

How to use this manual

A Few Words About Safety

Service Information

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

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

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

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

For Your Customer's Safety

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

WARNING

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

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

For Your Safety

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

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

WARNING

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

Follow the procedures and precautions in this manual carefully.

Important Safety Precautions

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

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

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

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

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

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

This manual describes the service procedures for the WW125EX2/150-C.

Sections 1 and 3 apply to the whole scooter. 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 scooter, grouped according to location.

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

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


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

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

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

You must use your own good judgement.

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

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

These signal words mean:

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

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

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

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

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

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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, NOGI #2 or equivalent). Example: <ul style="list-style-type: none">• Molykote® BR-2 plus manufactured by Dow Corning U.S.A.• Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan
	Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NOGI #2 or equivalent). Example: <ul style="list-style-type: none">• Molykote® G-n Paste manufactured by Dow Corning U.S.A.• Honda Moly 60 (U.S.A. only)• Rocol ASP manufactured by Rocol Limited, U.K.• Rocol Paste manufactured by Sumico Lubricant, Japan
	Use silicone grease.
	Apply a locking agent. Use a medium strength locking agent unless otherwise specified.
	Apply sealant.
	Use DOT 3 or DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified.
	Use fork or suspension fluid.

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GENERAL INFORMATION

SERVICE RULES

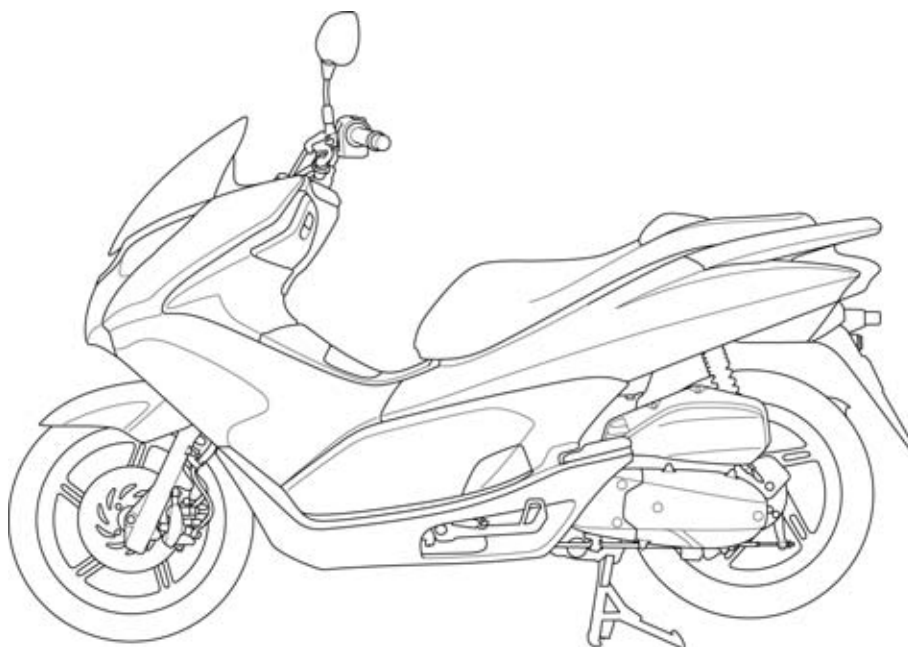
1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda's design specifications may cause damage to the scooter.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the scooter. 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 1-15).
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
CBS	Combined 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
HDS	Honda Diagnostic System
IACV	Idle Air Control Valve
IAT sensor	Intake Air Temperature sensor
MAP sensor	Manifold Absolute Pressure sensor
MIL	Malfunction Indicator Lamp
PGM-FI	Programmed Fuel Injection
SCS connector	Service Check Short connector
TP sensor	Throttle Position sensor
VS sensor	Vehicle Speed sensor

MODEL IDENTIFICATION

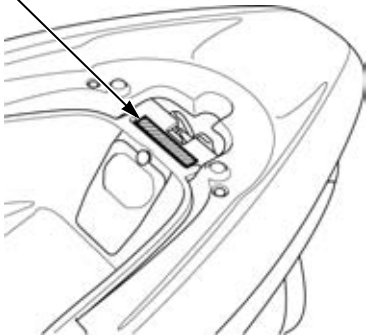
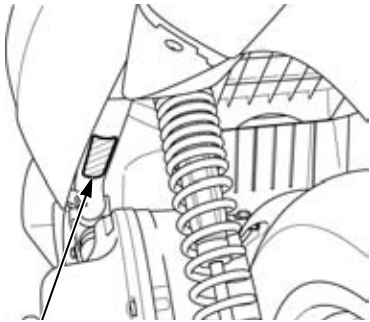
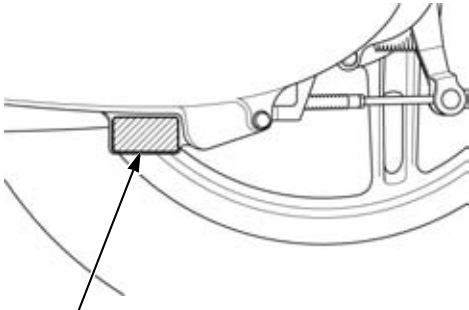
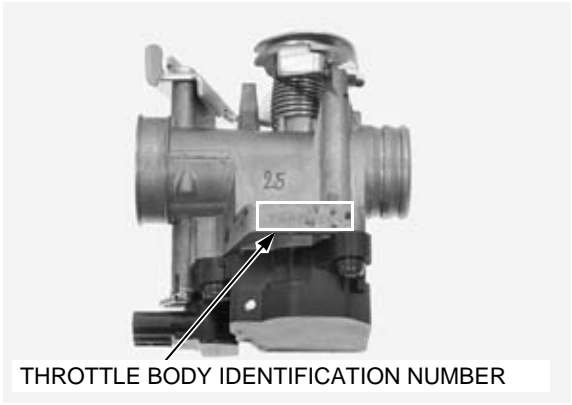
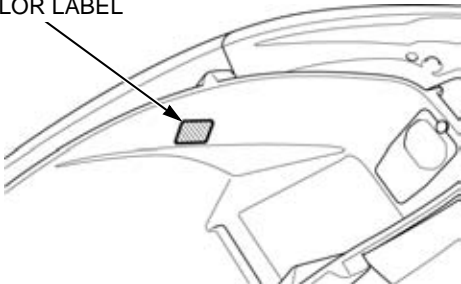
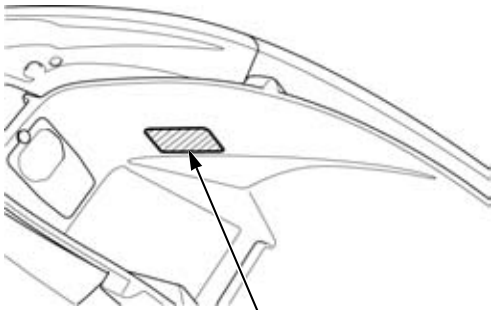


DESTINATION CODE

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

DESTINATION CODE	REGION
E	U.K.
ED	European direct sales
F	France
KO	Korea
U	Australia, New Zealand

SERIAL NUMBERS

<p>VEHICLE IDENTIFICATION NUMBER</p> 	 <p>E/ED/F type: REGISTERED NUMBER PLATE U type: COMPLIANCE PLATE</p>
 <p>ENGINE SERIAL NUMBER</p>	 <p>THROTTLE BODY IDENTIFICATION NUMBER</p>
<p>COLOR LABEL</p> 	<p>KO type only:</p>  <p>EMISSION CONTROL INFORMATION LABEL</p>

GENERAL INFORMATION

SPECIFICATIONS

GENERAL SPECIFICATIONS

ITEM				SPECIFICATIONS	
MODEL				WW125EX2	WW150
DIMENSIONS	Overall length			1,915 mm (75.4 in)	
	Overall width		Except KO type	740 mm (29.1 in)	740 mm (29.1 in)
			KO type	705 mm (27.8 in)	
	Overall height			1,090 mm (42.9 in)	
	Wheelbase			1,315 mm (51.8 in)	
	Seat height			760 mm (29.9 in)	
	Footpeg height			260 mm (10.2 in)	
	Ground clearance			130 mm (5.1 in)	
Curb weight		Except KO type	128 kg (282.2 lbs)	129 kg (284.4 lbs)	
		KO type	130 kg (286.6 lbs)		
FRAME	Frame type			Under bone type	
	Front suspension			Telescopic fork	
	Front axle travel			89 mm (3.5 in)	
	Rear suspension			Unit swing	
	Rear axle travel			79 mm (3.1 in)	
	Front tire size			90/90 - 14M/C 46P	
	Rear tire size			100/90 - 14M/C 57P	
	Tire brand		Front	SS-560F (IRC)	
				TT900F (DUNLOP)	
			Rear	SS-560R (IRC)	
				TT900A (DUNLOP)	
	Front brake			Hydraulic disc brake	
	Rear brake			Mechanical leading trailing	
	Caster angle			27°00'	
	Trail length			86 mm (3.4 in)	
Fuel tank capacity			5.9 liter (1.56 US gal, 1.30 Imp gal)		
ENGINE	Bore and stroke			52.4 x 57.9 mm (2.06 x 2.28 in)	58.0 x 57.9 mm (2.28 x 2.28 in)
	Displacement			125 cm ³ (7.6 cu-in)	153 cm ³ (9.3 cu-in)
	Compression ratio			11.0 : 1	10.6 : 1
	Valve train			2 valve, single chain driven SOHC	
	Intake valve	opens	at 1 mm (0.04 in) lift	5° BTDC	
		closes	at 1 mm (0.04 in) lift	35° ABDC	
	Exhaust valve	opens	at 1 mm (0.04 in) lift	30° BBDC	
		closes	at 1 mm (0.04 in) lift	0° TDC	
	Lubrication system			Forced pressure and wet sump	
	Oil pump type			Trochoid	
	Cooling system			Liquid cooled	
	Air filtration			Viscous paper filter	
	Engine dry weight			29.8 kg (65.7 lbs)	30.1 kg (66.4 lbs)
FUEL DELIVERY SYSTEM	Type			PGM-FI (Programmed Fuel Injection)	
	Throttle bore			24 mm (0.9 in)	26 mm (1.0 in)
DRIVE TRAIN	Clutch system			Dry, automatic centrifugal clutch	
	Drive belt ratio			2.60 : 1 - 0.82 : 1	2.45 : 1 - 0.81 : 1
	Final reduction			11.271 (53/17 x 47/13)	10.552 (53/17 x 44/13)
ELECTRICAL	Ignition system			Full transistorized	
	Starting system			Electric starter	
	Charging system			Triple phase output alternator	
	Lighting system			Battery	

PGM-FI SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Engine idle speed		1,700 ± 100 min ⁻¹ (rpm)
ECT sensor resistance	(40°C/104°F)	1.0 – 1.3 kΩ
	(100°C/212°F)	0.1 – 0.2 kΩ
Fuel injector resistance (20°C/68°F)		11 – 13 Ω

IGNITION SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	WW125EX2	CPR7EA-9 (NGK)/U22EPR-9 (DENSO)
	WW150	CPR7EA-9 (NGK)
Spark plug gap		0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil peak voltage		100 V minimum
Ignition timing		12° BTDC at idle speed

FUEL SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Throttle body identification number	WW125EX2	GQY3A
	WW150	GQMHA
Throttle grip freeplay		2 – 6 mm (0.1 – 0.2 in)
Fuel pressure at idle		294 kPa (3.0 kgf/cm ² , 43 psi)
Fuel pump flow (at 12 V)		98 cm ³ (3.31 US oz, 3.45 Imp oz) minimum/10 seconds

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	0.8 liter (0.8 US qt, 0.7 Imp qt)	–
	After disassembly	0.9 liter (1.0 US qt, 0.8 Imp qt)	–
	After oil strainer removal	0.9 liter (1.0 US qt, 0.8 Imp qt)	–
Recommended engine oil		Honda "4-stroke motorcycle oil" or an equivalent API classification: SG or higher (except oils labeled as energy conserving on the circular API service label) Viscosity: SAE 10W-30 JASO T 903 standard: MB	–
Oil pump rotor	Oil pump body I.D.	23.150 – 23.180 (0.9114 – 0.9126)	–
	Outer rotor O.D.	22.970 – 23.000 (0.9043 – 0.9055)	–
	Body-to-outer rotor clearance	0.15 – 0.21 (0.0059 – 0.0083)	0.35 (0.014)
	Oil pump body depth	7.020 – 7.090 (0.2764 – 0.2791)	–
	Outer rotor height	6.960 – 6.980 (0.2740 – 0.2748)	–
Side clearance		0.040 – 0.130 (0.0016 – 0.0051)	0.15 (0.006)

COOLING SYSTEM SPECIFICATIONS

ITEM			SPECIFICATIONS
Coolant capacity	Radiator and engine	WW125EX2	0.51 liter (0.54 US qt, 0.45 Imp qt)
		WW150	0.48 liter (0.51 US qt, 0.42 Imp qt)
	Reserve tank		0.18 liter (0.19 US qt, 0.16 Imp qt)
Radiator cap relief pressure			108 – 137 kPa (1.1 – 1.4 kgf/cm ² , 16 – 20 psi)
Thermostat	Begin to open		74 – 78 °C (165 – 172 °F)
	Fully open		100 °C (212 °F)
	Valve lift		8 mm (0.3 in) minimum
Recommended antifreeze			High quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors
Standard coolant concentration			1:1 (mixture with distilled water)

GENERAL INFORMATION

CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM				STANDARD	SERVICE LIMIT
Cylinder compression				1,098 kPa (11.2 kgf/cm ² , 159.3 psi) at 850 min ⁻¹ (rpm)	—
Cylinder head warpage				—	0.05 (0.002)
Camshaft	Cam lobe height		IN	33.616 – 33.856 (1.3235 – 1.3329)	—
			EX	33.393 – 33.633 (1.3147 – 1.3241)	—
Valve, valve guide	Valve clearance		IN	0.10 ± 0.02 (0.004 ± 0.001)	—
			EX	0.24 ± 0.02 (0.009 ± 0.001)	—
	Valve stem O.D.		IN	4.975 – 4.990 (0.1959 – 0.1965)	4.90 (0.193)
			EX	4.955 – 4.970 (0.1951 – 0.1957)	4.90 (0.193)
	Valve guide I.D.		IN/EX	5.000 – 5.012 (0.1969 – 0.1973)	5.03 (0.198)
	Stem-to-guide clearance		IN	0.010 – 0.037 (0.0004 – 0.0015)	0.08 (0.003)
			EX	0.030 – 0.057 (0.0012 – 0.0022)	0.10 (0.004)
	Valve guide projection above cylinder head	WW125EX2	IN/EX	10.55 – 10.85 (0.415 – 0.427)	—
		WW150	IN/EX	11.05 – 11.35 (0.435 – 0.447)	—
Valve seat width			IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length			IN/EX	36.94 (1.454)	—

CYLINDER/PISTON SPECIFICATIONS

WW125EX2:

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		52.400 – 52.410 (2.0630 – 2.0634)	52.50 (2.067)
	Out-of-round		—	0.05 (0.002)
	Taper		—	0.05 (0.002)
	Warpage		—	0.05 (0.002)
Piston, piston rings, piston pin	Piston O.D.		52.370 – 52.390 (2.0618 – 2.0626)	52.35 (2.061)
	Piston O.D. measurement point		6.5 (0.26) from bottom of skirt	—
	Piston pin bore I.D.		13.002 – 13.008 (0.5119 – 0.5121)	13.04 (0.513)
	Piston pin O.D.		12.994 – 13.000 (0.5116 – 0.5118)	12.96 (0.510)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.02 (0.001)
	Piston ring-to-ring groove clearance	Top	0.015 – 0.055 (0.0006 – 0.0022)	0.08 (0.003)
		Second	0.015 – 0.055 (0.0006 – 0.0022)	0.08 (0.003)
	Piston ring end gap	Top	0.10 – 0.25 (0.004 – 0.0010)	0.45 (0.018)
		Second	0.25 – 0.45 (0.010 – 0.0018)	0.65 (0.026)
Oil (side rail)		0.20 – 0.70 (0.008 – 0.028)	—	
Cylinder-to-piston clearance			0.01 – 0.04 (0.0004 – 0.0016)	0.09 (0.004)
Connecting rod small end I.D.			13.010 – 13.028 (0.5122 – 0.5129)	13.05 (0.514)
Connecting rod-to-piston pin clearance			0.010 – 0.034 (0.0004 – 0.0013)	0.05 (0.002)

WW150:

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		58.000 – 58.010 (2.2835 – 2.2839)	–
	Out-of-round		–	0.05 (0.002)
	Taper		–	0.05 (0.002)
	Warpage		–	0.05 (0.002)
Piston, piston rings, piston pin	Piston O.D.		57.970 – 57.990 (2.2822 – 2.2831)	–
	Piston O.D. measurement point		6.5 (0.26) from bottom of skirt	–
	Piston pin bore I.D.		14.002 – 14.008 (0.5513 – 0.5515)	14.04 (0.553)
	Piston pin O.D.		13.994 – 14.000 (0.5509 – 0.5512)	13.96 (0.550)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.02 (0.001)
	Piston ring-to-ring groove clearance	Top	0.015 – 0.055 (0.0006 – 0.0022)	0.08 (0.003)
		Second	0.015 – 0.055 (0.0006 – 0.0022)	0.08 (0.003)
	Piston ring end gap	Top	0.10 – 0.25 (0.004 – 0.0010)	0.45 (0.018)
		Second	0.38 – 0.52 (0.015 – 0.0020)	–
Oil (side rail)		0.20 – 0.70 (0.008 – 0.028)	–	
Cylinder-to-piston clearance			0.01 – 0.04 (0.0004 – 0.0016)	0.09 (0.004)
Connecting rod small end I.D.			14.010 – 14.028 (0.5516 – 0.5523)	14.06 (0.554)
Connecting rod-to-piston pin clearance			0.010 – 0.034 (0.0004 – 0.0013)	0.05 (0.002)

DRIVE PULLEY/DRIVEN PULLEY/CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Drive belt width		22.0 (0.87)	21.0 (0.83)
Movable drive face	Bushing I.D.	23.989 – 24.052 (0.9444 – 0.9469)	24.08 (0.948)
	Boss O.D.	23.960 – 23.974 (0.9433 – 0.9439)	23.93 (0.942)
	Weight roller O.D.	19.92 – 20.08 (0.784 – 0.791)	19.5 (0.77)
Clutch	Lining thickness	–	2.0 (0.08)
	Clutch outer I.D.	125.0 – 125.2 (4.92 – 4.93)	125.5 (4.94)
Driven pulley	Face spring free length	103.1 (4.06)	–
	Driven face O.D.	33.965 – 33.985 (1.3372 – 1.3380)	33.94 (1.336)
	Movable driven face I.D.	34.000 – 34.025 (1.3386 – 1.3396)	34.06 (1.341)

FINAL REDUCTION SPECIFICATIONS

Unit: mm (in)

ITEM		SPECIFICATIONS
Final reduction oil capacity	After draining	0.12 liter (0.13 US qt, 0.11 Imp qt)
	After disassembly	0.14 liter (0.15 US qt, 0.12 Imp qt)
Recommended final reduction oil		Honda "4-stroke motorcycle oil" or an equivalent API classification: SG or higher (except oils labeled as energy conserving on the circular API service label) Viscosity: SAE 10W-30 JASO T 903 standard: MB

CRANKCASE/CRANKSHAFT SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance	0.10 – 0.35 (0.004 – 0.014)	0.55 (0.022)
	Connecting rod radial clearance	0.004 – 0.016 (0.0002 – 0.0006)	0.05 (0.002)
	Runout	–	0.10 (0.004)

GENERAL INFORMATION

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	1.5 (0.06)
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)
Fork	Spring free length	291.8 (11.49)	—
	Pipe runout	—	0.2 (0.01)
	Recommended fluid	Honda Ultra Cushion Oil 10W	—
	Fluid level	75 (2.95)	—
	Fluid capacity	122.0 ± 2.5 cm ³ (4.13 ± 0.05 US oz, 4.29 ± 0.05 Imp oz)	—

REAR WHEEL/BRAKE/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	2.0 (0.08)
Cold tire pressure	Driver only	225 kPa (2.25 kgf/cm ² , 33 psi)	—
	Driver and passenger	250 kPa (2.50 kgf/cm ² , 36 psi)	—
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Brake	Brake lever freeplay	10 – 20 (0.4 – 0.8)	—
	Brake drum I.D.	130.0 – 130.2 (5.12 – 5.13)	131.0 (5.16)

HYDRAULIC BRAKE SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Specified brake fluid			DOT 3 or 4	—
Brake disc	Thickness		3.5 ± 0.2 (0.14 ± 0.008)	3.0 (0.12)
	Warpage		0.10 (0.004)	0.30 (0.001)
Front brake master cylinder	Cylinder I.D.		12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Piston O.D.		12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
CBS master cylinder	Cylinder I.D.		11.000 – 11.043 (0.4331 – 0.4348)	11.055 (0.4352)
	Piston O.D.		10.957 – 10.984 (0.4314 – 0.4324)	10.945 (0.4309)
Caliper	Cylinder I.D.	Upper	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
		Center/ lower	22.650 – 22.700 (0.8917 – 0.8937)	22.710 (0.8941)
	Piston O.D.	Upper	25.318 – 25.368 (0.9968 – 0.9987)	25.31 (0.996)
		Center/ Lower	22.585 – 22.618 (0.8892 – 0.8905)	22.56 (0.888)

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Capacity		12 V – 6 Ah (10HR)
	Current leakage		0.1 mA max.
	Voltage	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.4 V
	Charging current	Normal	0.6 A/5 – 10 h
		Quick	3 A/1 h
Alternator	Capacity	WW125EX2	0.329 kW/5,000 min ⁻¹ (rpm)
		WW150	0.343 kW/5,000 min ⁻¹ (rpm)

LIGHTS/METERS/SWITCHES SPECIFICATIONS

ITEM		SPECIFICATIONS
Bulbs	Headlight	12 V – 35/30 W x 2
	Position light	12 V – 5 W x 2
	Tail/brake light	12 V – 5 W/21W
	License light	12 V – 5 W
	Front turn signal light	12 V – 21 W x 2
	Rear turn signal light	12 V – 21 W x 2
	Instrument light	LED
	PGM-FI malfunction indicator lamp (MIL)	LED
	High beam indicator	LED
	Turn signal indicator	LED
	Coolant temperature indicator	LED
	Idling stop indicator	LED
Fuse	Main fuse 1	10 A
	Main fuse 2	30 A
	Sub fuse	10 A x 3, 15 A x 1

TORQUE VALUES

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

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

FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Front reflex reflector mounting nut (U type only)	2	6	1.5 (0.15, 1.1)	U-nut
Tail/brake light unit mounting screw	4	4	1 (0.1, 0.7)	
Exhaust pipe joint nut	2	7	29 (3.0, 21)	For tightening sequence; See page 2-13
Muffler mounting bolt	3	10	49 (5.0, 36)	For tightening sequence; See page 2-13
Exhaust pipe stud bolt	2	7	–	See page 2-13

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Spark plug	1	10	16 (1.6, 12)	
Valve adjusting screw lock nut	2	5	10 (1.0, 7)	Apply oil to the threads and seating surface.
Engine oil drain bolt	1	12	24 (2.4, 18)	
Engine oil strainer screen cap	1	30	20 (2.0, 15)	
Final reduction oil check bolt	1	8	23 (2.3, 17)	
Final reduction oil drain bolt	1	8	23 (2.3, 17)	
Air cleaner housing cover screw	7	5	1.1 (0.11, 0.8)	

PGM-FI SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
ECT sensor	1	10	12 (1.2, 9)	
O ₂ sensor	1	12	24.5 (2.5, 18)	

GENERAL INFORMATION

ELECTRIC STARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Sidestand switch bolt	1	6	10 (1.0, 7)	ALOC bolt: replace a with new one.

FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Fuel pump set plate nut	4	6	12 (1.2, 9)	For tightening sequence; See page 7-9
Air cleaner housing mounting bolt	2	6	11 (1.1, 8)	
Rear inner fender socket bolt - Air cleaner side	1	6	3.5 (0.36, 2.6)	
Sensor unit torx screw	3	5	3.4 (0.35, 2.5)	
Throttle cable bracket mounting screw	1	5	3.4 (0.35, 2.5)	
IACV torx screw	2	4	2.1 (0.21, 1.5)	
Insulator band bolt	2	5	5 (0.51, 3.7)	

LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Oil pump mounting bolt	2	6	10 (1.0, 7)	

COOLING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Radiator drain bolt	1	10	1 (0.1, 0.7)	
Radiator base screw	1	4	0.8 (0.08, 0.6)	
Radiator top cover screw	4	4	3.2 (0.33, 2.4)	

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Camshaft stopper bolt	1	6	10 (1.0, 7)	
Rocker arm shaft stopper bolt	2	5	5 (0.51, 3.7)	Apply oil to the threads and seating surface.
Cam sprocket socket bolt	2	5	8 (0.82, 5.9)	Apply oil to the threads and seating surface.
Cam chain tensioner lifter screw	1	6	4 (0.41, 3.0)	
Water pump holder bolt	2	6	10 (1.0, 7)	
Cylinder head nut	4	8	27 (2.8, 20)	Apply oil to the threads and seating surface.
Cylinder head sealing bolt	1	12	32 (3.3, 24)	

CYLINDER/PISTON

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Cylinder stud bolt	4	8	—	See page 11-6

DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Drive pulley face nut	1	14	59 (6.0, 44)	Apply oil to the threads and seating surface.
Clutch/driven pulley nut	1	28	54 (5.5, 40)	
Clutch outer nut	1	12	49 (5.0, 36)	

FINAL REDUCTION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Final reduction case bolt	6	8	23 (2.3, 17)	
Final reduction oil drain bolt	1	8	23 (2.3, 17)	

ALTERNATOR/STARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Stator mounting socket bolt	3	6	10 (1.0, 7)	
CKP sensor mounting special bolt	1	6	10 (1.0, 7)	
Flywheel nut	1	12	69 (7.0, 51)	
Cooling fan mounting bolt	3	6	8.5 (0.87, 6.3)	
Pillion step mounting bolt	4	8	26.5 (2.7, 20)	

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Engine hanger link pivot nut				
- Frame side	1	10	59 (6.0, 44)	U-nut
- Engine side	1	10	49 (5.0, 36)	U-nut
Shock absorber upper mounting nut	2	10	24 (2.4, 18)	

FRONT WHEEL/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Front brake disc socket bolt	4	8	42 (4.3, 31)	ALOC bolt: replace with new ones.
Front axle nut	1	12	59 (6.0, 44)	U-nut
Fork socket bolt	2	8	20 (2.0, 15)	Apply locking agent to the threads.
Bottom bridge pinch bolt	4	10	49 (5.0, 36)	
Brake caliper mounting bolt	2	8	30 (3.1, 22)	ALOC bolt: replace with new ones.
Handlebar upper holder socket bolt	4	8	27 (2.8, 20)	For tightening sequence; See page 17-19
Right/left handlebar switch housing screw	4	5	2.5 (0.26, 1.8)	
Handlebar weight screw	2	6	9 (0.9, 7)	Apply locking agent to the threads.
Front master cylinder holder socket bolt	2	6	12 (1.2, 9)	
Rear brake lever bracket socket bolt	2	6	12 (1.2, 9)	
Rearview mirror lock nut	2	10	34 (3.5, 25)	Left hand threads.
Handlebar lower holder nut	2	10	44 (4.5, 33)	U-nut
Handlebar post nut	1	10	39 (4.0, 29)	U-nut
Rearview mirror adapter bolt	2	10	34 (3.5, 25)	
Steering stem top thread	1	26	—	See page 17-27
Steering stem lock nut	1	26	—	See page 17-27
Throttle cable lock nut (handlebar side)	1	10	1.5 (0.15, 1.1)	
Rear brake lever pivot bolt	1	5	1 (0.1, 0.7)	
Rear brake lever pivot nut	1	5	4.5 (0.46, 3.3)	U-nut

REAR WHEEL/BRAKE/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Rear axle nut	1	16	118 (12.0, 87)	U-nut, Apply oil to the threads and seating surface.
Shock absorber upper mounting nut	2	10	24 (2.4, 18)	
Rear brake arm bolt	1	6	10 (1.0, 7)	ALOC bolt: replace a with new one.
Rear inner fender socket bolt				
- Engine side	1	6	10 (1.0, 7)	
- Air cleaner side	1	6	3.5 (0.36, 2.6)	

GENERAL INFORMATION

HYDRAULIC BRAKE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake caliper bleed valve	2	8	5.4 (0.55, 4.4)	
Front brake master cylinder reservoir cap screw	2	4	1.5 (0.15, 1.1)	
CBS master cylinder reservoir bolt	1	6	6 (0.61, 4.4)	
Front brake light switch screw	1	4	1 (0.1, 0.7)	
Brake pad pin	1	10	18 (1.8, 13)	
Front brake lever pivot bolt	1	6	1 (0.1, 0.7)	
Front brake lever pivot nut	1	6	6 (0.61, 4.4)	
Front master cylinder holder socket bolt	2	6	12 (1.2, 9)	
Brake hose oil bolt	4	10	34 (3.5, 25)	
Rearview mirror lock nut	2	10	34 (3.5, 25)	Left hand threads.
CBS master cylinder stay bolt	2	6	12 (1.2, 9)	
Knocker pivot bolt	1	6	2.5 (0.26, 1.8)	Left hand threads.
Knocker pivot nut	1	6	10 (1.0, 7)	Left hand threads, U-nut
CBS master cylinder mounting bolt	2	6	12 (1.2, 9)	
CBS master cylinder cover bolt	1	6	12 (1.2, 9)	
Brake caliper mounting bolt	2	8	30 (3.1, 22)	ALOC bolt: replace with new ones.
Brake caliper torque pin	1	8	22 (2.2, 16)	
Brake caliper pin	1	8	18 (1.8, 13)	

LIGHTS/METERS/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear turn signal light lens screw	4	4	0.9 (0.09, 0.6)	
License light lens screw	2	4	1 (0.1, 0.7)	
License light unit mounting nut	2	5	4.3 (0.44, 3.2)	U-nut
Speedometer mounting screw	4	5	1.1 (0.11, 0.8)	
Speedometer screw	8	3	0.54 (0.06, 0.4)	
VS sensor protector socket bolt	2	6	10 (1.0, 7)	Apply locking agent to the threads.
Fuel lid/seat opener lower cover screw	1	4	1.1 (0.11, 0.8)	
Key shutter socket bolt	1	5	5.1 (0.52, 3.8)	
Ignition switch mounting screw	2	6	9 (0.9, 6.6)	

OTHERS

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Muffler protector mounting bolt	2	6	10 (1.0, 7)	
Brake shoe anchor pin nut	1	8		
(When using the stake nut)			20 (2.0, 15)	
(When using the normal nut)			18 (1.8, 13)	
Sidestand pivot nut	1	10	29 (3.0, 21)	
Sidestand pivot bolt	1	10	10 (1.0, 0.7)	
Rear reflex reflector mounting nut	1	5	1.5 (0.15, 1.1)	U-nut
Radiator distance bolt	4	7	16.5 (1.7, 12)	
Breather separator plate screw	4	4	3.2 (0.33, 2.4)	

LUBRICATION & SEAL POINTS

ENGINE

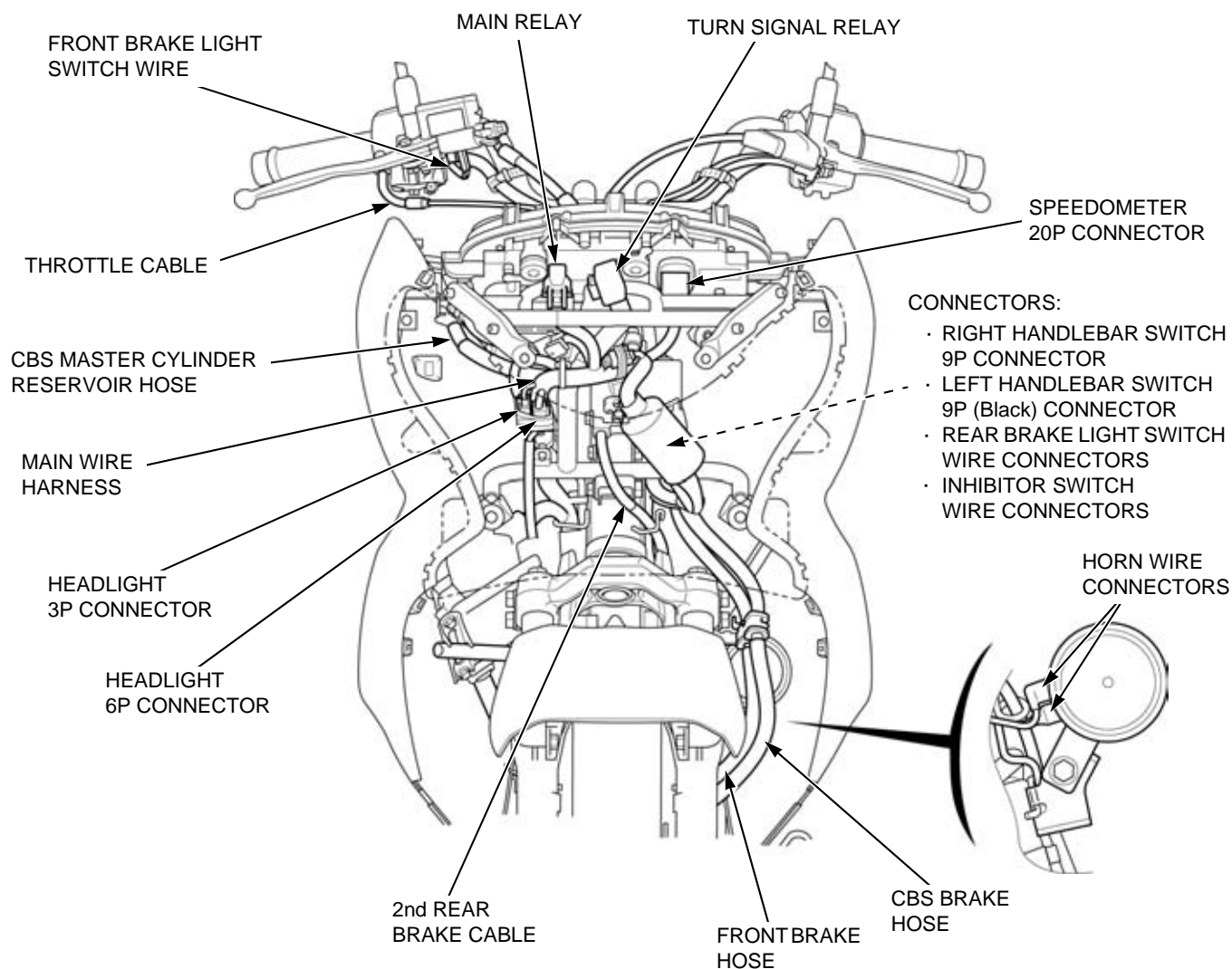
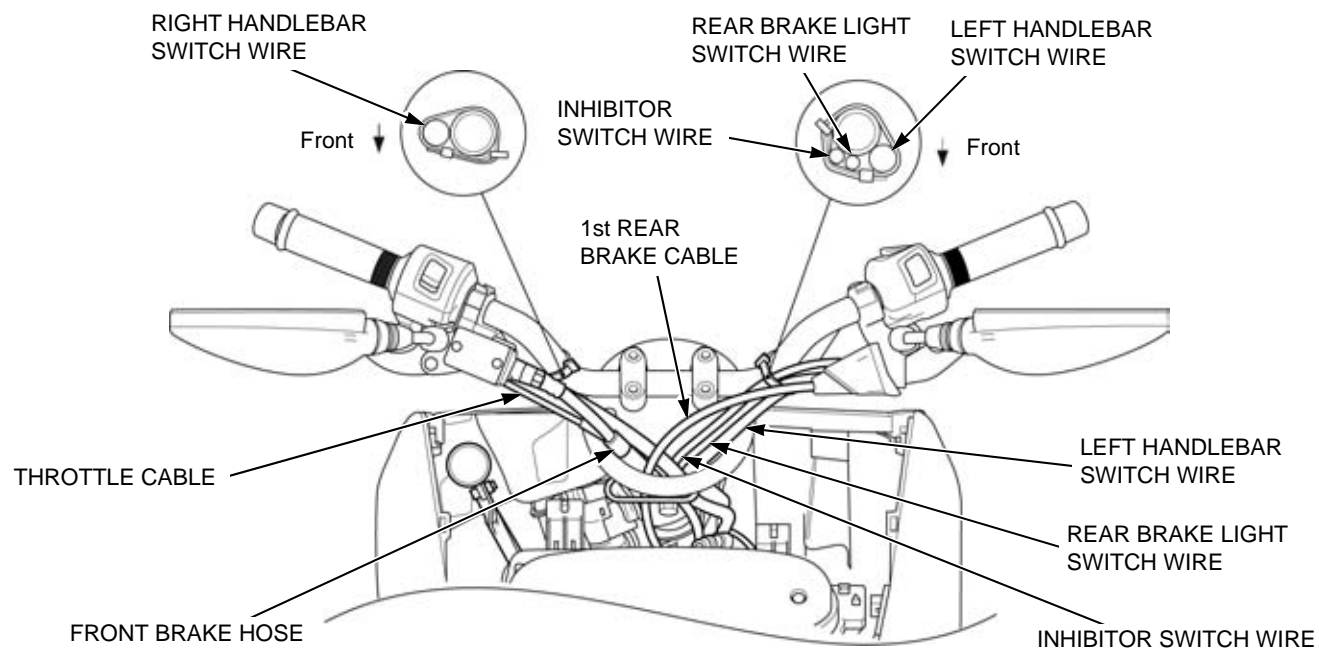
MATERIAL	LOCATION	REMARKS
Liquid sealant (Three Bond 1207B or 1215 or LOCTITE 5060S or 5020 or equivalent)	Right crankcase mating surface	See page 15-9
	Cylinder head-to-water pump holder mating surface	See page 10-19
Liquid sealant (Three Bond 5211C or 1215 or SHIN-ETSU-SILICONE KE45T or LOCTITE 5060S or 5020 or equivalent)	Cylinder head-to-rubber seal mating surface	See page 10-6
	Cylinder head-to-water pump joint mating surface	See page 9-10
Molybdenum oil solution (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	Camshaft cam lobes	
	Decompressor cam area and rotating surface	
	Rocker arm shaft sliding surface	
	Valve stem sliding surface and stem end	
Molybdenum disulfide paste (SUMICO MOLYPASTE 300 or equivalent)	Water pump shaft mating area with camshaft	
Grease (Shell ALVANIA R3 or IDEMITSU AUTOREX B or NIPPON OIL POWERNOC WB3 or equivalent)	Driven face boss inner surface	7.3 – 8.3 g
	Movable driven face guide groove	1.7 – 2.2 g
Grease (NIPPON OIL P/U N6B or N6C or equivalent)	Driven face ball bearing sliding area	
Grease (Shell RETINEX LX2 or NIPPON OIL P/U N6B or equivalent)	Driven face needle bearing sliding area	
Engine oil (Without molybdenum additives)	Oil pump drive and driven gear teeth	
	Oil pump inner and outer rotor whole surface	
	Oil pump shaft sliding surface	
	Injector seal ring	
	Rocker arm roller surface and needle bearing sliding surface	
	Cylinder head washer whole surface	
	Camshaft bearing	
	Cam sprocket teeth	
	Cam chain whole surface	
	Valve stem seal inner surface	
	Timing sprocket teeth	
	Cylinder inner surface	
	Piston sliding surface and ring grooves	
	Piston pin hole inner surface	
	Piston ring whole surface	
	Piston pin outer surface	
	Connecting rod small end inner surface	
	Connecting rod big end bearing	Fill up 3 cm ³ minimum
	Crankshaft bearings	Fill up 2 cm ³ minimum
	Crankshaft bearing plunger sliding surface	
	Bearing area of drive, counter and final gear shaft	
	Drive, counter and final gear teeth	
	Ball and needle bearing sliding area	
	Each O-ring whole surface	
	Each oil seal lips and outer surfaces	

GENERAL INFORMATION

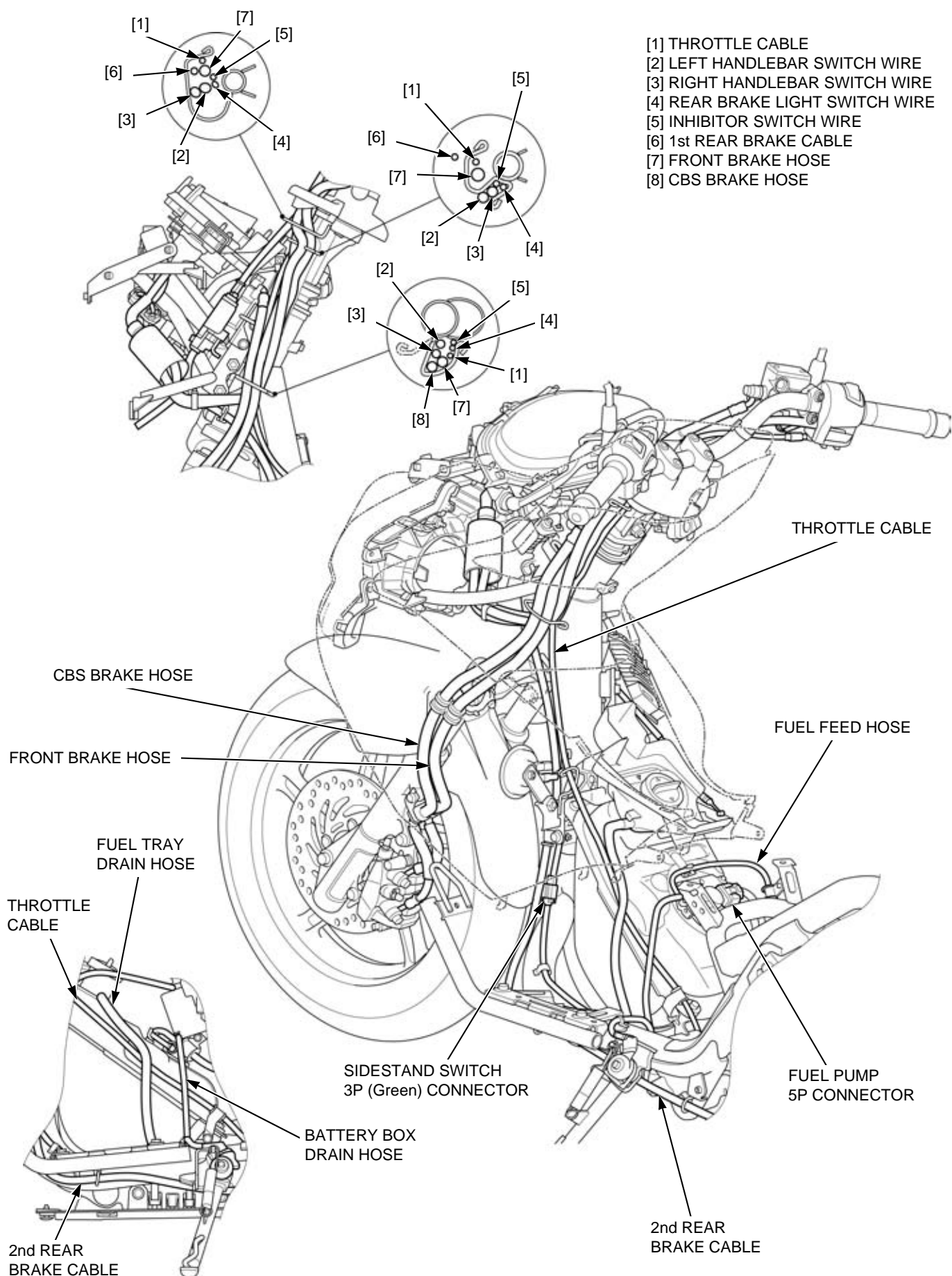
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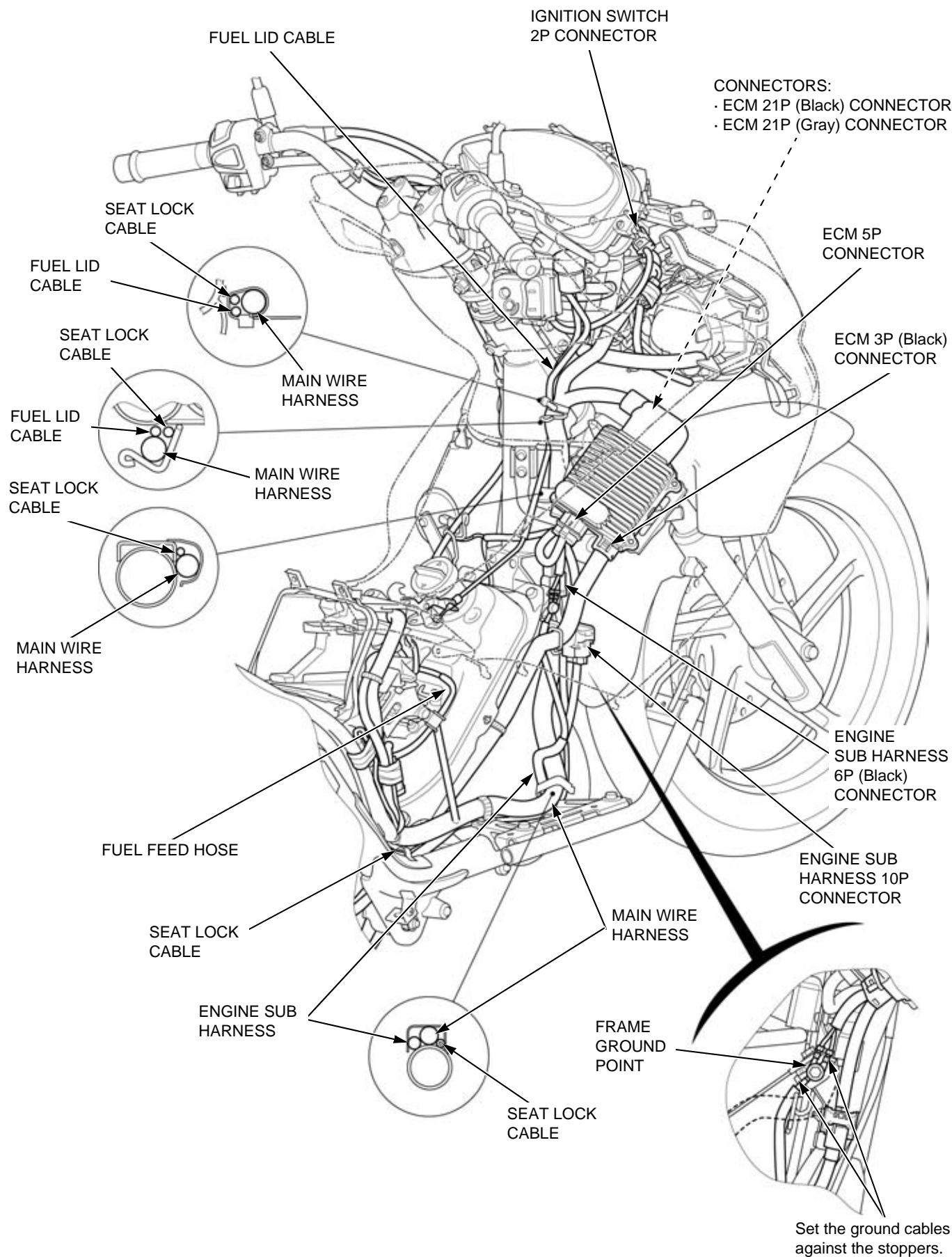
MATERIAL	LOCATION	REMARKS
Multi-purpose grease with extreme pressure (recommended: EXCELIGHT EP2 manufactured by KYODO YUSHI, japan. or Shell ALVANIA EP2 or equivalent)	Steering bearing race	Spread each 3 - 5 g
	Steering stem dust seal lip	Spread each 3 - 5 g
Multi-purpose grease	Front wheel dust seal lip	
	Swingarm dust seal lip	
	Front wheel axle sliding surface	
	Throttle cable end and rolling area	Apply 0.1 - 0.2 g
	Finalshaft groove	Apply 0.03 - 0.04 g
	Finalshaft/swingarm bearing sliding area	
	Rear brake cam and shaft	Spread each 0.2 - 0.3 g
	Rear brake cam sleeve cavity	
	Rear brake anchor pin shaft	Spread 0.2 - 0.3 g
	Rear brake dust seal lip	
	Rear brake lever pivot bolt sliding surface	
	Seat catch contact area	Apply 1.5 g minimum
	Seat hinge sliding area	Apply 0.3 g minimum
	Pillion step pivot pin sliding area	
	Centerstand pivot area	
	Sidestand pivot area	
Silicone grease	1st/2nd rear brake cable cap boot inside	
	Front brake lever-to-master piston contacting area	Spread 0.1 g minimum
	Master cylinder piston boot inside	
	Knocker-to-master piston contacting area	Spread each 0.1 g
	Equalizer sliding area	Spread each 0.1 g
	Knocker pivot bolt sliding area	
	Front brake lever pivot sliding area	Spread each 0.1 g
	Brake caliper pin boot/pin sliding area	Spread 0.4 g minimum
	Brake caliper pad pin O-ring whole surface	
	Brake caliper dust seal whole surface	
Brake fluid (DOT 3 or DOT 4)	Master cylinder inside and sliding area	
	Reservoir hose joint O-ring whole surface	
	Brake caliper piston seal whole surface	
	Brake caliper piston whole surface	
	Master cylinder piston cup	
Honda Ultra Cushion Oil 10W or equivalent	Fork dust seal and oil seal lips	
	Fork spring seat O-ring whole surface	
Adhesive (Honda bond A or equivalent)	Handlebar grip rubber inside	
	Air cleaner connecting hose-to-housing mating area	

CABLE & HARNESS ROUTING

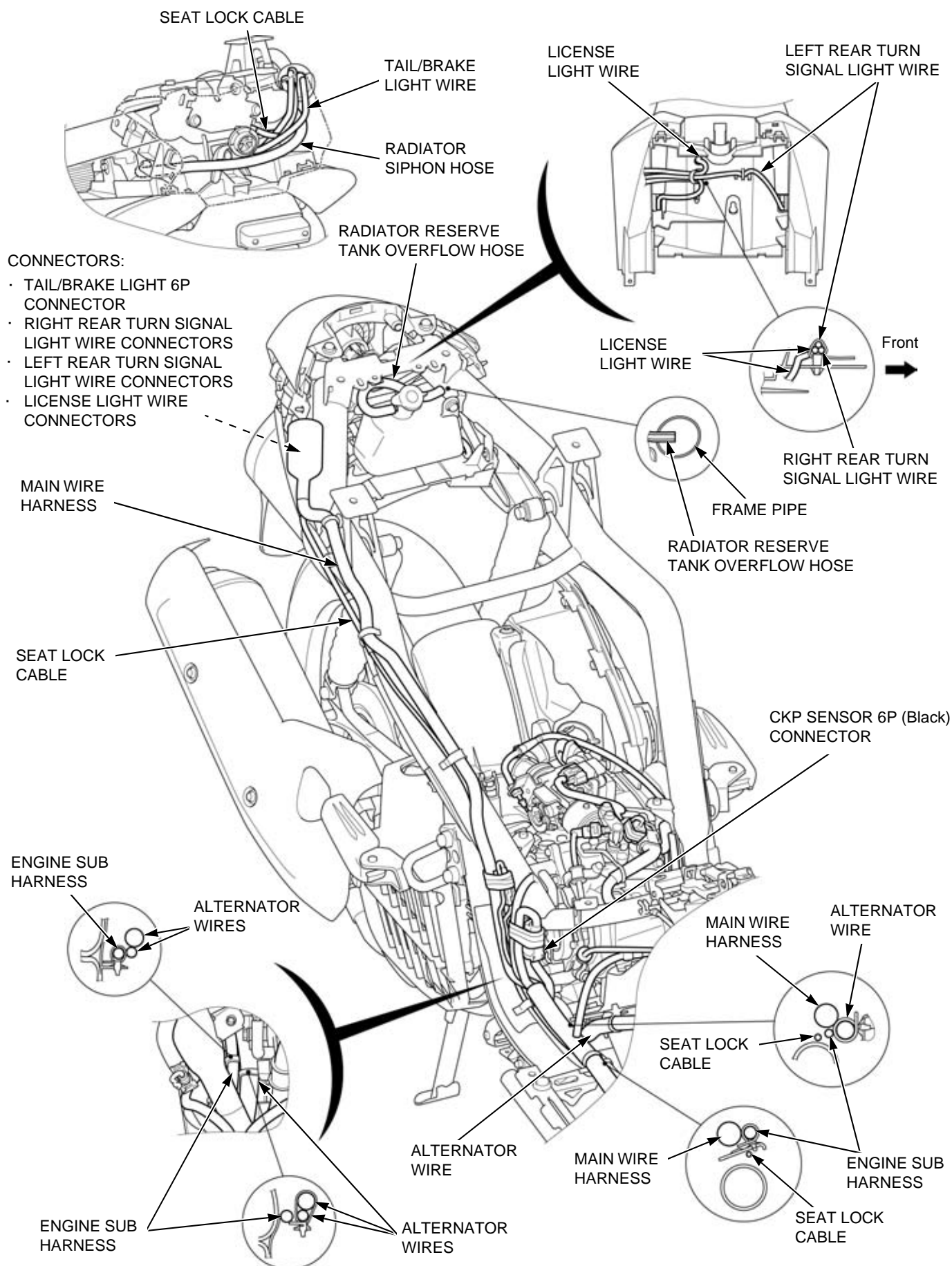


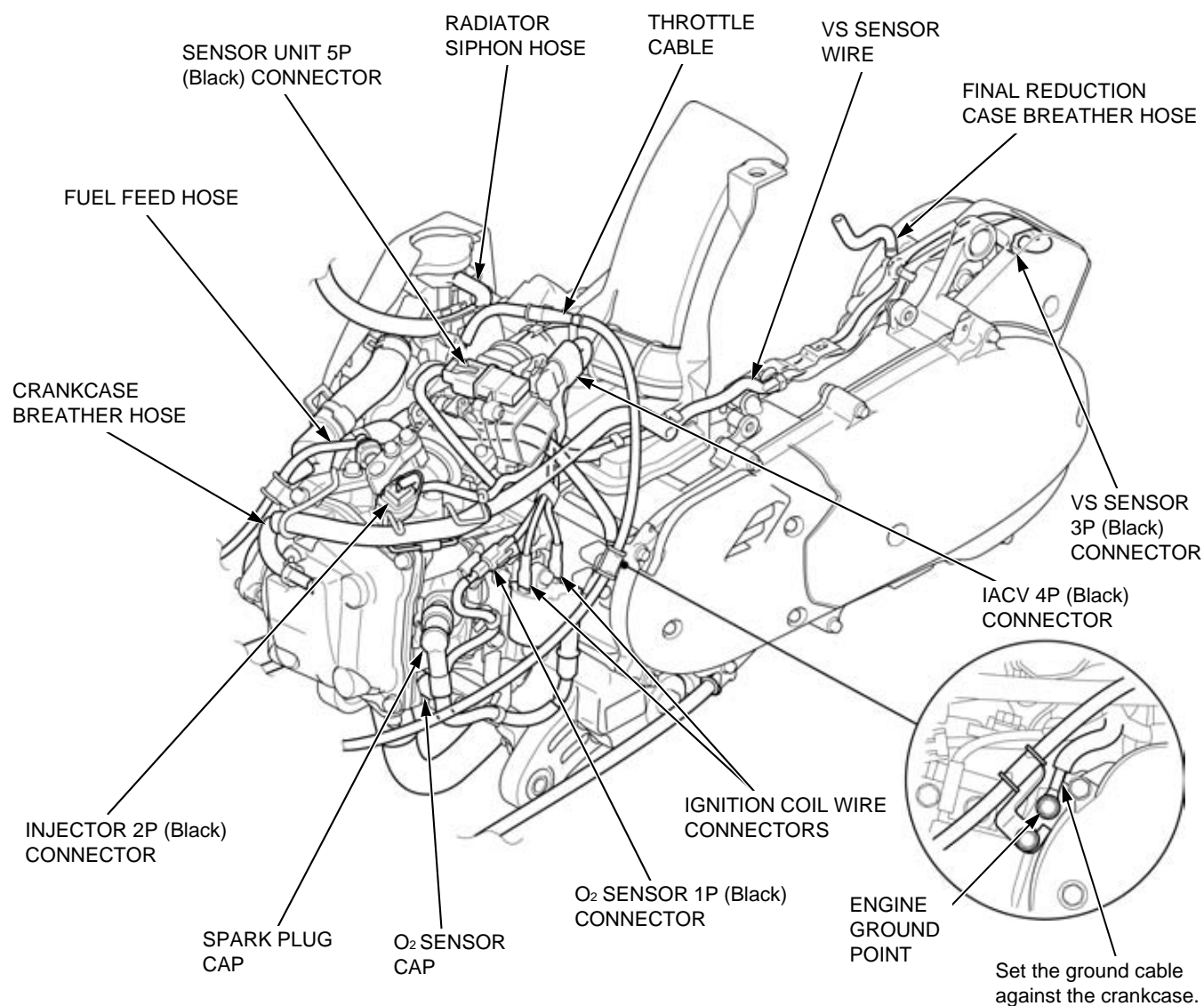
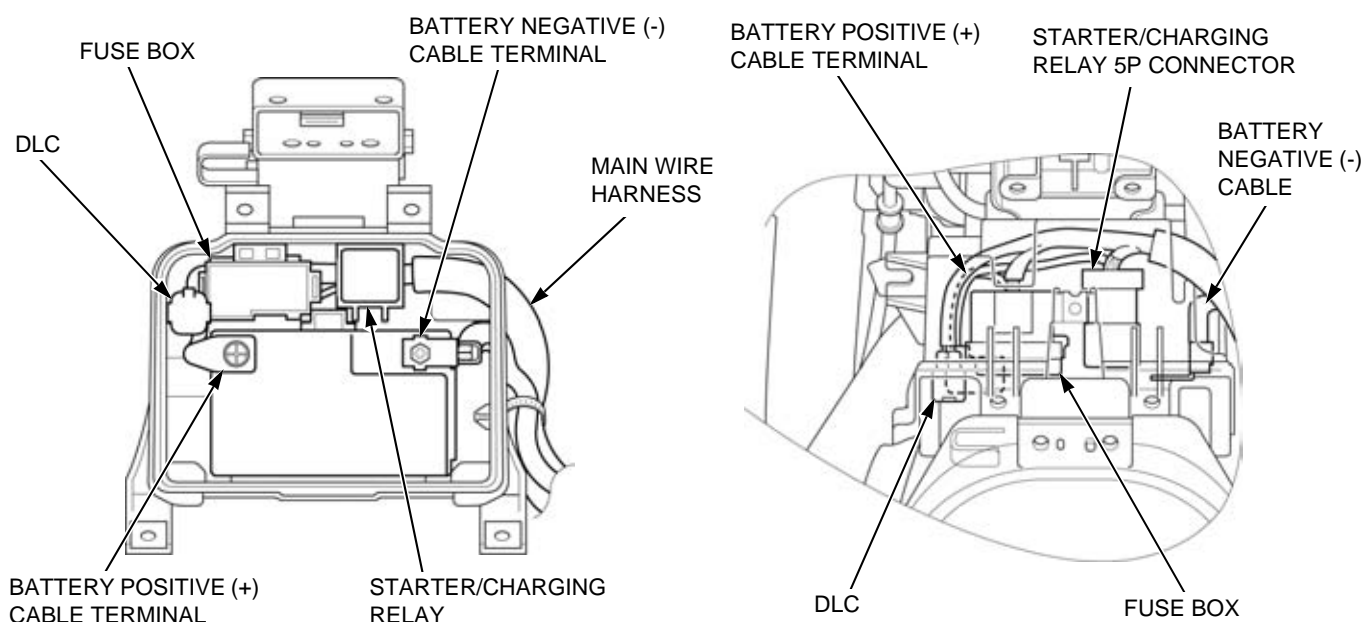
GENERAL INFORMATION



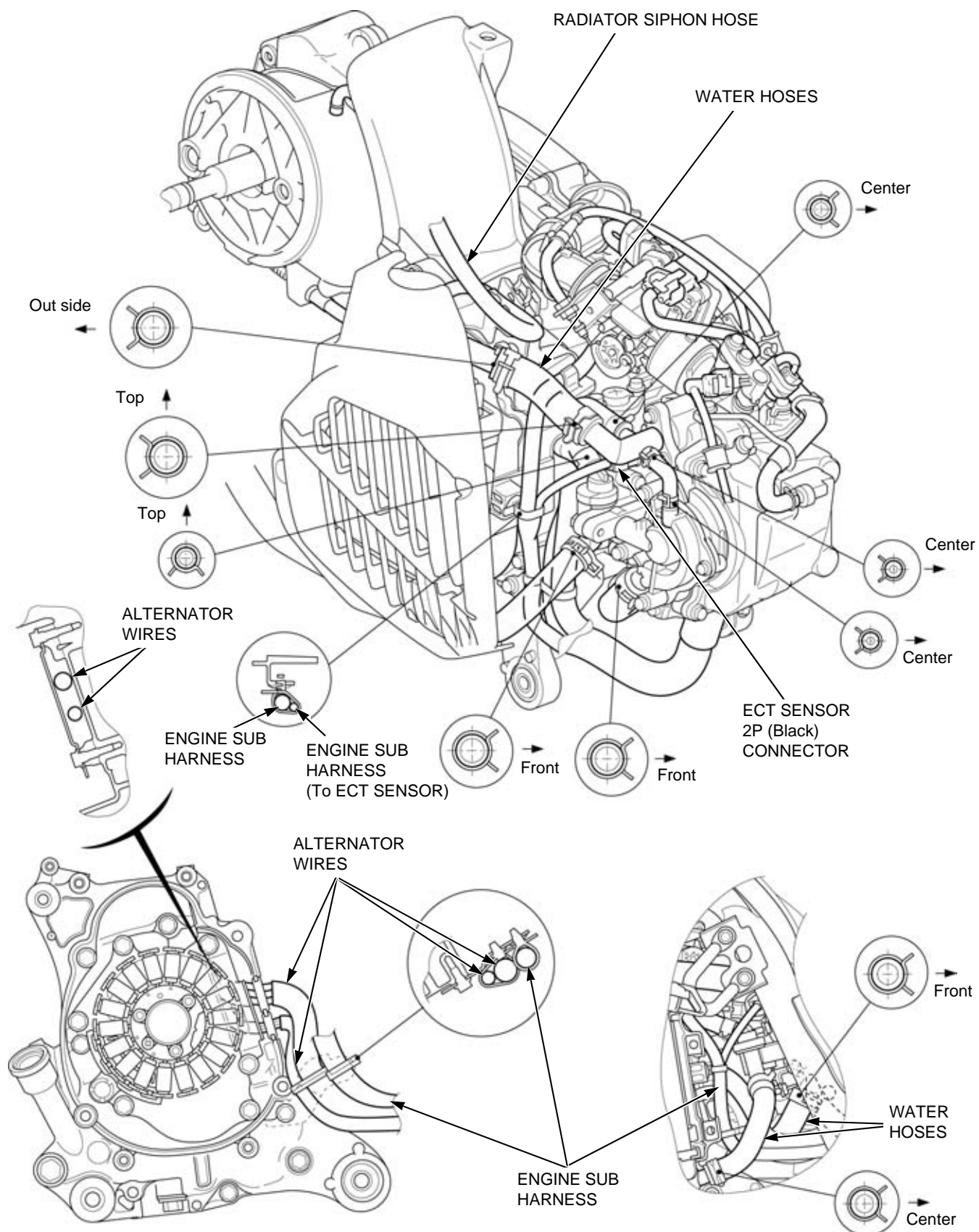


GENERAL INFORMATION





GENERAL INFORMATION



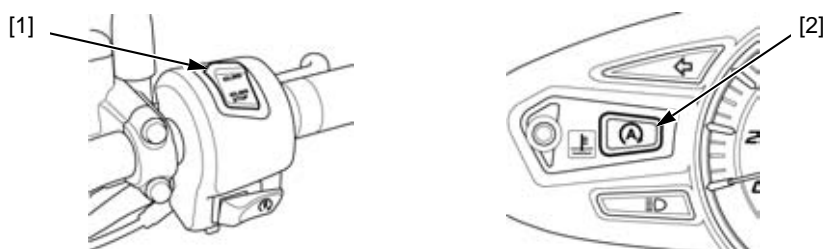
TECHNICAL FEATURE

IDLING STOP SYSTEM

SYSTEM OUTLINE

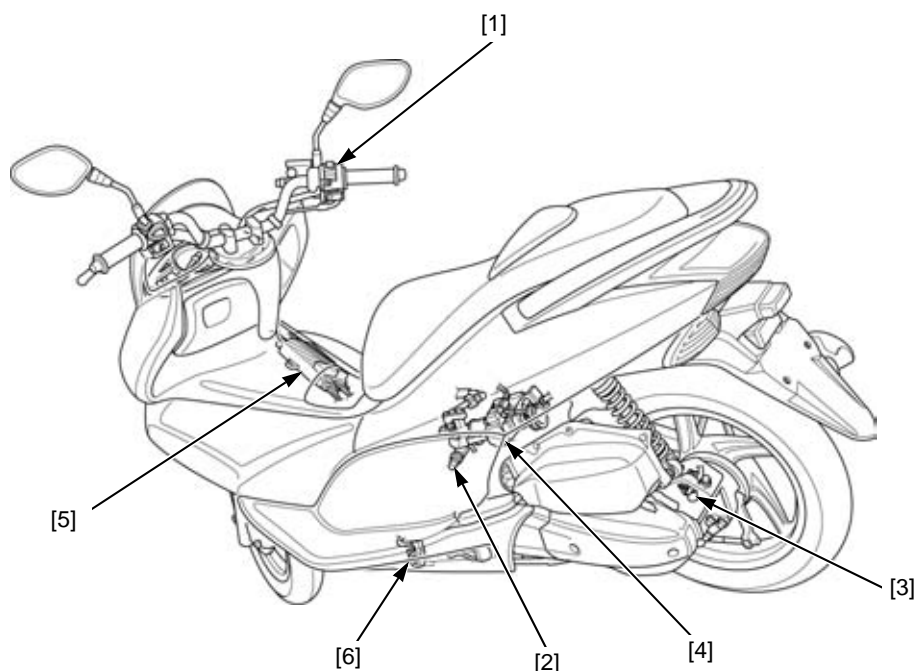
This vehicle is equipped with an idling stop system, which stops the engine three seconds after the vehicle makes a stop when the engine is completely warmed up, and restarts the engine with throttle operation.

This system can be turned ON/OFF with the idling stop switch [1] operation. The system is activated when the switch is at "IDLING STOP" position and the indicator [2] turns ON. When the vehicle makes a stop and the system stops the engine, the indicator starts blinking to notify the rider that the engine can be restarted any time.



IDLING STOP SYSTEM OPERATION

- OPERATING CONDITION
 - Idling stop switch [1] is at "IDLING STOP" position
 - Coolant temperature higher than 60°C (140°F) is detected by ECT sensor [2] (engine warm-up is complete)
- SYSTEM OPERATION WHEN THE VEHICLE MAKES A STOP
 - After the VS sensor [3] detects the vehicle speed has already reached faster than 10 km/h, when the TP sensor [4] detects the completely closed throttle and the VS sensor detects 0 km/h, ECM [5] cuts off the fuel injection to stop the engine, starting the idling stop operation.
- SYSTEM OPERATION WHEN THE VEHICLE RESTARTS
 - During idling stop operation, the engine restarts and vehicle starts running when the TP sensor detects the throttle operation. However, if the sidestand switch [6] detects that the sidestand is lowered during the idling stop operation, the system will be disabled in order to prevent the vehicle from falling. The engine can not be restarted with the throttle operation.



GENERAL INFORMATION

EMISSION CONTROL SYSTEMS

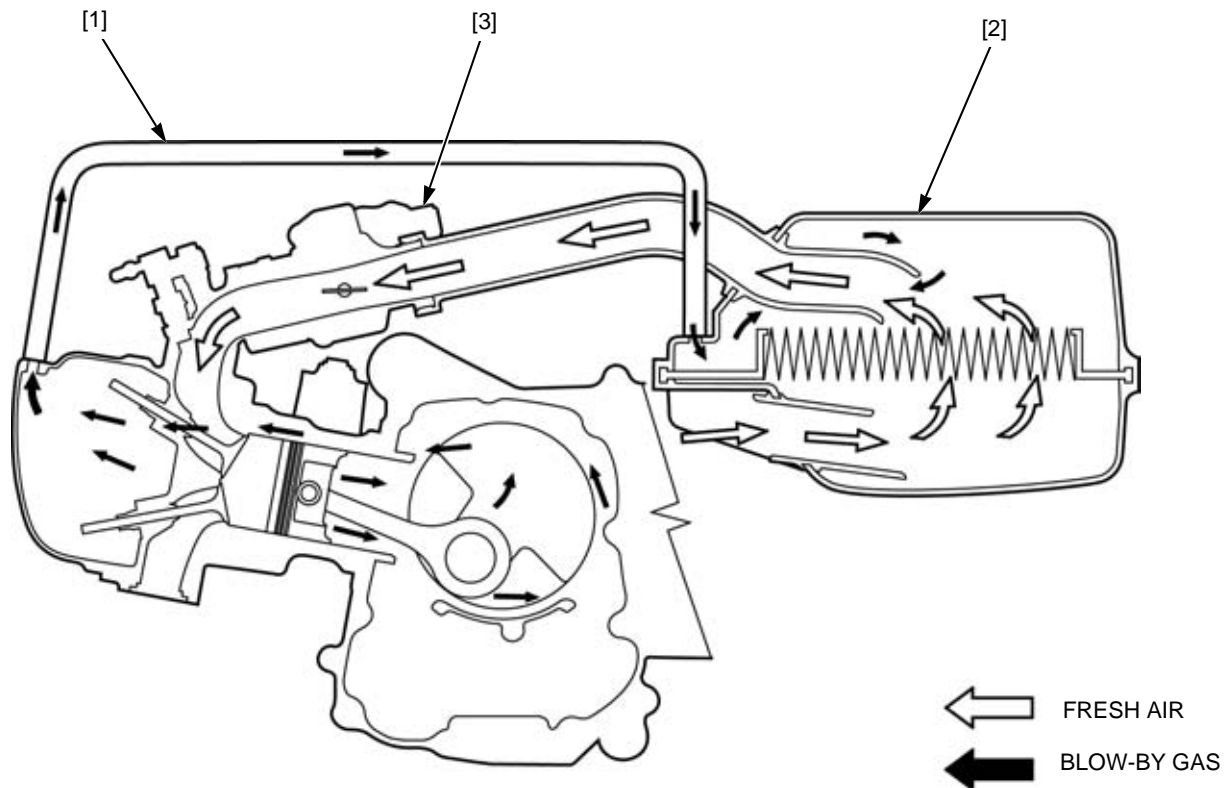
SOURCE OF EMISSIONS

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

Honda Motor Co., Ltd. utilizes various systems (page 1-22), 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 [2] and throttle body [3].



THREE-WAY CATALYTIC CONVERTER

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

The three-way catalytic converter is in the exhaust system. Through chemical reactions, they convert 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.

NOISE EMISSION CONTROL SYSTEM

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

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

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

2. FRAME/BODY PANELS/EXHAUST SYSTEM

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SIDE COVER	2-6	BODY COVER	2-11
UNDER COVER	2-6	LUGGAGE BOX	2-12
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CENTER COVER	2-7	REAR FENDER	2-13
METER PANEL COVER	2-7	EXHAUST PIPE/MUFFLER	2-13
RIGHT INNER MAINTENANCE LID	2-7	CENTERSTAND	2-14

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the body panels and exhaust system.
- Always replace the exhaust pipe gasket 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 joint first, then tighten the mounting fasteners. If you tighten the mounting fasteners first, the exhaust pipe may not seat properly.
- Always start the engine and inspect the exhaust system for leaks after installation.

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front reflex reflector mounting nut (U type only)	2	6	1.5 (0.15, 1.1)	U-nut
Tail/brake light unit mounting screw	4	4	1 (0.1, 0.7)	
Exhaust pipe joint nut	2	7	29 (3.0, 21)	For tightening sequence; See page 2-13
Muffler mounting bolt	3	10	49 (5.0, 36)	For tightening sequence; See page 2-13
Exhaust pipe stud bolt	2	7	–	See page 2-13

TROUBLESHOOTING

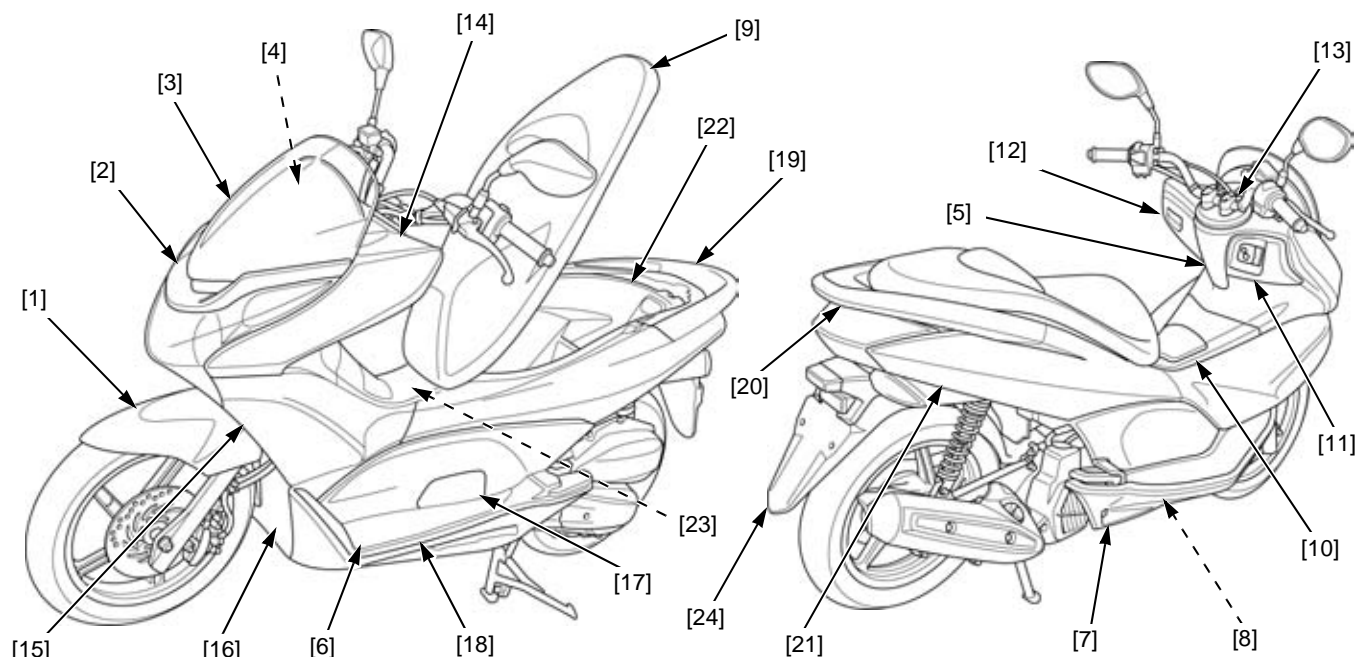
Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

BODY PANEL LOCATIONS



[1] Front fender (page 2-4)

[2] Front grille (page 2-4)

[3] Meter visor (page 2-5)

[4] Front meter panel (page 2-5)

[5] Meter panel cover (page 2-7)

[6] Floor mat (page 2-5)

[7] Side cover (page 2-6)

[8] Under cover (page 2-6)

[9] Seat (page 2-6)

[10] Center cover (page 2-7)

[11] Right inner maintenance lid (page 2-7)

[12] Inner cover (page 2-8)

[13] Handlebar front cover (page 2-8)

[14] Rear meter panel (page 2-8)

[15] Front cover (page 2-9)

[16] Front lower cover (page 2-9)

[17] Plug maintenance lid (page 2-9)

[18] Floor step (page 2-10)

[19] Grab rail cover (page 2-10)

[20] Grab rail (page 2-11)

[21] Body cover (page 2-11)

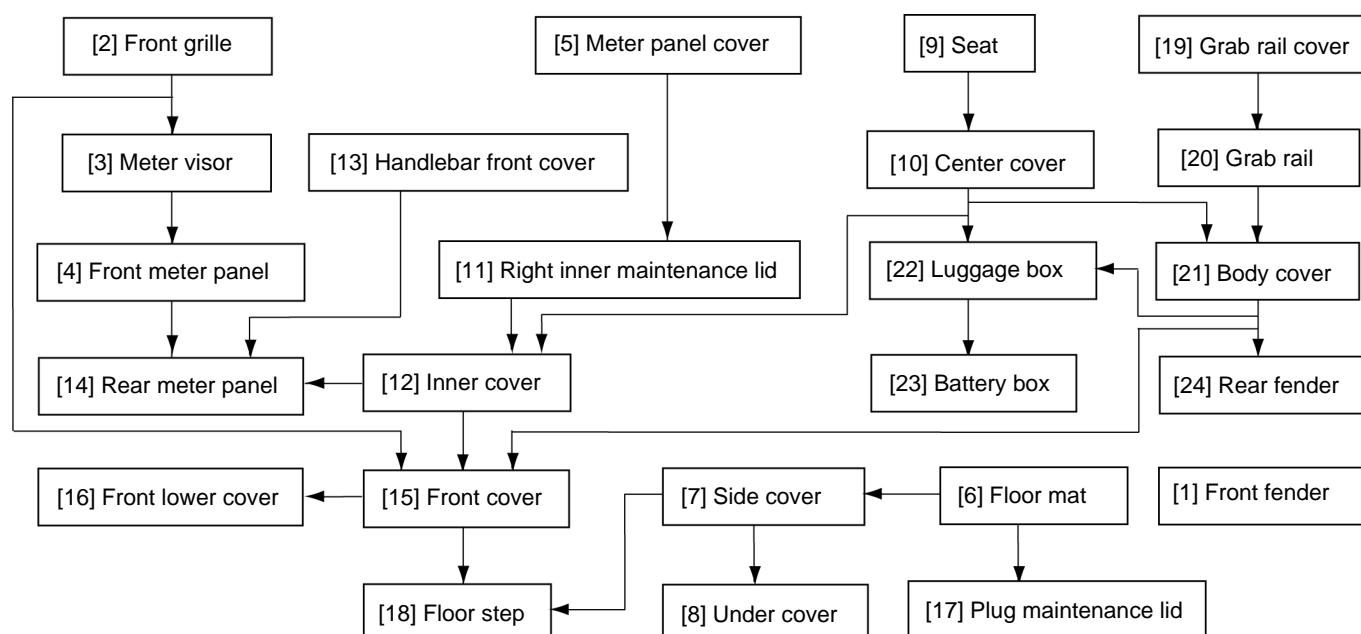
[22] Luggage box (page 2-12)

[23] Battery box (page 2-12)

[24] Rear fender (page 2-13)

BODY PANEL REMOVAL CHART

- This chart shows removal order of body panels by means of arrow.



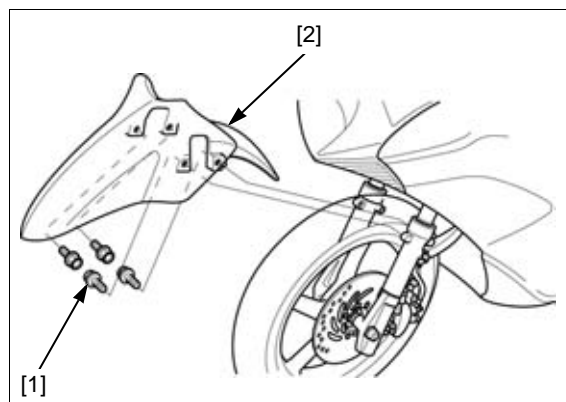
FRONT FENDER

REMOVAL/INSTALLATION

EXCEPT U TYPE

Remove the four bolts [1] and front fender [2].

Installation is in the reverse order of removal.



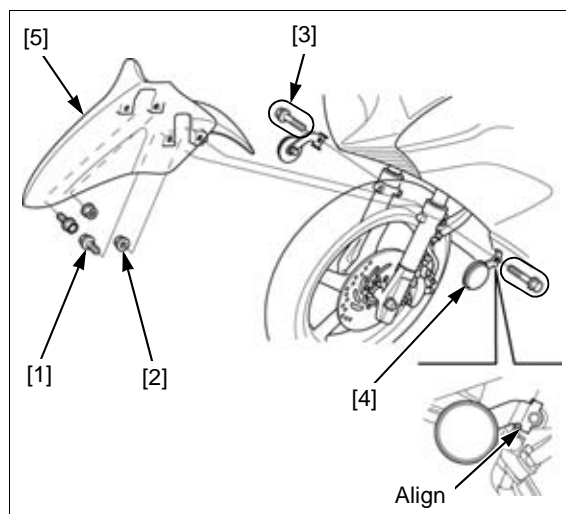
U TYPE

Remove the following:

- Two bolts [1]
- Two nuts [2]/bolts [3]/reflex reflectors [4]
- Front fender [5]

Installation is in the reverse order of removal.

- Tighten the nut while aligning the reflex reflector with the boss of the fork slider.



FRONT GRILLE

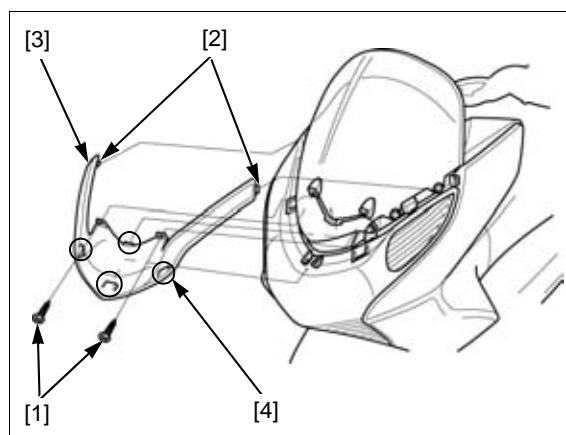
REMOVAL/INSTALLATION

Remove the two screws [1].

Release the snap fit clips [2].

Pull the front grille [3] forward and release the hooks [4], then remove the front grille.

Installation is in the reverse order of removal.



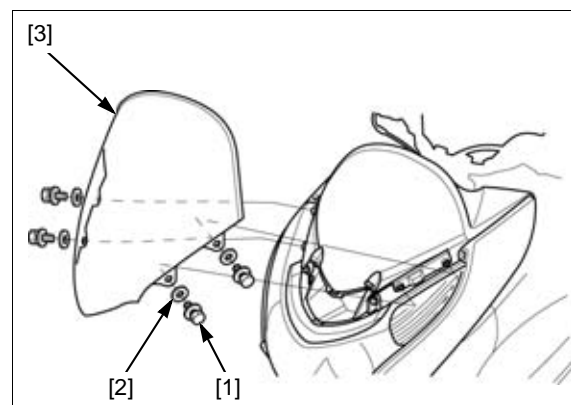
METER VISOR

REMOVAL/INSTALLATION

Remove the front grille (page 2-4).

Remove the four bolts [1]/plastic washers [2] and meter visor [3].

Installation is in the reverse order of removal.



FRONT METER PANEL

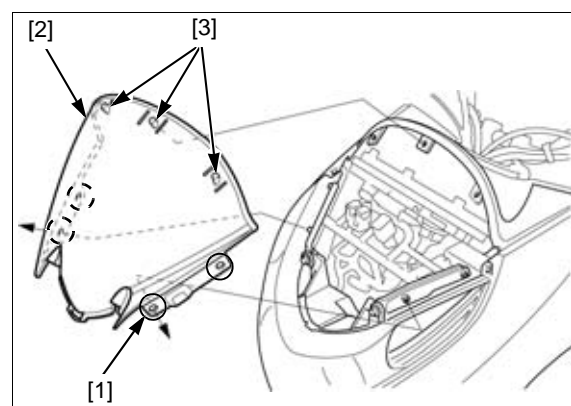
REMOVAL/INSTALLATION

Remove the meter visor (page 2-5).

Release the holes [1] of the front meter panel [2] from the bosses of the front cover stay.

Remove the front meter panel by releasing the hooks [3] from the holes of the rear meter panel.

Installation is in the reverse order of removal.

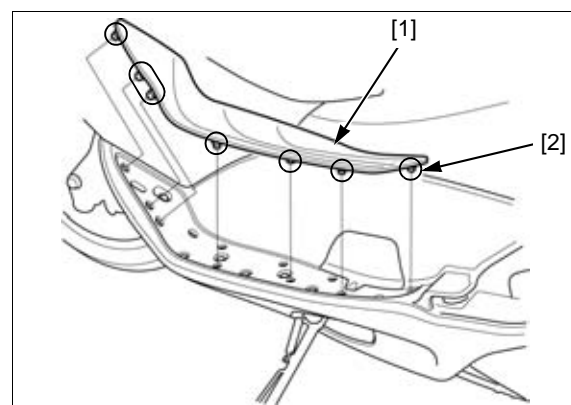


FLOOR MAT

REMOVAL/INSTALLATION

Remove the floor mat [1] by releasing the bosses [2] of the reverse side from the holes of the floor step.

Installation is in the reverse order of removal.



SIDE COVER

REMOVAL/INSTALLATION

Remove the floor mat (page 2-5).

Place the scooter on its centerstand.

Open the pillion step and remove the special bolt [1].

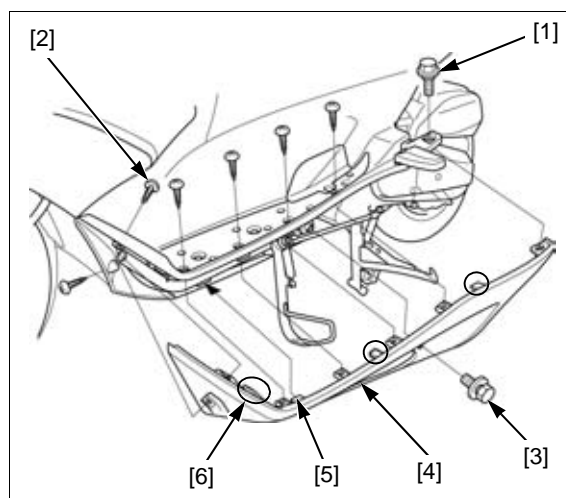
Remove the following:

- Six tapping screws [2]
- Bolt/washer [3]

Remove the side cover [4] by releasing the following:

- Hook [5] from the slot of the under cover
- Three tabs [6] from the slots of the floor step

Installation is in the reverse order of removal.



UNDER COVER

REMOVAL/INSTALLATION

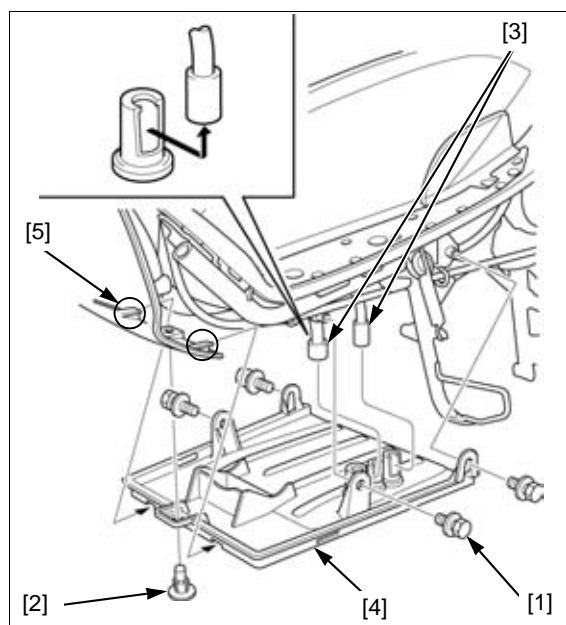
Remove the side covers (page 2-6).

Remove the four bolts/washers [1] and trim clip [2].

Release the two hoses [3] from the under cover [4] as shown.

Remove the under cover from the tabs [5] of the front lower cover.

Installation is in the reverse order of removal.



SEAT

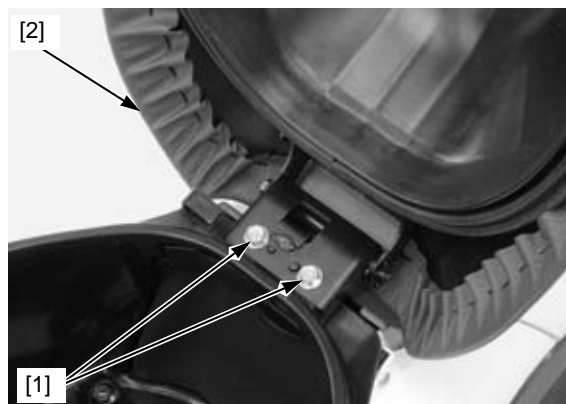
REMOVAL/INSTALLATION

Unlock and open the seat.

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

Install the seat and tighten the bolts so that the seat is completely centered.

- Apply grease to the seat hinge sliding area if necessary.



CENTER COVER

REMOVAL/INSTALLATION

Remove the seat (page 2-6).

Unlock and open the fuel lid.

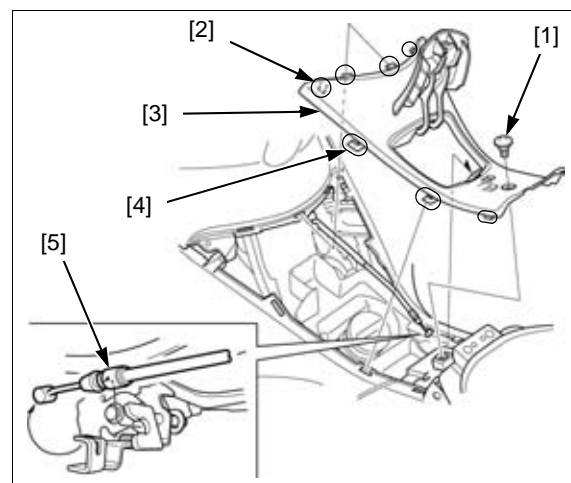
Remove the special screw [1].

Release the front side five tabs [2].

Pull the center cover [3] rearward and release the hooks [4].

Pull up the center cover and disconnect the fuel lid cable [5] as shown.

Installation is in the reverse order of removal.



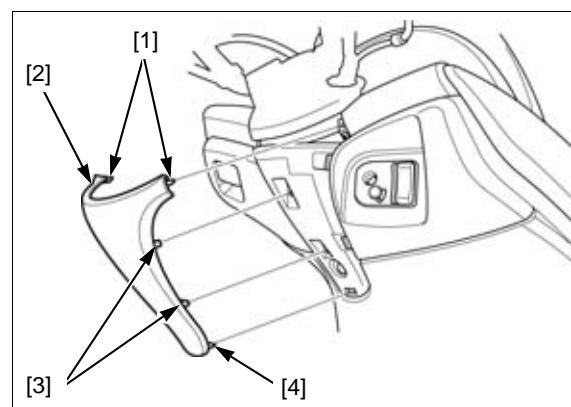
METER PANEL COVER

REMOVAL/INSTALLATION

Release the both upper side hooks [1].

Remove the meter panel cover [2] by releasing the two snap fit clips [3] and lower side hook [4].

Installation is in the reverse order of removal.



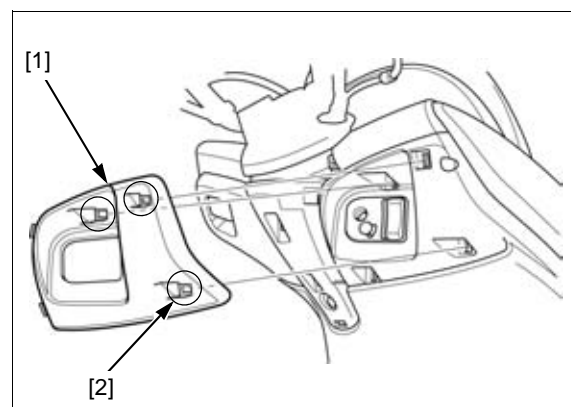
RIGHT INNER MAINTENANCE LID

REMOVAL/INSTALLATION

Remove the meter panel cover (page 2-7).

Remove the right inner maintenance lid [1] by releasing the snap fit clips [2].

Installation is in the reverse order of removal.



INNER COVER

REMOVAL/INSTALLATION

Remove the following:

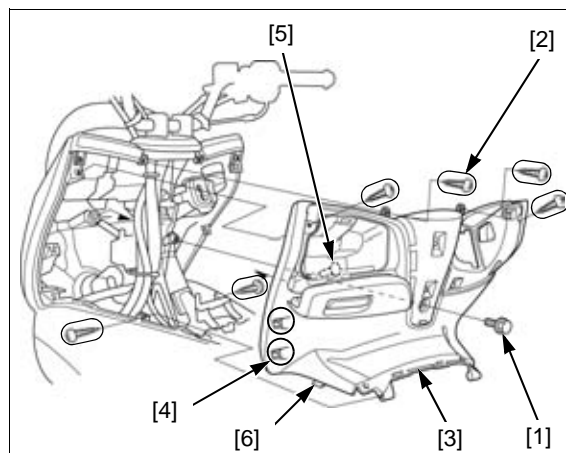
- Right inner maintenance lid (page 2-7)
- Center cover (page 2-7)
- Bolt [1]

Open the inner pocket and remove the six tapping screws [2].

Remove the inner cover [3] by releasing the following:

- Snap fit clips [4]
- Boss [5] from the grommet of the front cover stay
- Hooks [6] from the slots of the front cover

Installation is in the reverse order of removal.

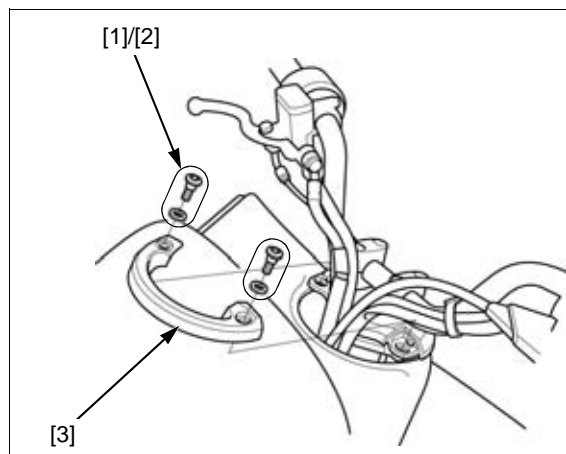


HANDLEBAR FRONT COVER

REMOVAL/INSTALLATION

Remove the two socket bolts [1]/plastic washers [2] and handlebar front cover [3].

Installation is in the reverse order of removal.



REAR METER PANEL

REMOVAL/INSTALLATION

Remove the following:

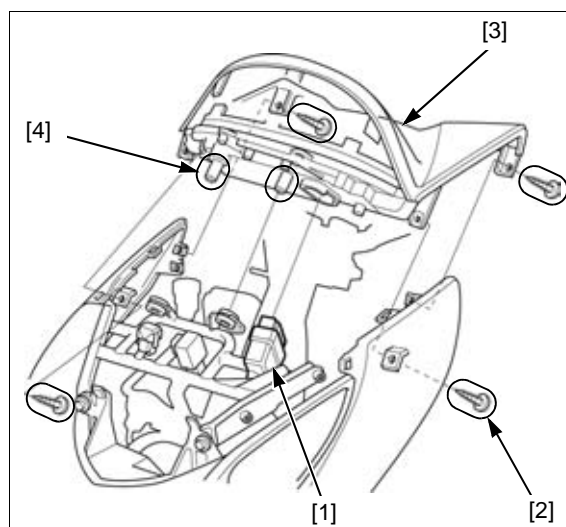
- Front meter panel (page 2-5)
- Inner cover (page 2-8)
- Handlebar front cover (page 2-8)

Pull off the dust cover and disconnect the speedometer 20P connector [1].

Remove the four screws [2].

Remove the rear meter panel [3] by releasing the bosses [4] from the grommets of the front cover stay.

Installation is in the reverse order of removal.



FRONT COVER

REMOVAL/INSTALLATION

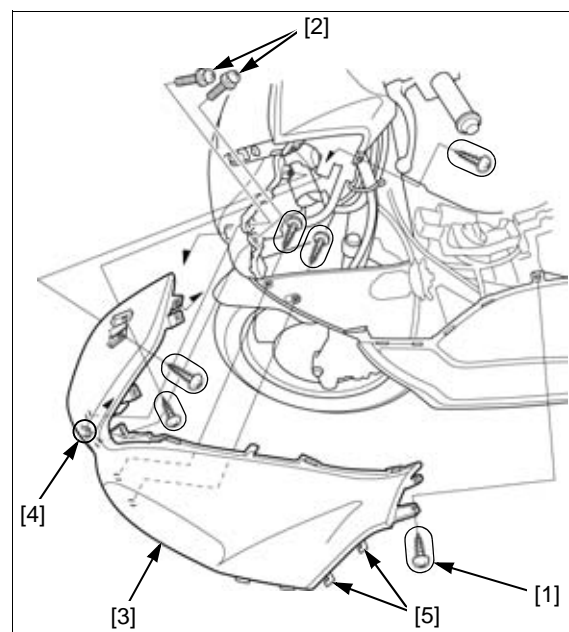
Remove the following:

- Front grille (page 2-4)
- Inner cover (page 2-8)
- Body cover (page 2-11)
- Six tapping screws [1]
- Two screws/washers [2]

Remove the front cover [3] by releasing the following:

- Tab [4] from the groove of the headlight unit
- Hooks [5] from the slots of the floor step

Installation is in the reverse order of removal.



FRONT LOWER COVER

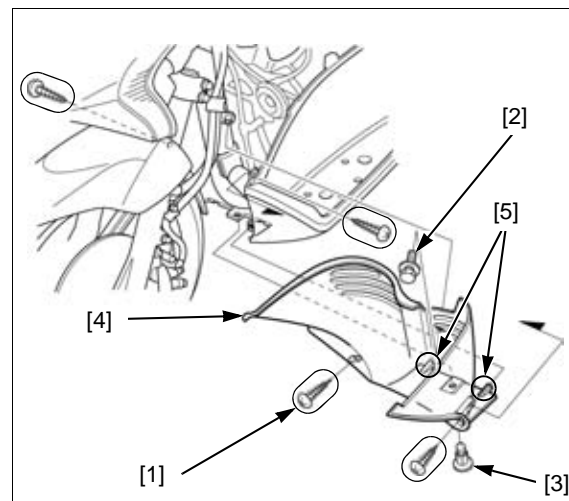
REMOVAL/INSTALLATION

Remove the front cover (page 2-9).

Remove the four screws [1], bolt/washer [2] and trim clip [3].

Remove the front lower cover [4] by releasing the tabs [5] from the slots of the under cover.

Installation is in the reverse order of removal.



PLUG MAINTENANCE LID

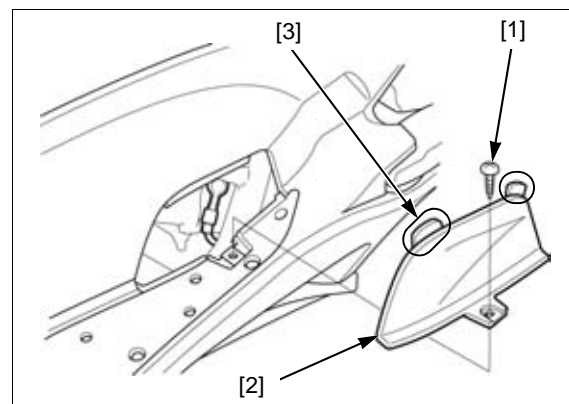
REMOVAL/INSTALLATION

Remove the left floor mat (page 2-5).

Remove the screw [1].

Remove the maintenance lid [2] by releasing the tabs [3].

Installation is in the reverse order of removal.



FLOOR STEP

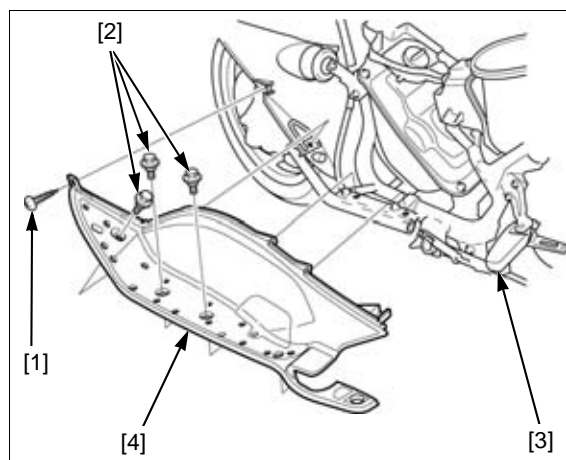
REMOVAL/INSTALLATION

Remove the following:

- Side cover (page 2-6)
- Front cover (page 2-9)

Remove the screw [1] and three special bolts [2].
Open the pillion step [3] and remove the floor step [4].

Installation is in the reverse order of removal.



GRAB RAIL COVER

REMOVAL/INSTALLATION

Unlock the seat with the seat opener.
Open the seat.

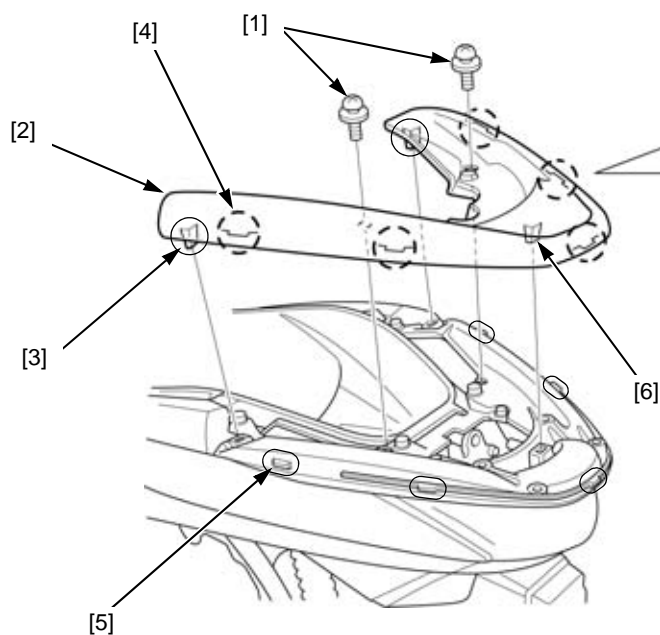
Remove the two screws/washers [1].

Carefully pull up the front side of grab rail cover [2] and release the two snap fit clips [3].

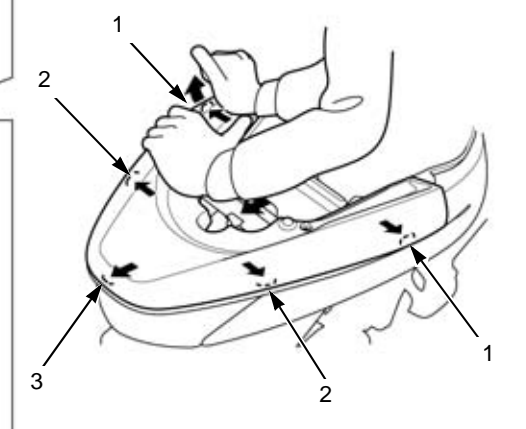
Push the grab rail cover to outside and release the grooves [4] from the bosses [5] of the grab rail as shown.

Carefully pull up the rear side of grab rail cover and release the snap fit clip [6] and remove the grab rail cover.

Installation is in the reverse order of removal.



Releasing the grooves procedure:



GRAB RAIL

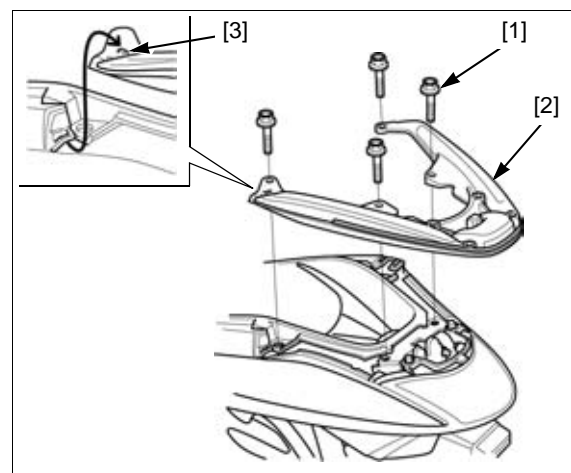
REMOVAL/INSTALLATION

Remove the grab rail cover (page 2-10).

Remove the four bolts [1].

Remove the grab rail [2] by releasing the bosses [3] from the grooves of the body cover as shown.

Installation is in the reverse order of removal.



BODY COVER

REMOVAL/INSTALLATION

Remove the following:

- Center cover (page 2-7)
- Grab rail (page 2-11)

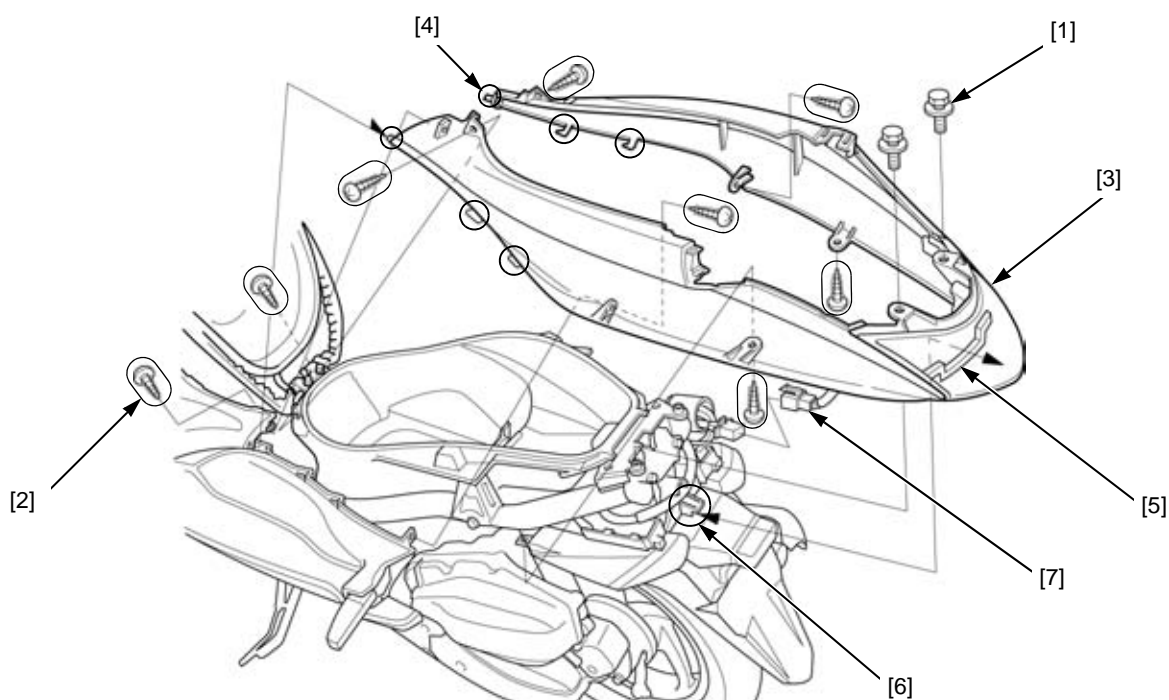
Remove the two bolts/washers [1] and eight tapping screws [2].

Slightly slide the body cover [3] backward and release the following:

- Hooks [4] from the slots
- Groove [5] from the stopper [6] of the tail/brake light unit

Pull the body cover backward and disconnect the brake/tail light 6P connector [7], then remove the body cover.

Installation is in the reverse order of removal.



FRAME/BODY PANELS/EXHAUST SYSTEM

DISASSEMBLY/ASSEMBLY

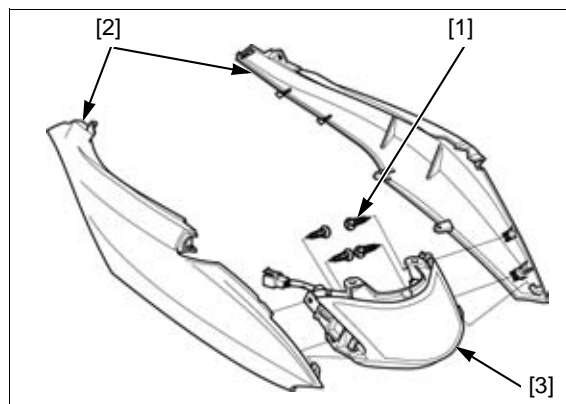
Remove the following:

- Four tapping screws [1]
- Right/left body covers [2]
- Tail/brake light unit [3]

Assembly is in the reverse order of disassembly.

TORQUE:

Tail/brake light unit mounting screw:
1 N·m (0.1 kgf·m, 0.7 lbf·ft)



LUGGAGE BOX

REMOVAL/INSTALLATION

Remove the following:

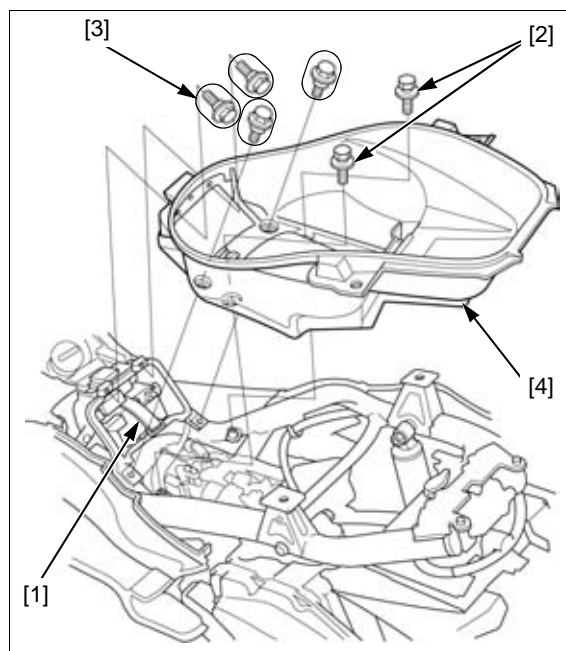
- Center cover (page 2-7)
- Body cover (page 2-11)
- Battery maintenance lid (page 20-5)

Release the battery band [1].

Remove the following:

- Two bolts/washers [2]
- Four special bolts [3]
- Luggage box [4]

Installation is in the reverse order of removal.



BATTERY BOX

REMOVAL/INSTALLATION

Remove the following:

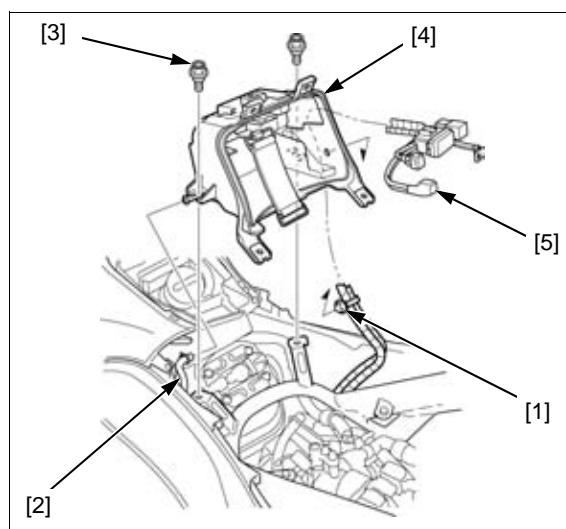
- Luggage box (page 2-12)
- Battery (page 20-5)

Remove the wire band boss [1] and disconnect the battery box drain hose [2] from the joint.

Remove the two special bolts [3].

Remove the battery box [4] by pulling out the main wire harness [5].

Installation is in the reverse order of removal.



REAR FENDER

REMOVAL/INSTALLATION

Remove the body cover (page 2-11).

Disconnect the following connectors:

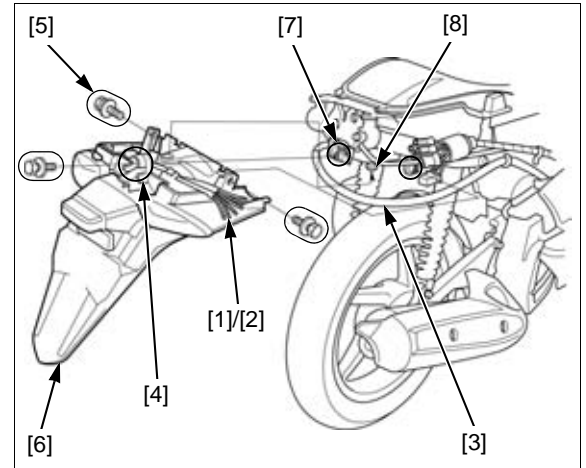
- Turn signal light (Light blue, Orange, Green) wire connectors [1]
- License light (Brown, Green) wire connectors [2]

Release the radiator siphon hose [3] from the hose groove [4].

Remove the three bolts/washers [5].

Remove the rear fender [6] from the frame bosses [7] and boss [8] of the radiator reserve tank.

Installation is in the reverse order of removal.



EXHAUST PIPE/MUFFLER

REMOVAL/INSTALLATION

Remove the joint nuts [1].

Remove the three muffler mounting bolts [2] and exhaust pipe/muffler [3].

Remove the gasket [4] from the exhaust pipe.

Installation is in the reverse order of removal.

- Always replace the gasket with a new one.
- Tighten the exhaust pipe joint nuts fast, then tighten the muffler mounting bolts.
- After installation, start the engine and inspect the exhaust system for leaks.

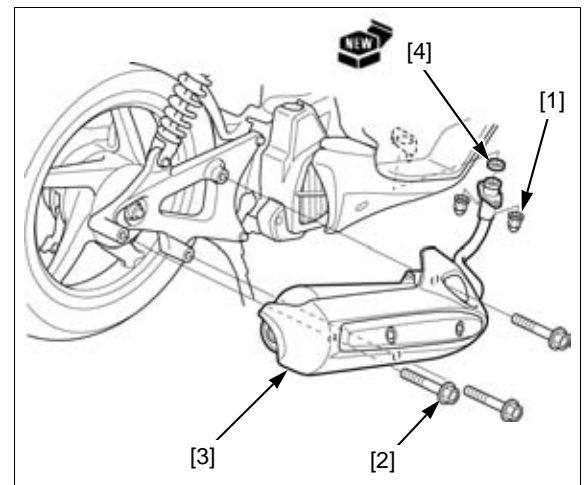
TORQUE:

Exhaust pipe joint nut:

29 N·m (3.0 kgf·m, 21 lbf·ft)

Muffler mounting bolt:

49 N·m (5.0 kgf·m, 36 lbf·ft)



EXHAUST PIPE STUD BOLT REPLACEMENT

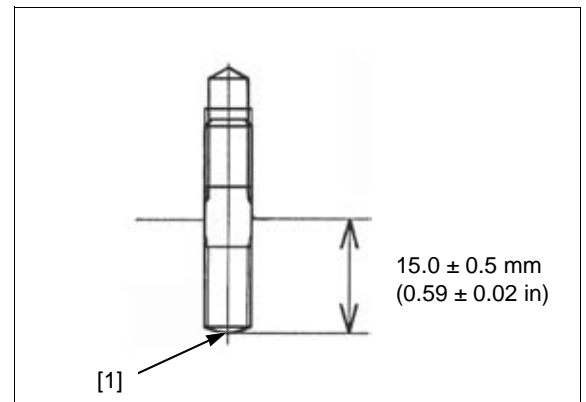
Thread two nuts to the stud bolt and tighten them together, then use a wrench on them to turn the stud bolt out.

Install the stud bolts with their rounded end [1] facing out.

Install and tighten new stud bolts into the cylinder head to the specified torque.

TORQUE: 9 N·m (0.92 kgf·m, 6.6 lbf·ft)

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



CENTERSTAND

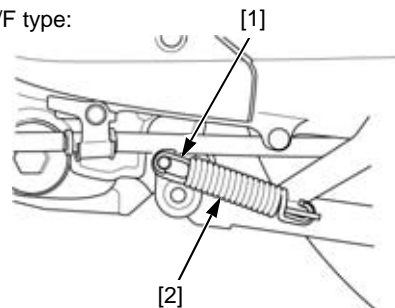
REMOVAL/INSTALLATION

Retract the centerstand and support the scooter securely.

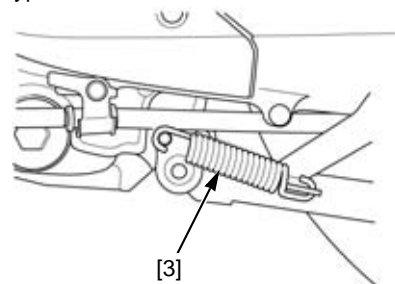
E/ED/F type: Remove the centerstand inner spring [1] and outer spring [2].

KO/U type: Remove the centerstand spring [3].

