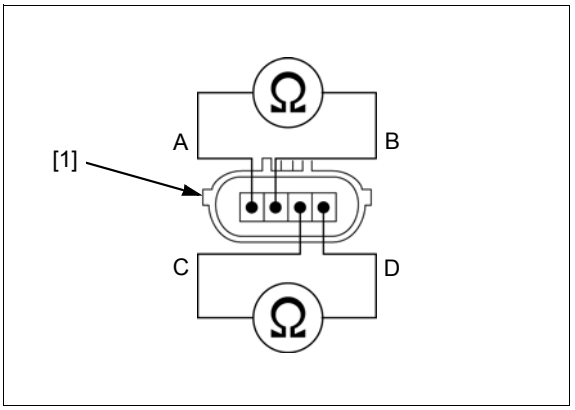
TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

CONNECTION: A – B
C – D

Is there continuity?

YES – Faulty IACV

NO – GO TO STEP 4.



4. IACV Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-31).
Check for continuity between the wire harness side ECM 33P (Black) connector [1] and IACV 4P (Black) connector [2] terminals.

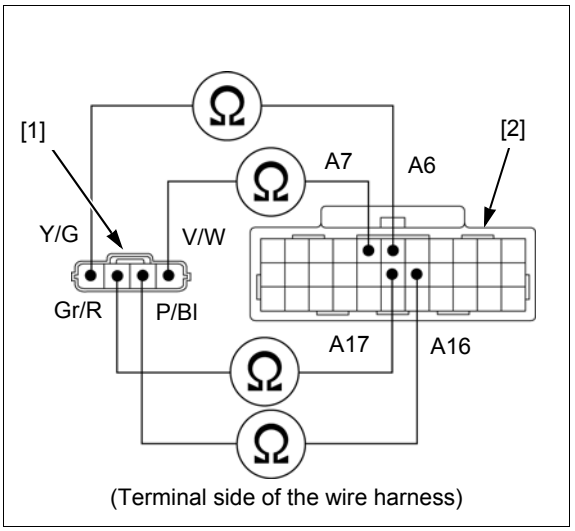
TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

CONNECTION:
Yellow/green – A6
Violet/white – A7
Gray/red – A17
Pink/black – A16

Is there continuity?

YES – GO TO STEP 5.

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



(Terminal side of the wire harness)

5. IACV Line Short Circuit Inspection

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

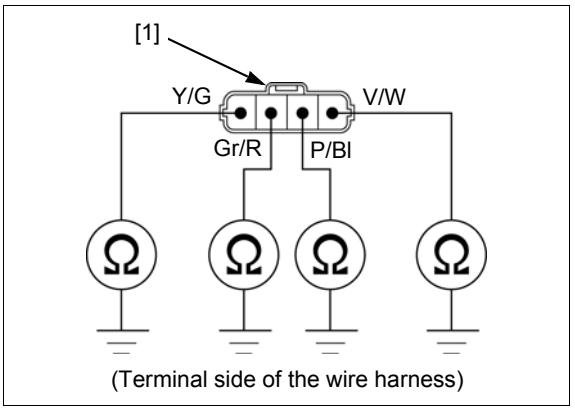
TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

CONNECTION:
Yellow/green – Ground
Violet/white – Ground
Gray/red – Ground
Pink/black – Ground

Is there continuity?

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

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



(Terminal side of the wire harness)

DTC 33-2 (ECM EEPROM)

1. Recheck DTC

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

Is the DTC 33-2 indicated?

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

NO – Intermittent failure

DTC 54-1 (BANK ANGLE SENSOR LOW VOLTAGE)

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

1. Bank Angle Sensor System Inspection

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

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Bank Angle Sensor Signal Line Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the following:

– bank angle sensor 2P (Black) connector (page 4-36).
– ECM 33P (Gray) connector (page 4-31)

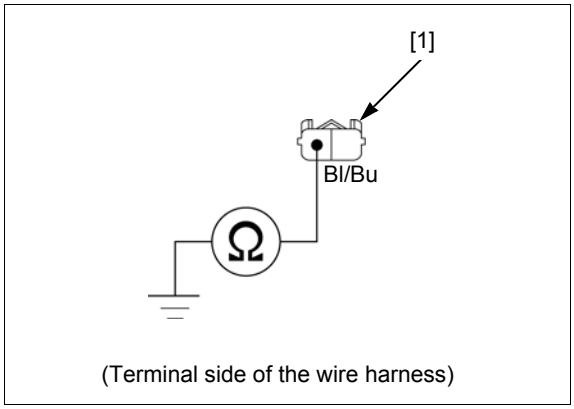
Check for continuity between the wire harness side bank angle sensor 2P (Black) connector [1] terminal and ground.

CONNECTION: Black/blue – Ground

Is there continuity?

YES – Short circuit in the Black/blue wire

NO – GO TO STEP 3.



(Terminal side of the wire harness)

3. Bank Angle Sensor Signal Line Open Circuit Inspection

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

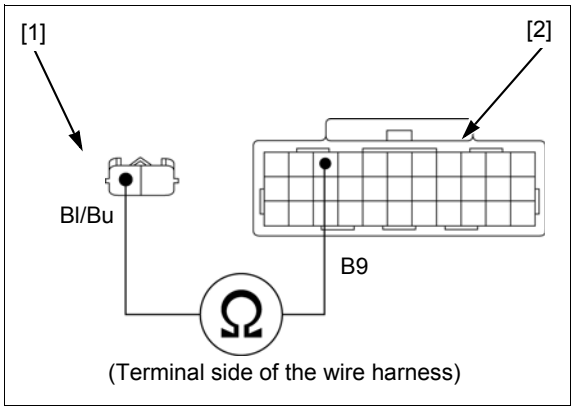
TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

CONNECTION: Black/blue – B9

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Black/blue wire



(Terminal side of the wire harness)

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

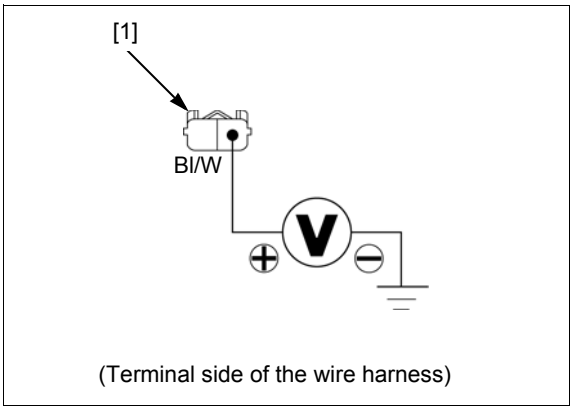
   Temporarily install the ECM to the wire harness by connecting the 33P (Gray) connector.
   Turn the ignition switch ON with the engine stop switch "".
   Measure the voltage between the wire harness side bank angle sensor 2P (Black) connector [1] terminal and ground.

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

   Is there battery voltage?

   YES – GO TO STEP 5.

   NO – Open circuit in Black/white wire



(Terminal side of the wire harness)

5. **Bank Angle Sensor Inspection**

   Check the bank angle sensor (page 4-36).

   Is the bank angle sensor normal?

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

   NO – Faulty bank angle sensor

DTC 54-2 (BANK ANGLE SENSOR HIGH VOLTAGE)

1. **Bank Angle Sensor System Inspection**

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

   Is about 5 V indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **Bank Angle Sensor Inspection**

   Replace the bank angle sensor with a known good one (page 4-36).
   Erase the DTC (page 4-7).
   Check the bank angle sensor with the MCS.

   Is DTC 54-2 indicated?

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

   NO – Faulty original bank angle sensor

MIL CIRCUIT TROUBLESHOOTING

NOTE:
Before starting the inspection, check the speedometer power input line (page 21-7).

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

If the engine can be started but the MIL does not come on when the ignition switch is turned ON and engine stop switch "○", check as follows:

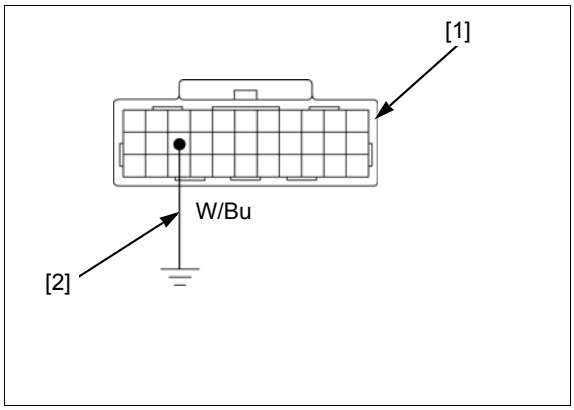
Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector (page 4-31).

Ground the following terminal of the wire harness side ECM 33P (Black) connector [1] with a jumper wire [2].

CONNECTION: White/blue – Ground

TOOL:
Test probe, 2 pack 07ZAJ-RDJA110



Turn the ignition switch ON and engine stop switch "○" the MIL should come on.

– If the MIL comes on, replace the ECM with a known good one and recheck the MIL indication.
– If the MIL does not come on, check for open circuit in the White/blue wire between the speedometer and ECM 33P (Black) connector.
  If the wire is OK, replace the speedometer.

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

Turn the ignition switch OFF.

Disconnect the ECM 33P (Gray) connector (page 4-31).

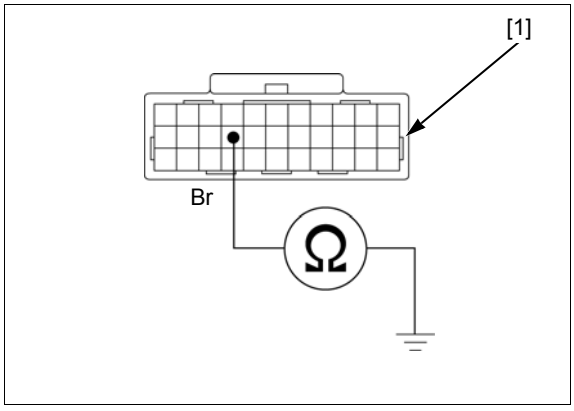
Turn the ignition switch ON and engine stop switch "○".

– If the MIL comes on, check for short circuit in the White/blue wire between the speedometer and ECM.
  If the White/blue wire is OK, replace the ECM with a known good one and recheck.
– If the MIL turns off, check the following.

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

CONNECTION: Brown – Ground
STANDARD: No continuity

TOOL:
Test probe, 2 pack 07ZAJ-RDJA110



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

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

ECM

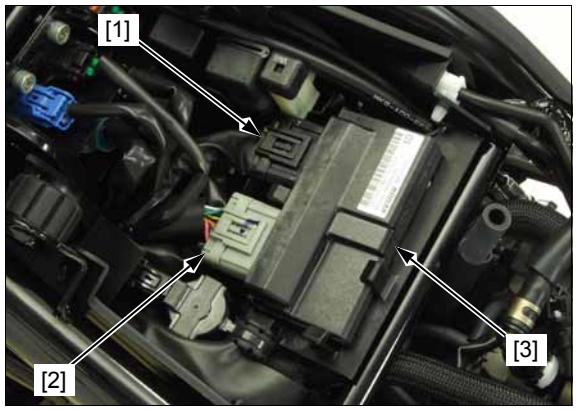
REMOVAL/INSTALLATION

Remove the fuel tank (page 7-9).

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector [1] and 33P (Gray) connector [2].
Remove the ECM [3] from the tank under tray.

Installation is in the reverse order of removal.



ECM POWER/GROUND LINE INSPECTION

NOTE:

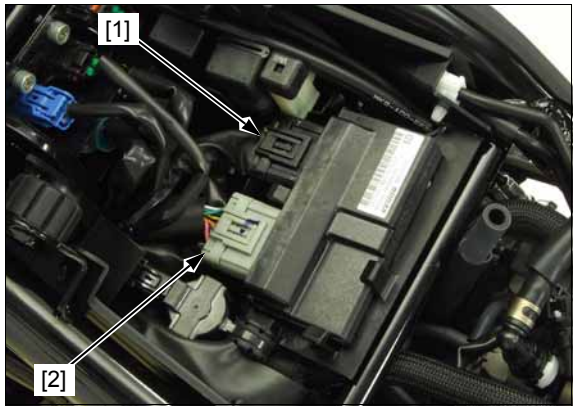
Before starting the inspection, check for loose or poor contact on the ECM 33P (Black) connector and recheck the MIL blinking.

ENGINE DOES NOT START (MIL does not came on and fuel pump does not operate)

1. ECM Power Input Voltage Inspection

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

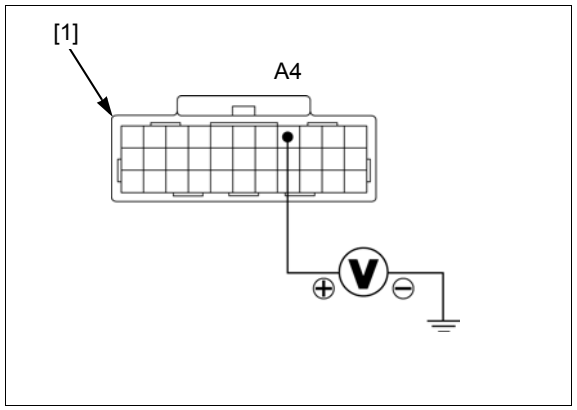
Disconnect the ECM 33P (Black) connector [1] and ECM 33P (Gray) connector [2].



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

Measure the voltage at the ECM 33P (Black) connector [1] of the wire side and ground.

Connection: A4 (+) – Ground (–)
Standard: Battery voltage



TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

Does the standard voltage exist?

YES – GO TO STEP 2.

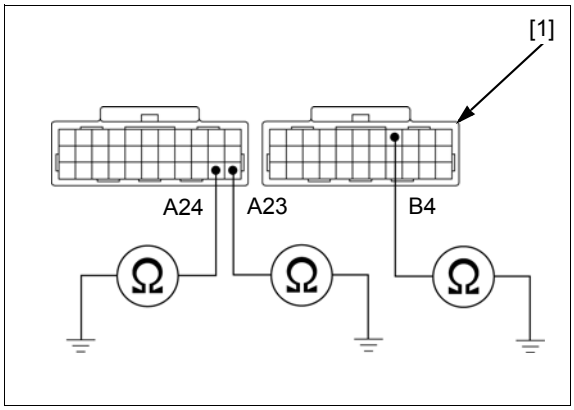
NO –
- Open or short circuit in Black/white wire
- Faulty ignition switch
- Blown main fuse 30 A
- Blown FI 15 A fuse or ENG STOP 7.5 A fuse
- Faulty engine stop switch

2. ECM Ground Line Inspection

Turn the ignition switch OFF.

Check the continuities between the ECM 33P (Black) connector [1] and ECM 33P (Gray) connector [1] of the wire side and ground.

Connection: A23 – Ground
A24 – Ground
B4 – Ground



TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

Is there continuity?

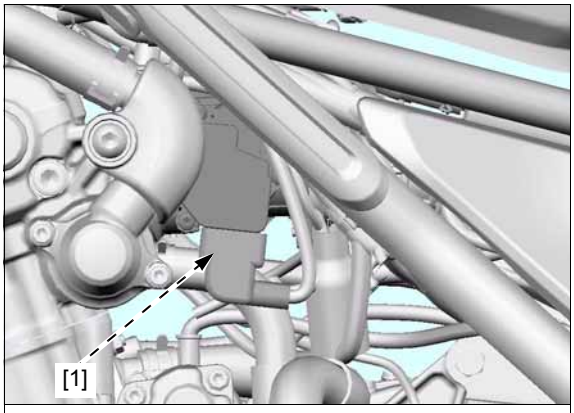
YES – GO TO STEP 3.

NO – • Open circuit in Green/black wire
• Open circuit in Green wires

3. Sensor Unit Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the sensor unit 5P (Black) connector [1].
Check for continuity between the sensor unit 5P (Black) connector of the wire side and ground.

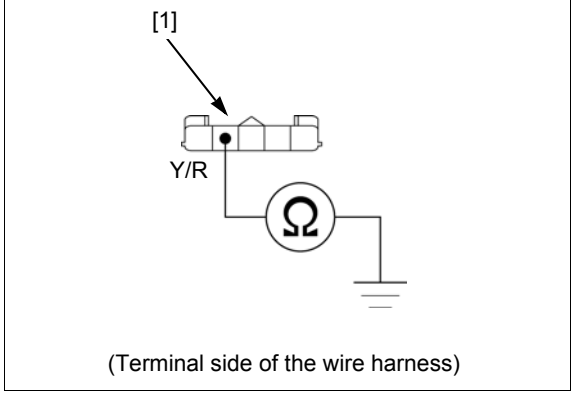
CONNECTION: Yellow/red – Ground



Is there continuity?

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

NO – Short circuit in Yellow/red wire



(Terminal side of the wire harness)

SENSOR UNIT

REMOVAL/INSTALLATION

Remove the heat guard (page 8-6).

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

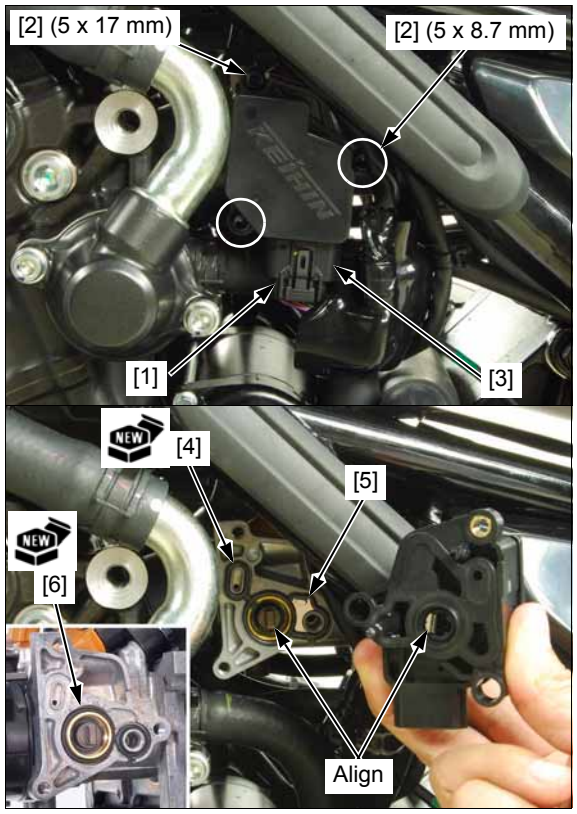
Remove the following:

– torx screws [2]
– sensor unit [3]
– O-ring A [4]
– setting plate [5]
– O-ring B [6]

Installation is in the reverse order of removal.

NOTE:

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



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

Perform the TP sensor reset procedure (page 4-33).

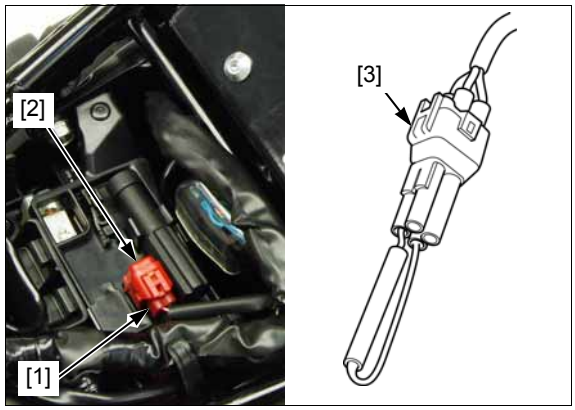
TP SENSOR RESET PROCEDURE

- Make sure that the DTC is not stored in ECM. If the DTC is stored in ECM, TP sensor reset mode won't start by following the procedure below.

1. Remove the single seat (page 2-4).
2. Turn the ignition switch OFF.

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

   TOOL:
   [3] SCS short connector 070PZ-ZY30100



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

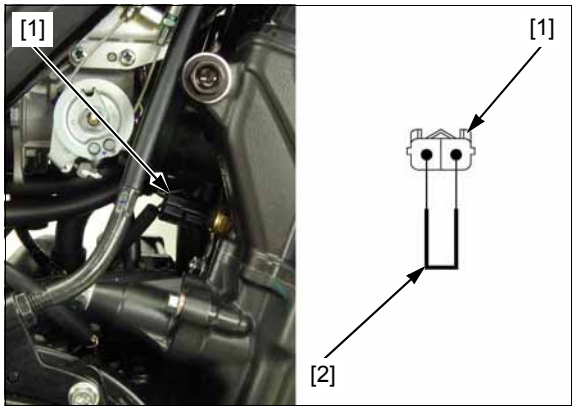
   Short the wire harness side ECT sensor 2P (Black) connector terminals with a jumper wire [2].

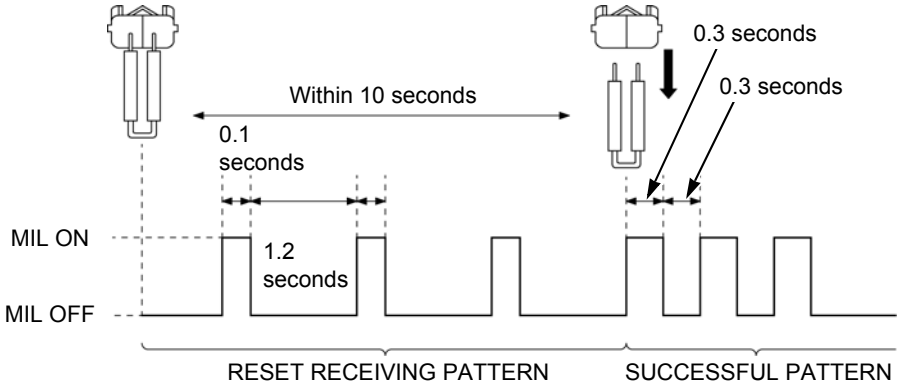
5. Turn the ignition switch ON with the engine stop switch "○", then disconnect the jumper wire from the ECT sensor 2P (Black) connector within 10 seconds while the MIL is blinking (reset receiving pattern).

6. Check if the MIL blinks.

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

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





7. Turn the ignition switch OFF. Remove the special tool and install the DLC into the dummy connector.

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

9. Check the engine idle speed (page 3-12).

ECT SENSOR

REMOVAL/INSTALLATION

Drain the coolant (page 8-5).

Remove the ECT sensor while the engine is cold.

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

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

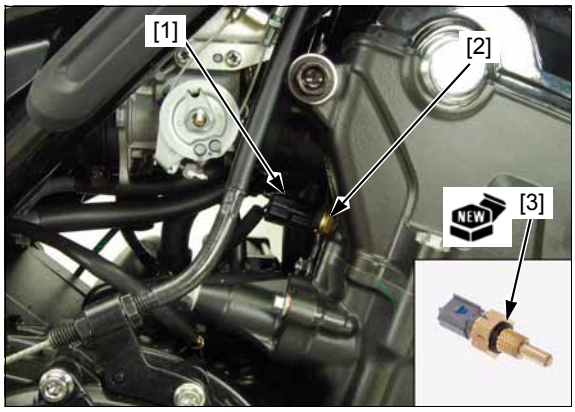
Installation is in the reverse order of removal.

NOTE:

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

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

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



VS SENSOR

REMOVAL/INSTALLATION

Remove the throttle body (page 7-13).

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

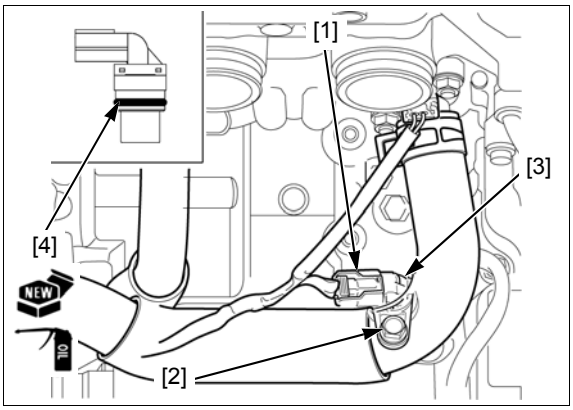
Remove the following:

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

Installation is in the reverse order of removal.

NOTE:

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



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

O_2 SENSOR

REMOVAL/INSTALLATION

NOTICE

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

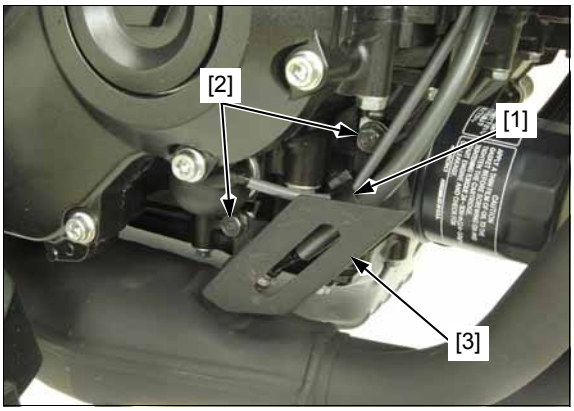
NOTE:

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

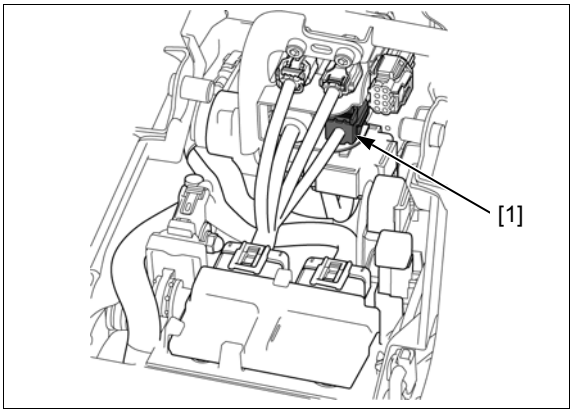
Lift the fuel tank and support it (page 3-4).

Release the wire clip [1].

Remove the two bolts [2] and the sensor protector [3].

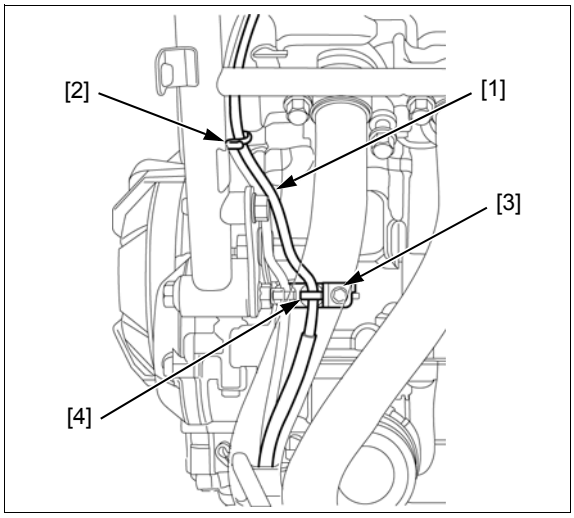


Disconnect the O_2 sensor 4P (Black) connector [1].



Release the O_2 sensor wire [1] from the wire guide [2] and remove it out of the frame.

Remove the wire band [3] (securing the O_2 sensor and oil pressure switch wires) and the band clip [4] from the stay on the crankcase.

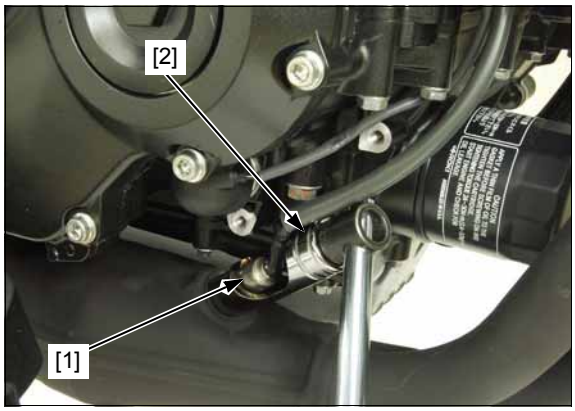


Remove the O_2 sensor [1] using the special tool.

TOOL:
TOOL: FRXM17 (Snap on) or equivalent [2]

Installation is in the reverse order of removal.

TORQUE:
O_2 sensor: 25 N·m (2.5 kgf·m, 18 lbf·ft)



BANK ANGLE SENSOR

REMOVAL/INSTALLATION

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

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

Remove the following:

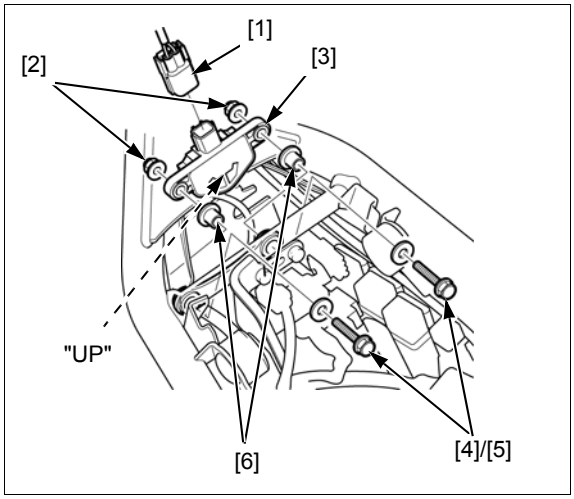
– two nuts [2]
– bank angle sensor [3]
– two bolts [4] and washers [5]
– two collars [6]

Installation is in the reverse order of removal.

NOTE:

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

TORQUE:
Bank angle sensor nut:
8.5 N·m (0.9 kgf·m, 6.3 lbf·ft)



INSPECTION

Remove the bank angle sensor without disconnecting its connector (page 4-36).

SYSTEM INSPECTION WITH MCS

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

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

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

STANDARD:
Horizontal Position: 7.0 – 8.8 V
Approx. 70°: 0.40 – 0.84 V

FUNCTION CHECK

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

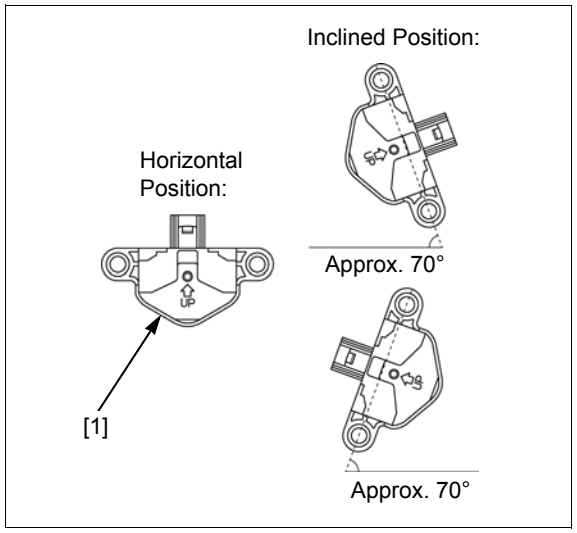
– ECM
– ignition coils

Place the bank angle sensor [1] horizontal.

Start the engine.

Incline the bank angle sensor approximately 70° to the left or right.

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



MAIN RELAY

CIRCUIT INSPECTION

For relay inspection (page 4-38).

Remove the main relay (page 2-8).

RELAY COIL POWER INPUT LINE

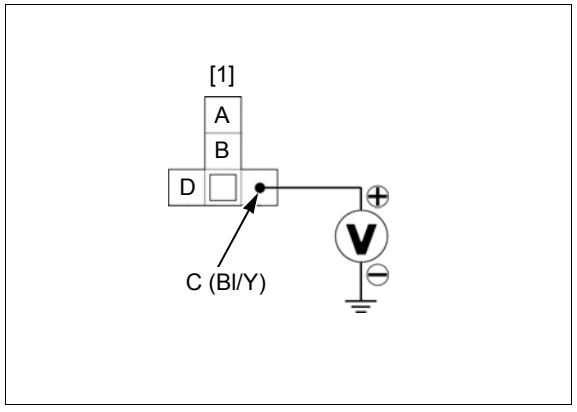
Measure the voltage between the main relay terminal of the relay box [1] and ground.

CONNECTION: C (+) – Ground (–)

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

If there is no voltage, check the following:

– Black/yellow wire between the main relay and engine stop switch for open circuit
– engine stop switch (page 21-14)
– White/yellow wire between the engine stop switch and fuse box for open circuit
– ENG STOP (7.5 A) fuse



RELAY SWITCH POWER INPUT LINE

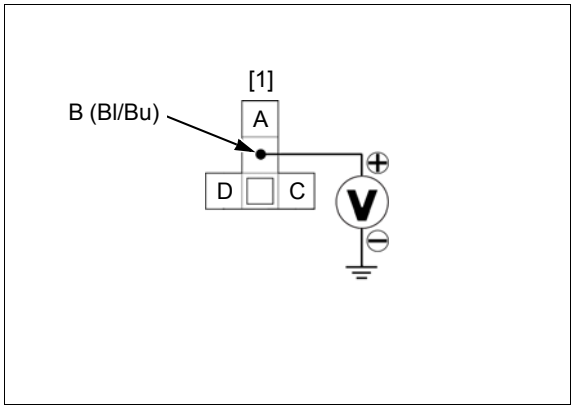
Measure the voltage between the main relay terminal of the relay box [1] and ground.

CONNECTION: B (+) – Ground (–)

There should be battery voltage at all times.

If there is no voltage, check the following:

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



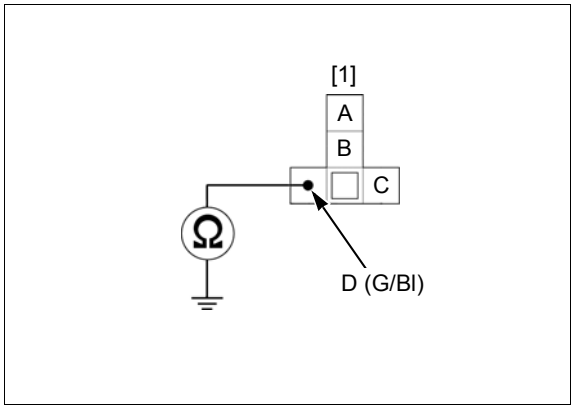
GROUND LINE

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

CONNECTION: D – Ground

There should be continuity at all times.

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

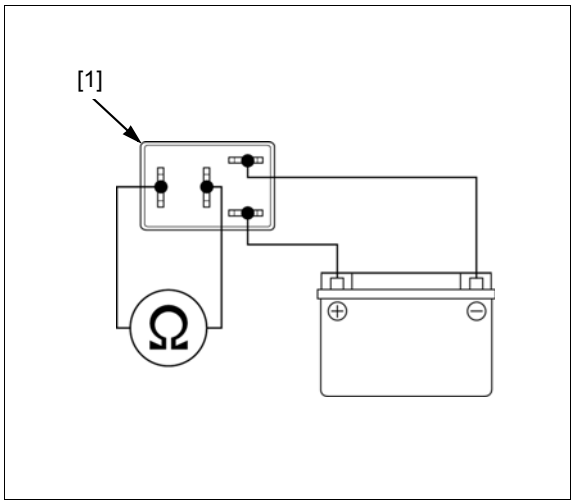


RELAY INSPECTION

Remove the relay (page 2-8).

Connect an ohmmeter and a 12 V battery to the headlight relay [1] terminals as shown.

There should be continuity only when 12 V battery is connected.



5. IGNITION SYSTEM

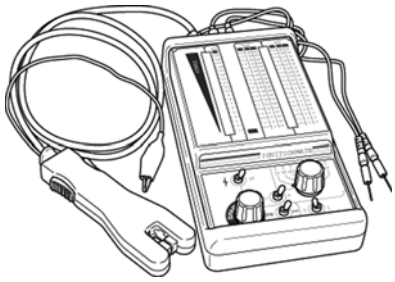
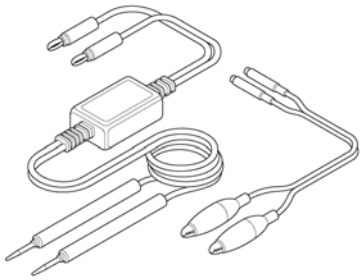
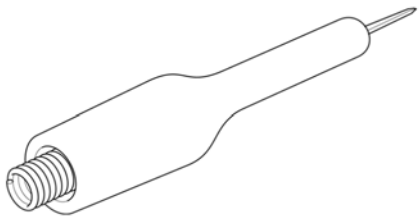
SERVICE INFORMATION

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.*
- When servicing the ignition system, always follow the steps in the troubleshooting table (page 5-3).
- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned to ON position 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.
- For CKP sensor service (page 12-5).
- For ECM service (page 4-31).
- Refer to following components informations:
  – ignition switch (page 21-14)
  – engine stop switch (page 21-14)
  – bank angle sensor (page 4-36)
  – sidestand switch(page 21-17)
  – neutral switch (page 21-16)

TOOLS

IgnitionMate peak voltage tester MTP07-0286 (U.S.A. only) 	Peak voltage adaptor 07HGJ-0020100  (not available in U.S.A.) with commercially available digital multimeter (impedance 10 MΩ?/DCV minimum)	Test probe, 2 pack 07ZAJ-RDJA110 

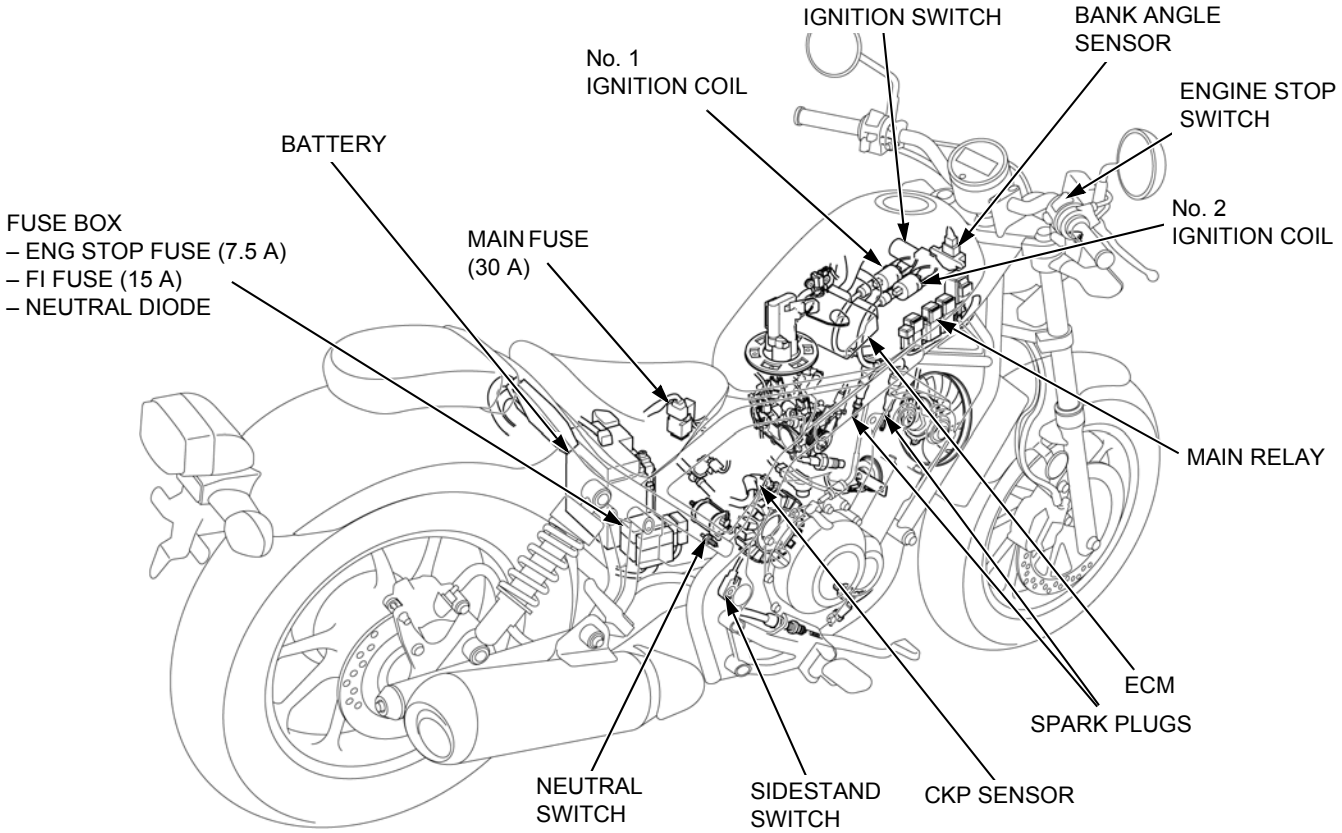
TROUBLESHOOTING

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

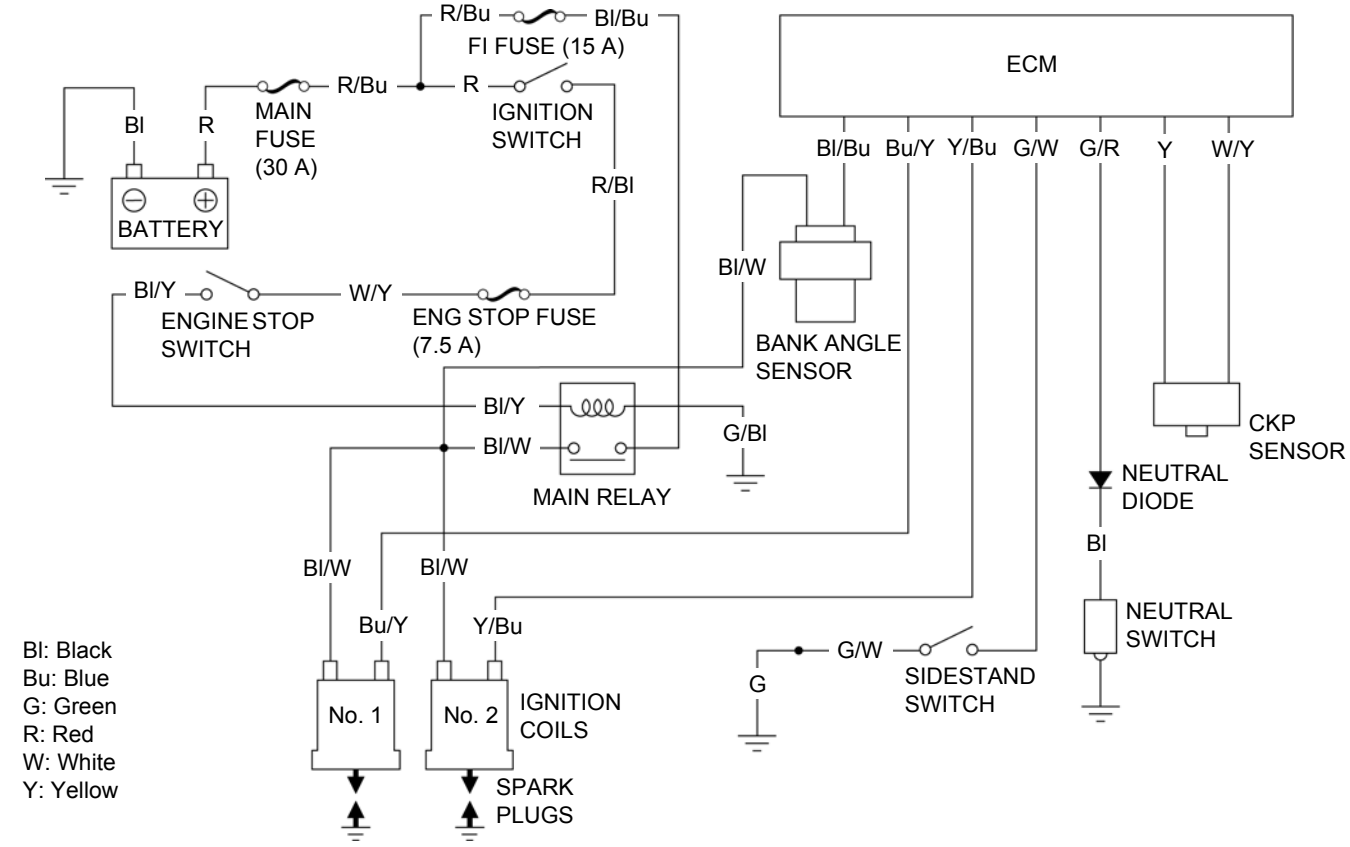
No spark at spark plug

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/white wire between the main relay and ignition coil. 2. Faulty main relay or its related circuits. 3. Loose or poor connection of the primary terminal, or an open circuit in the primary coil. 4. Faulty ECM (in case when the initial voltage is normal with the ECM connector disconnected).
	Initial voltage is normal, but it drops by 2 – 4 V while cranking the engine.	1. Incorrect peak voltage adaptor connections (System is normal if measured voltage is over the specifications with reverse connections). 2. Battery is undercharged (Voltage drops largely when the engine is started). 3. No voltage between the Black/white (+) wire and body ground (–) at the ECM connector or loosen ECM connection. 4. An open circuit or loose connection in the Green or Green/black wire of the ECM. 5. An open circuit or loose connection in the Blue/yellow or Yellow/blue wire between the ignition coil and ECM. 6. Faulty sidestand switch or neutral switch. 7. Loose or poor connection or an open circuit in No. 6 related wires. – Sidestand switch line: Green/white and Green – Neutral switch line: Green/red and Black 8. Faulty CKP sensor (Measure peak voltage). 9. Faulty ECM (in case when above No. 1 through 8 are normal).
	Initial voltage is normal but there is no peak voltage while cranking the engine.	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.
CKP sensor	Peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too low (Battery is undercharged). 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). 4. Faulty CKP sensor (in case when above No. 1 through 3 are normal).
	No peak voltage	1. Faulty peak voltage adaptor. 2. Faulty CKP sensor.

SYSTEM LOCATION



SYSTEM DIAGRAM

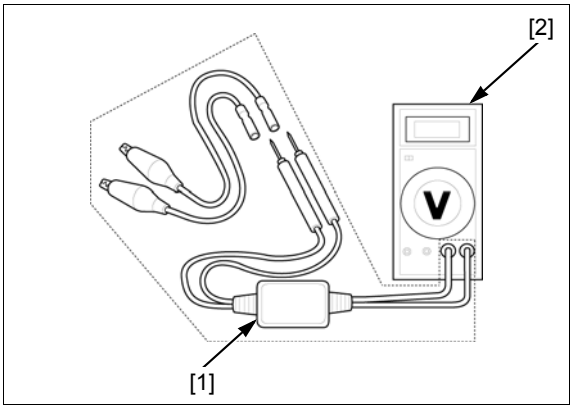


IGNITION SYSTEM INSPECTION

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 the peak voltage tester (U.S.A. only) is used, follow the manufacturer's instructions.

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



TOOL:

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

IGNITION COIL PRIMARY PEAK VOLTAGE

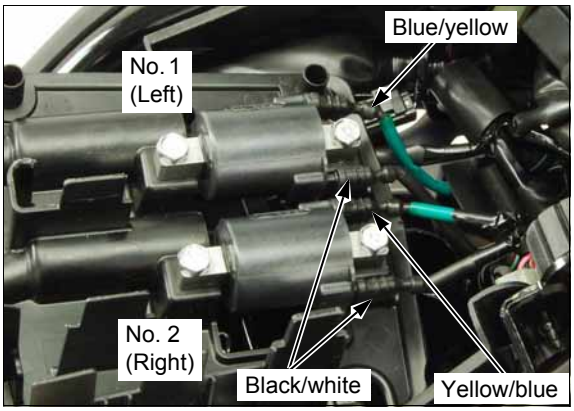
NOTE:

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

Remove the tank under tray (page 2-9).

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

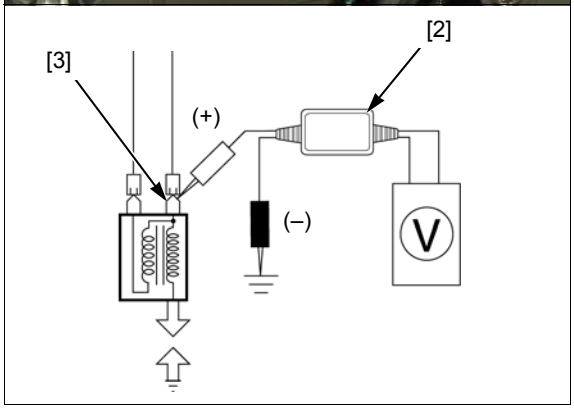
– ECM 33P connectors
– ignition coils
– ignition switch 2P connector
– EOP switch 2P (Black) connector
– bank angle sensor 2P (Black) connector
– VS sensor 3P (Black) connector
– O_2 sensor 4P (Black) connector



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

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

CONNECTION:
No. 1 (left) ignition coil:
Blue/yellow (+) – Ground (–)
No. 2 (Right) ignition coil:
Yellow/blue (+) – Ground (–)



Turn the ignition switch ON with the engine stop switch "○".
Check the initial voltage at this time.
The battery voltage should be measured.
If the initial voltage cannot be measured, follow the checks described in the troubleshooting table (page 5-3).

Shift the transmission into neutral.

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

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

PEAK VOLTAGE: 100 V minimum

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

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

Install the removed parts in the reverse order of removal.

CKP SENSOR PEAK VOLTAGE

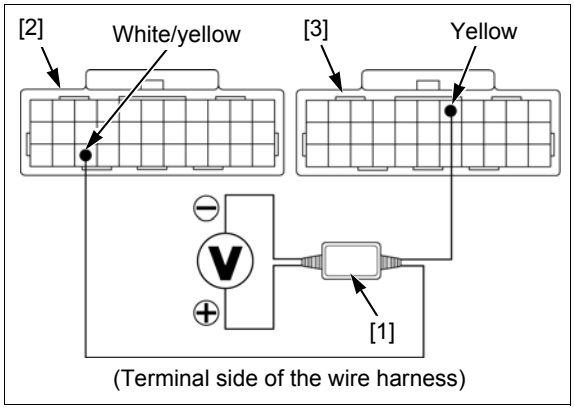
NOTE:
- Check the cylinder compression and check that the spark plugs are installed correctly in the cylinder head.

Disconnect the ECM 33P connectors (page 4-31).

Connect the peak voltage adaptor [1] or Imrie tester probes to the ECM 33P (Black) connector [2] terminal and ECM 33P (Gray) connector [3] terminal of the wire harness side, using the test probes (page 4-7).

TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

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



(Terminal side of the wire harness)

Shift the transmission into neutral.
Turn the ignition switch ON with the engine stop switch "○".

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

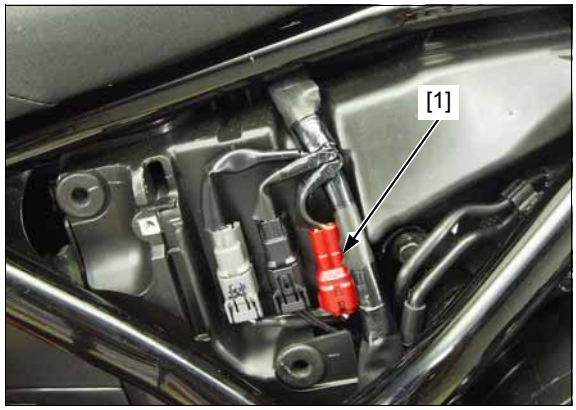
PEAK VOLTAGE: 0.7 V minimum

If the peak voltage measured at the ECM connectors is abnormal, measure the peak voltage at the CKP sensor connector.

Remove the right side cover (page 2-4).

Turn the ignition switch OFF.

Disconnect the CKP sensor 2P (Red) connector [1].



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

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

In the same manner as at the ECM 33P connectors, measure the peak voltage and compare it to the voltage measured at the ECM 33P connectors.

NOTE:

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

For CKP sensor replacement (page 12-5).

Install the removed parts in the reverse order of removal.

IGNITION TIMING

NOTE:

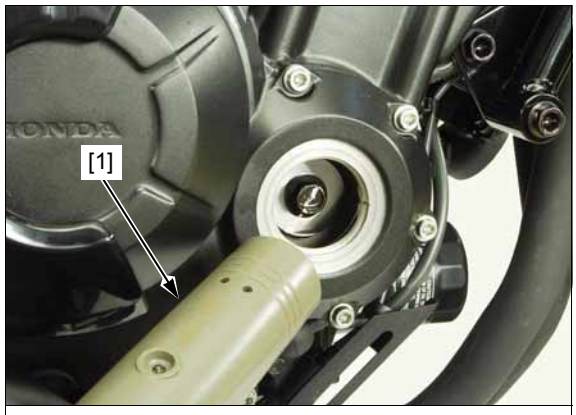
- The ignition timing cannot be adjusted since the ECM is factory preset.

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

Stop the engine and remove the crankshaft hole cap.

Read the instructions for timing light operation.

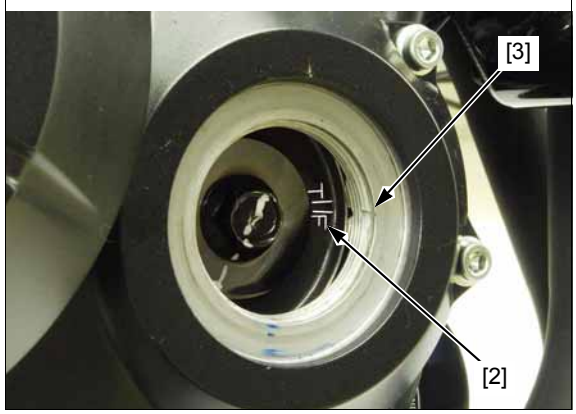
Lift and support the fuel tank (page 3-4) and connect the timing light [1] to the spark plug wire.



Start the engine and let it idle.

IDLE SPEED: 1,200 ± 100 rpm

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



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

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

Tighten the crankshaft hole cap to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Remove the timing light in the reverse order of connection.

IGNITION COIL

REMOVAL/INSTALLATION

Remove the fuel tank under tray (page 2-8).

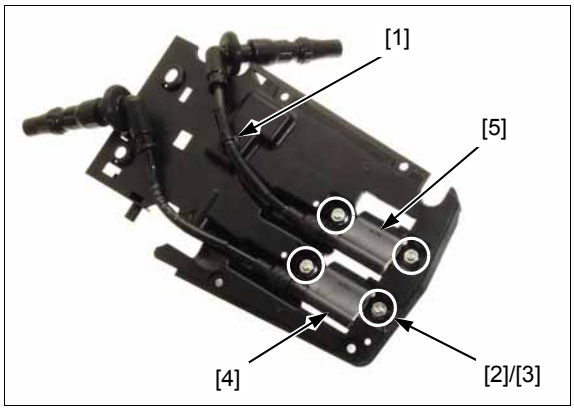
Release the wire band boss [1] from the fuel tank under tray.

Remove the nuts [2] and bolts [3].
Remove the No. 1 (left) ignition coil [4] and then the No. 2 (right) ignition coil [5].

Installation is in the reverse order of removal.

NOTE:

- Do not interchange the ignition coils.
  - No. 1 (left) ignition coil; Without wire band
  - No. 2 (right) ignition coil; With wire band



6. ELECTRIC STARTER

SERVICE INFORMATION

GENERAL

NOTICE

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

- The starter motor can be serviced with the engine installed in the frame.
- Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- When servicing the starter system, always follow the steps in the troubleshooting flow chart (page 6-3).
- Refer to the following components information:
  - ignition switch (page 21-14)
  - starter switch (page 21-14)
  - engine stop switch (page 21-14)
  - neutral switch (page 21-16)
  - sidestand switch (page 21-17)
  - clutch switch (page 21-15)

TROUBLESHOOTING

NOTE:

- Make sure the battery is fully charged and in good condition.
- Check for a blown main fuse (30 A) and sub-fuse (ENG STOP; 7.5 A). (Check for a short circuit in the related wires if the fuse is blown again)
- The starter motor should operate with the following conditions:
  – transmission in neutral or clutch lever squeezed with sidestand retracted
  – ignition switch turned ON with engine stop switch turned "⟳"
  – starter switch pushed

Starter motor does not turn

1. **Starter Relay Switch Operation**

   Check the operation of the starter relay switch as above starting conditions (page 6-9).
   You should hear the relay "CLICK" when the starter switch button is depressed.

   Is there a "CLICK"?

   YES – GO TO STEP 2.

   NO – GO TO STEP 3.

2. **Starter Motor Inspection**

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

   Does the starter motor turn?

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

   NO – Faulty starter motor (page 6-6)

3. **Relay Coil Ground Lines Inspection**

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

   Is there continuity?

   YES – GO TO STEP 4.

   NO –
   - Loose or poor contact connector
   - Open circuit in wire harness
   - Faulty neutral diode (page 6-10)
   - Faulty neutral switch (page 21-16)
   - Faulty sidestand switch (page 21-17)
   - Faulty clutch switch (page 21-15)

4. **Starter Relay Input Voltage Inspection**

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

   Is the starter relay switch normal?

   YES – GO TO STEP 5.

   NO –
   - Faulty ignition switch (page 21-14)
   - Faulty starter switch (page 21-14)
   - Faulty engine stop switch (page 21-14)
   - Loose or poor contact connector
   - Open circuit in wire harness

5. **Starter Relay Switch Continuity Inspection**

   Check the starter relay switch (page 6-10).

   Is the starter relay switch normal?

   YES – Loose or poor contact starter relay switch connector

   NO – Faulty starter relay switch

The starter motor turns when the transmission is in neutral, but does not turn with the transmission in any position except neutral, with the sidestand up and the clutch lever pulled in.

1. Clutch Switch Inspection

Check the clutch switch operation (page 21-15).

Is the clutch switch operation normal?

YES – GO TO STEP 2.

NO – Faulty clutch switch

2. Sidestand Switch Inspection

Check the sidestand switch operation (page 3-22).

Is the sidestand switch operation normal?

YES – • Loose or poor contact connector
• Open circuit in wire harness

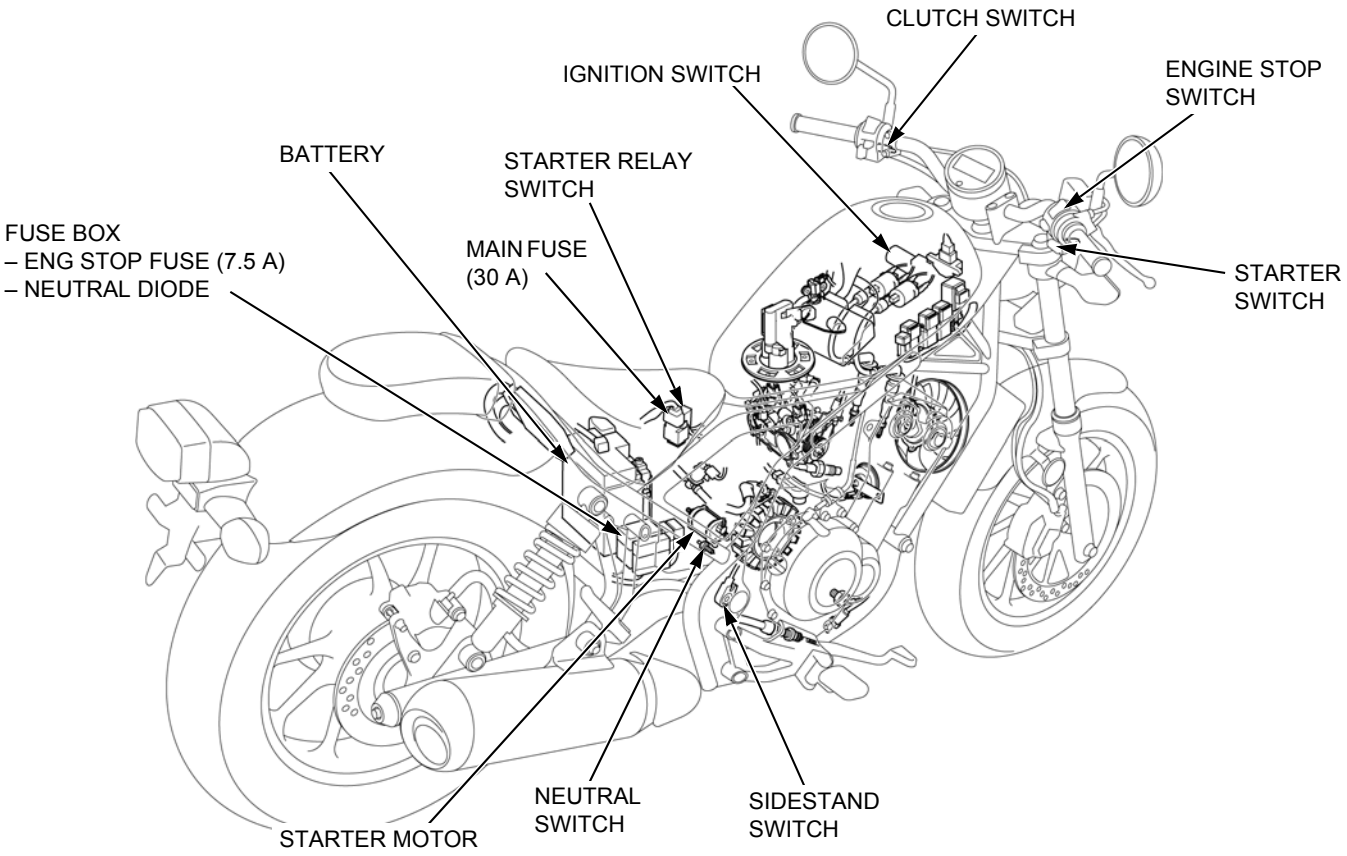
NO – Faulty sidestand switch

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

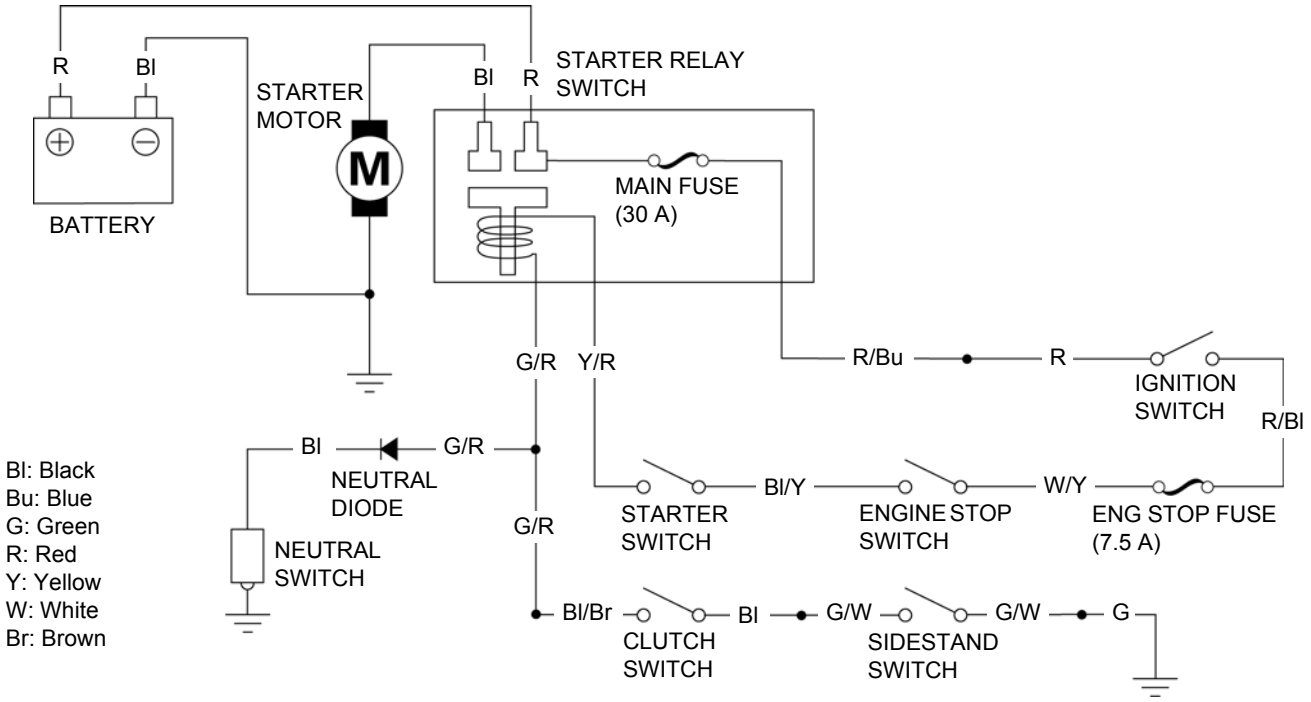
Starter motor turns, but engine does not turn
- Starter motor is running backwards
  – Case assembled improperly
  – Terminals connected improperly
- Faulty starter clutch
- Damaged or faulty reduction gear

Starter relay switch "Clicks", but engine does not turn over
- Crankshaft does not turn due to engine problems

SYSTEM LOCATION



SYSTEM DIAGRAM



STARTER MOTOR

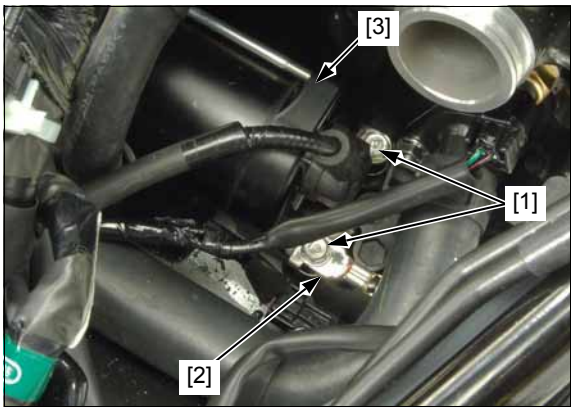
REMOVAL

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

Remove the throttle body (page 7-13).

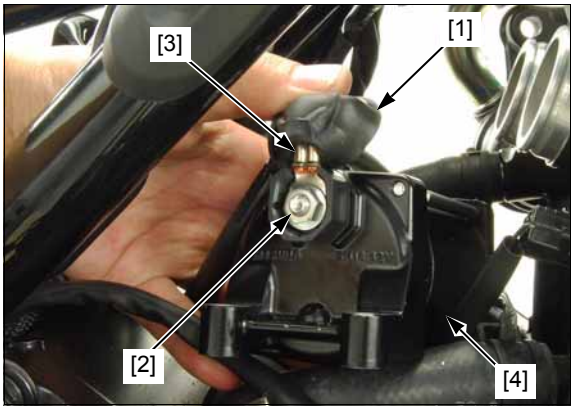
Remove the two mounting bolts [1] and negative (–) cable [2].

Remove the starter motor [3] from the crankcase.



Release the terminal cap [1].

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

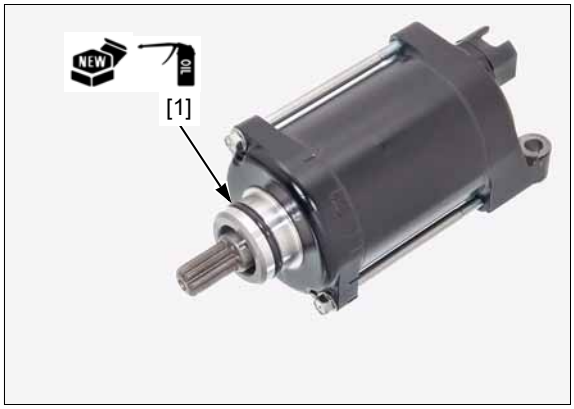


Remove the O-ring [1].

Installation is in the reverse order of removal.

NOTE:

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

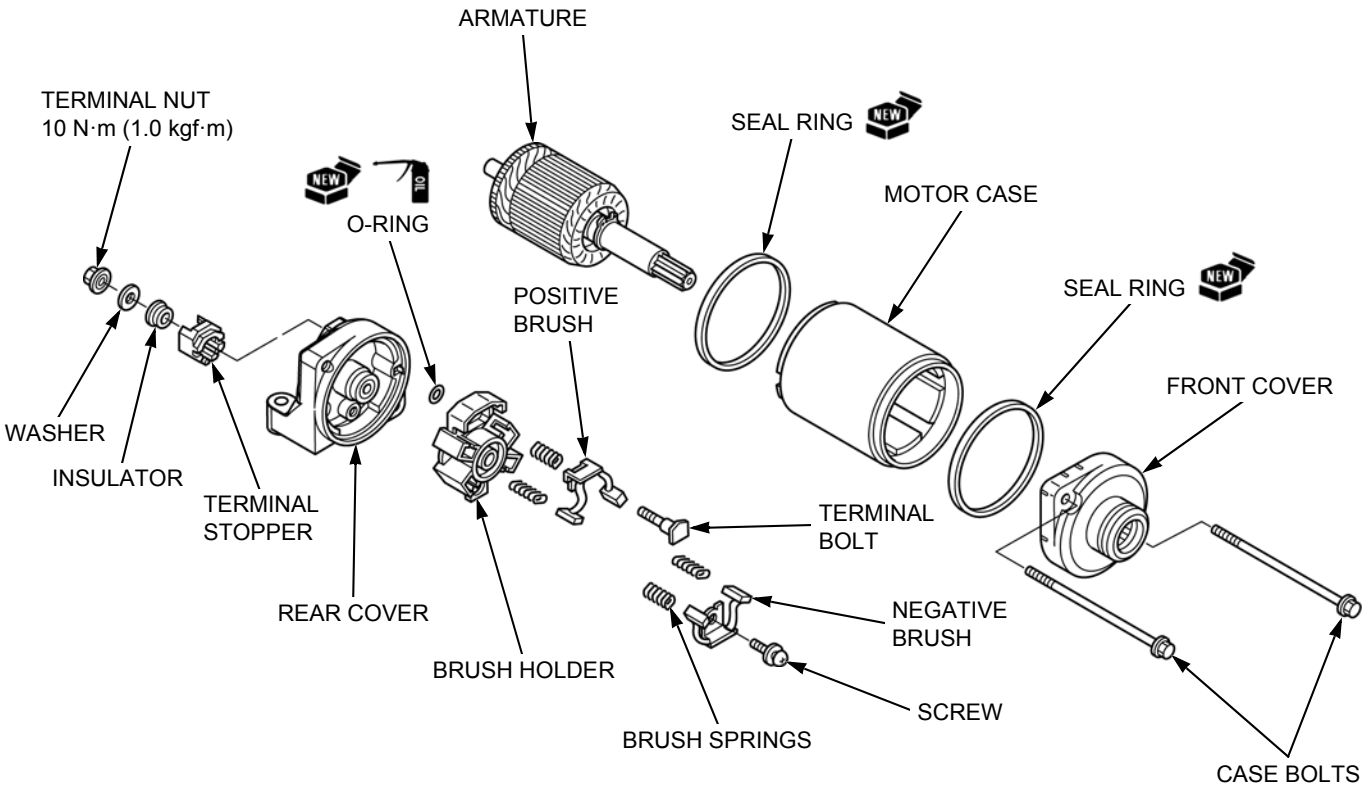


DISASSEMBLY/ASSEMBLY

Disassemble and assemble the starter motor as shown in the following illustration.

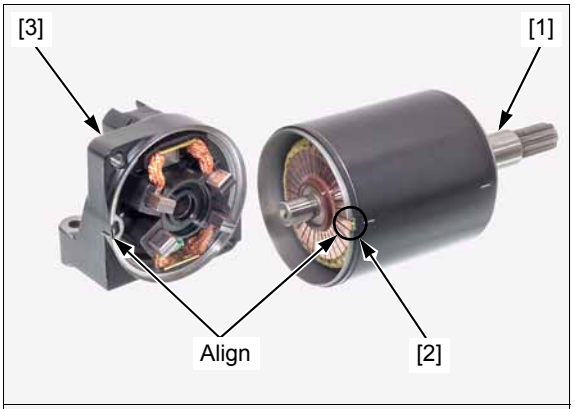
NOTICE

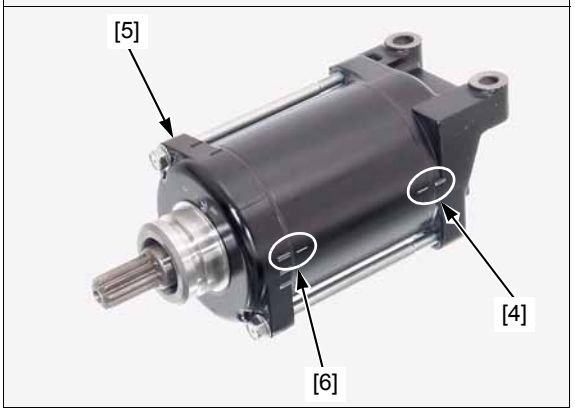
The coil may be damaged if the magnet pulls the armature against the motor case.



NOTE:

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





INSPECTION

FRONT COVER

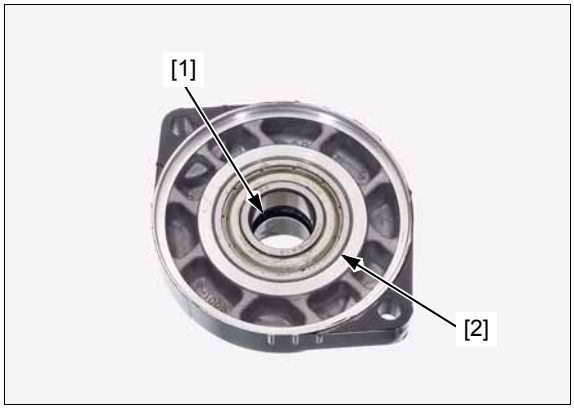
Check the oil seal [1] in the front cover for deterioration, wear or damage.

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

The bearings should turn smoothly and quietly.

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

Replace the starter motor as an assembly if necessary.

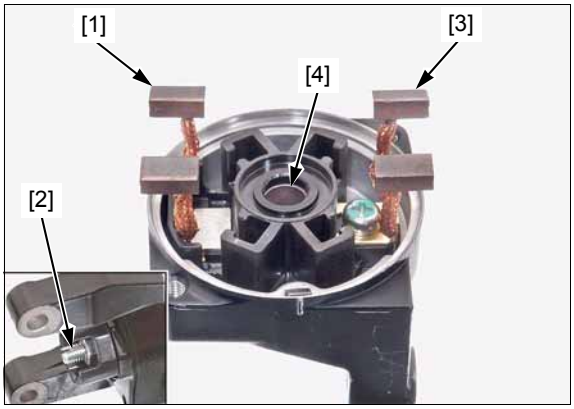


REAR COVER

Check for continuity or no continuity for each part of rear cover as follows:

– between the positive brush [1] and cable terminal [2]; there should be continuity.
– between the cable terminal and rear cover; there should be no continuity.
– between negative brush [3] and rear cover; there should be continuity.

Check the bushing [4] in the rear cover for wear or damage.



ARMATURE

Do not use emery or sand paper on the commutator.

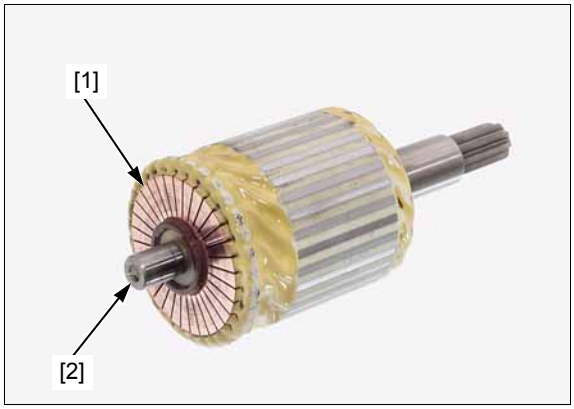
Clean the metallic debris off the commutator bars [1].

Check the commutator bars for discoloration.

Check for continuity on the armature as follows:

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

Replace the starter motor as an assembly if necessary.



STARTER RELAY SWITCH

INSPECTION

Remove the left side cover (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 using a procedure below.

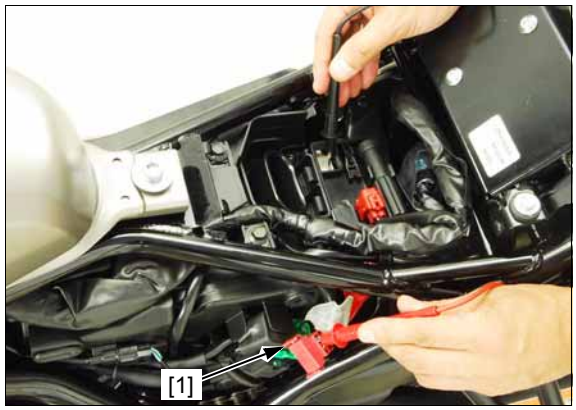
GROUND LINE

Turn the ignition switch OFF.

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

Check for continuity between the Green/red wire of the wire harness side (ground line) and ground.

If there is continuity when the transmission is in neutral or when the clutch is disengaged and the sidestand is retracted, the ground circuit of the relay coil is normal. (In neutral, there is a slight resistance due to the diode.)

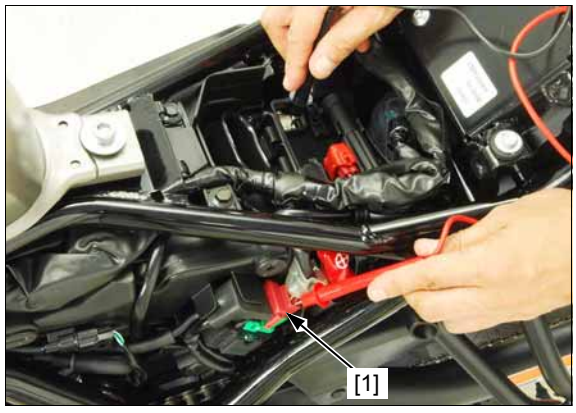


STARTER RELAY INPUT VOLTAGE

Connect the starter relay switch 4P (Red) connector [1]. Turn the ignition switch ON and engine stop switch "○".

Measure the voltage between the Yellow/red (+) wire terminal at the starter relay switch 4P (Red) connector and ground (–).

If the battery voltage appears only when the starter switch is pushed with the ignition switch ON and engine stop switch "○", the starter relay input voltage is normal.

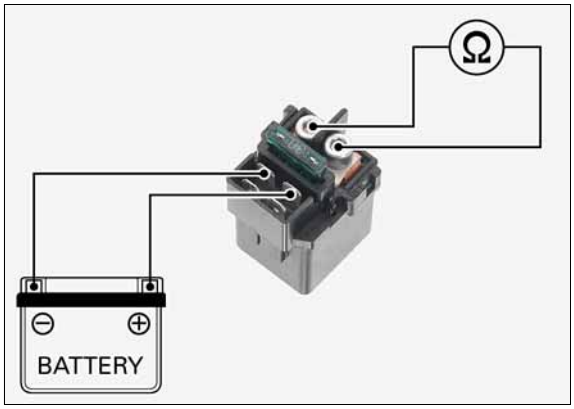


OPERATION CHECK

Remove the starter relay switch (page 6-10).

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

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



REMOVAL/INSTALLATION

Remove the left side cover (page 2-4).

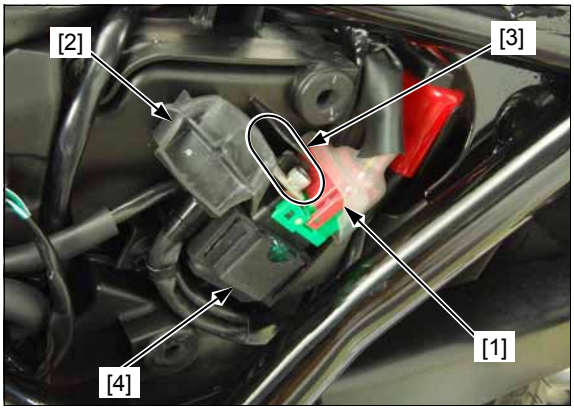
Disconnect the negative (–) cable from the battery (page 20-5).

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

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

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

Installation is in the reverse order of removal.

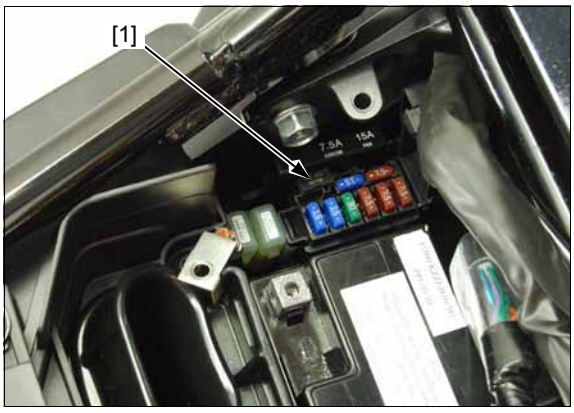


NEUTRAL DIODE

INSPECTION

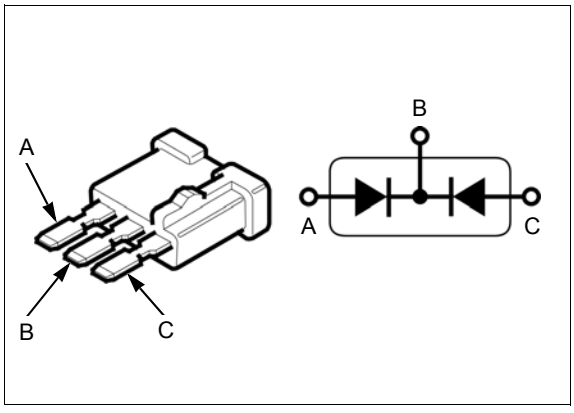
Remove the single seat (page 2-4).

Open the fuse box cover and remove the neutral diode [1].



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

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



7. FUEL SYSTEM

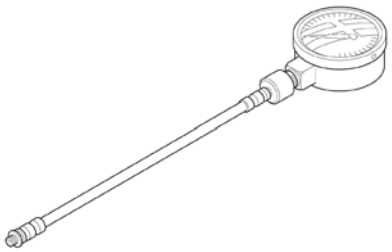
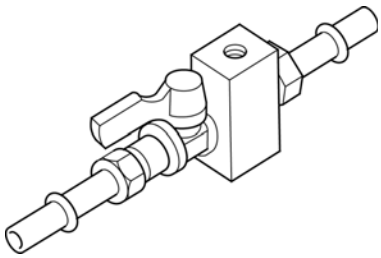
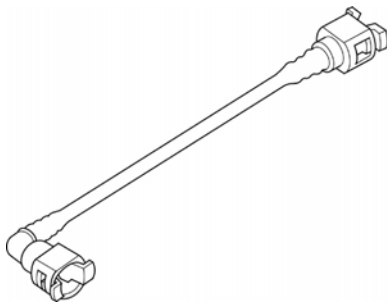
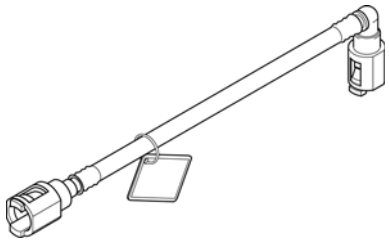
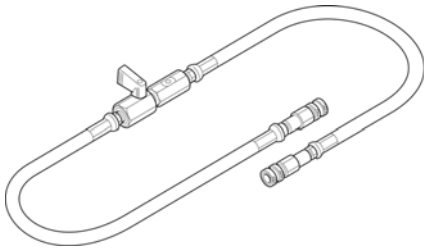
SERVICE INFORMATION

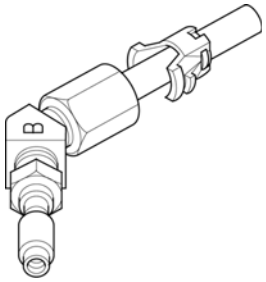
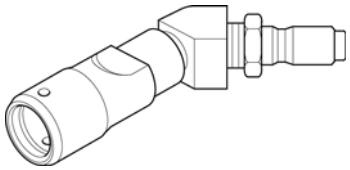
GENERAL

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- Before disconnecting the fuel feed hose, relieve fuel pressure from the system by disconnecting the quick connect fitting from the system (page 7-5).
- Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.
- Do not snap the throttle valve from full open to full close after the throttle cable has been removed. It may cause incorrect idle operation.
- Seal the intake ports with tape or 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.
- When disassembling the PGM-FI system parts, note the location of the O-rings. Replace them with new ones upon reassembly.
- For fuel level sensor inspection (page 21-13).

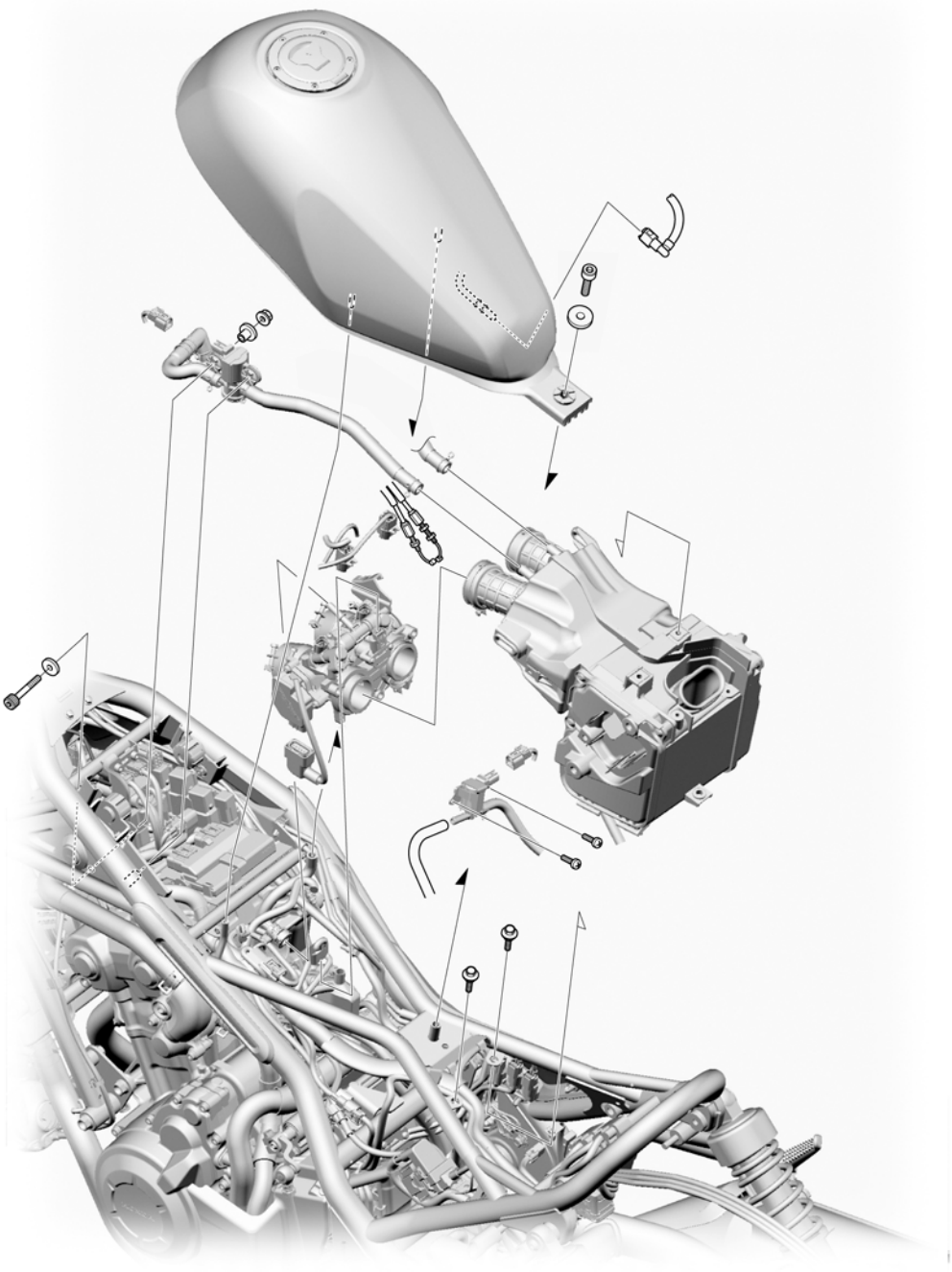
Bl = Black	G = Green	Lg = Light Green	R = Red	Y = Yellow
Br = Brown	Gr = Gray	O = Orange	V = Violet	
Bu = Blue	Lb = Light Blue	P = Pink	W = White	

TOOLS

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

Adaptor, male "C" 07AAJ-S6MA300 (U.S.A. only) 	Adaptor, female "C" 07AAJ-S6MA500 (U.S.A. only) 

COMPONENT LOCATION



FUEL LINE INSPECTION

FUEL PRESSURE RELIEVING

NOTE:

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

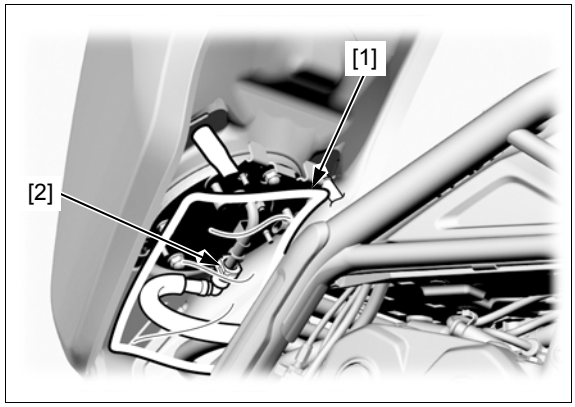
1. Turn the ignition switch OFF.
2. Lift the fuel tank and support it (page 3-4).
3. Disconnect the fuel pump 3P (Black) connector [1].
4. Start the engine, and let it idle until the engine stalls.
5. Turn the ignition switch OFF.

QUICK CONNECT FITTING REMOVAL

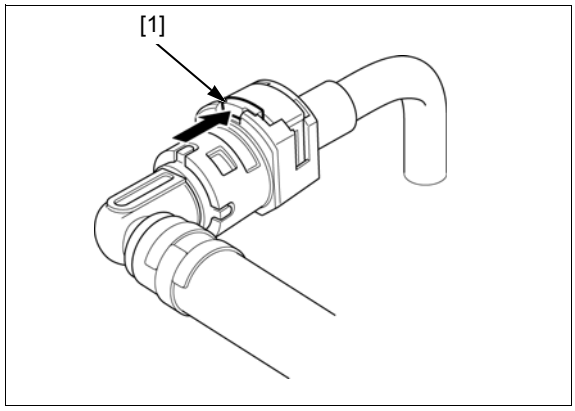
NOTE:

- Clean around the quick connect fitting before disconnecting the fuel feed hose, and be sure that no dirt is allowed to enter into the fuel system.
- Do not bend or twist the fuel feed hose.

1. Relieve the fuel pressure (page 7-5).
2. Disconnect the negative (–) cable from the battery (page 20-5).
3. Lift the fuel tank and support it (page 3-4).
4. Place a shop towel [1] over the quick connect fitting [2].



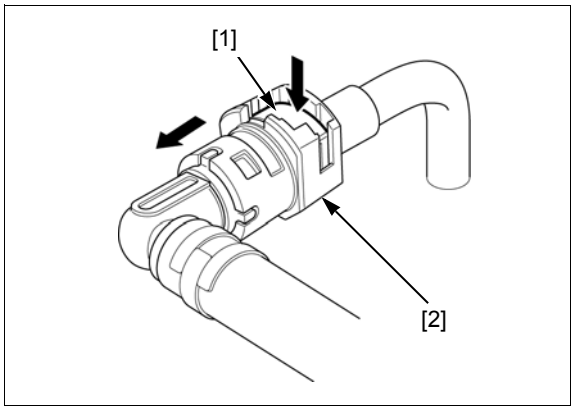
5. Push the retainer tab [1] forward.



6. Press down the retainer [1] and hold.

   Disconnect the connector [2] from the fuel pump joint/fuel injector joint.

   Check the retainer condition and replace it if necessary.



NOTE:

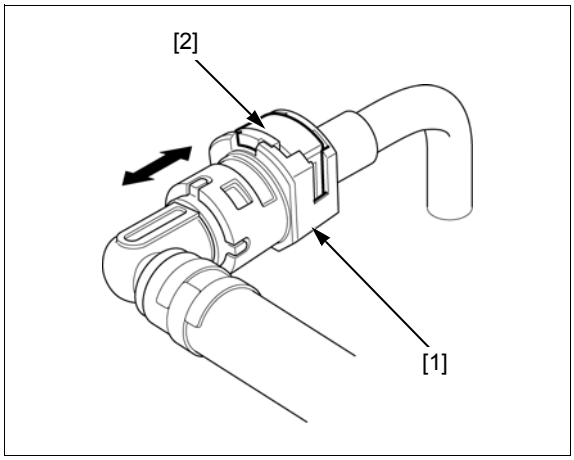
- Prevent the remaining fuel in the fuel feed hose from flowing out, using a shop towel.
- Be careful not to damage the hose or other parts.
- Do not use tools.
- If the connector does not move, alternately pull and push the connector until it comes off easily.

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

QUICK CONNECT FITTING INSTALLATION

- Do not bend or twist fuel feed hose.

1. Press the connector [1] onto the fuel pump joint/fuel injector joint until the retainer [2] locks with a "CLICK".



NOTE:

- Align the quick connect fitting with the pipe.

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

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

FUEL PRESSURE NORMALIZATION

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

NOTE:

- Do not start the engine.

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

  Turn the ignition switch OFF.

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

FUEL PRESSURE TEST

NOTE:

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

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

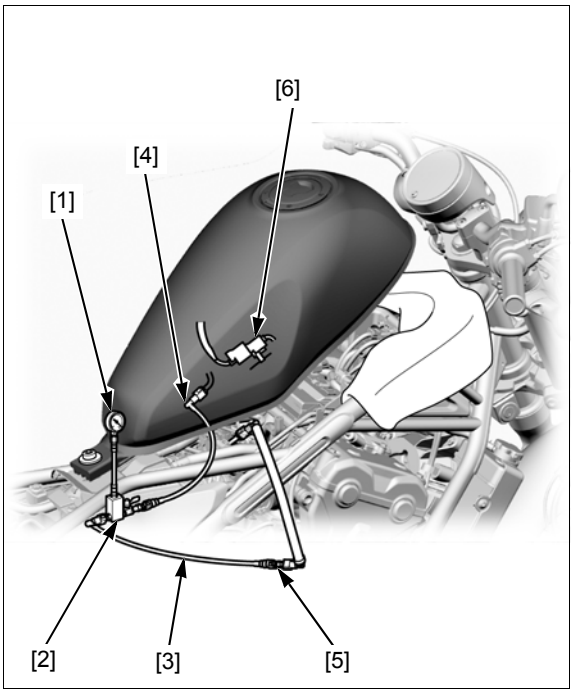
Attach the special tools between the fuel feed hose and fuel pipe of the fuel pump.

Except U.S.A. TOOLS:

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

U.S.A. TOOLS:

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



Lower the fuel tank until the fuel pump 3P (Black) connector [6] can be connected and support it.