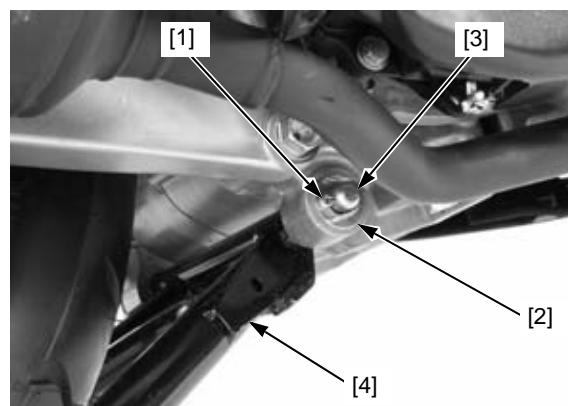
E/ED/F type:



KO/U type:



Remove the cotter pin [1] and washer [2].
Pull out the pivot shaft [3] and remove the centerstand [4].

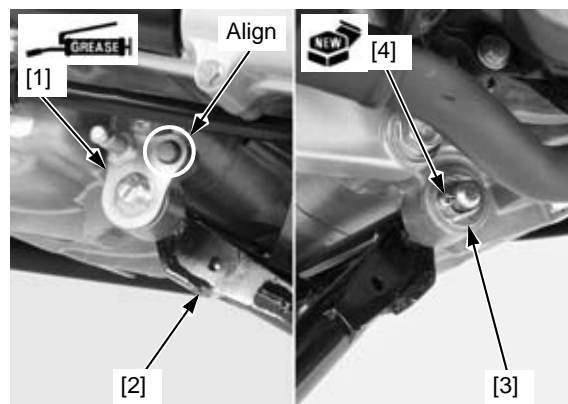


Apply thin coat of grease to the centerstand pivot shaft [1] surface.

Install the centerstand [2] and insert the pivot shaft while aligning its hole with the crankcase boss.

Install the washer [3] and a new cotter pin [4].

Install the centerstand spring in the reverse order of removal.



SERVICE INFORMATION	3-2	FINAL DRIVE OIL	3-11
MAINTENANCE SCHEDULE	3-3	BATTERY	3-12
FUEL LINE	3-4	BRAKE FLUID	3-13
THROTTLE OPERATION	3-4	BRAKE SHOES/PADS WEAR	3-13
AIR CLEANER	3-5	BRAKE SYSTEM	3-14
CRANKCASE BREATHER	3-5	BRAKE LIGHT SWITCH	3-16
SPARK PLUG	3-6	HEADLIGHT AIM	3-16
VALVE CLEARANCE	3-6	CLUTCH SHOES WEAR	3-17
ENGINE OIL	3-8	SIDESTAND	3-17
ENGINE OIL STRAINER SCREEN	3-9	SUSPENSION	3-17
ENGINE IDLE SPEED	3-9	NUTS, BOLTS, FASTENERS	3-18
RADIATOR COOLANT	3-10	WHEELS/TIRES	3-18
COOLING SYSTEM	3-10	STEERING HEAD BEARINGS	3-18
DRIVE BELT	3-11		

MAINTENANCE

SERVICE INFORMATION

GENERAL

- 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.
- If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area. 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 enclosed area.
- Place the scooter on a level ground before starting any work.

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 that the actual battery condition of the load can be measured.

Recommended battery tester: **BM-210 or BATTERY MATE or equivalent**

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Spark plug	1	10	16 (1.6, 12)	
Valve adjusting screw lock nut	2	5	10 (1.0, 7)	Apply oil to the threads and seating surface.
Engine oil drain bolt	1	12	24 (2.4, 18)	
Engine oil strainer screen cap	1	30	20 (2.0, 15)	
Final reduction oil check bolt	1	8	23 (2.3, 17)	
Final reduction oil drain bolt	1	8	23 (2.3, 17)	
Air cleaner housing cover screw	7	5	1.1 (0.11, 0.8)	

MAINTENANCE SCHEDULE

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

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

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

ITEMS	FREQUENCY	NOTE	ODOMETER READING (NOTE 1)					ANNUAL CHECK	REGULAR REPLACE	REFER TO PAGE
			x 1,000 km x 1,000 mi	1 0.6	4 2.5	8 5	12 7.5			
* FUEL LINE				I	I	I	I	I		3-4
* THROTTLE OPERATION				I	I	I	I	I		3-4
* AIR CLEANER	NOTE 2		EVERY 16,000 km (10,000 mi) R							3-5
CRANKCASE BREATHER	NOTE 3			C	C	C	C	C		3-5
SPARK PLUG					R					3-6
* VALVE CLEARANCE				I	I	I	I			3-6
ENGINE OIL				R		R		R		3-8
* ENGINE OIL STRAINER SCREEN							C			3-9
* ENGINE IDLE SPEED				I	I	I	I	I		3-9
RADIATOR COOLANT	NOTE 4					I		I	2 years	3-10
* COOLING SYSTEM						I		I		3-10
* DRIVE BELT			EVERY 8,000 km (5,000 mi) I, EVERY 24,000 km (15,000 mi) R							3-11
* FINAL DRIVE OIL	NOTE 4								2 years	3-11
* BATTERY				I	I	I	I	I		3-12
BRAKE FLUID	NOTE 4				I	I	I	I	2 years	3-13
BRAKE SHOES/PADS WEAR					I	I	I	I		3-13
BRAKE SYSTEM				I	I	I	I	I		3-14
BRAKE LIGHT SWITCH					I	I	I	I		3-16
HEADLIGHT AIM					I	I	I	I		3-16
** CLUTCH SHOES WEAR						I				3-17
SIDESTAND					I	I	I	I		3-17
* SUSPENSION					I	I	I	I		3-17
* NUTS, BOLTS, FASTENERS				I		I		I		3-18
** WHEELS/TIRES					I	I	I	I		3-18
** STEERING HEAD BEARINGS				I			I	I		3-18

* 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 scooter after each periodic maintenance is carried out.

NOTES:

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

FUEL LINE

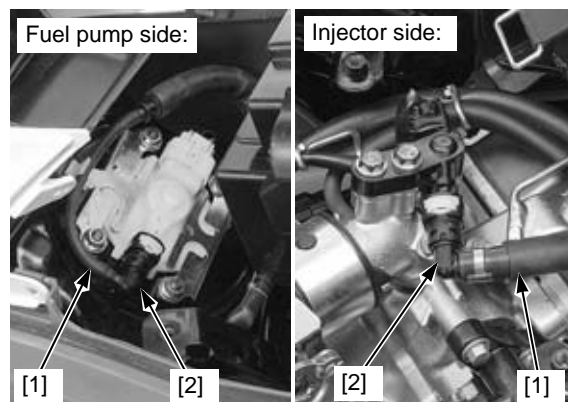
Remove the two bolts and pull up the battery box (page 7-4).

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

Also, check the fuel hose fittings [2] for leakage.

Replace the fuel hose if necessary.

Install the battery box (page 2-12).



THROTTLE OPERATION

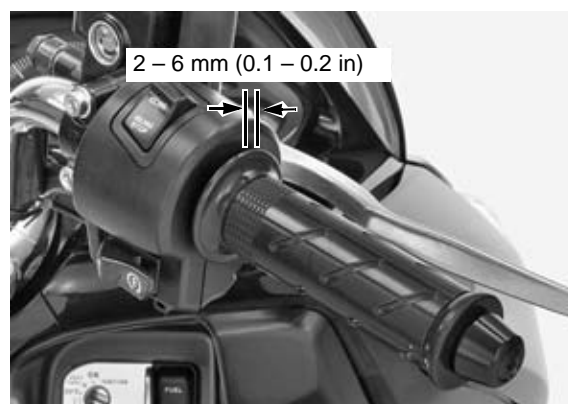
NOTE:

- Reusing a damaged or abnormally bent or kinked throttle cable can prevent proper throttle slide operation and may lead to a loss of throttle control while riding.

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, overhaul and lubricate the throttle grip housing.

If the throttle grip still does 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 routing.

Measure the throttle grip freeplay at the throttle grip flange.

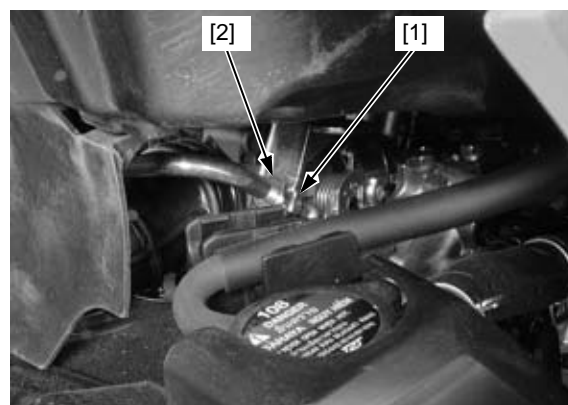
FREEPLAY: 2 – 6 mm (0.1 – 0.2 in)

Throttle grip freeplay can be adjusted by turning the adjuster [1].

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

Tighten the lock nut.

Recheck the throttle operation.



AIR CLEANER

NOTE:

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

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



Remove the air cleaner element [1] from the air cleaner housing cover [2].

Discard the air cleaner element in accordance with the maintenance schedule (page 3-3).

Replace the element any time if it is excessively dirty or damaged.

Install the removed parts in the reverse order of removal.

TORQUE:

Air cleaner housing cover screw:

1.1 N·m (0.11 kgf·m, 0.8 lbf·ft)



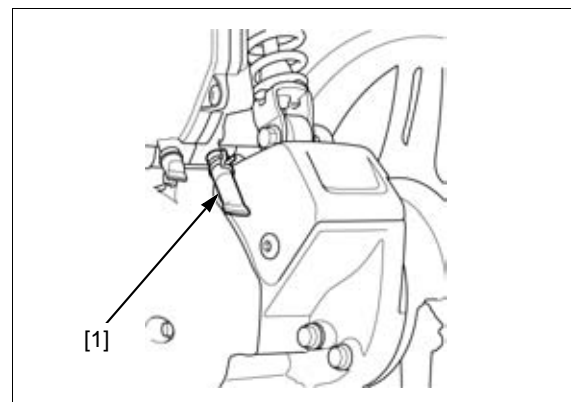
CRANKCASE BREATHER

NOTE:

- Service more frequently when ridden in rain, at full throttle, or after the scooter is washed or overturned. Service if the deposit level can be seen in the transparent section of the drain plug.

Remove the crankcase breather drain plug [1] from the air cleaner and drain deposits into a suitable container.

Install the crankcase breather drain plug.



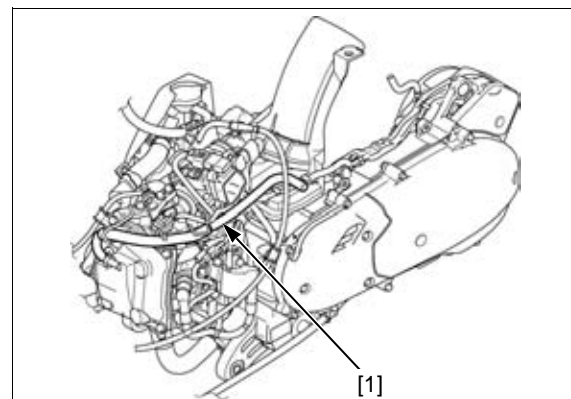
Remove the luggage box (page 2-12).

Check the crankcase breather hose [1] for deterioration, damage or leakage.

Replace the crankcase breather hose if necessary.

Also check the crankcase breather hose fittings for leakage.

Install the luggage box (page 2-12).



SPARK PLUG

Remove the plug maintenance lid (page 2-9).

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

Always use the specified spark plug on this motorcycle.

Disconnect the spark plug cap [1] and remove the spark plug [2].

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

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

Check the insulator for cracks or damage, and electrodes for wear, fouling or discoloration.

SPECIFIED SPARK PLUG:

WW125EX2:

Standard: CPR7EA-9 (NGK)/U22EPR-9 (DENSO)

WW150:

Standard: CPR7EA-9 (NGK)

Measure the spark plug gap between the center and side electrodes with a feeler gauge of a wire type.

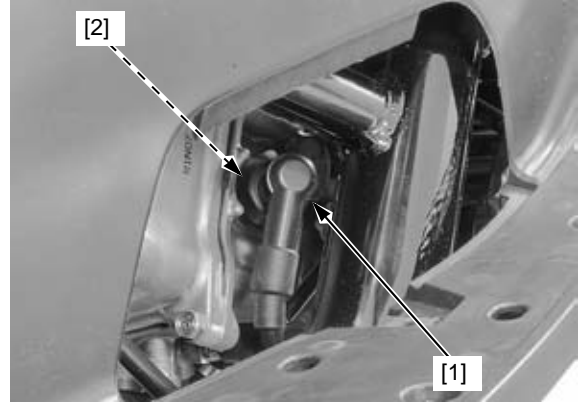
If necessary, adjust the gap by bending the side electrode carefully.

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

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

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Install the removed parts in the reverse order of removal.



VALVE CLEARANCE

INSPECTION

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

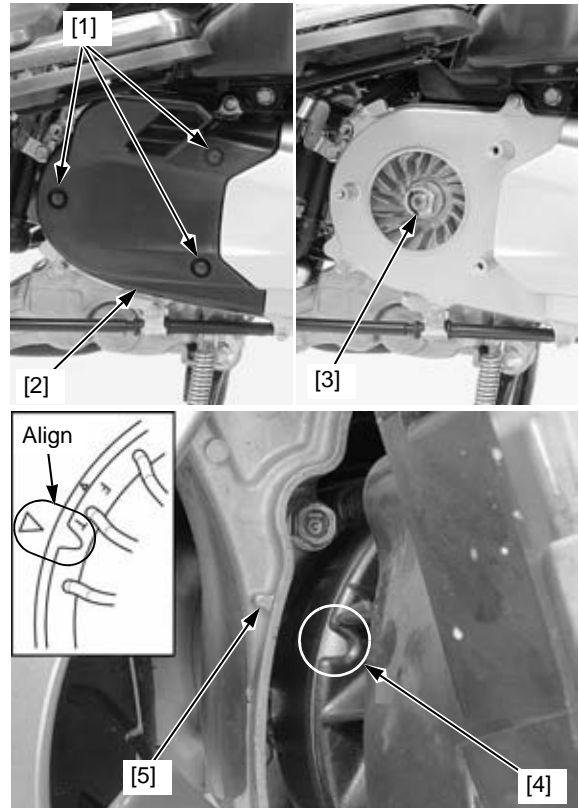
Remove the following:

- Side cover (page 2-6)
- Radiator cover (page 9-4)
- Cylinder head cover (page 10-5)
- Three bolts [1]
- Left crankcase cover duct [2]

It is not necessary to disconnect the water hoses from the radiator.

Remove the four radiator mounting bolts and move the radiator so that the cooling fan is visible (page 9-6).

Rotate the crankshaft [3] counterclockwise slowly and align the cut out ("T" mark) [4] of the cooling fan with the index mark [5] on the crankcase.



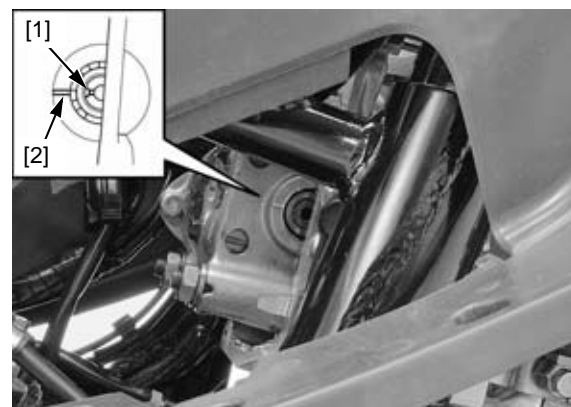
Make sure the mark [1] of the camshaft and index line [2] of the cylinder head are aligned.

Make sure the piston is at TDC (Top Dead Center) on the compression stroke.

This position can be confirmed by checking that there is slack in the rocker arm.

If there is no slack, it is because the piston is moving through the exhaust stroke to TDC.

Rotate the crankshaft one full turn counterclockwise slowly and match up again.

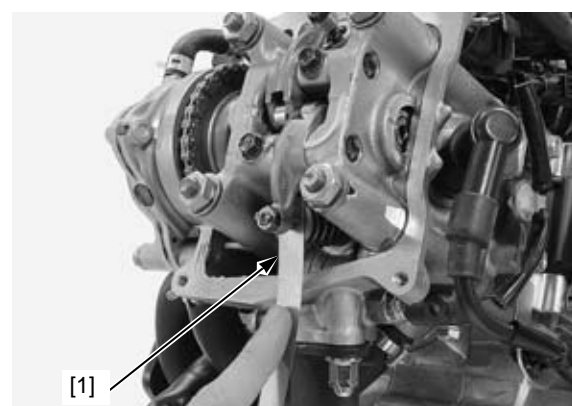


Check the valve clearance by inserting a feeler gauge [1] between the valve adjusting screw and valve stem.

VALVE CLEARANCE:

IN: 0.10 ± 0.02 mm (0.004 ± 0.001 in)

EX: 0.24 ± 0.02 mm (0.009 ± 0.001 in)



If the valve clearance is incorrect, loosen the valve adjusting screw lock nut [1] and adjust the valve clearance by turning the adjusting screw [2] until there is a slight drag on the feeler gauge [3].

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

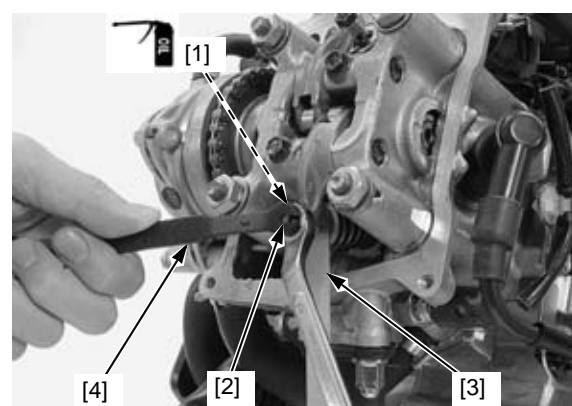
Hold the adjusting screw using a special screw and tighten the lock nut to the specified torque.

TOOL:

[4] Valve adjusting wrench **07908-KE90000**

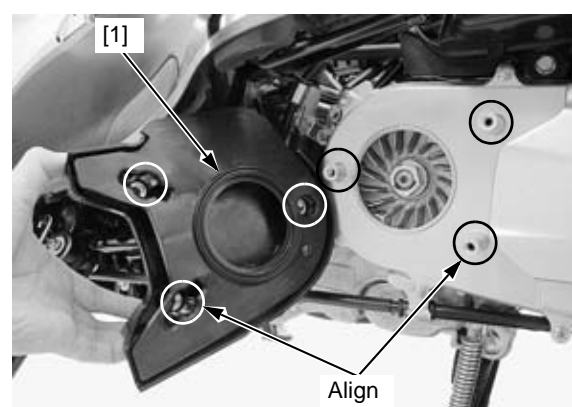
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Recheck the valve clearance.



Make sure the left crankcase cover duct rubber seal [1] is in good condition and replace it if necessary.

Install the left crankcase cover duct by aligning the holes with bosses of the left crankcase cover.

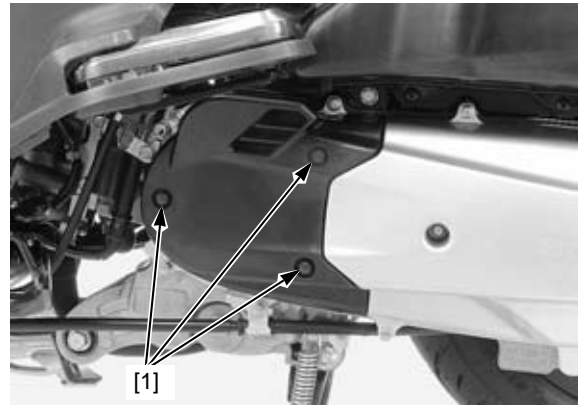


MAINTENANCE

Install and tighten the three bolts [1].

Install the following:

- Cylinder head cover (page 10-6)
- Four radiator mounting bolts (page 9-6)
- Radiator cover (page 9-4)
- Side cover (page 2-6)



ENGINE OIL

OIL LEVEL CHECK

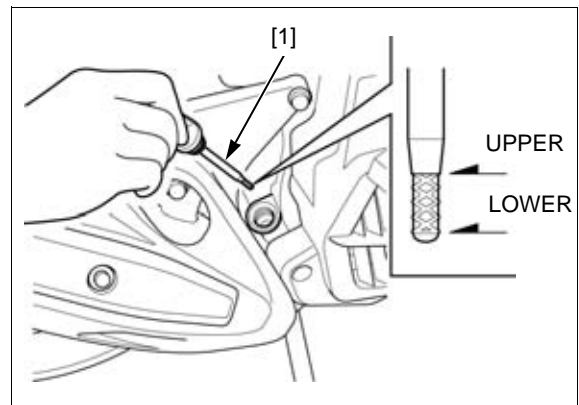
Support the scooter with its centerstand on a level surface.

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

Remove the oil filler cap/dipstick [1] and wipe off the oil from the dipstick with a clean cloth.

Insert the oil filler cap/dipstick without screwing it in, remove it and check the oil level.

If the oil level is below or near the lower level line on the dipstick, add the recommended oil to the upper level.



RECOMMENDED ENGINE OIL:

Honda "4-stroke motorcycle oil" or an equivalent

API classification: SG or higher

(except oils labeled as energy conserving on the circular API service label)

Viscosity: SAE 10W-30

JASO T 903 standard: MB

Install the oil filler cap/dipstick.

OIL CHANGE

Warm up the engine.

Stop the engine, remove the oil filler cap/dipstick and wipe oil from the dipstick with a clean cloth.

Remove the drain bolt [1] and sealing washer [2].
Drain oil completely.

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

TORQUE: 24 N·m (2.4 kgf·m, 18 lbf·ft)

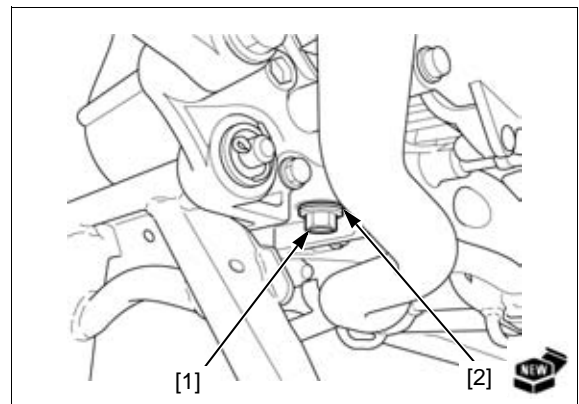
Fill the crankcase with the recommended engine oil.

ENGINE OIL CAPACITY:

0.8 liter (0.8 US qt, 0.7 Imp qt) after draining

0.9 liter (1.0 US qt, 0.8 Imp qt) after disassembly

0.9 liter (1.0 US qt, 0.8 Imp qt) after oil strainer removal



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

Install the oil filler cap/dipstick.

Check the oil level (page 3-8).

ENGINE OIL STRAINER SCREEN

Drain the engine oil (page 3-8).

Remove the oil strainer screen cap [1], O-ring [2], spring [3] and oil strainer screen [4].

Wash the strainer screen thoroughly in non-flammable or high flash point cleaning solvent until all accumulated dirt has been removed.

Blow dry it with compressed air to clean completely.

Before installing the strainer screen, it should be examined closely for damage and make sure the sealing rubber is in good condition.

Make sure the O-ring is in good condition and replace it if necessary.

Install the oil strainer screen and spring with the strainer sealing rubber toward the crankcase.

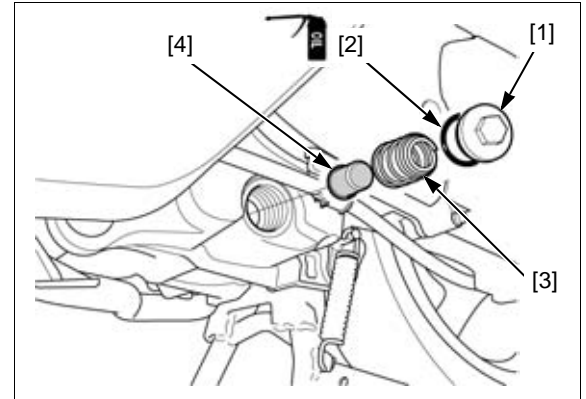
Coat the O-ring with engine oil and install the oil strainer screen cap.

Tighten the oil strainer screen cap to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

Fill the crankcase with recommended engine oil and check the engine oil level (page 3-8).

Make sure that there are no oil leaks.



ENGINE IDLE SPEED

- Inspect the idle speed after all other engine maintenance items have been performed and are within specifications.
- Before checking the idle speed, inspect following items.
 - No MIL blinking
 - Spark plug condition (page 3-6)
 - Air cleaner condition (page 3-5)
- The engine must be warm for accurate idle speed inspection.
- This system eliminates the need for manual idle speed adjustment.
- Use a tachometer with graduations of 50 min^{-1} (rpm) or smaller that will accurately indicate a 50 min^{-1} (rpm) change.

Support the scooter with its centerstand.

Warm up the engine about ten minutes.

Connect the tachometer and check the idle speed.

ENGINE IDLE SPEED: $1,700 \pm 100 \text{ min}^{-1}$ (rpm)

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

- Throttle operation and throttle grip freeplay (page 3-4).
- Intake air leak or engine top-end problem (page 10-4).
- IACV operation (page 7-17).

RADIATOR COOLANT

Support the scooter with its centerstand.

Unlock and open the seat.

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

The level should be between the "UPPER" level line [1] and "LOWER" level line [2] with the scooter upright on a level surface.

If the level is low, fill as follows:

Remove the radiator reserve tank lid (page 9-6).

Remove the reserve tank cap [3] and fill the tank to the "UPPER" level line with a 1:1 mixture of distilled water and antifreeze.

RECOMMENDED ANTIFREEZE:

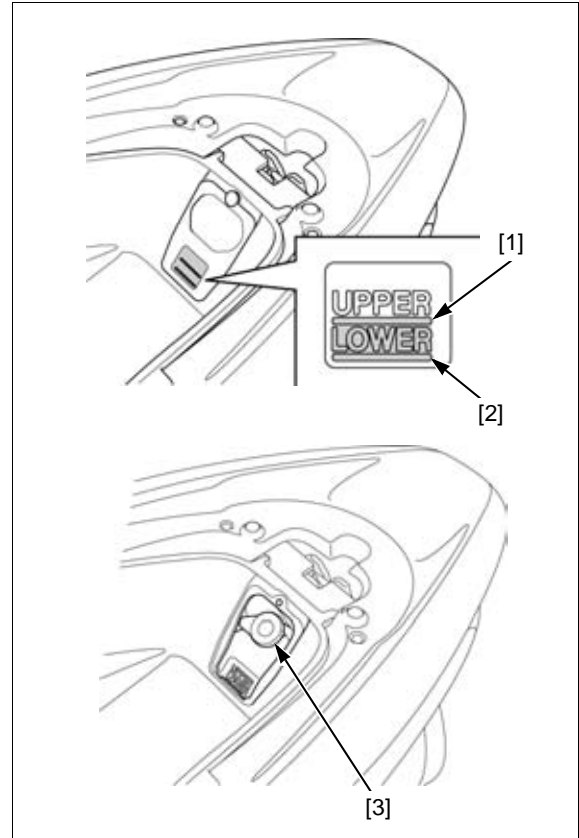
High quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors

Check 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 all air from the cooling system (page 9-5).

Install the radiator reserve tank lid (page 9-6).



COOLING SYSTEM

Remove the following:

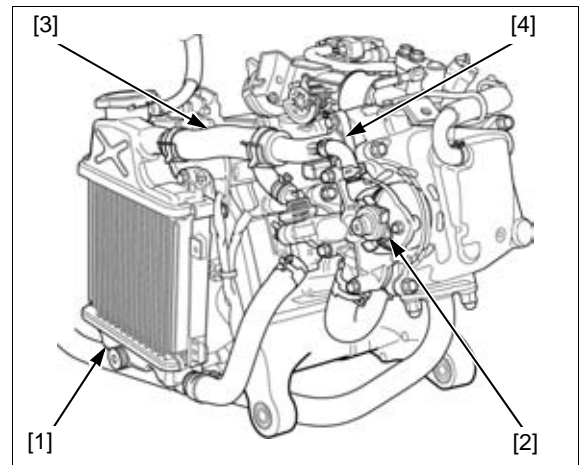
- Luggage box (page 2-12)
- Radiator cover (page 9-4)

Check the radiator [1] for leakage.

Check for coolant leakage from the water pump [2], water hoses [3] and hose joints [4].

Check the water hoses for cracks or deterioration and replace if necessary.

Check that all hose clamps are tight.

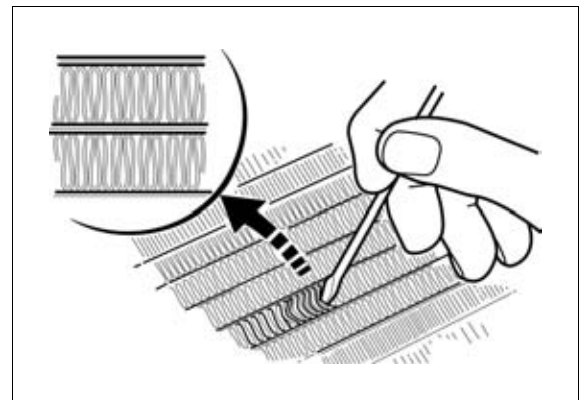


Check the radiator air passage for clogs or damage.

Straighten bent fins with a small, flat blade screwdriver and remove insects, mud or other obstructions with compressed air or low pressure water.

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

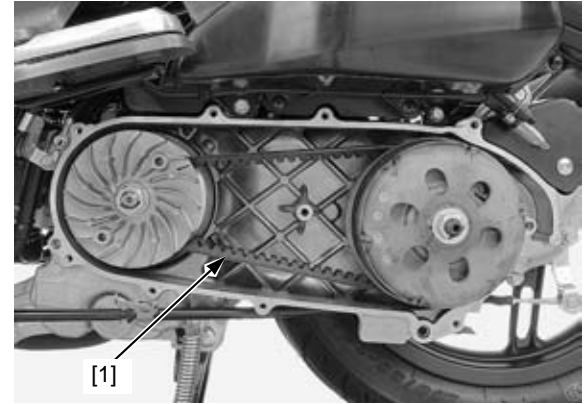
Install the removed parts in the reverse order of removal.



DRIVE BELT

Remove the left crankcase cover (page 12-4).

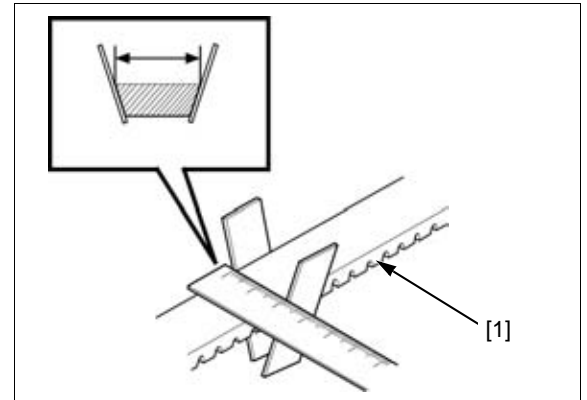
Check the drive belt [1] for cracks, separation or abnormal or excessive wear and replace it if necessary (page 12-6).



Using the suitable two flat plates, measure the drive belt [1] width as shown.

SERVICE LIMIT: 21.0 mm (0.83 in)

Replace the drive belt if it is less than the service limit (page 12-6).



FINAL DRIVE OIL

OIL LEVEL CHECK

Make sure that the final reduction case has no oil leaks.

Support the scooter with its centerstand.

Remove the oil check bolt [1] and sealing washer [2].

Check whether the oil flows out from the check bolt hole.

If the level is low (oil does not flow out), add the recommended oil as described below.

RECOMMENDED FINAL REDUCTION OIL:

Honda "4-stroke motorcycle oil" or an equivalent

API classification: SG or higher

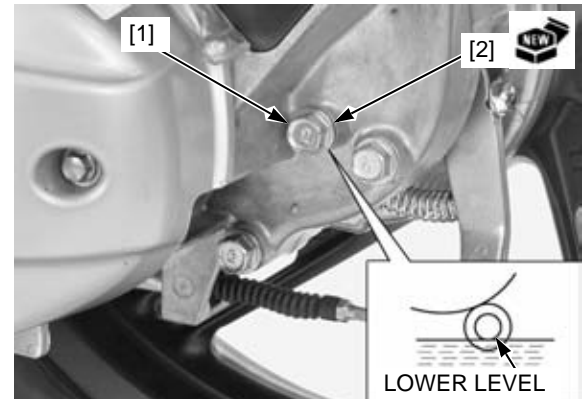
(except oils labeled as energy conserving on the circular API service label)

Viscosity: SAE 10W-30

JASO T 903 standard: MB

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

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



MAINTENANCE

OIL CHANGE

Place an oil drain pan under the final reduction case to collect the oil, then remove the oil check bolt [1], oil drain bolt [2] and sealing washers [3].

Slowly turn the rear wheel and drain the oil.

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

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Fill the final reduction case with recommended oil up to the correct level (page 3-11).

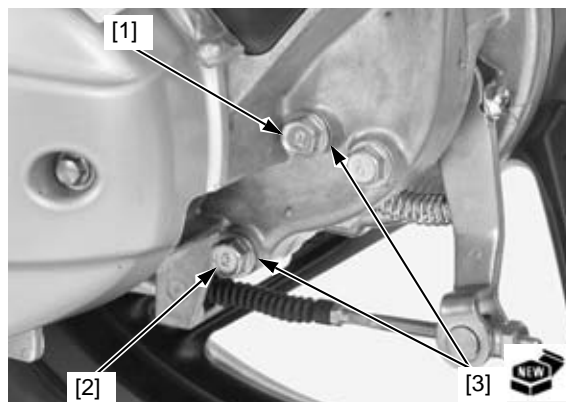
FINAL REDUCTION OIL CAPACITY:

0.12 liter (0.13 US qt, 0.11 Imp qt) after draining

0.14 liter (0.15 US qt, 0.12 Imp qt) after disassembly

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

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



BATTERY

VOLTAGE INSPECTION

Remove the battery maintenance lid (page 20-5).

Measure the battery voltage using a commercially available digital multimeter.

VOLTAGE (20 °C/68 °F):

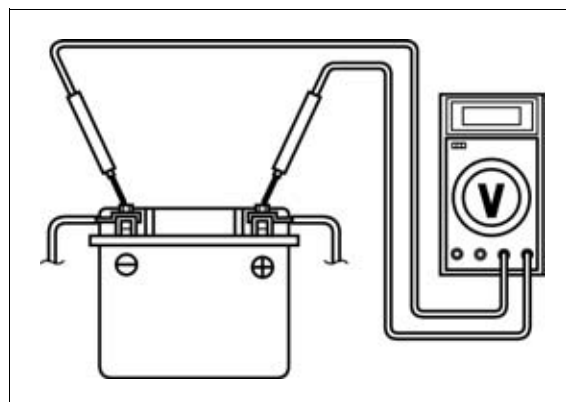
Fully charged: 13.0 – 13.2 V

Under charged: Below 12.4 V

NOTE:

- When measuring the battery voltage after charging, leave it for least 30 minutes, or the accurate results cannot be obtained because the battery voltage fluctuates just after charging.

Install the battery maintenance lid (page 20-5).



BATTERY TESTING

Refer to the instructions that are appropriate to the battery testing equipment available to you.

TOOL:

Battery tester **BM-210, BATTERY MATE or equivalent**

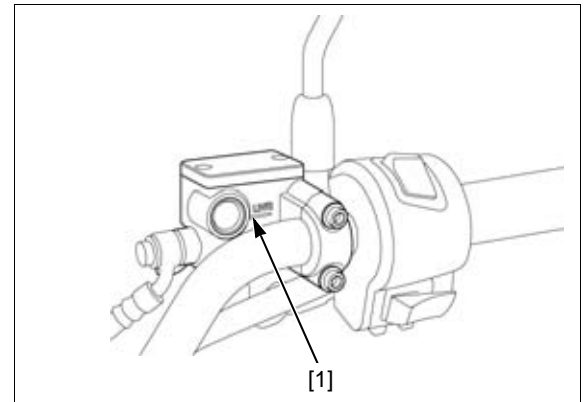
BRAKE FLUID

- Spilling fluid can damage painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.
- 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 3-13). A low fluid level may be due to wear of the brake pads.
If the brake pads are worn, the caliper piston is pushed out, and this accounts for a low reservoir level. If the brake pads are not worn and fluid level is low, check entire system for leaks (page 3-14).

FRONT BRAKE LINE

Support the scooter with its centerstand.
Turn the handlebar to the left so the reservoir is level and check the front brake reservoir fluid level through the sight glass.

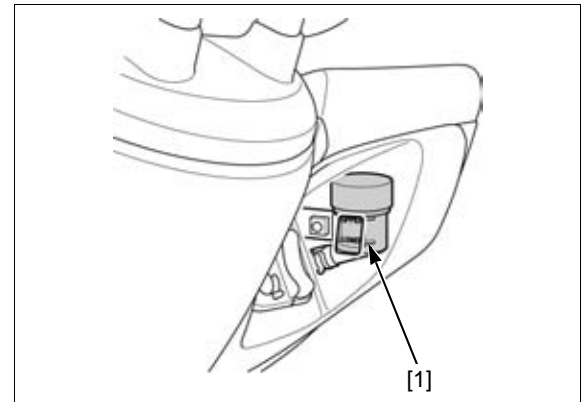
If the level is near the "LOWER" level mark [1], check the brake pads for wear (page 3-13).



CBS BRAKE LINE

Support the scooter with its centerstand.
Check the CBS brake reservoir fluid level.

If the level is near the "LOWER" level mark [1], check the brake pads for wear (page 3-13).

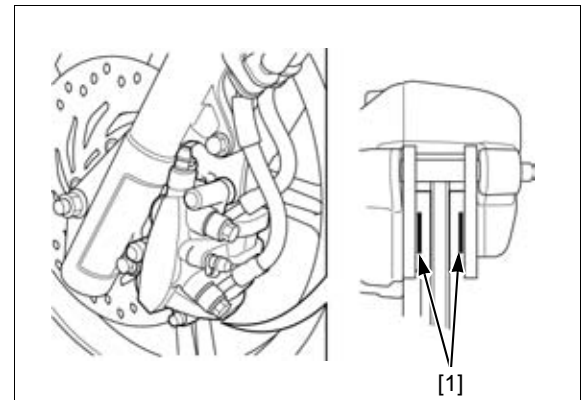


BRAKE SHOES/PADS WEAR

FRONT DISC BRAKE PADS

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

For brake pad replacement (page 19-10).



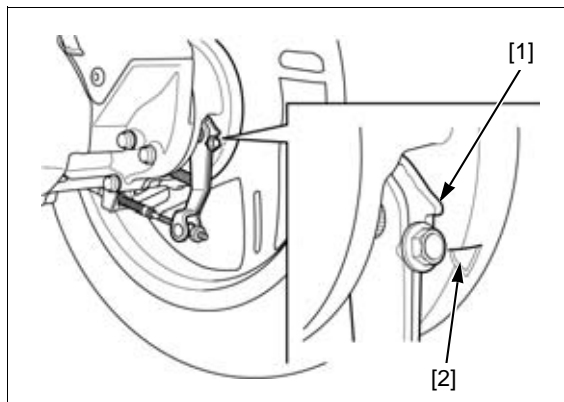
MAINTENANCE

REAR DRUM BRAKE SHOES

Check the wear indicator position when the brake lever is applied.

If the indicator [1] aligns with the triangle mark [2], inspect the brake drum (page 18-7).

Replace the brake shoes if the drum I.D. is within service limit.



BRAKE SYSTEM

FRONT DISC BRAKE

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

If the lever feels soft or spongy when operated, bleed the air from the system.

For air bleeding procedures (page 19-7).

Remove the front meter panel (page 2-5).

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

Tighten any loose fittings.

Replace the hoses and fittings as required.

Install the front meter panel (page 2-5).

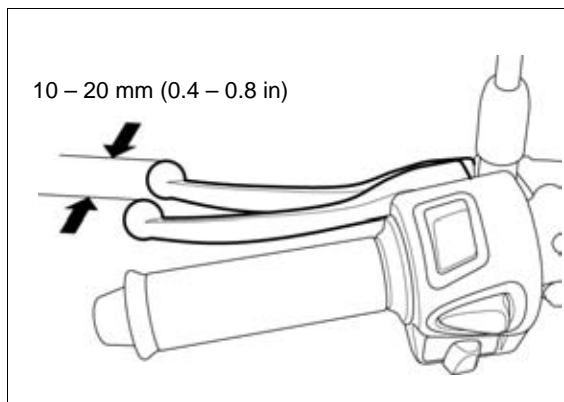


REAR DRUM BRAKE

Check the brake cable and brake lever for loose connections, excessive play or other damage. Replace or repair if necessary.

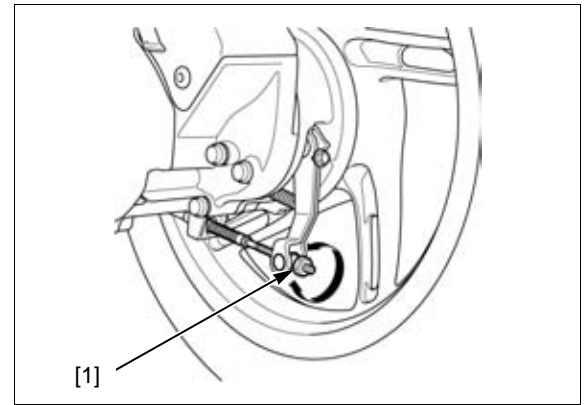
Measure the rear brake lever freeplay at the end of the lever.

FREEPLAY: 10 – 20 mm (0.4 – 0.8 in)



Make sure the cut-out of the adjusting nut is seated on the joint pin.

Adjust the rear brake lever freeplay by turning the rear brake arm adjusting nut [1].



CBS

- Before inspection, check the following first:
 - Rear brake system (page 3-14)
 - Front brake system (page 3-14)

Support the scooter with its centerstand.

Apply the rear brake lever.

Make sure that the rear wheel does not rotate while the rear brake lever is applied.

Lift the front wheel off the ground and rotate it by hand. Make sure that the front wheel rotates smoothly.

Lift the front wheel off the ground and strongly apply the rear brake lever.

Make sure that the front wheel does not rotate while the rear brake lever is applied.

If it is abnormal, inspect as follows:

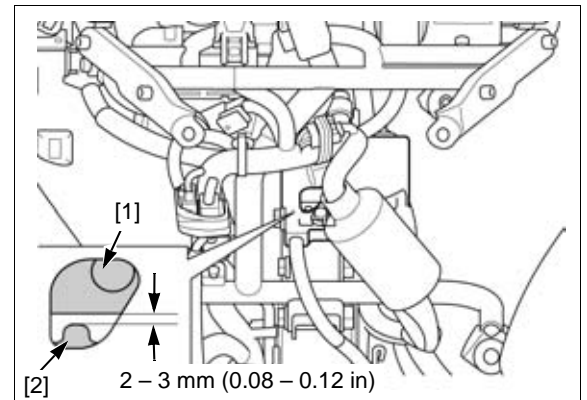
- Inspect and adjust the the CBS with the steering positioned straight.
- Adjust the CBS after removing the CBS master cylinder and/or rear brake cable.

Remove the front meter panel (page 2-5).

Measure the distance between the equalizer [1] and boss [2] of the master cylinder body as shown.

STANDARD: 2 – 3 mm (0.08 – 0.12 in)

If the distance exceeds the standard, adjust the following:



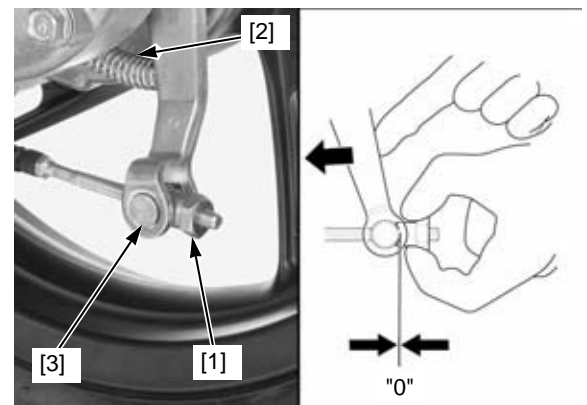
Loosen the rear brake arm adjusting nut [1] fully. Remove the return spring [2].

Push the brake arm and tighten the rear brake adjusting nut until the gap between the its nut and joint pin [3] is "0" as shown.

- The rear brake starts being applied at this position.

Install the return spring.

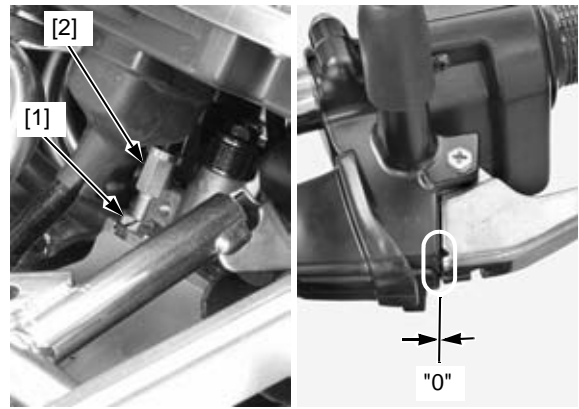
- The brake arm will be pushed back when the return spring is installed, creating the clearance between the brake shoes and brake drum.



MAINTENANCE

Loosen the lock nut [1] and turn the adjuster [2] until the distance between the edge surface of the rear brake lever and edge surface of the rear brake lever bracket is "0".

Tighten the lock nut while holding the adjuster.



Apply the rear brake lever completely several times.

Recheck the distance between the equalizer [1] and boss [2] of the master cylinder body.

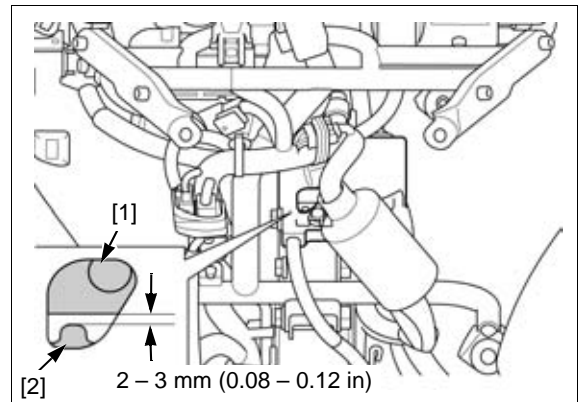
STANDARD: 2 – 3 mm (0.08 – 0.12 in)

- If the combined brake system adjustment is normal, but the front wheel rotates abnormally, check for other malfunction parts.

Install the front meter panel (page 2-5).

Adjust the rear brake lever freeplay (page 3-14).

Check that the rear wheel turns freely without brake dragging.



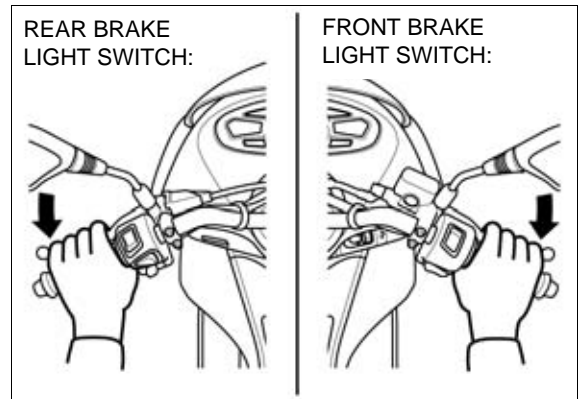
BRAKE LIGHT SWITCH

NOTE:

- The brake light switch on the brake lever cannot be adjusted. If the brake light switch actuation and brake engagement are not synchronized, either replace the switch or malfunction parts of the system.

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

For brake light switch inspection (page 21-15).



HEADLIGHT AIM

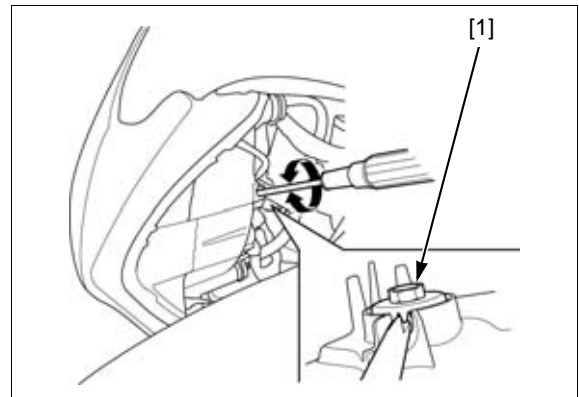
NOTE:

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

Place the scooter on a level ground.

Adjust the headlight beam vertically by turning the headlight aim adjusting screw [1] using the screwdriver.

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



CLUTCH SHOES WEAR

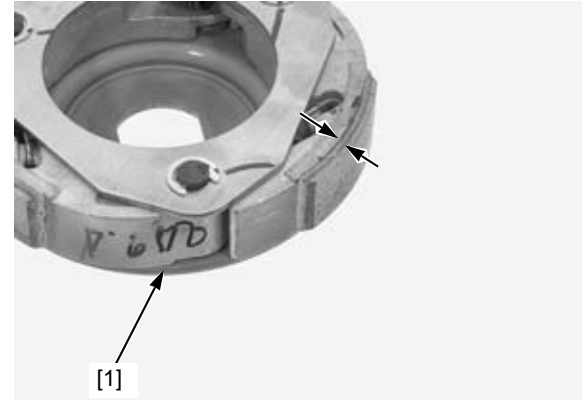
Remove the clutch assembly (page 12-9).

Check the clutch shoes [1] for abnormal wear.
Measure the thickness of each shoe.

SERVICE LIMIT: 2.0 mm (0.08 in)

Replace the clutch shoes if they are less than the service limit (page 12-10).

Install the clutch assembly (page 12-18).



SIDESTAND

Support the scooter with its centerstand.

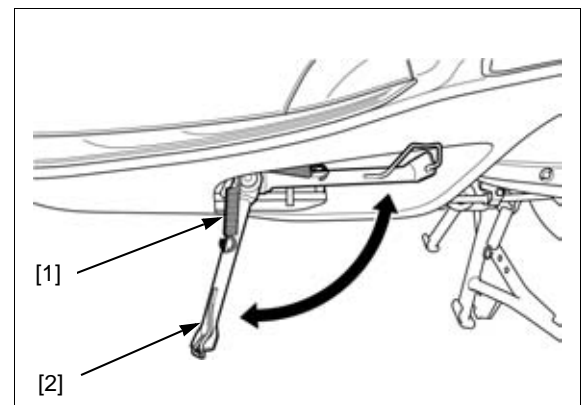
Check the sidestand spring [1] for damage or loss of tension.

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

Check the sidestand switch system:

1. Retract the sidestand.
2. Start the engine.
3. Move the sidestand full down.
4. The engine should stop as the sidestand is lowered.

If there is a problem with the system, check the sidestand switch (page 6-12).



SUSPENSION

FRONT

Loose, worn or damaged suspension parts impair scooter stability and control.

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

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

For fork service (page 17-7).

REAR

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

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

For rear shock absorber service (page 18-11).

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

Check for worn engine mounting bushings by grabbing the engine and attempting to move the engine side to side.

For engine bushing service (page 16-6).

NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-9).

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

WHEELS/TIRES

Support the scooter with its centerstand.

Making sure that the fork is not allowed to move, raise the front wheel and check for play.

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

Replace the front wheel bearings if any looseness is noted.

Turn the wheel and check that it rotates smoothly with no unusual noises.

If any abnormal conditions are suspected, inspect the front wheel bearings (page 17-5).

Support the scooter securely and raise the rear wheel.

Check for worn final gear shaft bearings by grabbing the rear wheel and attempting to move the wheel side to side.

Replace the final gear shaft bearings if any looseness is noted.

Turn the wheel and check that it rotates smoothly with no unusual noises.

If any abnormal conditions are suspected, check the final reduction (page 13-4).

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

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

Check the front wheel and rear wheel for trueness.

Measure the tread depth at the center of the tires.

Replace the tires when the tread depth reaches the following limits.

MINIMUM TIRE TREAD DEPTH:

FRONT: 1.5 mm (0.06 in)

REAR: 2.0 mm (0.08 in)

STEERING HEAD BEARINGS

NOTE:

- Check that the control cables do not interfere with handlebar rotation.

Support the scooter with its centerstand and raise the front wheel off the ground.

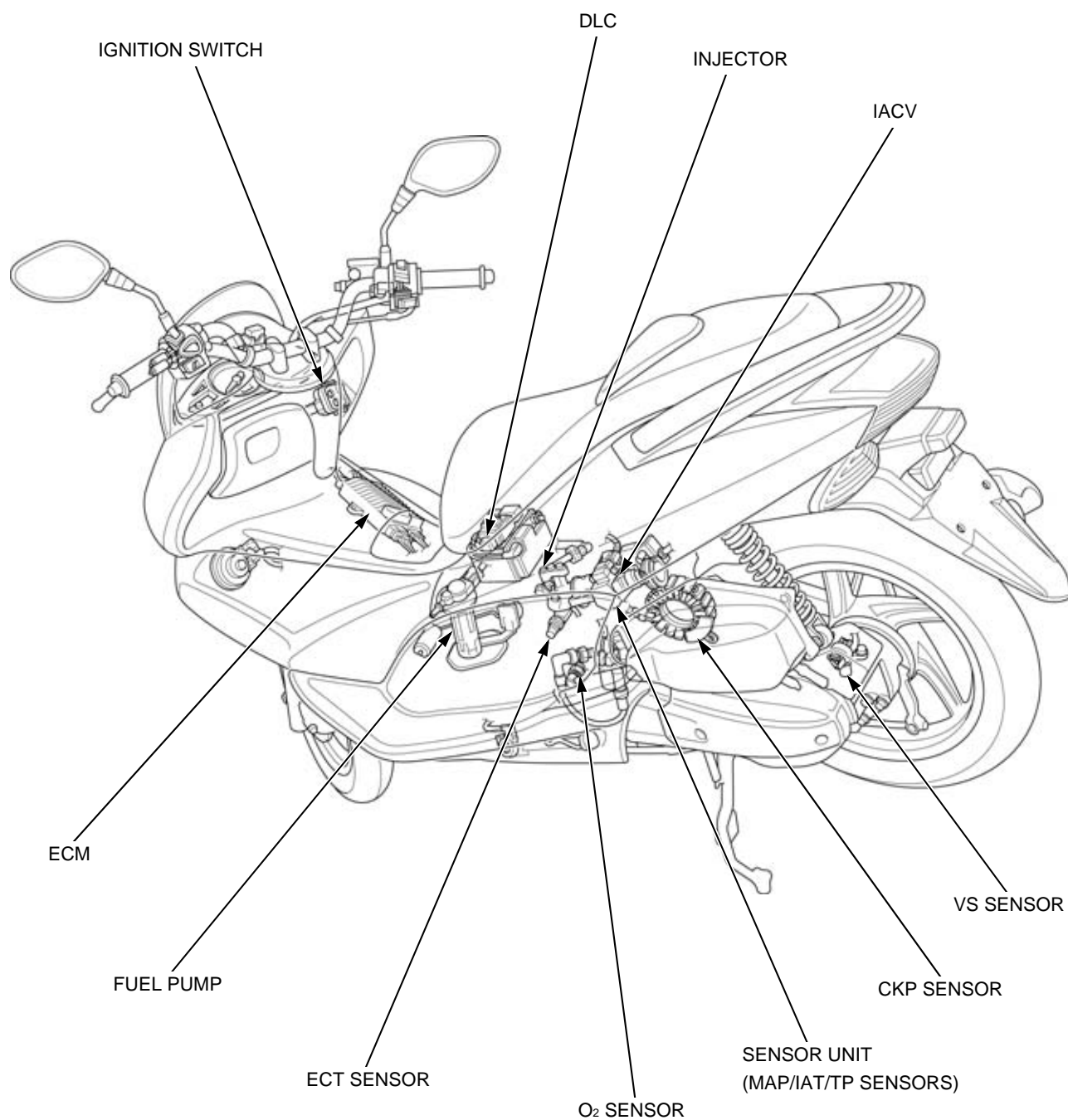
Check that the handlebar moves freely from side-to-side. If the handlebar moves unevenly or binds, inspect the steering head bearings (page 17-23).

Hold the scooter and check the steering head bearings for wear by moving the fork forward and backward.

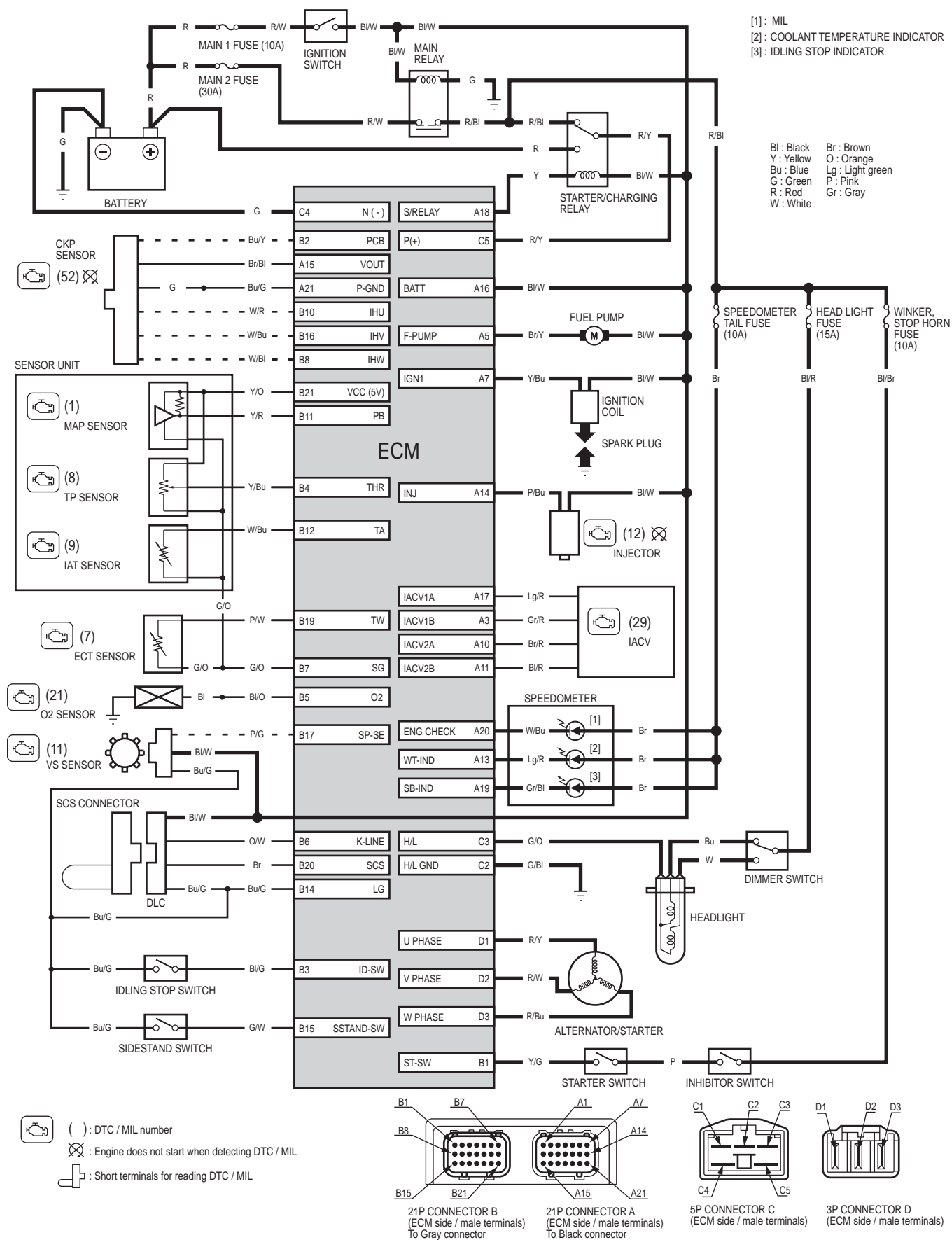
If the steering stem has vertical movement, inspect the steering head bearing (page 17-23).

PGM-FI SYSTEM LOCATION	4-2	DTC TROUBLESHOOTING	4-10
PGM-FI SYSTEM DIAGRAM.....	4-3	MIL TROUBLESHOOTING	4-27
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PGM-FI SYSTEM LOCATION



PGM-FI SYSTEM DIAGRAM



SERVICE INFORMATION**GENERAL**

- Use an electric heating element to heat the water for the ECT sensor inspection, keep flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.
- A faulty PGM-FI system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- The PGM-FI system is equipped with the Self-Diagnostic System (page 4-6). If the MIL blinks, follow the Self-Diagnostic Procedures to remedy the problem.
- When checking the PGM-FI, always follow the steps in the troubleshooting flow chart.
- The PGM-FI system is provided with fail-safe function to secure a minimum running capability even when there is any trouble in the system. When any abnormality is detected by the self-diagnosis function, running capability is secured by making use of the numerical values of a situation preset in the simulated program map.
It must be remembered, however, that when any abnormality is detected in injector, the fail-safe function stops the engine to protect it from damage.
- For PGM-FI system location (page 4-2).
- Use a digital tester for PGM-FI system inspection.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Engine idle speed		1,700 ± 100 min ⁻¹ (rpm)
ECT sensor resistance	(40°C/104°F)	1.0 – 1.3 kΩ
	(100°C/212°F)	0.1 – 0.2 kΩ
Fuel injector resistance (20°C/68°F)		11 – 13 Ω

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
ECT sensor	1	10	12 (1.2, 9)	
O ₂ sensor	1	12	24.5 (2.5, 18)	

PGM-FI SYMPTOM TROUBLESHOOTING

When the scooter has one of these symptoms, check the DTC or MIL blinking, refer to the DTC index (page 4-9) and begin the appropriate troubleshooting procedure. If there are no DTC/MIL blinking 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 does not crank (No fuel pump operation sound when turning ignition switch ON)	<ol style="list-style-type: none"> 1. ECM power/ground circuits malfunction (page 4-39). 2. Sensor unit power/ground circuits malfunction (page 4-39). 	<ul style="list-style-type: none"> • Open circuit in the power input and/or ground wire of the ECM • Blown MAIN 2 fuse (30 A)
Engine cranks but won't start (No MIL blinking)	<ol style="list-style-type: none"> 1. Crank the engine for more than ten seconds and check the MIL (page 4-6) and execute the troubleshooting according to the MIL. 2. Inspect the fuel supply system (page 7-4). 	<ul style="list-style-type: none"> • No fuel to injector <ul style="list-style-type: none"> – Clogged fuel filter – Clogged fuel tank cap breather hole – Pinched or clogged fuel feed hose – Faulty fuel pump – Faulty fuel pump circuits • Intake air leak • Contaminated/deteriorated fuel • Faulty fuel injector • IACV stuck • Faulty ignition system
Engine stalls, hard to start, rough idling	<ol style="list-style-type: none"> 1. Check the idle speed (page 3-9). 2. Check the IACV (page 7-17). 3. Inspect the fuel supply system (page 7-4). 	<ul style="list-style-type: none"> • Restricted fuel feed hose • Contaminated/deteriorated fuel • Intake air leak • Restricted fuel tank cap breather • Faulty ignition system
Backfiring or misfiring during acceleration	Check the ignition system (page 5-5).	
Poor performance (driveability) and poor fuel economy	Inspect the fuel supply system (page 7-4).	<ul style="list-style-type: none"> • Air cleaner element contaminated • Pinched or clogged fuel feed hose • Faulty pressure regulator (fuel pump) • Faulty injector • Faulty ignition system
Idle speed is below specifications (No MIL blinking)	<ol style="list-style-type: none"> 1. Check the idle speed (page 3-9). 2. Check the IACV (page 7-17). 	<ul style="list-style-type: none"> • Faulty fuel supply system • Faulty ignition system
Idle speed is above specifications (No MIL blinking)	<ol style="list-style-type: none"> 1. Check the idle speed (page 3-9). 2. Check the throttle operation and freeplay (page 3-4). 3. Check the IACV (page 7-17). 	<ul style="list-style-type: none"> • Faulty ignition system • Intake air leak • Engine top-end problem • Air cleaner condition
MIL stays ON or MIL never comes ON at all (Engine operates normally)	Inspect the MIL circuit (page 4-38).	
MIL stays ON (Engine operates normally and No MIL code set)	Inspect the DLC circuit (page 4-38).	

PGM-FI TROUBLESHOOTING INFORMATION

GENERAL TROUBLESHOOTING

Intermittent Failure

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

Opens and Shorts

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

If the MIL has come on

Refer to DTC READOUT (page 4-7).

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 4-5).

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 (Malfunction Indicator Lamp) 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 and/or CKP sensor, the fail-safe function stops the engine to protect it from damage.

DTC (Diagnostic Trouble Code)

- 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 HDS pocket tester.
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 HDS Pocket Tester.
For example:

MIL BLINK PATTERN

- DTC can be read by the MIL blink pattern.
- In case the ECM does not detect any problem at present, when the ignition switch is turned ON, the MIL will stay on for a few seconds, then go off.
- In case the ECM detects the problem at present, when the ignition switch is turned ON, the MIL will stay on for a few seconds and go off, then the MIL blinks as its DTC (Except MIL 52 blinks: CKP sensor).
- The engine must be cranked to indicate MIL 52 blinks (CKP sensor), as the ECM can detect CKP sensor malfunction only when the engine is cranking.
- 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 to ten short blinks. For example, when two long blinks are followed by nine short blinks, the MIL is 29 (two long blinks = 29 blinks, plus nine short blinks).
- The MIL will start blinking when the ignition switch is ON or engine revs are below 2,000 min⁻¹ (rpm). In any other conditions, the MIL will illuminate and stay on.

MIL CHECK

When the ignition switch is turned ON, the MIL will stay on for a few seconds, then go off. If the MIL does not come on or stays on when the ignition switch is turned ON, inspect the MIL circuit (page 4-38).

CURRENT DTC/FREEZE DTC

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

- In case the ECM detects the problem at present, the MIL will start blinking as its DTC. It is possible to read out the MIL blink pattern as the current DTC.
- In case the ECM does not detect any problem at present but has a problem stored in its memory, the MIL will not blink. If it is necessary to retrieve the past problem, read out the stored DTC by following the DTC readout procedure (page 4-7).

HDS POCKET TESTER INFORMATION

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

How to connect the HDS Pocket Tester

Turn the ignition switch OFF.

Remove the dummy connector from the DLC (page 4-7).

Connect the HDS pocket tester to the DLC.

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

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

ECM reset

The HDS can reset the ECM data including the DTC, freeze data and some learning memory.

DTC READOUT

Support the scooter with its centerstand.

Turn the ignition switch ON and check the MIL.

- When the ignition switch is turned ON, the MIL will stay on for a few seconds, then go off.

If the MIL stays on or blinks, connect the HDS Pocket Tester to the DLC (page 4-7).

Crank the engine for more than ten seconds and check the MIL.

- MIL 52 blinks (CKP sensor) is indicated only when the engine is cranked.

If the MIL stays on or blinks, connect the HDS Pocket Tester to the DLC (page 4-7).

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

Reading DTC with the MIL

Turn the ignition switch OFF.

Remove the battery maintenance lid (page 20-5).

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

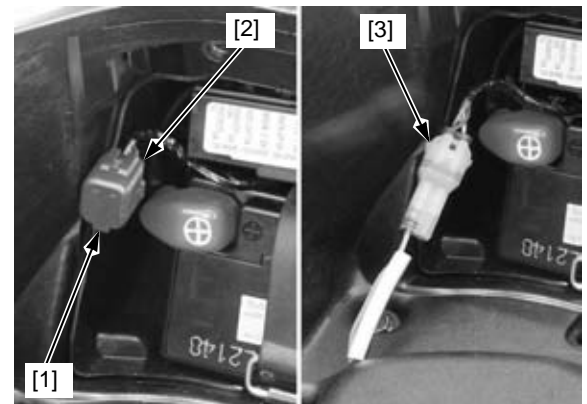
TOOL:

[3] SCS connector 070PZ-ZY30100

CONNECTION: Brown – Blue/green

Turn the ignition switch ON, read the MIL blinks and refer to the troubleshooting 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.



CLEARING DTC

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

Connect the HDS pocket tester to the DLC (page 4-7).

Clear the DTC with the HDS while the engine is stopped.

To clear the DTC without HDS, refer to the following procedure.

How to clear the DTC with SCS connector

1. Connect the SCS connector to the DLC (page 4-7).

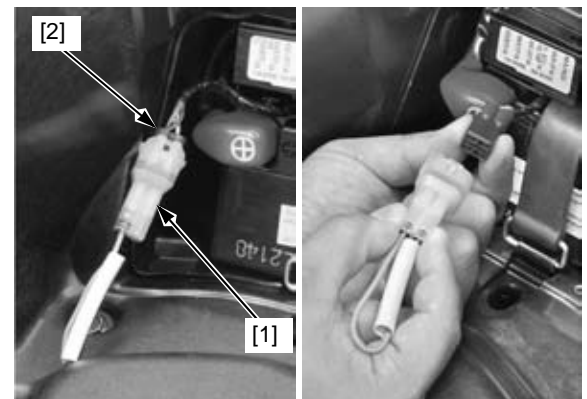
2. Turn the ignition switch ON.

3. Disconnect the SCS connector [1] from the DLC [2].

Connect the SCS connector to the DLC again while the MIL stays ON about 5 seconds (reset receiving pattern).

4. The stored DTC is erased if the MIL goes off and starts blinking (successful pattern).

- The DLC must be jumped while the MIL lights. If not, the MIL will not start blinking. In that case, turn the ignition switch OFF and try again from step 3.
- Note that the self-diagnostic memory cannot be erased if the ignition switch is turned "OFF" before the MIL starts blinking.



PGM-FI SYSTEM

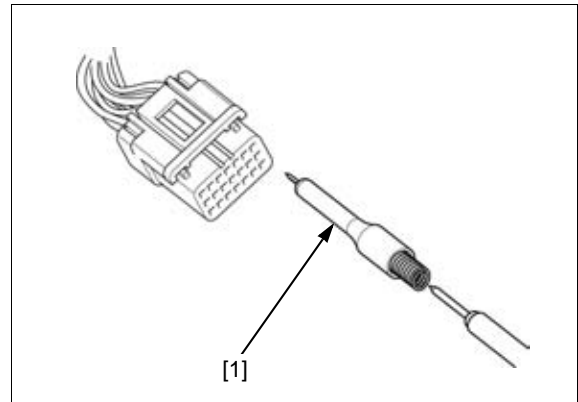
CIRCUIT INSPECTION

INSPECTION AT ECM CONNECTOR

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

TOOL:

[1] Test probe 07ZAJ-RDJA110



TEST HARNESS CONNECTION

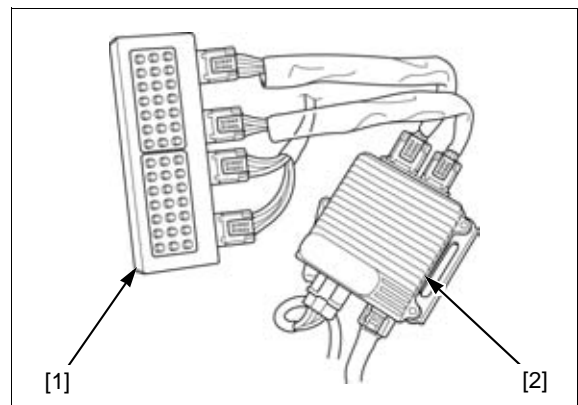
Turn the ignition switch OFF.

Disconnect the ECM 21P (Black) and 21P (Gray) connectors from the ECM (page 4-39).

Connect the ECM test harness [1] between the main wire harness and ECM [2].

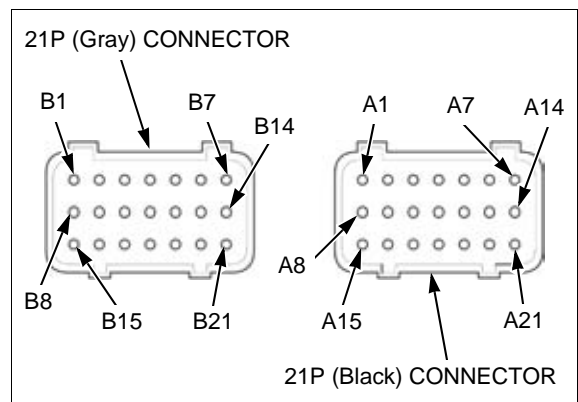
TOOL:

[1] ECM test harness 21P 070MZ-GEV0100

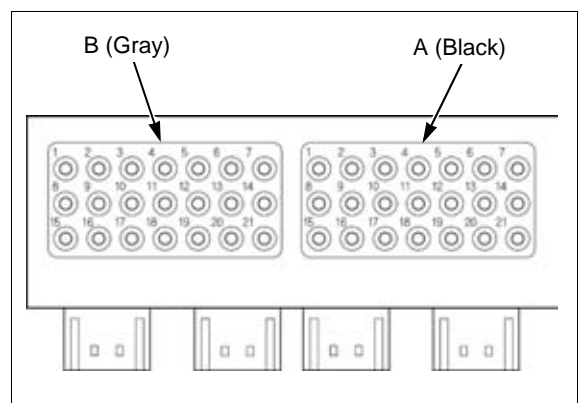


TEST HARNESS TERMINAL LAYOUT

The ECM connector terminals are numbered as shown in this illustration.



The ECM test harness terminals are same layout as for the ECM connector terminals as shown.



DTC INDEX

DTC (MIL blinks)	Function Failure	Symptom/Fail-safe function	Refer to (DTC)	Refer to (MIL)
1-1 (1)	MAP sensor circuit low voltage (less than 0.200V) • MAP sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 61 kPa	4-10	4-27
1-2 (1)	MAP sensor circuit high voltage (more than 3.848 V) • Loose or poor contact of the sensor unit 5P (Black) connector • MAP sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 61 kPa	4-12	
7-1 (7)	ECT sensor circuit low voltage (less than 0.078 V) • ECT sensor or its circuit malfunction	• Hard start at a low temperature • Pre-program value: 82 °C/ 180 °F	4-13	4-28
7-2 (7)	ECT sensor circuit high voltage (more than 4.922 V) • Loose or poor contact of the ECT sensor connector • ECT sensor or its circuit malfunction	• Hard start at a low temperature • Pre-program value: 82 °C/ 180 °F	4-14	
8-1 (8)	TP sensor circuit low voltage (less than 0.200 V) • Loose or poor contact of the sensor unit 5P (Black) connector • TP sensor or its circuit malfunction	• Poor engine acceleration • Pre-program value: 0°	4-15	4-29
8-2 (8)	TP sensor circuit high voltage (more than 4.902 V) • TP sensor or its circuit malfunction	• Poor engine acceleration • Pre-program value: 0°	4-17	
9-1 (9)	IAT sensor circuit low voltage (less than 0.078 V) • IAT sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 35 °C/ 95 °F	4-18	4-31
9-2 (9)	IAT sensor circuit high voltage (more than 4.922 V) • Loose or poor contact of the sensor unit 5P (Black) connector • IAT sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 35 °C/ 95 °F	4-19	
11-1 (11)	VS sensor malfunction • Loose or poor contact of the VS sensor connector • VS sensor or its circuit malfunction	• Engine operates normally • Idling stop system shut down	4-20	4-32
12-1 (12)	Injector malfunction • Loose or poor contact of the injector connector • Injector or its circuit malfunction	• Engine does not start • Injector, fuel pump and ignition coil shut down	4-22	4-34
21-1 (21)	O ₂ sensor malfunction • Loose or poor contact of the O ₂ sensor connector • O ₂ sensor or its circuit malfunction	• Engine operates normally	4-23	4-35
29-1 (29)	IACV malfunction • Loose or poor contact of the IACV connector • IACV or its circuit malfunction	• Engine stalls, hard to start, rough idling	4-24	4-36
52-1 (52)	CKP sensor malfunction • Loose or poor contact of the CKP sensor connector • CKP sensor or its circuit malfunction	• Engine does not start	4-26	4-37

DTC TROUBLESHOOTING

DTC 1-1 (MAP SENSOR LOW VOLTAGE)

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

1. MAP Sensor System Inspection 1

Turn the ignition switch ON.

Check the MAP sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – GO TO STEP 2.

- NO** –
- Intermittent failure
 - Loose or poor contact on the sensor unit 5P (Black) connector

2. MAP Sensor System Inspection 2

Turn the ignition switch OFF.

Disconnect the sensor unit 5P (Black) connector (page 7-12).

Turn the ignition switch ON.

Measure the voltage between the sensor unit 5P (Black) connector [1] of the wire harness side and ground.

CONNECTION:

Yellow/orange (+) – Green/orange(–)

STANDARD: 4.75 – 5.25 V

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 3.

NO – GO TO STEP 4.

3. MAP Sensor Output Voltage Inspection

Measure the voltage between the sensor unit 5P (Black) connector [1] of the wire harness side and ground.

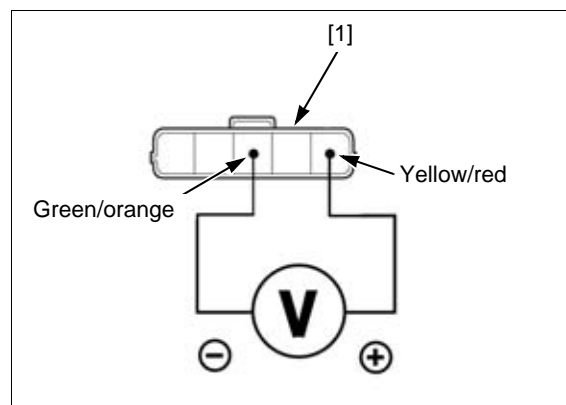
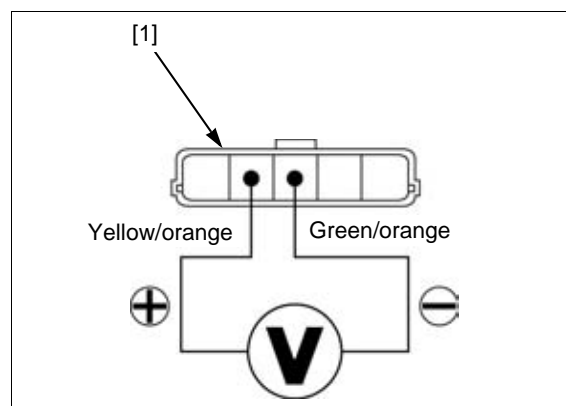
CONNECTION: Yellow/red (+) – Green/orange(–)

STANDARD: 3.80 – 5.25 V

Is the voltage within 3.80 – 5.25 V?

YES – Replace the sensor unit with a new one and recheck (Faulty MAP sensor)

NO – GO TO STEP 5.



4. MAP Sensor Input Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 21P (Gray) connector (page 4-39).

Check for continuity between the ECM 21P (Gray) connector [1] of the wire harness side and sensor unit 5P (Black) connector [2] of the wire harness side.

Connection: Yellow/orange – B21 (Yellow/orange)

Green/orange – B7 (Green/orange)

STANDARD: Continuity

TOOL:

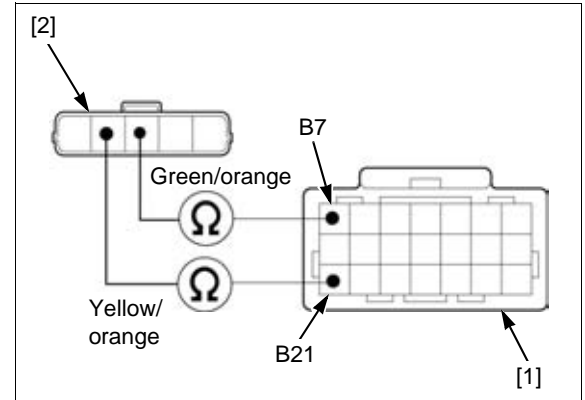
Test probe

07ZAJ-RDJA110

Is there continuity?

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

NO – • Open circuit in Yellow/orange wire
• Open circuit in Green/orange wire



5. MAP Sensor Output Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 21P (Gray) connector (page 4-39).

Check for continuity between the ECM 21P (Gray) connector [1] of the wire harness side and sensor unit 5P (Black) connector [2] of the wire harness side.

CONNECTION: Yellow/red – B11 (Yellow/red)

STANDARD: Continuity

TOOL:

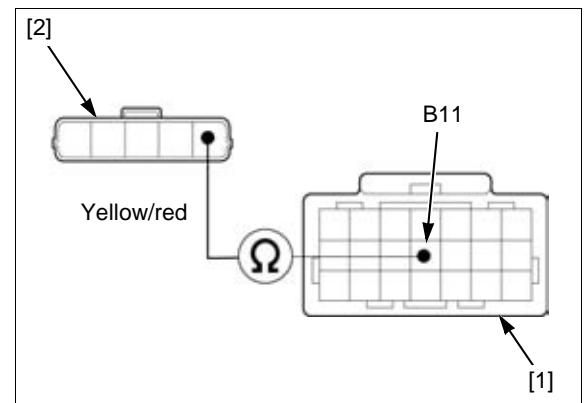
Test probe

07ZAJ-RDJA110

Is there continuity?

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

NO – Open circuit in Yellow/red wire



DTC 1-2 (MAP SENSOR HIGH VOLTAGE)

1. MAP Sensor System Inspection

Turn the ignition switch ON.
Check the MAP sensor with the HDS pocket tester.

Is about 5 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. MAP Sensor Inspection

Turn the ignition switch OFF.
Disconnect the sensor unit 5P (Black) connector (page 7-12).

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

CONNECTION: Yellow/red – Green/orange

Turn the ignition switch ON.
Check the MAP sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – Replace the sensor unit with a new one and recheck (Faulty MAP sensor)

NO – GO TO STEP 3.

3. MAP Sensor Output Line Open Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 21P (Gray) connector (page 4-39).

Check for continuity between the sensor unit 5P (Black) connector [1] and ECM 21P (Gray) connector [2] of the wire harness side.

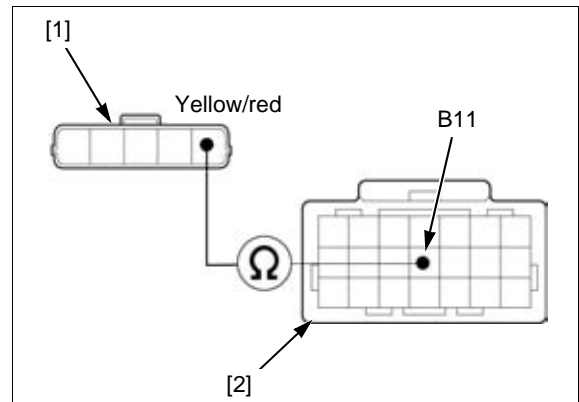
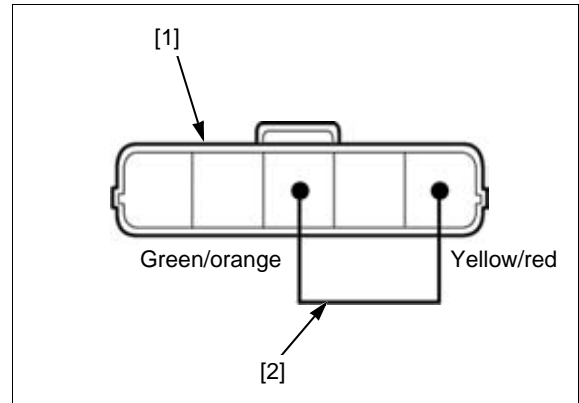
CONNECTION: Yellow/Red – B11 (Yellow/red)

STANDARD: Continuity

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in Yellow/red wire



4. MAP Sensor Ground Line Open Circuit Inspection

Check for continuity between the sensor unit 5P (Black) connector [1] and ECM 21P (Gray) connector [2] of the wire harness side.

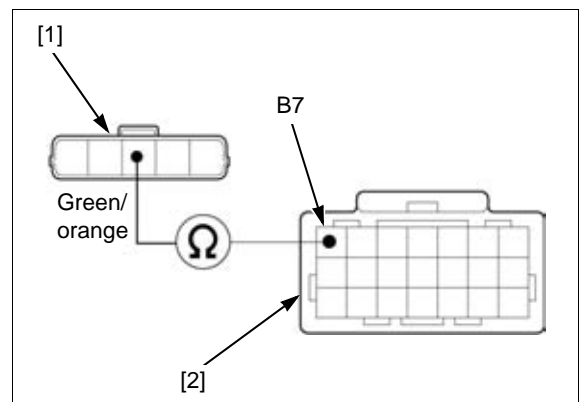
CONNECTION: Green/orange – B7 (Green/orange)

STANDARD: Continuity

Is there continuity?

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

NO – Open circuit in Green/orange wire



DTC 7-1 (ECT SENSOR LOW VOLTAGE)

1. ECT Sensor System Inspection

Turn the ignition switch ON.
Check the ECT sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. ECT Sensor Inspection

Turn the ignition switch OFF.
Disconnect the ECT sensor 2P (Black) connector (page 4-40).

Turn the ignition switch ON.
Check the ECT sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – GO TO STEP 4.

NO – GO TO STEP 3.

3. ECT Sensor Resistance Inspection

Turn the ignition switch OFF.
Measure the resistance at the 2P connector [1] terminals of the ECT sensor side.

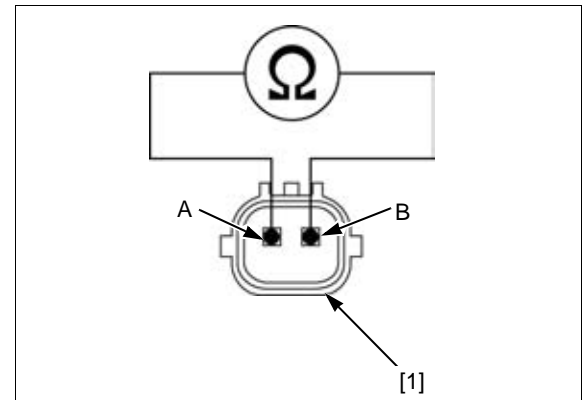
CONNECTION: A – B

STANDARD: 2.3 – 2.6 k Ω (20°C/68°F)

Is the resistance within 2.3 – 2.6 k Ω ?

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

NO – Faulty ECT sensor



4. ECT Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 21P (Gray) connector (page 4-39).

Check for continuity between the ECT sensor 2P (Black) connector [1] terminal of the wire harness side and ground with ECM 21P (Gray) connector disconnected.

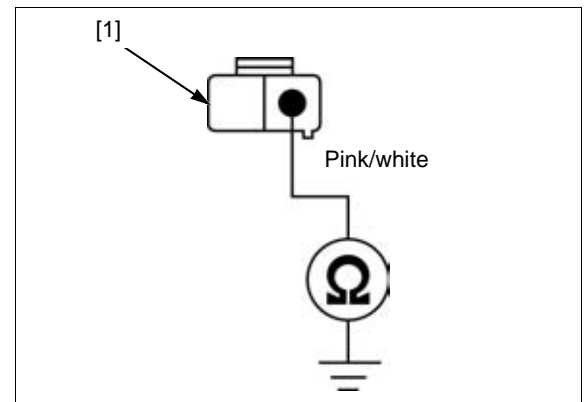
Connection: Pink/White – ground

STANDARD: No continuity

Is there continuity?

YES – Short circuit in Pink/white wire

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



DTC 7-2 (ECT SENSOR HIGH VOLTAGE)

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

1. ECT Sensor System Inspection

Turn the ignition switch ON.
Check the ECT sensor with the HDS pocket tester.

Is about 5 V indicated?

YES – GO TO STEP 2.

NO –

- Intermittent failure
- Loose or poor contact on the ECT sensor 2P (Black) connector

2. ECT Sensor Inspection

Turn the ignition switch OFF.
Disconnect the ECT sensor 2P (Black) connector (page 4-40).

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

Connection: Pink/white – Green/orange

Turn the ignition switch ON.
Check the ECT sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – Inspect the ECT sensor (page 4-41).

NO – GO TO STEP 3.

3. ECT Sensor Output/ground Line Inspection

Turn the ignition switch OFF.
Disconnect the jumper wire.

Disconnect the ECM 21P (Gray) connector (page 4-39).

Check the continuity between the ECT sensor 2P (Black) connector [1] of the wire harness side and ECM 21P (Gray) connector [2].

Connection: Pink/white – B19 (Pink/White)
Green/orange – B7 (Green/orange)

STANDARD: Continuity

TOOL:

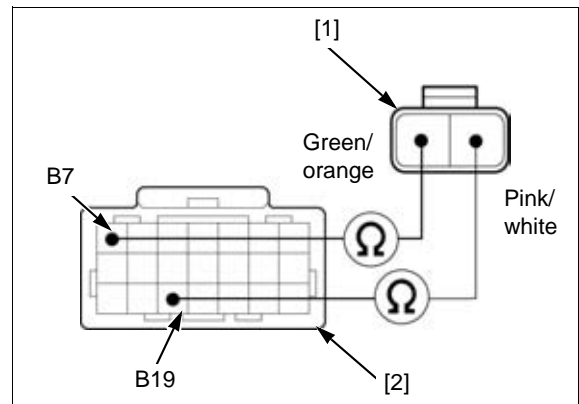
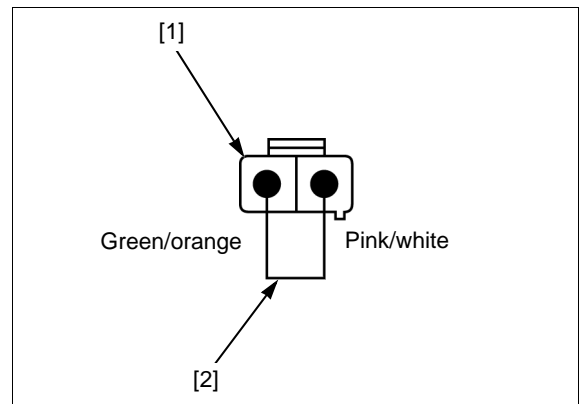
Test probe 07ZAJ-RDJA110

Are there continuity?

YES – Replace the ECM with new one and recheck.

NO –

- Open circuit in Pink/white wire
- Open circuit in Green/orange wire



DTC 8-1 (TP SENSOR LOW VOLTAGE)

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

1. TP Sensor System Inspection

Turn the ignition switch ON.

Check the TP sensor with the HDS pocket tester when the throttle fully closed.

Is about 0 V indicated?

YES – GO TO STEP 3.

NO – GO TO STEP 2.

2. TP Sensor Inspection

Check the TP sensor voltage is increasing uninterrupted when moving the throttle from fully closed to fully opened using the data list menu of the HDS pocket tester.

Does the voltage increase continuously?

YES – • Intermittent failure
• Loose or poor contact on the sensor unit 5P (Black) connector

NO – Replace the sensor unit with a new one, and recheck (Faulty TP sensor).

3. TP Sensor Resistance Inspection

Turn the ignition switch OFF.

Disconnect the sensor unit 5P (Black) connector (page 7-12).

Measure the resistance at the 5P connector [1] of the sensor unit side.

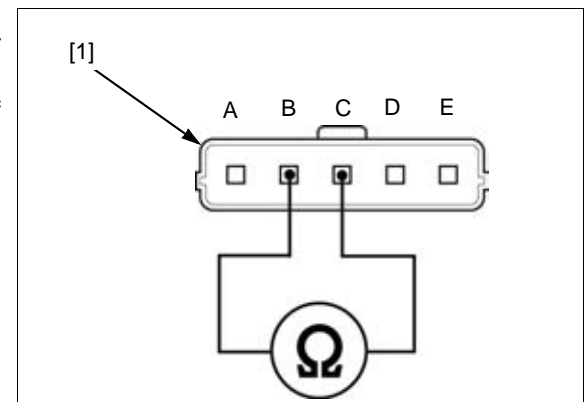
Connection: B – C

STANDARD: 0.5 – 0.7 k Ω (20°C/68°F)

Is the resistance within 0.5 – 0.7 k Ω ?

YES – GO TO STEP 4.

NO – Replace the sensor unit with a new one, and recheck (Faulty TP sensor)

**4. TP Sensor Output Line Open Circuit Inspection**

Disconnect the ECM 21P (Gray) connector (page 4-39).

Check for continuity between the ECM 21P (Gray) connector [1] of the wire harness side and sensor unit 5P (Black) connector [2] of the wire harness side.

Connection: Yellow/blue – B4 (Yellow/blue)

STANDARD: Continuity

TOOL:

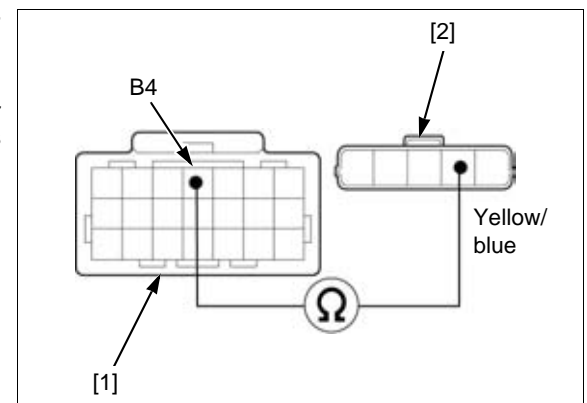
Test probe

07ZAJ-RDJA110

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in Yellow/blue wire



5. TP Sensor Output Line Short Circuit Inspection

Check for continuity between the sensor unit 5P (Black) connector [1] terminal of the wire harness side and ground with ECM 21P (Gray) connector disconnected.

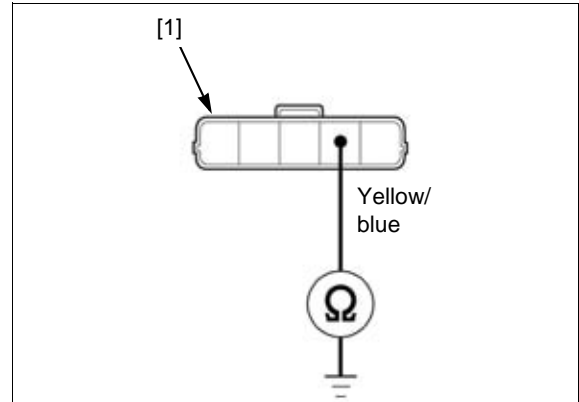
Connection: Yellow/blue – ground

STANDARD: No continuity

Is there continuity?

YES – Short circuit in Yellow/blue wire

NO – GO TO STEP 6.



6. TP Sensor Input Voltage Inspection

Connect the ECM 21P (Gray) connector (page 4-39).

Turn the ignition switch ON.

Measure the voltage between the sensor unit 5P (Black) connector [1] of the wire harness side and ground.

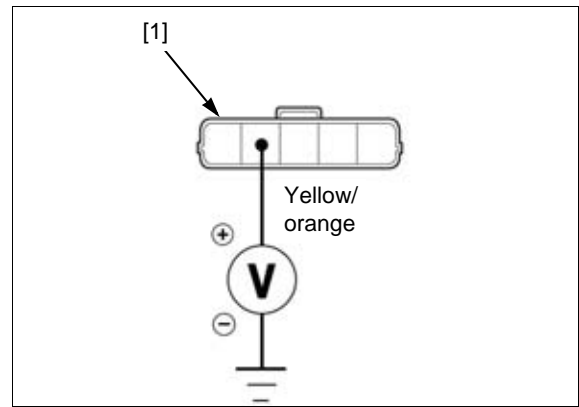
CONNECTION: Yellow/orange (+) – Ground (–)

STANDARD: 4.75 – 5.25 V

Is the voltage within 4.75 – 5.25 V?

YES – Replace the sensor unit with a new one and recheck (Faulty TP sensor).

NO – GO TO STEP 7.



7. TP Sensor Input Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 21P (Gray) connector (page 4-39).

Check for continuity between the sensor unit 5P (Black) connector [1] and ECM 21P (Gray) connector [2] of the wire harness side.

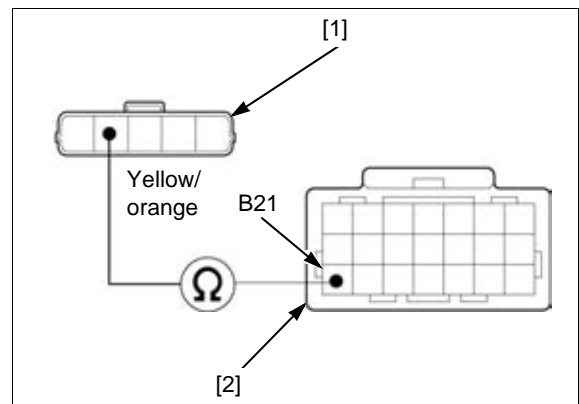
CONNECTION: Yellow/orange – B21 (Yellow/orange)

STANDARD: Continuity

Is there continuity?

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

NO – Open circuit in Yellow/orange wire.



DTC 8-2 (TP SENSOR HIGH VOLTAGE)**1. TP Sensor System Inspection**

Turn the ignition switch ON.
Check the TP sensor with the HDS pocket tester with the throttle fully closed.

Is about 5 V indicated?

YES – GO TO STEP 3.

NO – GO TO STEP 2.

2. TP Sensor Inspection

Check the TP sensor voltage is increasing uninterrupted when moving the throttle from fully closed to fully opened using the data list menu of the HDS pocket tester.

Does the voltage increase continuously?

YES – Intermittent failure

NO – Replace the sensor unit with a new one, and recheck (Faulty TP sensor).

3. TP Sensor Resistance Inspection

Turn the ignition switch OFF.
Disconnect the sensor unit 5P (Black) connector (page 7-12).

Measure the resistance at the 5P connector [1] of the sensor unit side.

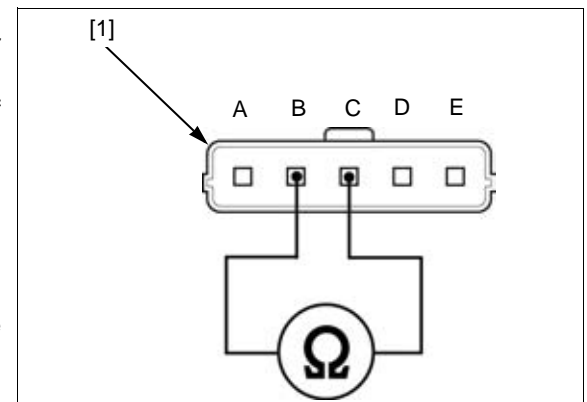
Connection: B – C

STANDARD: 0.5 – 0.7 k Ω (20°C/68°F)

Is the resistance within 0.5 – 0.7 k Ω ?

YES – GO TO STEP 4.

NO – Replace the sensor unit with a new one and recheck (Faulty TP sensor).

**4. TP Sensor Ground line Inspection**

Turn the ignition switch ON.
Measure the voltage between the sensor unit 5P (Black) connector [1] of the wire harness side.

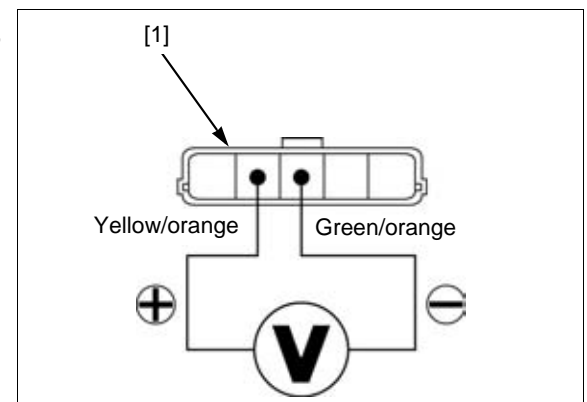
CONNECTION: Yellow/orange (+) – Green/orange(–)

STANDARD: 4.75 – 5.25 V

Is the voltage within 4.75 – 5.25 V?

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

NO – Open circuit in Green/orange wire



DTC 9-1 (IAT SENSOR LOW VOLTAGE)

1. IAT Sensor System Inspection

Turn the ignition switch ON.
Check the IAT sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. IAT Sensor Inspection

Turn the ignition switch OFF.
Disconnect the sensor unit 5P (Black) connector (page 7-12).

Turn the ignition switch ON.
Check the IAT sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – GO TO STEP 3.

NO – Replace the sensor unit with a new one and recheck (Faulty IAT sensor).

3. IAT Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 21P (Gray) connector (page 4-39).

Check for continuity between the ECM 21P (Gray) connector [1] of the wire harness side and ground with sensor unit 5P (Black) connector disconnected.

CONNECTION: B12 (White/blue) – Ground

STANDARD: No continuity

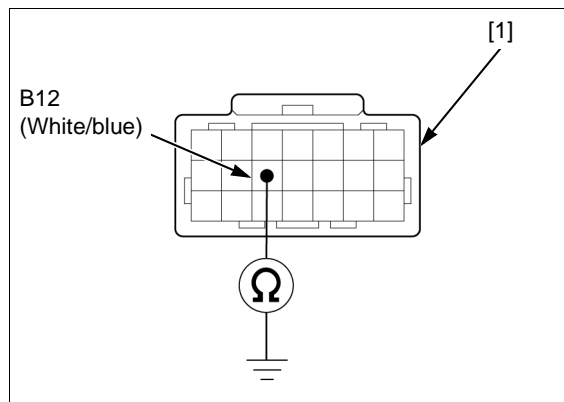
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

YES – Short circuit in the White/blue wire

NO – Replace the ECM with a new one and recheck.



DTC 9-2 (IAT SENSOR HIGH VOLTAGE)

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

1. IAT Sensor System Inspection

Turn the ignition switch ON.
Check the IAT sensor with the HDS pocket tester.

Is about 5 V indicated?

YES – GO TO STEP 2.

NO –

- Intermittent failure
- Loose or poor contact on the sensor unit 5P (Black) connector

2. IAT Sensor Output Voltage Inspection

Turn the ignition switch OFF.
Disconnect the sensor unit 5P (Black) connector (page 7-12).

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

Connection: White/blue – Green/orange

Turn the ignition switch ON.
Check the IAT sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – Replace the sensor unit with a new one and recheck (Faulty IAT sensor).

NO – GO TO STEP 3.

3. IAT Sensor Output Line Open Circuit Inspection

Turn the ignition switch OFF.
Disconnect the jumper wire.

Disconnect the ECM 21P (Gray) connector (page 4-39).

Check for continuity between the sensor unit 5P (Black) connector [1] of the wire harness side and ECM 21P (Gray) connector [2] of the wire harness side.

CONNECTION: White/blue – B12 (White/blue)

STANDARD: Continuity

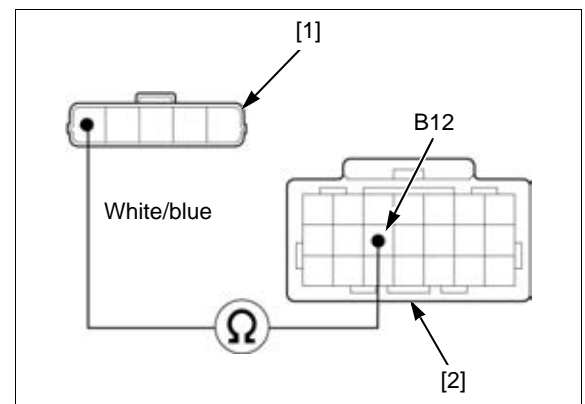
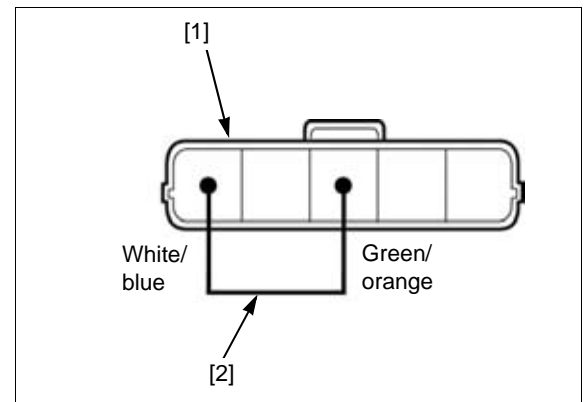
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the White/blue wire



4. IAT Sensor Ground line Inspection

Turn the ignition switch OFF.
Disconnect the ECM 21P (Gray) connector (page 4-39).

Check for continuity between the sensor unit 5P (Black) connector [1] of the wire harness side and ECM 21P (Gray) connector [2] of the wire harness side.

CONNECTION:

Green/orange – B7 (Green/orange)

STANDARD: Continuity

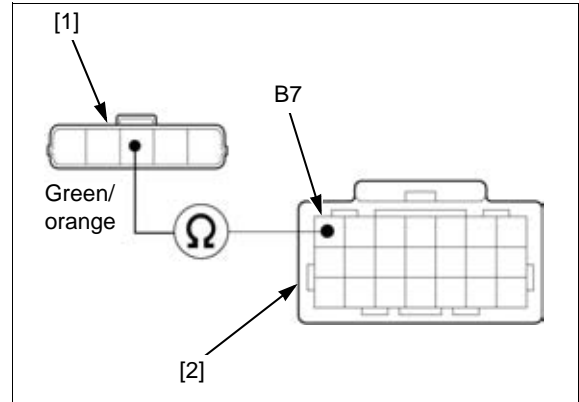
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

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

NO – Open circuit in Green/orange wire



DTC 11-1 (VS SENSOR)

- Before starting the inspection, check for loose or poor contact on the VS sensor 3P (Black) connector and recheck the DTC.

1. VS Sensor System Inspection

Clear the DTC's (page 4-7).

Test ride the scooter.

Stop the engine.

Turn the ignition switch ON.

Check the VS sensor with the HDS pocket tester.

Is DTC 11-1 indicated?

YES – GO TO STEP 2.

NO – • Intermittent failure
• Loose or poor contact on the VS sensor 3P (Black) connector

2. VS Sensor Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the VS sensor 3P (Black) connector (page 21-8).

Turn the ignition switch ON.

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

CONNECTION:

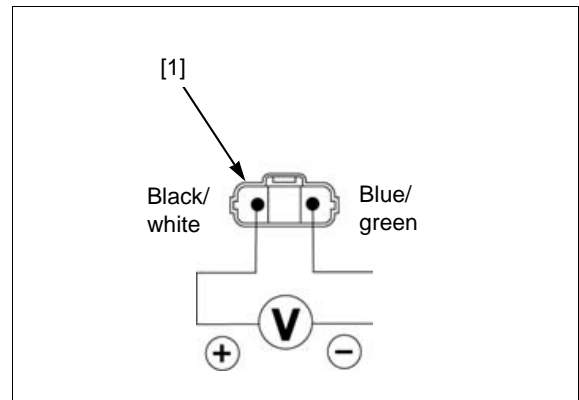
Black/white (+) – Blue/green (–)

STANDARD: Battery voltage

Does the standard voltage exist?

YES – GO TO STEP 3.

NO – • Open circuit in Black/white wire
• Open circuit in Blue/green wire



3. VS Sensor Signal Line Open Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 21P (Gray) connector (page 4-39).

Check the continuity between the ECM 21P (Gray) connector [1] and VS sensor 3P (Black) connector [2] of the wire harness side.

TOOL:

Test probe 07ZAJ-RDJA110

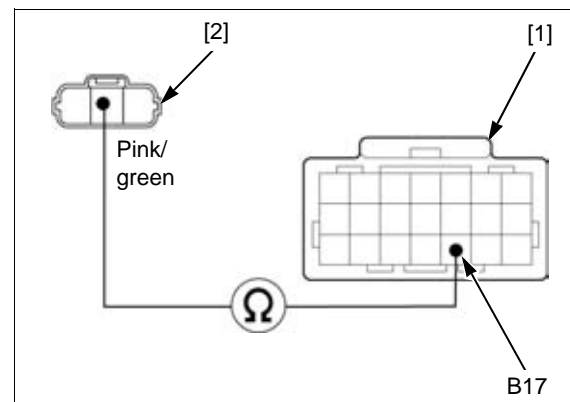
CONNECTION:

Pink/green – B17 (Pink/green)

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in Pink/green wire



4. VS Sensor Signal Line Short Circuit Inspection

Connect the ECM 21P (Gray) connector (page 4-39).

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

TOOL:

Test probe 07ZAJ-RDJA110

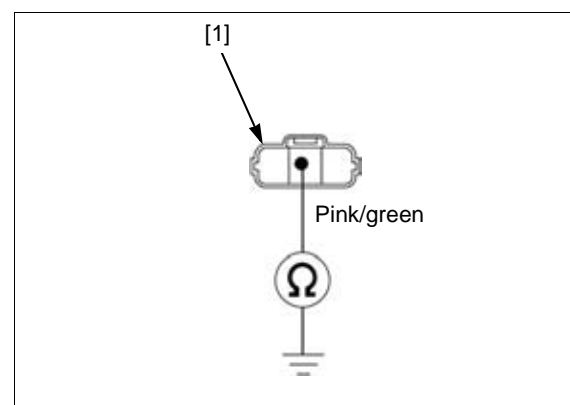
CONNECTION:

Pink/green – Ground

Is there continuity?

YES – Short circuit in Pink/green wire

NO – Inspect the VS sensor (page 21-9)



DTC 12-1 (INJECTOR)

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

1. Injector System Inspection

Clear the DTC's (page 4-7).
Turn the ignition switch ON, then start the engine and check the injector with the HDS pocket tester.

Is the DTC 12-1 indicated?

YES – GO TO STEP 2.

- NO** –
- Intermittent failure
 - Loose or poor contact on the injector 2P (Black) connector

2. Injector Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the injector 2P (Black) connector (page 7-17).

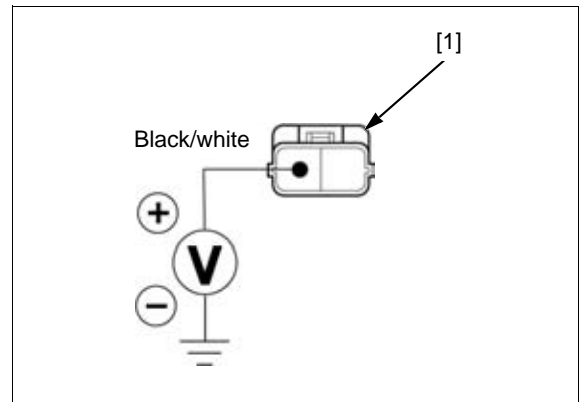
Turn the ignition switch ON.
Measure the voltage between the injector 2P (Black) connector [1] of the wire harness side and ground.

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

Does the battery voltage exist?

YES – GO TO STEP 3.

NO – Open circuit in Black/white wire



3. Injector Resistance Inspection

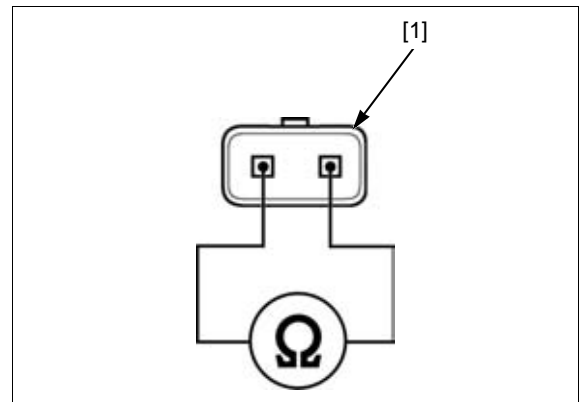
Turn the ignition switch OFF.
Measure the resistance at the 2P connector [1] terminals of the injector side.

STANDARD: 11 – 13 Ω (20 °C/68 °F)

Is the resistance within 11 – 13 Ω (20°C/68°F)?

YES – GO TO STEP 4.

NO – Faulty injector



4. Injector Signal Line Open Circuit Inspection

Disconnect the ECM 21P (Black) connector (page 4-39).

Check the continuity between the injector 2P (Black) connector [1] of the wire harness side and ECM 21P (Black) connector [2] of the wire harness side.

Connection: Pink/Blue – A14 (Pink/Blue)

STANDARD: Continuity

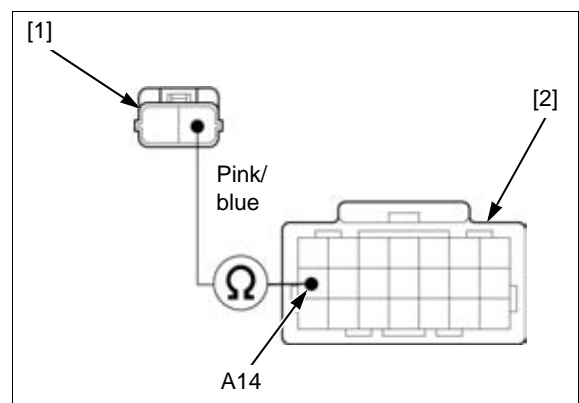
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in Pink/blue wire



5. Injector Signal Line Short Circuit Inspection

Check for continuity between the injector 2P (Black) connector [1] and ground with the ECM 21P (Black) connector disconnected.

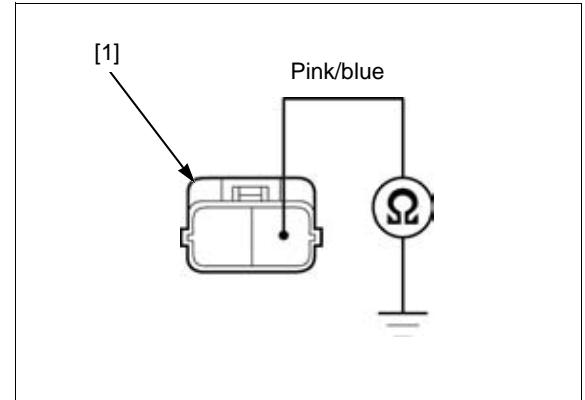
Connection: Pink/blue – Ground

STANDARD: No continuity

Is there continuity?

YES – Short circuit in Pink/blue wire

NO – Replace the ECM with a new one and recheck.



DTC 21-1 (O₂ SENSOR)

- Before starting the inspection, check for loose or poor contact on the O₂ sensor cap connector and recheck the DTC.

1. O₂ Sensor Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the following:

- ECM 21P (Gray) connector (page 4-39)
- O₂ sensor cap (page 4-41)

Check the continuity between the ECM 21P (Gray) connector [1] of the wire harness side and O₂ sensor cap terminal [2].

Connection:

O₂ sensor cap terminal – B5 (Black/orange)

STANDARD: Continuity

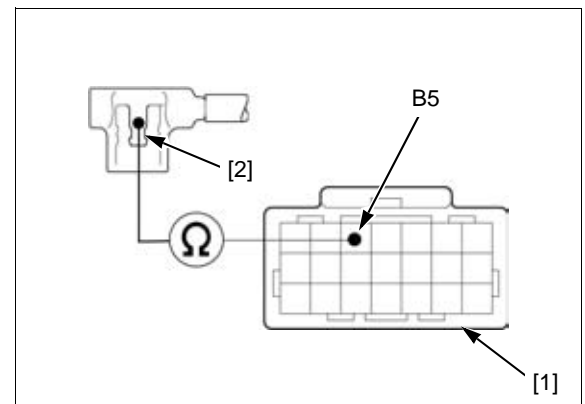
TOOL:

Test probe 07ZAJ-RDJA110

Are there continuity?

YES – GO TO STEP 2.

NO – Open circuit in Black or Black/orange wire



2. O₂ Sensor Line Short Circuit Inspection

With the ECM 21P (Gray) connector disconnected, check for continuity between the O₂ sensor cap terminal [1] and ground.

Connection: O₂ sensor cap terminal – Ground

STANDARD: No continuity

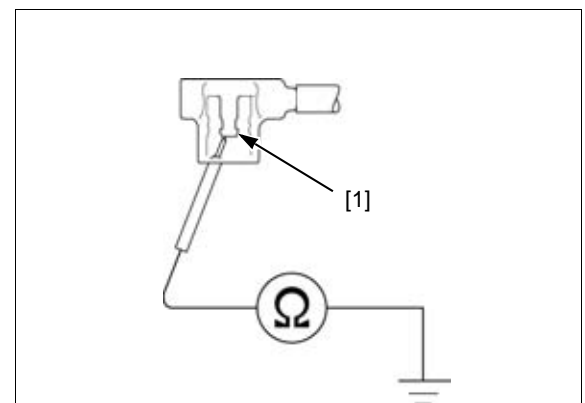
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

YES – Short circuit in the Black or Black/orange wire

NO – GO TO STEP 3.



3. O₂ Sensor Inspection

Replace the O₂ sensor with a known good one (page 4-41).

Clear the DTC's (page 4-7).

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

Test-ride the scooter and check the O₂ sensor with the HDS pocket tester.

Is the DTC 21-1 indicated?

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

NO – Faulty original O₂ sensor

DTC 29-1 (IACV)

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

1. Recheck DTC

Clear the DTC's (page 4-7).

Start the engine and recheck the DTC.

Is the DTC 29-1 indicated?

YES – GO TO STEP 2.

NO –

- Intermittent failure
- Loose or poor contact on the IACV 4P (Black) connector

2. IACV Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the IACV 4P (Black) connector (page 7-16).

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

Connection: Light green/red – Ground
Brown/red – Ground
Gray/red – Ground
Black/red – Ground

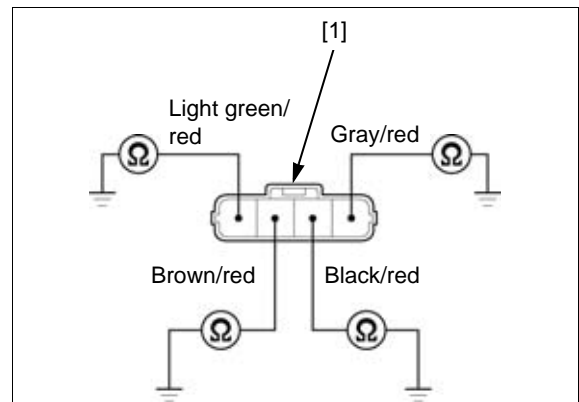
STANDARD: No continuity

Are there continuities?