Temporarily connect the fuel pump 3P (Black) connector and battery negative (–) cable.

Start the engine and let it idle.

Read the fuel pressure.

STANDARD:

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

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

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

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

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

Remove the special tools.

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

FUEL FLOW INSPECTION

NOTE:

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

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

Wipe off spilled out gasoline.

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

Lower the fuel tank until the fuel pump 3P (Black) [2] connector can be connected and support it.

Temporarily connect the fuel pump 3P (Black) connector and battery negative (–) cable.

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

NOTE:

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

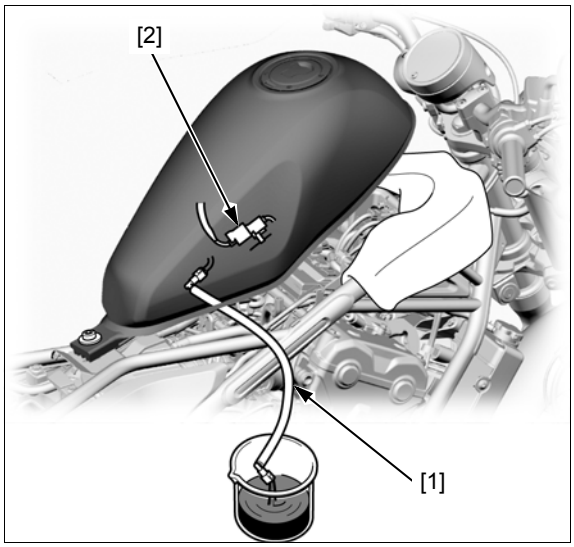
Measure the amount of fuel flow.

Amount of fuel flow:
319 cm³ (10.8 US oz, 11.2 Imp oz) minimum/ 10 seconds at 12 V

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

– fuel feed hose for clogs
– fuel tank breather hose (tank side) for pinched or clogs (A, CM models)
– fuel filter for clogs
– fuel pump (page 7-10)

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



FUEL TANK

REMOVAL/INSTALLATION

Relieve the fuel pressure and disconnect the quick connect fitting (page 7-5).

Release the fuel feed hose [1] from the hose guide [2].

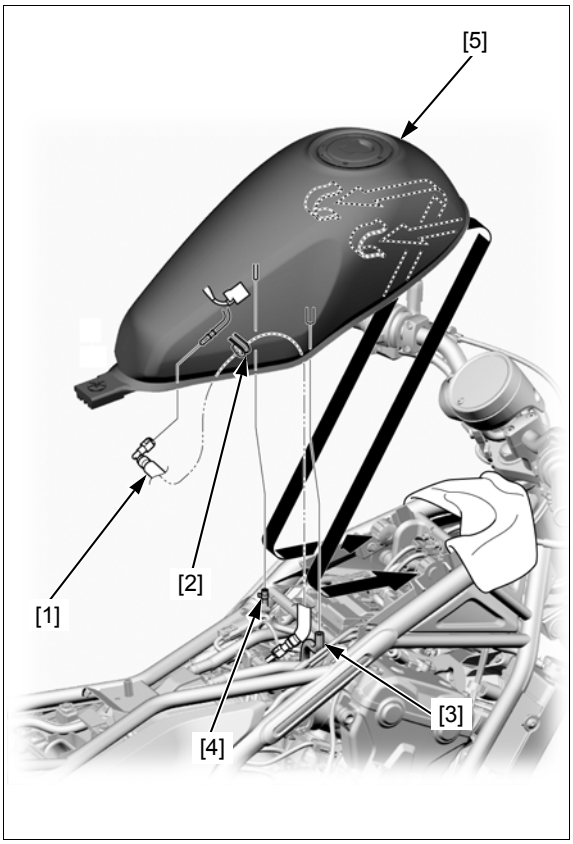
Disconnect the following:

– fuel tank drain hose [3]
– AC model: EVAP canister hose [4]
– A, CM models: fuel tank breather hose [4]

Remove the fuel tank [5].

Install the fuel tank in the reverse order of removal.

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



FUEL FILLER CAP

REMOVAL/INSTALLATION

Remove the following:

– socket bolt [1]
– fuel filler cap [2]
– breathe seal [3]

A pressure release can be heard when opening the fuel cap, but this is not blockage of the passage.

If checking for clog in the passage of the fuel tank side is necessary, apply air pressure to the breather hose end with the fuel filler cap opened.

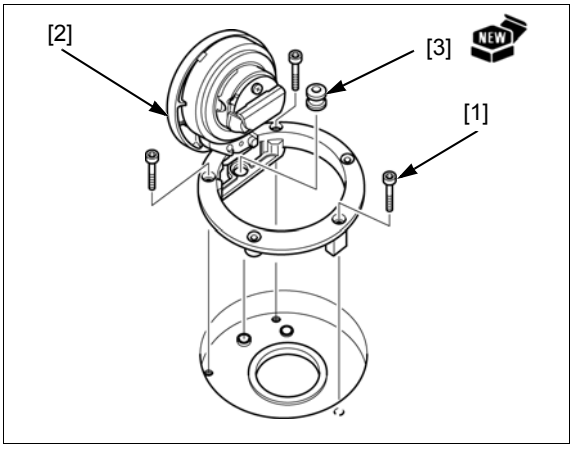
NOTE:

• Replace the breather seal with a new one.

Installation is in the reverse order of removal.

TORQUE:

Fuel filler cap mount 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:

Turn the ignition switch OFF.

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

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

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

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

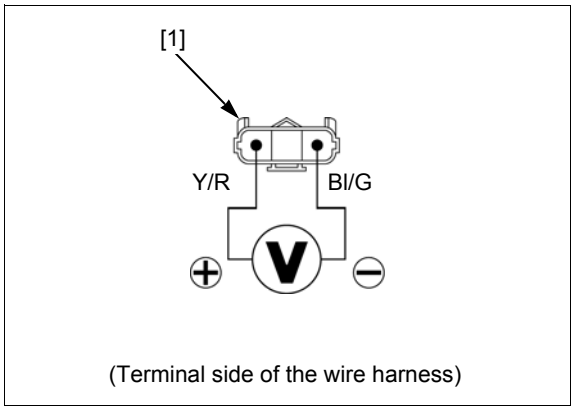
CONNECTION: Yellow/Red (+) – Black/Green (–)

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:

– Black/green wire between the fuel pump and ground for open circuit
– Yellow/red wire between the fuel pump relay and fuel pump for open circuit
– fuel pump relay and its circuits (page 7-23)
– ECM (page 4-31)



(Terminal side of the wire harness)

REMOVAL/INSTALLATION

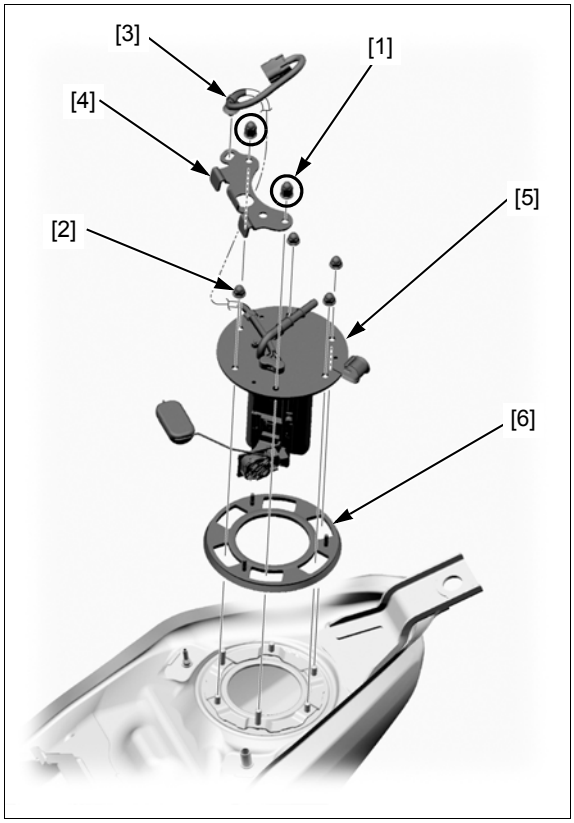
Remove the fuel tank (page 7-9).

Clean around the fuel pump.

Loosen the two mounting nuts (long) [1] and four mounting nuts (short) [2] in a crisscross pattern in several steps and remove them.

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

Remove the band clip [3], fuel pump stay [4], fuel pump unit [5] and the rubber seal [6].

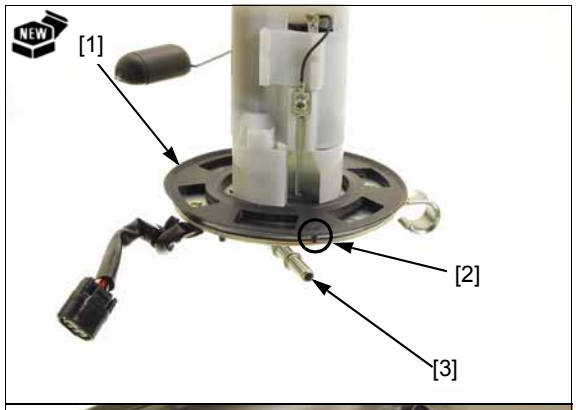


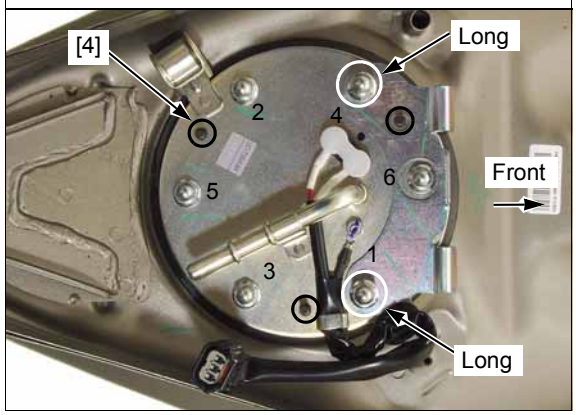
Installation is in the reverse order of removal.

NOTE:

- Replace the rubber seal [1] with a new one.
- Clean the rubber seal seating areas of the fuel tank and fuel pump base plate, and be sure that no foreign materials are allowed.
- Place the rubber seal with the boss [2] facing toward the fuel pipe [3] and pull the three retaining pins [4] in the holes securely to seat it on the base plate.
- Tighten the six mounting nuts to the specified torque in the sequence as shown.

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



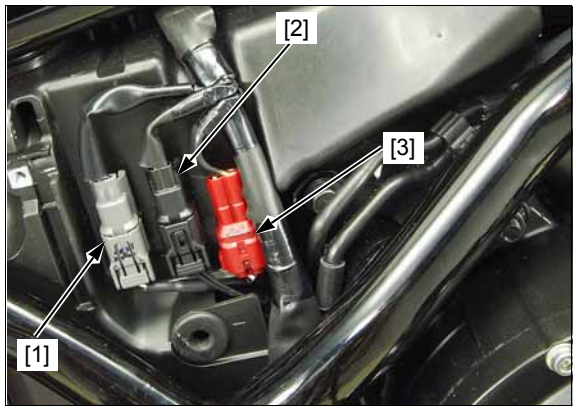


AIR CLEANER HOUSING

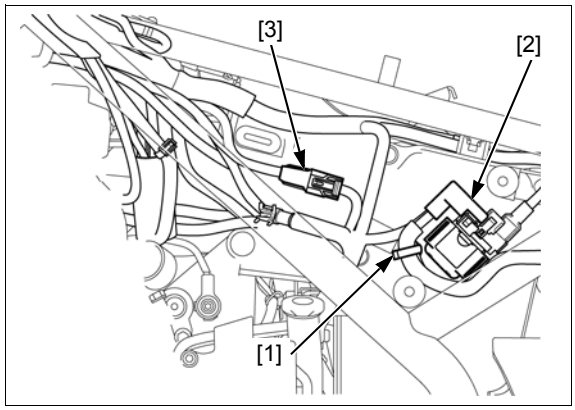
REMOVAL/INSTALLATION

Remove the following:

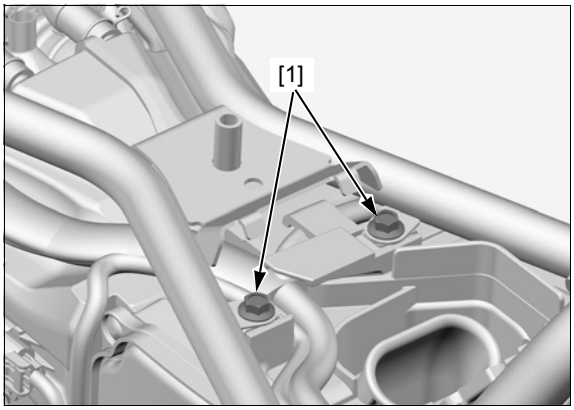
– battery case (page 2-11)
– rear fender (page 2-6)
– side cover (page 2-4)
– fuel tank (page 7-9)
– rear wheel speed sensor 2P (Gray) connector [1]
– rear brake light switch 2P (Black) connector [2]
– CKP sensor 2P (Red) connector [3]



– band clip [1]
– starter relay switch [2]
– sidestand switch 2P (Black) connector [3]

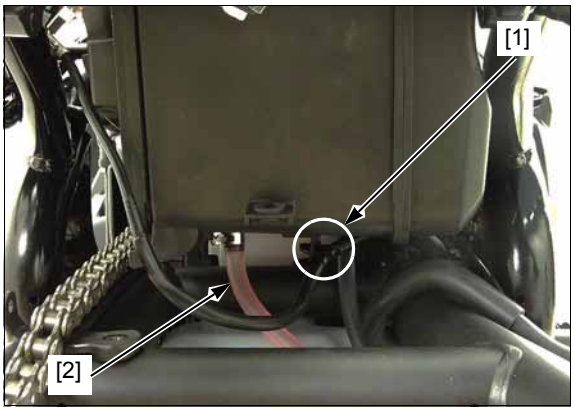


– two bolts [1]



Remove the wire band [1].

Disconnect the crankcase breather drain hose [2].



Remove the wire junction [1].

Disconnect the secondary air supply hose [2] and crankcase breather hose [3].

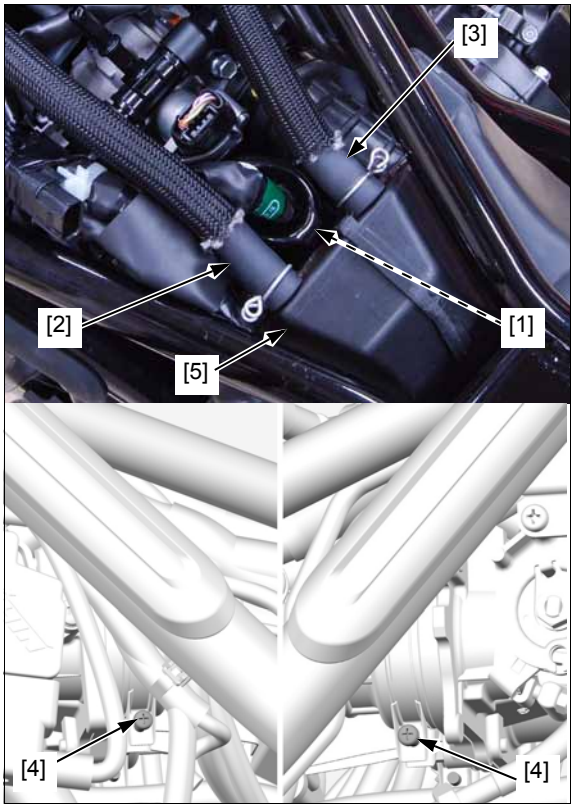
Loosen the two insulator band screws (air cleaner housing side) [4].

Remove the air cleaner housing [5].

Installation is in the reverse order of removal.

NOTE:

After installing the air cleaner housing, make sure the crankcase breather drain hose is not kinked or pinched.



THROTTLE BODY

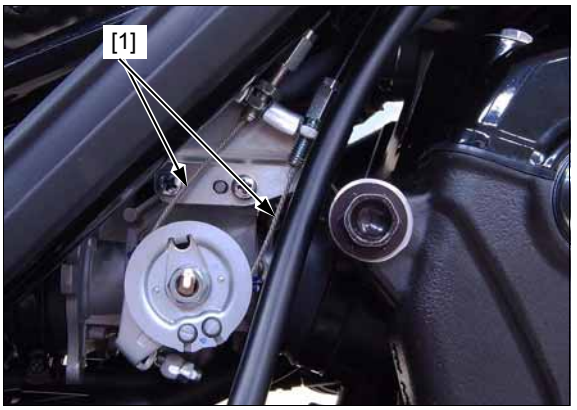
REMOVAL/INSTALLATION

Remove the following:

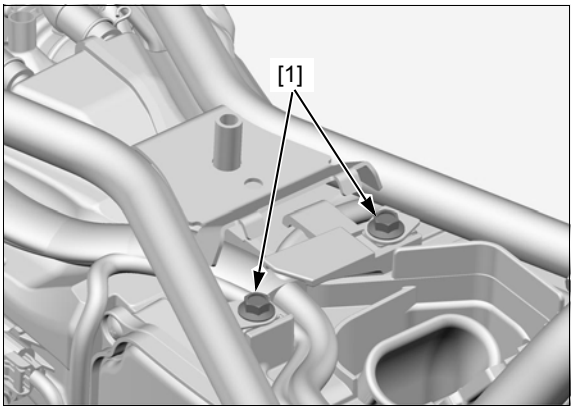
– side cover (page 2-4)
– fuel tank (page 7-9)

Disconnect the throttle cables [1] (remove from the cable holder and disconnect from the throttle drum).

Disconnect the sensor unit 5P (Black) connector (page 4-33).

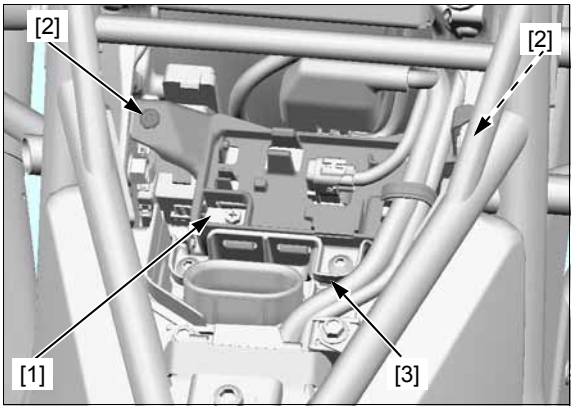


Remove the two bolts [1].

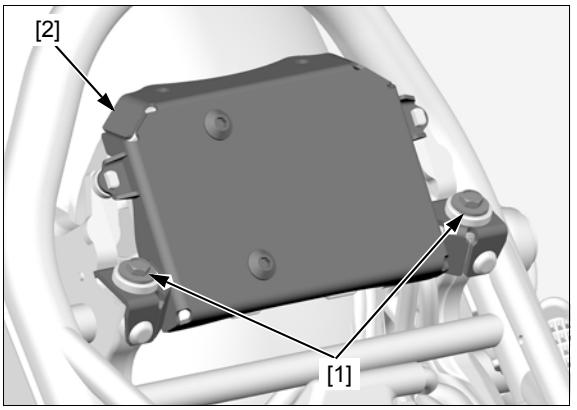


Disconnect the negative (–) cable [1] by removing the terminal bolt.

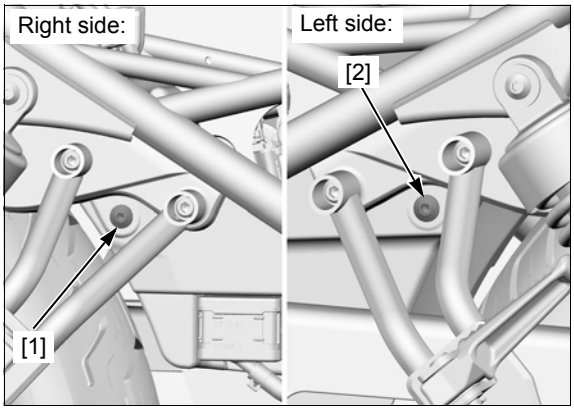
Remove the two trim clips [2] and battery cover [3].



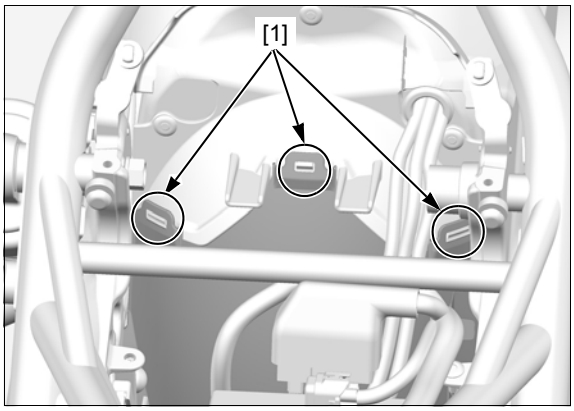
Remove the two bolt/washers [1] and regulator/rectifier stay [2].



Remove the right side battery case mounting socket bolt [1] and left side battery case mounting socket bolt [2].

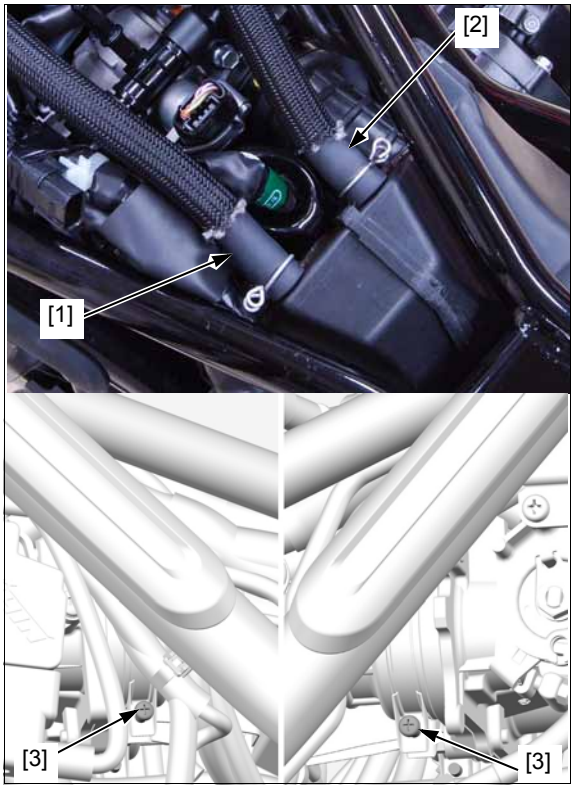


Release the three grooves [1].



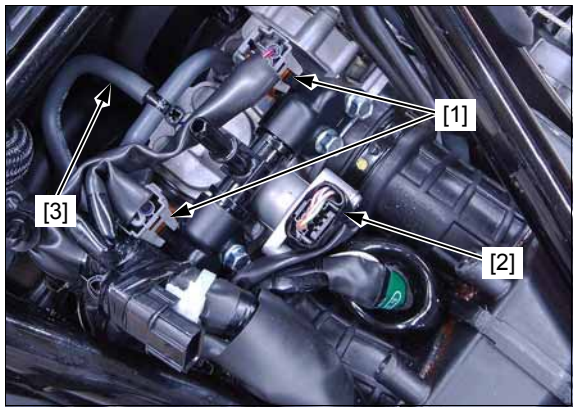
Disconnect the secondary air supply hose [1] and crankcase breather hose [2].

Loosen the two insulator band screws (air cleaner housing side) [3].



Disconnect the following:

– fuel injector 2P (Gray) connectors [1]
– IACV 4P (Black) connector [2]
– AC model: EVAP canister-to-throttle body hose [3] (from the 3-way joint)



Slide the throttle body and release the insulators off of the cylinder head.

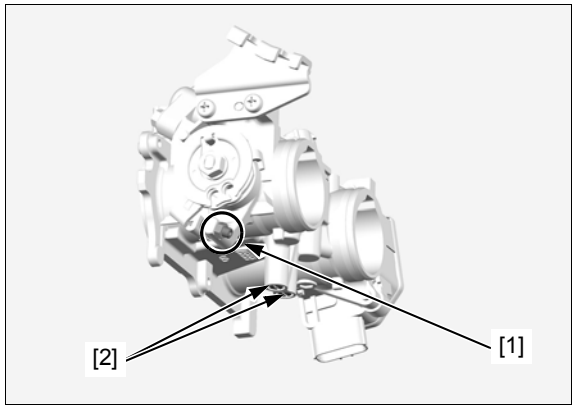
Remove the throttle body out of the frame.

Installation is in the reverse order of removal.

DISASSEMBLY/ASSEMBLY

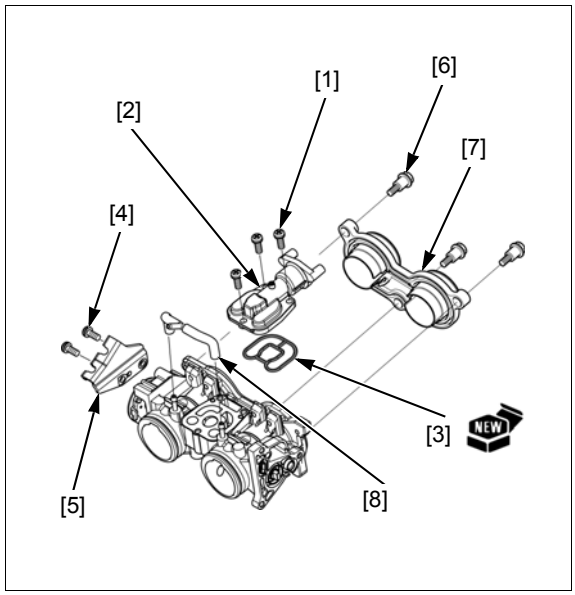
NOTE:

- The throttle body is factory pre-set. Do not disassemble in a way other than shown in this manual.
- Do not snap the throttle valve from full open to full close after the throttle cable has been removed. It may cause incorrect idle operation.
- Do not damage the throttle body. It may cause incorrect throttle valve operation.
- Do not loosen or tighten the white painted nut [1] and air screws [2]. Loosening or tightening them can cause throttle body malfunction.



Remove the following:

– sensor unit (page 4-33)
– IACV (page 7-17)
– fuel injectors (page 7-16)
– three screws [1]
– IACV body [2]
– rubber seal [3]
– two screws [4]
– throttle cable holder [5]
– three screws [6]
– air funnel [7]
– AC model: EVAP canister-to-throttle body hoses [8]



Clean the air passages in the throttle body and IACV body with compressed air.

NOTE:

- Cleaning with the a piece of wire will damage the throttle body.
- Replace the rubber seals with new ones.

Assembly is in the reverse order of removal.

TORQUE:

Throttle cable holder screw:
3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)

IACV body screw:
3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)

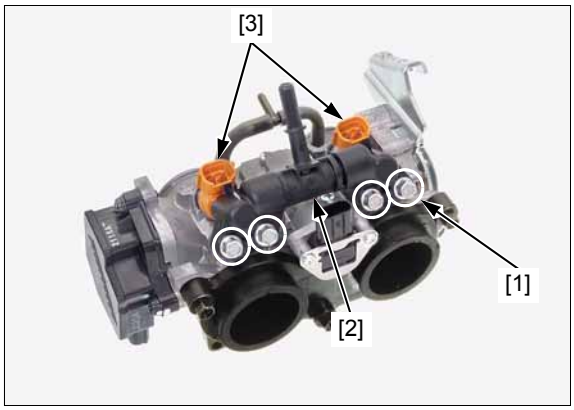
INJECTOR

REMOVAL/INSTALLATION

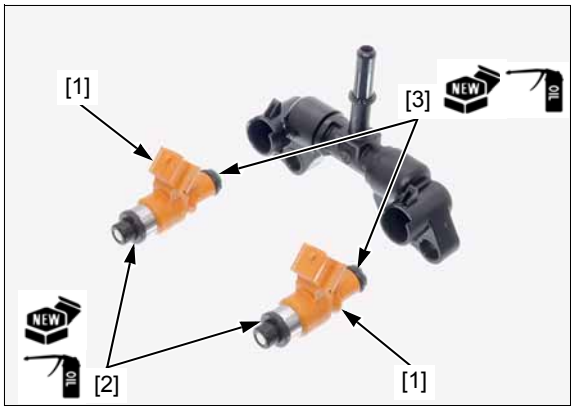
Remove the throttle body from the air cleaner housing (page 7-11).

Remove the following:

– four bolts [1]
– fuel pipe [2] and fuel injectors [3] (as an assembly)

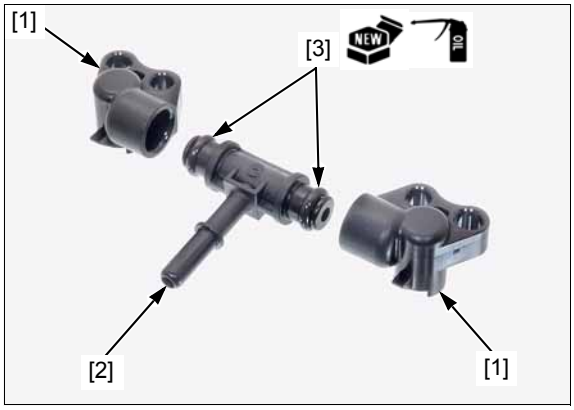


– fuel injectors [1]
– seal rings [2]
– O-rings [3]



– injector joints [1]
– fuel pipe [2]
– O-rings [3]

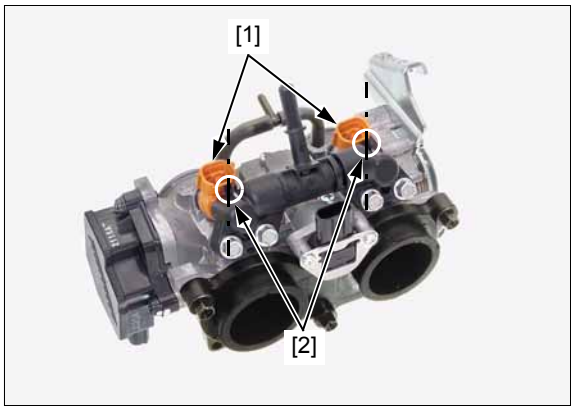
Check each part for wear or damage and replace it if necessary.



Installation is in the reverse order of removal.

NOTE:

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



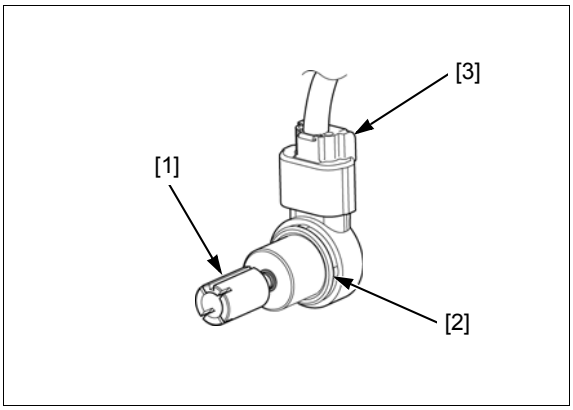
TORQUE:

Fuel injector joint bolt:
5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)

IACV

INSPECTION

- The IACV is installed on the throttle body and is operated by the step motor. When the ignition switch is turned ON, the IACV operates for a few seconds.



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

Turn the ignition switch ON with the engine stop switch "○" and check the IACV.

If the operating (beep) sound is not heard with no MIL blinking, perform the following inspection.

Remove the IACV (page 7-17).

Check the IACV slide valve [1] and IACV air passage in the throttle body for carbon deposits.
Check the O-ring [2] on the IACV for deterioration or damage.

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

– throttle body; fuel injector 2P (Gray) and sensor unit 5P (Black)
– IACV; 4P (Black) [3]

Turn the ignition switch ON with the engine stop switch "○" while holding the slide valve lightly.

The slide valve should move back and forth.

Turn the ignition switch OFF.
Disconnect the connectors to remove the throttle body and IACV from the wire harness.

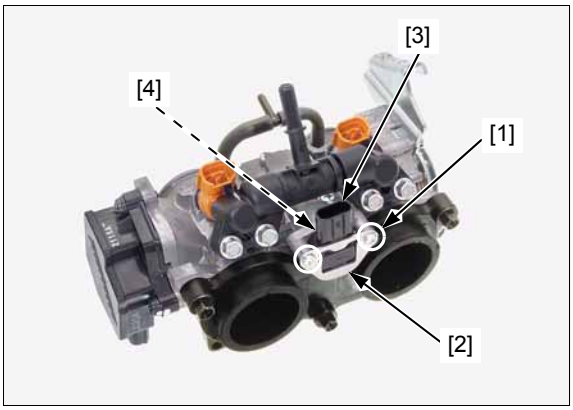
Install the IACV (page 7-17).

REMOVAL/INSTALLATION

Remove the throttle body (page 7-13).

Remove the following:

– two screws [1]
– setting plate [2]
– IACV [3]
– O-ring [4]



Installation is in the reverse order of removal.

NOTE:

- Replace the O-ring [1] with a new one (do not apply oil).
- Turn the slide valve [2] clockwise until it is seated lightly and install by aligning the long slot with the pin on the throttle body.
- Align the cutout in the setting plate [3] with the lug of the IACV body.

TORQUE:
IACV setting plate torx screw:
2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)

SECONDARY AIR SUPPLY SYSTEM

SYSTEM INSPECTION

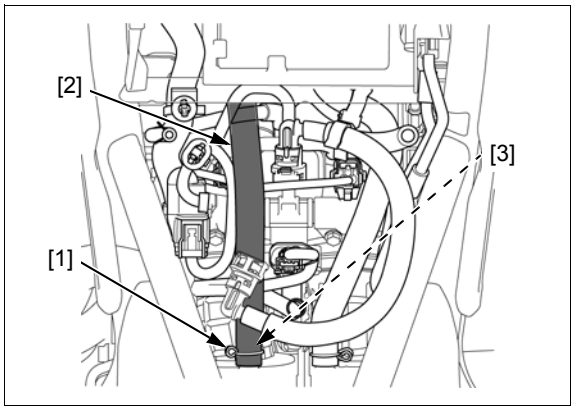
Start the engine and warm it up to normal operating temperature.

Stop the engine.

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

Remove the hose clip [1] and disconnect the air supply hose [2] from the air cleaner housing.

Check that the hose joint (secondary air intake port) [3] of the air cleaner housing is clean and free of carbon deposits.
Check the PAIR check valve if the port is carbon fouled (page 7-20).

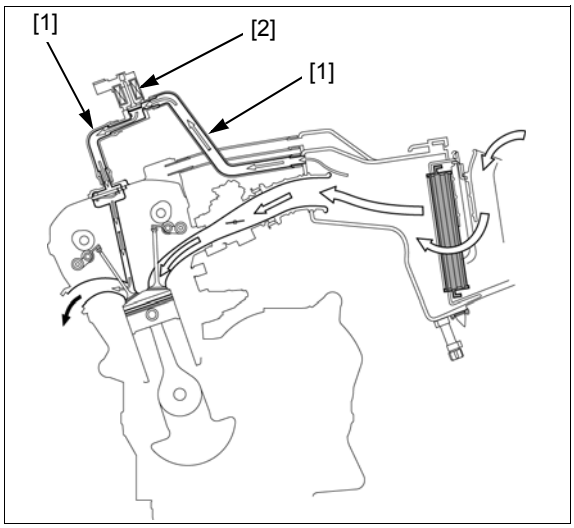


Lower the fuel tank until the fuel pump 3P (Black) connector can be connected and support it.

Temporarily connect the fuel pump 3P (Black) connector.

Start the engine and open the throttle slightly to be certain that air is sucked in through the disconnected air supply hose.

If the air is not drawn in, check the air supply hoses [1] for clogs and PAIR control solenoid valve [2] (page 7-19).



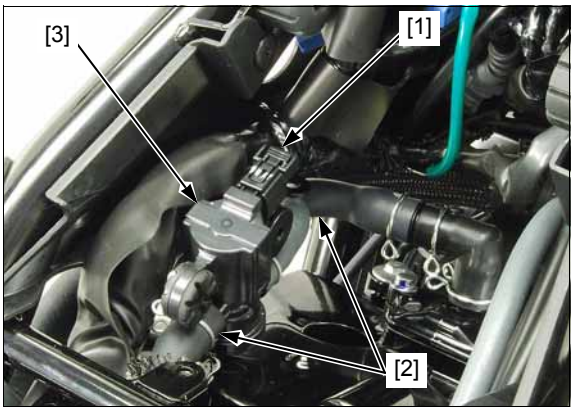
PAIR CONTROL SOLENOID VALVE REMOVAL/INSTALLATION

Remove the fuel tank under tray (page 2-8).

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

Disconnect the air supply hoses [2] to remove the PAIR control solenoid valve [3].

Installation is in the reverse order of removal.



PAIR CONTROL SOLENOID VALVE INSPECTION

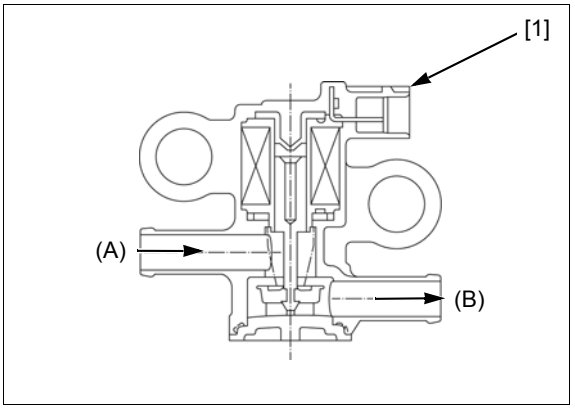
Remove the PAIR control solenoid valve (page 7-19).

Check the air flow through the solenoid valve.

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

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

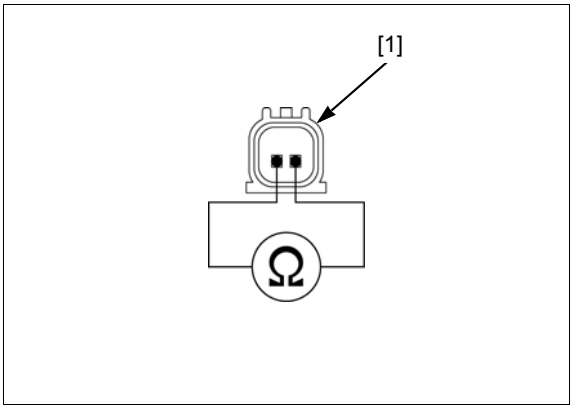
Air should not flow when the battery is connected.



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

STANDARD: 24 – 28 Ω (20°C/68°F)

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

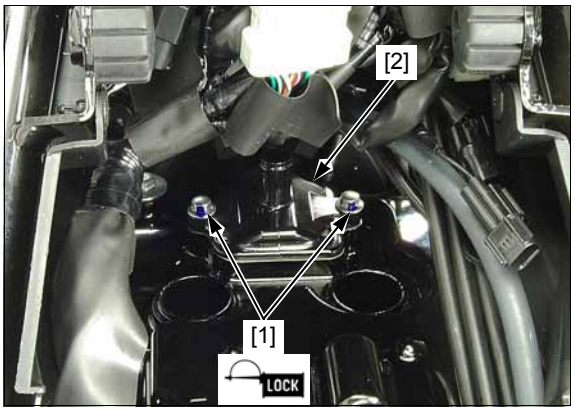


PAIR CHECK VALVE REMOVAL/ INSTALLATION

Remove the fuel tank under tray (page 2-8).

Disconnect the air supply hose [1] from the cylinder head cover.

Remove the two bolts [1] and check valve cover [2].



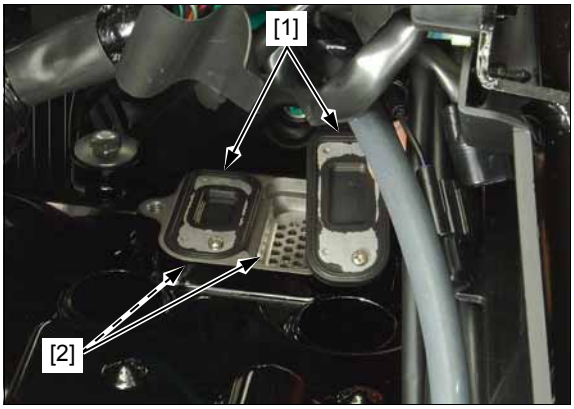
Remove the PAIR check valves [1] and baffle plates [2].

Installation is in the reverse order of removal.

NOTE:

- Apply locking agent to the threads of the PAIR check valve cover bolt (page 1-18).

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

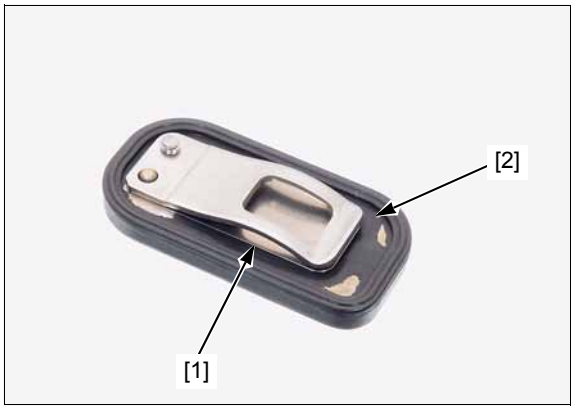


PAIR CHECK VALVE INSPECTION

Remove the PAIR check valves (page 7-20).

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

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



EVAP PURGE CONTROL SOLENOID VALVE (AC model)

REMOVAL/INSTALLATION

Remove the air cleaner housing (page 7-11).

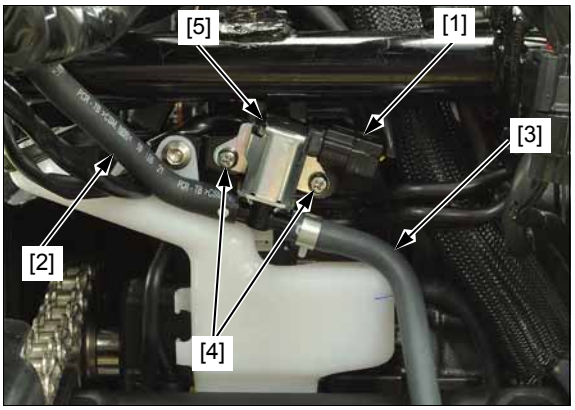
Disconnect the following:

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

Remove the following:

– two screws [4]
– EVAP purge control solenoid valve [5]

Installation is in the reverse order of removal.



INSPECTION

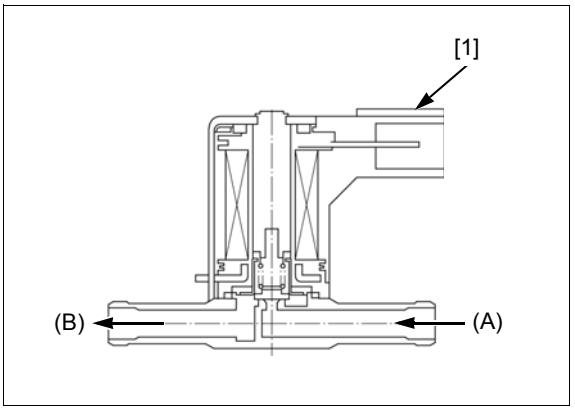
Remove the EVAP purge control solenoid valve (page 7-21).

Check the air flow through the solenoid valve.

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

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

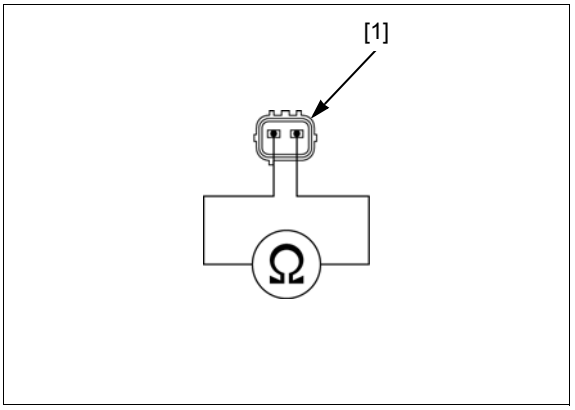
Air should flow when the battery is connected.



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

STANDARD: 30 – 34 Ω (20°C/68°F)

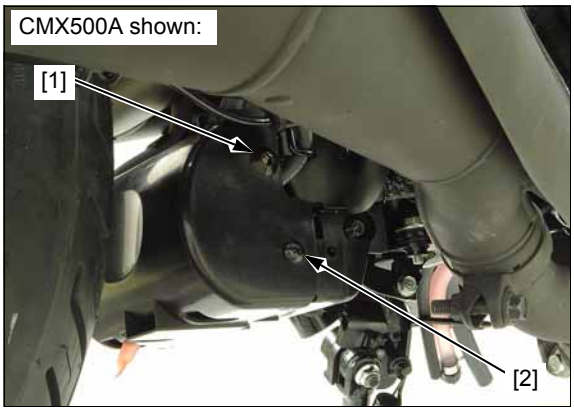
If the resistance is out specification, replace the EVAP purge control solenoid valve.



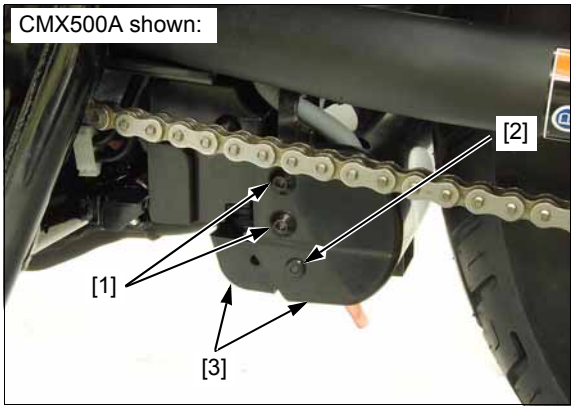
EVAP CANISTER (AC model)

REMOVAL/INSTALLATION

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



Remove the two socket bolts [1], trim clip [2] and EVAP canister cover [3].

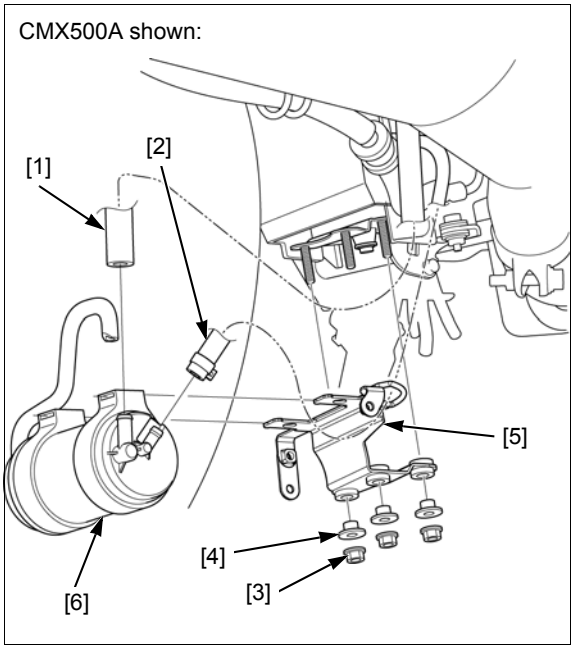


Disconnect the EVAP purge control solenoid valve hose [1] and fuel tank-to-EVAP canister hose [2].

CMX500A: Remove the three nuts [3], three collars [4] and EVAP canister stay [5].

Remove the EVAP canister [6] from the stay.

Installation is in the reverse order of removal.



FUEL PUMP RELAY

CIRCUIT INSPECTION

For relay inspection (page 4-38).

Remove the fuel pump relay (page 2-8).

RELAY SWITCH/COIL POWER INPUT LINE

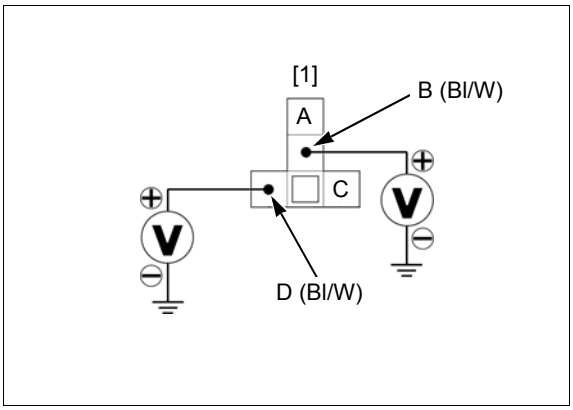
Measure the voltage between each fuel pump relay terminal of the relay box [1] and ground.

CONNECTION: B (+) – Ground (–)
D (+) – Ground (–)

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

If there is no voltage, check the following:

– Black/white wire(s) in the relay box between the main and fuel pump relays
– main relay and its circuit (page 7-23)



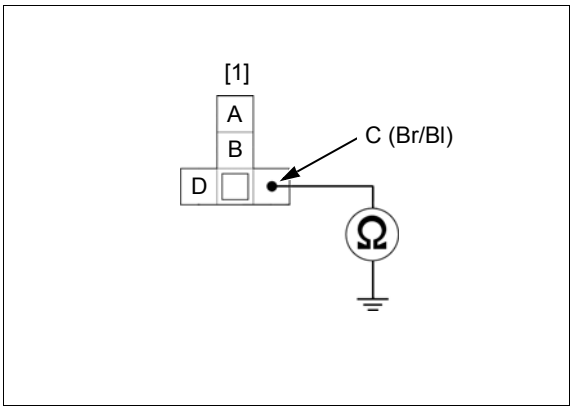
SIGNAL LINE

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

CONNECTION: C – Ground

There should be no continuity with the ignition switch OFF.
If there is continuity, check for short circuit in the Brown/black wire between the relay box and ECM.

There should be continuity for a few seconds when the ignition switch is turned ON with the engine stop switch ""
If there is no continuity, check for open circuit in the Brown/black wire between the relay box and ECM.



MEMO

8. COOLING SYSTEM

SERVICE INFORMATION

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.

- *The coolant should be inspected and replaced properly by following the maintenance schedule (page 3-3).*
- *DO NOT use non-ethylene glycol coolant, tap water, nor mineral water when adding or replacing the coolant. Use of improper coolant may cause damage, such as corrosion in the engine, blockage of the cooling passage or the radiator and premature wear of the water pump seal.*
- Add cooling system at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- For high coolant temperature indicator (page 21-11).
- For fan control relay inspection (page 21-21).

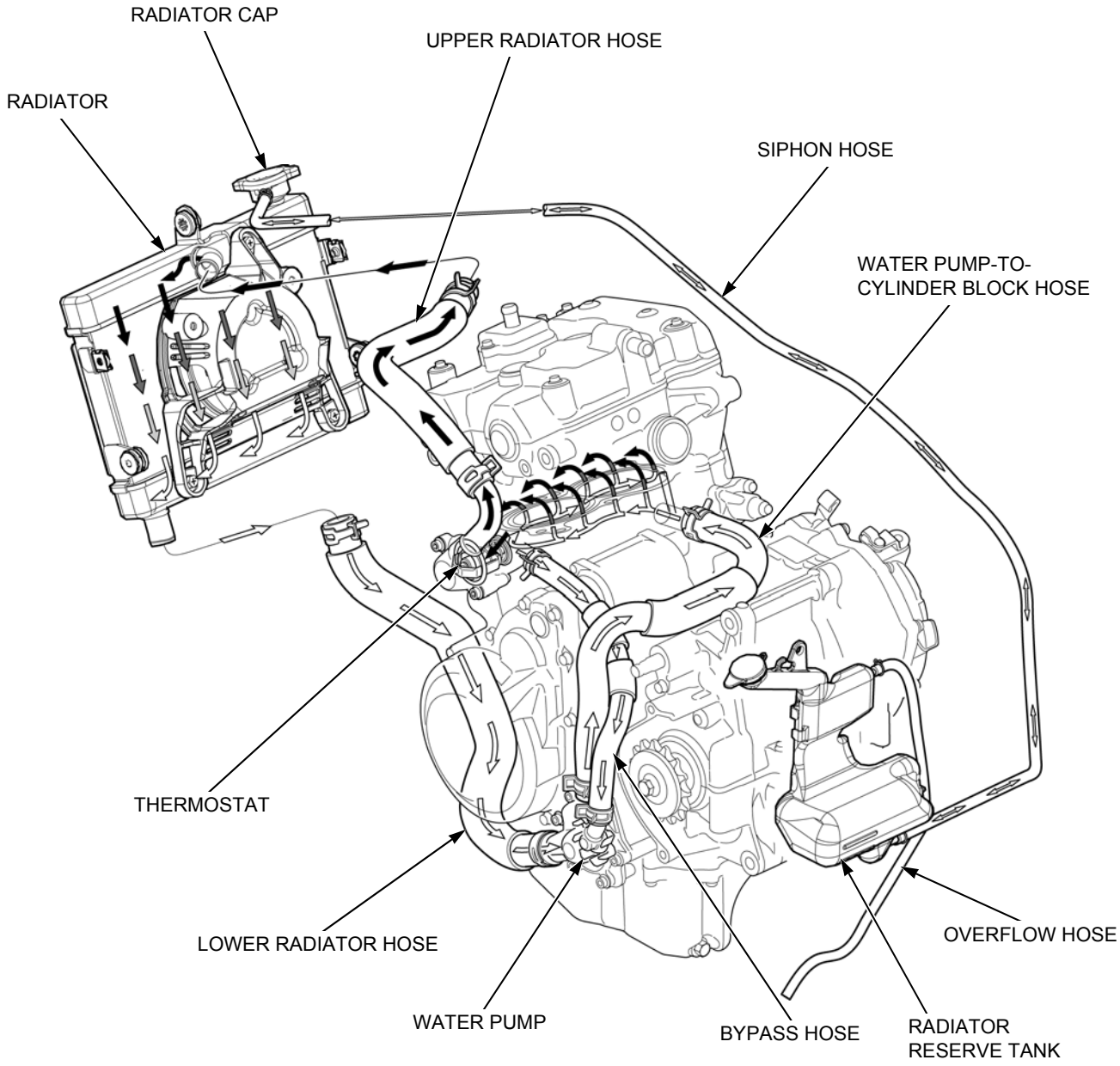
TROUBLESHOOTING

Engine temperature too high
- Faulty high coolant temperature indicator or ECT sensor or ECM (page 21-11)
- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passage blocked in radiator, hoses or water jacket
- Air in system
- Faulty cooling fan motor
- Faulty fan control relay (page 21-21)
- Faulty water pump

Engine temperature too low
- Faulty high coolant temperature indicator or ECT sensor or ECM (page 21-11)
- Thermostat stuck open
- Faulty fan control relay

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

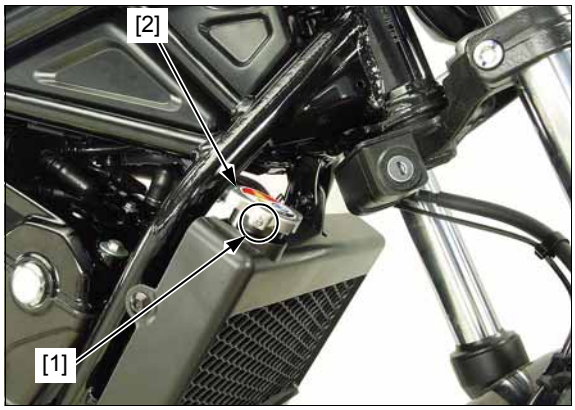
SYSTEM FLOW PATTERN



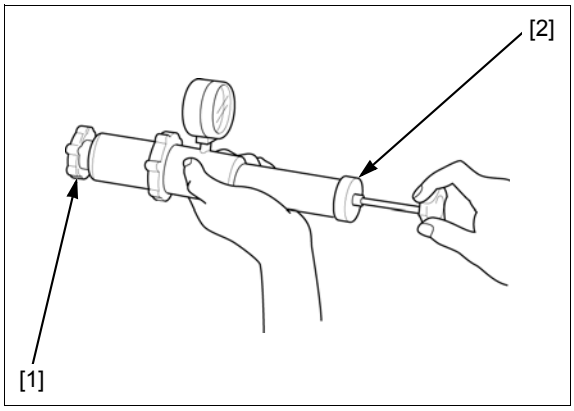
SYSTEM TESTING

RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Remove the screw [1] and radiator cap [2].



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 (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.

Lift the fuel tank and support it (page 3-4).
Remove the rider left footpeg bracket (page 18-10).

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

Remove the screw [3] and radiator cap [4] and drain the coolant.

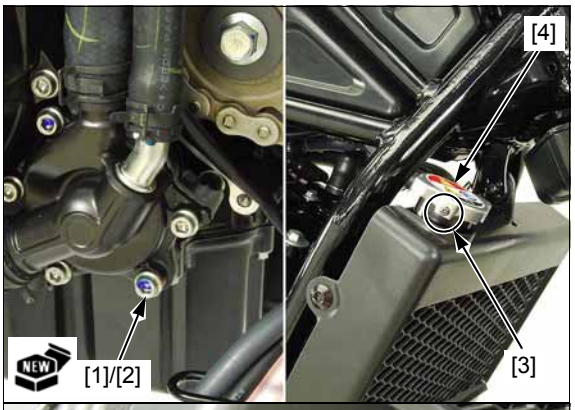
Remove the cylinder drain bolt [5], sealing washer [6] and drain the coolant from the cylinder.

Reinstall the drain bolts with new sealing washers.

Tighten the drain bolts to the specified torque.

TORQUE:

Water pump drain bolt:
13 N·m (1.3 kgf·m, 10 lbf·ft)



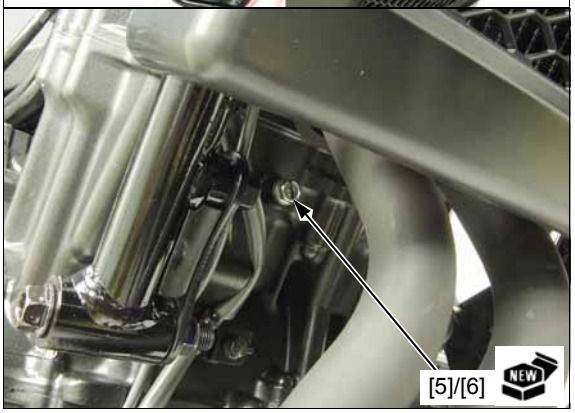
Remove the radiator reserve tank (page 8-9).

Empty the coolant and rinse the inside of the reserve tank with water.

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

Install the following:

– fuel tank (page 3-4)
– left rider footpeg bracket (page 18-10)



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

RECOMMENDED ANTIFREEZE:

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

STANDARD COOLANT CONCENTRATION:

1:1 mixture with distilled water

Bleed air from the system as follow:

1. Shift the transmission into neutral.
   Start the engine and let it idle for 2 – 3 minutes.
2. Snap the throttle 3 – 4 times to bleed air from the system.
3. Stop the engine and add coolant up to the filler neck if necessary.
4. Install the radiator cap [2] and screw [3].

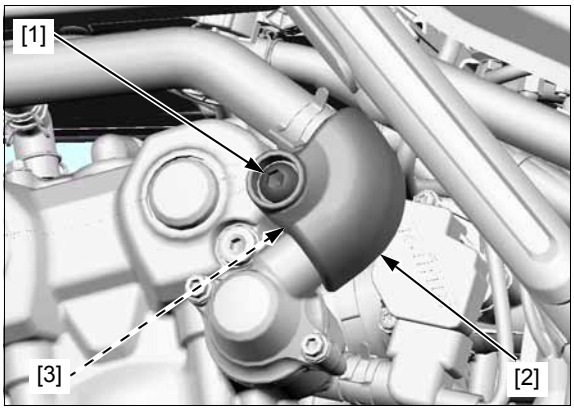
Fill the reserve tank with the recommended coolant (page 3-12).

THERMOSTAT

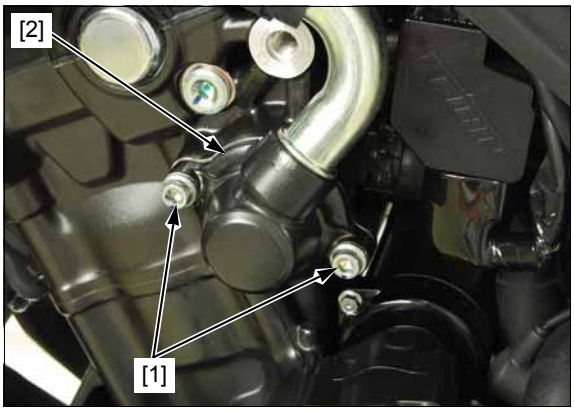
REMOVAL/INSTALLATION

Drain the coolant (page 8-5).

Remove the socket bolts [1], heat guard [2] and washer [3].

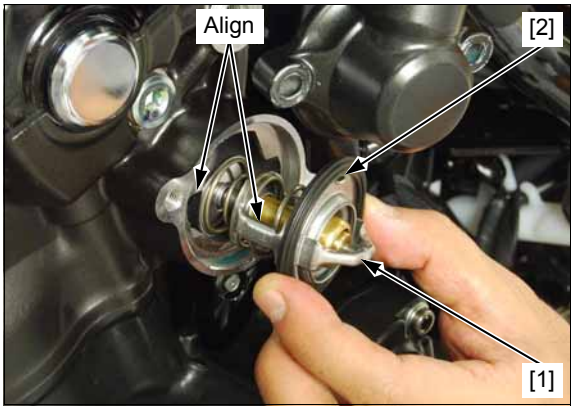


Remove the socket bolts [1] and thermostat cover [2].



Remove the thermostat [1] from the cylinder head.

Installation is in the reverse order of removal.



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

NOTE:

- Install the thermostat with the air bleed hole [2] facing up, aligning the body ribs with the grooves of the cylinder head.

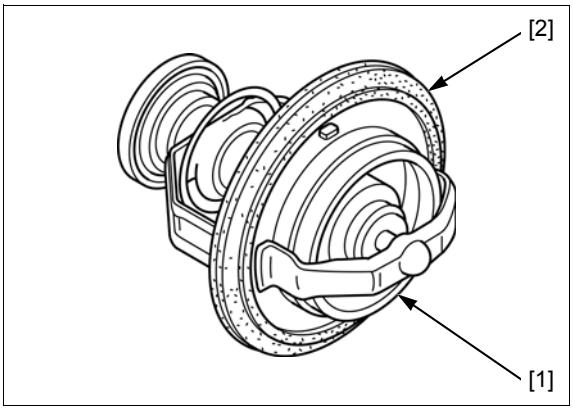
Fill and bleed the cooling system (page 8-5).

INSPECTION

Visually inspect the thermostat [1] for damage.

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

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



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

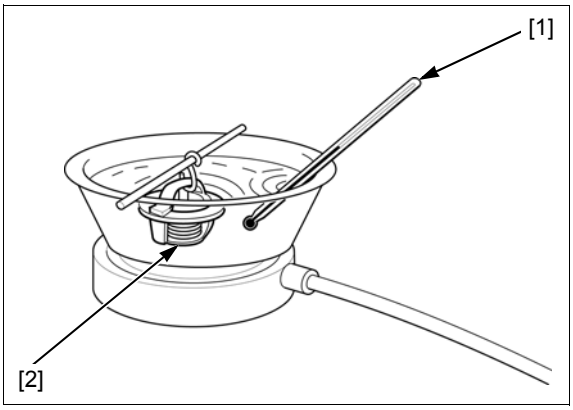
Heat the water with an electric heating element to operating temperature for 5 minutes.

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

THERMOSTAT BEGIN TO OPEN:
81 – 84°C (178 – 183°F)

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

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



RADIATOR/COOLING FAN

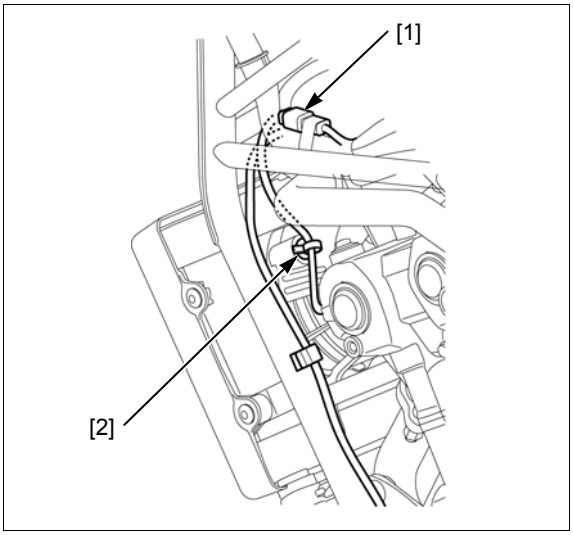
REMOVAL/INSTALLATION

Drain the coolant (page 8-5).

Remove the ignition switch stay (page 21-14).

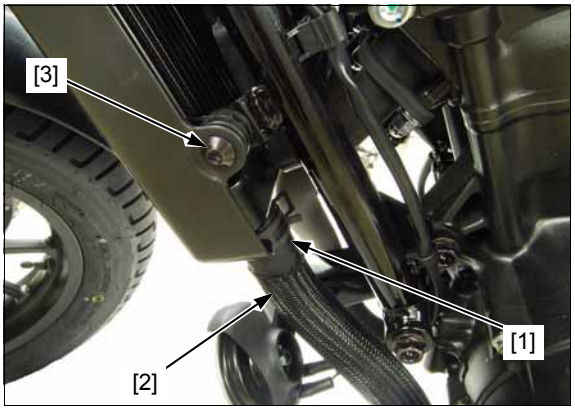
Disconnect the fan motor 2P (Black) connector [1] and remove it from the stay.

Remove the wire band clip [2] from the fan motor shroud.



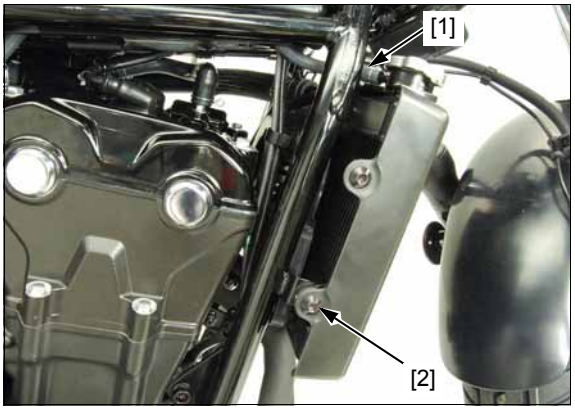
Release the hose clip [1] and disconnect lower radiator hose [2].

Remove the left side radiator mounting socket bolt [3].



Disconnect the siphon hose [1].

Remove the right side radiator mounting socket bolt [2].



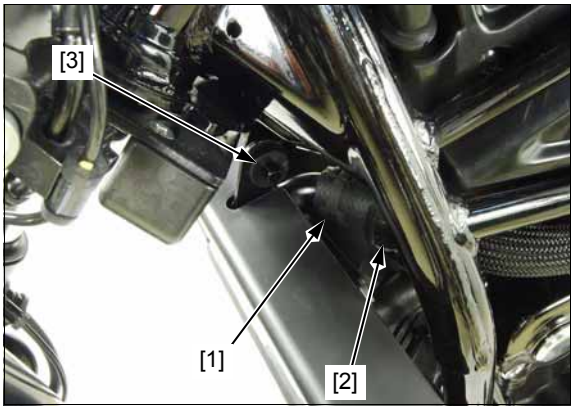
Be careful not to damage the radiator fins.

Release the hose clip [1] and disconnect upper radiator hose [2].

Release the radiator grommets [3] from the frame bosses by moving the radiator to the right to remove the radiator.

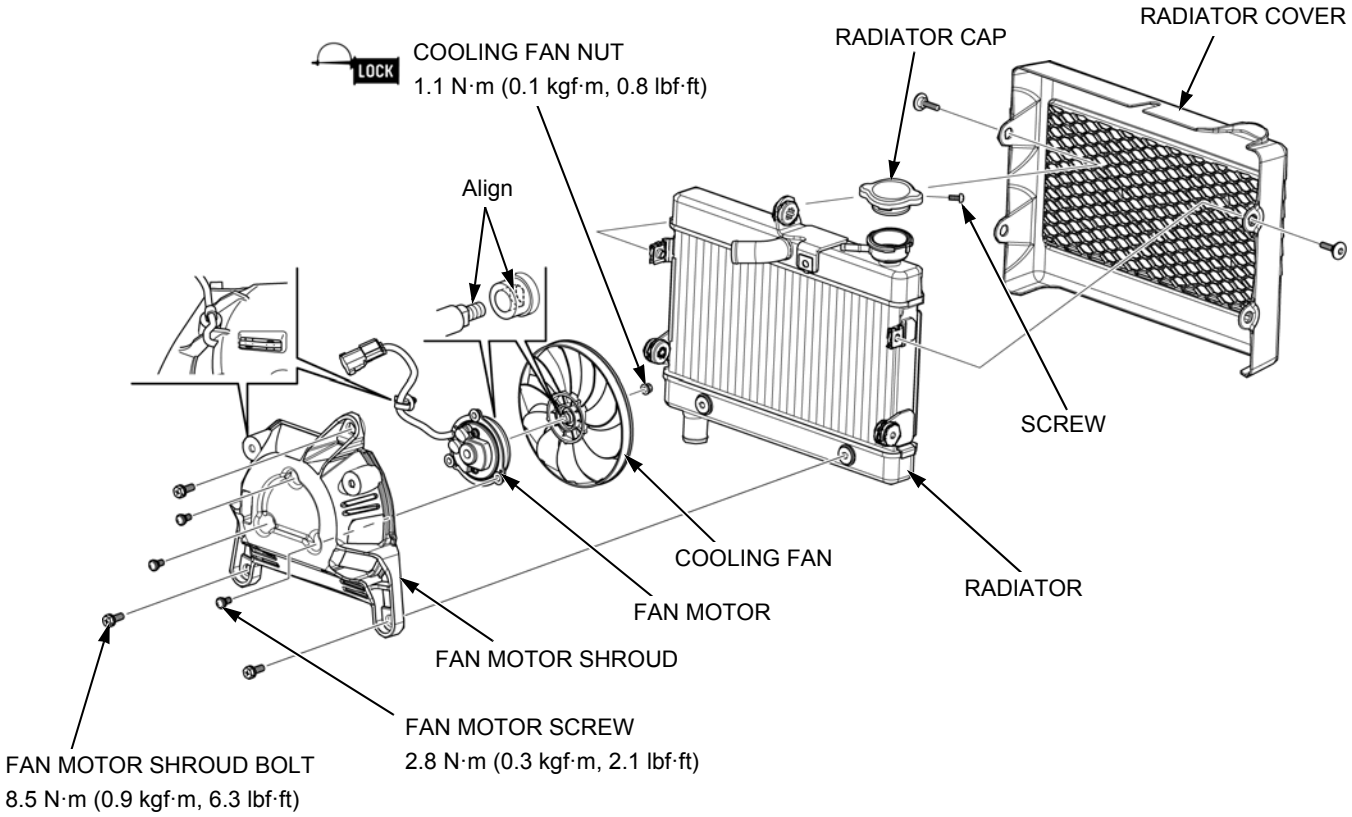
Installation is in the reverse order of removal.

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



DISASSEMBLY/ASSEMBLY

Disassemble and assemble the radiator as shown in the following illustration.



RADIATOR RESERVE TANK

REMOVAL/INSTALLATION

Remove the following:

– tank under tray (page 2-8)
– air cleaner housing (page 7-11)
– swingarm (page 17-8)

Remove the socket bolt [1], then release the two bosses [2] of the reserve tank [3] from the frame.

Disconnect the overflow hose [4] from the reserve tank.

Disconnect the siphon hose [5] and release it from the guide [6].

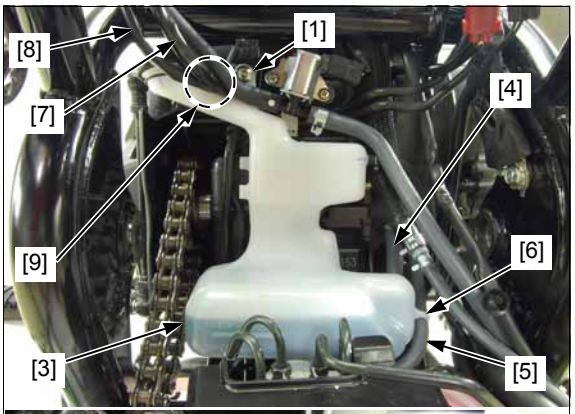
Release the AC generator/ CKP sensor wire [7] and sidestand switch wire [8] from the guide [9].

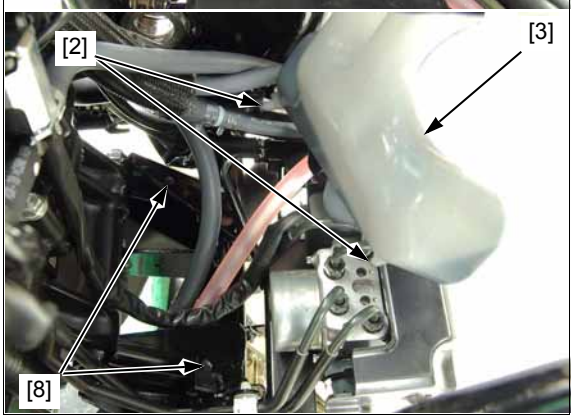
Drain the coolant to remove the radiator reserve tank.

Installation is in the reverse order of removal.

- Install the reserve tank by aligning the bosses of the reserve tank with the holes [8] of the frame.

Fill the reserve tank with the recommended coolant (page 3-12).





WATER PUMP

MECHANICAL SEAL INSPECTION

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

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

Replace the water pump as an assembly if necessary.

REMOVAL/INSTALLATION

NOTE:

- Place a clean oil pan under the engine because engine oil will flow out when removing the water pump body. Add the recommended engine oil to the specified level after installation (page 3-10).

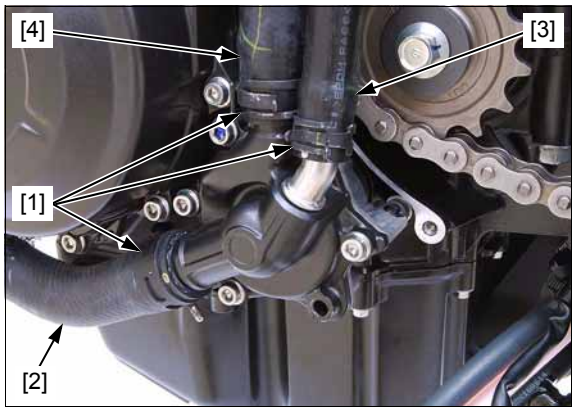
Drain the coolant (page 8-5).

Remove the drive sprocket cover (page 2-7).

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

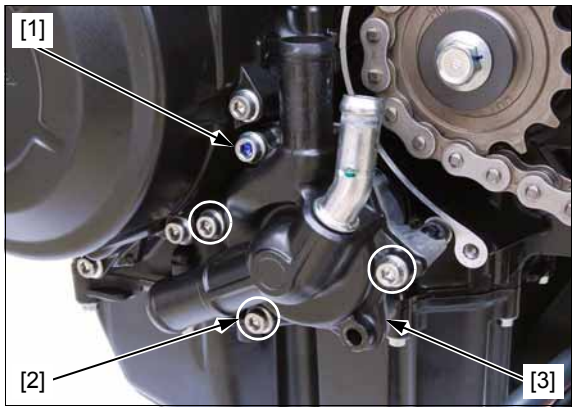
Release the hose clips [1] and disconnect the following from the water pump:

– lower radiator hose [2]
– bypass hose [3]
– water pump-to-cylinder block hose [4]



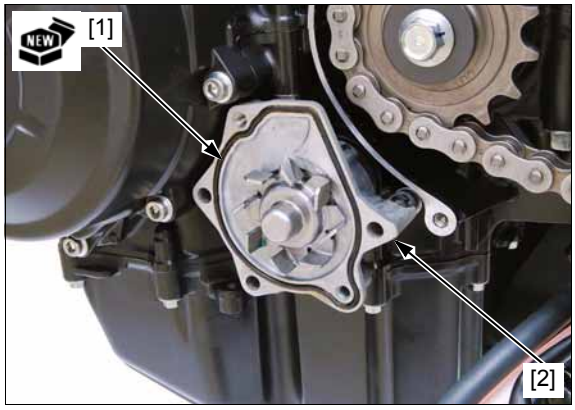
Remove the following:

– cover socket bolt [1]
– three mounting socket bolts [2]
– water pump cover [3]



Remove the cover O-ring [1] from the water pump body [2].

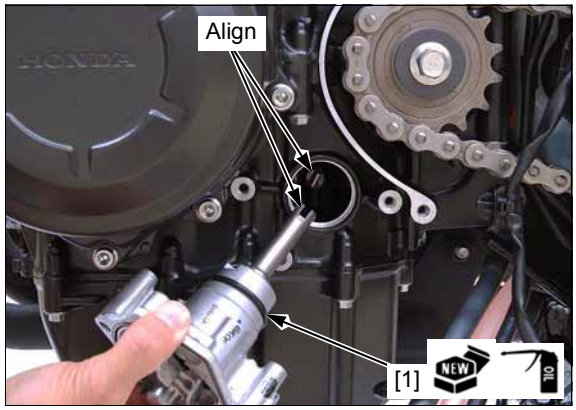
Remove the water pump body from the crankcase.



Remove the water pump body O-ring [1].

Installation is in the reverse order of removal.

TORQUE:
Water pump mounting socket bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)
Water pump cover socket bolt:
13 N·m (1.3 kgf·m, 10 lbf·ft)



NOTE:
- Do not disassemble the water pump body.
- Replace the O-rings with new ones.
- Apply engine oil to the water pump body O-ring.
- Do not apply engine oil to the cover O-ring.
- Align the water pump shaft groove with the oil pump shaft end by turning the water pump impeller.

Check the oil level (page 3-10).

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

WATER HOSE JOINT

REMOVAL/INSTALLATION

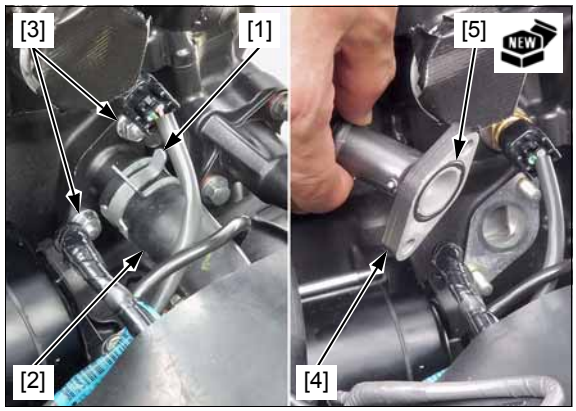
Drain the coolant (page 8-5).

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

Release the hose clip [1] and disconnect the water pump-to-cylinder block hose [2].

Remove the nuts [3], water hose joint [4] and O-ring [5].

Installation is in the reverse order of removal.



NOTE:
- Replace the O-ring with a new one.

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

STUD BOLT REPLACEMENT

Remove the water hose joint (page 8-11).

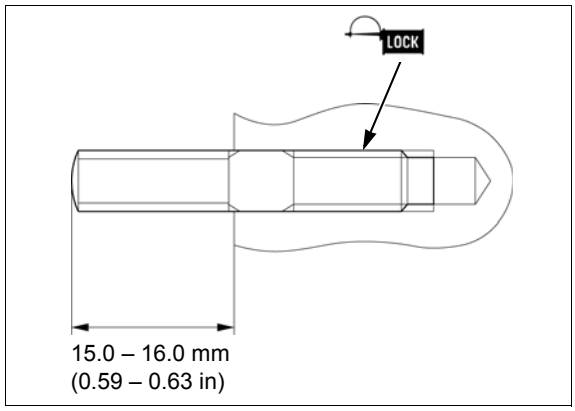
Thread two nuts onto the stud and tighten them together, and use a wrench on them to turn the stud bolt out.

Apply locking agent to new stud bolt threads (page 1-18).

Install the stud bolts into the cylinder block as shown.

After installing the stud bolts, check that the length from the bolt head to the cylinder block surface is within specification.

SPECIFIED LENGTH: 15.0 – 16.0 mm (0.59 – 0.63 in)



Install the water hose joint (page 8-11).

MEMO

9. LUBRICATION SYSTEM

SERVICE INFORMATION

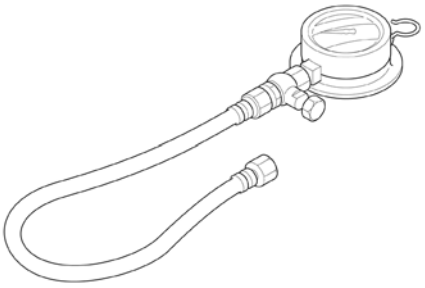
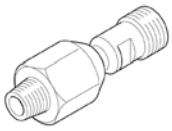
GENERAL

⚠ CAUTION

Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.

- The oil pump can be serviced with the engine installed in the frame.
- The service procedures in this section must be performed with the engine oil drained.
- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the oil pump has been installed, check that there are no oil leaks and that oil pressure is correct.
- For engine oil pressure indicator/EOP switch inspection (page 21-12).
- For piston oil jet service (page 14-16).

TOOLS

Oil pressure gauge set 07506-3000001  or equivalent commercially available in U.S.A.	Oil pressure gauge attachment 07406-0030000  or equivalent commercially available in U.S.A.

TROUBLE SHOOTING

Oil level too low
- Oil consumption
- External oil leak
- Worn piston rings (page 14-14)
- Improperly installed piston rings (page 14-15)
- Worn cylinders (page 14-14)
- Worn stem seals (page 10-16)
- Worn valve guide (page 10-17)

Low oil pressure
- Oil level low
- Clogged oil strainer
- Internal oil leak
- Incorrect oil being used

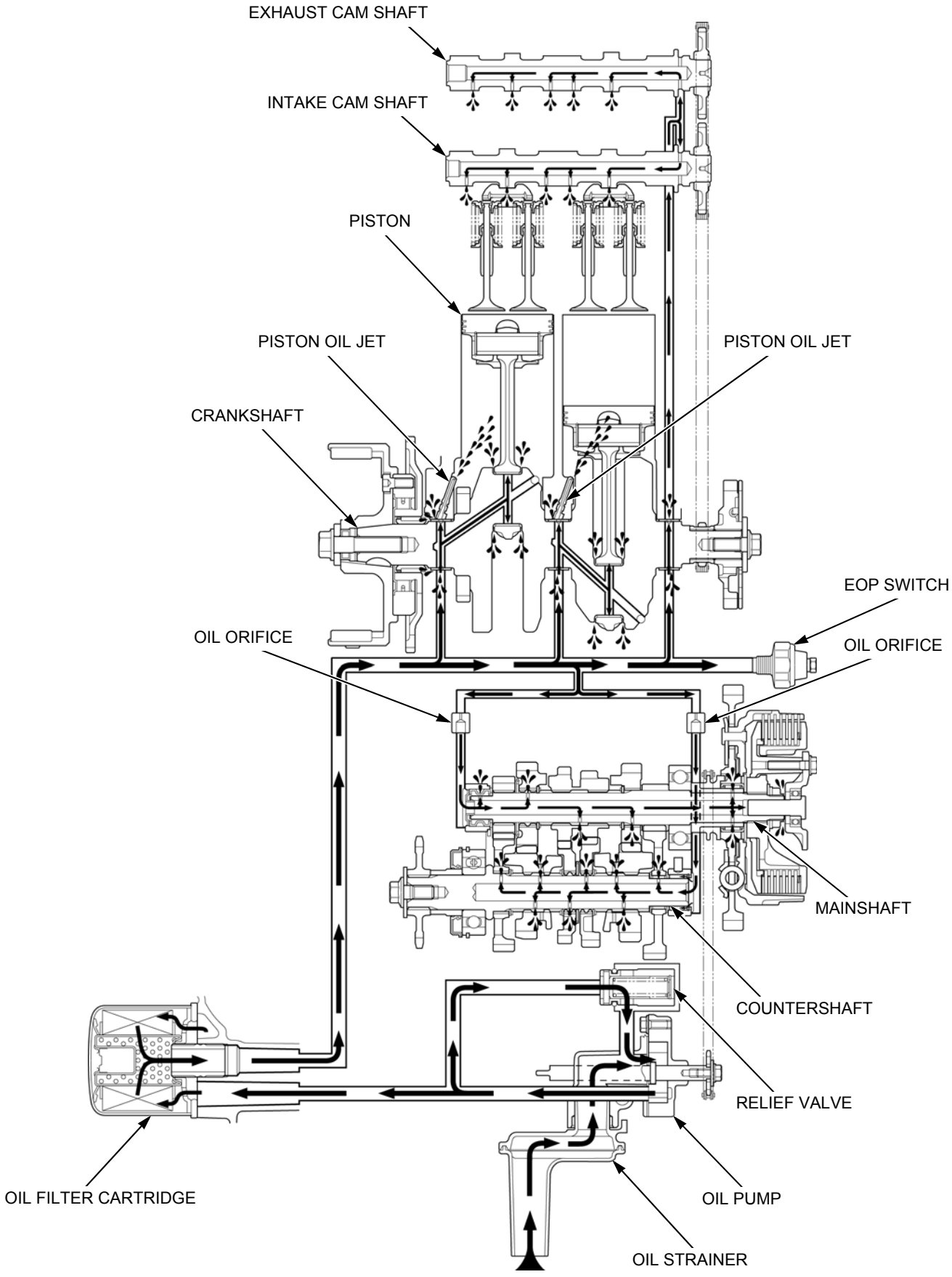
No oil pressure
- Oil level too low
- Oil pressure relief valve stuck open
- Broken oil pump drive chain
- Broken oil pump drive or driven sprocket
- Damaged oil pump
- Internal oil leak

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

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

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

LUBRICATION SYSTEM DIAGRAM



OIL PRESSURE INSPECTION

NOTE:

- If the engine oil pressure indicator remains on while the engine is running, check the indicator system before checking the oil pressure (page 21-12).

Remove the EOP switch (page 21-12).

Install the oil pressure gauge attachment [1] to the switch base.

Connect the oil pressure gauge [2] to the oil pressure gauge attachment.

TOOLS:

Oil pressure gauge set	**07506-3000001 or equivalent commercially available in U.S.A.**
Oil pressure gauge attachment	**07406-0030000 or equivalent commercially available in U.S.A.**

Check the oil level and add the recommended oil if necessary (page 3-10).

Warm the engine to normal operating temperature (approximately 80°C) and increase the engine speed to 1,200 rpm and read the oil pressure.

STANDARD:
93 kPa (0.9 kgf/cm^2, 13 psi) at 1,200 rpm/ 80°C (176°F)

Stop the engine and remove the tools.

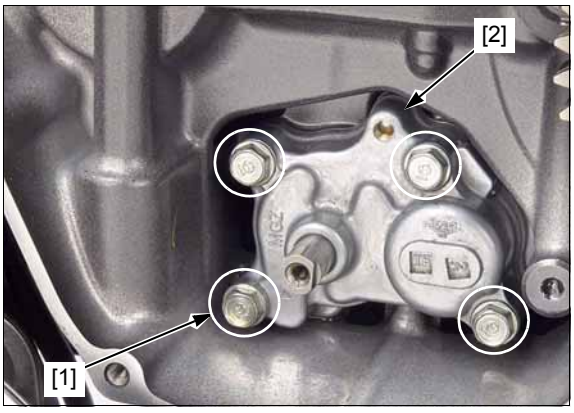
Install the EOP switch (page 21-12).

OIL PUMP

REMOVAL/INSTALLATION

Remove the clutch (page 11-7).

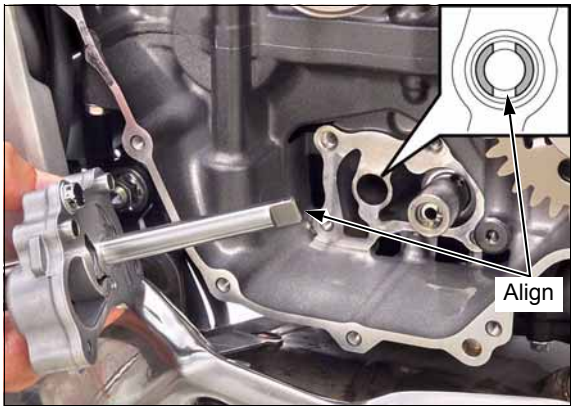
Remove the bolts [1] and oil pump [2].



Installation is in the reverse order of removal.

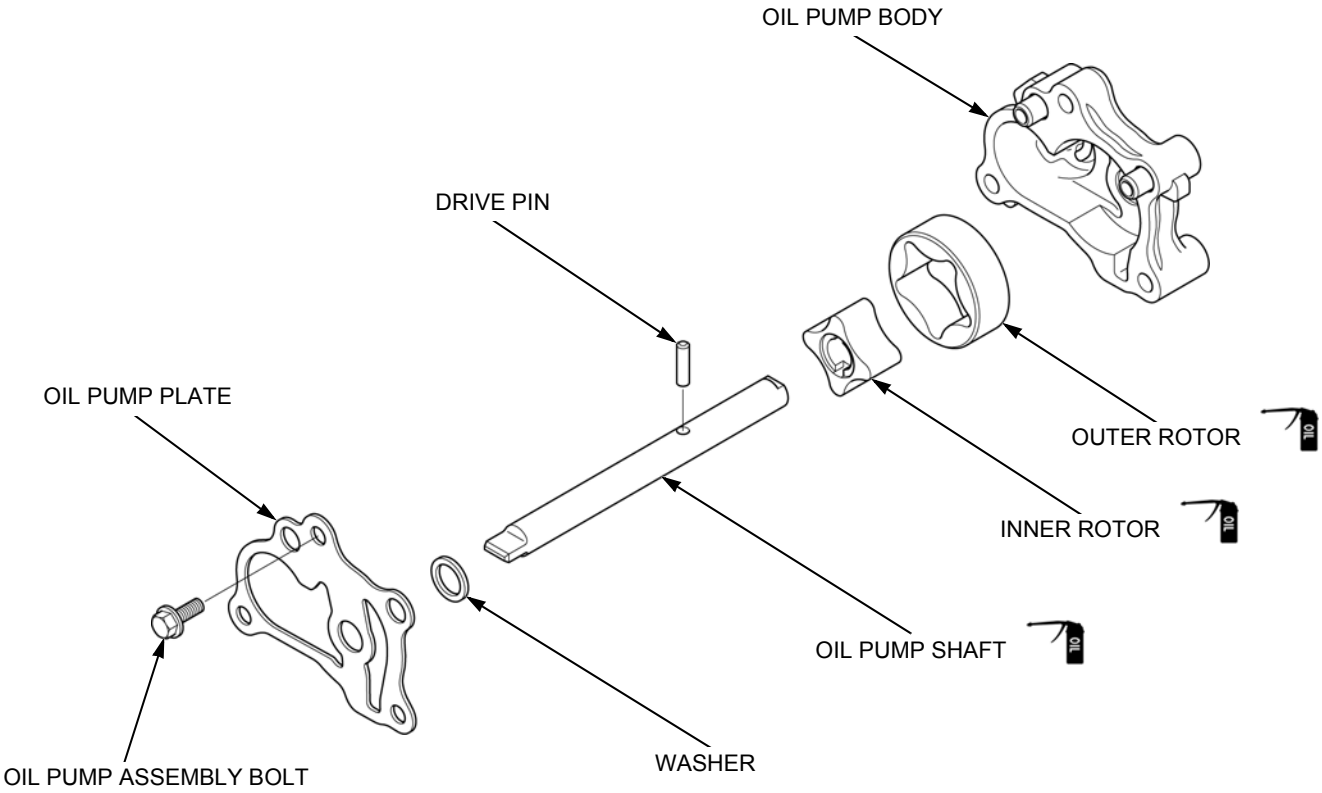
NOTE:

- Align the oil pump shaft end with the water pump shaft groove.



DISASSEMBLY/ASSEMBLY

Disassemble and assemble the oil pump as shown in the following illustration.



INSPECTION

- For oil pump drive sprocket, driven sprocket and drive chain inspection (page 11-10).

Inspect the following parts for damage, abnormal wear, deformation or burning.

– oil pump shaft
– drive pin
– inner rotor
– outer rotor
– oil pump body

Measure the oil pump clearances according to LUBRICATION SYSTEM SPECIFICATIONS (page 1-8).

If any of the measurement is out of the service limit, replace the oil pump as an assembly.

PRESSURE RELIEF VALVE

REMOVAL/INSTALLATION

Remove the oil pump (page 9-5).

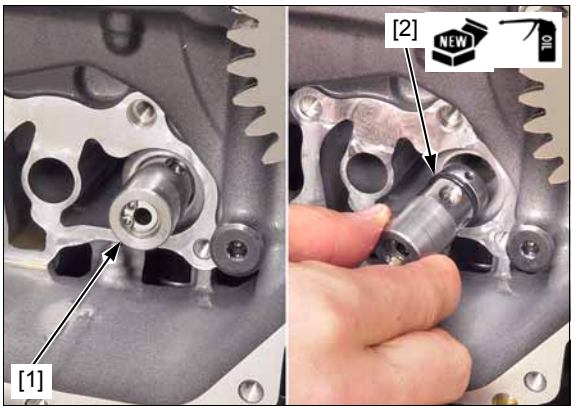
Remove the oil pressure relief valve [1] and O-ring [2].

Apply engine oil to a new O-ring.

Install the O-ring to the oil pressure relief valve groove.

Install the oil pressure relief valve into the crankcase.

Install the oil pump (page 9-5).



INSPECTION

Check the operation of the pressure relief valve by pushing on the piston [1].

Disassemble the pressure relief valve by removing the snap ring [2].

Remove the washer [1], spring [2] and piston [3].

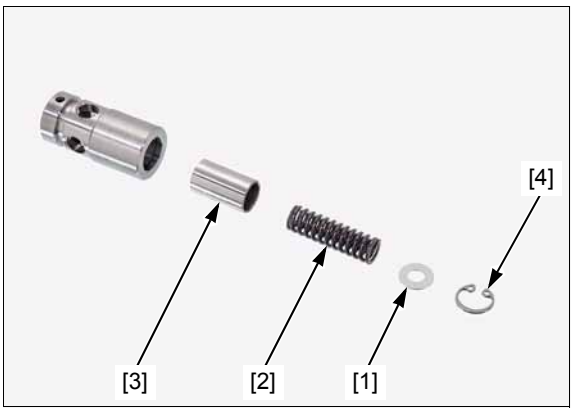
Check the piston for wear, sticking or damage.

Check the spring for fatigue or damage.

Assemble the pressure relief valve in the reverse order of disassembly.

NOTE:

- Install the snap ring [4] with the chamfered edge facing the thrust load side.
- Make sure the snap ring is seated in the groove.



OIL STRAINER

REMOVAL

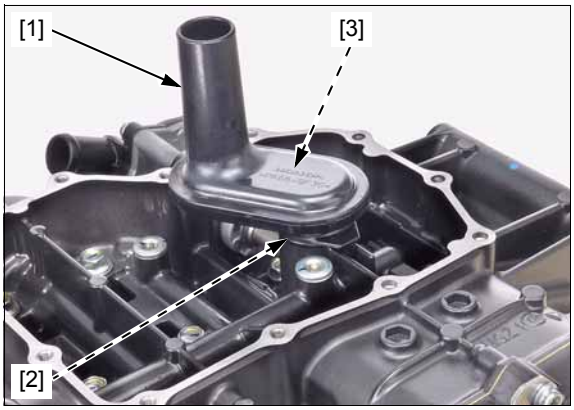
Drain the engine oil (page 3-10).

Remove the exhaust pipe (page 2-13).

Loosen the bolts [1] in a crisscross pattern in 2 or 3 steps, and remove the bolts, oil pan [2].

Remove the oil strainer [1] and seal ring [2].

Clean the oil strainer screen [3] and check for damage.



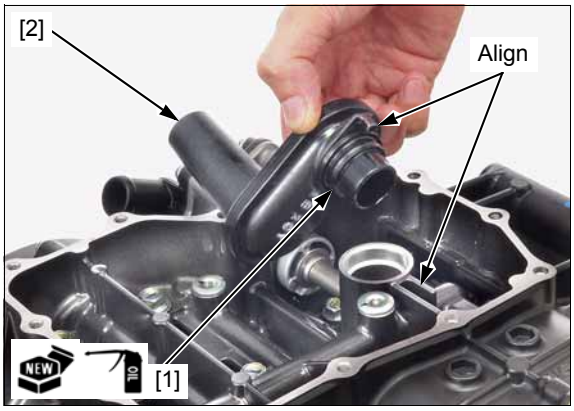
INSTALLATION

Be careful not to damage the mating surfaces.

Clean the oil pan and crankcase mating surfaces thoroughly.

Apply engine oil to a new seal ring [1] and install it onto the oil strainer [2].

Install the oil strainer into the crankcase while aligning the oil strainer boss with the crankcase groove.



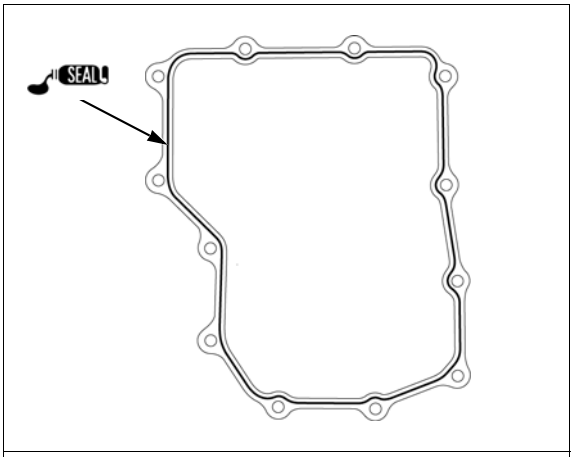
Apply liquid sealant to the oil pan as shown (page 1-18).

Install the oil pan and bolts [1] to the crankcase.

Tighten the bolts in a crisscross pattern in 2 or 3 steps.

Install the exhaust pipe (page 2-13).

Fill the engine with the recommended engine oil and check that there are no oil leaks (page 3-10).



MEMO

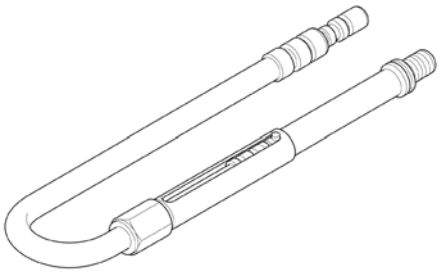
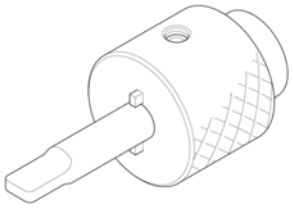
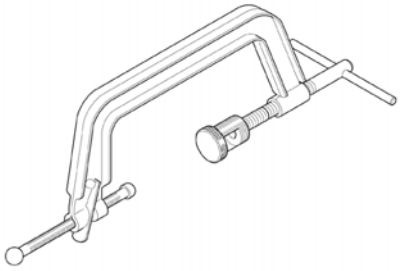
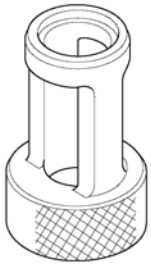
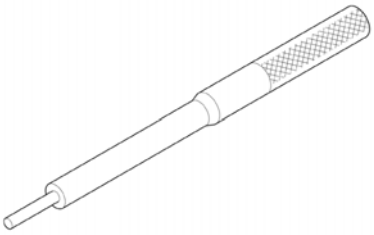
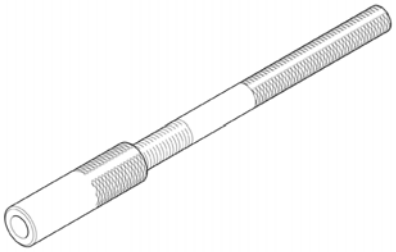
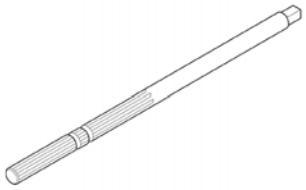
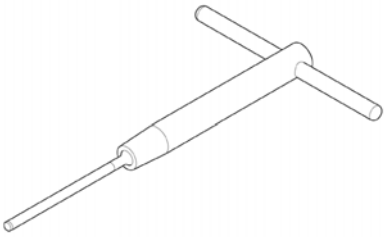
10. CYLINDER HEAD/VALVES

SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves, rocker arms and camshafts.
- The rocker arms, camshafts and cam chain tensioner lifter services can be done with the engine installed in the frame. The cylinder head and valve service requires engine removal.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshafts and rocker arms lubricating oil is fed through oil passages in the cylinder head and camshaft holder. Clean the oil passages before assembling them.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.

TOOLS

Compression gauge attachment 07RMJ-MY50100  or equivalent commercially available in U.S.A.	Tensioner stopper 070MG-0010100  or 07AMG-001A100 (U.S.A. only) or 07AMG-MFJA100 (U.S.A. only)	Valve spring compressor 07757-0010000 
Valve spring compressor attachment 07959-KM30101 	Valve guide driver, 4.3 mm 07HMD-ML00101 	Valve guide adjusting driver 07743-0020000  (not available in U.S.A.)
Valve guide reamer, 4.5 mm 07HMH-ML00101  or 07HMH-ML0010B (U.S.A. only)	Cutter holder, 4.5 mm 07781-0010600  or equivalent commercially available in U.S.A.	Seat cutter, 27.5 mm (IN, 45°) 07780-0010200  or equivalent commercially available in U.S.A.

Seat cutter, 24 mm (EX, 45°) 07780-0010600  or equivalent commercially available in U.S.A.	Flat cutter, 28 mm (IN, 32°) 07780-0012100  or equivalent commercially available in U.S.A.	Flat cutter 24 mm (EX, 32°) 07780-0012500  or equivalent commercially available in U.S.A.
Interior cutter, 26 mm (IN, 60°) 07780-0014500  or equivalent commercially available in U.S.A.	Interior cutter, 22 mm (EX, 60°) 07780-0014202  or equivalent commercially available in U.S.A.	

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problem can be diagnosed by a compression test or by tracing engine noises to the top-end with a sounding rod stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather hose. If the hose is smoky, check for a seized piston ring (page 14-14).

Compression too low, hard starting or poor performance at low speed

- Valves:
  - Incorrect valve clearance adjustment
  - Burned or bent valve
  - Incorrect valve timing
  - Broken valve spring
  - Uneven valve seating
- Cylinder head:
  - Leaking or damaged cylinder head gasket
  - Warped or cracked cylinder head
  - Loose spark plug
- Worn cylinder, piston or piston rings (page 14-14)

Compression too high, overheating or knocking

- Excessive carbon build-up on piston crown or on combustion chamber

Excessive smoke

- Cylinder head:
  - Worn valve stem or valve guide
  - Damaged stem seal
- Worn cylinder, piston or piston rings (page 14-14)

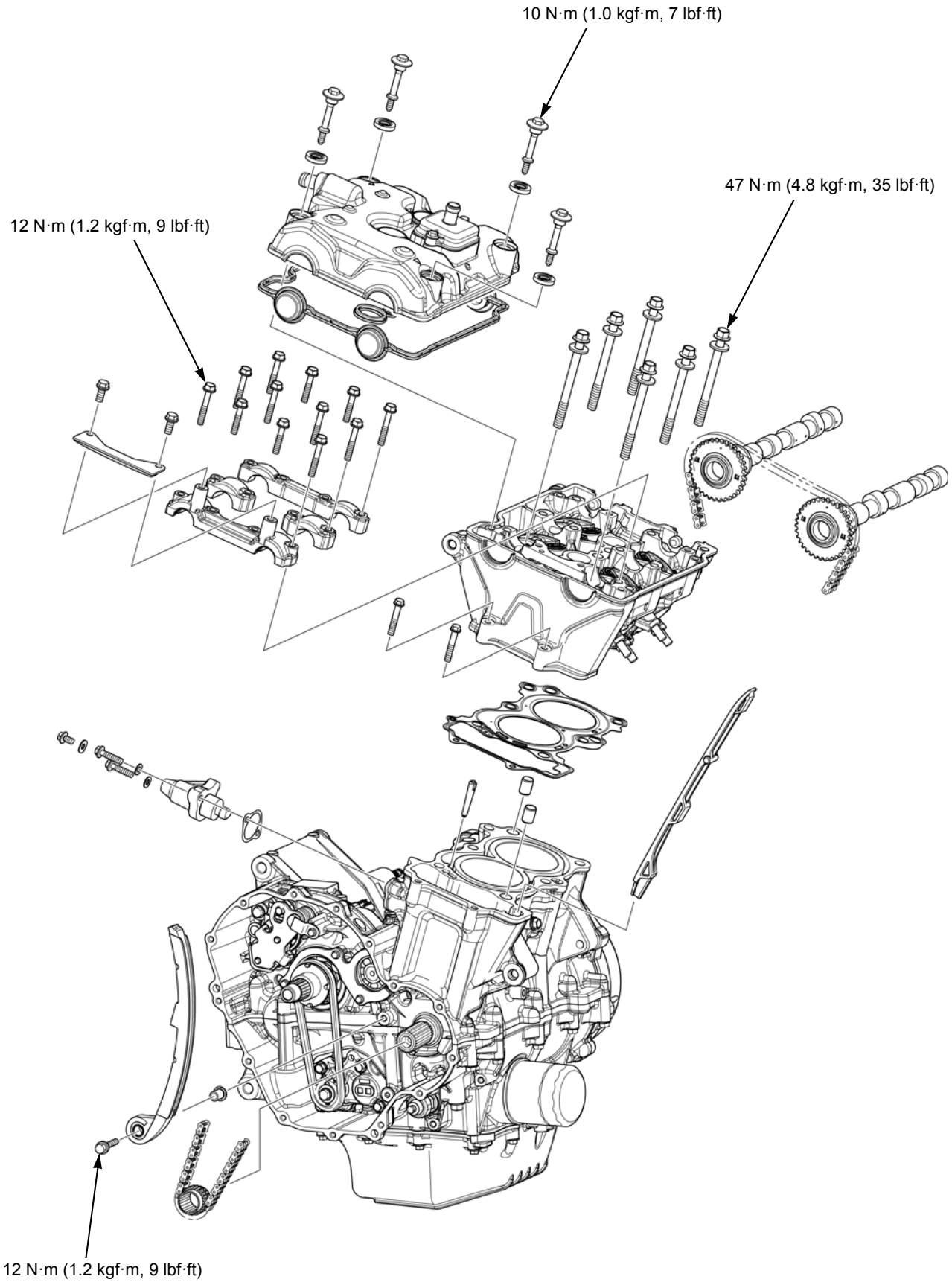
Excessive noise

- Cylinder head:
  - Incorrect valve clearance adjustment
  - Sticking valve or broken valve spring
  - Damaged or worn camshaft
  - Worn rocker arm and/or shaft
  - Worn rocker arm and valve stem end
  - Loose or worn cam chain
  - Worn or damaged cam chain
  - Worn or damaged cam chain tensioner
  - Worn cam sprocket teeth
- Worn cylinder, piston or piston rings (page 14-14)

Rough idle

- Low cylinder compression

COMPONENT LOCATION



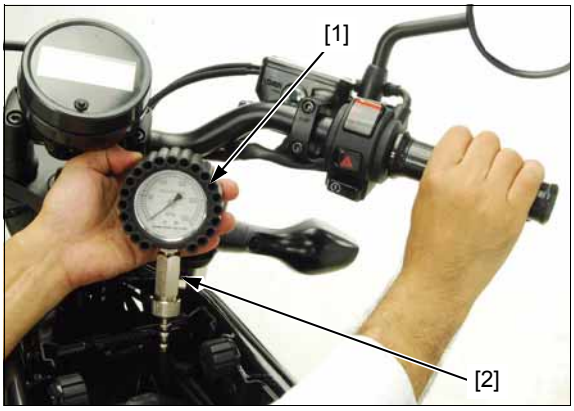
CYLINDER COMPRESSION TEST

Warm the engine to normal operating temperature.

Stop the engine and remove the fuel tank under tray (page 2-8).

Temporarily install the ECM to the wire harness by connecting the 33P connectors.

Install a compression gauge [1] with the attachment into the spark plug hole.



TOOL:

[2] Compression gauge attachment	**07RMJ-MY50100 or equivalent commercially available in U.S.A.**

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

Shift the transmission into neutral.

Open the throttle all the way and crank the engine with the starter motor until the gauge reading stops rising.

The maximum reading is usually reached within 4 – 7 seconds.

Compression pressure:
1,393 kPa (14.2 kgf/cm^2, 202 psi) at 450 rpm

Low compression can be caused by:
– Blown cylinder head gasket
– Improper valve clearance adjustment
– Valve leakage
– Worn piston rings or cylinder

High compression can be caused by:
– Carbon deposits in combustion chamber or on piston head

CYLINDER HEAD COVER

REMOVAL/INSTALLATION

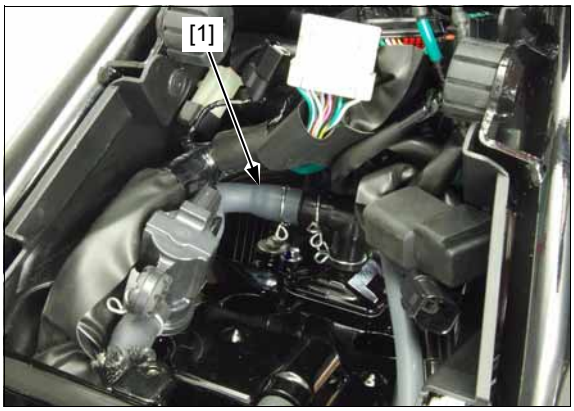
NOTE:

- The cylinder head cover can be serviced with the engine installed in the frame.

Remove the following:

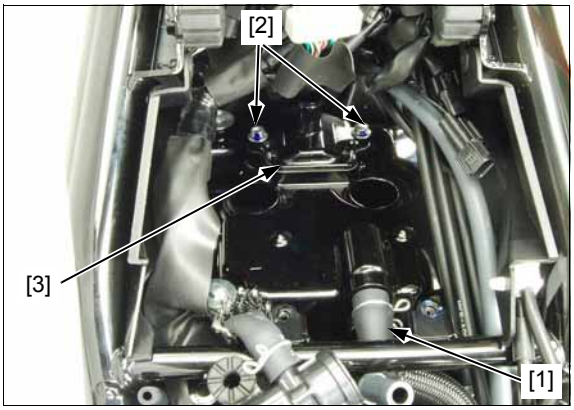
– heat guard (page 8-6)
– fuel tank under tray (page 2-8)
– radiator (page 8-7)

Disconnect the PAIR air supply hose [1] from the cylinder head cover.



Disconnect the crankcase breather hose [1] from the cylinder head cover.

Remove the bolts [2] and PAIR check valve cover [3]



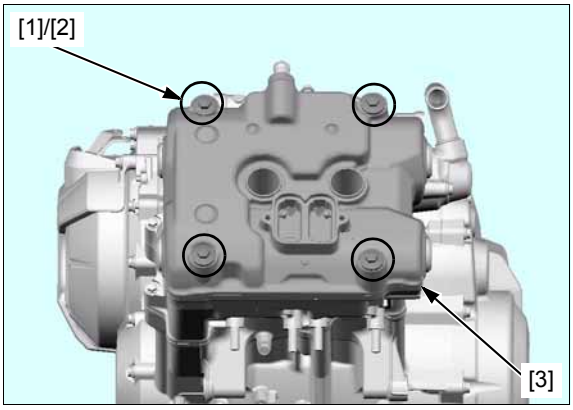
Disconnect the upper radiator hose [1].

Remove the cylinder head cover bolts [1] and mounting rubbers [2].

Remove the cylinder head cover [3] from the cylinder head.

NOTE:

- Do not forcibly remove the dowel pins from the cylinder head cover.



Remove the cylinder head cover packing [1] from the cylinder head cover.

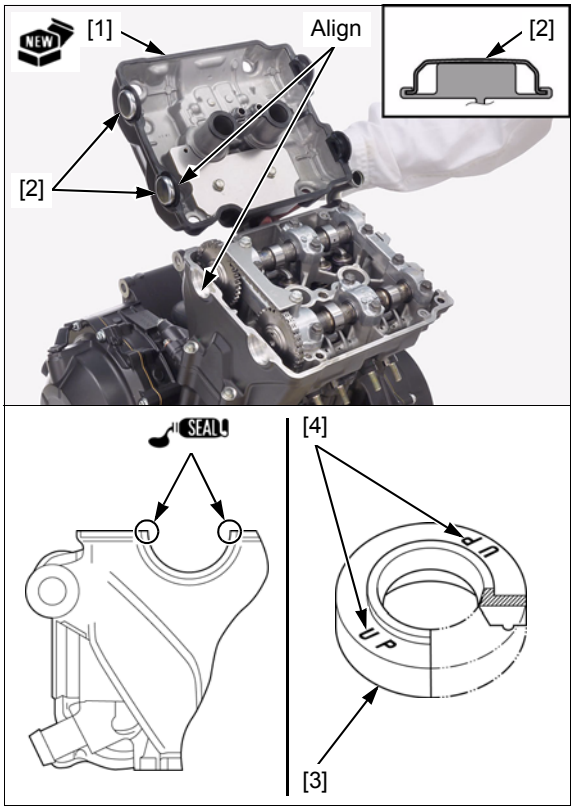
Installation is in the reverse order of removal.

TORQUE:
Cylinder head cover bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)

NOTE:
- Replace the cylinder head cover packing with a new one.
- Install the cylinder head cover packing into the groove in the cylinder head cover.
- Make sure the cylinder head cover packing caps [2] are installed in position.
- Apply sealant to the cylinder head semi-circular edges as shown (8 places) (page 1-18).
- Install the cylinder head cover onto the cylinder head while aligning the cylinder head cover packing with the grooves in the cylinder head semi-circular areas.
- Check the mounting rubbers [3] are in good condition, replace them if necessary.
- Install the mounting rubbers with their "UP" mark [4] facing up.
- Align the clutch cable holder hole with the right crankcase cover boss.

Adjust the following:

– throttle grip freeplay (page 3-4)
– clutch lever freeplay (page 3-21)



CAMSHAFT

REMOVAL

NOTE:
- The camshaft can be serviced with the engine installed in the frame.

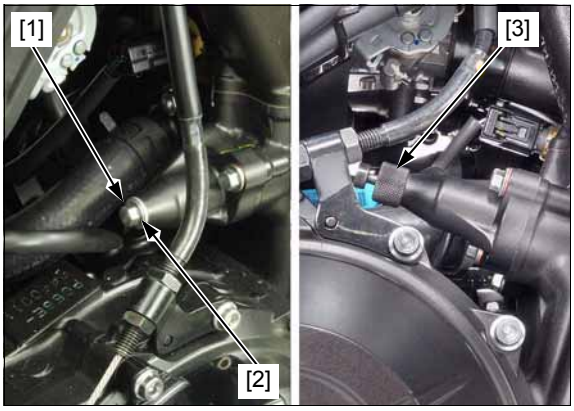
Remove the cylinder head cover (page 10-6).

Make sure the No. 1 piston is at TDC (Top Dead Center) on the compression stroke (page 3-7).

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

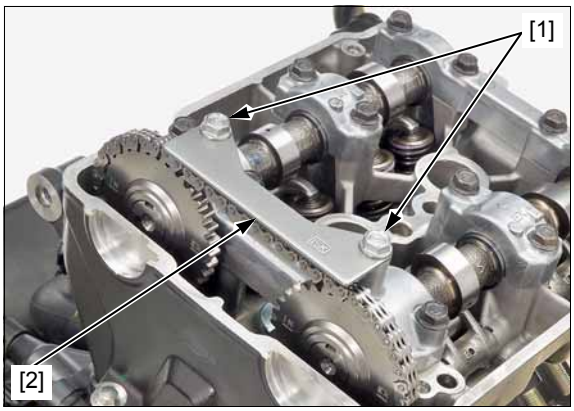
Turn the cam chain tensioner lifter shaft fully in (clockwise) and secure it using the special tool.

TOOL:
[3] Tensioner stopper **070MG-0010100 or 07AMG-001A100 (U.S.A. only) or 07AMG-MFJA100 (U.S.A. only)**



Be careful not to let the cam chain guide bolts fall into the crankcase.

Remove the bolts [1] and cam chain guide B [2].



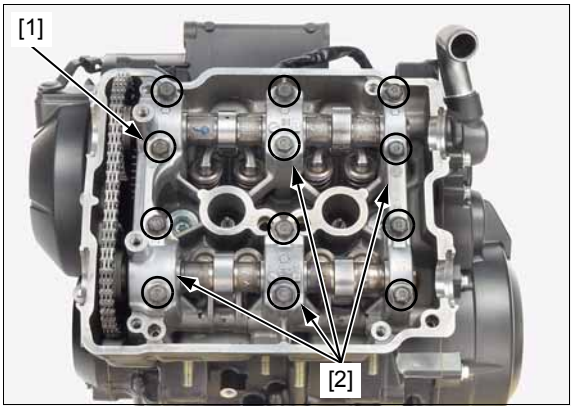
NOTICE

From outside to inside, loosen the bolts in a crisscross pattern in several steps or the camshaft holder might break.

Be careful not to let the camshaft holder bolts fall into the crankcase.

Loosen the camshaft holder bolts [1] gradually in a crisscross pattern in 2 or 3 steps, and remove them.

Remove the camshaft holders [2] with the dowel pins from the cylinder.

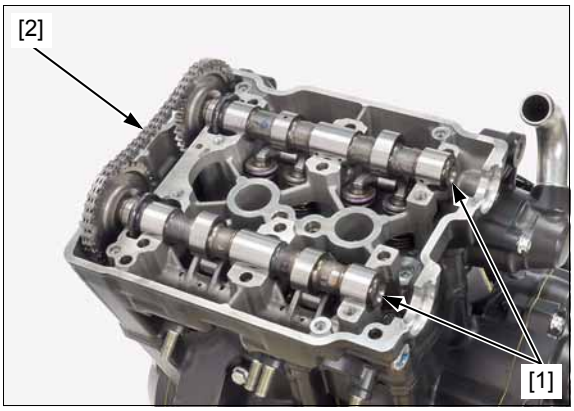


NOTE:

- Do not forcibly remove the dowel pins from the camshaft holders.

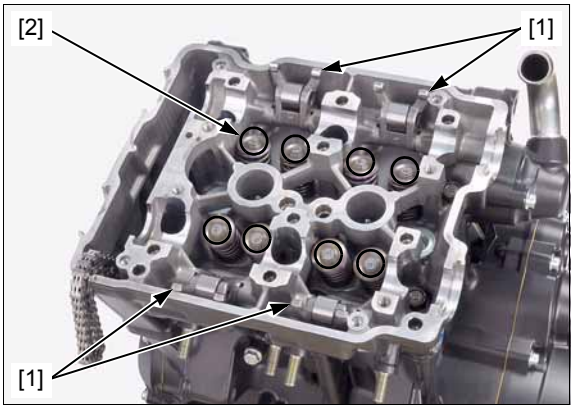
Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.

Remove the camshafts [1] by removing the cam chain [2] from the cam sprockets.



Lift the rocker arms [1].

Remove the shims [2].



NOTE:

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

INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning or clogs in oil passages.

– cam sprockets/camshafts
– camshaft holders/dowel pins
– cam chain guide B

Measure each part according to CYLINDER HEAD/ VALVES SPECIFICATIONS (page 1-8).

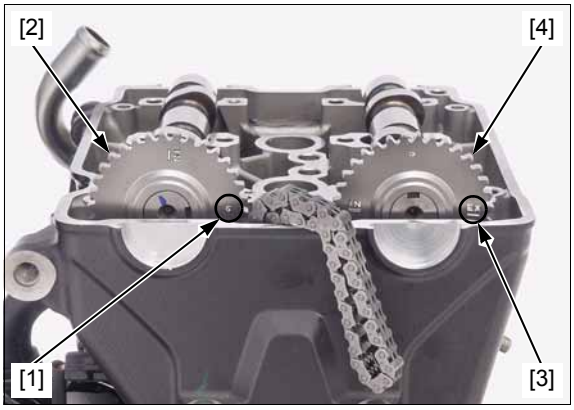
Replace any part if it is out of service limit.

CAMSHAFT OIL CLEARANCE

Wipe any oil from the journals of the camshaft, cylinder head and camshaft holders.

Install the camshafts onto the cylinder head.

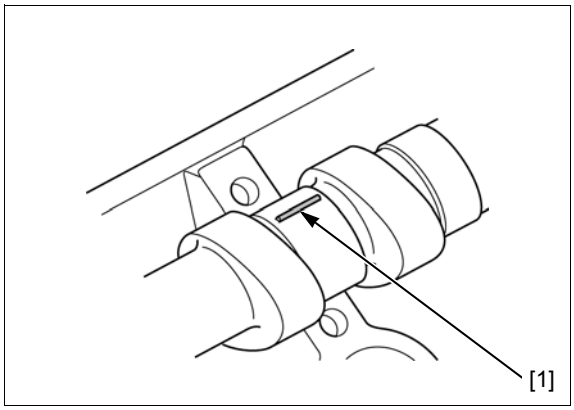
- Align the punch mark [1] on the intake cam sprocket [2] with the cylinder head top surface as shown.
- Align the outside index line ("EX" [3] mark) on the exhaust cam sprocket [4] with the cylinder head top surface as shown.



Lay a strip of plastigauge [1] lengthwise on top of each camshaft journal avoiding the oil hole.

NOTE:

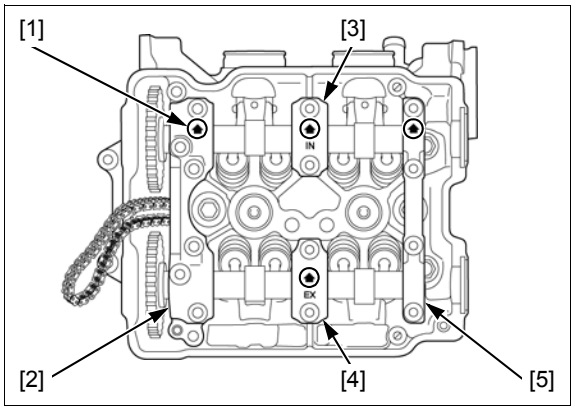
- Do not rotate the camshaft during inspection.



Be sure the dowel pins in the camshaft holder align with the holes in the cylinder head.

Install each camshaft holder with the arrow [1] facing the intake side in the correct locations as shown.

– camshaft holder A [2]
– camshaft holder B [3] ("IN" mark: intake side holder)
– camshaft holder C [4] ("EX" mark: exhaust side holder)
– camshaft holder D [5]



Apply engine oil to the camshaft holder bolt threads and seating surface.

Install the camshaft holder bolts:

– 6 x 39.5 mm bolts [1]
– 6 x 32 mm bolts [2]

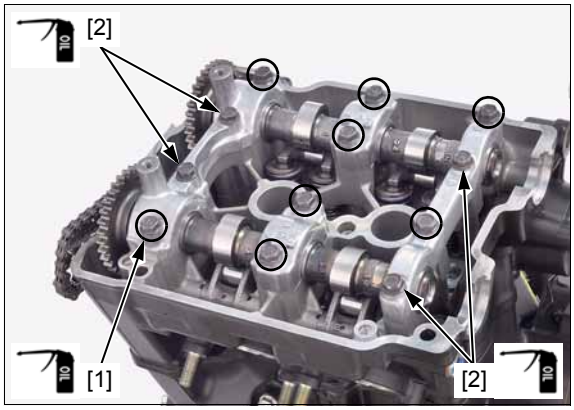
NOTICE

Failure to tighten the camshaft holder in a crisscross pattern may cause the camshaft holder to break.

From inside to outside tighten the camshaft holder bolts gradually until the camshaft holders seats on the cylinder head.

Tighten the camshaft holder bolts in a crisscross pattern in 2 or 3 steps to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



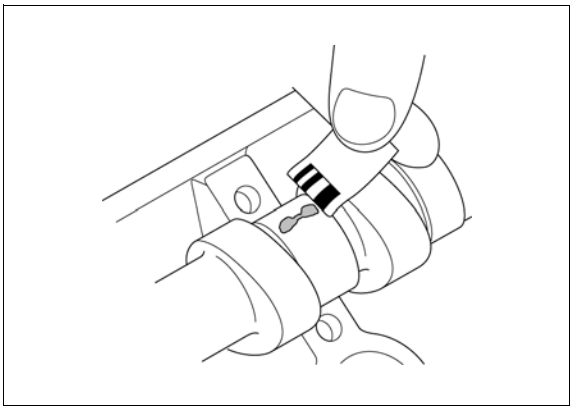
Remove the camshaft holders and measure the width of each plastigauge.

The widest thickness determines the oil clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)

When the service limits are exceeded, replace the camshaft and recheck the oil clearance.

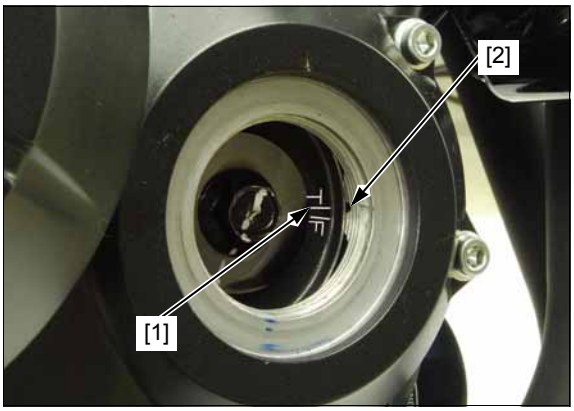
Replace the cylinder head and camshaft holders as a set if the clearance still exceeds the service limit.



INSTALLATION

Be careful not to jam the cam chain into the timing sprocket on the crankshaft when rotating the crankshaft.

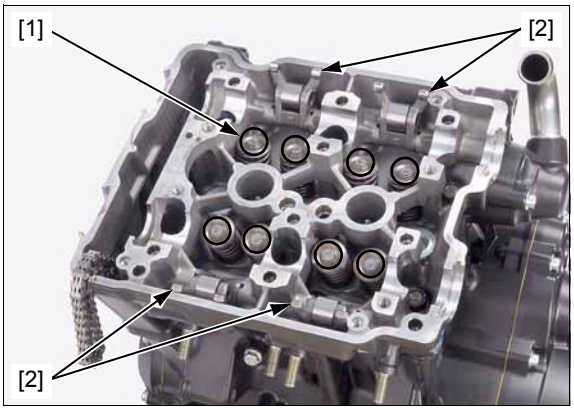
Rotate the crankshaft clockwise, and align the "T" mark [1] on the primary drive gear with the index notch [2] on the right crankcase cover.



Be careful not to let the shims fall into the crankcase.

Install the shims [1] in their original locations on the valve retainer.

Lower the rocker arms [2].



Each camshaft has an identification mark.

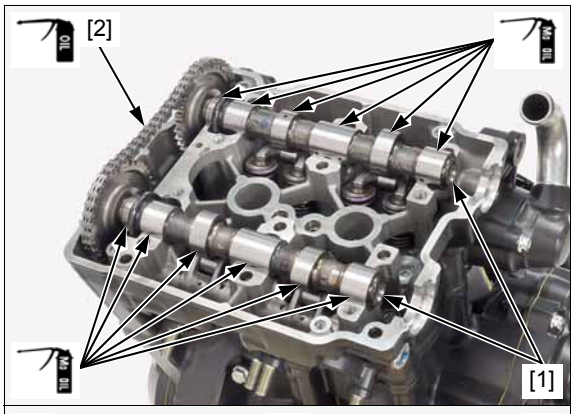
- "IN" mark [1]: intake camshaft
- "EX" mark [2]: exhaust camshaft

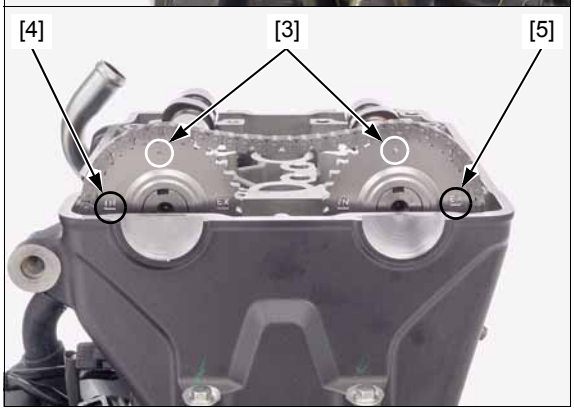
Apply molybdenum oil solution to the camshaft [1] lobes, journal and thrust surfaces.

Apply engine oil to the cam chain [2] whole surface.

Install the camshafts onto the cylinder head while installing cam chain onto the cam sprockets.

Position the punch marks [3] on the cam sprockets facing up, and align the outside index line ("IN" [4] and "EX" [5] marks) with the cylinder head top surface as shown.

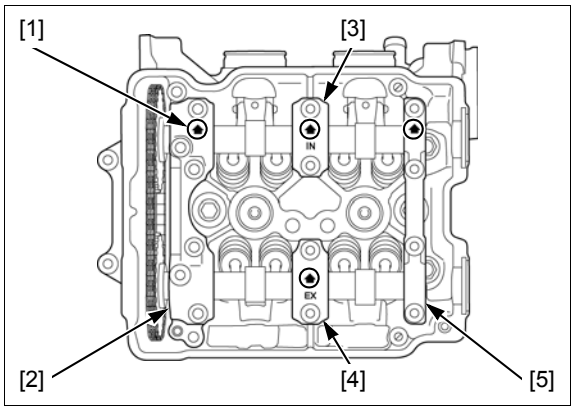




Be sure the dowel pins in the camshaft holder align with the holes in the cylinder head.

Install each camshaft holder with the arrow [1] facing the intake side in the correct locations as shown.

- camshaft holder A [2]
- camshaft holder B [3] ("IN" mark: intake side holder)
- camshaft holder C [4] ("EX" mark: exhaust side holder)
- camshaft holder D [5]



Apply engine oil to the camshaft holder bolt threads and seating surface.

Install the camshaft holder bolts:

- 6 x 39.5 mm bolts [1]
- 6 x 32 mm bolts [2]

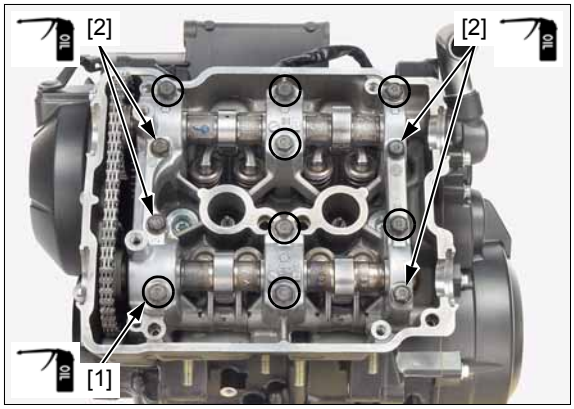
NOTICE

Failure to tighten the camshaft holder in a crisscross pattern may cause the camshaft holder to break.

From inside to outside tighten the camshaft holder bolts gradually until the camshaft holders seats on the cylinder head.

Tighten the camshaft holder bolts in a crisscross pattern in 2 or 3 steps to the specified torque.

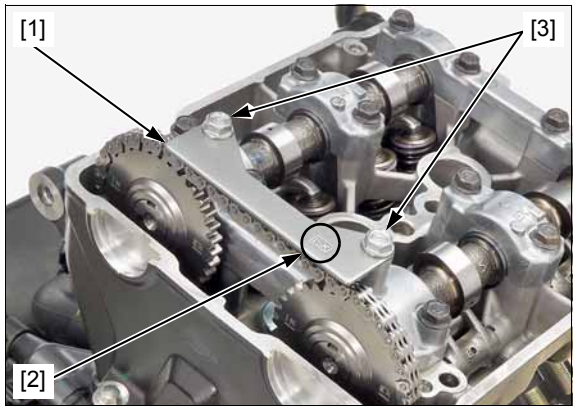
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install the cam chain guide B [1] with the "EX" mark [2] facing the exhaust side.

Be careful not to let the cam chain guide bolts fall into the crankcase.

Install and tighten the cam chain guide bolts [3] securely.



Remove the tensioner stopper [1] from the cam chain tensioner lifter.

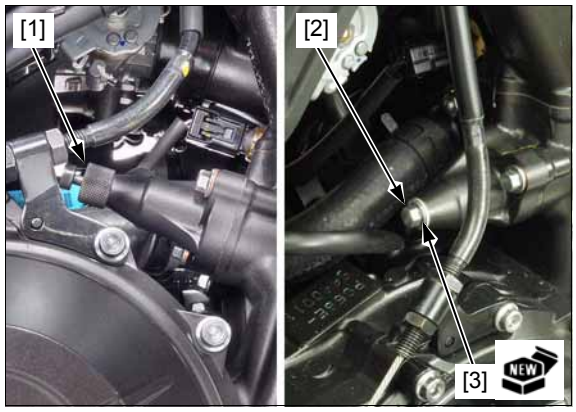
Turn the crankshaft clockwise several times, and align the "T" mark on the primary drive gear with the index notch on the right crankcase cover (page 10-11).

Recheck the valve timing.

Inspect the valve clearance (page 3-7).

Install the sealing bolt [2] with a new sealing washer [3] and tighten it securely.

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



ROCKER ARM

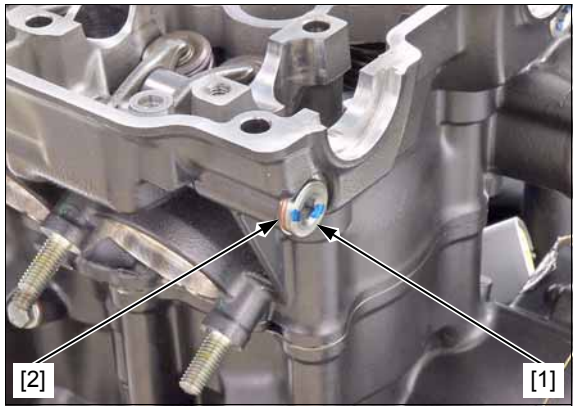
REMOVAL/INSTALLATION

NOTE:

- The rocker arm can be serviced with the engine installed in the frame.
- The intake and exhaust rocker arm services are the same procedures.

Remove the camshafts (page 10-8).

Remove the stopper bolt [1] and sealing washer [2].



Remove the rocker arm shaft [1] using a 6 mm bolt [2] while holding the rocker arm [3].

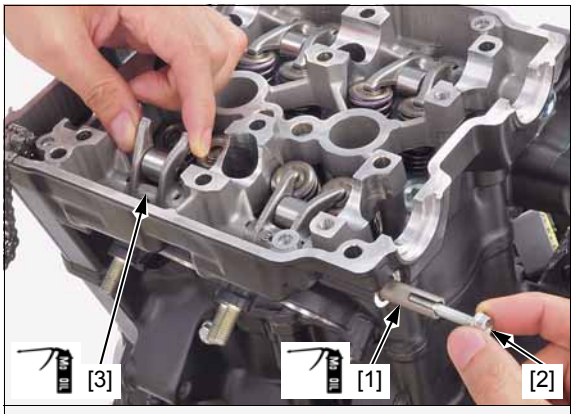
Remove the rocker arms.

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

Install the rocker arms and rocker arm shaft.

NOTE:

- The rocker arms are identified by the stamped marks:
  – "I" mark [4]: intake rocker arm
  – "E" mark [5]: exhaust rocker arm

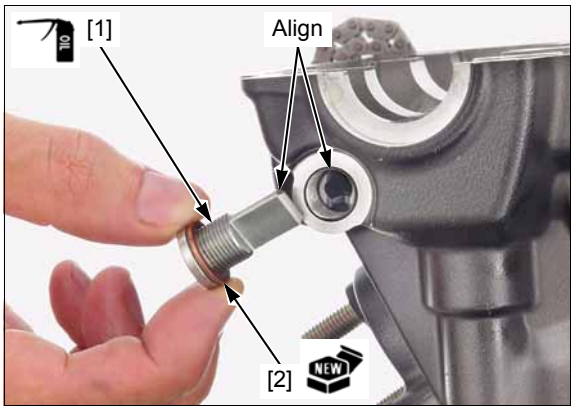


Apply engine oil to the threads of stopper bolt [1] and install it with a new sealing washer [2], aligning the blade with the groove.

Tighten the stopper bolt to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

Install the camshafts (page 10-11).



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning or clogs in oil passages.

– rocker arms
– rocker arm shafts

Measure each part and clearance according to CYLINDER HEAD/VALVES SPECIFICATIONS (page 1-8).

Replace any part if it is out of service limit.

CYLINDER HEAD

REMOVAL

Remove the following:

– engine (page 15-4)
– rocker arms (page 10-13)
– thermostat (page 8-6)

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

Release the hose clip [2] and disconnect the bypass hose [3].

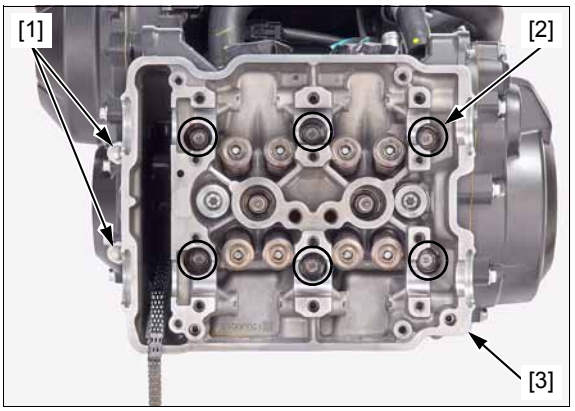
Remove the 6 mm bolts [1].

Loosen the 9 mm washer-bolts [2] in a crisscross pattern in 2 or 3 steps, then remove them.

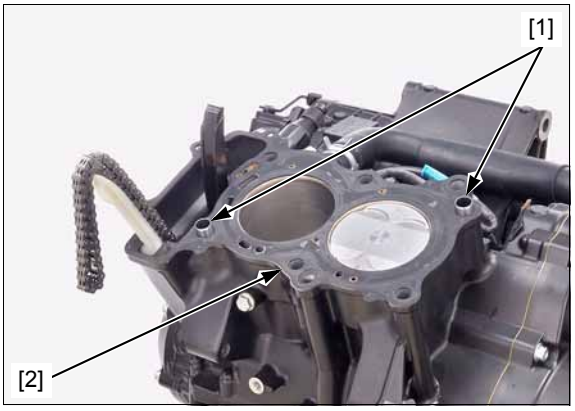
Remove the cylinder head [3].

NOTE:

- Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.
- Do not tap the cylinder head too hard and do not damage the mating surface with a screwdriver.



Remove the dowel pins [1] and gasket [2].



Remove the cam chain guide A [1].

Remove the partition pin [1].

Check the partition pin for deterioration or damage.

DISASSEMBLY

Remove the following:

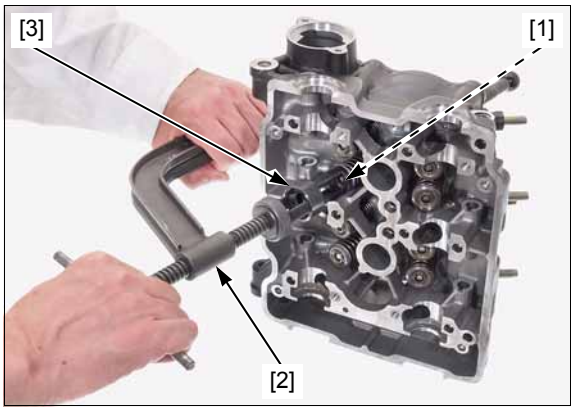
– spark plugs (page 3-6)
– ECT sensor (page 4-34)

To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.

Remove the valve spring cotters [1] using the special tools.

TOOLS:

[2] Valve spring compressor	**07757-0010000**
[3] Valve spring compressor attachment	**07959-KM30101**



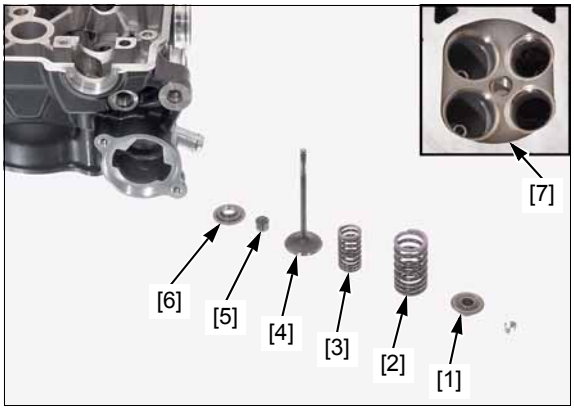
Mark all parts during disassembly so they can be placed back in their original locations.

Remove the valve spring compressor and remove the following:

– valve spring retainers [1]
– outer valve springs [2]
– inner valve springs [3]
– valves [4]
– valve stem seals [5]
– valve spring seats [6]

Avoid damaging the cylinder mating surface and valve seat surfaces.

Remove the carbon deposits from the combustion chamber [7] and clean off the cylinder head gasket surface.



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning or clogs in oil passages.

– cylinder head
– inner/outer valve springs
– valves
– valve guides
– cam chain guide A

Measure each part and clearance according to CYLINDER HEAD/VALVES SPECIFICATIONS (page 1-8).

Replace any part if it is out of service limit.

- Ream the valve guide using the valve guide reamer to remove any carbon build up before measuring the guide (page 10-18).
- Refer to valve seat inspection (page 10-18).

VALVE GUIDE REPLACEMENT

Disassemble the cylinder head (page 10-16).

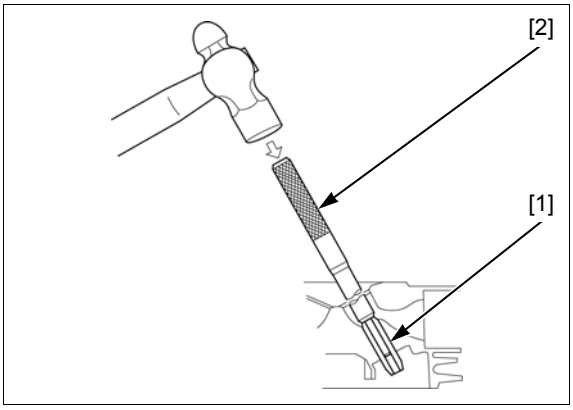
Chill new valve guides in a freezer for about 1 hour.

NOTE:

- Be sure to wear heavy gloves to avoid burns when handling the heated cylinder head.
- Using a torch to heat the cylinder head may cause warpage.

Heat the cylinder head to 130 – 140°C (266 – 284°F) with a hot plate or oven. Do not heat the cylinder head beyond 150°C (302°F). Use temperature indicator sticks, available from welding supply stores, to be sure the cylinder head is heated to the proper temperature.

Support the cylinder head and drive the valve guides [1] out of the cylinder head from the combustion chamber side.



TOOL:
[2] Valve guide driver, 4.3 mm 07HMD-ML00101

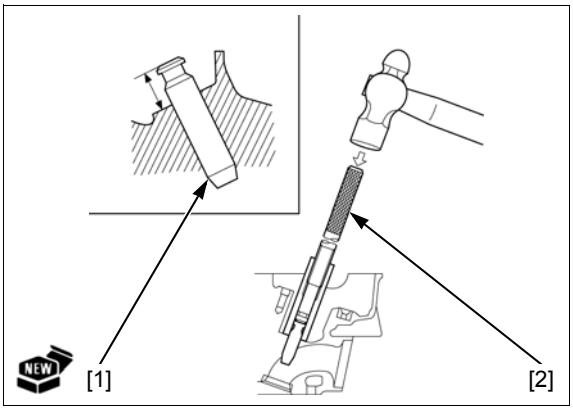
Take out new valve guides [1] from the freezer.

While the cylinder head is still heated, drive new valve guides from the camshaft side until the exposed height is specified value.

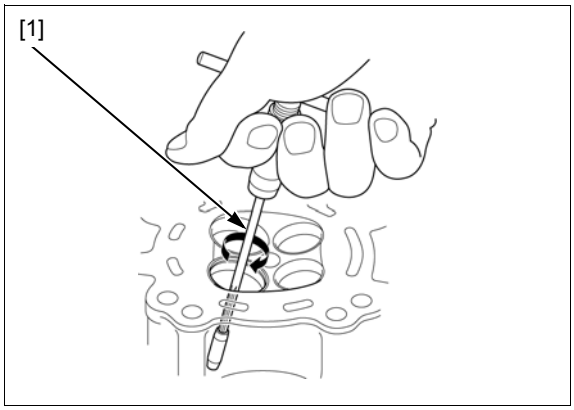
TOOL:
[2] Valve guide adjusting driver 07743-0020000 (not available in U.S.A.)

SPECIFIED HEIGHT:
IN/EX: 14.10 – 14.30 mm (0.555 – 0.563 in)

Let the cylinder head cool to room temperature.



Ream new valve guides after installation.



NOTE:

- Take care not to tilt or lean the reamer [1] in the guide while reaming.
- Use cutting oil on the reamer during this operation.

Insert the reamer from the combustion chamber side of the cylinder head and always rotate the reamer clockwise.

TOOL:

Valve guide reamer, 4.3 mm	**07HMH-ML00101 or 07HMH-ML0010B (U.S.A. only)**

Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat (page 10-19).

VALVE SEAT INSPECTION/REFACING

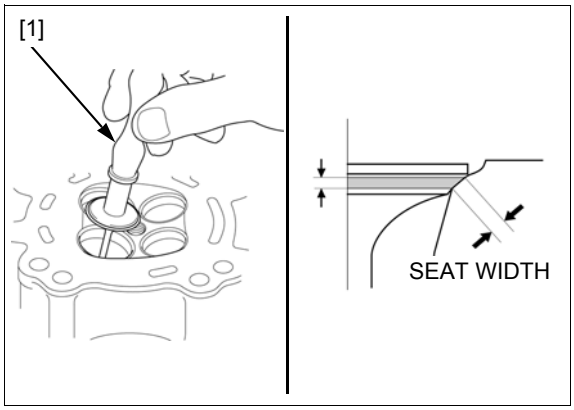
INSPECTION

Disassemble the cylinder head (page 10-16).

Clean the intake and exhaust valves thoroughly to remove carbon deposits.

Apply a light coat of Prussian Blue to the valve seats.

Tap the valve against the valve seat several times using a hand-lapping tool [1], without rotating the valve to make a clear pattern.



The valves cannot be ground. If the valve face is burned, badly worn or if it contacts the seat unevenly, replace the valve.

Remove the valve and inspect the valve seat face.

The valve seat contact should be within the specified width and even all around the circumference.

STANDARD: 0.90 – 1.10 mm (0.035 – 0.043 in)
SERVICE LIMIT: 1.5 mm (0.06 in)

If the valve seat width is not within specification, reface the valve seat (page 10-19).

Inspect the valve seat face for:

- Damaged face:
  – Replace the valve and reface the valve seat
- Uneven seat width:
  – Bent or collapsed valve stem; Replace the valve and reface the valve seat
- Contact area (too low or too high):
  – Reface the valve seat

REFACING

Reface the valve seat using the following tools.

TOOLS:

Cutter holder, 4.5 mm	**07781-0010600**
Seat cutter, 27.5 mm (IN, 45°)	**07780-0010200**
Seat cutter, 24 mm (EX, 45°)	**07780-0010600**
Flat cutter, 28 mm (IN, 32°)	**07780-0012100**
Flat cutter, 24 mm (EX, 32°)	**07780-0012500**
Interior cutter, 26 mm (IN, 60°)	**07780-0014500**
Interior cutter, 22 mm (EX, 60°)	**07780-0014202**

or equivalent commercially available in U.S.A.

VALVE SEAT WIDTH:

0.90 – 1.10 mm (0.035 – 0.043 in)

NOTE:

- Follow the refacer manufacturer's operating instructions.
- Be careful not to grind the seat more than necessary.

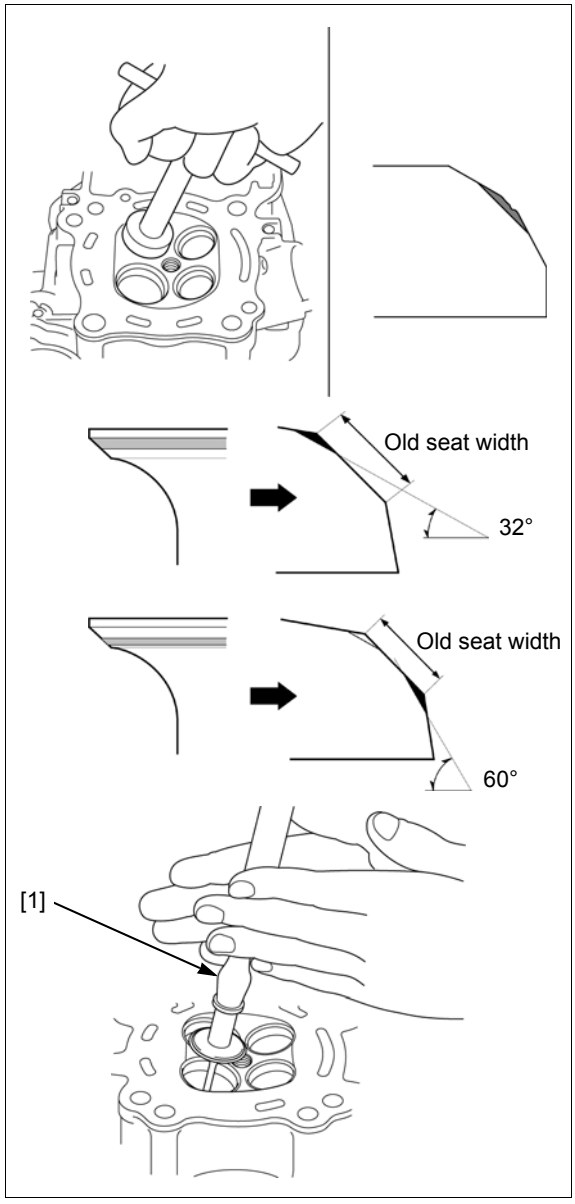
1. Use a 45° seat cutter, remove any roughness or irregularities from the seat.
2. Use a 32° flat cutter, remove the top 1/4 of the existing valve seat material.
3. Use a 60° interior cutter, remove the bottom 1/4 of the existing valve seat material.
4. Using a 45° seat cutter, cut the seat to the proper width.
   Make sure that all pitting and irregularities are removed.
5. After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

NOTE:

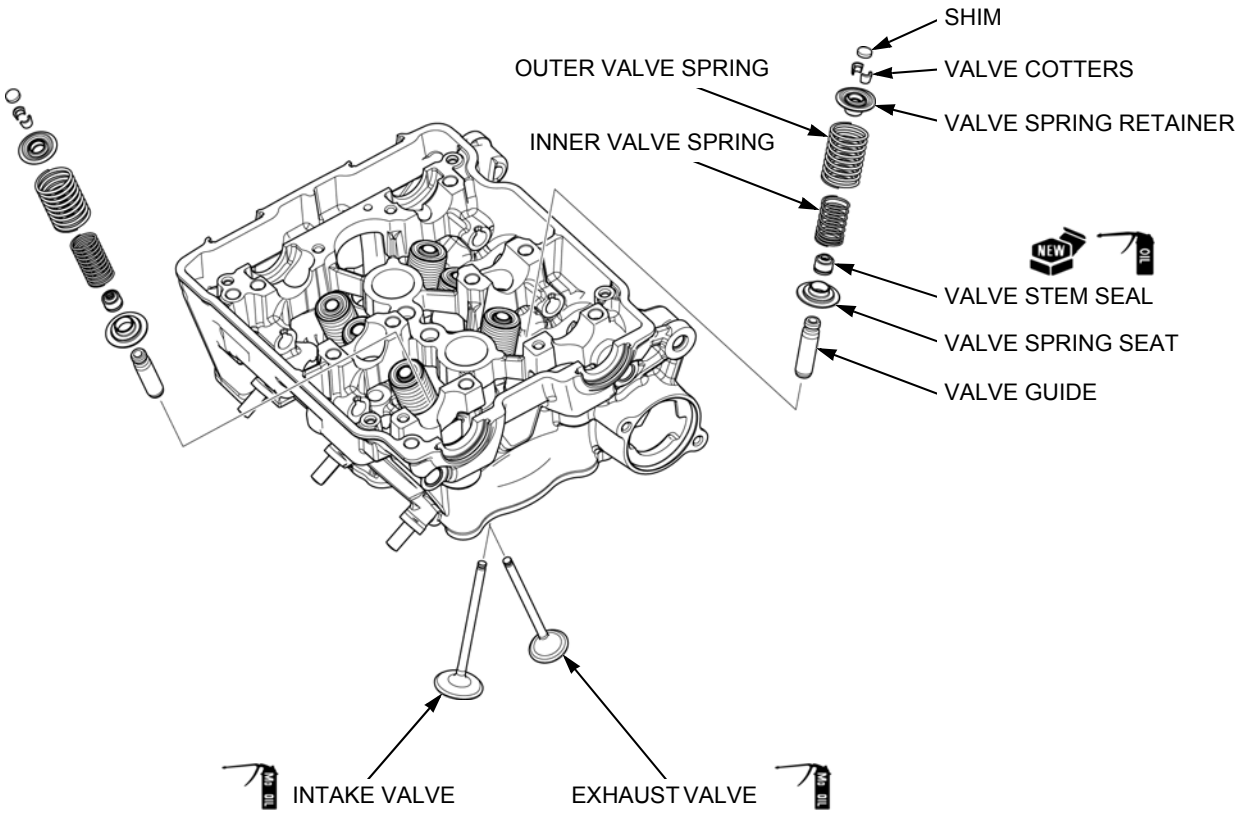
- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool [1] frequently to prevent uneven seat wear.
- Do not allow lapping compound to enter the guides.

After lapping, wash any residual compound off the cylinder head and valve and recheck the seat contact.

Assemble the cylinder head (page 10-20).



ASSEMBLY



Clean the cylinder head assembly with solvent and blow through all oil passages with compressed air.

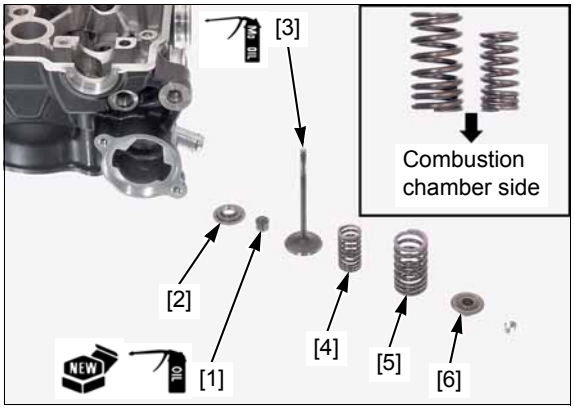
Apply engine oil to the fitting area of new valve stem seals [1].

Install the valve spring seats [2] and valve stem seals.

Apply molybdenum oil solution to each valve stem end and sliding surface.

Insert the valves [3] into the valve guides while turning them slowly to avoid damage to the valve stem seals.

Install the inner valve spring [4] and outer valve spring [5] with the tightly wound coils should facing the combustion chamber.



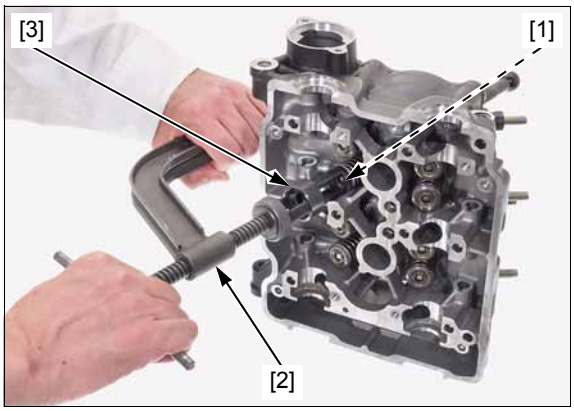
Install the valve spring retainers [6].

Grease the cotters to ease installation. To prevent loss of tension, do not compress the valve spring more than necessary.

Install the valve cotters [1] using the special tool.

TOOLS:

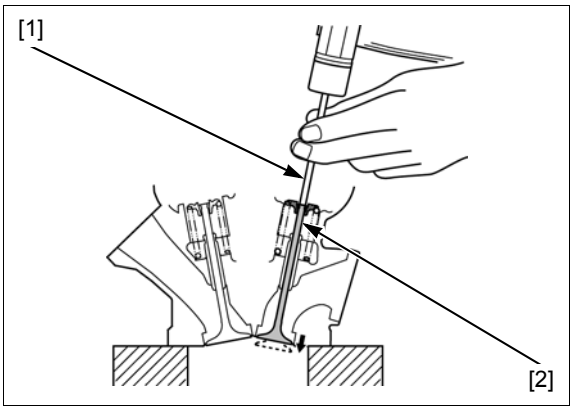
[2] Valve spring compressor	**07757-0010000**
[3] Valve spring compressor attachment	**07959-KM30101**



Support the cylinder head above the work bench surface to prevent valve damage.

Place a suitable tool [1] onto the valve stem [2].

Tap the tool gently to seat the valve cotters [3] firmly using a hammer.



Install the following:

– ECT sensor (page 4-34)
– spark plugs (page 3-6)

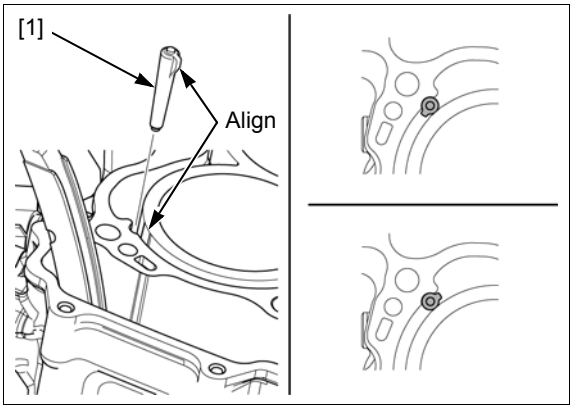
INSTALLATION

Do not allow dust and dirt to enter the crankcase.

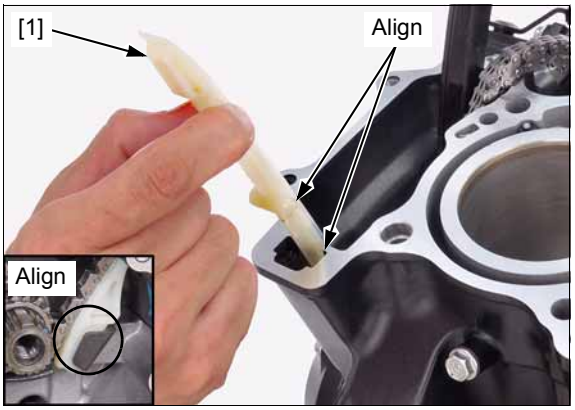
Clean any gasket material from the cylinder mating surfaces.

The lug is positioned in either the right or left.

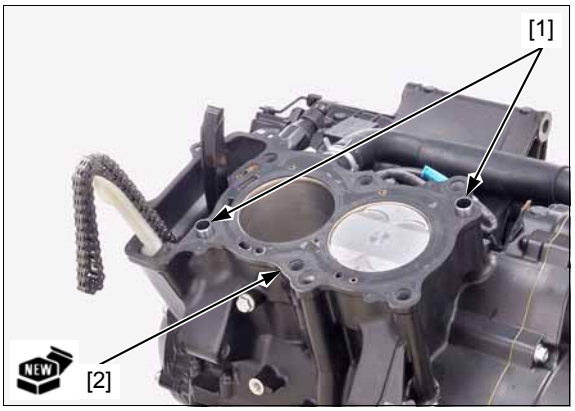
Install the partition pin [1] into the recess of the No. 2 cylinder intake side with the tapered side facing down, aligning its lug with the cylinder water jacket.



Install the cam chain guide A [1] while aligning its pins with the grooves in the cylinder, and its end with the groove in the crankcase.



Install the dowel pins [1] and a new gasket [2].



Route the cam chain through the cylinder head and install the cylinder head [1] onto the cylinder.

Clean the cylinder head 9 mm washer-bolts in solvent, and dry them thoroughly.

Apply engine oil to the 9 mm washer-bolt [2] threads and seating surfaces.

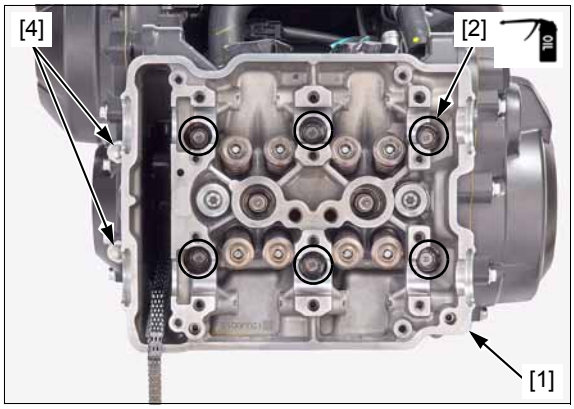
Install and tighten the 9 mm washer-bolt in a crisscross pattern in 2 or 3 steps to the specified torque.

TORQUE: 47 N·m (4.8 kgf·m, 35 lbf·ft)

Install and tighten the 6 mm bolts [4] securely.

Install the following:

– thermostat (page 8-6)
– rocker arms (page 10-13)
– engine (page 15-8)



CAM CHAIN TENSIONER LIFTER

REMOVAL/INSTALLATION

NOTE:

- The cam chain tensioner lifter can be serviced with the engine installed in the frame.

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

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

TOOL:

[3] Tensioner stopper	**070MG-0010100 or 07AMG-001A100 (U.S.A. only) or 07AMG-MFJA100 (U.S.A. only)**

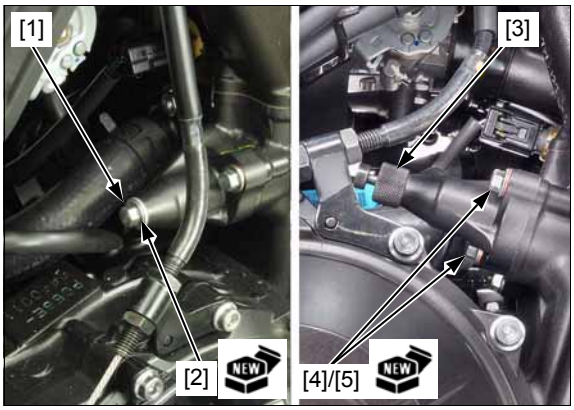
Remove the cam chain tensioner lifter mounting bolts [4] and sealing washers [5].

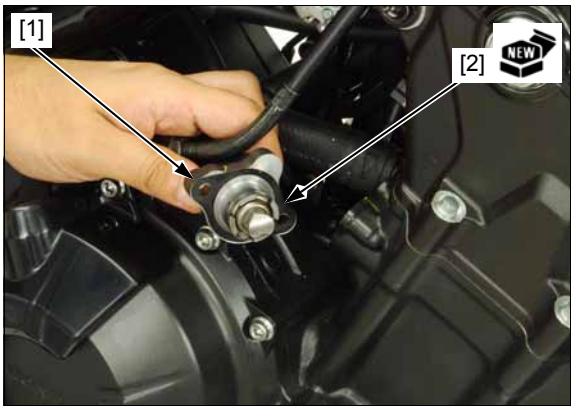
Remove the cam chain tensioner lifter [1] and gasket [2].

Installation is in the reverse order of removal.

NOTE:

- Replace the gasket and sealing washers with new ones.

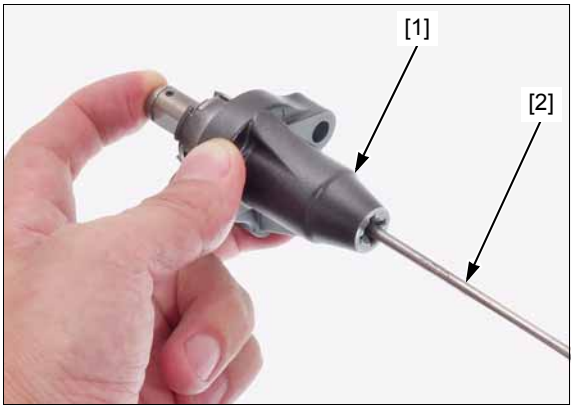




INSPECTION

Check the cam chain tensioner lifter [1] operation:

– The cam chain tensioner lifter shaft should not go into the cam chain tensioner lifter body when it is pushed.
– When it is turned clockwise with a tensioner stopper or a screwdriver [2], the cam chain tensioner lifter shaft should be pulled into the cam chain tensioner lifter body. The cam chain tensioner lifter shaft should spring out of the cam chain tensioner lifter body as soon as the stopper tool is released.



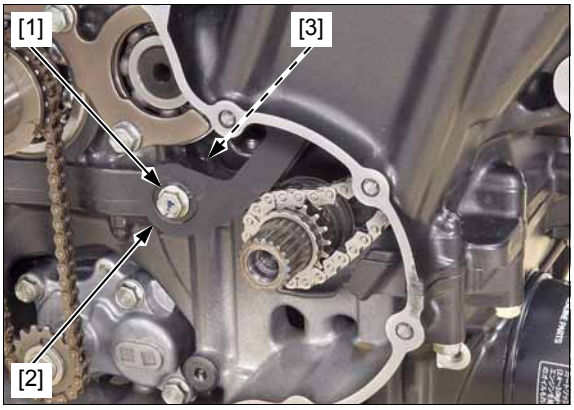
CAM CHAIN/TIMING SPROCKET

REMOVAL

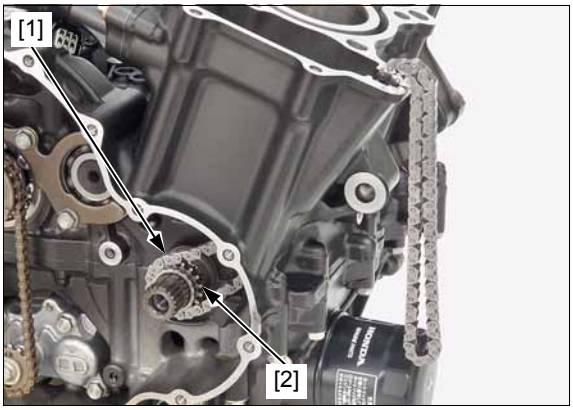
Remove the following:

– cylinder head (page 10-15)
– primary drive gear (page 11-14)
– clutch outer (page 11-7)

Remove the bolt [1], cam chain tensioner [2] and collar [3].



Remove the cam chain [1] and timing sprocket [2] from the crankshaft.



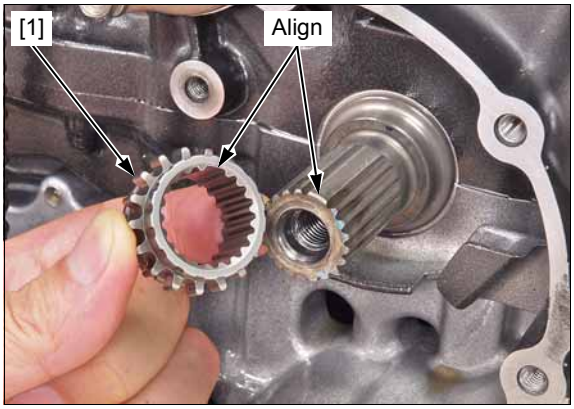
INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

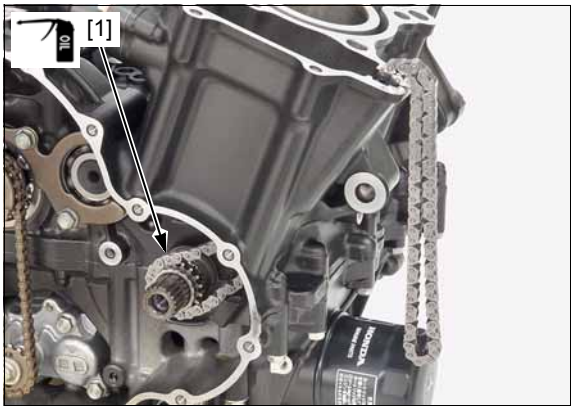
– cam chain
– cam chain tensioner
– timing sprocket

INSTALLATION

Install the timing sprocket [1] by aligning the wide groove with the wide tooth of the crankshaft.



Apply engine oil to the cam chain [1] whole surface and install it to the timing sprocket.



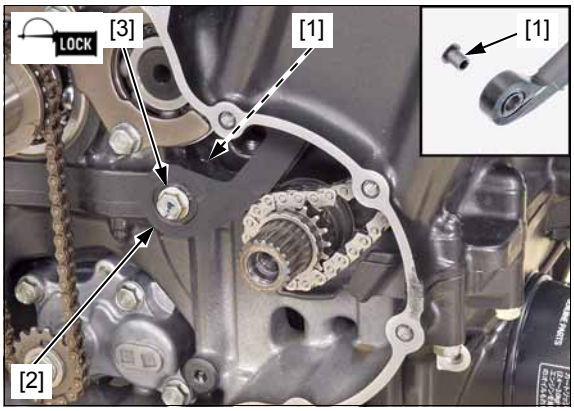
Apply a locking agent to the cam chain tensioner pivot bolt threads (page 1-18).

The collar is installed in the direction as shown.

Install the collar [1], cam chain tensioner [2] and bolt [3].

Tighten the cam chain tensioner pivot bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install the following:

– clutch outer (page 11-11)
– primary drive gear (page 11-15)
– cylinder head (page 10-21)

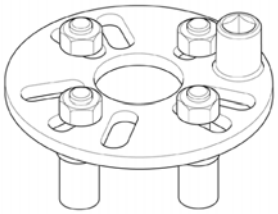
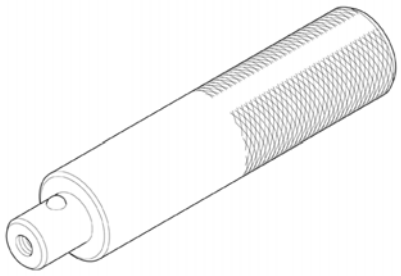
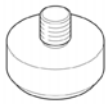
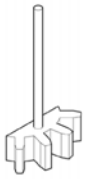
11. CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION

GENERAL

- This section covers service of the clutch and gearshift linkage. All service can be done with the engine installed in the frame.
- Engine oil viscosity and level have an effect on clutch disengagement. When the clutch does not disengage or the motorcycle creeps with clutch disengaged, inspect the engine oil level before servicing the clutch system.

TOOLS

Clutch center holder 07JMB-MN50302  or 07HGB-001010B (plate) and 07HGB-001020B (collar) (U.S.A. only) with 6 x 40 mm bolts	Driver 07749-0010000 	Attachment, 32 x 35 mm 07746-0010100 
Pilot, 28 mm 07746-0041100 	Gear holder, 2.5 07724-0010100  or 07724-001A100 (U.S.A. only)	

TROUBLESHOOTING

Clutch lever is too hard to pull in
- Damaged, kinked or dirty clutch cable
- Improperly routed clutch cable
- Damaged clutch lifter mechanism
- Faulty clutch lifter bearing
- Clutch lifter piece installed improperly

Clutch slips when accelerating
- Clutch lifter sticking
- Worn clutch discs
- Weak clutch springs
- No clutch lever freeplay
- Engine oil mixed with molybdenum or graphite additive

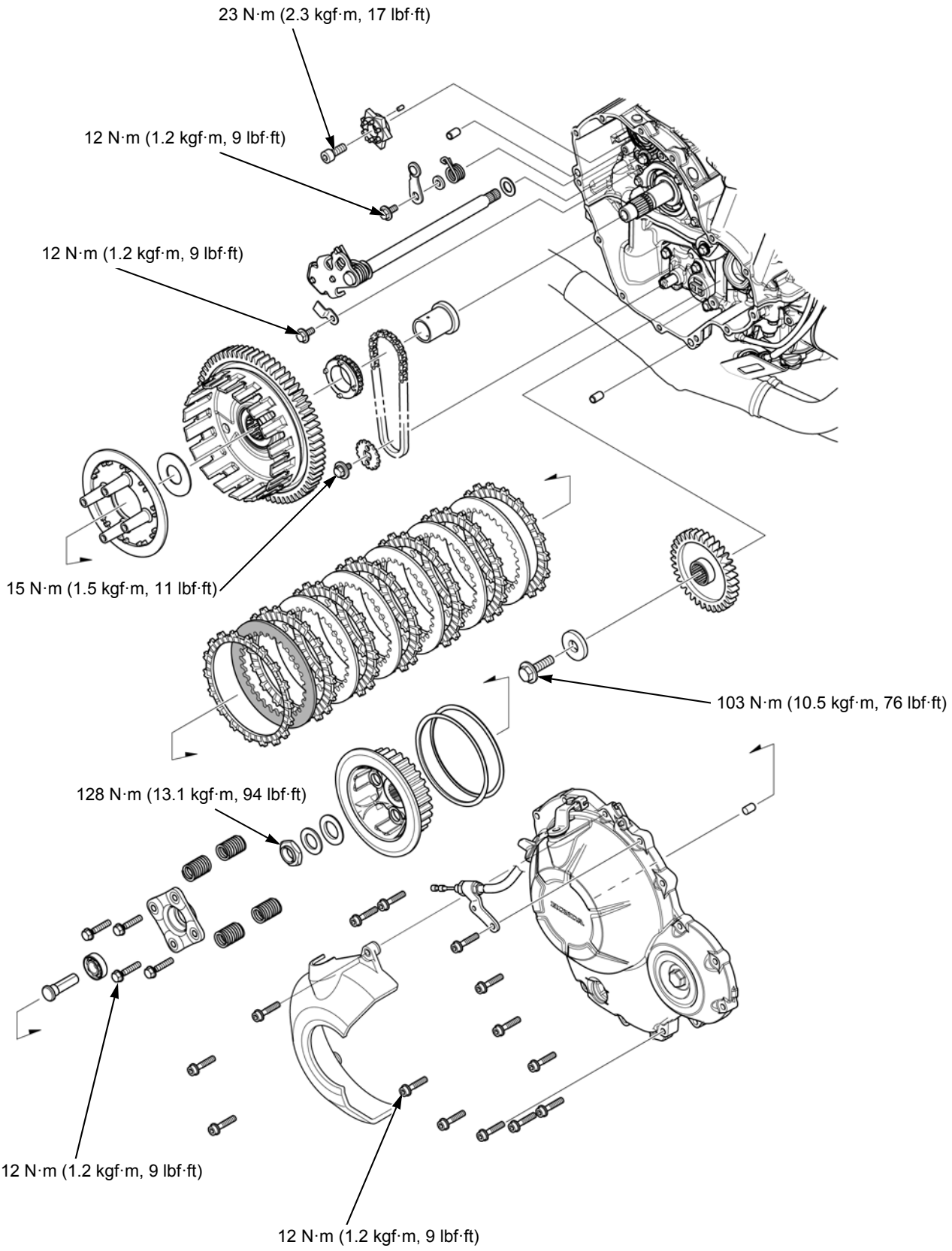
Clutch will not disengage or motorcycle creeps with clutch disengaged
- Excessive clutch lever freeplay (page 3-21)
- Clutch plate warped
- Engine oil level too high, improper engine oil viscosity or additive used
- Loose clutch center lock nut
- Damaged clutch lifter mechanism
- Clutch lifter rod installed improperly
- Worn clutch outer slot and clutch center grooves
- Improper clutch operation

Hard to shift
- Incorrect clutch cable adjustment
- Improper clutch operation
- Improper engine oil viscosity
- Damaged or bent shift forks (page 13-10)
- Bent shift fork shaft (page 13-10)
- Bent shift fork claw (page 13-10)
- Loose shift drum center bolt
- Damaged shift drum center
- Damaged shift drum guide grooves (page 13-10)
- Damaged or bent gearshift spindle

Transmission jumps out of gear
- Worn shift drum stopper arm
- Weak or broken shift drum stopper arm return spring
- Loose shift drum center bolt
- Damaged shift drum center
- Bent shift fork shaft (page 13-10)
- Damaged or bent shift forks (page 13-10)
- Worn gear engagement dogs or slots (page 13-10)

Gearshift pedal will not return
- Weak or broken gearshift spindle return spring
- Damaged or bent gearshift spindle

COMPONENT LOCATION

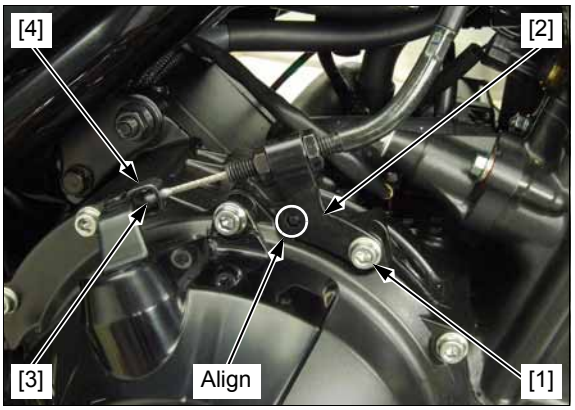


RIGHT CRANKCASE COVER

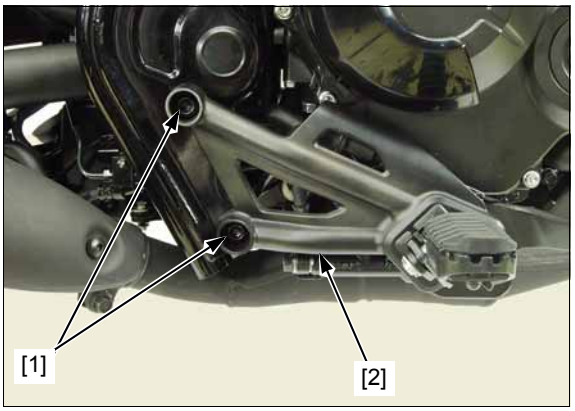
REMOVAL/INSTALLATION

Drain the engine oil (page 3-10).

Remove the socket bolt [1] and clutch cable holder [2], then disconnect the clutch cable [3] from the clutch lifter arm [4].



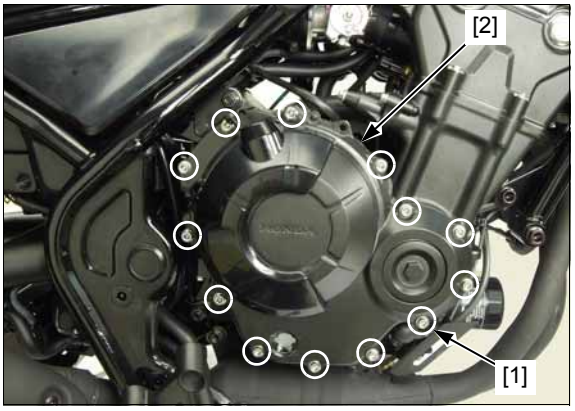
Remove the socket bolts [1] and step bracket [2].



Loosen the right crankcase cover socket bolts [1] in a crisscross pattern in 2 or 3 steps.

Remove the following:

– socket bolts
– right crankcase cover [2]



Remove the dowel pins [1].

Be careful not to damage the mating surfaces.

Clean any gasket material from the mating surfaces of the crankcase and cover.

Installation is in the reverse order of removal.

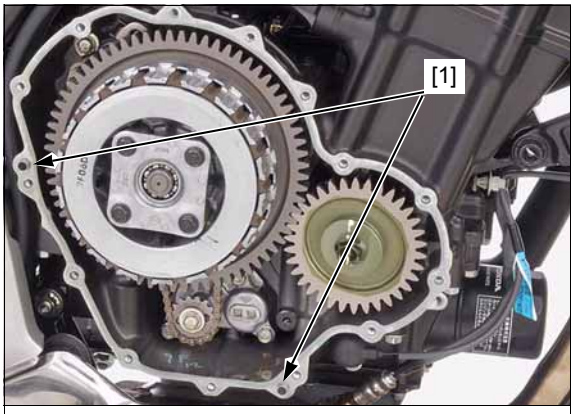
TORQUE:
Right crankcase cover socket bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

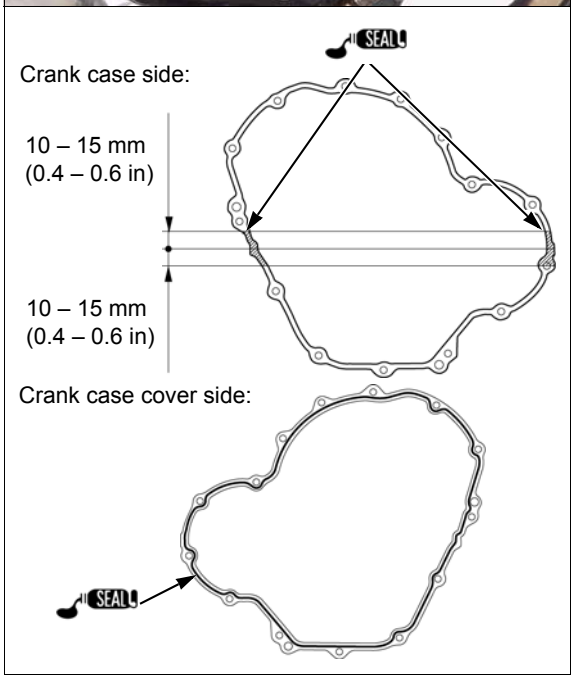
NOTE:

- Apply liquid sealant to the crankcase and crankcase cover as shown (page 1-18).
- Align the clutch cable holder hole with the right crankcase cover boss.

Adjust the clutch lever freeplay (page 3-21).

Fill the engine with the recommended engine oil and check that there are no oil leaks (page 3-10).

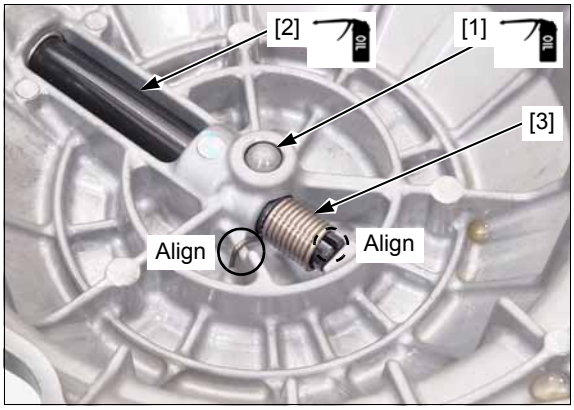




DISASSEMBLY/ASSEMBLY

Remove the clutch lifter rod A [1] while turning the clutch lifter arm [2].

Remove the clutch lifter arm and return spring [3] from the right crankcase cover.

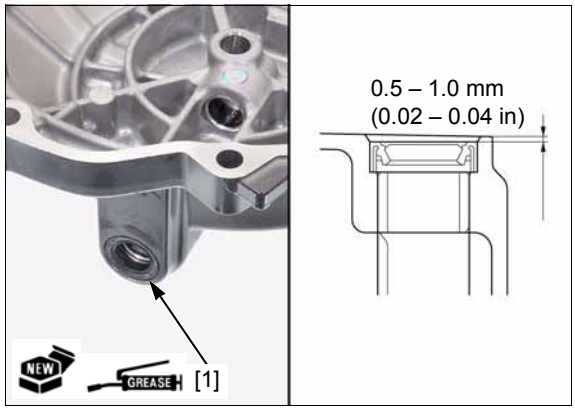


Remove the oil seal [1] from the right crankcase cover.

Assembly is in the reverse order of disassembly.

NOTE:

- Apply grease to a new oil seal lips.
- Install the oil seal to the specified depth as shown.
- Align the return spring hook with right crankcase cover.
- Align the return spring end with clutch lifter arm groove.
- Apply engine oil to the clutch lifter arm and lifter rod A sliding surface.



INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

– clutch lifter arm bushing
– clutch lifter arm
– return spring
– clutch lifter rod A

CLUTCH

REMOVAL

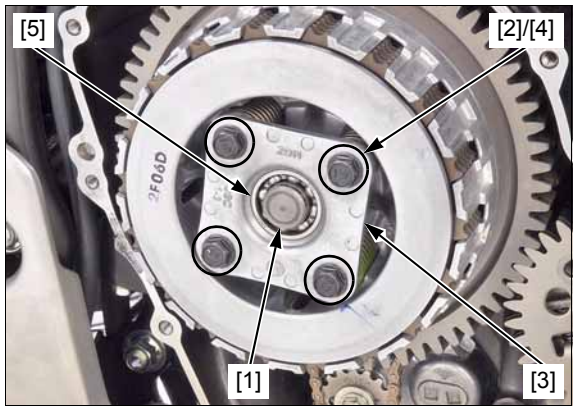
Remove the right crankcase cover (page 11-5).

If the clutch outer guide will be removed, loosen the oil pump driven sprocket washer-bolt [1] with the clutch installed.

Remove the clutch lifter rod B [1].

Loosen the clutch lifter plate bolts [2] in a crisscross pattern in 2 or 3 steps, and remove the bolts, lifter plate [3] and clutch springs [4].

Remove the lifter plate bearing [5] from the lifter plate.



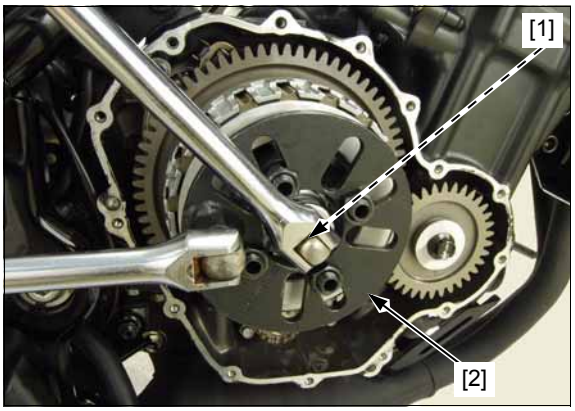
Be careful not to damage the mainshaft threads.

Unstake the clutch center lock nut [1].

Hold the clutch pressure plate with the special tool and loosen the clutch center lock nut [1].

TOOL:

[2] Clutch center holder	**07JMB-MN50302 or 07HGB-001010B (plate) and 07HGB-001020B (collar) (U.S.A. only)**



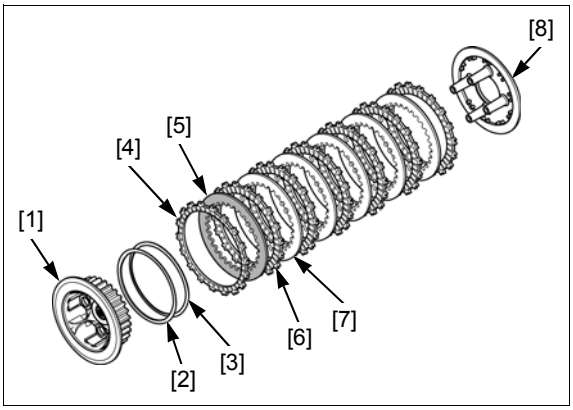
Remove and discard the lock nut.

Remove the lock washer [1] and washer [2].

Remove the clutch center assembly [1].

Remove the following:

– clutch center [1]
– spring seat [2]
– judder spring [3]
– clutch disc B [4]
– clutch plate B [5]
– six clutch discs A [6]
– five clutch plate A [7]
– pressure plate [8]

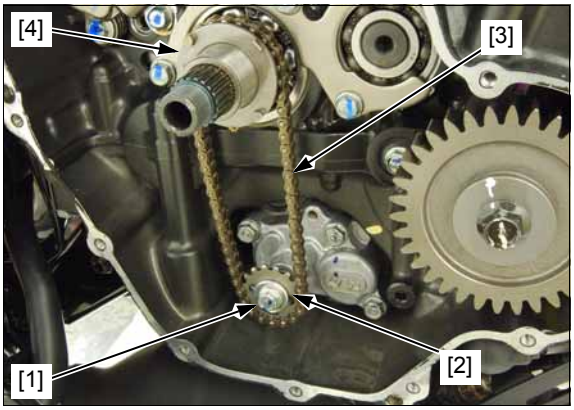


Remove the thrust washer [1].

Remove the clutch outer [1].

Remove the following:

– washer-bolt [1]
– oil pump driven sprocket [2]
– oil pump drive chain [3]
– oil pump drive sprocket [4]



Remove the clutch outer guide [1].

INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

– clutch lifter rod B
– clutch lifter bearing
– clutch lifter plate
– clutch springs
– clutch center
– spring seat
– judder spring
– clutch discs/plates
– clutch outer/primary driven gear/needle bearing
– clutch outer guide
– oil pump drive/driven sprockets
– oil pump drive chain
– mainshaft

Measure each part according to CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS (page 1-9).

Replace any part if it is out of service limit.

NOTE:
- Replace the clutch springs as a set.
- Replace the clutch discs and plates as a set.