YES –

- Short circuit in Light green/red or Brown/red wire
- Short circuit in Gray/red or Black/red wire

NO – GO TO STEP 3.



3. IACV Circuit Continuity Inspection

Disconnect the ECM 21P (Black) connector (page 4-39).

Check the continuity between the ECM 21P (Black) connector [1] terminals and IACV 4P (Black) connector [2] terminals of the wire harness side.

Connection:

Light green/red – A17 (Light green/red)

Brown/red – A10 (Brown/red)

Gray/red – A3 (Gray/red)

Black/red – A11 (Black/red)

STANDARD: Continuity

TOOL:

Test probe

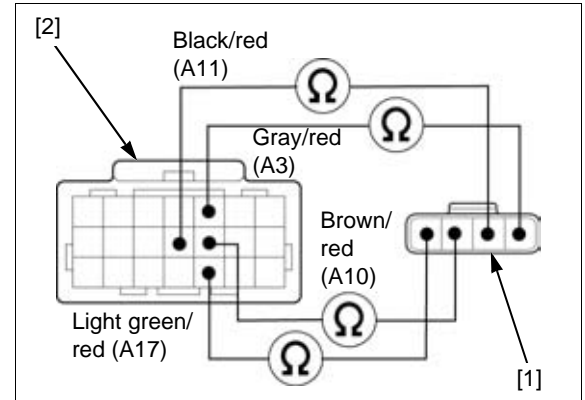
07ZAJ-RDJA110

Are there continuity?

YES – GO TO STEP 4.

NO –

- Open circuit in Light green/red or Brown/red wire
- Open circuit in Gray/red or Black/red wire



4. IACV Resistance Inspection

Measure the resistance at the IACV 4P (Black) connector [1] terminals of the IACV side.

Connection: A – D

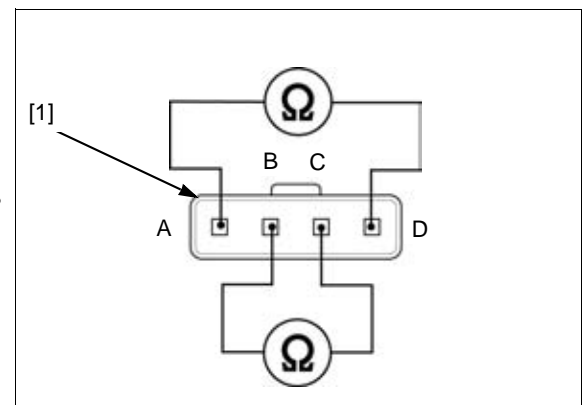
B – C

STANDARD: 110 – 150 Ω (20 °C/68 °F)

Is the resistance within 110 – 150 Ω (20°C/68°F)?

YES – GO TO STEP 5.

NO – Faulty IACV. Replace the IACV with a new one and recheck.



5. IACV Short Circuit Inspection

Check for continuity at the IACV 4P (Black) connector [1] terminals of the IACV side.

Connection: A – B

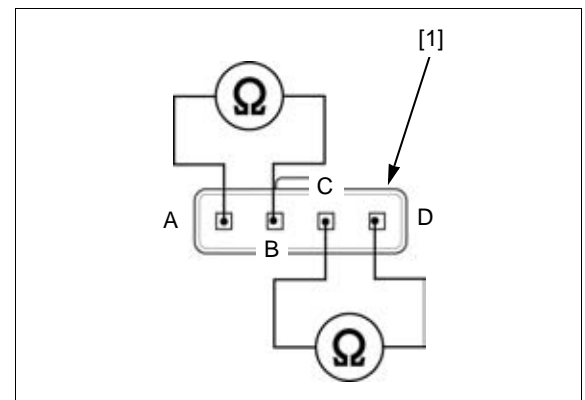
C – D

STANDARD: No continuity

Is there continuity?

YES – Faulty IACV. Replace the IACV with a new one and recheck.

NO – Replace the ECM with new one and recheck.



DTC 52-1 (CKP SENSOR)

- Before starting the inspection, check for loose or poor contact on the CKP sensor 6P (Black) connector and ECM 3P (Black) connector and recheck the DTC.

1. Recheck DTC

Clear the DTC's (page 4-7).
Start the engine and recheck the DTC.

Is the DTC 52-1 indicated?

YES – GO TO STEP 2.

- NO** –
- Intermittent failure
 - Loose or poor contact on the CKP sensor 6P (Black) connector
 - Loose or poor contact on the ECM 3P (Black) connector

2. CKP Sensor Circuit Inspection

Turn the ignition switch OFF.
Disconnect the CKP sensor 6P (Black) connector (page 6-10).

Check the connector for loose contacts or corroded terminals.

Measure the voltage at the CKP sensor 6P (Black) connector [1] of the wire harness side.

Connection: White/red (+) – Ground (–)
White/blue (+) – Ground (–)
White/black (+) – Ground (–)
Blue/yellow (+) – Ground (–)

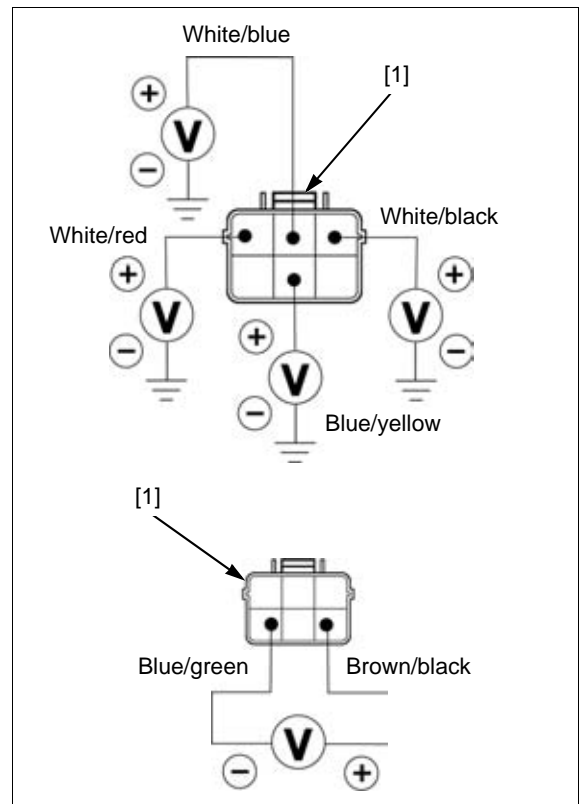
STANDARD: 5 – 10 V

Connection: Brown/black (+) – Blue/green (–)
STANDARD: Battery voltage

Does the standard voltage exist?

YES – GO TO STEP 3.

- NO** – Open circuit in wire harness between the ECM and CKP sensor connector



3. CKP Sensor Inspection

Replace the CKP sensor with a known good one (page 14-4).

Clear the DTC's (page 4-7).

Start the engine and warm it up.
Test-ride the scooter and recheck the DTC.

Is the DTC 52-1 indicated?

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

NO – Faulty original CKP sensor

MIL TROUBLESHOOTING

MIL 1 BLINK (MAP SENSOR)

- Before starting the inspection, check for loose or poor contact on the sensor unit 5P (Black) connector and ECM 21P (Gray) connector and recheck the MIL blinking.

1. Sensor Unit Power Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the sensor unit 5P (Black) connector [1].
Turn the ignition switch ON.
Measure the voltage at the wire harness side.

CONNECTION:

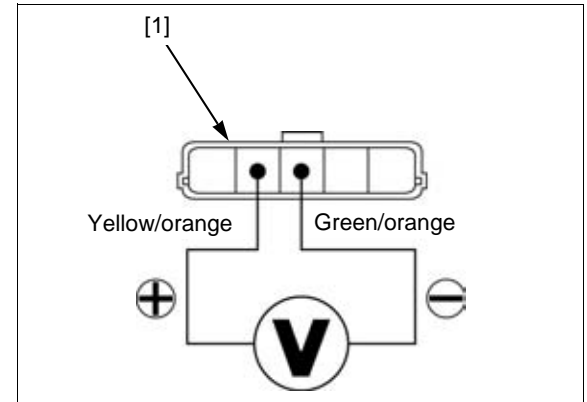
Yellow/orange (+) – Green/orange (–)

STANDARD: 4.75 – 5.25 V

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 3.

NO – GO TO STEP 2.



2. Sensor Unit Circuit Inspection

Turn the ignition switch OFF.
Connect the ECM test harness to ECM connectors (page 4-8).

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

CONNECTION:

B21 (Yellow/orange) – Yellow/orange

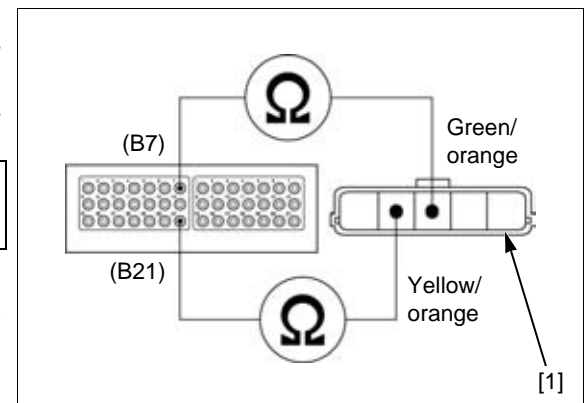
B7 (Green/orange) – Green/orange

Is there continuity?

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

NO –

- Open circuit in Yellow/orange wire
- Open circuit in Green/orange wire



3. MAP Sensor Input Voltage Inspection

Turn the ignition switch ON.
Measure the voltage at the sensor unit 5P (Black) connector [1] of the wire harness side.

CONNECTION:

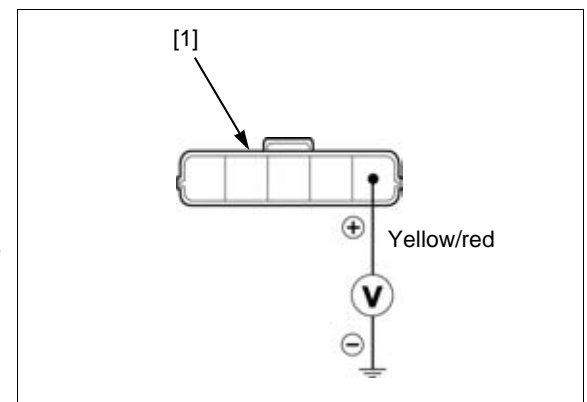
Yellow/red (+) – Ground (–)

STANDARD: 3.80 – 5.25 V

Is the voltage within 3.80 – 5.25 V?

YES – Replace the sensor unit with a new one and recheck (faulty MAP sensor).

NO – GO TO STEP 4.



4. MAP Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 21P (Gray) connector (page 4-39).

Check for continuity between sensor unit 5P (Black) connector [1] and ground.

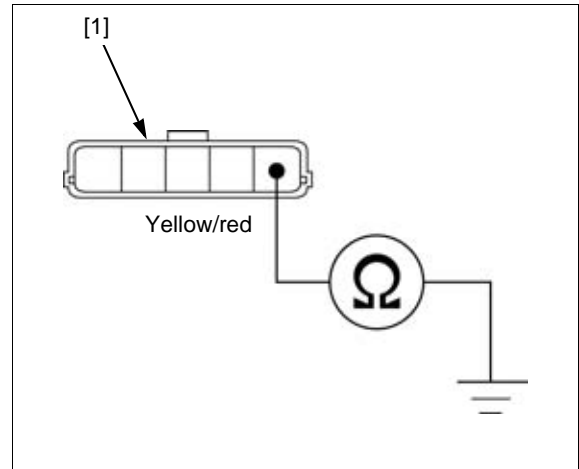
CONNECTION:

Yellow/red – Ground

Is there continuity?

YES – Short circuit in Yellow/red wire

NO – GO TO STEP 5.



5. MAP Sensor Output Line Open Circuit Inspection

Turn the ignition switch OFF.
Connect the ECM test harness to ECM connectors (page 4-8).

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

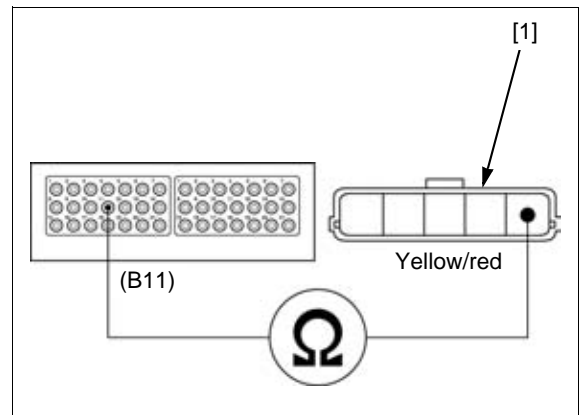
CONNECTION:

B11 (Yellow/red) – Yellow/red

Is there continuity?

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

NO – Open circuit in Yellow/red wire



MIL 7 BLINKS (ECT SENSOR)

- Before starting the inspection, check for loose or poor contact on the ECT sensor 2P (Black) connector and ECM 21P (Gray) connector and recheck the MIL blinking.

1. ECT Sensor Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the ECT sensor 2P (Black) connector (page 4-40).

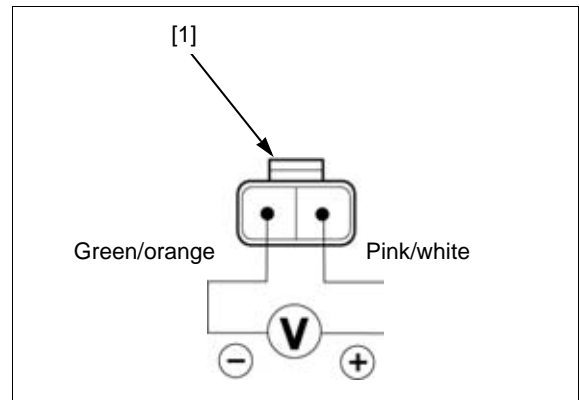
Turn the ignition switch ON.
Measure the voltage at the ECT sensor 2P (Black) connector [1] of the wire harness side and ground.

CONNECTION: Pink/white (+) –Green/orange (–)
STANDARD: 4.75 – 5.25 V

Is the voltage within 4.75 – 5.25 V?

YES – Inspect the ECT sensor (page 4-41), and if the sensor is normal, replace the ECM with a known good one, and recheck.

NO – GO TO STEP 2.



2. ECT Sensor Open Circuit Inspection

Turn the ignition switch OFF.
Connect the ECM test harness to ECM connectors (page 4-8).

Check for continuity between the test harness terminal and ECT sensor 2P (Black) connector [1].

CONNECTION:

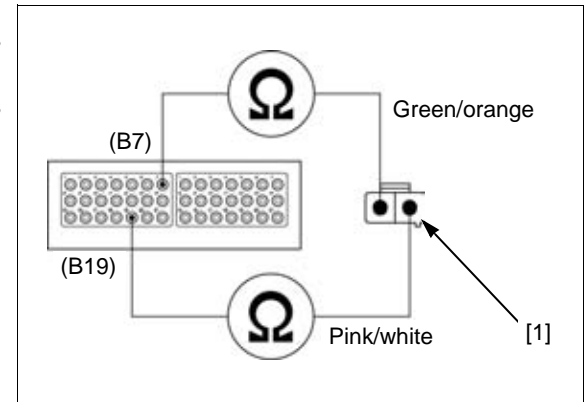
B19 (Pink/white) – Pink/white

B7 (Green/orange) – Green/orange

Is there continuity?

YES – GO TO STEP 3.

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



3. ECT Sensor Short Circuit Inspection

Check for continuity between ECT sensor 2P (Black) connector [1] and ground.

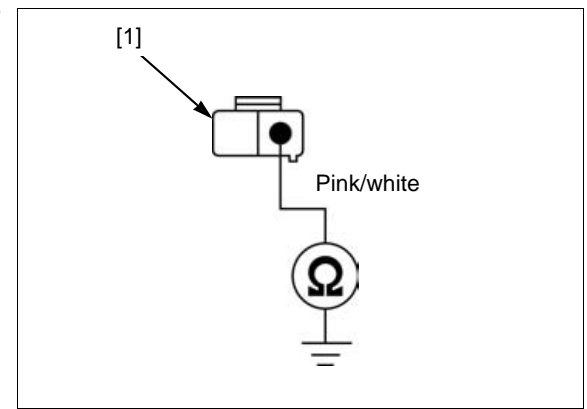
CONNECTION:

Pink/white – Ground

Is there continuity?

YES – Short circuit in Pink/white wire

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



MIL 8 BLINKS (TP SENSOR)

- Before starting the inspection, check for loose or poor contact on the sensor unit 5P (Black) connector and ECM 21P (Gray) connector and recheck the MIL blinking.

1. Sensor Unit Power Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the sensor unit 5P (Black) connector (page 7-12).

Turn the ignition switch ON.
Measure the voltage at the sensor unit 5P (Black) connector [1] of the wire harness side.

CONNECTION:

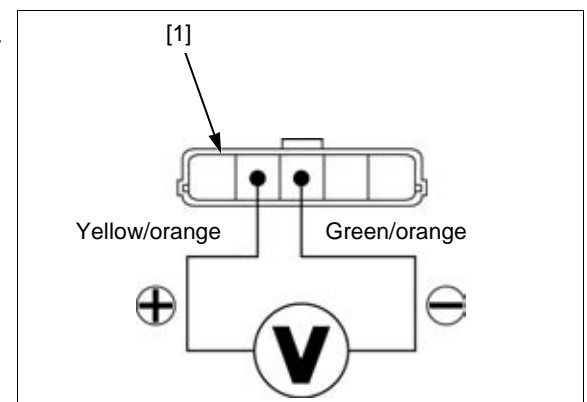
Yellow/orange (+) – Green/orange (–)

STANDARD: 4.75 – 5.25 V

If the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 3.

NO – GO TO STEP 2.



2. Sensor Unit Circuit Inspection

Turn the ignition switch OFF.
Connect the ECM test harness to ECM connectors (page 4-8).

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

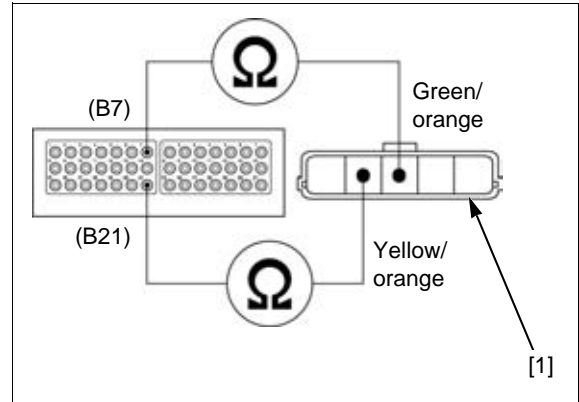
CONNECTION:

B21 (Yellow/orange) – Yellow/orange
B7 (Green/orange) – Green/orange

Is there continuity?

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

NO – • Open circuit in Yellow/orange wire
• Open circuit in Green/orange wire



3. TP Sensor Output Voltage Inspection

Turn the ignition switch OFF.
Connect the ECM test harness to ECM connectors (page 4-8).

Turn the ignition switch ON.
Measure the TP sensor output voltage at the test harness terminals.

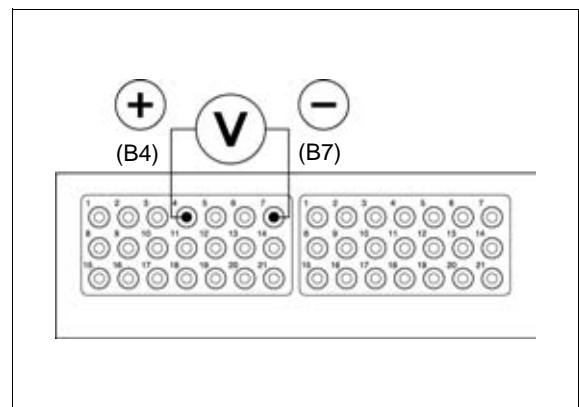
CONNECTION: B4 (+) – B7 (-)

STANDARD: 0.29 – 0.71 V (throttle fully closed)
4.13 – 4.76 V (throttle fully open)

Is there standard voltage?

YES – Intermittent failure

NO – GO TO STEP 4.



4. TP Sensor Signal Line Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 21P (Gray) connector (page 4-39).

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

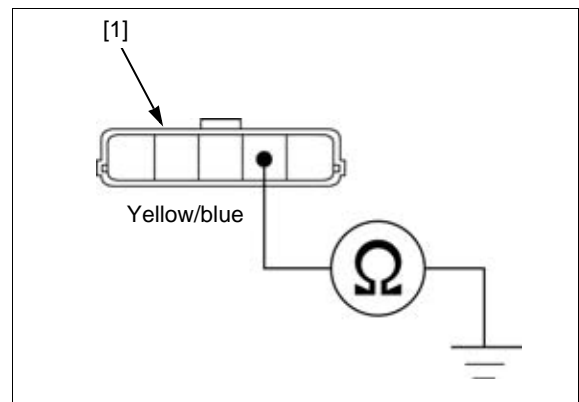
CONNECTION:

Yellow/blue – Ground

Is there continuity?

YES – Short circuit in Yellow/blue wire

NO – GO TO STEP 5.



5. TP Sensor Signal Line Open Circuit Inspection

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

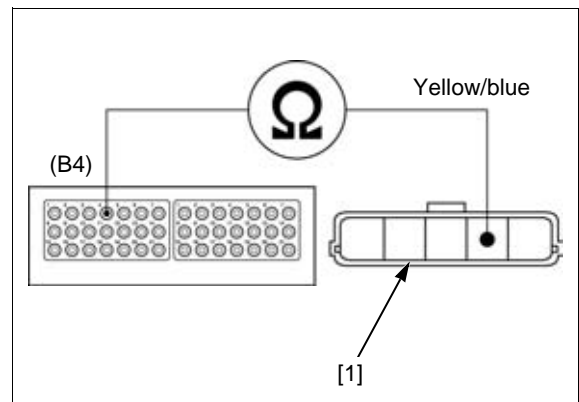
CONNECTION:

B4 (Yellow/blue) – Yellow/blue

Is there continuity?

YES – Replace the sensor unit with a new one and recheck (faulty TP sensor).

NO – Open circuit in Yellow/blue wire



MIL 9 BLINKS (IAT SENSOR)

- Before starting the inspection, check for loose or poor contact on the sensor unit 5P (Black) connector and ECM 21P (Gray) connector and recheck the MIL blinking.

1. IAT Sensor Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the sensor unit 5P (Black) connector (page 7-12).

Turn the ignition switch ON.

Measure the voltage at the sensor unit 5P (Black) connector [1] of the wire harness side.

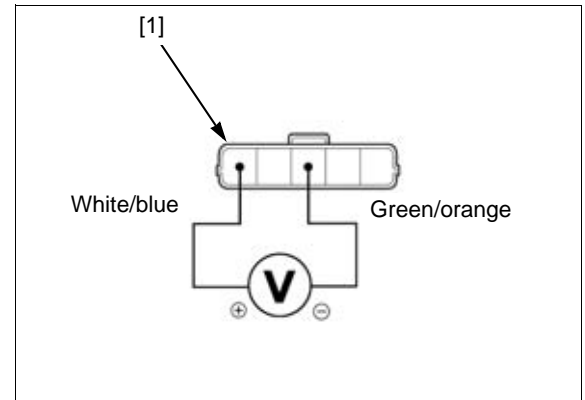
CONNECTION: White/blue (+) – Green/orange (-)

STANDARD: 4.75 – 5.25 V

If the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 5.

NO – GO TO STEP 2.

**2. IAT Sensor Short Circuit Inspection**

Turn the ignition switch OFF.

Disconnect the ECM 21P (Gray) connector (page 4-39).

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

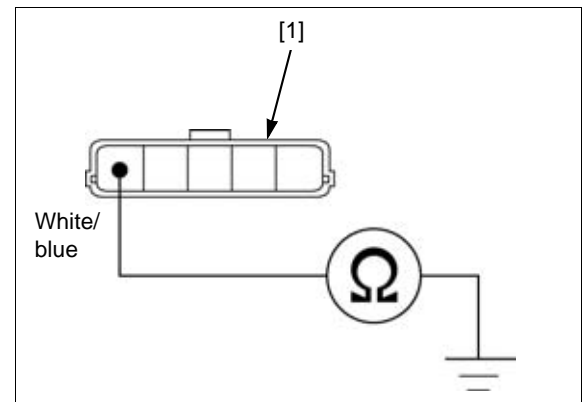
CONNECTION:

White/blue – Ground

Is there continuity?

YES – Short circuit in White/blue wire

NO – GO TO STEP 3.

**3. IAT Sensor Open Circuit Inspection**

Turn the ignition switch OFF.

Connect the ECM test harness to ECM connectors (page 4-8).

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

CONNECTION:

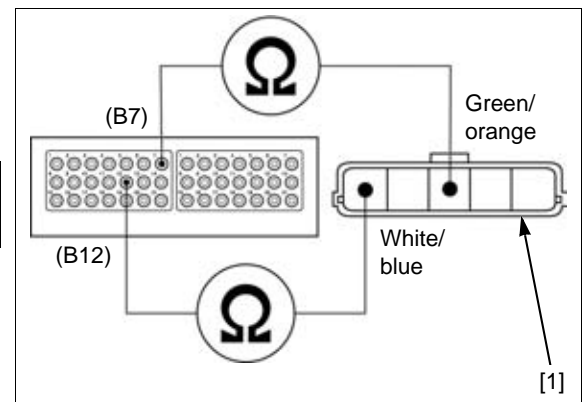
B12 (White/blue) – White/blue

B7 (Green/orange) – Green/orange

Is there continuity?

YES – GO TO STEP 4.

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



4. IAT Output Voltage Inspection

Connect the sensor unit 5P (Black) connector.
Turn the ignition switch ON.

Measure the voltage at the test harness terminals.

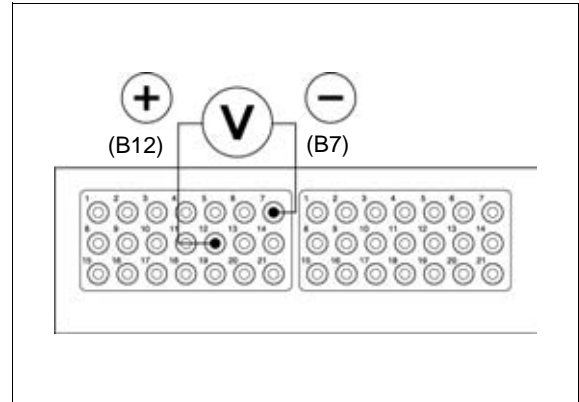
CONNECTION: B12 (+) – B7 (–)

STANDARD: 2.9 – 3.4 V (20 °C/68 °F)

Is the voltage within 2.9 – 3.4 V (20 °C/68 °F)?

YES – Intermittent failure

NO – GO TO STEP 5.



5. IAT Resistance Inspection

Turn the ignition switch OFF.

Measure the resistance at the test harness terminals.

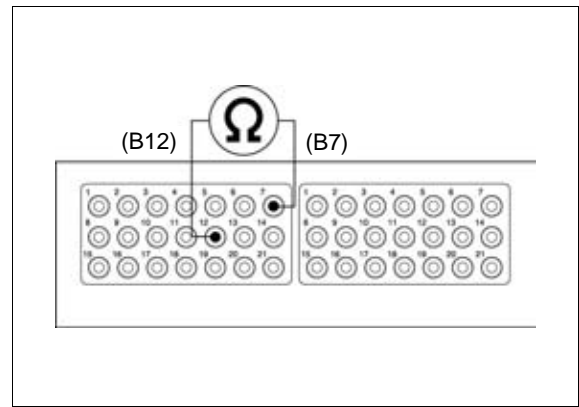
CONNECTION: B12 – B7

STANDARD: 1 – 4 kΩ (20 °C/68 °F)

Is the resistance within 1 – 4 kΩ (20 °C/68 °F)?

YES – • Intermittent failure (from STEP 3.)
• Replace the ECM with a known good one and recheck. (from STEP 4.)

NO – Replace the sensor unit with a new one and recheck. (Faulty IAT sensor)



MIL 11 BLINKS (VS SENSOR)

- Before starting the inspection, check for loose or poor contact on the VS sensor 3P (Black) connector and ECM 21P (Gray) connector and recheck the MIL blinking.

1. VS Sensor Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the VS sensor 3P (Black) connector (page 21-8).

Turn the ignition switch ON.

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

CONNECTION:

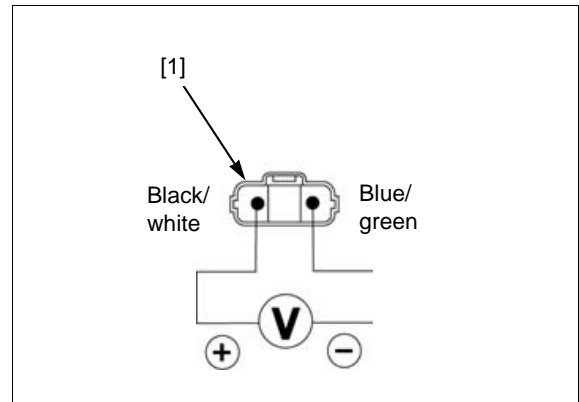
Black/white (+) – Blue/green (–)

STANDARD: Battery voltage

Does the standard voltage exist?

YES – GO TO STEP 2.

NO – • Open circuit in Black/white wire
• Open circuit in Blue/green wire



2. VS Sensor Signal Line Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 21P (Gray) connector (page 4-39).

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

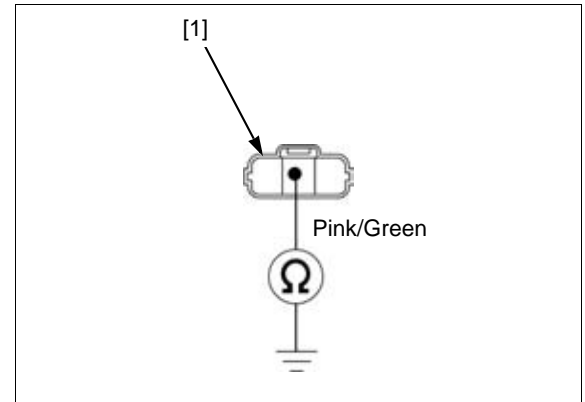
CONNECTION:

Pink/green – Ground

Is there continuity?

YES – Short circuit in Pink/green wire

NO – GO TO STEP 3.



3. VS Sensor Signal Line Open Circuit Inspection

Connect the ECM test harness to ECM connectors (page 4-8).

Check for continuity between the test harness terminal and VS sensor 3P (Black) connector [1].

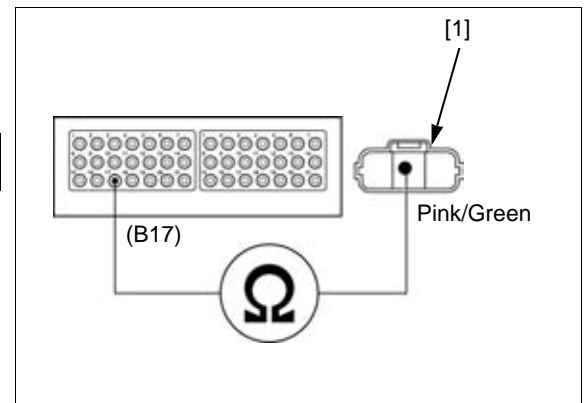
CONNECTION:

B17 (Pink/green) – Pink/green

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in Pink/green wire



4. VS Sensor Inspection

Replace the VS sensor with a known good one (page 21-8).

Clear the DTC's (page 4-7).

Start the engine and warm it up.

Test-ride the scooter and recheck the MIL blinking.

Does the MIL blink 11 times?

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

NO – Faulty original VS sensor

MIL 12 BLINKS (INJECTOR)

- Before starting the inspection, check for loose or poor contact on the injector 2P (Black) connector and ECM 21P (Black) connector and recheck the MIL blinking.

1. Injector Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the injector 2P (Black) connector (page 7-17).

Turn the ignition switch ON.
Measure the voltage between the injector 2P (Black) connector [1] of the wire harness side and ground.

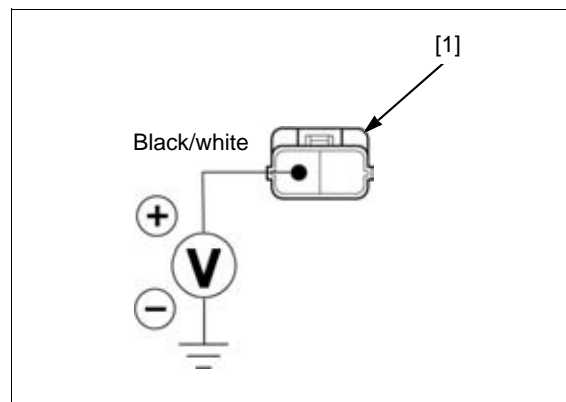
CONNECTION: Black/white (+) – Ground (–)

STANDARD: Battery voltage

Does the standard voltage exist?

YES – GO TO STEP 2.

NO – Open or short circuit in Black/white wire



2. Injector Resistance Inspection

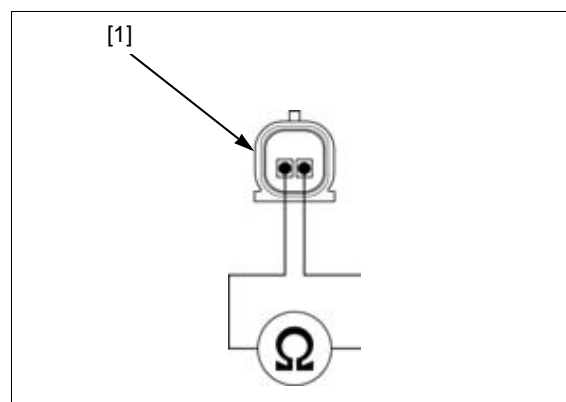
Measure the resistance of the injector side 2P connector [1] terminals.

STANDARD: 11 – 13 Ω (20 °C/68 °F)

Is the resistance within 11 – 13 Ω (20 °C/68 °F)?

YES – GO TO STEP 3.

NO – Faulty injector



3. Injector Signal Line Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 21P (Black) connector (page 4-39).

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

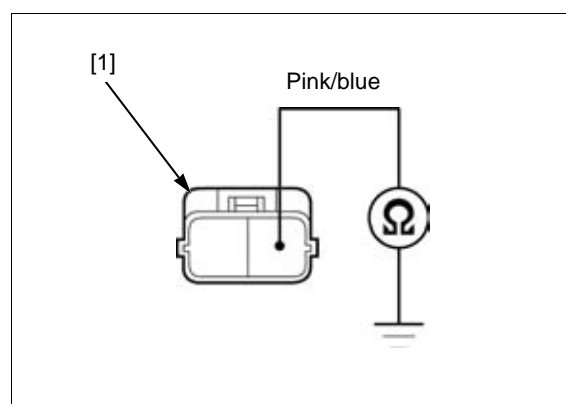
CONNECTION:

Pink/blue – Ground

Is there continuity?

YES – Short circuit in Pink/blue wire

NO – GO TO STEP 4.



4. Injector Signal Line Open Circuit Inspection

Connect the ECM test harness to ECM connectors (page 4-8).

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

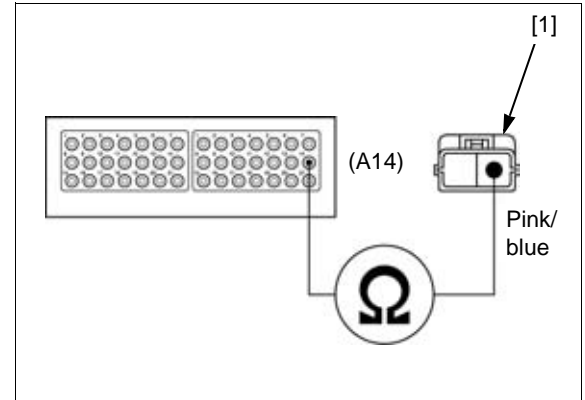
CONNECTION:

A14 (Pink/blue) – Pink/blue

Are the above inspections normal?

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

NO – Open circuit in Pink/blue wire



MIL 21 BLINKS (O₂ SENSOR)

- Before starting the inspection, check for loose or poor contact on the O₂ sensor 1P (Black) connector and ECM 21P (Gray) connector and recheck the MIL blinking.

1. O₂ Sensor Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the following:

- ECM 21P (Gray) connector (page 4-39)
- O₂ sensor cap (page 4-41)

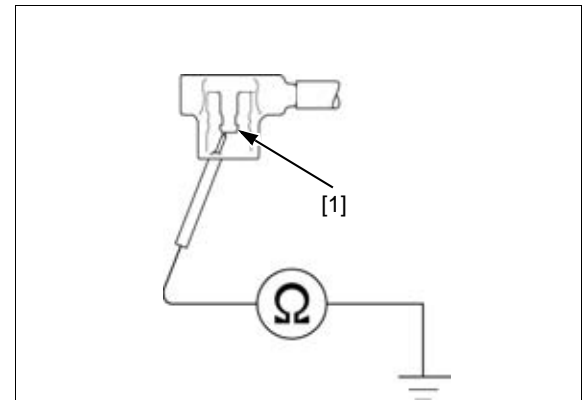
Check the continuity between the O₂ sensor cap terminal [1] and ground.

CONNECTION: O₂ sensor cap terminal – Ground

Is there continuity?

YES – Short circuit in Black or Black/orange wire.

NO – GO TO STEP 2.



2. O₂ Sensor Circuit Continuity Inspection

Connect the ECM test harness to ECM connectors (page 4-8).

Check for continuity between the test harness terminal and O₂ sensor cap terminal [1].

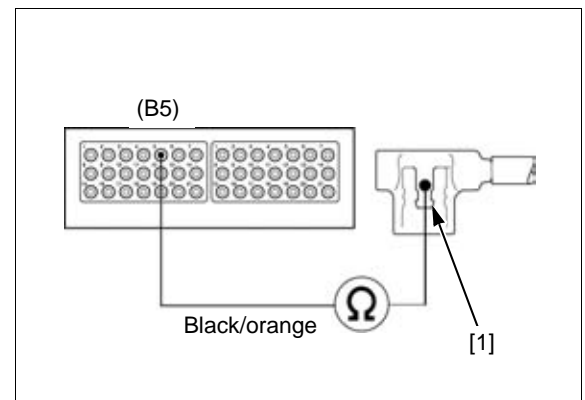
CONNECTION:

B5 (Black/orange) – O₂ sensor cap terminal

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in Black or Black/orange wire



3. O₂ Sensor Inspection

Replace the O₂ sensor with a known good one (page 4-41).

Clear the DTC's (page 4-7).

Start the engine and warm it up.

Test-ride the scooter and recheck the MIL blinking.

Does the MIL blink 21 times?

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

NO – Faulty original O₂ sensor

MIL 29 BLINKS (IACV)

- Before starting the inspection, check for loose or poor contact on the IACV 4P (Black) connector and ECM 21P (Black) connector and recheck the MIL blinking.

1. IACV Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the IACV 4P (Black) connector (page 7-16).

Check the connector for loose contacts or corroded terminals.

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

Connection:

Light green/red – Ground
Brown/red – Ground
Gray/red – Ground
Black/red – Ground

Is there continuity?

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

NO – GO TO STEP 2.

2. IACV Circuit Continuity Inspection

Connect the ECM test harness to ECM connectors (page 4-8).

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

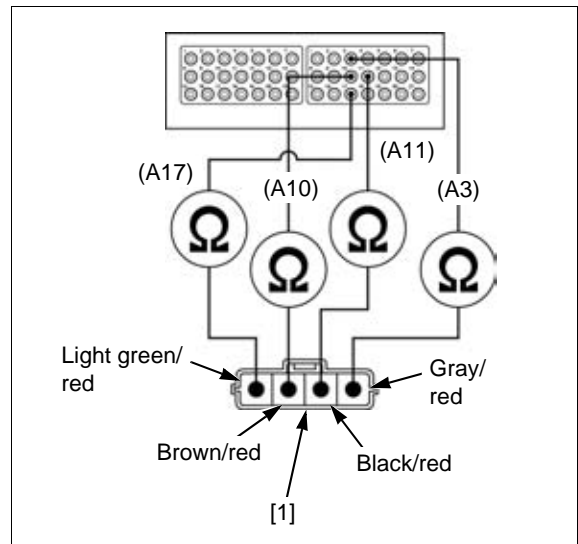
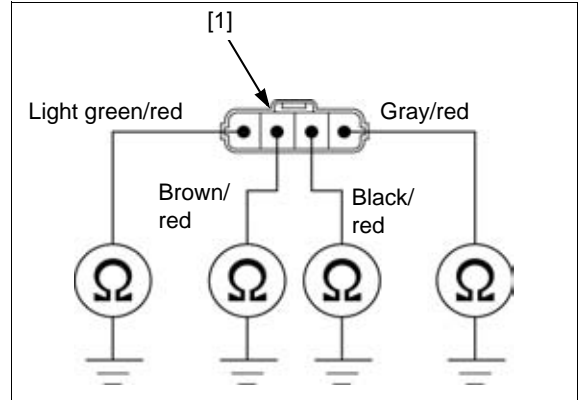
Connection:

A17 (Light green/red) – Light green/red
A10 (Brown/red) – Brown/red
A3 (Gray/red) – Gray/red
A11 (Black/red) – Black/red

Is there continuity?

YES – GO TO STEP 3.

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



3. IACV Resistance Inspection

Measure the resistance at the IACV side 4P connector [1] terminals.

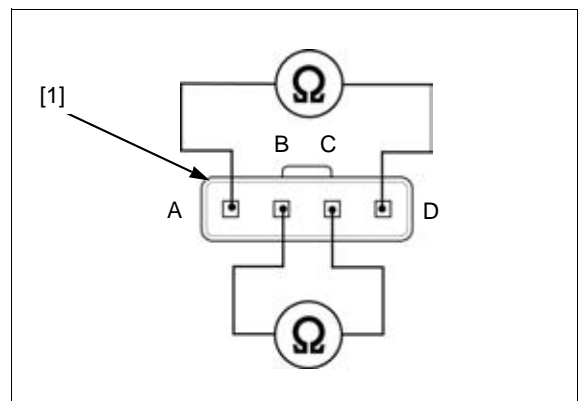
Connection: A – D
B – C

STANDARD: 110 – 150 Ω (20 °C/68 °F)

Is the resistance within 110 – 150 Ω (20 °C/68 °F)?

YES – GO TO STEP 4.

- NO** – Replace the IACV with a new one, and recheck (Faulty IACV).



4. IACV Short Circuit Inspection

Check for continuity at the IACV side 4P connector [1] terminals.

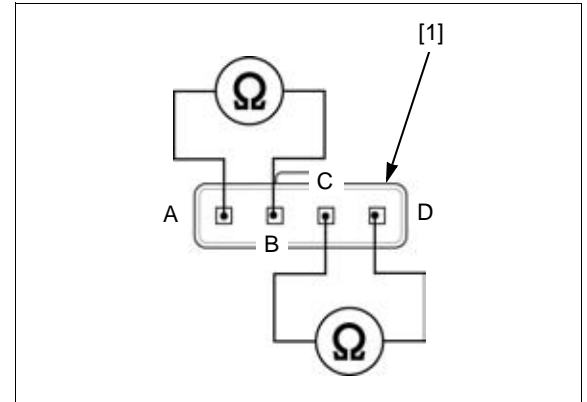
Connection: A – B
C – D

STANDARD: No continuity

Is there continuity?

YES – Replace the IACV with a new one, and recheck (Faulty IACV).

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



MIL 52 BLINKS (CKP SENSOR)

- Before starting the inspection, check for loose or poor contact on the CKP sensor 6P (Black) connector and ECM 21P connectors and recheck the MIL blinking.

1. CKP Sensor Circuit Inspection

Turn the ignition switch OFF.

Disconnect the CKP sensor 6P (Black) connector (page 6-10).

Check the connector for loose contacts or corroded terminals.

Measure the voltage at the CKP sensor 6P (Black) connector [1] of the ECM side.

Connection: White/red (+) – Ground (–)
White/blue (+) – Ground (–)
White/black (+) – Ground (–)
Blue/yellow (+) – Ground (–)

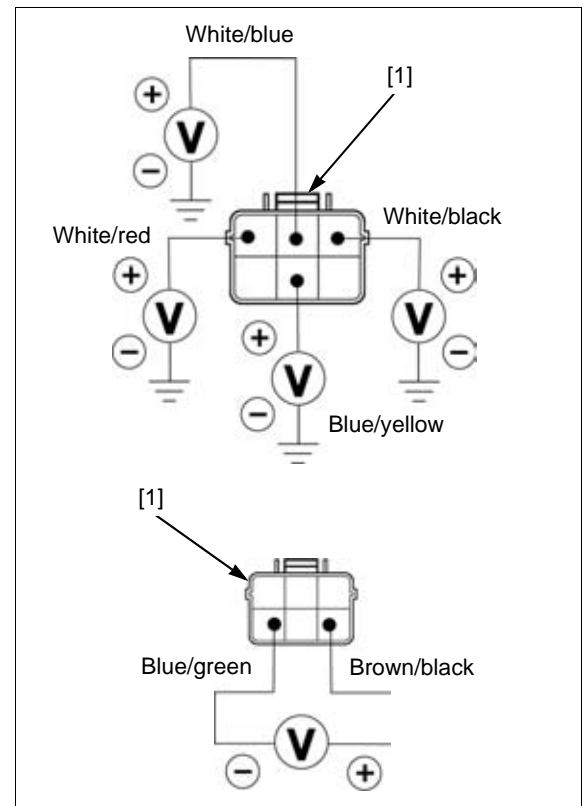
STANDARD: 5 – 10 V

Connection: Brown/black (+) – Blue/green (–)
STANDARD: Battery voltage

Does the standard voltage exist?

YES – GO TO STEP 2.

NO – Open circuit in wire harness between the ECM and CKP sensor connector



2. CKP Sensor Inspection

Replace the CKP sensor with a known good one (page 14-4).

Clear the DTC's (page 4-7).

Start the engine and warm it up.

Test-ride the scooter and recheck the MIL blinking.

Does the MIL blink 52 times?

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

NO – Faulty original CKP sensor

MIL CIRCUIT INSPECTION

WHEN THE IGNITION SWITCH IS TURNED ON, THE MIL DOES NOT COME ON

Turn the ignition switch OFF.

Disconnect the ECM 21P (Black) connector (page 4-39).

Ground the ECM 21P (Black) connector [1] terminal of the wire harness side connector with a jumper wire.

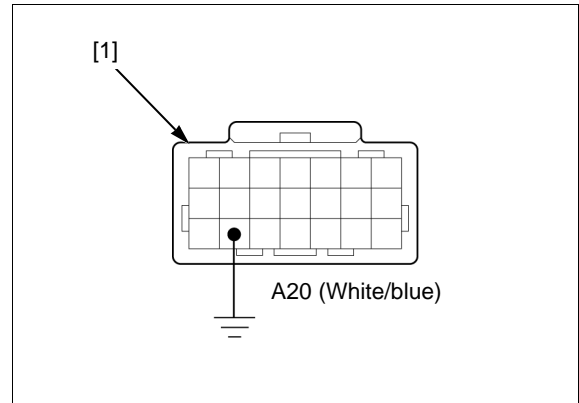
CONNECTION: White/blue – Ground

TOOL:

Test probe 07ZAJ-RDJA110

Turn the ignition switch ON, the MIL should come on.

- If the MIL comes on, replace the ECM with a known good one, and recheck.
- If the MIL does not come on, check for open circuit in the White/blue wire between the speedometer and ECM.



WHEN THE IGNITION SWITCH IS TURNED ON, THE MIL DOES NOT GO OFF WITHIN A FEW SECONDS (ENGINE STARTS)

Turn the ignition switch OFF.

Disconnect the ECM 21P (Black) connector (page 4-39).

Turn the ignition switch ON, the MIL should stay off.

- If the MIL comes on, check for short circuit in the White/blue wire between the speedometer and ECM.
- If the MIL turns off, check the following.

Disconnect the ECM 21P (Gray) connector (page 4-39).

Check for continuity between the ECM 21P (Gray) connector [1] and ground.

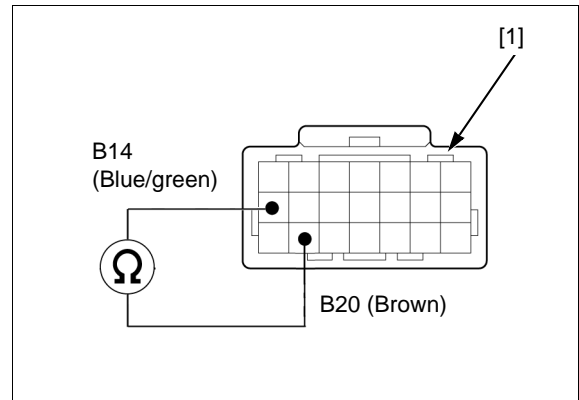
CONNECTION: Brown – Blue/green

STANDARD: No continuity

TOOL:

Test probe 07ZAJ-RDJA110

- If there is continuity, check for short circuit between the Brown wire and Blue/green wire.
- If there is no continuity, replace the ECM with a known good one, and recheck.



ECM

REMOVAL/ INSTALLATION

Remove the right front cover (page 2-9).

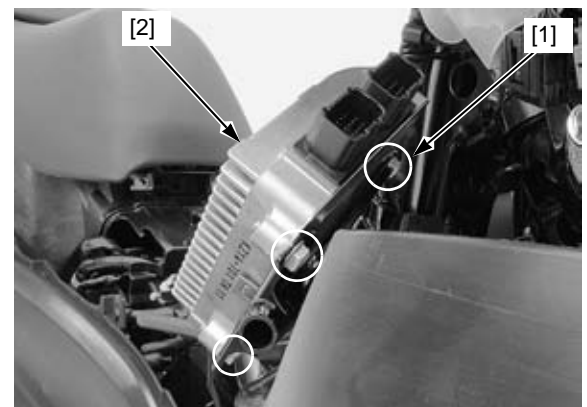
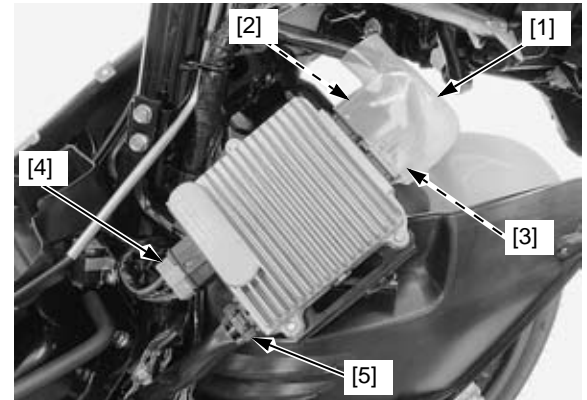
Pull off the dust cover [1].

Disconnect the following:

- ECM 21P (Black) connector [2]
- ECM 21P (Gray) connector [3]
- ECM 5P connector [4]
- ECM 3P (Black) connector [5]

Remove the three bolts [1] and ECM [2].

Installation is in the reverse order of removal.



INSPECTION

MIL DOES NOT COME ON AND FUEL PUMP DOES NOT OPERATE (ECM DOES NOT OPERATE)

- Before starting the inspection, check for loose or poor contact on the ECM connectors, and recheck the MIL blinking.
- Make sure that the battery is fully charged.

1. Fuse Inspection

Check for blown fuse.

Is the fuse blown?

YES - Replace the fuse.

NO - GO TO STEP 2.

2. ECM Ground Line Inspection

Turn the ignition switch OFF.

Disconnect the ECM 21P (Gray) connector and 5P connector (page 4-39).

Check for continuity between the ECM 5P connector [1] of the wire harness side and ground.

TOOL:

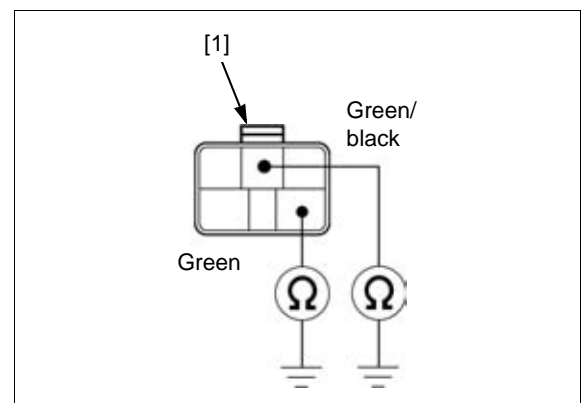
Test probe 07ZAJ-RDJA110

CONNECTION: Green - Ground
Green/black - Ground

Is there continuity?

YES - GO TO STEP 3.

- NO** -
- Open circuit in Green wire.
 - Open circuit in Green/black wire.



3. Sensor Unit Power Input Line Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the sensor unit 5P (Black) connector (page 7-12).

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

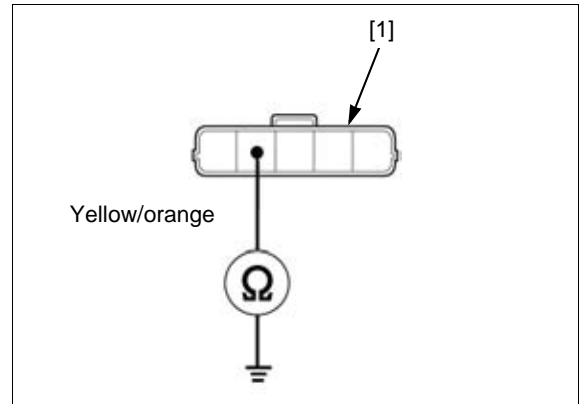
CONNECTION: Yellow/orange – Ground

STANDARD: No continuity

Is there continuity?

YES – Short circuit in the Yellow/orange wire

NO – GO TO STEP 4.



4. ECM Power Line Inspection

Turn the ignition switch ON.

Measure the voltage between the ECM 21P (Black) connector [1] of the wire harness side and ground.

TOOL:

Test probe 07ZAJ-RDJA110

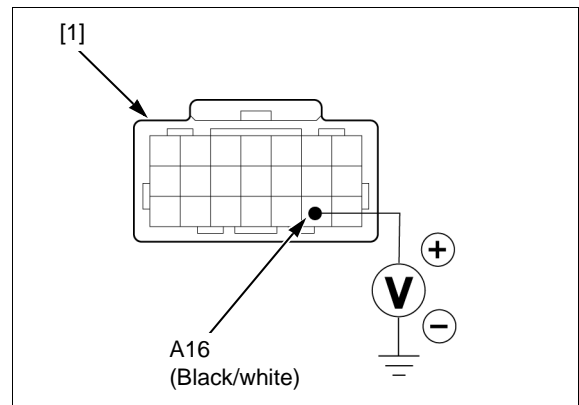
CONNECTION:

A16 (Black/white) (+) – Ground (–)

Does the battery voltage exist?

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

NO – Open circuit in Black/white wire between the ignition switch and ECM.



ECT SENSOR

REMOVAL/INSTALLATION

Remove the right side cover (page 2-6).

Drain the coolant (page 9-5).

Remove the ECT sensor while the engine is cold.

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

Do not apply engine oil to this O-ring.

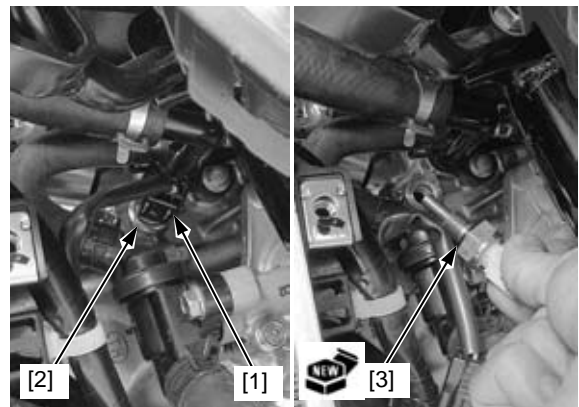
Remove the ECT sensor [2] and replace the O-ring [3] with a new one.

Tighten the ECT sensor to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Fill the cooling system with recommended coolant (page 9-5).

Install the right side cover (page 2-6).



INSPECTION

Remove the ECT sensor (page 4-40).

*Wear insulated gloves and adequate eye protection.
Keep flammable materials away from the burner.*

Heat the coolant with an electric heating element. Suspend the ECT sensor [1] in heated coolant and check the continuity through the sensor as the coolant heats up.

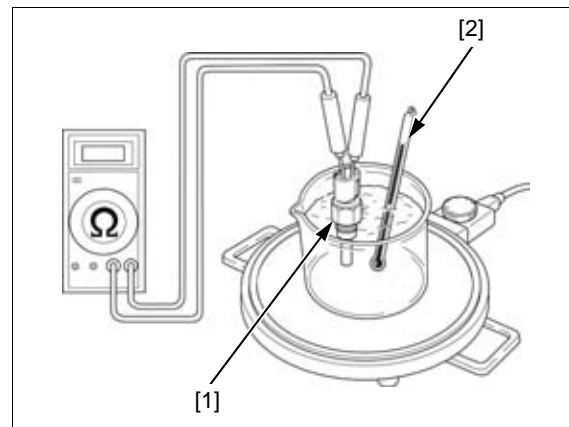
- Soak the ECT sensor in coolant up to its threads with at least 40 mm (1.57 in) from the bottom of the pan to the bottom of the sensor.
- Keep temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect readings. Do not let the thermometer [2] or ECT sensor touch the pan.

CONNECTION: A – B

Temperature °C (°F)	40 (104)	100 (212)
Resistance (kΩ)	1.0 – 1.3	0.1 – 0.2

Replace the ECT sensor if it is out of specifications.

Install the ECT sensor (page 4-40).



O₂ SENSOR

NOTICE

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

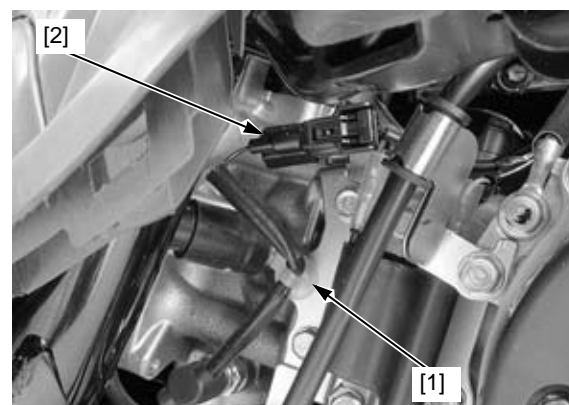
REMOVAL

Replace the O₂ sensor while the engine is cold.

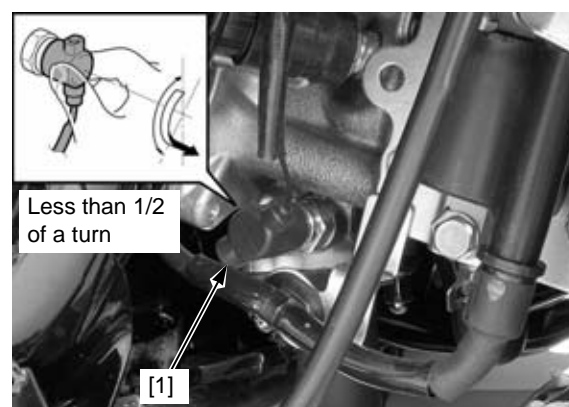
Remove the left side cover (page 2-6).

Release the wire band boss [1] from the stay.

Release the O₂ sensor 1P (Black) connector [2] from the stay and disconnect it.



Hold the center of the O₂ sensor cap [1] as shown. Disconnect the cap from the sensor while slightly turning it, less than 1/2 of a turn.



PGM-FI SYSTEM

Remove the O₂ sensor while the engine is cold.

Remove the O₂ sensor [1] from the cylinder head.

- Do not use an impact wrench when removing or installing the O₂ sensor, or it may be damaged.



INSTALLATION

Install and tighten the O₂ sensor [1] to the cylinder head to the specified torque.

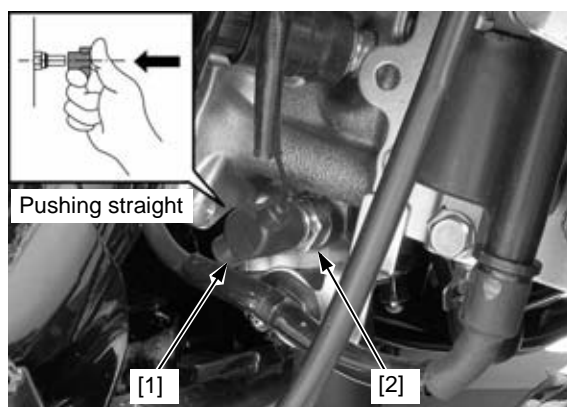
TORQUE: 24.5 N·m (2.5 kgf·m, 18 lbf·ft)



Connect the O₂ sensor cap [1] to the O₂ sensor [2] by pushing it straight.

NOTICE

- Be careful not to tilt the O₂ sensor cap when connecting the cap to the O₂ sensor.

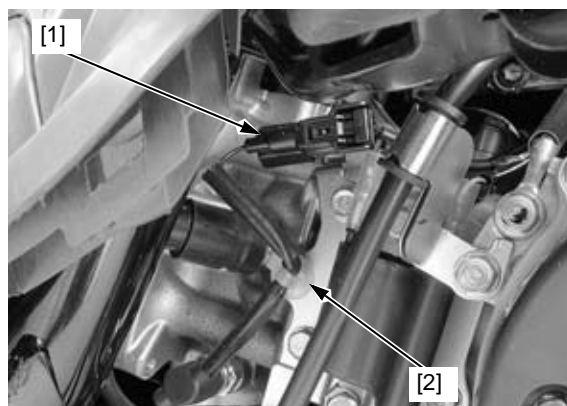


Connect the O₂ sensor 1P (Black) connector [1] and set it to the stay.

Set the wire band boss [2] to the stay.

After installation, make sure the exhaust gas does not leak.

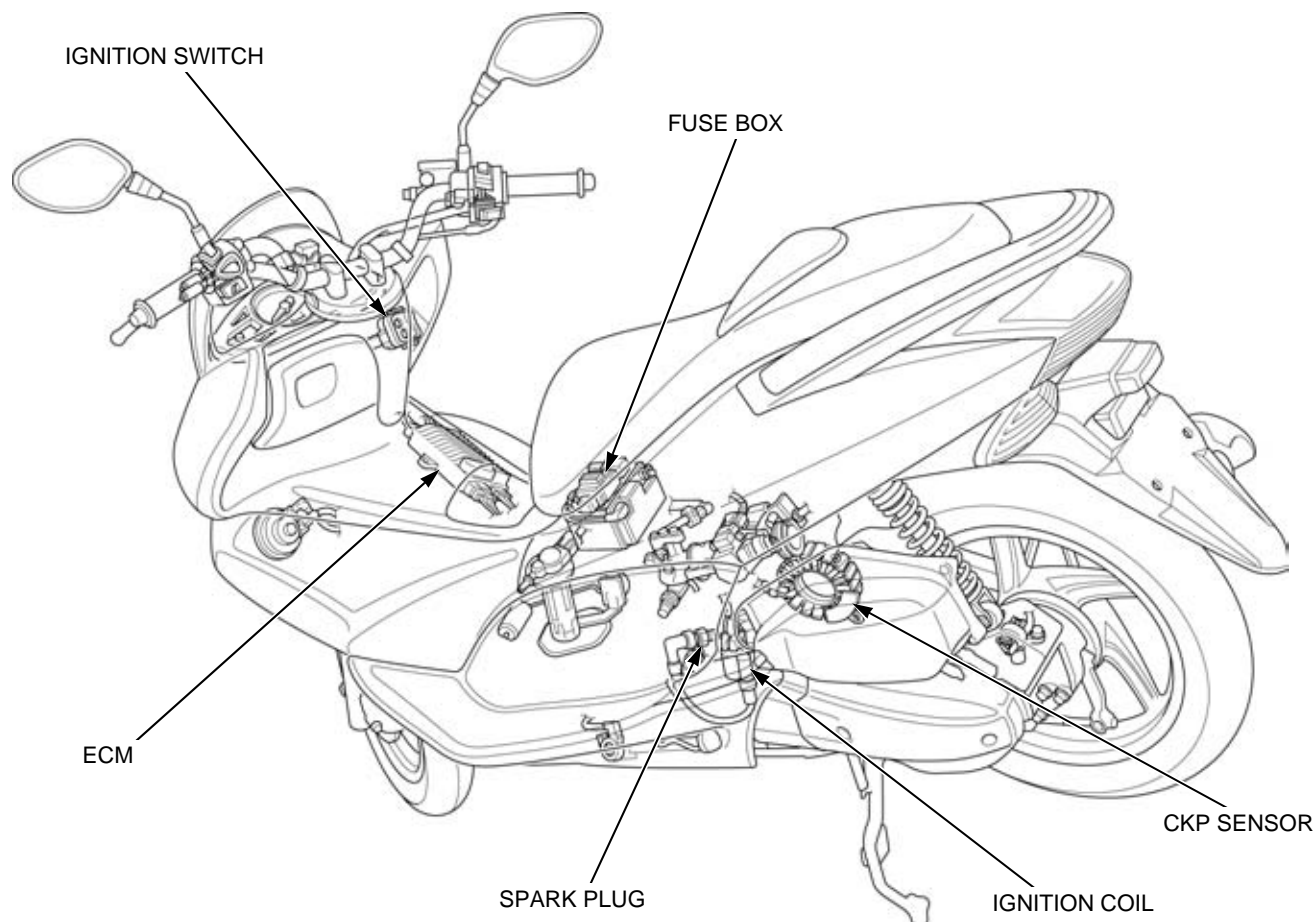
Install the left side cover (page 2-6).



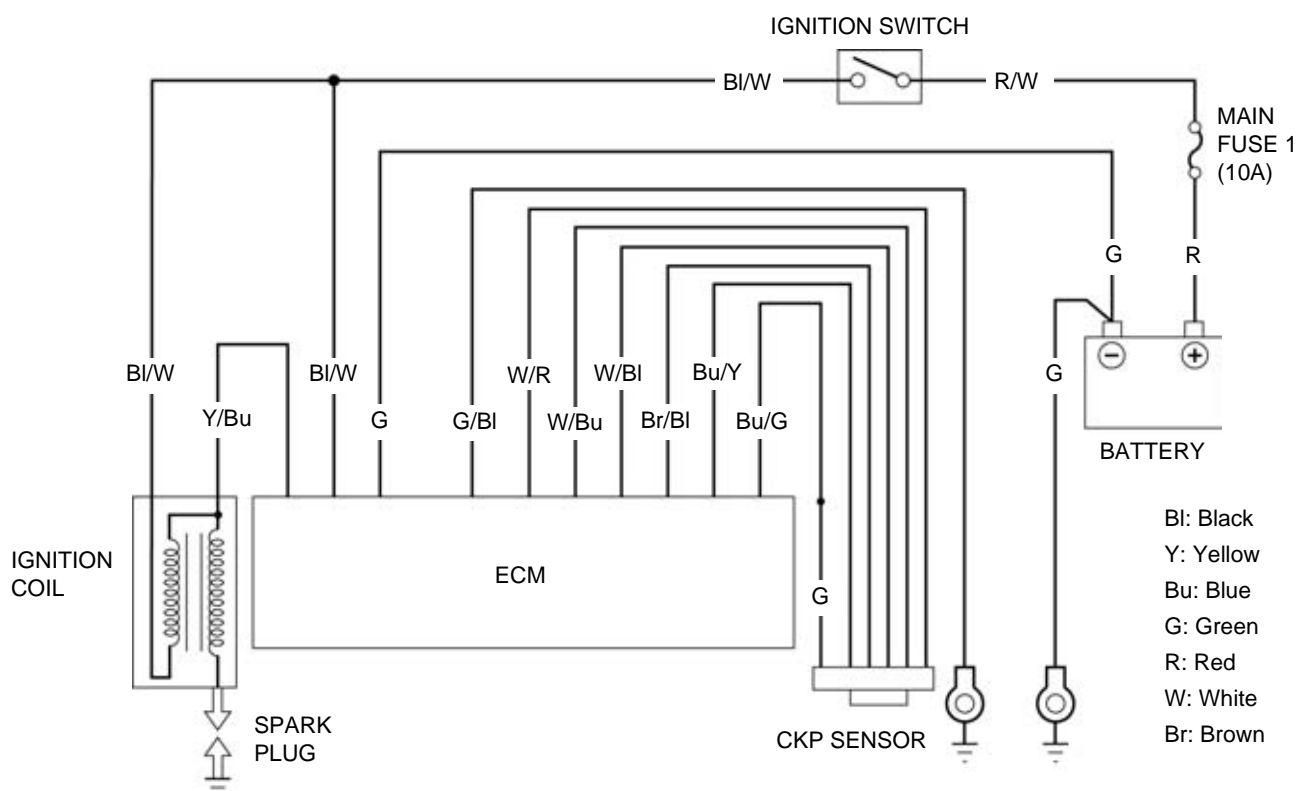
SYSTEM LOCATION.....	5-2	IGNITION SYSTEM INSPECTION	5-5
SYSTEM DIAGRAM	5-2	IGNITION COIL	5-6
SERVICE INFORMATION	5-3	IGNITION TIMING	5-6
TROUBLESHOOTING.....	5-4		

IGNITION SYSTEM

SYSTEM LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

- The ECM may be damaged if dropped. Also, if the connector is disconnected when current is flowing, the excessive voltage may damage the ECM. Always turn the ignition switch OFF before servicing.
- Use spark plug with the correct heat range. Using spark plug with an incorrect heat range can damage the engine.
- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned ON and current is present.
- When servicing the ignition system, always follow the steps in the troubleshooting (page 5-4).
- The ignition timing cannot be adjusted since the ECM is factory preset.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding.
- Make sure the battery is adequately charged. Using the starter with a weak battery results in a slower engine cranking speed as well as no spark at the spark plug.
- Inspect the following:
 - Spark plug (page 3-6)
 - Ignition switch (page 21-14)
 - CKP sensor (page 4-37)
- Refer to CKP sensor service (page 14-4).

SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	WW125EX2	CPR7EA-9 (NGK)/U22EPR-9 (DENSO)
	WW150	CPR7EA-9 (NGK)
Spark plug gap		0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil peak voltage		100 V minimum
Ignition timing		12° BTDC at idle speed

IGNITION SYSTEM

TROUBLESHOOTING

- Inspect the following before diagnosing the system.
 - Turn the ignition switch ON and check the DTC (page 4-9).
DTC 52-1 (CKP sensor) is indicated only when the engine is cranked.
 - Faulty spark plug
 - Loose spark plug cap or spark plug wire connection
 - Water in the spark plug cap (Leaking the ignition coil secondary voltage)
- "Initial voltage" of the ignition primary coil is the battery voltage with the ignition switch turned ON. (The engine is not cranked by the starter.)

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. (Other electrical components are normal)	<ol style="list-style-type: none">1. An open circuit or loose connection in Black/white wire.2. Loose or poor connection of the ignition coil primary wire terminal or an open circuit in primary coil.3. Faulty ECM (in case when the initial voltage is normal when ECM 21P (Black) connector is disconnected).
	Initial voltage is normal, but it drops by 2 – 4 V while cranking the engine.	<ol style="list-style-type: none">1. Incorrect peak voltage adaptor connections. (System is normal if measured voltage is over the specifications with reverse connections.)2. Battery is undercharged. (Voltage drops largely when the engine is started.)3. Loose or poor connection or an open circuit in Yellow/blue wire between the ignition coil and ECM.4. A short circuit in the ignition primary coil.5. Faulty CKP sensor (Check the MIL blinking: 4-37)6. Faulty ECM (in case when above No. 1 through 5 are normal).
	Initial voltage is normal but there is no peak voltage while cranking the engine.	<ol style="list-style-type: none">1. Incorrect peak voltage adaptor connections. (System is normal if measured voltage is over the specifications with reverse connections.)2. Faulty peak voltage adaptor.3. Faulty ECM (in case when above No. 1 and 2 are normal).
	Initial voltage is normal but peak voltage is lower than the standard value.	<ol style="list-style-type: none">1. The multimeter impedance is too low; below 10 MΩ/DCV.2. Cranking speed is too slow. (Battery is undercharged.)3. The sampling timing of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.)4. Faulty ECM (in case when above No. 1 through 3 are normal).
	Initial and peak voltages are normal but no spark jumps.	<ol style="list-style-type: none">1. Faulty spark plug or leaking ignition coil secondary current.2. Faulty ignition coil.

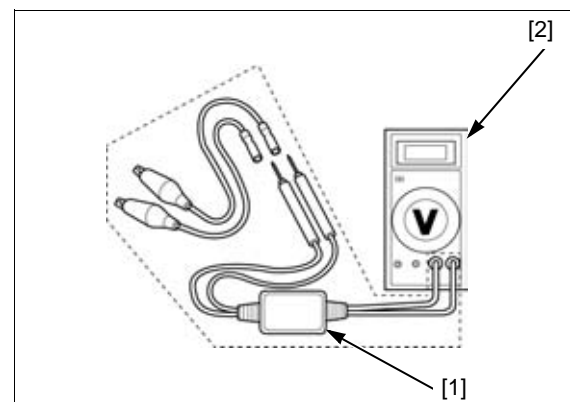
IGNITION SYSTEM INSPECTION

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

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

TOOL:

**Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum)**



IGNITION COIL PRIMARY PEAK VOLTAGE

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

Support the scooter with its centerstand on a level surface.

Remove the plug maintenance lid (page 2-9).

Disconnect the spark plug cap from the spark plug.

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

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

TOOL:

**Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum)**

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

Turn the ignition switch ON.

Check the initial voltage at this time.

The battery voltage should be measured.

If the initial voltage cannot be measured, follow the checks in the troubleshooting table (page 5-4).

Squeeze the brake lever fully and retract the sidestand.
Crank the engine with the starter and measure the ignition coil primary peak voltage.

PEAK VOLTAGE: 100 V minimum

If the peak voltage is lower than the standard value, follow the checks in the troubleshooting table (page 5-4).



IGNITION COIL

REMOVAL/INSTALLATION

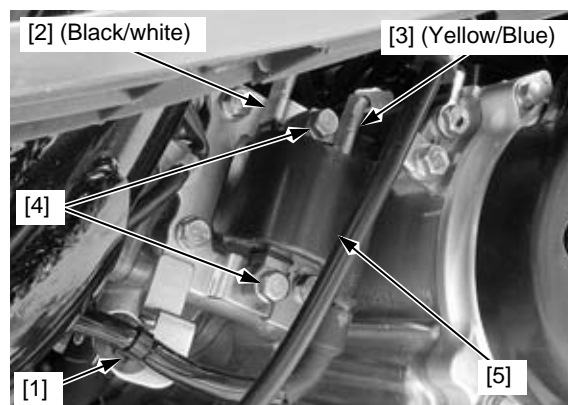
Remove the left side cover (page 2-6).

Disconnect the spark plug cap.
Release the wire band boss [1].

Disconnect the ignition coil wire connectors [2]/[3].

Remove the mount bolts [4] and ignition coil [5].

Installation is in the reverse order of removal.



IGNITION TIMING

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

It is not necessary to disconnect the water hoses from the radiator.

Remove the four radiator mounting bolts and move it so that the cooling fan is visible (page 9-6).

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

- Never allow the cooling fan to come in contact with the radiator while the engine is running, or the radiator will be severely damaged.

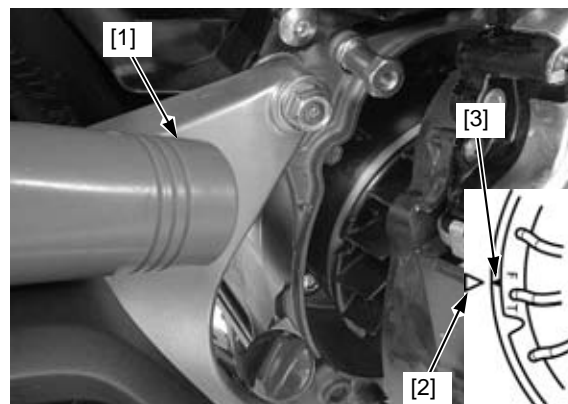
Read the instructions for timing light operation.

Connect the timing light [1] to the spark plug wire.

Start the engine and let it idle ($1,700 \pm 100 \text{ min}^{-1}$ (rpm)).

The ignition timing is correct if the index mark [2] on the radiator base aligns with the "F" mark [3] on the cooling fan.

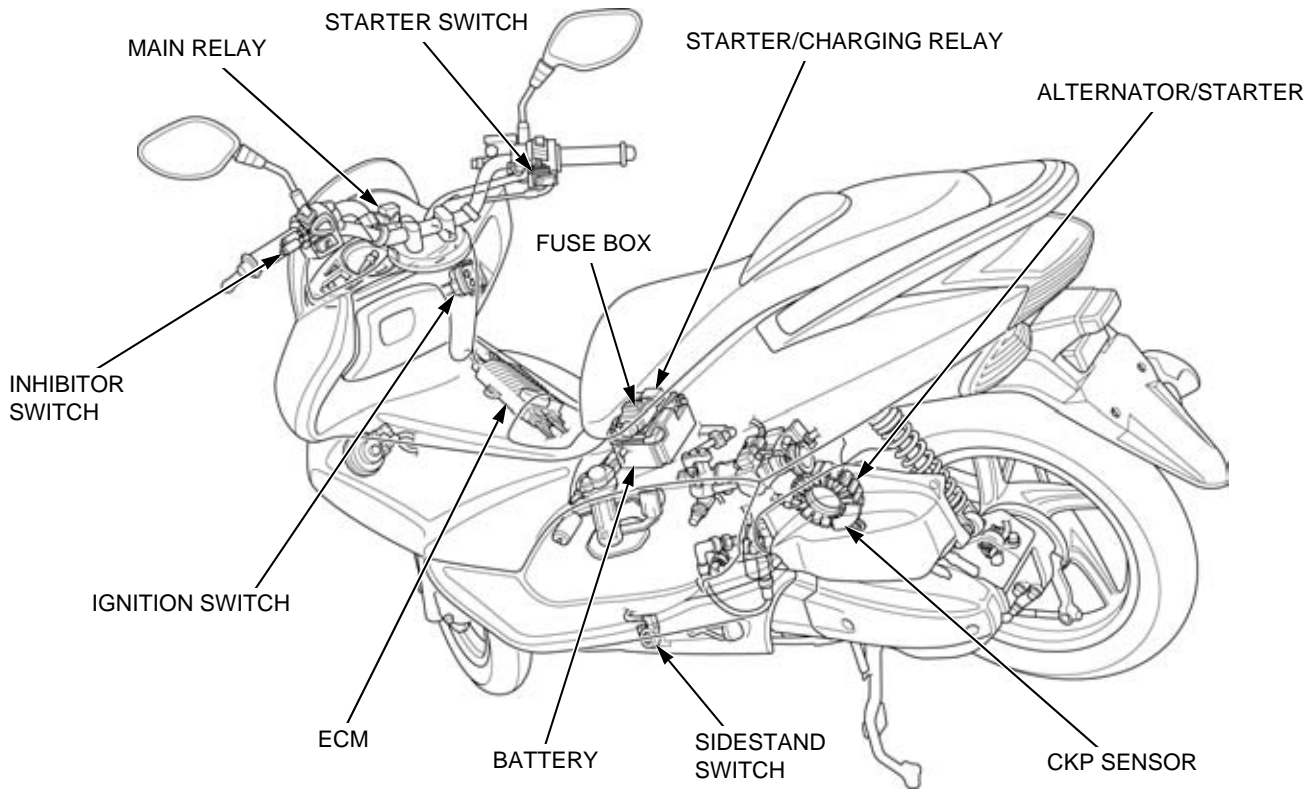
If the ignition timing is incorrect, replace the ECM with a new one (page 4-39) and recheck.



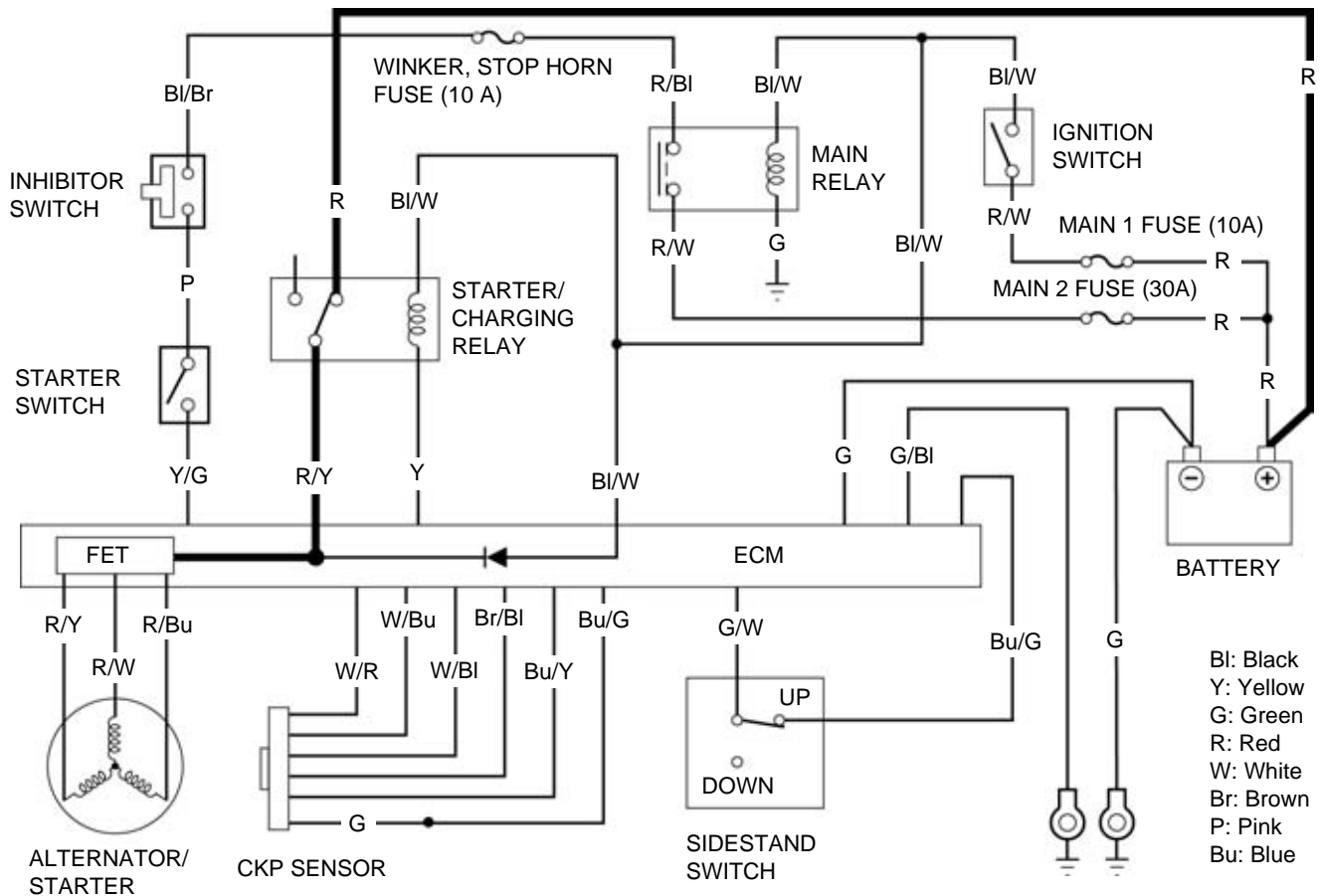
SYSTEM LOCATION (STARTER SYSTEM).....	6-2	SERVICE INFORMATION.....	6-4
SYSTEM DIAGRAM (STARTER SYSTEM).....	6-2	TROUBLESHOOTING	6-5
SYSTEM LOCATION (IDLING STOP SYSTEM).....	6-3	STARTER/CHARGING RELAY	6-8
SYSTEM DIAGRAM (IDLING STOP SYSTEM).....	6-3	STARTER SYSTEM INSPECTION	6-10
		IDLING STOP SYSTEM INSPECTION	6-11
		SIDESTAND SWITCH.....	6-12

ELECTRIC STARTER

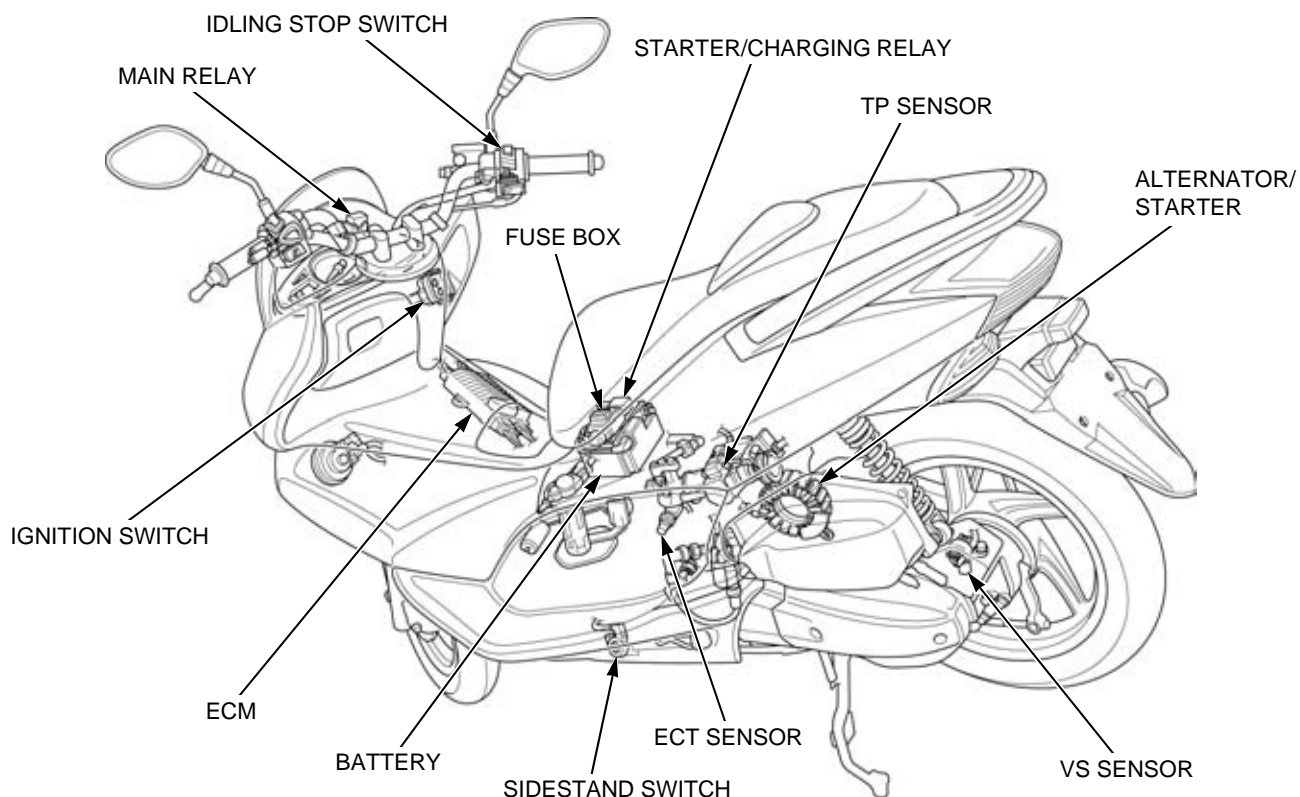
SYSTEM LOCATION (STARTER SYSTEM)



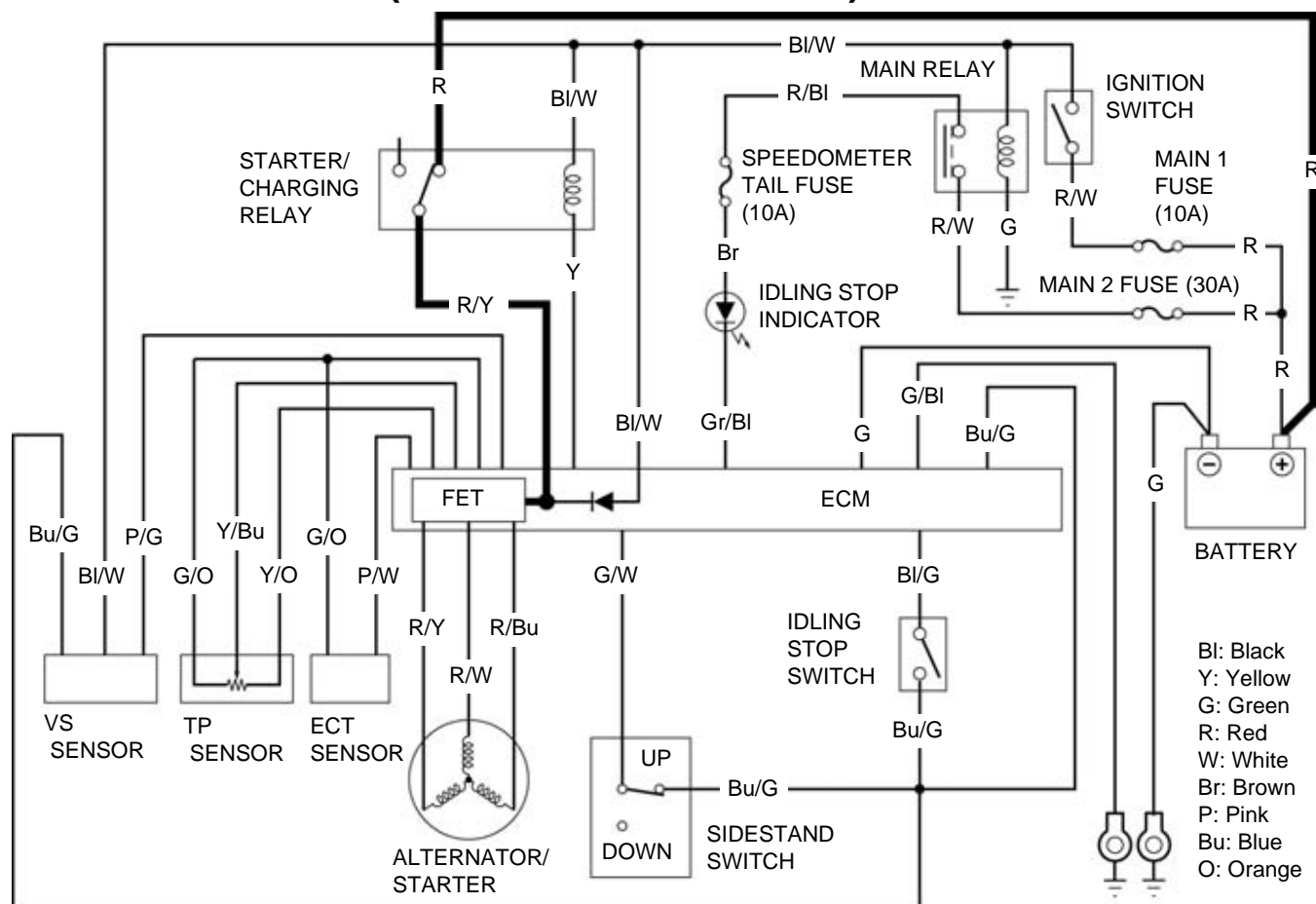
SYSTEM DIAGRAM (STARTER SYSTEM)



SYSTEM LOCATION (IDLING STOP SYSTEM)



SYSTEM DIAGRAM (IDLING STOP SYSTEM)



ELECTRIC STARTER

SERVICE INFORMATION

GENERAL

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned ON and current is present.
- A weak battery may be unable to turn the alternator/starter quickly enough, or supply adequate ignition current.
- This scooter has adopted an alternator/starter that functions like both an alternator and starter.
- When checking the starter system, always follow the steps in the troubleshooting (page 6-5).
- If the current is kept flowing through the alternator/starter to turn it while the engine is not cranking over, the alternator/starter may be damaged.
- Refer to the following component information.
 - Ignition switch (page 21-12)
 - Brake light switch (page 21-15)
 - Starter switch (page 21-14)
 - Idling stop switch (page 21-14)
- Refer to the alternator/starter removal/installation (page 14-4).

TORQUE VALUE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Sidestand switch bolt	1	6	10 (1.0, 7)	ALOC bolt: replace a with new one.

TROUBLESHOOTING

Alternator/starter does not turn

1. Standard inspection

Check the following:

- Battery condition
- Burned fuses

Are the above items in good condition?

YES – GO TO STEP 2.

NO – Replace or repair the malfunction part(s).

2. PGM-FI system inspection

Check the MIL blinks.

Does the MIL blink?

YES – Inspect the PGM-FI system (page 4-6).

NO (MIL does not come on) – Inspect the ECM power/ground line (page 4-39).

NO (MIL stay on a few second then go off) –GO TO STEP 3.

3. Starter/charging relay operation

Turn the ignition switch ON.

Retract the sidestand.

Squeeze the rear brake lever fully and push the starter switch.

You should hear the relay "CLICK" when the starter switch is depressed.

Is the "CLICK" heard?

YES – GO TO STEP 4.

NO – GO TO STEP 7.

4. Starter/charging Relay Switch Line Inspection

Turn the ignition switch OFF.

Disconnect the ECM 5P connector.

Turn the ignition switch ON.

Retract the sidestand.

Squeeze the rear brake lever fully and push the starter switch.

Measure the voltage between the ECM 5P connector and ground.

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

STANDARD: Battery voltage

Does the battery voltage exist?

YES – GO TO STEP 5.

- NO** –
- Loose or poorly connected connector.
 - Open circuit in Red/yellow wire between the starter/charging relay and ECM.
 - Open circuit in Red wire between the starter/charging relay and battery.
 - Faulty starter/charging relay (Inspect the starter/charging relay: page 6-8)

5. Stator Coil Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 3P (Black) connector.

Measure the resistance at the ECM 3P (Black) connector.

CONNECTION: Red/yellow – Red/white

Red/yellow – Red/blue

Red/white – Red/blue

Is the resistance within 0.03 – 0.20 Ω (20 °C/68 °F)?

YES – GO TO STEP 6.

NO – Replace the alternator/starter with a new one and recheck.

6. CKP Sensor Circuit Inspection

Turn the ignition switch OFF.

Disconnect the CKP sensor 6P (Black) connector.

Turn the ignition switch ON.

Measure the voltage at the 6P (Black) connector of the ECM side and ground.

CONNECTION: White/red (+) – Ground (–)
White/blue (+) – Ground (–)
White/black (+) – Ground (–)
Blue/yellow (+) – Ground (–)

STANDARD: 5 – 10 V

Measure the voltage at the 6P (Black) connector of the ECM side.

CONNECTION: Brown/black (+) – Blue/green (–)

STANDARD: Battery voltage

Does the standard voltage exist?

YES – Replace the CKP sensor with a new one and recheck.

NO – • Open circuit in wire harness between the ECM and CKP sensor connector
• Replace the ECM with a new one and recheck.

7. Inhibitor Switch/Starter Switch Line Inspection

Turn the ignition switch OFF.

Disconnect the ECM 21P (Gray) connector.

Turn the ignition switch ON.

Squeeze the rear brake lever fully and push the starter switch.

Measure the voltage between the ECM 21P (Gray) connector and ground.

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

STANDARD: Battery voltage

Does the battery voltage exist?

YES – GO TO STEP 8.

NO – • Loose or poorly connected connector.
• Open circuit in Black/brown wire between the fuse box and inhibitor switch.
• Faulty inhibitor switch (page 21-15).
• Open circuit in Pink wire between the inhibitor switch and starter switch.
• Open circuit in Yellow/green wire between the starter switch and ECM.
• Faulty starter switch (page 21-14).

8. Starter/charging Relay Continuity Inspection

Check the starter/charging relay operation (page 6-9).

Is the operation normal?

YES – GO TO STEP 9.

NO – Faulty starter/charging relay.

9. Starter/charging Relay Coil Line Inspection

Turn the ignition switch OFF.

Install the starter/charging relay (page 6-8).

Disconnect the ECM 21P (Black) connector.

Turn the ignition switch ON.

Measure the voltage between the ECM 21P (Black) connector and ground.

CONNECTION: Yellow (+) – Ground (–)

STANDARD: Battery voltage

Does the battery voltage exist?

YES – GO TO STEP 10.

NO – • Loose or poorly connected connector.
• Open circuit in Black/white wire between the ignition switch and starter/charging relay.
• Open circuit in Yellow wire between the starter/charging relay and ECM.

10. Sidestand Inspection

Turn the ignition switch OFF.

Retract the sidestand and check for continuity between the following terminal of the ECM 21P (Gray) connector.

CONNECTION: Green/white – Blue/green

Is there continuity?

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

NO –

- Loose or poorly connected connector.
- Open circuit in Green/white wire between the ECM and sidestand switch.
- Open circuit in Blue/green wire between the ECM and sidestand switch.
- Faulty sidestand switch.

Idling stop switch is turned "IDLING STOP" but idling stop system does not operate

1. Idling Stop System Operation

Start the engine and warm up the engine.

Test ride the scooter above 10 km/h (6 mph).

Turn the throttle grip to completely closed position.

Stop the scooter and wait more than three seconds with sidestand retracted.

Does the engine stop?

YES – Intermittent failure

NO – GO TO STEP 2.

2. PGM-FI System Inspection

Check the MIL blinks.

Does the MIL blink?

YES – Inspect the PGM-FI system (page 4-6).

NO – GO TO STEP 3.

3. Idling Stop Switch Inspection

Turn the ignition switch OFF.

Disconnect the ECM 21P (Gray) connector.

Push the idling stop switch to "IDLING STOP" and check for continuity between the following terminals of the ECM 21P (Gray) connector.

CONNECTION: Black/green – Blue/green

Is there continuity?

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

NO –

- Loose or poorly connected connector.
- Open circuit in Blue/green wire between the ECM and idling stop switch.
- Open circuit in Black/green wire between the ECM and idling stop switch.
- Faulty idling stop switch (Inspect the idling stop switch: page 6-11).

Alternator/starter turns engine slowly

- Low battery voltage.
- Poorly connected battery terminal cable.
- Crankshaft slowly turn due to engine problems.
- Poor connected battery ground cable.

Starter/charging relay "CLICK", but engine does not turn

- Crankshaft does not turn due to engine problems.

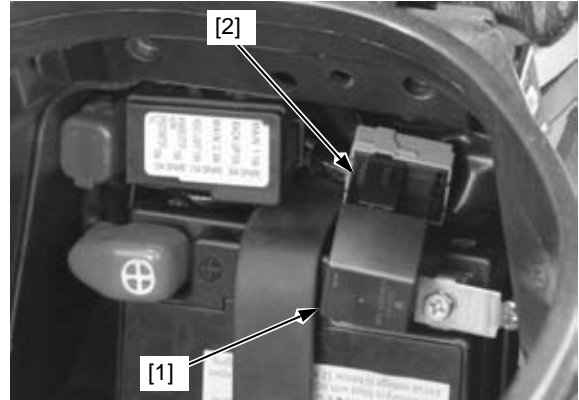
STARTER/CHARGING RELAY

REMOVAL/INSTALLATION

Remove the battery maintenance lid (page 20-5).

Pull the starter/charging relay [1] and disconnect it from the 5P connector [2].

Installation is in the reverse order of removal.



OPERATION INSPECTION

Remove the battery maintenance lid (page 20-5).

Turn the ignition switch ON.

Retract the sidestand.

Squeeze the rear brake lever fully and push the starter switch.

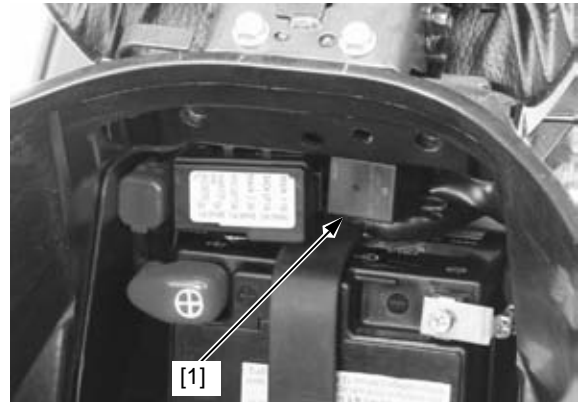
The system is normal if the starter/charging relay [1] clicks.

If you hear the relay "CLICK", but starter does not turn, inspect the following:

- Relay switch line (page 6-8)
- Stator (page 6-10)
- CKP sensor line (page 6-10)
- ECM power/ground line (page 4-39)

If you don't hear the relay "CLICK", inspect the following:

- Inhibitor switch/starter switch line (page 6-11)
- Starter/charging relay switch continuity (page 6-9)
- Relay coil line (page 6-9)
- Sidestand switch line (page 6-12)



RELAY SWITCH LINE INSPECTION

Disconnect the ECM 5P connector [1] (page 4-39).

Turn the ignition switch ON.

Squeeze the rear brake lever fully and push the starter switch.

Measure the voltage between the ECM 5P connector [1] of the wire harness side and ground.

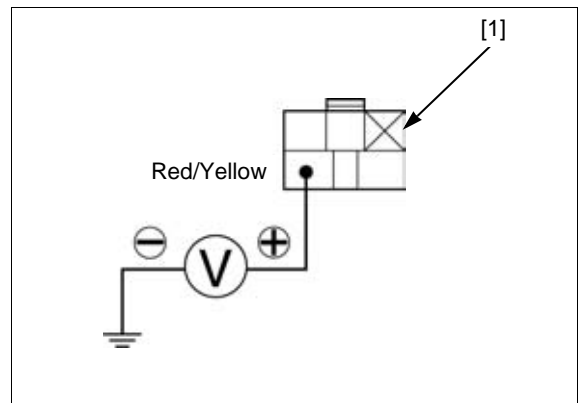
CONNECTION: Red/yellow (+) – ground (–)

STANDARD: Battery voltage

If there is battery voltage, relay switch line is normal.

If there is no voltage, inspect the following:

- Loose or poor contacts of related terminal.
- Open circuit in Red wire between the battery and starter/charging relay.
- Open circuit in Red/yellow wire between the starter/charging relay and ECM.



RELAY COIL LINE INSPECTION

Disconnect the ECM 21P (Black) connector (page 4-39).

Turn the ignition switch ON.

Squeeze the rear brake lever fully and push the starter switch.

Measure the voltage between the ECM 21P (Black) connector [1] of the wire harness side and ground.

TOOL:

Test probe 07ZAJ-RDJA110

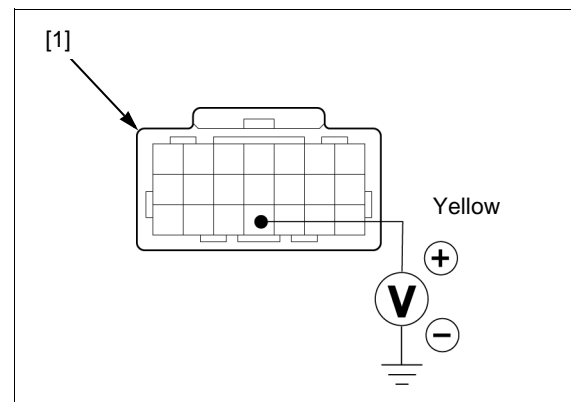
CONNECTION: Yellow (+) – ground (–)

STANDARD: Battery voltage

If there is battery voltage, relay coil line is normal.

If there is no voltage, inspect the following:

- Loose or poorly connected connector.
- Open circuit in Black/white wire between the ignition switch and starter/charging relay.
- Open circuit in Yellow wire between the starter/charging relay and ECM.



CONTINUITY INSPECTION

Remove the starter/charging relay (page 6-8).

Connect the ohmmeter to the following relay [1] connector terminals.

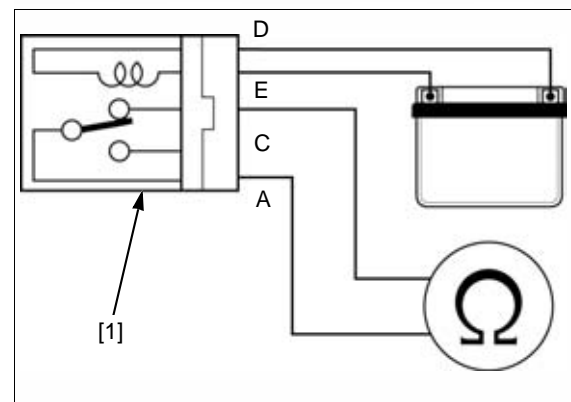
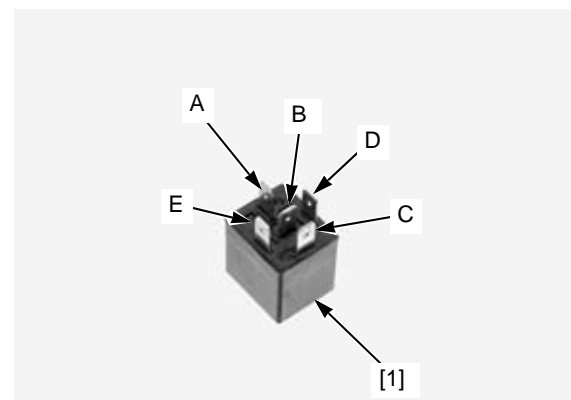
CONNECTION: A – C

Connect the 12V battery to the following relay connector terminals.

CONNECTION: D – E

There should be continuity when the battery voltage is connected and there should be no continuity when the battery voltage is disconnected.

Are the above inspection is abnormal, replace the starter/charging relay.



STARTER SYSTEM INSPECTION

CKP SENSOR LINE INSPECTION

Remove the luggage box (page 2-12).

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

Turn the ignition switch ON.

Measure the voltage between the CKP sensor 6P (Black) connector of the ECM side and ground.

CONNECTION: White/red (+) – ground (–)
White/blue (+) – ground (–)
White/black (+) – ground (–)
Blue/yellow (+) – ground (–)

STANDARD: 5 – 10 V

Measure the voltage between the CKP sensor 6P (Black) connector of the ECM side.

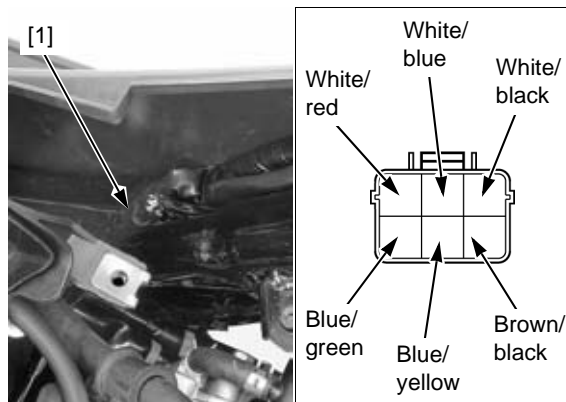
CONNECTION: Brown/black (+) – Blue/green (–)

STANDARD: Battery voltage

If there is standard voltage, CKP sensor lines are normal.

If there is no voltage, Inspect the following:

- Loose or poor contacts of related terminal.
- Open circuit in wire harness between the ECM and CKP sensor connector.
- Faulty ECM.



STATOR INSPECTION

Disconnect the ECM 3P (Black) connector (page 4-39).

Measure the resistance at the ECM 3P (Black) connector [1].

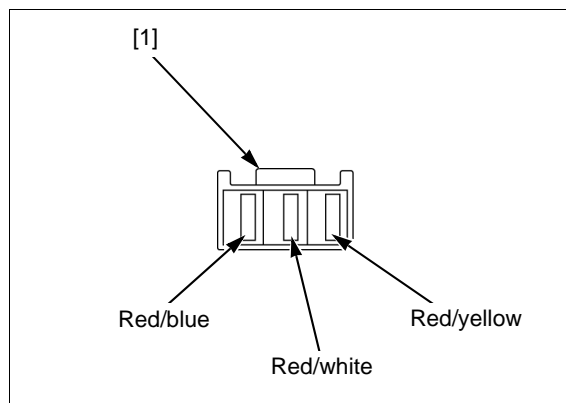
CONNECTION: Red/yellow – Red/white
Red/yellow – Red/blue
Red/white – Red/blue

STANDARD: 0.03 – 0.20 Ω (20 °C/68 °F)

If there is standard value, stator is normal.

If the value is abnormal at any connection, inspect the following:

- Loose or poor contacts of related terminal.
- Open circuit in wire harness between the ECM and stator.



INHIBITOR SWITCH/STARTER SWITCH LINE INSPECTION

Disconnect the ECM 21P (Gray) connector (page 4-39).

Turn the ignition switch ON.

Squeeze the rear brake lever fully and push the starter switch.

Measure the voltage between the ECM 21P (Gray) connector [1] of the wire harness side and ground.

TOOL:

Test probe 07ZAJ-RDJA110

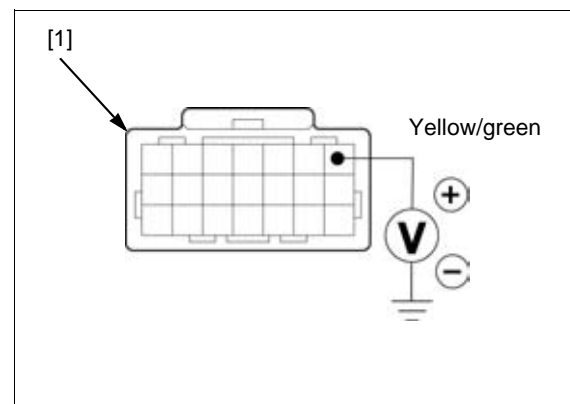
CONNECTION: Yellow/green (+) – ground (–)

STANDARD: Battery voltage

If there is battery voltage, switch line is normal.

If there is no voltage, inspect the following:

- Loose or poorly connected connector.
- Open circuit in Black/brown wire between the fuse box and inhibitor switch.
- Faulty inhibitor switch (page 21-15).
- Open circuit in Pink wire between the inhibitor switch and starter switch.
- Open circuit in Yellow/green wire between the starter switch and ECM.
- Faulty starter switch (page 21-14).



IDLING STOP SYSTEM INSPECTION

IDLING STOP SWITCH LINE INSPECTION

Disconnect the ECM 21P (Gray) connector (page 4-39).

Turn the idling stop switch "IDLING STOP" position and check for continuity between the following terminals of the ECM 21P (Gray) connector [1].

TOOL:

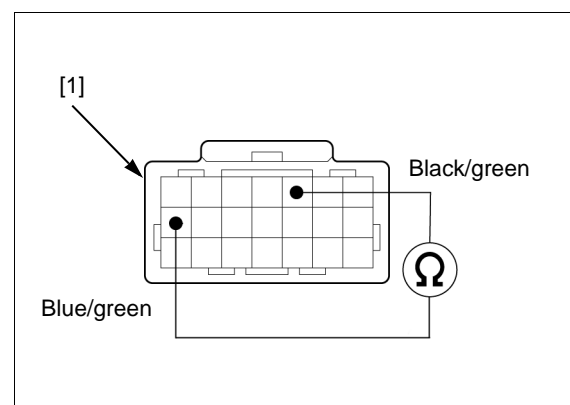
Test probe 07ZAJ-RDJA110

CONNECTION: Black/green – Blue/green

If there is continuity, idling stop switch line is normal.

If there is no continuity, inspect the following:

- Loose or poorly connected connector.
- Open circuit in Black/green wire between the ECM and idling stop switch.
- Open circuit in Blue/green wire between the ECM and idling stop switch.
- Faulty the idling stop switch (page 21-14).



SIDESTAND SWITCH

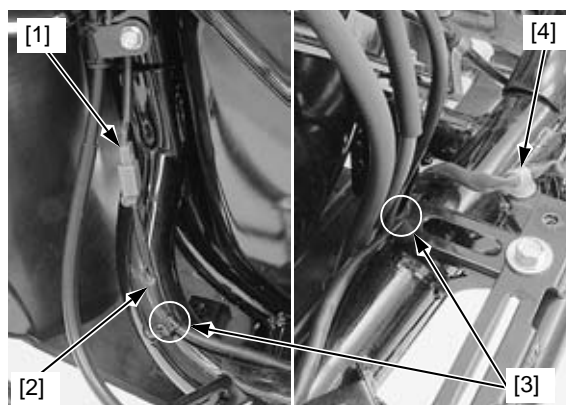
REMOVAL/INSTALLATION

Remove the left floor step (page 2-10).

Disconnect the sidestand switch 3P (Green) connector [1].

Release the wire [2] from the wire clamps [3].

Release the wire band boss [4].



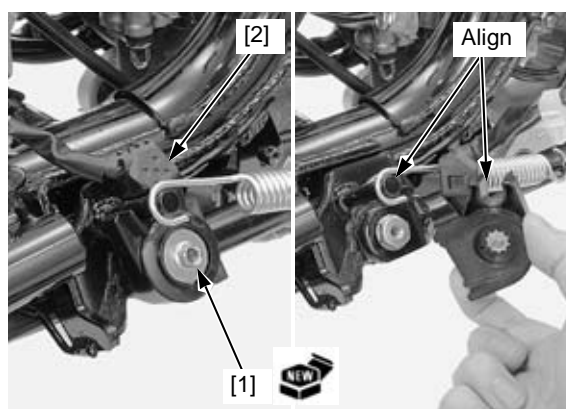
Remove the bolt [1] and sidestand switch [2].

Installation is in the reverse order of removal.

- Install the sidestand switch while aligning its groove with the spring pin.
- When installing the sidestand switch bolt, replace it with a new one and tighten it to the specified torque.

TORQUE:

Sidestand switch bolt: 10 N·m (1.0 kgf·m, 7 lbf·ft)



INSPECTION

Disconnect the ECM 21P (Gray) connector (page 4-39).

Check for continuity between the following terminals of the ECM 21P (Gray) connector [1] of the wire harness side.

TOOL:

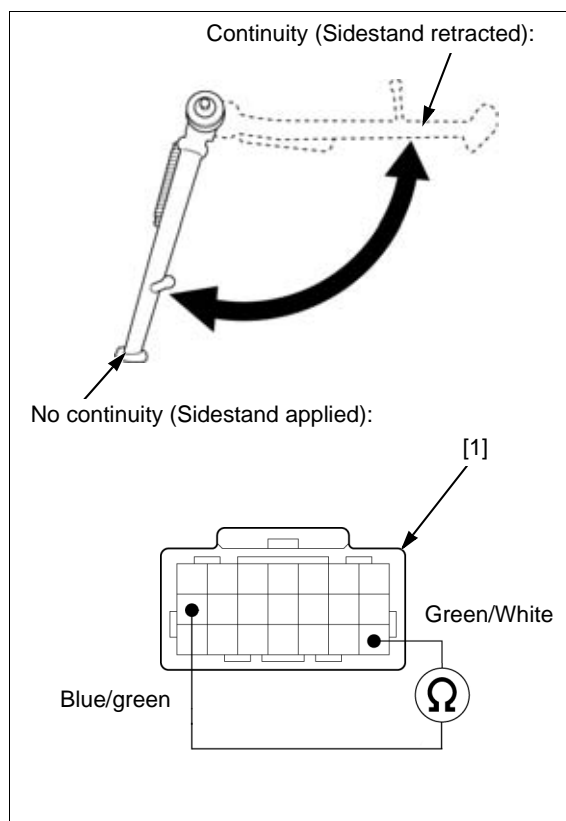
Test probe

07ZAJ-RDJA110

CONNECTION: Green/white – Blue/green

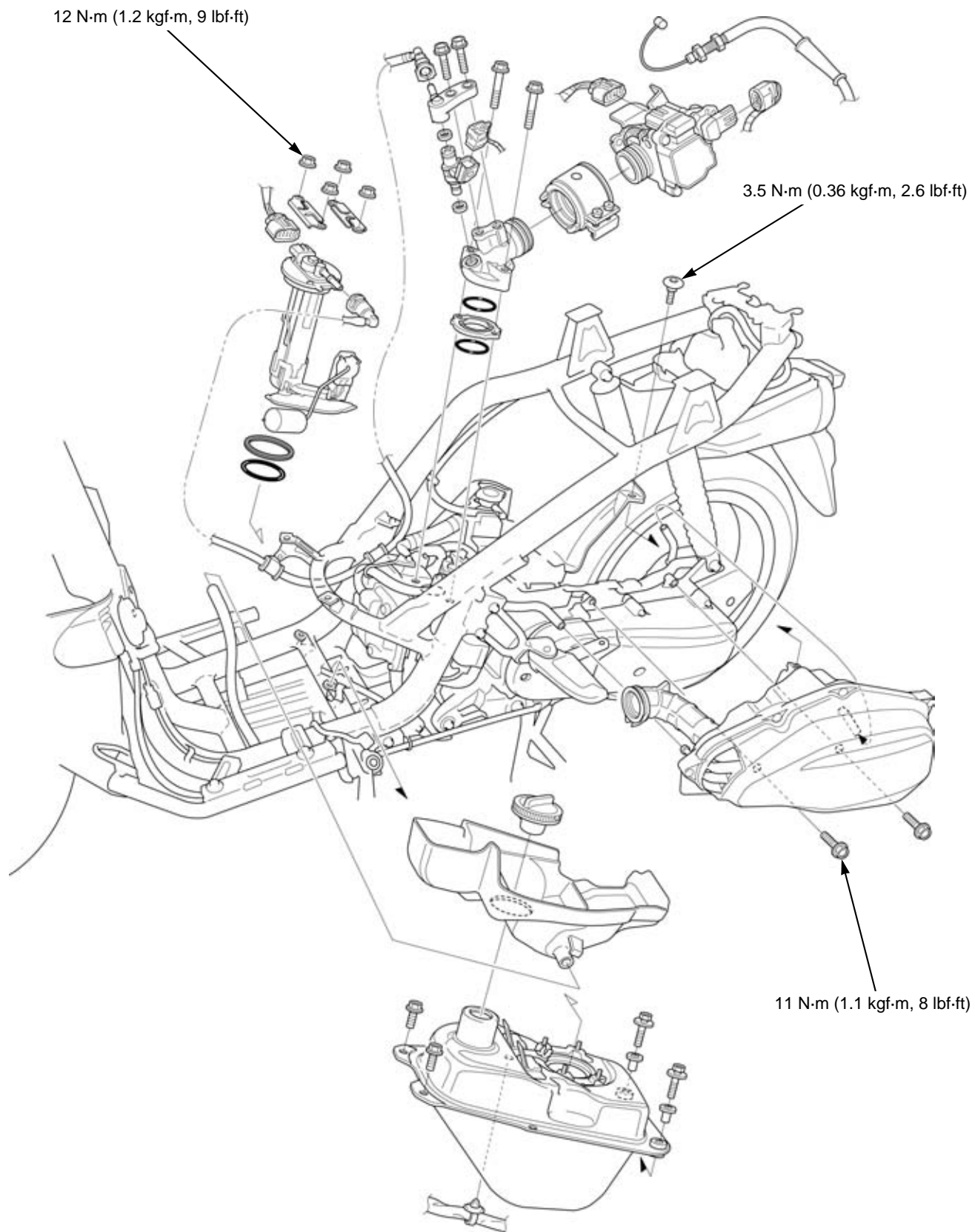
There should be continuity with the sidestand retracted, and there should be no continuity with the sidestand applied.