CLUTCH OUTER NEEDLE BEARING REPLACEMENT

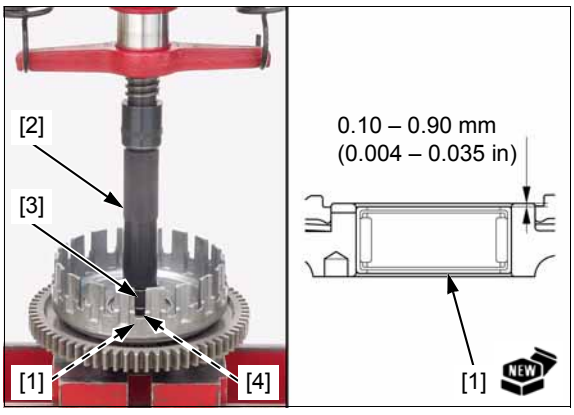
Press the needle bearing [1] out of the clutch outer using the special tools.

TOOLS:

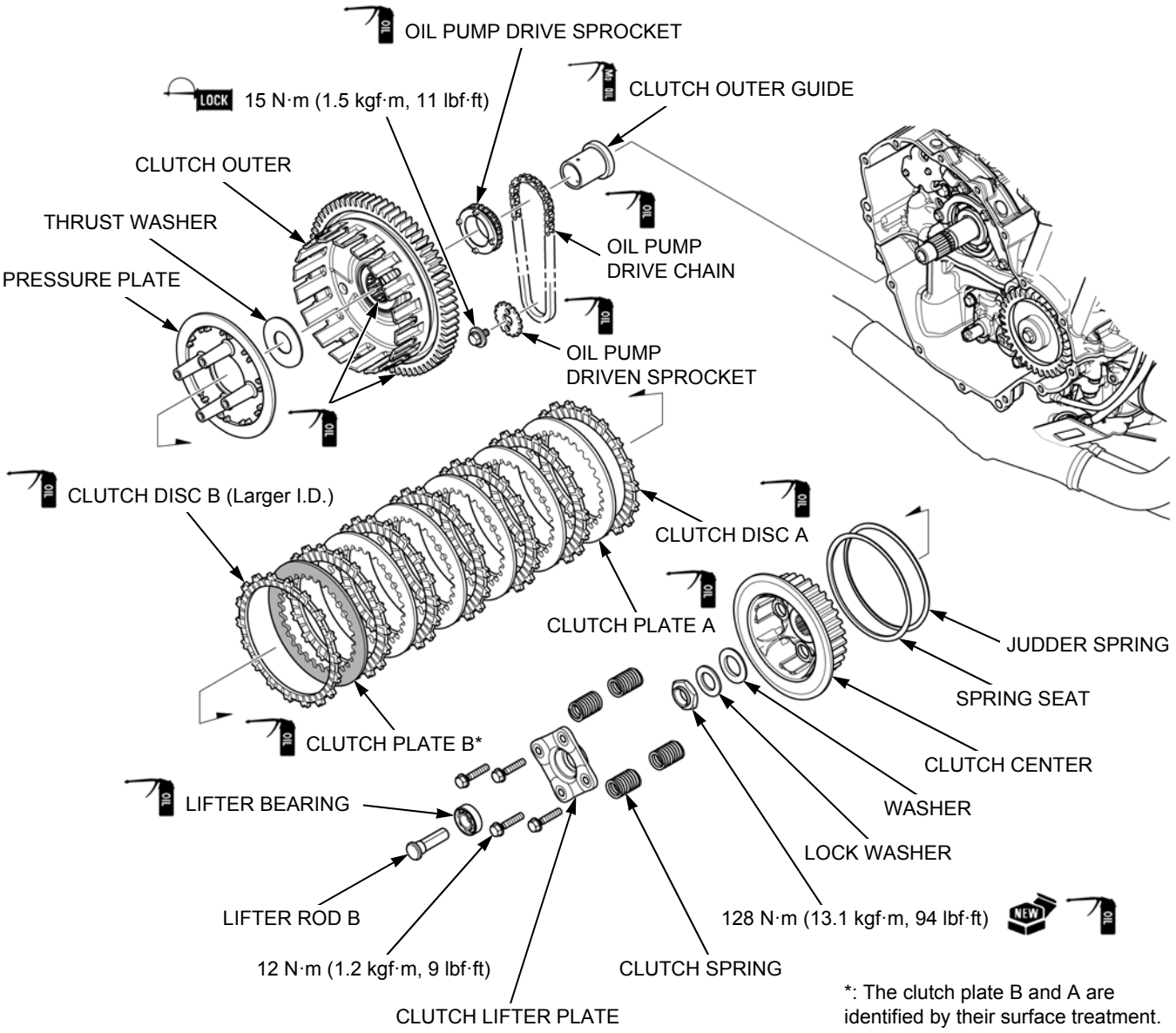
[2] Driver	**07749-0010000**
[3] Attachment, 32 x 35 mm	**07746-0010100**
[4] Pilot, 28 mm	**07746-0041100**

Press in the needle bearing with the marked side facing up.

Press a new needle bearing into the clutch outer so that the depth from the clutch outer is 0.10 – 0.90 mm, using the same special tools.

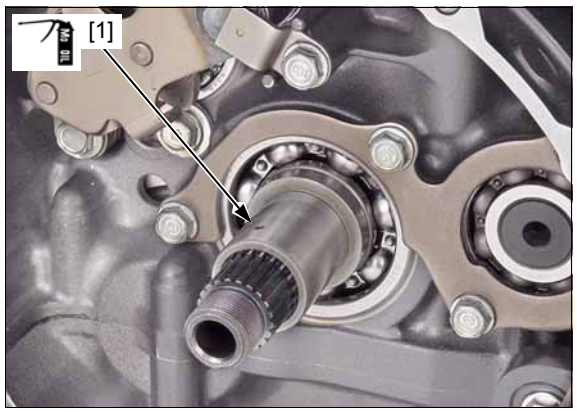


INSTALLATION



*: The clutch plate B and A are identified by their surface treatment.

Apply molybdenum oil solution to the clutch outer guide [1] entire surface and install it to the mainshaft.



Apply engine oil to the oil pump drive/driven sprocket teeth and drive chain.

Install the oil pump drive sprocket [1] and drive chain [2] with the drive sprocket "MGZ" mark [3] facing out.

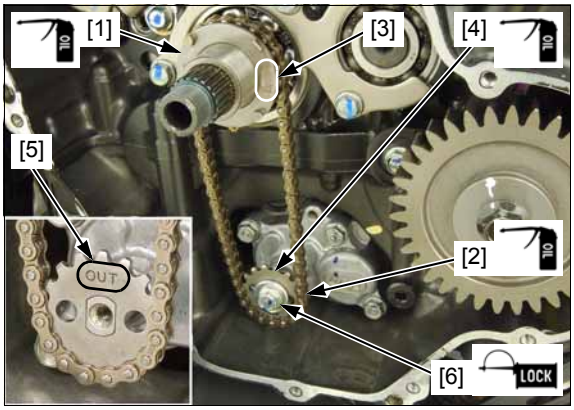
Install the oil pump driven sprocket [4] with its "OUT" mark [5] facing out by aligning the flat surfaces.

Apply a locking agent to the oil pump driven sprocket washer-bolt threads (page 1-18).

Install the oil pump driven sprocket washer-bolt [6].

NOTE:

- Tighten the driven sprocket bolt to the specified torque after installing the clutch.



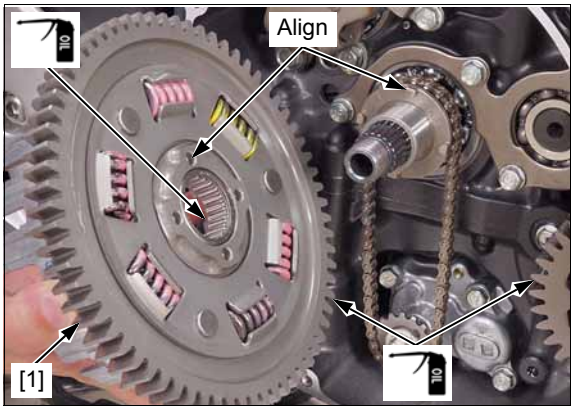
Apply engine oil to the clutch outer needle bearing, primary drive gear and driven gear teeth.

When installing the clutch outer, turn the oil pump driven sprocket.

Install the clutch outer [1] while aligning the bosses of the oil pump drive sprocket with the holes of the clutch outer.

NOTE:

- Make sure the side surfaces of the primary drive and driven gears are flush.



Install the thrust washer [1].

Apply engine oil to the entire surface of clutch discs and plates.

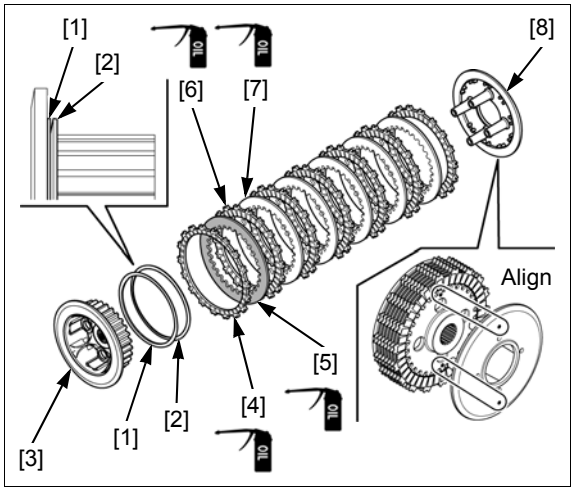
Install the spring seat [1] and judder spring [2] onto the clutch center [3] as shown.

Install the clutch disc B [4] and clutch plate B [5] onto the clutch center.

- Clutch disc B: larger I.D.
- Clutch plate B: surface treatment difference from clutch plate A

Install the clutch discs A [6] and plates A [7] alternately, starting with the clutch disc.

Install the pressure plate [8] onto clutch center while aligning "○" mark of clutch center and pressure plate.



Install the clutch center assembly [1] into the clutch outer by aligning the clutch disc tabs with the grooves of the clutch outer one by one, and the splines of the clutch center and mainshaft.

Install the washer [1].

Install the lock washer [2] with its "OUTSIDE" mark [3] facing out.

Apply engine oil to a new clutch center lock nut threads and seating surface.

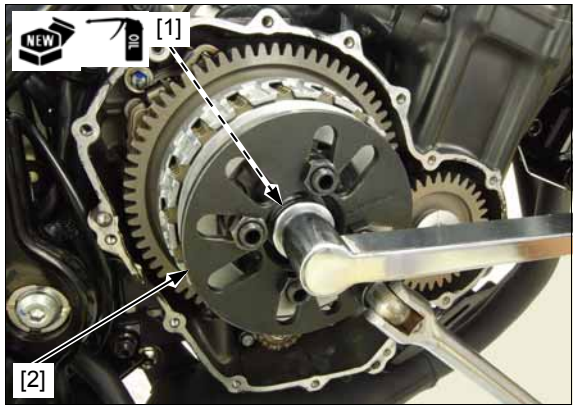
Install the clutch center lock nut [1] onto the mainshaft.

Hold the pressure plate with the special tool and tighten the lock nut to the specified torque.

TOOL:

[2] Clutch center holder	**07JMB-MN50302 or 07HGB-001010B (plate) and 07HGB-001020B (collar) (U.S.A. only)**

TORQUE: 128 N·m (13.1 kgf·m, 94 lbf·ft)



Be careful not to damage the mainshaft threads.

Stake the clutch center lock nut [1] into the mainshaft groove.

Apply engine oil to the lifter plate bearing rotating area.

Install the lifter plate bearing [1] into the lifter plate [2].

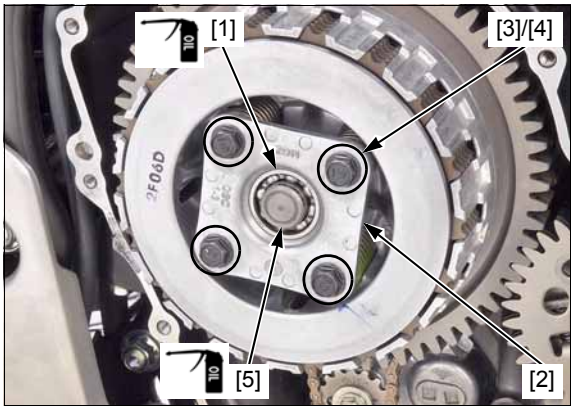
Install the clutch springs [3], lifter plate and clutch lifter plate bolts [4].

Tighten the clutch lifter plate bolts in a crisscross pattern in 2 or 3 steps to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Apply engine oil to the clutch lifter rod B sliding surface.

Install the clutch lifter rod B [5].



Tighten the oil pump driven sprocket washer-bolt [1] to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

Install the right crankcase cover (page 11-5).

PRIMARY DRIVE GEAR

REMOVAL

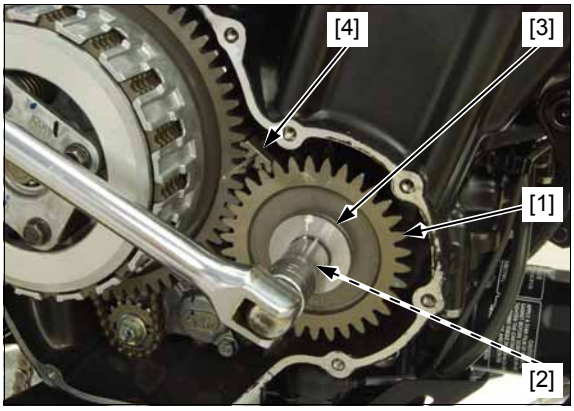
Remove the right crankcase cover (page 11-5).

Hold the primary drive gear [1] using a special tool as shown, and remove the primary drive gear bolt [2] and washer [3].

TOOL:

[4] Gear holder, 2.5	**07724-0010100 or 07724-001A100 (U.S.A. only)**

Remove the gear holder and primary drive gear.

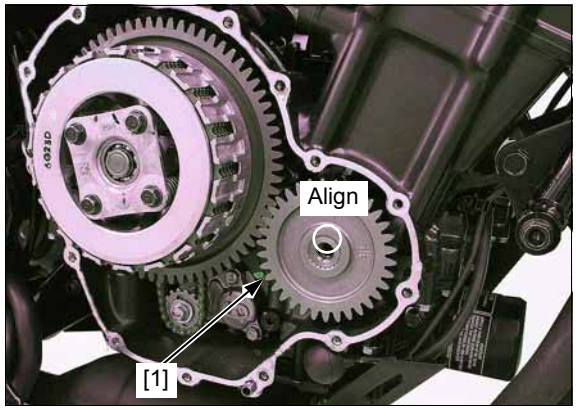


INSPECTION

Inspect the primary drive gear for scratch, damage, abnormal wear and deformation. Replace if necessary.

INSTALLATION

Install the primary drive gear [1] on the crankshaft by aligning its wide groove with the wide tooth of the crankshaft.



Apply engine oil to the primary drive gear bolt threads and seating surface.

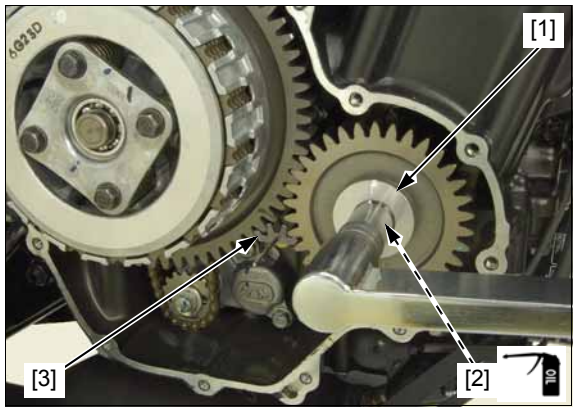
Install the washer [1] and primary drive gear bolt [2].

Hold the primary drive gear using a special tool as shown, and tighten the primary drive gear bolt to the specified torque.

TOOL:

[3] Gear holder, 2.5	**07724-0010100 or 07724-001A100 (U.S.A. only)**

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)



Remove the gear holder.

Install the right crankcase cover (page 11-5).

GEARSHIFT LINKAGE

REMOVAL

Remove the following:

– clutch (page 11-7)
– gearshift arm (page 11-19)

Clean off any dirt from the gearshift spindle serration.

Remove the bolt [1] and setting plate [2].

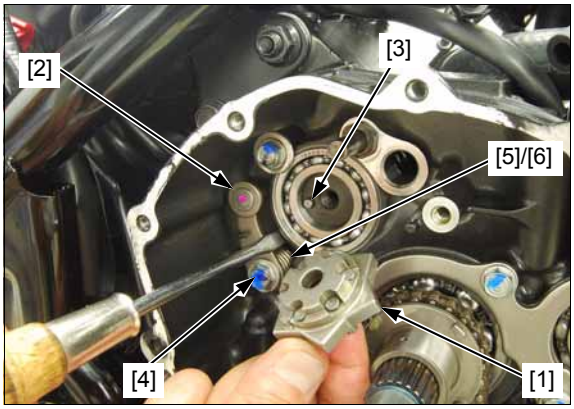
Pull the gearshift spindle assembly [1] and thrust washer [2] out of the crankcase.

Remove the shift drum center socket bolt [1].

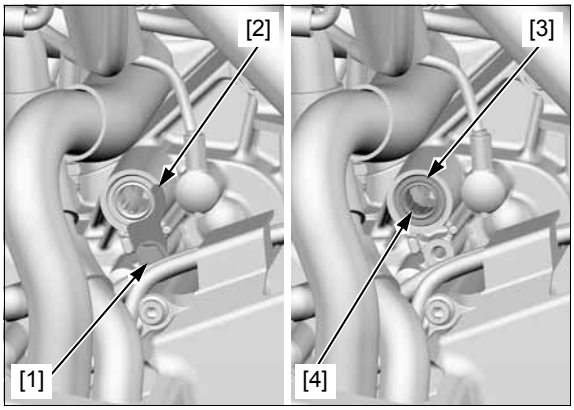
Remove the shift drum center [1] while holding the stopper arm [2] using a screwdriver as shown.

Remove the following:

– dowel pin [3]
– shift drum stopper arm pivot bolt [4]
– shift drum stopper arm
– washer [5]
– return spring [6]



Remove the bolt [1], gearshift spindle oil seal setting plate [2], oil seal [3] and needle bearing [4].



INSPECTION

Inspect the following parts for damage, abnormal wear and deformation. Replace if necessary.

– shift drum center
– shift drum stopper arm
– shift drum stopper arm return spring
– gearshift spindle needle bearing

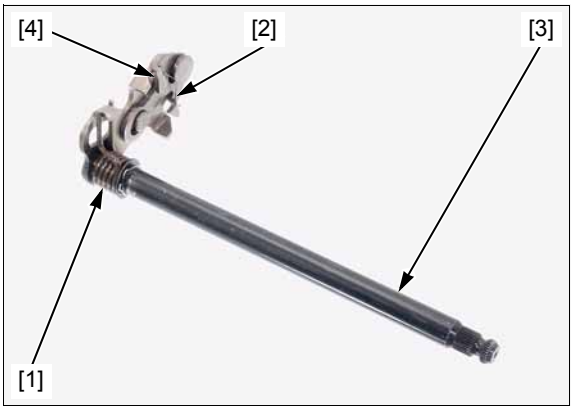
GEARSHIFT SPINDLE

Check the return spring [1] and spindle arm spring [2] for fatigue or damage replace them if necessary.

Check the gearshift spindle [3] for wear or bend.

Check the spindle arm [4] for wear, damage or deformation.

Replace the gearshift spindle as an assembly if necessary.



INSTALLATION

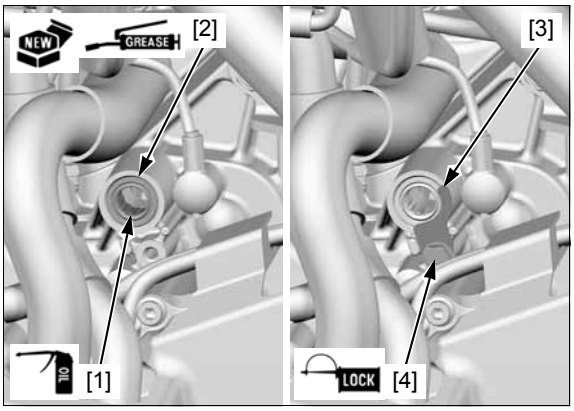
Apply engine oil to the gearshift spindle needle bearing [1], then install it into the crankcase.

Apply grease to a new oil seal [2] lips, then install it into the crankcase until it is flush with the crankcase surface.

Apply locking agent to the gearshift spindle oil seal setting plate bolt threads (page 1-18).

Install the gearshift spindle oil seal setting plate [3] in the direction as shown, and tighten the bolt [4] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



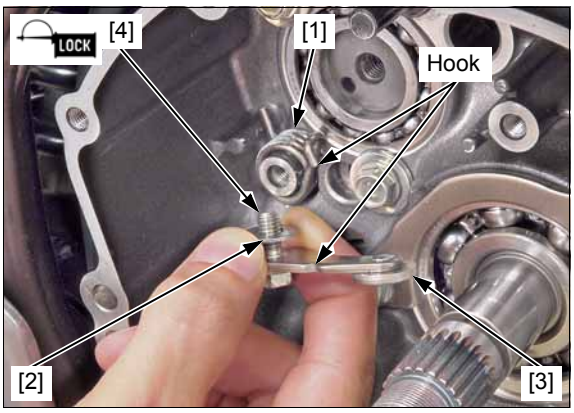
Apply locking agent to the shift drum stopper arm bolt threads (page 1-18).

Install the return spring [1], washer [2] and stopper arm [3] while hooking the return spring at the stopper arm groove.

Install and tighten the stopper arm bolt [4] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

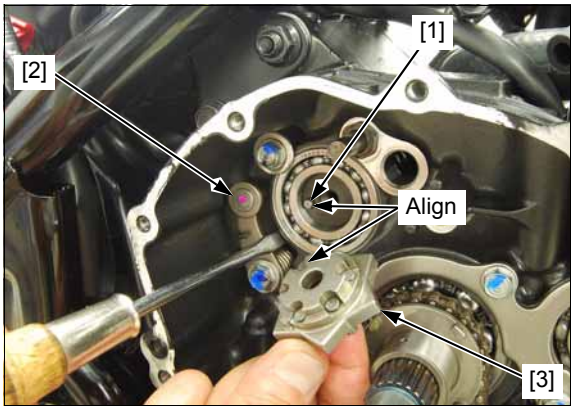
Check the stopper arm for proper operation.



Install the dowel pin [1] into the hole of the shift drum.

Hold the stopper arm [2] using a screwdriver as shown.

Install the shift drum center [3] while aligning its slot with the dowel pin.



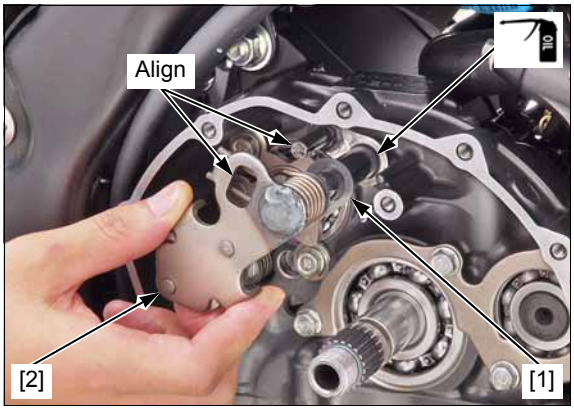
Apply locking agent to the shift drum center socket bolt threads (page 1-18).

Install and tighten the shift drum center socket bolt [1] to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Apply engine oil to the gearshift spindle shaft outer surface.

Install the thrust washer [1] and gearshift spindle assembly [2] into the crankcase while aligning the return spring ends with the spring pin.



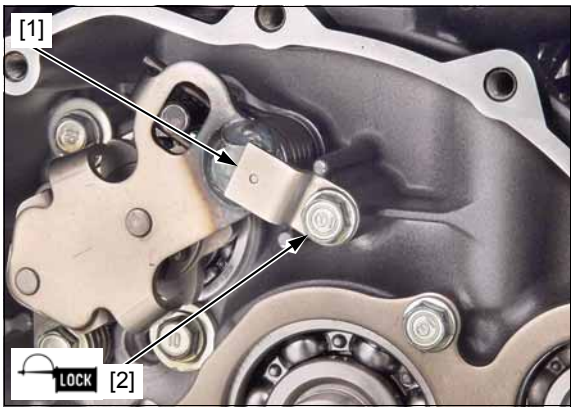
Apply locking agent to the setting plate bolt threads (page 1-18).

Install the setting plate [1], bolt [2] and tighten it to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the following:

– gearshift arm (page 11-19)
– clutch (page 11-11)



GEARSHIFT PEDAL REMOVAL/ INSTALLATION

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

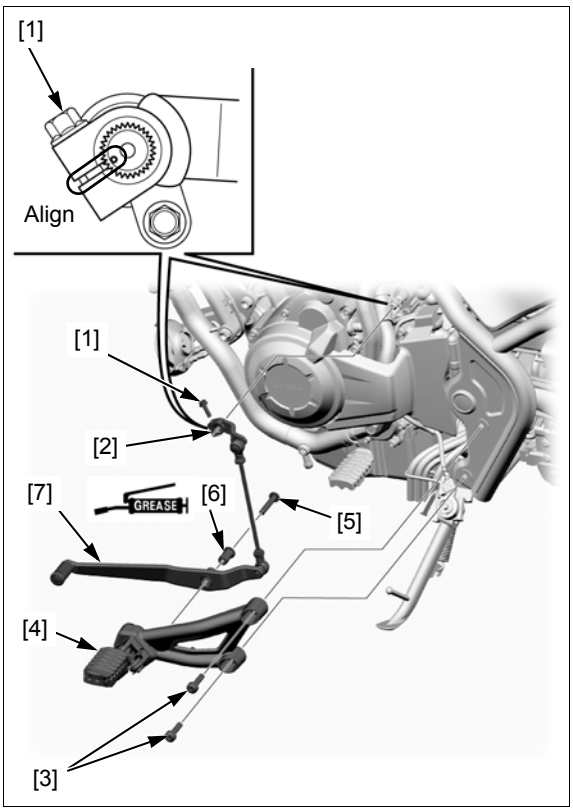
Remove the socket bolts [3] and rider footpeg bracket [4].

Remove the pivot socket bolt [5], pivot collar [6] and gearshift pedal [7].

Installation is in the reverse order of removal.

TORQUE:

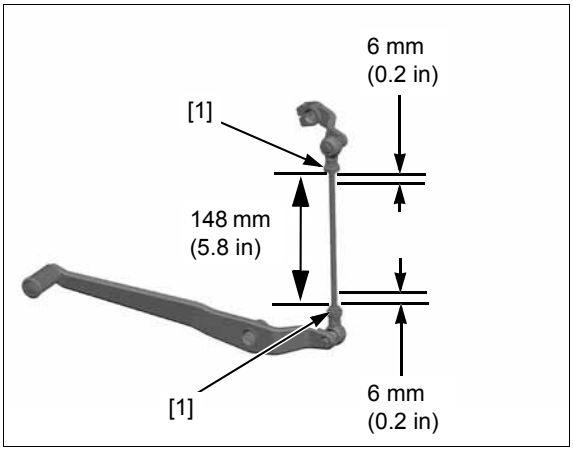
Gearshift pedal pivot socket bolt:
27 N·m (2.8 kgf·m, 20 lbf·ft)
Rider footpeg socket bolt:
37 N·m (3.8 kgf·m, 27 lbf·ft)



NOTE:

- Apply grease to the gearshift pedal pivot sliding area (grease groove) of the pivot collar.
- Apply grease to the gearshift pedal tie-rod ball joint.
- Align the slit of the gearshift arm with the punch mark on the spindle

When adjusting the gearshift pedal height, perform by loosing the lock nuts [1] and it must be noted as follows.



NOTE:

- The gearshift arm side lock nut has left hand threads.

Adjust the tie-rod length so that the distance between the ball joint ends is standard length as shown.

After adjustment tighten the gearshift pedal adjuster lock nuts securely.

NOTE:

- Tighten the lock nuts with the position of each ball joint in parallel to the gearshift arm and gearshift pedal as shown.
- Be sure the thread length from the lock nut is less than the specified value.
  – gearshift arm side: 6 mm (0.2 in)
  – gearshift pedal side: 6 mm (0.2 in)

MEMO

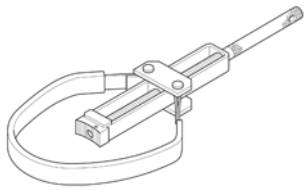
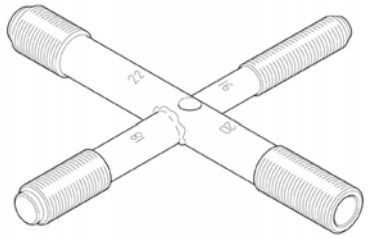
12. ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION

GENERAL

- This section covers service of the alternator stator and flywheel. All service can be done with the engine installed in the frame.
- For alternator charging coil inspection (page 20-7).
- For CKP sensor inspection (page 12-5).
- For starter motor service (page 6-6).

TOOLS

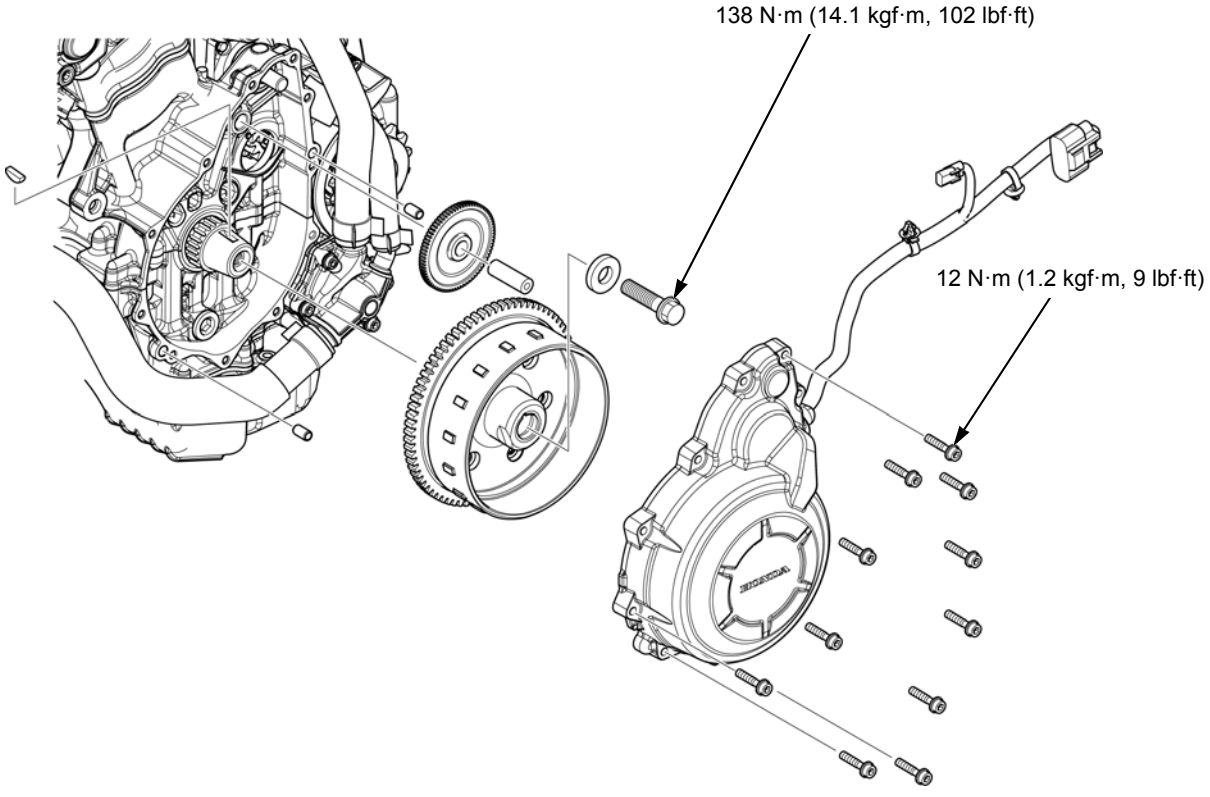
Flywheel holder 07725-0040001 	Flywheel puller 07733-0020001  or 07933-3950000 (U.S.A. only)

TROUBLESHOOTING

Starter motor turns, but engine does not turn

- Faulty starter clutch
- Damaged starter reduction gear/shaft
- Damaged or faulty starter motor pinion gear
- Damaged starter driven gear

COMPONENT LOCATION



LEFT CRANKCASE COVER

REMOVAL/INSTALLATION

NOTE:

- Place a clean oil pan under the engine because engine oil will flow out when removing the left crankcase cover. Add the recommended engine oil to the specified level after installation (page 3-10).

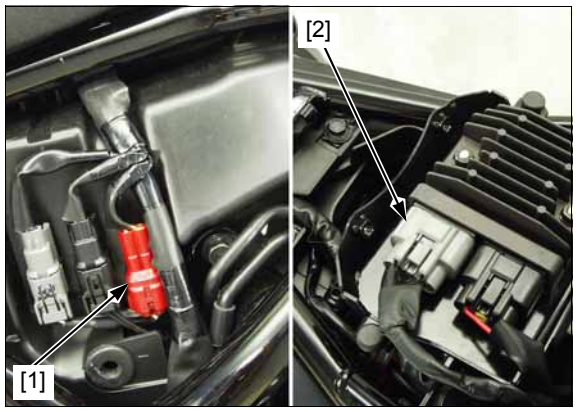
Support the motorcycle in an upright position on a level surface.

Remove the following:

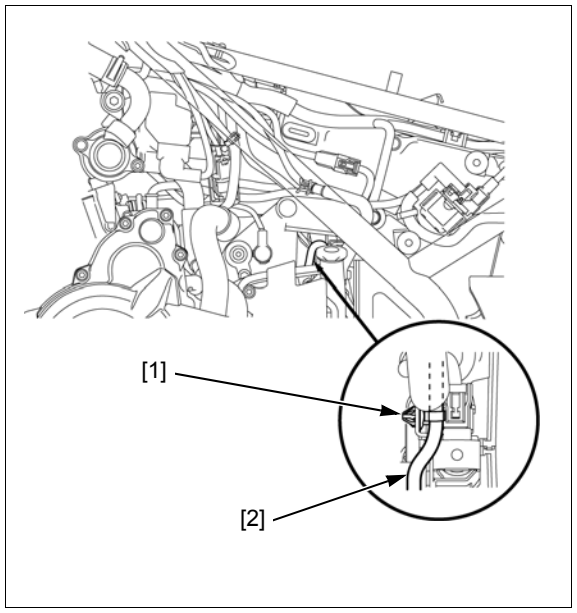
– side cover (page 2-4)
– gearshift pedal (page 11-15)
– drive sprocket cover (page 2-7)
– regulator/rectifier cover (page 20-7)

Disconnect following:

– CKP sensor 2P (Red) connector [1]
– alternator 3P (Gray) connector [2]

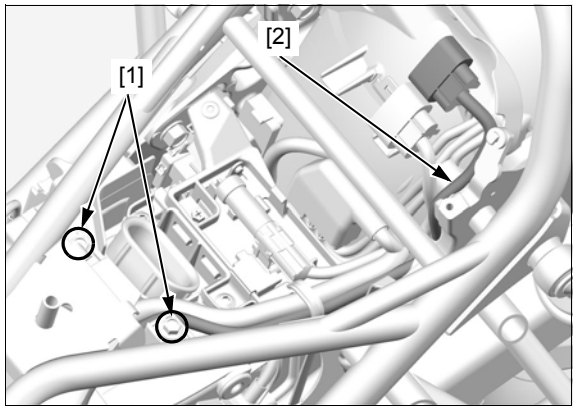


Remove the wire band [1] and CKP sensor wire [2] out of the frame.



Loosen the air cleaner housing mounting bolts [1].

Remove the stator wire harness [2] out of the frame.



Loosen the left crankcase cover socket bolts [1] in a crisscross pattern in 2 or 3 steps.

Remove the following:

– socket bolts
– left crankcase cover [2]

NOTE:

• The left crankcase cover (stator) is magnetically attracted to the flywheel, be careful during removal and installation.

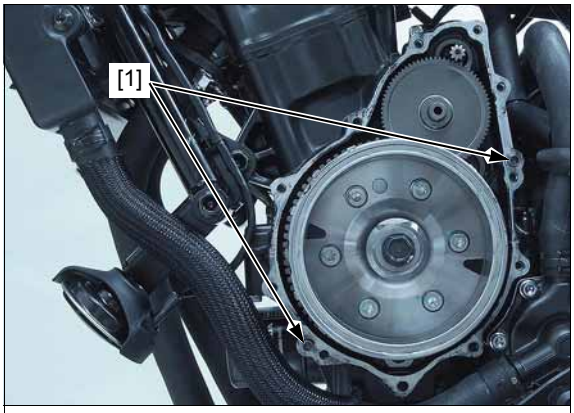
Remove the dowel pins [1].

Be careful not to damage the mating surfaces.

Clean the crankcase and cover mating surfaces thoroughly.

Installation is in the reverse order of removal.

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

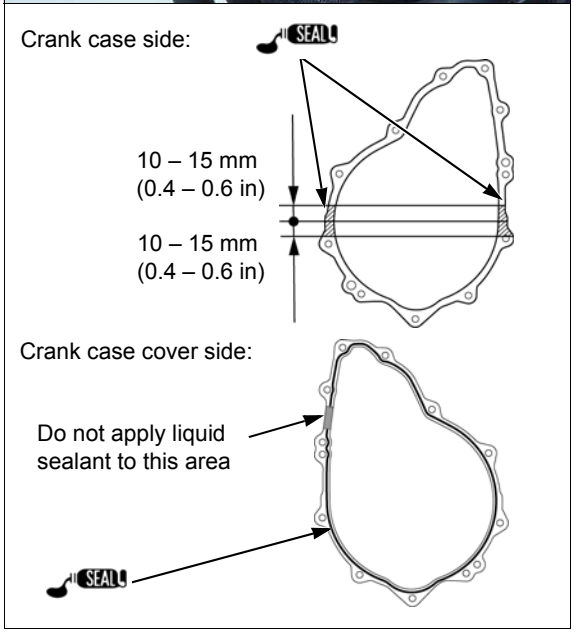


NOTE:

• Apply liquid sealant to the crankcase and crankcase cover as shown (page 1-18).

Check the oil level (page 3-10).

Make sure there are no oil leaks.



STATOR/CKP SENSOR

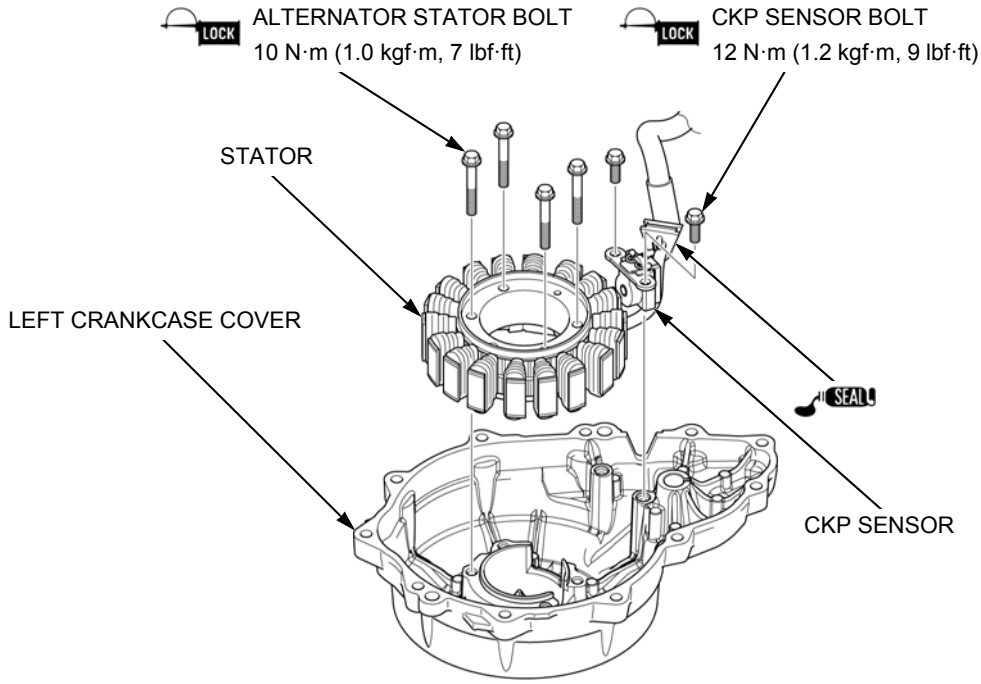
REMOVAL/INSTALLATION

Remove the left crankcase cover (page 12-3).

Remove and install the stator/CKP sensor as shown in the following illustration.

- Apply locking agent to the stator and CKP sensor bolt threads (page 1-18).
- Apply sealant to the alternator/CKP sensor wire grommet sealing surface (page 1-18).

Installation is in the reverse order of removal.



FLYWHEEL

REMOVAL

Remove the left crankcase cover (page 12-3).

Remove the starter reduction gear shaft [1] and starter reduction gear [2].

Hold the flywheel [1] using the special tool and loosen the flywheel bolt [2].

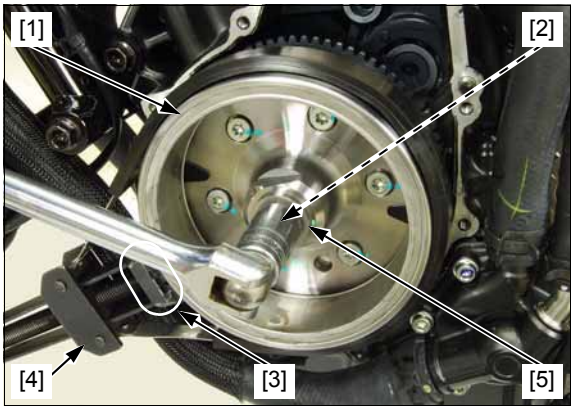
NOTE:

- Set the holding block [3] of the flywheel holder [4] avoiding the flywheel reluctors.

TOOL:

Flywheel holder	**07725-0040001**

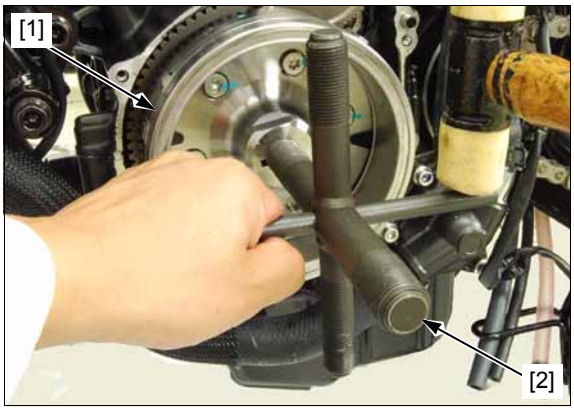
Remove the flywheel bolt and washer [5].



Remove the flywheel [1] using the special tool.

TOOL:

[2] Flywheel puller	**07733-0020001 or 07933-3950000 (U.S.A. only)**



Be careful not to damage the key groove and crankshaft.

Remove the woodruff key [1].

INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

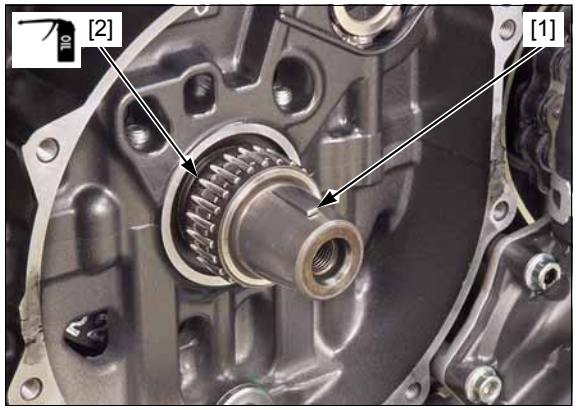
– starter reduction gear shaft
– starter reduction gear
– woodruff key
– needle bearing

INSTALLATION

Be careful not to damage the key groove and crankshaft.

Install the woodruff key [1].

Apply engine oil to the needle bearing [2] rotating area.



Clean any oil from the crankshaft tapered area and flywheel thoroughly.

Install the flywheel [1] while aligning the woodruff key on the crankshaft with flywheel keyway.

Apply engine oil to the flywheel bolt threads and seating surface.

Install the washer [1] and flywheel bolt [2].

Hold the flywheel [3] using the special tool and tighten the flywheel bolt to the specified torque.

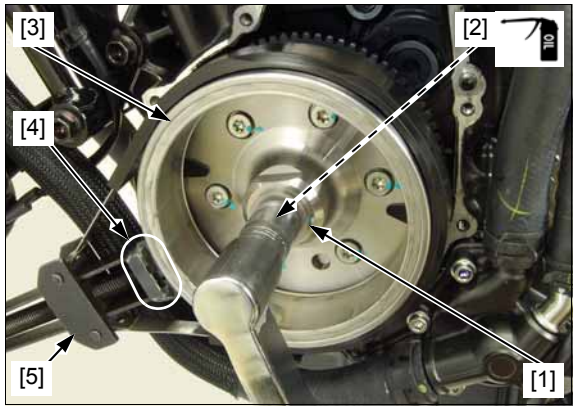
NOTE:

- Set the holding block [4] of the flywheel holder [5] avoiding the flywheel reluctors.

TOOL:

Flywheel holder	**07725-0040001**

TORQUE: 138 N·m (14.1 kgf·m, 102 lbf·ft)



Apply molybdenum oil solution to the starter reduction gear shaft outer surface.

Install the starter reduction gear [1] and shaft [2].

Install the left crankcase cover (page 12-3).

STARTER CLUTCH

ONE-WAY CLUTCH OPERATION INSPECTION

Remove the flywheel (page 12-5).

Check the operation of the one-way clutch by turning the starter driven gear [1].

Make sure that the starter driven gear turns counterclockwise smoothly and does not turn clockwise.

REMOVAL

Remove the flywheel (page 12-5).

Remove the starter driven gear [1] while turning the starter driven gear counterclockwise.

Hold the flywheel [1] using the special tool and remove the starter clutch socket bolts [2].

NOTE:

- Set the holding block [3] of the flywheel holder [4] avoiding the flywheel reluctors.

TOOL:

Flywheel holder	**07725-0040001**

Remove the starter clutch assembly.

Remove the starter one-way clutch [1] from the starter clutch outer [2].

INSPECTION

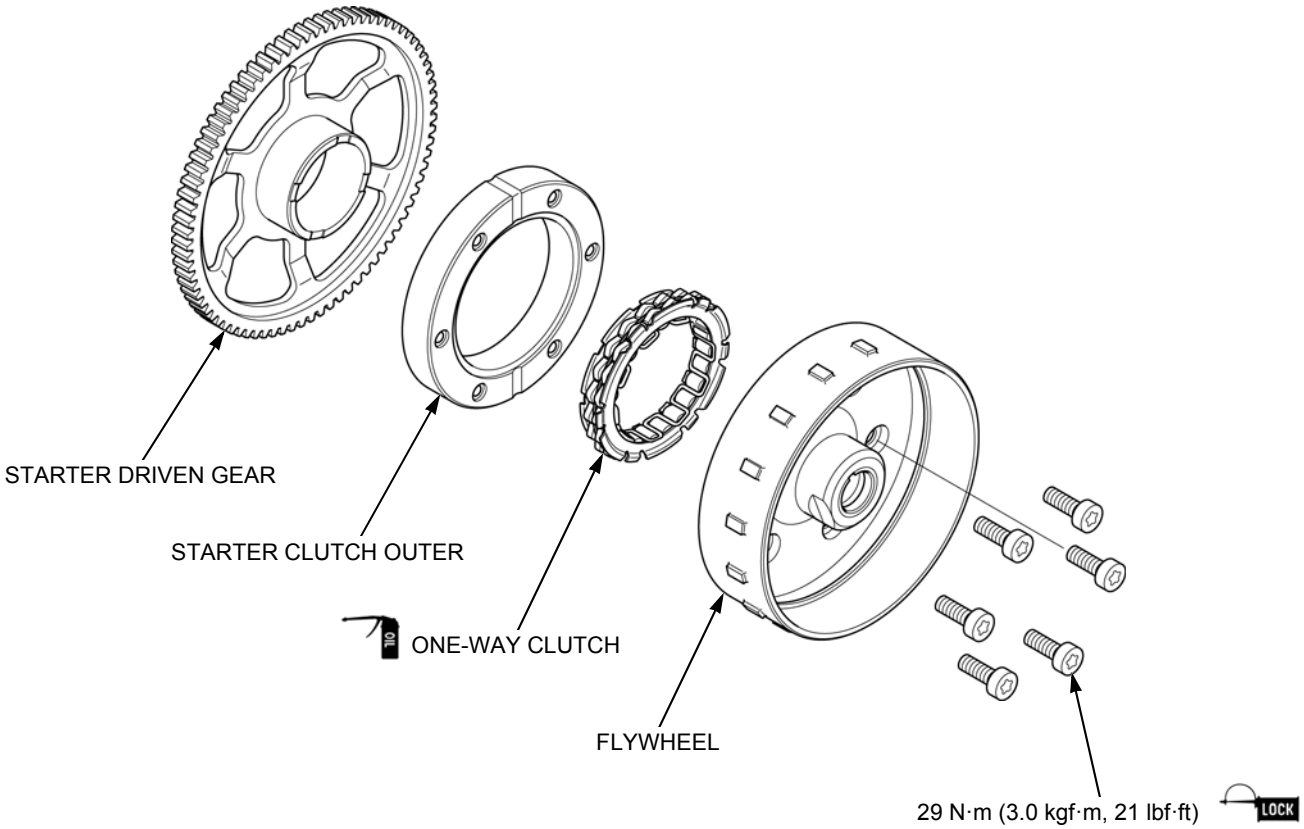
Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

– starter driven gear
– starter clutch outer
– starter one-way clutch

Measure each part according to ALTERNATOR/ STARTER CLUTCH SPECIFICATIONS (page 1-9).

Replace any part if it is out of service limit.

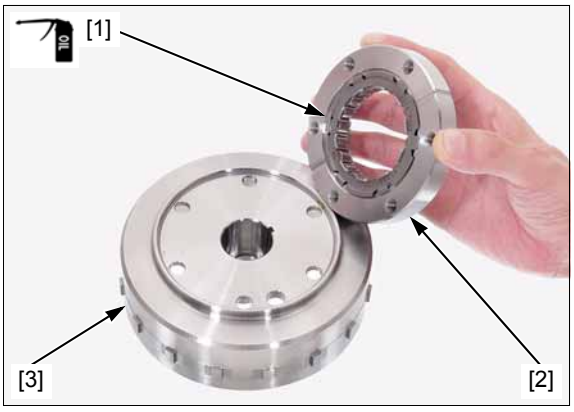
INSTALLATION



Apply engine oil to the starter one-way clutch contacting surface.

Install the starter one-way clutch [1] into the starter clutch outer [2].

Install the starter clutch assembly onto the flywheel [3].



Hold the flywheel [1] using the special tool.

NOTE:

- Set the holding block [2] of the flywheel holder [3] avoiding the flywheel reluctors.

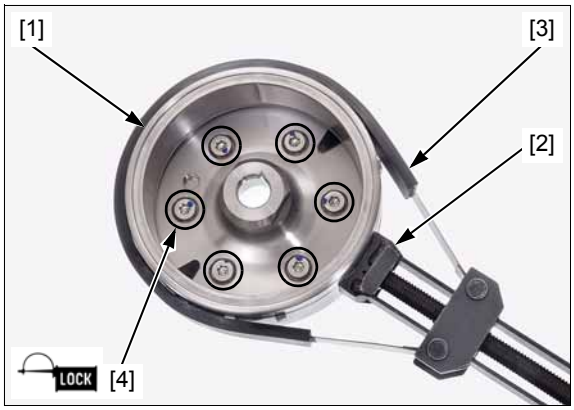
TOOL:

Flywheel holder	**07725-0040001**

Apply locking agent to the starter clutch socket bolt threads (page 1-18).

Install and tighten the starter clutch socket bolts [4] to the specified torque.

TORQUE: 29 N·m (3.0 kgf·m, 21 lbf·ft)



Install the starter driven gear [1] into the starter clutch outer while turning the starter driven gear counterclockwise.

Check the one-way clutch operation (page 12-8).

Install the flywheel (page 12-7).

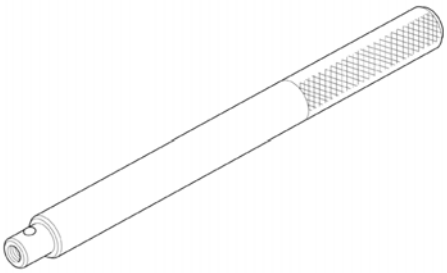
13. CRANKCASE/TRANSMISSION

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the following:
  – transmission
  – crankshaft (page 14-4)
  – balancer (page 14-17)
  – piston/connecting rod/cylinder (page 14-13)
- The following components must be removed before separating the crankcase:
  – engine (page 15-4)
  – gearshift linkage (page 11-15)
  – flywheel (page 12-5)
  – cylinder head (page 10-15)
  – cam chain tensioner lifter (page 10-22)
  – cam chain/timing sprocket (page 10-23)
  – oil strainer (page 9-8)
  – pressure relief valve (page 9-7)
  – engine oil filter (page 3-11)
  – water pump (page 8-10)
  – water hose joint (page 8-11)
  – EOP switch (page 21-12)
  – VS sensor (page 4-35)
  – neutral switch (page 21-16)
- Be careful not to damage the crankcase mating surfaces when servicing.
- Clean the oil passages before assembling the crankcase halves.
- Prior to assembling the crankcase halves, apply sealant to their mating surfaces. Wipe off excess sealant thoroughly.
- The crankpin and main journal bearing inserts are select fit and are identified by color codes. Select replacement bearings from the code tables. After selecting new bearings, recheck the oil clearance with a plastigauge. Incorrect oil clearance can cause major engine damage.

TOOLS

Driver 07949-3710001	Attachment, 32 x 35 mm 07746-0010100
	

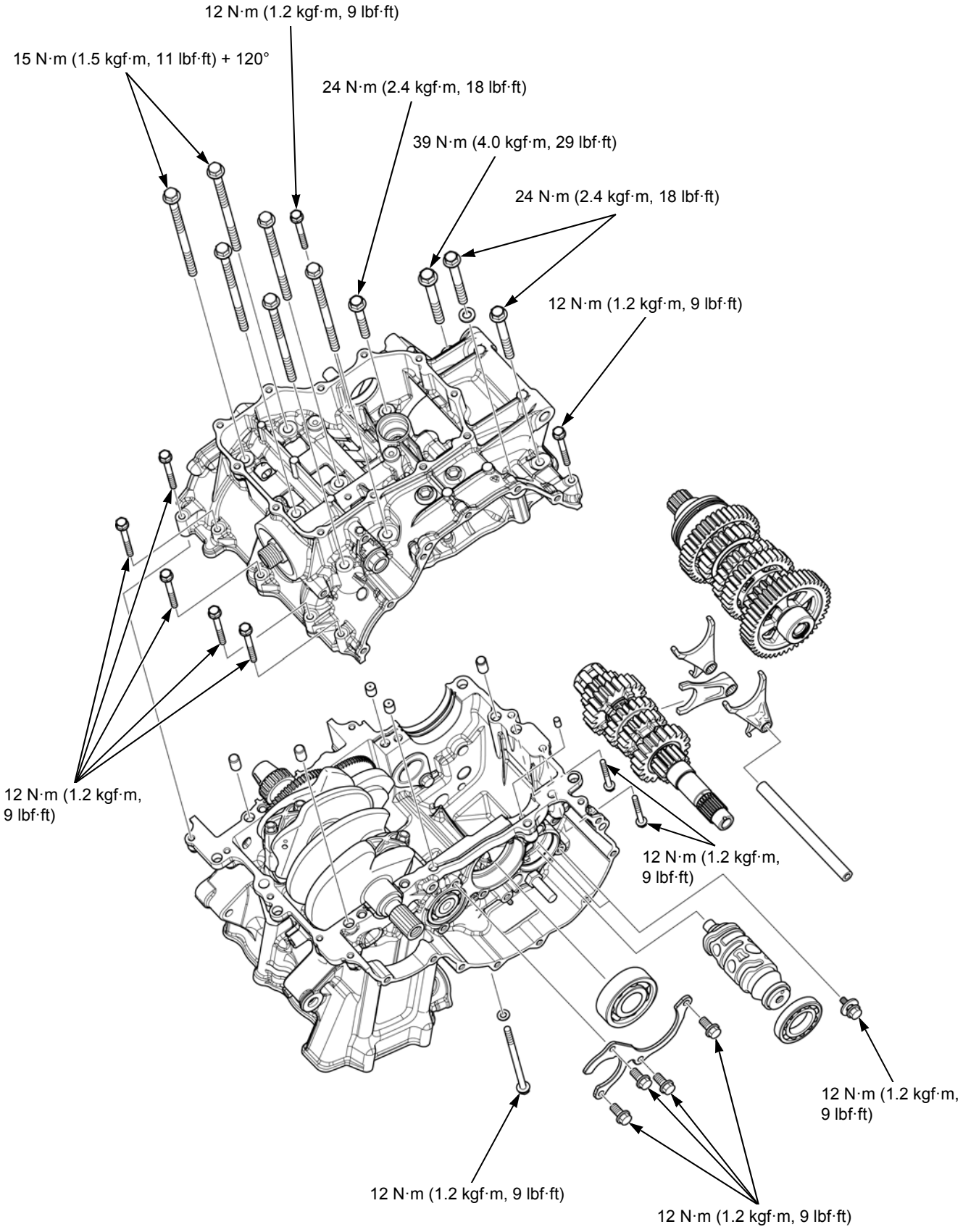
TROUBLESHOOTING

Hard to shift
- Improper clutch operation
- Improper engine oil viscosity
- Bent shift fork
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum guide groove
- Bent gearshift spindle (page 11-17)

Transmission jumps out of gear
- Worn gear dogs
- Worn gear shifter groove
- Bent shift fork shaft
- Broken shift drum stopper arm (page 11-17)
- Broken shift drum stopper arm return spring (page 11-17)
- Worn or bent shift forks
- Broken gearshift spindle return spring (page 11-17)

Excessive engine noise
- Worn or damaged transmission gear
- Worn or damaged transmission bearings

COMPONENT LOCATION

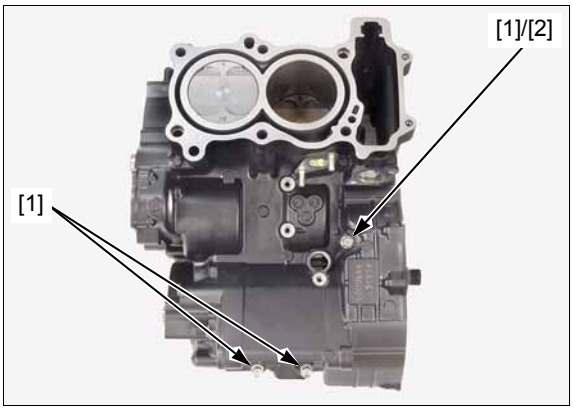


CRANKCASE

SEPARATION

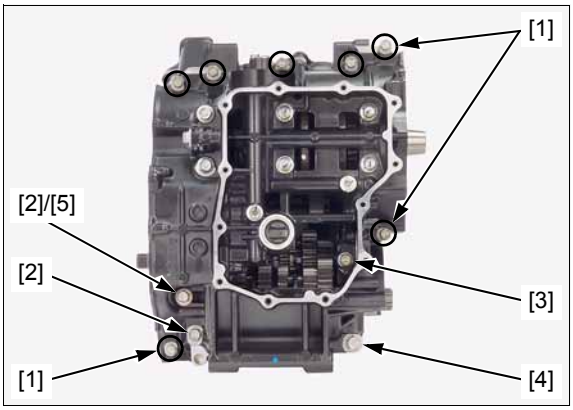
Refer to Service Information for removal of necessary parts before separating the crankcase (page 13-2).

Remove the crankcase 6 mm bolts [1] and sealing washer [2].



Place the engine upside down.

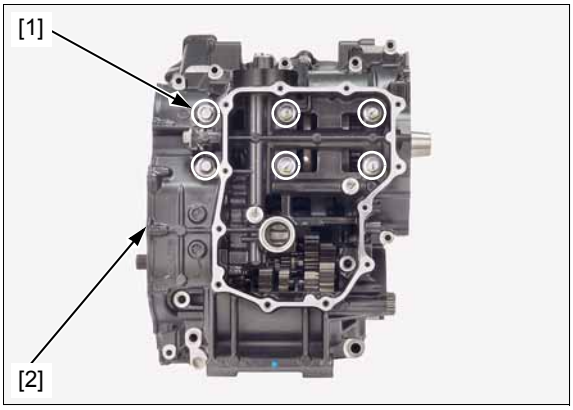
Loosen the crankcase 6 mm bolt [1], 8 x 75 mm bolts [2], 8 x 55 mm bolt [3] and 10 mm bolts [4] in a crisscross pattern in 2 or 3 steps, and remove all the bolts and sealing washer [5].



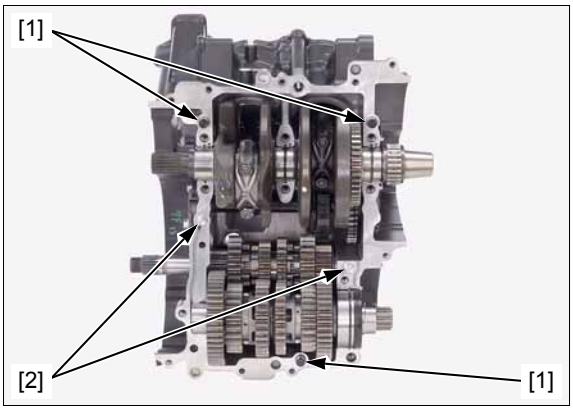
Loosen the crankcase main journal bolt [1] in a crisscross pattern in 2 or 3 steps, and remove them.

Do not pry the crankcase halves with a screwdriver.

Separate the lower crankcase [2] from the upper crankcase.



Remove the dowel pins [1] and oil orifices [2].



ASSEMBLY

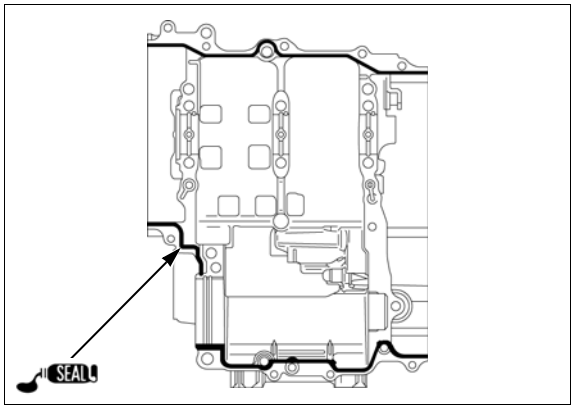
Clean the upper and lower crankcase mating surfaces thoroughly, being careful not to damage them.

Check the crankcase oil passages for clogs, and clean them if necessary.

Apply liquid sealant to the crankcase mating surface as shown (page 1-18).

NOTE:

- Do not apply liquid sealant more than necessary.
- Do not apply liquid sealant to the crankcase main journal bolts area and the oil passage area.

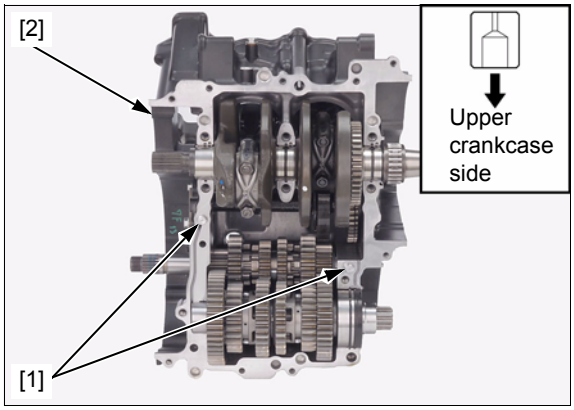


Clean the oil orifices in solvent thoroughly.

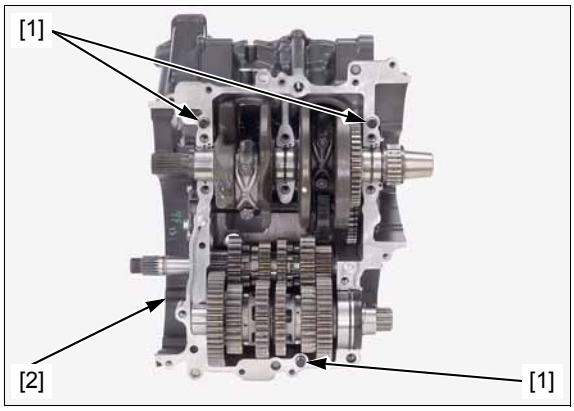
Check the oil orifices for clogs, and replace them if necessary.

Install the oil orifices with its large I.D. side facing the upper crankcase.

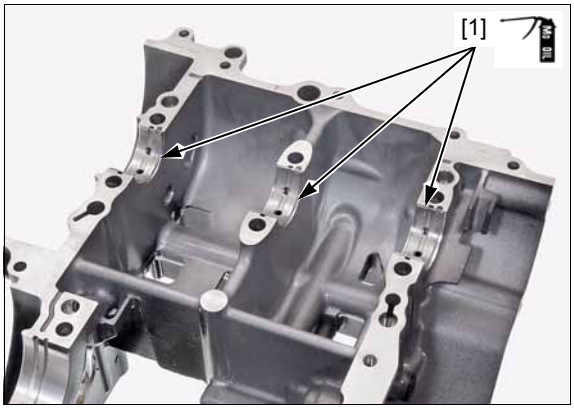
Install the oil orifices [1] into the upper crankcase [2].



Install the dowel pins [1] into the upper crankcase [2].



Apply molybdenum oil solution to the main journal bearing [1] sliding surfaces on the lower crankcase.

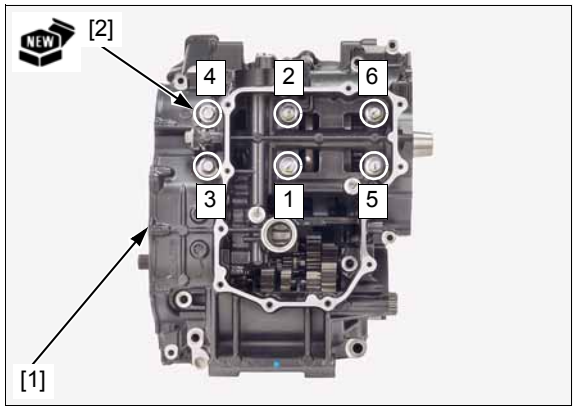


Install the lower crankcase [1] onto the upper crankcase.

Install new crankcase main journal bolts [2].

NOTE:

- Tighten the crankcase main journal bolts using the Plastic Region Tightening Method.
- Do not reuse the crankcase main journal bolts, because the correct axial tension will not be obtained.
- The crankcase main journal bolts are pre-coated with an oil additive for axial tension stability. Do not remove the oil additive from the new crankcase main journal bolt surfaces.



Make sure the upper and lower crankcase are seated securely.

Tighten the crankcase main journal bolts in numerical order as shown in a crisscross pattern in 2 or 3 steps to the specified torque.

Further tighten the crankcase main journal bolts 120°.

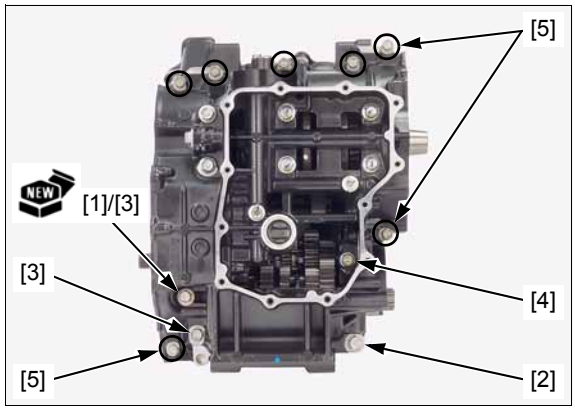
TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft) + 120°

Install a new sealing washer [1] and crankcase bolts.

Tighten the crankcase bolts in a crisscross pattern in 2 or 3 steps to the specified torque.

NOTE:

- The sealing washer location is indicated on the lower crankcase by the "△" mark.



TORQUE:

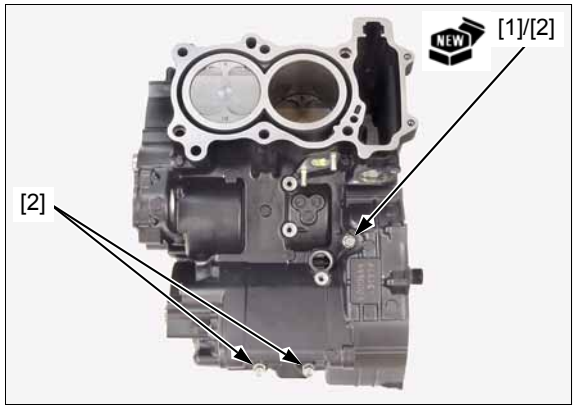
Crankcase 10 mm bolt [2]:
39 N·m (4.0 kgf·m, 29 lbf·ft)
Crankcase 8 x 75 mm bolt [3]:
24 N·m (2.4 kgf·m, 18 lbf·ft)
Crankcase 8 x 55 mm bolt [4]:
24 N·m (2.4 kgf·m, 18 lbf·ft)
Crankcase 6 mm bolt [5]
12 N·m (1.2 kgf·m, 9 lbf·ft)

Place the engine with the lower side down.

Install a new sealing washer [1] and crankcase 6 mm bolts [2].

NOTE:

- The sealing washer location is indicated on the upper crankcase by the "△" mark.



Tighten the crankcase 6 mm bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the removed parts in the reverse order of removal (page 13-2).

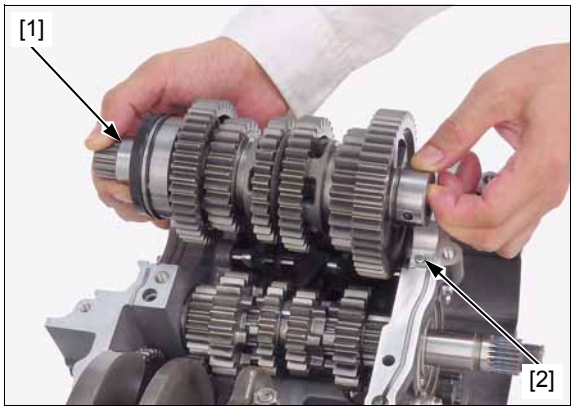
TRANSMISSION

REMOVAL/DISASSEMBLY

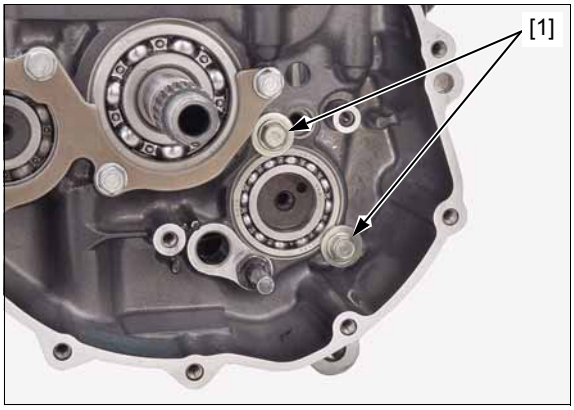
Separate the crankcase halves (page 13-5).

Align the index line [1] on the balancer drive gear with the upper crankcase top surface of the front side.

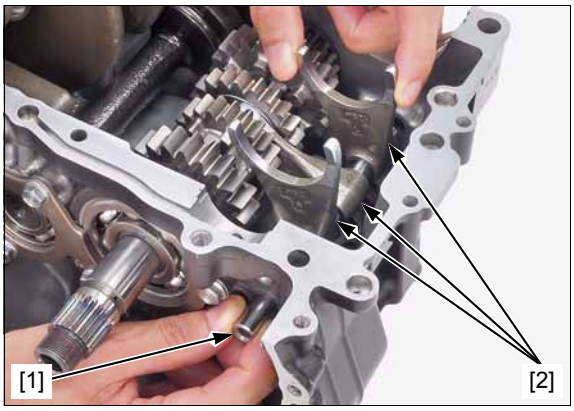
Remove the countershaft assembly [1] and dowel pin [2].



Remove the shift drum bearing setting washer-bolts [1].



Remove the shift fork shaft [1] and shift forks [2].



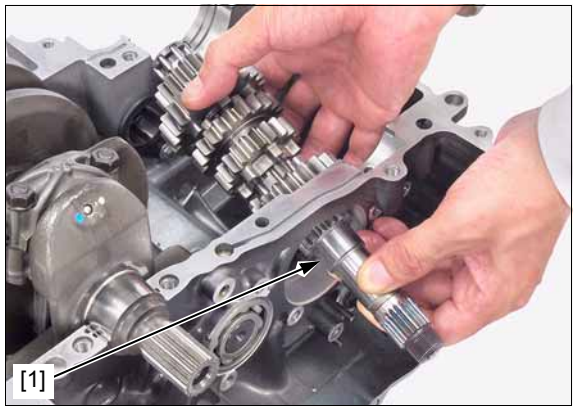
Remove the shift drum [1]/bearing [2] assembly.

Remove the shift drum bearing from the shift drum.

Remove the bolts [1] and balancer/right mainshaft bearing setting plate [2].

Slide the mainshaft assembly off the upper crankcase and remove the right mainshaft bearing [1].

Remove the mainshaft assembly [1].



Disassemble the mainshaft assembly [1] and countershaft assembly [2].

NOTE:

- Keep track of the disassembled parts (gears, bushings, washers, and snap rings) by sliding them onto a tool or a piece of wire.
- Do not expand the snap ring more than necessary for removal. To remove a snap ring, expand the snap ring and pull it off using the gear behind it.

INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

– transmission gears
– transmission bushings
– transmission bearings
– shift drum/bearing
– shift forks
– shift fork shaft

Measure each part and calculate the clearance according to CRANKCASE/TRANSMISSION SPECIFICATIONS (page 1-9).

Replace any part if it is out of service limit.

LEFT MAINSHAFT BEARING OUTER RACE REPLACEMENT

Remove the following:

– balancer (page 14-17)
– piston (page 14-13)

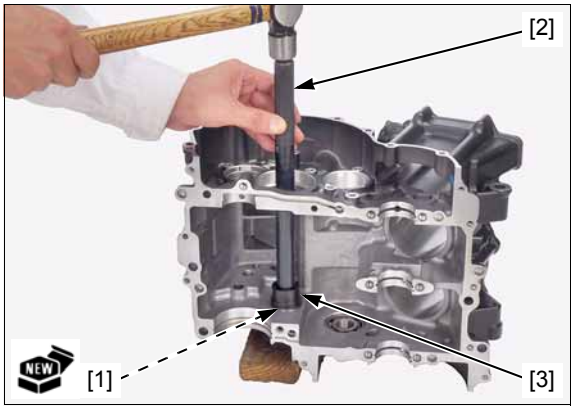
Remove the bolt [1] and bearing outer race setting plate [2].

Remove the left mainshaft bearing outer race [3] from the upper crankcase using a suitable tool.

Drive in a new left mainshaft bearing outer race [1] squarely into the upper crankcase until it is fully seated using the special tools.

TOOLS:

[2] Driver	**07949-3710001**
[3] Attachment, 32 x 35 mm	**07746-0010100**

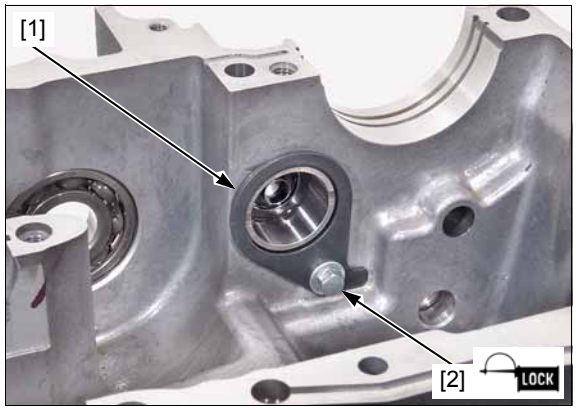


Apply locking agent to the bearing outer race setting plate bolt threads (page 1-18).

Install the bearing outer race setting plate [1], bolt [2] and tighten the bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the removed parts in the reverse order of removal.



ASSEMBLY

Clean all parts in solvent, and dry them thoroughly.

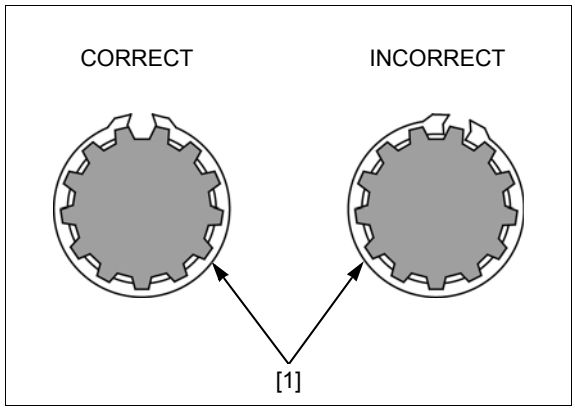
Apply engine oil to the gear teeth, rotating surface and bearing.

Apply molybdenum oil solution to the gear spline bushing outer surface (M6, C3, C4), gear bushing entire surface (M5, C2), needle bearing rotating area (C1) and gear shifter grooves (M3/4, C5, C6).

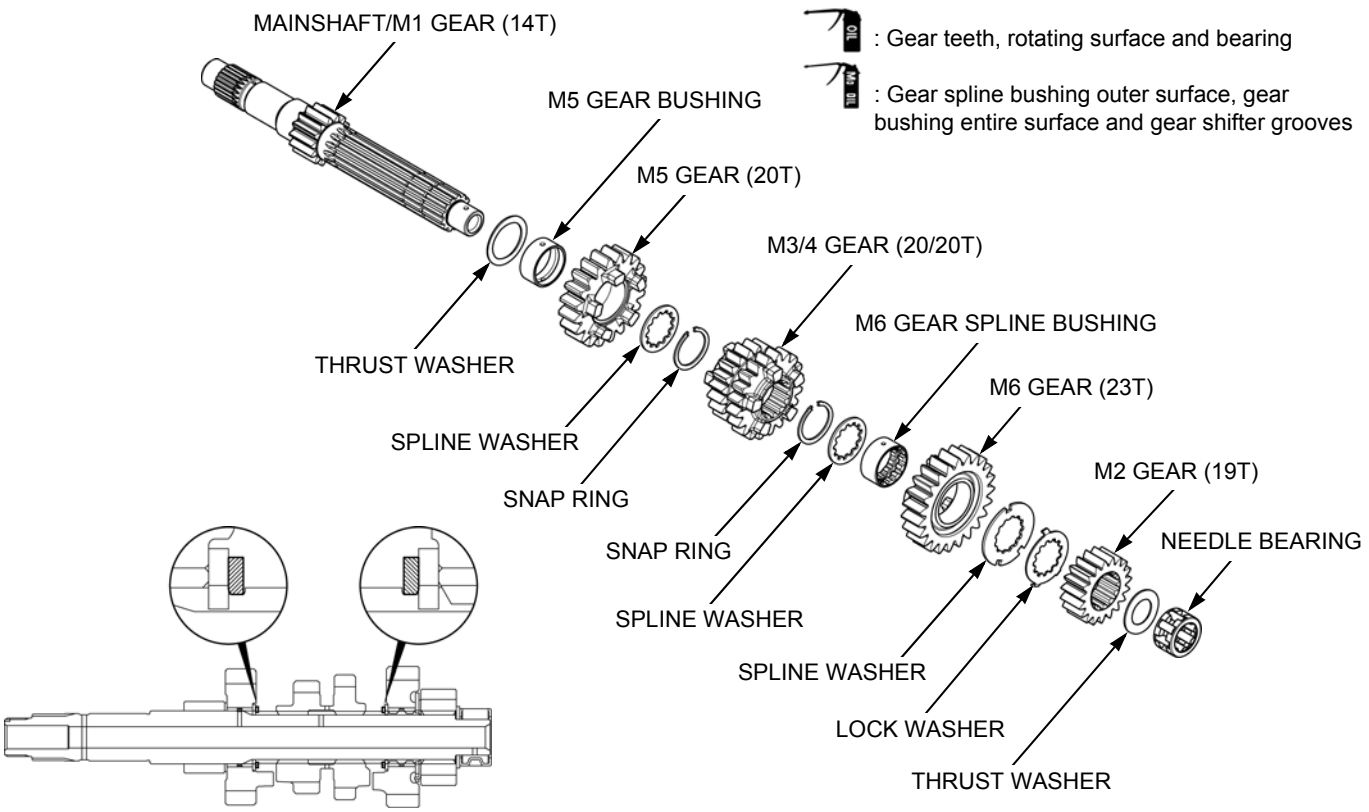
Assemble the mainshaft and countershaft.

NOTE:

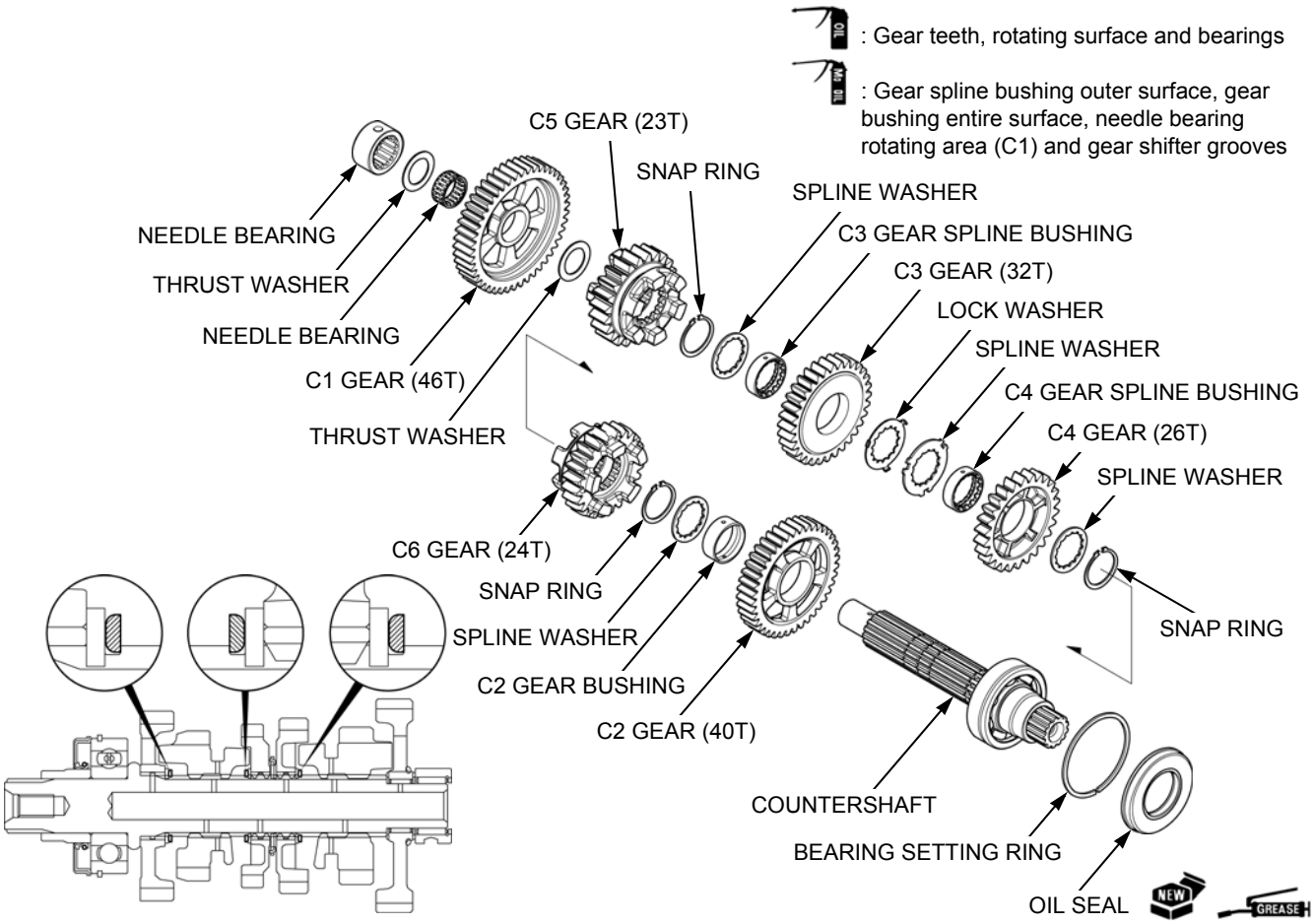
- Coat each gear with clean engine oil and check for smooth movement.
- Align the lock washer tabs with the spline washer grooves.
- Always install the thrust washers and snap rings with the chamfered (rolled) edge facing away from the thrust load.
- Install the snap rings [1] so that the end gap aligns with the groove of the splines.
- Make sure that the snap rings are fully seated in the shaft groove after installing them.



MAINSHAFT



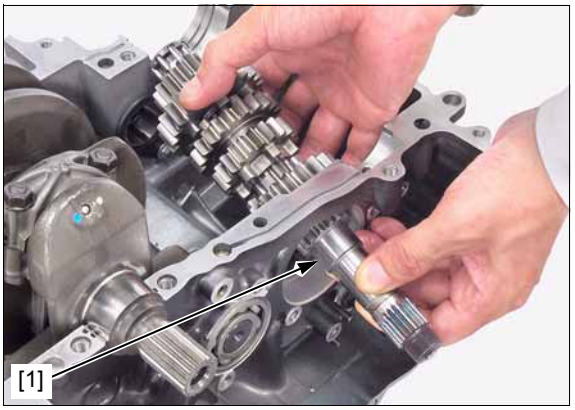
COUNTERSHAFT



INSTALLATION

Align the index line [1] on the balancer drive gear with the upper crankcase top surface of the front side.

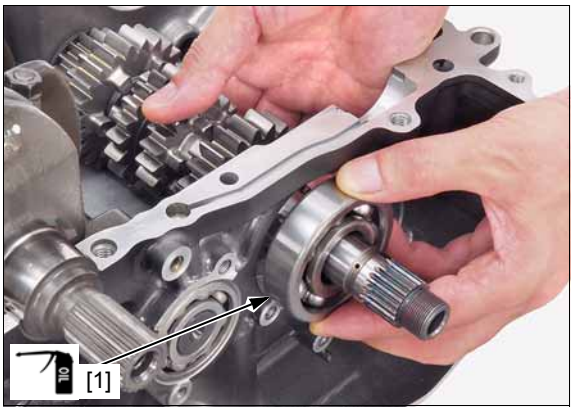
Install the mainshaft assembly [1] into the upper crankcase.



Apply engine oil to the right mainshaft bearing.

Install the bearing into the crankcase with the marked side facing out.

Install the right mainshaft bearing [1] into the upper crankcase.



Apply locking agent to the balancer/right mainshaft bearing setting plate bolts threads (page 1-18).

Install the balancer/right mainshaft bearing setting plate [1] and setting plate bolts [2].

Tighten the setting plate bolts to the specified torque.

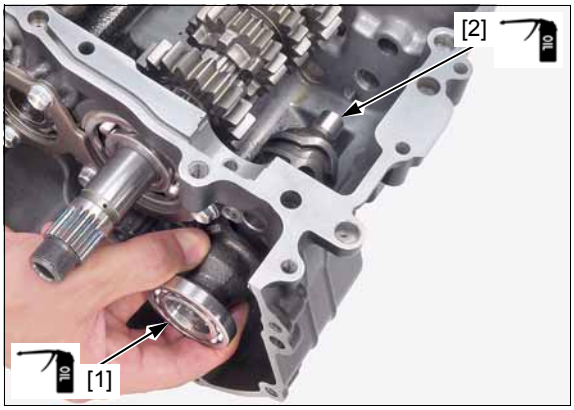
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Apply engine oil to the shift drum bearing and shift drum journal outer surface.

Install the bearing onto the shift drum with the marked side facing out.

Install the shift drum bearing [1] onto the shift drum [2].

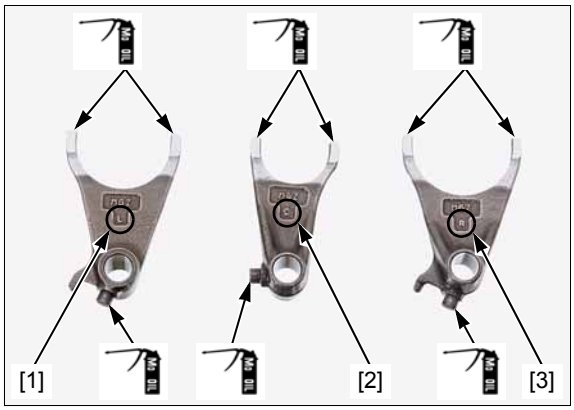
Install the shift drum/bearing assembly into the upper crankcase.



The shift forks have the following identification marks:

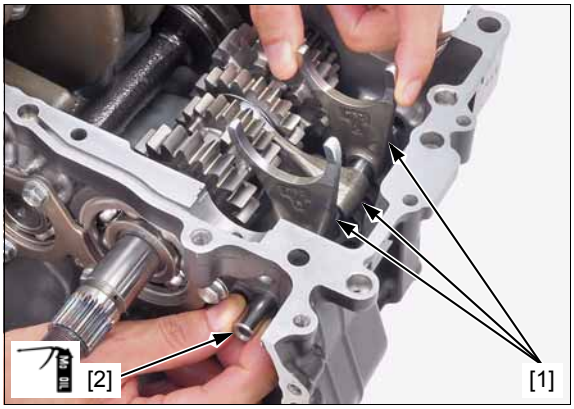
– "L" mark [1]: left shift fork
– "C" mark [2]: center shift fork
– "R" mark [3]: right shift fork

Apply molybdenum oil solution to the shift fork guide area and guide pin.



Apply molybdenum oil solution to the shift fork shaft outer surface.

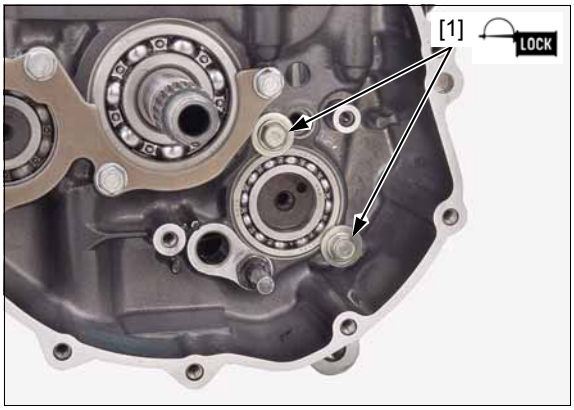
Install the shift forks [1] into the shift drum guide grooves and shifter groove (center shift fork) with the identification marks facing toward the right side of the engine, then insert the fork shaft [2].



Apply locking agent to the shift drum bearing setting washer-bolt threads (page 1-18).

Install and tighten the shift drum bearing setting washer-bolts [1] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



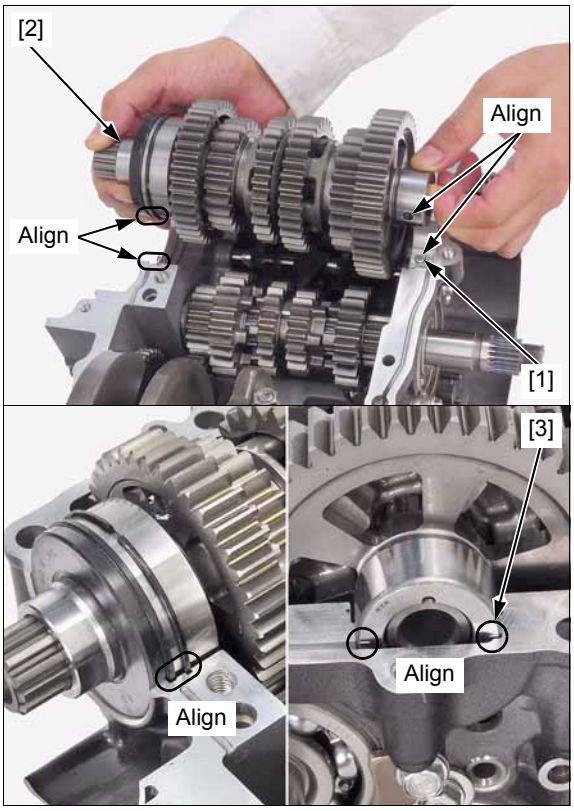
Install the dowel pin [1] onto the upper crankcase hole.

Install the countershaft assembly [2] by aligning the bearing setting ring and oil seal flange with the upper crankcase grooves, and needle bearing cap hole with the dowel pin.

NOTE:

- Make sure the index lines [3] on the bearing cap is aligned with the upper crankcase top surface.

Assemble the crankcase halves (page 13-6).



MEMO

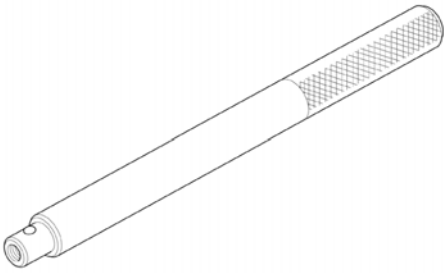
14. CRANKSHAFT/PISTON/CYLINDER/BALANCER

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the crankshaft, balancer, cylinder, piston/connecting rod and piston oil jet. Refer to procedures for crankcase separation (page 13-5).
- Mark and store the connecting rods, bearing caps and bearing inserts to be sure of their correct locations for reassembly.
- The crankpin and main journal bearing inserts are select fit and are identified by color codes. Select replacement bearings from the code tables. After selecting new bearings, recheck the oil clearance with a plastigauge. Incorrect oil clearance can cause major engine damage.

TOOLS

Driver 07949-3710001	Attachment, 42 x 47 mm 07746-0010300	Pilot, 20 mm 07746-0040500
		

TROUBLESHOOTING

Cylinder compression is too low, hard to starting or poor performance at low speed
- Leaking cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston

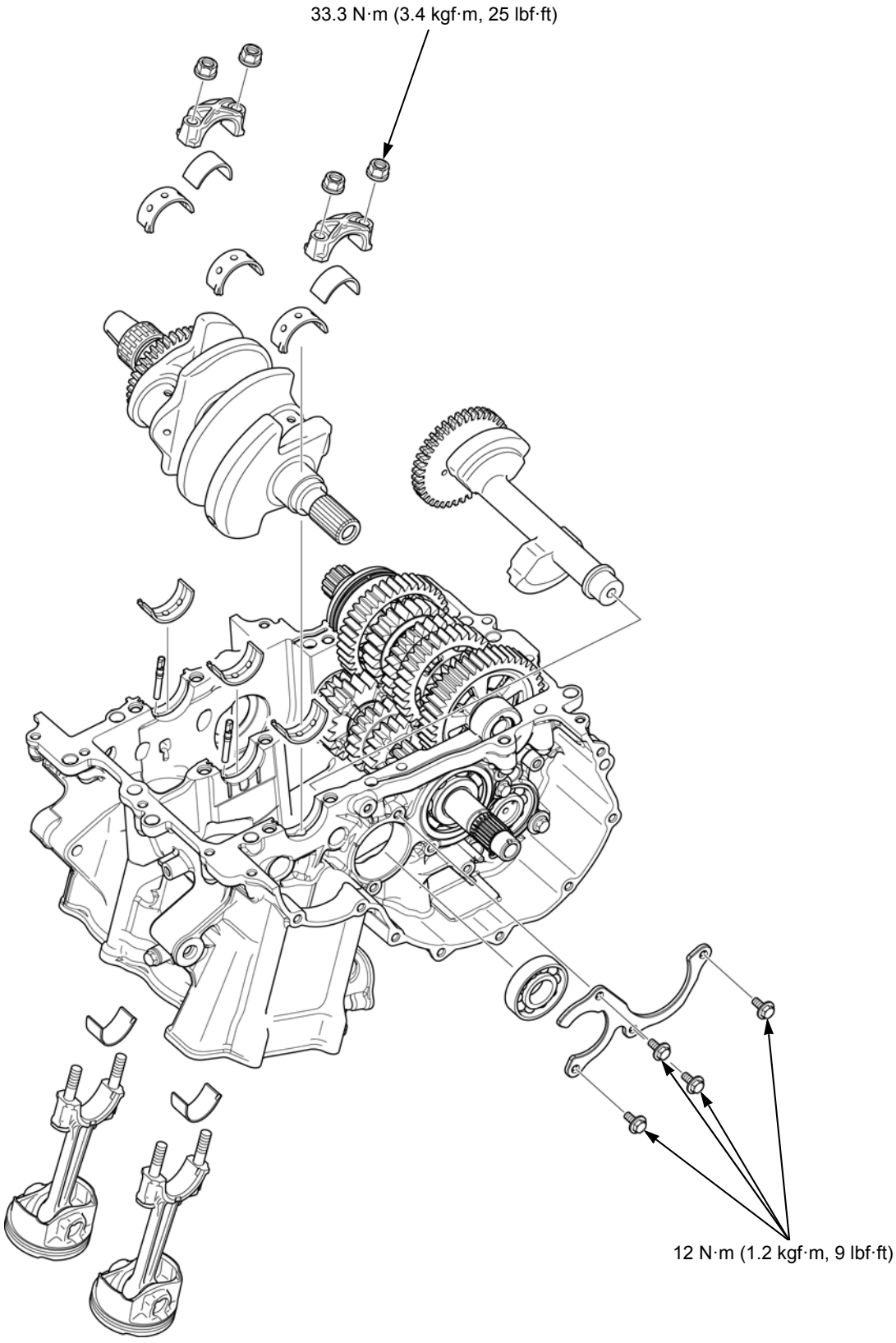
Cylinder compression too high, overheating or knocking
- Excessive carbon built-up on piston head or combustion chamber

Excessive smoke
- Worn cylinder, piston or piston ring
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

Abnormal noise
- Worn piston pin or piston pin hole
- Worn connecting rod small end
- Worn cylinder, piston or piston rings
- Worn main journal bearings
- Worn crankpin bearings

Engine vibration
- Excessive crankshaft runout

COMPONENT LOCATION



CRANKSHAFT

SIDE CLEARANCE INSPECTION

Separate the crankcase halves (page 13-5).

Measure the connecting rod side clearance.

SERVICE LIMIT: 0.30 mm (0.012 in)

If the clearance exceeds the service limit, replace the connecting rod (page 14-13).

Recheck and if still out of limit, replace the crankshaft (page 14-4).

REMOVAL

NOTICE

Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

Separate the crankcase halves (page 13-5).

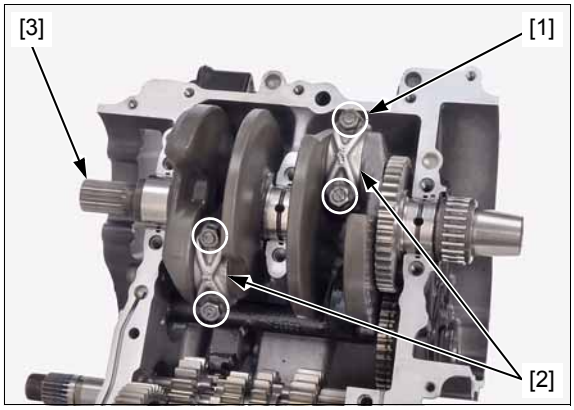
Mark the bearing caps and bearings as you remove them to indicate the correct cylinder for reassembly.

Be careful not to damage the crankpin, main journal and bearing inserts.

Remove the crankpin bearing cap nuts [1] and bearing caps [2].

- Tap the side of the cap lightly if the bearing cap is hard to remove.

Remove the crankshaft [3].

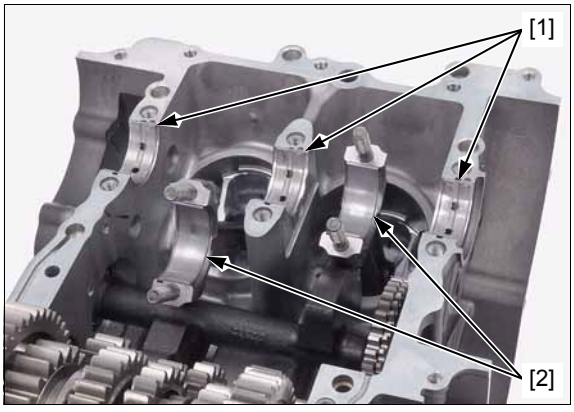


NOTICE

Before removal, position all the pistons at TDC (Top Dead Center) to prevent damaging the crankpin with the connecting rod.

Remove the main journal bearings [1] from both crankcase halves.

Remove the crankpin bearings [2] from the connecting rods and bearing caps.



NOTICE

Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

INSPECTION

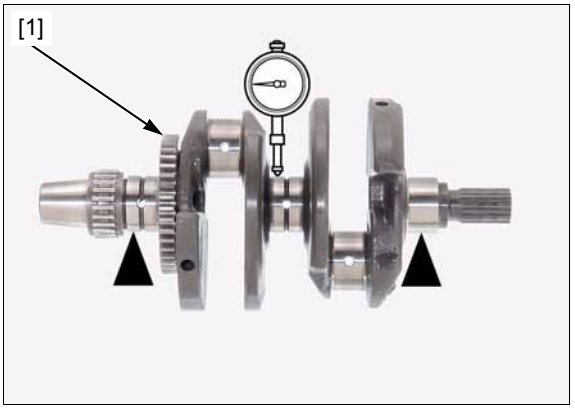
Support the crankshaft on both end journals.

Set a dial gauge on the center main journal of the crankshaft avoiding the oil groove and hole.

Rotate the crankshaft two revolutions (720°) and read the runout.

SERVICE LIMIT: 0.05 mm (0.002 in)

Check the balancer drive gear [1] teeth for abnormal wear or damage.



INSTALLATION

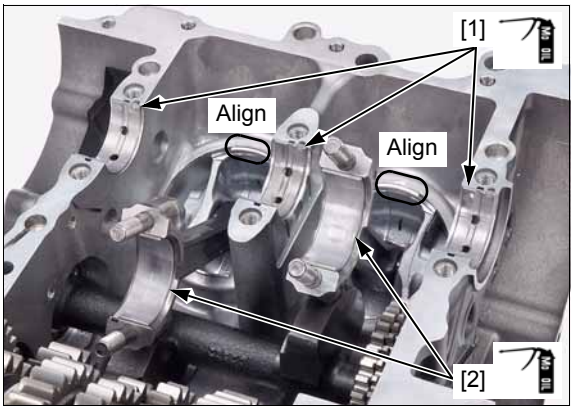
Install the main journal bearings [1] and crankpin bearings [2] in the original locations.

– main journal bearing (page 14-10)
– crankpin bearing (page 14-13)

NOTICE

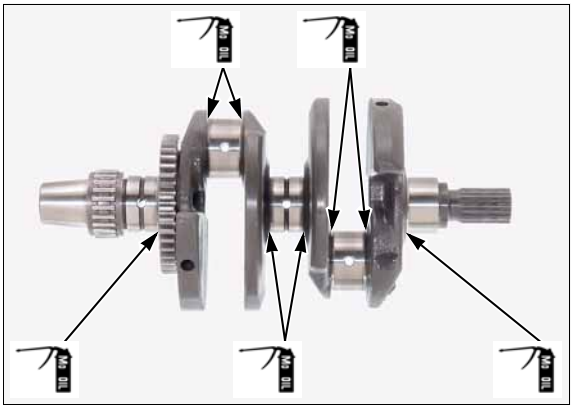
Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

Apply molybdenum oil solution to the main journal bearing sliding surfaces on the upper crankcase and crankpin bearing sliding surfaces on the connecting rods.



Align both the piston skirt ends with the cylinder edges.

Apply molybdenum oil solution to the thrust surfaces of the crankshaft as shown.

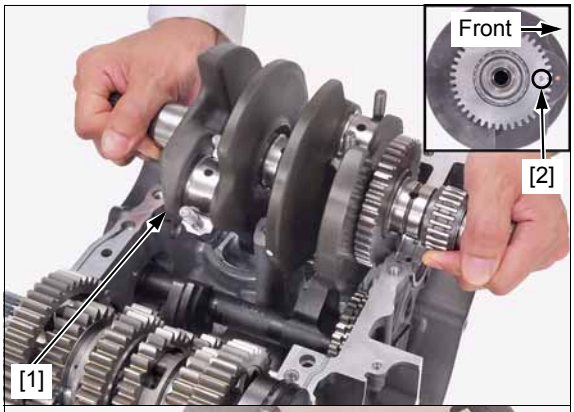


Align the balancer shaft end groove with the projection of the upper crankcase.

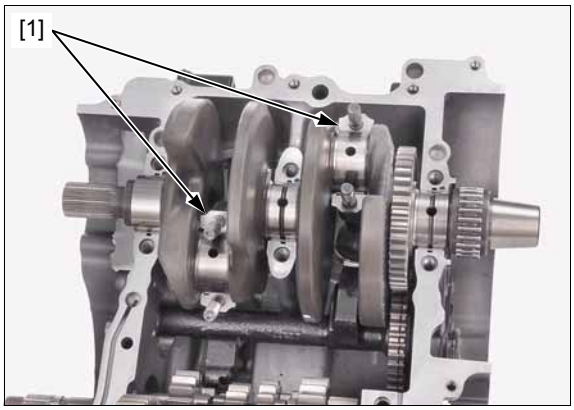
Be careful not to damage the crankpin, main journal and bearing inserts.

Hold the crankshaft [1] over the crankcase securely with "△" mark [2] on the balancer drive gear facing the front side of the engine, and set its crankpins onto the connecting rods.

Install the crankshaft onto the upper crankcase while aligning the balancer driven gear index line [3] between the balancer drive gear index lines [4] as shown.



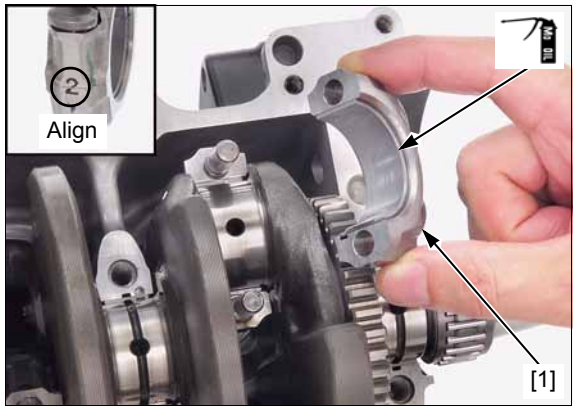
Set the connecting rods [1] onto the crankpins.



Clean the mating surface of the connecting rods and crankpin bearing caps with solvent and blow them with compressed air.

Apply molybdenum oil solution to the crankpin bearing sliding surfaces on the crankpin bearing caps.

Install the crankpin bearing caps [1] by aligning the I.D. code number on the connecting rod and bearing cap.



NOTICE

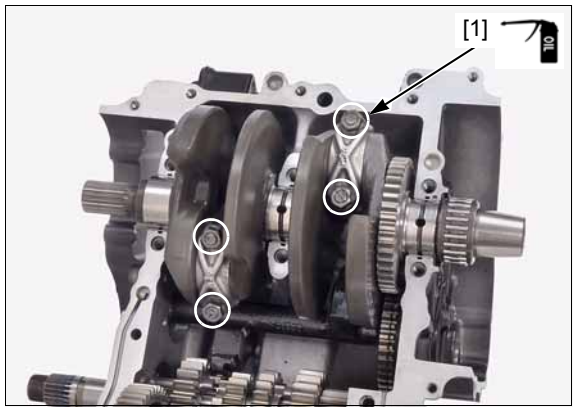
Be sure to install each part in its original position, as noted during removal.

Apply engine oil to the crankpin bearing cap nut threads and seating surfaces.

Install and tighten the crankpin bearing cap nuts [1] in 2 or 3 steps alternately to the specified torque.

TORQUE: 33.3 N·m (3.4 kgf·m, 25 lbf·ft)

Assemble the crankcase halves (page 13-6).



MAIN JOURNAL BEARING

NOTICE

Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

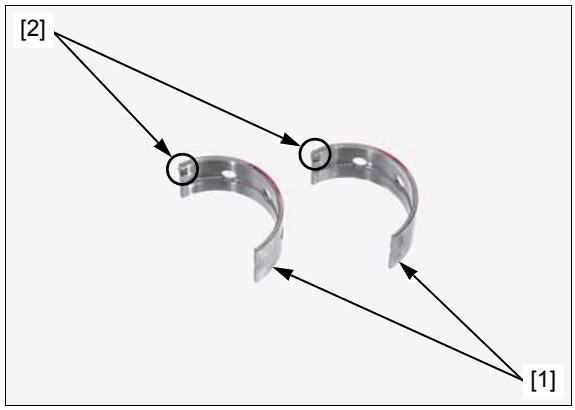
BEARING INSPECTION

Remove the crankshaft (page 14-4).

Check the main journal bearing inserts [1] for unusual wear or peeling.

Check the bearing tabs [2] and surfaces for damage.

If the main journal bearing damaged, select a replacement bearing (page 14-9).



OIL CLEARANCE INSPECTION

Remove the crankshaft (page 14-4).

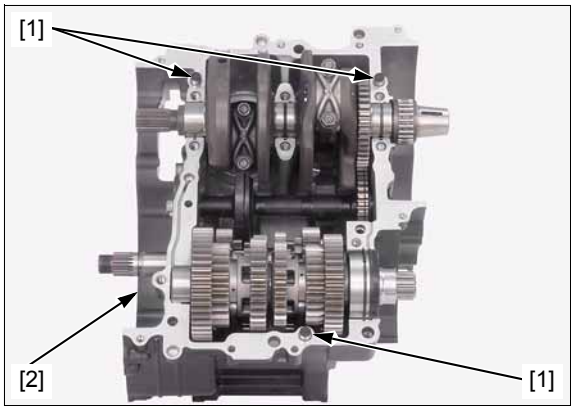
Clean off any oil from the bearing inserts and main journals.

Install the crankshaft onto the upper crankcase (page 14-5).

Do not rotate the crankshaft during inspection.

Put a strip of plastigauge [1] lengthwise on each main journal avoiding the oil hole.

Install the dowel pins [1] onto the upper crankcase [2].



Install the lower crankcase [1] onto the upper crankcase.

Clean the crankcase main journal bolts (reuse) in solvent, and dry them thoroughly.

Apply engine oil to the crankcase main journal bolt threads and seating surfaces.

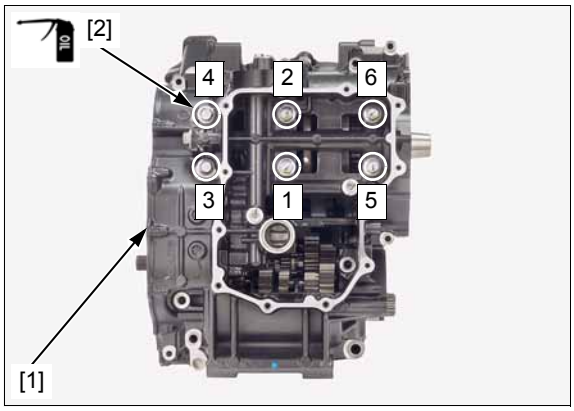
Install the crankcase main journal bolts [2].

Make sure the upper and lower crankcase are seated securely.

Tighten the crankcase main journal bolts in numerical order as shown in a crisscross pattern in 2 or 3 steps to the specified torque.

Further tighten the crankcase main journal bolts 120°.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft) + 120°



Remove the crankcase main journal bolt and lower crankcase.

Measure the compressed plastigauge at its widest point on each main journal to determine the oil clearance.

SERVICE LIMIT: 0.05 mm (0.002 in)

If the oil clearance exceeds the service limit, select a replacement bearing (page 14-9).

BEARING SELECTION

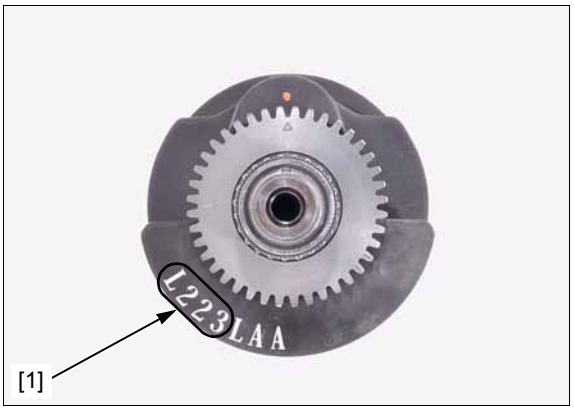
Letters (A, B or C) on the left side of upper crankcase are bearing support I.D. codes from left to right.

Record the crankcase bearing support I.D. code letters [1] from left side of the upper crankcase as shown.

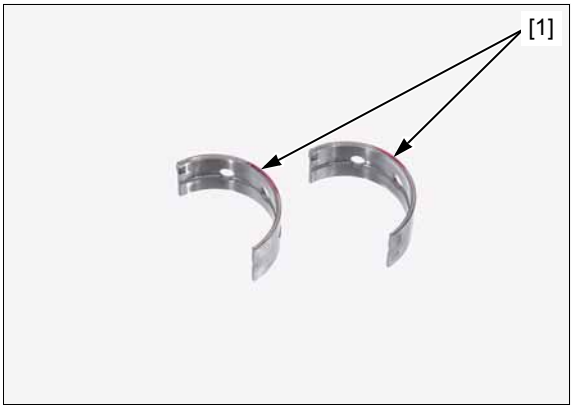
Numbers (1, 2 or 3) on the crank weight are main journal O.D. codes from left to right.

If you are replacing the crankshaft, record the corresponding main journal O.D. code numbers [1] from the crank weight.

If you are reusing the crankshaft, measure the crankpin O.D. with a micrometer.



Cross-reference the main journal and bearing support codes to determine the replacement bearing color code [1].



MAIN JOURNAL BEARING THICKNESS:

A: Black: Thickest
B: Brown:
C: Green:
D: Yellow:
E: Pink: Thinnest

MAIN JOURNAL BEARING SELECTION TABLE:

			BEARING SUPPORT I.D. CODE		
			A	B	C
			37.000 – 37.006 mm (1.4567 – 1.4569 in)	37.006 – 37.012 mm (1.4569 – 1.4572 in)	37.012 – 37.018 mm (1.4572 – 1.4574 in)
MAIN JOURNAL O.D. CODE	1	34.000 – 34.006 mm (1.3386 – 1.3388 in)	E (Pink)	D (Yellow)	C (Green)
	2	33.994 – 34.000 mm (1.3383 – 1.3386 in)	D (Yellow)	C (Green)	B (Brown)
	3	33.988 – 33.994 mm (1.3381 – 1.3383 in)	C (Green)	B (Brown)	A (Black)

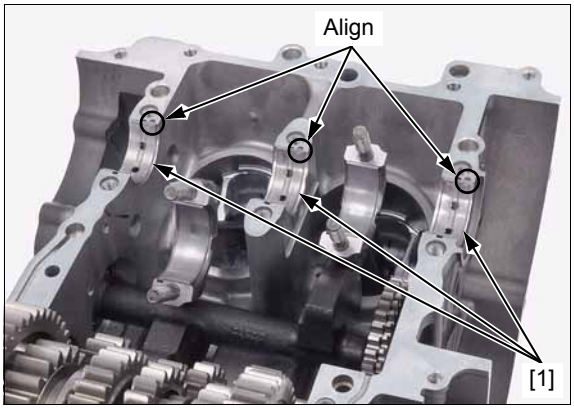
NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

BEARING INSTALLATION

Clean the bearing outer surfaces and crankcase bearing supports.

Install the main journal bearing inserts [1] onto the crankcase bearing supports, aligning each tab with each groove.



CRANKPIN BEARING

NOTICE

Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

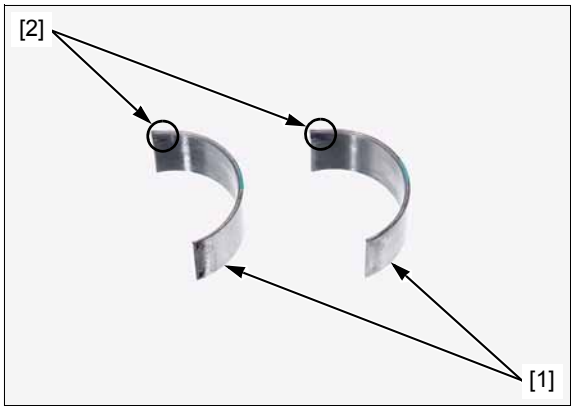
BEARING INSPECTION

Remove the crankshaft (page 14-4).

Check the crankpin bearing inserts [1] for unusual wear or peeling.

Check the bearing tabs [2] and surfaces for damage.

If the crankpin bearing damaged, select a replacement bearing (page 14-12).



OIL CLEARANCE INSPECTION

Remove the crankshaft (page 14-4).

Clean the mating surface of the connecting rod and crankpin bearing cap with solvent and blow them with compressed air.

Clean off any oil from the bearing inserts and crankpins.

Install the crankshaft onto the upper crankcase (page 14-5).

Set the connecting rods onto the crankpins.

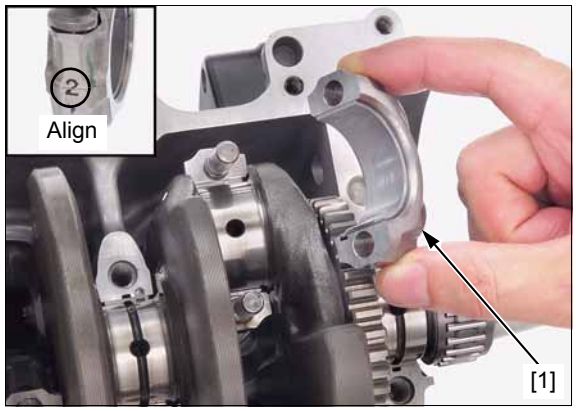
Do not rotate the crankshaft during inspection.

Put a strip of plastigauge [1] lengthwise on each crankpin avoiding the oil hole.

Install the crankpin bearing caps [1] by aligning the I.D. code number on the connecting rod and bearing cap.

NOTICE

Be sure to install each part in its original position, as noted during removal.

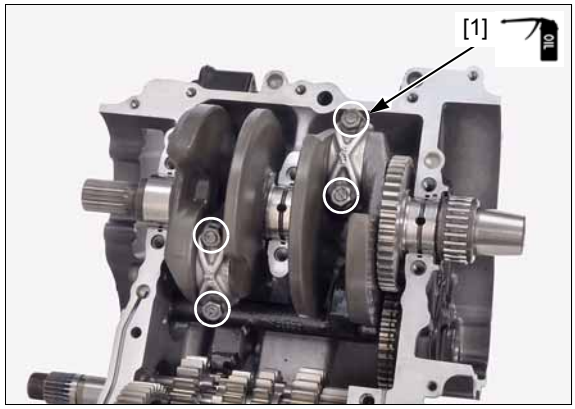


Apply engine oil to the crankpin bearing cap nut threads and seating surfaces.

Install and tighten the crankpin bearing cap nuts [1] in 2 or 3 steps alternately to the specified torque.

TORQUE: 33.3 N·m (3.4 kgf·m, 25 lbf·ft)

Remove the bearing caps.



Measure the compressed plastigauge at its widest point on the crankpin to determine the oil clearance.

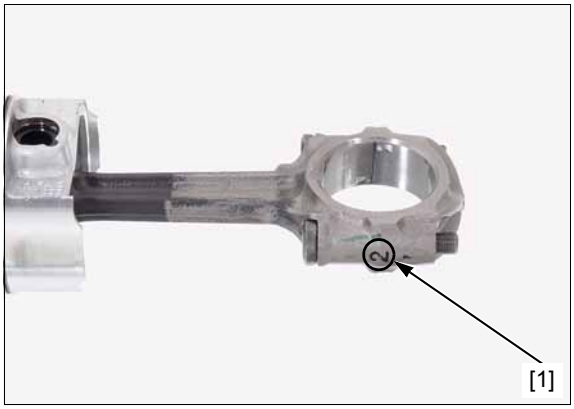
SERVICE LIMIT: 0.072 mm (0.0028 in)

If the oil clearance exceeds the service limit, select the correct replacement bearings (page 14-12).

BEARING SELECTION

Numbers (1, 2 or 3) on the connecting rods are the connecting rod I.D. codes.

Record the connecting rod I.D. code number [1] or measure the I.D. with the crankpin bearing cap installed without bearing inserts.



Letters (A, B or C) on the crank weight are the crankpin O.D. codes from left to right.

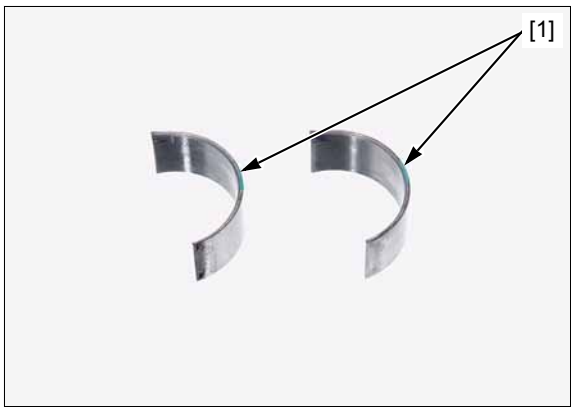
If you are replacing the crankshaft, record the corresponding crankpin O.D. code letter [1].

If you are reusing the crankshaft, measure the crankpin O.D. with a micrometer.

Cross-reference the connecting rod and crankpin codes to determine the replacement bearing color code [1].

CRANKPIN BEARING THICKNESS:

A: Blue: Thickest
B: Black:
C: Brown:
D: Green:
E: Yellow: Thinnest



CRANKPIN BEARING SELECTION TABLE:

			CONNECTING ROD I.D. CODE		
			1	2	3
			39.000 – 39.006 mm (1.5354 – 1.5357 in)	39.006 – 39.012 mm (1.5357 – 1.5359 in)	39.012 – 39.018 mm (1.5359 – 1.5361 in)
CRANKPIN O.D. CODE	A	35.994 – 36.000 mm (1.4171 – 1.4173 in)	E (Yellow)	D (Green)	C (Brown)
	B	35.988 – 35.994 mm (1.4168 – 1.4171 in)	D (Green)	C (Brown)	B (Black)
	C	35.982 – 35.988 mm (1.4166 – 1.4168 in)	C (Brown)	B (Black)	A (Blue)

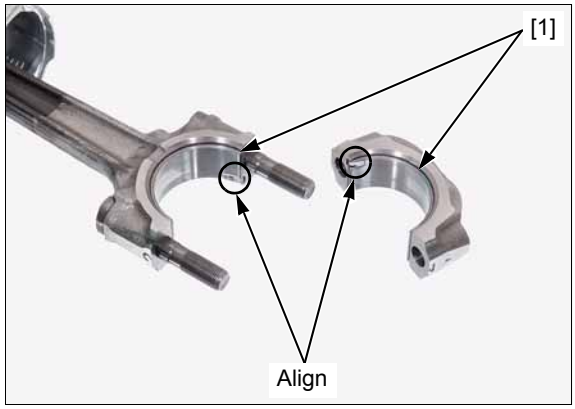
NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

BEARING INSTALLATION

Clean the bearing outer surfaces, crankpin bearing cap and connecting rod.

Install the crankpin bearing inserts [1] onto the bearing cap and connecting rod, aligning each tab with each groove.



PISTON/CYLINDER

PISTON/CONNECTING ROD REMOVAL

NOTICE

- *Before piston removal, place a clean shop towel around the connecting rod to prevent damaging the cylinder sleeve.*
- *Do not try to remove the piston/connecting rod assembly from bottom of the cylinder; the assembly will get stuck in the gap between the cylinder liner and the upper crankcase.*
- *Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.*

Remove the following:

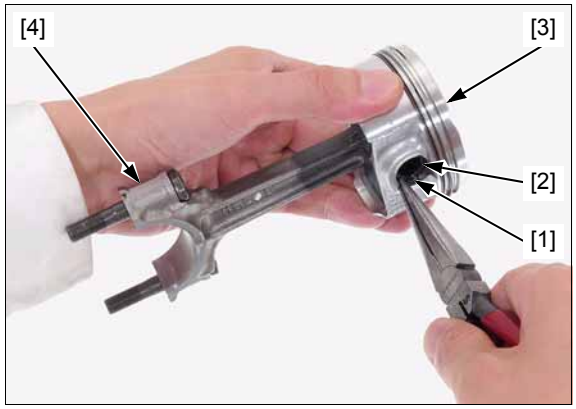
– countershaft (page 13-8)
– crankshaft (page 14-4)

Remove the piston/connecting rod assembly [1] from the top of the cylinder.

PISTON REMOVAL

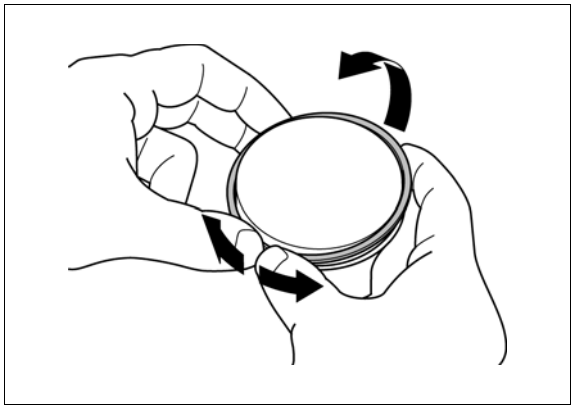
Remove the piston pin clips [1] with pliers.

Push the piston pin [2] out of the piston [3] and connecting rod [4], and remove the piston.



PISTON RING REMOVAL

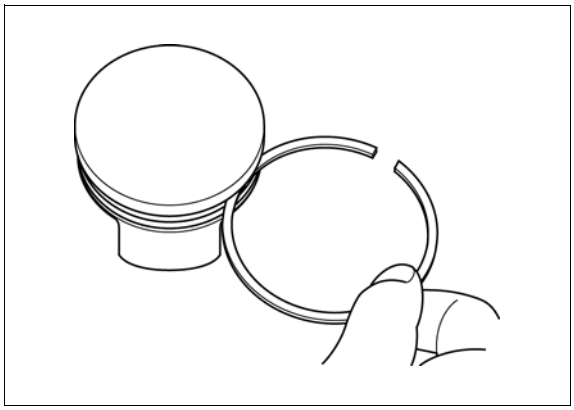
Spread each piston ring ends and remove them by lifting up at a point opposite the gap.



NOTE:

- Do not damage the piston ring by spreading the ends too far.
- Be careful not to damage the piston when removing the piston ring.

Clean carbon deposits from the piston ring grooves with a ring that will be discarded.



NOTE:

- Never use a wire brush; it will scratch the groove.

INSPECTION

Inspect the following parts for scratch, damage, abnormal wear, deformation, burning or clogs in oil passages.

– cylinder
– piston
– piston rings
– piston pin
– connecting rod small end

Measure each part and calculate the clearance according to CRANKSHAFT/PISTON/CYLINDER/ BALANCER SPECIFICATIONS (page 1-9).

Replace any part if it is out of service limit.

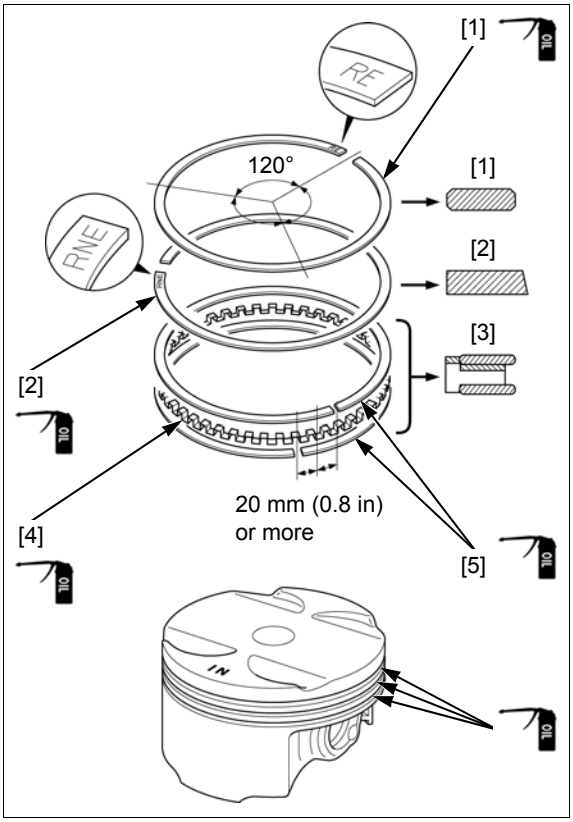
PISTON RING INSTALLATION

Clean the piston ring grooves thoroughly and install the piston rings.

- Apply engine oil to the piston ring entire surface and piston ring grooves.
- Avoid piston and piston ring damage during installation.
- Install the piston rings with the marked side facing up.
  – "RE" mark: top ring [1]
  – "RNE" mark: second ring [2]
- To install the oil ring [3], install the spacer [4] first, then install the side rails [5].

Stagger the piston ring end gaps 120° apart from each other.
Stagger the side rail end gaps as shown.

After installation, the rings should rotate freely in the ring groove.



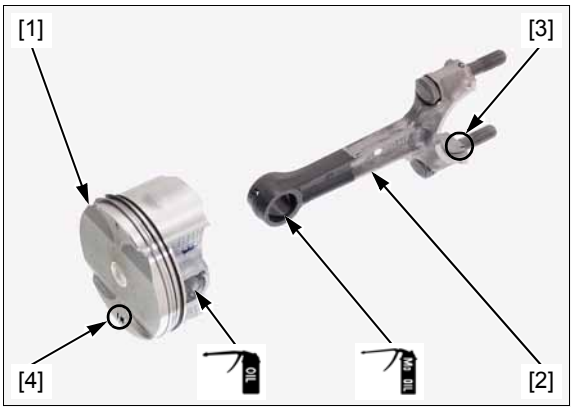
PISTON INSTALLATION

Install the crankpin bearings in the original locations (page 14-13).

Apply engine oil to the piston pin hole inner surface.

Apply molybdenum oil solution to the connecting rod small end inner surface.

Assemble the piston [1] and connecting rod [2] with the crankpin bearing tab [3] facing to the piston "IN" mark [4].



Apply molybdenum oil solution to the piston pin outer surface.

Install the piston pin [1] and secure it using new piston pin clips [2].

NOTE:

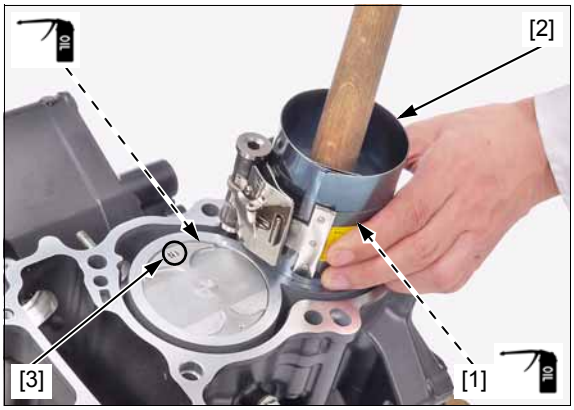
- Make sure that the piston pin clips are seated securely.
- Do not align the piston pin clip end gap with the piston cutout.

Apply engine oil to the cylinder walls and piston sliding surface.

Install the piston/connecting rod assembly with the piston "IN" mark [3] facing the intake side.

Install the piston/connecting rod assembly [1] into the cylinder using a commercially available piston ring compressor tool [2].

When reusing the connecting rods, they must be installed in their original locations.



NOTICE

- *While installing the piston, be careful not to damage the top surface of the cylinder, especially around the cylinder bore.*
- *Be careful not to damage the cylinder sleeve and crankpin with the connecting rod.*

Make sure the piston ring compressor tool sits flush on the top surface of the cylinder.

Use the handle of a plastic hammer or equivalent tool to tap the piston into the cylinder.

Install the following:

– crankshaft (page 14-5)
– countershaft (page 13-13)

PISTON OIL JET

REMOVAL/INSTALLATION

Remove the piston/connecting rod assembly (page 14-13).

Be careful not to damage the oil jet hole.

Remove the oil jets [1] to the main journal side while pushing the oil jet tip from the cylinder side.

Remove the O-ring [2] from the oil jet.

Clean the oil jets in solvent thoroughly.

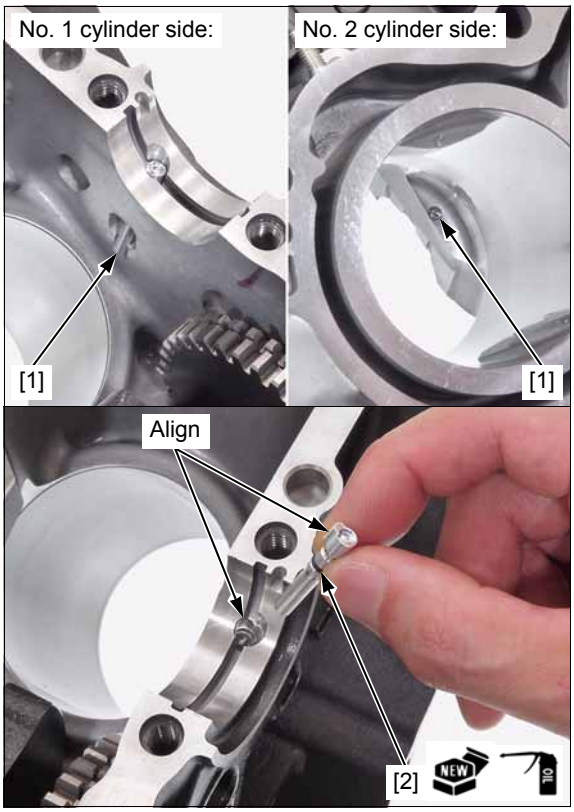
Check the oil jets for clogs, and replace them if necessary.

Blow through the oil passage on the upper crankcase and oil jet with compressed air.

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

Install the oil jets into the upper crankcase until it is fully seated while aligning the lug and groove in the crankcase.

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



BALANCER

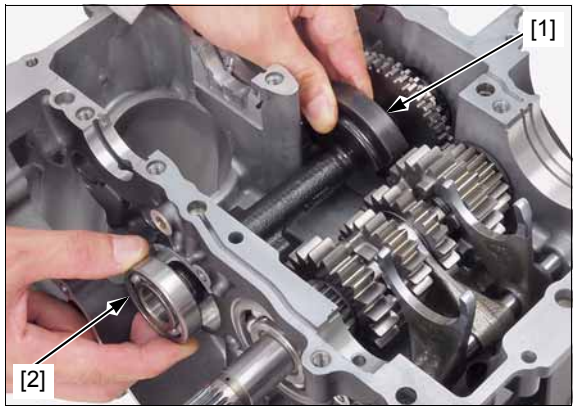
REMOVAL

Remove the piston/connecting rod assembly (page 14-13).

Remove the bolts [1] and balancer/right mainshaft bearing setting plate [2].

Position the balancer shaft with the left balancer weight [1] facing up.

Slide the balancer shaft off the upper crankcase and remove the right balancer shaft bearing [2].



Remove the balancer shaft [1].

INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

– balancer driven gear
– balancer driven sub-gear
– springs
– balancer shaft
– balancer shaft bearings

LEFT BALANCER SHAFT BEARING REPLACEMENT

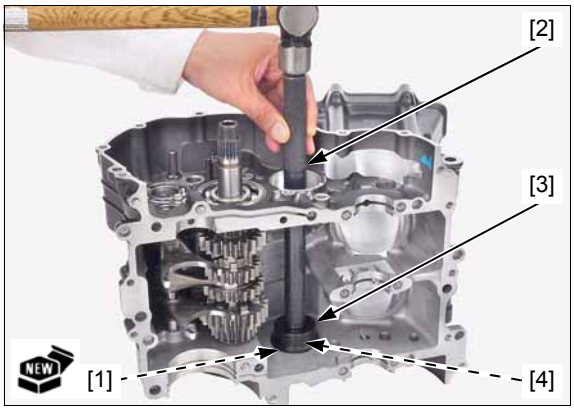
Drive out the left balancer shaft bearing [1] from the upper crankcase.

Drive in squarely with the marked side facing up.

Drive in a new left balancer shaft bearing [1] into the upper crankcase until it is fully seated using the special tools.

TOOLS:

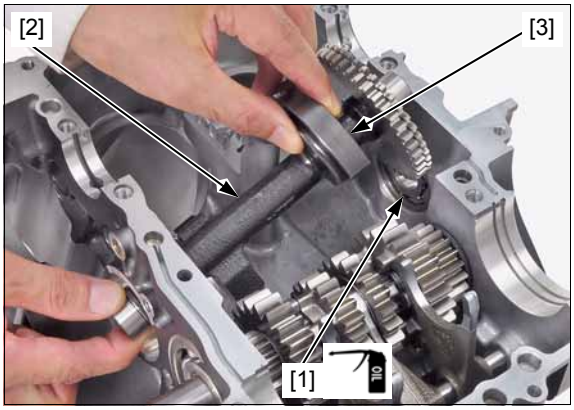
[2] Driver	**07949-3710001**
[3] Attachment, 42 x 47 mm	**07746-0010300**
[4] Pilot, 20 mm	**07746-0040500**



INSTALLATION

Apply engine oil to the left balancer shaft bearing [1].

Install the balancer shaft [2] into the upper crankcase while the left balancer weight [3] is facing up.



Apply engine oil to the right balancer shaft bearing.

Install with the marked side facing out.

Install the right balancer shaft bearing [1] into the upper crankcase.

Apply locking agent to the balancer/right mainshaft bearing setting plate bolts threads (page 1-18).

Install the balancer/right mainshaft bearing setting plate [1] and setting plate bolts [2].

Tighten the setting plate bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the piston/connecting rod assembly (page 14-15).

MEMO

15. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

GENERAL

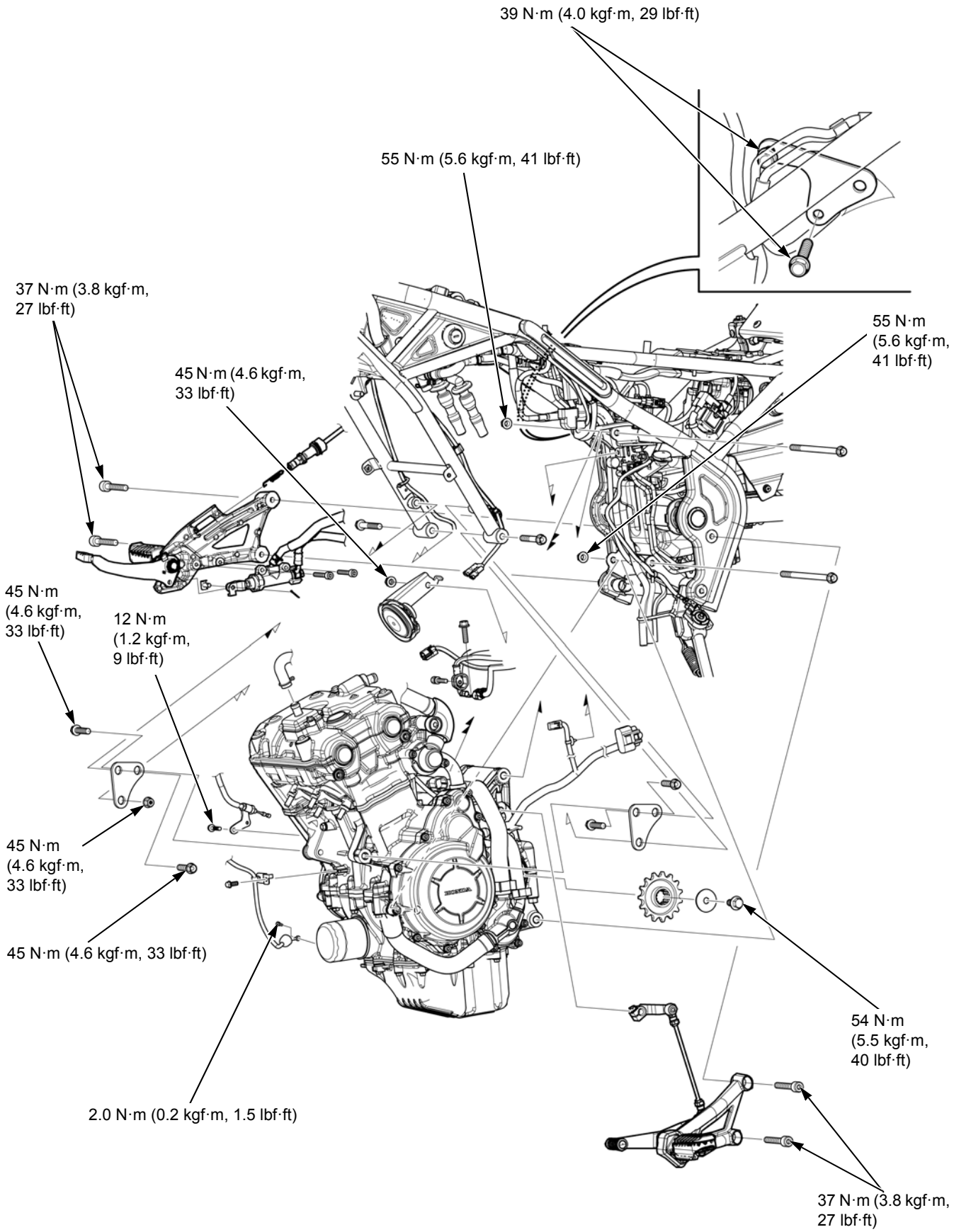
- A hoist or equivalent is required to support the motorcycle when removing and installing the engine.
- A floor jack or other adjustable support is required to support and maneuver the engine.

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 6-6)
  - Throttle body (page 7-13)
  - air cleaner housing (page 7-11)
  - Water pump (page 8-10)
  - Oil pump (page 9-5)
  - oil strainer (page 9-8)
  - Camshaft (page 10-8)
  - Rocker arm (page 10-13)
  - Cam chain tensioner lifter (page 10-22)
  - Clutch (page 11-7)
  - Primary drive gear (page 11-14)
  - Gearshift linkage (page 11-15)
  - Stator/CKP sensor (page 12-5)
  - Flywheel (page 12-5)
  - Starter clutch (page 12-8)
- The following components require engine removal for service.
  - Cylinder head/valves (page 10-15)
  - Transmission (page 13-8)
  - Crankshaft (page 14-4)
  - Piston/cylinder (page 14-13)
  - Balancer (page 14-17)

COMPONENT LOCATION



ENGINE REMOVAL

Drain the engine oil (page 3-10).

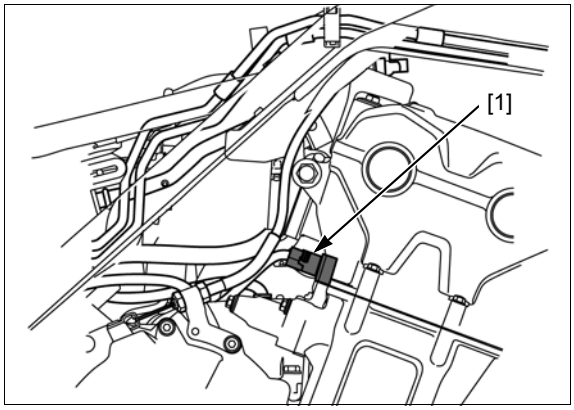
Fully slacken the drive chain (page 3-14).

Remove the following:

– drive sprocket cover (page 2-7)
– exhaust pipe (page 2-13)
– fuel tank under tray (page 2-8)
– starter motor (page 6-6)
– regulator/rectifier (page 20-7)
– radiator (page 8-7)
– left side footpeg bracket (page 11-5)

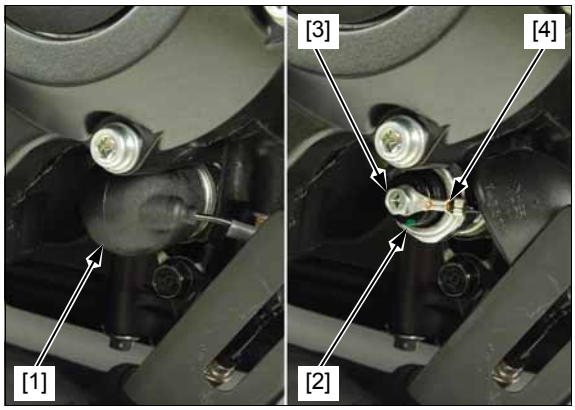
Remove the socket bolt [1] and clutch cable holder [2], then disconnect the clutch cable [3] from the clutch lifter arm [4].

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

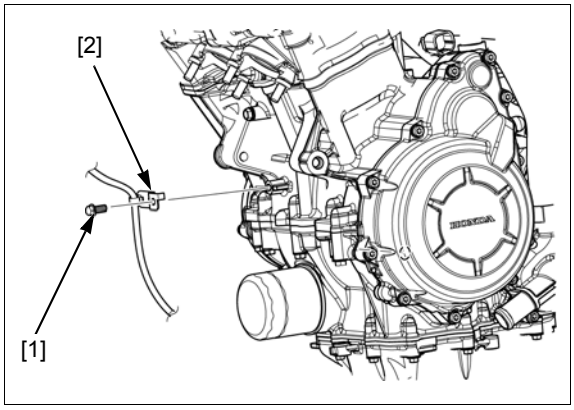


Release the rubber cap [1] from the EOP switch [2].

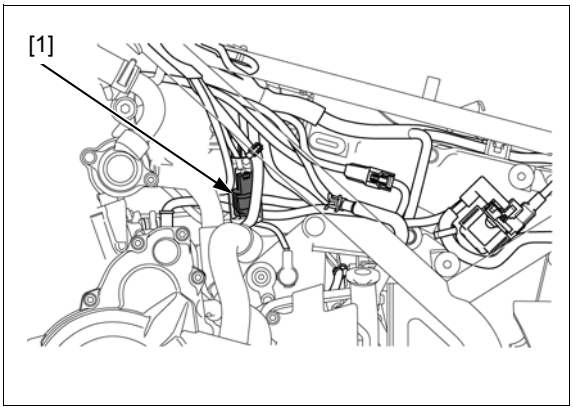
Remove the terminal screw [3] and disconnect the switch wire [4].



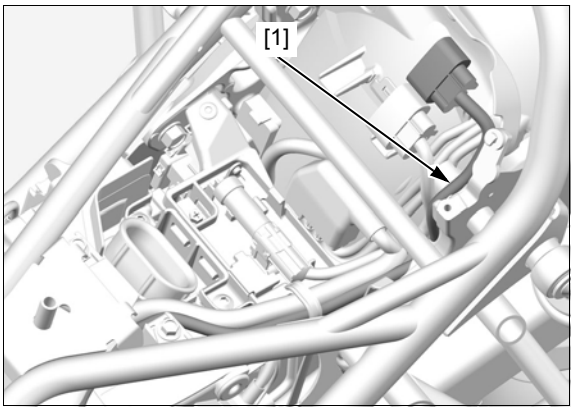
Remove the bolt [1] and wire harness stay [2].



Disconnect the neutral switch 2P (Black) connector [1].

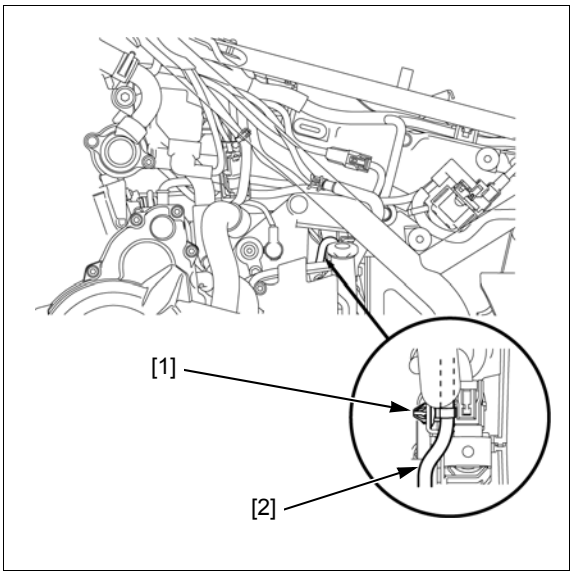


Remove the AC generator wire [1] out of the frame.



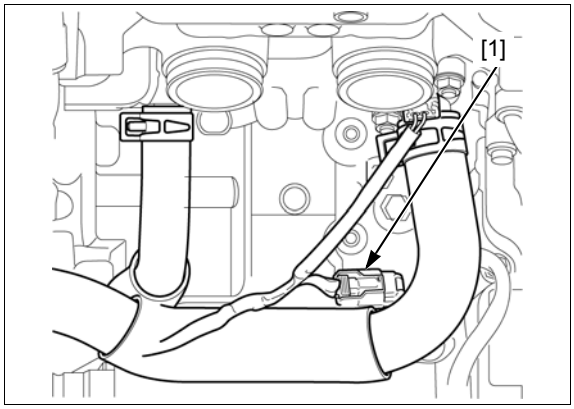
Disconnect the CKP sensor 2P (Red) connector [1].

Remove the wire band [1] and CKP sensor wire [2] out of the frame.

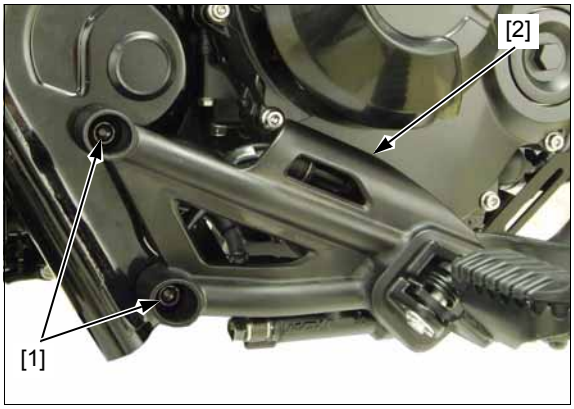


Disconnect the air supply hoses [1].

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

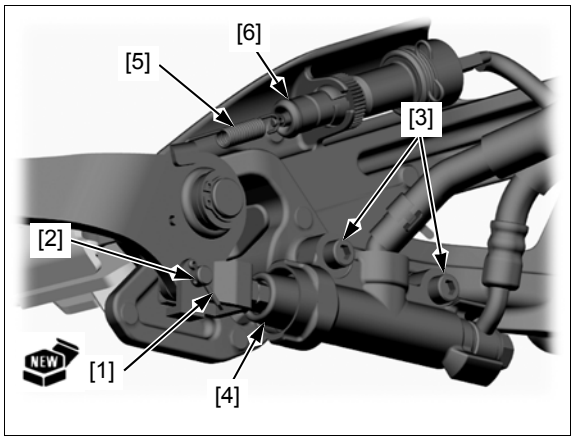


Remove the two socket bolts [1] and right rider footpeg bracket [2].



Remove the cotter pin [1], joint pin [2].

Remove the master cylinder mounting bolts [3], master cylinder [4] switch spring [5] and rear brake light switch [6].



Remove the drive sprocket bolt [1], washer [2] and drive sprocket [3].

Support the motorcycle securely with a hoist or equivalent.

Do not use the oil filter as a jacking point.

Place a floor jack or other adjustable support under the engine.

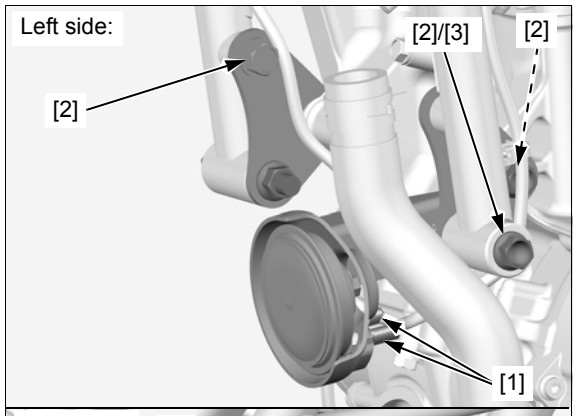
NOTE:

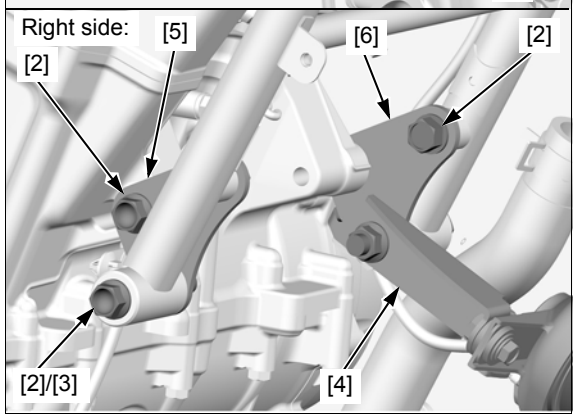
- The jack height must be continually adjusted to relieve stress for ease of bolt removal.

Disconnect the connectors [1] from the horn.

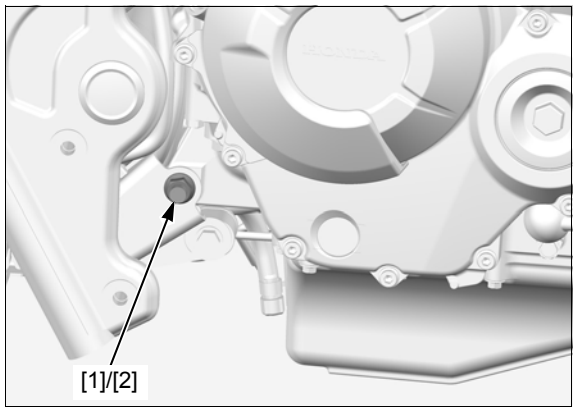
Remove the following:

– front engine hanger bolts [2]
– front engine hanger nuts [3]
– horn mounting stay [4]
– right engine hanger [5]
– left engine hanger nuts [6]





Remove the rear lower engine hanger bolt [1] and nut [2].

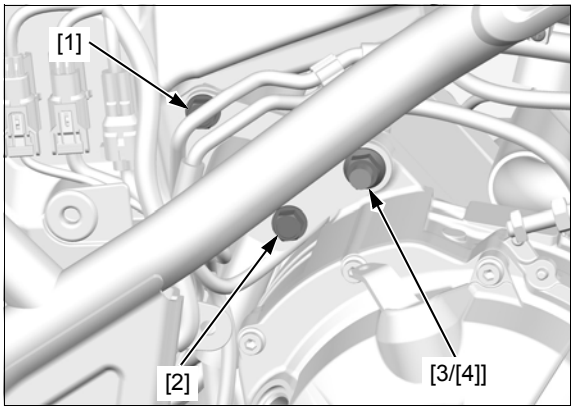


Loosen the upper engine hanger stay bolt [1].

Remove the upper engine hanger stay bolt [2], upper engine hanger stay bolt [3] and nut [4].

During engine removal, hold the engine securely and be careful not to damage the frame and engine.

Carefully lower the jack or adjustable support, then remove the engine from the frame.



ENGINE INSTALLATION

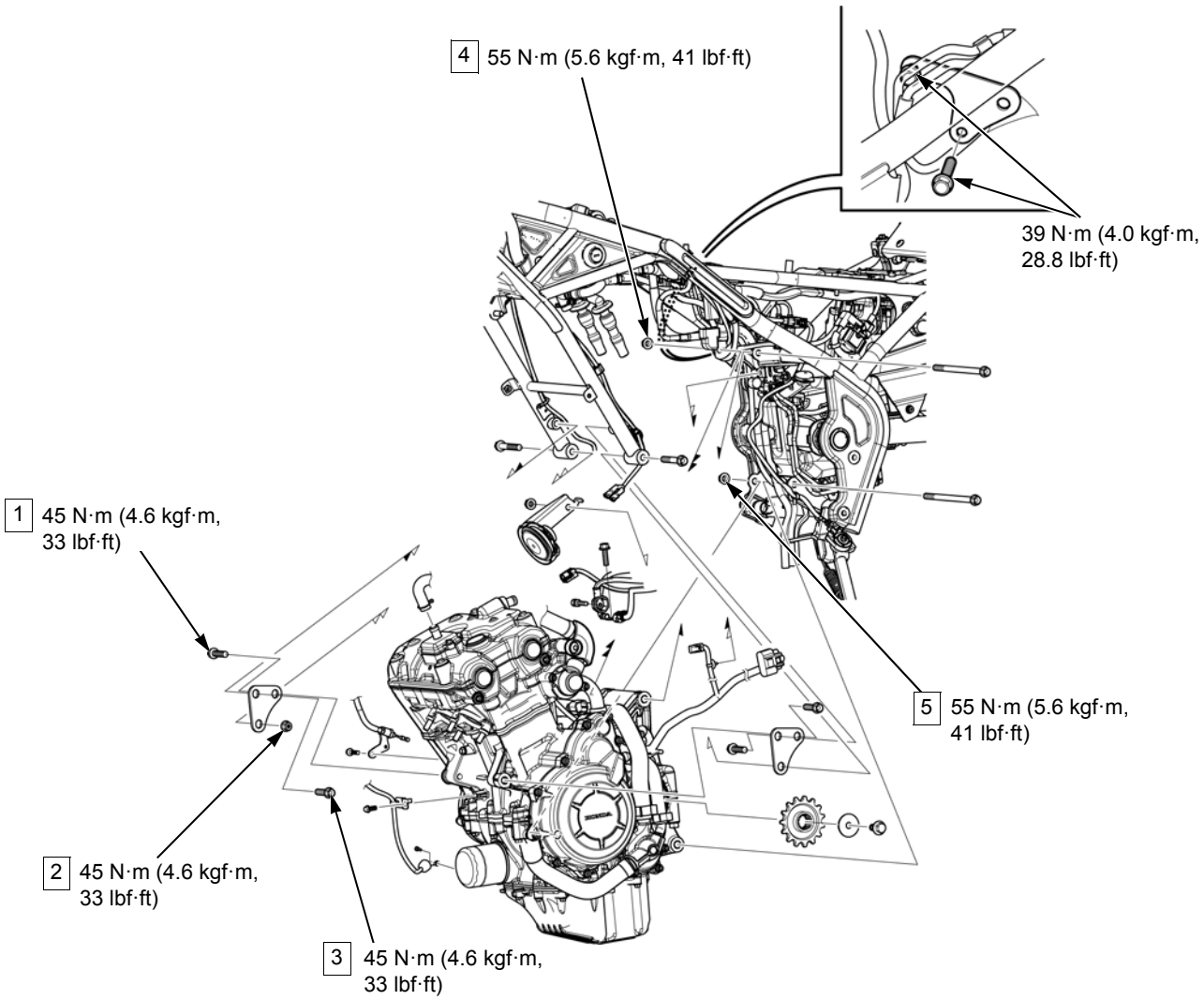
During engine installation, hold the engine securely and be careful not to damage the frame and engine.

Place the engine in the frame, then loosely install all the bolts, collars, washers and nuts.

NOTE:

- Place the jack or other adjustable support under the engine.
- Do not use the oil filter as a jacking point.
- The jack height must be continually adjusted to relieve stress for ease bolt installation.
- Carefully align the mounting points with the jack to prevent damage to engine, frame, radiator hoses, wires and cables.

Tighten the bolts and nuts to the specified torque in the specified sequence as shown.



Install the removed parts in the reverse order of removal.

TORQUE:
Rider footpeg bracket bolt:
37 N·m (3.8 kgf·m, 27 lbf·ft)
Drive sprocket bolt:
54 N·m (5.5 kgf·m, 40 lbf·ft)
EOP switch terminal screw:
2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)
Right crankcase cover bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:
- Install the drive sprocket [1] with its "OUT" mark [2] facing out.
- Align the clutch cable holder hole with the right crankcase cover boss.

Adjust the following:

– throttle grip freeplay (page 3-4)
– clutch lever freeplay (page 3-21)
– drive chain slack (page 3-14)

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

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

Check the exhaust system and cooling system for leaks.

MEMO

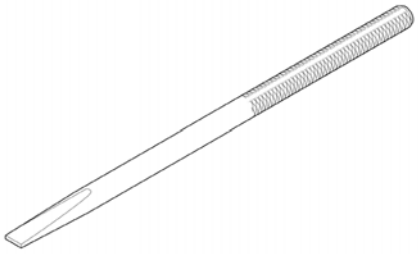
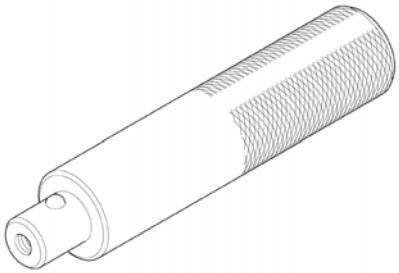
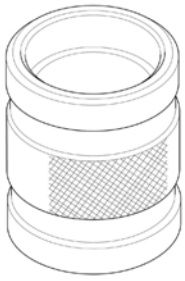
16. FRONT WHEEL/SUSPENSION/STEERING

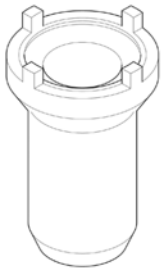
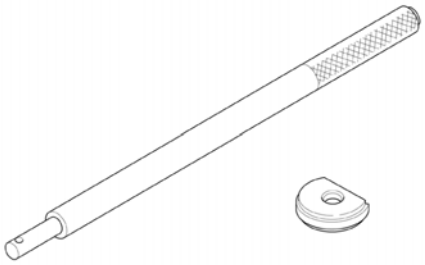
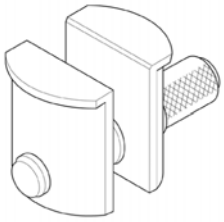
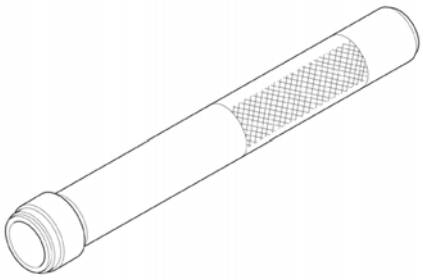
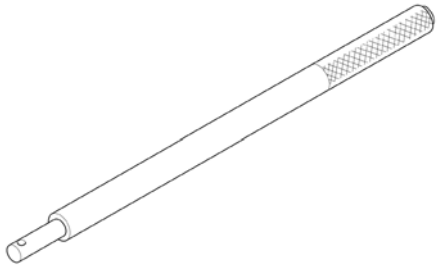
SERVICE INFORMATION

GENERAL

- A hoist or equivalent is required to support the motorcycle when servicing the front wheel, fork and steering stem.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Do not operate the brake lever after removing the front wheel.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked " FOR TUBELESS".
- After the front wheel installation, check the brake operation by applying the brake lever.
- For brake system service (page 18-2).

TOOLS

Bearing remover head, 17 mm 07746-0050500 	Bearing remover shaft 07746-0050100 	Driver 07749-0010000 
Attachment, 37 x 40 mm 07746-0010200 	Attachment, 42 x 47 mm 07746-0010300 	Attachment, 52 x 55 mm 07746-0010400 
Pilot, 17 mm 07746-0040400 	Fork seal driver attachment, 41 mm 07947-KF00100 	Fork seal driver 07947-KA50100 

Steering stem socket 07916-3710101 	Ball race remover set 07953-MJ10000  or 07953-MJ1000B (U.S.A. only)	Bearing remover 07946-3710500 
Steering stem driver 07946-MB00000 	Remover attachment 07953-MJ10100 	Remover shaft 07953-MJ10200 

TROUBLESHOOTING

Hard steering
- Insufficient tire pressure
- Faulty tire
- Steering stem adjustment nut too tight
- Worn or damaged steering beatings
- Worn or damaged steering beating races
- Bent steering stem

Steers to one side or does not track straight
- Bent axle
- Wheel installed incorrectly
- Worn or damaged wheel bearings
- Bent fork leg
- Damaged or loose steering bearings
- Damaged frame
- Faulty wheel bearing

Front wheel wobbles
- Bent rim
- Faulty tire
- Worn or damaged wheel bearings
- Loose axle
- Unbalanced tire and wheel

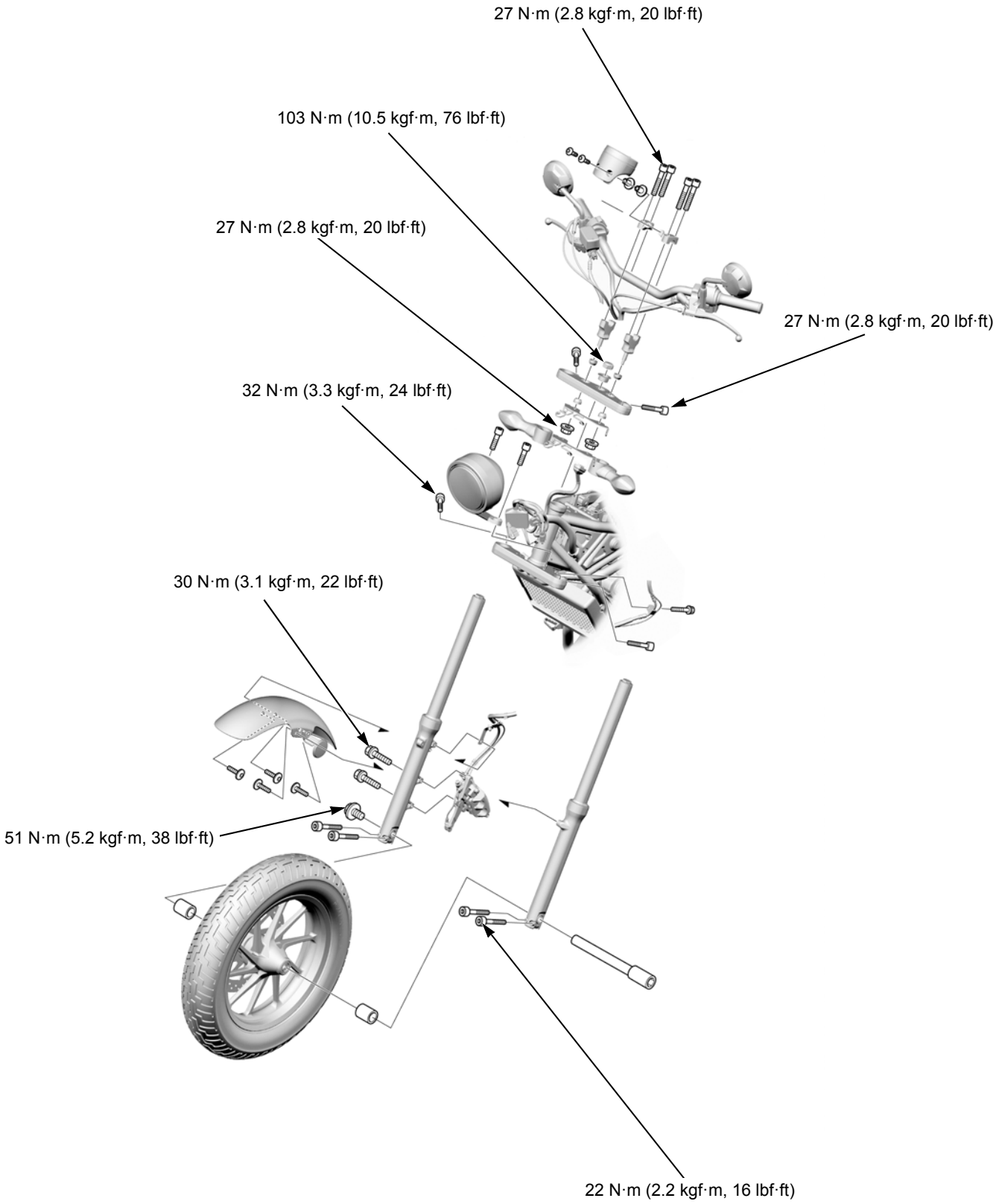
Wheel hard to turn
- Faulty wheel bearings
- Bent axle
- Brake drag (page 18-2)

Soft suspension
- Low tire pressure
- Weak fork spring
- Low fluid level in fork
- Incorrect fork fluid weight (low viscosity)

Stiff suspension
- High tire pressure
- Bent fork tube
- Fork slider binds
- High fluid level in fork
- Incorrect fork fluid weight (high viscosity)
- Clogged fork fluid passage

Front suspension noise
- Loose fork fasteners
- Incorrect fork fluid weight (low viscosity)
- Worn slider of fork tube bushing

COMPONENT LOCATION



HANDLEBAR

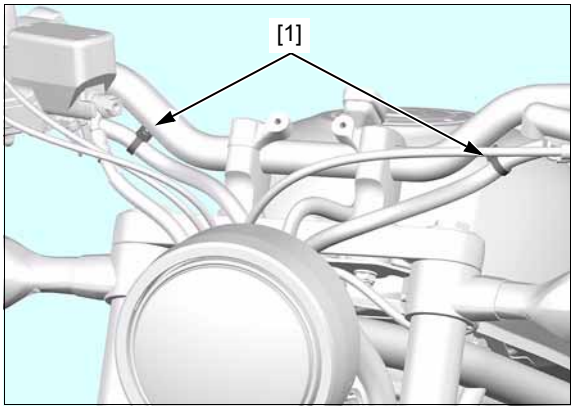
REMOVAL

Remove the following:

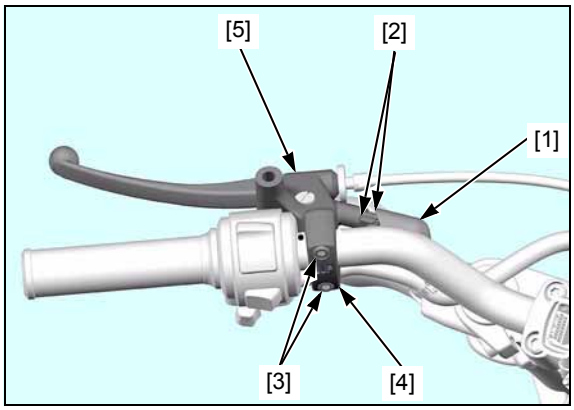
– rearview mirrors (page 2-5)
– speedometer (page 21-7)

Remove the following:

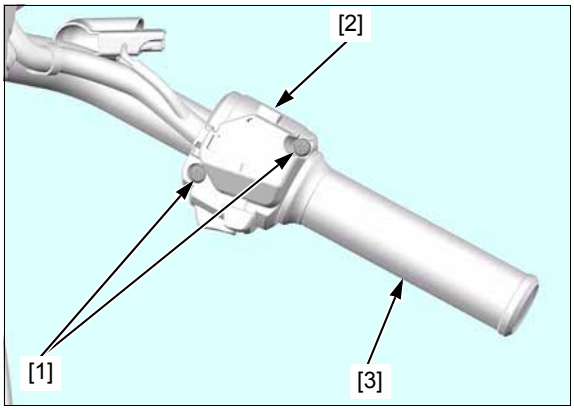
– wire bands [1]



– connector boot [1]
– clutch switch connectors [2]
– two socket bolts [3]
– bracket holder [4]
– clutch lever bracket [5]

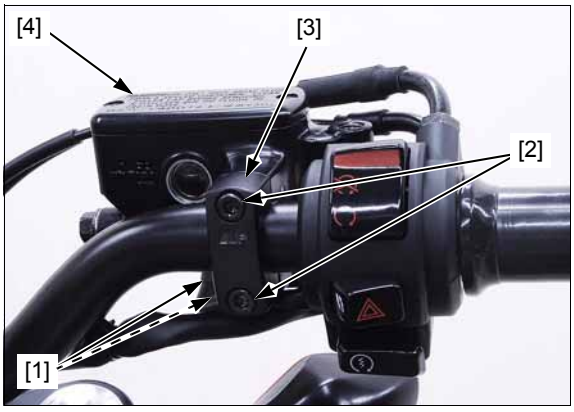


– two screws [1]
– left handlebar switch housing [2]
– left handlebar grip [3]

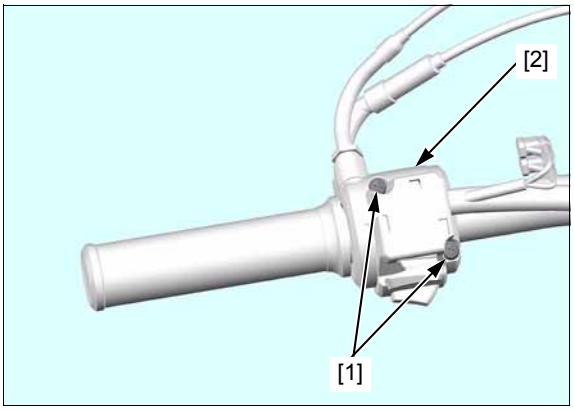


Keep the reservoir upright to prevent air from entering the hydraulic system.

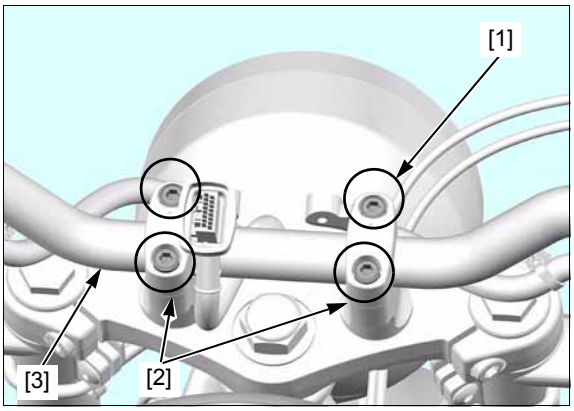
– brake light switch connectors [1]
– two socket bolts [2]
– master cylinder holder [3]
– front master cylinder [4]



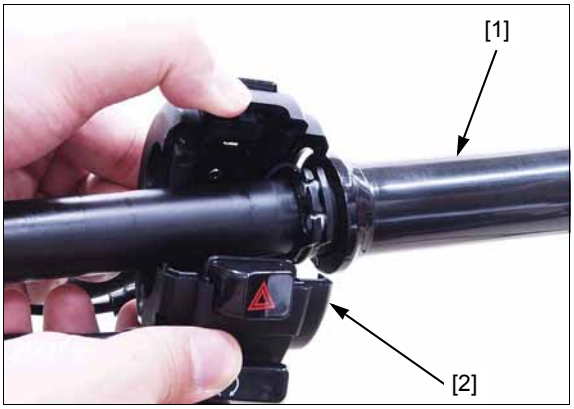
– two screws [1]
– right handlebar switch housing [2]



– four socket bolts [1]
– two handlebar holders [2]
– handlebar [3]



– throttle grip [1] (from the handlebar)
– lower right handlebar switch housing [2] (from the throttle grip)



HANDLEBAR LOWER HOLDER REMOVAL/INSTALLATION

Remove the speedometer (page 21-7).

Loosen the handlebar lower holder nuts [1].

Remove the handlebar mounting socket bolts [2], handlebar holders [3] and handlebar [4] (page 16-6).

Remove the lower holder nuts, handlebar lower holders [5] and mount rubbers [6].

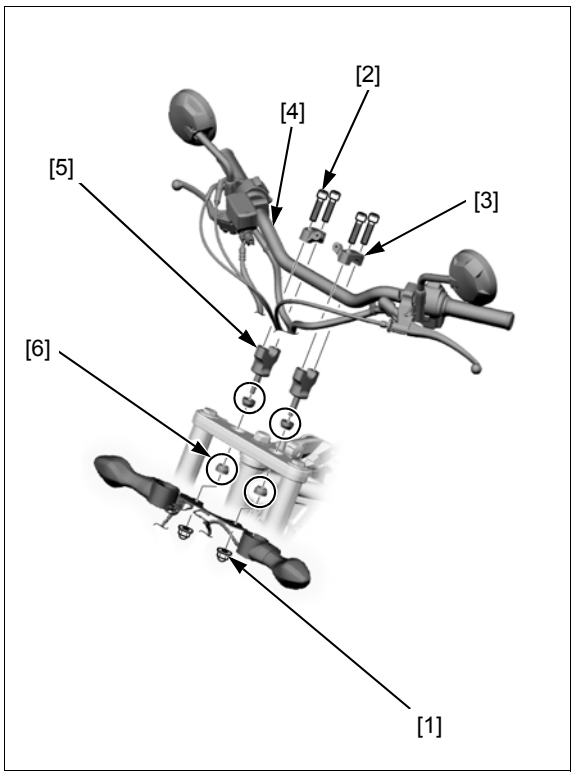
Install the mount rubbers, handlebar lower holders and lower holder nuts.

Temporarily install the handlebar, handlebar holders and socket bolts (page 16-8).

Tighten the lower holder nuts to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Install the removed parts in the reverse order of removal.



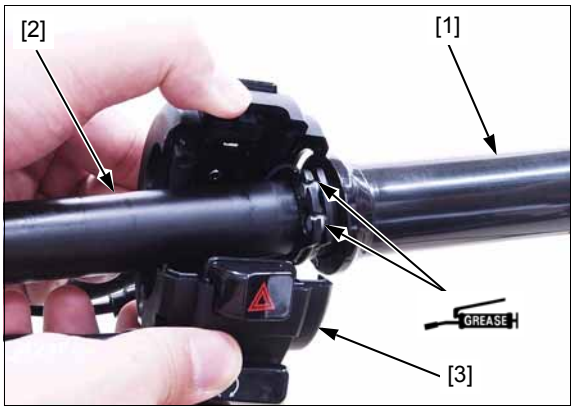
INSTALLATION

Clean the sliding surfaces of the throttle grip [1] and right handlebar [2].

Apply grease to the cable groove and roll-up area of the throttle grip.

Set the throttle grip into the lower right handlebar switch housing [3].

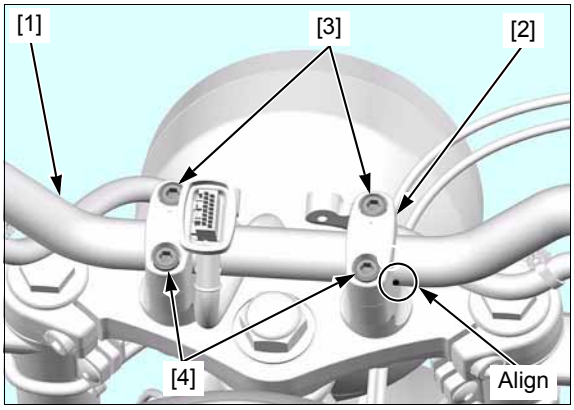
Install the throttle grip onto the handlebar.



Align the punch mark with the edge of the lower holder.

Install the handlebar [1] and holders [2]. Tighten the front socket bolts [3] first, then tighten the rear socket bolts [4] to the specified torque.

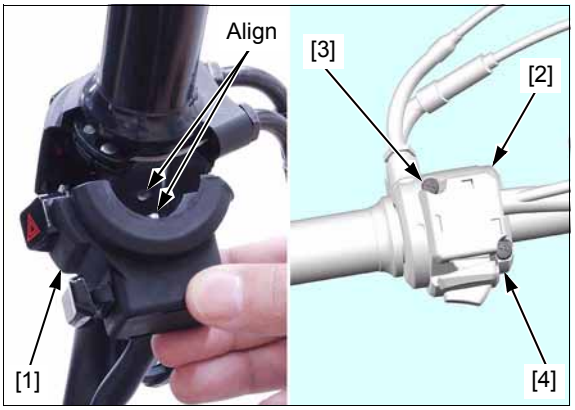
TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



Install the lower right handlebar switch housing [1] by aligning the locating pin with the hole in the handlebar.

Install the upper right handlebar switch housing [2]. Tighten the front screw first [3], then tighten the rear screw [4] to the specified torque.

TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)

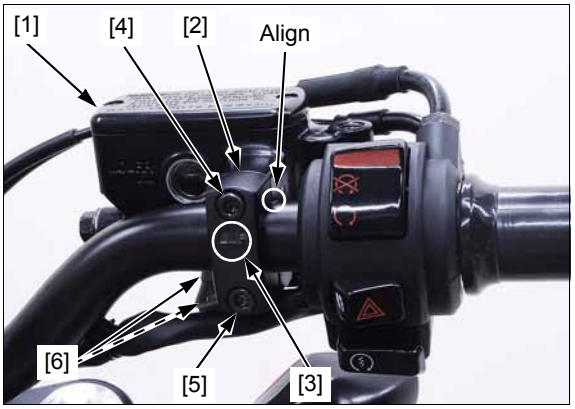


Align the edge of the master cylinder with the punch mark on the handlebar.

Install the master cylinder [1] and holder [2] with the "UP" mark [3] facing up. Tighten the upper socket bolt first [4], then the lower socket bolt [5] to the specified torque.

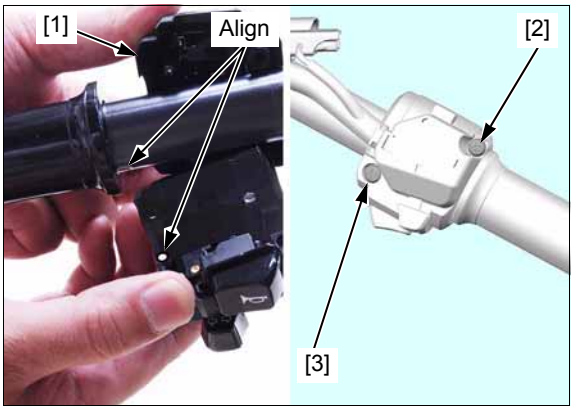
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the brake light switch connectors [6].



Install the left handlebar switch housing [1] by aligning the locating pin with the hole in the handlebar. Tighten the front screw first [2], then tighten the rear screw [3] to the specified torque.

TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)

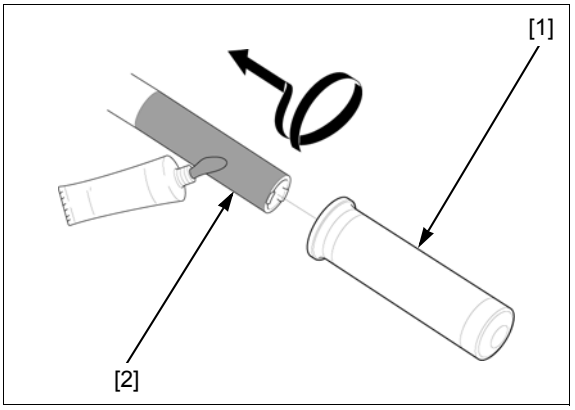


If the left handlebar grip [1] was removed, apply Honda Bond A or equivalent to the inside surface of the grip and to the clean surface of the handlebar [2].

Wait 3 – 5 minutes and install the grip.

Allow the adhesive to dry for 1 hour before using.

Rotate the grip for even application of the adhesive.

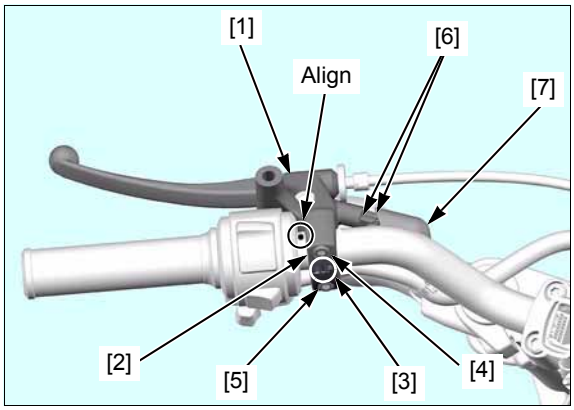


Align the edge of the bracket with the punch mark on the handlebar.

Install the clutch lever bracket [1] and holder [2] with the "UP" mark [3] facing up. Tighten the upper socket bolt first [4], then the lower socket bolt [5].

Connect the clutch switch connectors [6].

Install the connector boot [7] over the bracket sleeve.



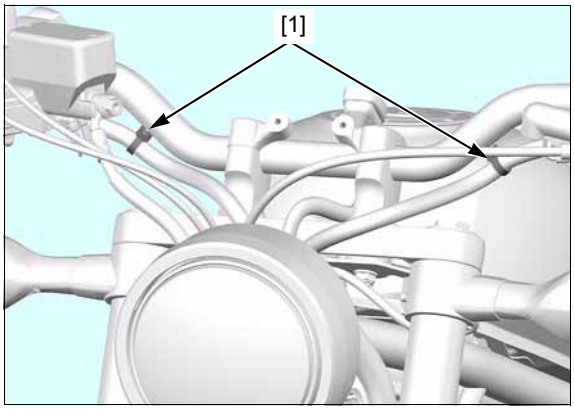
Secure the wires with the wire bands [1].

Install the following:

– rearview mirrors (page 2-5).
– speedometer (page 21-7)

Check the following:

– clutch lever freeplay (page 3-21)
– throttle grip freeplay (page 3-4)



FRONT WHEEL

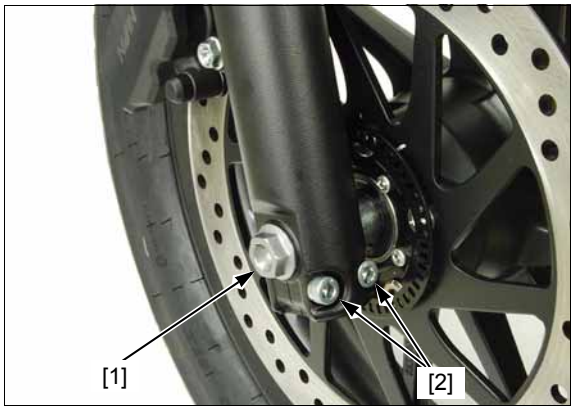
REMOVAL

Do not operate the brake lever after the brake caliper is removed.

Remove the axle bolt [1].

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

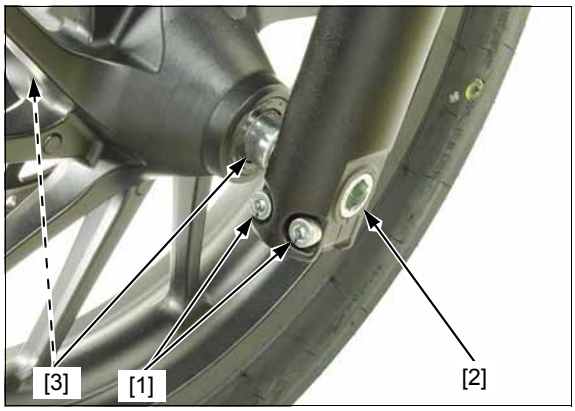
Loosen the right axle holder pinch socket bolts [2].



Loosen the left axle holder pinch socket bolts [1].

Remove the axle shaft [2] and the front wheel.

Remove the side collars [3].



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

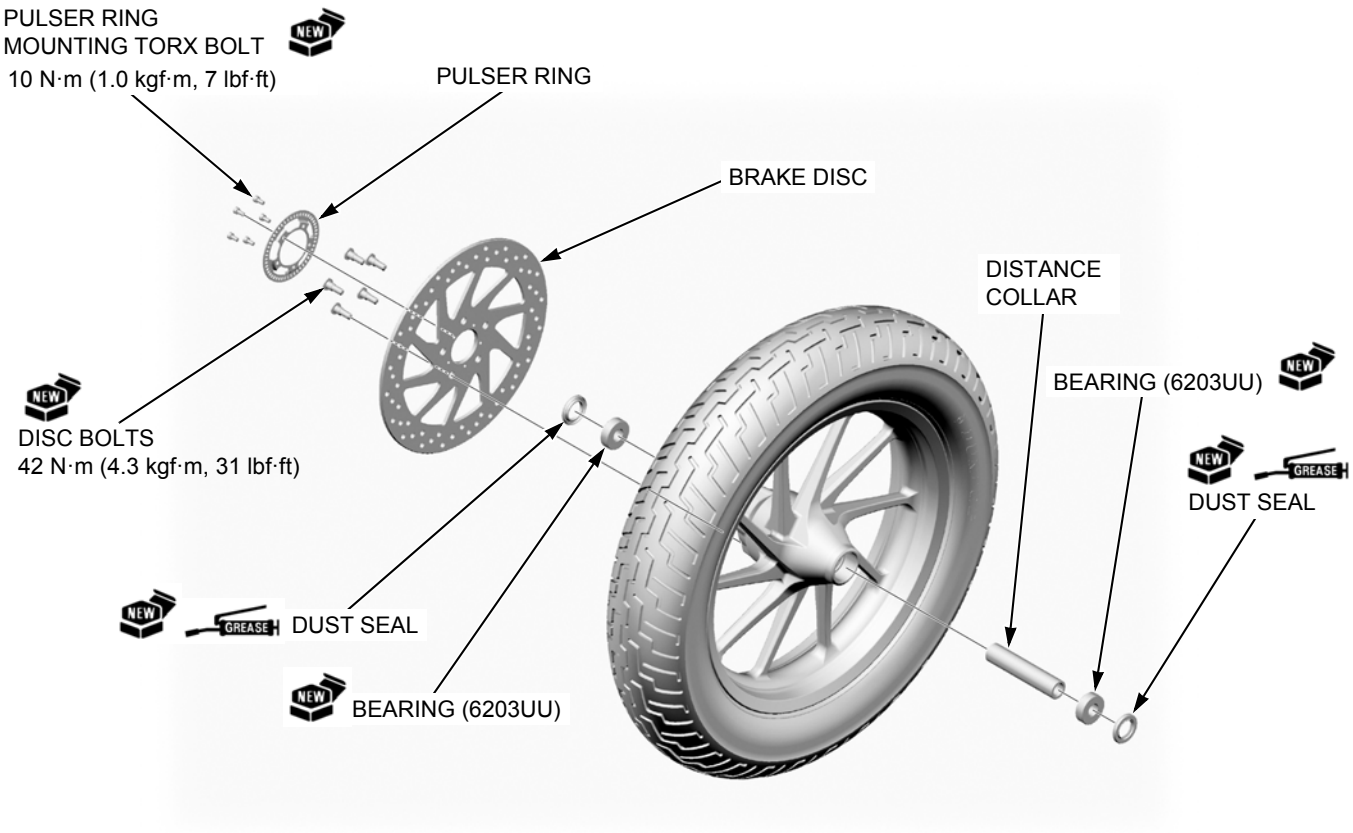
Measure each part according to FRONT WHEEL/ SUSPENSION/STEERING SPECIFICATIONS (page 1-10).