If there is no continuity with the sidestand retracted, the wire harness is broken or the sidestand switch is faulty.



COMPONENT LOCATION	7-2	AIR CLEANER HOUSING	7-10
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COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- Bending or twisting the control cable will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- When disassembling fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- Before disconnecting the fuel feed hose, relieve fuel pressure from the system (page 7-4).
- Do not snap the throttle valve from full open to full close after the throttle cable has been removed. It may cause incorrect idle operation.
- Seal the intake 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.
- For fuel level sensor inspection (page 21-11).

SPECIFICATIONS

ITEM		SPECIFICATIONS
Throttle body identification number	WW125EX2	GQY3A
	WW150	GQMHA
Throttle grip freeplay		2 – 6 mm (0.1 – 0.2 in)
Fuel pressure at idle		294 kPa (3.0 kgf/cm ² , 43 psi)
Fuel pump flow (at 12 V)		98 cm ³ (3.31 US oz, 3.45 Imp oz) minimum/10 seconds

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel pump set plate nut	4	6	12 (1.2, 9)	For tightening sequence; See page 7-9
Air cleaner housing mounting bolt	2	6	11 (1.1, 8)	
Rear inner fender socket bolt - Air cleaner side	1	6	3.5 (0.36, 2.6)	
Sensor unit torx screw	3	5	3.4 (0.35, 2.5)	
Throttle cable bracket mounting screw	1	5	3.4 (0.35, 2.5)	
IACV torx screw	2	4	2.1 (0.21, 1.5)	
Insulator band bolt	2	5	5 (0.51, 3.7)	

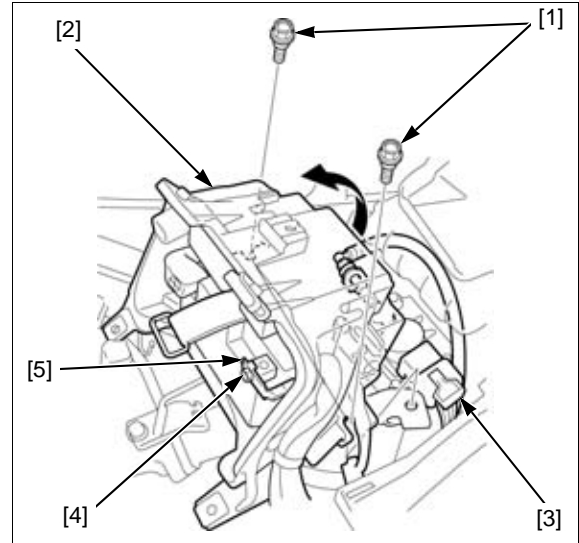
FUEL LINE INSPECTION

FUEL PRESSURE RELIEVING

NOTE:

Before disconnecting quick connect fitting, relieve pressure from the system by following the procedures below.

1. Remove the luggage box (page 2-12).
2. Turn the ignition switch OFF.
Remove the two bolts [1] and pull up the battery box [2] as shown.
Disconnect the fuel pump 5P connector [3].
3. Start the engine and let it idle until the engine stalls.
4. Turn the ignition switch OFF.
5. Remove the bolt [4] and disconnect the battery negative (-) cable [5].



QUICK CONNECT FITTING REMOVAL

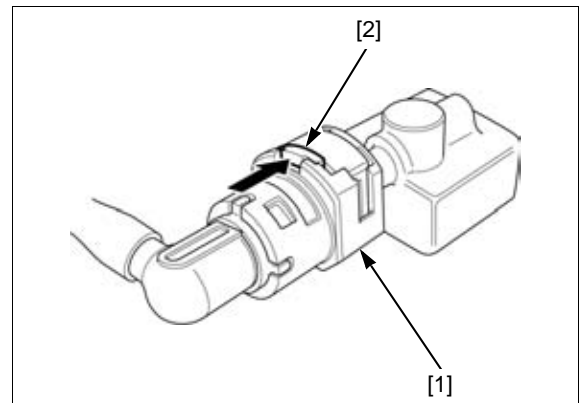
NOTE:

- Before disconnecting fuel feed hose, relieve pressure from the system by following the procedures above.
- This scooter uses resin for the part of materials in the fuel feed hose. Do not bend or twist the fuel feed hose.

1. Check the fuel quick connect fitting [1] for dirt, and clean if necessary.

Place a shop towel over the quick connect fitting.

Push the retainer tab [2] forward.



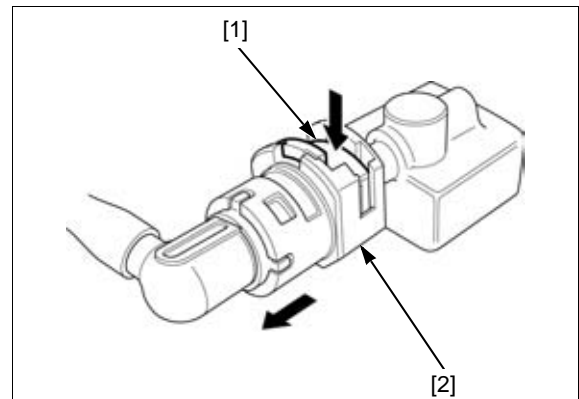
2. Press down the retainer [1] and hold.

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

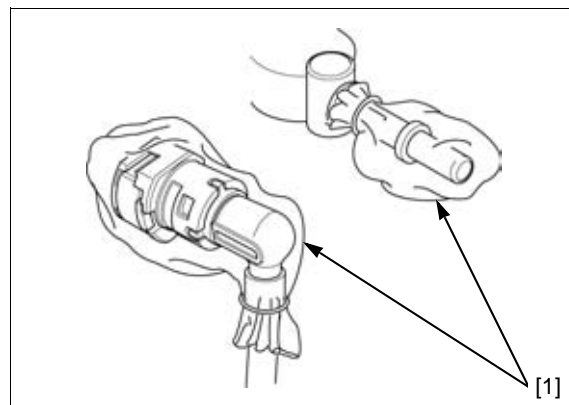
Check the retainer condition and replace it if necessary.

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.



3. To prevent damage and keep foreign matter out, cover the disconnected connector and pipe end with the plastic bags [1].



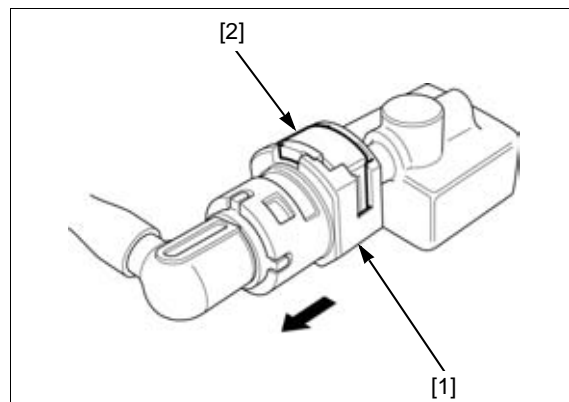
QUICK CONNECT FITTING INSTALLATION

NOTE:

- When replacing the retainer, use the same manufacturer's retainer as the removed one (The several manufacturers feature different retainer specifications).
 - Do not bend or twist fuel feed hose.
1. Press the connector [1] onto the fuel pump joint/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.

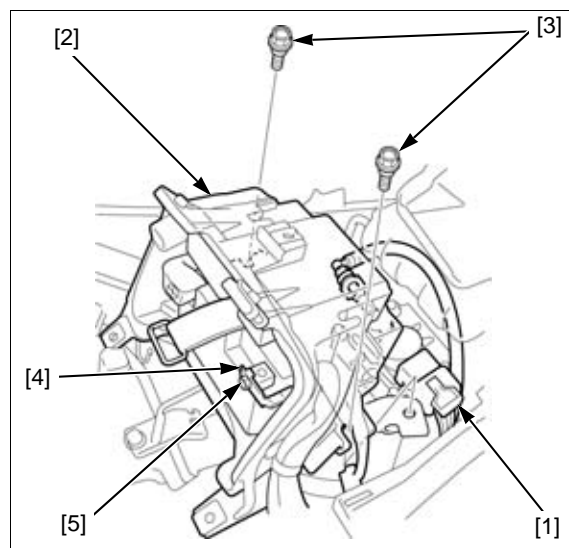


FUEL PRESSURE NORMALIZATION

1. Connect the fuel pump 5P connector [1].
2. Set the battery box [2] in position, then install and tighten the two special bolts [3].
3. Connect the negative (-) cable [4] to the battery and tighten the bolt [5].
4. Turn the ignition switch ON.

NOTE:

- Do not start the engine.
 - The fuel pump will run for about 2 seconds, and fuel pressure will rise.
Repeat 2 or 3 times, and check that there is no leakage in the fuel supply system.
5. Turn the ignition switch OFF.
 6. Install the luggage box (page 2-12).



FUEL PRESSURE TEST

Relieve the fuel pressure and disconnect the fuel pump side quick connect fitting (page 7-4).

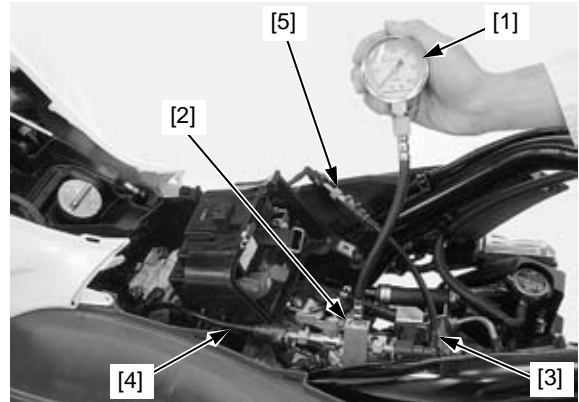
Attach the fuel pressure gauge, attachments and manifold.

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, 6 mm/9 mm	07ZAJ-S5A0130
[5] Attachment joint, 6 mm/9 mm	07ZAJ-S5A0150

Temporarily connect the positive cable and negative cable to the battery and fuel pump 5P connector. Start the engine and let it idle.

Read the fuel pressure.



STANDARD: 294 kPa (3.0 kgf/cm², 43 psi)

- If the fuel pressure is higher than specified, replace the fuel pump assembly (page 7-7).
- If the fuel pressure is lower than specified, inspect the following:
 - Fuel line leaking (page 3-4)
 - Fuel pump unit (page 7-7)
 - Clogged fuel filter (page 7-7)

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

Remove the fuel pressure gauge, attachment and manifold from the fuel pump.

Connect the fuel pump side quick connect fitting and normalize the fuel pressure (page 7-5).

FUEL FLOW INSPECTION

Relieve the fuel pressure and disconnect the injector side quick connect fitting (page 7-4).

Wipe off spilled out gasoline.

Place the end of the hose into an approved gasoline container.

Temporarily connect the negative (–) cable [1] to the battery and fuel pump 5P connector.

Turn the ignition switch ON.

Measure the amount of fuel flow.

NOTE:

- The fuel pump operates for 2 seconds. Repeat 5 times to meet the total measuring time.
- Return fuel to the fuel tank when the first fuel is flowed.

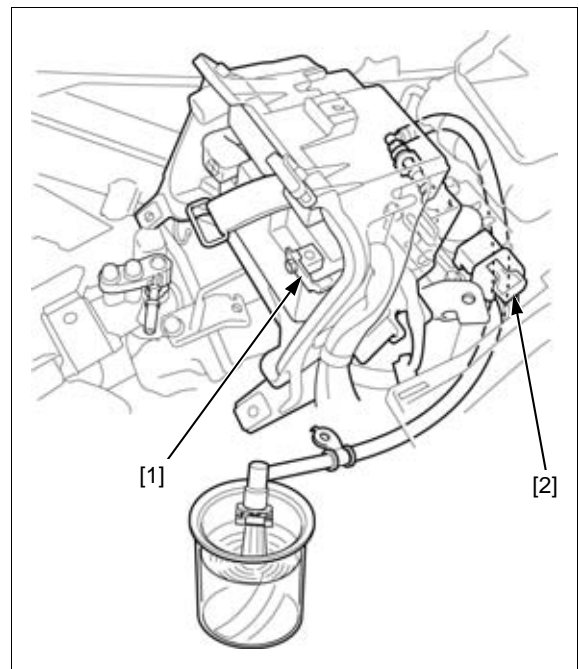
Amount of fuel flow:

**98 cm³ (3.31 US oz, 3.45 Imp oz) minimum/
10 seconds**

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

- Clogged fuel hose
- Fuel pump unit (page 7-7)
- Clogged fuel filter (page 7-7)

Connect the quick connect fitting and normalize the fuel pressure (page 7-5).



FUEL PUMP UNIT

SYSTEM INSPECTION

Before starting inspection, check the MIL is normal operation.

Turn the ignition switch ON 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.

Disconnect the fuel pump 5P connector (page 7-4).

Turn the ignition switch ON and measure the voltage at the fuel pump 5P connector [1] terminals of the wire harness side.

CONNECTION: Black/white (+) – Brown/yellow (–)

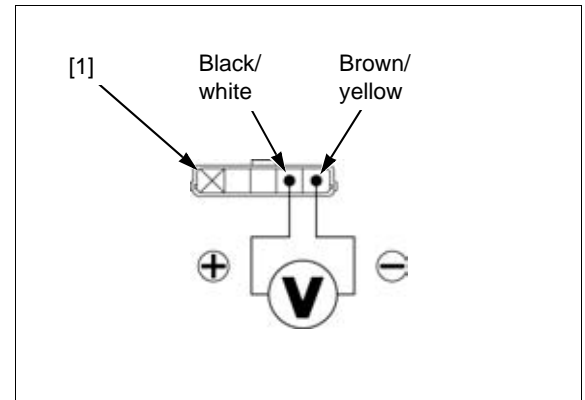
STANDARD: Battery voltage

There should be standard voltage for a few seconds.

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

If there is no standard voltage, inspect the following:

- Open circuit in Black/white or Brown/yellow wire
- ECM (page 4-39)



REMOVAL

NOTE:

- This scooter uses resin for the part of materials in the fuel hose. Do not bend or twist the fuel hose.

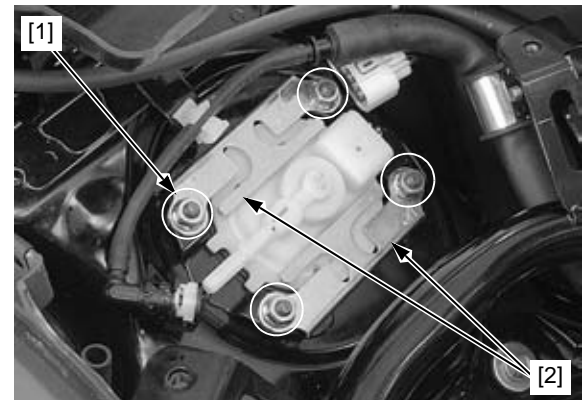
Relieve the fuel pressure and disconnect the fuel pump side quick connect fitting (page 7-4).

Remove the battery box (page 2-12).

Clean around the fuel pump.

Loosen the nuts [1] in a crisscross pattern in several steps and remove it.

Remove the set plates [2].



Pull up the fuel pump unit [1] until the edge of the fuel filter [2] comes out of the fuel tank hole.

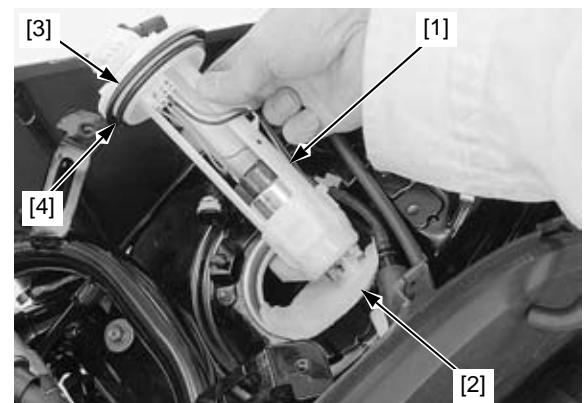
Turn the fuel pump unit until the fuel filter comes out of the hole while folding the fuel filter to prevent damage.

NOTE:

Carefully remove the fuel pump unit from the fuel tank to prevent damage the fuel level sensor.

Remove the dust seal [3] and O-ring [4] from the fuel pump unit.

- Check the fuel filter for clog or damage and replace it if necessary (page 7-8).

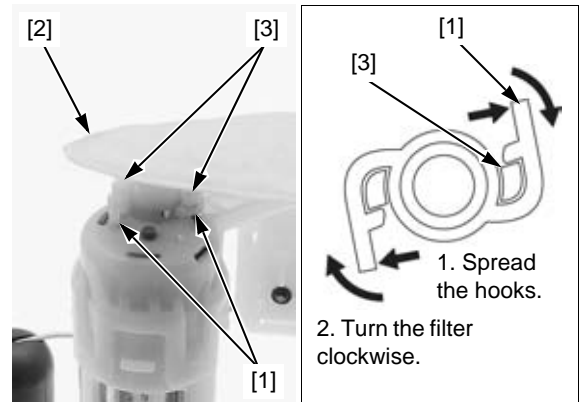


FUEL FILTER REPLACEMENT

Remove the fuel pump unit (page 7-7).

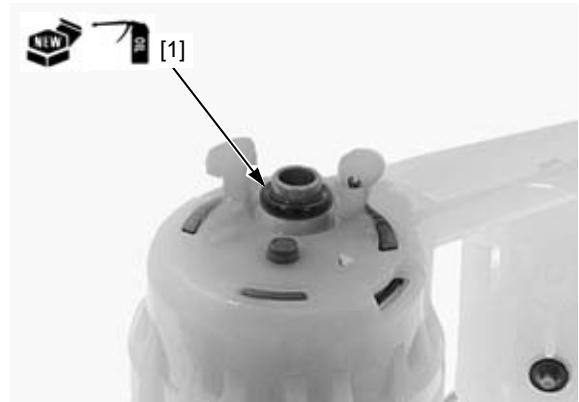
Release the hooks [1] of the fuel filter [2] from the stoppers [3] by slightly spreading the hooks, then turn the filter clockwise.

Pull up the filter and remove it from the fuel pump.



Remove the O-ring [1].

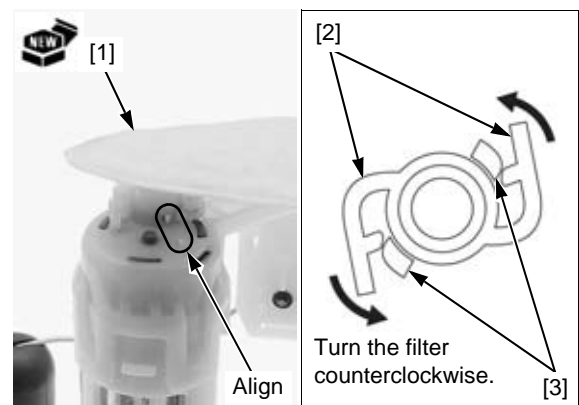
Apply a small amount of engine oil to a new O-ring and install it.



Install a new fuel filter [1] in the correct direction so that the triangle marks on the filter and fuel pump body will be aligned when it is hooked.

Turn the filter counterclockwise until the hooks [2] are completely secured by the stoppers [3], being careful not to damage them.

Install the fuel pump unit (page 7-8).

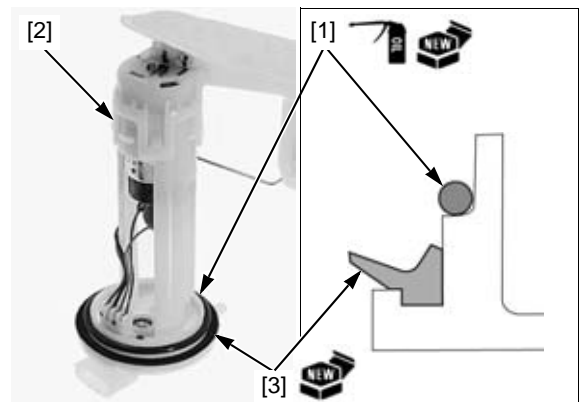


INSTALLATION

Always replace the O-ring and dust seal with new ones. Be careful not to pinch the dirt and debris between the fuel pump unit, O-ring and dust seal.

Apply 1 g maximum of engine oil to a new O-ring [1] and install it onto the fuel pump unit [2].

Install a new dust seal [3] in the correct direction as shown.



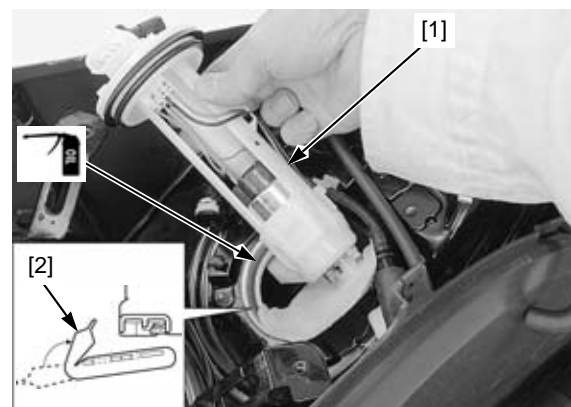
Apply a small amount of engine oil to the O-ring and dust seal seating area of the fuel tank.

Be careful not to damage the filter and float arm.

Install the fuel pump unit [1] to the fuel tank hole.

NOTE:

Insert the fuel level sensor into the tank while bending the fuel filter [2] as shown.



Push the fuel pump unit [1] into the fuel tank so that the pump tabs [2] are positioned between the ribs as shown.

NOTE:

Make sure the dust seal is installed properly.



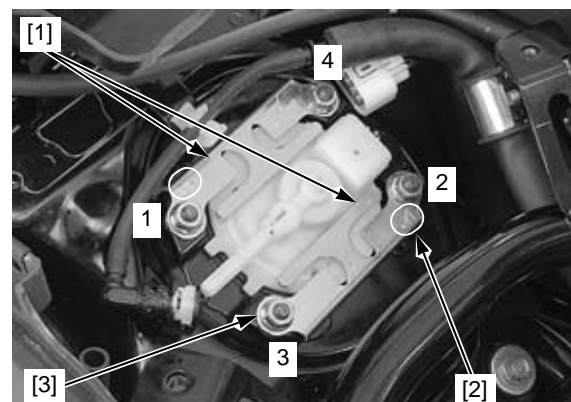
Install the set plates [1] with their "UP" marks [2] facing up while pushing down the fuel pump unit.

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

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the fuel pump side quick connect fitting and normalize the fuel pressure (page 7-5).

Install the battery box (page 2-12).



FUEL TANK

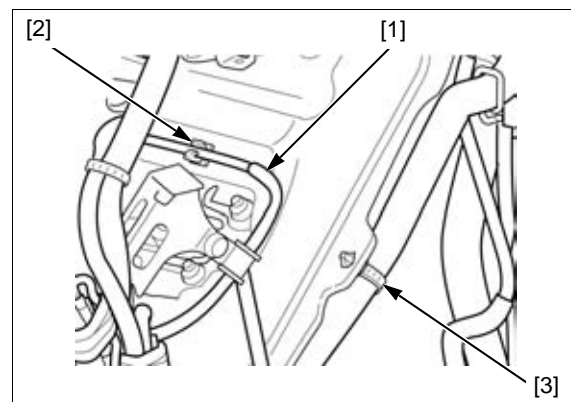
REMOVAL/INSTALLATION

Remove the following:

- Battery box (page 2-12)
- Floor step (page 2-10)

Relieve the fuel pressure and disconnect the fuel pump side quick connect fitting (page 7-4).

Release the fuel hose [1] from the clamp [2] and wire band boss [3] from the fuel tank.

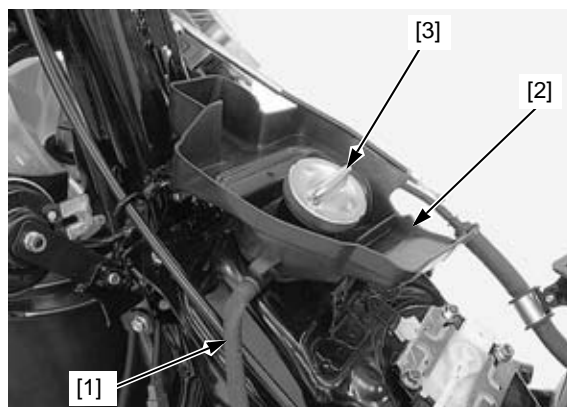


FUEL SYSTEM

Disconnect the fuel tray drain hose [1] from the fuel tray [2].

Remove the fuel tank cap [3] and fuel tray.

Install the fuel tank cap.



Remove the following:

- Two bolts [1]
- Bolt/washers [2]
- Collars [3]
- Fuel tank [4]

Installation is in the reverse order of removal.

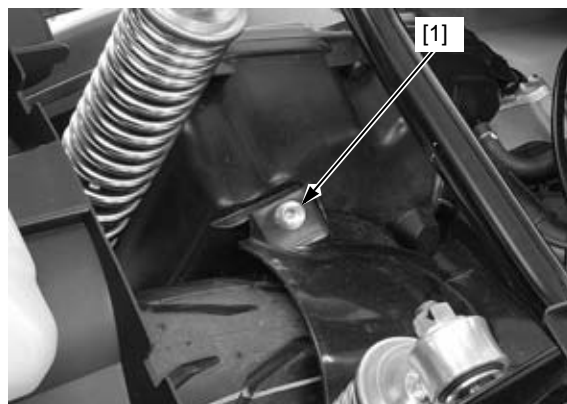


AIR CLEANER HOUSING

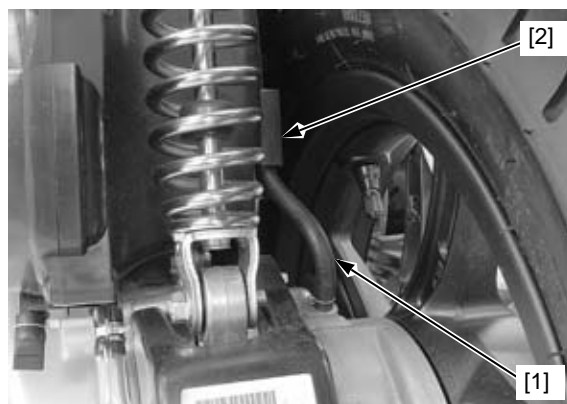
REMOVAL/INSTALLATION

Remove the luggage box (page 2-12).

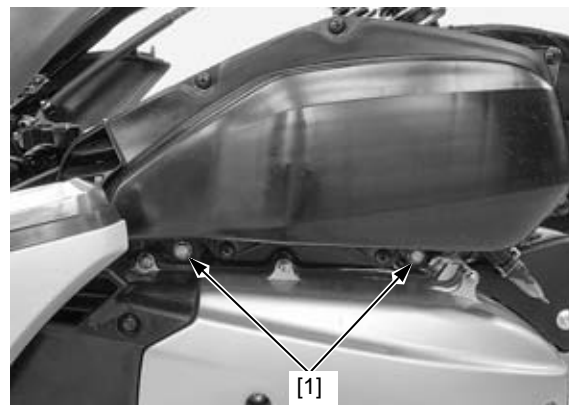
Remove the socket bolt [1] from the rear inner fender.



Pull out the final reduction case breather hose [1] from the air cleaner housing groove [2].



Remove the two air cleaner housing mounting bolts [1] from the left side.

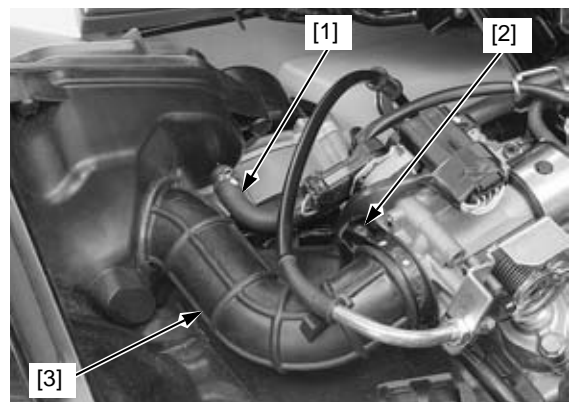


Disconnect the crankcase breather hose [1] from the air cleaner housing.

Loosen the air cleaner connecting hose band screw [2].

Disconnect the connecting hose [3] from the throttle body by holding the throttle body and pulling the air cleaner housing backward.

Remove the air cleaner housing.



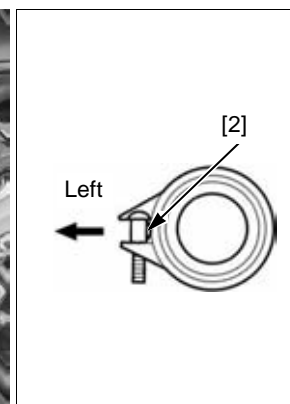
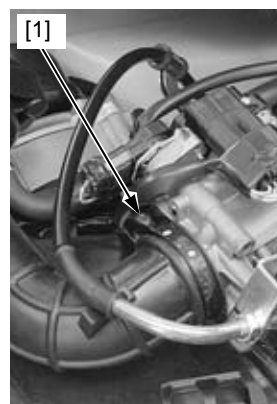
Installation is in the reverse order of removal

- Set the connecting hose band with its band screw [1] facing left side as shown.
- Tighten the air cleaner connecting hose band screw until the band seat on the collar [2].

TORQUE:

Air cleaner housing mounting bolt:
11 N·m (1.1 kgf·m, 8 lbf·ft)

Rear inner fender socket bolt:
3.5 N·m (0.36 kgf·m, 2.6 lbf·ft)



THROTTLE BODY

REMOVAL

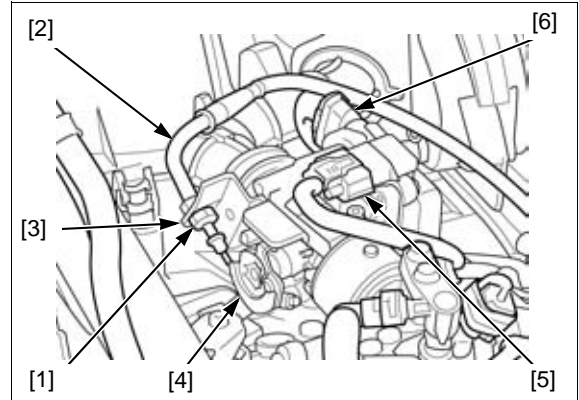
- If the sensor unit has been removed, perform the TP sensor reset procedure (page 7-15).

Remove the luggage box (page 2-12).

Loosen the throttle cable lock nut [1].

Disconnect the throttle cable [2] from the cable bracket [3] and throttle drum [4].

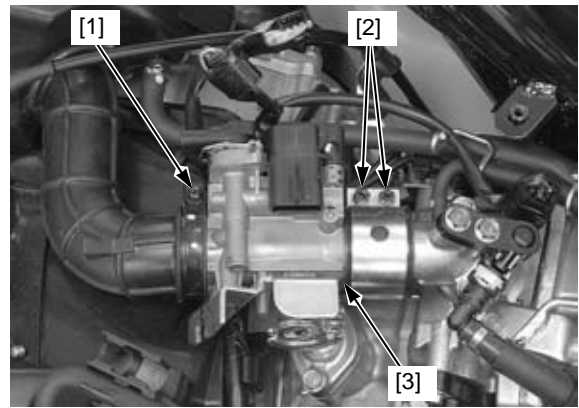
Disconnect the sensor unit 5P (Black) connector [5] and IACV 4P (Black) connector [6].



Loosen the connecting hose band screw [1] and insulator band bolts [2].

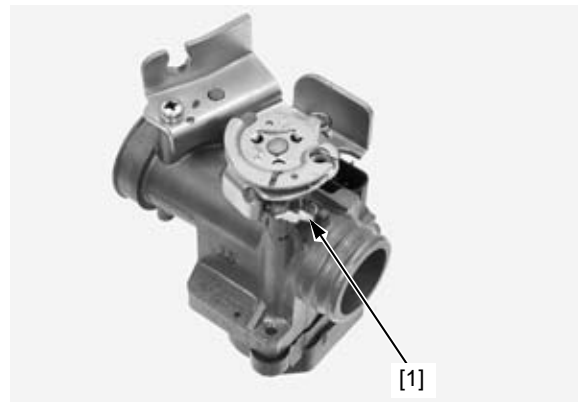
Remove the throttle body [3].

- Seal the intake pipe with a shop towel or cover it with a piece of tape to prevent any foreign material from dropping into the engine.



DISASSEMBLY

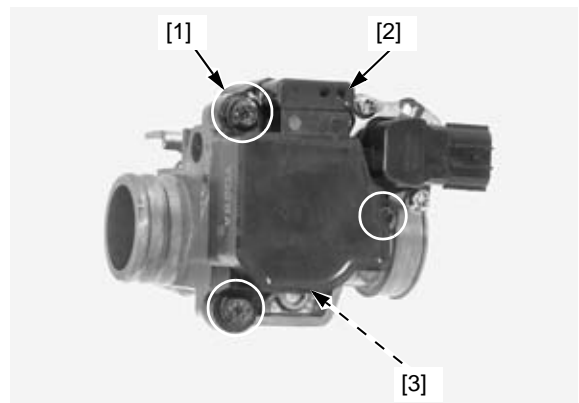
- The throttle body is factory pre-set. Do not disassemble in a way other than shown in this manual.
- Do not snap the throttle valve from full open to full close after the throttle cable has been removed. It may cause incorrect idle operation.
- Do not damage the throttle body. It may cause incorrect throttle valve operation.
- Do not loosen or tighten the white painted nut [1] of the throttle drum. Loosening or tightening it can cause throttle body malfunction.



- Always clean around the throttle body before the sensor unit removal to prevent dirt and debris from entering the air passage.

Remove the torx screws [1], sensor unit [2] and O-ring [3].

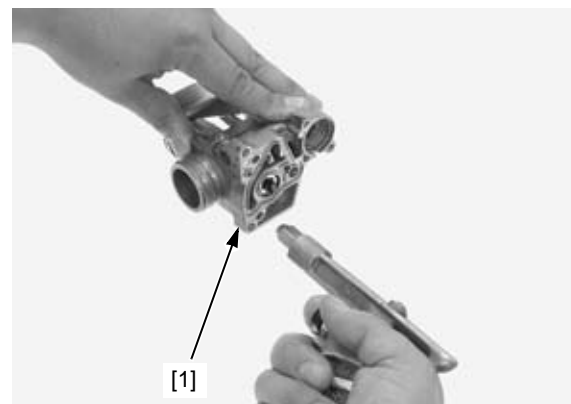
Remove the IACV (page 7-16).



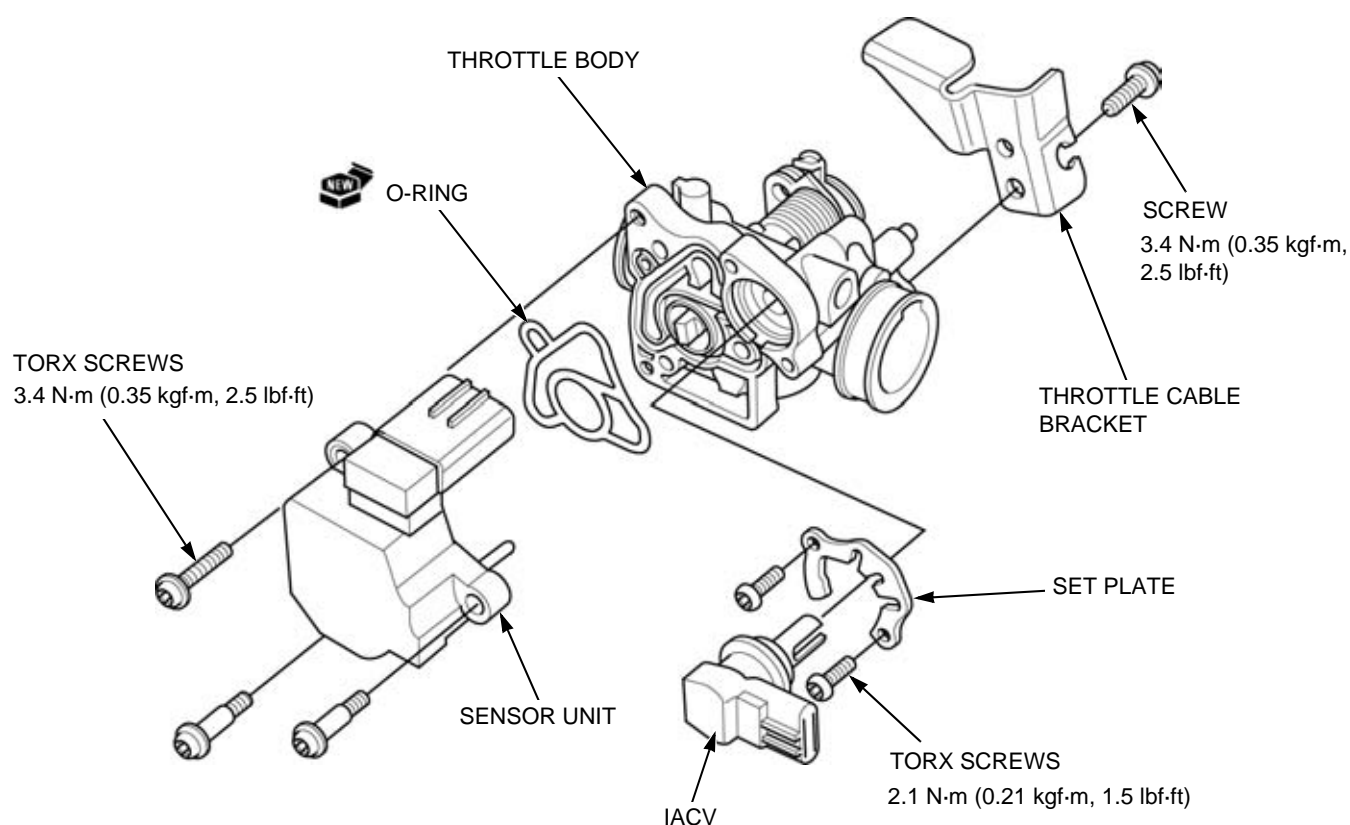
CLEANING

Blow open each air passage in the throttle body [1] with the compressed air.

- Do not use high pressure air or bring the nozzle too close to the throttle body.



ASSEMBLY

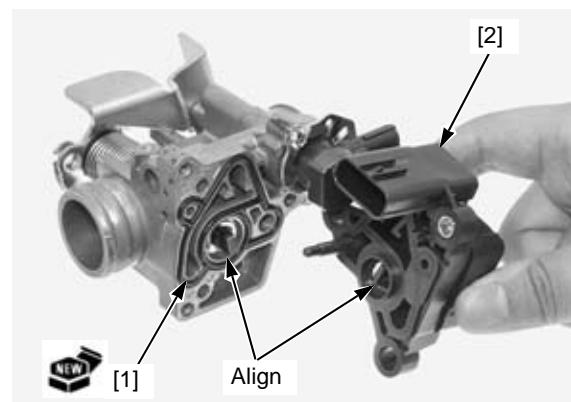


If the O-ring is not installed properly, the idle air will leak and engine idle speed will be unstable.

Install a new O-ring [1] to the throttle body properly.

Install the sensor unit [2] to the throttle body by aligning the clip of the TP sensor and boss 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.

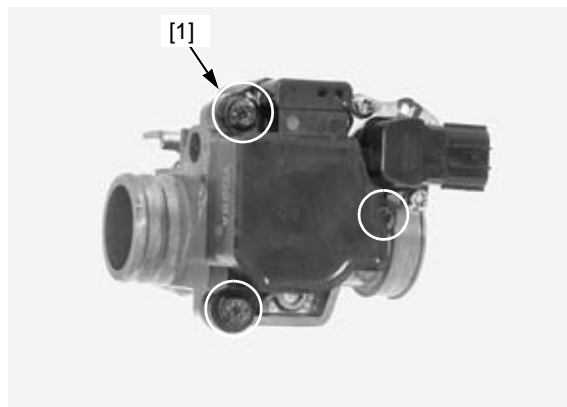


FUEL SYSTEM

Install and tighten the torx screws [1] to the specified torque.

TORQUE: 3.4 N·m (0.35 kgf·m, 2.5 lbf·ft)

- After installing the throttle body, perform the TP sensor reset procedure (page 7-15).



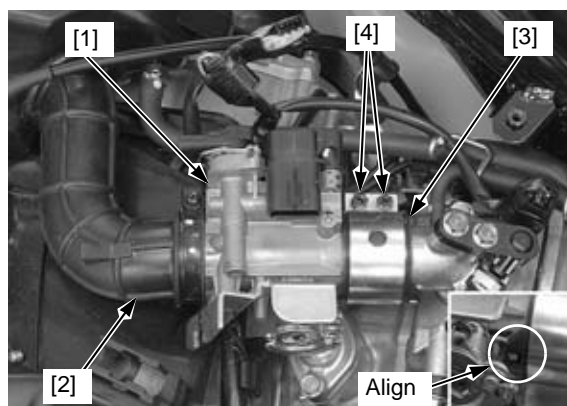
INSTALLATION

Install the throttle body [1] between the connecting hose [2] and insulator band [3].

Align the throttle body tab with the insulator band groove.

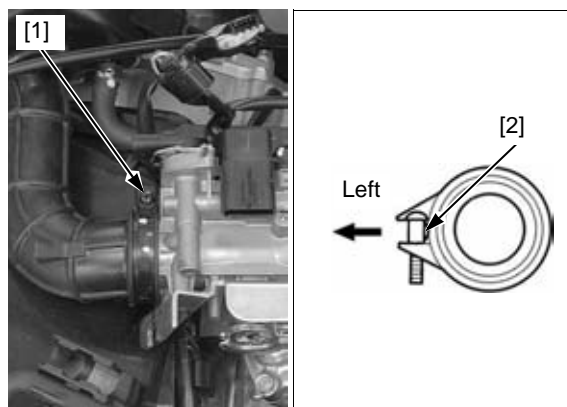
Tighten the insulator band bolts [4] to the specified torque.

TORQUE: 5 N·m (0.51 kgf·m, 3.7 lbf·ft)



Position the connecting hose band with its band screw [1] facing left side as shown.

Tighten the connecting hose band screw until the band seats on the collar [2].



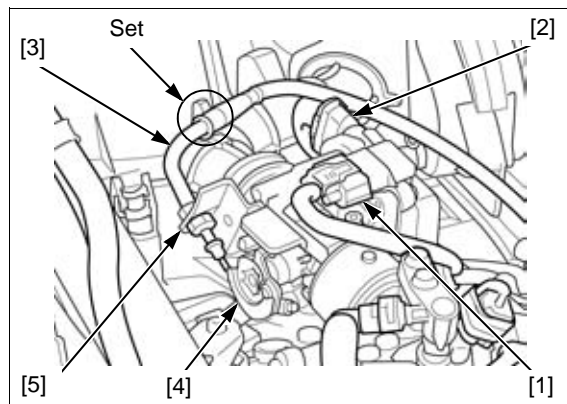
Connect the sensor unit 5P (Black) connector [1] and IACV 4P (Black) connector [2].

Connect the throttle cable [3] to the throttle drum [4] and cable bracket [5], then adjust the throttle grip freeplay (page 3-4).

- Set the throttle cable against the connecting hose.

Install the luggage box (page 2-12).

If the sensor unit has been removed, perform the TP sensor reset procedure (page 7-15).



TP SENSOR RESET PROCEDURE

- Make sure that 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.

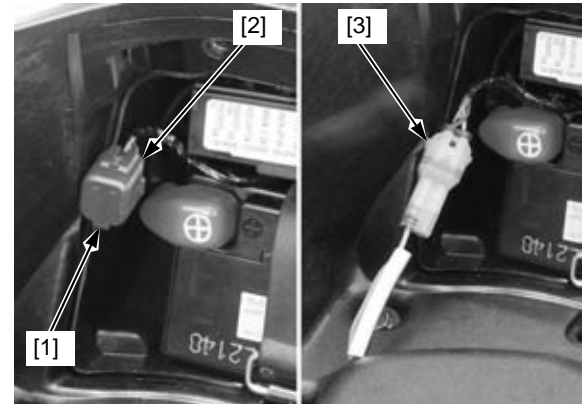
Remove the following:

- Battery maintenance lid (page 20-5)
- Right side cover (page 2-6)

1. Turn the ignition switch OFF.
2. Remove the dummy connector [1] from the DLC [2].
3. Connect the special tool to the DLC.

TOOL:

[3] SCS connector 070PZ-ZY30100



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

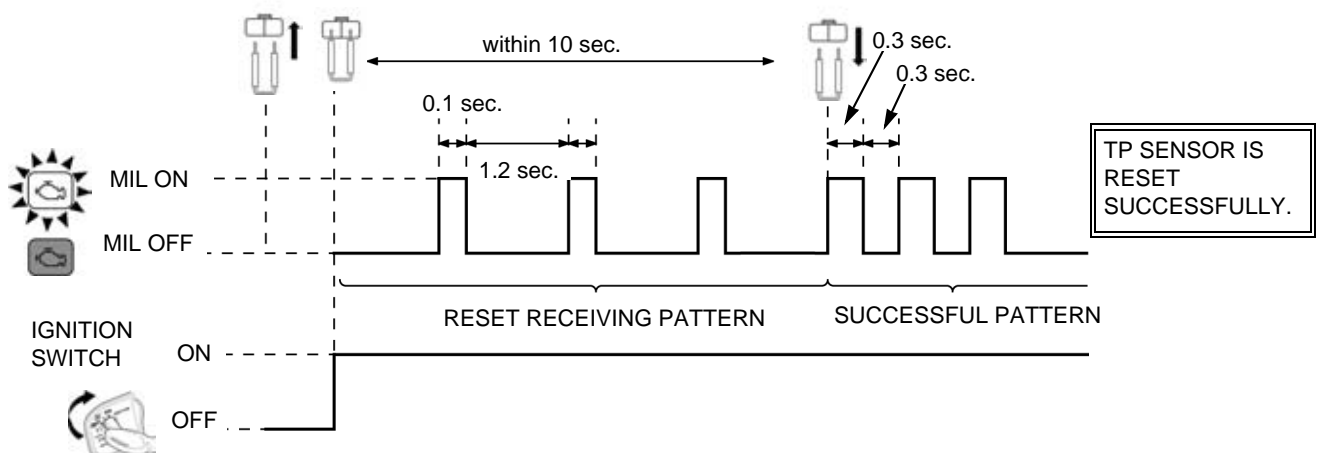
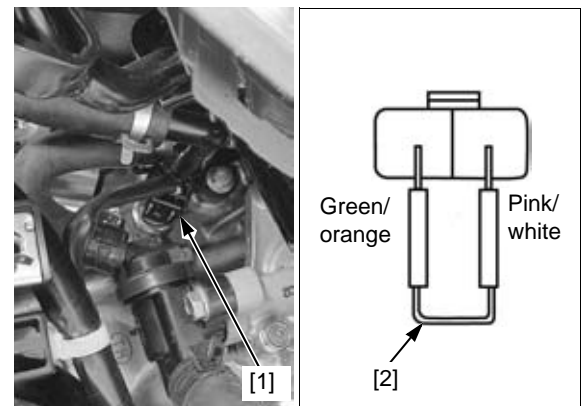
Short the ECT sensor terminals with jumper wire [2].

CONNECTION: Pink/white – Green/orange

5. Turn the ignition switch ON 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). Try again from the step 4.



Install the removed parts in the reverse order of removal.

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

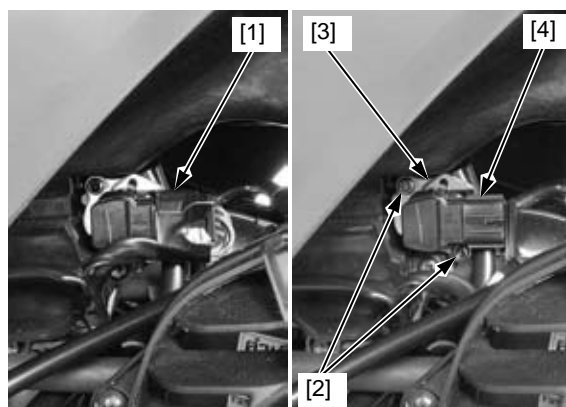
IACV

REMOVAL

Remove the left side cover (page 2-6).

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

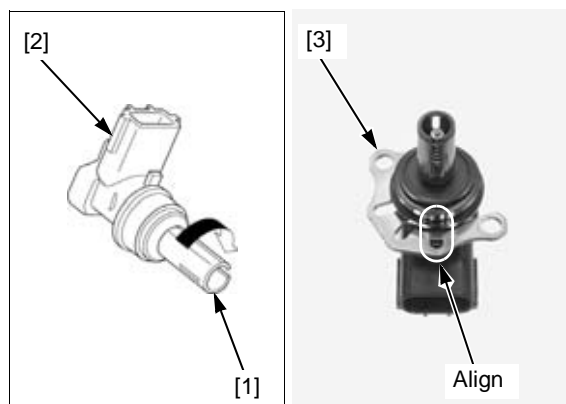
Remove the torx screws [2], set plate [3] and IACV [4].



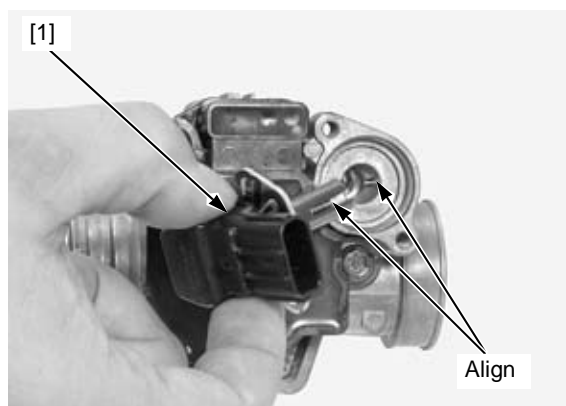
INSTALLATION

Turn the slide valve [1] clockwise until lightly seated on IACV [2].

Install the set plate [3] by aligning the tab of the IACV with the slot of set plate as shown.



Install the IACV [1] by aligning the pin with the slide valve slot.

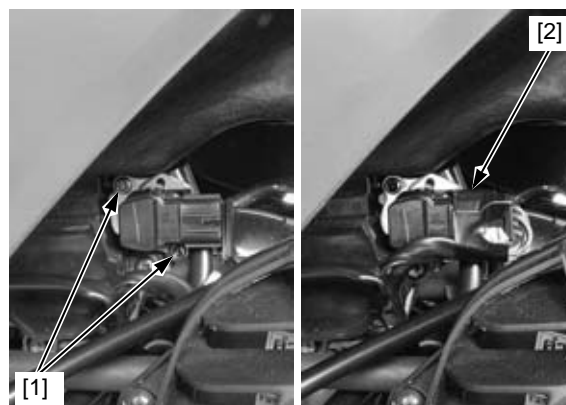


Install and tighten the torx screws [1] to the specified torque.

TORQUE: 2.1 N·m (0.21 kgf·m, 1.5 lbf·ft)

Connect the IACV 4P (Black) connector [2].

Install the left side cover (page 2-6).



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.

Check the step motor operating sound with the ignition switch turned ON.

Remove the IACV (page 7-16).

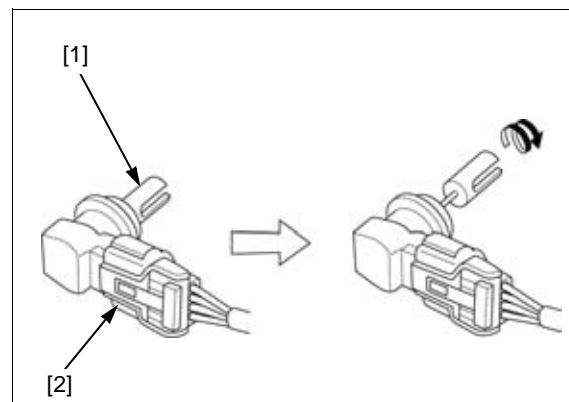
Check the IACV slide valve [1] and IACV air passage in the throttle body for carbon deposits.
Clean the IACV slide valve and IACV air passage if necessary.

Temporarily connect the IACV 4P (Black) connector [2].
Turn the ignition switch ON.
The slide valve should move back and forth.

Turn the ignition switch OFF.

Disconnect the IACV 4P (Black) connector and install the IACV (page 7-16).

Recheck the engine idle speed (page 3-9).



INJECTOR

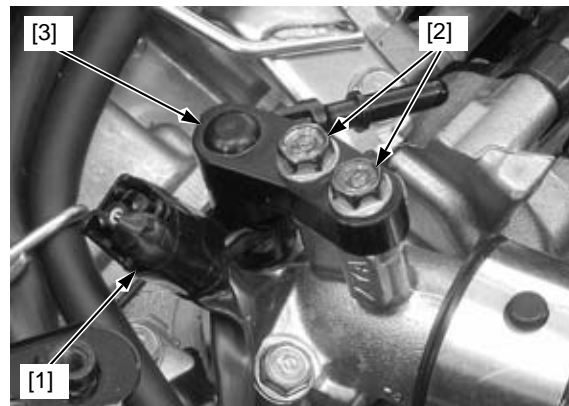
REMOVAL

- Always clean around the injector before the injector removal to prevent dirt and debris from entering the injector passage.

Relieve the fuel pressure and disconnect the injector side quick connect fitting (page 7-4).

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

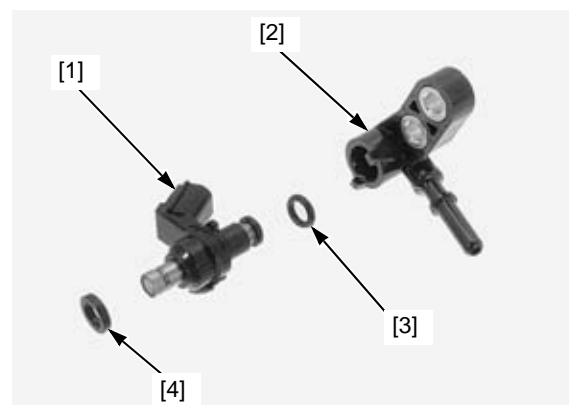
Remove the bolts [2], injector joint/injector [3] from the intake pipe.



Remove the injector [1] from the injector joint [2].

Remove the O-ring [3] and seal ring [4] from the injector.

Check the removed parts for wear or damage and replace them if necessary.

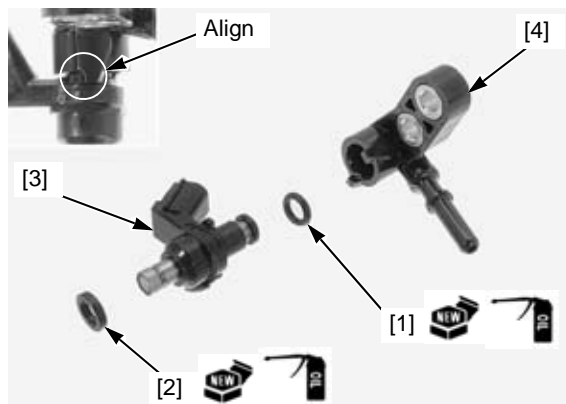


FUEL SYSTEM

INSTALLATION

Coat new O-ring [1] and seal ring [2] with engine oil. Install a new O-ring and seal ring to the injector [3], being careful not to damage them.

Install the injector joint [4] to the injector by aligning the both tabs.

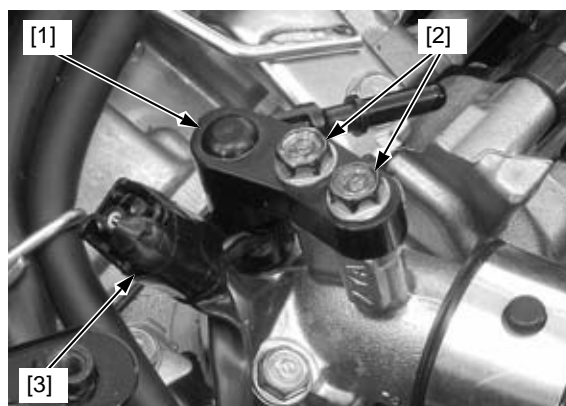


Install the injector joint/injector [1] into the intake pipe. Install and tighten the injector joint mounting bolts [2].

Connect the injector 2P (Black) connector [3].

Connect the injector side quick connect fitting and normalize the fuel pressure (page 7-5).

Install the removed parts in the reverse order of removal.



INTAKE PIPE

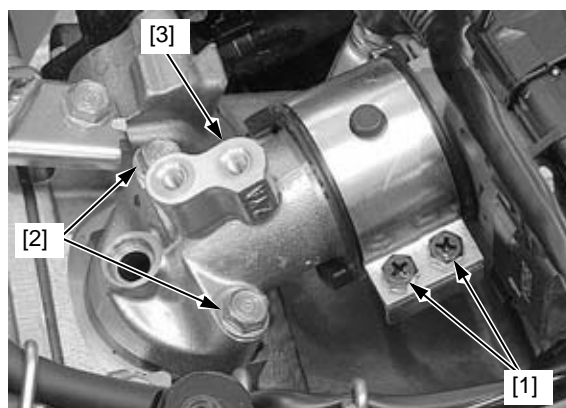
REMOVAL

Remove the injector (page 7-17).

Loosen the insulator band bolts [1].

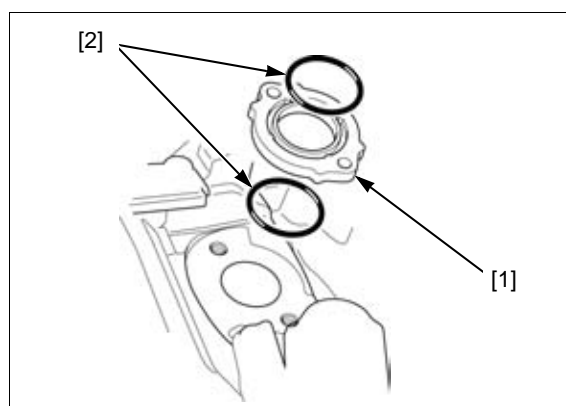
Remove the intake pipe mounting bolts [2].

Remove the intake pipe/insulator band [3] from the throttle body.

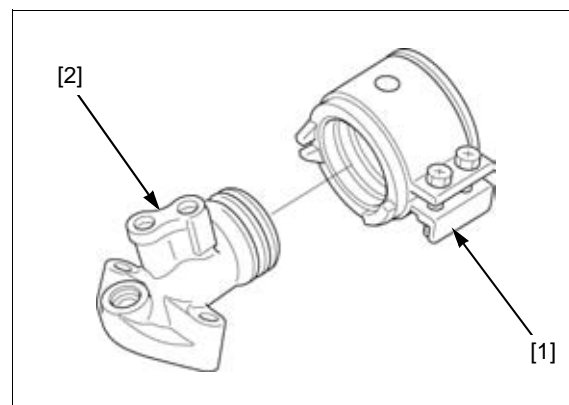


Remove the insulator [1] from the intake port.

Remove the O-rings [2] from the insulator.

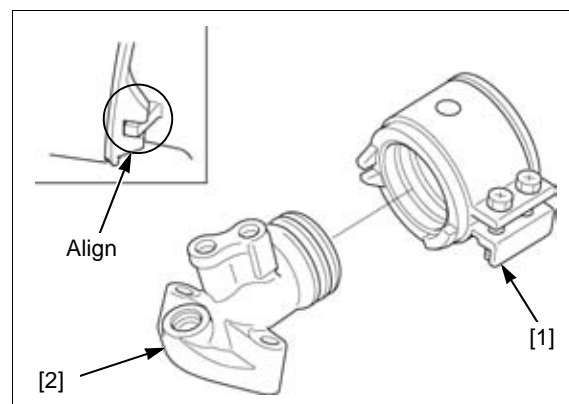


Remove the insulator band [1] from the intake pipe [2].
Seal the cylinder head intake port with a shop towel or cover it with a piece of tape to prevent any foreign material from dropping into the engine.



INSTALLATION

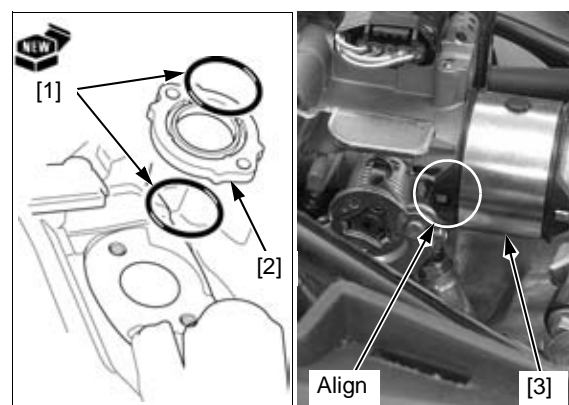
Install the insulator band [1] to the intake pipe [2] by aligning the tab and groove.



Install the new O-rings [1] to the groove on the insulator [2].

Set the insulator to the intake port.

Install the intake pipe/insulator band [3] to the throttle body by aligning the tab and groove.



Install and tighten the intake pipe mounting bolts [1].

Tighten the insulator band bolts [2] to the specified torque.

TORQUE: 5 N·m (0.51 kgf-m, 3.7 lbf-ft)

Install the injector (page 7-18).

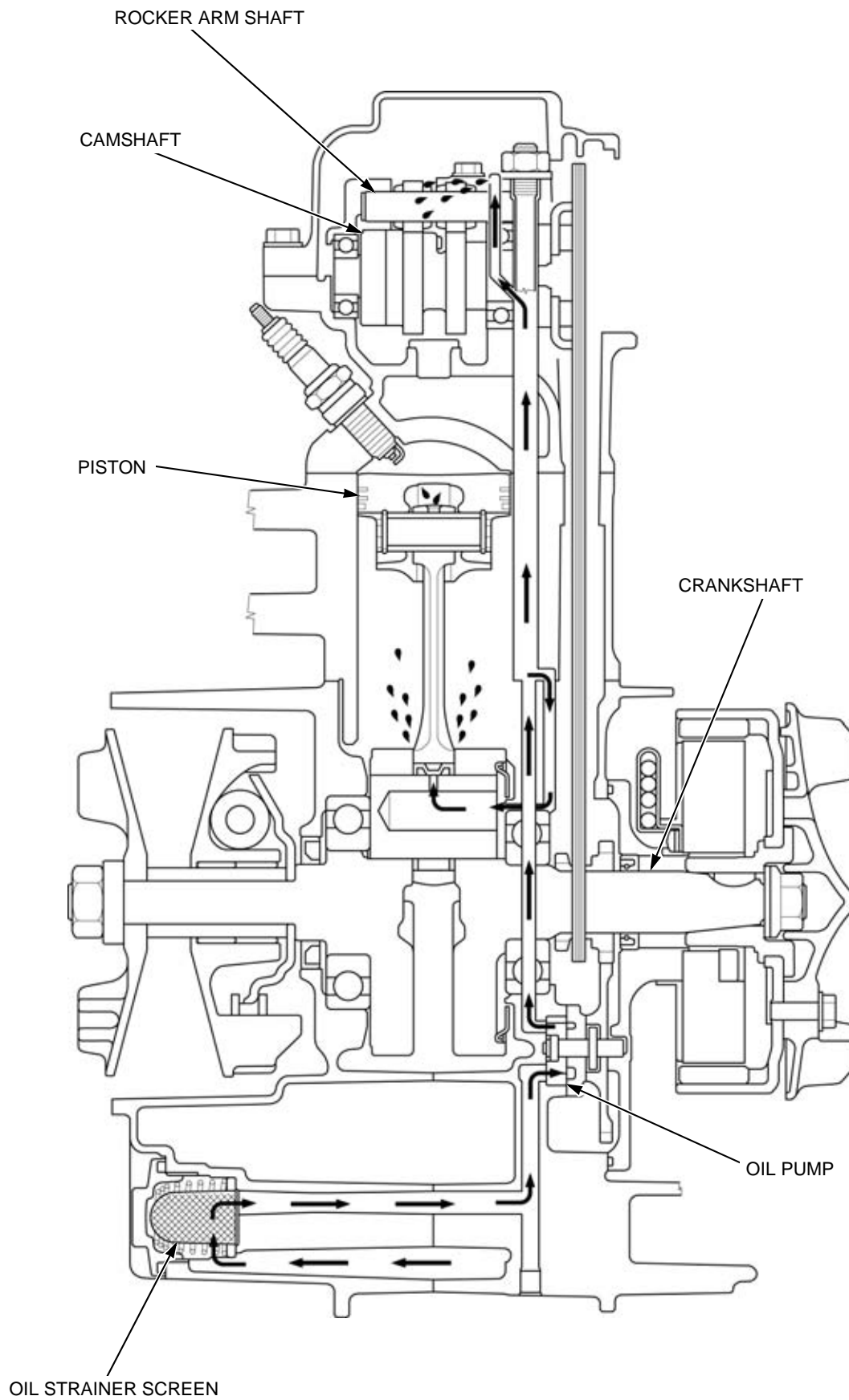


MEMO

8. LUBRICATION SYSTEM

LUBRICATION SYSTEM DIAGRAM	8-2	TROUBLESHOOTING	8-3
SERVICE INFORMATION	8-3	OIL PUMP	8-4

LUBRICATION SYSTEM DIAGRAM



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.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	0.8 liter (0.8 US qt, 0.7 Imp qt)	—
	After disassembly	0.9 liter (1.0 US qt, 0.8 Imp qt)	—
	After oil strainer removal	0.9 liter (1.0 US qt, 0.8 Imp qt)	—
Recommended engine oil		Honda "4-stroke motorcycle oil" or an equivalent API classification: SG or higher (except oils labeled as energy conserving on the circular API service label) Viscosity: SAE 10W-30 JASO T 903 standard: MB	—
Oil pump rotor	Oil pump body I.D.	23.150 – 23.180 (0.9114 – 0.9126)	—
	Outer rotor O.D.	22.970 – 23.000 (0.9043 – 0.9055)	—
	Body-to-outer rotor clearance	0.15 – 0.21 (0.0059 – 0.0083)	0.35 (0.014)
	Oil pump body depth	7.020 – 7.090 (0.2764 – 0.2791)	—
	Outer rotor height	6.960 – 6.980 (0.2740 – 0.2748)	—
	Side clearance	0.040 – 0.130 (0.0016 – 0.0051)	0.15 (0.006)

TORQUE VALUE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil pump mounting bolt	2	6	10 (1.0, 7)	

TROUBLESHOOTING

Engine oil level too low

- Oil consumption
- External oil leak
- Worn piston rings (page 11-8)
- Incorrect piston ring installation (page 11-9)
- Worn cylinder (page 11-5)
- Worn valve guide (page 10-14)
- Worn valve stem seal (page 10-13)

Oil contamination

- Oil not changed often enough
- Faulty cylinder head gasket
- Worn piston rings (page 11-8)

OIL PUMP

REMOVAL

- When removing the oil pump, do not allow dust or dirt to enter the engine.

Drain the engine oil (page 3-8).

Remove the stator (page 14-4).

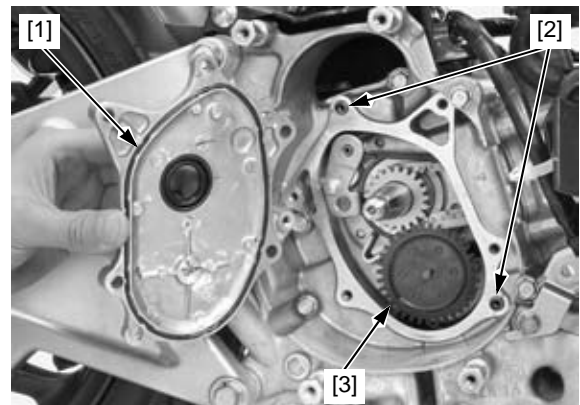
Remove the bolts [1] and stator base [2].



Remove the O-ring [1] from the stator base groove.

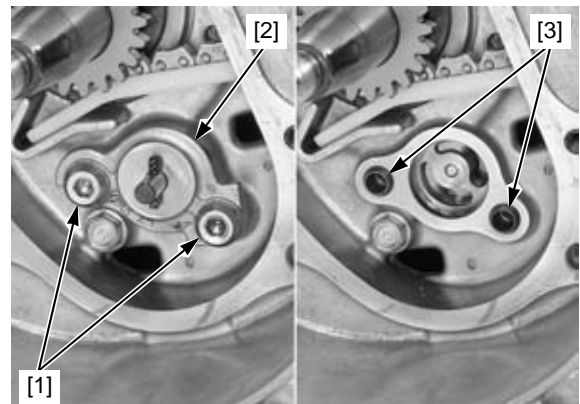
Remove the dowel pins [2] from right crankcase.

Remove the oil pump driven gear [3].

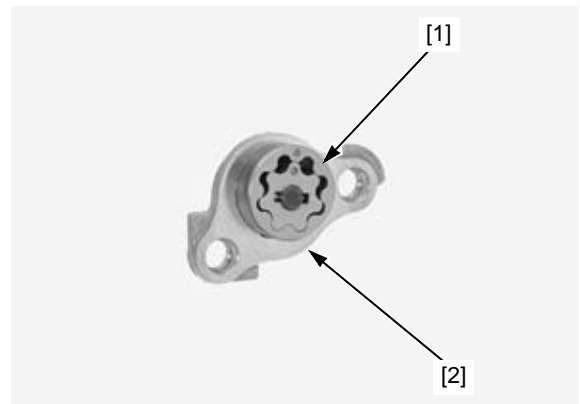


Remove the oil pump mounting bolts [1] and oil pump [2].

Remove the dowel pins [3].



Remove the outer rotor [1] from the oil pump assembly [2].



INSPECTION

- If any clearance of the oil pump exceeds the specified service limits, replace the oil pump as an assembly.

OIL PUMP BODY (RIGHT CRANKCASE)

Check the oil pump body sliding surface for wear or damage.

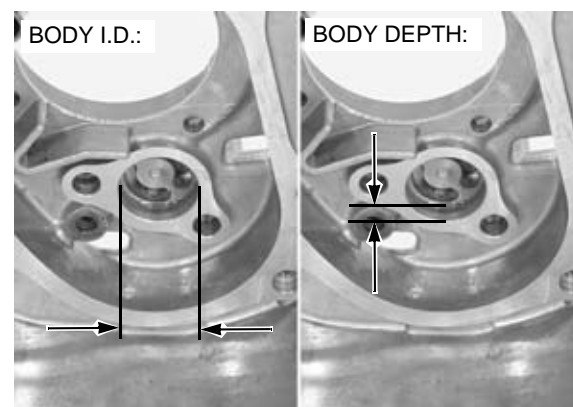
Measure the I.D. and depth of oil pump body.

STANDARD:

OIL PUMP BODY I.D.: 23.150 – 23.180 mm
(0.9114 – 0.9126 in)

OIL PUMP BODY DEPTH: 7.020 – 7.090 mm
(0.2764 – 0.2791 in)

- Measure at several points and use the largest reading.



OUTER ROTOR

Check the oil pump outer rotor sliding surface for wear or damage.

Measure the O.D. and height of outer rotor.

STANDARD:

OUTER ROTOR O.D.: 22.970 – 23.000 mm
(0.9043 – 0.9055 in)

OUTER ROTOR HEIGHT: 6.960 – 6.980 mm
(0.2740 – 0.2748 in)

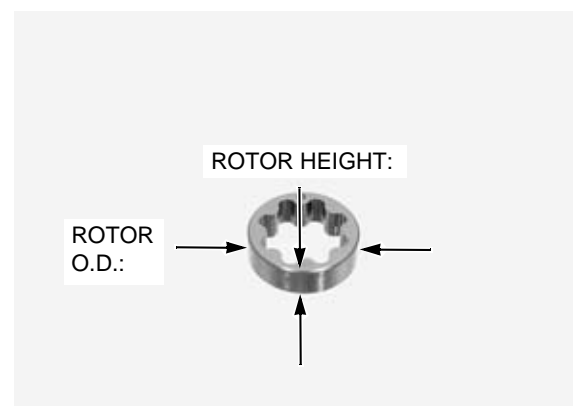
- Measure at several points and use the smallest reading.

Calculate the oil pump body-to-outer rotor clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)

Calculate the side clearance.

SERVICE LIMIT: 0.15 mm (0.006 in)



INNER ROTOR

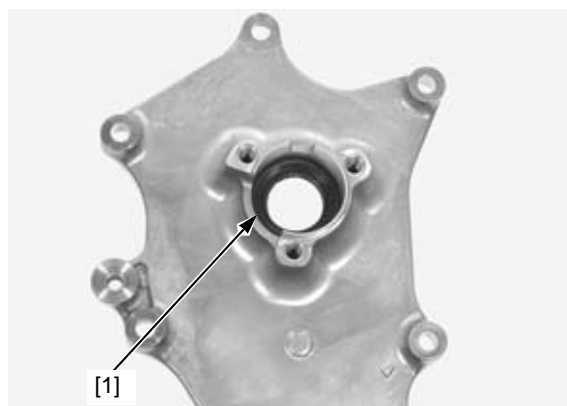
Check the oil pump inner rotor [1] sliding surface for wear or damage.



LUBRICATION SYSTEM

RIGHT CRANKSHAFT OIL SEAL INSPECTION/REPLACEMENT

Check the condition of the right crankshaft oil seal [1].
If damaged or deteriorated, replace as follows.

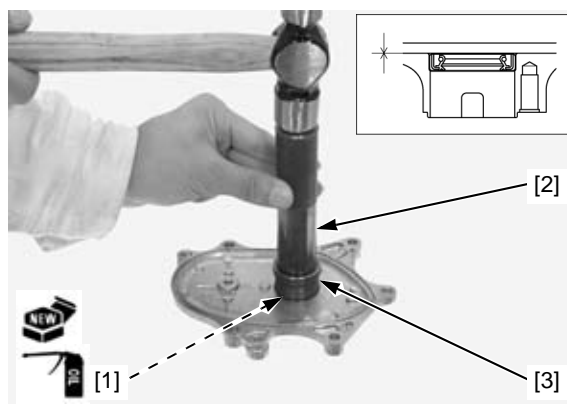


Apply engine oil to a new oil seal [1] lip.
Install the oil seal to the stator base squarely until it is flush with the stator base surface as shown, using the special tools.

TOOLS:

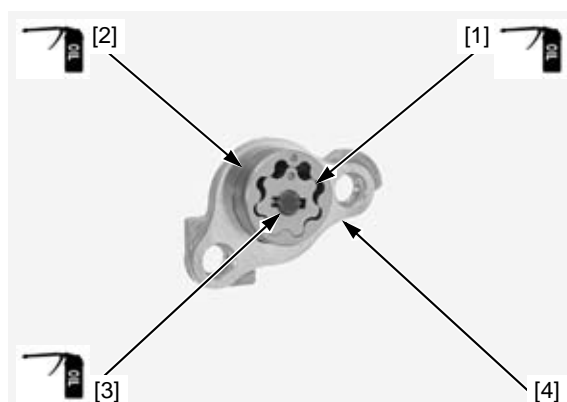
[2] Driver 07749-0010000

[3] Attachment, 32 x 35 mm 07746-0010100



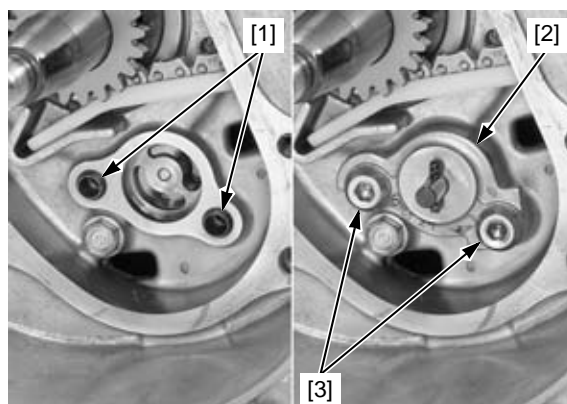
INSTALLATION

Apply engine oil to the inner [1] and outer [2] rotors whole surface and oil pump shaft [3] sliding surface.
Install the outer rotor to the oil pump assembly [4].

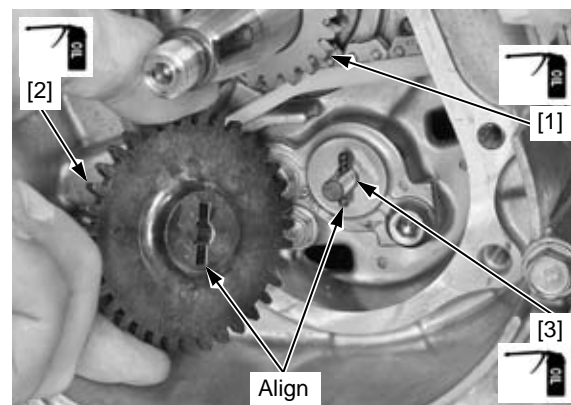


Install the dowel pins [1].
Install the oil pump [2] to the crankcase.
Install and tighten the oil pump mounting bolts [3] to the specified torque.

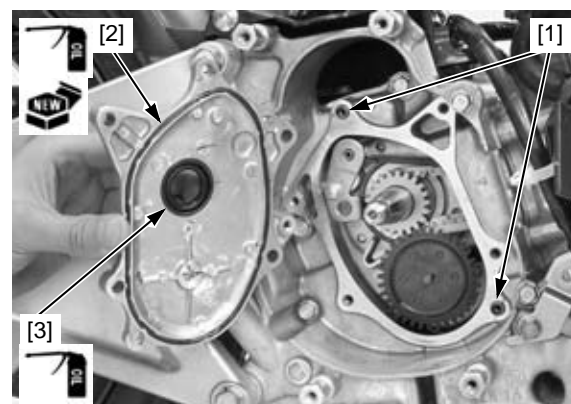
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



Apply engine oil to the oil pump drive [1] and driven [2] gear teeth.
 Apply engine oil to the oil pump shaft [3] sliding surface.
 Install the oil pump driven gear by aligning its groove with the oil pump shaft pin.



Install the dowel pins [1] to the right crankcase.
 Apply engine oil to a new O-ring [2].
 Install the O-ring to the stator base groove.
 Apply engine oil to the right crankshaft oil seal [3] lips.



Install the stator base [1] and tighten the bolts [2].
 Install the stator (page 14-6).
 Fill the engine oil (page 3-8).



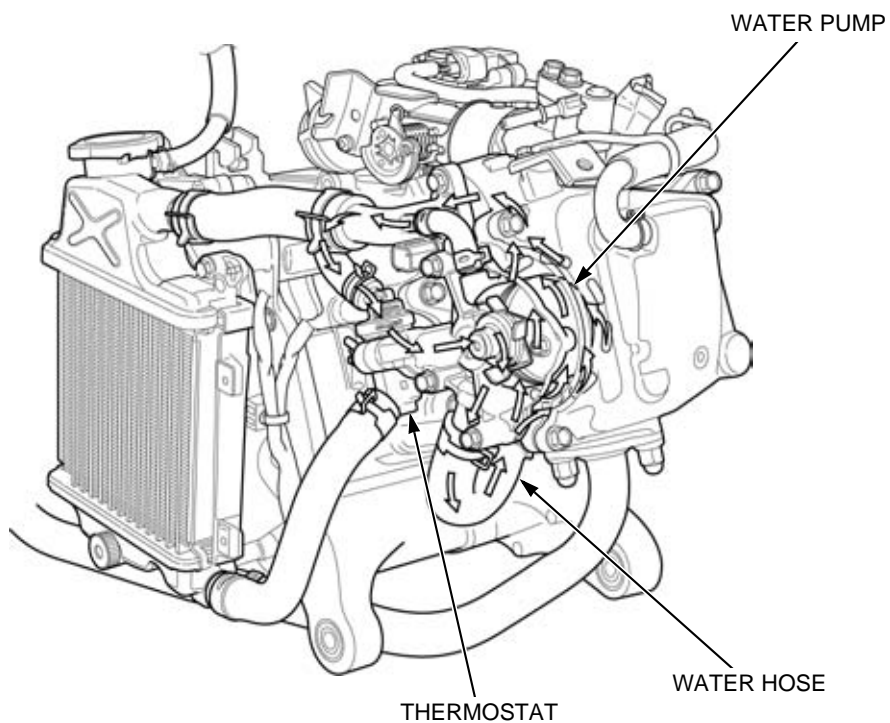
MEMO

SYSTEM FLOW PATTERN.....	9-2	COOLANT REPLACEMENT.....	9-5
SERVICE INFORMATION	9-3	RADIATOR.....	9-6
TROUBLESHOOTING.....	9-3	RADIATOR RESERVE TANK.....	9-6
COOLING SYSTEM TESTING	9-4	WATER PUMP/THERMOSTAT	9-7

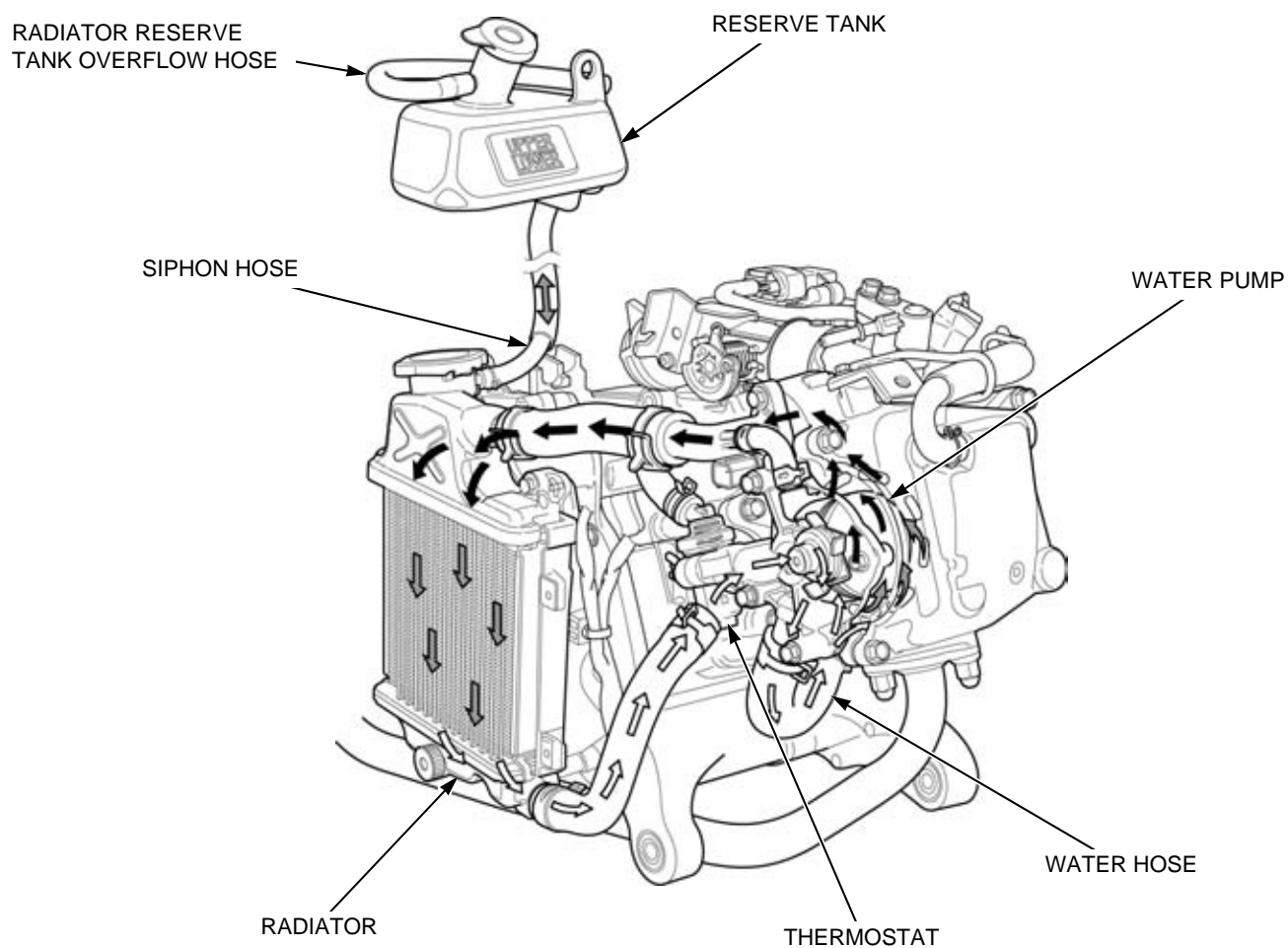
COOLING SYSTEM

SYSTEM FLOW PATTERN

When the engine is cold:



When the engine is hot:



SERVICE INFORMATION

GENERAL

⚠ WARNING

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

NOTICE

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

- Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system can be serviced with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.

SPECIFICATIONS

ITEM			SPECIFICATIONS
Coolant capacity	Radiator and engine	WW125EX2	0.51 liter (0.54 US qt, 0.45 Imp qt)
		WW150	0.48 liter (0.51 US qt, 0.42 Imp qt)
	Reserve tank		0.18 liter (0.19 US qt, 0.16 Imp qt)
Radiator cap relief pressure			108 – 137 kPa (1.1 – 1.4 kgf/cm ² , 16 – 20 psi)
Thermostat	Begin to open		74 – 78 °C (165 – 172 °F)
	Fully open		100 °C (212 °F)
	Valve lift		8 mm (0.3 in) minimum
Recommended antifreeze			High quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors
Standard coolant concentration			1:1 (mixture with distilled water)

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Radiator drain bolt	1	10	1 (0.1, 0.7)	
Radiator base screw	1	4	0.8 (0.08, 0.6)	
Radiator top cover screw	4	4	3.2 (0.33, 2.4)	

TROUBLESHOOTING

Engine temperature too high

- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passage blocked in radiator, hoses or water jacket
- Air in system
- Faulty water pump

Engine temperature too low

- Thermostat stuck open

Coolant leak

- Deteriorated O-rings
- Faulty radiator cap
- Damaged or deteriorated cylinder head gasket
- Loose hose connection or clamp
- Damaged or deteriorated hoses

COOLING SYSTEM TESTING

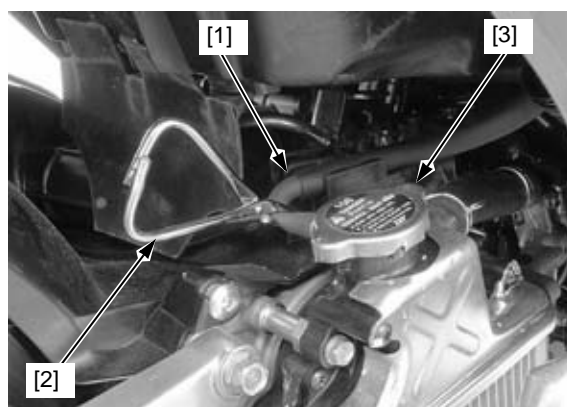
RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Remove the right side cover. (page 2-6)

Remove the three bolts [1] and radiator cover [2].



Pinch the siphon hose [1] using a hose clamp [2].
Remove the radiator cap [3].



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

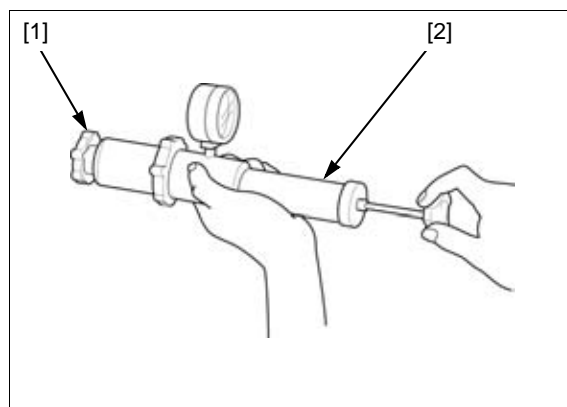
Pressurize the radiator cap using the tester.
Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low.
The cap must hold the specified pressure for at least 6 seconds.

RADIATOR CAP RELIEF PRESSURE:

108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)

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

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



NOTICE

Excessive pressure can damage the cooling system components. Do not exceed 137 kPa.

Install the removed parts in the reverse order of removal.

COOLANT REPLACEMENT

REPLACEMENT/AIR BLEEDING

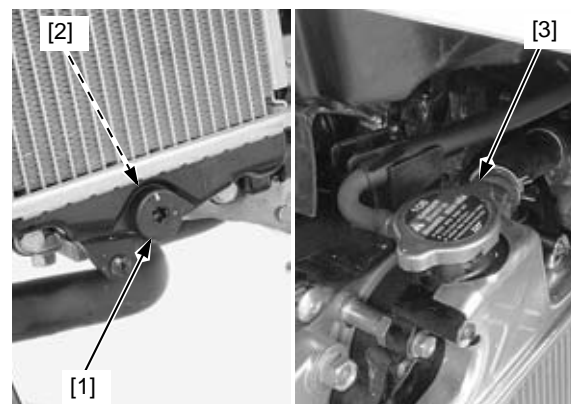
NOTE:

- When filling the system or reserve tank with coolant, or checking the coolant level, support the scooter with its centerstand on a flat, level surface.

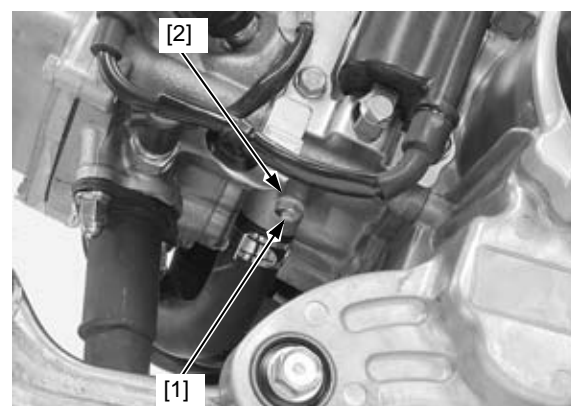
Remove the radiator cover (page 9-4).

Remove the radiator drain bolt [1], O-ring [2] and drain the coolant from the radiator.

Remove the radiator cap [3].



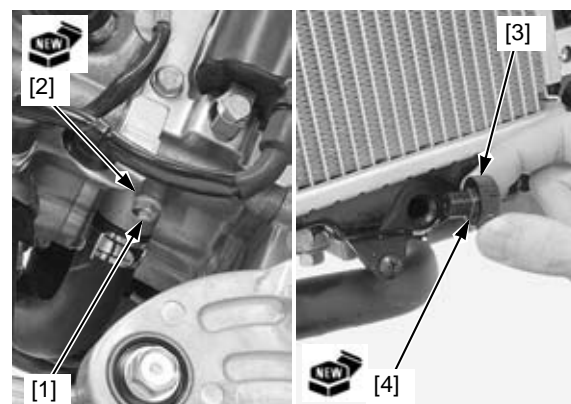
Remove the drain bolt [1] with sealing washer [2] from the cylinder and drain the coolant from the engine.



Reinstall the drain bolt [1] with a new sealing washer [2] onto the cylinder.

Reinstall the radiator drain bolt [3] with a new O-ring [4] onto the radiator and tighten it to the specified torque.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)



When filling the system or reserve tank with coolant, or checking the coolant level, support the scooter with its centerstand on a flat, level surface.

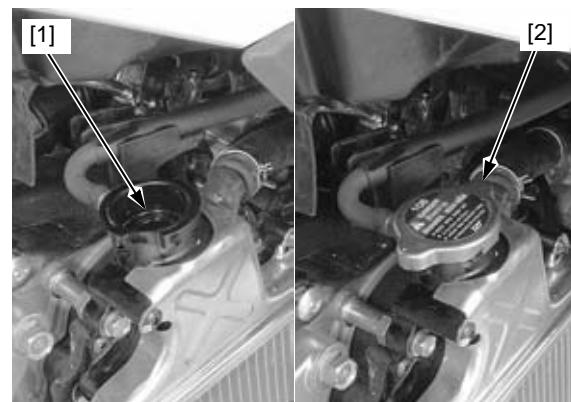
Fill the system with the coolant through the filler opening to the filler neck [1].

RECOMMENDED ANTIFREEZE:

High quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors

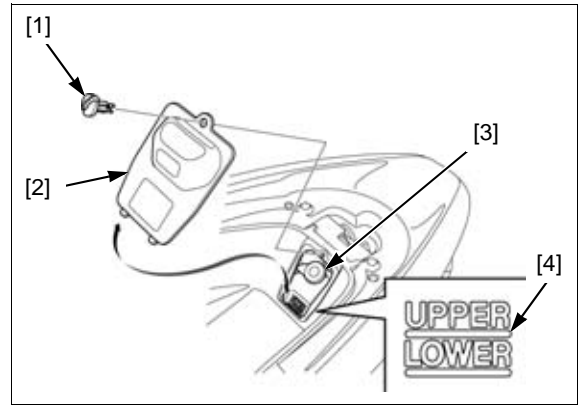
Bleed air from the system as follows:

1. Start the engine and let it idle for 2 – 3 minutes.
2. Snap the throttle three or four times to bleed air from the system.
3. Stop the engine and add coolant up to the filler neck.
4. Reinstall the radiator cap [2].



COOLING SYSTEM

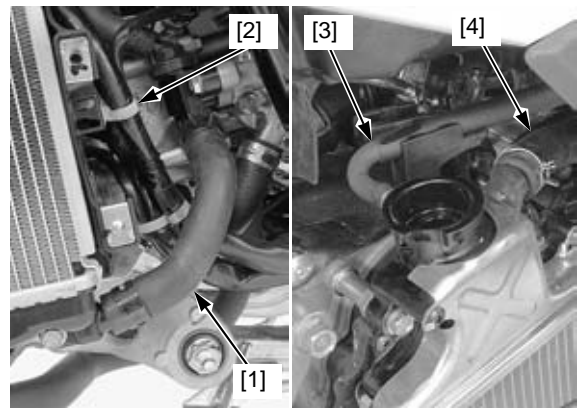
Unlock and open the seat.
Remove the trim clip [1] and radiator reserve tank lid [2].
Remove the reserve tank cap [3].
Fill the reserve tank with the coolant to the upper level line [4].
Install the removed parts in the reverse order of removal.



RADIATOR

REMOVAL/INSTALLATION

Drain the coolant (page 9-5).
Disconnect the water hose [1] from the radiator.
Release the wire band boss [2].
Disconnect the siphon hose [3] and water hose [4] from the radiator.



Be careful not to damage the fins while servicing the radiator.

Make sure that the hose clips are installed in the correct direction (page 1-15).

Remove the four radiator mounting bolts [1] and radiator [2].
Installation is in the reverse order of removal.
Fill and bleed the cooling system (page 9-5).
After installation, make sure the coolant does not leak.



RADIATOR RESERVE TANK

REMOVAL/INSTALLATION

Remove the luggage box (page 2-12).
Disconnect the overflow hose [1] from the reserve tank [2].
Remove the special bolt [3].



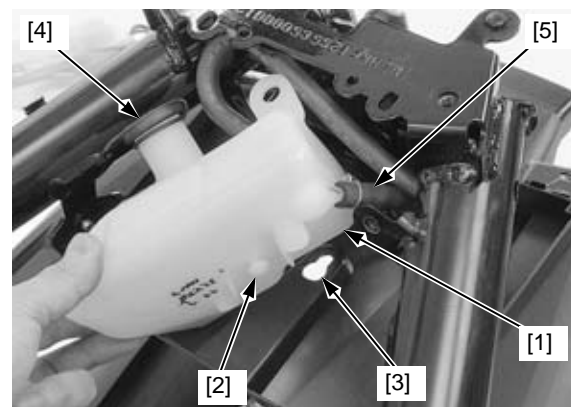
Remove the reserve tank [1] by releasing the boss [2] from the groove [3] of the rear fender.

Open the reserve tank cap [4] and drain the coolant into an approved pan.

Disconnect the siphon hose [5] from the reserve tank.

Installation is in the reverse order of removal.

- After installation, fill the reserve tank with the coolant (page 9-6).



WATER PUMP/THERMOSTAT

MECHANICAL SEAL INSPECTION

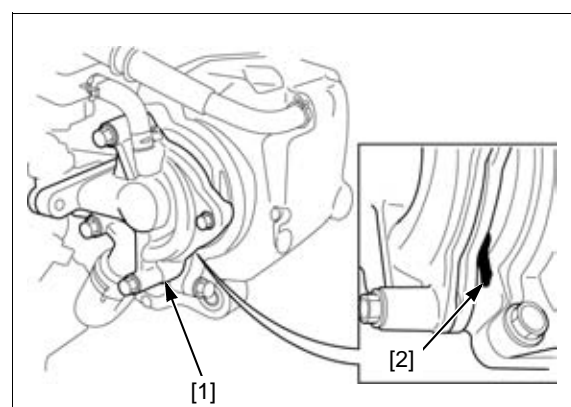
The water pump bleed hole is located in the lower side of water pump [1] joint area with cylinder head.

If there is coolant leak around this area, remove the water pump (page 9-7).

Check the bleed hole of the water pump for signs of coolant leakage [2].

If the coolant is leaking out from the bleed hole, the mechanical seal in the water pump assembly is faulty. Replace the water pump as an assembly.

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



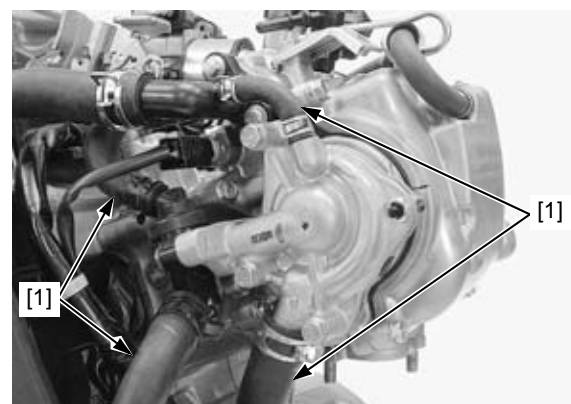
REMOVAL/DISASSEMBLY

- Water pump can be serviced with the engine installed on the frame.

Drain the coolant (page 9-5).

Remove the right side cover (page 2-6).

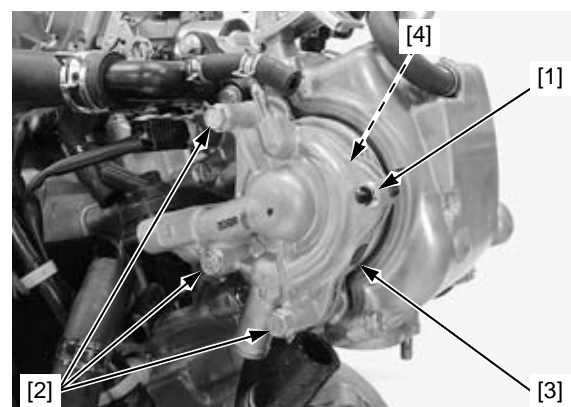
Disconnect the water hoses [1] from the water pump and thermostat.



Loosen the water pump cover bolt [1].

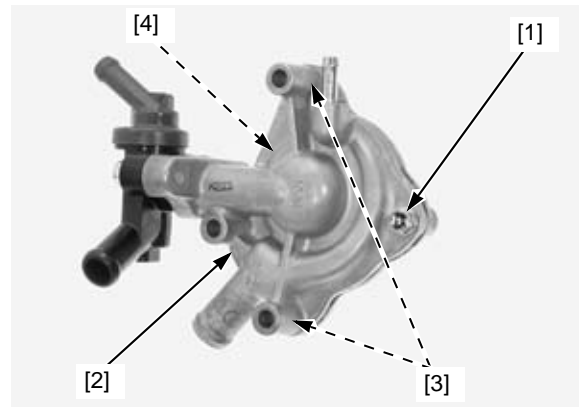
Remove the three bolts [2] and water pump/thermostat [3].

Remove the O-ring [4].

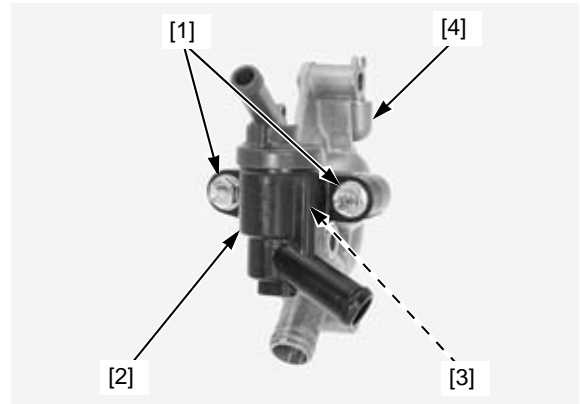


COOLING SYSTEM

Remove the water pump cover bolt [1], water pump cover/thermostat [2] and dowel pins [3].
Remove the O-ring [4].



Remove the two bolts [1], thermostat [2] and O-ring [3] from the water pump cover [4].



THERMOSTAT INSPECTION

Visually inspect the thermostat [1] for damage.
Replace the thermostat if it stays open at room temperature.

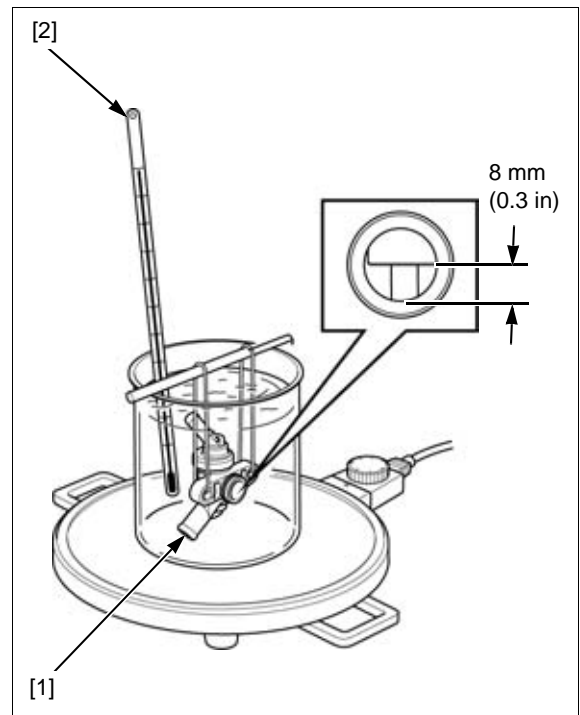
Wear insulated gloves and adequate eye protection. Keep flammable materials away from the electric heating element.

Heat a container of water with an electric heating element for 5 minutes.
Suspend the thermostat in heated water to check its operation.

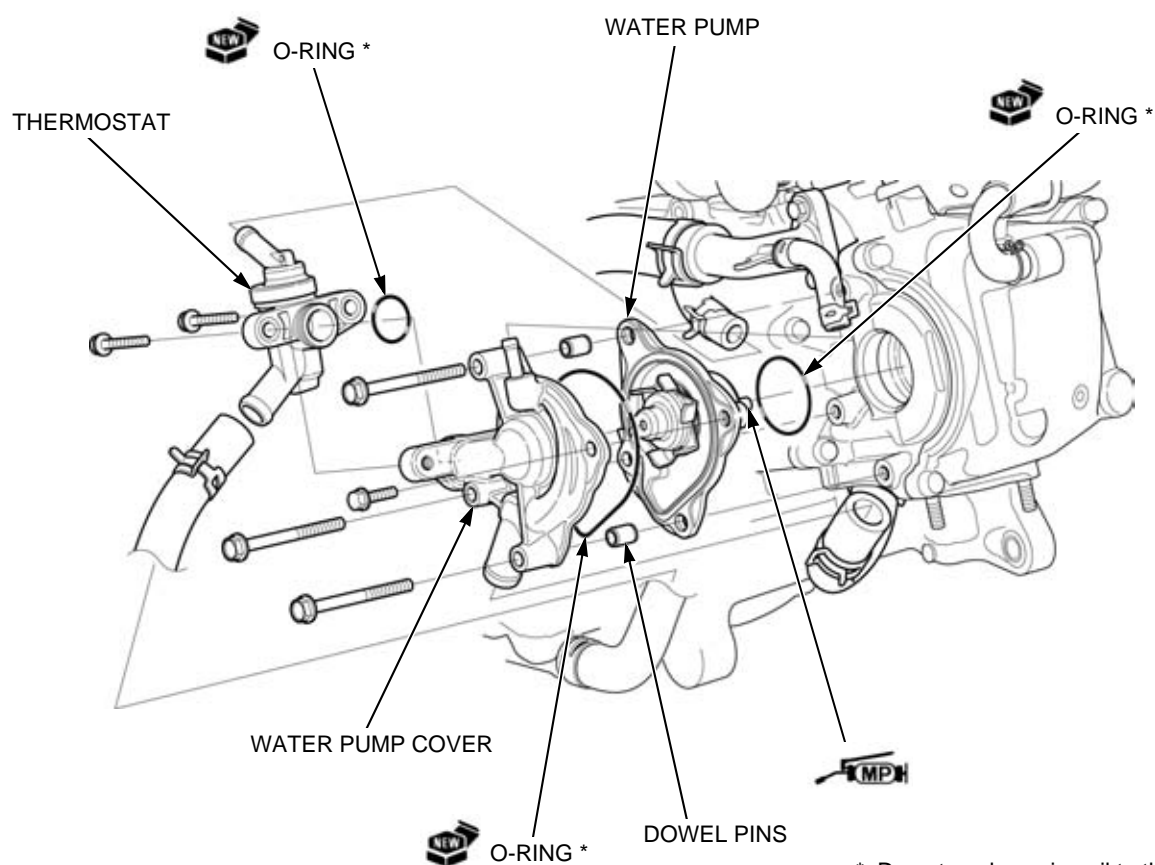
VALVE BEGINS TO LIFT (OPEN):
74 – 78 °C (165 – 172 °F)

VALVE LIFT:
8 mm (0.3 in) minimum at 100 °C (212 °F)

Replace the thermostat if the valve opens at temperature other than specified.

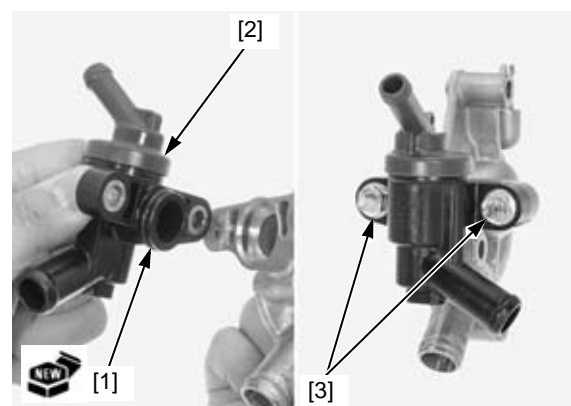


ASSEMBLY/INSTALLATION

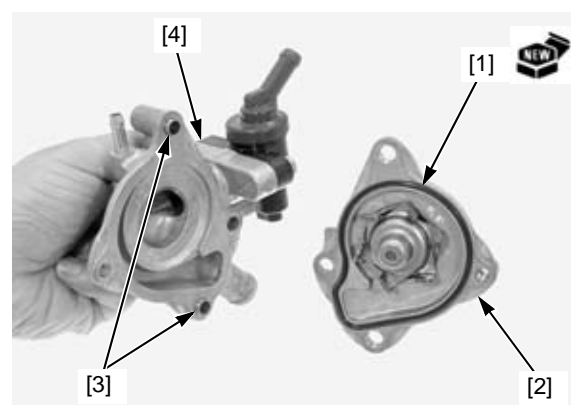


*: Do not apply engine oil to these O-rings.

Do not apply engine oil to this O-ring. Install a new O-ring [1] into the groove of the thermostat [2].
Install the thermostat to the water pump cover and tighten the bolts [3].



Do not apply engine oil to this O-ring. Install a new O-ring [1] into the groove of the water pump [2].
Install the two dowel pins [3] to the water pump cover.
Install the water pump cover/thermostat [4] to the water pump.



COOLING SYSTEM

Temporarily install the water pump cover bolt [1], but do not tighten it yet.



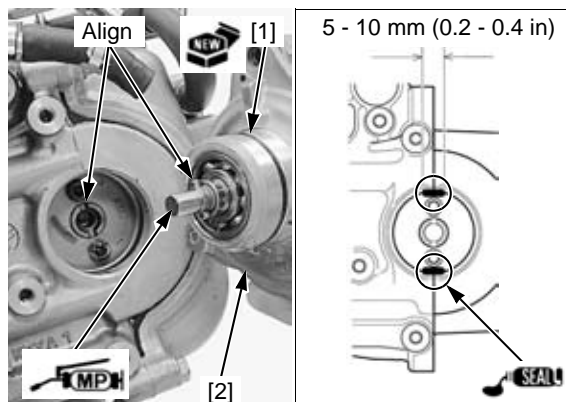
Apply liquid sealant (Three Bond 5211C or 1215 or SHIN-ETSU-SILICONE KE45T or LOCTITE 5060S or 5020 or equivalent) to the specified area as shown.

Do not apply engine oil to this O-ring.

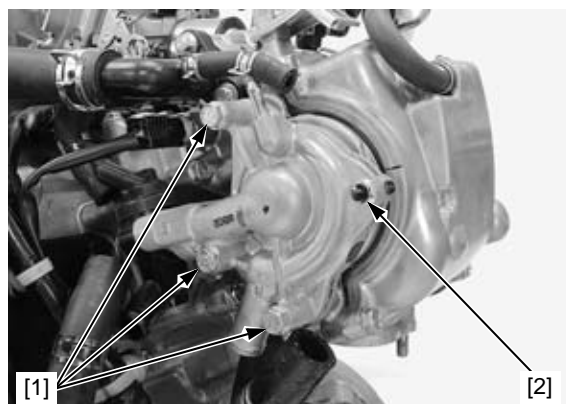
Install a new O-ring [1] into the groove of the water pump.

Apply molybdenum disulfide paste (SUMICO MOLYPASTE 300 or equivalent) to the water pump shaft mating area with camshaft.

Install the water pump/thermostat assembly [2] to the cylinder head while aligning the pin on the water pump shaft with the groove on the camshaft.



Install and tighten the three water pump mounting bolts [1], then tighten the water pump cover bolt [2].



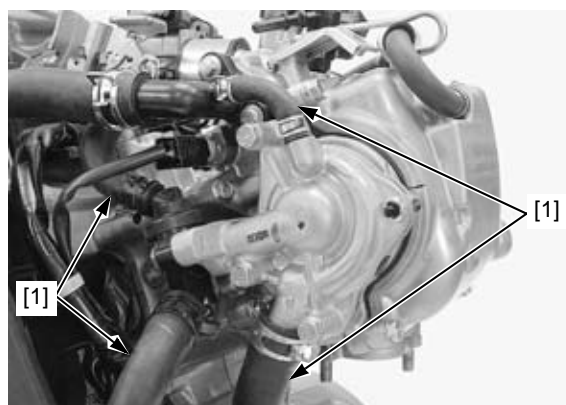
Make sure that the hoses and clips are installed in the correct direction (page 1-15).

Connect the water hoses [1] to the water pump and thermostat.

Fill and bleed the cooling system (page 9-5).

Install the right side cover (page 2-6).

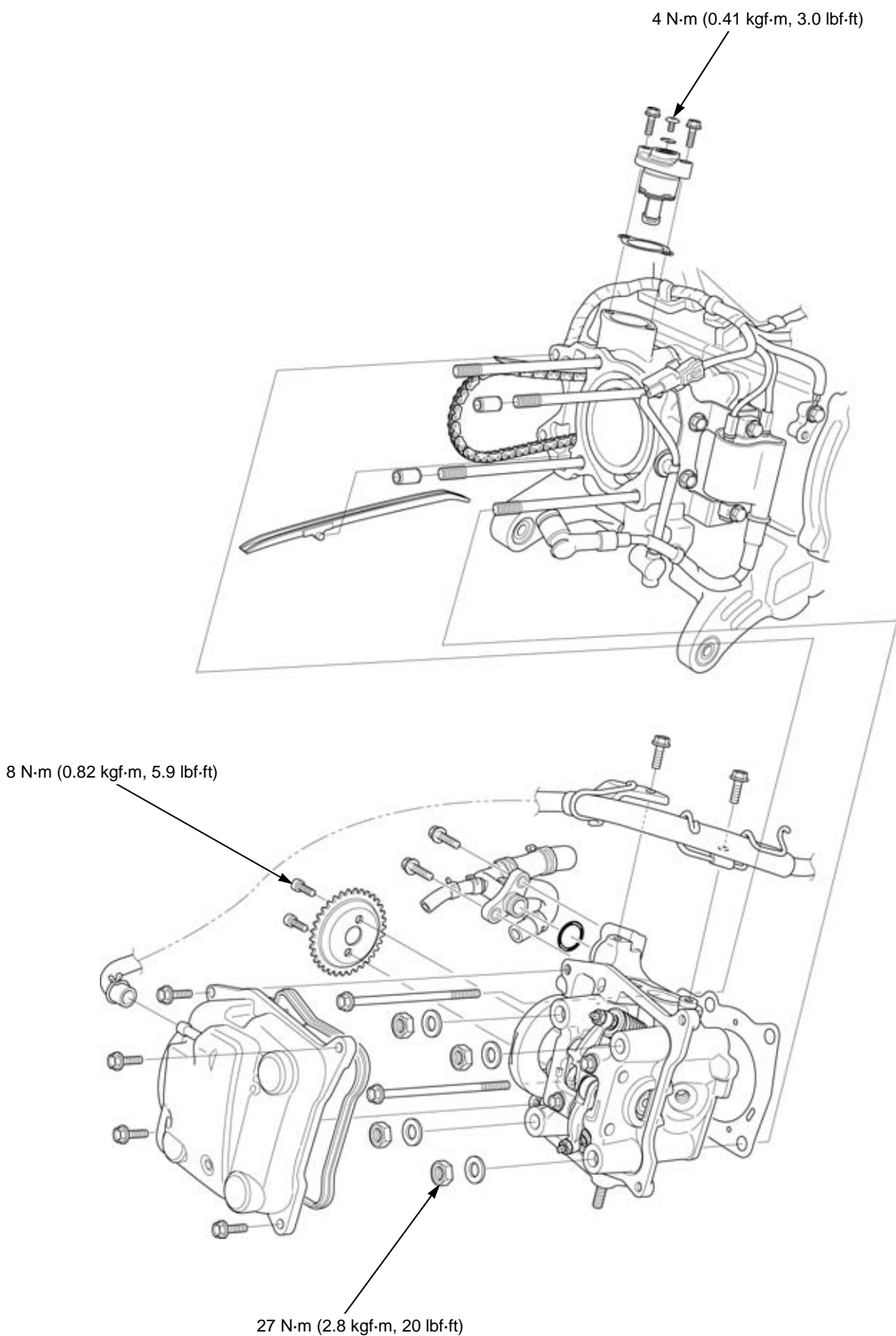
After installation, make sure the coolant does not leak.



10. CYLINDER HEAD/VALVES

COMPONENT LOCATION	10-2	CYLINDER HEAD COVER	10-5
SERVICE INFORMATION	10-3	CAMSHAFT.....	10-7
TROUBLESHOOTING.....	10-4	CYLINDER HEAD	10-12
CYLINDER COMPRESSION TEST.....	10-5	CAM CHAIN TENSIONER LIFTER.....	10-21

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves, rocker arms, camshaft and cam chain tensioner.
- The rocker arms, camshaft, cam chain tensioner services can be done with the engine installed in the frame. The cylinder head service requires engine removal.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft and rocker arm lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling cylinder head.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head. Do not tap the cylinder head cover and cylinder head too hard during removal.