Replace any part if it is out of service limit.

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the front wheel as shown in the following illustration.

- Install each dust seal with the flat side facing out so that it is flush with the wheel hub.
- Install the brake disc with the rotation mark (arrow) facing out.



BEARING REPLACEMENT

Install the remover head [1] into the bearing.

From the opposite side of the wheel, install the bearing remover shaft [2] and drive the bearing out of the wheel hub.

TOOLS:

Bearing remover head, 17 mm	**07746-0050500**
Bearing remover shaft	**07746-0050100**

Remove the distance collar and drive out the other bearing.

Drive in a new right side bearing (brake disc side) squarely with the marked side facing up until it is fully seated.

Install the distance collar.

Drive in a new left side bearing squarely with the marked side facing up until it is fully seated.

TOOLS:

[1] Driver	**07749-0010000**
[2] Attachment, 37 x 40 mm	**07746-0010200**
[3] Pilot, 17 mm	**07746-0040400**

WHEEL BALANCE

NOTE:

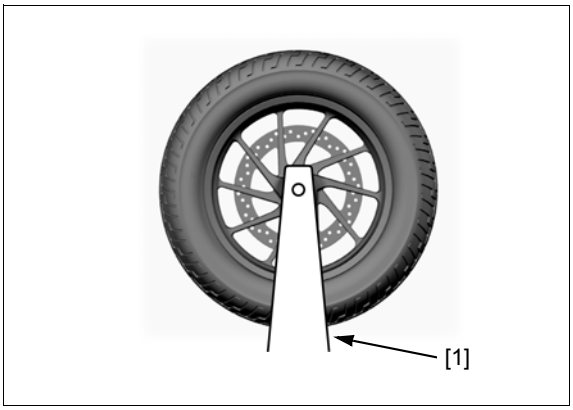
- Mount the tire with the arrow mark [1] facing in the direction of rotation.
- For optimum balance, the tire balance mark [2] (light mass point: a paint dot on the side wall) must be located next to the valve stem [3]. Remount the tire if necessary.
- The wheel balance must be checked when the front tire is remounted.
- Stick-type balance weights should be used on this motorcycle. Use genuine Honda balance weights.
  - Before installing the weights, remove any adhesive from the rim thoroughly and clean the area where new weights are to be placed with degreasing agent. Take care not to scratch the rim surface.
  - Do not touch the adhesive surface of the weight with your bare hands when installing.
  - The balance weights are always replaced with new ones whenever they are removed. Do not reuse them.

Mount the wheel, tire and brake disc assembly on an inspection stand [1].

Spin the wheel, allow it to stop, and mark the lowest (heaviest) part of the wheel with chalk.

Do this two or three times to verify the heaviest area.

If the wheel is balanced, it will not stop consistently in the same position.

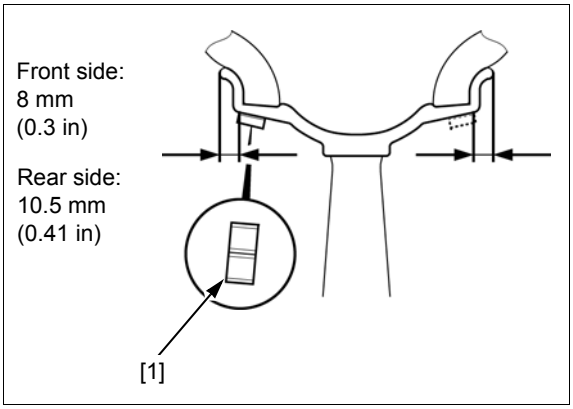


To balance the wheel, install the wheel weights [1] on the highest side of the rim, on the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun.
Do not add more than 60 g (2.1 oz) to the wheel.

Press the weights by your hands firmly and make sure they are not come off the rim.

NOTE:

- The front wheel weights are attached to the position at 8 mm (0.3 in) from the side surface of the rim in the direction as shown.
- The rear wheel weights are attached to the position at 10.5 mm (0.41 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.

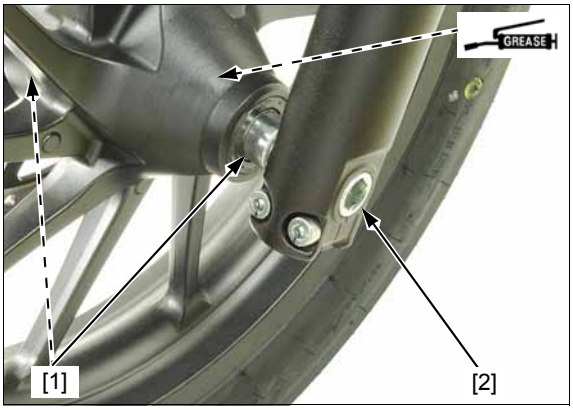


INSTALLATION

Install the left and right side collars [1].

Install the front wheel between the fork legs.

Apply a thin layer of grease to the axle shaft [2] surface. Install the axle shaft from the left side.



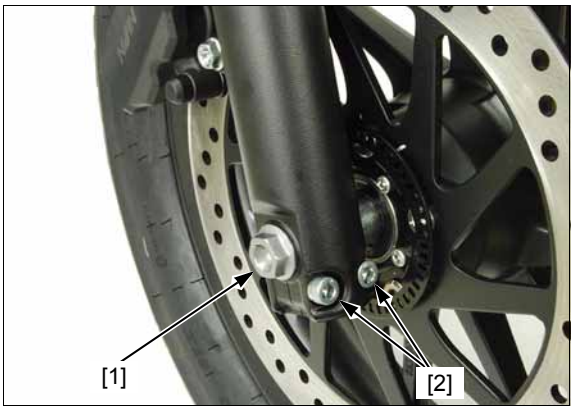
Hold the axle shaft and tighten the axle bolt [1] to the specified torque.

TORQUE: 51 N·m (5.2 kgf·m, 38 lbf·ft)

Tighten the right axle holder pinch socket bolts [2] to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

With the front brake applied, pump the fork up and down several times to seat the axle and check the brake operation by applying the brake lever and pedal.



Tighten the left axle holder pinch socket bolts [1] to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

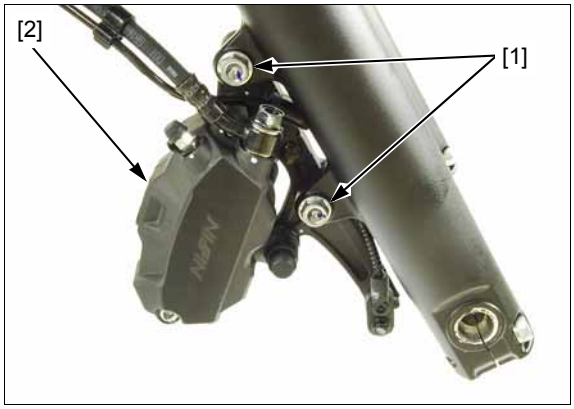
FORK

REMOVAL

Remove the front fender (page 2-5).

Support the brake caliper so it does not hang from the brake hose. Do not twist the brake hose.

Remove the two mounting bolts [1] and front brake caliper [2].



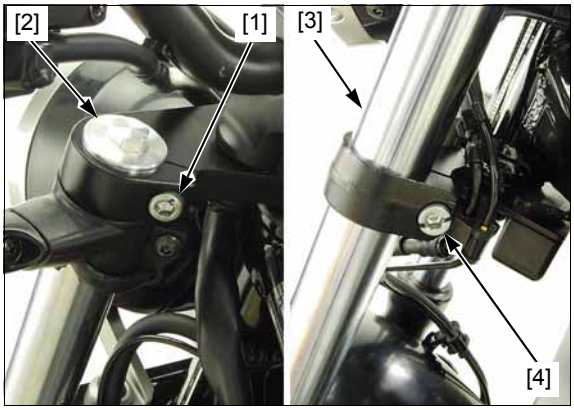
Keep the reservoir upright to prevent air from entering the hydraulic system.

Loosen the top bridge pinch socket bolt [1].

When the fork is ready to be disassembled, loosen the fork cap [2], but do not remove it.

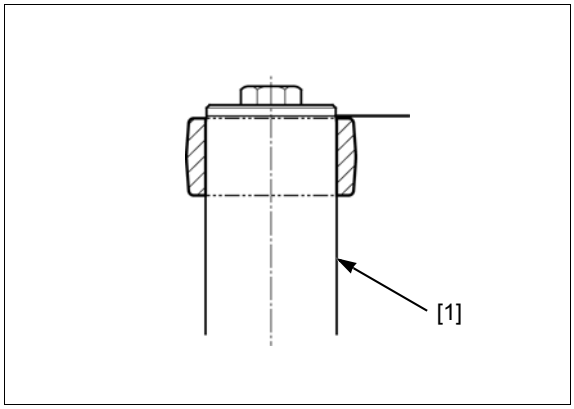
Support the fork leg [3] securely.

Loosen the bottom bridge pinch socket bolt [4] and pull the fork leg down, then remove it out of the top and bottom bridges.



INSTALLATION

Align the top end of the fork pipe [1] with the upper surface of the top bridge as shown, then temporarily tighten the pinch bolt.



Tighten the bottom bridge pinch socket bolt [1] to the specified torque.

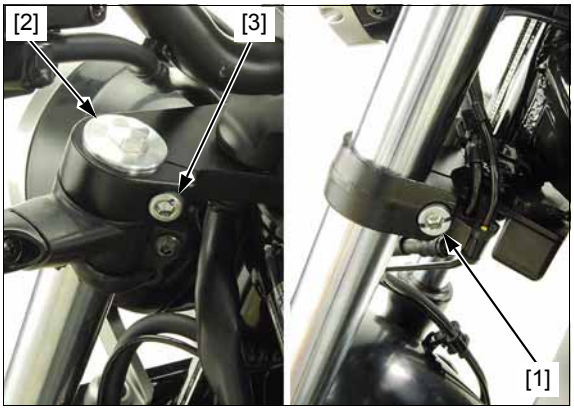
TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

Tighten the fork cap [2] to the specified torque if it was removed.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Tighten the top bridge pinch socket bolt [3] to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

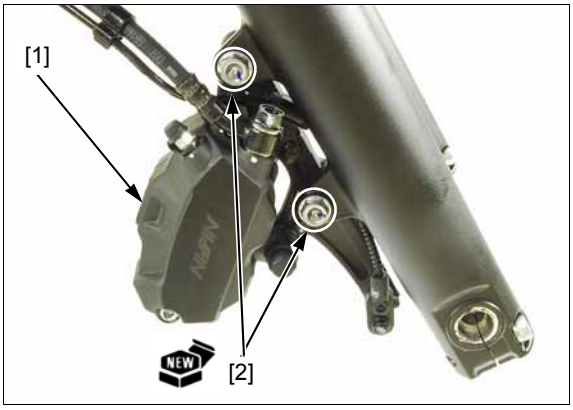


Install the brake caliper [1] with new mounting bolts [2], and tighten them to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Install the following:

– front fender (page 2-5)
– front wheel (page 16-13)

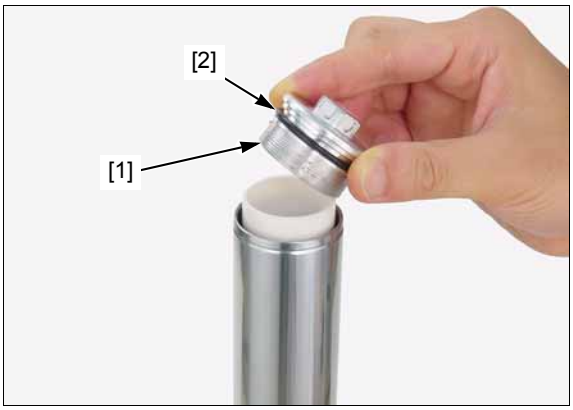


DISASSEMBLY

Fork cap is under spring pressure; use care when loosing it.

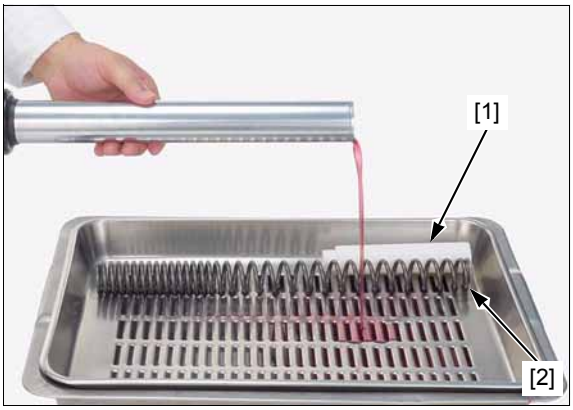
Remove the following:

– fork cap [1]
– O-ring [2]



– spring collar [1]
– fork spring [2]

Pour out the fork fluid by pumping the fork tube up and down several times.

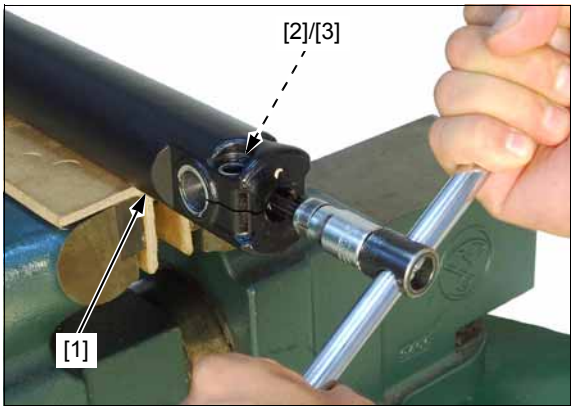


Hold the fork slider [1] in a vise with soft jaws or shop towels.

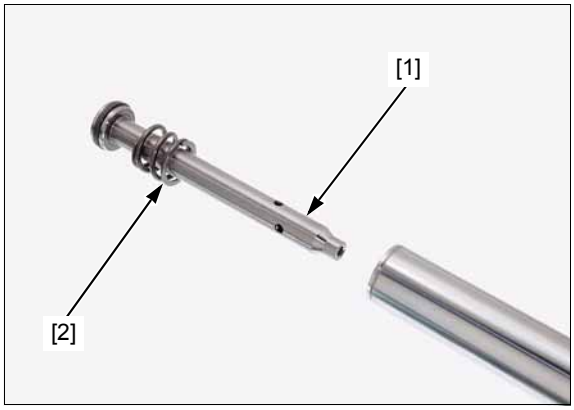
Remove the following:

If the fork piston turns with the socket bolt, temporarily install the above components (spring, spring collar and fork cap).

– fork socket bolt [2]
– sealing washer [3]



– fork piston [1]
– rebound spring [2]



Be careful not to scratch the fork tube.

– dust seal [1]
– stopper ring [2]

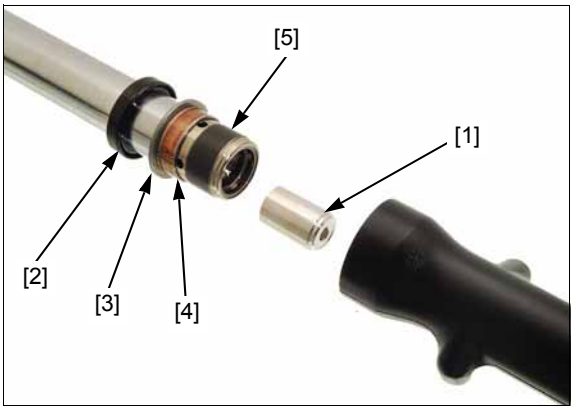
Using quick successive motions, pull the fork tube out of the fork slider.

Remove the following:

– oil lock piece [1]
– oil seal [2]
– back-up ring [3]
– guide bushing [4]

Do not remove the fork tube bushing, unless it is necessary to replace with a new one (page 16-17).

Carefully remove the fork tube bushing [5] by prying the slit with a flat blade screwdriver until the bushing can be pulled off by hand.



INSPECTION

Inspect the following parts for damage, abnormal wear, bend, deformation, scoring and teflon coating wear.

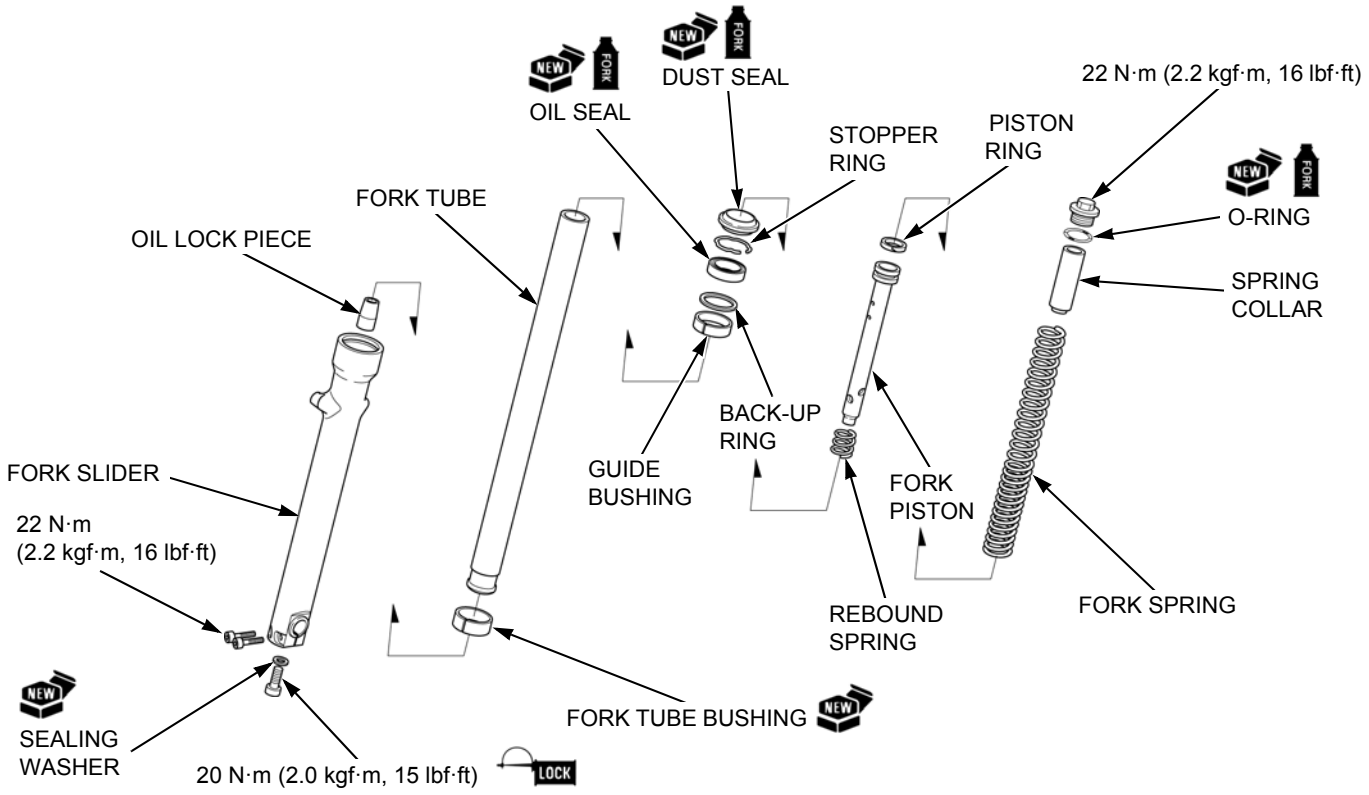
– fork tube
– fork slider
– fork spring
– rebound spring
– piston ring
– fork piston
– oil lock piece
– guide bushing
– fork tube bushing
– buck-up ring

Measure the each part according to FRONT WHEEL/ SUSPENSION/STEERING SPECIFICATIONS (page 1-10).

Replace any part if it is out of service limit.

ASSEMBLY

Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them off completely.



Be careful not to damage the coating on the bushing. Do not spread open the bushing more than necessary.

Install a new fork tube bushing [1] if it has been removed.

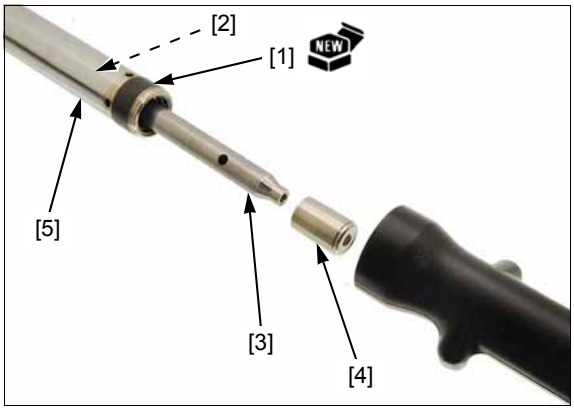
NOTE:

- Remove the burrs from the bushing mating surface, being careful not to peel off the coating.

Install the following:

– rebound spring [2] (onto the fork piston)
– fork piston [3] (into the fork tube)
– oil lock piece [4] (onto the fork piston)

Install the fork tube [5] into the fork slider.



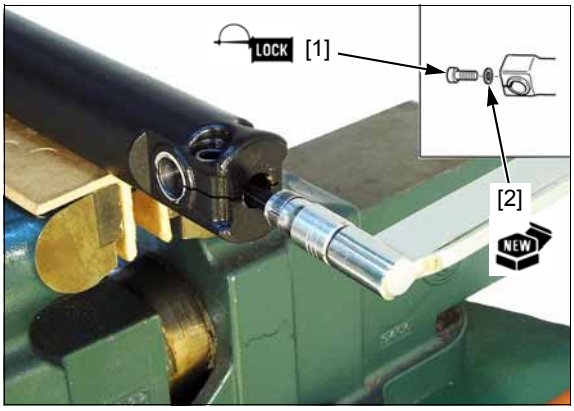
Hold the fork slider in a vise with soft jaws or shop towels.

Apply locking agent to the threads of the fork socket bolt [1].

If the fork piston turns with the socket bolt, temporarily install the fork spring, spring collar and fork cap.

Install the socket bolt with a new sealing washer [2] and tighten it to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



Place the guide bushing [1] over the fork tube and rest it on the slider. Put the back-up ring [2] and an old bushing or equivalent tool on the guide bushing.

Drive the bushing into place, using the special tools.

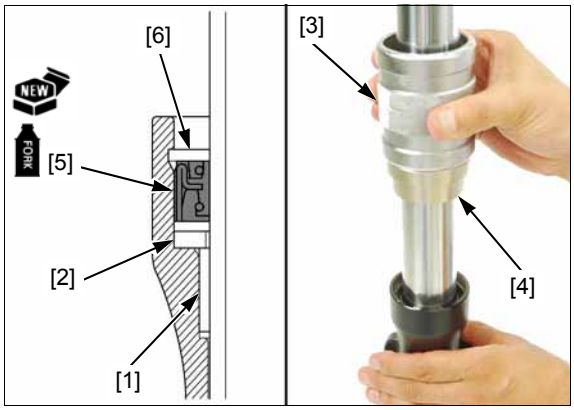
TOOLS:

[3] Fork seal driver	**07947-KA50100**
[4] Fork seal driver attachment	**07947-KF00100**

Wrap vinyl tape around the fork tube top end to avoid damaging the oil seal lip.

Apply fork fluid to the lips of a new oil seal [5] and install it with the marking facing up.

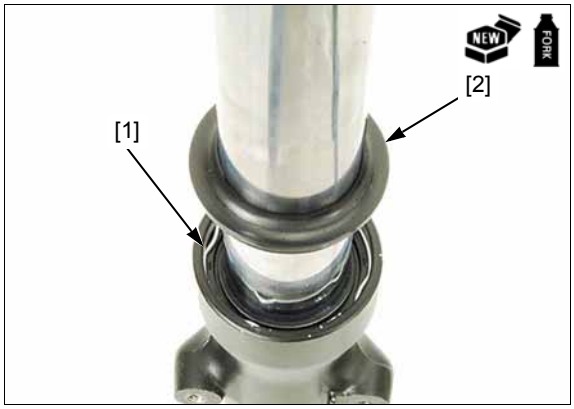
Drive the oil seal until the stopper ring groove [6] is visible using the same tools.



Be careful not to scratch the fork tube.

Install the stopper ring [1] into the groove in the fork slider.

Apply fork fluid to the lips of a new dust seal [2] and install it.



Pour the specified amount of recommended fork fluid into the fork tube.

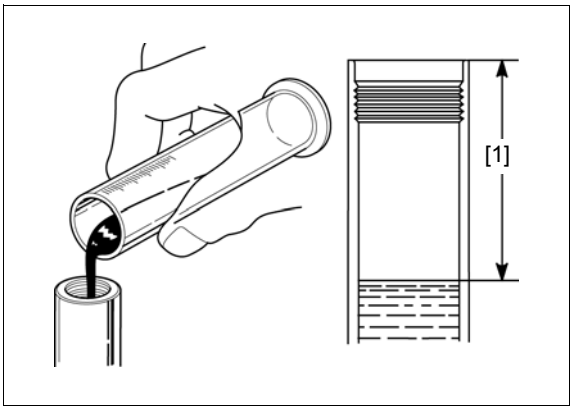
RECOMMENDED FORK FLUID:
Pro Honda Suspension Fluid SS-8 (10W)

FORK FLUID CAPACITY:
432 ± 2.5 cm³ (14.6 ± 0.08 US oz, 15.2 ± 0.09 Imp oz)

Slowly pump the fork tube several times to remove any trapped air from the lower portion of the fork tube.

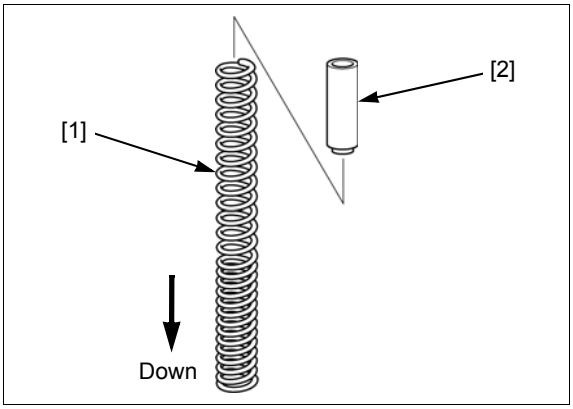
Compress the fork tube fully and measure the fluid level from the top end of the fork tube.

[1] FLUID LEVEL:
165 mm (6.5 in)



Pull the fork pipe up and install the fork spring [1] with the tightly wound coil side facing down.

Install the spring collar [2] with the stepped side facing down.



Coat a new O-ring [1] with fork fluid and install it into the groove in the fork cap [2].

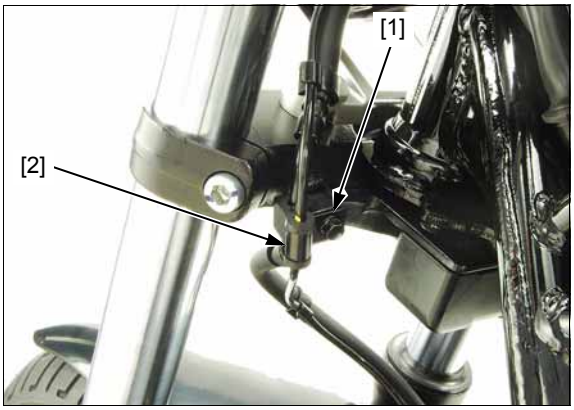
Tighten the fork cap after installing the fork tube into the fork bridges.

Install the fork cap into the fork tube.

STEERING STEM

REMOVAL

Remove the bolt [1] and clamp [2].



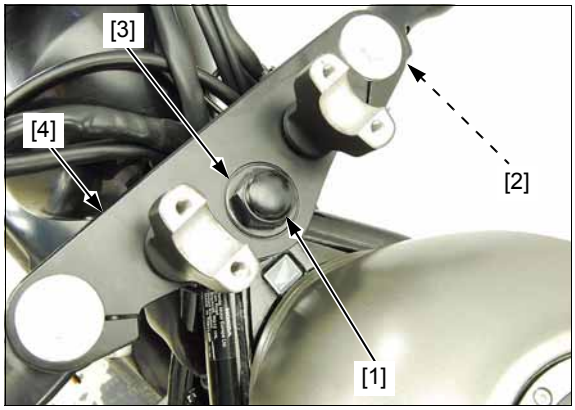
Remove the handlebar (page 16-6).

Loosen the steering stem nut [1] and top bridge pinch socket bolt [2].

Remove the fork legs (page 16-14).

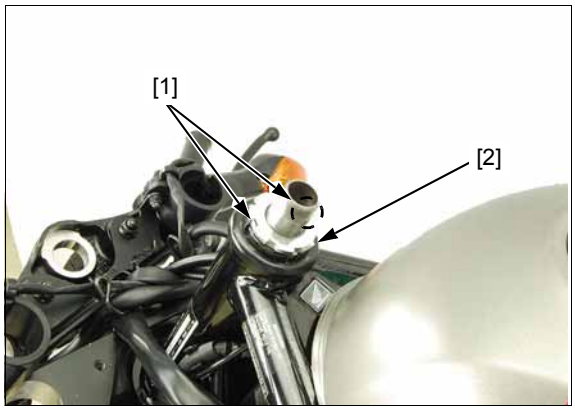
Remove the following:

– stem nut
– top bridge pinch socket bolt
– collar [3]
– top bridge [4]



Straighten the lock washer tabs [1].

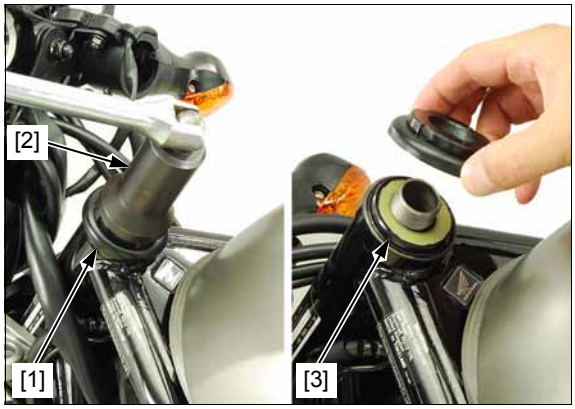
Remove the lock nut [2] and lock washer.



Loosen the steering bearing adjustment nut [1] using the special tool.

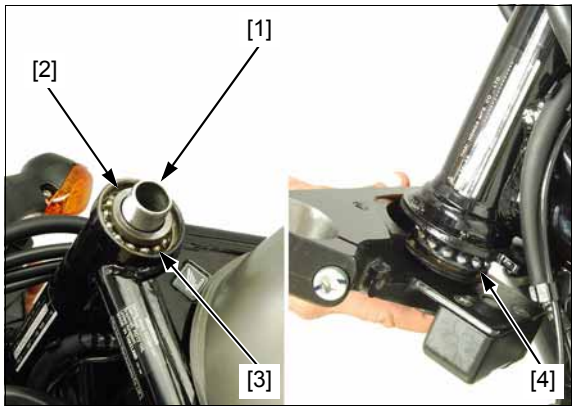
TOOL:
[2] Steering stem socket 07916-3710101

While holding the steering stem, remove the adjustment nut and upper dust seal [3].



Remove the following:

– steering stem [1]
– upper inner race [2]
– upper steering bearing [3]
– lower steering bearing [4]



BEARING REPLACEMENT

Always replace the bearing and races as a set.

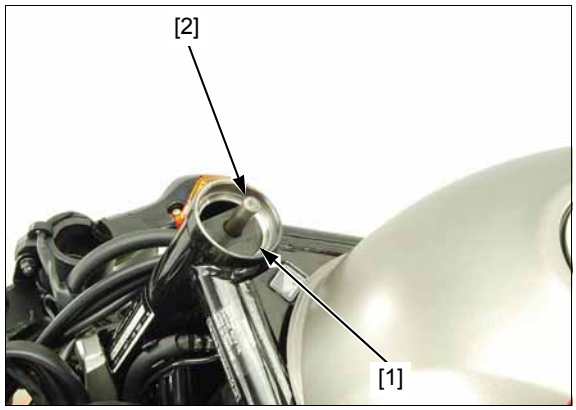
Remove the upper outer race using the special tools.

TOOLS:

Ball race remover set	**07953-MJ10000**
– [1] remover attachment	**07953-MJ10100**
– [2] remover shaft	**07953-MJ10200**

U.S.A. TOOLS:

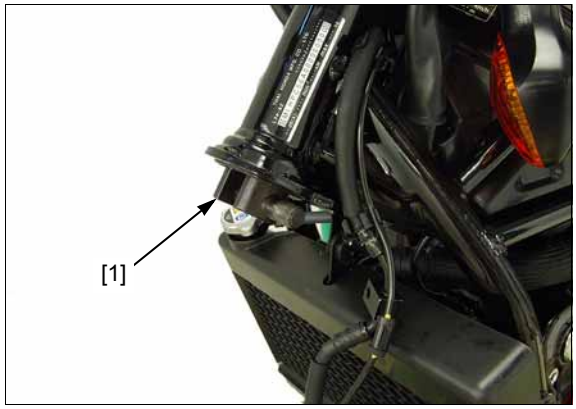
Ball race remover set	**07953-MJ1000B**



Remove the lower outer race using the special tool and a suitable shaft.

TOOL:

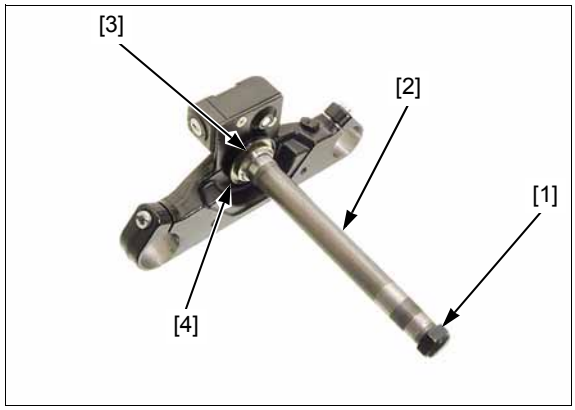
[1] Bearing remover	**07946-3710500**



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].

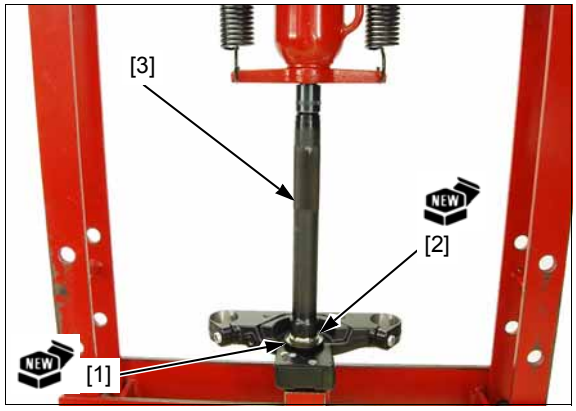


Install a new lower dust seal [1] onto the steering stem.

Press a new lower inner race [2] using the special tool.

TOOL:

[3] Steering stem driver	**07946-MB00000**



Drive in a new upper outer race [1] into the steering head pipe using the special tool.

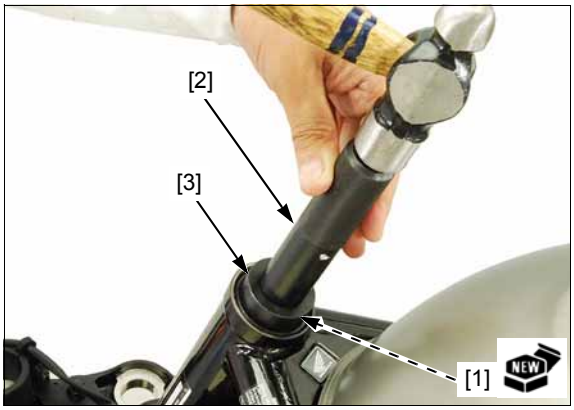
TOOLS:

[2] Driver	**07749-0010000**
[3] Attachment, 42 x 47 mm	**07746-0010300**

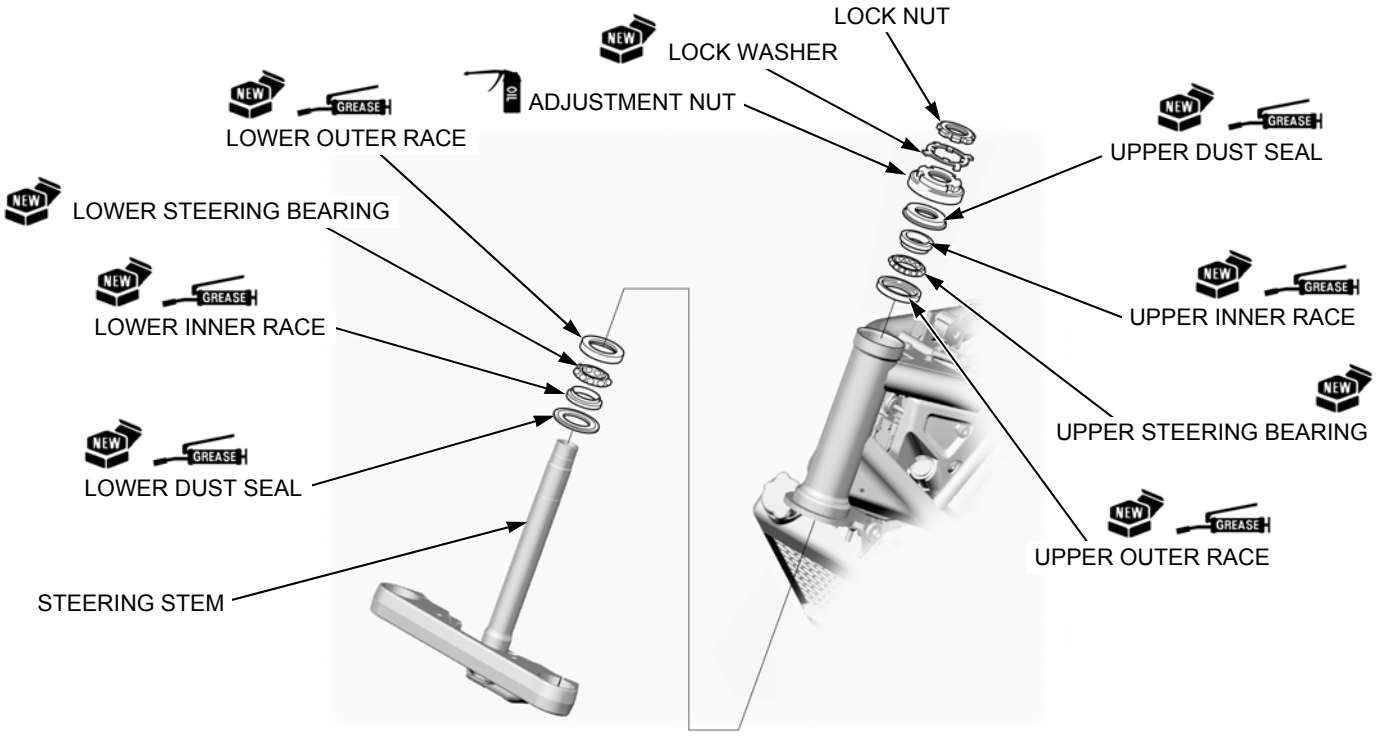
Drive in a new lower outer race.

TOOLS:

Driver	**07749-0010000**
Attachment, 52 x 55 mm	**07746-0010400**



INSTALLATION



NOTE:

- Use urea based multi-purpose extreme pressure grease NLGI #2 (EXCELITE EP2 manufactured by KYODO YUSHI CO., LTD., STAMINA EP2 manufactured by Shell or equivalent) for the bearing race sliding surface and dust seals.

Apply grease to the lip of the lower dust seal [1].

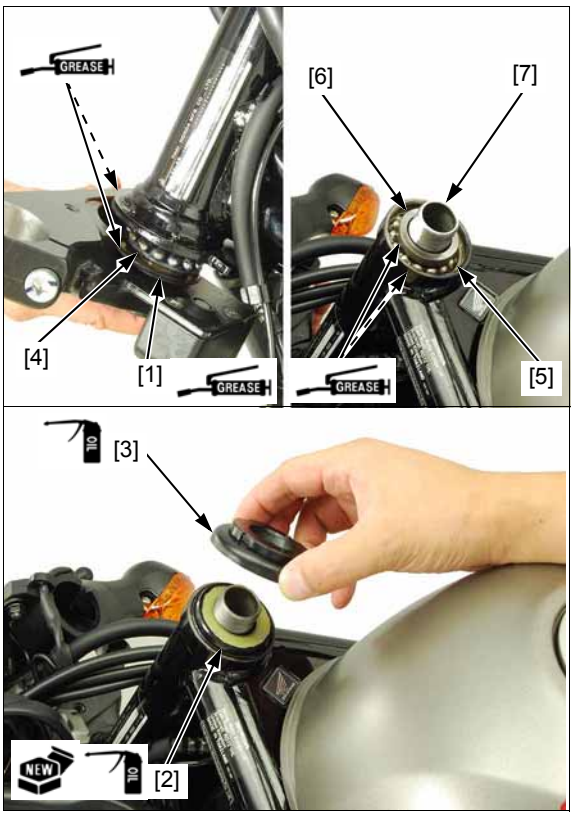
Apply 3 – 5 g (0.1 – 0.2 oz) (per each bearing) of grease to the bearing race sliding surfaces.

Apply grease to the lip of a new upper dust seal [2].

Apply engine oil to the threads of the adjustment nut [3].

Install the following:

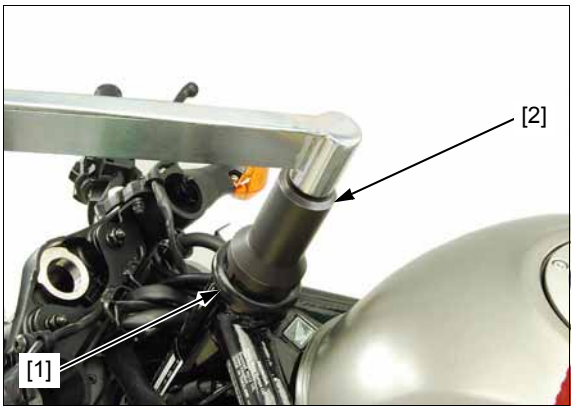
– lower steering bearing [4]
– upper steering bearing [5]
– upper inner race [6]
– steering stem [7]
– upper dust seal
– adjustment nut



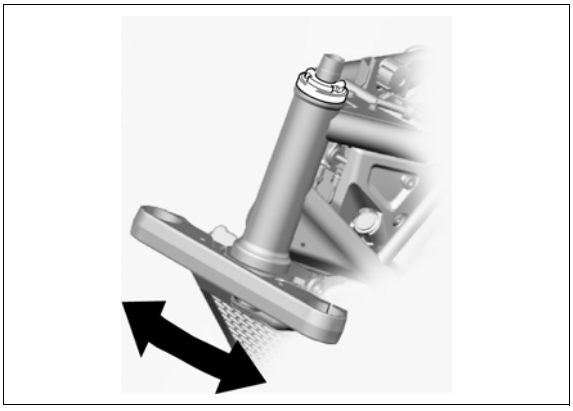
1. Tighten the adjustment nut [1] to the specified torque using the special tool.

   TOOL:
   [2] Steering stem socket 07916-3710101

   TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



2. Turn the steering stem left and right, lock-to-lock at least five times to seat the bearings.
3. Retighten the adjustment nut to the same torque.

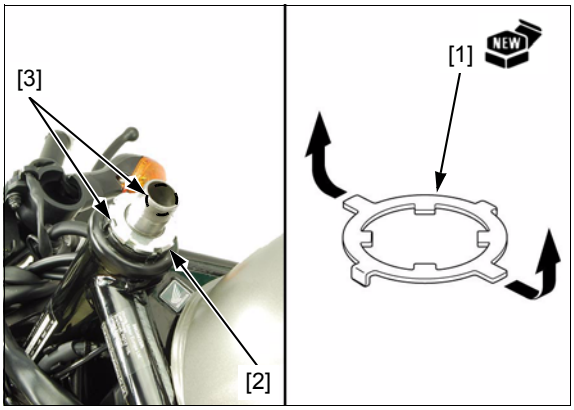


Install a new lock washer [1], aligning its bent tabs with the grooves in the adjustment nut.

Install the lock nut [2] and finger tighten it all the way.

Do not over tighten the lock nut, this will flatten the lock washer.

Further tighten the lock nut, within 90°, to align its grooves with the tabs of the lock washer.
Bend the lock washer tabs [3] up into the grooves in the lock nut.



Clean the threads of the stem with a degreasing agent.

Install the top bridge [1], collar [2] and steering stem nut [3].

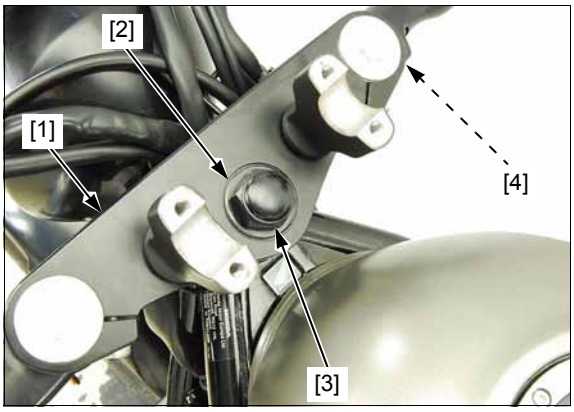
Do not tighten the top bridge pinch bolts [4].

Temporarily install the fork legs into the bottom and top bridges by tightening the bottom bridge pinch socket bolts.

Tighten the stem nut to the specified torque.

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

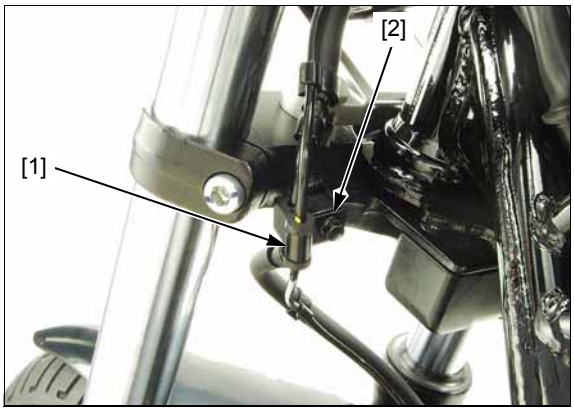
Make sure the steering stem moves smoothly, without play or binding.



Install the following:

– fork legs (page 16-14)
– handlebar (page 16-8)

Install the clamp [1] onto the bottom bridge and tighten the bolt [2].



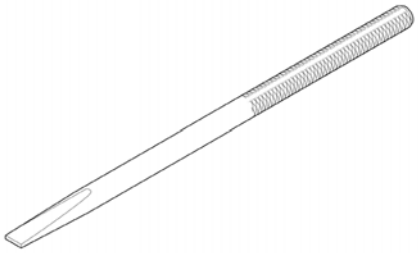
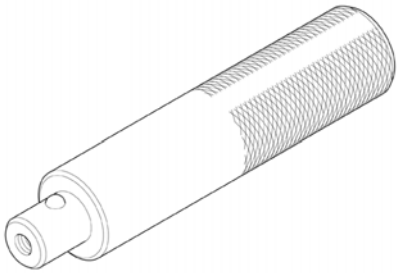
17. REAR WHEEL/SUSPENSION

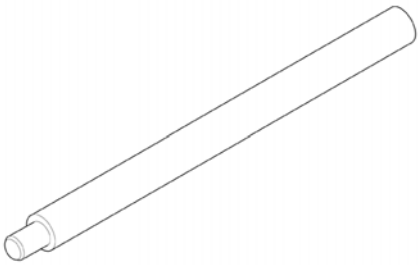
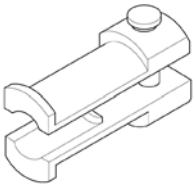
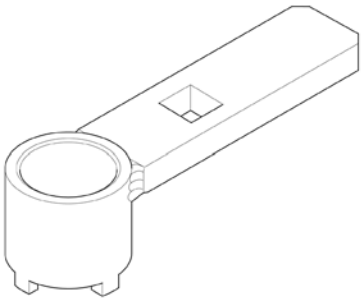
SERVICE INFORMATION

GENERAL

- When servicing the rear wheel and suspension, support the motorcycle using a safety stand or hoist.
- When using a safety stand, do not pinch the rear wheel speed sensor wire.
- 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".
- When using the pivot locknut wrench, use a 25 cm (9.8 in) long deflecting beam type torque wrench. The pivot locknut wrench increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the swingarm pivot locknut. The specification given on this page is actual torque applied to the swingarm pivot locknut, not the reading on the torque wrench when used with the pivot locknut wrench. The procedure later in the text gives the actual and indicated torque.
- Use genuine Honda replacement bolts and nuts for all suspension pivot and mounting point.
- For brake system information (page 18-2).

TOOLS

Bearing remover head, 17 mm 07746-0050500 	Bearing remover shaft 07746-0050100 	Driver 07749-0010000 
Attachment, 28 x 30 mm 07946-1870100 	Attachment, 32 x 35 mm 07746-0010100 	Attachment, 42 x 47 mm 07746-0010300 
Pilot, 15 mm 07746-0040300 	Pilot, 17 mm 07746-0040400 	Pilot, 20 mm 07746-0040500 

Pilot, 22 mm 07746-0041000 	Driver shaft 07946-MJ00100 	Bearing remover attachment, 22 mm 07GMD-KT70200 
Pivot locknut Wrench 07GMA-KT70200 		

TROUBLESHOOTING

Steers to one side or does not track straight
- Drive chain adjusters not adjusted equally
- Bent axle
- Bent frame
- Worn swingarm pivot components

Rear wheel wobbling
- Bent rim
- Worn wheel bearing
- Worn driven flange bearing
- Faulty tire
- Bent frame or swingarm
- Axle not tightened properly
- Unbalanced tire and wheel
- Insufficient tire pressure

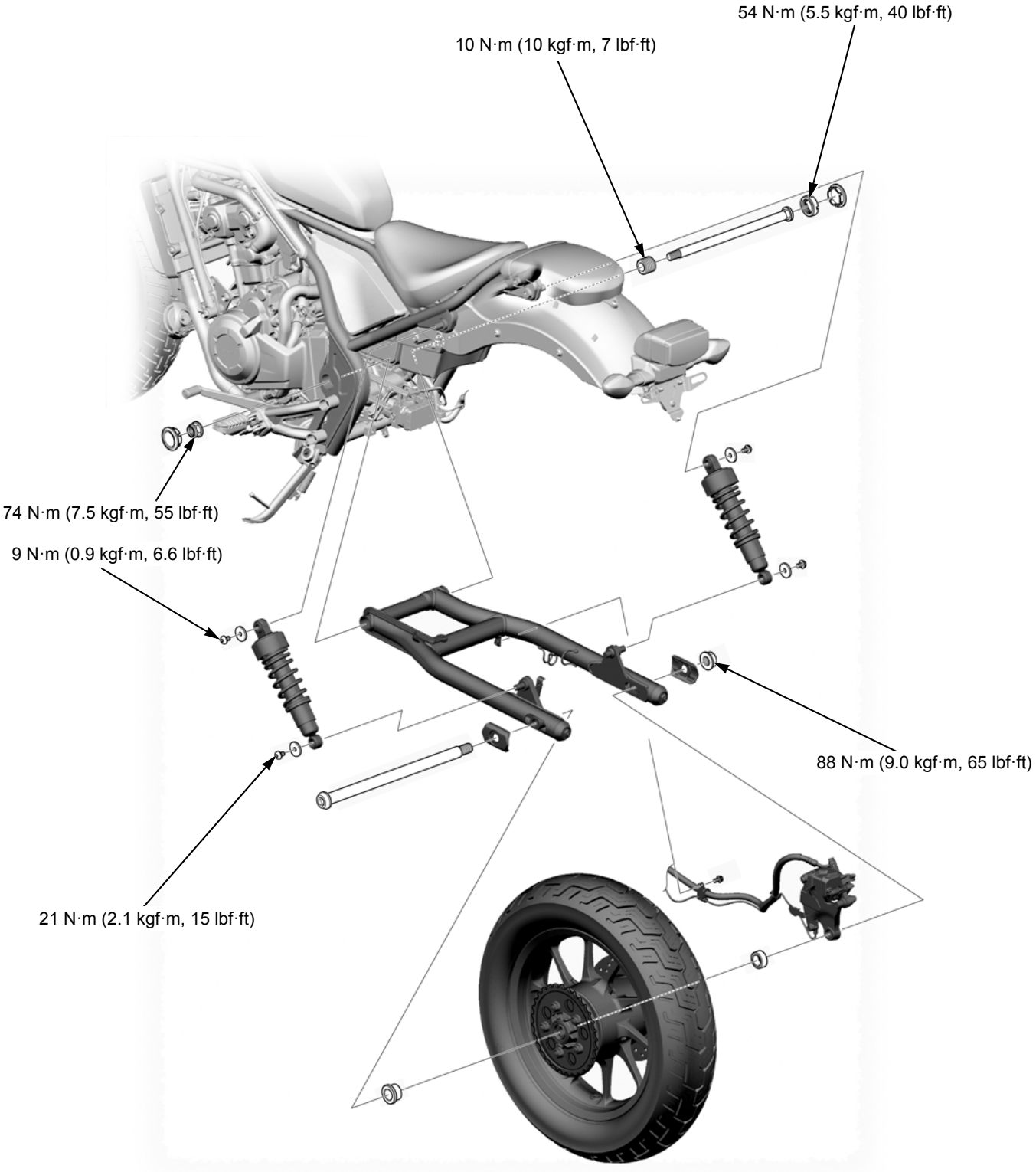
Wheel hard to turn
- Brake drag
- Faulty wheel bearing
- Faulty driven flange bearing
- Bent axle
- Drive chain too tight (page 3-14)

Soft suspension
- Weak shock absorber spring
- Oil leakage from damper unit
- Insufficient tire pressure

Stiff suspension
- Bent shock absorber damper rod
- Damaged suspension or swingarm pivot bushing
- Bent swingarm pivot or frame

Rear suspension noisy
- Loose suspension fasteners
- 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.

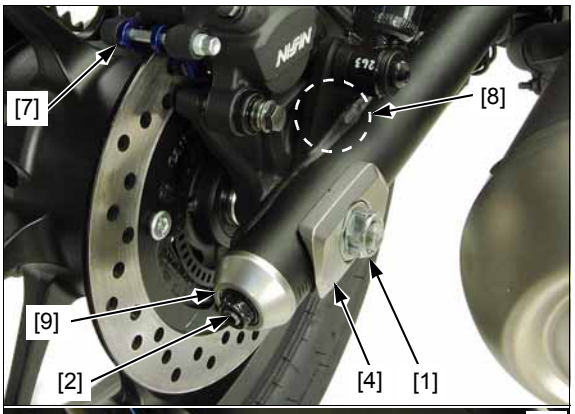
Loosen the chain adjusters [2] so the wheel can be moved forward all the way.

Push the rear wheel forward and derail the drive chain [3] from the driven sprocket.

Support the caliper so it does not hang from the brake hose. Do not twist the brake hose and rear wheel speed sensor wire.

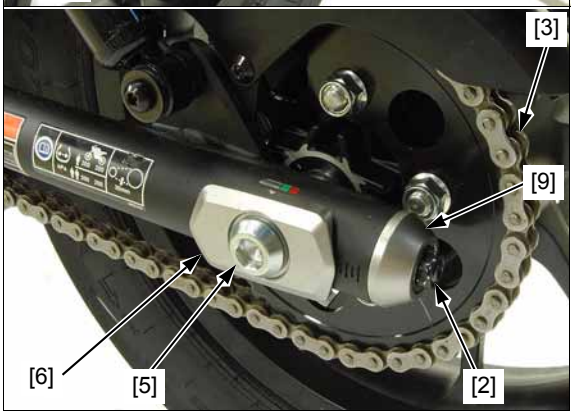
Remove the following:

– axle nut
– right setting plate [4]
– axle [5]
– left setting plate [6]
– rear wheel
– rear brake caliper [7] (from the swingarm boss [8])
– chain adjusters [9]



NOTE:

• Do not operate the brake pedal after removing the wheel.



Remove the following:

– left side collar (flange) [1]
– right side collar [2]

Install the removed parts in the reverse order of removal.

Adjust the drive chain slack (page 3-14).

INSPECTION

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

Replace the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub.

Inspect the following parts for damage, abnormal wear, deformation or bend.

– rear axle
– wheel rim
– driven sprocket (page 3-16)
– damper rubbers (page 17-6)

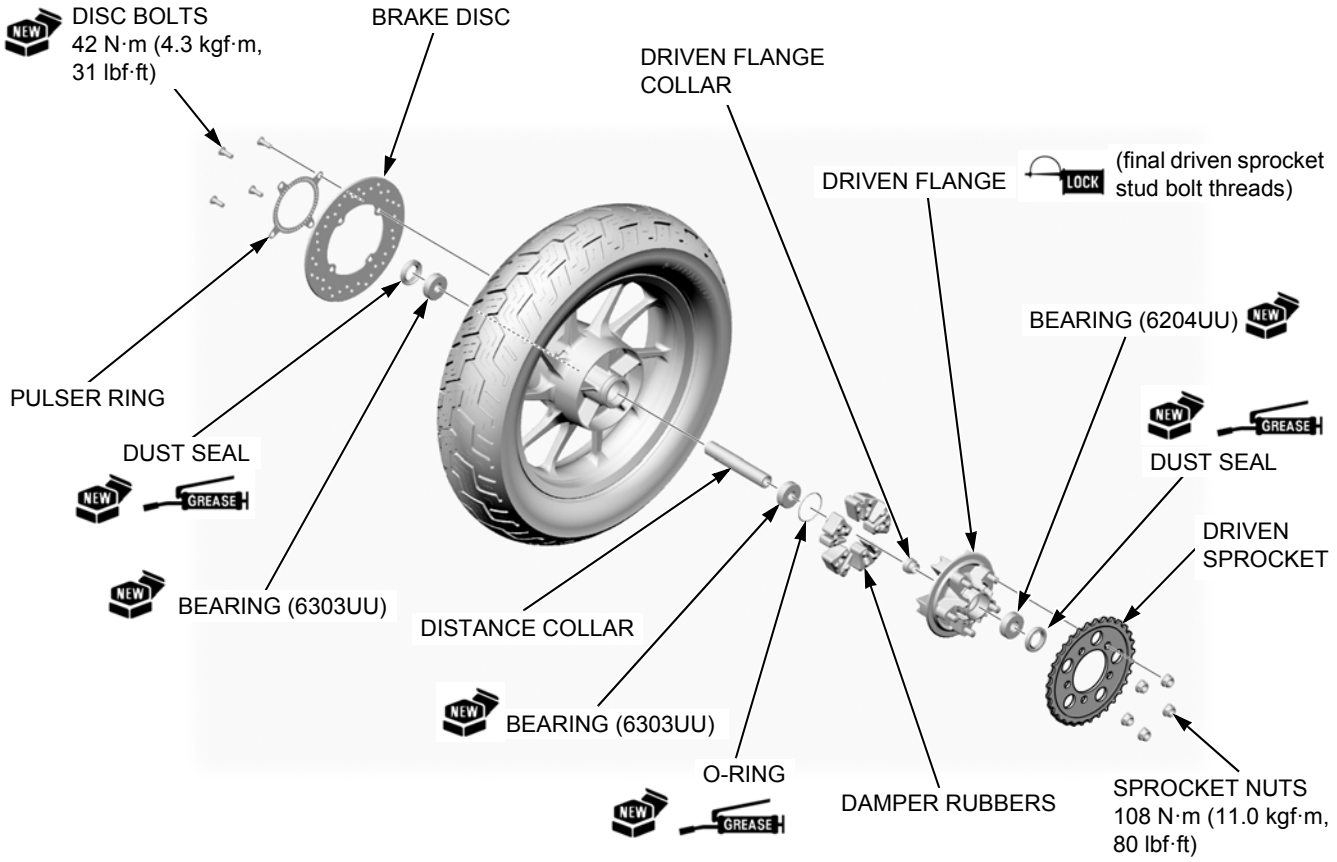
Measure each part according to REAR WHEEL/ SUSPENSION SPECIFICATIONS (page 1-10).

Replace any part if it is out of service limit.

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the rear wheel as shown in the following illustration.

- For wheel balance service (page 16-12).
- Install each dust seal with the flat side facing out so that it is flush with the hub and driven flange end surfaces.
- Install the brake disc with the rotation mark (arrow) facing out.
- Install the driven sprocket with the stepped surface facing out.
- Apply locking agent to the final driven sprocket stud bolt threads (driven flange side).

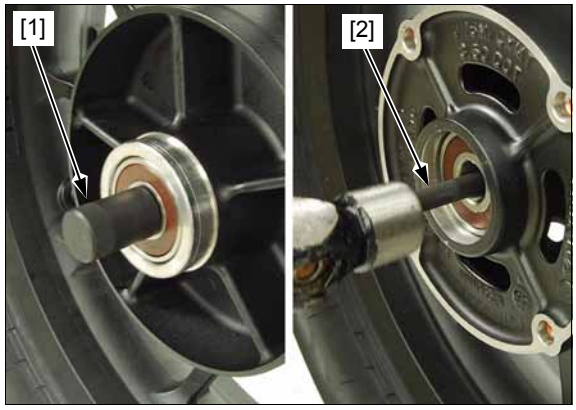


BEARING REPLACEMENT

WHEEL BEARING

Install the bearing remover head [1] into the bearing.

From the opposite side of the wheel, install the bearing remover shaft [2] and drive the bearing out of the wheel hub.



TOOLS:

Bearing remover head, 17 mm	**07746-0050500**
Bearing remover shaft	**07746-0050100**

Remove the distance collar and drive out the other bearing.

Drive in a new right side bearing (brake disc side) squarely with the marked side facing up until it is fully seated.

Install the distance collar.

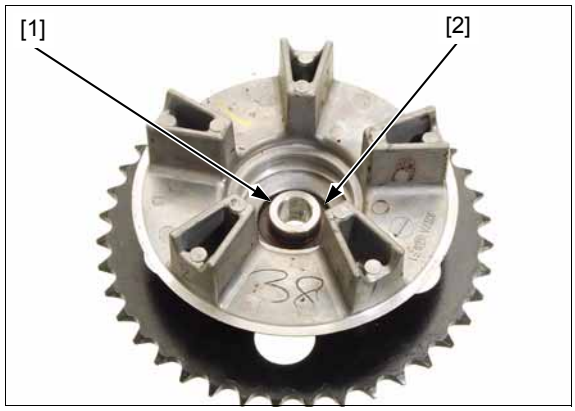
Drive in a new left side bearing squarely with the marked side facing up until it is fully seated.

TOOLS:

[1] Driver	**07749-0010000**
[2] Attachment, 42 x 47 mm	**07746-0010300**
[3] Pilot, 17 mm	**07746-0040400**

DRIVEN FLANGE BEARING

Drive out the driven flange collar [1] and the bearing [2].

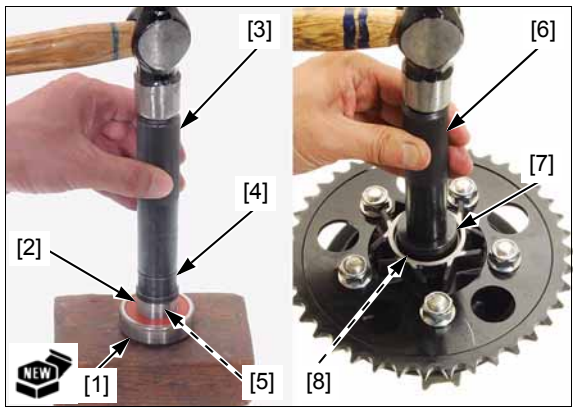


Place a new bearing [1] with the marked side facing down. Install the driven flange collar [2] into the bearing until it is fully seated.

TOOLS:

[3] Driver	**07749-0010000**
[4] Attachment, 28 x 30 mm	**07946-1870100**
[5] Pilot, 17 mm	**07746-0040400**

Drive in the driven flange bearing/collar squarely with the collar side facing down until it is fully seated.



TOOLS:

[6] Driver	**07749-0010000**
[7] Attachment, 42 x 47 mm	**07746-0010300**
[8] Pilot, 20 mm	**07746-0040500**

SHOCK ABSORBER

REMOVAL/INSTALLATION

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

Remove the following:

– shock absorber upper mounting socket bolt [1]
– washer [2]
– shock absorber lower mounting socket bolt [3]
– washer [4]
– shock absorber [5]

Installation is in the reverse order of removal.

TORQUE:
Shock absorber upper mounting socket bolt:
9 N·m (0.9 kgf·m, 6.6 lbf·ft)
Shock absorber lower mounting socket bolt:
21 N·m (2.1 kgf·m, 15 lbf·ft)

INSPECTION

Inspect the following parts of the shock absorber for damage, abnormal wear, oil leakage or bend.

– damper unit
– pivot bushing

SWINGARM

REMOVAL

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

Remove the following:

– right side cover (page 2-4)
– drive chain cover (page 2-7)
– rear wheel (page 17-5)
– shock absorber (page 17-8)
– EVAP canister (AC model) (page 7-22)

CMX500A: Disconnect the rear wheel speed sensor 2P (Gray) connector [1].

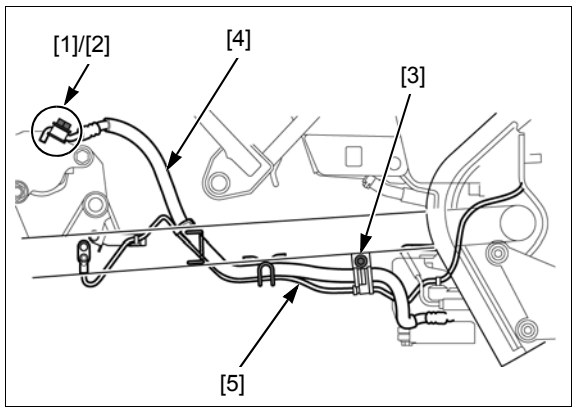
Drain the brake fluid from the rear brake hydraulic system (page 18-5).

When removing the oil bolt, cover the end of brake hose to prevent contamination.

Remove the following:

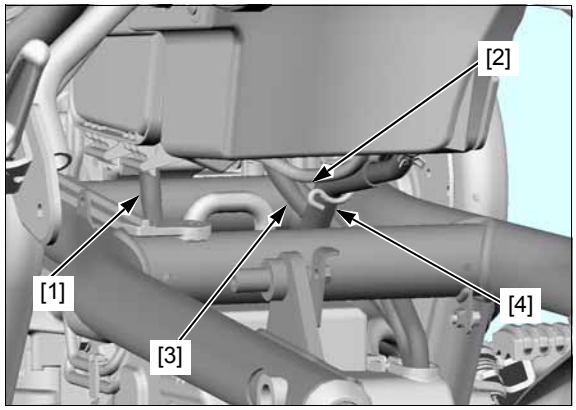
– oil bolt [1]
– sealing washers [2]
– bolt [3]

Remove the brake hose [4] and rear wheel speed sensor wire (CMX500A) [5] out of the swingarm.



Remove the crankcase breather hose [1].

Pull out the crankcase breather hose, EVAP canister hose (AC model only) [2], EVAP purge control solenoid valve hose (AC model only) [3] and rear brake master hose [4] from the swingarm opening.

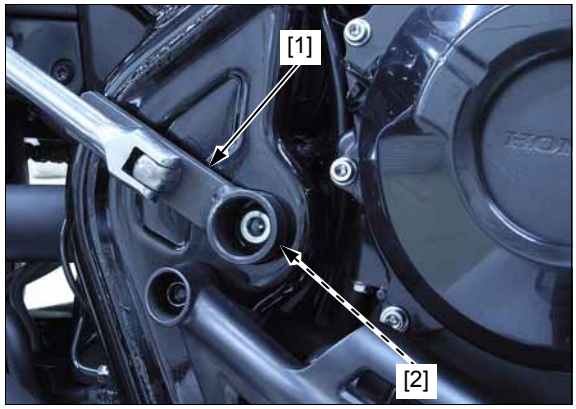


Remove the swingarm pivot caps [1].

Using a special tool [1] as shown, and remove the swingarm pivot lock nut [2].

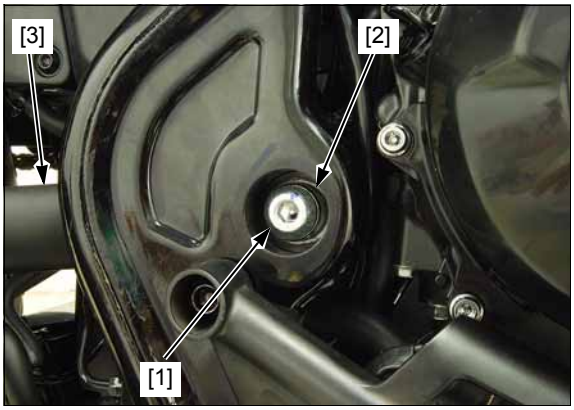
TOOL:

Pivot locknut Wrench 07GMA-KT70200



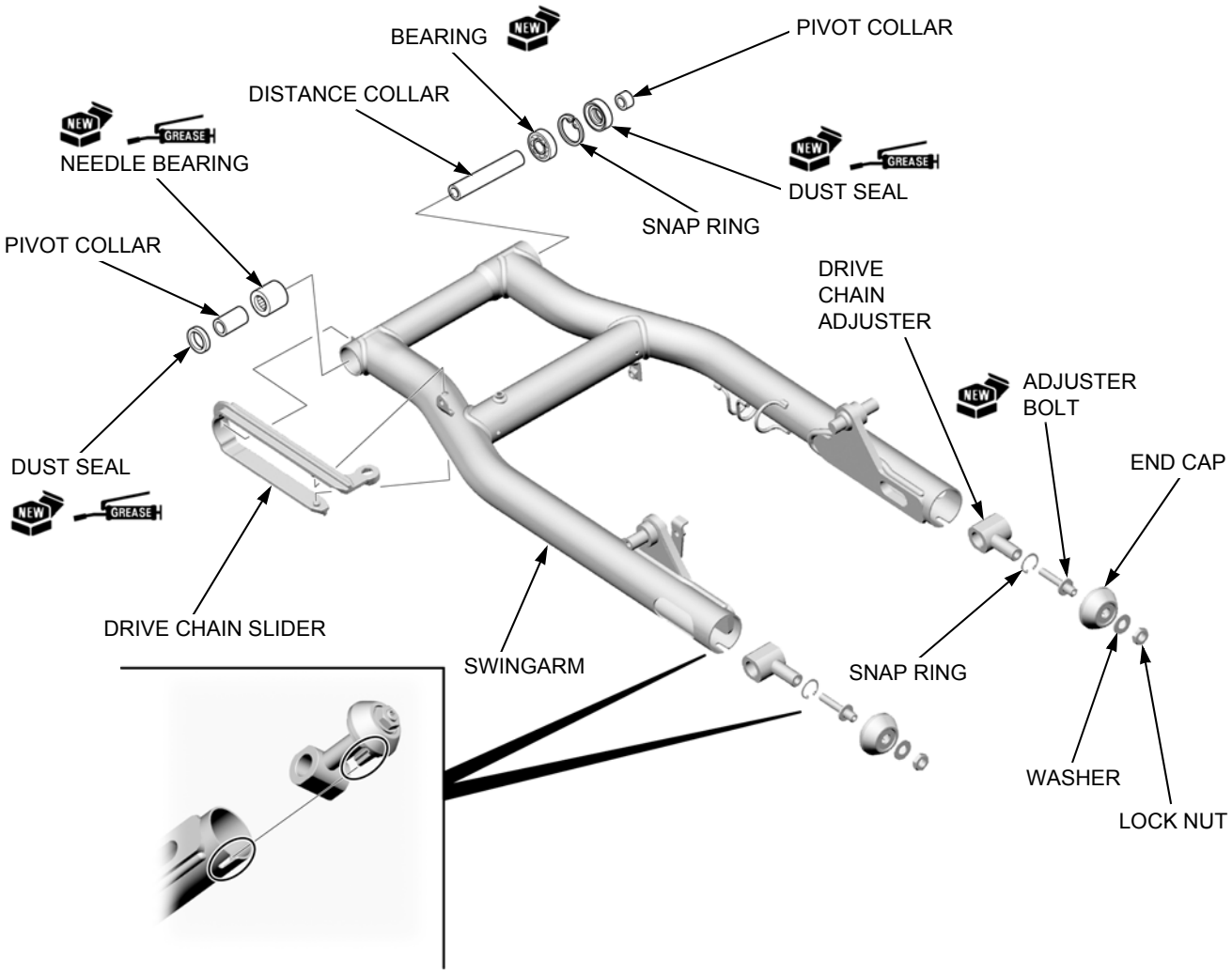
Remove the swingarm pivot nut [1]

Remove the swingarm pivot bolt [1], swingarm adjuster bolt [2] and swingarm [3].



DISASSEMBLY/ASSEMBLY

- Install each dust seal with the flat side facing out so that it is flush with the pivot end surface.



Check the collars for wear, damage or fatigue.

Check the needle bearing for damage or loose fit, replace it if necessary (page 17-13).

Install the left dust seal until it is flush with the pivot end surface.

Install the right dust seal until the depth from the pivot end surface is 0.75 – 1.25 mm (0.030 – 0.049 in).

INSPECTION

Inspect the following parts for damage, abnormal wear, or deformation and replace if necessary.

– dust seals
– pivot collars
– swingarm
– bearings
– drive chain slider

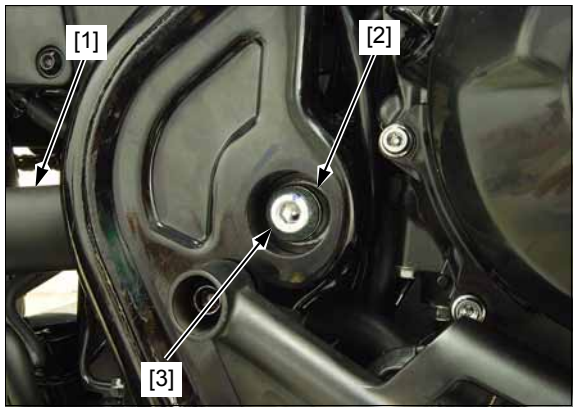
INSTALLATION

Install the swingarm [1].

Install the swingarm adjust bolt [2] so that bolt end does not procedure out of inner surf of the frame.

Install and tighten the swingarm pivot bolt [3] to the specified torque.

TORQUE:
Swingarm pivot bolt:
10 N·m (10 kgf·m, 7 lbf·ft)

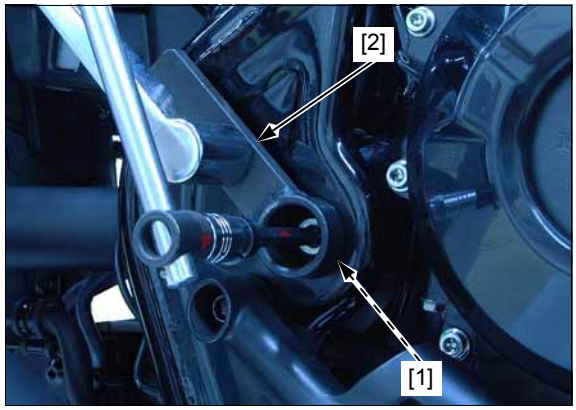


Install the swingarm pivot lock nut [1].

Using a special tool as shown, and tighten the swingarm pivot lock nut to the specified torque while holding the pivot bolt.

TOOL:
[2] Pivot locknut Wrench 07GMA-KT70200

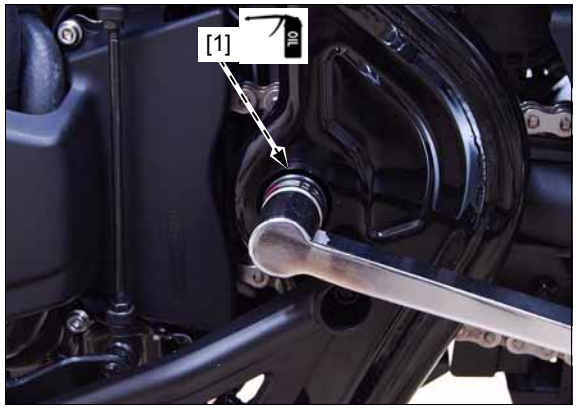
TORQUE:
Swingarm pivot lock nut:
Actual: 54 N·m (5.5 kgf·m, 40 lbf·ft)
Indicated: 49 N·m (5.0 kgf·m, 36 lbf·ft)



Apply engine oil to the swingarm pivot nut [1].

Install and tighten the swingarm pivot nut to the specified torque.

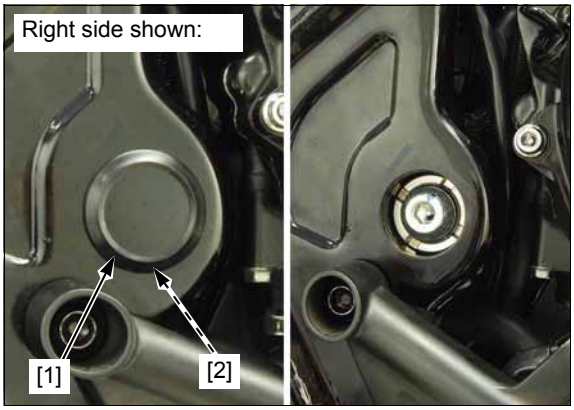
TORQUE:
Swingarm pivot nut:
74 N·m (7.5 kgf·m, 55 lbf·ft)



Install the swingarm pivot caps [1].

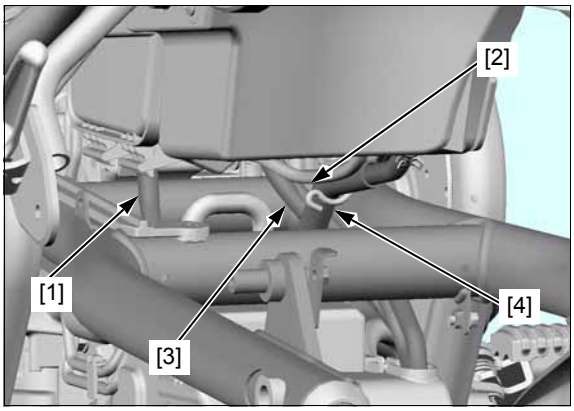
NOTE:

- When install the swingarm pivot cap, attach a slit [2] downward.



Insert the crankcase breather hose [1], EVAP canister hose (AC model only) [2], EVAP purge control solenoid valve hose (AC model only) [3] and rear brake master hose [4] into the swingarm opening.

Install the crankcase breather hose.



Install the following:

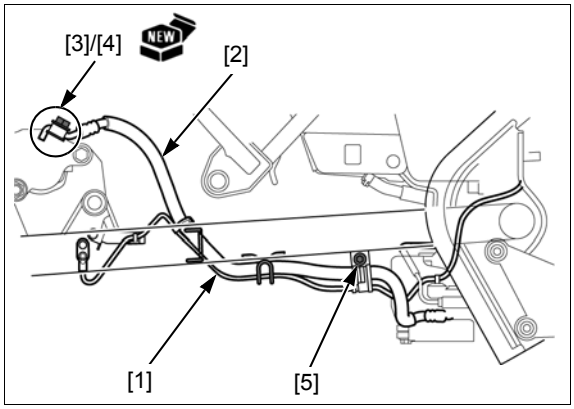
– rear wheel speed sensor wire (CMX500A) [1]
– brake hose [2]
– sealing washers [3]
– oil bolt [4]
– bolt [5]

TORQUE: Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the rear brake hydraulic system (page 18-6).

NOTE:

- Replace the and sealing washers with new ones.



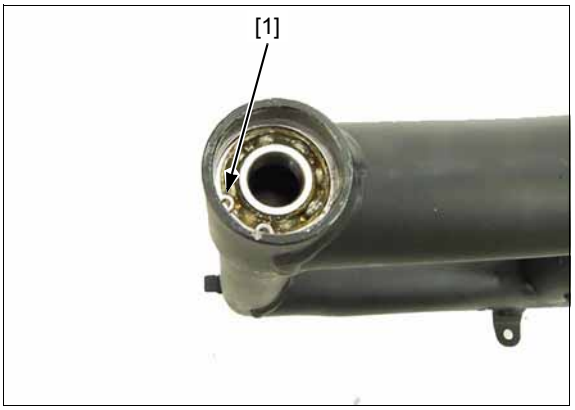
Connect the rear wheel speed sensor 2P (Gray) connector [1].

install the following:

– right side cover (page 2-4)
– drive chain cover (page 2-7)
– rear wheel (page 17-5)
– shock absorber (page 17-8)
– EVAP canister (AC model) (page 7-22)

PIVOT BEARING REPLACEMENT

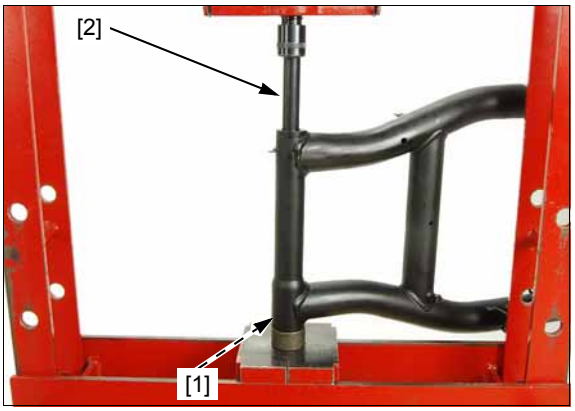
Remove the snap ring [1] from the right pivot.



Drive the ball bearing [1] out of the swingarm using a hydraulic press and special tool.

TOOL:

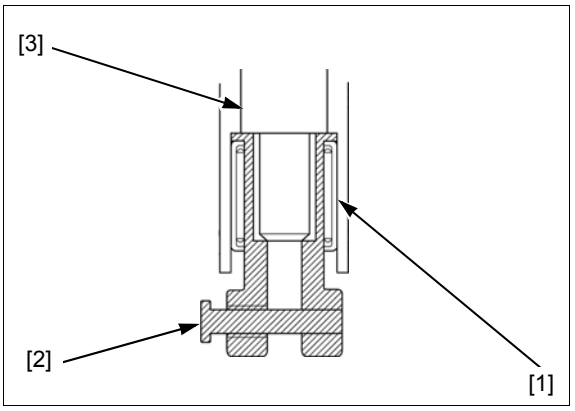
Driver shaft [2]	**07946-MJ00100**



Drive the needle bearing [1] out of the swingarm using a hydraulic press and special tools.

TOOLS:

Remover attachment, 22 mm [2]	**07GMD-KT70200**
Driver shaft [3]	**07946-MJ00100**

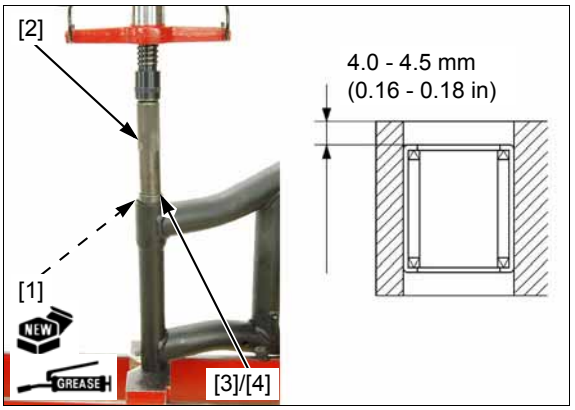


Apply grease to a new needle bearing rotating area.

Carefully press the bearing in the left pivot with the marked side facing up until the depth from the pivot end surface is 4.0 – 4.5 mm (0.16 – 0.18 in), using the special tools.

TOOLS:

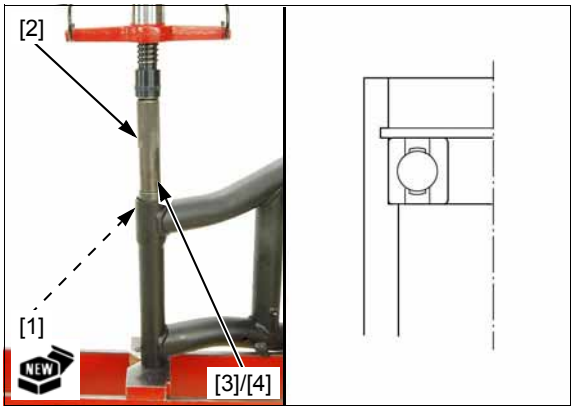
Driver [2]	**07749-0010000**
Attachment, 28 x 30 mm [3]	**07946-1870100**
Pilot, 22 mm [4]	**07746-0041000**



Install new ball bearing [1] into the swingarm with the marked side facing out until they are fully seated.

TOOLS:

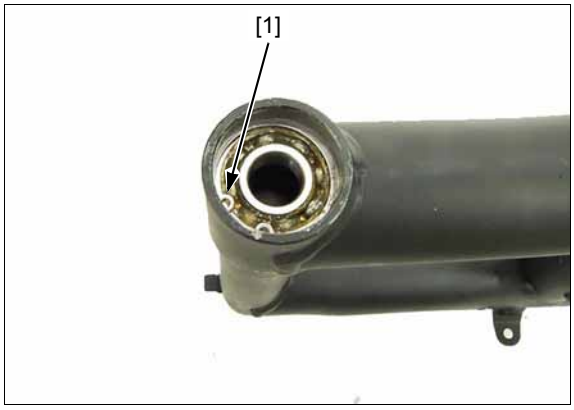
Driver [2]	**07749-0010000**
Attachment, 32 x 35 mm [3]	**07746-0010100**
Pilot, 15 mm [4]	**07746-0040300**



Install the snap ring [1] into the right pivot groove securely.

NOTE:

- Do not reuse the snap ring which could easily spin in the groove.
- Make sure that the snap ring is firmly seated in the groove.



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 cover; make sure the front reservoir is horizontal first.

- This section covers service of the conventional brake components of the brake system. For Anti-lock Brake System (ABS) service (page 19-2).
- This models is equipped with the ABS, however, the brake fluid replacement procedure is performed in the same manner as in the ordinary air bleeding procedure. Note that replacement and bleeding air from the brake fluid in the ABS modulator is not necessary, as it sealed in the modulator.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid, they may not be compatible.
- Never allow contaminates (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always check brake operation before riding the motorcycle.
- When the wheel speed sensor is removed, be sure to check the air gap between the wheel caliper bracket and pulser ring after installing it (page 19-22).

TROUBLESHOOTING

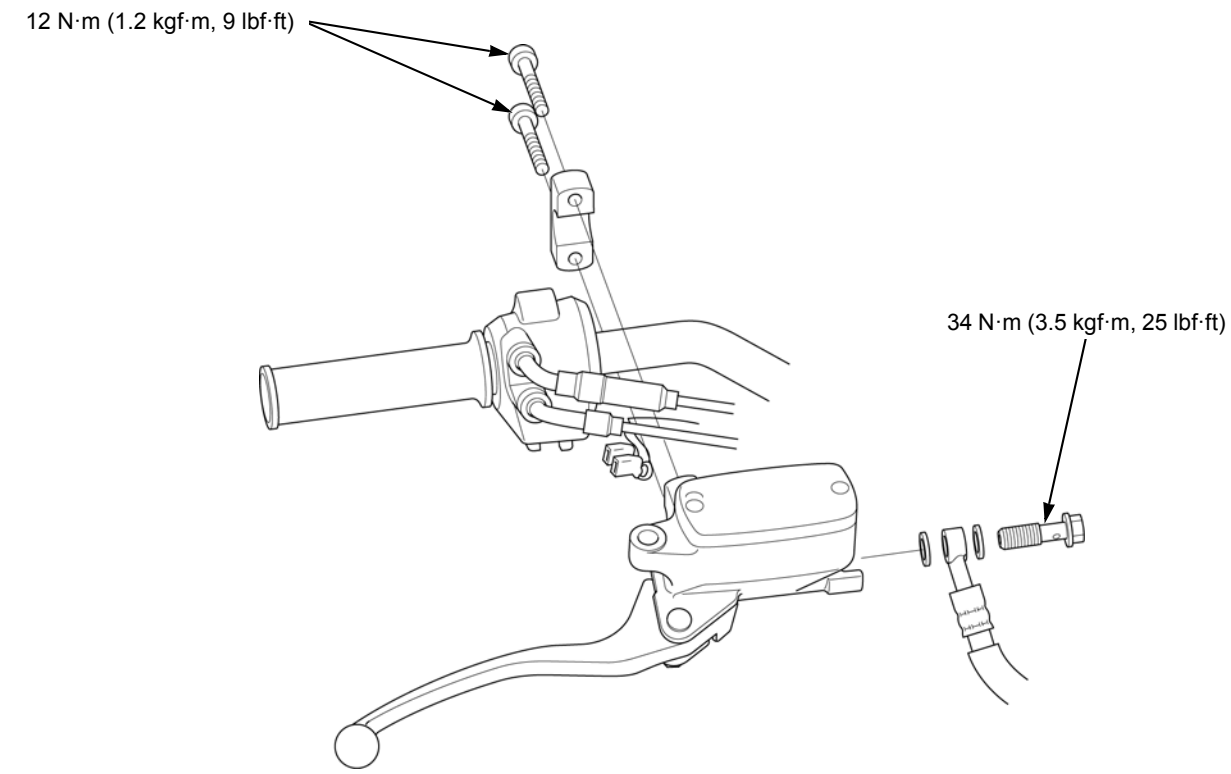
Brake lever/pedal soft or spongy
- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master piston cups
- Worn brake pad/disc
- Contaminated caliper
- Contaminated master cylinder
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master piston
- Bent brake lever/pedal

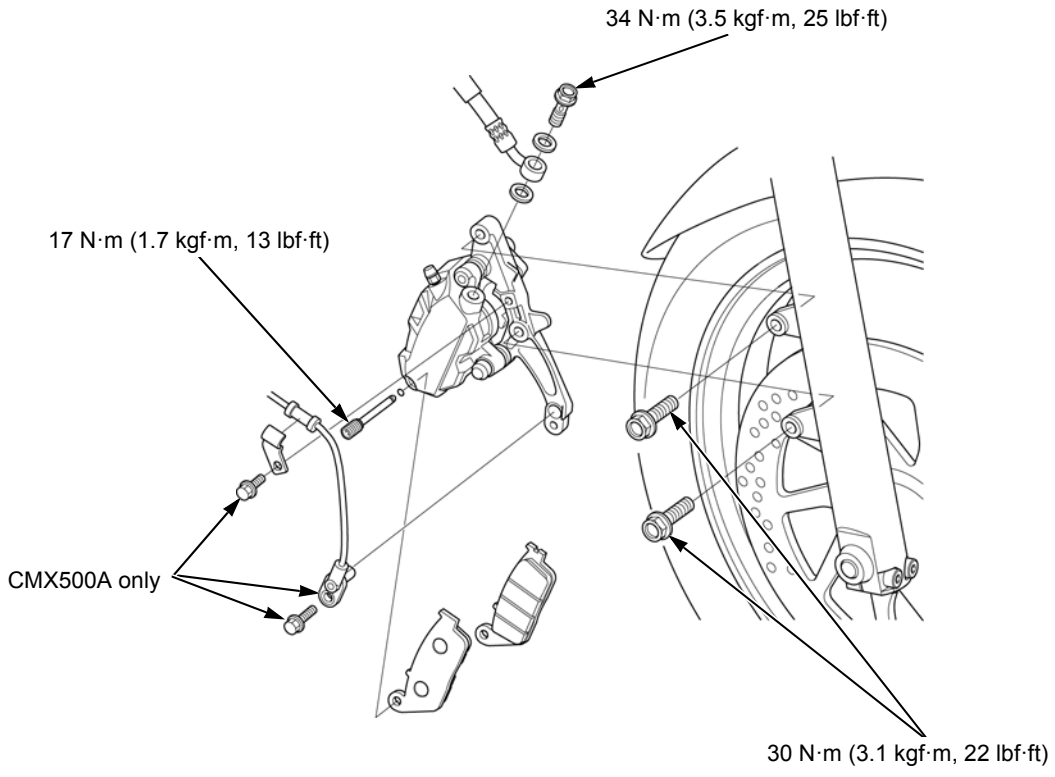
Brake lever/pedal hard
- Clogged/restricted fluid passage
- Sticking/worn caliper piston
- Caliper not sliding properly
- Worn caliper piston seal
- Sticking/worn master piston
- Bent brake lever/pedal

Brake drags
- Contaminated brake pad/disc
- Misaligned wheel
- Badly worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Sticking caliper piston

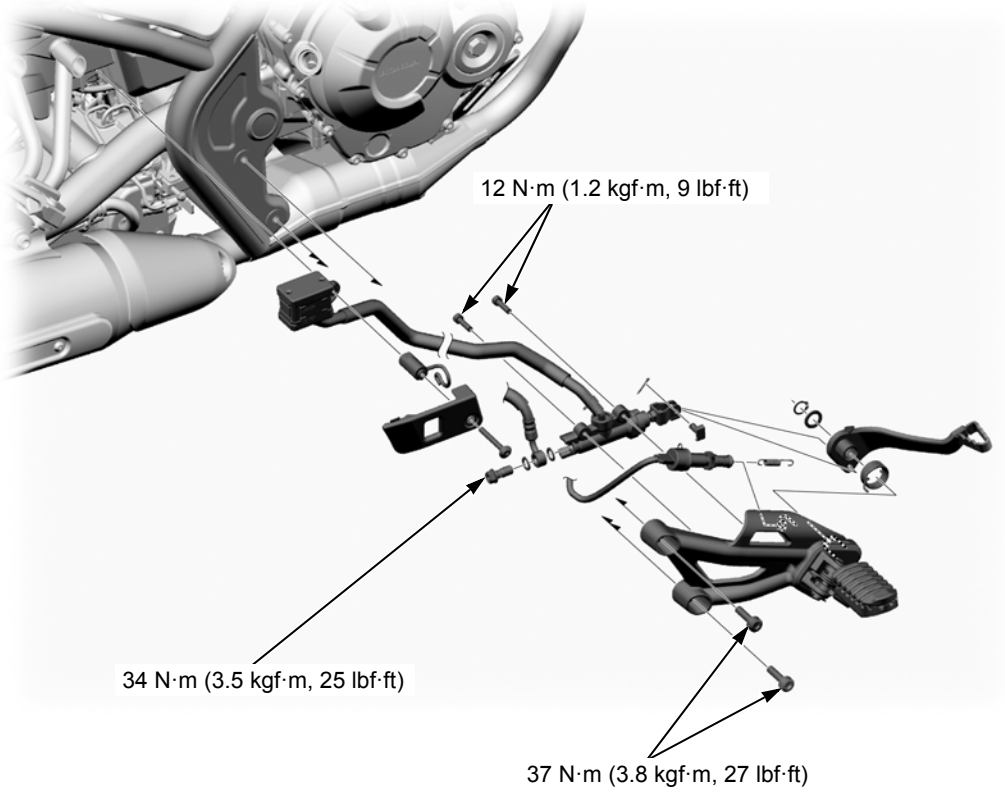
COMPONENT LOCATION

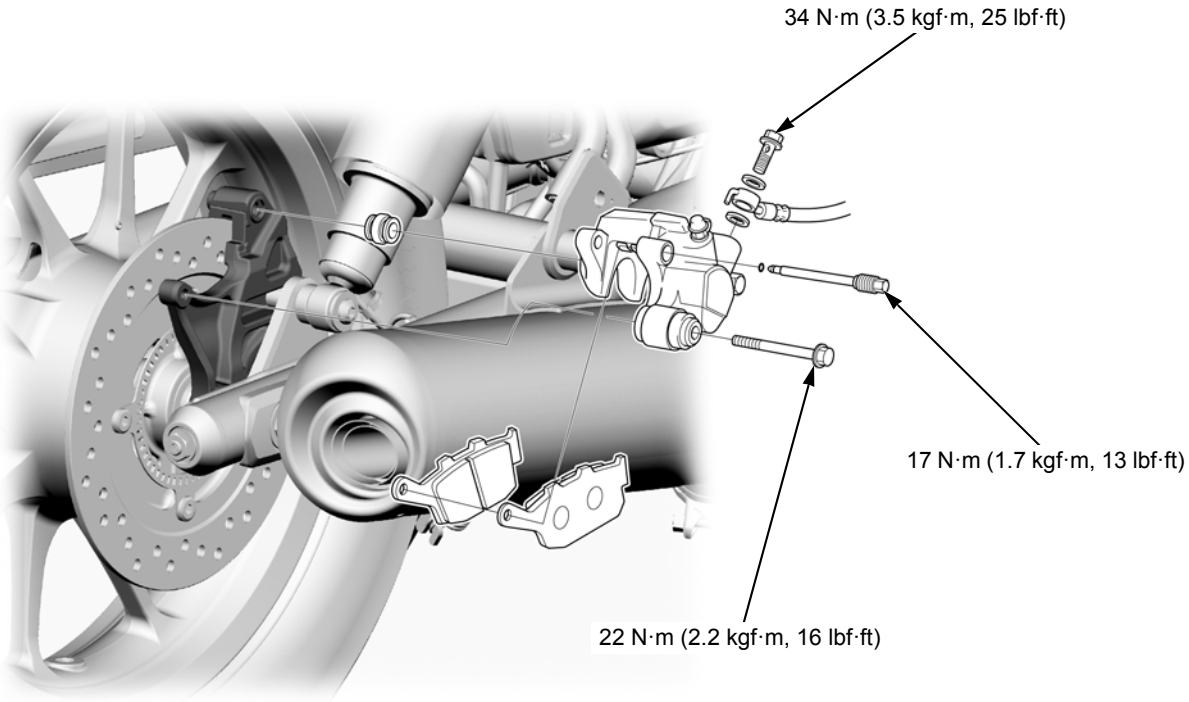
FRONT:





REAR:


12 N·m (1.2 kgf·m, 9 lbf·ft)
34 N·m (3.5 kgf·m, 25 lbf·ft)
37 N·m (3.8 kgf·m, 27 lbf·ft)


34 N·m (3.5 kgf·m, 25 lbf·ft)
17 N·m (1.7 kgf·m, 13 lbf·ft)
22 N·m (2.2 kgf·m, 16 lbf·ft)

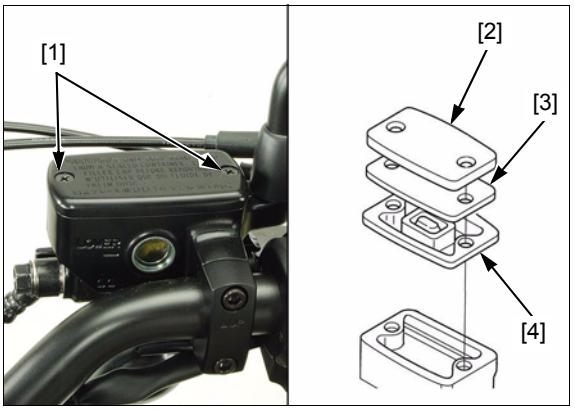
BRAKE FLUID REPLACEMENT/AIR BLEEDING

BRAKE FLUID DRAINING

For front brake: Turn the handlebar so the reservoir is level.

Remove the following:

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

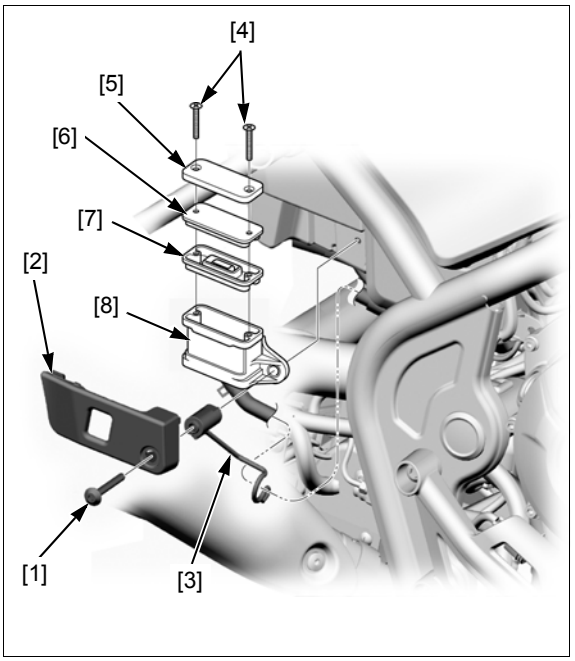


Take care not to spill the fluid out of the reservoir.

Remove the following:

– reservoir mounting bolt [1]
– reservoir cover [2]
– brake hose stay [3]
– two screws [4]
– reservoir cap [5]
– set plate [6]
– diaphragm [7]

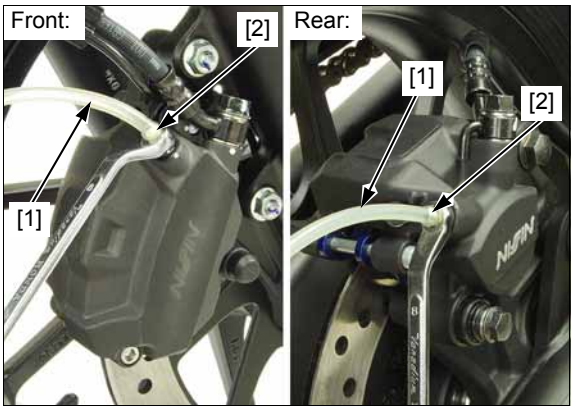
Temporarily install the reservoir [8] onto the battery case with the mounting bolt secure it so the reservoir is level.



Connect a bleed hose [1] to the caliper bleed valve [2].

Loosen the bleed valve and pump the brake lever or pedal until no more fluid flows out of the bleed valve.

Close the bleed valve.



BRAKE FLUID FILLING/AIR BLEEDING

Fill the reservoir to the upper level line [1] with DOT 4 brake fluid from a sealed container.

Connect a commercially available brake bleeder to the bleed valve.

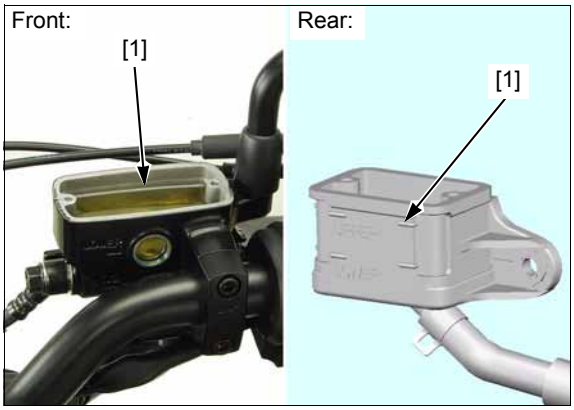
Operate the brake bleeder and loosen the bleed valve.

Check the fluid level often while bleeding to prevent air from being pumped into the system.

If an automatic refill system is not used, add fluid when the fluid level in the reservoir is low.

Perform the bleeding procedure until the system is completely flushed/bled.

Close the bleed valve and operate the brake lever or pedal. If it still feels spongy, bleed the system again.



If the brake bleeder is not available, use the following procedure.

Connect a bleed hose to the bleed valve.

Pump up the system pressure with the brake lever/pedal until the lever/pedal resistance is felt.

Do not release the brake lever or pedal until the bleed valve has been closed.

1. Squeeze the brake lever or depress the brake pedal all the way, and loosen the bleed valve 1/4 of a turn. Wait several seconds and then close it.
2. Release the brake lever/pedal slowly and wait several seconds after it reaches the end of its travel.
3. Repeat the steps 1 and 2 until there are no air bubbles in the bleed hose.

After bleeding the system completely, tighten the bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

Fill the reservoir to the upper level line with DOT 4 brake fluid.

For front brake: Install the diaphragm, set plate, reservoir cap and tighten the screws to the specified torque.

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

For rear brake: Carefully remove the reservoir [1] from the battery case by removing the mounting bolt [2].

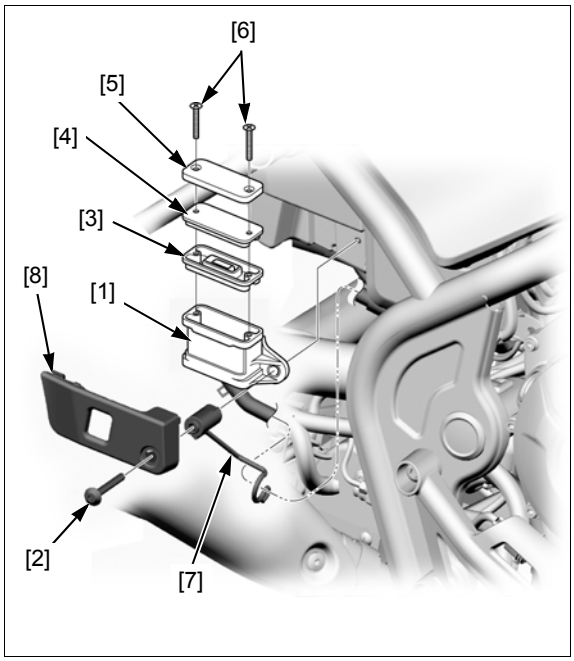
Take care not to spill the fluid out of the reservoir.

Install the diaphragm [3], set plate [4], reservoir cap [5] and tighten the screws [6] to the specified torque.

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

Set the brake hose stay [7] to the brake hose.

Install the reservoir, cover [8] and tighten the mounting bolt.



BRAKE PAD/DISC

BRAKE PAD REMOVAL/ INSTALLATION

NOTE:

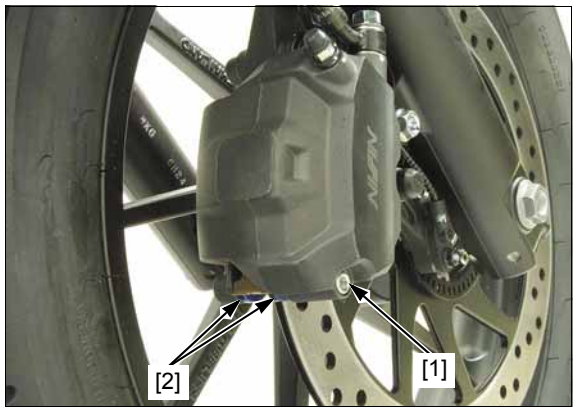
Check the fluid level in the reservoir as this operation causes the fluid level to rise.

- If you replace the brake pads with new ones, push the caliper pistons all the way in by pushing the caliper body inward to allow installation of new brake pads before removing the pads.
  Always replace the brake pads in pairs to ensure even disc pressure.

FRONT

Do not operate the brake lever after removing the pads.

Remove the pad pin [1] by pushing the pads against the pad spring, then the brake pads [2] out of the caliper.



Make sure the pad spring [1] is installed in position (page 18-13).

Be sure the stopper ring [2] on the pad pin is in good condition, and replace it with a new one if necessary.

Coat the stopper ring with silicone grease.

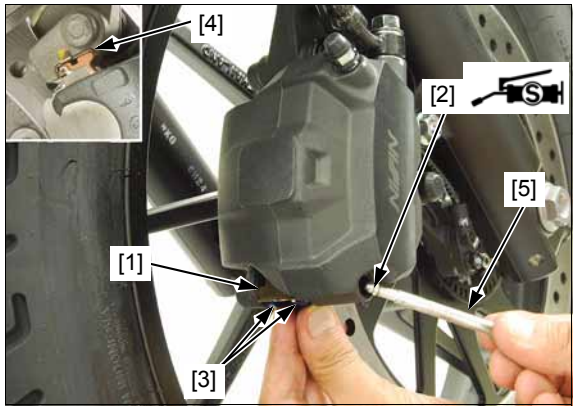
Install the pads [3] so that their ends are set in the retainer [4] properly.

Install the pad pin [5] by pushing the pads against the pad spring to align the pad pin holes in the pads and caliper body.

Tighten the pad pin to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

Operate the brake lever to seat the caliper pistons against the pads.

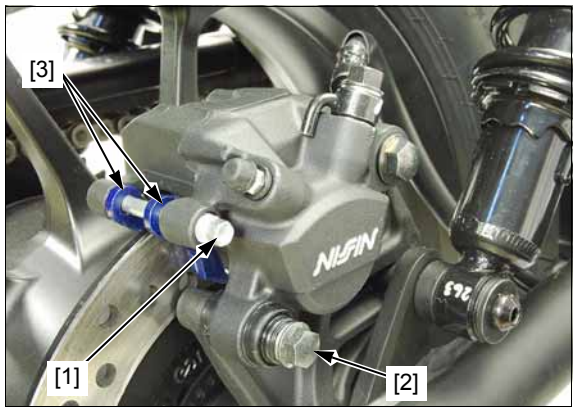


REAR

Loosen the pad pin [1] and remove the caliper bolt [2].

Do not operate the brake pedal after removing the pads.

Pivot the caliper body up, and remove the pad pin and brake pads [3].



Make sure the pad spring [1] is installed in position (page 18-14).

Be sure the stopper ring [2] on the pad pin is in good condition, and replace it with a new one if necessary.

Coat the stopper ring with silicone grease.

Install the pads [3] so that their ends are rest on the pad retainer [4] properly.

Lower the caliper body and loosely install a new caliper bolt [5].

Install the pad pin [6] by pushing the pads against the pad spring to align the pad pin holes in the pads and caliper body.

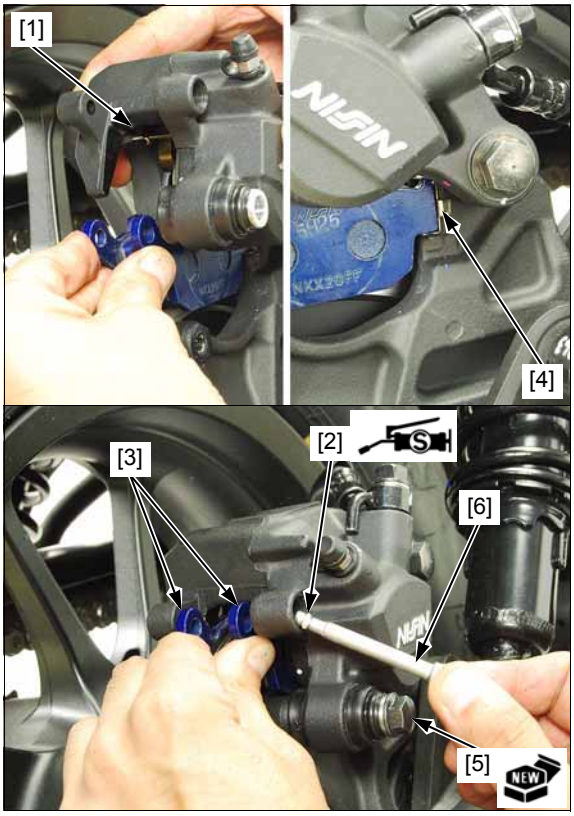
Tighten the caliper bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Tighten the pad pin to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

Operate the brake pedal to seat the caliper piston against the pads.



BRAKE DISC INSPECTION

Visually inspect the brake disc for damage or cracks.

Measure the brake disc according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

FRONT MASTER CYLINDER

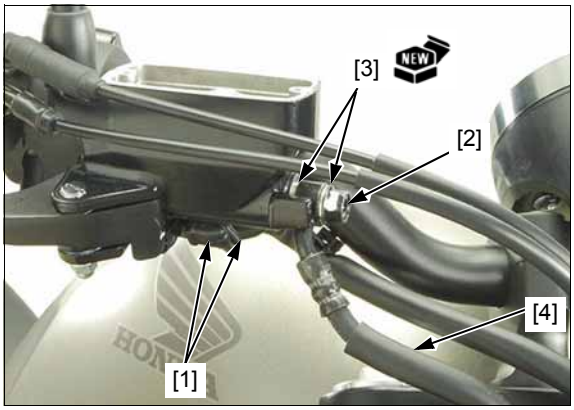
REMOVAL/INSTALLATION

Drain the brake fluid from the front brake hydraulic system (page 18-5).

When removing the oil bolt, cover the end of the brake hose to prevent contamination.

Remove the following:

– right rearview mirror (page 2-5)
– brake light switch connectors [1]
– oil bolt [2]
– sealing washers [3]
– brake hose [4]

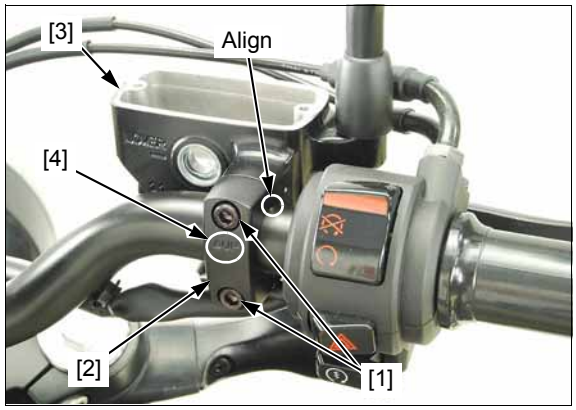


– two socket bolts [1]
– master cylinder holder [2]
– master cylinder [3]

Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washers with new ones.
- Install the master cylinder holder with the "UP" mark [4] facing up.
- Align the edge of the master cylinder with the punch mark on the handlebar, and tighten the upper bolt first then tighten the lower bolt.
- Be sure to set the eyelet joint into the groove when connecting the brake hose.



TORQUE:

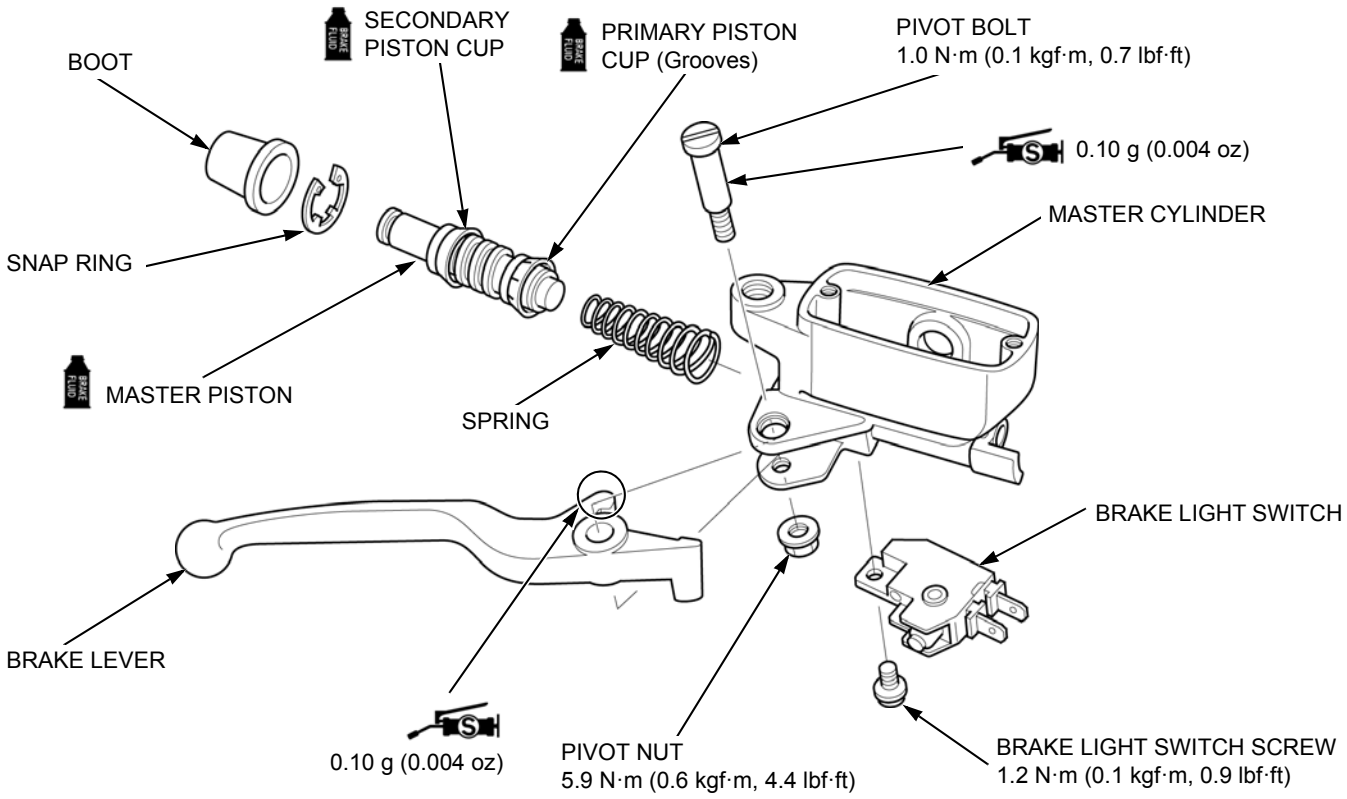
Front master cylinder holder socket bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)
Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the front brake hydraulic system (page 18-6).

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the front master cylinder as shown in the 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.

– master cylinder
– master piston
– piston cups
– spring
– boot

Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

REAR MASTER CYLINDER

REMOVAL/INSTALLATION

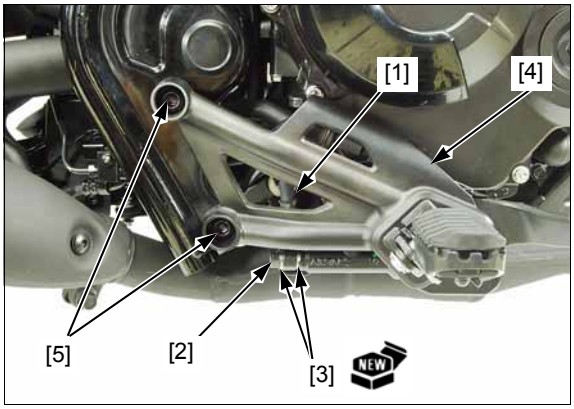
Drain the brake fluid from the rear brake hydraulic system (page 18-5).

Remove the rear brake reservoir (page 18-6).

When removing the oil bolt, cover the end of the brake hose to prevent contamination.

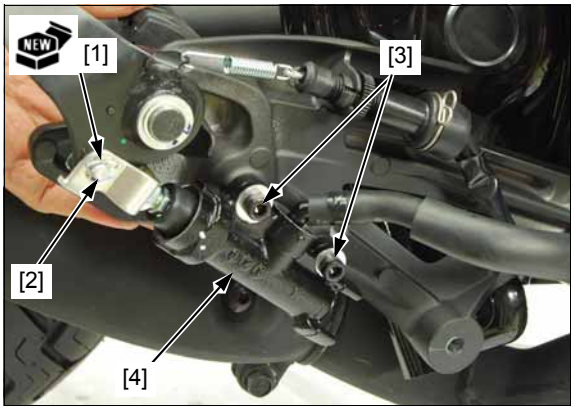
Disconnect the brake hose [1] by removing the oil bolt [2] and sealing washers [3].

Support the right rider footpeg bracket [4] securely and remove the bracket bolts [5].



Remove the following.

– cotter pin [1]
– joint pin [2]
– mounting bolts [3]
– master cylinder [4]



Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washers and cotter pin with new ones.
- Be sure to rest the eyelet stopper pin against the stopper when tightening the oil bolt.

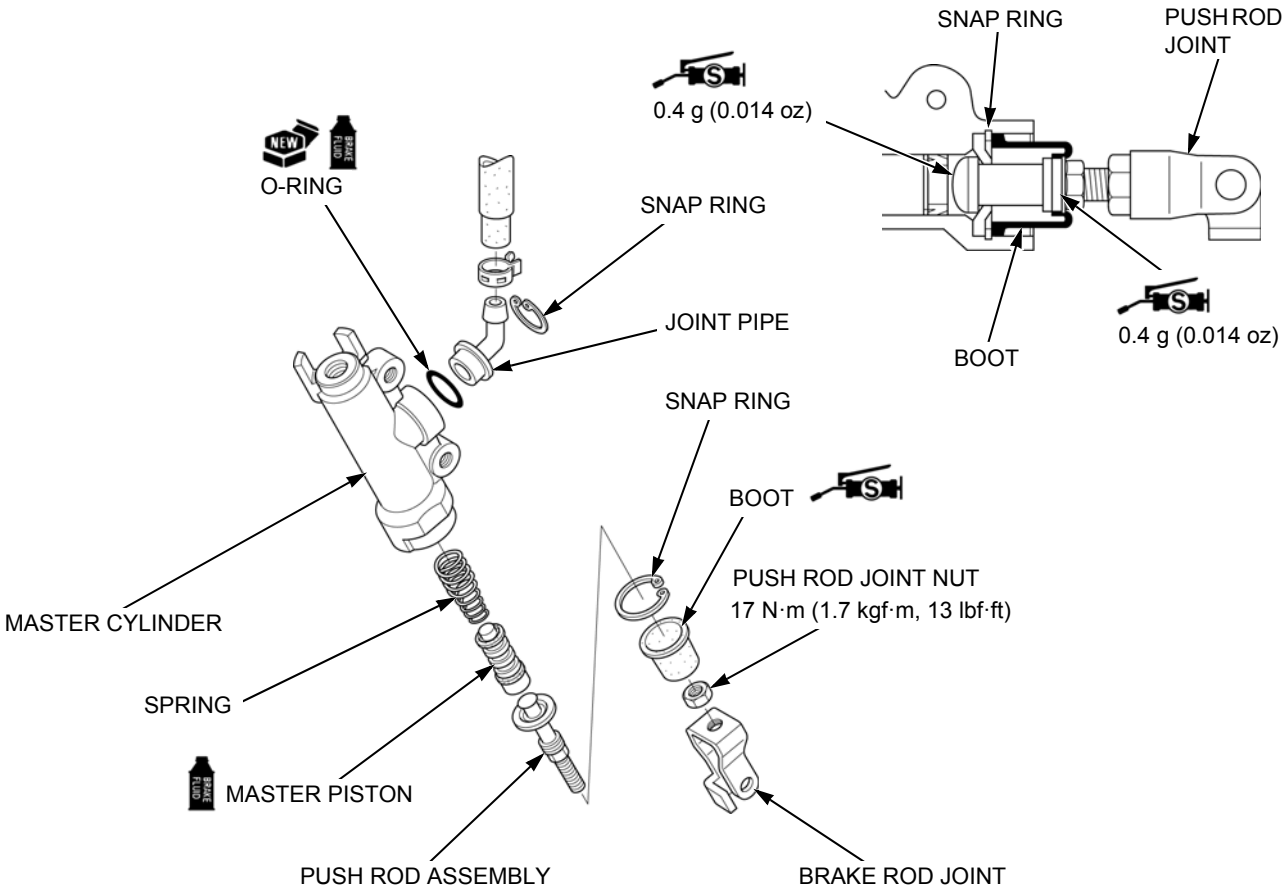
TORQUE:
Rider footpeg bracket bolt:
37 N·m (3.8 kgf·m, 27 lbf·ft)
Rear master cylinder mounting bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)
Oil bolt:
34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the rear brake hydraulic system (page 18-6).

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the rear master cylinder as shown in the following illustration.

- Adjust the push rod length between the center of the lower mounting bolt hole and center of the joint pin hole when installing the push rod joint.
- Do not allow the piston cup lips to turn inside out.
- Install the snap ring with the chamfered edge facing the thrust load side and be certain it is firmly seated in the groove. Do not reuse the snap ring which could easily spin in the groove.



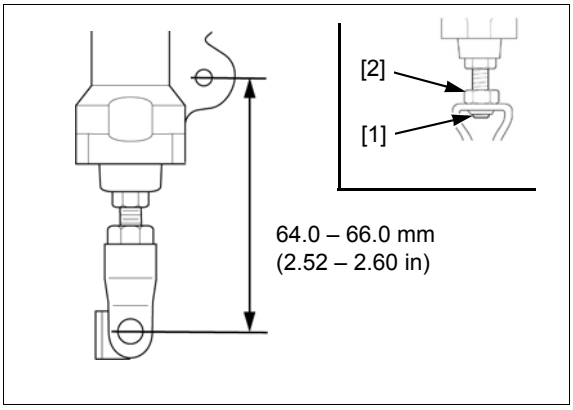
When the push rod has been disassembled, adjust the push rod length so that the distance from the center of the master cylinder lower mounting bolt hole to the center of the joint pin hole is standard length as shown.

If the length is adjusted to the longer position, make sure that the lower end of the push rod thread [1] is visible inside the joint.

After adjustment, tighten the joint nut [2] to the specified torque.

TORQUE:

Rear master cylinder push rod joint nut:
17 N·m (1.7 kgf·m, 13 lbf·ft)



INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

– master cylinder
– master piston
– piston cups
– spring
– boot

Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

FRONT BRAKE CALIPER

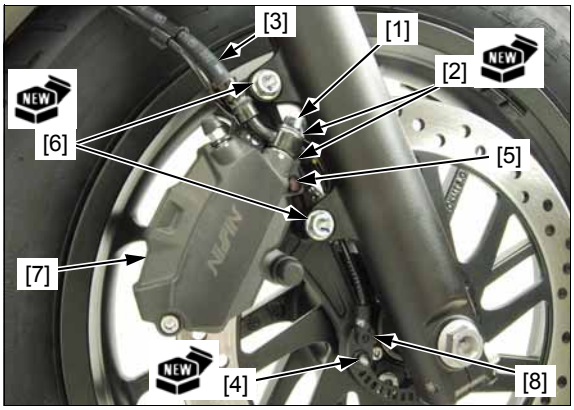
REMOVAL/INSTALLATION

Drain the brake fluid from the front brake hydraulic system (page 18-5).

Remove the following:

When removing the oil bolt, cover the end of brake hose to prevent contamination.

– oil bolt [1]
– sealing washers [2]
– brake hose [3]
– sensor mounting bolt (CMX500A) [4]
– sensor wire guide blot (CMX500A) [5]
– brake caliper mounting bolts [6]
– brake caliper [7]
– front wheel speed sensor (CMX500A) [8]



Installation is in the reverse order of removal.

NOTE:

- Replace the brake caliper mounting bolts and sealing washers with new ones.
- Be sure to rest the eyelet stopper pin against the caliper body when tightening the oil bolt.
- Before installing the wheel speed sensor, wipe the sensor tip and mounting area to remove any foreign material.
- Always replace the front wheel speed sensor bolt with a new one.

TORQUE:
Front brake caliper mounting bolt:
30 N·m (3.1 kgf·m, 22 lbf·ft)
Oil bolt:
34 N·m (3.5 kgf·m, 25 lbf·ft)

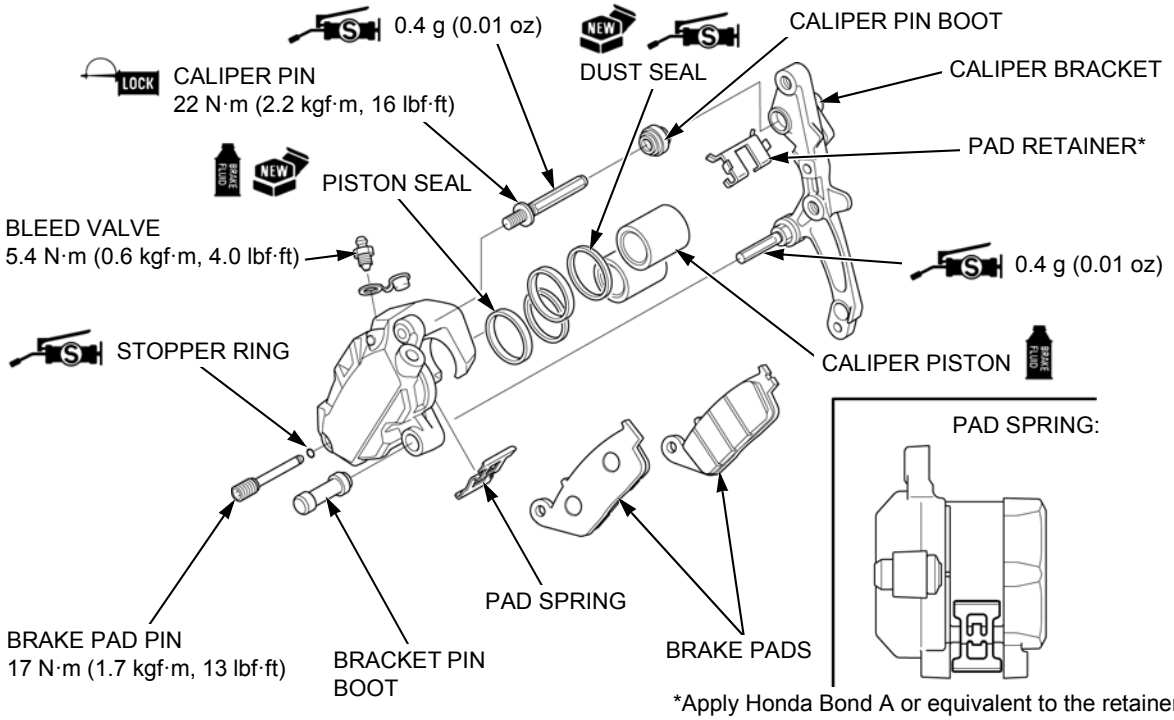
Fill and bleed the rear brake hydraulic system (page 18-6).

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the front brake caliper as shown in the following illustration.

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

- Mark the pistons to ensure that they are reinstalled in their original locations.
- When removing the caliper pistons with compressed air, place a shop towel over the pistons to prevent damaging the pistons and caliper body. Do not use high pressure or bring the nozzle too close to the fluid inlet.
- Install the pistons with the opening toward the pads.



*Apply Honda Bond A or equivalent to the retainer seating surface.

INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

– caliper cylinders
– caliper pistons

Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

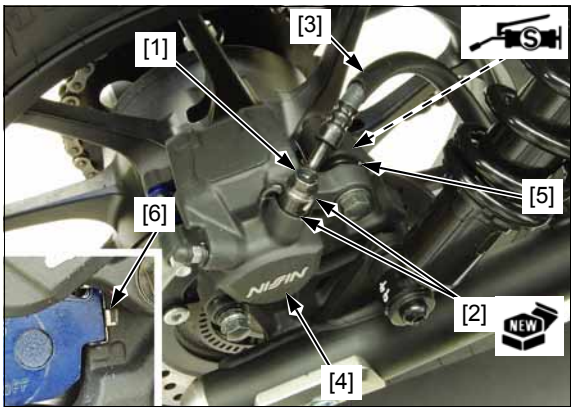
REAR BRAKE CALIPER

REMOVAL/INSTALLATION

Drain the brake fluid from the rear brake hydraulic system (page 18-5).

When removing the oil bolt, cover the end of brake hose to prevent contamination.

– oil bolt [1]
– sealing washers [2]
– brake hose [3]
– brake caliper [4]
– caliper pin boot [5]



Installation is in the reverse order of removal.

NOTE:

- Replace the and sealing washers with new ones.
- If the pad retainer [6] was removed, apply Honda Bond A or equivalent to the retainer seating surface.
- Apply 0.4 g 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.

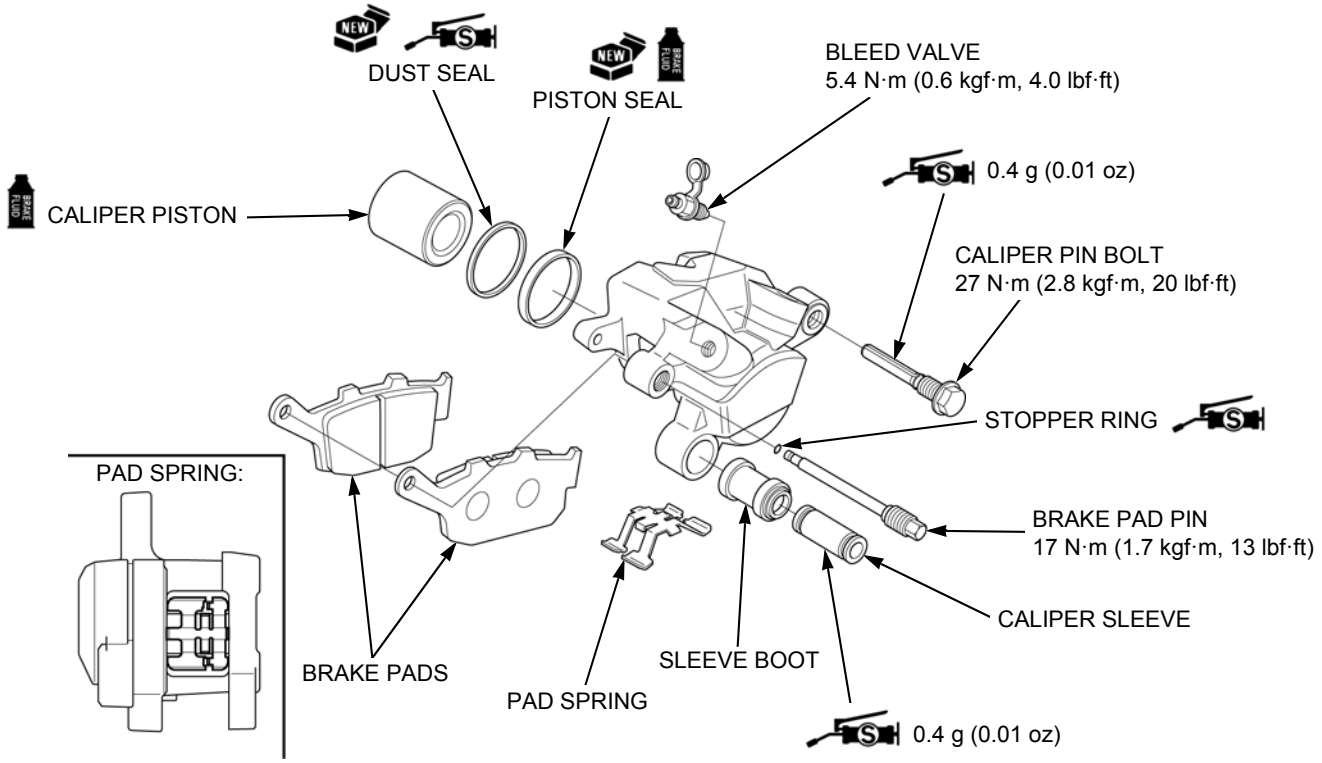
TORQUE: Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the rear brake hydraulic system (page 18-6).

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the rear brake caliper as shown in the following illustration.

- When removing the caliper piston with compressed air, place a shop towel over the piston to prevent damaging the piston and caliper body. Do not use high pressure or bring the nozzle too close to the fluid inlet.
- Install the piston with the opening toward the pads.



INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

– caliper cylinder
– caliper piston

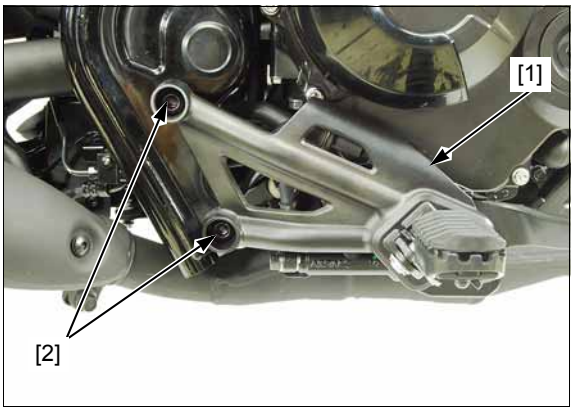
Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

BRAKE PEDAL

REMOVAL/INSTALLATION

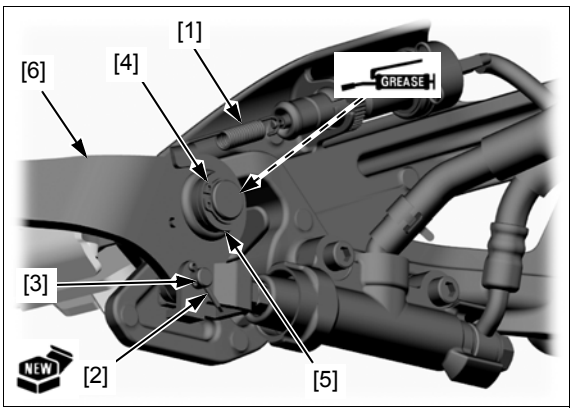
Remove the right side cover (page 2-4).

Support the right rider footpeg bracket [1] securely and remove the bracket bolts [2].



Remove the following:

– switch spring [1]
– cotter pin [2]
– joint pin [3]
– snap ring [4]
– washer [5]
– brake pedal [6]



Installation is in the reverse order of removal.

NOTE:

- Apply grease to the pedal pivot sliding area (grease groove).
- Install the snap ring with the chamfered edge facing the thrust load side and be certain it is firmly seated in the groove. Do not reuse the snap ring which could easily spin in the groove.
- Replace the cotter pin with a new one.
- Install the each spring in the direction as shown.

TORQUE:

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

MEMO

19. ANTI-LOCK BRAKE SYSTEM (ABS)

SERVICE INFORMATION

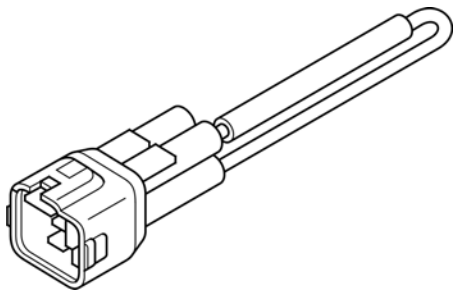
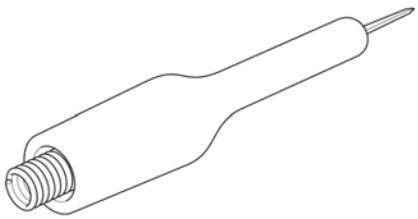
GENERAL

NOTICE

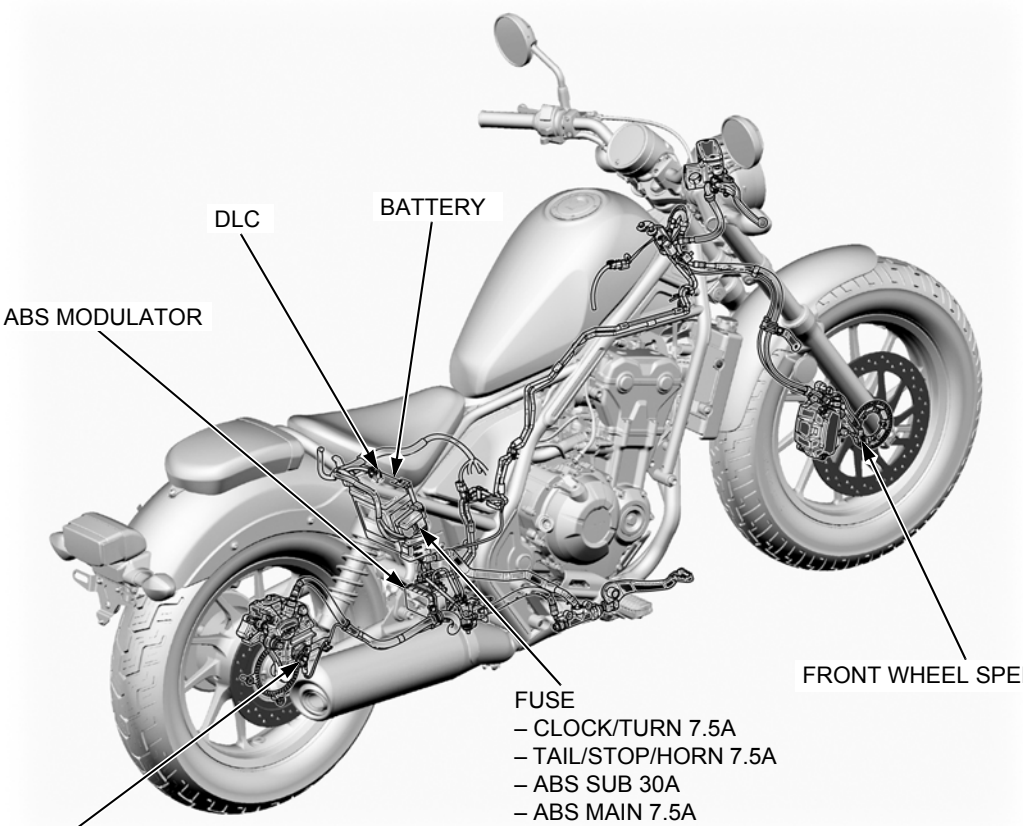
- *The ABS modulator may be damaged if dropped. Also if a connector is disconnected when current is flowing, the excessive voltage may damage the control unit. Always turn off the ignition switch before servicing.*
- *Spilling brake fluid will severely damage plastic parts and painted surfaces. It is 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 19-22).
- The following color codes are used throughout this section.

Bl = Black	G = Green	P = Pink	W = White
Bu = Blue	Gr = Gray	R = Red	

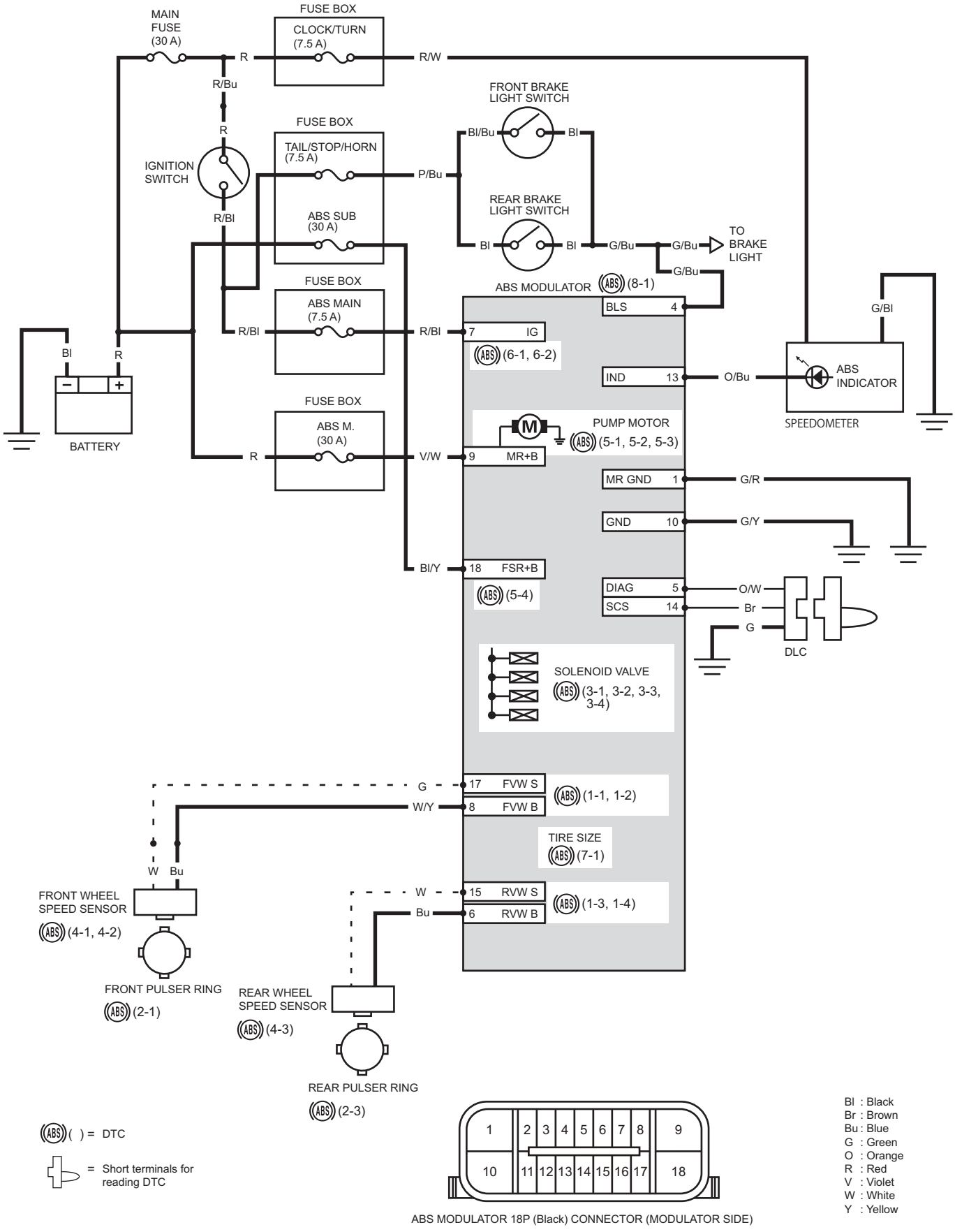
TOOLS

SCS short connector 070PZ-ZY30100	Test probe, 2 pack 07ZAJ-RDJA110
	

SYSTEM LOCATION



SYSTEM DIAGRAM



ABS TROUBLESHOOTING INFORMATION

SYSTEM DESCRIPTION

SUMMARY OF ABS PRE-START SELF-DIAGNOSIS SYSTEM

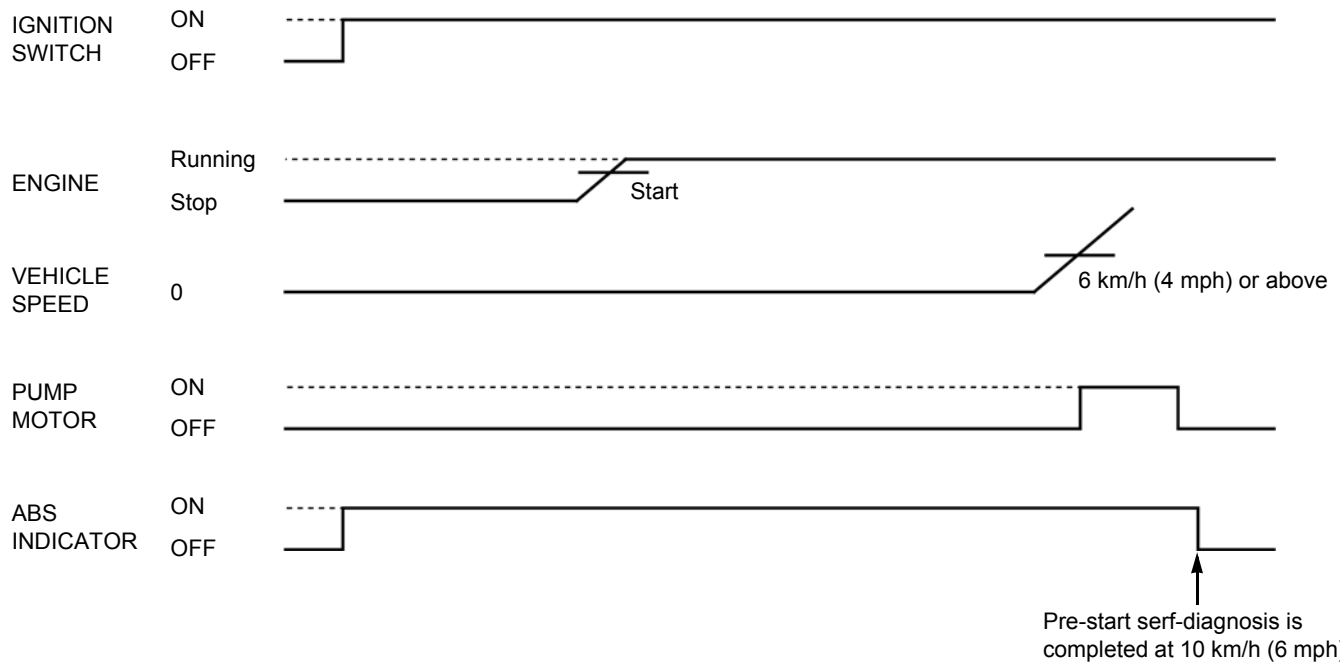
The ABS pre-start self-diagnosis system diagnoses the electrical system as well as the operating status of the modulator. When there is any abnormality, the problem and the associated part can be detected by reading the DTC.

When the motorcycle is running, pulse signals generated at the front and rear wheel speed sensors are sent to the ABS control unit. When the vehicle speed reaches approximately 6 km/h (4 mph), the ABS control unit operates the pump motor to check it. When the vehicle speed reaches 10 km/h (6 mph), the ABS control unit turns off the ABS indicator if the system is normal and the pre-start self-diagnosis is completed.

If any problem is detected, the ABS indicator blinks or comes on and stays on to notify the rider of the problem. The self-diagnosis is also made while the motorcycle is running, and the ABS indicator blinks when a problem is detected.
When the ABS indicator blinks, the cause of the problem can be identified by reading the DTC (page 19-6).

If the ABS indicator does not come on when the ignition switch is turned ON, or the ABS indicator stays on after the pre-start self-diagnosis is completed although the ABS system is normal, the ABS indicator circuit may be faulty. Follow the troubleshooting (page 19-11).

Pre-start 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

- The MCS can read out and erase the DTC.

How to connect the MCS

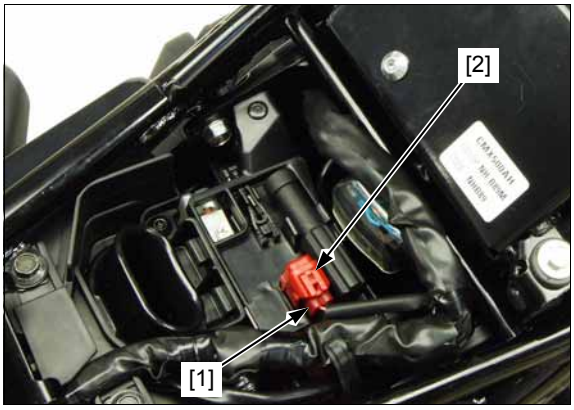
Remove the single seat (page 2-4).

Turn the ignition switch OFF.

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

Connect the MCS to the DLC.

Turn the ignition switch ON with the engine stop switch "○" and check the DTC.



DTC READOUT

NOTE:

- The DTC is not erased by turning the ignition switch OFF while the DTC is being output. Note that turning the ignition switch ON again does not indicate the DTC. To show the DTC again, repeat the DTC readout procedures from the beginning.
- Be sure to record the indicated DTC(s).
- After diagnostic troubleshooting, erase the DTC and perform the pre-start self-diagnosis procedure to be sure that there is no problem in the ABS (page 19-5).
- Do not apply the brake during DTC readout.

Connect the MCS to the DLC (page 19-6).

Read the DTC and follow the DTC index (page 19-9).

- If the MCS is not available, perform the following.

Reading DTC with the ABS indicator

Remove the single seat (page 2-4).

Turn the ignition switch OFF.

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

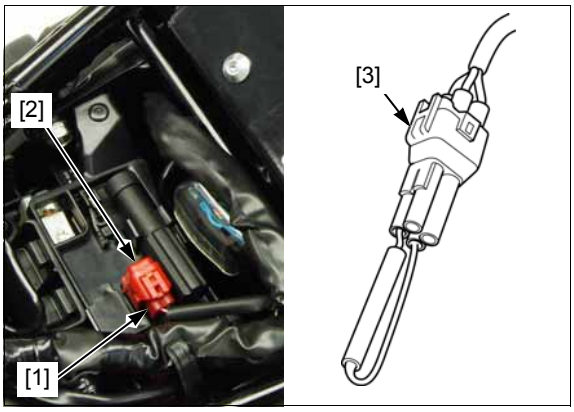
TOOL:
[2] SCS short connector 070PZ-ZY30100

CONNECTION: Brown – Green

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

The ABS indicator should come on 2 seconds (start signal) (then goes off 3.6 seconds) and starts DTC indication.

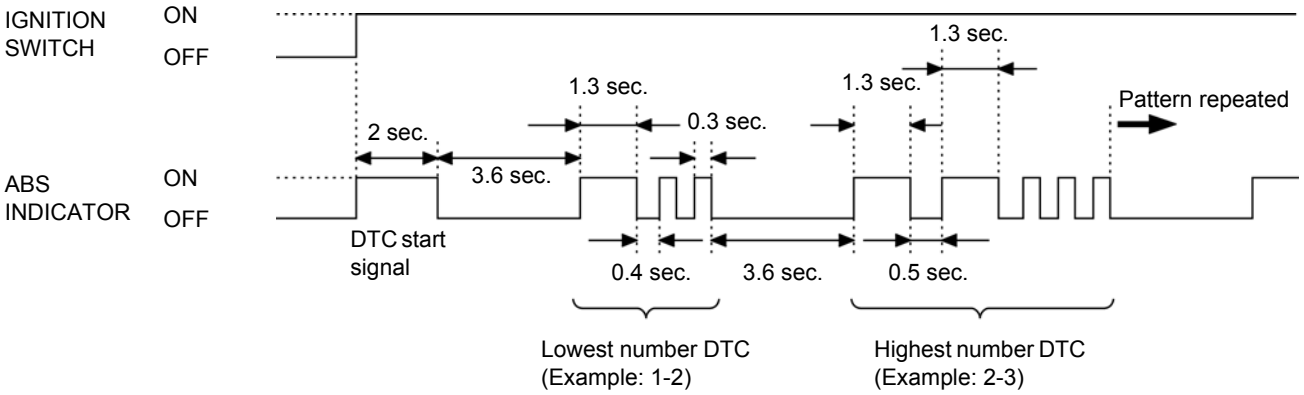
The DTC is indicated by the number of the times of the ABS indicator blinking.
If the DTC is not stored, the ABS indicator stays on.



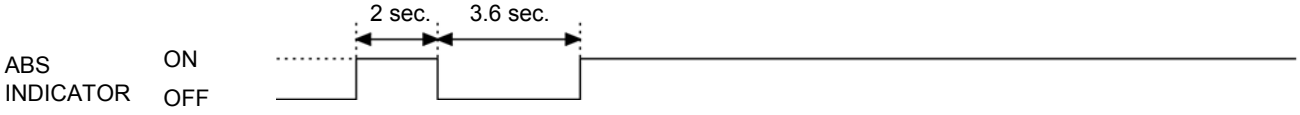
DTC INDICATION PATTERN

NOTE:

- The ABS indicator indicates the DTC by blinking a specified number of times. The indicator has two types of blinking, a long blink and short blink. The long blink lasts for 1.3 seconds, the short blink lasts for 0.3 seconds. For example, when one long blink is followed by two short blinks, the DTC is 1-2 (one long blink = 1 blink, plus two short blinks = 2 blinks).
- When the ABS control unit stores some DTCs, the ABS indicator shows the DTCs in the order from the lowest number to highest number. For example, when the ABS indicator indicates DTC 1-2, then indicates DTC 2-3, two failures have occurred.



When the DTC is not stored:



ERASING STORED DTC

NOTE:

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

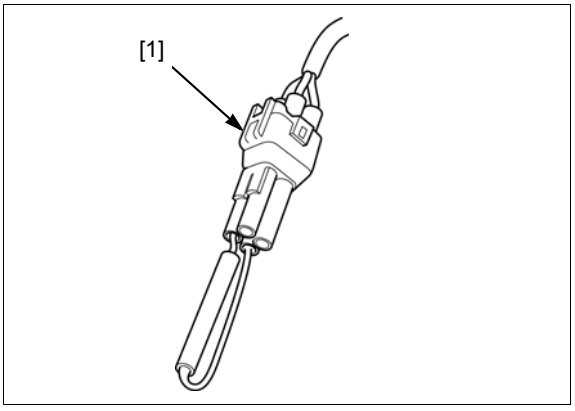
Erase the DTC with the MCS while the engine is stopped.

How to erase the DTC without MCS

1. Connect the SCS short connector [1] to the DLC (page 19-6).
2. While squeezing the brake lever, turn the ignition switch ON with the engine stop switch to "". The ABS indicator should come on for 2 seconds and go off.
3. Release the brake lever immediately after the ABS indicator goes off. The ABS indicator should come on.
4. Squeeze the brake lever immediately after the ABS indicator comes on. The ABS indicator should go off.
5. Release the brake lever immediately after the ABS indicator goes off.

   When the DTC is erased, the ABS indicator blinks 2 times and stays on. If the ABS indicator does not blink 2 times, the self-diagnostic memory has not been erased, so try again.
6. Turn the ignition switch OFF and remove the SCS short connector from the DLC.

   Install the single seat (page 2-4).



CIRCUIT INSPECTION

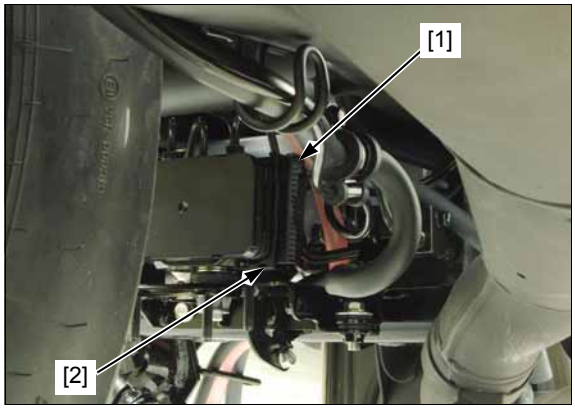
INSPECTION AT ABS MODULATOR CONNECTOR

Remove the ABS modulator cover (page 19-24).

Turn the ignition switch OFF.

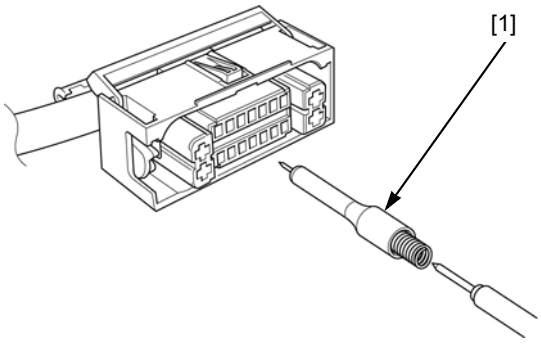
Disconnecting procedure:
Turn the lock lever [1] to this side while pressing the lock tab to release it.
Be sure the lock lever is turned all the way and disconnect the ABS modulator 18P (Black) connector [2].

Connecting procedure:
Be sure to seat the lock lever against the wire side of the connector fully.
Connect the ABS modulator 18P (Black) connector by pressing it straight at the area as shown (arrow) until the lock tab clicks.
Make sure the connector is locked securely.

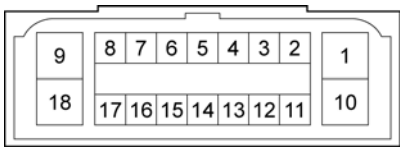


- Always clean around and keep any foreign material away from the connector before disconnecting it.
- A faulty ABS is often related to poorly connected or corroded connections. Check those connections before proceeding.
- In testing at ABS modulator 18P (Black) connector terminals (wire harness side; except No. 9 and No. 18 terminals), always use the test probe [1]. Insert the test probe into the connector terminal, then connect the digital multimeter probe to the test probe.

TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**



TERMINAL LAYOUT:



(Terminal side of the wire harness)

DTC INDEX

NOTE:

- The ABS indicator might blink in the following cases. Correct the faulty part.
  - Incorrect tire pressure.
  - Tires not recommended for the motorcycle were installed (incorrect tire size).
  - Deformation of the wheel or tire.
- The ABS indicator might blink while riding under the following conditions. This is temporary failure. Be sure to erase the DTC (page 19-7). Then, test-ride the motorcycle above 30 km/h (19 mph) and check the DTC (page 19-6). Ask the rider for the riding conditions in detail when the motorcycle is brought in for inspection.
  - The motorcycle has continuously run bumpy roads.
  - The front wheel leaves the ground for a long time when riding (wheelie).
  - Only either the front or rear wheel rotates.
  - The ABS operates continuously.
  - The ABS control unit has been disrupted by an extremely powerful radio wave (electromagnetic interference).

DTC	Function failure	Detection		Symptom/Fail-safe function	Refer to
		A	B		
–	ABS indicator malfunction • ABS modulator voltage input line • Indicator related wires • speedometer • ABS modulator • ABS MAIN fuse (7.5 A)			• ABS indicator never comes ON at all	19-11
				• ABS indicator stays ON at all	19-11
1-1	Front wheel speed sensor circuit malfunction • Wheel speed sensor or related wires	○	○	• Stops ABS operation	19-13
1-2	Front wheel speed sensor malfunction • Wheel speed sensor, pulser ring or related wires • Electromagnetic interference		○	• Stops ABS operation	19-13
1-3	Rear wheel speed sensor circuit malfunction • Wheel speed sensor or related wires	○	○	• Stops ABS operation	19-15
1-4	Rear wheel speed sensor malfunction • Wheel speed sensor, pulser ring or related wires • Electromagnetic interference		○	• Stops ABS operation	19-15
2-1	Front pulser ring • Pulser ring or related wires		○	• Stops ABS operation	19-13
2-3	Rear pulser ring • Pulser ring or related wires		○	• Stops ABS operation	19-15
3-1	Solenoid valve malfunction (ABS modulator)	○	○	• Stops ABS operation	19-17
3-2					
3-3					
3-4					
4-1	Front wheel lock • Riding condition		○	• Stops ABS operation	19-13
4-2	Front wheel lock (Wheelie) • Riding condition		○		
4-3	Rear wheel lock • Riding condition		○	• Stops ABS operation	19-15
5-1	Pump motor lock • Pump motor (ABS modulator) or related wires • ABS M. fuse (30 A)	○	○	• Stops ABS operation	19-17
5-2	Pump motor stuck off • Pump motor (ABS modulator) or related wires • ABS M. fuse (30 A)	○	○	• Stops ABS operation	19-17
5-3	Pump motor stuck on • Pump motor (ABS modulator) or related wires • ABS M. fuse (30 A)	○	○	• Stops ABS operation	19-17
5-4	Fail safe relay malfunction • Fail safe relay relay (ABS modulator) or related wires • ABS sub fuse (30 A)	○	○	• Stops ABS operation	19-19

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 (7.5 A)	○	○	• Stops ABS operation	19-20
6-2	Power circuit over voltage • Input voltage (too high)	○	○	• Stops ABS operation	
7-1	Tire malfunction • Tire size		○	• Stops ABS operation	19-21
8-1	ABS control unit • ABS control unit malfunction (ABS modulator)	○	○	• Stops ABS operation	19-21

(A) Pre-start self-diagnosis (page 19-5).

(B) Ordinary self-diagnosis: diagnoses while the motorcycle is running (after pre-start self-diagnosis)

ABS INDICATOR CIRCUIT TROUBLESHOOTING

ABS INDICATOR DOES NOT COME ON (when the ignition switch turned ON)

NOTE:

- Before starting this inspection, check the initial operation of the speedometer (page 21-7).

1. Indicator Operation Inspection

Turn the ignition switch OFF.
Disconnect the ABS modulator 18P (Black) connector (page 19-8).
Turn the ignition switch ON with the engine stop switch "".
Check the ABS indicator.

Does the ABS indicator come on?

YES – Faulty ABS modulator

NO – GO TO STEP 2.

2. Indicator Signal Line Short Circuit Inspection

Turn the ignition switch OFF.
Check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

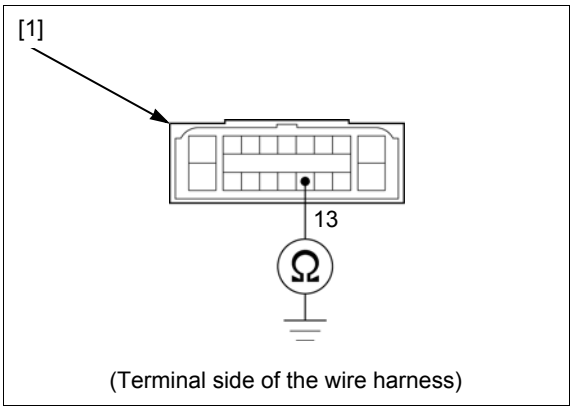
TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

CONNECTION: 13 – Ground

Is there continuity?

YES – Short circuit in the Orange/blue wire

NO – Faulty speedometer



(Terminal side of the wire harness)

ABS INDICATOR STAYS ON (Indicator does not go off when the motorcycle is running)

1. Service Check Line Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ABS modulator 18P (Black) connector (page 19-8).
Check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

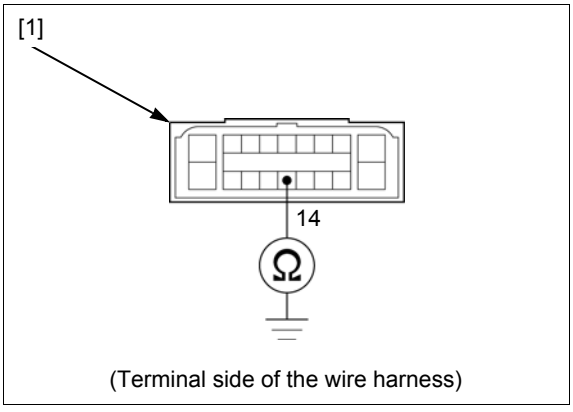
TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

CONNECTION: 14 – Ground

Is there continuity?

YES – Short circuit in the Brown wire

NO – GO TO STEP 2.



(Terminal side of the wire harness)

2. Indicator Signal Line Open Circuit Inspection

Short the wire harness side ABS modulator 18P (Black) connector [1] terminal to the ground with a jumper wire [2].

TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

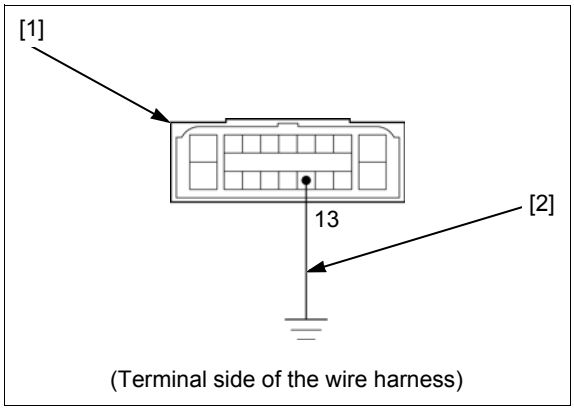
CONNECTION: 13 – Ground

Turn the ignition switch ON with the engine stop switch "".
Check the ABS indicator.

Does it go off?

YES – GO TO STEP 3.

NO – • Open circuit in the Orange/blue wire
• Faulty speedometer (if the Orange/blue wire is OK)



(Terminal side of the wire harness)

3. Modulator Ground Line Open Circuit Inspection

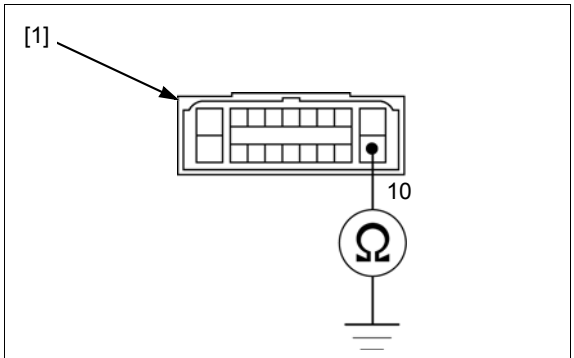
Turn the ignition switch OFF.
Check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

CONNECTION: 10 – Ground

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Green/yellow wire



(Terminal side of the wire harness)

4. Fuse Inspection

Remove the single seat (page 2-4).

Check the ABS MAIN fuse (7.5 A) [1] for blown.

Is the fuse blown?

YES – GO TO STEP 5.

NO – GO TO STEP 6.

5. Power Input Line Short Circuit Inspection

With the ABS MAIN fuse (7.5 A) removed, check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] and ground.

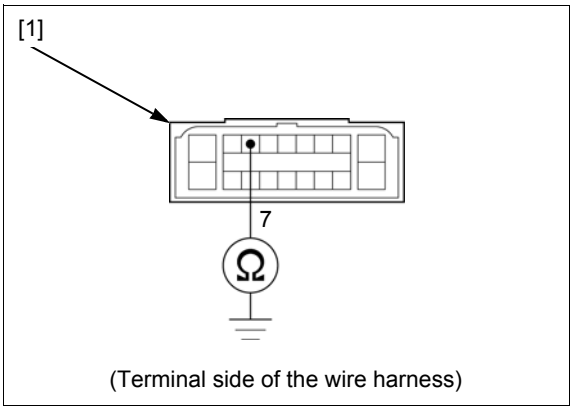
TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

CONNECTION: 7 – Ground

Is there continuity?

YES – Short circuit in Red/black wire

NO – Intermittent failure. Replace the ABS MAIN fuse (7.5 A) with a new one, and recheck.



(Terminal side of the wire harness)

6. Power Input Line Open Circuit Inspection

Install the ABS MAIN fuse (7.5 A).
Turn the ignition switch ON with the engine stop switch "".
Measure the voltage between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

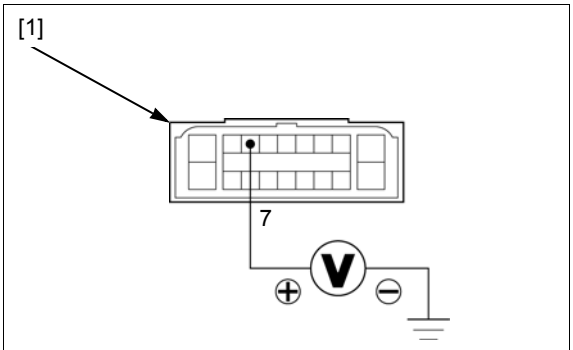
TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

CONNECTION: 7 (+) – Ground (–)

Is there battery voltage?

YES – Faulty ABS modulator

NO – Open circuit in Red/black wire



(Terminal side of the wire harness)

ABS TROUBLESHOOTING

NOTE:
- Perform inspection with the ignition switch OFF, unless otherwise specified.
- All connector diagrams in the troubleshooting are viewed from the terminal side.
- Use a fully charged battery. Do not diagnose with a charger connected to the battery.
- When the ABS modulator assembly is detected to be faulty, recheck the wire harness and connector connections closely before replacing it.
- After diagnostic troubleshooting, erase the DTC (page 19-7) and test-ride the motorcycle to check that the ABS indicator operates normally during pre-start self-diagnosis (page 19-5).

DTC 1-1, 1-2, 2-1, 4-1 or 4-2 (Front Wheel Speed Sensor Circuit/Front Wheel Speed Sensor/Front Pulser Ring/Front Wheel Lock)

NOTE:
- The ABS indicator might blink under unusual riding or conditions (page 19-9). This is temporary failure. Erase the DTC (page 19-7) then test-ride the motorcycle above 30 km/h (19 mph) check that the ABS indicator operates normally (page 19-5).
- If the DTC 4-1 is indicated, check the front brake for drag.

1. Speed Sensor Air Gap Inspection

Measure the air gap between the speed sensor and pulser ring (page 19-22).

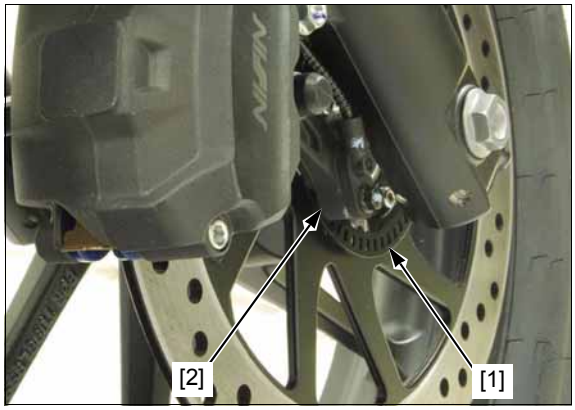
Is the air gap correct?

YES – GO TO STEP 2.

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

2. Speed Sensor Condition Inspection

Inspect the area around the front wheel speed sensor:
Check that there is iron or other magnetic deposits between the pulser ring [1] and wheel speed sensor [2], and the pulser ring slots for obstructions.
Check the installation condition of the pulser ring or wheel speed sensor for looseness.
Check the pulser ring and sensor tip for deformation or damage (e.g., chipped pulser ring teeth).



Are the sensor and pulser ring in good condition?

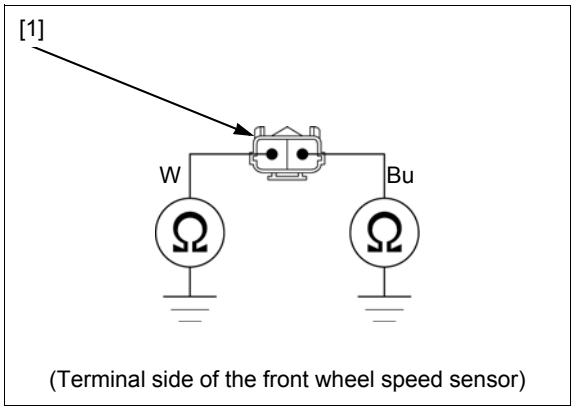
YES – GO TO STEP 3.

NO – Remove any deposits. Install properly or replace faulty part.

3. Front Wheel Speed Sensor Line Short Circuit Inspection (at sensor side)

Turn the ignition switch OFF.
Disconnect the front wheel speed sensor 2P (Blue) connector (page 19-22).
Check for continuity between each terminal of the sensor side front wheel speed sensor 2P (Blue) connector [1] and ground.

CONNECTION: White – Ground
Blue – Ground



(Terminal side of the front wheel speed sensor)

Is there continuity?

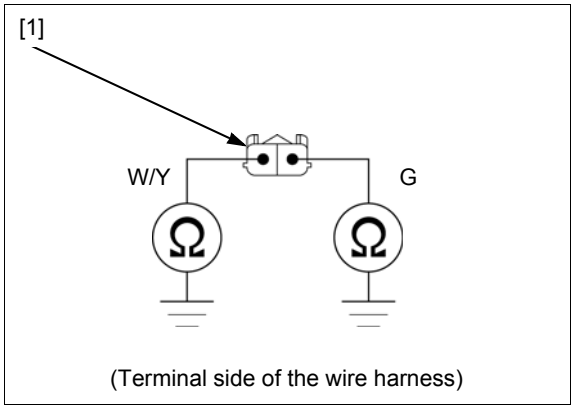
YES – Faulty front wheel speed sensor

NO – GO TO STEP 4.

4. Front Wheel Speed Sensor Line Short Circuit Inspection

Disconnect the ABS modulator 18P (Black) connector (page 19-8).
Check for continuity between each terminal of the wire harness side front wheel speed sensor 2P (Blue) connector [1] and ground.

CONNECTION: Green – Ground
White/yellow – Ground



(Terminal side of the wire harness)

Is there continuity?

YES – • Short circuit in the Green wire
• Short circuit in the White/yellow wire

NO – GO TO STEP 5.

5. Front Wheel Speed Sensor Line Open Circuit Inspection

Short the wire harness side ABS modulator 18P (Black) connector [1] terminals with a jumper wire [2].

CONNECTION: 8 – 17

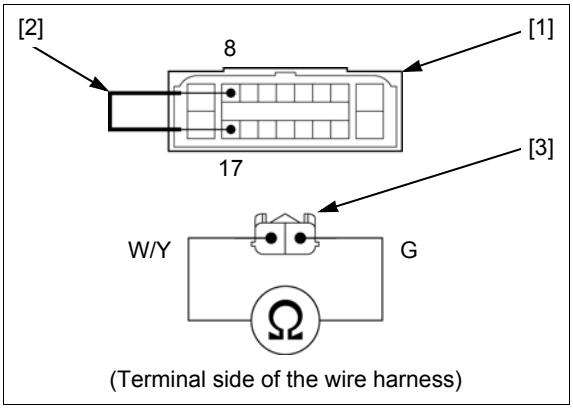
Check for continuity between the wire harness side front wheel speed sensor 2P (Blue) connector [3] terminals.

CONNECTION: Green – White/yellow

Is there continuity?

YES – GO TO STEP 6.

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



(Terminal side of the wire harness)

6. Failure Reproduction with a New Speed Sensor

Replace the front wheel speed sensor with a new one (page 19-22).
Connect the ABS modulator 18P (Black) and front wheel speed sensor 2P (Blue) connectors.
Erase the DTC (page 19-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-6).

Is the DTC 1-1, 1-2, 2-1, 4-1 or 4-2 indicated?

YES – Faulty ABS modulator

NO – Faulty original wheel speed sensor

DTC 1-3, 1-4, 2-3, or 4-3 (Rear Wheel Speed Sensor Circuit/Rear Wheel Speed Sensor/Rear Pulser Ring/Rear Wheel Lock)

NOTE:

- The ABS indicator might blink under unusual riding or conditions (page 19-9). This is temporary failure. Erase the DTC (page 19-7) then test-ride the motorcycle above 30 km/h (19 mph) check that the ABS indicator operates normally (page 19-5).
- If the DTC 4-3 is indicated, check the front brake for drag.

1. Speed Sensor Air Gap Inspection

Measure the air gap between the speed sensor and pulser ring (page 19-22).

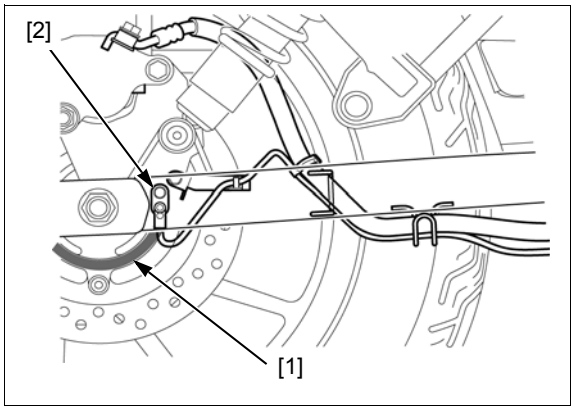
Is the air gap correct?

YES – GO TO STEP 2.

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

2. Speed Sensor Condition Inspection

Inspect the area around the rear wheel speed sensor:
Check that there is iron or other magnetic deposits between the pulser ring [1] and wheel speed sensor [2], and the pulser ring slots for obstructions.
Check the installation condition of the pulser ring or wheel speed sensor for looseness.
Check the pulser ring and sensor tip for deformation or damage (e.g., chipped pulser ring teeth).



Are the sensor and pulser ring in good condition?

YES – GO TO STEP 3.

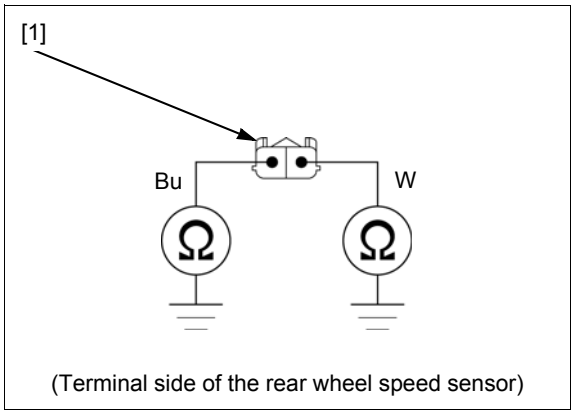
NO – Remove any deposits. Install properly or replace faulty part.

3. Rear Wheel Speed Sensor Line Short Circuit Inspection (at sensor side)

Turn the ignition switch OFF.
Remove the right side cover (page 2-4).
Disconnect the rear wheel speed sensor 2P (Gray) connector [1].

Check for continuity between each terminal of the sensor side rear wheel speed sensor 2P (Gray) connector [1] and ground.

CONNECTION: Blue – Ground
White – Ground



(Terminal side of the rear wheel speed sensor)

Is there continuity?

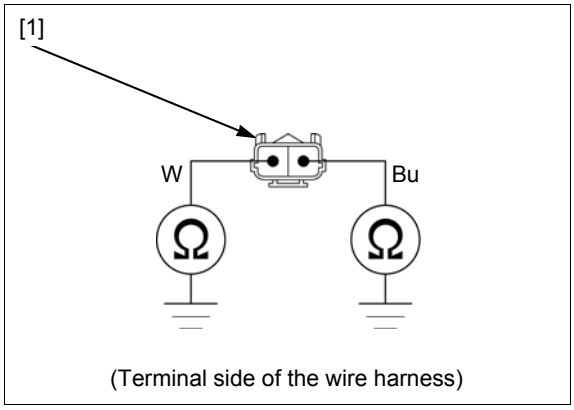
YES – Faulty rear wheel speed sensor

NO – GO TO STEP 4.

4. Rear Wheel Speed Sensor Line Short Circuit Inspection

Disconnect the ABS modulator 18P (Black) connector (page 19-8).
Check for continuity between each terminal of the wire harness side rear wheel speed sensor 2P (Gray) connector [1] and ground.

CONNECTION: Blue – Ground
White – Ground



(Terminal side of the wire harness)

Is there continuity?

YES – • Short circuit in the White wire
• Short circuit in the Blue wire

NO – GO TO STEP 5.

5. Rear Wheel Speed Sensor Line Open Circuit Inspection

Short the wire harness side ABS modulator 18P (Black) connector [1] terminals with a jumper wire [2].

CONNECTION: 6 – 15

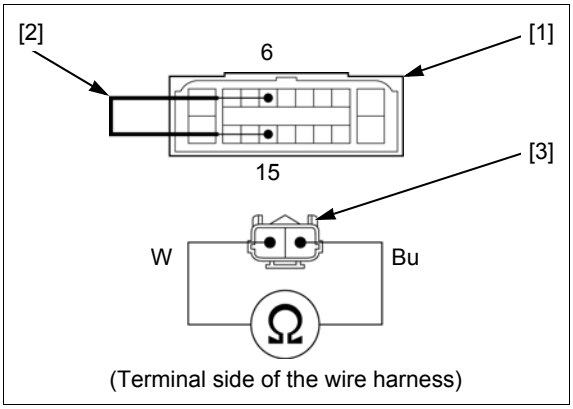
Check for continuity between the wire harness side rear wheel speed sensor 2P (Gray) connector [3] terminals.

CONNECTION: White – Blue

Is there continuity?

YES – GO TO STEP 6.

NO – Open circuit in the White or Blue wire



(Terminal side of the wire harness)

6. Failure Reproduction with a New Speed Sensor

Replace the rear wheel speed sensor with a new one (page 19-22).
Connect the ABS modulator 18P (Black) and rear wheel speed sensor 2P (Gray) connectors.
Erase the DTC (page 19-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-6).

Is the DTC 1-3, 1-4, 2-3, or 4-3 indicated?

YES – Faulty ABS modulator

NO – Faulty original wheel speed sensor

DTC 3-1, 3-2, 3-3 or 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 or 5-3 (Pump Motor Lock/ Stuck Off/stuck On)

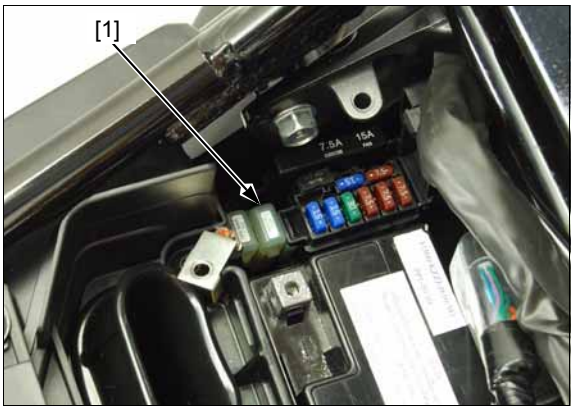
1. Fuse Inspection

Turn the ignition switch OFF.
Remove the single seat (page 2-4).
Check the ABS M. fuse (30 A) [1] for blown.

Is the fuse blown?

YES – GO TO STEP 2.

NO – GO TO STEP 3.



2. Motor Power Input Line Short Circuit Inspection

Disconnect the ABS modulator 18P (Black) connector (page 19-8).
With the ABS M. fuse (30 A) removed, check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

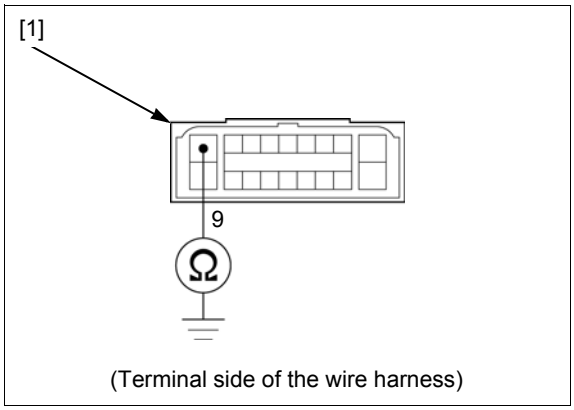
TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

CONNECTION: 9 – Ground

Is there continuity?

YES – Short circuit in the Violet/white wire between the fuse box and ABS modulator 18P (Black) connector

NO – Intermittent failure. Replace the ABS M. fuse (30 A) with a new one, and recheck.



(Terminal side of the wire harness)

3. Motor Power Input Line Open Circuit Inspection

Install the ABS M. fuse (30 A).
Disconnect the ABS modulator 18P (Black) connector (page 19-8).
Measure the voltage between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

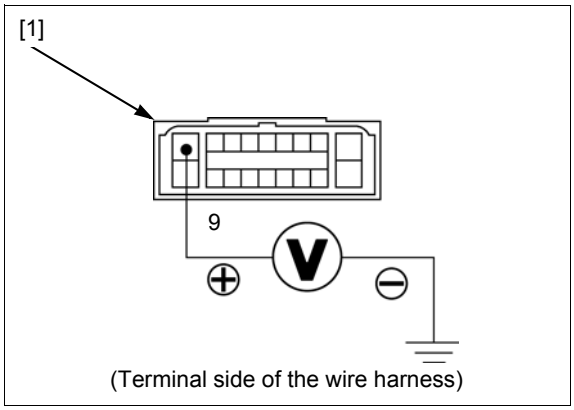
TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

CONNECTION: 9 (+) – Ground (–)

Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in the Red or Violet/white wire between the battery and ABS modulator 18P (Black) connector



(Terminal side of the wire harness)

4. Failure Reproduction

Turn the ignition switch OFF.
Connect the ABS modulator 18P (Black) connector.
Erase the DTC (page 19-7).
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?

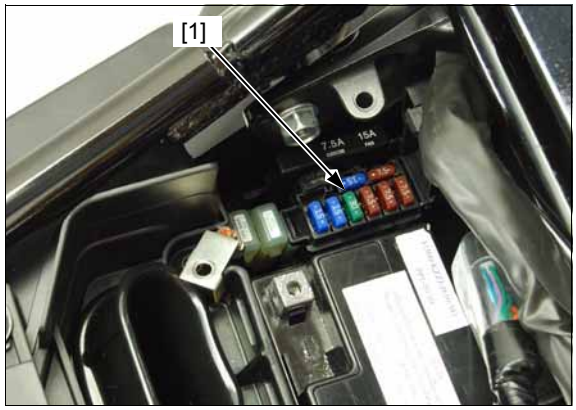
YES – Faulty ABS modulator

NO – Pump motor is normal (intermittent failure).

DTC 5-4 (Fail Safe Relay)

1. Fuse Inspection

Turn the ignition switch OFF.
Remove the single seat (page 2-4).
Check the ABS sub fuse (30 A) [1] for blown.



Is the fuse blown?

YES – GO TO STEP 2.