SPECIFICATIONS

Unit: mm (in)

ITEM				STANDARD	SERVICE LIMIT
Cylinder compression				1,098 kPa (11.2 kgf/cm ² , 159.3 psi) at 850 min ⁻¹ (rpm)	—
Cylinder head warpage				—	0.05 (0.002)
Camshaft	Cam lobe height		IN	33.616 – 33.856 (1.3235 – 1.3329)	—
			EX	33.393 – 33.633 (1.3147 – 1.3241)	—
Valve, valve guide	Valve clearance		IN	0.10 ± 0.02 (0.004 ± 0.001)	—
			EX	0.24 ± 0.02 (0.009 ± 0.001)	—
	Valve stem O.D.		IN	4.975 – 4.990 (0.1959 – 0.1965)	4.90 (0.193)
			EX	4.955 – 4.970 (0.1951 – 0.1957)	4.90 (0.193)
	Valve guide I.D.		IN/EX	5.000 – 5.012 (0.1969 – 0.1973)	5.03 (0.198)
	Stem-to-guide clearance		IN	0.010 – 0.037 (0.0004 – 0.0015)	0.08 (0.003)
			EX	0.030 – 0.057 (0.0012 – 0.0022)	0.10 (0.004)
	Valve guide projection above cylinder head	WW125EX2	IN/EX	10.55 – 10.85 (0.415 – 0.427)	—
		WW150	IN/EX	11.05 – 11.35 (0.435 – 0.447)	—
	Valve seat width		IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length			IN/EX	36.94 (1.454)	—

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Camshaft stopper bolt	1	6	10 (1.0, 7)	
Rocker arm shaft stopper bolt	2	5	5 (0.51, 3.7)	Apply oil to the threads and seating surface.
Cam sprocket socket bolt	2	5	8 (0.82, 5.9)	Apply oil to the threads and seating surface.
Cam chain tensioner lifter screw	1	6	4 (0.41, 3.0)	
Water pump holder bolt	2	6	10 (1.0, 7)	
Cylinder head nut	4	8	27 (2.8, 20)	Apply oil to the threads and seating surface.
Cylinder head sealing bolt	1	12	32 (3.3, 24)	

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These can be diagnosed by a compression test or by tracing engine noises to the top-end with a sounding rod or 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 11-8).

Compression too low, hard starting or poor performance at low speed

- Valves:
 - Incorrect valve adjustment
 - Burned or bent valve
 - Incorrect valve timing
 - Broken valve spring
 - Uneven valve seating
 - Valve stuck open
 - Weak valve spring
- Cylinder head:
 - Leaking or damaged cylinder head gasket
 - Warped or cracked cylinder head
 - Loose spark plug
- Worn cylinder (page 11-5).
- Worn piston or piston rings (page 11-8).

Compression too high, overheating or knocking

- Excessive carbon build-up on piston head or on combustion chamber

Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Worn cylinder (page 11-5).
- Worn piston or piston rings (page 11-8).

Excessive noise

- Incorrect valve adjustment
- Sticking valve or broken valve stem
- Excessively worn valve seat
- Worn or damaged camshaft
- Worn or damaged cam chain
- Worn cam sprocket teeth
- Worn rocker arm and/or shaft
- Worn or damaged cam chain tensioner
- Worn cylinder (page 11-5).
- Worn piston or piston rings (page 11-8).

Rough idle

- Low cylinder compression

CYLINDER COMPRESSION TEST

Warm up the engine to normal operating temperature. Stop the engine and remove the spark plug cap and spark plug (page 3-6).

Install a compression gauge [1] into the spark plug hole.

To avoid discharging the battery, do not operate the starter for more than 7 seconds.

Open the throttle all the way and crank the engine with the starter until the gauge reading stops rising. The maximum reading is usually reached within 4 – 7 seconds.

COMPRESSION PRESSURE:

1,098 kPa (11.2 kgf/cm², 159.3 psi) at 850 min⁻¹ (rpm)

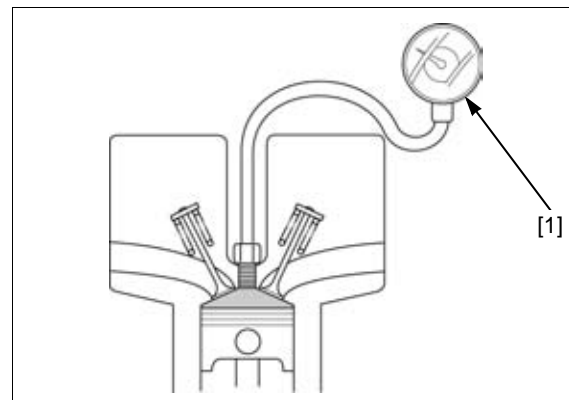
If compression is high, it indicates that carbon deposits have accumulated on the combustion chamber and/or the piston crown.

If compression is low, pour 3 – 5 cm³ of clean engine oil into the cylinder through the spark plug hole and recheck the compression.

If the compression increases from the previous value, check the cylinder, piston and piston rings.

- Leaking cylinder head gasket
- Worn piston ring
- Worn cylinder and piston

If compression is the same as the previous value, check the valves for leakage.



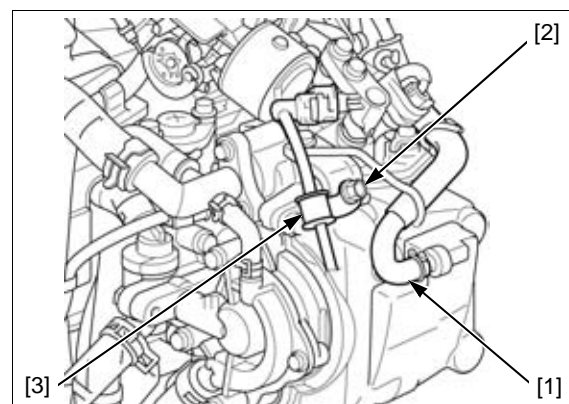
CYLINDER HEAD COVER

REMOVAL

Remove the battery box (page 2-12).

Disconnect the crankcase breather hose [1] from the cylinder head cover.

Remove the bolt [2] and release the hose guide [3].



Remove the bolts [1], cylinder head cover [2] and rubber seal [3].

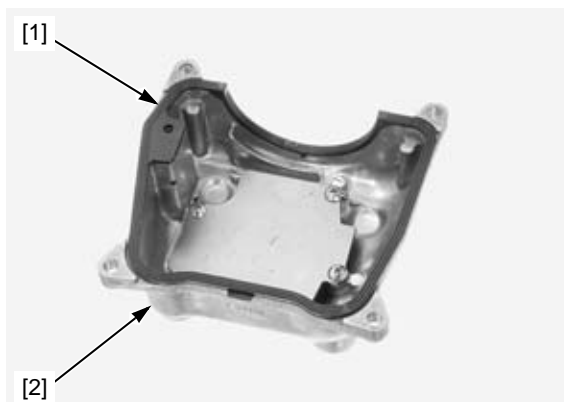


CYLINDER HEAD/VALVES

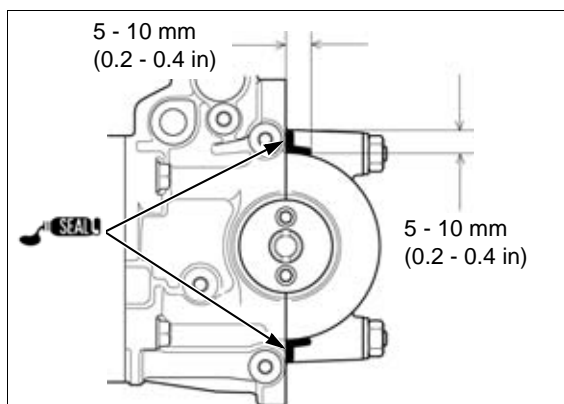
INSTALLATION

Make sure the cylinder head cover rubber seal [1] is in good condition and replace it if necessary.

Install the rubber seal into the groove on the cylinder head cover [2].



Apply liquid sealant (Three Bond 5211C or 1215 or SHIN-ETSU-SILICONE KE45T or LOCTITE 5060S or 5020 or equivalent) to the cylinder head and rubber seal mating surface as shown.



Install the cylinder head cover [1] onto the cylinder head.

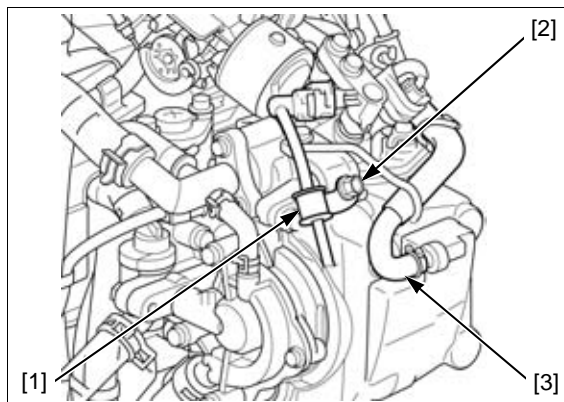
Install the bolts [2] and tighten them.



Set the hose guide [1], then install and tighten the bolt [2].

Connect the crankcase breather hose [3].

Install the battery box (page 2-12).



CAMSHAFT

REMOVAL

NOTE:

Camshaft can be serviced with the engine installed in the frame.

Drain the coolant (page 9-5).

Drain the engine oil (page 3-8).

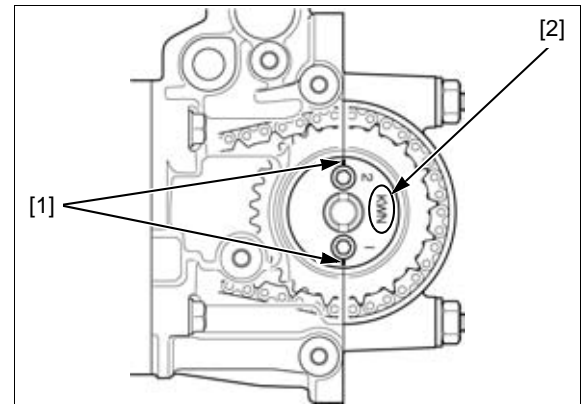
Remove the following:

- Body cover (page 2-11)
- Throttle body (page 7-12)
- Cylinder head cover (page 10-5)
- Water pump (page 9-7)

Set the piston to the TDC (Top Dead Center) on the compression stroke (page 3-6).

Make sure that the index lines [1] on the cam sprocket are flush with the top surface of cylinder head and that the "KWN" mark [2] on the cam sprocket is facing up as shown (TDC on the compression stroke).

If the cam sprocket "KWN" mark is not facing up, rotate the crankshaft one full turn and realign the index lines on the cam sprocket.

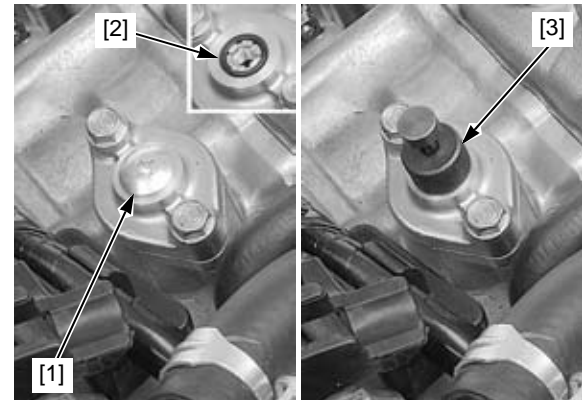


Remove the cam chain tensioner lifter screw [1] and O-ring [2].

Install the special tool into the tensioner body and turn the tool clockwise until it stops turning. Hold the tensioner lifter by pushing the tool while aligning the tabs of the tool with the grooves of the tensioner lifter.

TOOL:

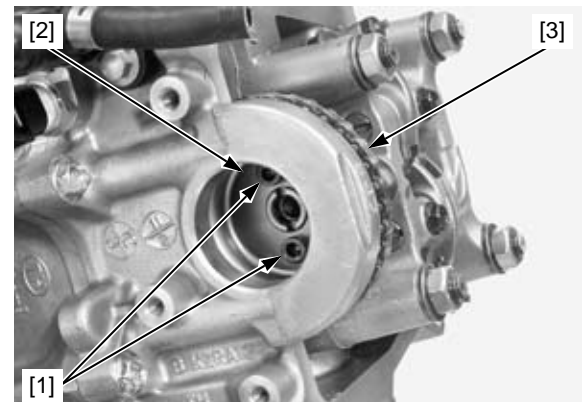
[3] Cam chain tensioner lifter stopper 070MG-0010100



Place a shop towel at the opening of the crankcase to prevent the cam sprocket bolt from falling into the crankcase.

Remove the bolts [1], cam sprocket [2] from the camshaft and cam chain [3] off the cam sprocket.

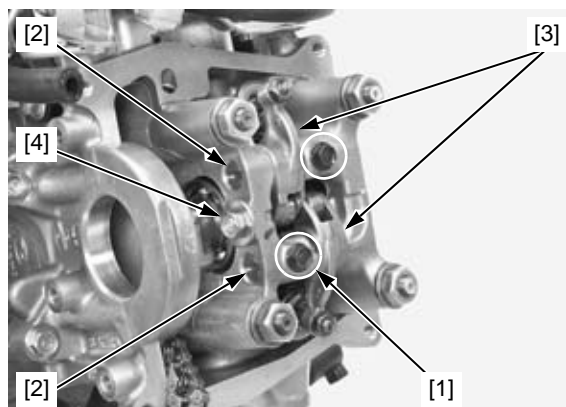
Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.



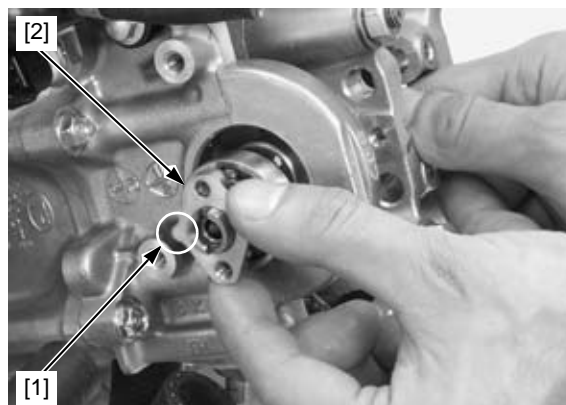
CYLINDER HEAD/VALVES

Remove the rocker arm shaft stopper bolts [1].
Push the rocker arm shafts [2] out from the opposite side of the cylinder head and remove the rocker arms [3].

Remove the camshaft stopper bolt/washer [4].



Turn the camshaft 180° so that the tab [1] on the camshaft flange [2] is facing backward, then remove the camshaft from the cylinder head.



INSPECTION

DECOMPRESSOR SYSTEM

Turn the decompressor [1] with your finger.
Make sure that the decompressor operates smoothly and that the weight returns back in position.

If the decompressor is faulty, replace the camshaft as an assembly.



CAMSHAFT

Turn the outer race of each camshaft bearing [1] with your finger. The bearing should turn smoothly and quietly.

Also check that the bearing inner race fits tightly on the camshaft.

Replace the camshaft assembly if the bearing does not turn smoothly, quietly, or if they fit loosely on the camshaft.



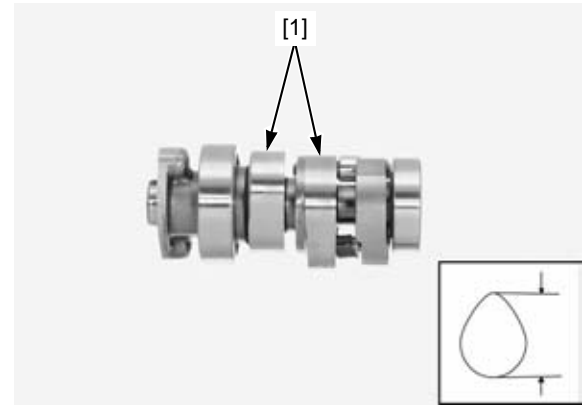
Check the cam lobes [1] for excessive wear and damage.

Measure the height of each cam lobe.

STANDARD:

IN: 33.616 – 33.856 mm (1.3235 – 1.3329 in)

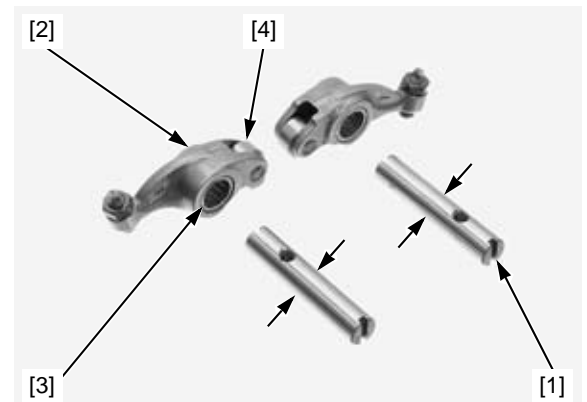
EX: 33.393 – 33.633 mm (1.3147 – 1.3241 in)



ROCKER ARM/SHAFT

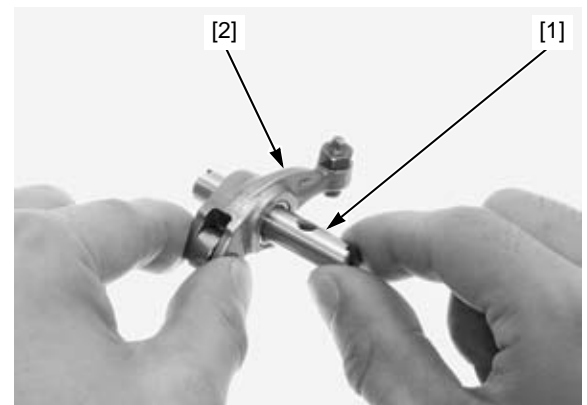
Check the rocker arm shafts [1] and rocker arms [2] for wear or damage.

Check the needle bearing [3] for wear or damage.
Turn the rocker arm rollers [4] with your finger.
The rollers should turn smoothly and quietly.



Temporarily install the rocker arm shaft [1] to the rocker arm [2].

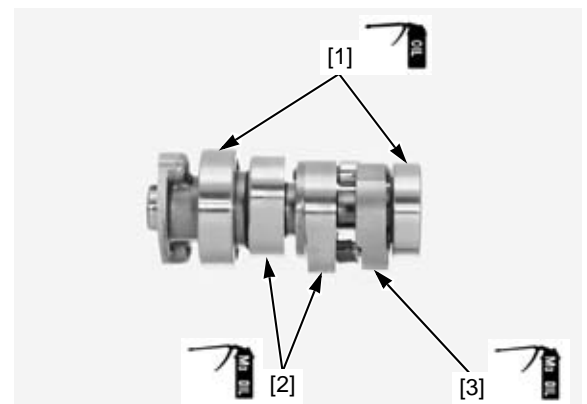
Check the rocker arm needle bearing for excessive play and rocker arm shaft for smooth movement.



INSTALLATION

Apply engine oil to the camshaft bearings [1].

Apply molybdenum oil solution to the cam lobes [2], decompressor [3] cam area and rotating surface.



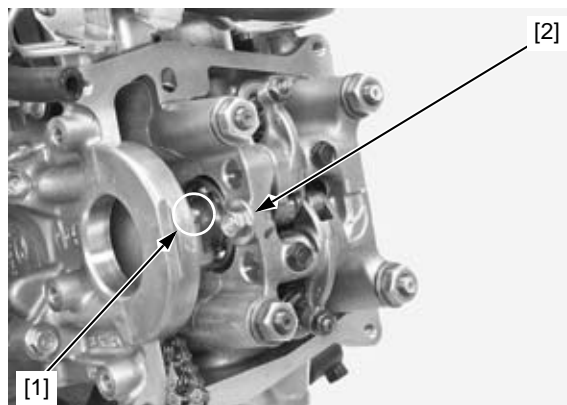
CYLINDER HEAD/VALVES

Install the camshaft with its flange tab [1] facing backward.

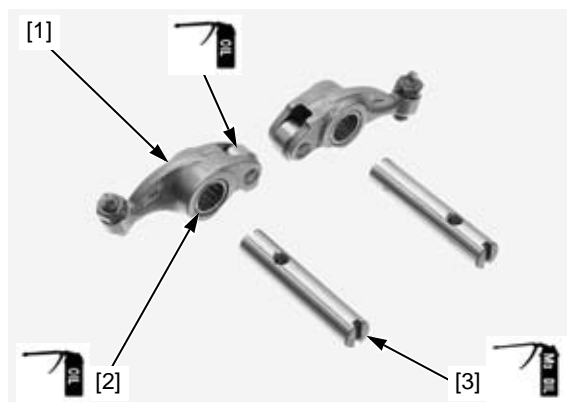


Turn the camshaft 180° so that the tab [1] on the camshaft flange is facing forward as shown. Install and tighten the camshaft stopper bolt [2] to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



Apply engine oil to the roller surface of the rocker arm [1].
Apply engine oil to the needle bearing [2] sliding surface.
Apply molybdenum oil solution to the sliding surface of the rocker arm shaft [3].



Intake and exhaust rocker arms have identification marks, "I" [1] is for the intake rocker arm and "E" [2] is for the exhaust rocker arm.



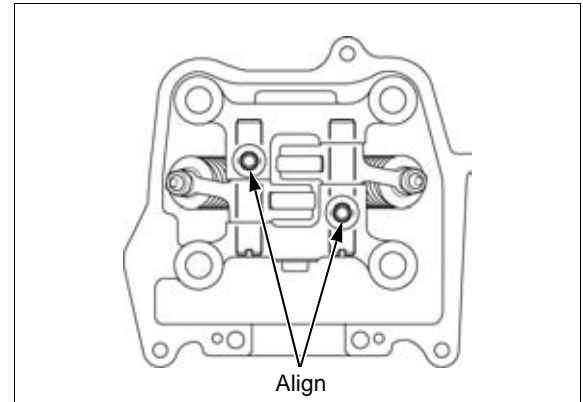
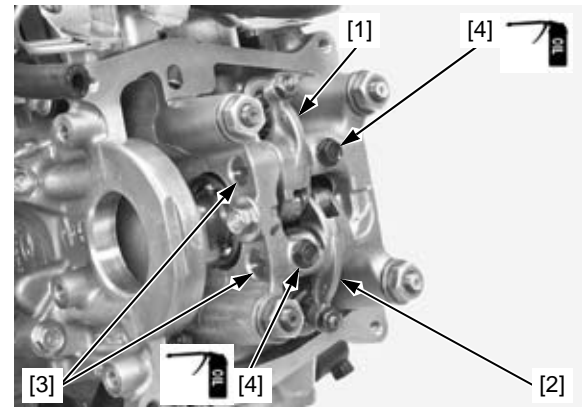
Install the intake [1] and exhaust [2] rocker arms to the cylinder head.

Insert the rocker arm shafts [3] into the cylinder head using a screwdriver while aligning the bolt holes of the shaft with the bolt holes on cylinder head.

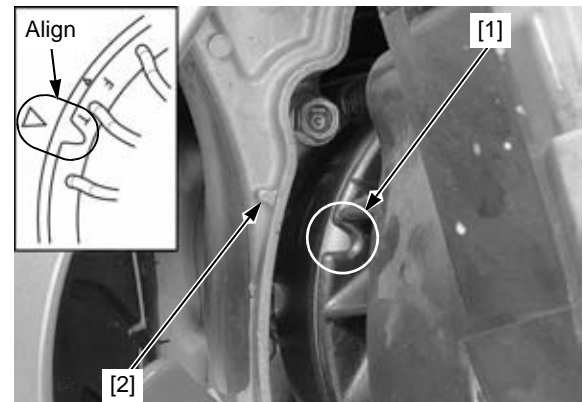
Apply engine oil to the rocker arm shaft stopper bolts [4] threads and seating surfaces.

Install and tighten the bolts to the specified torque.

TORQUE: 5 N·m (0.51 kgf·m, 3.7 lbf·ft)



Rotate the crankshaft and align the cut out ("T" mark) [1] on the cooling fan with the index mark [2] on the crankcase.



Apply engine oil to the cam chain [1] whole surface and cam sprocket [2] teeth.

Install the cam chain on the cam sprocket.

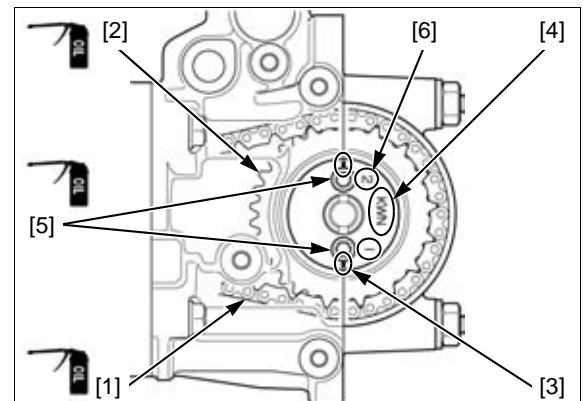
Install the cam sprocket to the camshaft so that the index lines [3] on the cam sprocket is flush with the cylinder head and "KWN" mark [4] is facing forward as shown (TDC on the compression stroke).

Apply engine oil to the seating surface and thread of the cam sprocket socket bolts [5].

Install and tighten the bolts to specified torque in the sequence of the cam sprocket numbers [6].

TORQUE: 8 N·m (0.82 kgf·m, 5.9 lbf·ft)

Place a shop towel at the opening of the crankcase to prevent the cam sprocket bolt from falling into the crankcase.



CYLINDER HEAD/VALVES

Remove the cam chain tensioner lifter stopper [1].
Coat a new O-ring [2] with engine oil and install it into the cam chain tensioner lifter groove.
Install and tighten the cam chain tensioner lifter screw [3] to the specified torque.

TORQUE: 4 N·m (0.41 kgf·m, 3.0 lbf·ft)

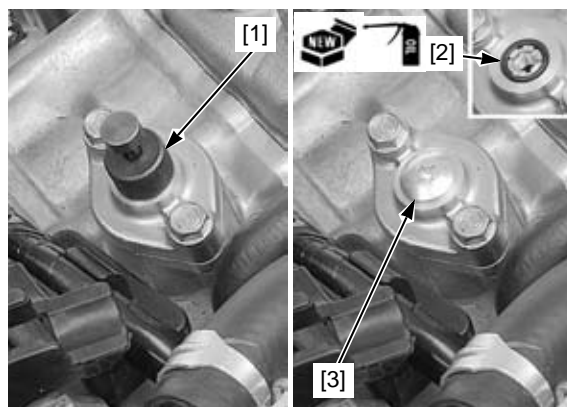
Install the following:

- Water pump (page 9-9)
- Cylinder head cover (page 10-6)
- Throttle body (page 7-14)
- Body cover (page 2-11)

Fill and bleed the coolant (page 9-5).

Fill the engine oil (page 3-8).

Inspect the valve clearance (page 3-6).



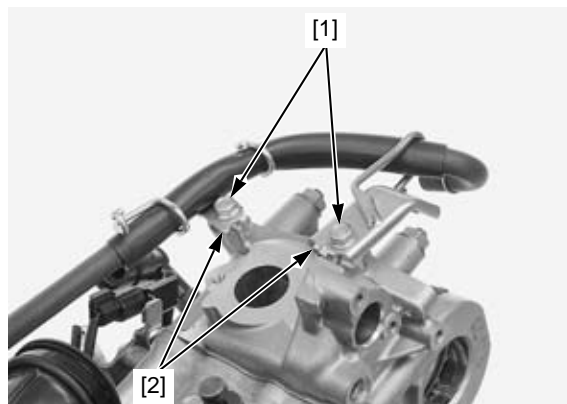
CYLINDER HEAD

REMOVAL

Remove the following:

- Engine (page 16-4)
- Camshaft (page 10-7)
- Exhaust pipe/muffler (page 2-13)
- Intake pipe (page 7-18)
- Spark plug (page 3-6)
- O₂ sensor (page 4-41)
- ECT sensor (page 4-40)

Remove the bolts [1] and wire guides [2] from the cylinder head.

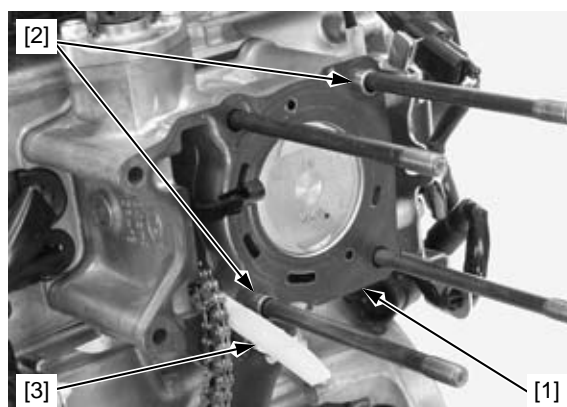
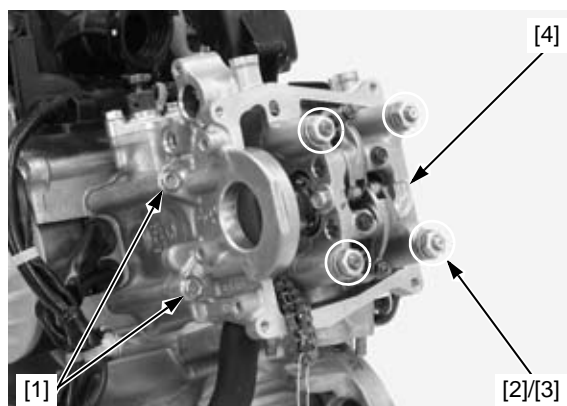


Remove the cylinder head bolts [1].

Loosen the cylinder head nuts [2] in a crisscross pattern in two or three steps.

Remove the nuts and washers [3].

Remove the cylinder head [4].



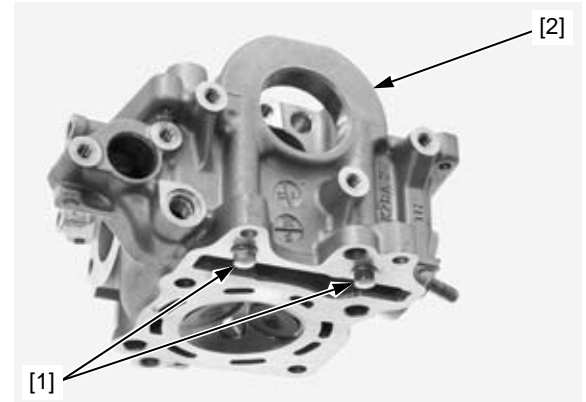
Do not reuse the old gasket.

Remove the gasket [1] and dowel pins [2].

Remove the cam chain guide [3].

DISASSEMBLY

Remove the bolts [1] and water pump holder [2].

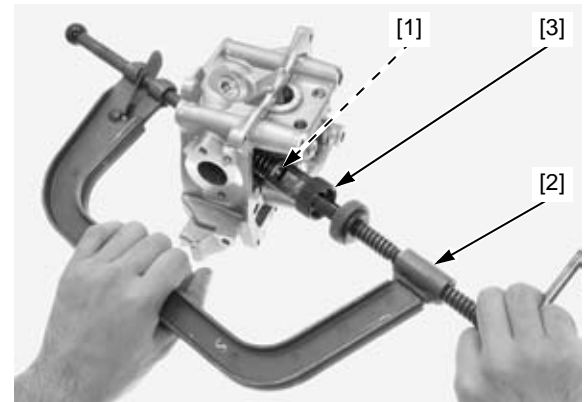


To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.

Remove the valve cotters [1] using the special tool.

TOOLS:

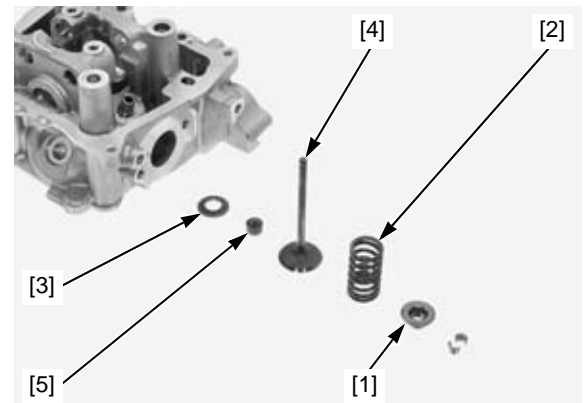
- [2] Valve spring compressor 07757-0010000
 [3] Valve spring compressor attachment 07959-KM30101



Mark all parts during disassembly so they can be placed back in their original locations.

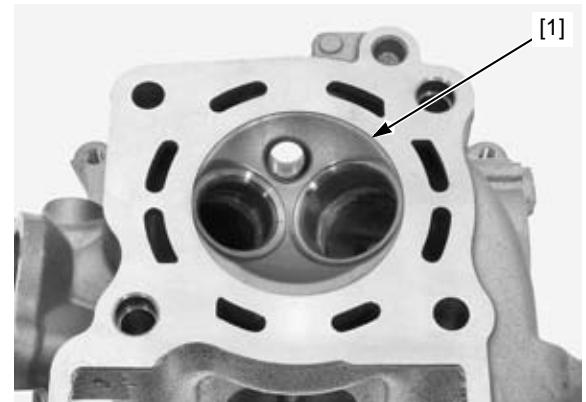
Remove the valve spring compressor and remove the following:

- Valve spring retainers [1]
- Valve springs [2]
- Valve spring seats [3]
- Valves [4]
- Valve stem seals [5]



Avoid damaging the cylinder mating surface and valve seat surfaces.

Remove the carbon deposits from the combustion chamber [1] and clean off the cylinder head gasket surface.



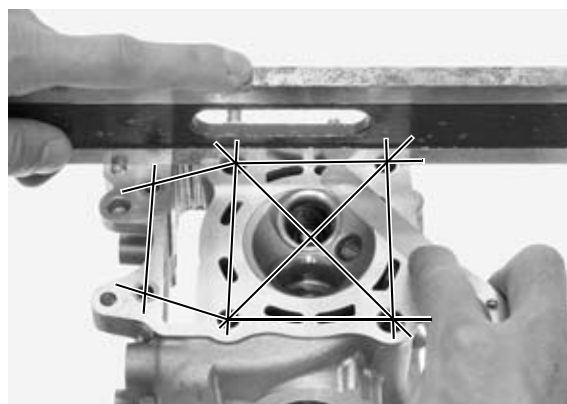
CYLINDER HEAD/VALVES

INSPECTION

CYLINDER HEAD

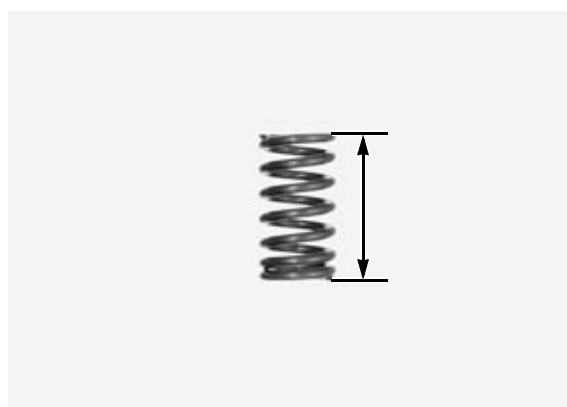
Check the spark plug hole and valve areas for cracks. Check the cylinder head for warpage with a straight edge and a feeler gauge.

SERVICE LIMIT: 0.05 mm (0.002 in)



VALVE SPRING

Check the valve spring for cracks.

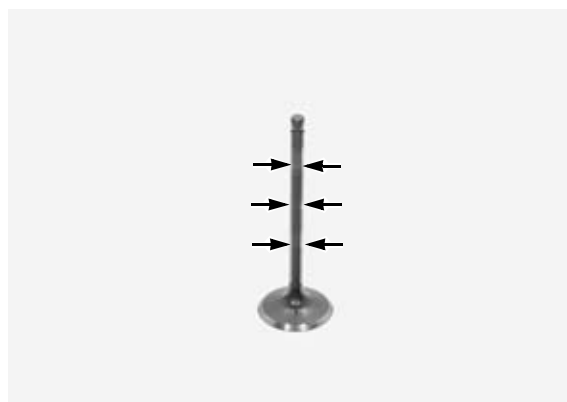


VALVE/VALVE GUIDE

Check that the valve moves smoothly in the guide. Check each valve for bend, burn, scratch or abnormal wear.

Measure each valve stem O.D. and record it.

SERVICE LIMITS: IN/EX: 4.90 mm (0.193 in)



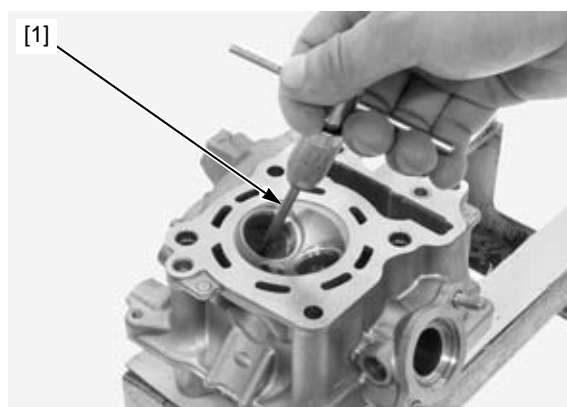
Always rotate the reamer clockwise, never counterclockwise when inserting, removing and reaming.

Ream the valve guide to remove any carbon build up before measuring the guide.

Insert the reamer [1] from the combustion chamber side of the cylinder head and always rotate the reamer clockwise.

TOOL:

[1] Valve guide reamer, 5.0 mm 07984-MA60001



Inspect and reface the valve seats whenever the valve guides are replaced (page 10-15).

Measure each valve guide I.D. and record it.

SERVICE LIMITS: IN/EX: 5.03 mm (0.198 in)

Subtract each valve stem O.D. from the corresponding guide I.D. to obtain the stem-to-guide clearance.

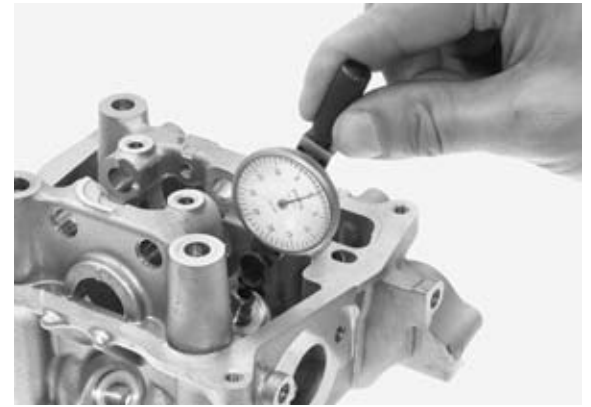
SERVICE LIMITS: IN: 0.08 mm (0.003 in)

EX: 0.10 mm (0.004 in)

If the stem-to-guide clearance exceeds the service limit, determine if a new guide with standard dimensions would bring the clearance within tolerance.

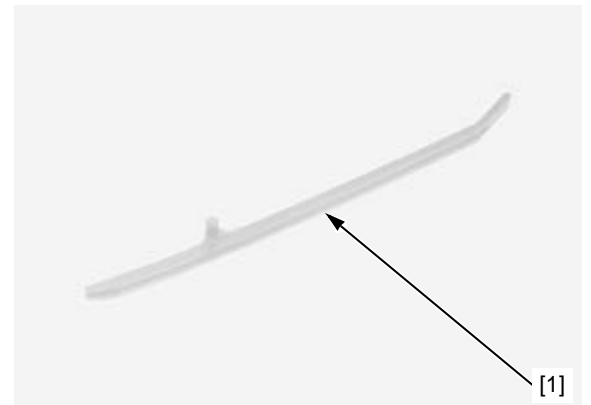
If so, replace any guides as necessary and ream to fit (page 10-14).

If the stem-to-guide clearance exceeds the service limit with new guide, also replace the valve.



CAM CHAIN GUIDE

Check the sliding area of the cam chain guide [1] for excessive wear or damage.



VALVE GUIDE REPLACEMENT

Disassemble the cylinder head (page 10-13).

Chill new valve guides in a freezer for about 1 hour.

NOTE:

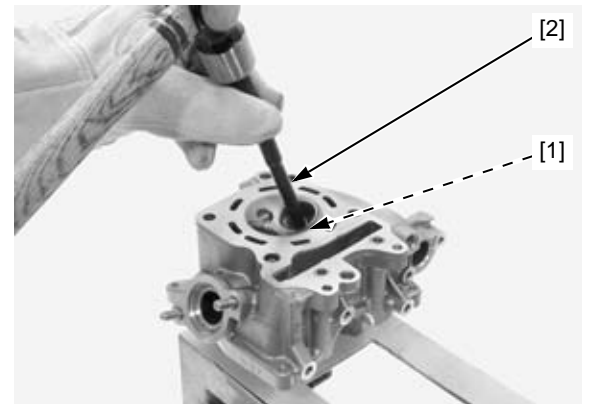
- Be sure to wear heavy gloves to avoid burns when handling the heated cylinder head.
- Using a torch to heat the cylinder head may cause warpage.
- Drive new guides [1] from the camshaft side while the cylinder head is still heated.

Heat the cylinder head to 130 – 140°C with a hot plate or oven. Do not heat the cylinder head beyond 150°C. 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 out of the cylinder head from the combustion chamber side.

TOOL:

[2] Valve guide driver, 5.0 mm 07942-MA60000



CYLINDER HEAD/VALVES

Take out new valve guides [1] from the freezer.

Drive new valve guides into the cylinder head to the specified height from the cylinder head.

TOOL:

[2] Valve guide adjusting driver 07743-0020000

VALVE GUIDE PROJECTION:

WW125EX2:

IN/EX: 10.55 – 10.85 mm (0.415 – 0.427 in)

WW150:

IN/EX: 11.05 – 11.35 mm (0.435 – 0.447 in)

Let the cylinder head cool to room temperature.

Ream new valve guides after installation.

NOTE:

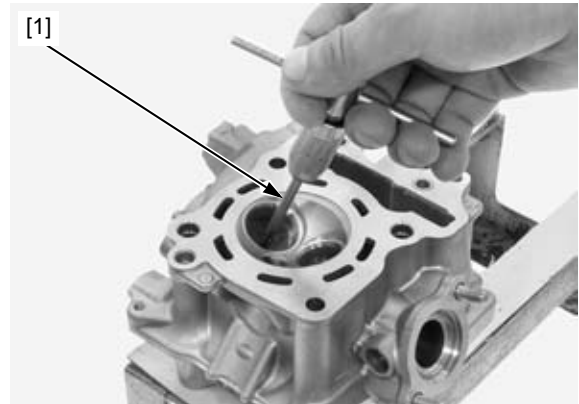
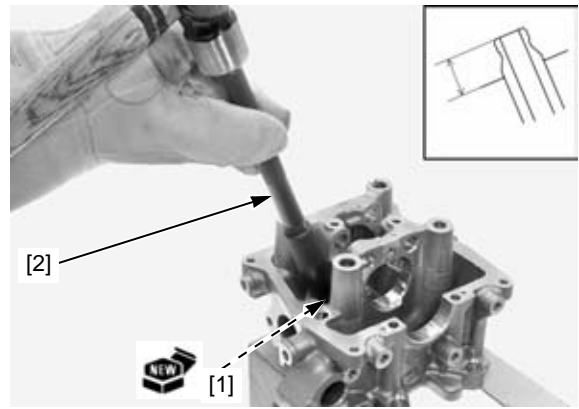
- Take care not to tilt or lean the reamer [1] in the guide while reaming.
- Use cutting oil on the reamer during this operation.

Insert the reamer from the combustion chamber side of the cylinder head and always rotate the reamer clockwise.

TOOL:

[1] Valve guide reamer, 5.0 mm 07984-MA60001

Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat (page 10-16).



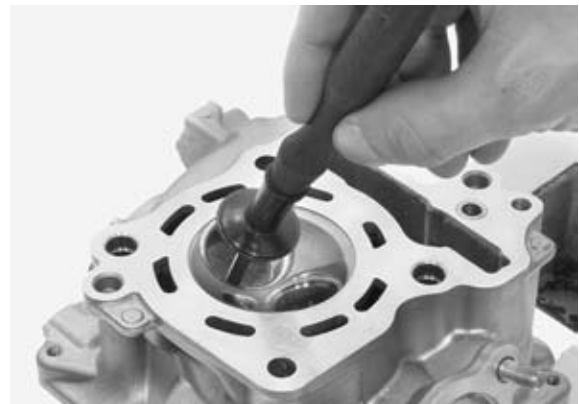
VALVE SEAT INSPECTION/REFACING

INSPECTION

Disassemble the cylinder head (page 10-13).

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, 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.

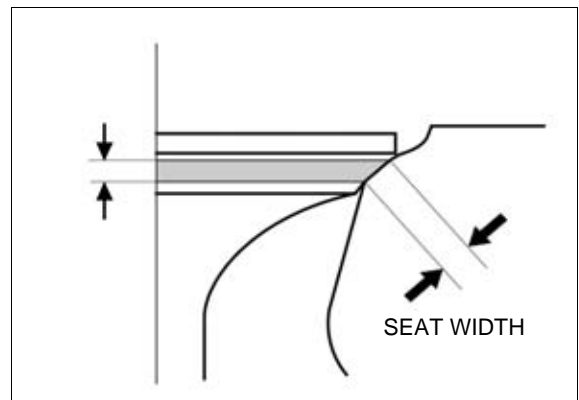
STANDARD: 0.90 – 1.10 mm (0.035 – 0.043 in)

SERVICE LIMIT: 1.5 mm (0.06 in)

If the valve seat width is not within specification, reface the valve seat.

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**NOTE:**

- Follow the refacer manufacturer's operating instructions.
- Be careful not to grind the seat more than necessary.

If the contact area is too high on the valve, the seat must be lowered using a 32° flat cutter.

If the contact area is too low on the valve, the seat must be raised using a 60° interior cutter.

Refinish the seat to specifications, using a 45° finish cutter.

Reface the seat with a 45° cutter whenever a valve guide is replaced.

Use a 45° seat cutter, remove any roughness or irregularities from the seat.

TOOLS:**WW125EX2:**

Seat cutter, 27.5 mm (IN, 45°)	07780-0010200
Seat cutter, 24 mm (EX, 45°)	07780-0010600
Cutter holder, 5.0 mm	07781-0010400

WW150:

Seat cutter, 29 mm (IN, 45°)	07780-0010300
Seat cutter, 27.5 mm (EX, 45°)	07780-0010200
Cutter holder, 5.0 mm	07781-0010400

Use a 32° flat cutter, remove the top 1/4 of the existing valve seat material.

TOOLS:**WW125EX2:**

Flat cutter, 27 mm (IN, 32°)	07780-0013300
Flat cutter, 22 mm (EX, 32°)	07780-0012601
Cutter holder, 5.0 mm	07781-0010400

WW150:

Flat cutter, 30 mm (IN, 32°)	07780-0012200
Flat cutter, 27 mm (EX, 32°)	07780-0013300
Cutter holder, 5.0 mm	07781-0010400

Use a 60° interior cutter, remove the bottom 1/4 of the existing valve seat material.

TOOLS:**WW125EX2:**

Interior cutter, 26 mm (IN, 60°)	07780-0014500
Interior cutter, 22 mm (EX, 60°)	07780-0014202
Cutter holder, 5.0 mm	07781-0010400

WW150:

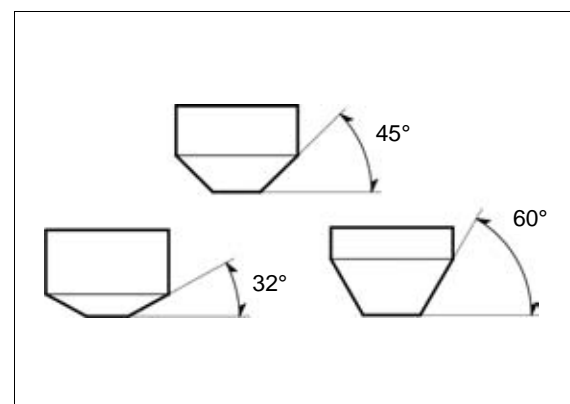
Interior cutter, 30 mm (IN, 60°)	07780-0014000
Interior cutter, 24 mm (EX, 60°)	070PH-Z0D0100
Cutter holder, 5.0 mm	07781-0010400

Using a 45° seat cutter, cut the seat to the proper width.

VALVE SEAT WIDTH:

0.90 – 1.10 mm (0.035 – 0.043 in)

Make sure that all pitting and irregularities are removed.



CYLINDER HEAD/VALVES

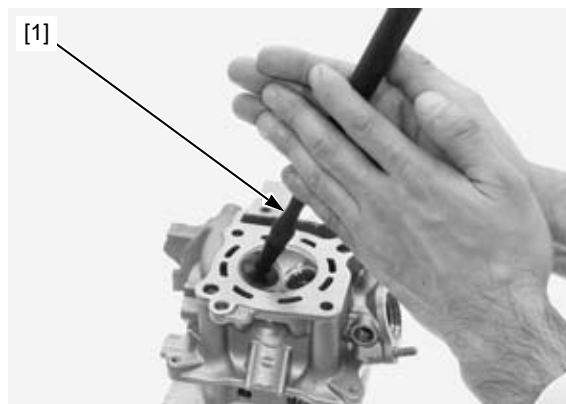
NOTE:

- 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.

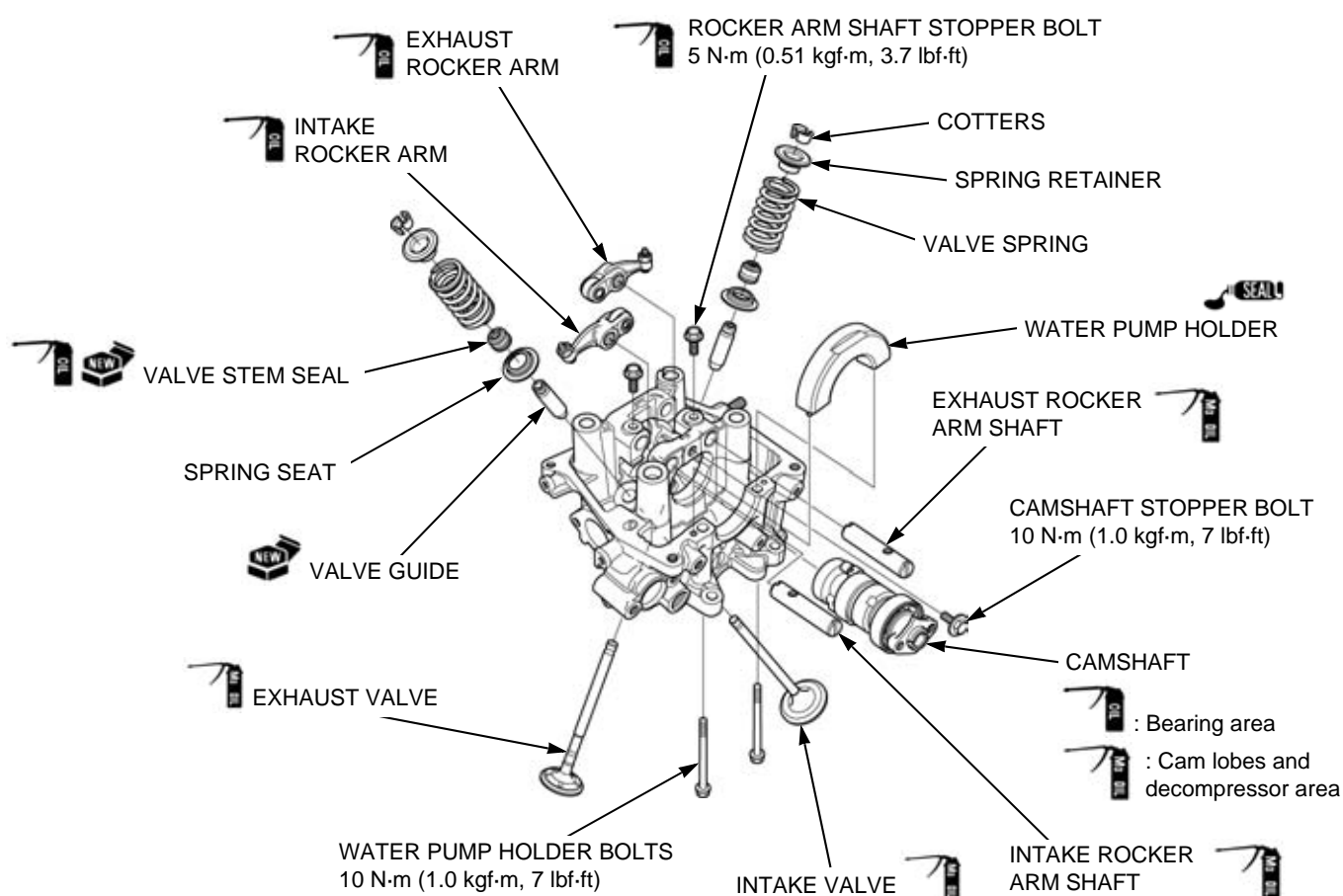
After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

After lapping, wash any residual compound off the cylinder head and valve and recheck the seat contact.

Assemble the cylinder head (page 10-18).



ASSEMBLY



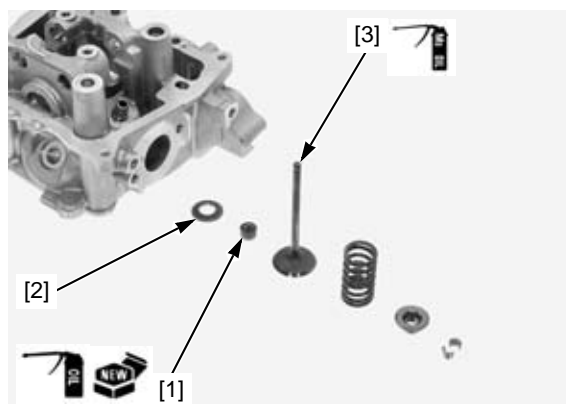
Blow through the oil passage in the cylinder head with compressed air.

Apply engine oil to the inner surface of new valve stem seals [1].

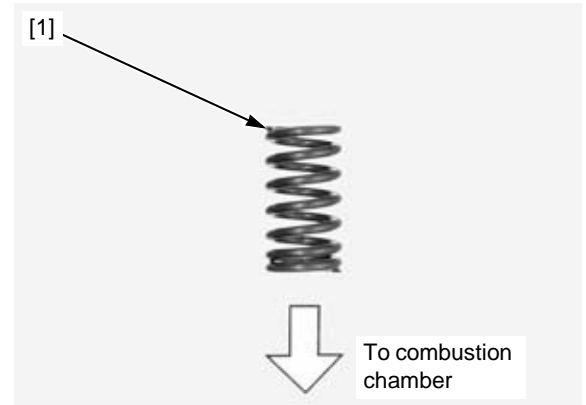
Install the valve spring seats [2] and new valve stem seals.

Apply molybdenum oil solution to the valve stem sliding surface and stem end.

Insert the valves [3] into the valve guides while turning them slowly to avoid damage to the valve stem seals.



Install the valve spring [1] with the tightly wound coil facing the combustion chamber.



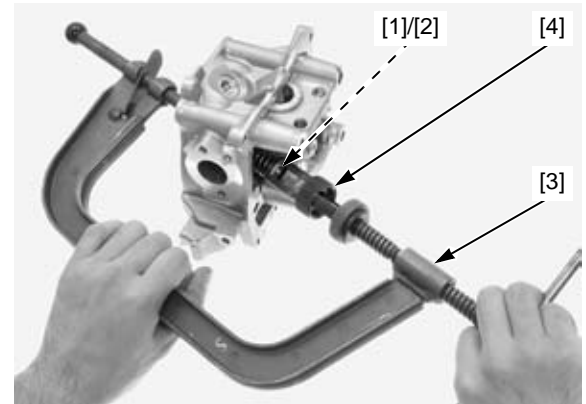
Install the valve spring retainer [1].

To prevent loss of tension, do not compress the valve spring more than necessary to install the cotters.

Install the valve cotters [2] using the special tool.

TOOLS:

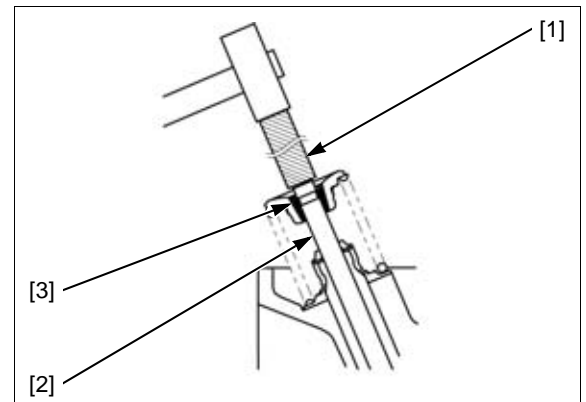
- [3] Valve spring compressor 07757-0010000
- [4] Valve spring compressor attachment 07959-KM30101



Support the cylinder head above the work bench surface to prevent valve damage.

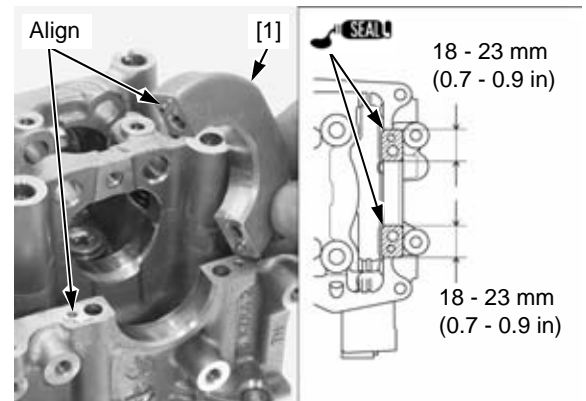
Place a suitable tool [1] onto the valve stem [2].

Tap the tool gently to seat the cotters [3] firmly using a hammer.



Apply liquid sealant (Three Bond 1207B or 1215 or LOCTITE 5060S or 5020 or equivalent) to the mating surface of the cylinder head and water pump holder [1] as shown.

Install the water pump holder while aligning its pins with the holes on the cylinder head.

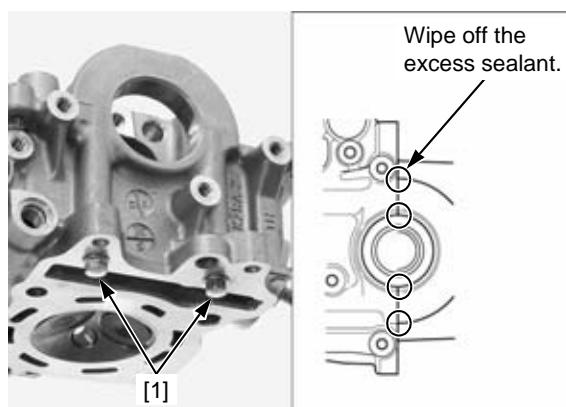


CYLINDER HEAD/VALVES

Install and tighten the water pump holder bolts [1] to the specified torque.

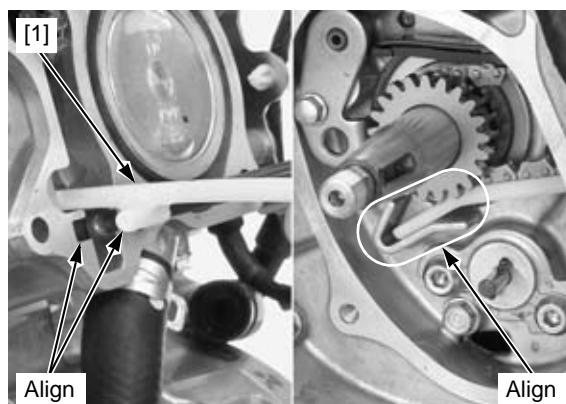
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

After tightening the bolts, wipe off the excess sealant from the water pump joint area and cylinder head cover rubber seal mating surfaces.



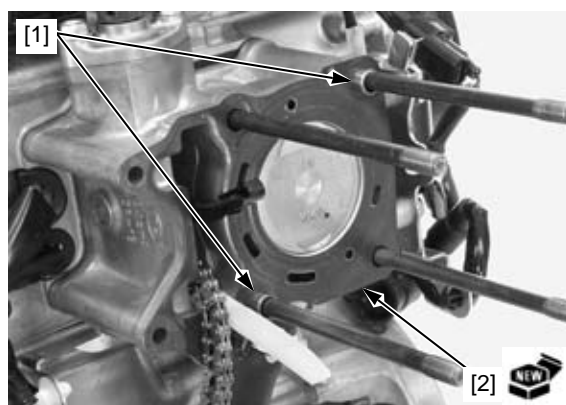
INSTALLATION

Install the cam chain guide [1] while aligning its pins with the grooves on the cylinder and its end with the groove on the right crankcase.



Clean the cylinder and cylinder head mating surface.

Do not reuse the old gasket. Install the dowel pins [1] and a new gasket [2] onto the cylinder.

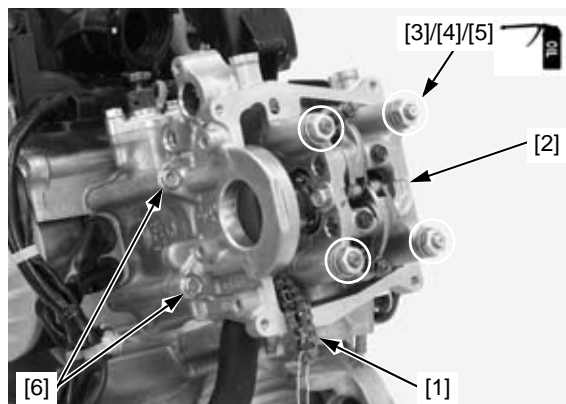


Route the cam chain [1] through the cylinder head [2] and install the cylinder head onto the cylinder.

Apply engine oil to the seating surface and threads of the cylinder head nuts [3], whole surface of the washers [4] and cylinder stud bolt upper threads [5]. Install the cylinder head nuts and washers, then tighten them in a crisscross pattern to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

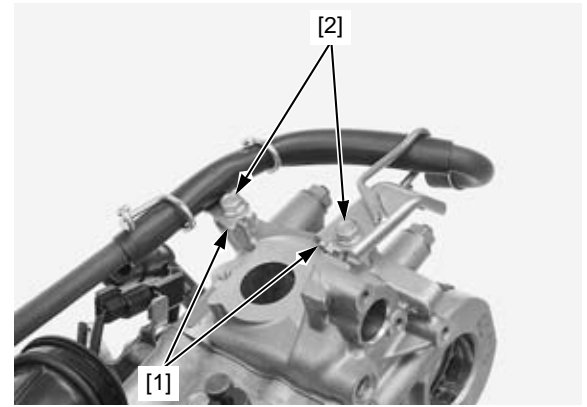
Install and tighten the cylinder head bolts [6].



Install the wire guides [1] and tighten the bolts [2].

Install the following:

- ECT sensor (page 4-40)
- O₂ sensor (page 4-42)
- Spark plug (page 3-6)
- Intake pipe (page 7-19)
- Exhaust pipe/muffler (page 2-13)
- Camshaft (page 10-9)
- Engine (page 16-6)



CAM CHAIN TENSIONER LIFTER

REMOVAL

Remove the throttle body (page 7-12).

Remove the tensioner screw [1] and O-ring [2].

Install the special tool into the tensioner body and turn the tool clockwise until it stops turning.

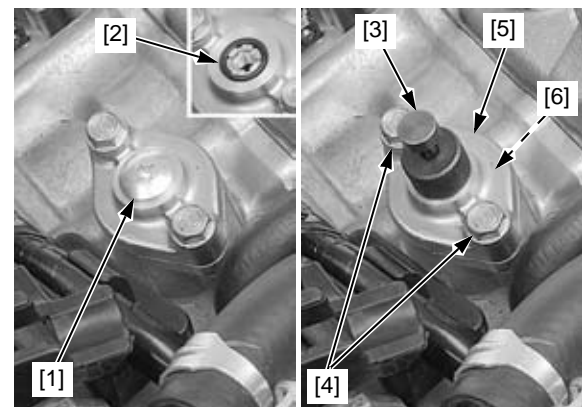
Hold the tensioner lifter by pushing the tool while aligning the tabs of the tool with the grooves of the tensioner lifter.

TOOL:

[3] Tensioner stopper 070MG-0010100

Remove the bolts [4] and cam chain tensioner lifter [5].

Remove the gasket [6] from the tensioner lifter.

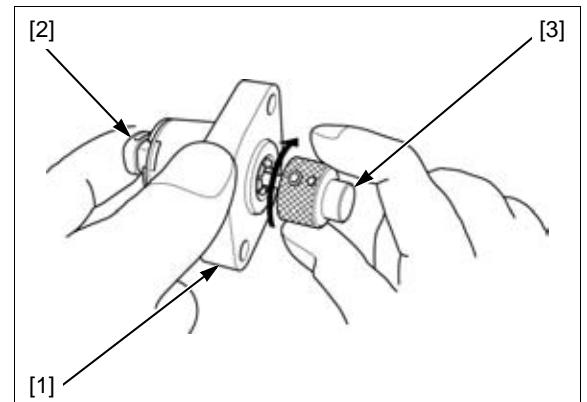


INSPECTION

Remove the cam chain tensioner lifter [1] (page 10-21).

Check the cam chain tensioner lifter operation:

- The tensioner shaft [2] should not go into the body when it is pushed.
- When it is turned clockwise with the tensioner stopper [3], the tensioner shaft should be pulled into the body. The shaft should protrude from the body as soon as the tensioner stopper is released.



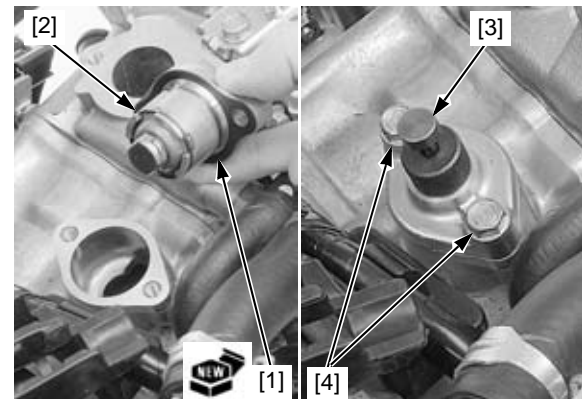
INSTALLATION

Install a new gasket [1] to the cam chain tensioner lifter [2].

Install the tensioner stopper [3] and turn the tensioner shaft clockwise with it to retract the tensioner fully.

Install the tensioner lifter and two bolt [4], then tighten them.

Remove the tensioner stopper.



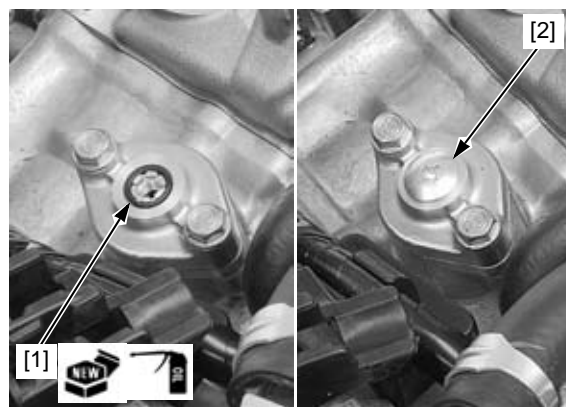
CYLINDER HEAD/VALVES

Apply engine oil to a new O-ring [1].

Install a new O-ring to the cam chain tensioner lifter.
Install and tighten the screw [2] to the specified torque.

TORQUE: 4 N·m (0.41 kgf·m, 3.0 lbf·ft)

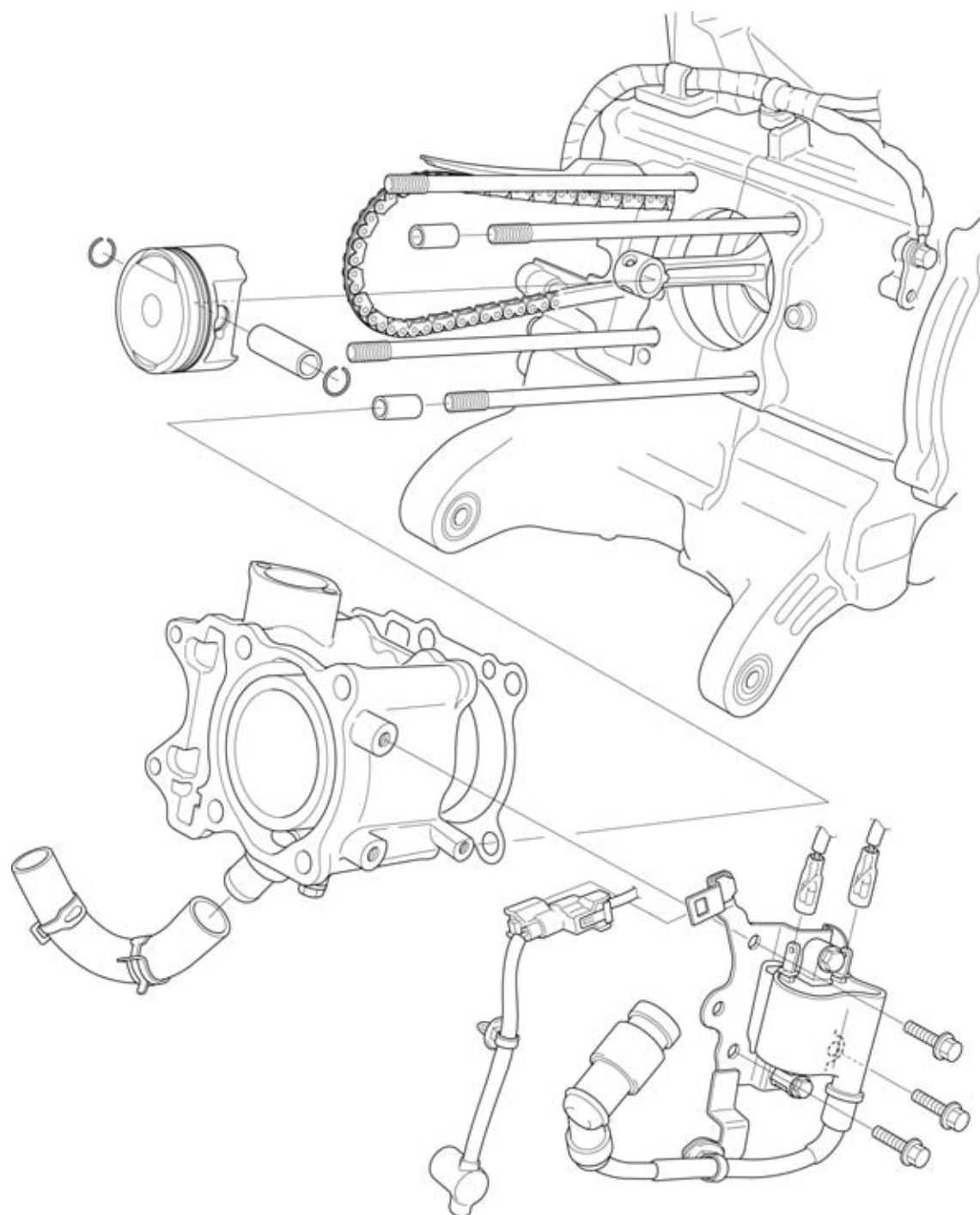
Install the throttle body (page 7-14).



11. CYLINDER/PISTON

COMPONENT LOCATION	11-2	CYLINDER	11-5
SERVICE INFORMATION	11-3	PISTON	11-7
TROUBLESHOOTING.....	11-4		

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers maintenance of the cylinder and piston. These services require engine removal.
- Be careful not to damage mating surfaces when removing the cylinder. Do not tap the cylinder too hard during removal.
- Take care not to damage the cylinder wall and piston.
- Clean all disassembled parts with clean solvent and dry them using compressed air before inspection.
- When removing the piston, clean carbon and sludge from the top of the cylinder.

SPECIFICATIONS

WW125EX2:

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		52.400 – 52.410 (2.0630 – 2.0634)	52.50 (2.067)
	Out-of-round		–	0.05 (0.002)
	Taper		–	0.05 (0.002)
	Warpage		–	0.05 (0.002)
Piston, piston rings, piston pin	Piston O.D.		52.370 – 52.390 (2.0618 – 2.0626)	52.35 (2.061)
	Piston O.D. measurement point		6.5 (0.26) from bottom of skirt	–
	Piston pin bore I.D.		13.002 – 13.008 (0.5119 – 0.5121)	13.04 (0.513)
	Piston pin O.D.		12.994 – 13.000 (0.5116 – 0.5118)	12.96 (0.510)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.02 (0.001)
	Piston ring-to-ring groove clearance	Top	0.015 – 0.055 (0.0006 – 0.0022)	0.08 (0.003)
		Second	0.015 – 0.055 (0.0006 – 0.0022)	0.08 (0.003)
	Piston ring end gap	Top	0.10 – 0.25 (0.004 – 0.010)	0.45 (0.018)
		Second	0.25 – 0.45 (0.010 – 0.018)	0.65 (0.026)
Oil (side rail)		0.20 – 0.70 (0.008 – 0.028)	–	
Cylinder-to-piston clearance			0.01 – 0.04 (0.0004 – 0.0016)	0.09 (0.004)
Connecting rod small end I.D.			13.010 – 13.028 (0.5122 – 0.5129)	13.05 (0.514)
Connecting rod-to-piston pin clearance			0.010 – 0.034 (0.0004 – 0.0013)	0.05 (0.002)

WW150:

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		58.000 – 58.010 (2.2835 – 2.2839)	–
	Out-of-round		–	0.05 (0.002)
	Taper		–	0.05 (0.002)
	Warpage		–	0.05 (0.002)
Piston, piston rings, piston pin	Piston O.D.		57.970 – 57.990 (2.2822 – 2.2831)	–
	Piston O.D. measurement point		6.5 (0.26) from bottom of skirt	–
	Piston pin bore I.D.		14.002 – 14.008 (0.5513 – 0.5515)	14.04 (0.553)
	Piston pin O.D.		13.994 – 14.000 (0.5509 – 0.5512)	13.96 (0.550)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.02 (0.001)
	Piston ring-to-ring groove clearance	Top	0.015 – 0.055 (0.0006 – 0.0022)	0.08 (0.003)
		Second	0.015 – 0.055 (0.0006 – 0.0022)	0.08 (0.003)
	Piston ring end gap	Top	0.10 – 0.25 (0.004 – 0.010)	0.45 (0.018)
		Second	0.38 – 0.52 (0.015 – 0.020)	–
Oil (side rail)		0.20 – 0.70 (0.008 – 0.028)	–	
Cylinder-to-piston clearance			0.01 – 0.04 (0.0004 – 0.0016)	0.09 (0.004)
Connecting rod small end I.D.			14.010 – 14.028 (0.5516 – 0.5523)	14.06 (0.554)
Connecting rod-to-piston pin clearance			0.010 – 0.034 (0.0004 – 0.0013)	0.05 (0.002)

TORQUE VALUE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder stud bolt	4	8	—	See page 11-6

TROUBLESHOOTING

Compression too low, hard starting or poor performance at low speed

- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston
- Bent connecting rod
- Cylinder head/valve problem (page 10-14)

Compression too high, overheating or knocking

- Excessive carbon build-up on piston head or on combustion chamber

Excessive smoke

- Worn cylinder, piston or piston ring
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall
- Cylinder head/valve problem (page 10-14)

Abnormal noise

- Worn piston pin or piston pin hole
- Worn connecting rod small end
- Worn cylinder, piston or piston rings

Piston ring sticking/scuffing, bearing damage

- Clogged oil gallery or oil strainer screen
- Internal oil leak
- Not using recommended engine oil

CYLINDER

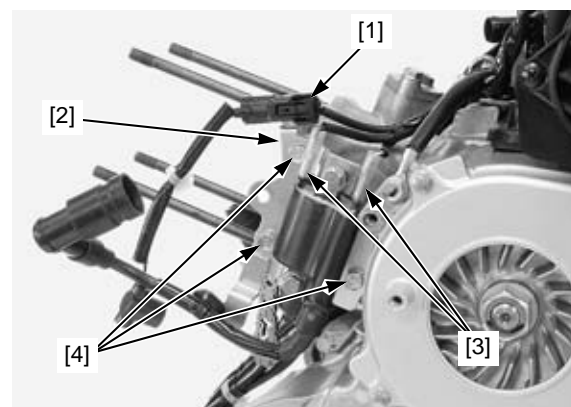
REMOVAL

Remove the cylinder head (page 10-12).

Release the O₂ sensor 1P (Black) connector [1] from the ignition coil stay [2].

Disconnect the ignition coil wire connectors [3]

Remove the bolts [4] and ignition coil stay.

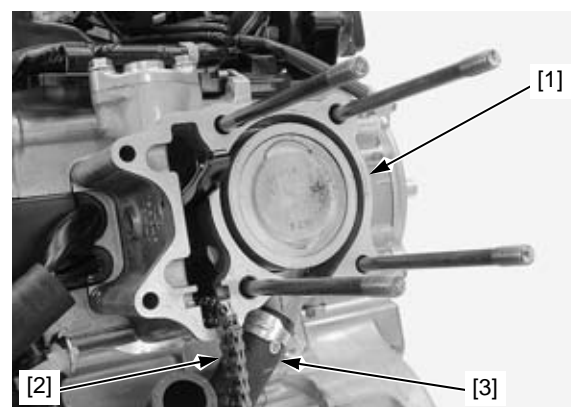


Be careful not to damage the mating surface.

Remove the cylinder [1].

- Attach a piece of wire to the cam chain [2] to prevent it from falling into the crankcase.

Disconnect the water hose [3] from the cylinder.



Do not reuse the old gasket.

Remove the gasket [1] and dowel pins [2].

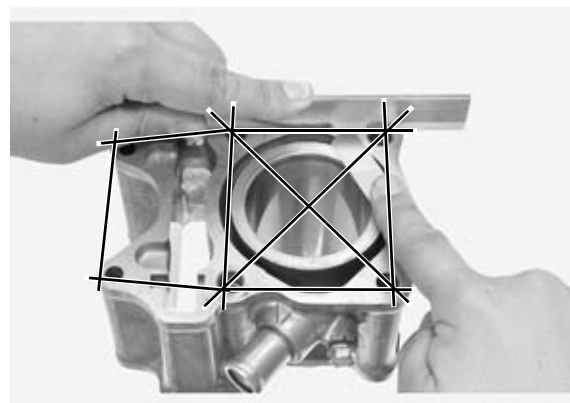
Clean off any gasket material from the cylinder mating surface of the crankcase.



INSPECTION

Check the cylinder for warpage with a straight edge and feeler gauge in the directions shown.

SERVICE LIMIT: 0.05 mm (0.002 in)



CYLINDER/PISTON

Inspect the cylinder bore for wear or damage.
Measure the cylinder I.D. in the X and Y axis at three levels.
Take the maximum reading to determine the cylinder wear.

WW125EX2:

STANDARD: 52.400 - 52.410 mm (2.0630 - 2.0634 in)

WW150:

STANDARD: 58.000 - 58.010 mm (2.2835 - 2.2839 in)

Calculate the taper and out-of-round at three levels in the X and Y axis. Take the maximum reading to determine both measurements.

SERVICE LIMITS: Taper: 0.05 mm (0.002 in)
Out of round: 0.05 mm (0.002 in)

The cylinder must be rebored and an oversize piston/piston rings fitted if the service limits are exceeded.

The following oversize pistons/piston rings are available:

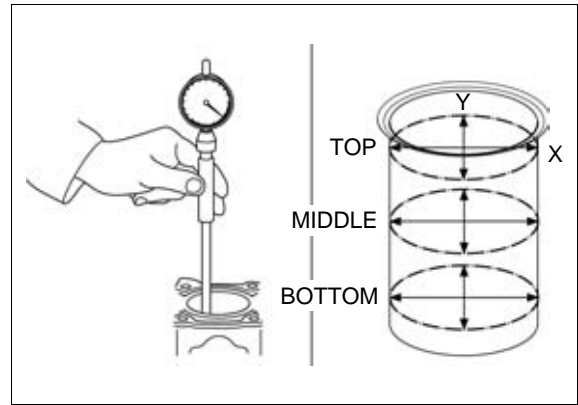
0.25 mm (0.010 in)

0.50 mm (0.020 in)

0.75 mm (0.030 in)

1.00 mm (0.039 in)

The piston to cylinder clearance for the oversize piston must be: 0.01 – 0.04 mm (0.0004 – 0.0016 in).



STUD BOLT REPLACEMENT

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

Install the stud bolts with their larger thread end O.D. [3] sides facing the crankcase.

Install new stud bolts A [1] into the right crankcase.

Install new stud bolts B [2] into the left crankcase.

Tighten the stud bolts to the specified torque.

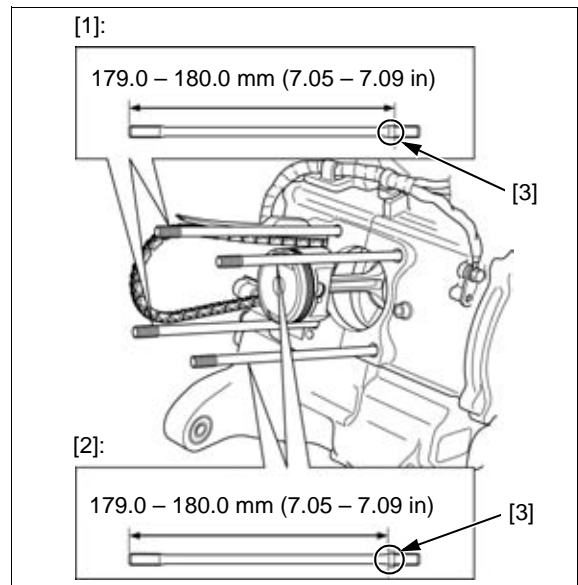
TORQUE: 9 N·m (0.9 kgf·m, 6.6 lbf·ft)

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

SPECIFIED LENGTH:

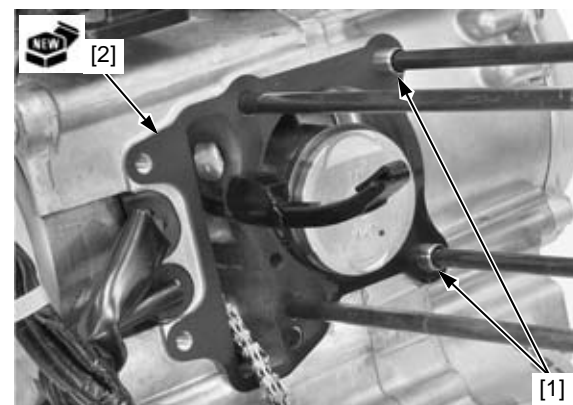
STUD BOLT A: 179.0 – 180.0 mm (7.05 – 7.09 in)

STUD BOLT B: 179.0 – 180.0 mm (7.05 – 7.09 in)



INSTALLATION

Do not reuse the old gasket. Install the dowel pins [1] and a new gasket [2].

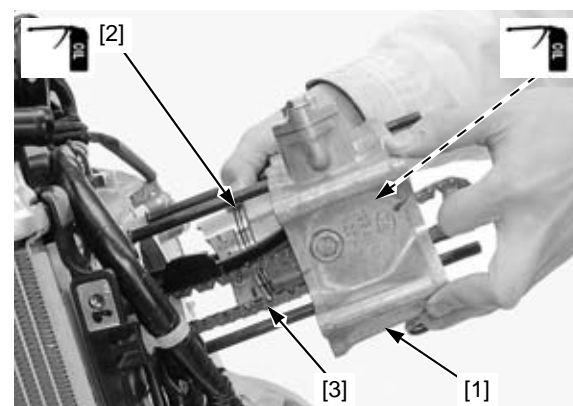


Apply engine oil to the cylinder [1] inner surface and piston sliding surface.
Apply engine oil to the piston rings [2] whole surface.

Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.

Route the cam chain [3] through the cylinder.

Install the cylinder over the piston while compressing the piston rings with your finger.

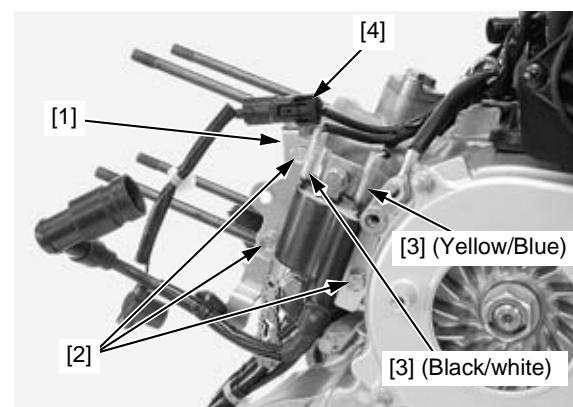


Install the ignition coil stay [1] and tighten the bolts [2].

Connect the ignition coil wire connectors [3].

Install the O₂ sensor 1P (Black) connector [4] to the ignition coil stay.

Install the cylinder head (page 10-20).



PISTON

REMOVAL

Be careful not to let the piston pin clips fall into the opening of the crankcase.

Remove the cylinder (page 11-5).

Remove the piston pin clips [1] with pliers.

Push the piston pin [2] out of the piston [3] and connecting rod, then remove the piston.

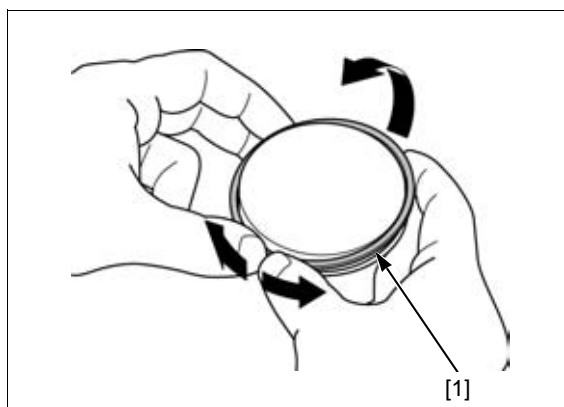


CYLINDER/PISTON

Spread each piston ring [1] and remove it by lifting up at a point opposite the gap.

Never use a wire brush. It will damage the groove.

Clean carbon deposits from the ring grooves with a ring that will be discarded.

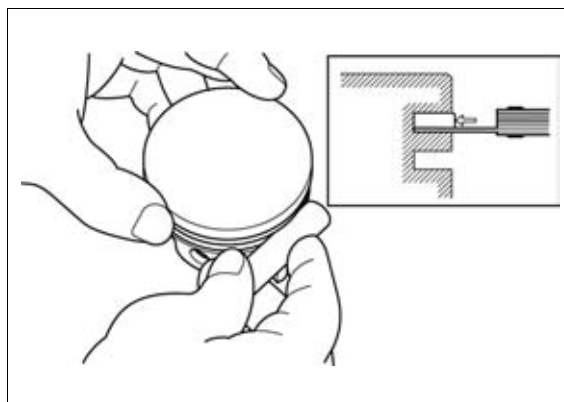


INSPECTION

Inspect the piston rings for movement by rotating the rings. The rings should be able to move in their grooves without catching.

Push the ring until the outer surface of the piston ring is nearly flush with the piston and measure the ring-to-groove clearance.

SERVICE LIMITS: Top/Second: 0.08 mm (0.003 in)



Insert each piston ring into the bottom of the cylinder squarely using the piston. Measure the ring end gap.

STANDARD:

WW125EX2:

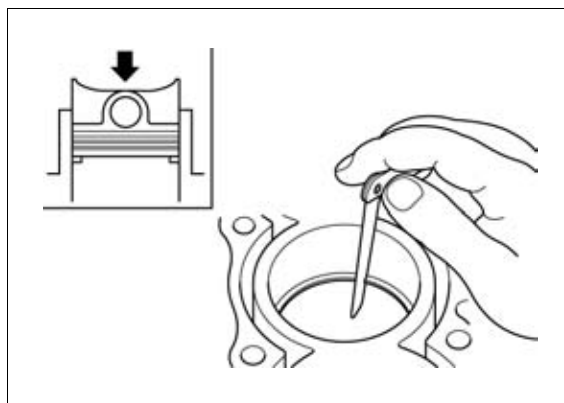
Top: 0.10 - 0.25 mm (0.004 - 0.010 in)

Second: 0.25 - 0.45 mm (0.010 - 0.018 in)

WW150:

Top: 0.10 - 0.25 mm (0.004 - 0.010 in)

Second: 0.38 - 0.52 mm (0.015 - 0.020 in)



Check the piston outer surface for scratches or damage.

Measure the piston pin hole. Take the maximum reading to determine I.D.

STANDARD:

WW125EX2: 13.002 - 13.008 mm (0.5119 - 0.5121 in)

WW150: 14.002 - 14.008 mm (0.5513 - 0.5515 in)

Measure the piston pin O.D. at piston and connecting rod sliding areas.

STANDARD:

WW125EX2: 12.994 - 13.000 mm (0.5116 - 0.5118 in)

WW150: 13.994 - 14.000 mm (0.5509 - 0.5512 in)

Calculate the piston-to-piston pin clearance.

STANDARD: 0.002 - 0.014 mm (0.0001 - 0.0006 in)

Measure the piston O.D. at the point 6.5 mm (0.26 in) from the bottom and 90° to the piston pin hole.

STANDARD:

WW125EX2: 52.370 - 52.390 mm (2.0618 - 2.0626 in)

WW150: 57.970 - 57.990 mm (2.2822 - 2.2831 in)

Calculate the cylinder-to-piston clearance (cylinder I.D.: page 11-6).

STANDARD: 0.01 - 0.04 mm (0.0004 - 0.0016 in)

Measure the connecting rod small end I.D.

STANDARD:

WW125EX2: 13.010 - 13.028 mm (0.5122 - 0.5129 in)

WW150: 14.010 - 14.028 mm (0.5516 - 0.5523 in)

Calculate the connecting rod-to-piston pin clearance.

STANDARD: 0.010 - 0.034 mm (0.0004 - 0.0013 in)

INSTALLATION

Apply engine oil to the rings and ring grooves [1].

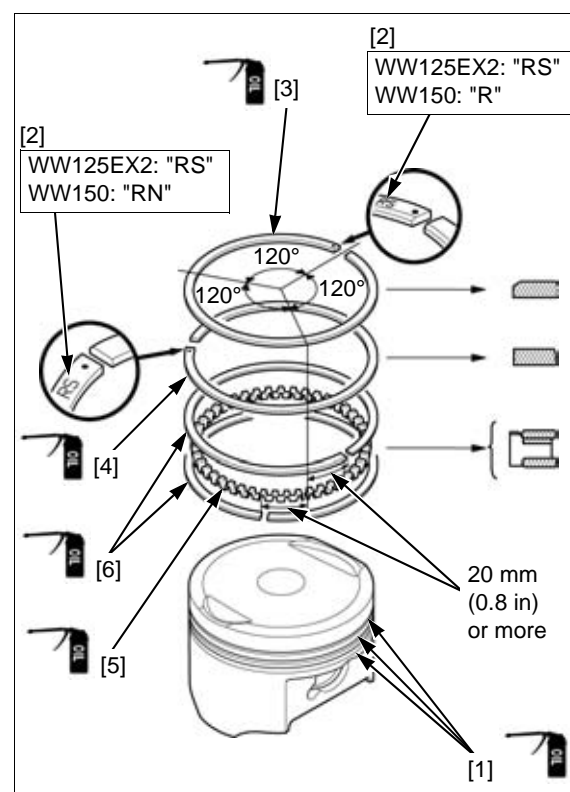
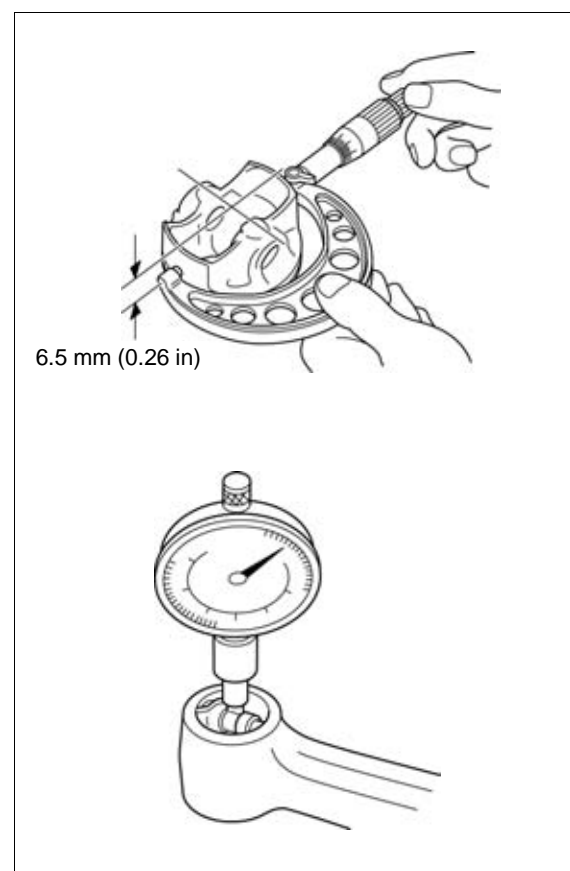
Carefully install the piston rings into the piston ring grooves with the markings [2] facing up.

NOTE:

- Do not confuse the top ring [3] and second ring [4].
- To install the oil ring, install the spacer [5] first, then install the side rails [6].

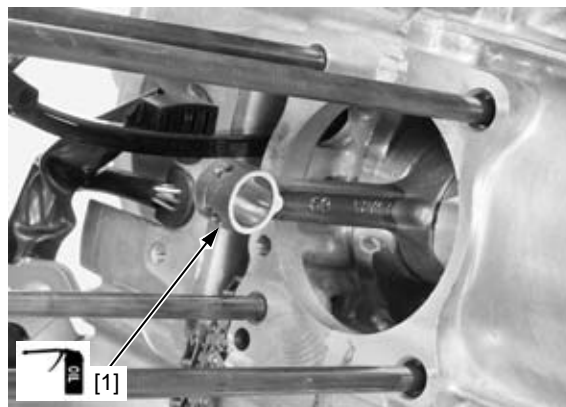
Stagger the piston ring end gaps 120° apart from each other.

Stagger the side rail end gaps as shown.



CYLINDER/PISTON

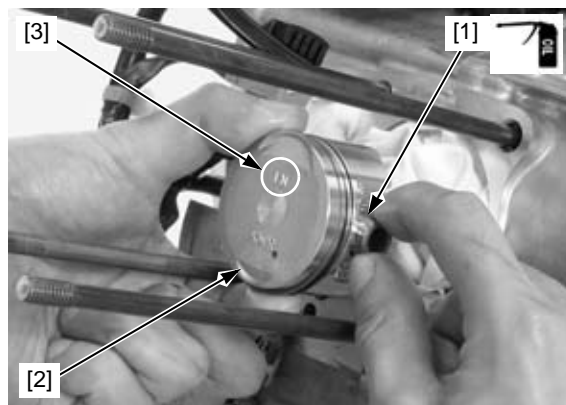
Apply engine oil to the connecting rod [1] small end inner surface.



Apply engine oil to the piston pin [1] outer surface and piston pin hole inner surface.

Install the piston [2] with the "IN" mark [3] facing the intake side.

Install the piston pin.



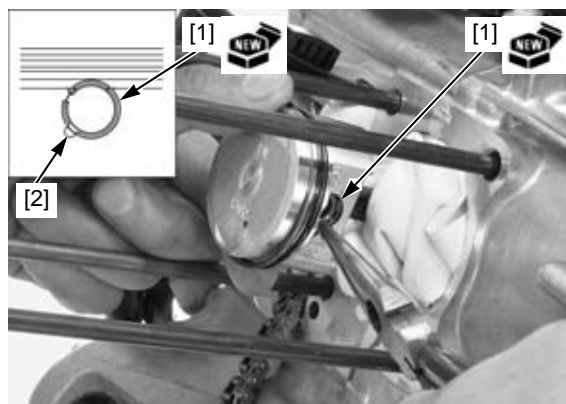
Be careful not to let the piston pin clips fall into the opening of the crankcase.

Install the new pin clips [1].

NOTE:

- Make sure the piston pin clips are seated securely.
- Do not align the piston pin clip end gap with the piston cut-out [2].

Install the cylinder (page 11-7).



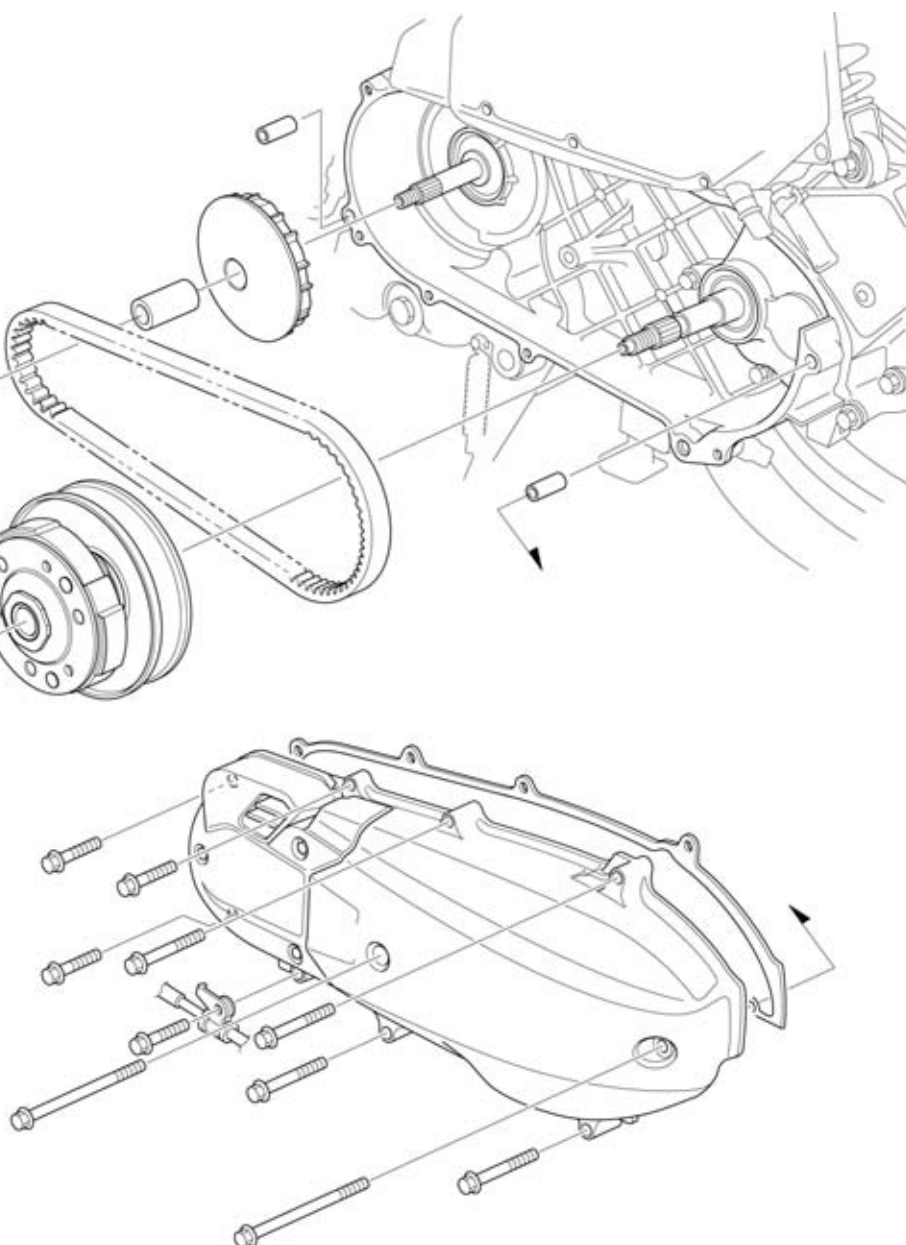
12. DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

COMPONENT LOCATION	12-2	DRIVE BELT	12-6
SERVICE INFORMATION	12-3	DRIVE PULLEY.....	12-7
TROUBLESHOOTING.....	12-3	CLUTCH/DRIVEN PULLEY	12-9
LEFT CRANKCASE COVER	12-4		

COMPONENT LOCATION

59 N·m (6.0 kgf·m, 44 lbf·ft)

49 N·m (5.0 kgf·m, 36 lbf·ft)



SERVICE INFORMATION

GENERAL

- This section covers maintenance of the drive pulley, driven pulley and clutch.
- These services can be done with the engine installed in the frame.
- Avoid getting grease and oil on the drive belt and drive/driven pulley faces in order to prevent belt slippage.
- Do not apply grease to the weight rollers.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Drive belt width		22.0 (0.87)	21.0 (0.83)
Movable drive face	Bushing I.D.	23.989 – 24.052 (0.9444 – 0.9469)	24.08 (0.948)
	Boss O.D.	23.960 – 23.974 (0.9433 – 0.9439)	23.93 (0.942)
	Weight roller O.D.	19.92 – 20.08 (0.784 – 0.791)	19.5 (0.77)
Clutch	Lining thickness	–	2.0 (0.08)
	Clutch outer I.D.	125.0 – 125.2 (4.92 – 4.93)	125.5 (4.94)
Driven pulley	Face spring free length	103.1 (4.06)	–
	Driven face O.D.	33.965 – 33.985 (1.3372 – 1.3380)	33.94 (1.336)
	Movable driven face I.D.	34.000 – 34.025 (1.3386 – 1.3396)	34.06 (1.341)

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Drive pulley face nut	1	14	59 (6.0, 44)	Apply oil to the threads and seating surface.
Clutch/driven pulley nut	1	28	54 (5.5, 40)	
Clutch outer nut	1	12	49 (5.0, 36)	

TROUBLESHOOTING

Engine starts but scooter won't move

- Worn drive belt
- Damaged ramp plate
- Worn or damaged clutch shoes and/or clutch outer
- Broken driven face spring

Engine stalls or scooter creeps

- Broken clutch shoe spring

Poor performance at high speed or lack of power

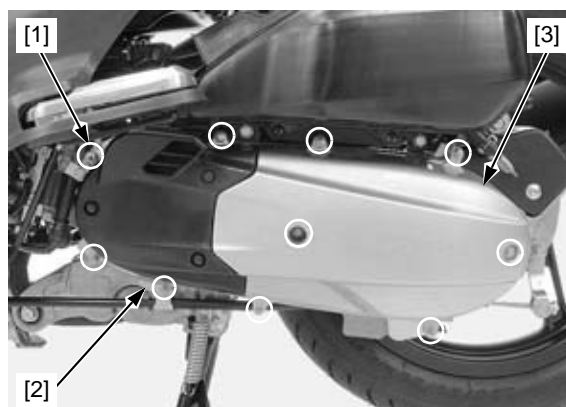
- Worn drive belt
- Weak driven face spring
- Worn weight rollers
- Contaminated pulley faces

LEFT CRANKCASE COVER

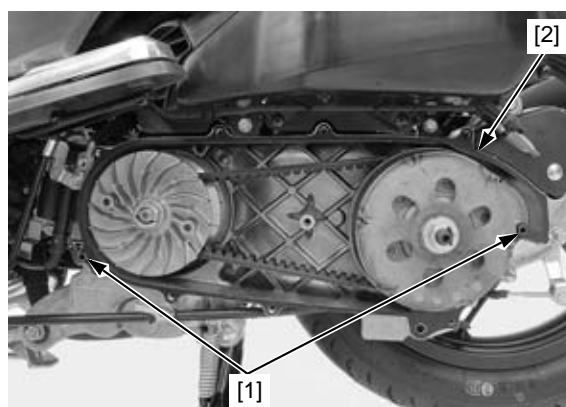
REMOVAL

Remove the left side cover (page 2-6).

Remove the bolts [1], rear brake cable clamp [2] and left crankcase cover [3].



Remove the dowel pins [1] and gasket [2] from the left crankcase.



BEARING INSPECTION/ REPLACEMENT

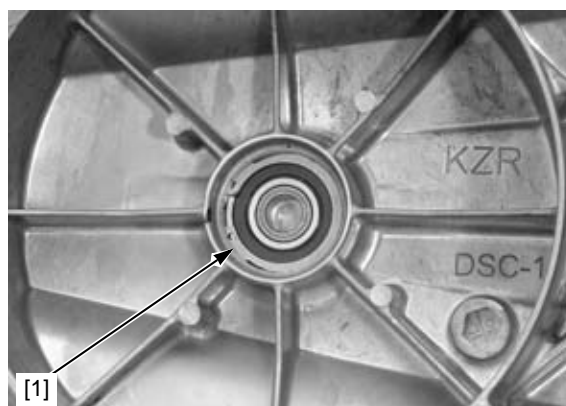
INSPECTION

Turn the inner race of the bearing with your finger.
The bearing should turn smoothly and quietly.
Also check that the bearing outer race fits tightly in the left crankcase cover.

Replace the bearing if the inner race does not turn smoothly, quietly, or if the outer race fits loosely in the left crankcase cover.

REPLACEMENT

Remove the snap ring [1] from the left crankcase cover groove.



Remove the drive shaft bearing [1]/bushing [2] using the special tools.

TOOLS:

[3] Bearing remover head, 10 mm 07936-GE00200

[4] Bearing remover shaft, 10 mm 07936-GE00100

[5] Remover weight 07741-0010201

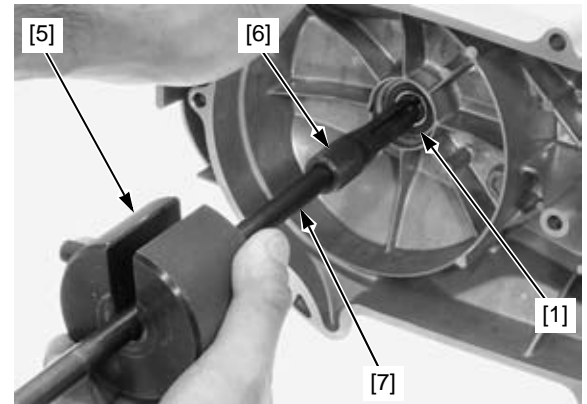
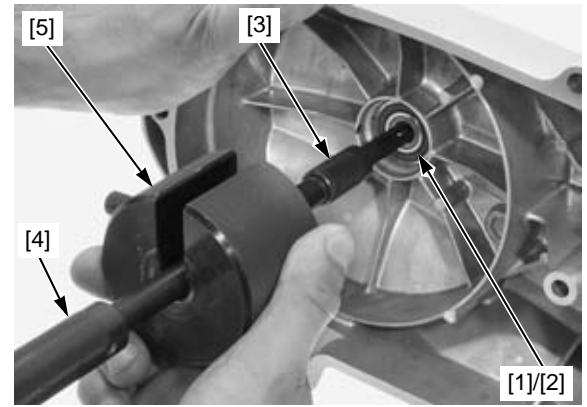
– If the bearing remains in the left crankcase cover, remove it using the following tools:

TOOLS:

[6] Bearing remover head, 15 mm 07936-KC10200

[7] Bearing remover shaft, 15 mm 07936-KC10100

[5] Remover weight 07741-0010201



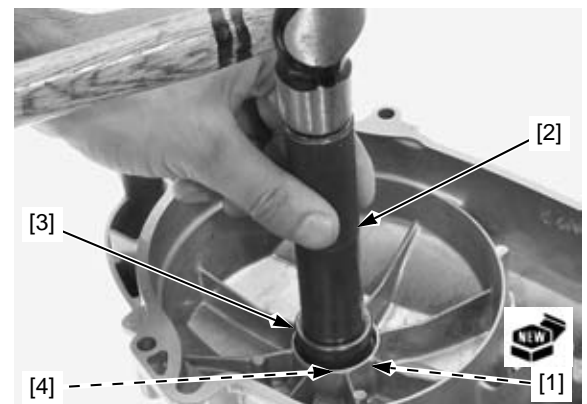
Drive a new drive shaft bearing/bushing [1] into the left crankcase cover squarely until it is fully seated, using the special tools.

TOOLS:

[2] Driver 07749-0010000

[3] Attachment, 32 x 35 mm 07746-0010100

[4] Pilot, 10 mm 07746-0040100



Install the snap ring with the chamfered edge facing the bearing.

Install the snap ring [1] to the left crankcase cover groove.



DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

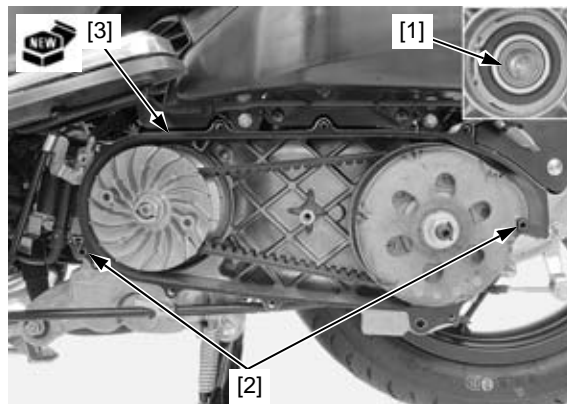
INSTALLATION

Clean the gasket mating surface.

Clean any oil and grease from the bearing bushing [1] on the left crankcase cover.

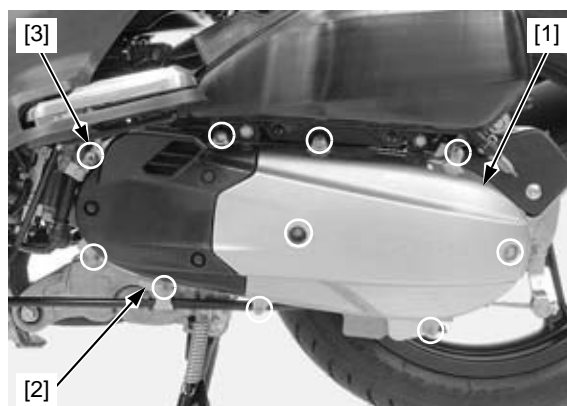
Install the dowel pins [2].

Install a new cover gasket [3].



Install the left crankcase cover [1], rear brake cable clamp [2] and tighten the bolts [3].

Install the left side cover (page 2-6).



DRIVE BELT

REPLACEMENT

Remove the following:

- Drive pulley face (page 12-7)
- Clutch outer (page 12-9)

Slide off the clutch/driven pulley assembly [1] from the drive shaft [2].

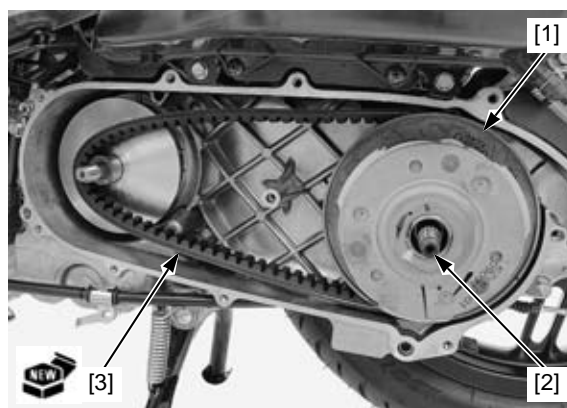
Remove the drive belt [3] and replace it with a new one.

Do not get grease on the drive shaft splines from the driven face inside.

Install the clutch/driven pulley assembly onto the drive shaft.

Install the following:

- Clutch outer (page 12-18)
- Drive pulley face (page 12-9)



DRIVE PULLEY

REMOVAL

Remove the left crankcase cover (page 12-4).

Hold the drive pulley face [1] with special tool and loosen the drive pulley face nut [2].

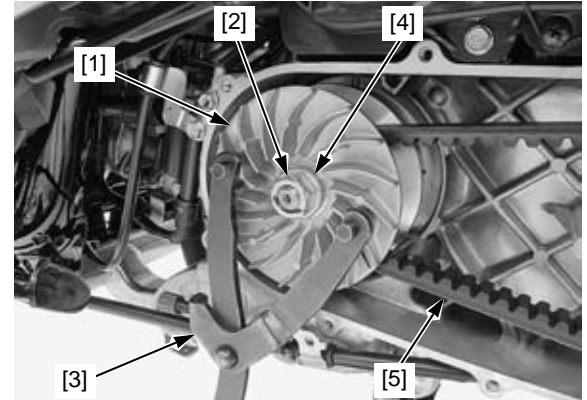
TOOL:

[3] Clutch center holder 07725-0030000

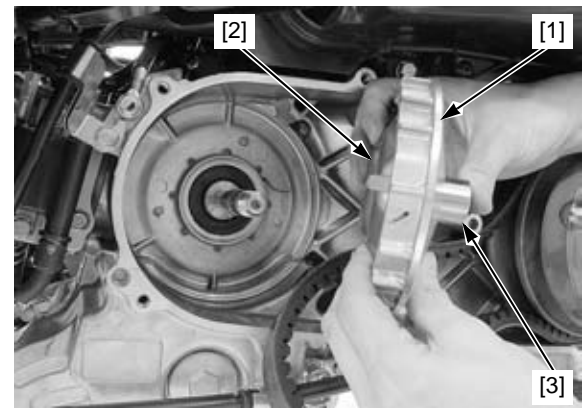
Remove the following:

- Nut
- Collar [4]
- Drive pulley face

Release the drive belt [5] from the drive pulley boss.



Remove the movable drive face assembly [1] while holding the back of the face (ramp plate [2]) and drive face boss [3].



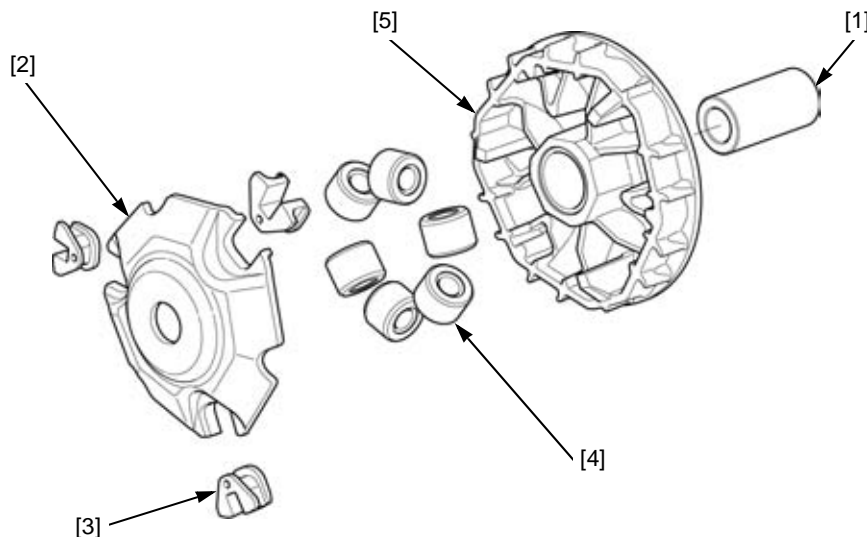
DISASSEMBLY/ASSEMBLY

Remove the following:

- Drive face boss [1]
- Ramp plate [2]
- Slide pieces [3]
- Weight rollers [4]

Assembly is in the reverse order of disassembly.

- Clean any oil and grease from the weight rollers and movable drive face [5].



DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

INSPECTION

DRIVE PULLEY FACE

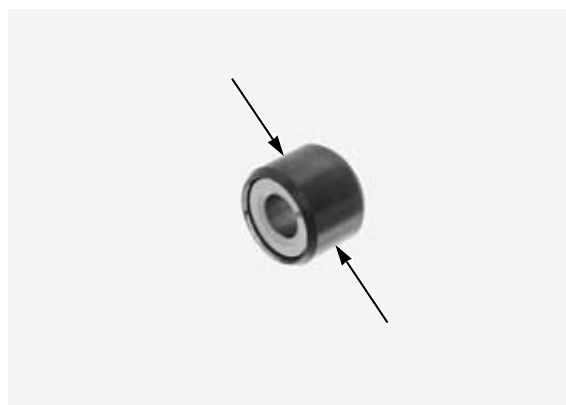
Check the drive pulley face [1] for scratches, scoring or damage.



WEIGHT ROLLER

Check each roller for abnormal wear.
Measure the weight roller O.D.

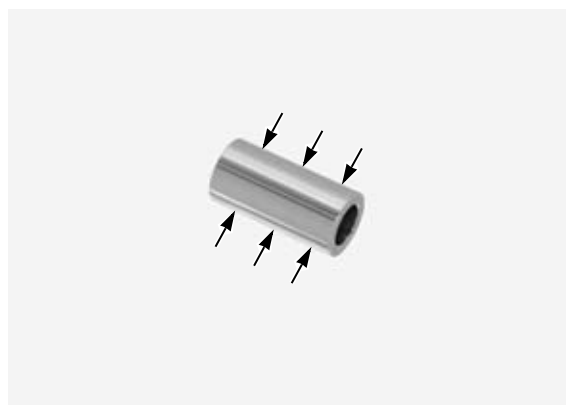
SERVICE LIMIT: 19.5 mm (0.77 in)



DRIVE FACE BOSS

Check the drive face boss for wear or damage.
Measure the drive face boss O.D.

SERVICE LIMIT: 23.93 mm (0.942 in)



MOVABLE DRIVE FACE

Check the movable drive face for scratches, scoring or damage.
Measure the drive face bushing I.D.

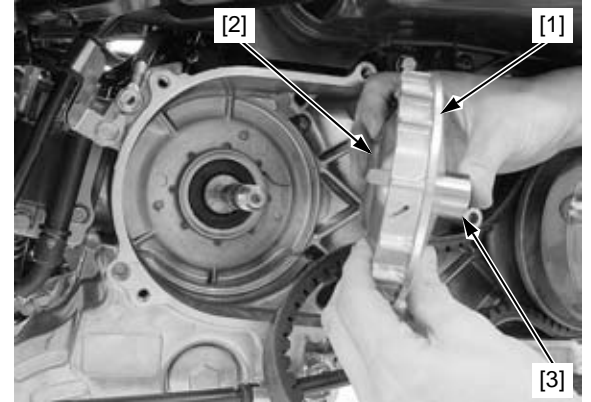
SERVICE LIMIT: 24.08 mm (0.948 in)



INSTALLATION

Clean any oil and grease from the drive face and drive belt.

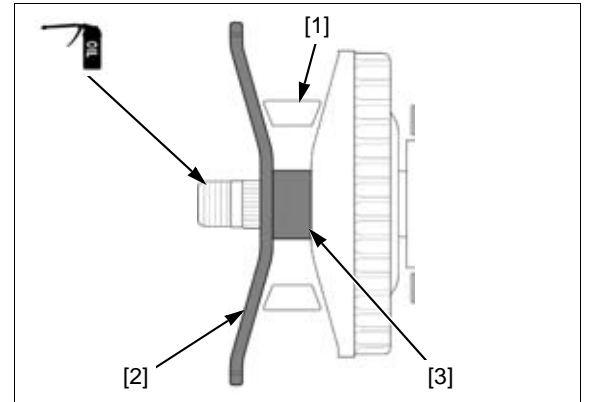
Install the movable drive face assembly [1] onto the crankshaft while holding the ramp plate [2] and drive face boss [3].



Set the drive belt [1] and install the drive pulley face [2] while aligning its splines with crankshaft splines.

Make sure that the drive pulley face is fully seated on the drive face boss [3].

Apply engine oil to the left crankshaft threads.



Apply engine oil to the drive pulley face nut [1] threads and seating surface then install it with the collar [2].

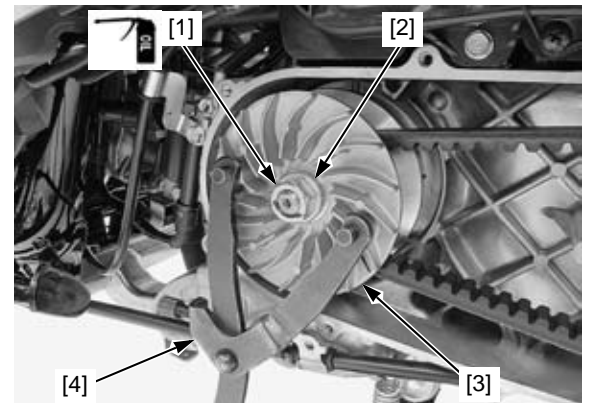
Hold the drive pulley face [3] with the special tool and tighten the nut to the specified torque.

TOOL:

[4] Clutch center holder 07725-0030000

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)

Install the left crankcase cover (page 12-6).



CLUTCH/DRIVEN PULLEY

REMOVAL

Remove the left crankcase cover (page 12-4).

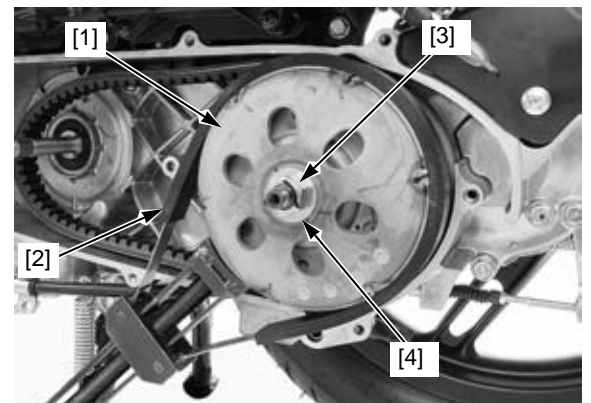
Use the special tool when loosening the lock nut. Holding the rear wheel or rear brake will damage the final reduction system.

Hold the clutch outer [1] with the special tool.

TOOL:

[2] Flywheel holder 07725-0040001

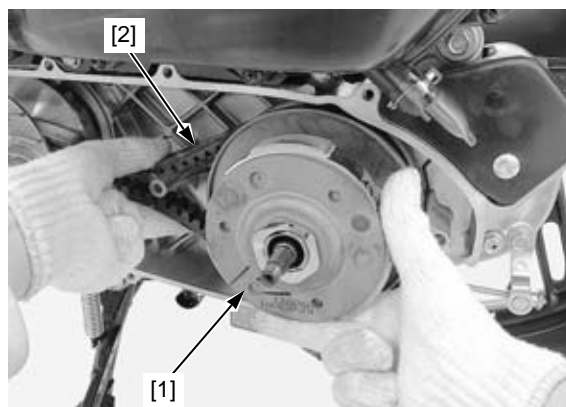
Remove the nut [3], washer [4] and clutch outer.



DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

Hold the clutch/driven pulley assembly [1] and compress the drive face spring by turning movable driven face clockwise until it stops.

Remove the drive belt [2] from the clutch/driven pulley assembly while removing the clutch/driven pulley assembly from the drive shaft.



DISASSEMBLY

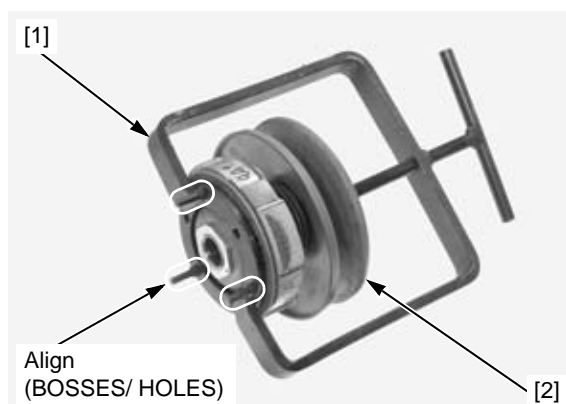
CLUTCH/DRIVEN PULLEY

Set the clutch spring compressor [1] onto the clutch/driven pulley [2] by aligning the bosses of the compressor with the holes of the clutch.

TOOL:

[1] Clutch spring compressor 07LME-GZ40201

Hold the clutch/driven pulley by turning the clutch spring compressor clockwise.

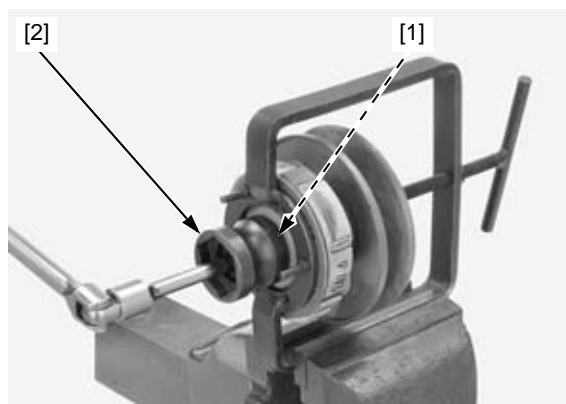


Hold the clutch spring compressor in a vise.

Remove the clutch/driven pulley nut [1] using the special tool.

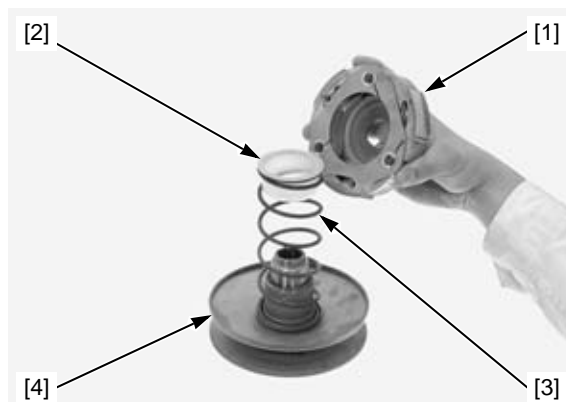
TOOL:

[2] Socket wrench, 39 x 41 mm 07GMA-KS40100



Loosen the clutch spring compressor gradually and remove the following:

- Clutch assembly [1]
- Spring seat [2]
- Driven face spring [3]
- Driven pulley assembly [4]

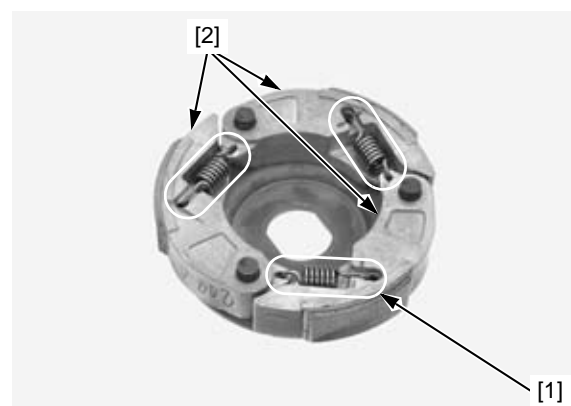


CLUTCH

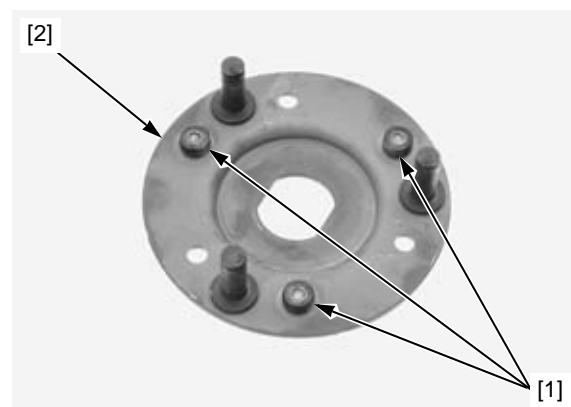
Remove the E-clips [1] and plate [2].



Unhook and remove the shoe springs [1].
Remove the clutch shoes [2] from the drive plate.



Remove the damper rubbers [1] from the drive plate [2].



DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

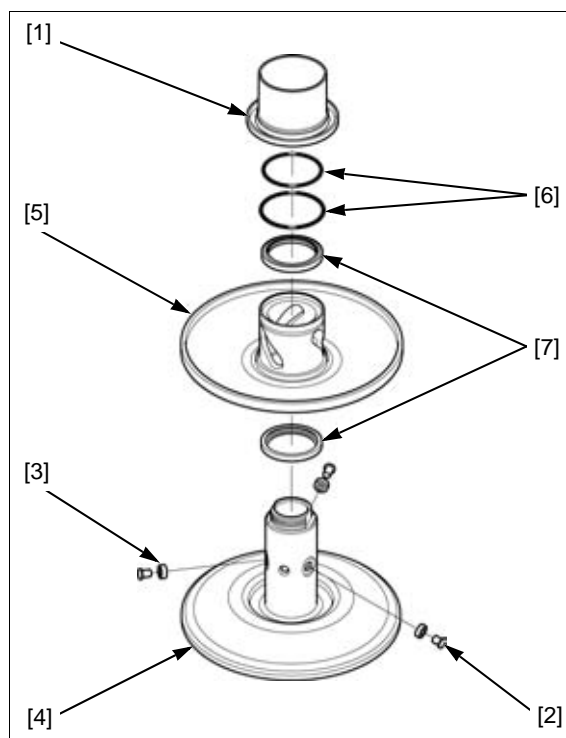
DRIVEN PULLEY

Remove the seal collar [1].

Remove the guide pins [2] and guide rollers [3] from the driven face [4].

Remove the movable driven face [5] from the driven face.

Remove the O-rings [6] and oil seals [7] from the movable driven face.



INSPECTION

NOTE:

For clutch shoes inspection (page 3-17).

CLUTCH OUTER

Check the clutch outer for wear or damage.

Measure the clutch outer I.D.

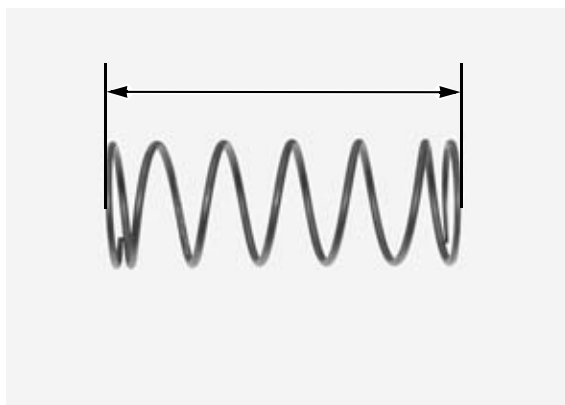
SERVICE LIMIT: 125.5 mm (4.94 in)



DRIVEN FACE SPRING

Measure the driven face spring free length.

STANDARD: 103.1 mm (4.06 in)



DRIVEN FACE

Check the driven face for scratches, scoring or damage.

Measure the driven face boss O.D.

SERVICE LIMIT: 33.94 mm (1.336 in)

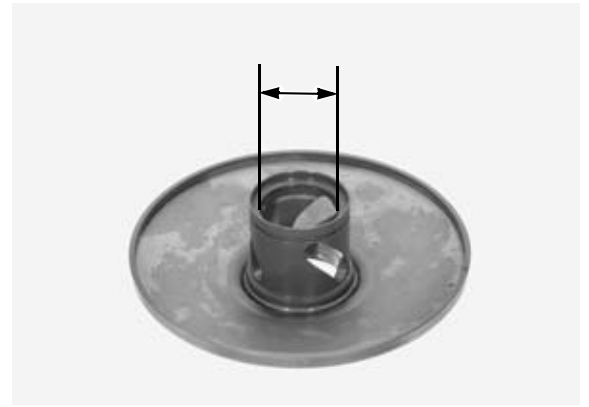
**MOVABLE DRIVEN FACE**

Check the movable driven face for scratches, scoring or damage.

Check the guide grooves for stepped wear or damage.

Measure the movable driven face I.D.

SERVICE LIMIT: 34.06 mm

**DRIVEN FACE BEARING REPLACEMENT**

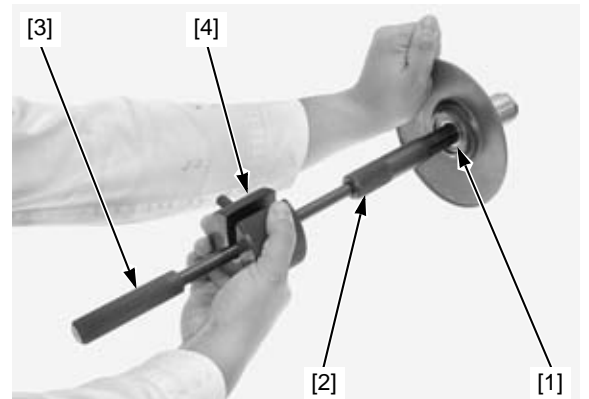
Remove the driven face needle bearing [1] using the special tools.

TOOLS:

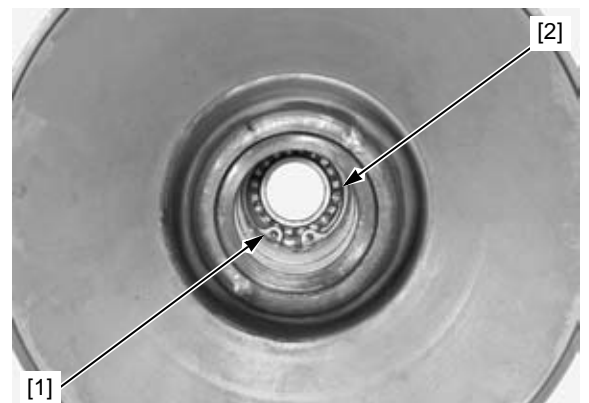
[2] Bearing remover, 20 mm 07936-3710600

[3] Remover handle 07936-3710100

[4] Remover weight 07741-0010201



Remove the snap ring [1] and drive the ball bearing [2] out of the driven face.



DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

Pack new ball bearing [1] with grease (NIPPON OIL P/U N6B or N6C or equivalent).

Install the ball bearing into the driven face squarely until it is fully seated with its sealed side facing down, using the special tools.

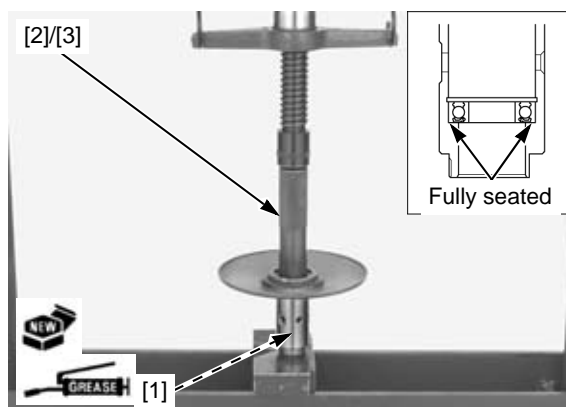
TOOLS:

[2] Driver

07749-0010000

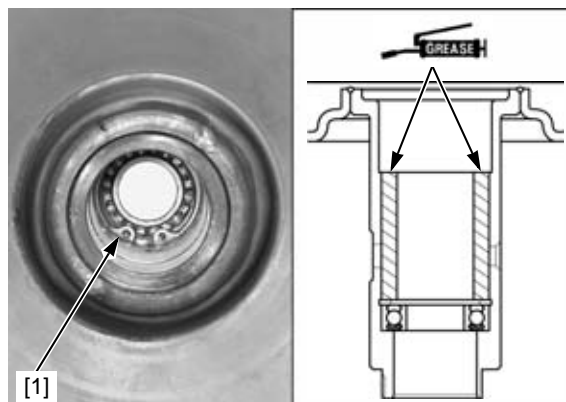
[3] Pilot, 28 mm

07746-0041100



Install the snap ring [1] to the groove on the driven face securely.

Apply 7.3 – 8.3 g of grease (Shell ALVANIA R3 or IDEMITSU AUTOREX B or NIPPON OIL POWERNOC WB3 or equivalent) to the driven face inner surface as shown.



Apply grease (Shell RETINEX LX2 or NIPPON OIL P/U N6B or equivalent) to a new needle bearing [1].

Set the needle bearing with its sealed side facing up. Press the needle bearing into the driven face until it is flush with the driven face surface as shown.

TOOLS:

[2] Driver

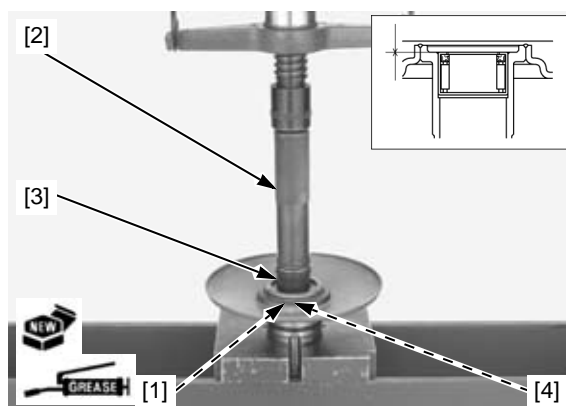
07749-0010000

[3] Attachment, 28 x 30 mm

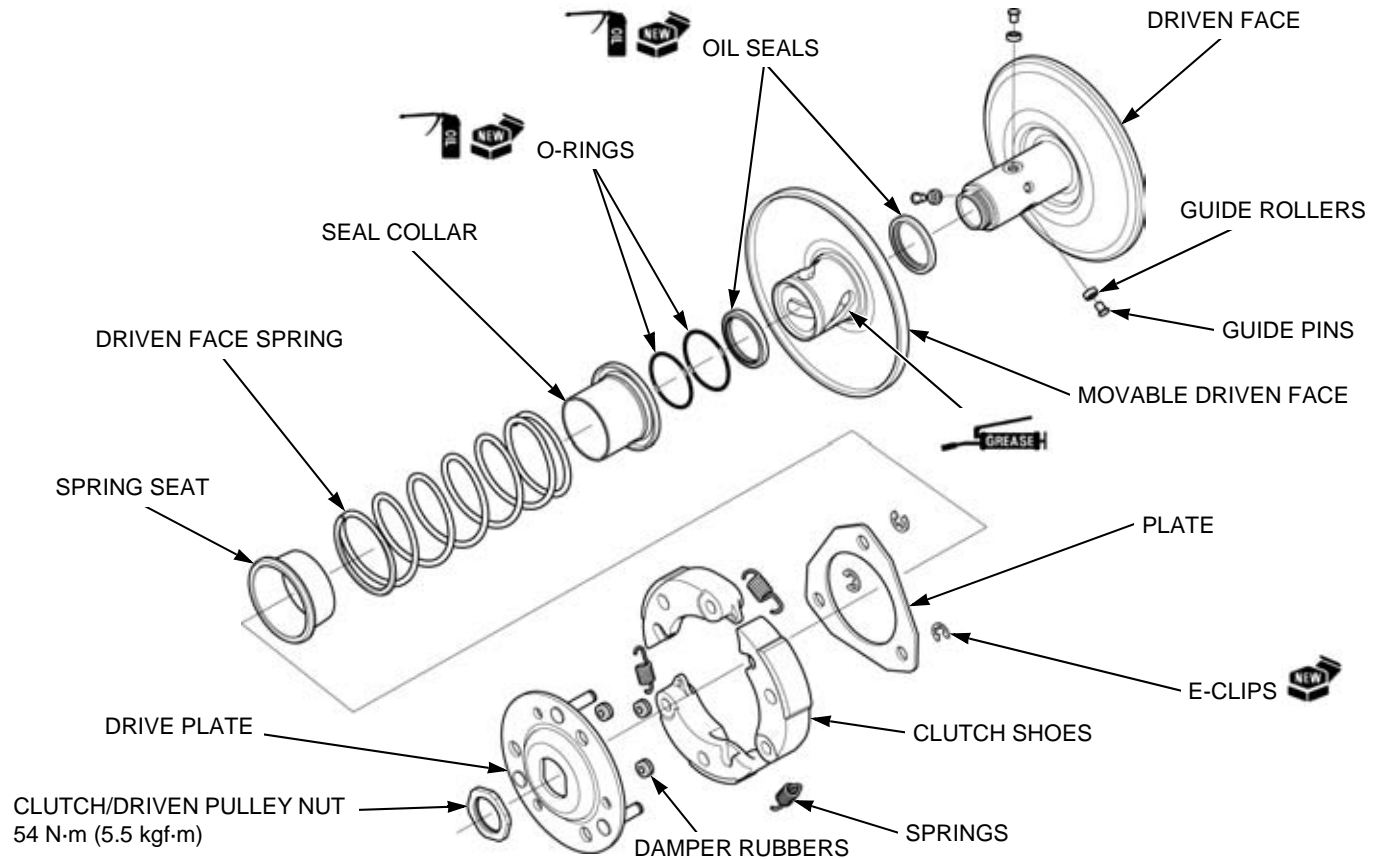
07946-1870100

[4] Pilot, 20 mm

07746-0040500



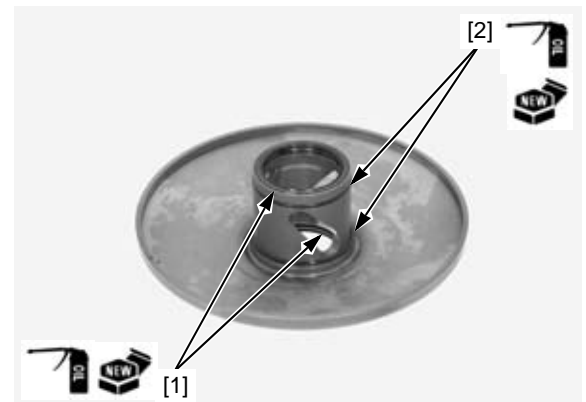
ASSEMBLY



DRIVEN PULLEY

Apply engine oil to new oil seal [1] lips and install them into the movable driven face.

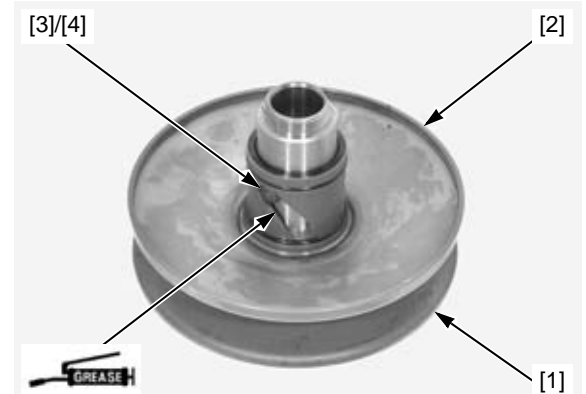
Apply engine oil to new O-rings [2] and install them into the movable driven face grooves.



Clean any oil and grease from the pulley face [1].

Install the movable driven face [2] onto the driven face. Install the guide rollers [3] and guide pins [4].

Apply 1.7 – 2.2 g of grease (Shell ALVANIA R3 or IDEMITSU AUTOREX B or NIPPON OIL POWERNOC WB3 or equivalent) to each guide groove.



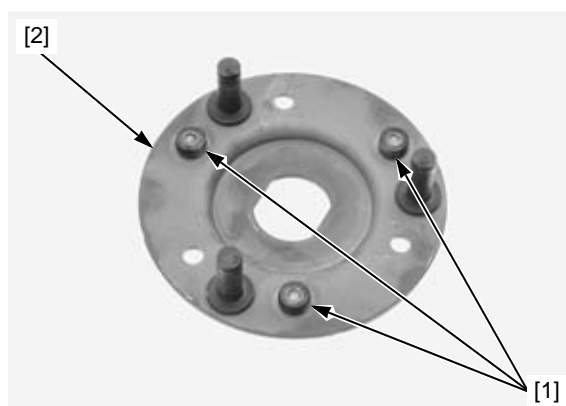
DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

Install the seal collar [1] to the driven pulley.

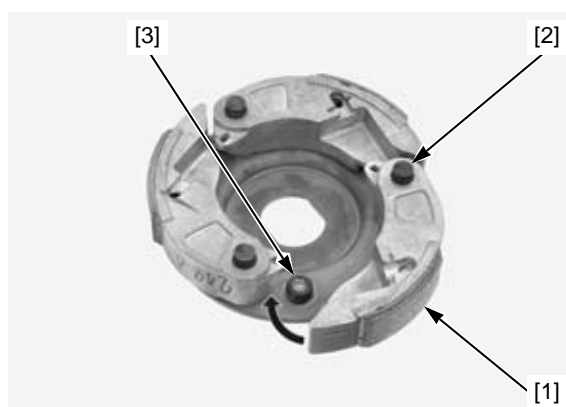


CLUTCH

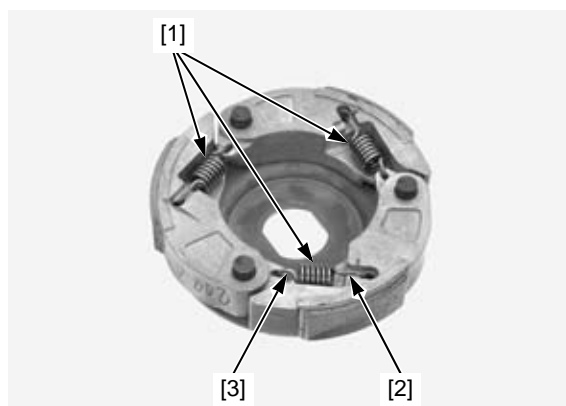
Install the damper rubbers [1] onto the drive plate [2].



Install the clutch shoes [1] to the drive plate bosses [2]. Turn the clutch shoes so that the damper rubbers [3] are positioned in the grooves of the clutch shoes.

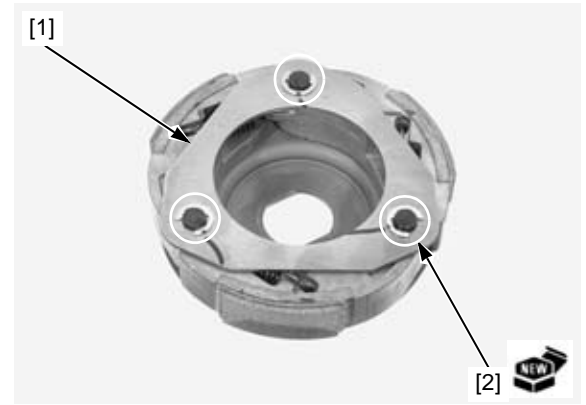


Hook the shoe spring [1] ends to the clutch shoe holes with their long ends [2] facing the center holes and short ends [3] facing the neighboring shoe holes as shown.



Install the E-clips with their open side facing out as shown.

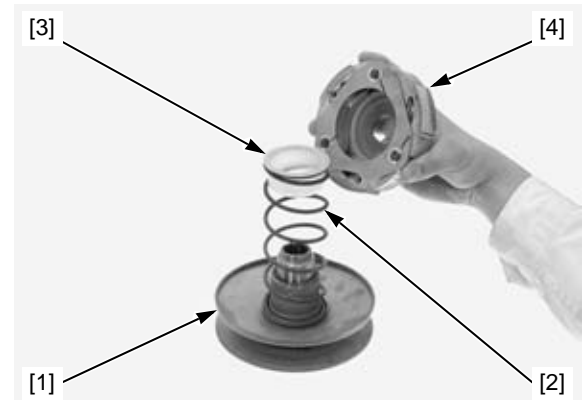
Install the plate [1] and new E-clips [2].



CLUTCH/DRIVEN PULLEY

Assemble the following:

- Driven pulley assembly [1]
- Driven face spring [2]
- Spring seat [3]
- Clutch assembly [4]



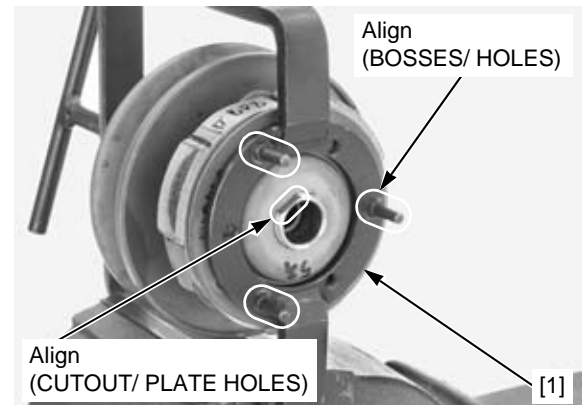
Set the clutch spring compressor [1] over the clutch/driven pulley assembly aligning the bosses of the compressor with the holes of the clutch.

TOOL:

[1] Clutch spring compressor 07LME-GZ40201

Be careful not to damage the driven face threads.

Compress the driven face spring while aligning the cutout of the driven face threads with the drive plate hole and install the clutch/driven pulley nut.



Hold the spring compressor [1] in a vice.

Install the nut with its chamfered side facing in.

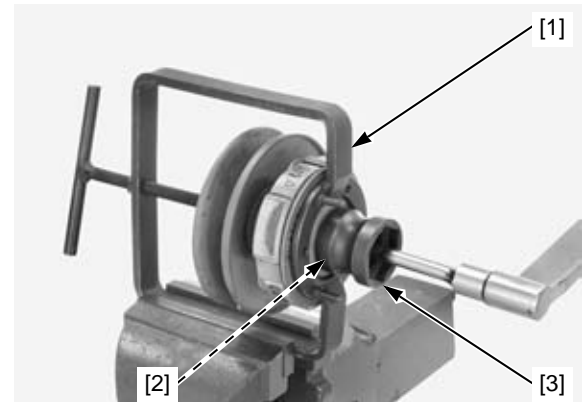
Tighten the clutch/driven pulley nut [2] to the specified torque, using the socket wrench [3].

TOOL:

[3] Socket wrench, 39 x 41 mm 07GMA-KS40100

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

Remove the spring compressor from the clutch/driven pulley assembly.



DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

INSTALLATION

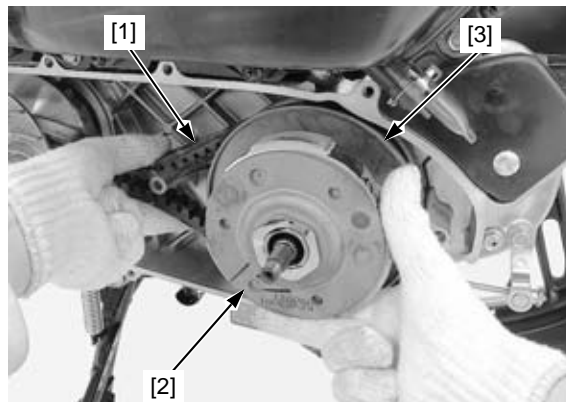
Clean any oil and grease from the driven face and drive belt [1].

Hold the clutch/driven pulley assembly [2] and compress the drive face spring by turning movable driven face [3] clockwise until it stops.

Set the drive belt onto the pulley groove while holding the movable driven face.

Do not get grease on the drive shaft splines from the driven face inside.

Install the clutch/driven pulley assembly onto the drive shaft.



Clean any oil and grease from the clutch outer [1].

Install the clutch outer while aligning its splines with drive shaft splines.

Install the washer [2] and clutch outer nut [3].

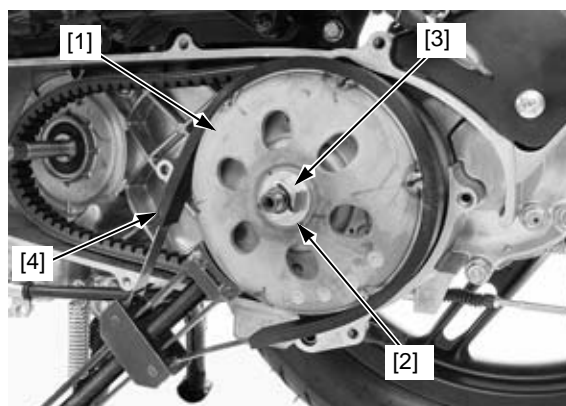
Hold the clutch outer with the special tool and tighten the clutch outer nut to the specified torque.

TOOL:

[4] Flywheel holder 07725-0040001

TORQUE: 49 N·m (5.0 kgf·m, 36 lbf·ft)

Install the left crankcase cover (page 12-6).

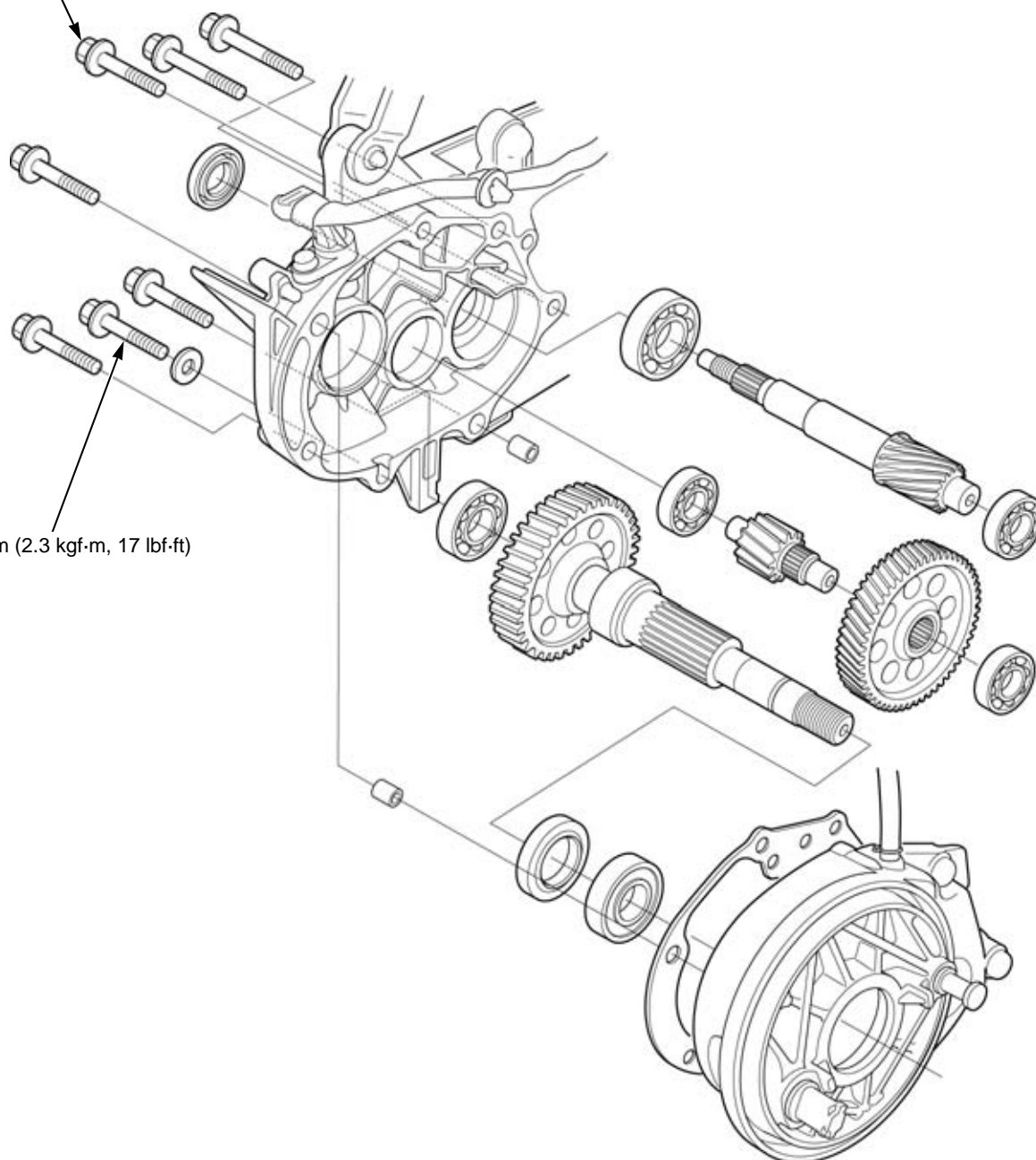


COMPONENT LOCATION	13-2	FINAL REDUCTION INSPECTION	13-4
SERVICE INFORMATION	13-3	FINAL REDUCTION BEARING REPLACEMENT	13-6
TROUBLESHOOTING.....	13-3	FINAL REDUCTION CASE ASSEMBLY	13-10
FINAL REDUCTION CASE SEPARATION.....	13-4		

COMPONENT LOCATION

23 N·m (2.3 kgf·m, 17 lbf·ft)

23 N·m (2.3 kgf·m, 17 lbf·ft)



SERVICE INFORMATION

GENERAL

- The final reduction can be serviced with the engine installed in the frame.
- When installing the driveshaft, be sure to use the special tools; position the special tools on the bearing inner race and pull the driveshaft into the bearing until it is fully seated.

SPECIFICATIONS

Unit: mm (in)

ITEM		SPECIFICATIONS
Final reduction oil capacity	After draining	0.12 liter (0.13 US qt, 0.11 Imp qt)
	After disassembly	0.14 liter (0.15 US qt, 0.12 Imp qt)
Recommended final reduction oil		Honda "4-stroke motorcycle oil" or an equivalent API classification: SG or higher (except oils labeled as energy conserving on the circular API service label) Viscosity: SAE 10W-30 JASO T 903 standard: MB

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Final reduction case bolt	6	8	23 (2.3, 17)	
Final reduction oil drain bolt	1	8	23 (2.3, 17)	

TROUBLESHOOTING

Engine starts but scooter won't move

- Damaged final reduction
- Seized final reduction
- Faulty drive pulley (page 12-8)
- Faulty driven pulley/clutch (page 12-12)

Abnormal noise

- Worn, seized or chipped gears
- Worn or damaged final reduction bearing

Oil leak

- Oil level too high
- Worn or damaged oil seal
- Cracked crankcase and/or final reduction case

FINAL REDUCTION CASE SEPARATION

NOTE:

The final reduction can be serviced with the engine installed in the frame.

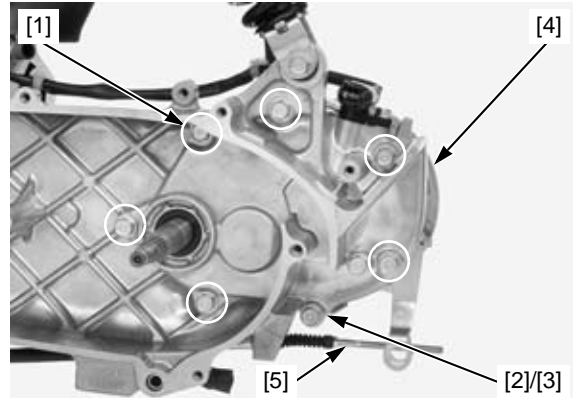
Drain the final reduction oil (page 3-12).

Remove the following:

- Clutch/driven pulley (page 12-9)
- Rear wheel (page 18-4)
- Rear brake shoes (page 18-7)
- VS sensor protector (page 21-8)

Remove the final reduction case bolts [1], drain bolt [2], sealing washer [3] and final reduction case [4].

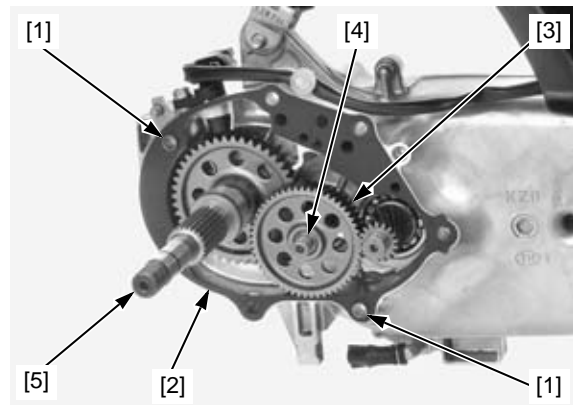
Release the rear brake cable [5] from the case.



Remove the dowel pins [1] and gasket [2].

Remove the following:

- Counter gear [3]
- Countershaft [4]
- Final gear shaft [5]



FINAL REDUCTION INSPECTION

BEARING

LEFT CRANKCASE

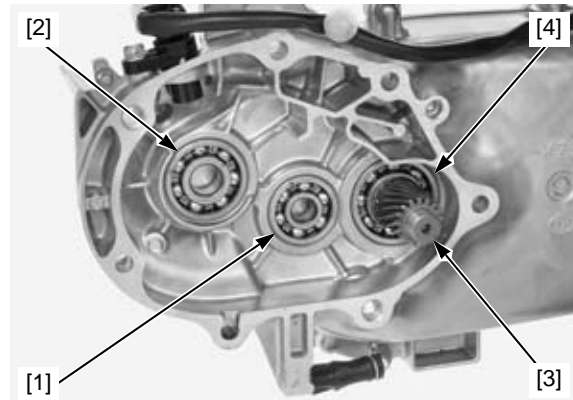
Check each bearing for wear or damage.

Turn the inner race of the countershaft [1] and final gear shaft [2] bearings with your finger. The bearing should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the crankcase.

Replace the bearings if they do not turn smoothly, quietly, or if they fit loosely in the crankcase.

Turn the driveshaft [3] with your hand. The bearing [4] should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the crankcase and bearing inner race fits tightly on the driveshaft.

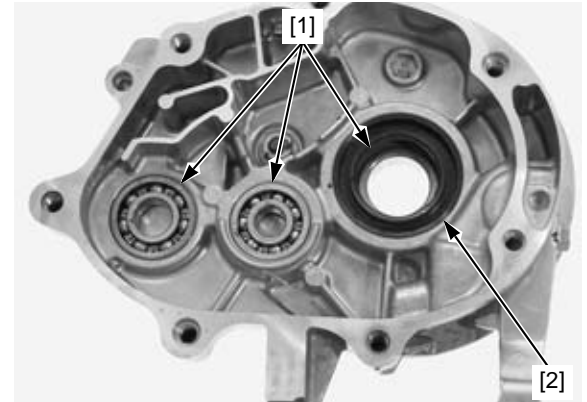
Replace the bearing if it does not turn smoothly, quietly, or if it fits loosely on the crankcase and driveshaft.



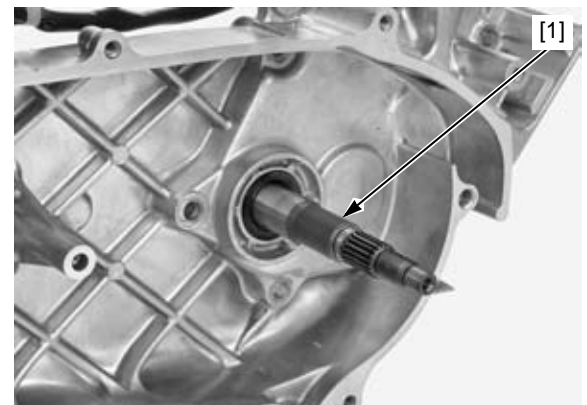
FINAL REDUCTION CASE

Check the final reduction case bearings [1] and final gear shaft oil seal [2] for wear or damage.

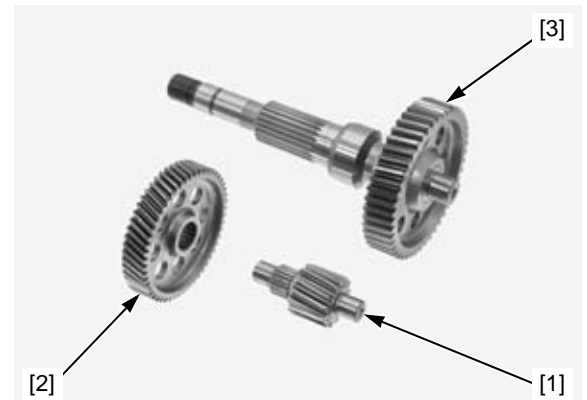
Turn each bearing inner race with your finger.
The bearing should turn smoothly without friction.
Check that there is no clearance between the outer race and final reduction case.

**GEAR/SHAFT****DRIVESHAFT**

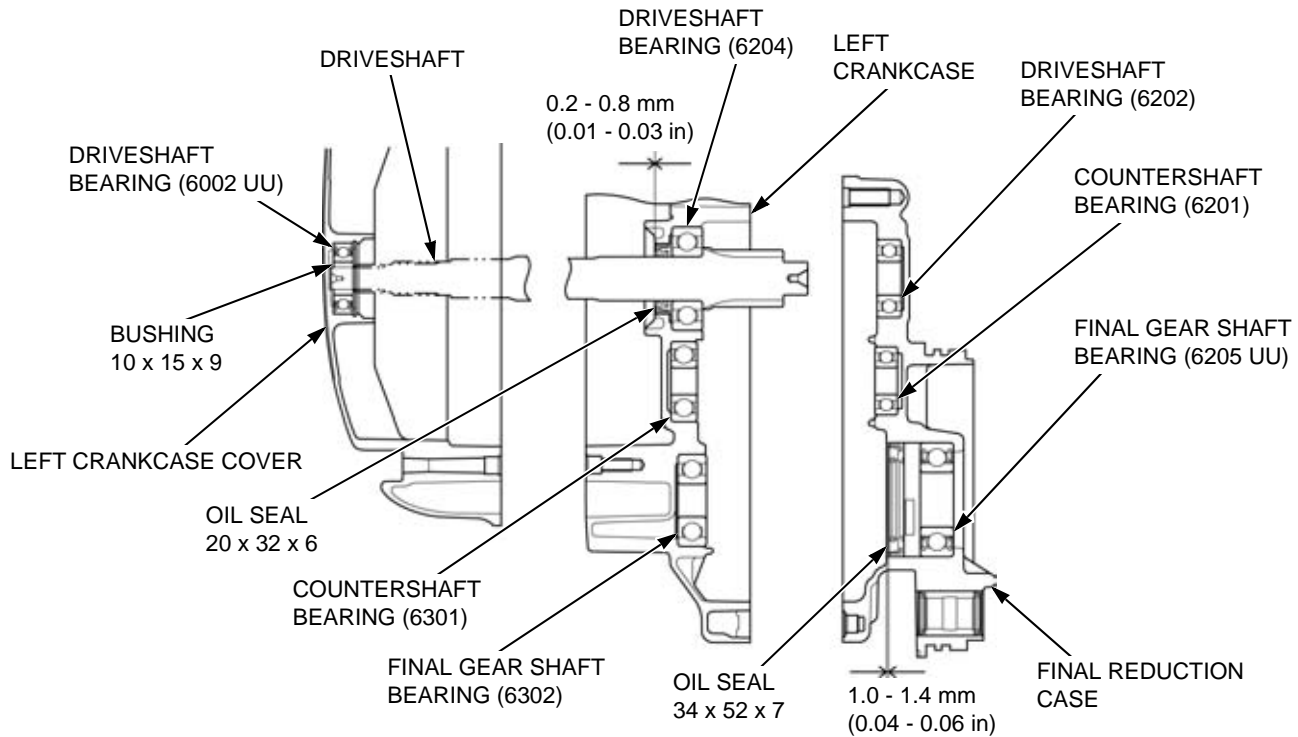
Check the driveshaft [1] for bend, wear or damage.

**COUNTER GEAR/COUNTERSHAFT/FINAL GEAR SHAFT**

Check the countershaft [1], counter gear [2] and final gear shaft [3] for wear or damage.



FINAL REDUCTION BEARING REPLACEMENT



LEFT CRANKCASE

Be careful not to damage the final reduction case mating surface.

Separate the final reduction case (page 13-4).

Remove the countershaft [1] and final gear shaft [2] bearings using the special tools.

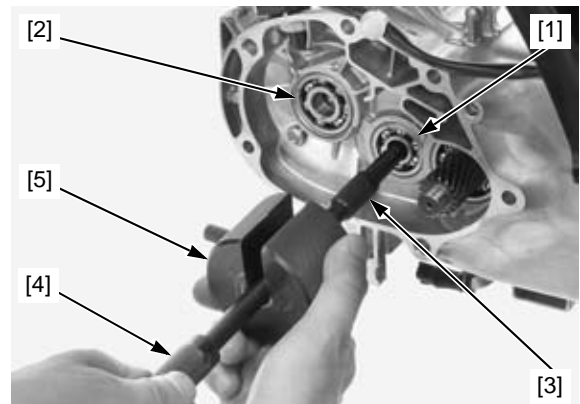
TOOLS:

Countershaft bearing:

- [3] Bearing remover head, 12 mm 07936-1660110
- [4] Bearing remover shaft, 12 mm 07936-1660120
- [5] Remover weight 07741-0010201

Final gear shaft bearing:

- Bearing remover head, 15 mm 07936-KC10200
- Bearing remover shaft, 15 mm 07936-KC10100
- Remover weight 07741-0010201



Apply engine oil to each bearing [1] cavity.

Set the bearings with their marked sides facing up.

Drive each new bearing into the left crankcase squarely until it is fully seated, using the special tools.

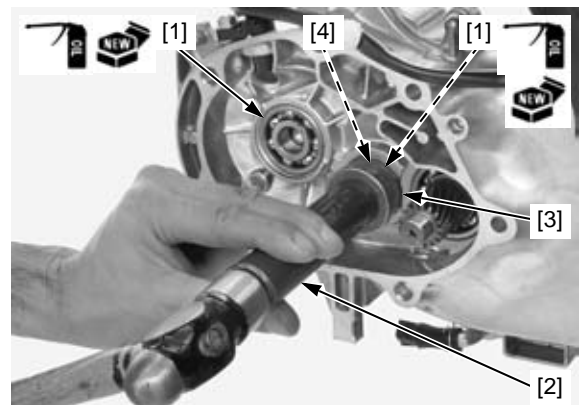
TOOLS:

Countershaft bearing:

- [2] Driver 07749-0010000
- [3] Attachment, 37 x 40 mm 07746-0010200
- [4] Pilot, 12 mm 07746-0040200

Final gear shaft bearing:

- Driver 07749-0010000
- Attachment, 42 x 47 mm 07746-0010300
- Pilot, 15 mm 07746-0040300



Assemble the final reduction case (page 13-10).

DRIVESHAFT

Separate the final reduction case (page 13-4).

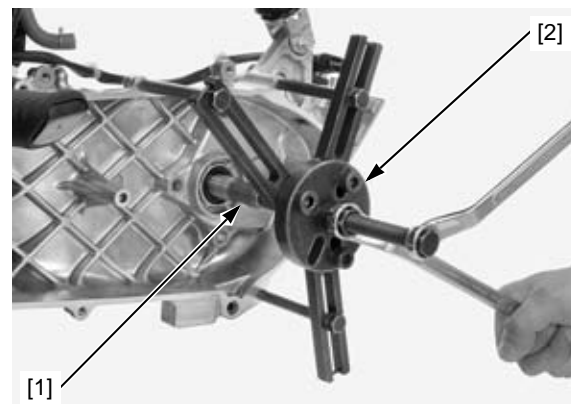
Remove the driveshaft [1] using the special tool.

TOOL:

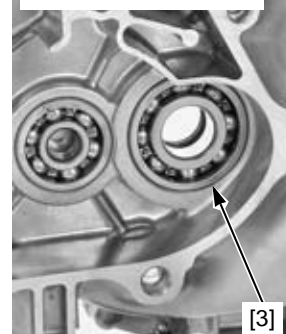
[2] Case puller

07SMC-0010001

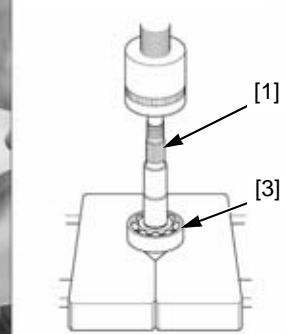
- If the driveshaft bearing [3] remains in the left crankcase, drive it out from the left side.
- If the bearing remains on the driveshaft, remove the bearing using a hydraulic press.



If the bearing remains in the left crankcase:



If the bearing remains on the driveshaft:



Remove the driveshaft oil seal [1].



Apply engine oil to the bearing cavity.

Set the bearing with its marked side facing up.

Drive a new driveshaft bearing [1] into the left crankcase squarely until it is fully seated, using the special tools.

TOOLS:

[2] Driver

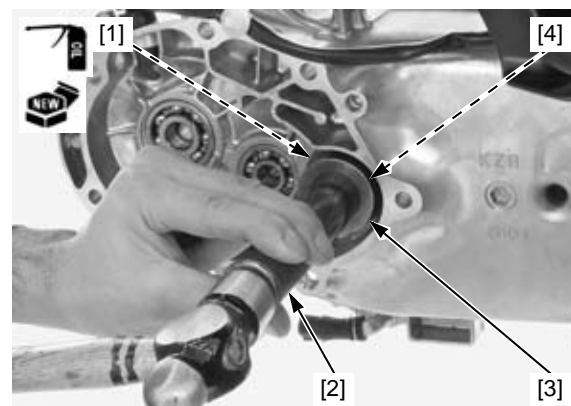
07749-0010000

[3] Attachment, 42 x 47 mm

07746-0010300

[4] Pilot, 20 mm

07746-0040500

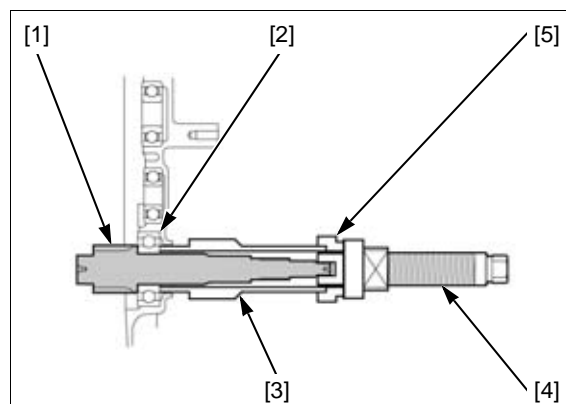
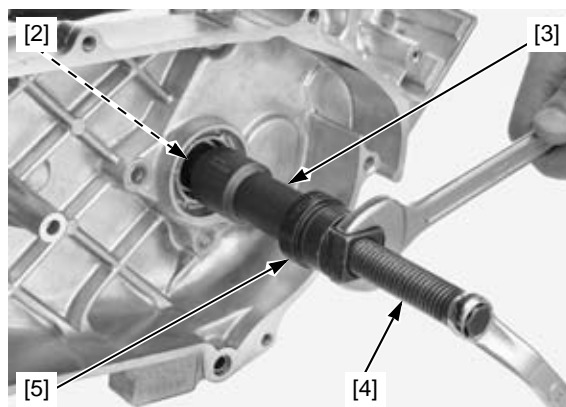


FINAL REDUCTION

Install the driveshaft [1] into the bearing [2].
Position the assembly collar [3] on the driveshaft bearing inner race and pull the driveshaft into the bearing until it is fully seated.

TOOLS:

[3] Assembly collar	07965-GM00100
[4] Assembly shaft	07965-1660200
[5] Assembly collar attachment	07965-GM00200



Apply engine oil to a new driveshaft oil seal [1] lip.

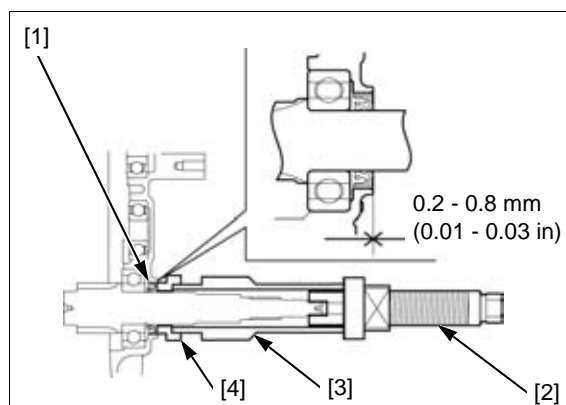
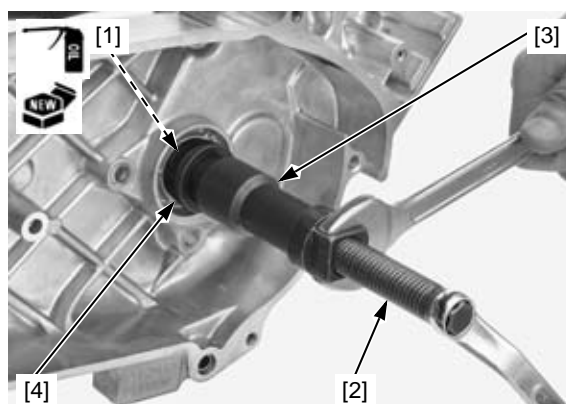
Do not insert the oil seal too far.

Install the driveshaft oil seal so that the depth from the left crankcase surface is 0.2 - 0.8 mm (0.01 - 0.03 in), using the special tools.

TOOLS:

[2] Assembly shaft	07965-1660200
[3] Assembly collar	07965-GM00100
[4] Assembly collar attachment	07965-GM00200

Assemble the final reduction case (page 13-10).



FINAL REDUCTION CASE

Separate the final reduction case (page 13-4).

Remove the driveshaft bearing [1] and countershaft bearing [2] using the special tools.

TOOLS:

Driveshaft bearing:

- [3] Bearing remover head, 15 mm 07936-KC10200
- [4] Bearing remover shaft, 15 mm 07936-KC10100
- [5] Remover weight 07741-0010201

Countershaft bearing:

- Bearing remover head, 12 mm 07936-1660110
- Bearing remover shaft, 12 mm 07936-1660120
- Remover weight 07741-0010201

Remove the final gear shaft oil seal [6] and bearing [7].

Apply engine oil to the driveshaft bearing [1] and countershaft bearing [2] cavity.

Set the bearings with their marked sides facing up.

Drive a new countershaft bearing and driveshaft bearing into the final reduction case squarely until they are fully seated, using the special tools.

TOOLS:

Driveshaft bearing:

- [3] Driver 07749-0010000
- [4] Attachment, 32 x 35 mm 07746-0010100
- [5] Pilot, 15 mm 07746-0040300

Countershaft bearing:

- Driver 07749-0010000
- Attachment, 32 x 35 mm 07746-0010100
- Pilot, 12 mm 07746-0040200

Apply engine oil to the final gear shaft bearing [1] cavity.

Set the bearing with its marked side facing up.

Drive a new final gear shaft bearing into the final reduction case squarely until it is fully seated, using the special tools.

TOOLS:

- [2] Driver 07749-0010000
- [3] Attachment, 51.5 mm 07946-3290000
- [4] Pilot, 25 mm 07746-0040600

Apply engine oil to a new final gear shaft oil seal [1] lip.

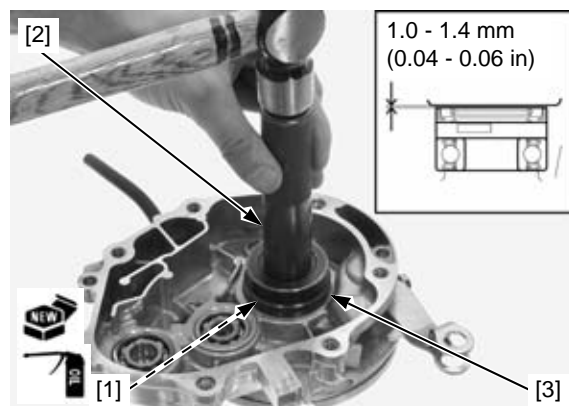
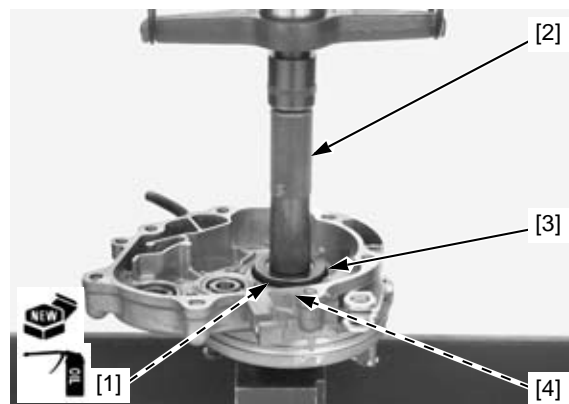
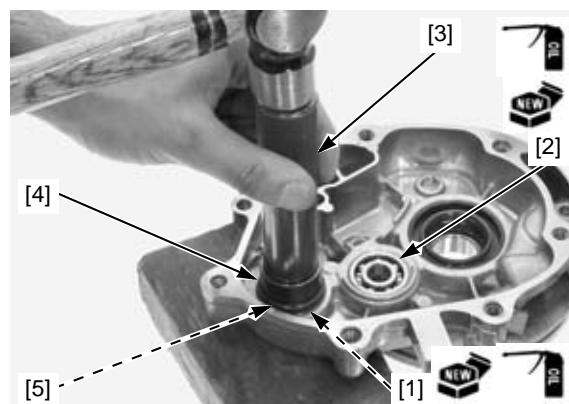
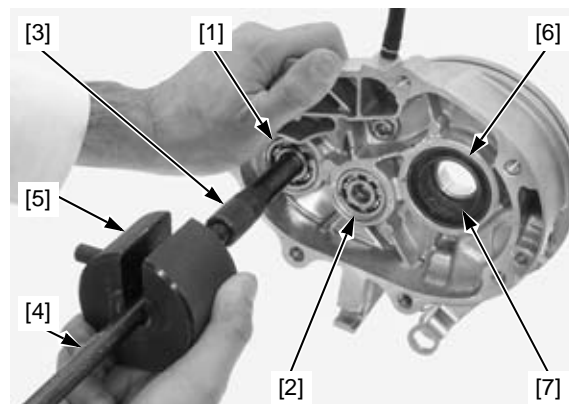
Do not insert the oil seal too far.

Install the oil seal with the flat side facing the rear wheel side so that the depth from the final reduction case surface is 1.0 - 1.4 mm (0.04 - 0.06 in) using the special tools.

TOOLS:

- [2] Driver 07749-0010000
- [3] Attachment, 51.5 mm 07946-3290000

Assemble the final reduction case (page 13-10).



FINAL REDUCTION

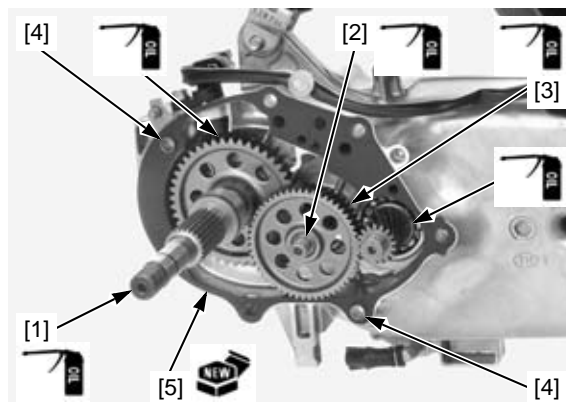
FINAL REDUCTION CASE ASSEMBLY

Apply engine oil to each gear tooth and each bearing sliding area of shaft.

Install the final gear shaft [1].

Install the countershaft [2] into the counter gear [3] while aligning the countershaft splines with the counter gear splines and install them to the left crankcase.

Install the dowel pins [4] and a new gasket [5].



Set the rear brake cable [1] in position.

Install the final reduction case [2], case bolts [3], drain bolt [4] and a new sealing washer [5].

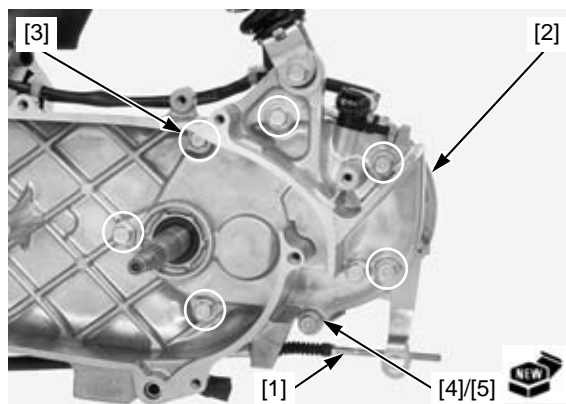
Tighten the final reduction case bolts and drain bolt in a crisscross pattern to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Install the following:

- VS sensor protector (page 21-8)
- Rear brake shoes (page 18-9)
- Rear wheel (page 18-5)
- Clutch/driven pulley (page 12-18)

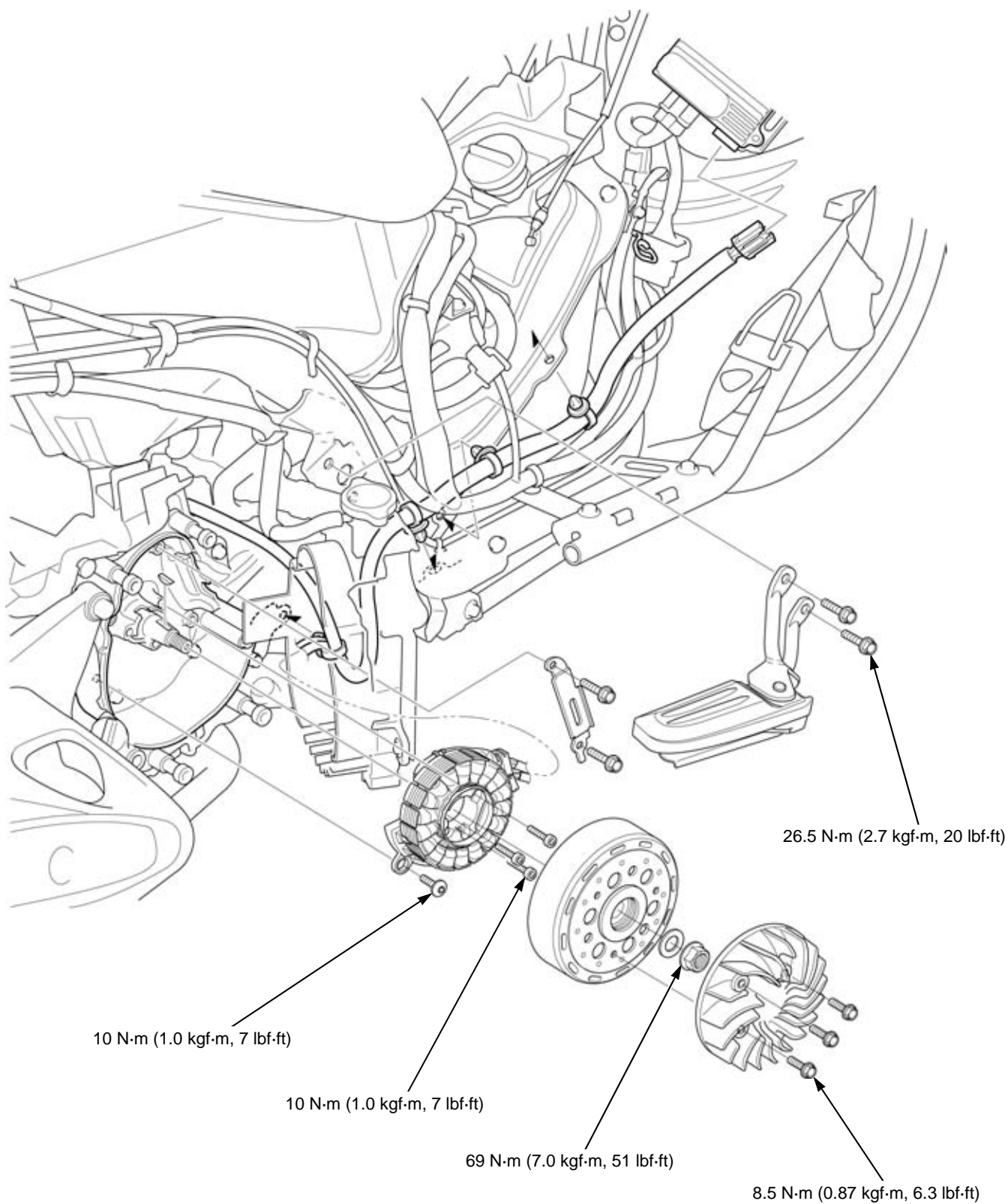
Fill the final reduction case with the recommended oil (page 3-12).



14. ALTERNATOR/STARTER

COMPONENT LOCATION	14-2	ALTERNATOR/STARTER	14-4
SERVICE INFORMATION	14-3		

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- Always turn the ignition switch OFF before servicing the alternator/starter. The alternator/starter could suddenly start when the ignition switch is turned ON, causing serious injury.
- This section covers the removal and installation of the flywheel and alternator/starter. These services can be done with the engine installed in the frame.
- For charging system inspection (page 20-5).
- For starter system inspection (page 6-10).

TORQUE VALUES

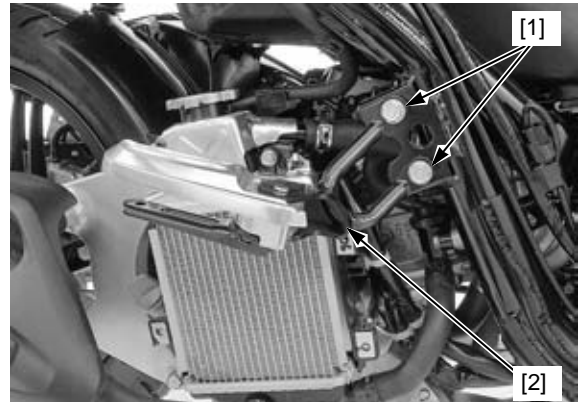
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Stator mounting socket bolt	3	6	10 (1.0, 7)	
CKP sensor mounting special bolt	1	6	10 (1.0, 7)	
Flywheel nut	1	12	69 (7.0, 51)	
Cooling fan mounting bolt	3	6	8.5 (0.87, 6.3)	
Pillion step mounting bolt	4	8	26.5 (2.7, 20)	

ALTERNATOR/STARTER

REMOVAL

Remove the right floor step (page 2-10).

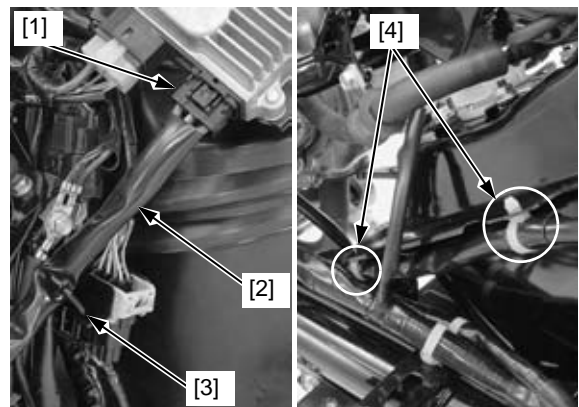
Remove the mounting bolts [1] and right pillion step [2].



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

Release the engine sub harness [2] from the frame clamp [3].

Release the two wire band bosses [4].

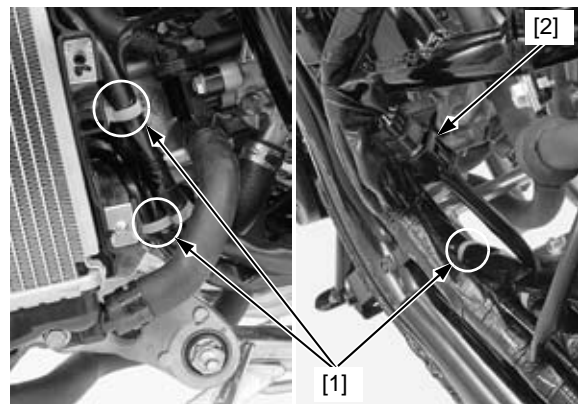


Release the three wire band bosses [1].

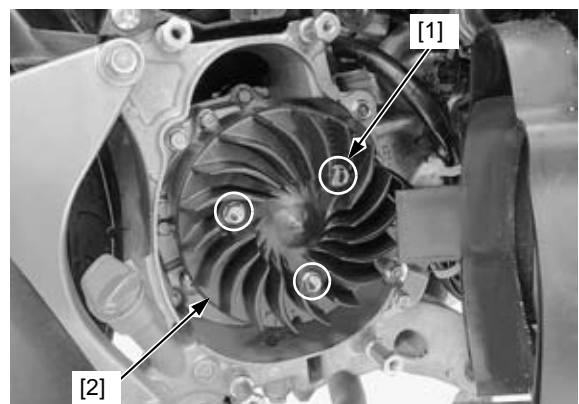
Disconnect the CKP sensor 6P (Black) connector [2].

It is not necessary to disconnect the water hoses from the radiator.

Remove the four radiator mounting bolts and move the radiator so that the cooling fan is accessible (page 9-6).



Remove the three bolts [1] and cooling fan [2].

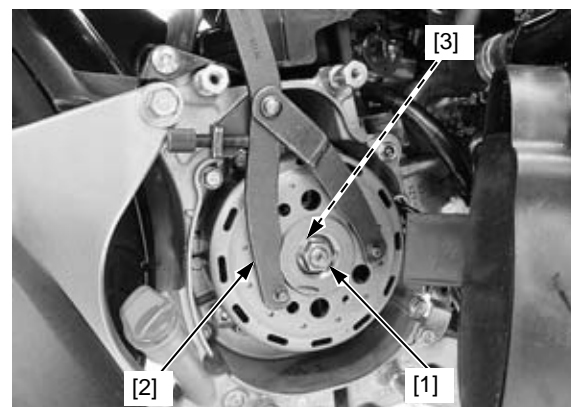


Hold the flywheel with the special tool and loosen the flywheel nut [1].

TOOL:

[2] Universal holder 07725-0030000

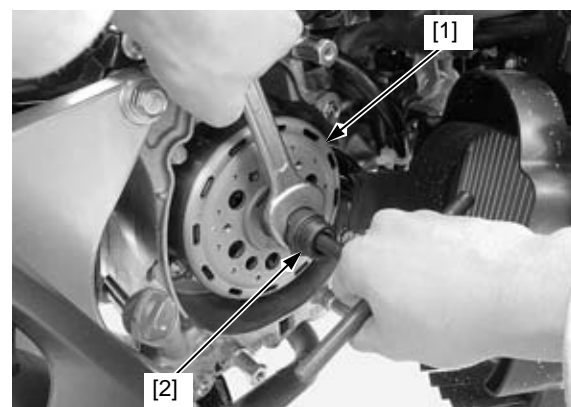
Remove the flywheel nut and washer [3].



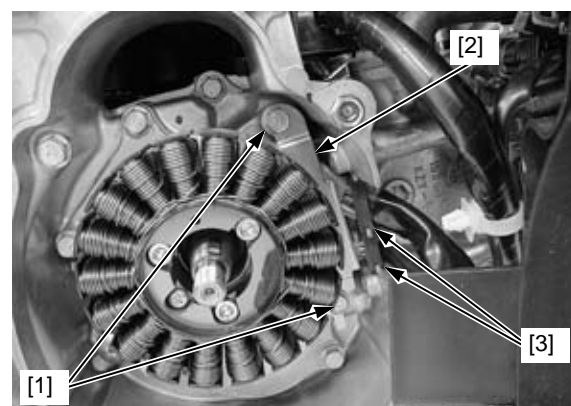
Remove the flywheel [1] using the special tool.

TOOL:

[2] Flywheel puller 07733-0010000

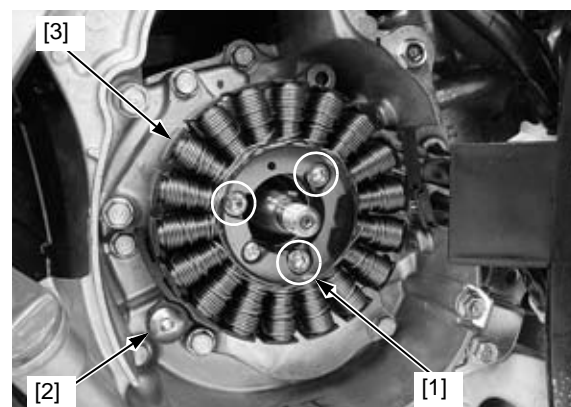


Remove the two bolts [1] and wire holder plate [2]. Release the grommets [3] from the right crankcase groove.



Do not forget to remove the special bolt.

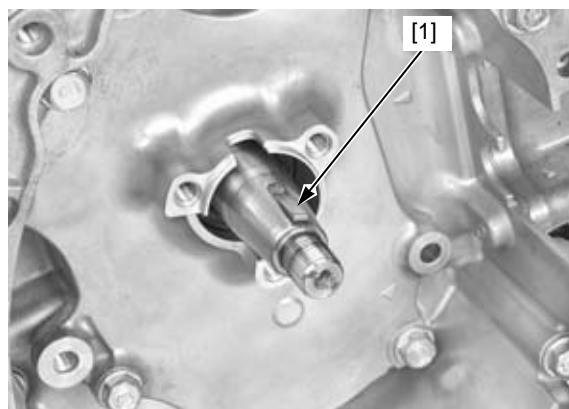
Remove the three mounting socket bolts [1], CKP sensor mounting special bolt [2] and stator [3] from the stator base.



ALTERNATOR/STARTER

Be careful not to damage the key and groove.

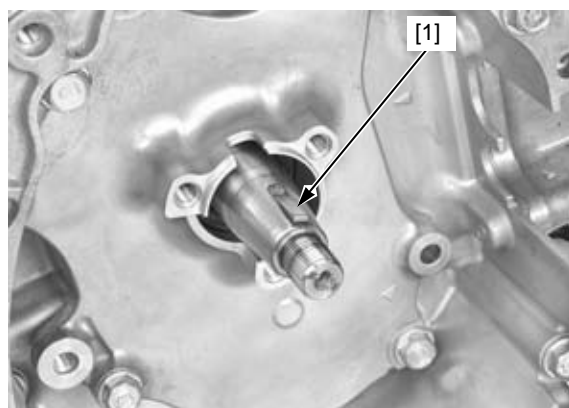
Remove the woodruff key [1].



INSTALLATION

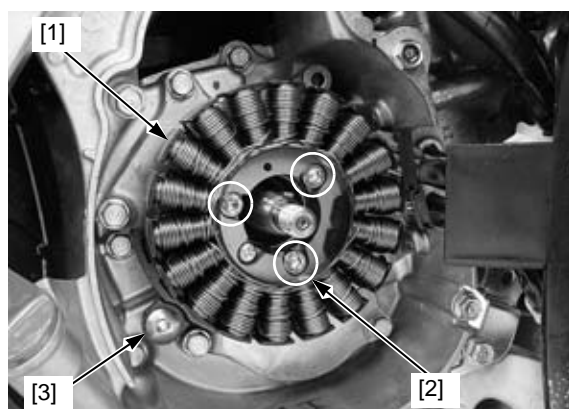
Install the woodruff key [1] into the crankshaft key groove.

Clean any oil and grease from the crankshaft.



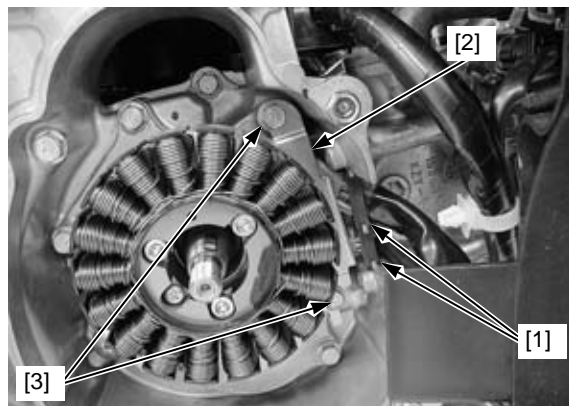
Set the stator assembly [1] onto the stator base. Install and tighten the stator mounting socket bolts [2] and CKP sensor mounting special bolt [3] to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

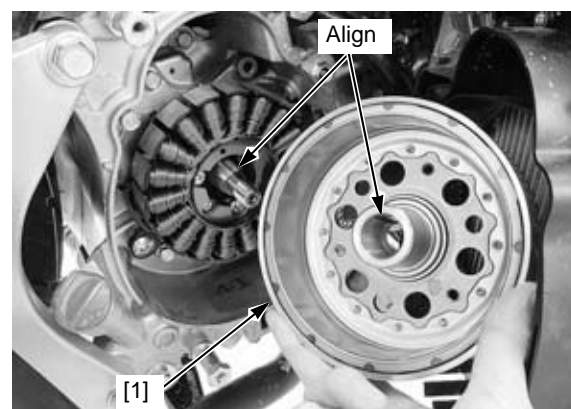


Route the wire properly and set the wire grommets [1] into the right crankcase grooves.

Set the wire holder plate [2] as shown and tighten the holder plate bolts [3].



Install the flywheel [1] onto the crankshaft by aligning the key way on the flywheel with the woodruff key.



Install the flywheel washer [1] and nut [2].

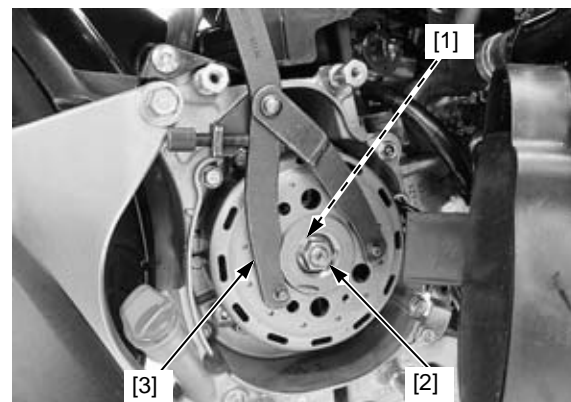
Hold the flywheel with the special tool and tighten the nut to the specified torque.

TOOL:

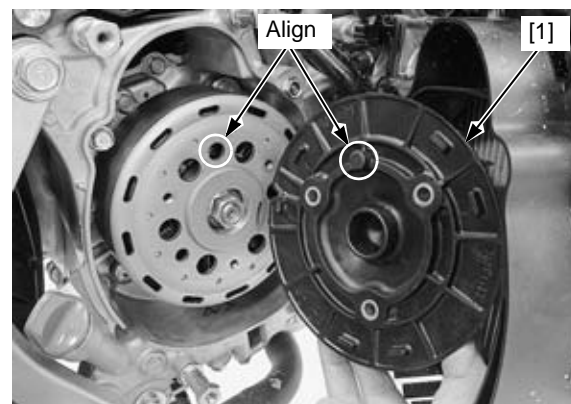
[3] Universal holder

07725-0030000

TORQUE: 69 N·m (7.0 kgf·m, 51 lbf·ft)



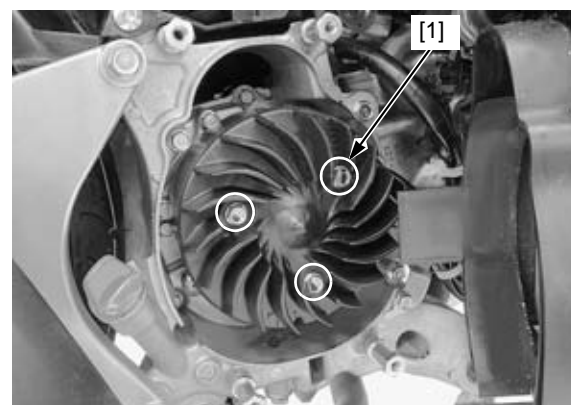
Install the cooling fan [1] while aligning its boss with the hole on the flywheel.



Install the cooling fan mounting bolts [1] and tighten them to the specified torque.

TORQUE: 8.5 N·m (0.87 kgf·m, 6.3 lbf·ft)

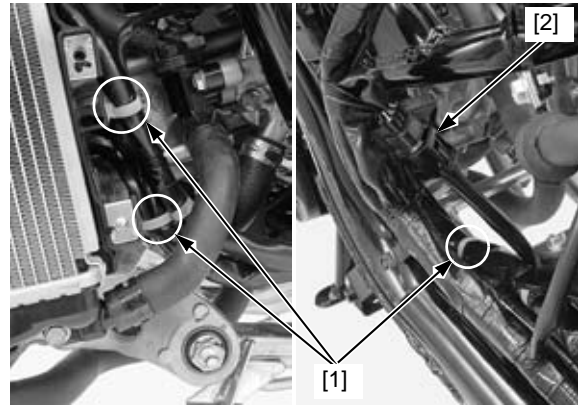
Install the radiator back in position (page 9-6).



ALTERNATOR/STARTER

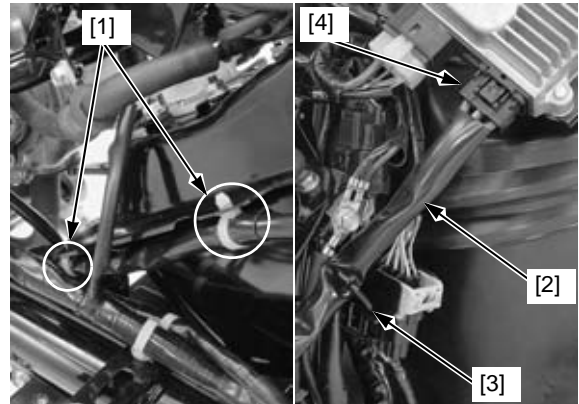
Install the three wire band bosses [1].

Connect the CKP sensor 6P (Black) connector [2].



Install the two wire band bosses [1] and secure the engine sub harness [2] into the frame clamp [3].

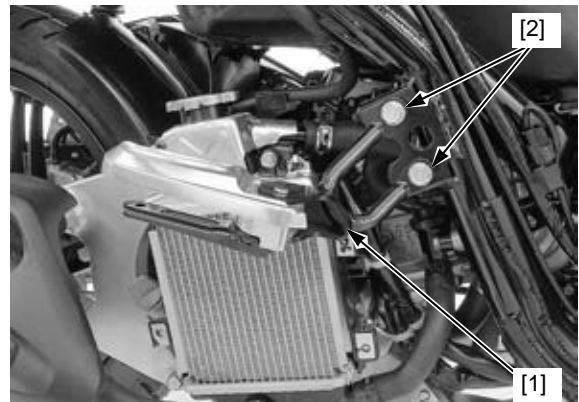
Connect the ECM 3P (Black) connector [4].



Set the right pillion step [1], then install and tighten the mounting bolts [2] to the specified torque.

TORQUE: 26.5 N·m (2.7 kgf·m, 20 lbf·ft)

Install the right floor step (page 2-10).

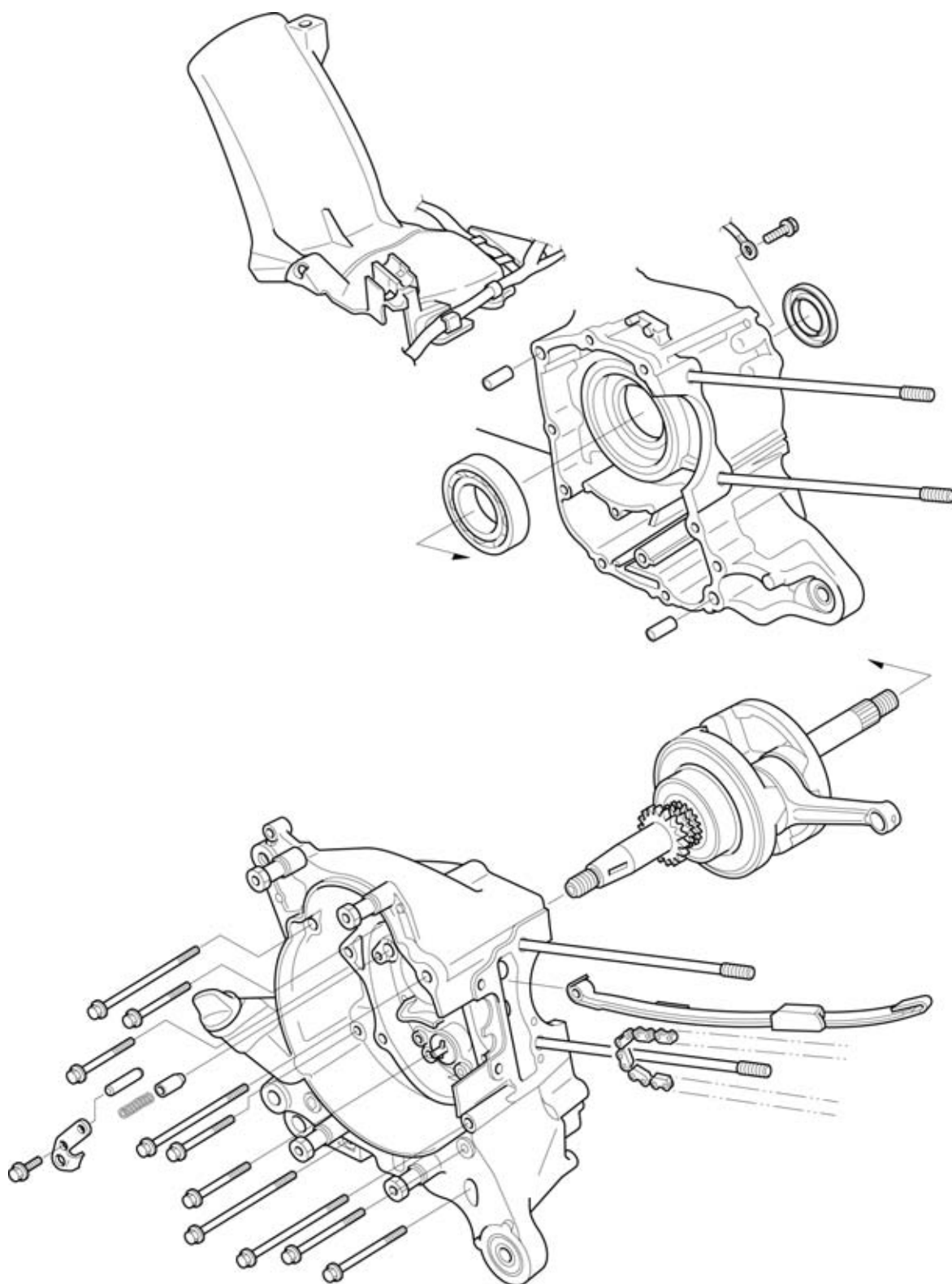


15. CRANKCASE/CRANKSHAFT

COMPONENT LOCATION	15-2	CRANKCASE SEPARATION	15-4
SERVICE INFORMATION	15-3	CRANKSHAFT INSPECTION	15-6
TROUBLESHOOTING.....	15-3	CRANKCASE ASSEMBLY	15-7

CRANKCASE/CRANKSHAFT

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers the crankcase separation to service the crankshaft.
- The following parts must be removed before separating the crankcase.
 - Centerstand (page 2-14)
 - Engine (page 16-4)
 - Cylinder head (page 10-12)
 - Cylinder (page 11-5)
 - Piston (page 11-7)
 - Drive pulley (page 12-7)
 - Clutch/driven pulley (page 12-9)
 - Flywheel/starter (page 14-4)
 - Stator base (page 8-4)
 - Oil pump driven gear (page 8-4)
- In addition to the parts listed above, remove the following parts when the left crankcase must be replaced.
 - Final reduction (page 13-4)
- In addition to the parts listed above, remove the following parts when the right crankcase must be replaced.
 - Oil pump (page 8-4)
- Be careful not to damage the crankcase mating surfaces when separating and assembling the crankcase halves.
- Clean all disassembled parts with clean solvent and dry them using compressed air before inspection.
- When installing the crankshaft, be sure to use the special tools; position the special tools on the bearing inner race and pull the crankshaft into the bearing until it is fully seated.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance	0.10 – 0.35 (0.004 – 0.014)	0.55 (0.022)
	Connecting rod radial clearance	0.004 – 0.016 (0.0002 – 0.0006)	0.05 (0.002)
	Runout	–	0.10 (0.004)

TROUBLESHOOTING

Abnormal noise

- Worn crankshaft bearing
- Worn connecting rod big end bearing
- Worn connecting rod small end (page 11-9)

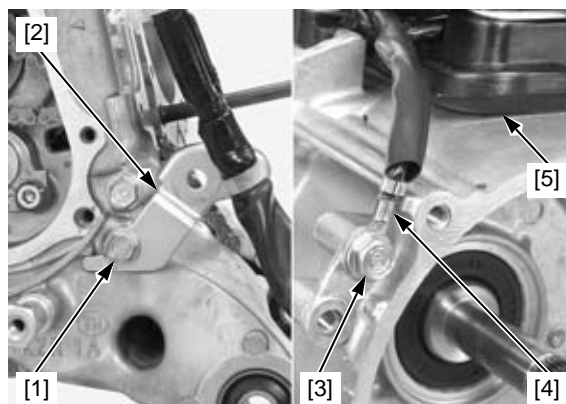
CRANKCASE SEPARATION

Refer to service information (page 15-3) for the parts which must be removed before separating the crankcase.

Remove the bolt [1] and stay [2].

Remove the bolt [3] and ground cable [4].

Remove the rear inner fender [5] from the crankcase.

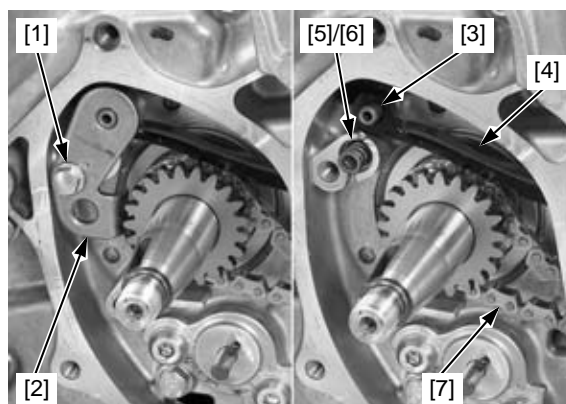


Remove the bolt [1] and set plate [2].

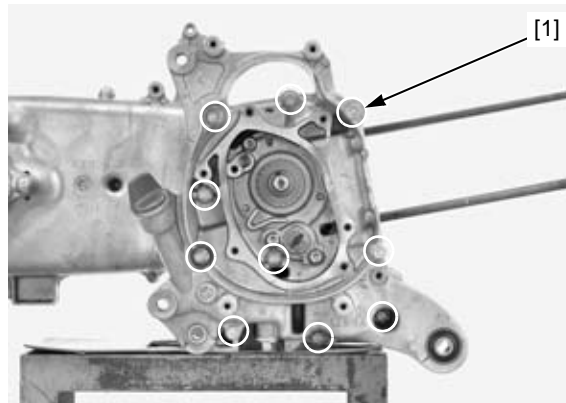
Remove the pivot [3] and cam chain tensioner slider [4].

Remove the spring [5] and plunger [6] from the right crankcase.

Remove the cam chain [7] from the crankshaft.

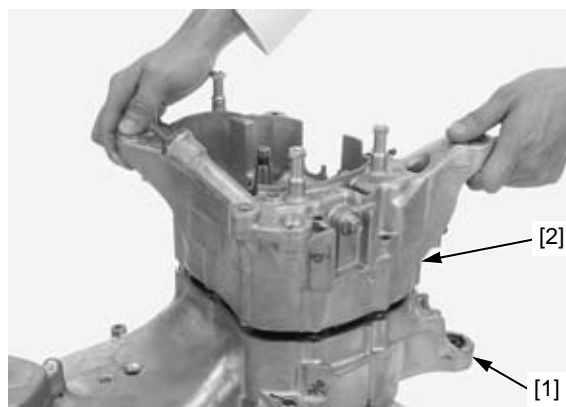


Remove the crankcase bolts [1] from the right crankcase.

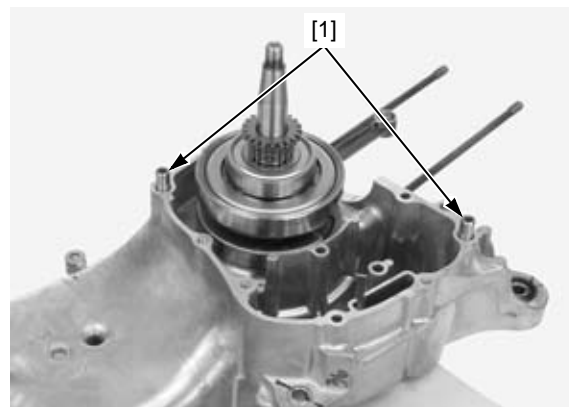


Be careful not to damage the crankcase mating surface.

Place the crankcase with the left crankcase [1] facing down and separate the left and right [2] crankcase.



Remove the dowel pins [1] from the left crankcase.

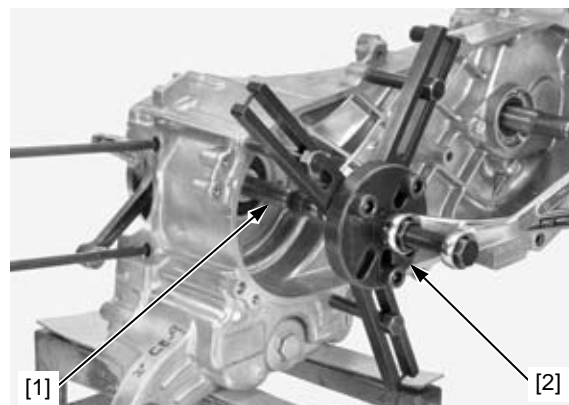


Remove the crankshaft [1] from the left crankcase using the special tool.

TOOL:

[2] Case puller

07SMC-0010001



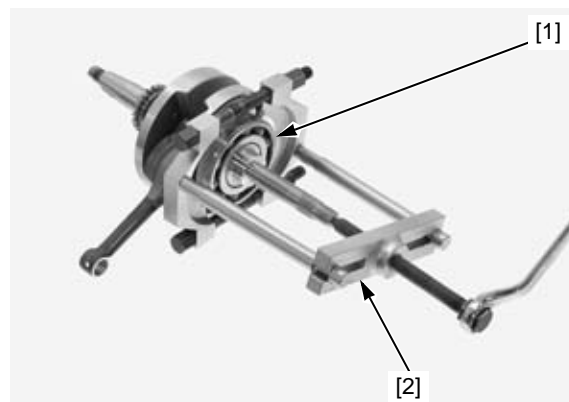
Remove the left crankshaft bearing [1] using the special tool.

TOOL:

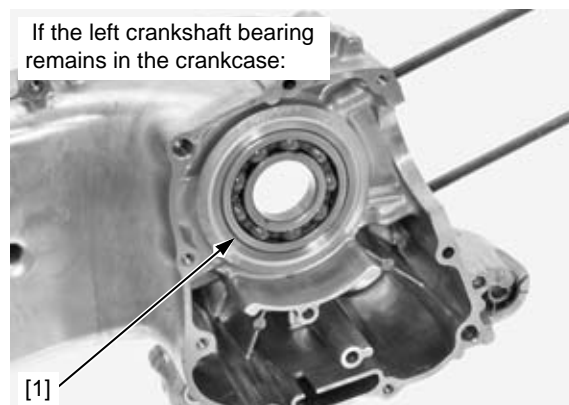
[2] Universal bearing puller

07631-0010000

- If the left crankshaft bearing remains in the crankcase, drive it out to the right side.

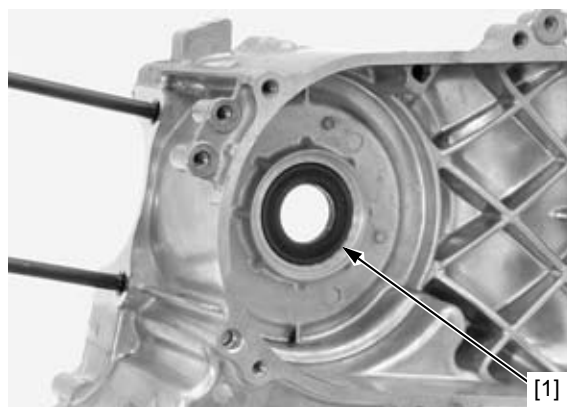


If the left crankshaft bearing remains in the crankcase:



CRANKCASE/CRANKSHAFT

Remove the oil seal [1] from the left crankcase.



CRANKSHAFT INSPECTION

Remove the crankshaft (page 15-4).

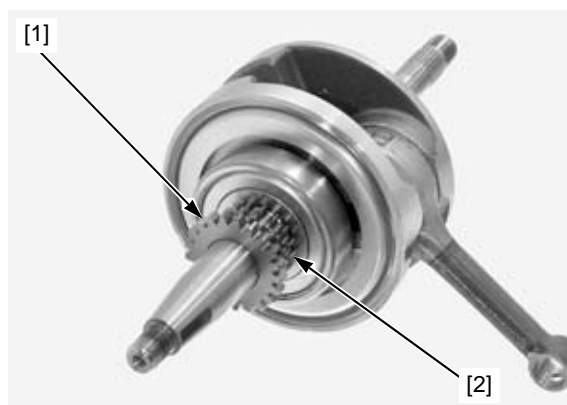
Turn the outer race of the right crankshaft bearing [1] with your finger. The bearing should turn smoothly and quietly. Also check that the bearing inner race fits tightly on the right crankshaft.

Replace the crankshaft as an assembly if the bearing does not turn smoothly, quietly, or if it fits loosely on the right crankshaft.



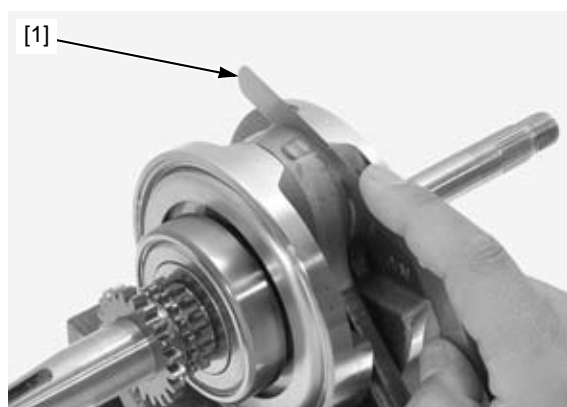
If the timing sprocket teeth are worn or damaged, check the cam chain, tensioner and cam sprocket.

Check the oil pump drive gear [1] and timing sprocket [2] teeth for wear or damage.



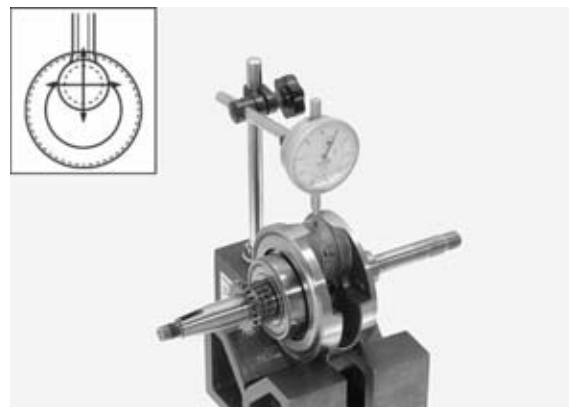
Measure the connecting rod big end side clearance with a feeler gauge [1].

SERVICE LIMIT: 0.55 mm (0.022 in)



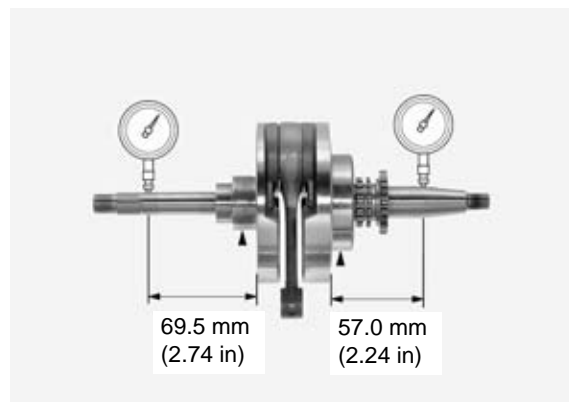
Set the crankshaft on V-blocks and measure the connecting rod big end radial clearance.

SERVICE LIMIT: 0.05 mm (0.002 in)



Set the crankshaft on V-blocks and measure the runout using a dial indicator. Actual runout is 1/2 of total indicator reading.

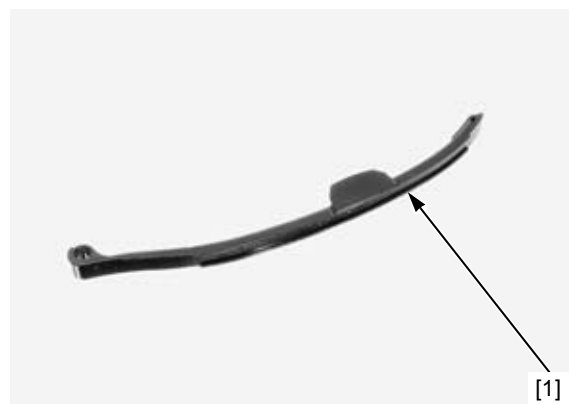
SERVICE LIMIT: 0.10 mm (0.004 in)



CAM CHAIN TENSIONER SLIDER INSPECTION

Check the cam chain tensioner slider [1] for excessive wear or damage. Replace if necessary.

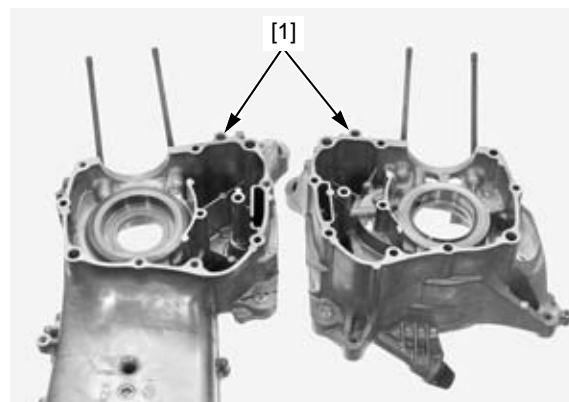
If the cam chain tensioner slider is worn or damaged, also check the condition of cam chain guide .



CRANKCASE ASSEMBLY

Be careful not to damage the crankcase mating surface.

Clean the insides and mating surface [1] of the crankcases. Check for cracks or other damage. Remove any roughness or irregularities with an oil stone.



CRANKCASE/CRANKSHAFT

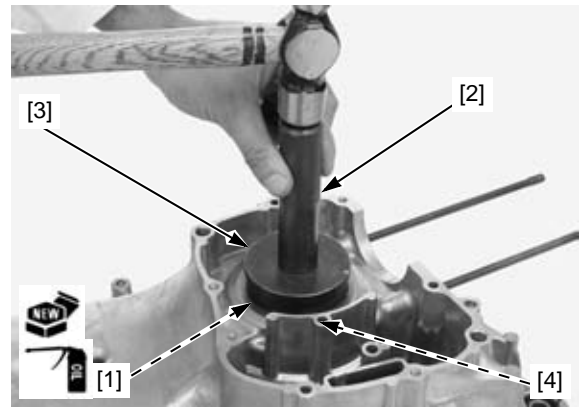
Apply engine oil to the bearing cavity.

Drive the left crankshaft bearing [1] into the left crankcase squarely until it is fully seated, using the special tool.

TOOLS:

[2] Driver	07749-0010000
[3] Attachment, 72 x 75 mm	07746-0010600
[4] Pilot, 35 mm	07746-0040800

Apply 2 cm³ minimum of engine oil to a new left crankshaft bearing.

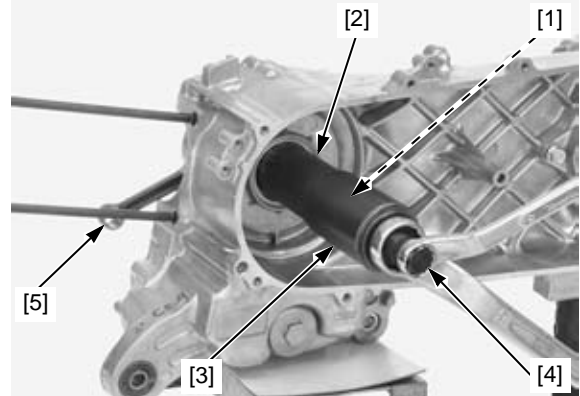


Install the crankshaft into the left crankshaft bearing as follows:

Install the assembly shaft adaptor [1] to the left crankshaft.

Position the assembly collar A [2] on the left crankshaft bearing inner race and set the assembly collar B [3] to the assembly collar A.

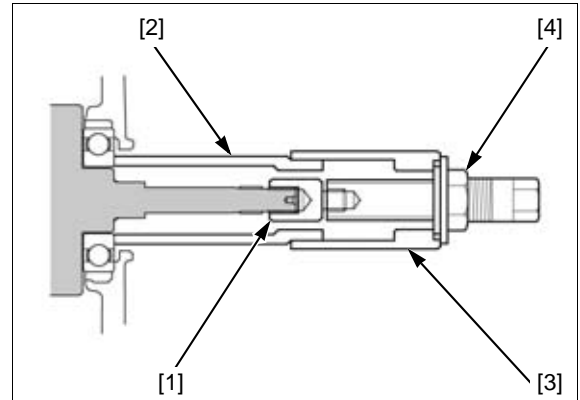
Install the assembly shaft [4] to the assembly collar B and screw it onto the assembly shaft adaptor while aligning the center of the assembly collar B with the assembly shaft.



NOTE:

When pulling the crankshaft into the bearing, be careful not to damage the connecting rod [5].

Pull the crankshaft into the bearing until it is fully seated while positioning the connecting rod in the cylinder sleeve opening on the left crankcase.



TOOLS:

[1] Assembly shaft adaptor	07WMF-KFF0200
[2] Assembly collar A	07965-VM00100
[3] Assembly collar B	07931-KF00100
[4] Assembly shaft	07965-VM00200

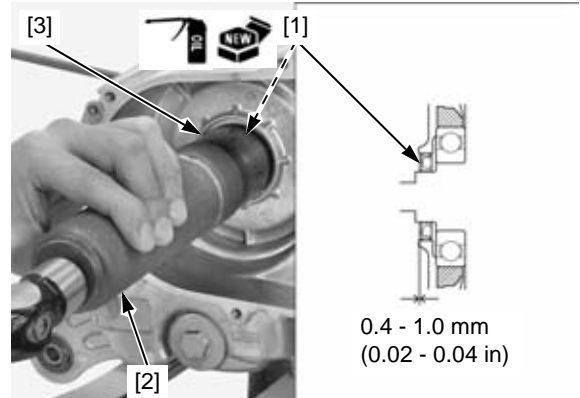
Apply engine oil to a new oil seal [1] lip.

Do not insert the oil seal too far.

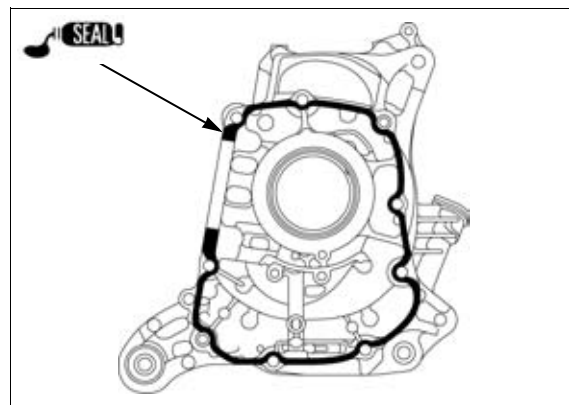
Install the oil seal to the left crankcase squarely so that the depth from the left crankcase surface is 0.4 - 1.0 mm (0.02 - 0.04 in), using the special tools.

TOOLS:

[2] Driver, 40 mm	07746-0030100
[3] Driver attachment, 35 mm	07HMD-MR70100



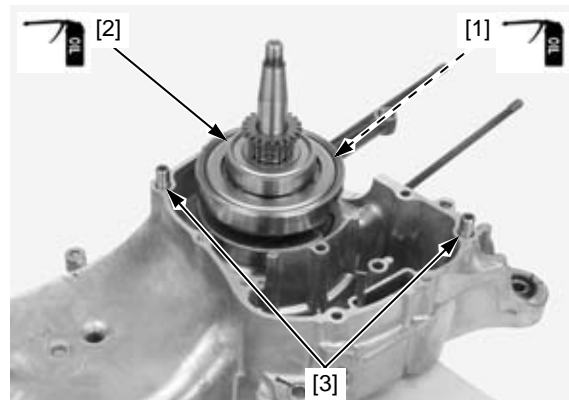
Apply sealant (Three bond 1207B or Three bond 1215 or LOCTITE 5060S or 5020 or equivalent) to the right crankcase mating surface.



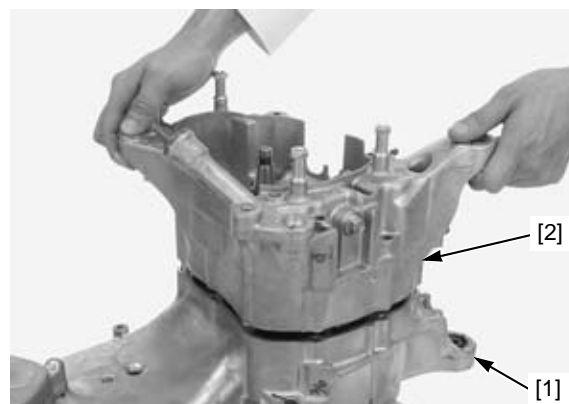
Inject minimum 3 cm³ of engine oil to the connecting rod big end bearing [1].

Apply 2 cm³ minimum of engine oil to right crankshaft bearing [2].

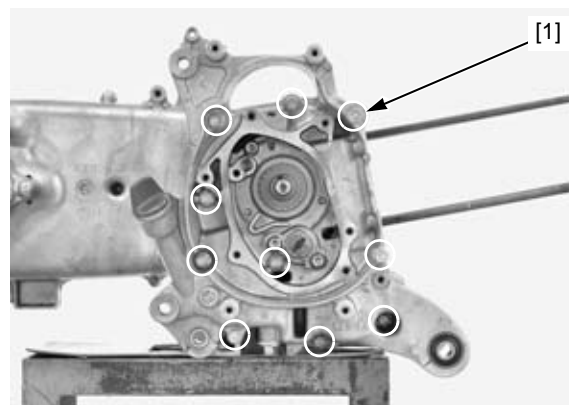
Install the dowel pins [3] to the left crankcase.



Assemble the left [1] and right [2] crankcase.

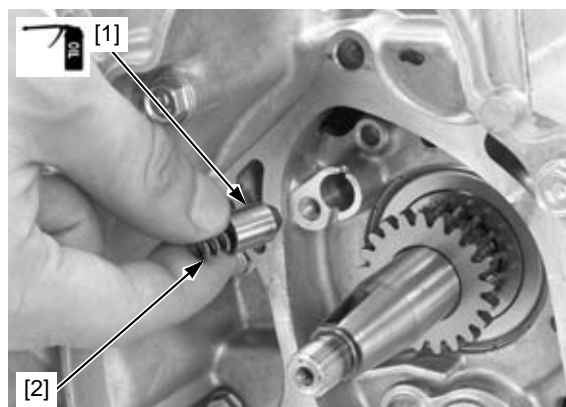


Install the crankcase bolts [1] and tighten them in a crisscross pattern in 2 - 3 steps.



CRANKCASE/CRANKSHAFT

Apply engine oil to the plunger [1] sliding surface and install the plunger and spring [2] into the right crankcase.

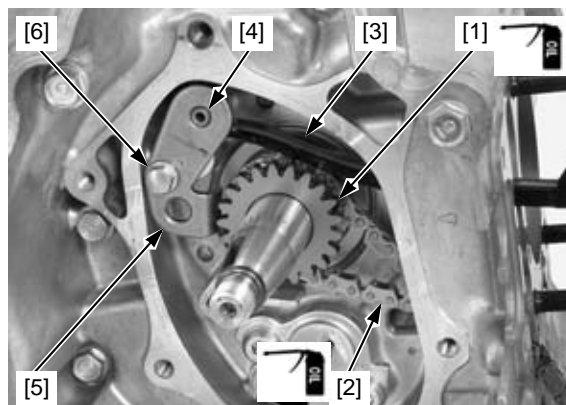


Apply engine oil to the timing sprocket [1] teeth and cam chain [2] whole surface.

Install the cam chain to the timing sprocket.

Install the cam chain tensioner slider [3], pivot [4] and set plate [5].

Install and tighten the bolt [6].

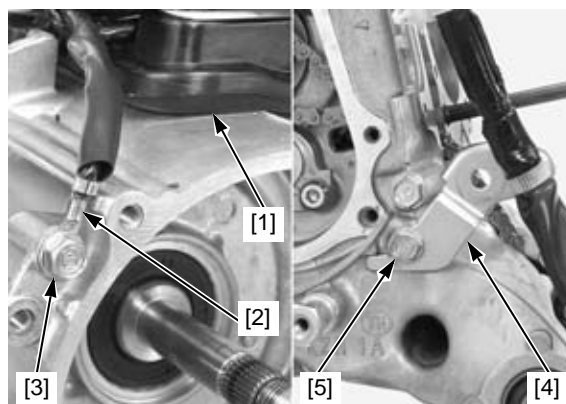


Install the rear inner fender [1] to the crankcase.