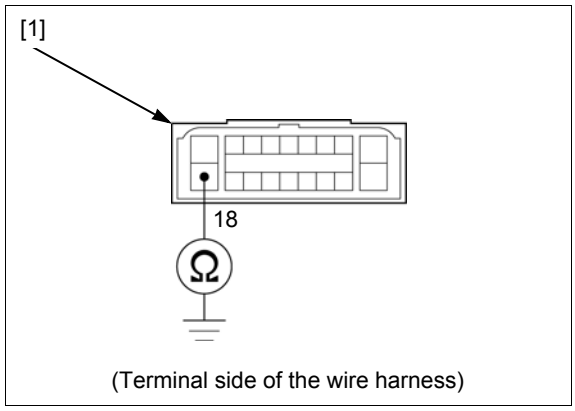
NO – GO TO STEP 3.

2. Relay Input Line Short Circuit Inspection

Disconnect the ABS modulator 18P (Black) connector (page 19-8).
With the ABS sub fuse (30 A) removed, check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

CONNECTION: 18 – Ground



(Terminal side of the wire harness)

Is there continuity?

YES – Short circuit in the Black/yellow wire between the fuse box and ABS modulator 18P (Black) connector

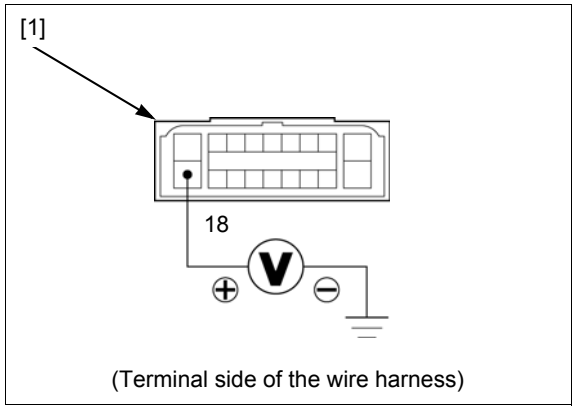
NO – Intermittent failure. Replace the ABS sub fuse (30 A) with a new one, and recheck.

3. Relay Input Line Open Circuit Inspection

Install the ABS sub fuse (30 A).
Disconnect the ABS modulator 18P (Black) connector (page 19-8).
Measure the voltage between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

CONNECTION: 18 (+) – Ground (–)



(Terminal side of the wire harness)

Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in the Red or Black/yellow wire between the battery and ABS modulator 18P (Black) connector

4. Failure Reproduction

Turn the ignition switch OFF.
Connect the ABS modulator 18P (Black) connector.
Erase the DTC (page 19-7).
Test-ride the motorcycle 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 or 6-2 (Power Circuit)

1. Fuse Inspection

Turn the ignition switch OFF.
Remove the single seat (page 2-4)
Check the ABS MAIN fuse (7.5 A) for blown.

Is the fuse blown?

YES – GO TO STEP 2.

NO – GO TO STEP 3.

2. Power Input Line Short Circuit Inspection

Disconnect the ABS modulator 18P (Black) connector (page 19-8).
With the ABS MAIN fuse (7.5 A) removed, check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] and ground.

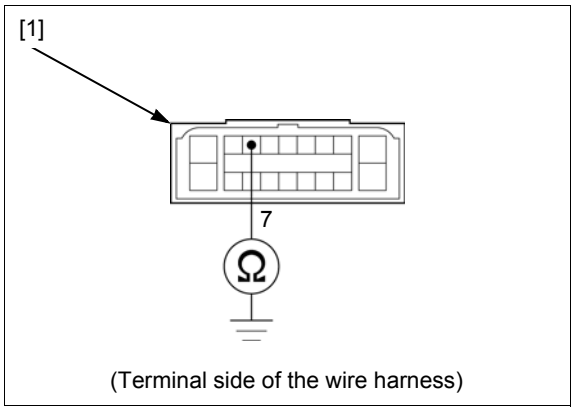
TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

CONNECTION: 7 – Ground

Is there continuity?

YES – Short circuit in Red/black wire

NO – Intermittent failure. Replace the ABS MAIN fuse (7.5 A) with a new one, and recheck.



(Terminal side of the wire harness)

3. Power Input Line Open Circuit Inspection

Install the ABS MAIN fuse (7.5 A).
Disconnect the ABS modulator 18P (Black) connector (page 19-8).
Turn the ignition switch ON with the engine stop switch "○".
Measure the voltage between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

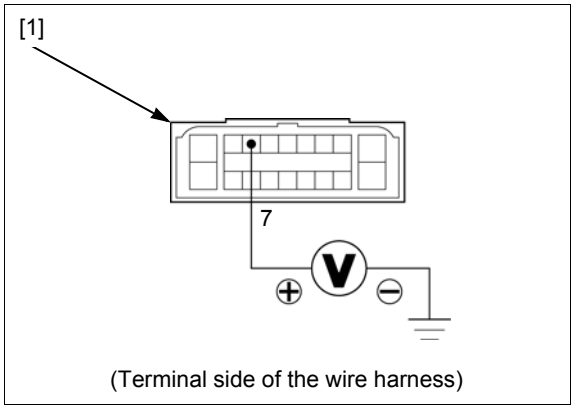
TOOL:
Test probe, 2 pack **07ZAJ-RDJA110**

CONNECTION: 7 (+) – Ground (–)

Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in Red/black wire



(Terminal side of the wire harness)

4. Failure Reproduction

Turn the ignition switch OFF.
Connect the ABS modulator 18P (Black) connector.
Erase the DTC (page 19-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-6).

Is the DTC 6-1 or 6-2 indicated?

YES – Faulty ABS modulator

NO – Power circuit is normal (intermittent failure)

DTC 7-1 (Tire Size)

NOTE:

- Check the following and correct the faulty part.
  – Incorrect tire pressure.
  – Tires not recommended for the motorcycle were installed (incorrect tire size).
  – Deformation of the wheel or tire.

1. Failure Reproduction

If the above items are normal, recheck the DTC indication:
Erase the DTC (page 19-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-6).

Is the DTC 7-1 indicated?

YES – Faulty ABS modulator

NO – Tire size is normal (intermittent failure)

DTC 8-1 (ABS Control Unit)

1. Failure Reproduction

Erase the DTC (page 19-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 19-6).

Is the DTC 8-1 indicated?

YES – Faulty ABS modulator

NO – ABS control unit is normal (intermittent failure)

WHEEL SPEED SENSOR

AIR GAP INSPECTION

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

Measure the clearance (air gap) between the caliper bracket and pulser ring at several points by turning the wheel slowly.
It must be within specification.

STANDARD:

Front:	**0.67 – 1.26 mm (0.026 – 0.050 in)**
Rear:	**0.72 – 1.31 mm (0.028 – 0.052 in)**

The clearance (air gap) cannot be adjusted.
If it is not within specification, check each part for deformation, looseness or damage.

Check the wheel speed sensor for damage, and replace if necessary.

Check the pulse ring for deformation or damage, and replace if necessary.

– Front pulser ring (page 16-11)
– Rear pulser ring (page 17-6)

WHEEL SPEED SENSOR REPLACEMENT

NOTE:
Refer to procedure for the pulser ring removal/ installation.

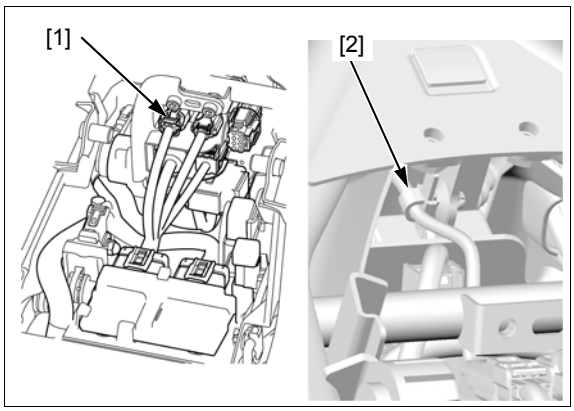
– Front pulser ring (page 16-11)
– Rear pulser ring (page 17-6)

FRONT WHEEL SPEED SENSOR REMOVAL/ INSTALLATION

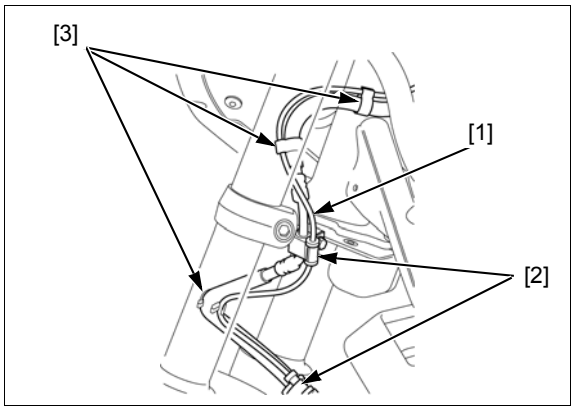
Lift the fuel tank and support it (page 3-4).

Remove the front wheel speed sensor 2P (Blue) connector [1] from the frame and disconnect the connector.

Release the sensor wire band boss [2] from the frame.

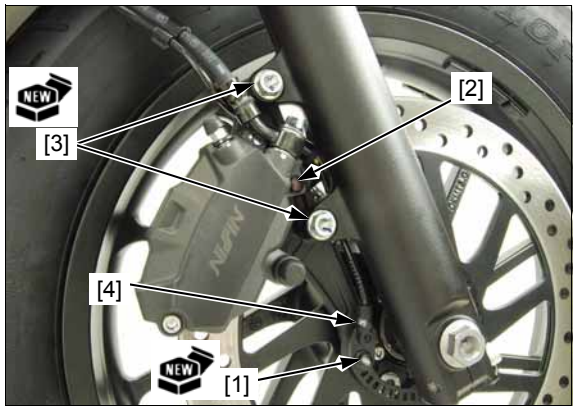


Remove the sensor wire [1] from the stays [2] and clamps [3].



Remove the front wheel speed sensor mounting bolt [1], sensor wire guide blot [2].

Remove the mounting bolts [3] and hold the front brake caliper.
Slide the front brake caliper and remove the front wheel speed sensor [4].



Installation is in the reverse order of removal.

NOTE:

- Clean around the mounting area of the caliper bracket thoroughly, and be sure that no foreign material is allowed to enter the mounting hole.
- Always replace the front brake caliper mounting bolts and front wheel speed sensor mounting bolt with new ones.
- Check the clearance between the caliper bracket and pulser ring is 0.67 – 1.26 mm (0.026 – 0.050 in).
- The clearance gap cannot be adjusted.
  If it is not within specification, check related part for deformation, looseness, or damage.

TORQUE:

Front brake caliper mounting bolt:
30 N·m (3.1 kgf·m, 22 lbf·ft)

REAR WHEEL SPEED SENSOR REMOVAL/ INSTALLATION

Remove the following:

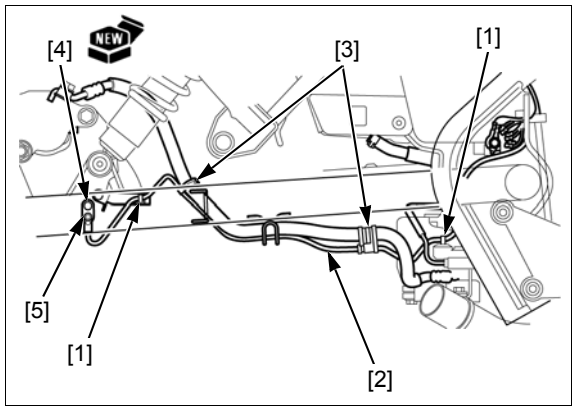
– right side cover (page 2-4)
– rear wheel (page 17-5)

Remove the rear wheel speed sensor 2P (Gray) connector [1] from the frame and disconnect the connector.

Release the sensor wire band bosses [1] from the ABS modulator stay.

Release the sensor wire [2] from the sensor wire stay [3].

Remove the mounting bolt [4] and rear wheel speed sensor [5].



Installation is in the reverse order of removal.

NOTE:

- Clean around the mounting area of the caliper bracket thoroughly, and be sure that no foreign material is allowed to enter the mounting hole.
- Always replace the rear wheel speed sensor mounting bolt with new a one.
- Check the clearance between the caliper bracket and pulser ring is 0.72 – 1.31 mm (0.028 – 0.052 in).
- The clearance gap cannot be adjusted.
  If it is not within specification, check related part for deformation, looseness, or damage.

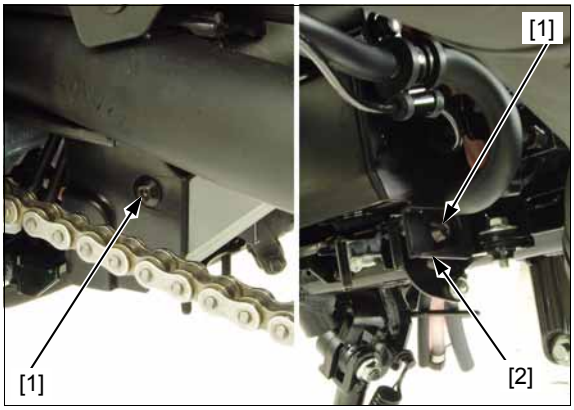
ABS MODULATOR/COVER

ABS MODULATOR COVER REMOVAL/ INSTALLATION

AC model only: Remove the EVAP canister (page 7-22).

Remove the socket bolts [1] and ABS modulator cover [2].

Installation is in the reverse order of removal.



ABS MODULATOR REMOVAL/ INSTALLATION

NOTE:

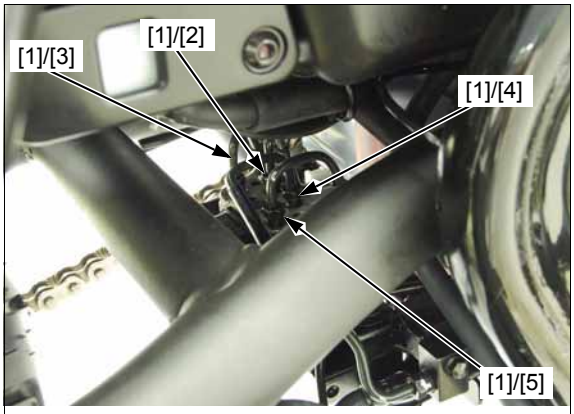
- Be careful not to bend or damage the brake pipes during assembly or removal.

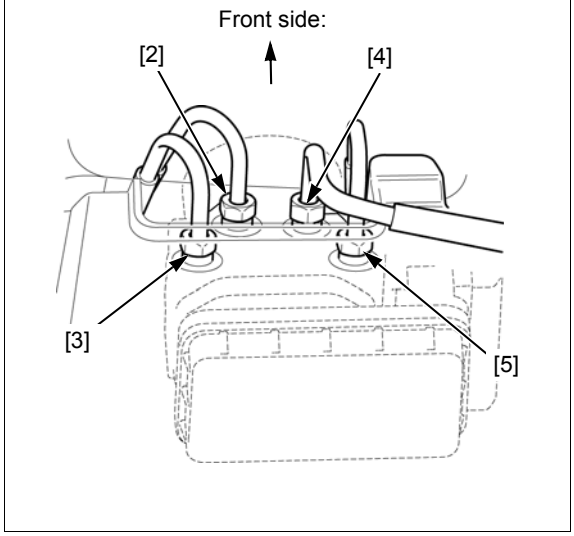
Drain the brake fluid from the lever/pedal brake line hydraulic systems (page 18-5).

Remove the ABS modulator cover (page 19-24).

Loosen the brake pipe joint nuts [1] and disconnect the following brake pipes:

– FRONT BRAKE PIPE (To FRONT MASTER CYLINDER) [2]
– FRONT BRAKE PIPE (To FRONT CALIPER) [3]
– REAR BRAKE PIPE (To REAR MASTER CYLINDER) [4]
– REAR BRAKE PIPE (To REAR CALIPER) [5]





Pull up the lock lever [1] and disconnect the ABS modulator 18P (Black) connector.

Remove the mounting bolts [2] and ABS modulator [3].

Installation is in the reverse order of removal.

Fill and bleed the front and rear brake hydraulic systems (page 18-5).

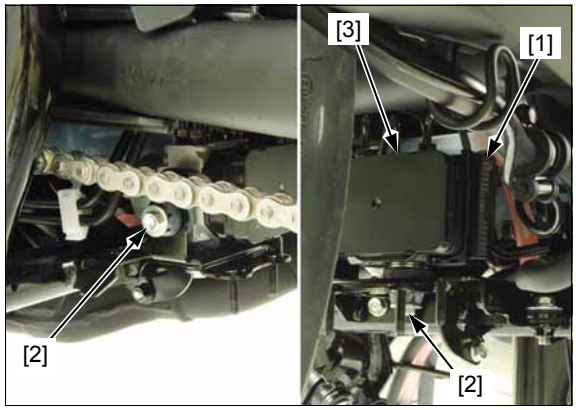
NOTE:

Apply brake fluid to the brake pipe joint nut threads while connecting the brake pipes.

TORQUE:

Brake pipe joint nut:

14 N·m (1.4 kgf·m, 10 lbf·ft)



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 physician immediately.

NOTICE

- *Always turn OFF the ignition switch before disconnecting any electrical component.*
- *Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.*

- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every 2 weeks.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.
- The maintenance free battery must be replaced when it reaches the end of its service life.
- The battery can be damaged if overcharged or undercharged, or if left to discharge for a long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2 – 3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and tail light ON for long periods of time without riding the motorcycle.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every 2 weeks to prevent sulfation from occurring.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 20-3).
- For alternator removal (page 12-5).

BATTERY CHARGING

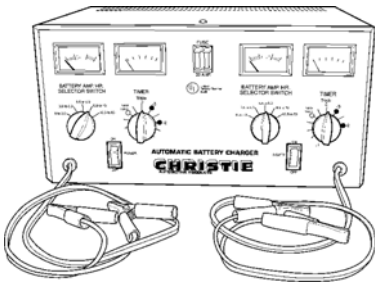
- Turn power ON/OFF at the charger, not at the battery terminal.
- For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.
- Quick charging should only be done in an emergency; slow charging is preferred.

BATTERY TESTING

Refer to the instruction of the Operation Manual for the recommended battery tester for details about battery testing. The recommended battery tester puts a "load" on the battery so the actual battery condition can be measured.

RECOMMENDED BATTERY TESTER: Micro 404XL (U.S.A. only)

TOOLS

Motorcycle battery analyzer Micro 404XL (U.S.A. only)	Christie battery charger MC1012/2T (U.S.A. only)
	

TROUBLESHOOTING

BATTERY IS DAMAGED OR WEAK

1. BATTERY TEST

Remove the battery (page 20-5).

Check the battery condition using a recommended battery tester.

RECOMMENDED BATTERY TESTER: Micro 404XL (U.S.A. only)

Is the battery in good condition?

YES – GO TO STEP 2.

NO – Faulty battery

2. CURRENT LEAKAGE TEST

Install the battery (page 20-5).

Check the battery current leakage test (Leak test; page 20-6).

Is the current leakage below 0.62 mA?

YES – GO TO STEP 4.

NO – GO TO STEP 3.

3. CURRENT LEAKAGE TEST WITHOUT REGULATOR/RECTIFIER CONNECTED

Disconnect the regulator/rectifier 3P connector and recheck the battery current leakage.

Is the current leakage below 0.62 mA?

YES – Faulty regulator/rectifier

NO –
- Shorted wire harness
- Faulty ignition switch

4. CHARGING VOLTAGE INSPECTION

Measure and record the battery voltage using a digital multimeter (page 20-5).

Start the engine.

Measure the charging voltage (page 20-6).

Compare the measurements to the results of the following calculation.

STANDARD:

Measured BV < Measured CV < 15.5 V
- **BV = Battery Voltage**
- **CV = Charging Voltage**

Is the measured charging voltage within the standard voltage?

YES – Faulty battery

NO – GO TO STEP 5.

5. ALTERNATOR CHARGING COIL INSPECTION

Check the alternator charging coil (page 20-7).

Is the alternator charging coil resistance within 0.1 – 1.0 Ω (20°C)?

YES – Faulty charging coil

NO – GO TO STEP 6.

6. REGULATOR/RECTIFIER SYSTEM INSPECTION

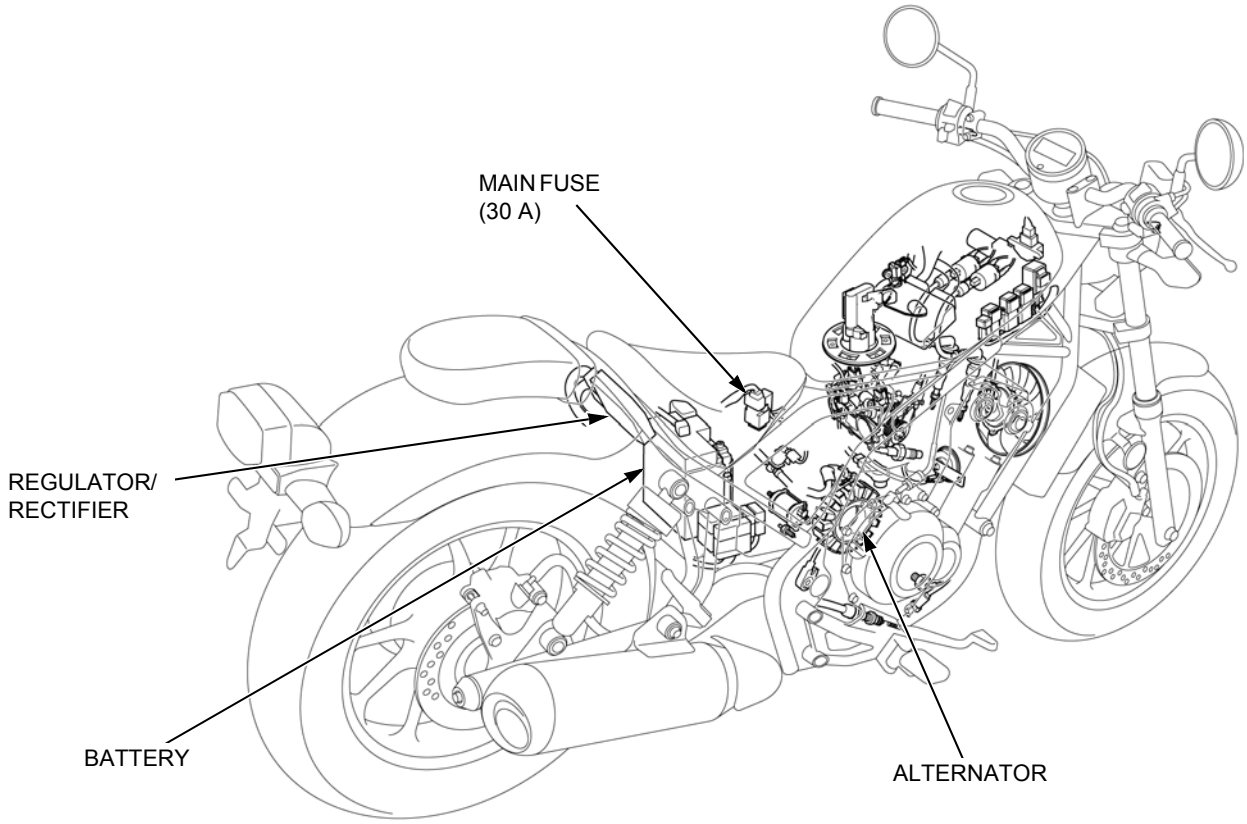
Check the voltage and resistance at the regulator/rectifier 3P (Black) connector (page 20-7).

Are the measurements correct?

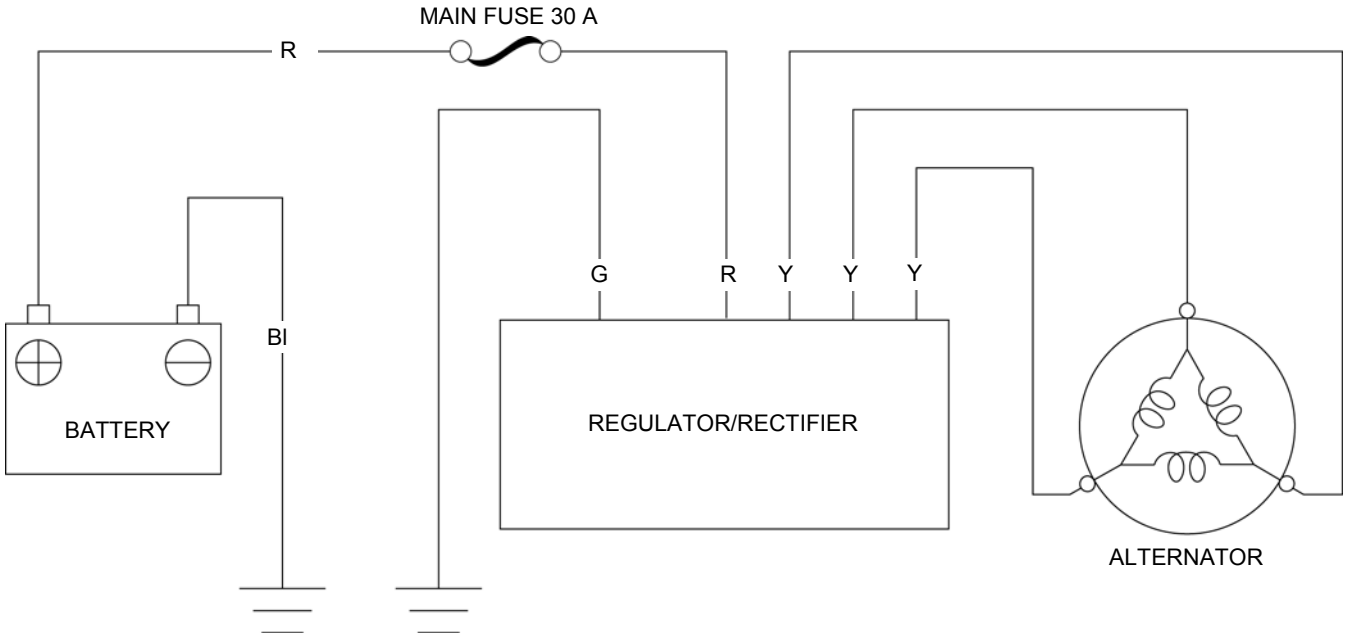
YES – Faulty regulator/rectifier

NO –
- Open circuit in related wire
- Loose or poor contacts of related terminal
- Shorted wire harness

SYSTEM LOCATION



SYSTEM DIAGRAM



Bl: Black
G: Green
R: Red
Y: Yellow

BATTERY

REMOVAL/INSTALLATION

Remove the single seat (page 2-4).

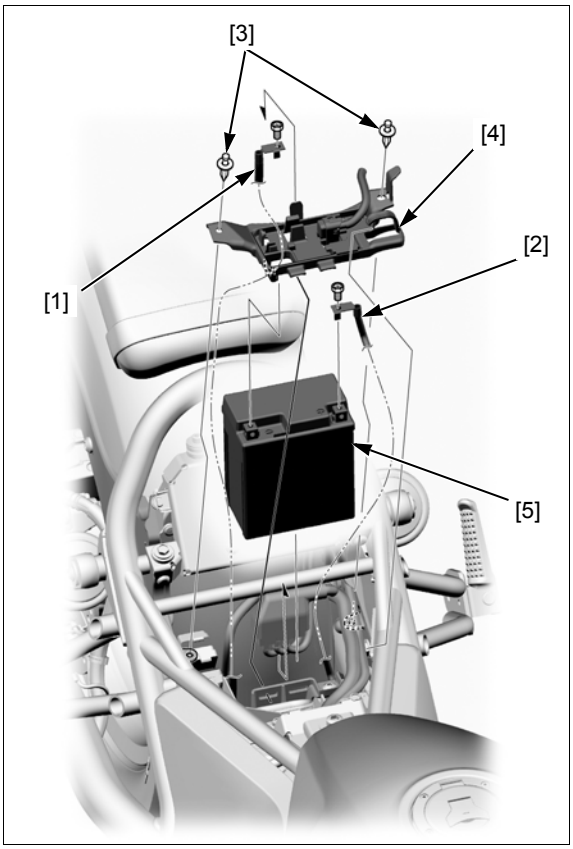
Turn the ignition switch OFF.

Disconnect the negative (–) cable [1] first and then the positive (+) cable [2].
Remove the trim clips [3] and part tray [4].

Remove the battery [5].

Connect the positive cable first and then the negative cable.

Install the battery in the reverse order of removal.



VOLTAGE INSPECTION

Measure the battery voltage using a commercially available digital multimeter.

VOLTAGE (20°C/68°F):
Fully charged: 13.0 – 13.2 V
Under charged: Below 12.3 V

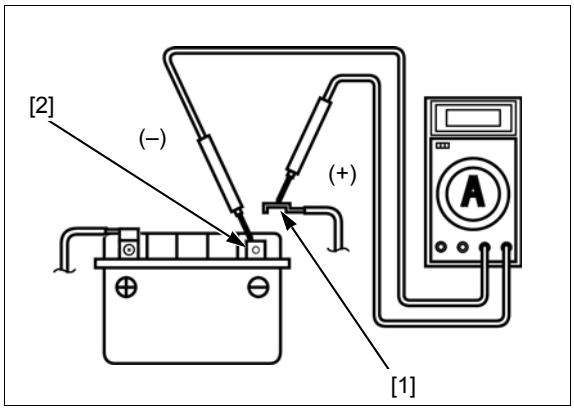
If the battery voltage is below 12.3 V, charge the battery.

CHARGING SYSTEM INSPECTION

CURRENT LEAKAGE INSPECTION

Remove the single seat (page 2-4).

With the ignition switch turned OFF, disconnect the negative (–) cable [1].
Connect the ammeter (+) probe to the wire harness negative (–) cable and ammeter (–) probe to the battery negative (–) terminal [2].
With the ignition switch turned OFF, check for current leakage.



NOTE:

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow the fuse in the tester.
- While measuring current, do not turn the ignition switch ON and engine stop switch to "". A sudden surge of current may blow the fuse in the tester.

SPECIFIED CURRENT LEAKAGE: 0.62 mA max.

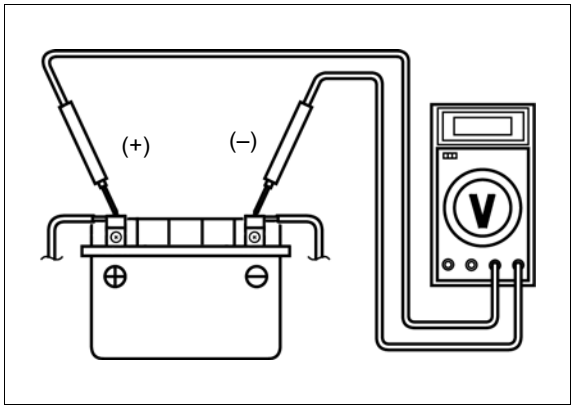
If current leakage exceeds the specified value, a shorted circuit is likely.
Locate the short by disconnecting connections one by one and measuring the current.

CHARGING VOLTAGE INSPECTION

Remove the single seat (page 2-4).

Be sure the battery is in good condition before performing this test.

Warm up the engine to normal operating temperature.
Connect the multimeter between the battery positive (+) terminal and negative (–) terminal.



NOTE:

- To prevent a short, make absolutely certain which are the positive (+) and negative (–) terminal or cable.
- Do not disconnect the battery or any cable in the charging system without first turning the ignition switch OFF. Failure to follow this precaution can damage the tester or electrical components.

With the headlight high beam, measure the voltage on the multimeter when the engine runs at 5,000 rpm.

STANDARD:

Measured BV < Measured CV < 15.5 V

- **BV = Battery Voltage**
- **CV = Charging Voltage**

ALTERNATOR CHARGING COIL

INSPECTION

It is not necessary to remove the stator coil to perform this test.

Remove the alternator cover (page 20-7).

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

Measure the resistance between the Yellow wire terminals of the alternator side connector.

STANDARD: 0.1 – 1.0 Ω (20°C/68°F)

Check for continuity between each wire terminal of the alternator/stator side connector and ground.
There should be no continuity.

Replace the alternator stator if the resistance is out of specification, or if any wire has continuity to ground.

For stator replacement (page 12-5).

REGULATOR/RECTIFIER

SYSTEM INSPECTION

It is not necessary to remove the stator coil to perform this test.

Remove the alternator cover (page 20-7).

Disconnect the alternator 3P (Gray) connector [1] and regulator/rectifier 3P (Black) connector [2].

If the charging voltage reading (page 20-6) is out of the specification, check the following at the wire harness side connector:

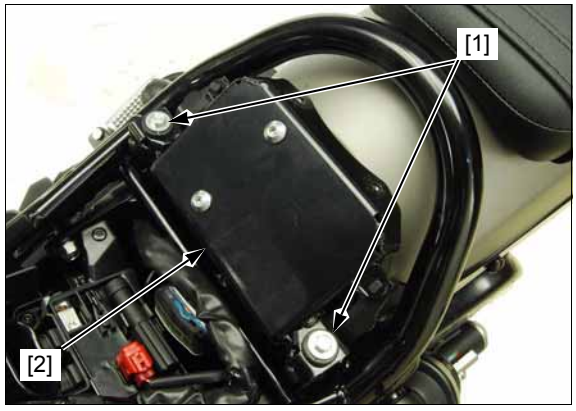
Item	Terminal	Specification
Battery charging line	Red (+) and ground (–)	Battery voltage should register
Charging coil line	Yellow and Yellow	0.1 – 1.0 Ω at (20°C/68°F)
Ground line	Green and ground	Continuity should exist

If all components of the charging system are normal and there are no loose connections at the regulator/ rectifier connector, replace the regulator/rectifier unit.

REMOVAL/INSTALLATION

Remove the single seat (page 2-4).

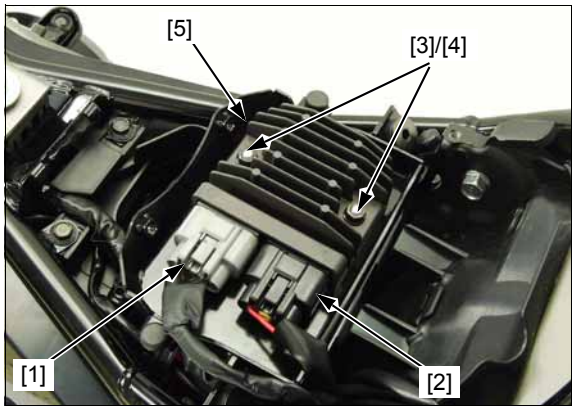
Remove the bolts [1] and regulator/rectifier cover [2].



Disconnect the alternator 3P (Gray) connector [1] and regulator/rectifier 3P (Black) connector [2].

Remove the socket bolts [3] and nuts [4] and regulator/rectifier [5] from the cover.

Install the regulator/rectifier in the reverse order of removal.



21. LIGHTS/METERS/SWITCHES

SERVICE INFORMATION

GENERAL

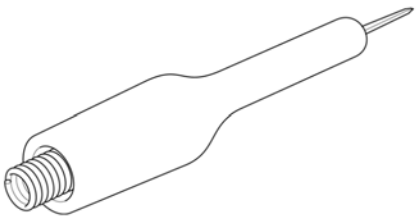
NOTICE

- *Note the following when replacing the halogen headlight bulb.*
  - *Wear clean gloves while replacing the bulb. Do not put fingerprints on the headlight bulb, as they may create hot spots on the bulb and cause it to fail.*
  - *If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.*
- Be sure to install the dust cover after replacing the headlight bulb.
- A halogen headlight bulb becomes very hot while the headlight is ON, and remains hot for a while after it is turned OFF. Be sure to let it cool down before servicing.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- Use an electric heating element to heat the water/coolant mixture for the ECT sensor inspection. Keep flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.
- A continuity test can be made with the switches installed on the motorcycle.
- The following color codes are used throughout this section.

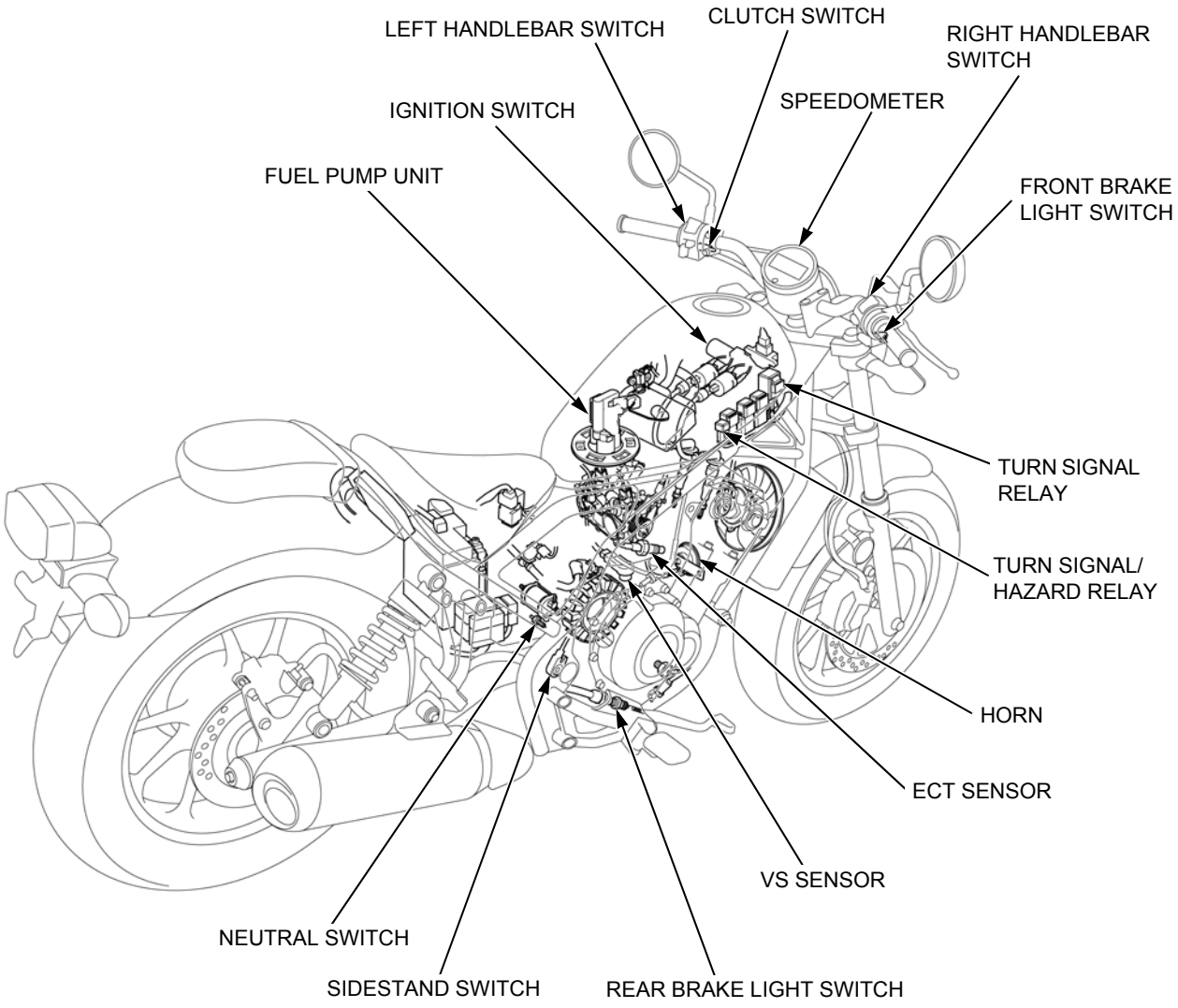
Bu = Blue	G = Green	Lb = Light Blue	O = Orange	R = Red	Y = Yellow
Bl = Black	Gr = Gray	Lg = Light Green	P = Pink	W = White	

TOOL

Test probe, 2 pack
07ZAJ-RDJA110



SYSTEM LOCATION



HEADLIGHT

BULB REMOVAL/INSTALLATION

Remove the two screws [1] and headlight cover [2].

Disconnect the headlight 3P (black) connector [3]

Remove the dust cover [4].

Unhook the bulb retainer [5] and remove the headlight bulb [6].

NOTICE

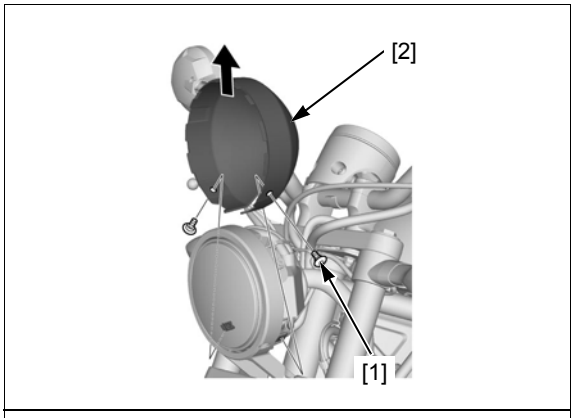
Avoid touching halogen headlight bulb. Fingerprints can create hot spots that cause a bulb to break.

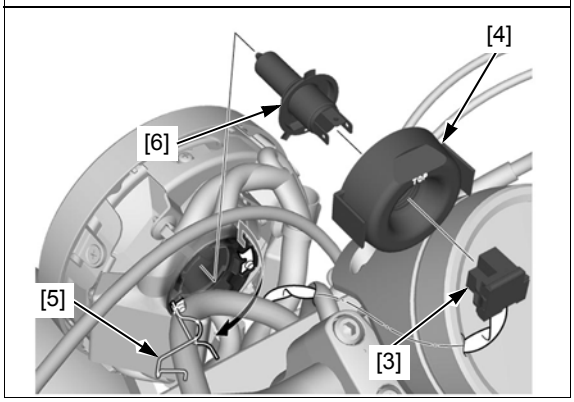
Install the bulb while aligning its tabs with the slots of the headlight unit.

Hook the bulb retainer into the headlight unit groove.

Install the dust cover tightly against the headlight unit.

Installation is in the reverse order of removal.





HEADLIGHT REMOVAL/ INSTALLATION

Remove the two screws [1] and headlight cover [2].

Disconnect the headlight 3P (Black) connector [3].

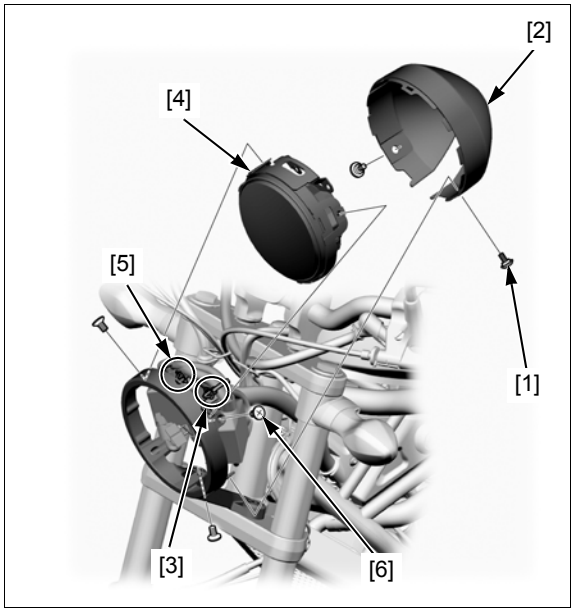
Remove the following fasteners and remove the headlight assembly [4].

– two band clips [5]
– three screws [6]

Installation is in the reverse order of removal.

TORQUE:

Headlight cover mounting screw:
0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)



TURN SIGNAL LIGHT

BULB REMOVAL/INSTALLATION

Remove the screw [1] and collar [2].

Remove the turn signal light lens [3] by releasing the tab [4].

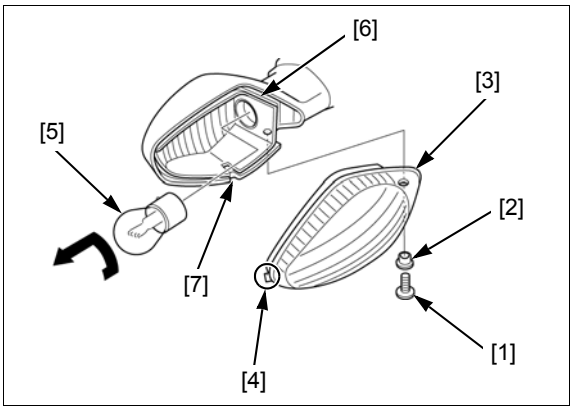
While pushing the bulb [5] in, turn it counterclockwise to remove it.

Make sure the rubber seal [6] in the light housing is installed in position and is in good condition, and replace it with a new one if necessary.

Installation is in the reverse order of removal.

NOTE:

- When installing the rubber seal, align the seal ends with the groove [7] in the housing.



FRONT TURN SIGNAL LIGHT REMOVAL/INSTALLATION

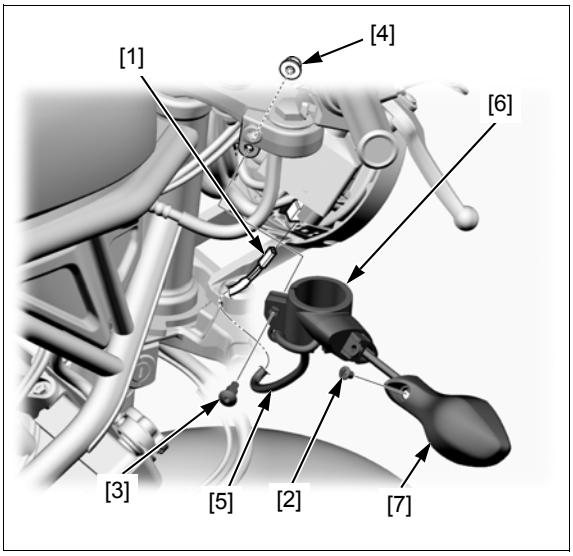
Remove the headlight cover (page 21-4).

Disconnect the turn signal 3P connector (left; Orange/ right; Light blue) [1].

Remove the following:

– screw [2]
– bolt [3]
– nut [4]
– wire [5]
– stay [6]
– turn signal light assembly [7]

Installation is in the reverse order of removal.

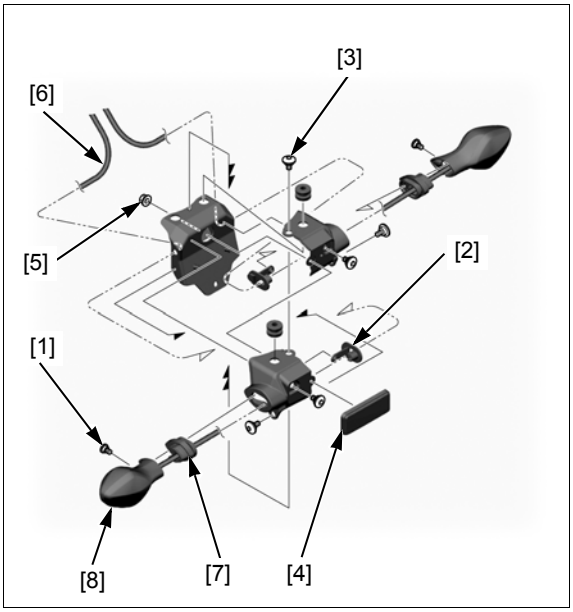


REAR TURN SIGNAL LIGHT REMOVAL/INSTALLATION

Remove the following:

– brake/tail light (page 21-6)
– turn signal light mount screw [1]
– setting plate [2]
– five setting bolts [3]
– tail reflex reflector [4]
– tail reflex reflector mounting nut [5]
– wire [6]
– stay [7]
– turn signal light assembly [8]

Installation is in the reverse order of removal.



BRAKE/TAIL LIGHT

BULB REMOVAL/INSTALLATION

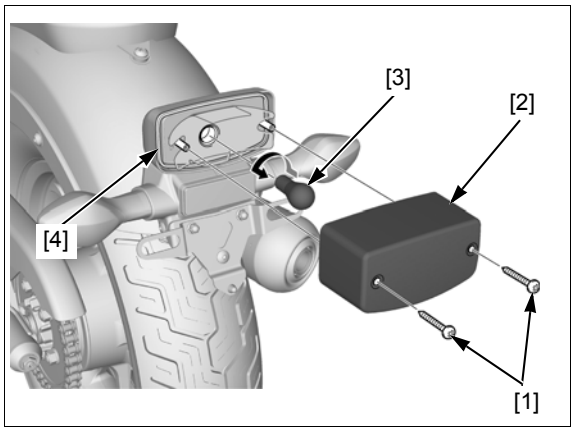
Remove the screws [1].

Remove the brake/tail light lens [2].

While pushing the bulb [3] in, turn it counterclockwise to remove it.

Make sure the rubber seal [4] in the light housing is installed in position and is in good condition, and replace it with a new one if necessary.

Installation is in the reverse order of removal.



BRAKE/TAILLIGHT REMOVAL/ INSTALLATION

Remove the single seat (page 2-4).

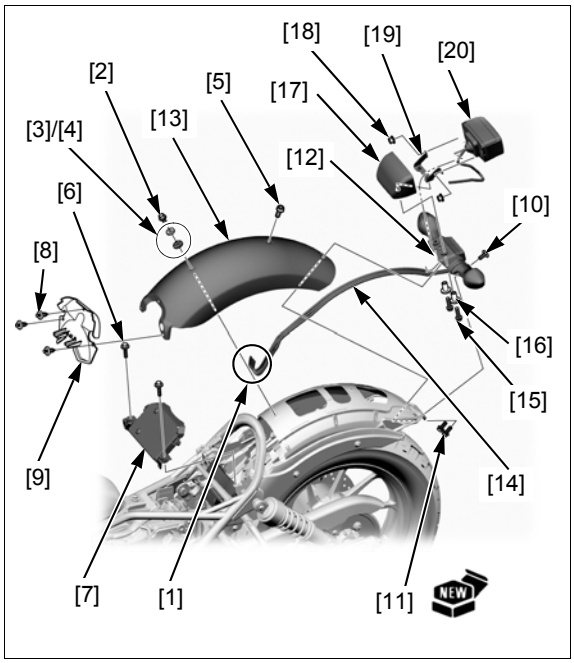
Disconnect the following connectors [1] in the connector boot:

– turn signal 2P (Light blue)
– turn signal 2P (Orange)
– brake/taillight 3P

Remove the following:

– passenger seat (CM model) (page 2-4)
– bolt [2]
– washer [3] and collar [4] (CM models)
– bolt (A, AC models) [5]
– two bolt/washers [6]
– regulator/rectifier stay [7]
– three trim clips [8]
– rear fender front cover [9]
– socket bolt [10]
– two bolts [11]
– turn signal light stay assembly [12]
– rear fender cover [13]
– wires [14]
– two bolts [15]
– two collars [16]
– brake/taillight cover [17]
– nuts [18]
– brake/taillight stay [19]
– brake/taillight assembly [20]

Installation is in the reverse order of removal.



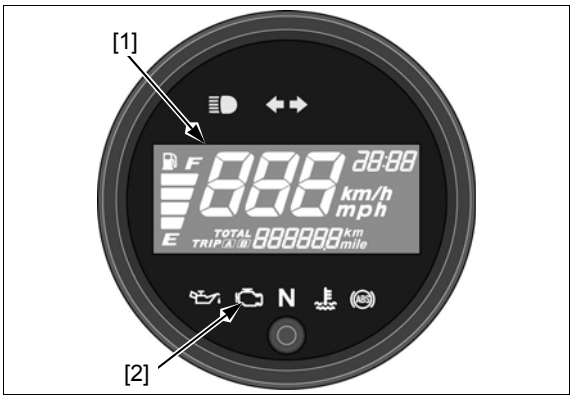
SPEEDOMETER

SYSTEM INSPECTION

NOTE:

Check for loose or poor contact terminals at the speedometer 16P (Gray) connector.

When the ignition switch is turned ON with the engine stop switch "", the speedometer will show the entire digital display [1] will reduce from full scale to zero.



NOTE:

- If the MIL [2] stays on and it does not go off, refer to MIL circuit troubleshooting (page 4-30).

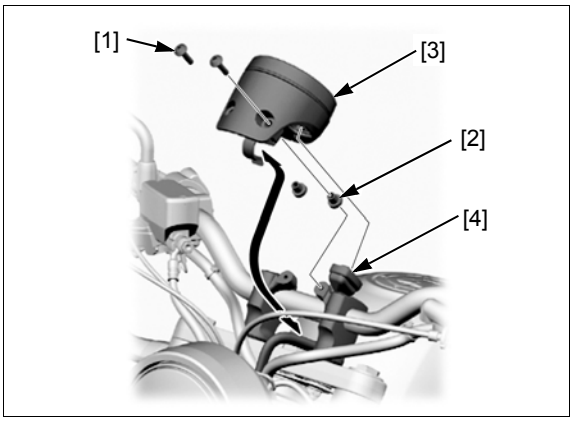
If the digital display does not function at all, inspect the speedometer power/ground line (page 21-7).

If the power and ground lines are OK, replace the speedometer (page 21-9).

POWER/GROUND LINES INSPECTION

NOTE:

- Check the following at the wire harness side connector of the speedometer.
- After inspection, reposition the dust cover securely.



Remove the bolt [1], collar [2] and speedometer [3].

Disconnect the speedometer 16P (Gray) connector [4].

POWER INPUT LINE

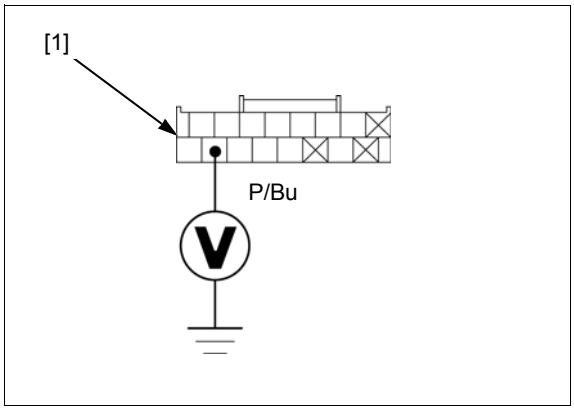
Measure the voltage between the speedometer 16P (Gray) connector [1] and ground.

CONNECTION: Pink/blue (+) – Ground (–)

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

If there is no battery voltage, check the following:

– Open circuit in the Pink/blue wire
– Open circuit in Red/black wire between the fuse box and ignition switch
– Blown sub fuse 7.5 A (TAIL, STOP, HORN)



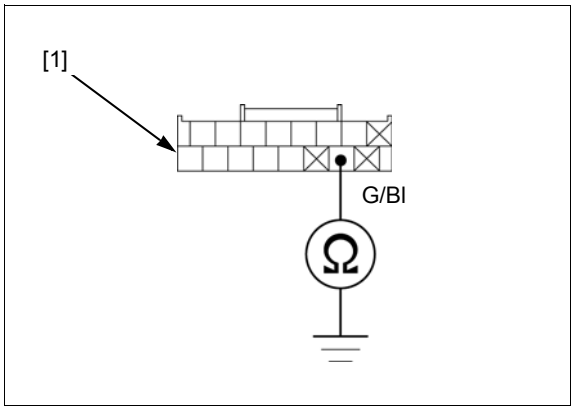
GROUND LINE

Check for continuity between the speedometer 16P (Gray) connector [1] and ground.

CONNECTION: Green/black – Ground

There should be continuity at all times.

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



BACK-UP VOLTAGE LINE

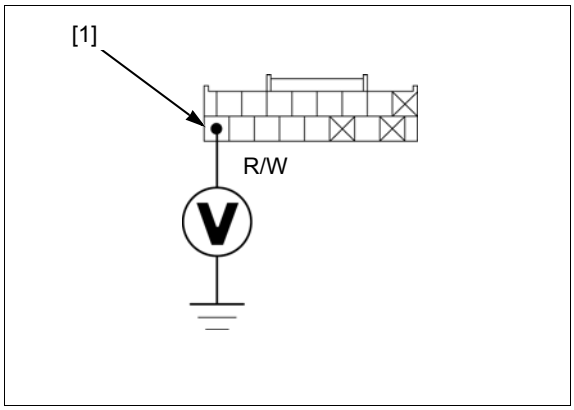
Measure the voltage between the speedometer 16P (Gray) connector [1] and ground.

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

There should be battery voltage at all times.

If there is no battery voltage, check the following:

– Open circuit in the Red wire
– Blown sub fuse 7.5 A (CLOCK, TURN)
– Blown main fuse 30 A
– Open circuit in Red wire between the fuse box and starter relay switch



REMOVAL/INSTALLATION

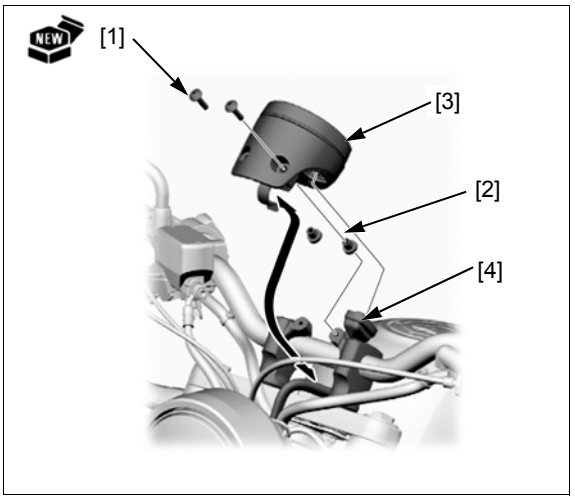
Remove the bolt [1], collar [2] and speedometer [3].

Disconnect the speedometer 16P (Gray) connector [4].

Installation is in the reverse order of removal.

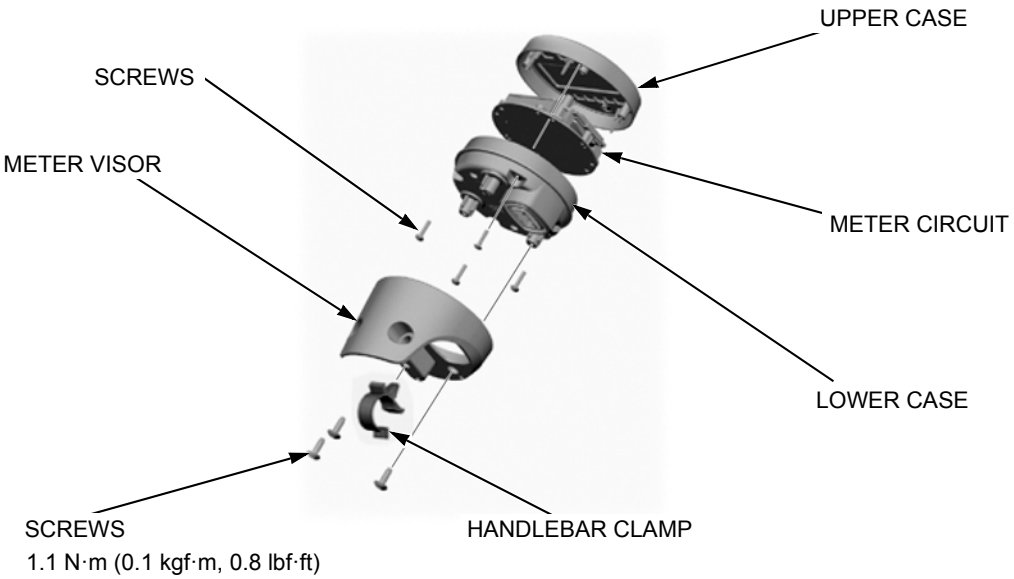
NOTE:

- Always replace the speedometer mounting bolt with a new one.



DISASSEMBLY/ASSEMBLY

Disassemble and assemble the speedometer according to the illustration.



DIGITAL CLOCK SETTING PROCEDURE

Turn the ignition switch ON.

The control is automatically switched from the setting mode to the ordinary display if the button is not pressed for about 30 seconds.

1. Press SEL button to select the odometer.
2. Press and hold SEL button until the current time format start flashing.
3. Press and hold SEL button until the current time format start flashing. Press and hold SEL button. The time format is set, and then the display moves to the clock setting.
4. Press SEL button until the desired hour is displayed.
5. Press and hold SEL button. The minute digits start flashing.
6. Press and hold SEL button. The minute digits start flashing. Press and hold SEL button. The clock is set, and then the display moves to the backlight brightness adjustment.
7. Press and hold SEL button. The backlight is set, and then the display will return to the ordinary display. Turn the ignition switch OFF.

Clock setting display flow:

1. 

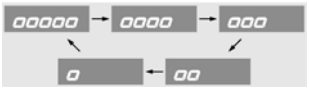
2. 

3. 

4. 

5. 

6. 

7. 

SPEEDOMETER/VS SENSOR

SYSTEM INSPECTION

If the speedometer does not operate, check the following:

– speedometer initial operation (page 21-7)
– MIL blinking: If the MIL blinks 11 (DTC 11-1), check the VS sensor system (page 4-20)

If the above items are OK, replace the speedometer (page 21-9).

HIGH COOLANT TEMPERATURE INDICATOR/ECT SENSOR

SYSTEM INSPECTION

NOTE:

• If the high coolant temperature indicator and digital display do not function at all, refer to speedometer initial operation check (page 21-7).

If the high coolant temperature indicator does not operate properly, check the following:

– MIL blinking: If the blinks 7 (DTC 7-1, 7-2), check the ECT sensor system (page 4-10)
– ECT sensor (page 21-11)

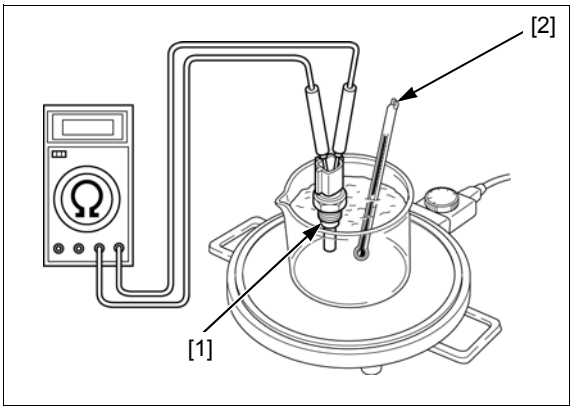
If the above items are OK, replace the speedometer (page 21-9).

ECT SENSOR INSPECTION

Remove the ECT sensor (page 4-34).

Suspend the ECT sensor [1] in a pan of coolant (Honda PRE-MIX COOLANT) on an electric heating element and measure the resistance between the sensor terminals as the coolant heats up.

• Soak the ECT sensor in coolant up to its threads with at least 40 mm (1.6 in) from the bottom of the pan to the bottom of the sensor.
• Keep the temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect readings. Do not let the thermometer [2] or ECT sensor touch the pan.



TEMPERATURE	40°C (104°F)	100°C (212°F)
RESISTANCE	1.0 – 1.3 kΩ	0.1 – 0.2 kΩ

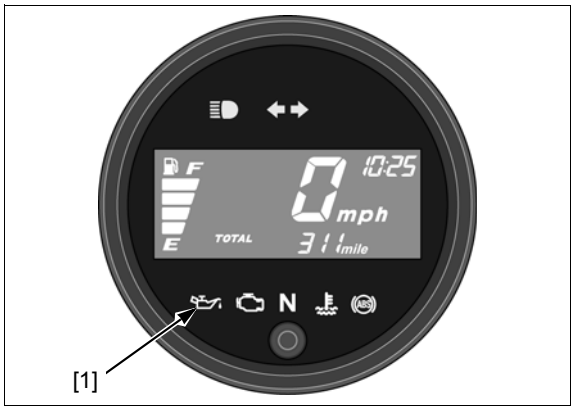
Replace the ECT sensor if it is out of specification by more than 10% at any temperature listed.

Install the ECT sensor (page 4-34).

ENGINE OIL PRESSURE INDICATOR/ EOP SWITCH

SYSTEM INSPECTION

When the system is normal, the engine oil pressure indicator [1] comes on when the ignition switch is turned ON with the engine stop switch "○", and then goes off when the engine is started.



NOTE:

- If the oil pressure indicator and digital display do not function at all, refer to speedometer initial operation check (page 21-7).

If the engine oil pressure indicator comes on for about 2 seconds and goes off when the ignition switch is turned ON, check the EOP switch line for open circuit (page 21-12).

If the engine oil pressure indicator stays on after the engine is started, stop the engine immediately and confirm the indication conditions:

- The engine oil pressure indicator stays on and the other indications function normally, check the following:
  – engine oil level (page 3-10)
  – EOP switch line for short circuit (page 21-12)
  – engine oil pressure (page 9-5)

If the above items are OK, replace the speedometer (page 21-9).

EOP SWITCH LINE INSPECTION

Turn the ignition switch OFF.

Disconnect the EOP switch wire (page 21-13).

Open Circuit Inspection

Check for continuity between the wire terminal [1] and ground.

There should be continuity.

– If there is no continuity, the EOP switch wire (Black or Light green) has a open circuit.
– If there is continuity, replace the EOP switch (page 21-13).

Short Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-31).

Check for continuity between the wire terminal and ground as same manner as above.

There should be no continuity.

– If there is continuity, the EOP switch wire (Black or Light green) has a short circuit.
– If there is no continuity, replace the EOP switch (page 21-13).

EOP SWITCH REMOVAL/ INSTALLATION

Place the motorcycle on its sidestand on a level surface.

Release the rubber cap [1] from the EOP switch [2].

Remove the terminal screw [3] and disconnect the switch wire [4].

Remove the EOP switch.

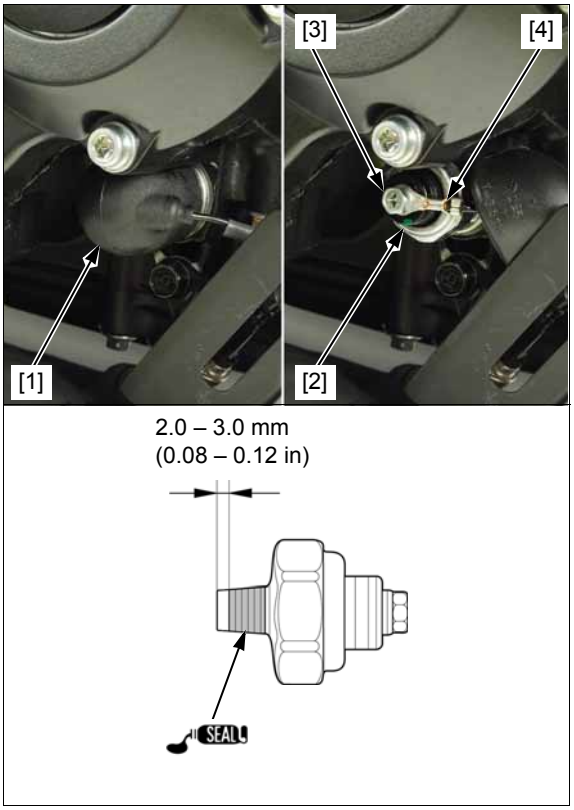
Installation is in the reverse order of removal.

NOTE:

- Before installing the EOP switch, clean the threads in the crankcase with a degreasing agent thoroughly.
- Apply sealant to the EOP switch threads. Do not apply to the sensor tip in the area as shown.

TORQUE:
EOP switch:
12 N·m (1.2 kgf·m, 9 lbf·ft)
EOP switch terminal screw:
2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)

Check the engine oil level (page 3-10).

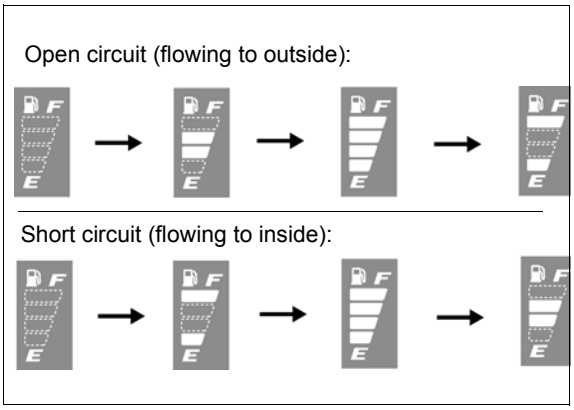


FUEL GAUGE/FUEL LEVEL SENSOR

FUEL GAUGE INSPECTION

When the circuit malfunction occurs, the speedometer displays the flow pattern in the fuel gauge. If it is indicated, check for open or short circuit in the Black/ green wire between the speedometer and fuel pump unit.

If the Red/black wire is OK, check the fuel level sensor (page 21-13).
If the fuel level sensor is OK, replace the speedometer (page 21-9).



FUEL LEVEL SENSOR INSPECTION

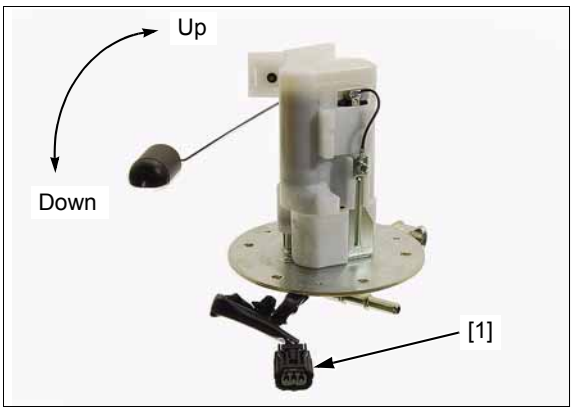
Remove the fuel pump unit (page 7-10).

Measure the resistance between the fuel pump unit 3P (Black) connector [1] terminals.

CONNECTION: Red/black – Black/white

FLOAT POSITION	Up (Full)	Down (Empty)
RESISTANCE	6 – 10 Ω	265.5 – 274.5 Ω

If the resistance is out of specification, replace the fuel pump unit as an assembly (page 7-10).



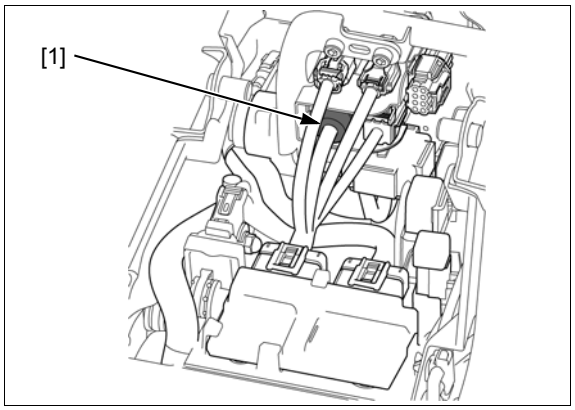
IGNITION SWITCH

INSPECTION

Remove the fuel tank (page 7-9).

Disconnect the ignition switch 2P connector [1].

Check for continuity between the switch side connector terminals in each switch position.
Continuity should exist between the color coded wires (page 22-2).



REMOVAL/INSTALLATION

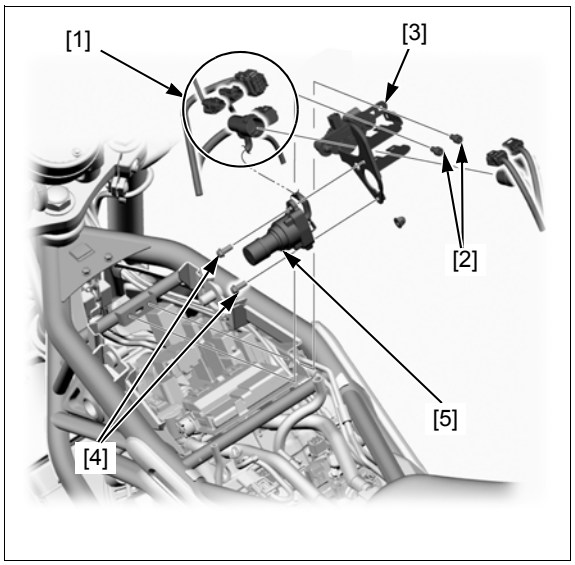
Remove the fuel tank (page 7-9).

Disconnect the following connectors [1]:

– front wheel speed sensor 2P (Blue)
– EOP switch 2P (Black)
– option 8P (Black)
– O_2 sensor 4P (Black)
– ignition switch 2P

Remove the two socket bolts [2], ignition switch stay [3], ignition switch mounting bolts [4] and ignition switch [5].

Installation is in the reverse order of removal.



HANDLEBAR SWITCH

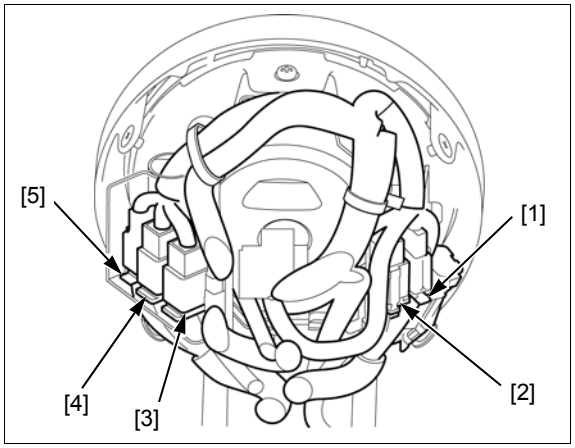
Remove the headlight cover (page 21-4).

Disconnect the right handlebar switch 3P [1] and 6P (Black) [2] connectors.

Disconnect the left handlebar switch 6P [3], 6P (Blue) [4] and 2P (Black) [5] connectors.

Check for continuity between the wire terminals of the handlebar switch connector in each switch position.

Refer to the wiring diagram for the terminals and switch status (page 22-2).



BRAKE LIGHT SWITCH

FRONT

Disconnect the front brake light switch connectors [1] and check for continuity between the switch terminals.

There should be continuity with the brake lever squeezed, and no continuity with the brake lever released.

REAR

Remove the right side cover (page 2-4).

Disconnect the rear brake light switch 2P (Black) connector [1].

Check for continuity between the switch side connectors.

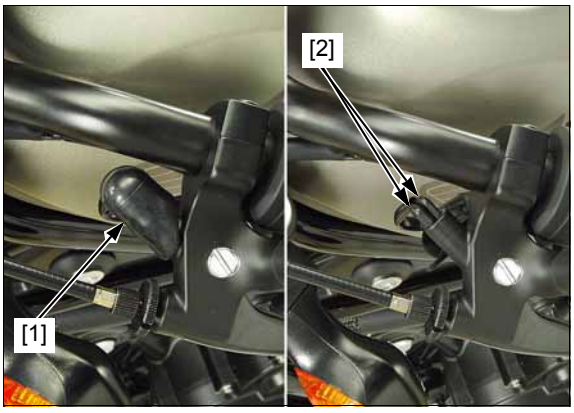
There should be continuity with the brake pedal depressed, and no continuity when the brake pedal released.

CLUTCH SWITCH

Remove the connector boot [1] from the bracket sleeve.

Disconnect the clutch switch connectors [2] and check for continuity between the switch terminals.

There should be continuity with the clutch lever squeezed, and no continuity when the clutch lever is released.



NEUTRAL SWITCH

INSPECTION

Disconnect the neutral switch wire (page 21-16).

Check for continuity between the switch terminal and engine ground.

There should be continuity with the transmission in neutral, and no continuity when the transmission is in gear except neutral.

REMOVAL/INSTALLATION

Remove the following:

– pinch bolt [1]
– gearshift arm [2]
– terminal cap [3]
– terminal nut [4]
– wire terminal [5]
– neutral switch [6]
– sealing washer [7]

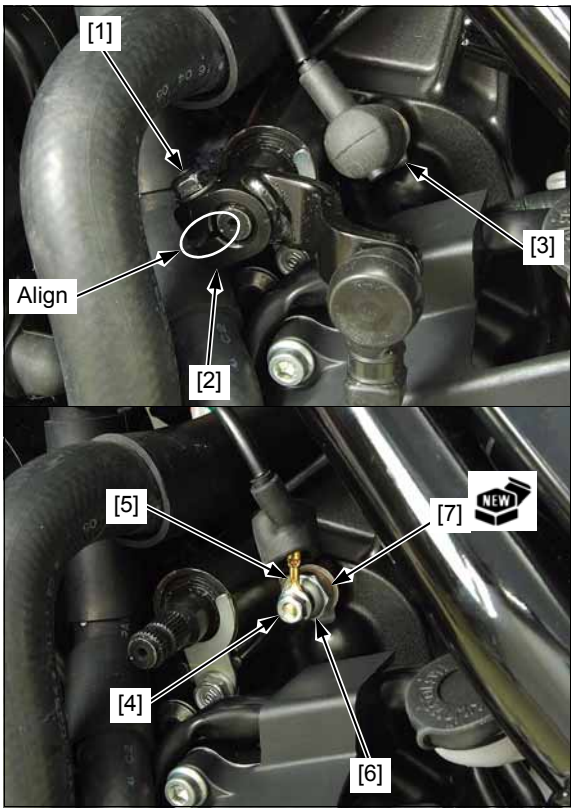
Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washer with a new one.
- When tightening the terminal nut, the wire terminal is facing up vertically.
- Align the slit in the gearshift arm with the punch mark on the spindle.

TORQUE:

Neutral switch: 12 N·m (1.2 kgf·m, 9 lbf·ft)
Terminal nut: 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)



SIDESTAND SWITCH

INSPECTION

Remove the left side cover (page 2-4).

Disconnect the sidestand switch 2P (Black) connector [1].

Check for continuity between the switch side connector terminals.

There should be continuity with the sidestand retracted, and, no continuity when the sidestand is lowered.

REMOVAL/INSTALLATION

Remove the following:

– left side cover (page 2-4)
– drive sprocket cover (page 2-7)

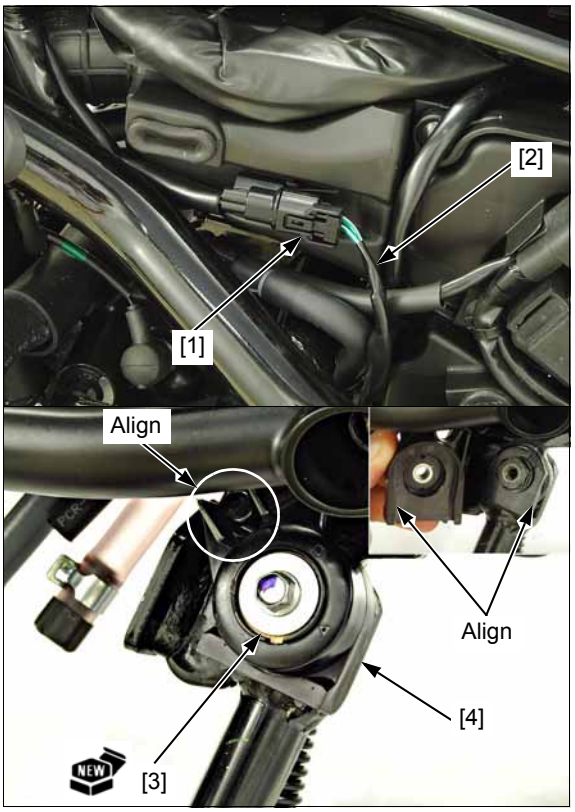
Disconnect the sidestand switch 2P (Black) connector [1] and remove the sidestand switch wire [2] out of the frame.

Remove the bolt [3] and sidestand switch [4].

Installation is in the reverse order of removal.

TORQUE:
Sidestand switch mounting bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:
- Align the switch groove with the locating pin, and the switch pivot holder with the sidestand end properly.
- Replace the switch bolt with a new one.



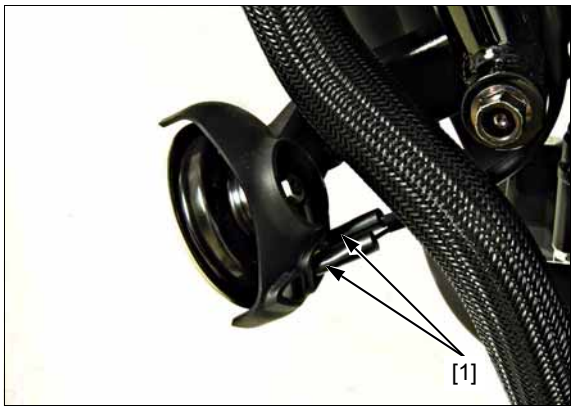
HORN

INSPECTION

Disconnect the connectors [1] from the horn.

Connect a 12 V battery to the horn terminals.

The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.



REMOVAL/INSTALLATION

Disconnect the connectors (page 21-18).

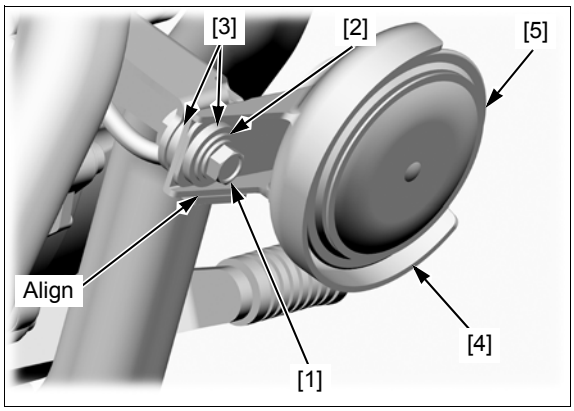
Remove the following:

– mounting bolt [1]
– collar [2]
– two rubber mounts [3]
– heat guard cover [4]
– horn [5]

Installation in the reverse order of removal.

NOTE:

• When tightening the mounting bolt, align the stay end of the heat guard cover with the tab of the horn stay.



TURN SIGNAL/HAZARD RELAY/DIODE

NOTE:

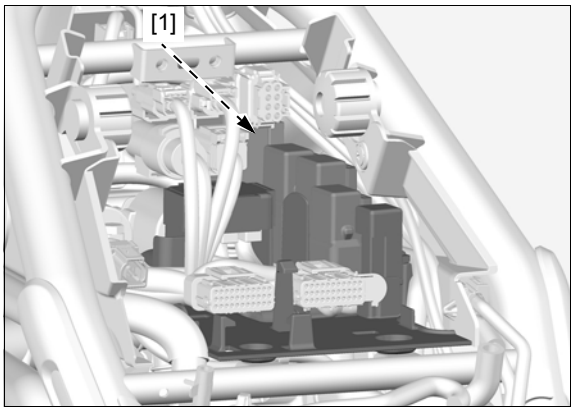
• When the ignition switch is turned OFF with the hazard flasher system operating, the system continue operating.

TURN SIGNAL/HAZARD RELAY REMOVAL/INSTALLATION

Remove the ignition switch stay (page 21-14).

Remove the turn signal/hazard relay [1] from the stay.

Installation is in the reverse order of removal.



RELAY CIRCUIT INSPECTION

Remove the turn signal/hazard relay (page 2-8).

Check the following at the wire harness side 4P connector.

1. Battery Power Source Line Open Circuit Inspection

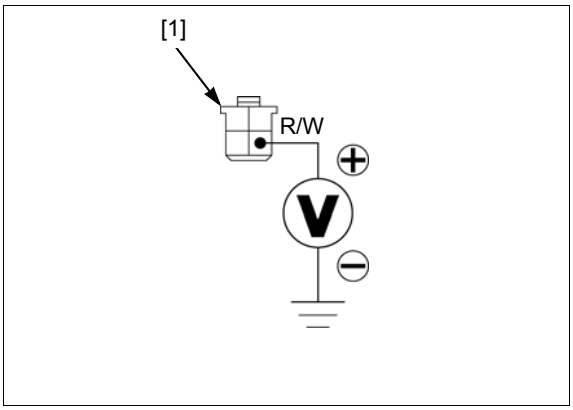
Measure the voltage between the 4P connector [1] terminal and ground.

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

Is there battery voltage?

YES – GO TO STEP 2.

NO – Open circuit in the Red/white wire



2. Ground Line Open Circuit Inspection

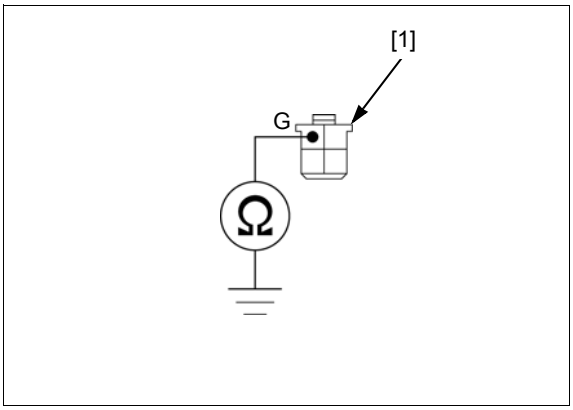
Check for continuity between the 4P connector [1] terminal and ground.

CONNECTION: Green – Ground

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Green wire



3. Turn Signal/hazard Switch Line Open Circuit Inspection

Connect the 4P connector [1] terminals with a jumper wire.

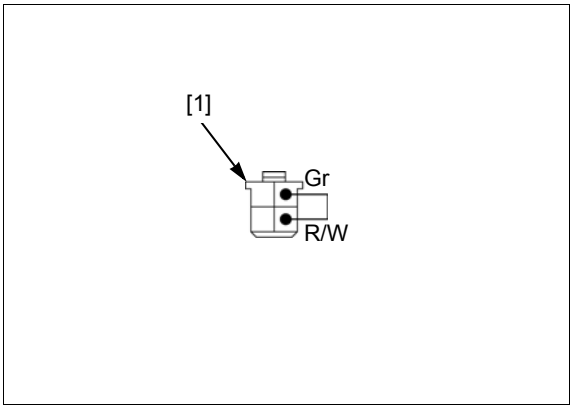
CONNECTION: Red/white – Gray

Operate the turn signal switch or push the hazard switch.

Do the turn signal lights illuminate?

YES – GO TO STEP 4.

NO –
- Open circuit in the Gray wire
- Faulty turn signal switch or hazard switch
- Faulty turn signal or hazard light circuit



4. Ignition Switch Power Source Line Open Circuit Inspection

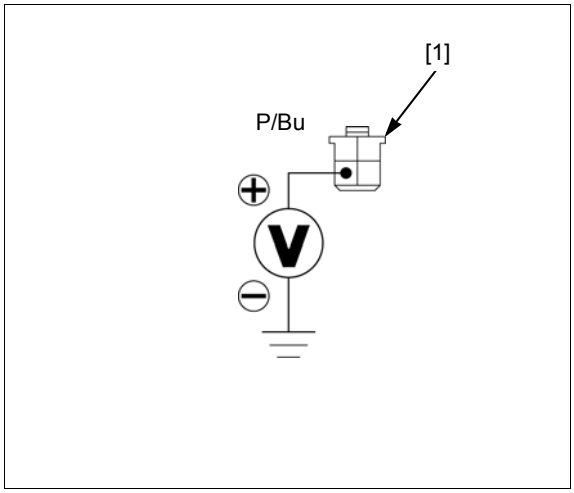
Turn the ignition switch ON.
Measure the voltage between the 4P connector [1] terminal and ground.

CONNECTION:
Pink/blue (+) – Ground (–)

Is there battery voltage?

YES – System is normal, replace the turn signal/ hazard relay.

NO – Open circuit in the Pink/blue wire



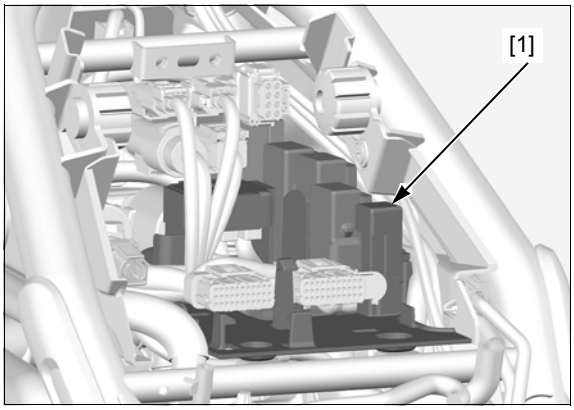
TURN SIGNAL/HAZARD DIODE

REMOVAL/INSTALLATION

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

Remove the turn signal/hazard diode [1] from the stay.

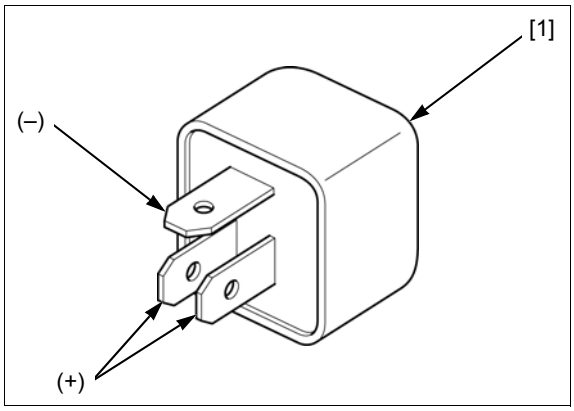
Installation is in the reverse order of removal.



INSPECTION

Check for continuity between the turn signal light diode [1] terminals.
When there is continuity, a small resistance value will register.

If there is continuity in one direction, the turn signal light diode is normal.



FAN CONTROL RELAY

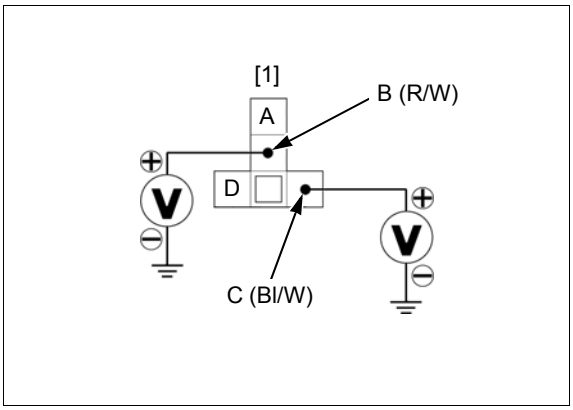
CIRCUIT INSPECTION

For relay inspection (page 4-38).

Remove the fan control relay (page 2-8).

RELAY SWITCH/COIL POWER INPUT LINE

Measure the voltage between the relay terminal (switch power input line) of the relay box [1] and ground.



CONNECTION: B (+) – Ground (–)

There should be battery voltage at all times.

If there is no voltage, check the following:

– Red/green wire between the relay box and fuse box 1 for open circuit
– FAN (15 A) fuse

Measure the voltage between the relay terminal (coil power input line) of the relay box [1] and ground.

CONNECTION: C (+) – Ground (–)

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

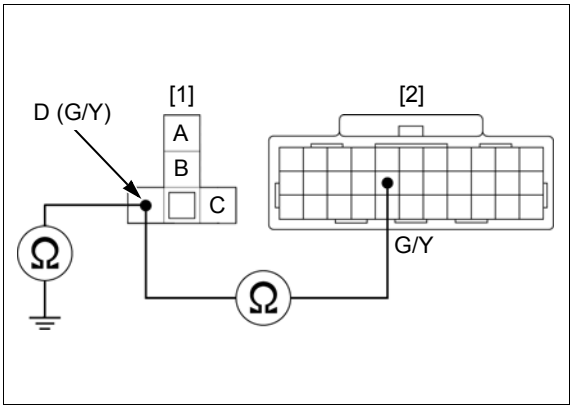
If there is no voltage, check the following:

– Black/white wire in the relay box between the main and fuel fan control relays for open circuit
– main relay and its circuit (page 4-37)

SIGNAL LINE

Disconnect the ECM 33P (Black) connector (page 4-31).

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



TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

CONNECTION: D – Green/yellow

There should be continuity.
If there is continuity, check for open circuit in the Green/yellow wire between the relay box and ECM.

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

CONNECTION: D – Ground

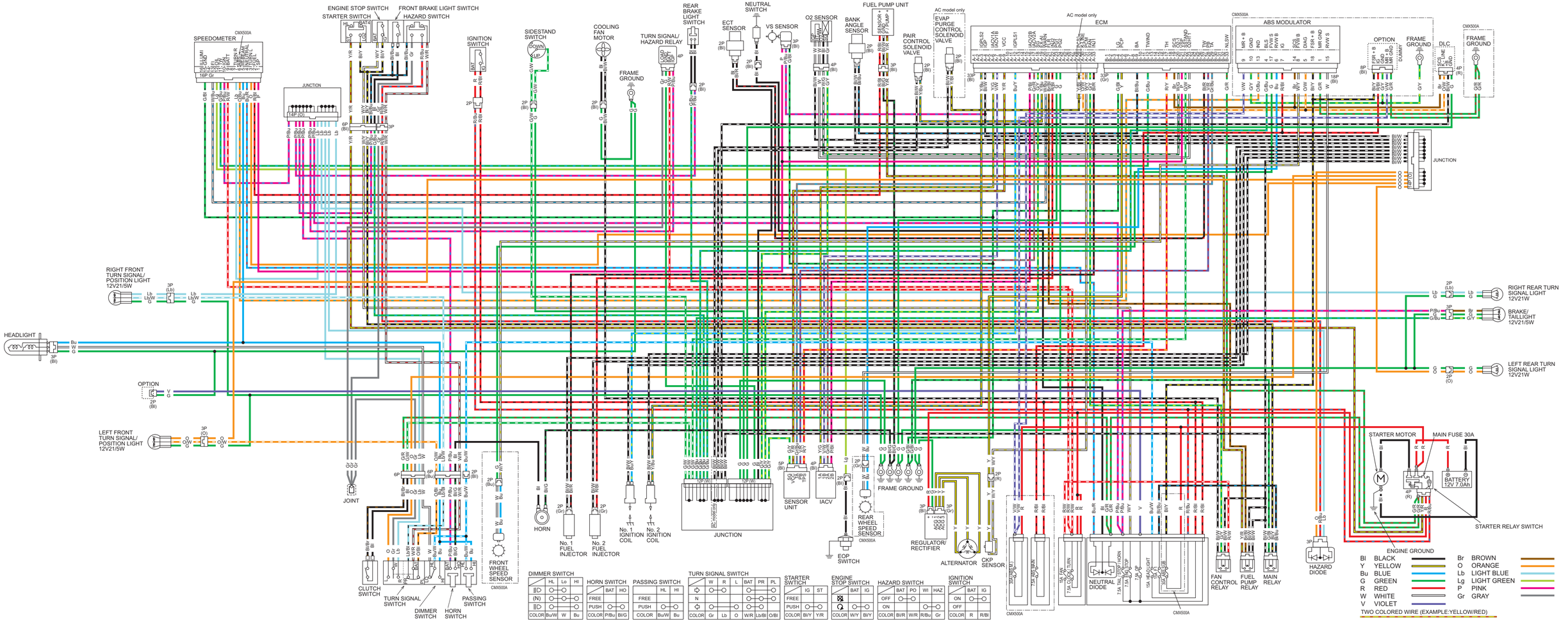
There should be no continuity.
If there is continuity, check for short circuit in the Green/yellow wire between the relay box and ECM.

If all of above inspections are normal, check for open circuit in the Black/white (A) wire between the relay box and fan motor.

MEMO

22. WIRING DIAGRAMS

WIRING DIAGRAM



MEMO

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