Set the ground cable [2], then install and tighten the bolt [3].

Install the stay [4] and tighten the bolt [5].

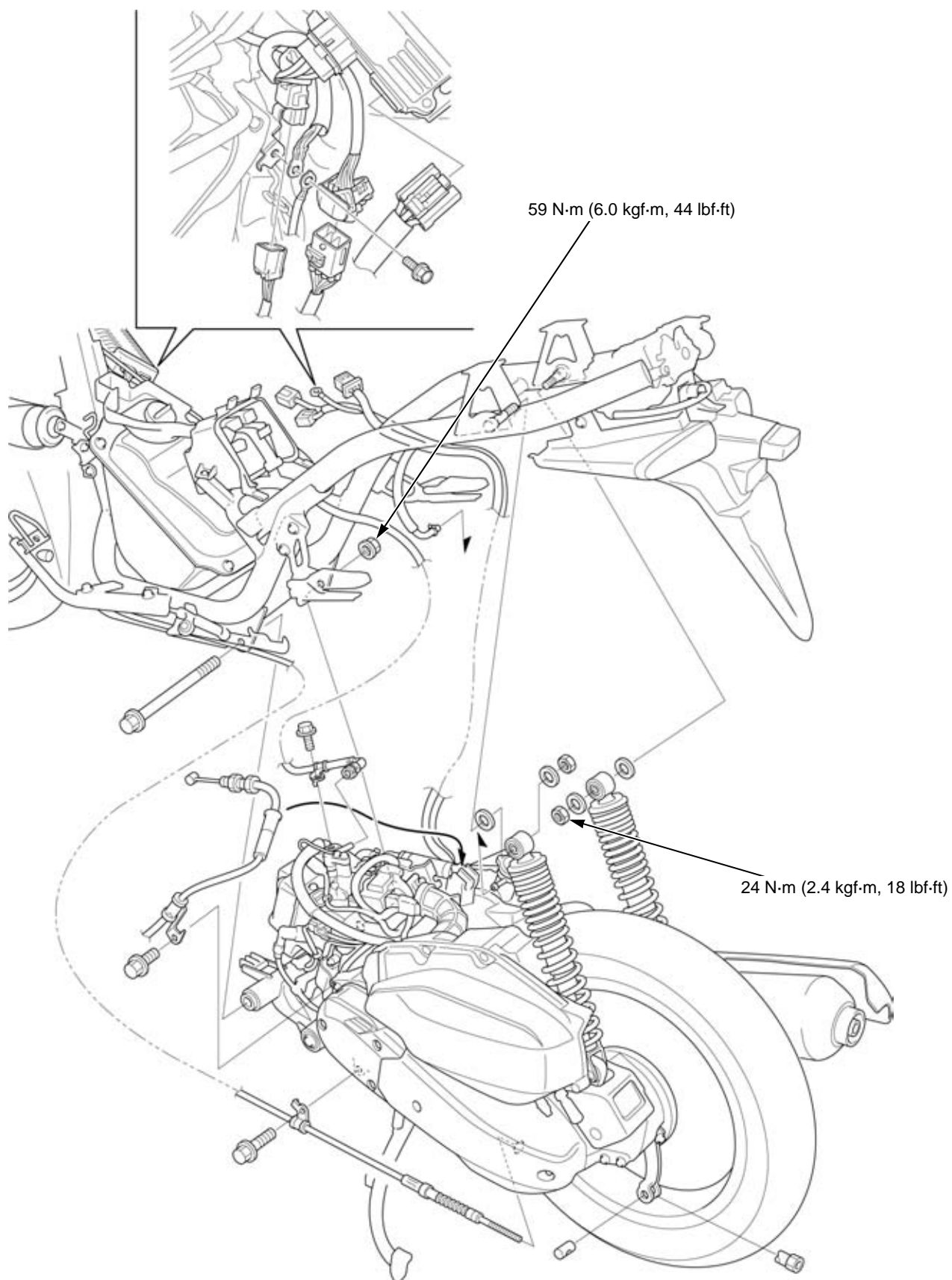
Refer to service information (page 15-3) for installation of parts removed to perform crankcase service.



16. ENGINE REMOVAL/INSTALLATION

COMPONENT LOCATION	16-2	ENGINE HANGER LINK	16-6
SERVICE INFORMATION	16-3	ENGINE INSTALLATION.....	16-6
ENGINE REMOVAL	16-4		

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- Support the frame using a hoist to ease engine mounting bolt removal.
- When removing/installing the engine, tape the frame around the engine beforehand for frame protection.
- The following components require engine removal for service.
 - Cylinder head/valves (page 10-3)
 - Cylinder/piston (page 11-3)
 - Crankcase/crankshaft (page 15-3)
- The following components can be serviced with the engine installed in the frame.
 - Drive pulley/driven pulley/clutch (page 12-3)
 - Final reduction (page 13-3)
 - Alternator/starter (page 14-3)
 - Camshaft (page 10-7)
 - Water pump (page 9-3)
 - Throttle body (page 7-12)
 - Oil pump (page 8-3)

SPECIFICATIONS

WW125EX2:

ITEM		SPECIFICATIONS
Engine dry weight		29.8 kg (65.7 lbs)
Coolant capacity	Radiator and engine	0.51 liter (0.54 US qt, 0.45 Imp qt)
Engine oil capacity	After draining	0.8 liter (0.8 US qt, 0.7 Imp qt)
	After disassembly	0.9 liter (1.0 US qt, 0.8 Imp qt)
	After oil strainer removal	0.9 liter (1.0 US qt, 0.8 Imp qt)

WW150:

ITEM		SPECIFICATIONS
Engine dry weight		30.1 kg (66.4 lbs)
Coolant capacity	Radiator and engine	0.48 liter (0.51 US qt, 0.42 Imp qt)
Engine oil capacity	After draining	0.8 liter (0.8 US qt, 0.7 Imp qt)
	After disassembly	0.9 liter (1.0 US qt, 0.8 Imp qt)
	After oil strainer removal	0.9 liter (1.0 US qt, 0.8 Imp qt)

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Engine hanger link pivot nut				
- Frame side	1	10	59 (6.0, 44)	U-nut
- Engine side	1	10	49 (5.0, 36)	U-nut
Shock absorber upper mounting nut	2	10	24 (2.4, 18)	

ENGINE REMOVAL

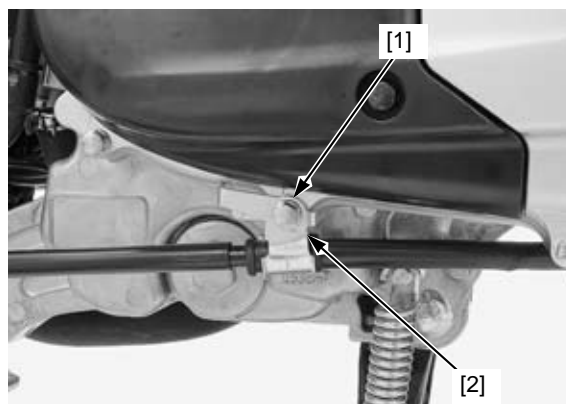
Place the scooter on its centerstand.

Remove the following:

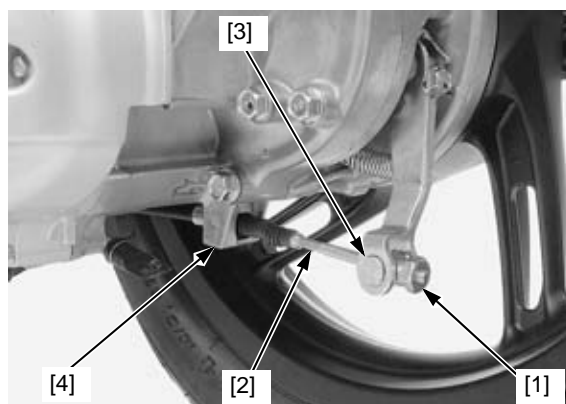
- Floor step (page 2-10)
- Luggage box (page 2-12)

Relieve the fuel pressure and disconnect the injector side quick connect fitting (page 7-4).

Remove the bolt [1] and cable clamp [2].

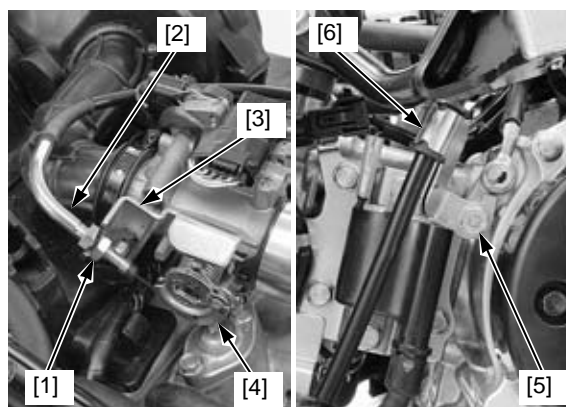


Remove the rear brake adjusting nut [1].
Pull out the brake cable [2] from the joint pin [3] and cable holder [4].
Remove the joint pin from the brake arm.



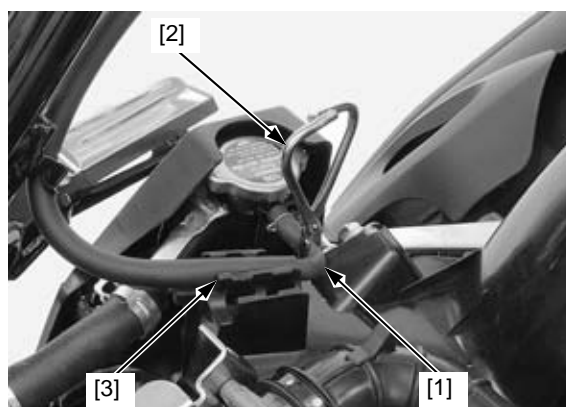
Loosen the throttle cable lock nut [1].
Disconnect the throttle cable [2] from the cable bracket [3] and throttle drum [4].

Remove the bolt [5] and cable clamp [6].



Pinch the siphon hose [1] using a hose clamp [2] and disconnect the hose from the radiator.

Release the siphon hose from the hose guide [3].

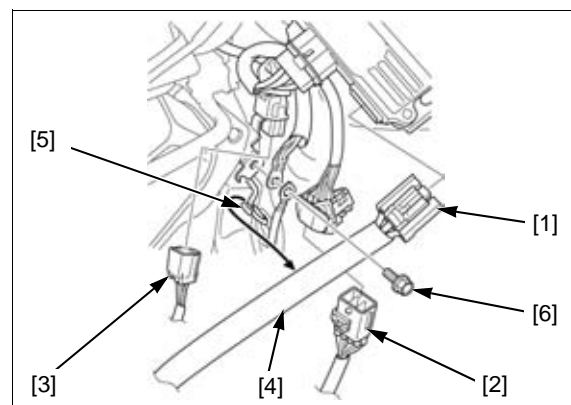


Disconnect the following:

- ECM 3P (Black) connector [1]
- Engine sub harness 10P (Black) connector [2]
- Engine sub harness 6P connector [3]

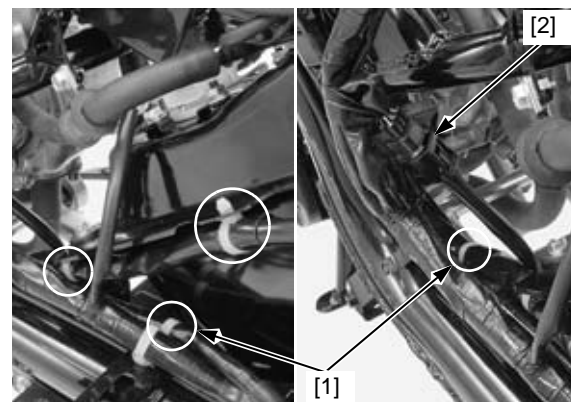
Release the engine sub harness [4] from the frame clamp [5].

Remove the bolt [6] and ground cables.



Release the four wire band bosses [1].

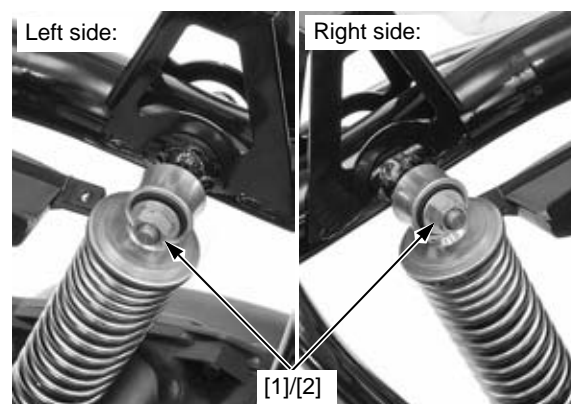
Disconnect the CKP sensor 6P (Black) connector [2].



Support the frame in upright position.
Hold the front wheel.

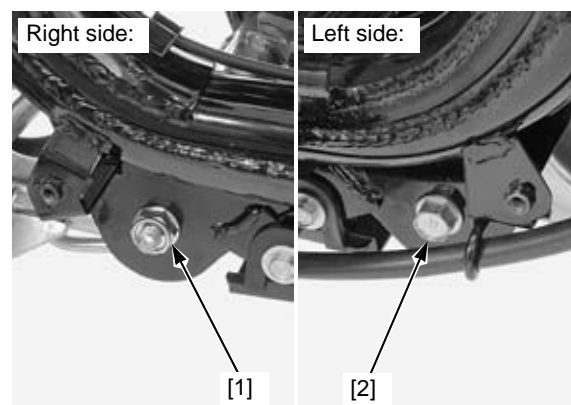
Remove the both rear shock absorber upper mounting nuts [1] and washers [2].

Release the both rear shock absorber upper mount from the frame.



Remove the engine hanger link nut (frame side) [1] and pull out the bolt [2].

Slightly pull the engine straight back to release it from the frame and remove the engine, being careful not to damage the rear fender.



ENGINE HANGER LINK

REMOVAL/INSTALLATION

Remove the following:

- Engine (page 16-4)
- Exhaust pipe/muffler (page 2-13)

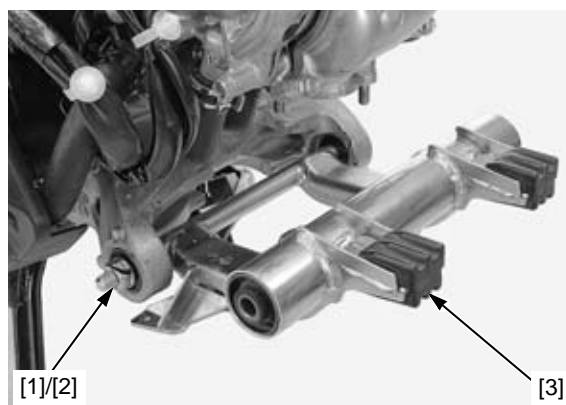
Remove the engine hanger link nut [1], bolt [2] and engine hanger link [3].

Install the engine hanger link, bolt and nut, then temporarily tighten the nut.

Install the removed parts in the reverse order of removal.

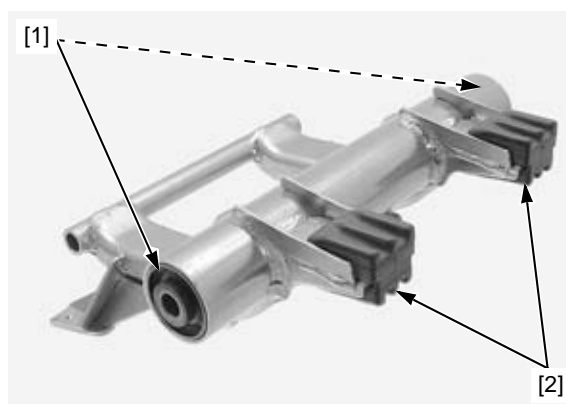
NOTE:

- After installing the engine to the frame, tighten the engine hanger link nut to the specified torque (page 16-7).

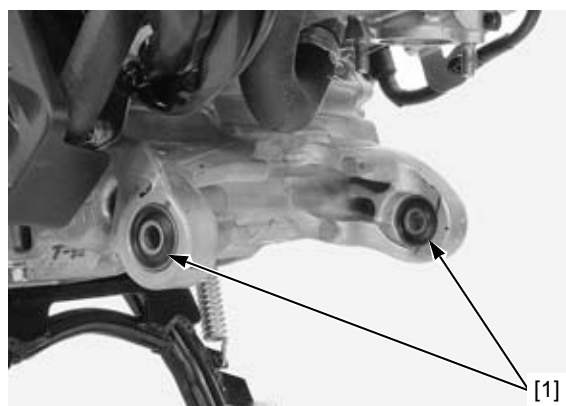


INSPECTION

Check the hanger link bushings [1] and stopper rubbers [2] for wear or damage.



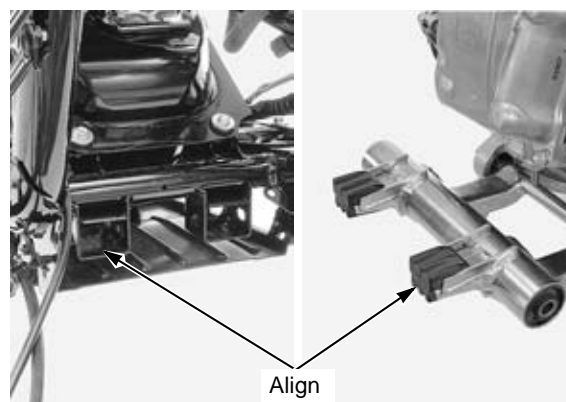
Check the engine mount bushings [1] for wear or damage.



ENGINE INSTALLATION

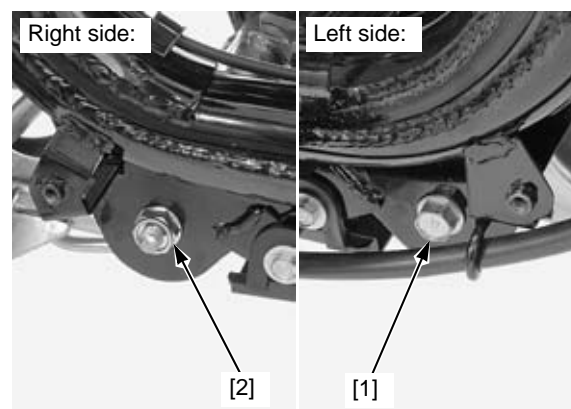
Support the frame in upright position.
Hold the front wheel.

Set the engine to the frame by aligning the frame grooves and engine hanger link bosses.



Install the engine hanger link bolt (frame side) [1] and nut [2], then tighten it to the specified torque.

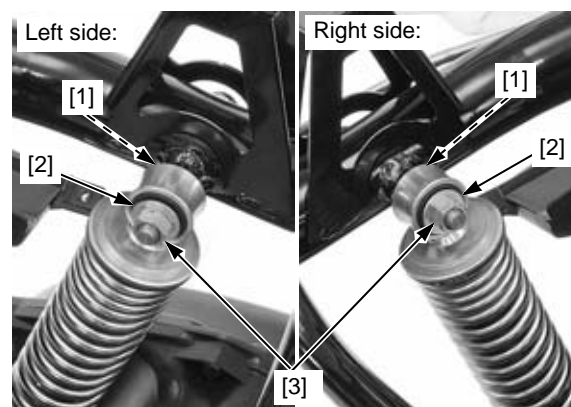
TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)



Install the inside washers [1], then set the both rear shock absorber upper mount to the frame.

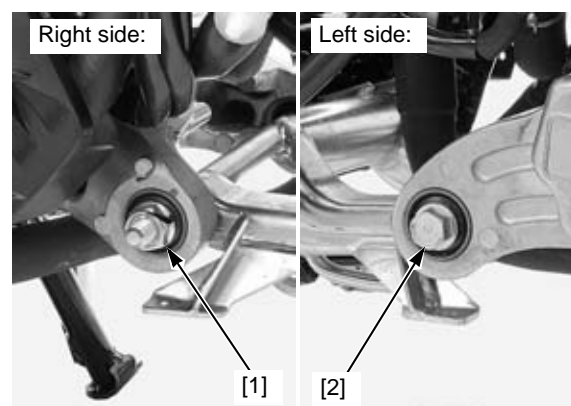
Install the outside washers [2] and both rear shock absorber upper mounting nuts [3], then tighten them to the specified torque.

TORQUE: 24 N·m (2.4 kgf·m, 18 lbf·ft)



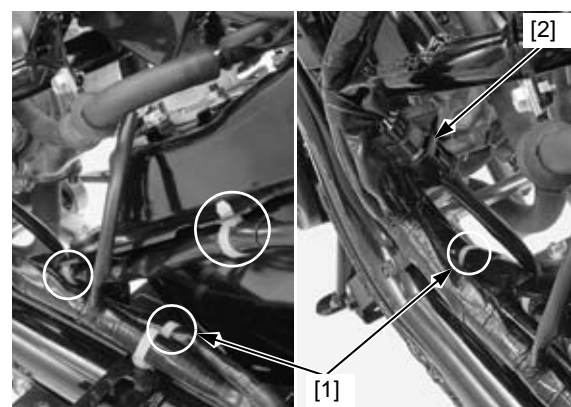
When you replaced or removed the engine hanger linkage, tighten the engine hanger link pivot nut (engine side) [1] to the specified torque while holding the pivot bolt [2].

TORQUE: 49 N·m (5.0 kgf·m, 36 lbf·ft)



Install the four wire band bosses [1].

Connect the CKP sensor 6P (Black) connector [2].



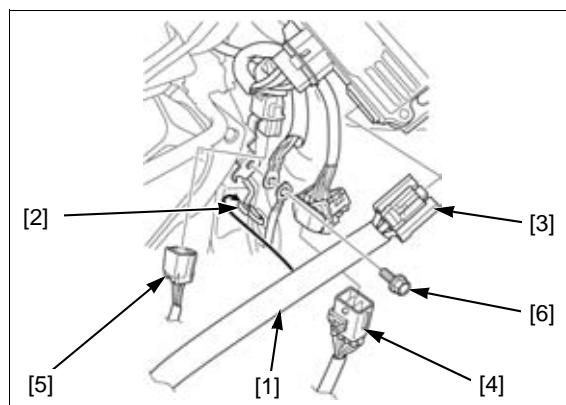
ENGINE REMOVAL/INSTALLATION

Secure the engine sub harness [1] to the frame clamp [2].

Connect the following:

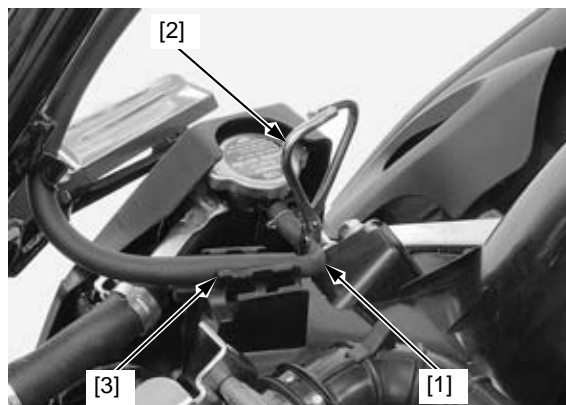
- ECM 3P (Black) connector [3]
- Engine sub harness 10P (Black) connector [4]
- Engine sub harness 6P connector [5]

Set the ground terminals as shown, then install and tighten the bolt [6].



Connect the siphon hose [1] to the radiator and remove the clamp [2].

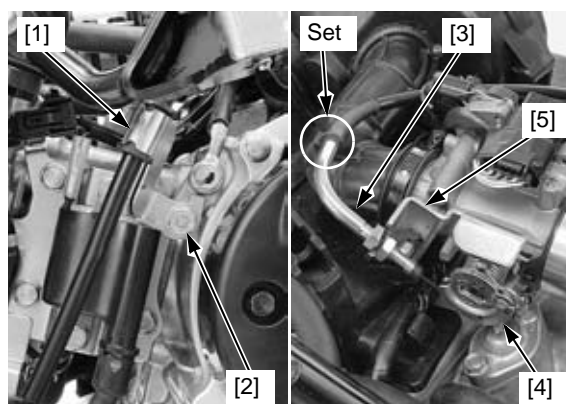
Install the siphon hose to the hose guide [3].



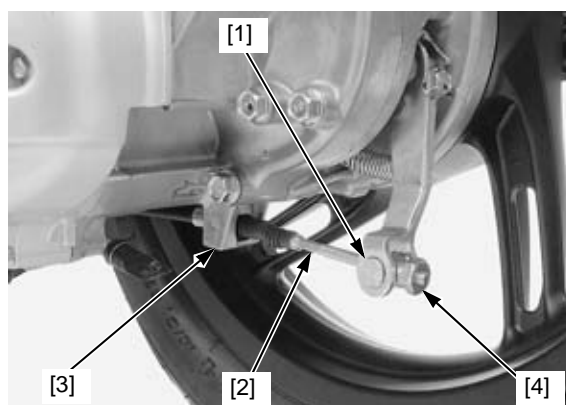
Install the cable clamp [1], then install and tighten the bolt [2].

Connect the throttle cable [3] to the throttle drum [4] and cable bracket [5], then adjust the throttle grip freeplay (page 3-4).

- Set the throttle cable against the connecting hose.



Install the joint pin [1] into the brake arm. Route the 2nd rear brake cable [2] into the cable holder [3] and joint pin, then install the adjusting nut [4].



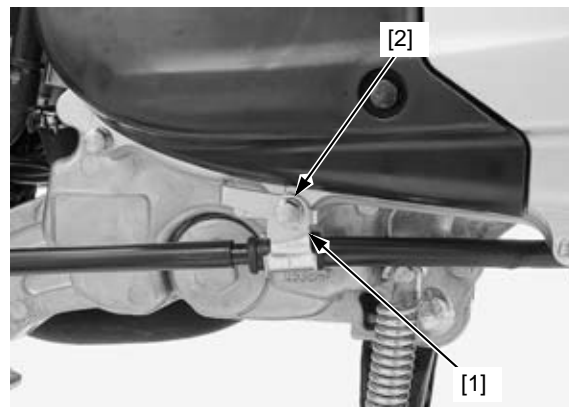
Install the cable clamp [1] and tighten the bolt [2].

Adjust the rear brake lever freeplay (page 3-14).

Connect the injector side quick connect fitting and normalize the fuel pressure (page 7-5).

Install the following:

- Floor step (page 2-10)
- Luggage box (page 2-12)

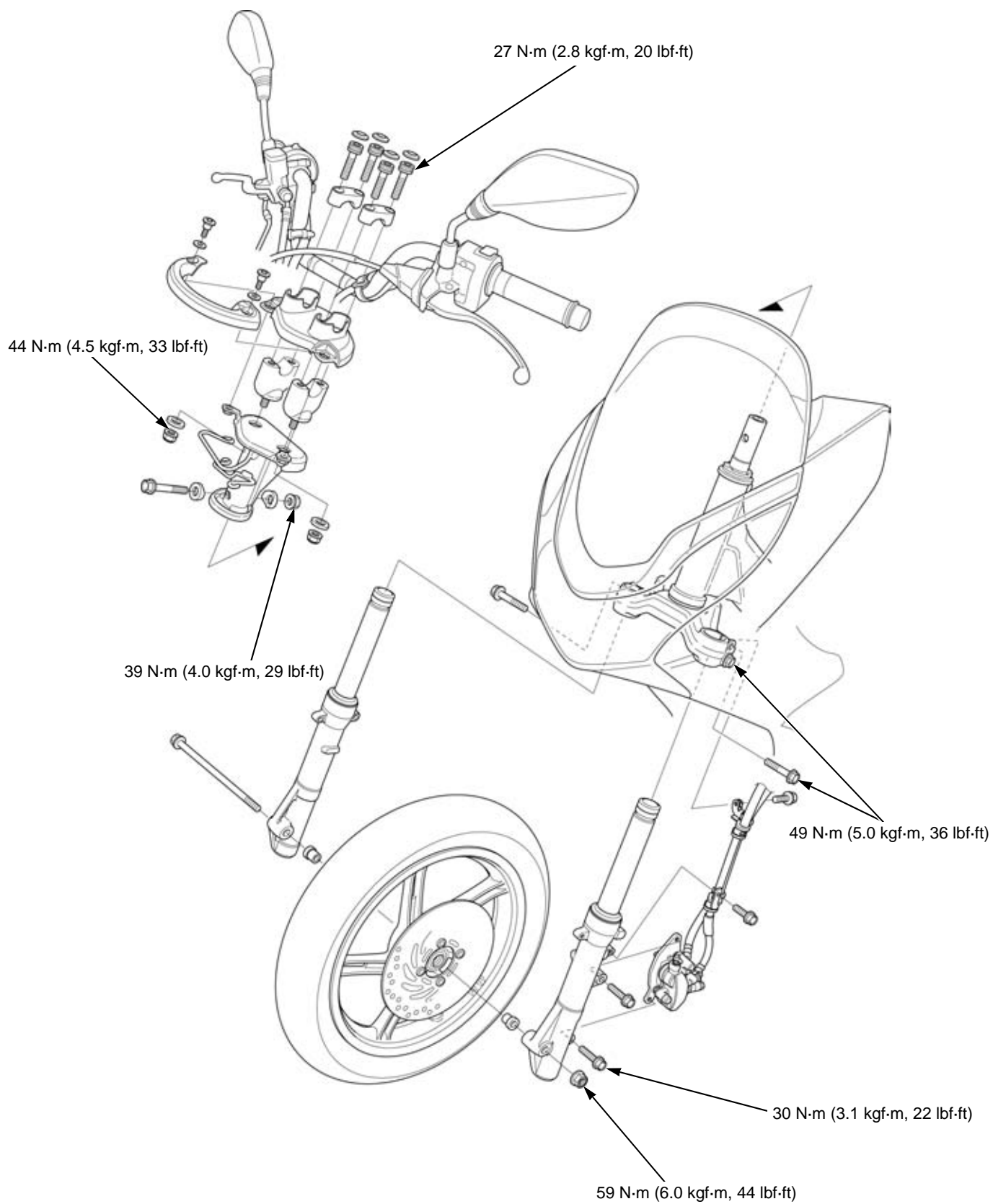


MEMO

17. FRONT WHEEL/SUSPENSION/STEERING

COMPONENT LOCATION	17-2	FORK.....	17-7
SERVICE INFORMATION	17-3	HANDLEBAR	17-16
TROUBLESHOOTING.....	17-4	HANDLEBAR POST	17-22
FRONT WHEEL	17-5	STEERING STEM	17-23

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

⚠ WARNING

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.

- This section covers the front wheel, fork, handlebar and steering stem.
- When servicing the front wheel, fork or steering stem, support the scooter using a jack or other support.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- After the front wheel installation, check the brake operation by applying the brake lever.
- For brake system service (page 19-3).

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	1.5 (0.06)
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)
Fork	Spring free length	291.8 (11.49)	—
	Pipe runout	—	0.2 (0.01)
	Recommended fluid	Honda Ultra Cushion Oil 10W	—
	Fluid level	75 (2.95)	—
	Fluid capacity	122.0 ± 2.5 cm ³ (4.13 ± 0.05 US oz, 4.29 ± 0.05 Imp oz)	—

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front brake disc socket bolt	4	8	42 (4.3, 31)	ALOC bolt: replace with new ones.
Front axle nut	1	12	59 (6.0, 44)	U-nut
Fork socket bolt	2	8	20 (2.0, 15)	Apply locking agent to the threads.
Bottom bridge pinch bolt	4	10	49 (5.0, 36)	
Brake caliper mounting bolt	2	8	30 (3.1, 22)	ALOC bolt: replace with new ones.
Handlebar upper holder socket bolt	4	8	27 (2.8, 20)	For tightening sequence; See page 17-19
Right/left handlebar switch housing screw	4	5	2.5 (0.26, 1.8)	
Handlebar weight screw	2	6	9 (0.9, 7)	Apply locking agent to the threads.
Front master cylinder holder socket bolt	2	6	12 (1.2, 9)	
Rear brake lever bracket socket bolt	2	6	12 (1.2, 9)	
Rearview mirror lock nut	2	10	34 (3.5, 25)	Left hand threads.
Handlebar lower holder nut	2	10	44 (4.5, 33)	U-nut
Handlebar post nut	1	10	39 (4.0, 29)	U-nut
Rearview mirror adapter bolt	2	10	34 (3.5, 25)	
Steering stem top thread	1	26	—	See page 17-27
Steering stem lock nut	1	26	—	See page 17-27
Throttle cable lock nut (handlebar side)	1	10	1.5 (0.15, 1.1)	
Rear brake lever pivot bolt	1	5	1 (0.1, 0.7)	
Rear brake lever pivot nut	1	5	4.5 (0.46, 3.3)	U-nut

TROUBLESHOOTING

Hard steering

- Insufficient tire pressure
- Faulty tire
- Steering stem lock nut too tight
- Faulty steering head bearing
- Faulty steering head bearing race
- Bent steering stem

Steers to one side or does not track straight

- Bent front axle
- Wheel installed incorrectly
- Worn or damaged front wheel bearings
- Bent fork
- Worn or damaged engine mounting bushings
- Bent frame
- Faulty steering head bearing

Front wheel wobbles

- Loose front axle fasteners
- Bent rim
- Worn or damaged front wheel bearings

Front wheel turns hard

- Front brake drag
- Bent front axle
- Faulty front wheel bearings

Soft suspension

- Low tire pressure
- Deteriorated fork fluid
- Incorrect fork fluid weight
- Insufficient fluid in fork
- Weak fork spring

Hard suspension

- High tire pressure
- Too much fluid in fork
- Incorrect fork fluid weight
- Bent fork pipes
- Clogged fork fluid passage

Suspension noisy

- Bent fork slider
- Insufficient fluid in fork
- Loose fork fasteners

FRONT WHEEL

REMOVAL

Loosen the front axle nut [1].

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

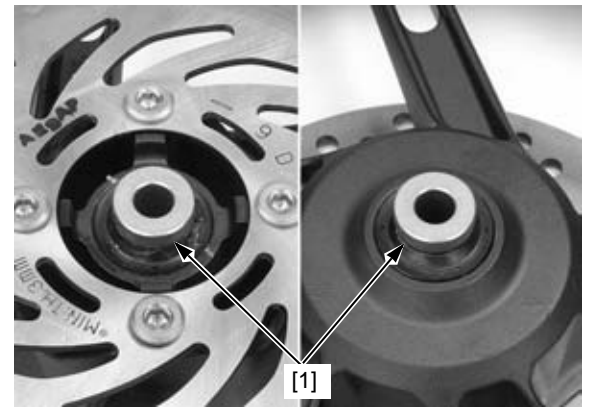
Remove the front axle nut.

Do not operate the brake lever after removing the front wheel.

Remove the front axle out and remove the front wheel.



Remove the side collars [1] from both side of the wheel.



INSPECTION

AXLE

Place the axle on V-blocks and measure the runout with a dial indicator.

SERVICE LIMIT: 0.2 mm (0.01 in)

Actual runout is 1/2 of the total indicator reading.

WHEEL BEARING

Turn the inner race of each bearing with your finger, the bearing should turn smoothly and quietly.

Also check that the bearing outer race fits tightly in the hub.

Replace the bearings in pairs.

Remove and discard the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the hub.

WHEEL RIM

Check the wheel rim runout by placing the wheel on a turning stand.

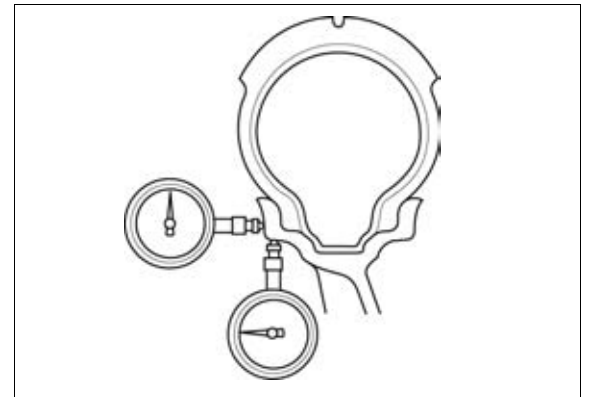
Spin the wheel by hand and read the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT:

Axial: 2.0 mm (0.08 in)

Radial: 2.0 mm (0.08 in)



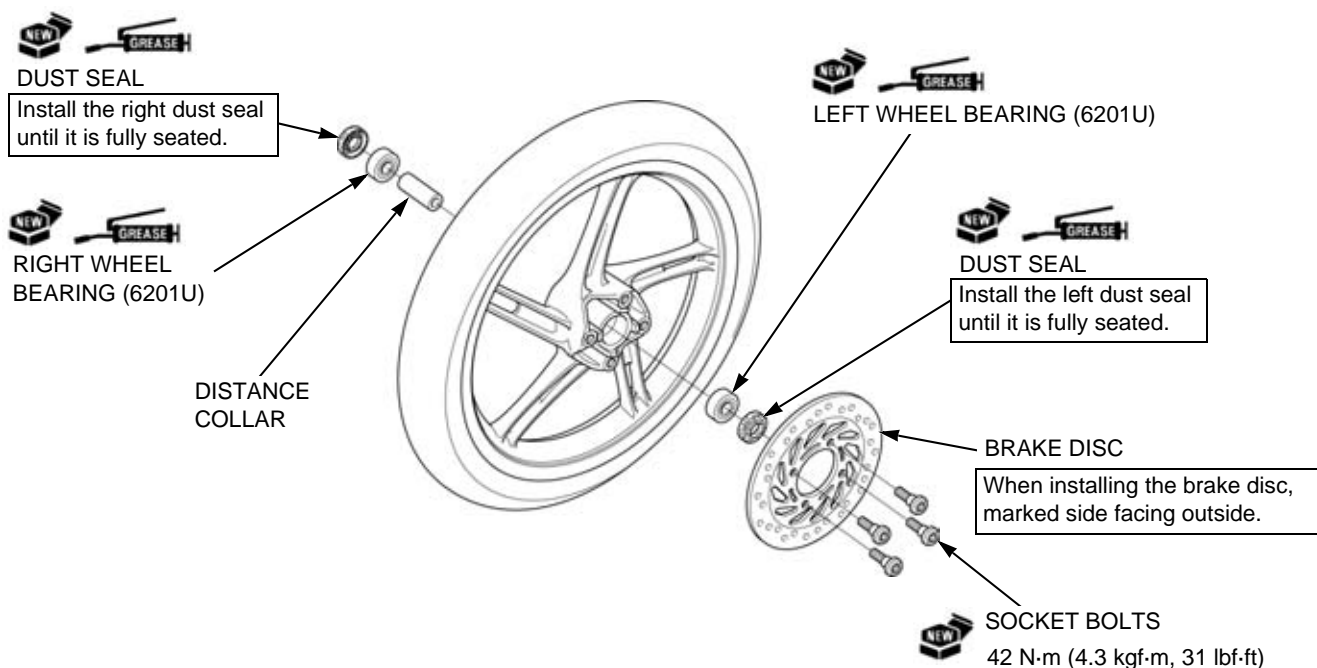
FRONT WHEEL/SUSPENSION/STEERING

DISASSEMBLY/ASSEMBLY

NOTE:

Refer to LUBRICATION & SEAL POINTS (page 1-13).

For wheel bearing replacement (page 17-6).



WHEEL BEARING REPLACEMENT

Install the bearing remover head [1] into the bearing. From the opposite side, install the bearing remover shaft [2] and drive the bearing out of the wheel hub. Remove the distance collar and drive out the other bearing.

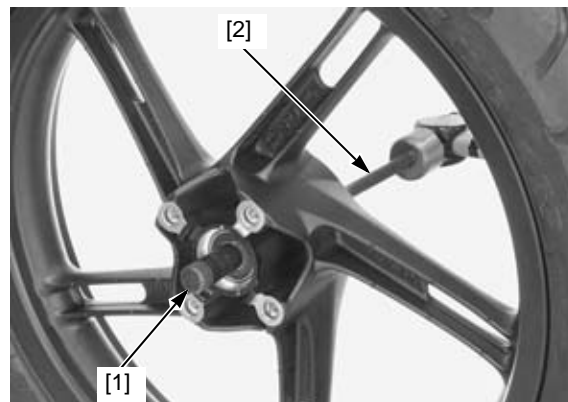
TOOLS:

[1] Remover head, 12 mm

07746-0050300

[2] Bearing remover shaft

07746-0050100



Pack all bearing cavities with grease.

Never install the old bearings. Once the bearings have been removed, the bearings must be replaced with new ones.

Drive in a new left bearing [1] squarely with its sealed side facing up until it is fully seated.

TOOLS:

[2] Driver

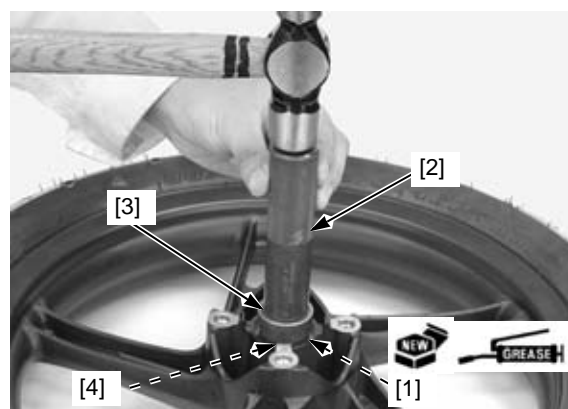
07749-0010000

[3] Attachment, 32 x 35 mm

07746-0010100

[4] Pilot, 12 mm

07746-0040200



Install the distance collar [1].

Drive in a new right bearing [2] squarely with its sealed side facing up until its inner race is seated on the distance collar.

TOOLS:

Driver

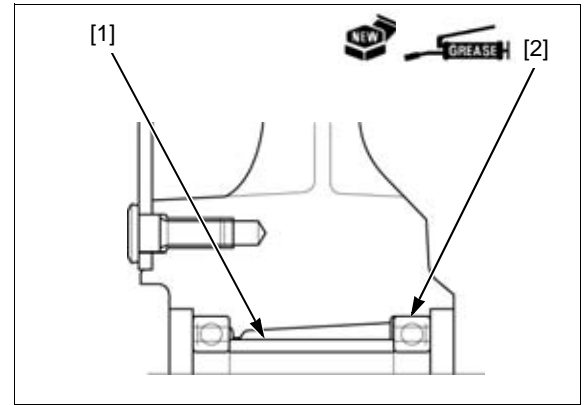
07749-0010000

Attachment, 32 x 35 mm

07746-0010100

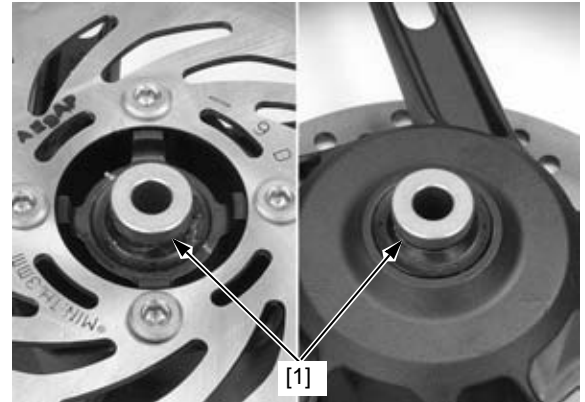
Pilot, 12 mm

07746-0040200



INSTALLATION

Install the side collars [1] to both side of the wheel.

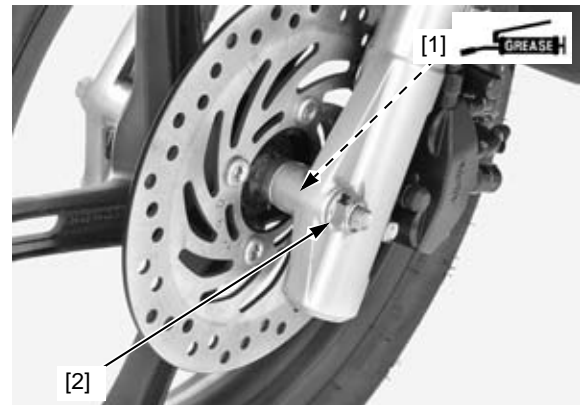


Install the front wheel between the fork legs while inserting the disc between the pads.

Apply thin coat of grease to the front axle [1] sliding surface and install it from the right side.

Install the axle nut [2] and tighten it to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)



FORK

REMOVAL

Remove the following:

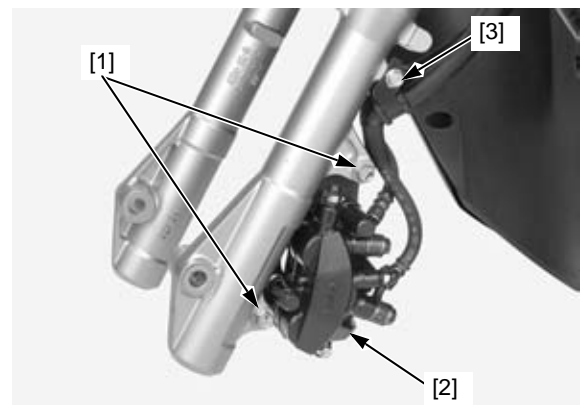
- Front fender
 - Except U type (page 2-4)
 - U type (page 2-4)
- Front wheel (page 17-5)

Support the front brake caliper with a piece of wire so that it does not hang from the front brake hose.

Do not twist the brake hose.

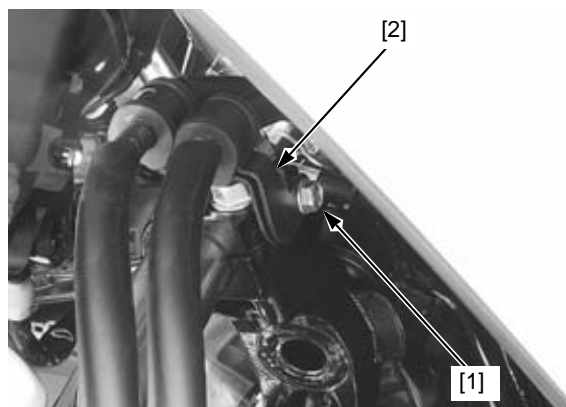
Remove the mounting bolts [1] and front brake caliper [2] from the left fork leg.

Remove the clamp bolt [3] and brake hose clamp from the left fork leg.



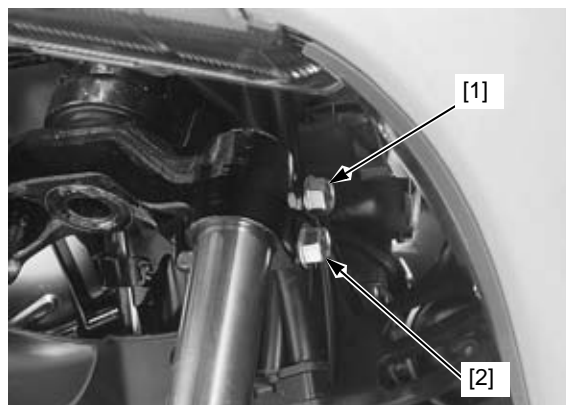
FRONT WHEEL/SUSPENSION/STEERING

Remove the clamp bolt [1] and brake hose clamp [2] from the steering stem.



Remove the upper fork pinch bolt [1].

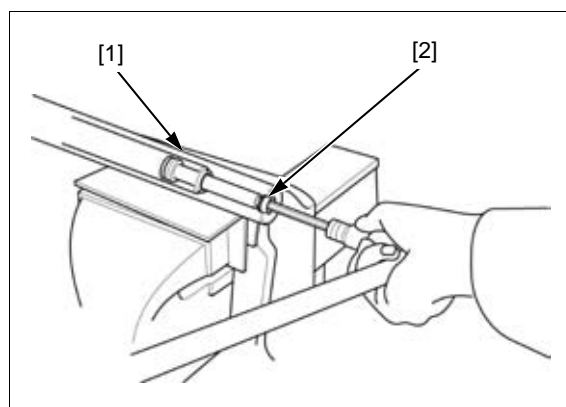
Loosen the lower fork pinch bolt [2] and remove the fork pipe from the steering stem.



DISASSEMBLY

Hold the fork slider [1] in a vice with soft jaws or a shop towel.

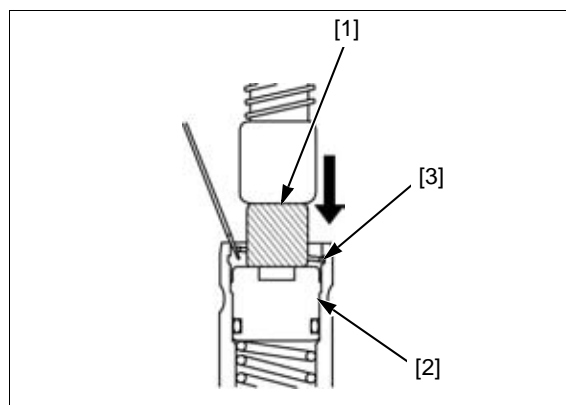
Loosen the fork socket bolt [2].



To prevent loss of tension, do not compress the fork spring more than necessary. The spring seat is under spring pressure. Use care when removing the fork assembly from the hydraulic press.

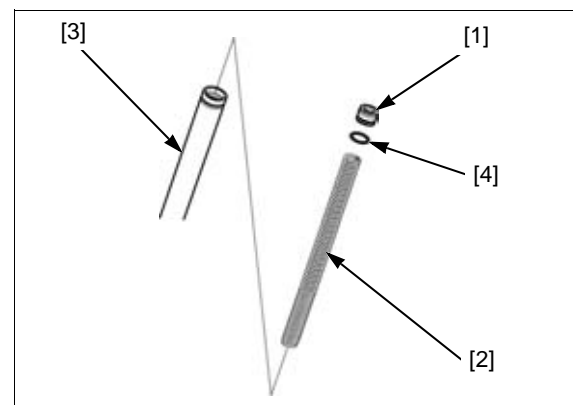
Put the suitable tool [1] on the spring seat [2].

Press the spring seat into the fork pipe using a suitable tool and hydraulic press, then remove the stopper ring [3] using a small screwdriver.

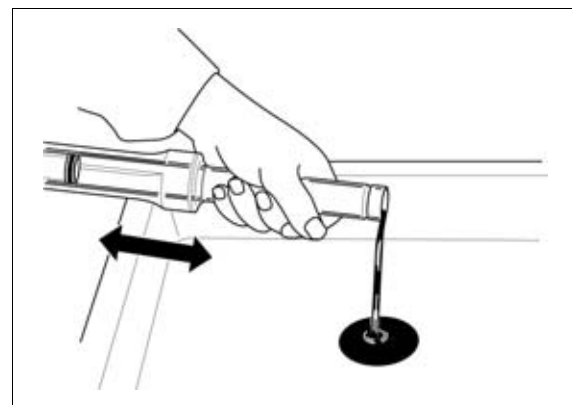


Remove the spring seat [1] and fork spring [2] from the fork pipe [3].

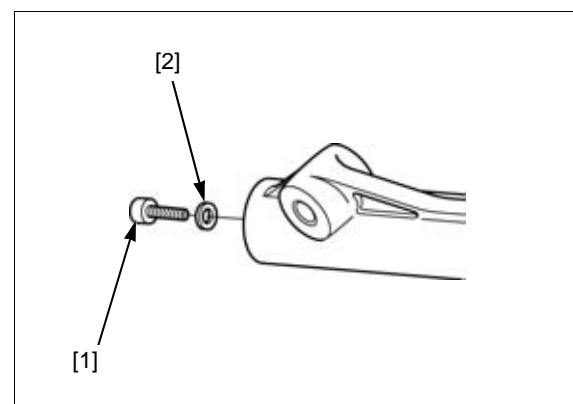
Remove the O-ring [4] from the spring seat.



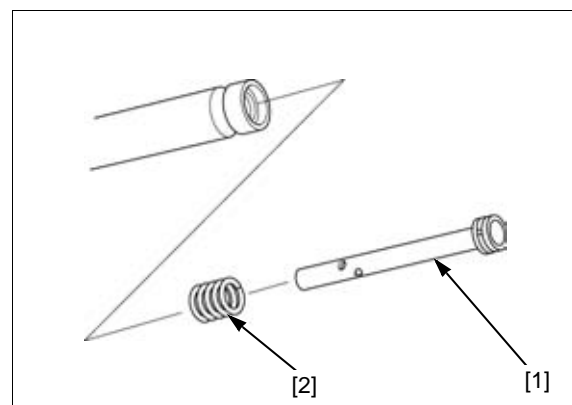
Pour out the fork fluid by pumping the fork pipe several times.



Remove the socket bolt [1] and sealing washer [2].

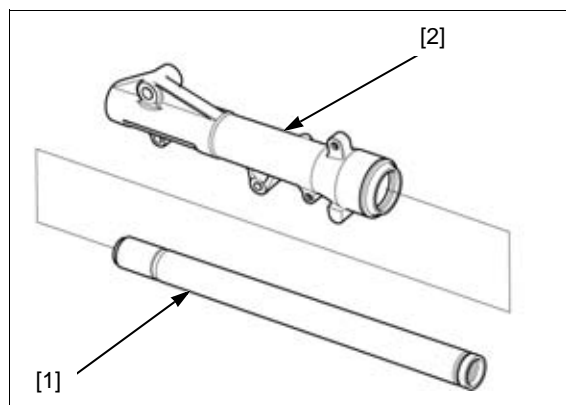


Remove the fork piston [1] and rebound spring [2] from the fork pipe.

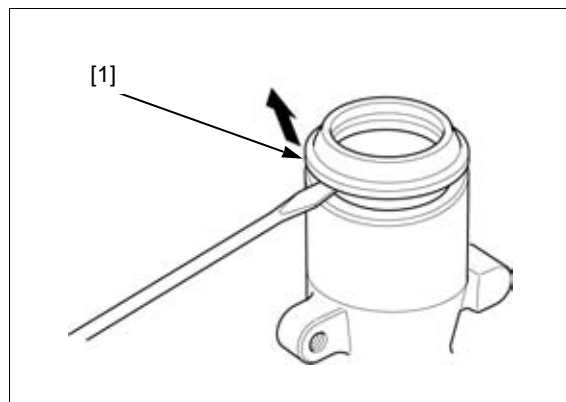


FRONT WHEEL/SUSPENSION/STEERING

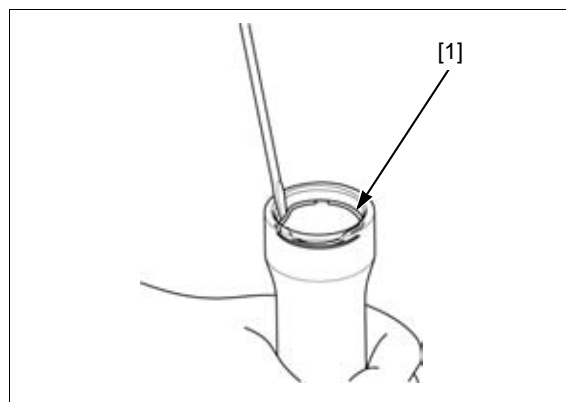
Pull the fork pipe [1] out from the fork slider [2].



Remove the dust seal [1].



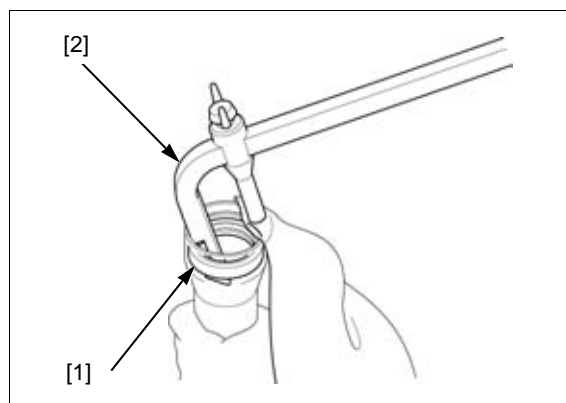
Remove the oil seal stopper ring [1].



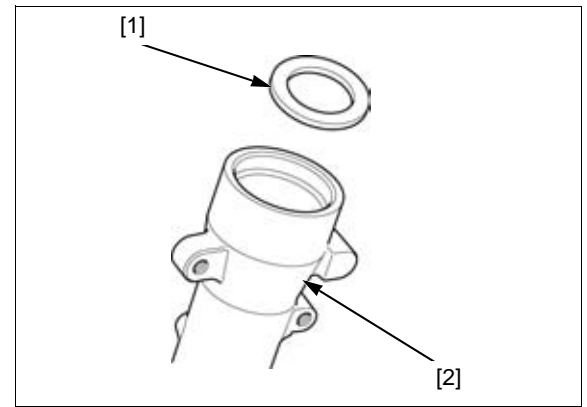
Remove the oil seal [1] using the special tool.

TOOL:

[2] Oil seal remover 07748-0010001 or equivalent



Remove the back-up ring [1] from the fork slider [2].

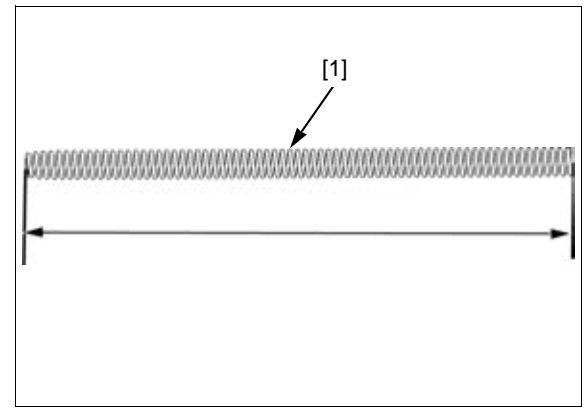


INSPECTION

FORK SPRING

Measure the fork spring [1] free length.

STANDARD: 291.8 mm (11.49 in)



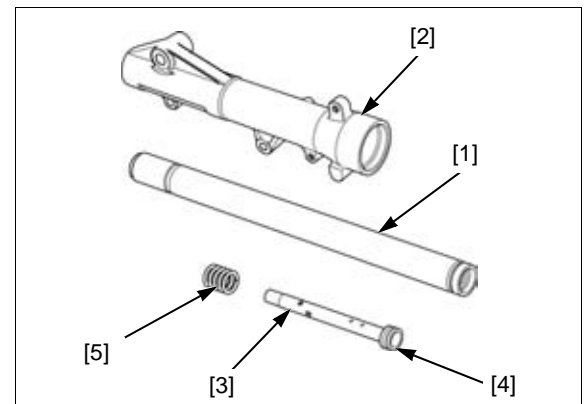
FORK PIPE/SLIDER/PISTON

Check the fork pipe [1], fork slider [2] and fork piston [3] for score mark, and excessive or abnormal wear.

Check the fork piston ring [4] for wear or damage.

Check the rebound spring [5] for fatigue or damage.

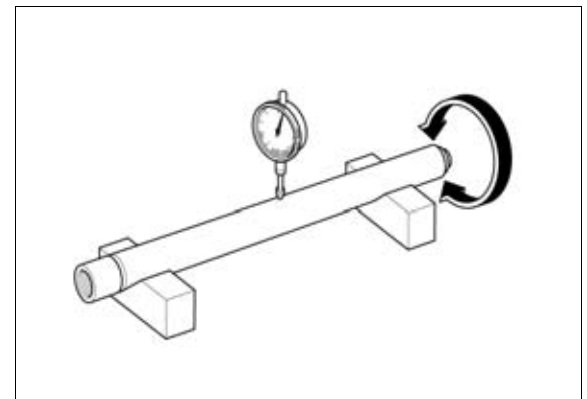
Replace the components if necessary.



Place the fork pipe on V-block and measure the runout.

Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.2 mm (0.01 in)

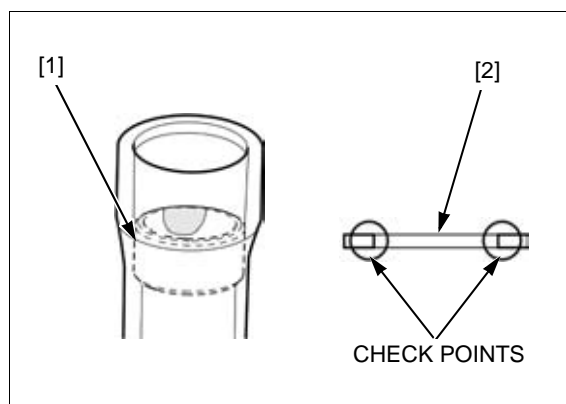


FRONT WHEEL/SUSPENSION/STEERING

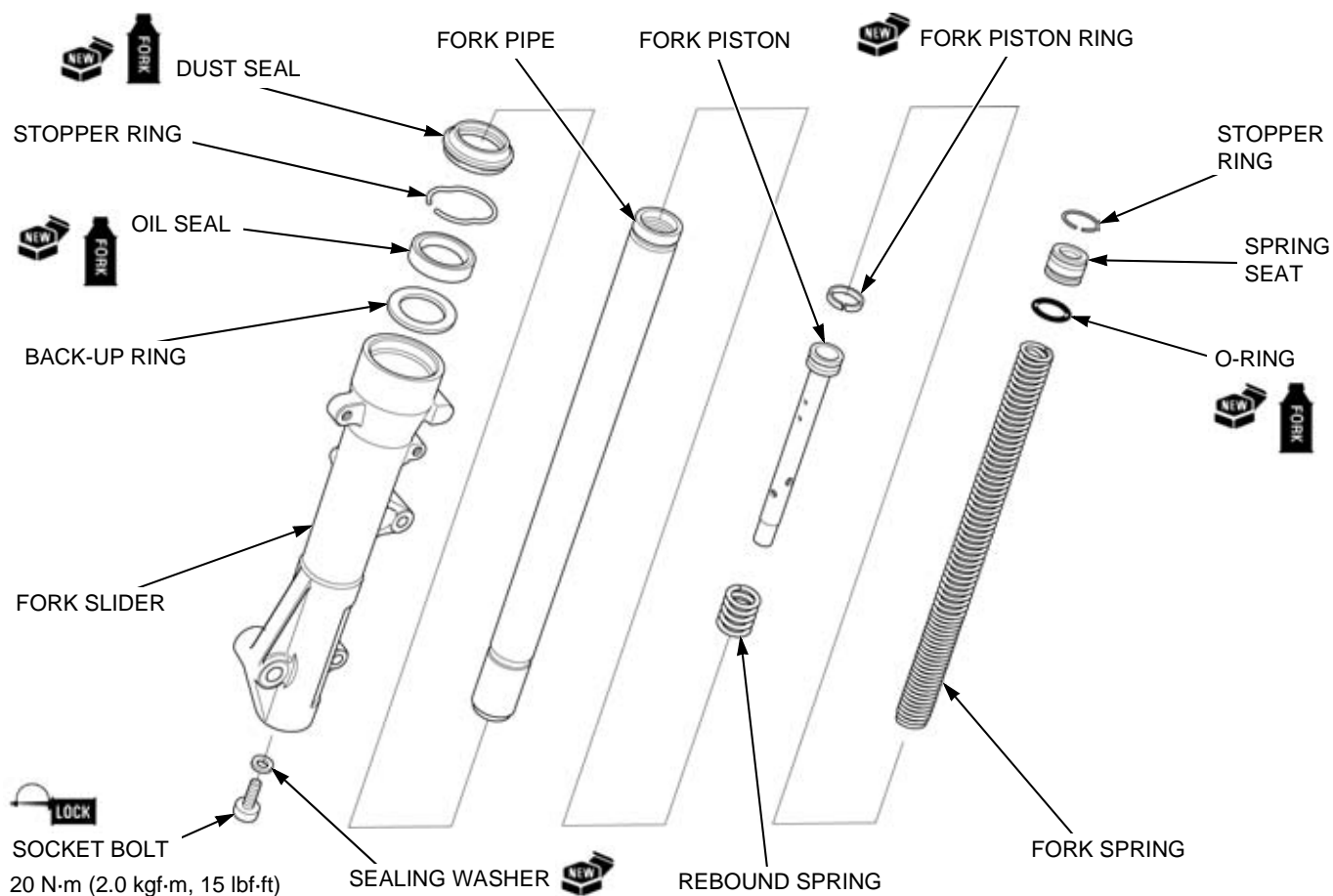
FORK PIPE BUSHING/BACK-UP RING

Visually inspect the guide bushing [1] in the fork slider. Replace the fork slider as an assembly if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more than 3/4 of the entire surface.

Check the back-up ring [2], replace it if there is any distortion at the points indicated by arrows on the figure.

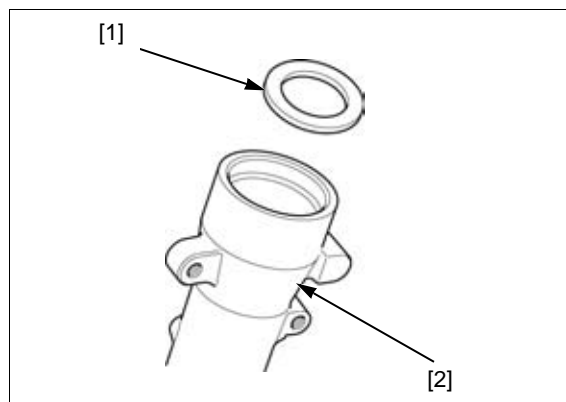


ASSEMBLY



Before assembly, wash all parts with high flash point or non-flammable solvent and wipe them dry.

Install the back-up ring [1] into the fork slider [2].



Install the oil seal with its marked side facing up.

Apply fork fluid to the lip of a new oil seal [1].

Drive the oil seal into the fork slider using the special tools.

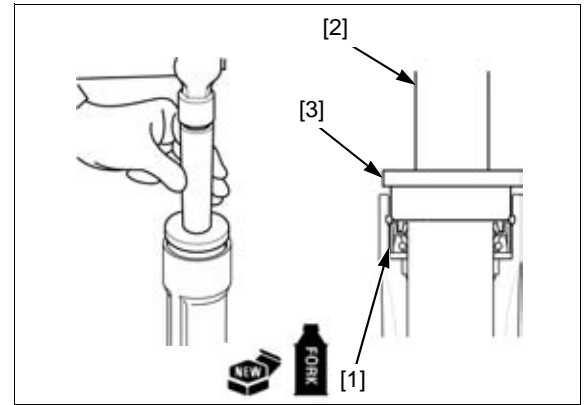
TOOLS:

[2] Driver

07749-0010000

[3] Attachment, 45x50 mm

07946-6920100

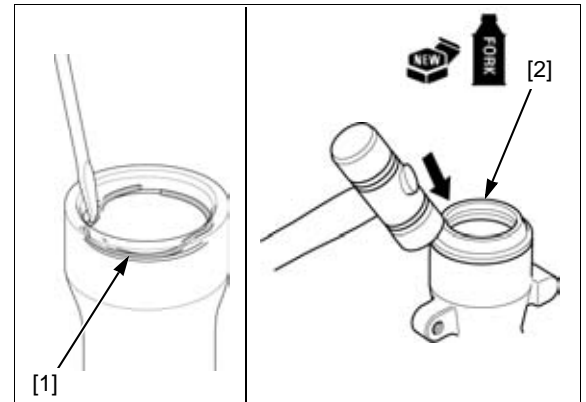


Install the oil seal stopper ring [1] into the stopper ring groove on the fork slider.

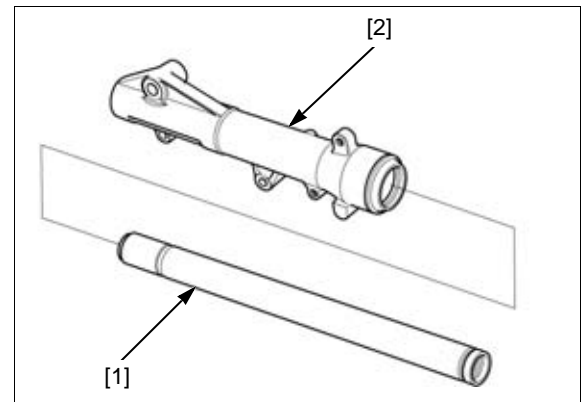
Apply fork fluid to a new dust seal [2] lip.

Do not tap the dust seal lip too hard.

Install the dust seal until it is fully seated.



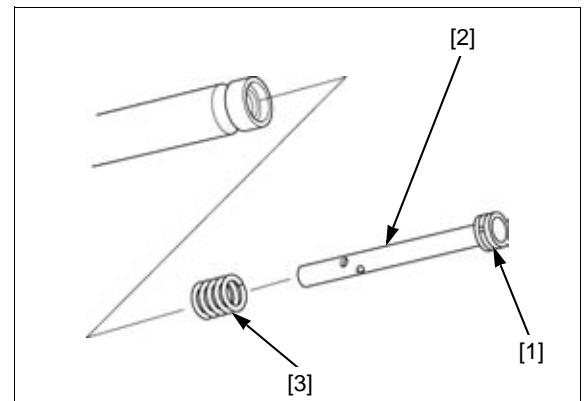
Install the fork pipe [1] into the fork slider [2].



If removing the fork piston ring [1] from the fork piston [2], install a new fork piston ring to the fork piston groove.

Make sure that the fork piston ring is seated in the groove.

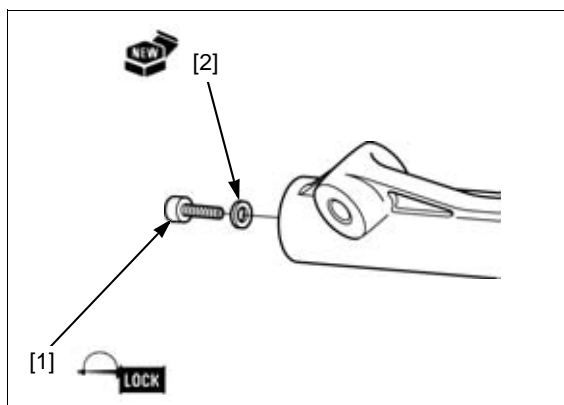
Install the rebound spring [3] and fork piston into the fork pipe.



FRONT WHEEL/SUSPENSION/STEERING

Clean the socket bolt threads and apply locking agent to the socket bolt [1] threads.

Install and temporary tighten the socket bolt with a new sealing washer [2] to the fork piston.



Pour the specified amount of recommended fork fluid into the fork pipe.

RECOMMENDED FORK FLUID:

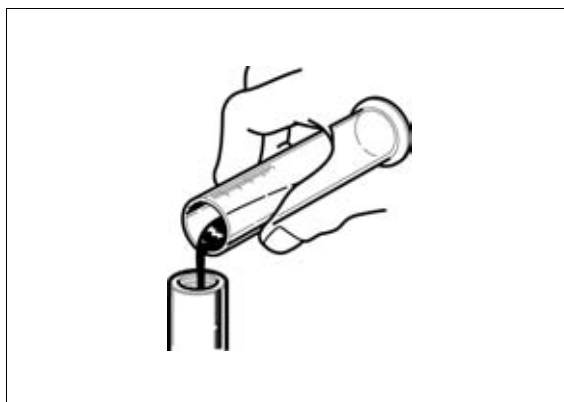
Honda Ultra Cushion Oil 10W or equivalent

FORK FLUID CAPACITY:

$122.0 \pm 2.5 \text{ cm}^3$

$(4.13 \pm 0.05 \text{ US oz, } 4.29 \pm 0.05 \text{ Imp oz})$

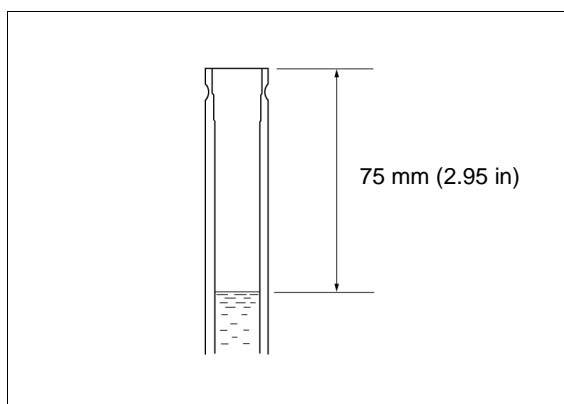
Pump the fork pipe several times to remove trapped air from the lower portion of the fork pipe.



Be sure the oil level is same in the both forks.

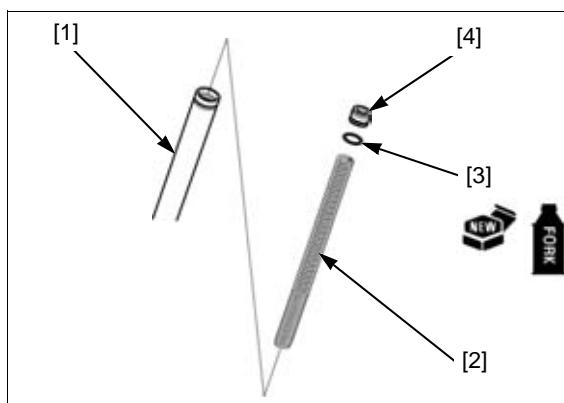
Compress the fork leg fully and measure the fluid level from the top of the fork pipe.

FORK FLUID LEVEL: 75 mm (2.95 in)



Pull the fork pipe [1] up and install the fork spring [2] with its tapered side facing down.

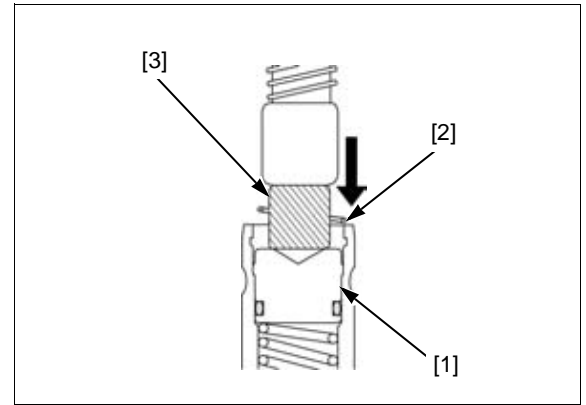
Coat a new O-ring [3] with fork fluid and install it into the groove in the spring seat [4].



Set the fork assembly, spring seat [1] and stopper ring [2] onto the hydraulic press.
Put the suitable tool [3] on the spring seat.
Install the stopper ring into the stopper ring groove of the fork pipe.

To prevent loss of tension, do not compress the fork spring more than necessary.

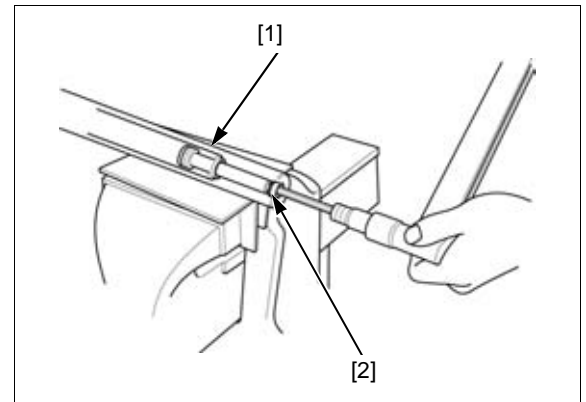
Press the spring seat into the fork pipe until the stopper ring groove is visible.



Hold the fork slider [1] in a vise with soft jaws or a shop towel.

Tighten the fork socket bolt [2] to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

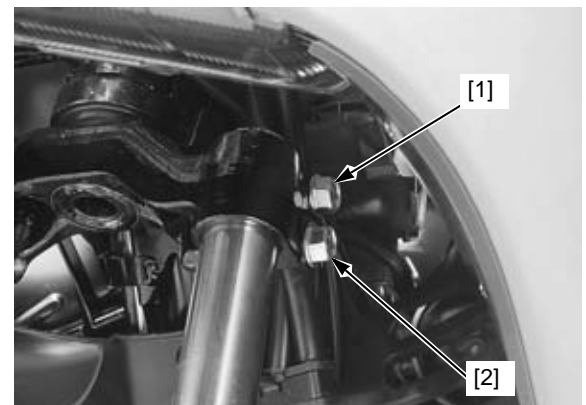


INSTALLATION

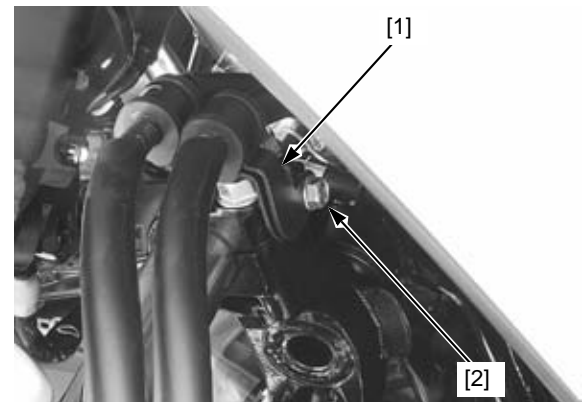
Install the fork into the steering stem and align the groove of the fork pipe with the upper bolt hole of the stem, then install the upper bottom bridge pinch bolt [1].

Tighten the upper and lower bottom bridge pinch bolt [2] to the specified torque.

TORQUE: 49 N·m (5.0 kgf·m, 36 lbf·ft)



Set the brake hose clamp [1] to the steering stem and install and tighten the clamp bolt [2].



FRONT WHEEL/SUSPENSION/STEERING

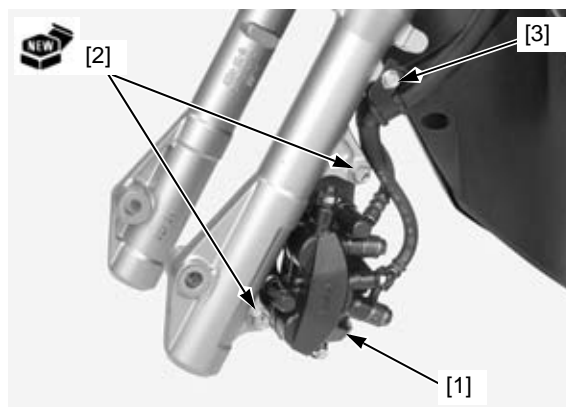
Install the front brake caliper [1] and new mounting bolts [2] to the left fork leg, then tighten them to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Install the brake hose clamp and bolt [3] to the left fork leg.

Install the following:

- Front wheel (page 17-7)
- Front fender
 - Except U type (page 2-4)
 - U type (page 2-4)

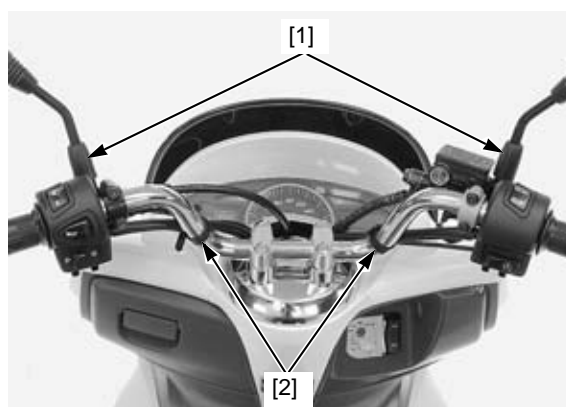


HANDLEBAR

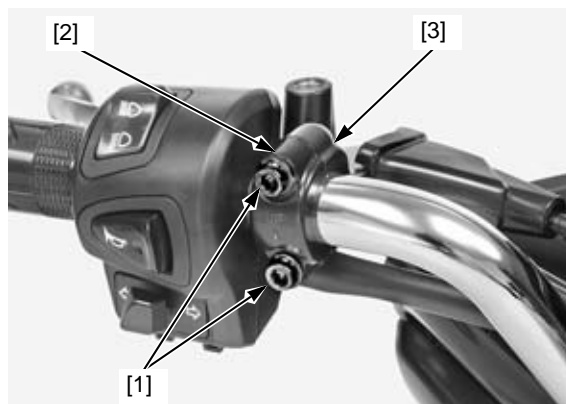
REMOVAL

The rearview mirror lock nuts has left hand threads. Remove the rearview mirrors [1].

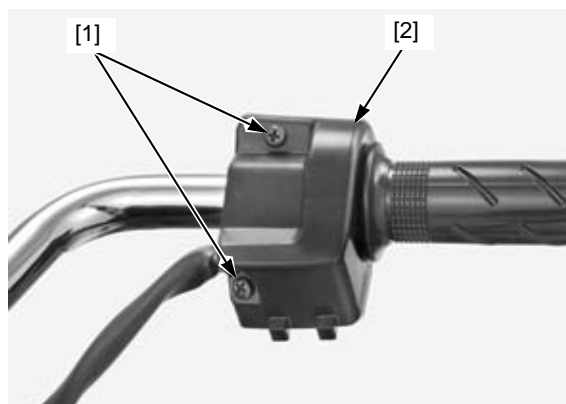
Remove the wire bands [2].



Remove the two socket bolts [1], holder [2] and rear brake lever bracket [3].



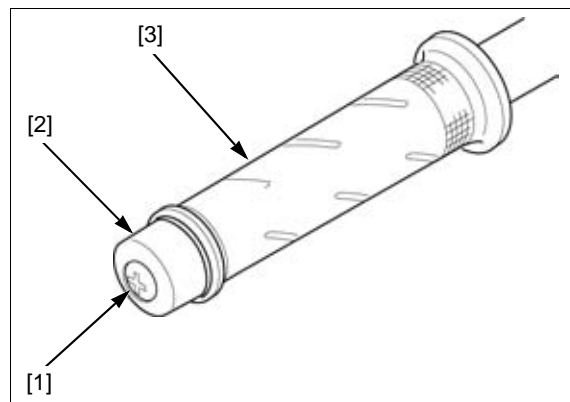
Remove the two screws [1] from the left handlebar switch housing [2].



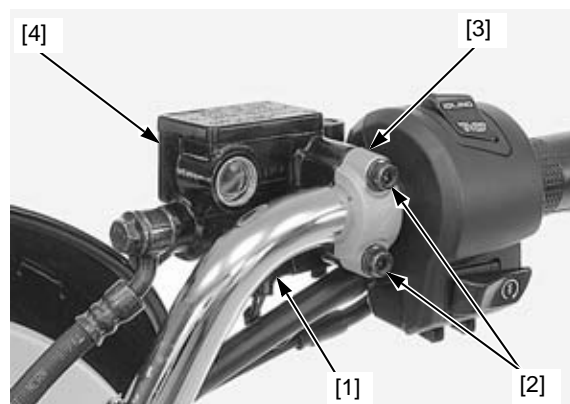
Separate the left handlebar switch [1] and remove it from the handlebar.



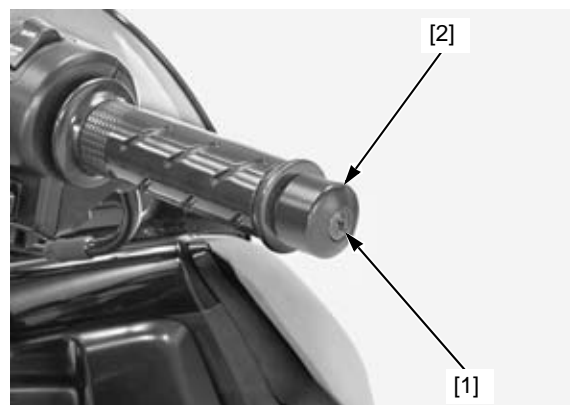
Remove the screw [1], left handlebar weight [2] and left handlebar grip [3].



Disconnect the front brake light switch connectors [1].
Remove the two socket bolts [2], holder [3] and front master cylinder [4].

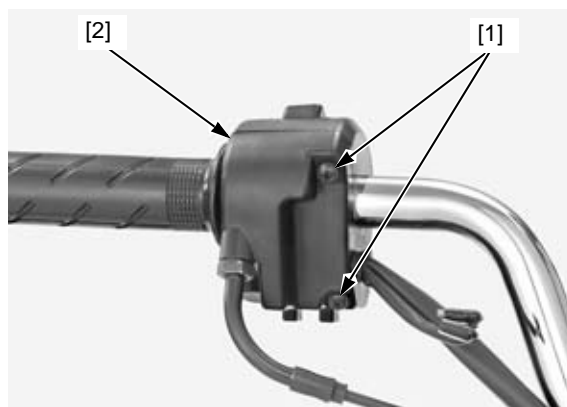


Remove the screw [1] and right handlebar weight [2].

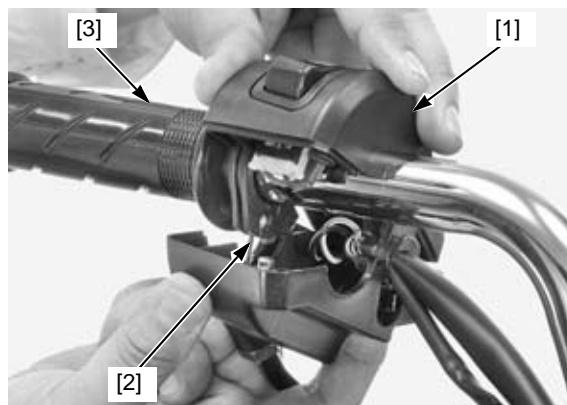


FRONT WHEEL/SUSPENSION/STEERING

Remove the two screws [1] from the right handlebar switch housing [2].

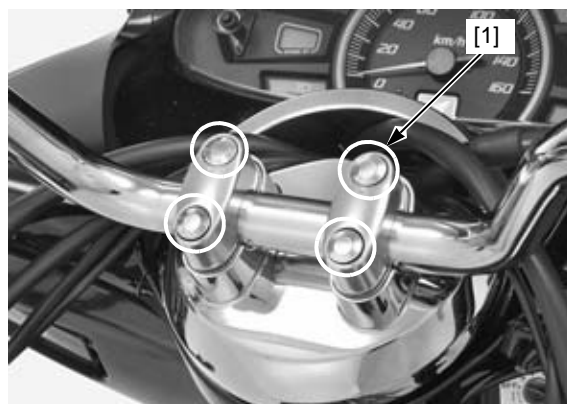


Separate the right handlebar switch [1] and disconnect the throttle cable [2] from the throttle grip [3].

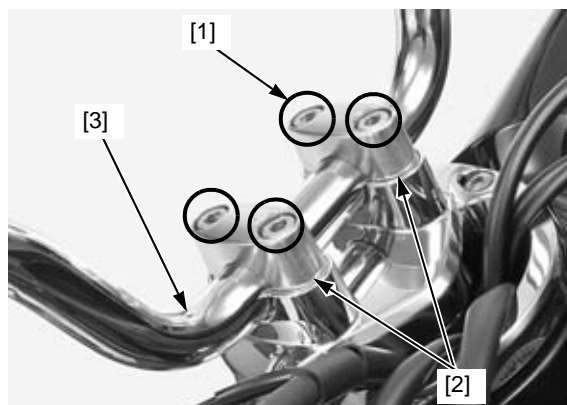


Remove the right handlebar switch and throttle grip.

Remove the four caps [1].



Remove the four socket bolts [1], upper holders [2] and handlebar [3].



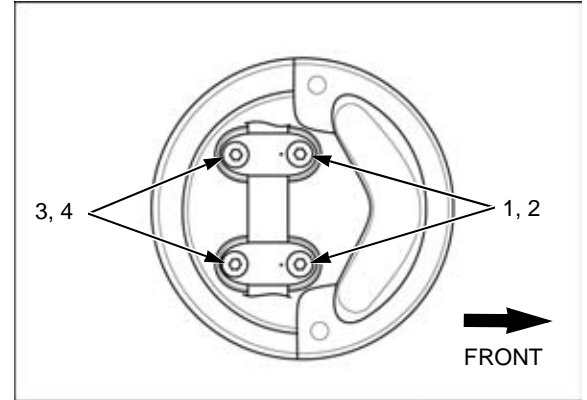
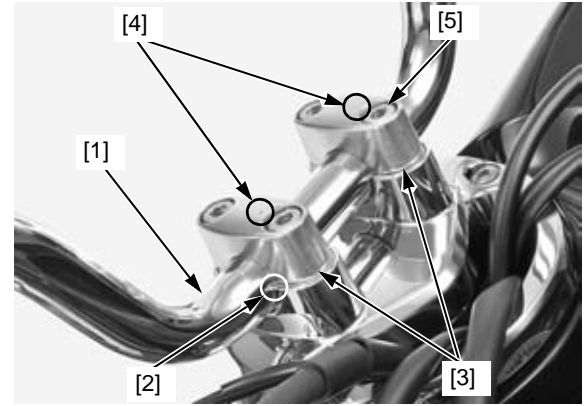
INSTALLATION

Install the handlebar [1] onto the lower holders by aligning the punch mark [2] on the handlebar with the top edge of the lower holder.

Install the upper holders [3] with the punch marks [4] facing forward.

Install the socket bolts [5] and tighten them to the specified torque in the specified sequence as shown.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



Install the four caps [1].

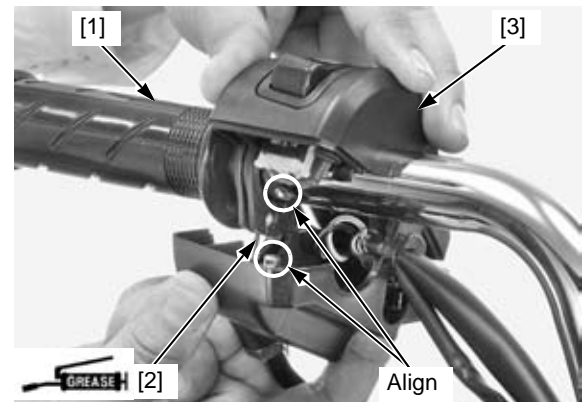


Install the throttle grip [1] onto the handlebar.

Apply 0.1 – 0.2 g of grease to the cable end and cable rolling area.

Connect the throttle cable [2] to the throttle grip.

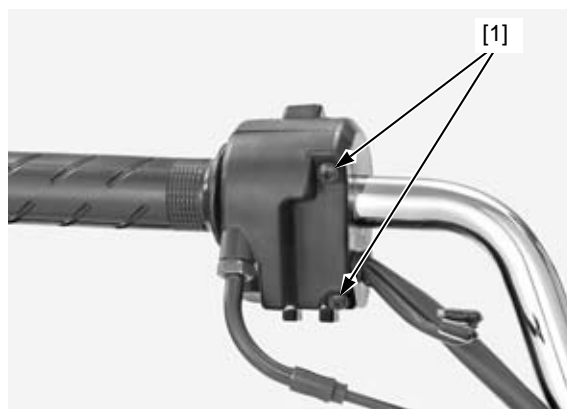
Install the right handlebar switch [3] by aligning the locating pin with the hole on the handlebar.



FRONT WHEEL/SUSPENSION/STEERING

Install the two screws [1] and tighten the front side screw first to the specified torque, then tighten the rear side screw to the specified torque.

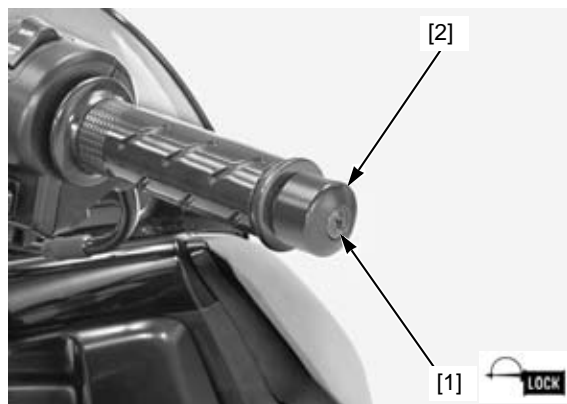
TORQUE: 2.5 N·m (0.26 kgf·m, 1.8 lbf·ft)



Apply locking agent to the handlebar weight screw [1] threads.

Install the right handlebar weight [2] and handlebar weight screw, then tighten it to the specified torque.

TORQUE: 9 N·m (0.9 kgf·m, 7 lbf·ft)

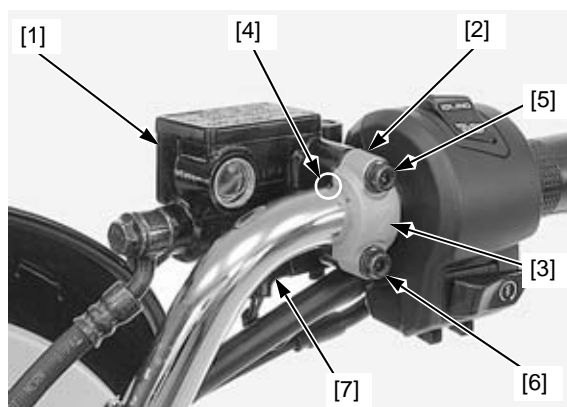


Install the brake master cylinder [1] and holder [2] with the "UP" mark [3] facing up.

Align the edge of the master cylinder with the punch mark [4] on the handlebar and tighten the upper bolt [5] first to the specified torque, then tighten the lower bolt [6] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the front brake light switch connectors [7].

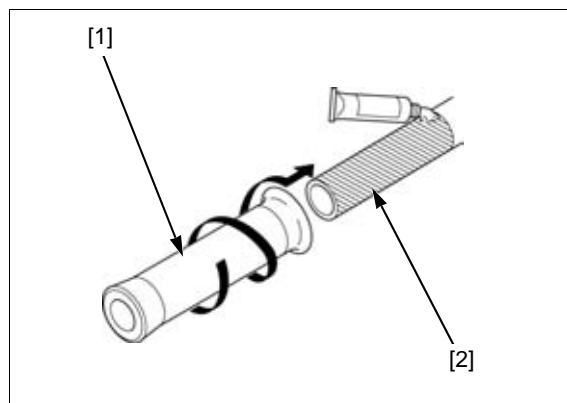


If the handlebar grip [1] were removed, apply Honda Bond A or equivalent to the inside of the grip and to the clean surfaces of the left handlebar [2].

Wait 3 – 5 minutes and install the grip.

Rotate the grip for even application of the adhesive.

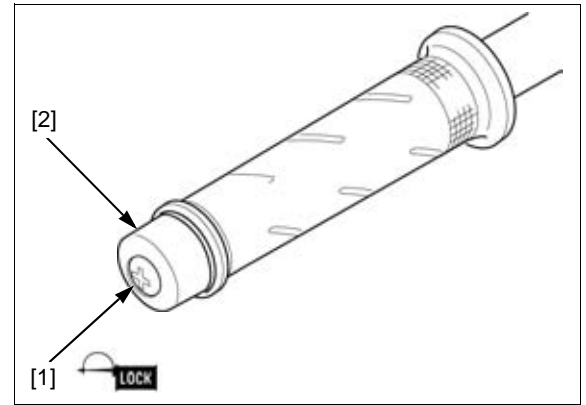
Allow the adhesive to dry for 1 hour before using.



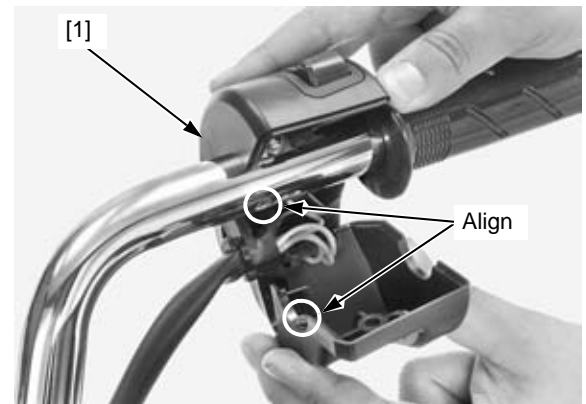
Apply locking agent to the handlebar weight screw [1] threads.

Install the left handlebar weight [2] and handlebar weight screw, then tighten it to the specified torque.

TORQUE: 9 N·m (0.9 kgf·m, 7 lbf·ft)

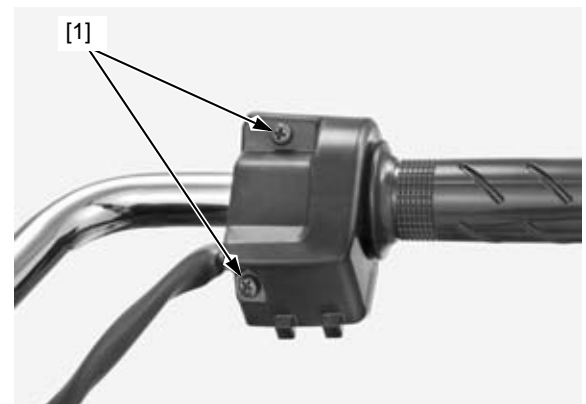


Install the left handlebar switch [1] by aligning the locating pin with the hole on the handlebar.



Install the two screws [1] and tighten the front side screw first to the specified torque, then tighten the rear side screw to the specified torque.

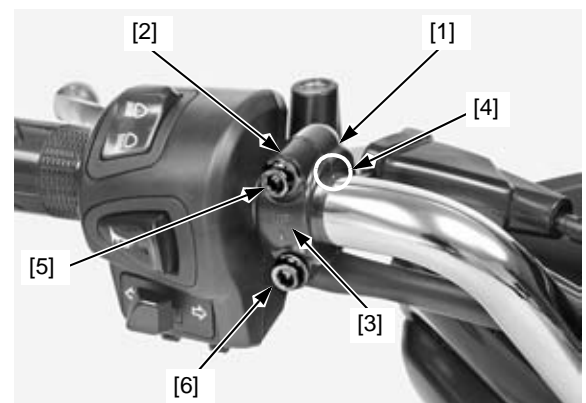
TORQUE: 2.5 N·m (0.26 kgf·m, 1.8 lbf·ft)



Install the rear brake lever bracket [1] and holder [2] with the "UP" mark [3] facing up.

Align the edge of the rear brake lever bracket with the punch mark [4] on the handlebar and tighten the upper bolt [5] first to the specified torque, then tighten the lower bolt [6] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



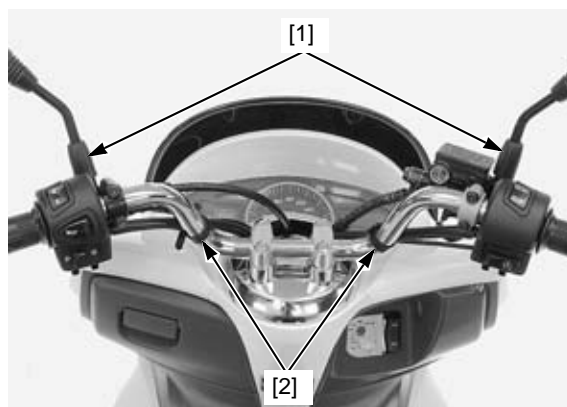
FRONT WHEEL/SUSPENSION/STEERING

Install the wire bands [1].

The rearview mirror lock nuts has left hand threads.

Install the rearview mirrors [2] and tighten the lock nuts to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

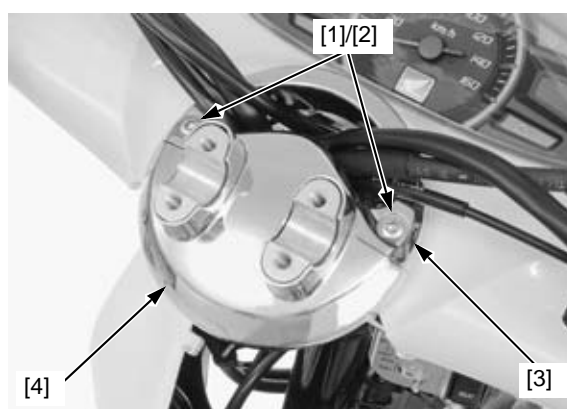


HANDLEBAR POST

REMOVAL/INSTALLATION

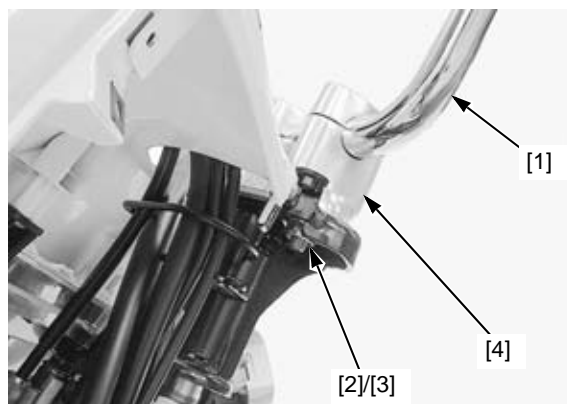
Remove the following:

- Handlebar (page 17-16)
- Inner cover (page 2-8)
- Socket bolts [1]
- Plastic washers [2]
- Handlebar front cover [3]
- Handlebar rear cover [4]



Temporarily install the handlebar [1], then remove the lower holder nuts [2] and washers [3].

Remove the handlebar and lower holders [4].



Release the following from the clamps [1]:

- Throttle cable
- 1st rear brake cable
- Right handlebar switch wire
- Left handlebar switch wire
- Rear brake switch wire
- Inhibitor switch wire
- Front brake hose



Remove the following:

- Nut [1]
- Rear collar [2]
- Bolt [3]
- Front collar [4]
- Handlebar post [5]

Installation is in the reverse order of removal.

- When tightening the handlebar lower holder nut, temporarily install the handlebar.

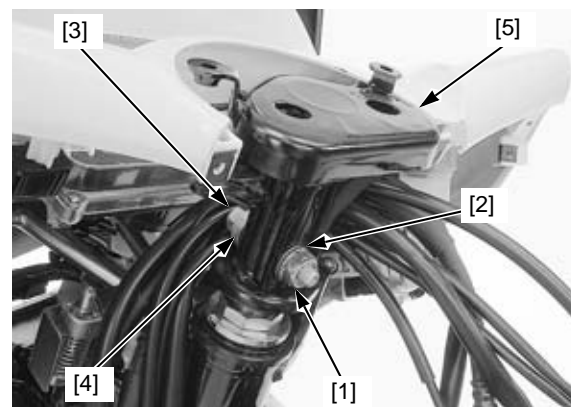
TORQUE:

Handlebar post nut:

39 N·m (4.0 kgf·m, 29 lbf·ft)

Handlebar lower holder nut:

44 N·m (4.5 kgf·m, 33 lbf·ft)



STEERING STEM

REMOVAL

Remove the following:

- Fork (page 17-7)
- Handlebar post (page 17-22)

Hold the top thread using the pin spanner [1] and loosen the steering stem lock nut [2] using the socket wrench [3].

TOOLS:

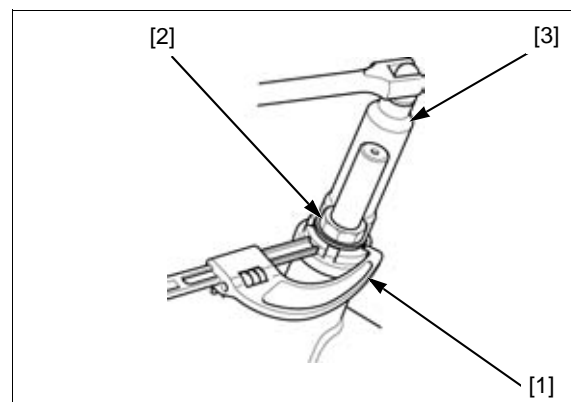
[2] Pin spanner

07702-0020001

[3] Socket wrench

07916-KM10000

Remove the steering stem lock nut.



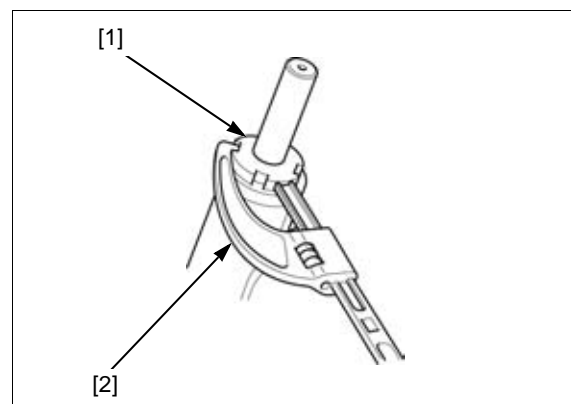
Hold the steering stem and loosen the top thread [1] using the pin spanner [2].

TOOL:

[2] Pin spanner

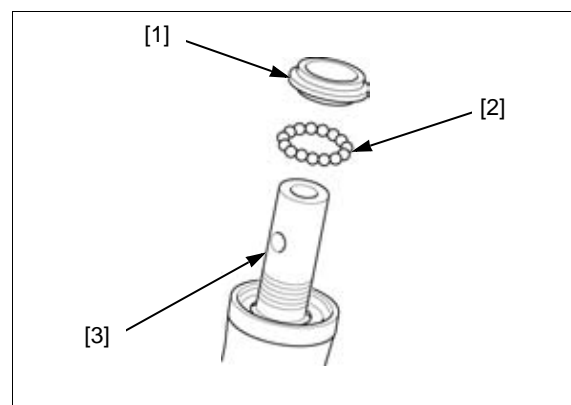
07702-0020001

Remove the top thread while holding the steering stem.



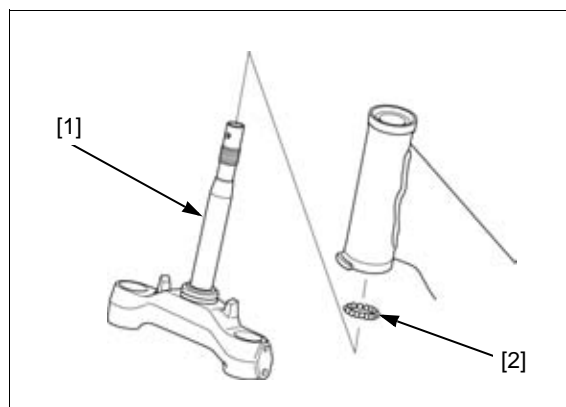
Remove the upper bearing inner race [1] and upper steel balls (23 balls) [2] while holding the steering stem [3].

- Always replace the steel balls and races as a set.



FRONT WHEEL/SUSPENSION/STEERING

Remove the steering stem [1] and lower steel balls (29 balls) [2].



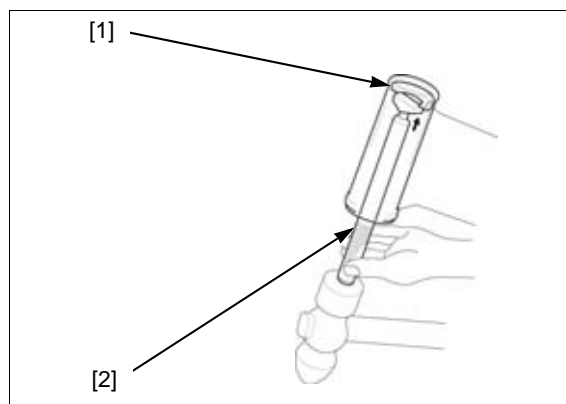
STEERING STEM BEARINGS REPLACEMENT

- Always replace the steel balls and races as a set.

Remove the upper bearing outer race [1] using the following tool.

TOOL:

[2] Ball race remover shaft 07GMD-KS40100

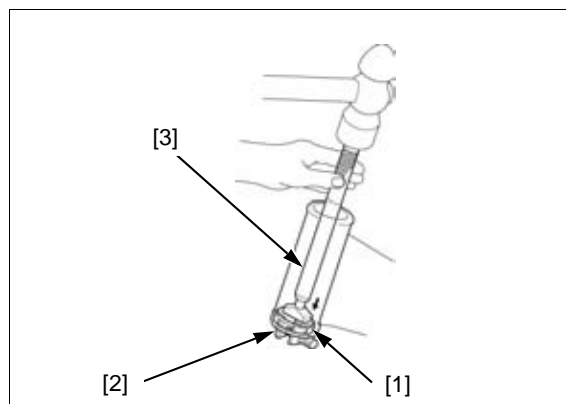


Remove the lower bearing outer race [1] using the following tools.

TOOLS:

[2] Ball race remover, 34.5 mm 07948-4630100

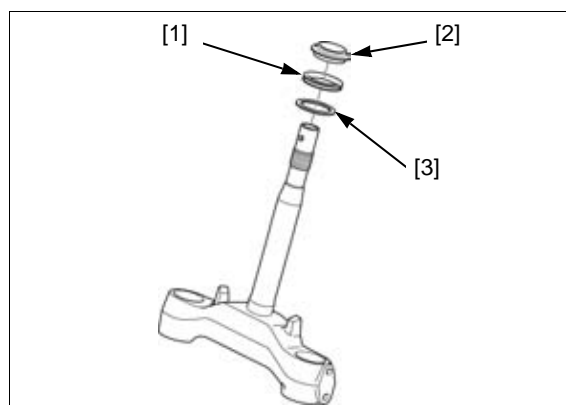
[3] Ball race remover shaft 07GMD-KS40100



Remove the dust seal [1] from the steering stem lower bearing inner race [2].

Remove the lower bearing inner race with a chisel or equivalent tool being careful not to damage the stem.

Remove the washer [3] from the steering stem.

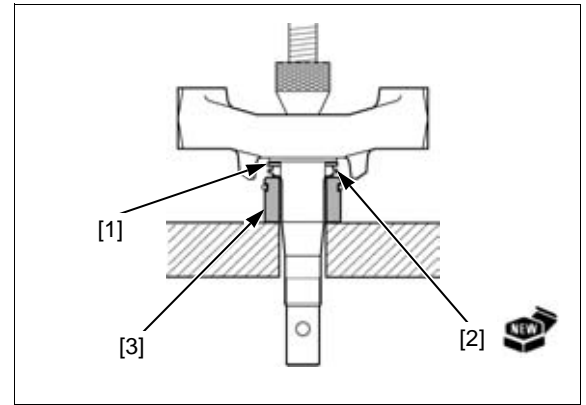


Install the washer [1] to the steering stem.

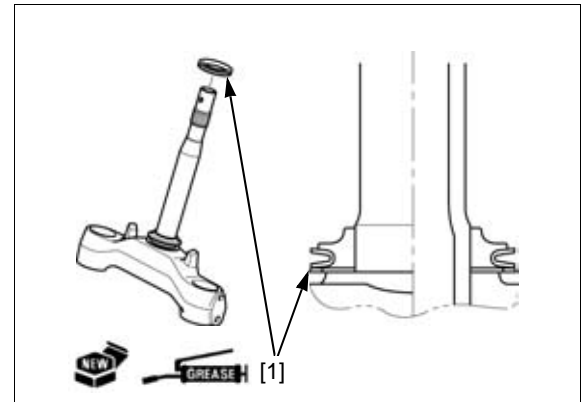
Install a new lower bearing inner race [2] using the following tool and hydraulic press.

TOOL:

[3] Fork seal driver attachment, 07947-KA20200
35.2 mm



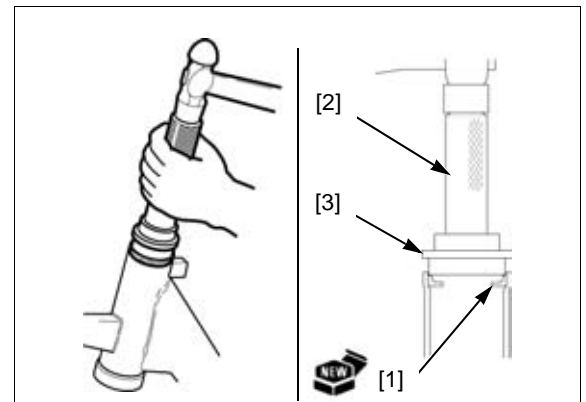
Apply 3 - 5 g of grease with extreme pressure agent (recommended: EXCELIGHT EP2 manufactured by KYODO YUSHI, Japan or Shell ALVANIA EP2 or equivalent) to a new dust seal [1] lip then install it to the lower bearing inner race.



Drive a new upper bearing outer race [1] into the head pipe using the following tools.

TOOLS:

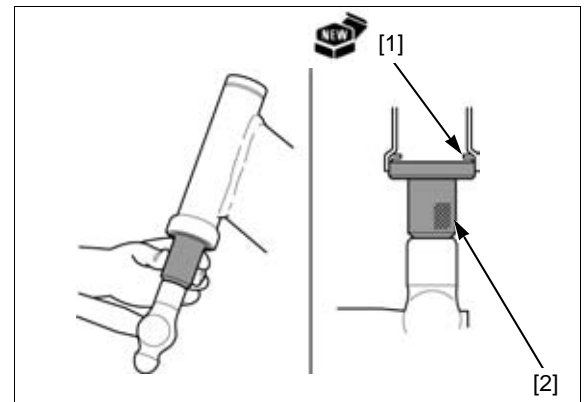
[2] Driver 07749-0010000
[3] Bearing driver attachment 07946-3710701



Drive a new lower bearing outer race [1] into the head pipe using the following tools.

TOOLS:

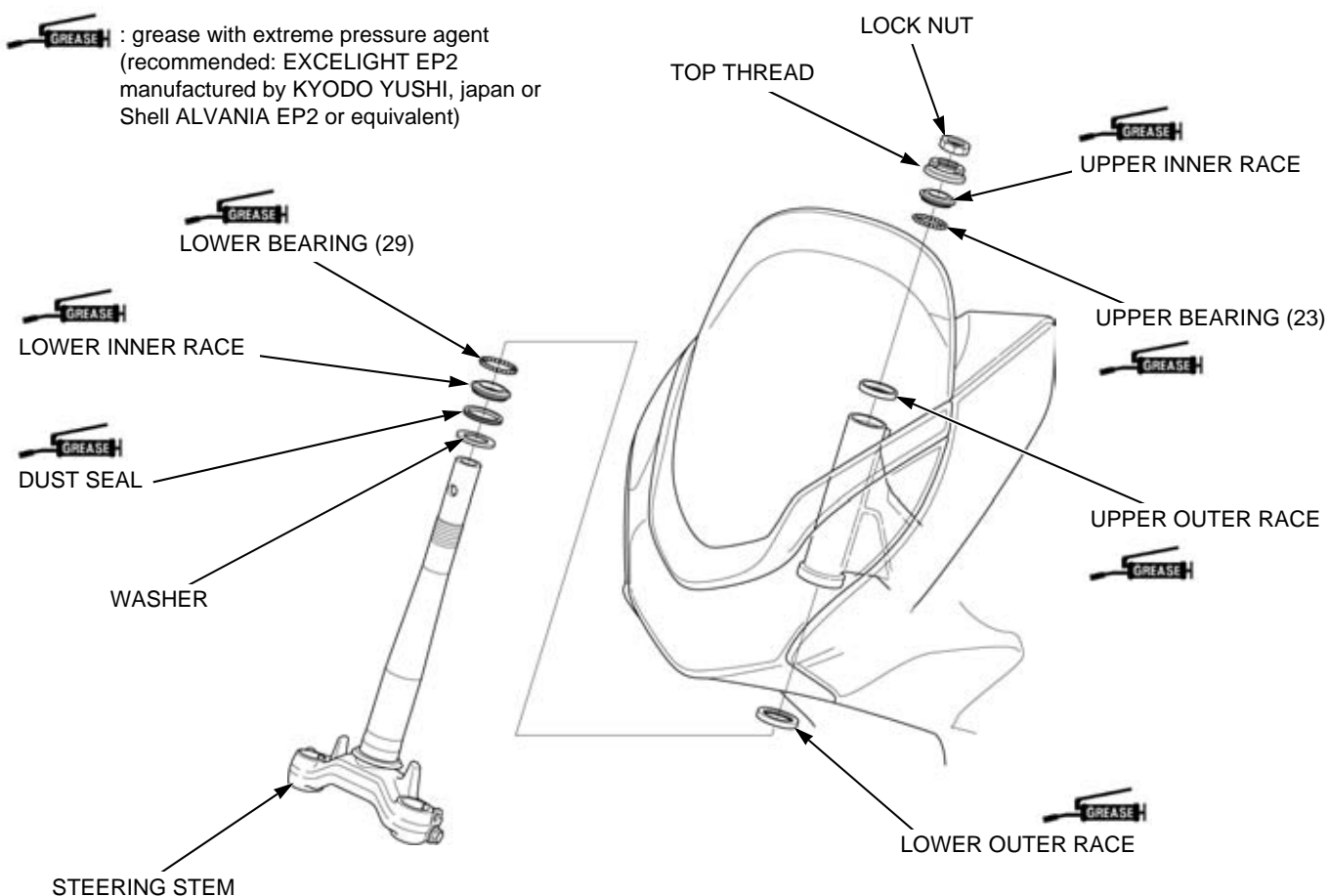
[2] Oil seal driver, 53.5 mm 07947-SB00200



FRONT WHEEL/SUSPENSION/STEERING

INSTALLATION

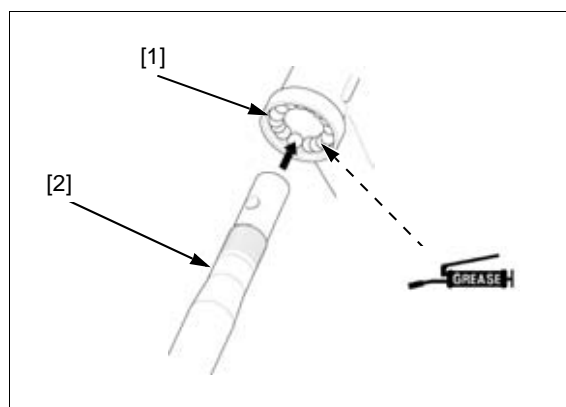
- Always replace the steel balls and races as a set.



Apply 3 - 5 g of grease with extreme pressure agent (recommended: EXCELIGHT EP2 manufactured by KYODO YUSHI, japan or Shell ALVANIA EP2 or equivalent) to the lower bearing races.

Attach the steel balls (29 balls) [1] to the lower bearing outer race.

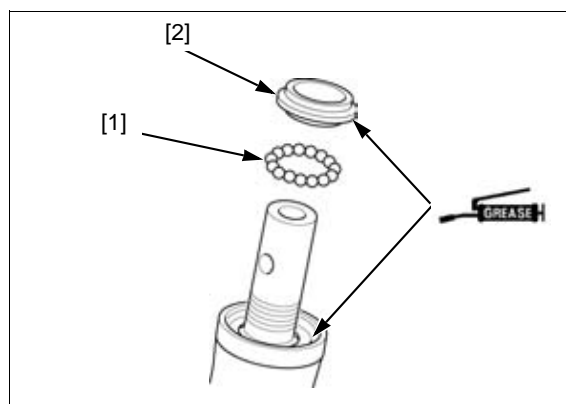
Insert the steering stem [2] into the steering head pipe, being careful not to drop the steel balls.



Apply 3 - 5 g of grease with extreme pressure agent (recommended: EXCELIGHT EP2 manufactured by KYODO YUSHI, japan or Shell ALVANIA EP2 or equivalent) to the upper bearing races.

Install the steel balls (23 balls) [1] onto the upper bearing outer race.

Install an upper bearing inner race [2] onto the stem.



Install the top thread [1].
Hold the steering stem and tighten the stem top thread to the initial torque using the special tool.

TOOL:

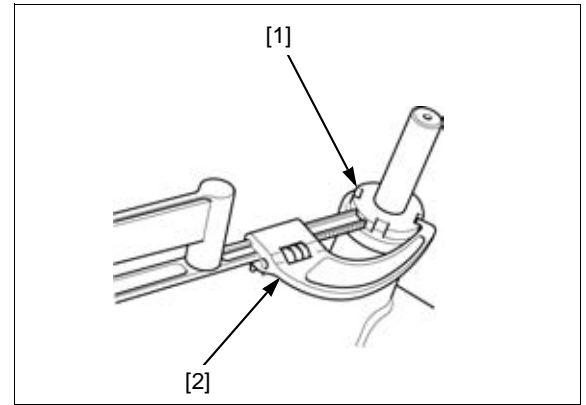
[2] Pin spanner

07702-0020001

TORQUE:

Actual: 25 N·m (2.5 kgf·m, 18 lbf·ft)

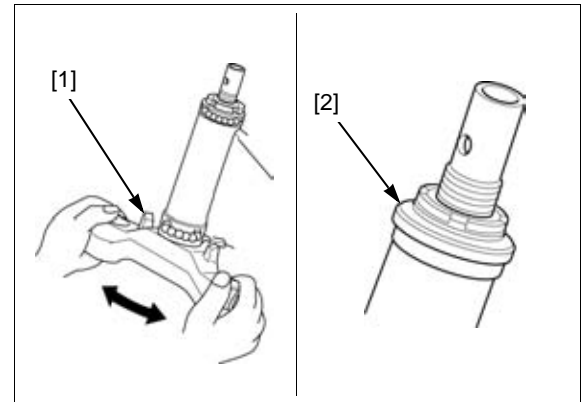
Indicated: 21 N·m (2.1 kgf·m, 15 lbf·ft)



Turn the steering stem [1] lock-to-lock several times to seat the bearing.

Completely loosen the top thread.

Tighten the top thread [2] fully by hand while holding the steering stem, then turn the top thread counterclockwise about 45 degrees.



Hold the top thread using the pin spanner and tighten the steering stem lock nut [1] to the specified torque.

TOOLS:

[2] Socket wrench

07916-KM10000

[3] Pin spanner

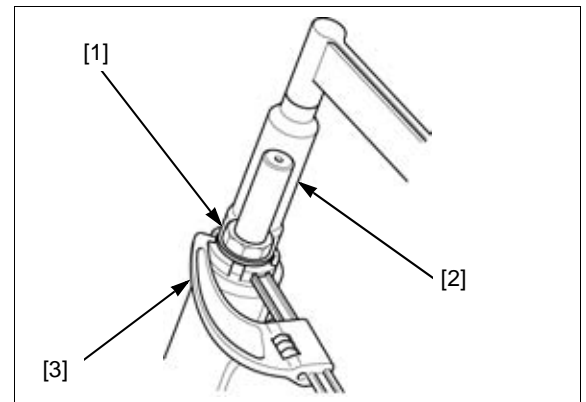
07702-0020001

TORQUE: 74 N·m (7.5 kgf·m, 55 lbf·ft)

Make sure the steering stem moves smoothly without play or binding.

Install the following:

- Handlebar post (page 17-22)
- Fork (page 17-19)

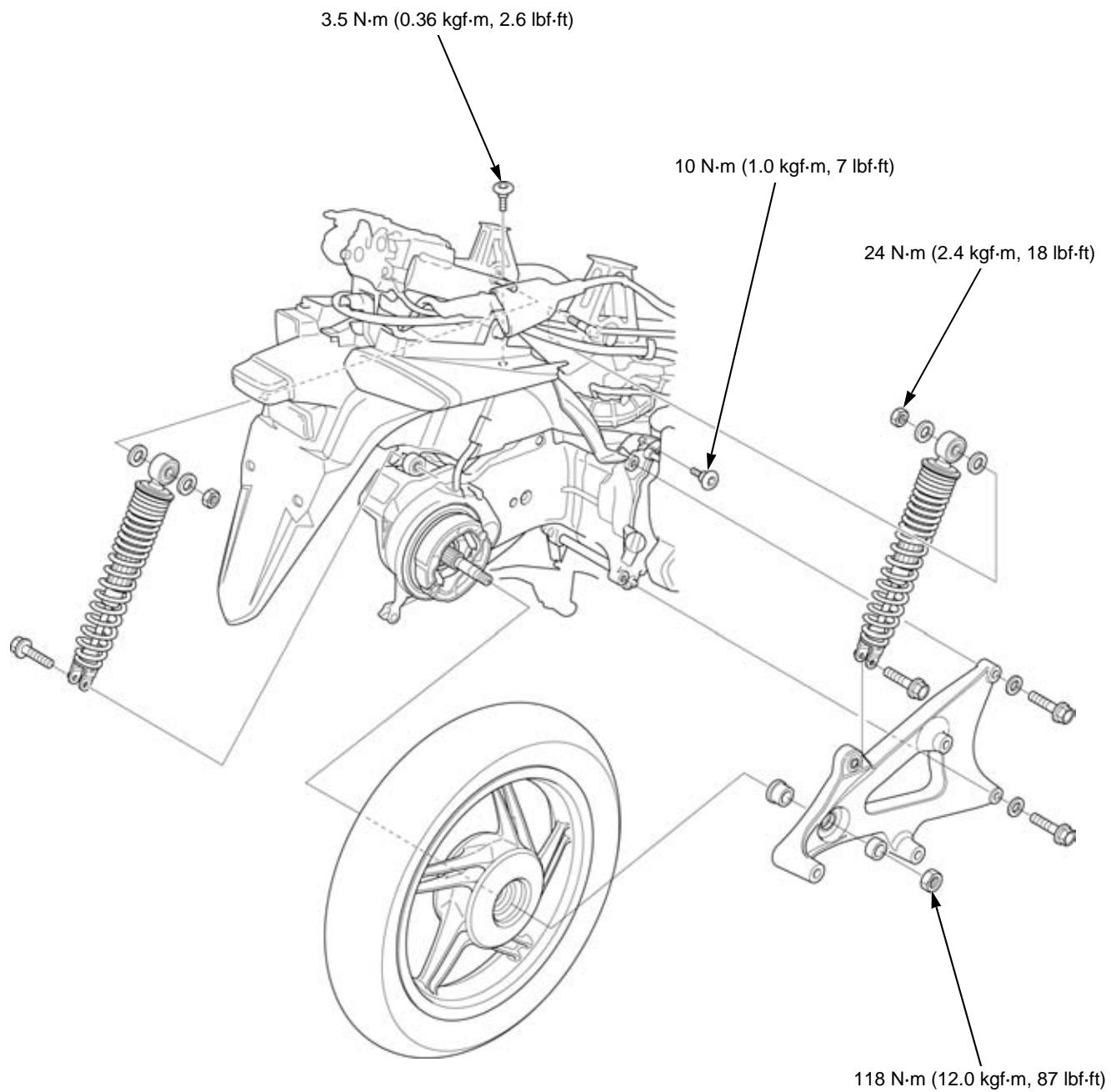


MEMO

18. REAR WHEEL/BRAKE/SUSPENSION

COMPONENT LOCATION	18-2	REAR WHEEL/SWINGARM	18-4
SERVICE INFORMATION	18-3	REAR DRUM BRAKE	18-7
TROUBLESHOOTING.....	18-3	REAR SHOCK ABSORBER	18-11

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

⚠ WARNING

Frequent inhalation of brake shoe 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.

- Use genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	2.0 (0.08)
Cold tire pressure	Driver only	225 kPa (2.25 kgf/cm ² , 33 psi)	—
	Driver and passenger	250 kPa (2.50 kgf/cm ² , 36 psi)	—
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Brake	Brake lever freeplay	10 – 20 (0.4 – 0.8)	—
	Brake drum I.D.	130.0 – 130.2 (5.12 – 5.13)	131.0 (5.16)

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear axle nut	1	16	118 (12.0, 87)	U-nut, Apply oil to the threads and seating surface.
Shock absorber upper mounting nut	2	10	24 (2.4, 18)	
Rear brake arm bolt	1	6	10 (1.0, 7)	ALOC bolt: replace a with new one.
Rear inner fender socket bolt				
- Engine side	1	6	10 (1.0, 7)	
- Air cleaner side	1	6	3.5 (0.36, 2.6)	

TROUBLESHOOTING

Rear wheel wobbles

- Bent rim
- Faulty tire
- Axle nut and/or engine mounting bolt/nut not tightened properly
- Loose or worn final gear shaft bearing
- Insufficient tire pressure

Soft suspension

- Weak rear shock absorber spring
- Oil leakage from damper unit
- Low tire pressure

Stiff suspension

- Bent damper rod
- High tire pressure

Rear suspension noisy

- Loose mounting fasteners
- Faulty shock absorber
- Weak rear suspension bushings

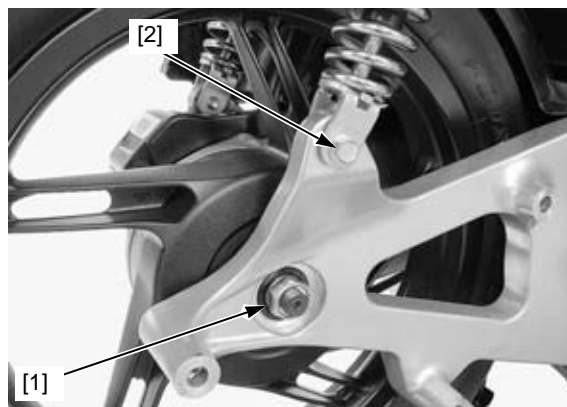
REAR WHEEL/SWINGARM

REMOVAL

Remove the exhaust pipe/muffler (page 2-13).

Support the scooter on its centerstand and remove the following:

- Axle nut [1]
- Right rear shock absorber lower mounting bolt [2]



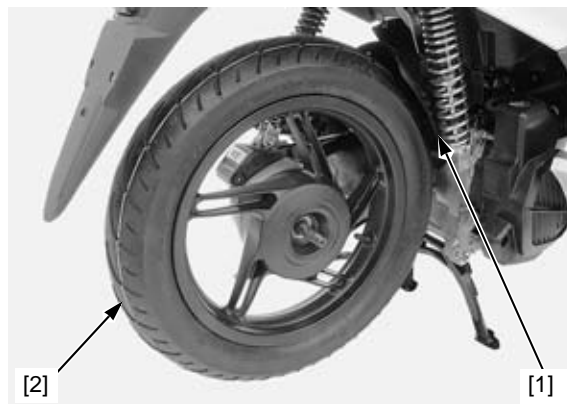
Remove the swingarm mounting bolts [1], washers [2] and swingarm [3].



Remove the two socket bolts [1].

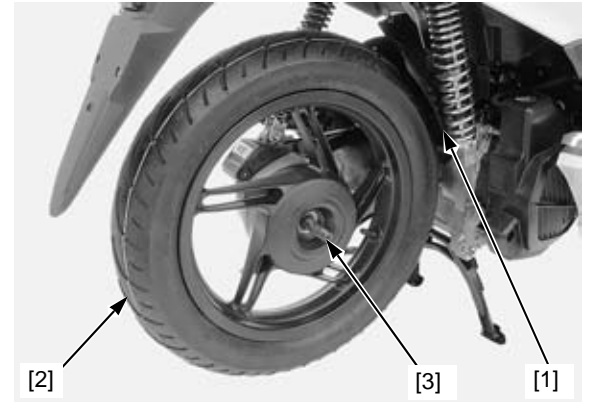


Slightly pull up the rear inner fender [1] and remove the rear wheel [2].



INSTALLATION

Slightly pull up the rear inner fender [1] and install the rear wheel [2] onto the final gear shaft [3] by aligning the splines.



Set the rear inner fender [1] back in position.

Install and tighten the two socket bolts [2] to the specified torque.

TORQUE:

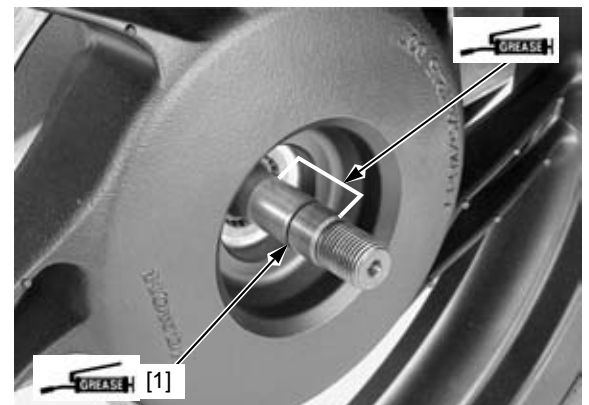
Engine side: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Air cleaner side: 3.5 N·m (0.36 kgf·m, 2.6 lbf·ft)



Apply 0.03 – 0.04 g of grease to the final gear shaft grease groove [1].

Apply grease to the swingarm bearing fitting area of the final gear shaft.



Install the swingarm [1] onto the final gear shaft.

Install the washers [2] and swingarm mounting bolts [3], then tighten them.



REAR WHEEL/BRAKE/SUSPENSION

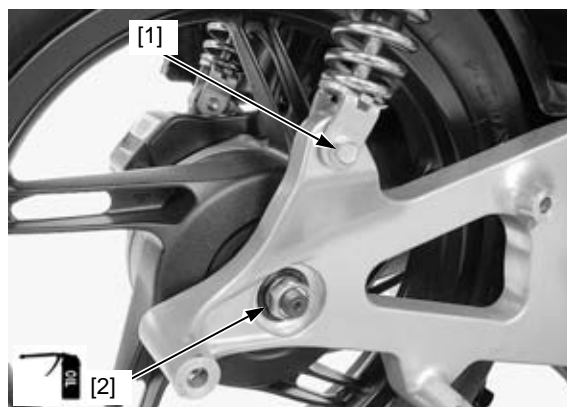
Install and tighten the right rear shock absorber lower mounting bolt [1].

Apply engine oil to the threads and seating surface of the rear axle nut [2].

Install the rear axle nut and tighten it to the specified torque.

TORQUE: 118 N·m (12.0 kgf·m, 87 lbf·ft)

Install the exhaust pipe/muffler (page 2-13).



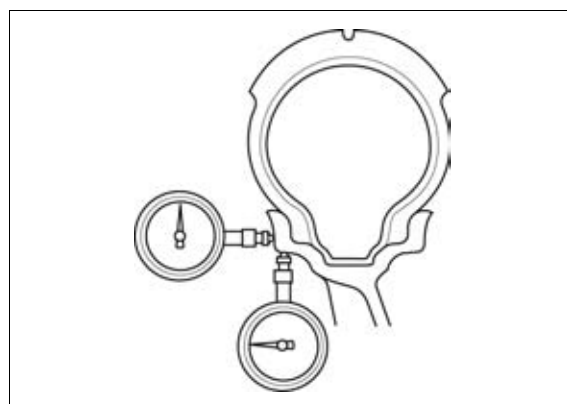
WHEEL INSPECTION

Check the wheel rim runout using dial indicators. Actual runout is 1/2 the total indicator readings.

SERVICE LIMITS:

Radial: 2.0 mm (0.08 in)

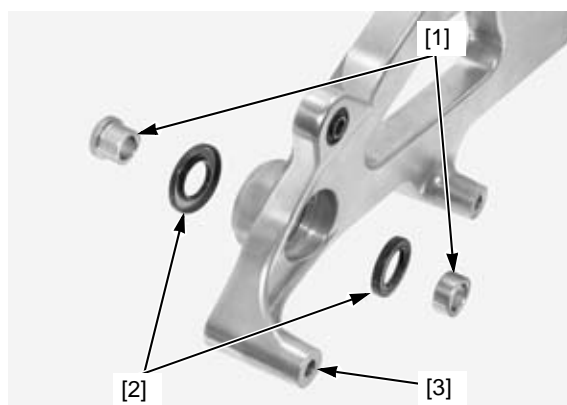
Axial: 2.0 mm (0.08 in)



SWINGARM BEARING INSPECTION/REPLACEMENT

Remove the swingarm (page 18-4).

Remove the side collars [1] and dust seals [2] from the swingarm [3].



Turn the inner race of the bearing [1] with your finger.

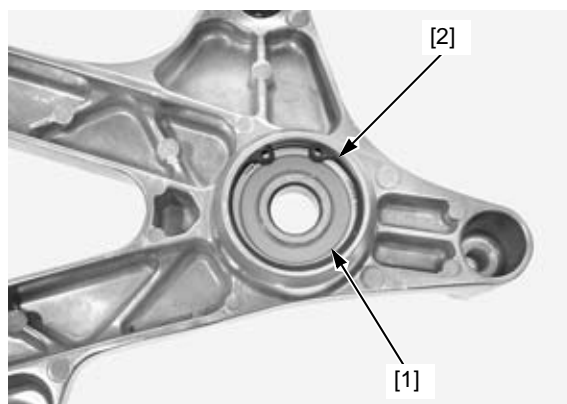
The bearing should turn smoothly and quietly.

Also check that the bearing outer race fits tightly in the swingarm.

If the inner race does not turn smoothly and quietly or outer race fits loosely, replace the bearing in the following procedure.

Remove the snap ring [2].

Drive the bearing out from the swingarm.



Drive in new bearing [1] squarely with the marked side facing up until it is fully seated.

TOOL:

[2] Driver

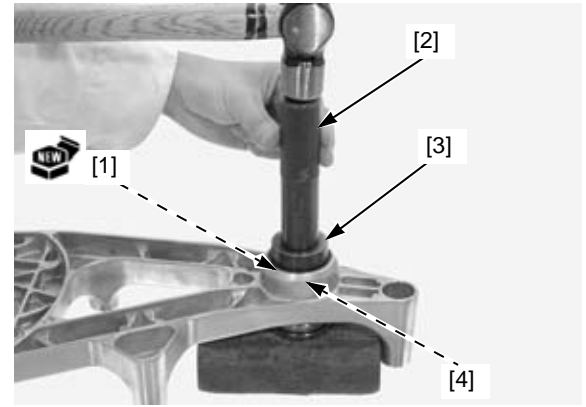
07749-0010000

[3] Attachment, 37 x 40 mm

07746-0010200

[4] Pilot, 17 mm

07746-0040400

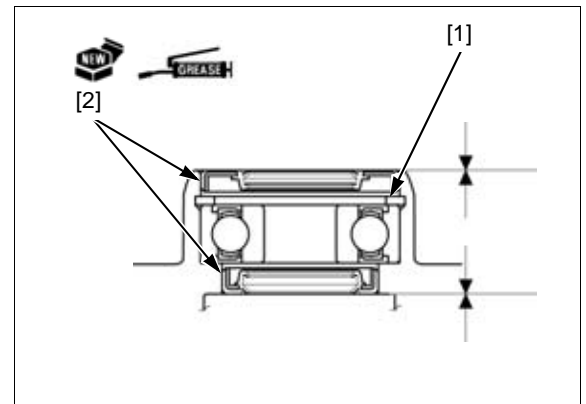


Install the snap ring [1] into the swingarm groove securely with the chamfered side facing the bearing.

Apply grease to the new dust seal [2] lips.

Install each dust seals until they are flush with the swingarm surfaces.

Install the swingarm (page 18-5).



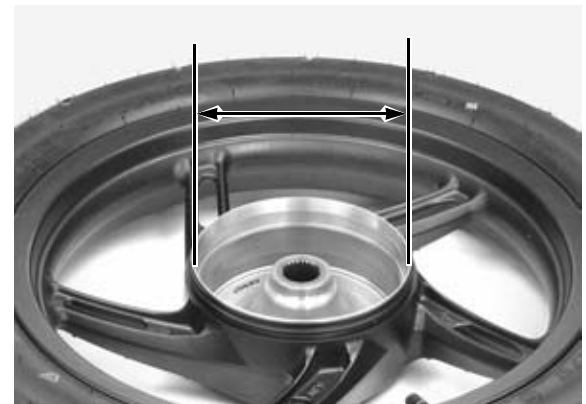
REAR DRUM BRAKE

INSPECTION

Remove the rear wheel (page 18-4)

Measure the rear brake drum I.D.

SERVICE LIMIT: 131.0 mm (5.16 in)

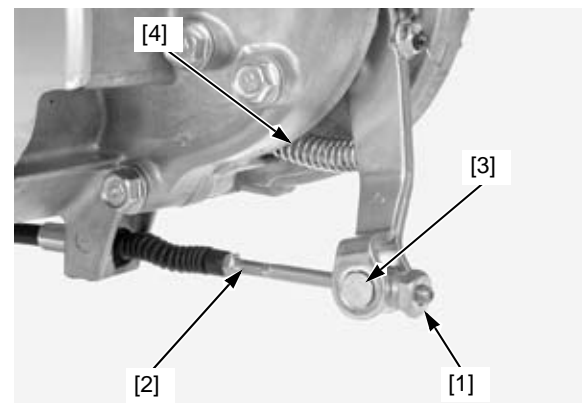


DISASSEMBLY

Remove the rear wheel (page 18-4).

Remove the adjusting nut [1] and brake cable [2] from the joint pin [3].

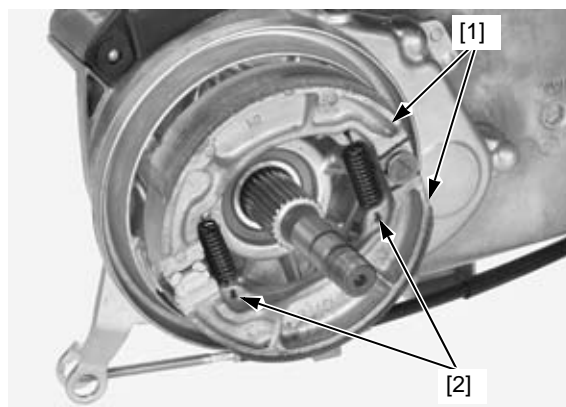
Remove the joint pin and return spring [4].



REAR WHEEL/BRAKE/SUSPENSION

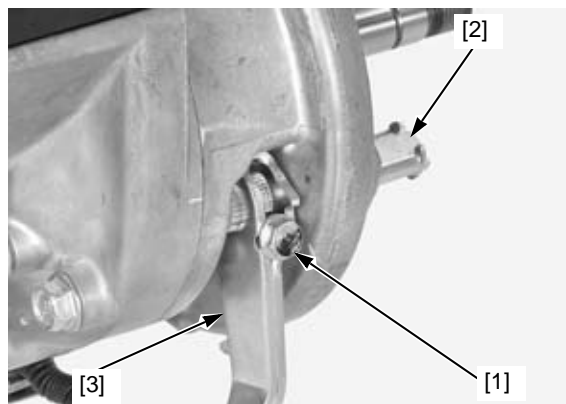
Mark all parts during disassembly so they can be placed back in the original locations.

Expand the brake shoes [1] and remove the brake shoes/shoe springs [2] from the brake panel.

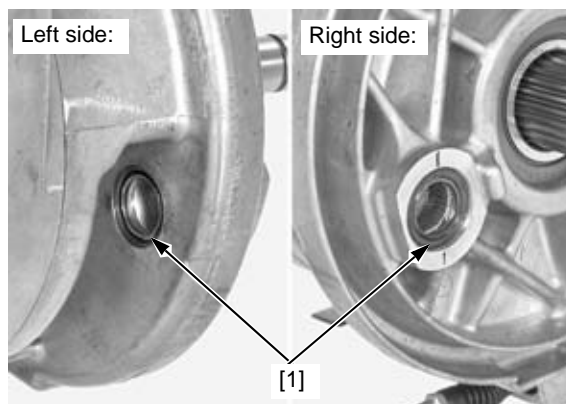


Remove the brake arm bolt [1].

Slightly pull out the brake cam [2] and remove the brake arm [3].



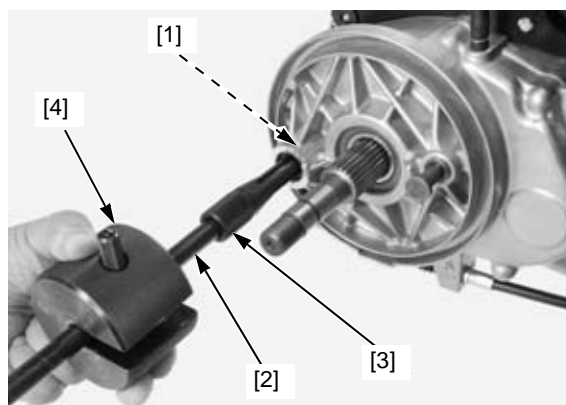
Remove the both dust seals [1].



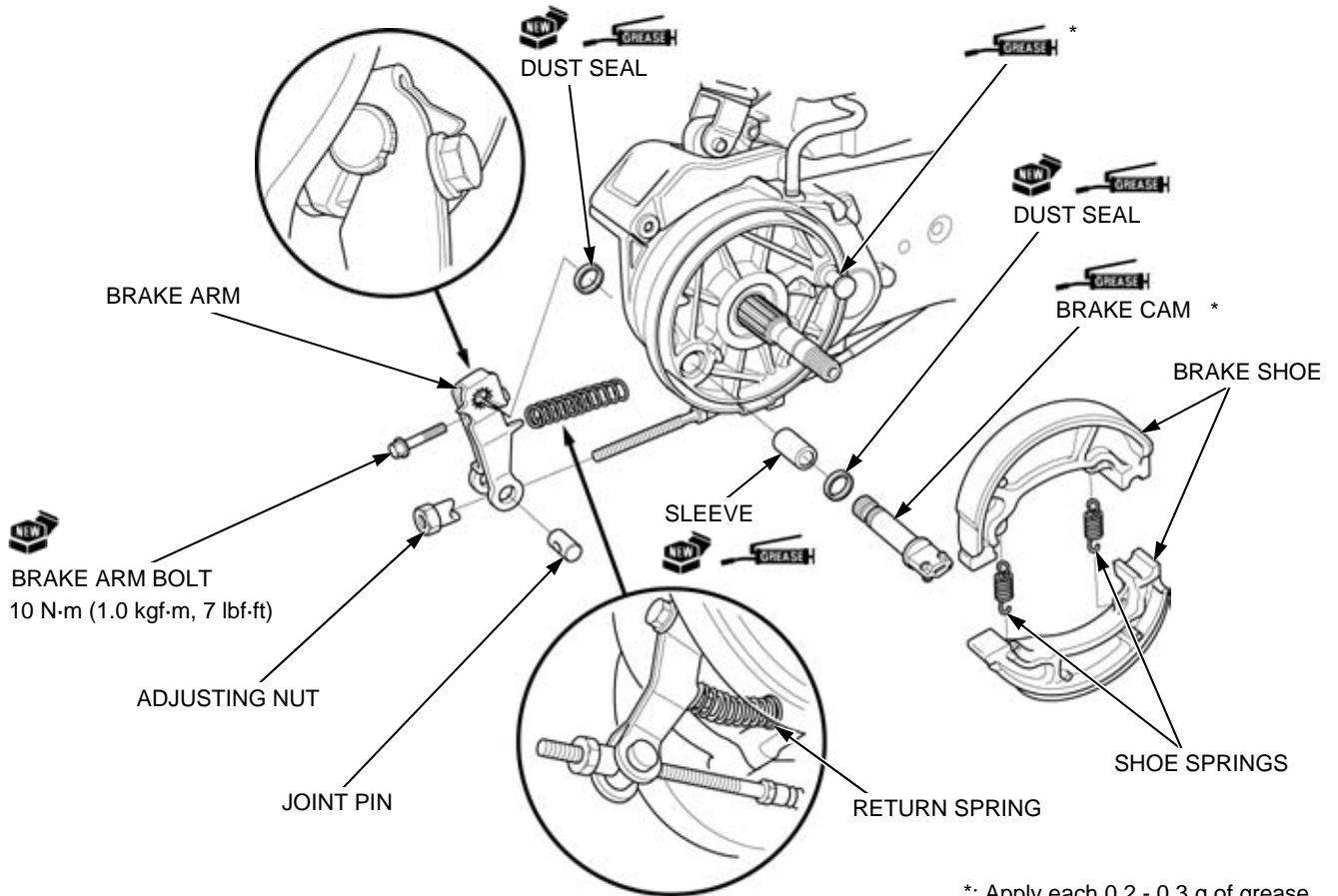
Remove the sleeve [1] using the special tools.

TOOLS:

- [2] Bearing remover shaft, 15 mm 07936-KC10100
- [3] Bearing remover head, 14 mm 07WMC-KFG0100
- [4] Remover weight 07741-0010201



ASSEMBLY



*: Apply each 0.2 - 0.3 g of grease

Apply grease to a new sleeve [1] cavity.

Drive the sleeve so that the depth from the final reduction case surface is 4.3 - 4.9 mm (0.17 - 0.19 in), using the special tools.

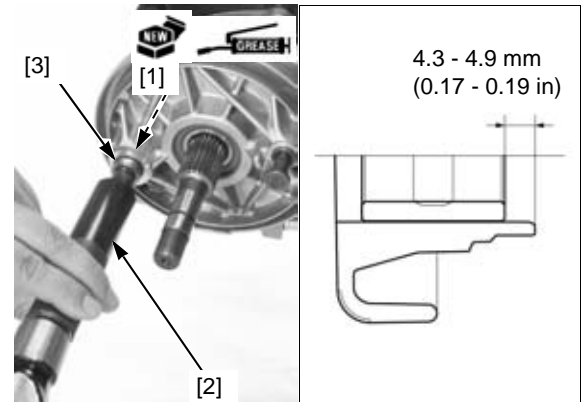
TOOLS:

[2] Driver

[3] Pilot, 20 mm

07749-0010000

07746-0040500

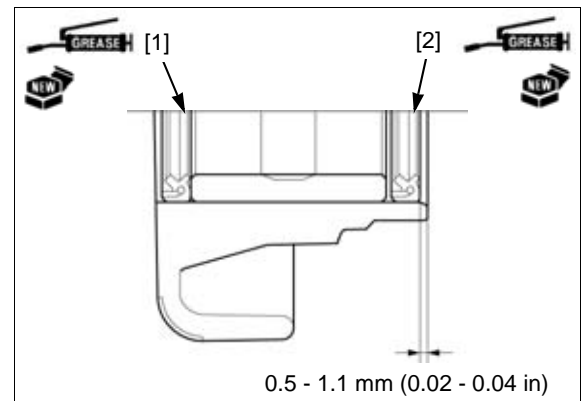


Apply grease to the both new dust seals.

Install the left dust seal [1] into the final reduction case until it is fully seated.

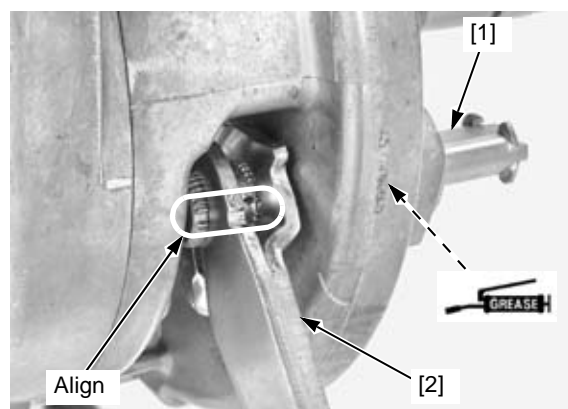
Install the right dust seal [2] so that the depth from the final reduction case surface is 0.5 - 1.1 mm (0.02 - 0.04 in).

- Install the dust seals in the correct direction as shown.



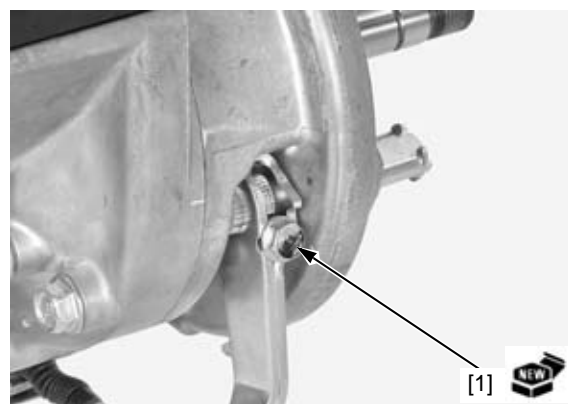
REAR WHEEL/BRAKE/SUSPENSION

Apply 0.2 - 0.3 g of grease to the brake cam pivot area. Install the brake cam [1] and brake arm [2] by aligning the wide tooth of the brake cam with the groove of the brake arm.

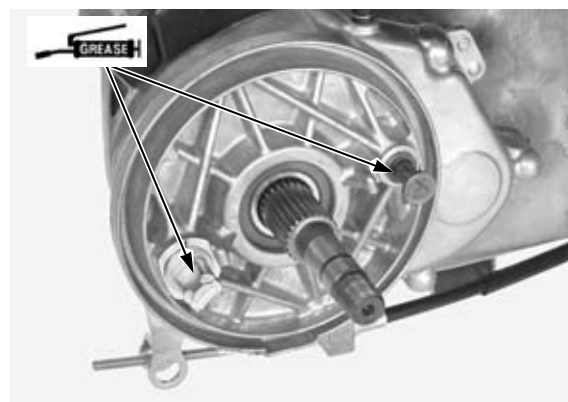


Install a new brake arm bolt [1] and tighten it to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



Apply 0.2 - 0.3 g grease to the anchor pin and brake cam sliding surface.

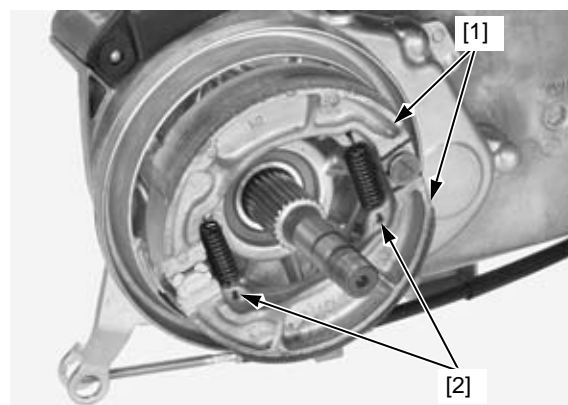


Always replace the brake shoes as a set. When not replaced the brake shoes, install to the original direction.

Assemble the brake shoes [1] and springs [2] in the direction as shown.

Wipe any excess grease from the brake cam and anchor pin.

Install the rear wheel (page 18-5).



REAR SHOCK ABSORBER

REMOVAL/INSTALLATION

To avoid damage to the rear shock absorber mounting bolt threads, slightly lift the rear wheel.

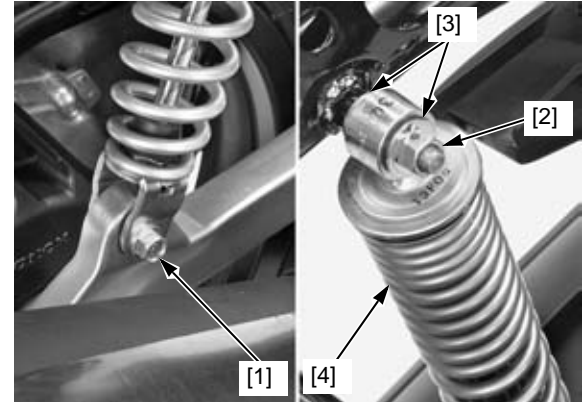
Remove the following:

- Luggage box (page 2-12)
- Lower mounting bolt [1]
- Upper mounting nut [2]
- Washers [3]
- Rear shock absorber [4]

Installation is in the reverse order of removal.

TORQUE:

Shock absorber upper mounting nut:
24 N·m (2.4 kgf·m, 18 lbf·ft)

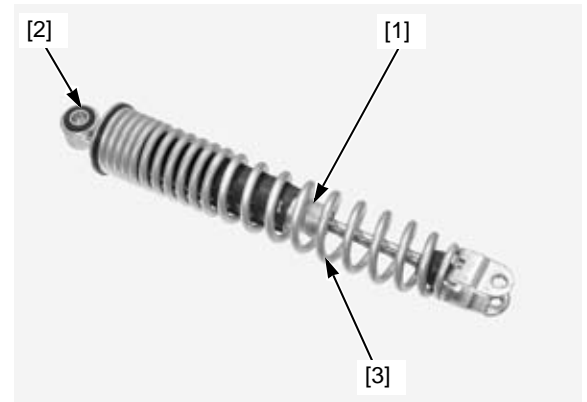


INSPECTION

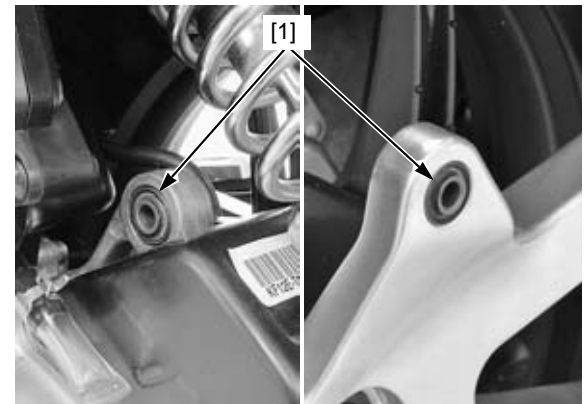
Check the damper unit [1] for leakage or other damage.

Check the shock absorber bushing [2] for wear or damage.

Replace the shock absorber [3] if necessary.



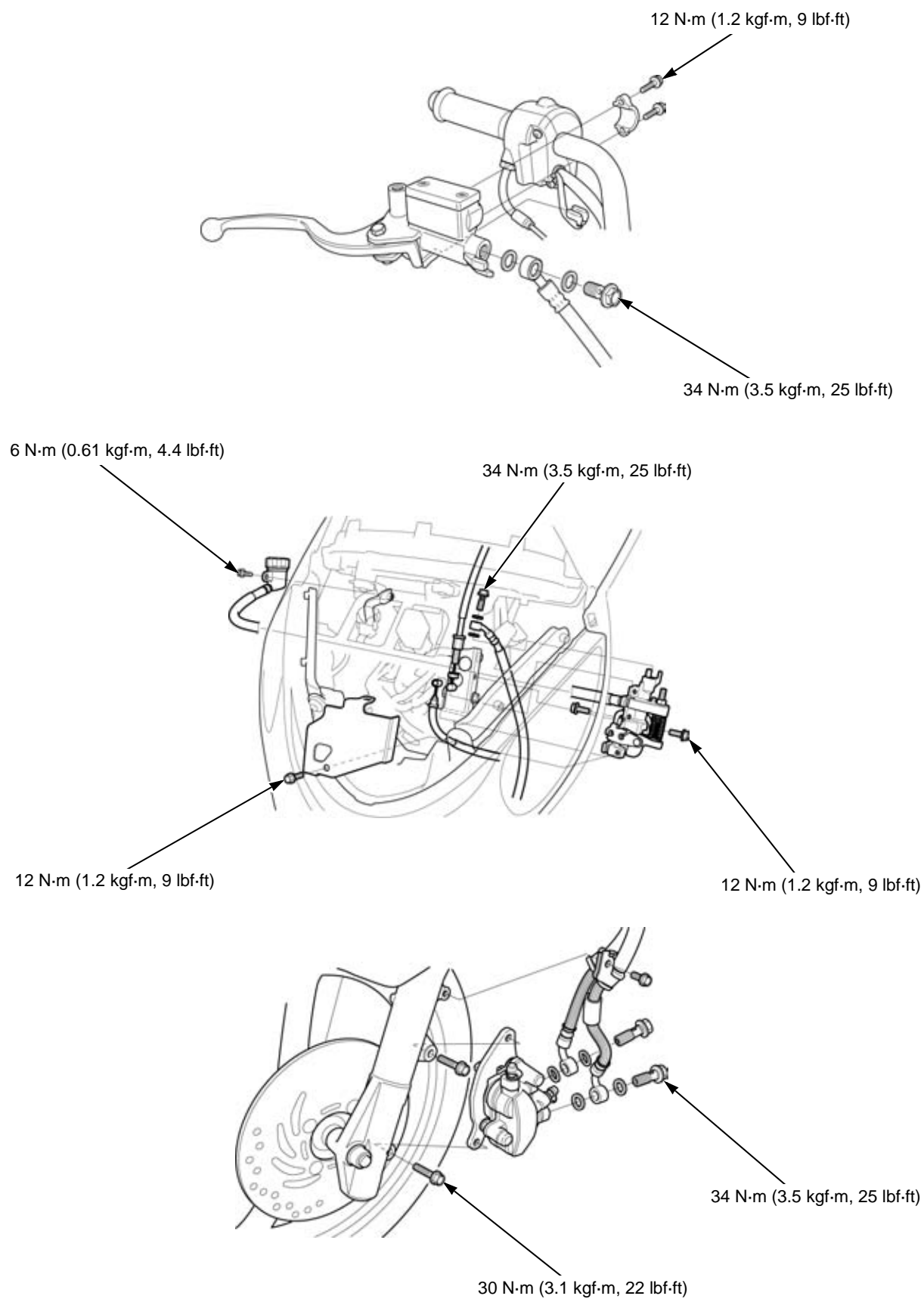
Check the rear shock absorber mount bushings [1] for wear or damage.



MEMO

COMPONENT LOCATION	19-2	BRAKE PAD/DISC	19-10
SERVICE INFORMATION	19-3	BRAKE MASTER CYLINDER	19-12
TROUBLESHOOTING.....	19-4	CBS MASTER CYLINDER.....	19-16
BRAKE FLUID REPLACEMENT/ AIR BLEEDING	19-5	BRAKE CALIPER	19-22

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

⚠ WARNING

Frequent inhalation of brake pad and shoe dust, regardless of material composition, could be hazardous to your health.

- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

NOTICE

Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the master cylinder reservoir is horizontal first.

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Check the brake system by applying the brake lever after the air bleeding.
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always use fresh DOT 3 or DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid, they may not be compatible.
- Always check brake operation before riding the scooter.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Specified brake fluid			DOT 3 or 4	—
Brake disc	Thickness		3.5 ± 0.2 (0.14 ± 0.008)	3.0 (0.12)
	Warpage		0.10 (0.004)	0.30 (0.001)
Front brake master cylinder	Cylinder I.D.		12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Piston O.D.		12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
CBS master cylinder	Cylinder I.D.		11.000 – 11.043 (0.4331 – 0.4348)	11.055 (0.4352)
	Piston O.D.		10.957 – 10.984 (0.4314 – 0.4324)	10.945 (0.4309)
Caliper	Cylinder I.D.	Upper	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
		Center/ lower	22.650 – 22.700 (0.8917 – 0.8937)	22.710 (0.8941)
	Piston O.D.	Upper	25.318 – 25.368 (0.9968 – 0.9987)	25.31 (0.996)
		Center/ Lower	22.585 – 22.618 (0.8892 – 0.8905)	22.56 (0.888)

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Brake caliper bleed valve	2	8	5.4 (0.55, 4.4)	
Front brake master cylinder reservoir cap screw	2	4	1.5 (0.15, 1.1)	
CBS master cylinder reservoir bolt	1	6	6 (0.61, 4.4)	
Front brake light switch screw	1	4	1 (0.1, 0.7)	
Brake pad pin	1	10	18 (1.8, 13)	
Front brake lever pivot bolt	1	6	1 (0.1, 0.7)	
Front brake lever pivot nut	1	6	6 (0.61, 4.4)	
Front master cylinder holder socket bolt	2	6	12 (1.2, 9)	
Brake hose oil bolt	4	10	34 (3.5, 25)	
Rearview mirror lock nut	2	10	34 (3.5, 25)	Left hand threads.
CBS master cylinder stay bolt	2	6	12 (1.2, 9)	
Knocker pivot bolt	1	6	2.5 (0.26, 1.8)	Left hand threads.
Knocker pivot nut	1	6	10 (1.0, 7)	Left hand threads, U-nut
CBS master cylinder mounting bolt	2	6	12 (1.2, 9)	
CBS master cylinder cover bolt	1	6	12 (1.2, 9)	
Brake caliper mounting bolt	2	8	30 (3.1, 22)	ALOC bolt: replace with new ones.
Brake caliper torque pin	1	8	22 (2.2, 16)	
Brake caliper pin	1	8	18 (1.8, 13)	

TROUBLESHOOTING

Poor rear brake performance

- Incorrect adjustment of rear brake lever
- Contaminated brake shoes
- Worn brake shoes
- Worn brake cam
- Worn brake drum
- Improperly installed brake arm
- Improperly engaged brake arm serrations

Brake lever soft or spongy

- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seals
- Worn master cylinder 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 cylinder piston
- Bent brake lever

Brake lever hard

- Clogged/restricted brake system
- Sticking/worn caliper piston
- Caliper not sliding properly
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever

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
- Improperly adjusted equalizer (page 3-15)

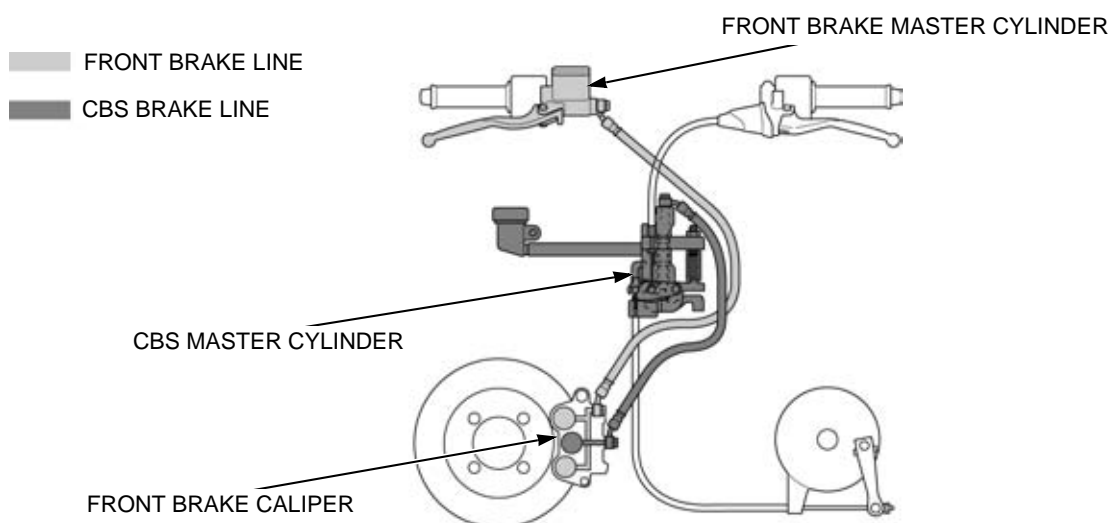
BRAKE FLUID REPLACEMENT/ AIR BLEEDING

BRAKE FLUID DRAINING

NOTICE

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

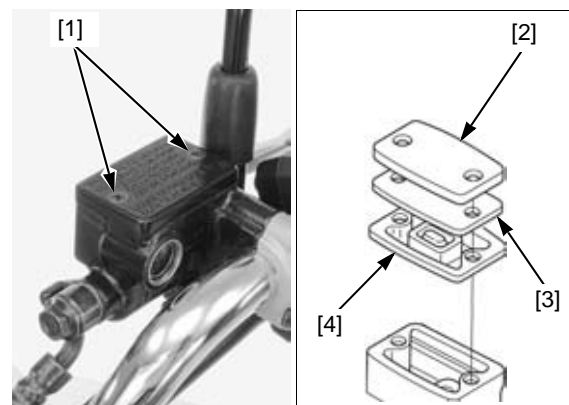
- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.



FRONT BRAKE LINE

Turn the handlebar until the reservoir is parallel to the ground before removing the reservoir cap.

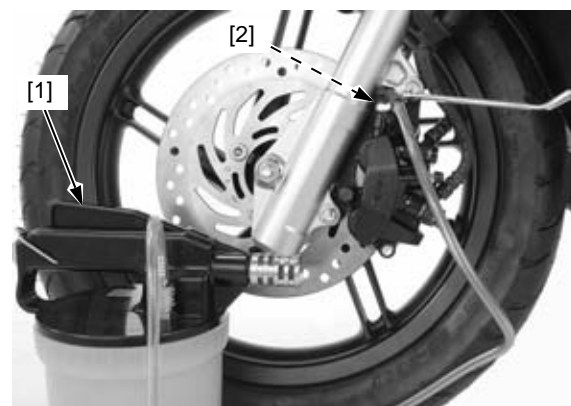
Remove the screws [1], reservoir cap [2], diaphragm plate [3] and diaphragm [4].



Be careful not to confuse with the CBS brake line bleed valve.

Connect a commercially available brake bleeder [1] to the front brake line bleed valve [2]. Loosen the bleed valve and operate the bleeder. Drain the brake fluid.

Tighten the front brake line bleed valve.

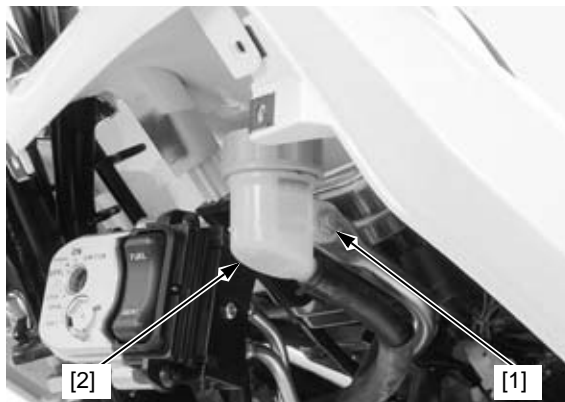


HYDRAULIC BRAKE

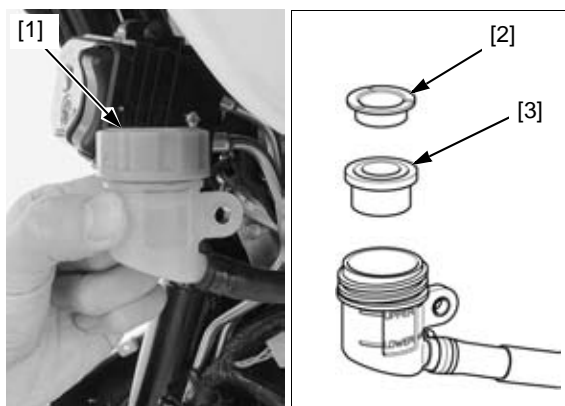
CBS BRAKE LINE

Remove the inner cover (page 2-8).

Remove the bolt [1] and CBS master cylinder reservoir [2].



Pull out the CBS master cylinder reservoir as shown. Remove the reservoir cap [1], diaphragm plate [2] and diaphragm [3].

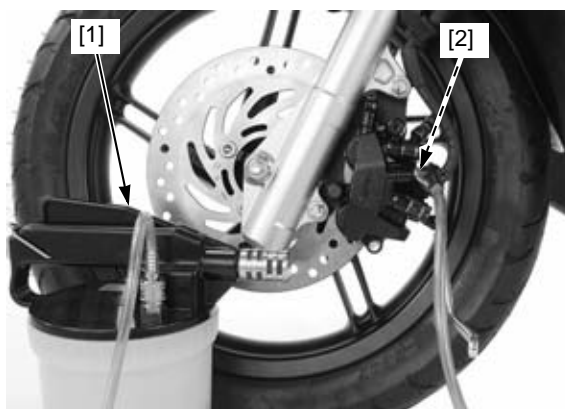


Be careful not to confuse with the front brake line bleed valve.

Connect a commercially available brake bleeder [1] to the CBS brake line bleed valve [2].

Loosen the bleed valve and operate the bleeder. Drain the brake fluid.

Tighten the CBS brake line bleed valve.



BRAKE FLUID FILLING/AIR BLEEDING**FRONT BRAKE LINE**

- Use only DOT 3 or DOT 4 brake fluid from a sealed container.
- Do not mix different types of fluid. They are not compatible.

Be careful not to confuse with the CBS brake line bleed valve.

Fill the master cylinder reservoir with DOT 3 or DOT 4 brake fluid from the sealed container to the upper level.

Connect a commercially available brake bleeder [1] to the front brake line bleed valve [2].

Operate the brake bleeder and loosen the front brake line bleed valve.

- If an automatic refill system is not used, add brake fluid when the fluid level in the reservoir is low.
- Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.
- When using a brake bleeder, follow the manufacturer's operating instructions.
- If air is entering the bleeder around the bleed valve threads, seal the threads with teflon tape.

Close the bleed valve.

Perform the bleeding procedure until the system is completely bled.

After bleeding the system completely, tighten the front brake line bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.55 kgf·m, 4.4 lbf·ft)

If the brake bleeder is not available, perform the following procedure.

Fill the master cylinder reservoir with DOT 3 or DOT 4 brake fluid from the sealed container to the upper level.

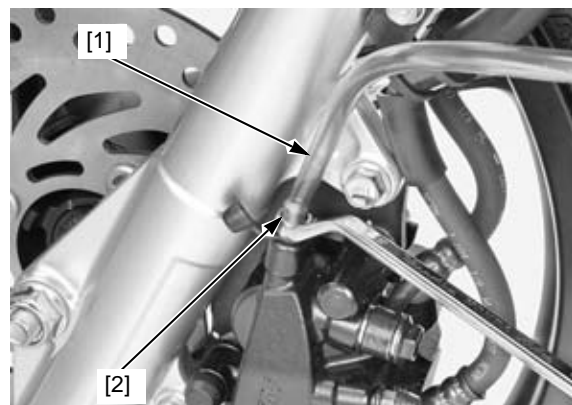
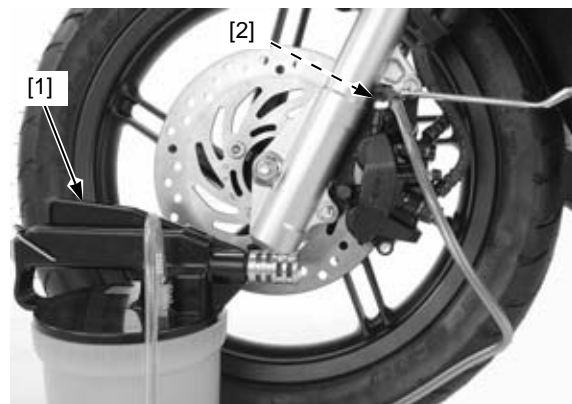
Pump up the system pressure with the brake lever until the lever resistance is felt.

Connect a bleed hose [1] to the bleed valve [2] and bleed the system as follows:

- Do not release the brake lever until the bleed valve has been closed.
 - Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.
1. Squeeze the brake lever all the way and loosen the bleed valve 1/2 of a turn. Wait several seconds and then close the bleed valve.
 2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.
 3. Repeat the steps 1 and 2 until there are no air bubbles in the bleed hose.

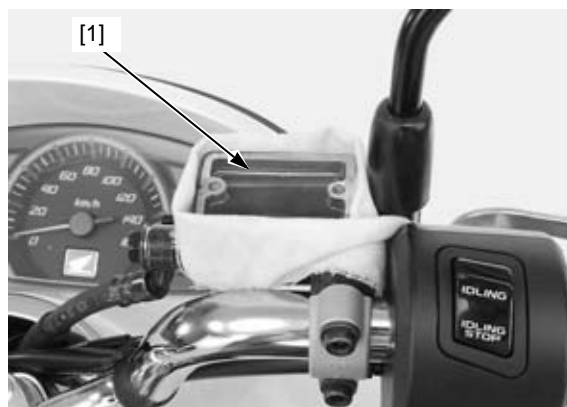
After bleeding the system completely, tighten the bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.55 kgf·m, 4.4 lbf·ft)



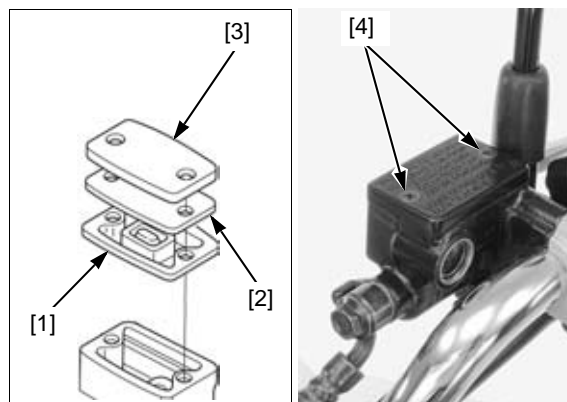
HYDRAULIC BRAKE

Fill the reservoir to the upper level [1] with DOT 3 or DOT 4 brake fluid from a sealed container.



Install the diaphragm [1], diaphragm plate [2] and reservoir cap [3], then tighten the screws [4] to the specified torque.

TORQUE: 1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)



CBS BRAKE LINE

- Use only DOT 3 or DOT 4 brake fluid from a sealed container.
- Do not mix different types of fluid. They are not compatible.

Be careful not to confuse with the front brake line bleed valve.

Fill the master cylinder reservoir with DOT 3 or DOT 4 brake fluid from the sealed container to the upper level.

Connect a commercially available brake bleeder [1] to the CBS brake line bleed valve [2].

Operate the brake bleeder and loosen the CBS brake line bleed valve.

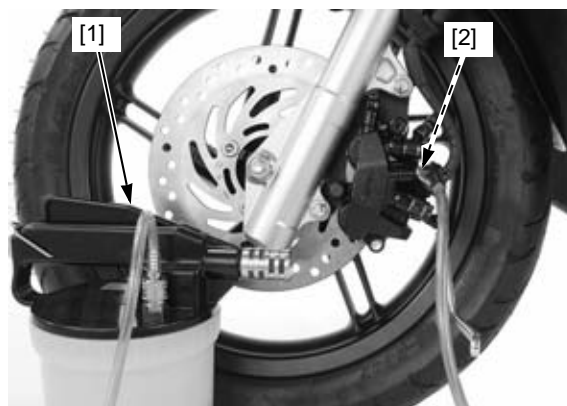
- If an automatic refill system is not used, add brake fluid when the fluid level in the reservoir is low.
- Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.
- When using a brake bleeder, follow the manufacturer's operating instructions.
- If air is entering the bleeder around the bleed valve threads, seal the threads with teflon tape.

Close the bleed valve.

Perform the bleeding procedure until the system is completely bled.

After bleeding the system completely, tighten the CBS brake line bleed valve to the specified torque.

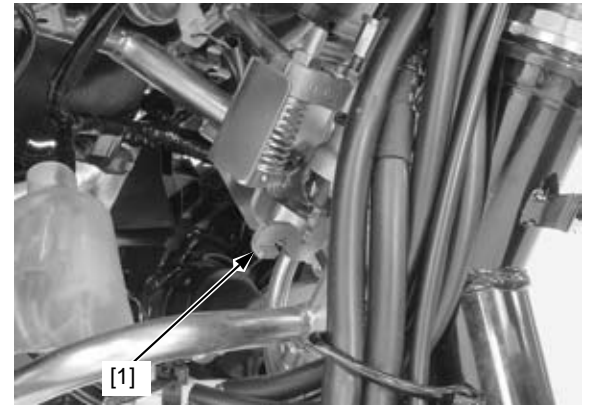
TORQUE: 5.4 N·m (0.55 kgf·m, 4.4 lbf·ft)



If the brake bleeder is not available, perform the following procedure.

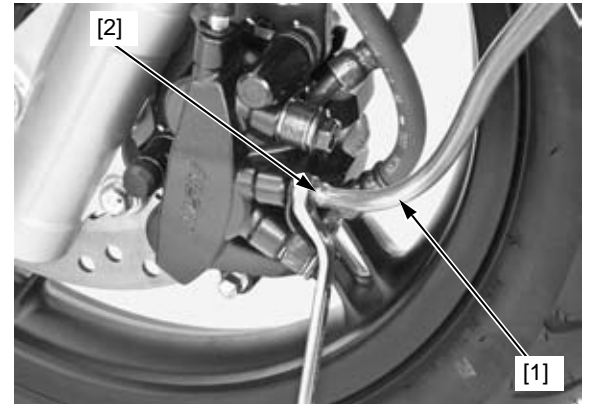
Fill the master cylinder reservoir with DOT 3 or DOT 4 brake fluid from the sealed container to the upper level.

Pump up the system pressure with the knocker arm [1] until the arm resistance is felt.



Connect a bleed hose [1] to the bleed valve [2] and bleed the system as follows:

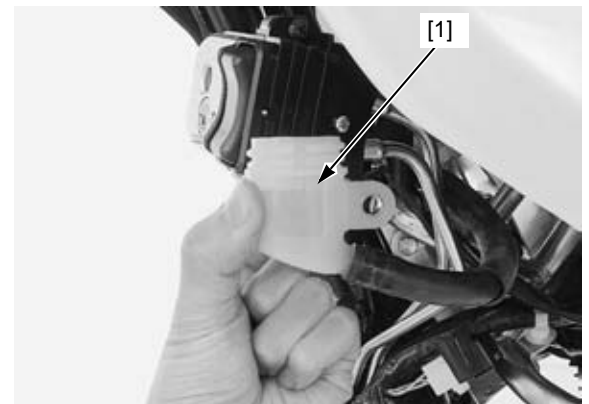
- Do not release the knocker arm until the bleed valve has been closed.
 - Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.
1. Push the knocker arm all the way and loosen the bleed valve 1/2 of a turn. Wait several seconds and then close the bleed valve.
 2. Release the knocker arm 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.



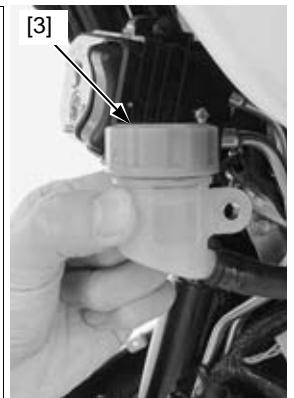
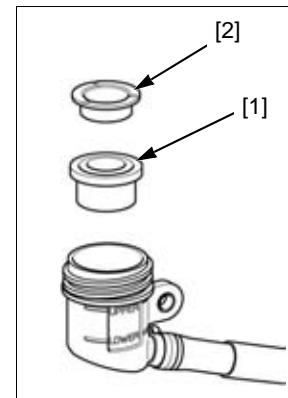
After bleeding the system completely, tighten the bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.55 kgf·m, 4.4 lbf·ft)

Fill the reservoir to the upper level [1] with DOT 3 or DOT 4 brake fluid from a sealed container.



Install the diaphragm [1], diaphragm plate [2] and reservoir cap [3] securely.

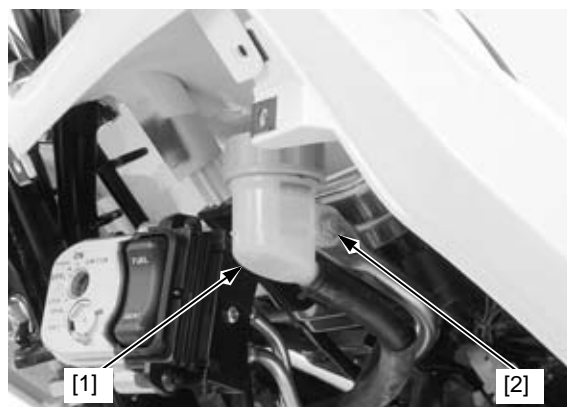


HYDRAULIC BRAKE

Install the CBS master cylinder reservoir [1] and bolt [2], then tighten the bolt to the specified torque.

TORQUE: 6 N·m (0.61 kgf·m, 4.4 lbf·ft)

Install the inner cover (page 2-8).

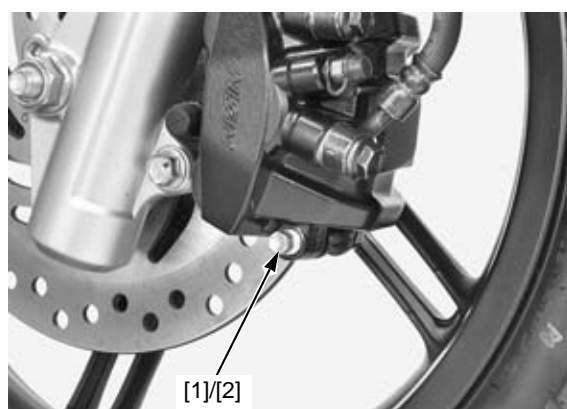


BRAKE PAD/DISC

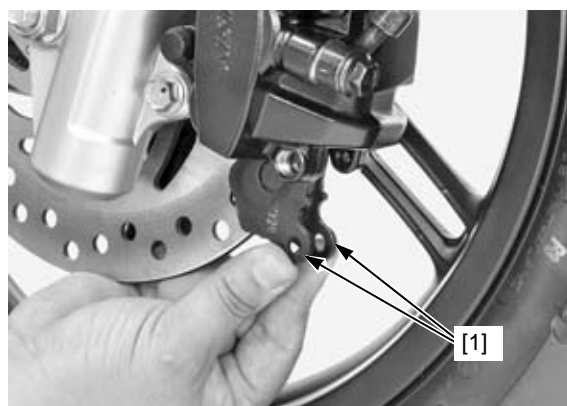
BRAKE PAD REPLACEMENT

Remove the pad pin [1] from the brake caliper.

Remove the O-ring [2] from the pad pin.

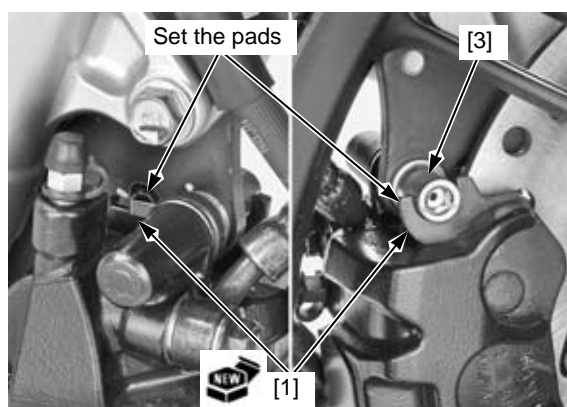


Remove the brake pads [1] from the brake caliper.



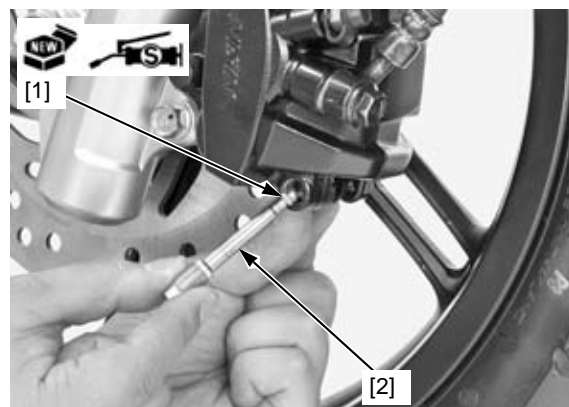
Always replace the brake pads in pairs to assure even disc pressure.

Install new brake pads [1] so that they are set on the brake caliper bracket and bracket pin [2].



Apply silicon grease to the new O-ring [1] and install it to the pad pin [2].

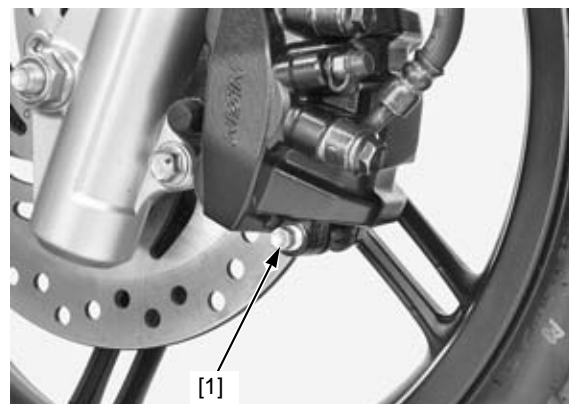
Install the pad pin by pushing the brake pads against the pad spring to align the pad pin holes on the pads and caliper hole.



After the brake pad replacement, check the brake operation by applying the brake lever.

Tighten the pad pin [1] to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



BRAKE DISC INSPECTION

Visually inspect the brake disc for damage or cracks. Measure the brake disc thickness at several points.

SERVICE LIMIT: 3.0 mm (0.12 in)



Check the brake disc for warpage.

SERVICE LIMIT: 0.30 mm (0.001 in)

If the warpage exceeds the service limit, check the wheel bearings for excessive play.

For brake disc replacement (page 17-6).



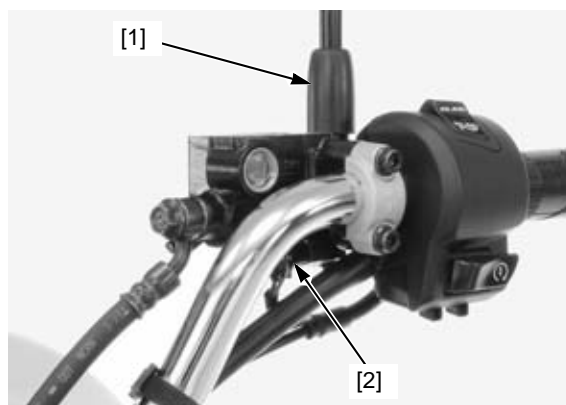
BRAKE MASTER CYLINDER

REMOVAL

Drain the brake fluid from the front brake line hydraulic system (page 19-5).

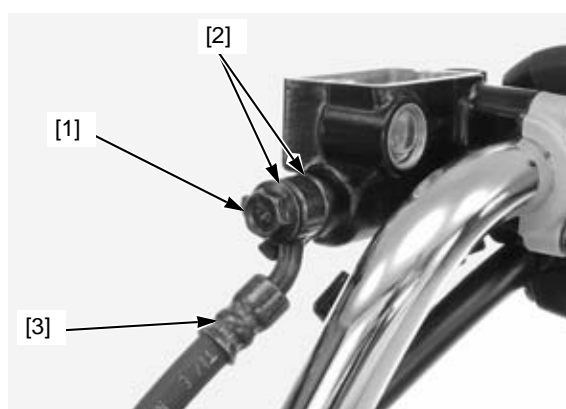
Remove the right rear view mirror [1].

Disconnect the front brake light switch connectors [2].

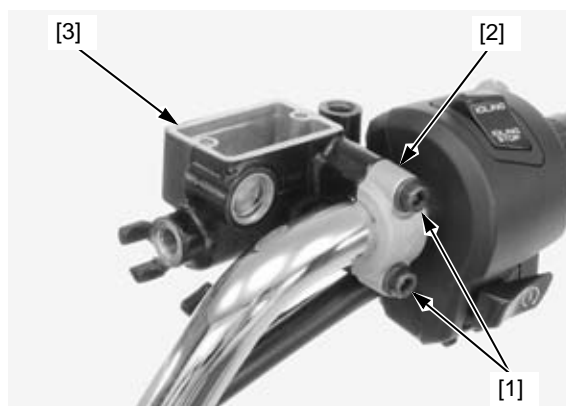


When removing the brake hose oil bolt, cover the end of the hose to prevent contamination. Secure the hose to prevent the fluid from leaking out.

Remove the brake hose oil bolt [1], sealing washers [2] and brake hose [3] eyelet.

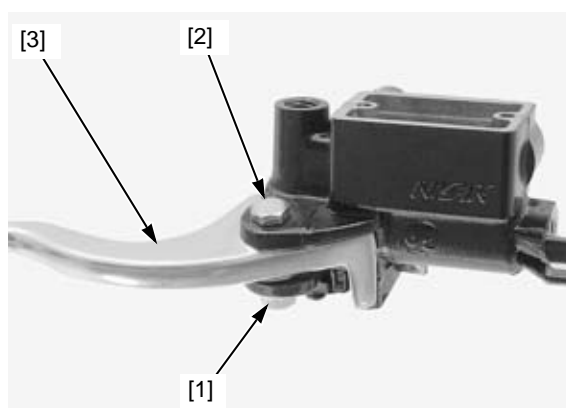


Remove the master cylinder holder socket bolts [1], holder [2] and master cylinder [3].

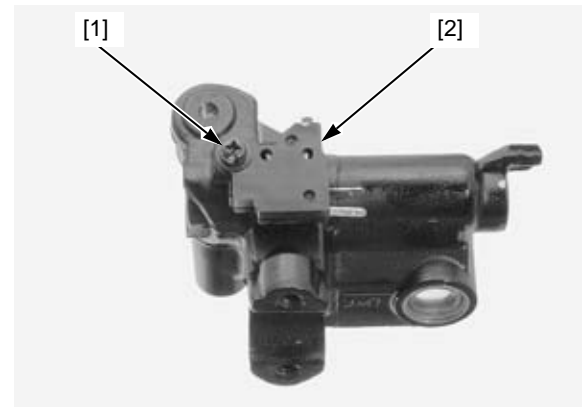


DISASSEMBLY

Remove the pivot nut [1], pivot bolt [2] and brake lever [3].



Remove the screw [1] and brake light switch [2].



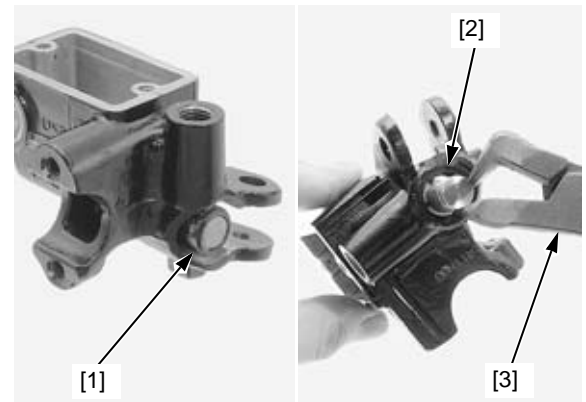
Remove the piston boot [1] from the front brake master cylinder and master piston.

Remove the snap ring [2] using the special tool.

TOOL:

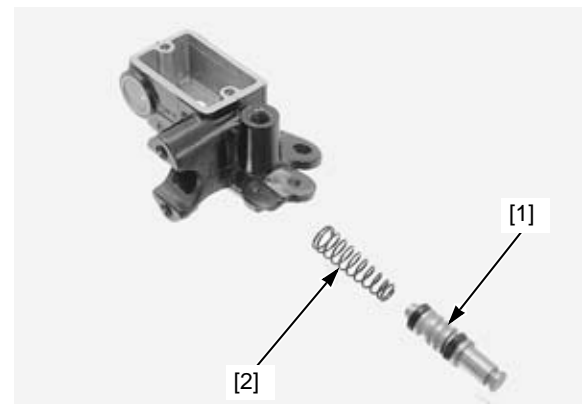
[3] Snap ring pliers

07914-SA50001



Remove the master piston [1] and spring [2].

Clean the master cylinder, reservoir and master piston.



INSPECTION

Check the piston cups for wear, deterioration or damage.

Check the master cylinder inner surface and piston outer surface for scratches or damage.

Measure the master cylinder I.D.

SERVICE LIMIT: 12.755 mm (0.5022 in)

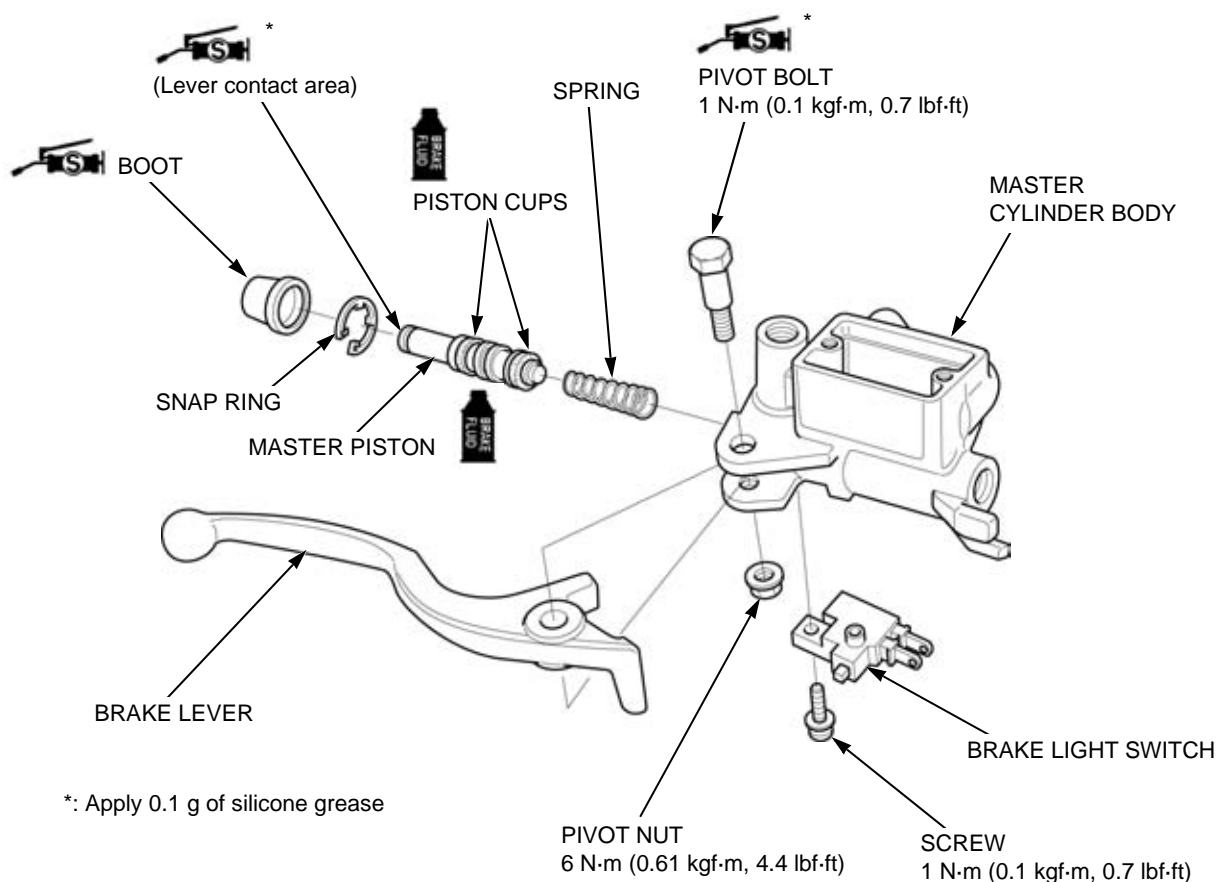
Measure the master piston O.D.

SERVICE LIMIT: 12.645 mm (0.4978 in)



HYDRAULIC BRAKE

ASSEMBLY



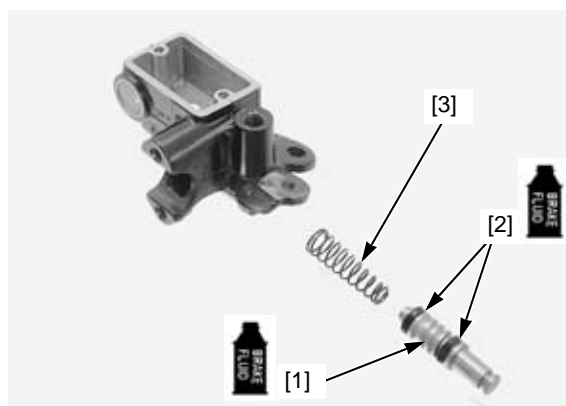
Keep the piston, cups, spring, snap ring and boot as a set; do not substitute individual parts.

Coat the master piston [1] and piston cups [2] with clean DOT 3 or DOT 4 brake fluid.

Install the spring [3] onto the master piston.

Do not allow the piston cup lips to turn inside out.

Install the spring and master piston into the master cylinder.



Be sure that snap ring is firmly seated in the groove.

Install the snap ring [1] into the groove in the master cylinder.

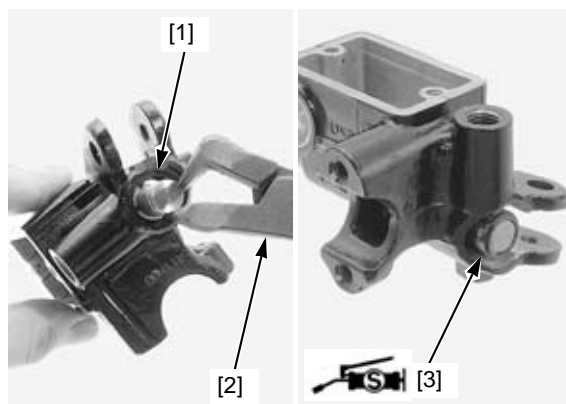
TOOL:

[2] Snap ring pliers

07914-SA50001

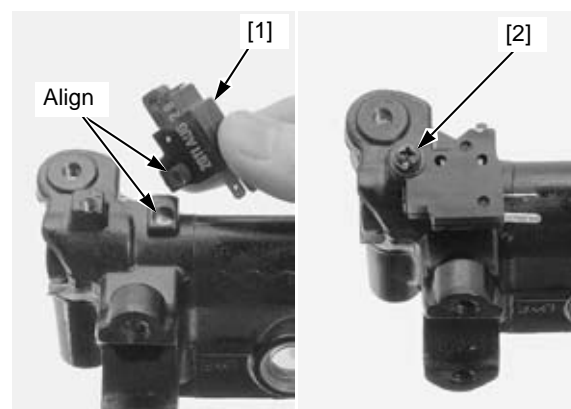
Apply silicon grease to the inside of the piston boot [3].

Install the piston boot into the master cylinder and groove in the piston.



Install the brake light switch [1] by aligning the boss of the switch body and hole of the master cylinder.
Install and tighten the screw [2] to the specified torque.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)



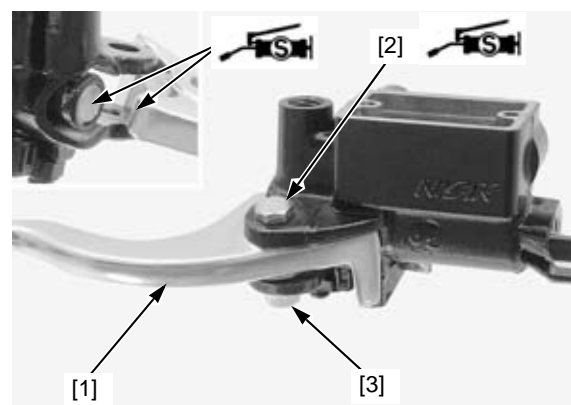
Apply 0.1 g of silicone grease to the contact surfaces of the brake lever [1], piston tip and brake lever pivot bolt [2] sliding surface.
Install the brake lever.

Install the pivot bolt and tighten it to the specified torque.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

Install the pivot nut [3] and tighten it to the specified torque while holding the pivot bolt.

TORQUE: 6 N·m (0.61 kgf·m, 4.4 lbf·ft)

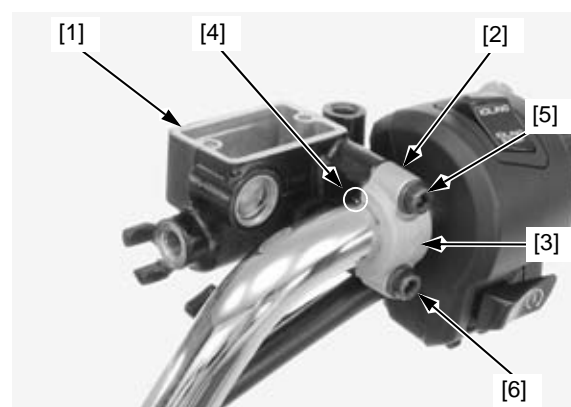


INSTALLATION

Install the master cylinder [1] and holder [2] with the "UP" mark [3] facing up.

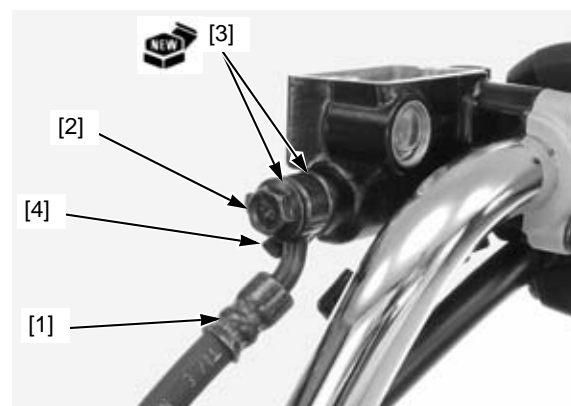
Align the end of the master cylinder with the punch mark [4] on the handlebar and tighten the upper bolt [5] first then tighten the lower bolt [6] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Connect the brake hose [1] with the oil bolt [2] and new sealing washers [3].
Set the brake hose joint onto the stopper [4] of the master cylinder then tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



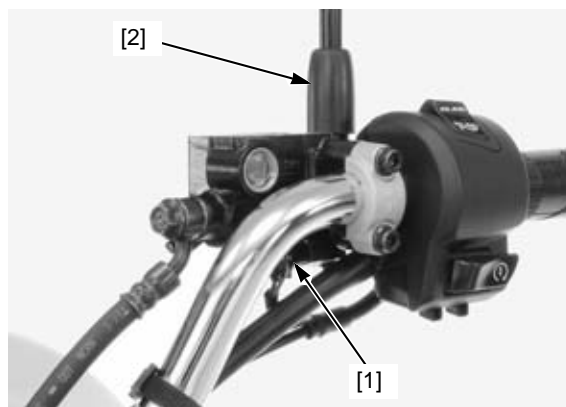
HYDRAULIC BRAKE

Connect the brake light switch connectors [1].

Install the right rearview mirror [2] and tighten the lock nut to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill brake fluid and bleed air from the front brake line hydraulic system (page 19-7).



CBS MASTER CYLINDER

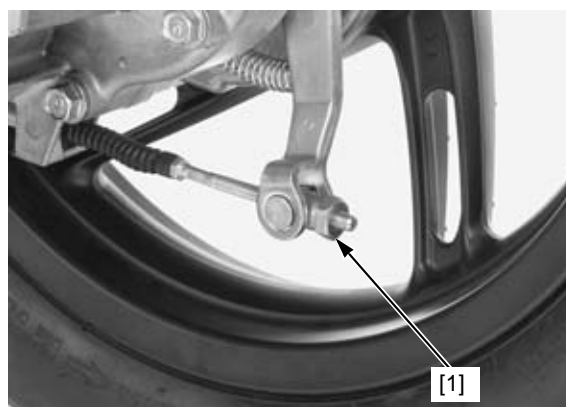
REMOVAL

Drain the brake fluid from the CBS brake line hydraulic system (page 19-6).

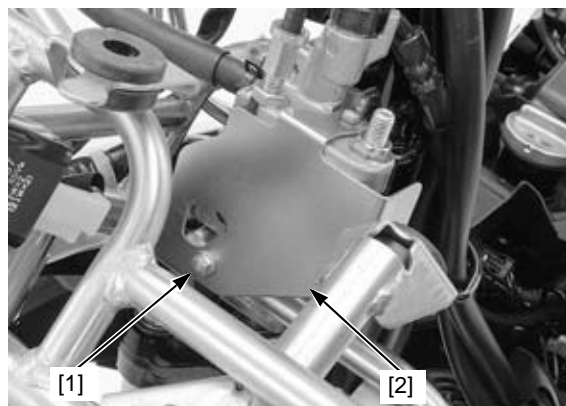
Remove the following:

- Front meter panel (page 2-5)
- Inner cover (page 2-8)

Loosen the adjusting nut [1] to the maximum.



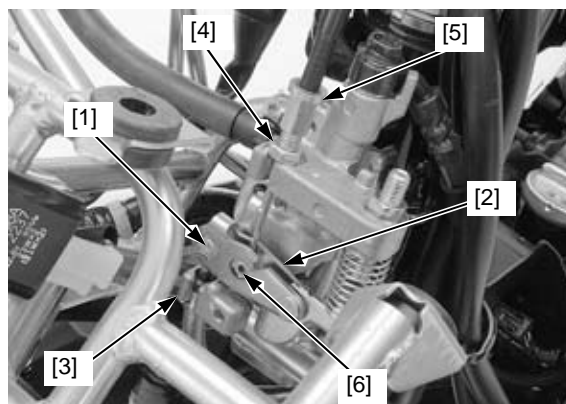
Remove the bolt [1] and CBS master cylinder cover [2].



Release the 2nd rear brake cable [1] from the equalizer [2] and cable guide [3].

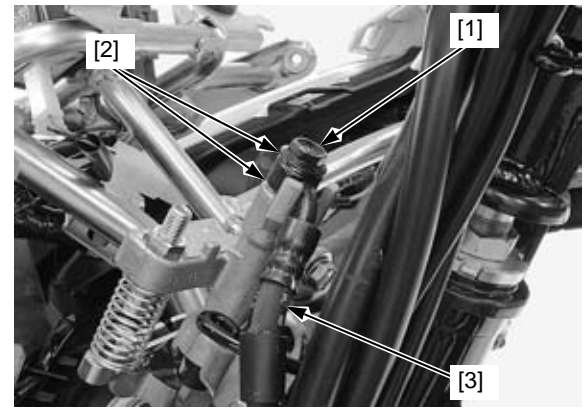
Loosen the lock nut [4] and adjuster [5].

Release the 1st rear brake cable [6] from the equalizer.

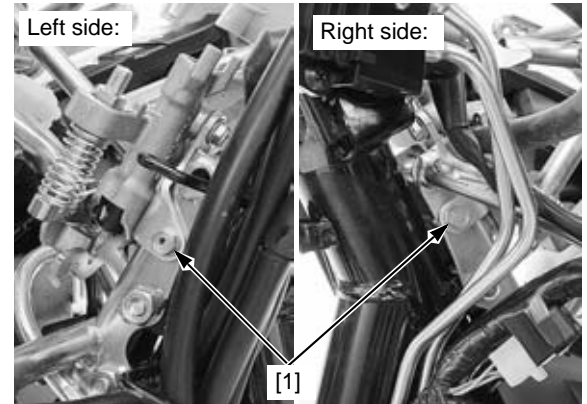


When removing the brake hose oil bolt, cover the end of the hose to prevent contamination. Secure the hose to prevent the fluid from leaking out.

Remove the brake hose oil bolt [1], sealing washers [2] and brake hose [3] eyelet.



Remove the CBS master cylinder mounting bolts [1] from both side and remove the CBS master cylinder.



DISASSEMBLY

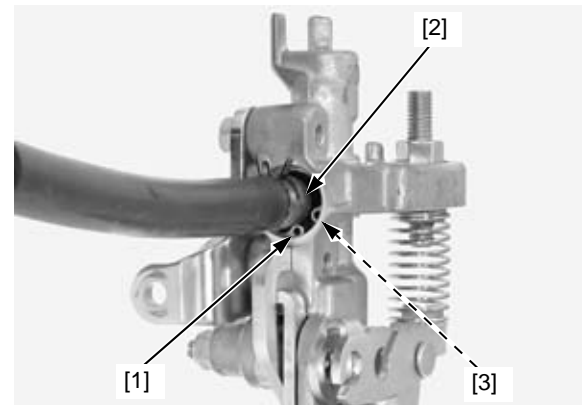
Remove the snap ring [1] and reservoir hose joint [2] from the CBS master cylinder.

TOOL:

Snap ring pliers

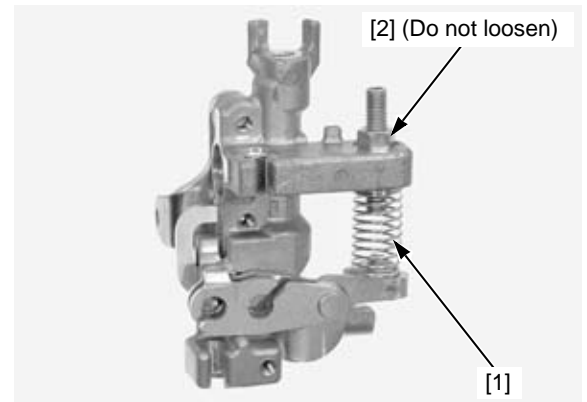
07914-SA50001

Remove the O-ring [3] from the reservoir hose joint.



Remove the delay spring [1].

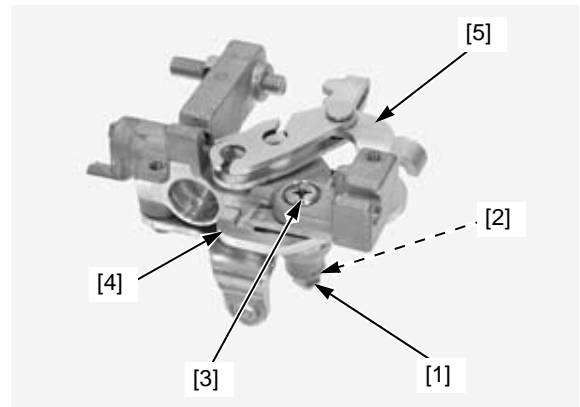
- Do not loosen the lock nut [2].



HYDRAULIC BRAKE

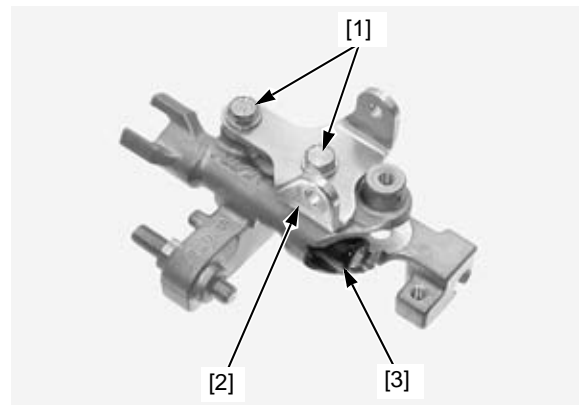
The pivot nut and pivot bolt has left-hand threads.

Remove the pivot nut [1], washer [2], pivot bolt [3], knocker arm [4] and equalizer [5].



Remove the two bolts [1] and CBS master cylinder stay [2].

Remove the piston boot [3] from the CBS master cylinder and master piston.



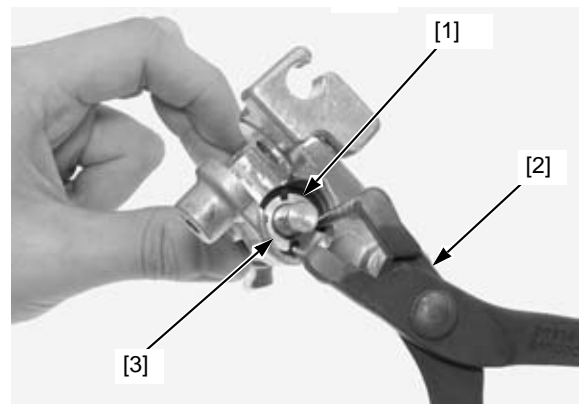
Remove the snap ring [1] using the special tool.

TOOL:

[2] Snap ring pliers

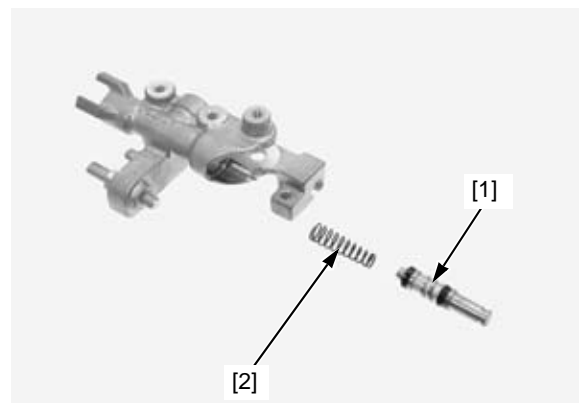
07914-SA50001

Remove the washer [3].



Remove the master piston [1] and spring [2].

Clean the master cylinder, reservoir and master piston.



INSPECTION

Check the piston cups for wear, deterioration or damage.

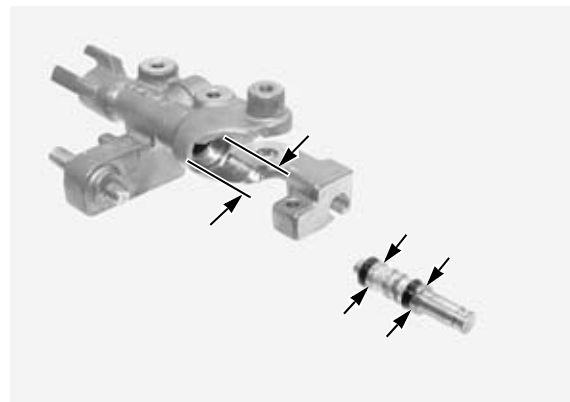
Check the master cylinder inner surface and piston outer surface for scratches or damage.

Measure the master cylinder I.D.

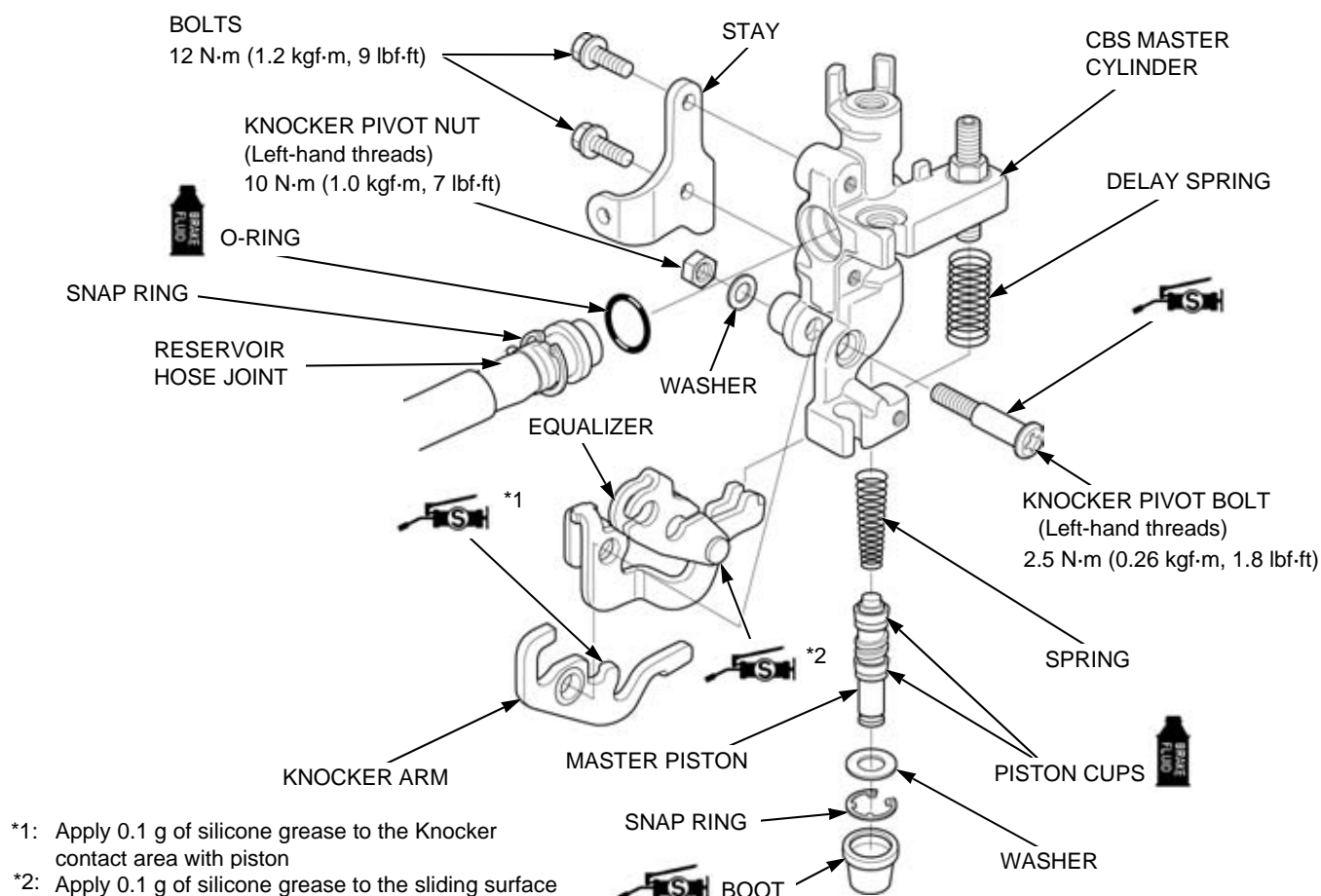
SERVICE LIMIT: 11.055 mm (0.4352 in)

Measure the master piston O.D.

SERVICE LIMIT: 10.945 mm (0.4309 in)



ASSEMBLY



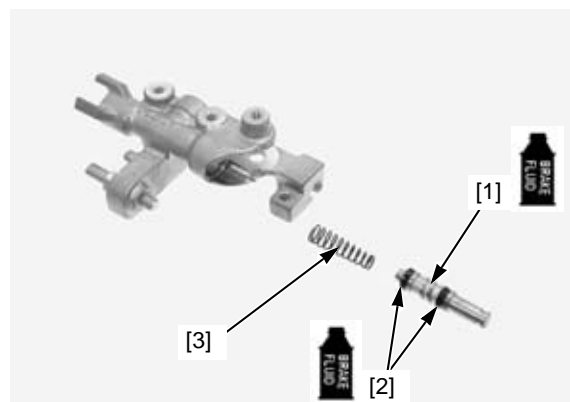
Keep the piston, cups, spring, snap ring and boot as a set; do not substitute individual parts.

Coat the master piston [1] and piston cups [2] with clean DOT 3 or DOT 4 brake fluid.

Install the spring [3] onto the master piston.

Do not allow the piston cup lips to turn inside out.

Install the spring and master piston into the master cylinder.



HYDRAULIC BRAKE

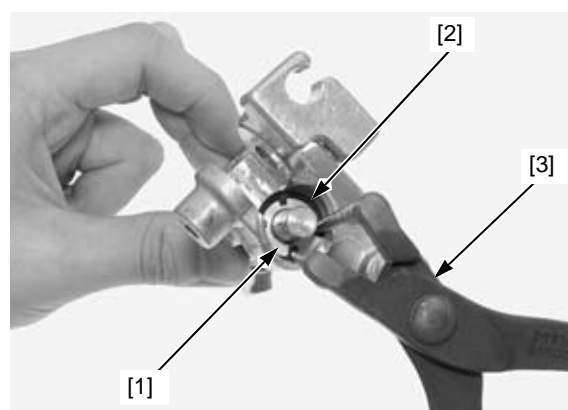
Be sure that snap ring is firmly seated in the groove.

Install the washer [1] and snap ring [2] into the groove in the master cylinder.

TOOL:

[3] Snap ring pliers

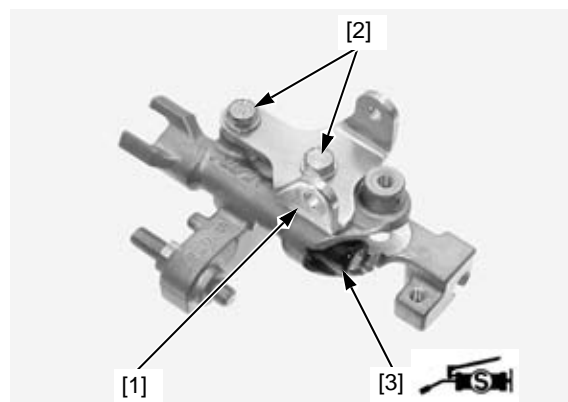
07914-SA50001



Install the CBS master cylinder stay [1].
Install the two bolts [2] and tighten them to the specified torque.

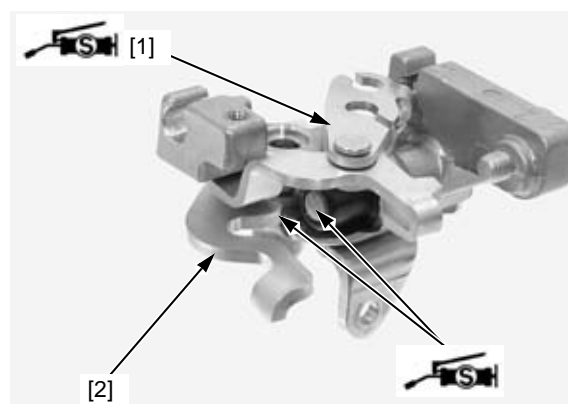
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Apply silicone grease to the inside of the piston boot [3].
Install the piston boot into the master cylinder and groove of the piston.



Apply 0.1 g of silicone grease to the equalizer [1] sliding surface.
Set the equalizer and knocker arm [2] onto the CBS master cylinder.

Apply 0.1 g of silicone grease to the contact surfaces of the knocker and piston tip.



Apply silicone grease to the knocker pivot bolt [1] sliding area.

The pivot bolt has left-hand threads.

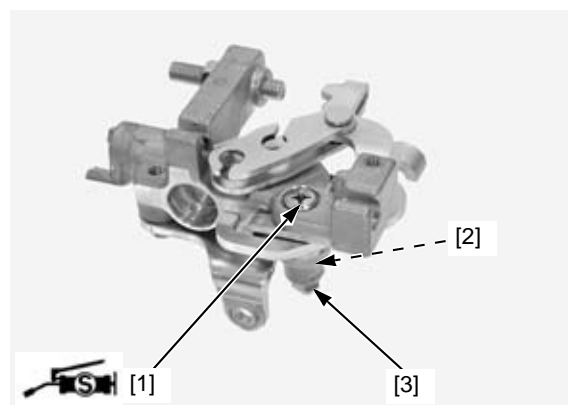
Install the pivot bolt and tighten it to the specified torque.

TORQUE: 2.5 N·m (0.26 kgf·m, 1.8 lbf·ft)

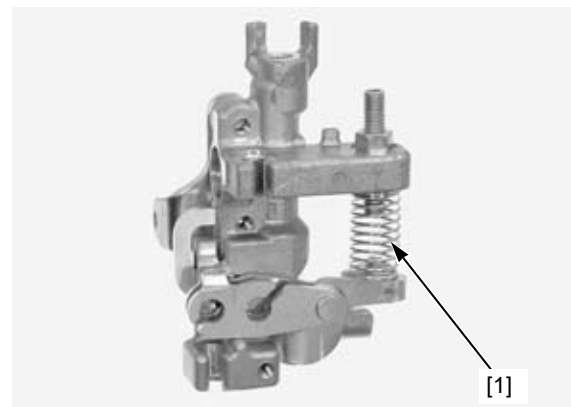
The pivot nut has left-hand threads.

Install the washer [2] and pivot nut [3], then tighten it to the specified torque.

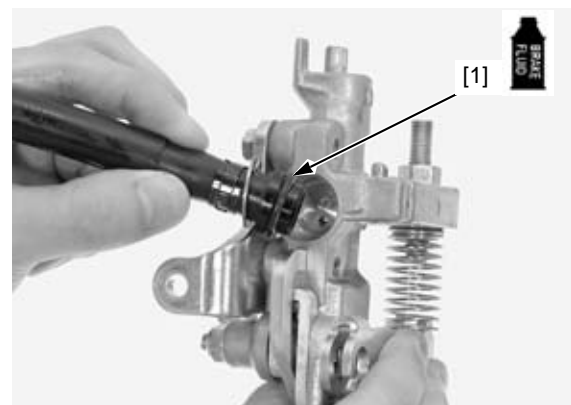
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



Install the delay spring [1].



Coat a new O-ring [1] with clean DOT 3 or DOT 4 brake fluid.
Install the O-ring onto the reservoir hose joint.



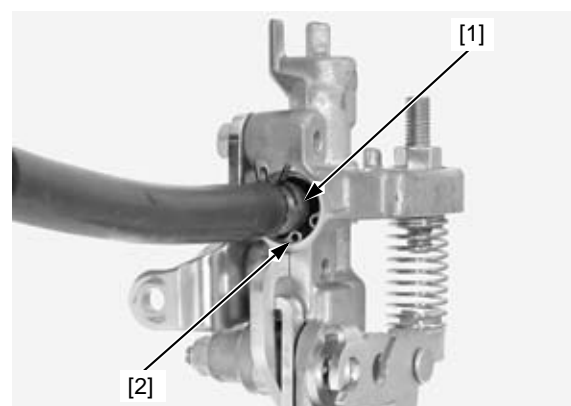
Be sure that snap ring is firmly seated in the groove.

Install the reservoir hose joint [1] and snap ring [2] onto the CBS master cylinder.

TOOL:

Snap ring pliers

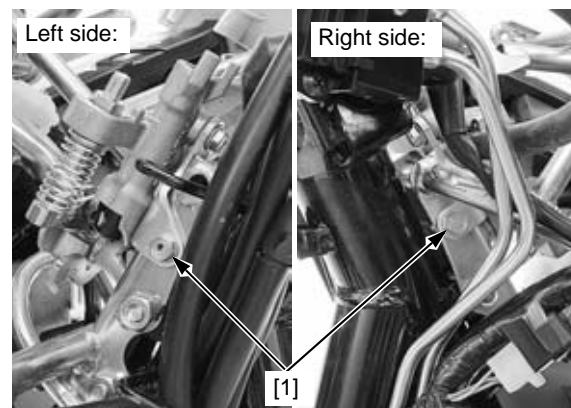
07914-SA50001



INSTALLATION

Install the CBS master cylinder and CBS master cylinder mounting bolts [1] to the both side, then tighten them to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

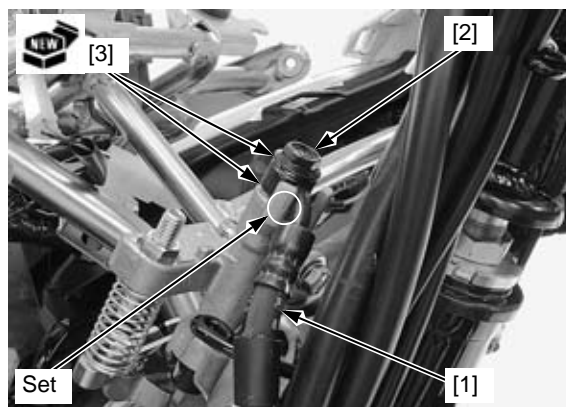


HYDRAULIC BRAKE

Connect the brake hose [1] with the oil bolt [2] and new sealing washers [3].

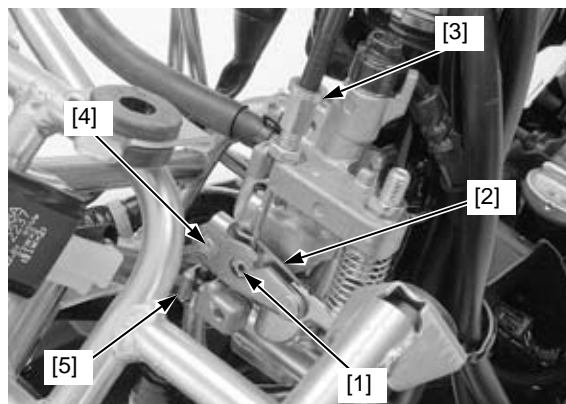
Set the brake hose joint between the stoppers [4] of the master cylinder then tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



Install the 1st rear brake cable [1] into the equalizer [2] and temporarily tighten the adjuster [3].

Install the 2nd rear brake cable [4] into the equalizer and cable guide [5].



Install the CBS master cylinder cover [1] by aligning the slot with the boss of the CBS master cylinder.

Install the bolt [2] and tighten it to the specified torque.

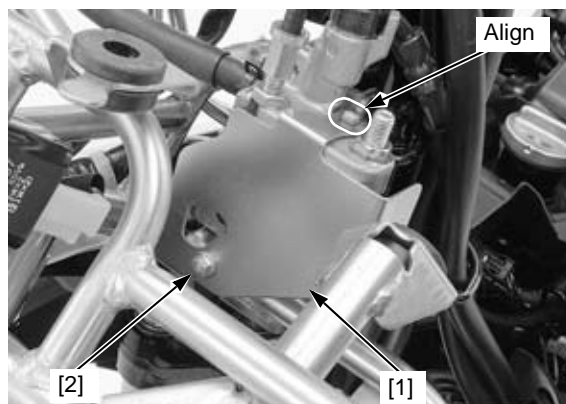
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the following:

- Inner cover (page 2-8)
- Front meter panel (page 2-5)

Fill brake fluid and bleed air from the CBS brake line hydraulic system (page 19-8).

Adjust the CBS brake system (page 3-15).



BRAKE CALIPER

REMOVAL

Drain the brake fluid from the following lines of the hydraulic systems:

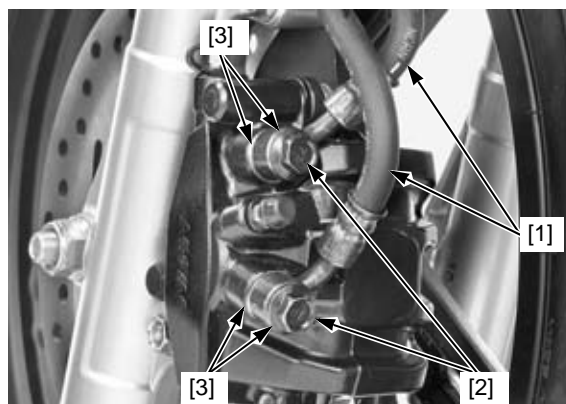
- Front brake line (page 19-5)
- CBS brake line (page 19-6)

Remove the brake pads (page 19-10).

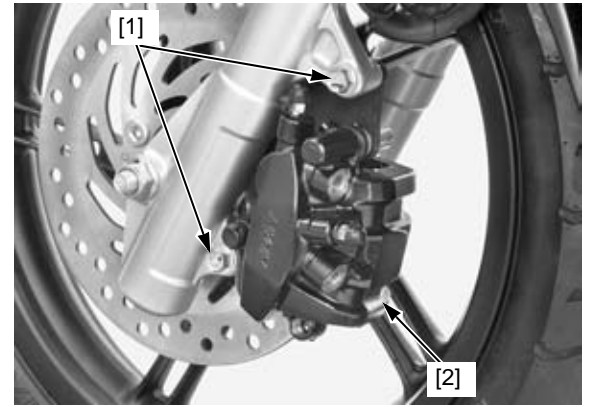
When removing the oil bolts, cover the end of the hoses to prevent contamination.

Disconnect the brake hoses [1] from the brake caliper by removing the oil bolts [2] and sealing washers [3].

Remove the front brake caliper mounting bolts and front brake caliper.

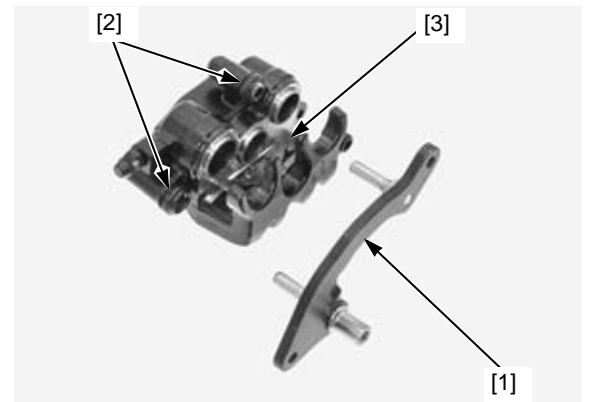


Remove the front brake caliper mounting bolts [1] and front brake caliper [2].



DISASSEMBLY

Remove the caliper bracket [1], pin boots [2] and pad spring [3].



Place a shop towel over the pistons.

Do not use high pressure air or bring the nozzle too close to the inlet.

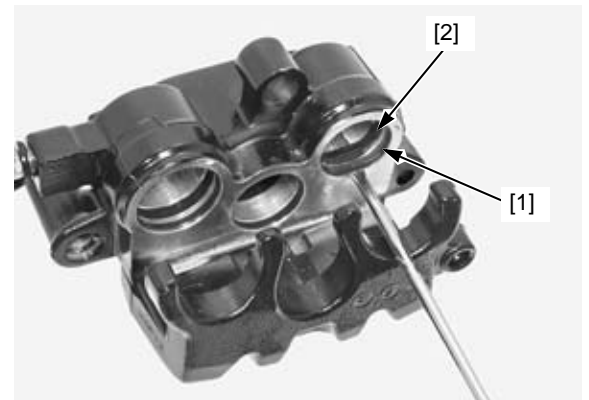
Position the caliper body with the piston facing down and apply small squirts of air pressure to the fluid inlet to remove the three pistons.



Be careful not to damage the piston sliding surface.

Push the dust seal [1] and piston seals [2] in and lift them out.

Clean the seal grooves, caliper cylinders and pistons.



HYDRAULIC BRAKE

INSPECTION

Check the caliper cylinder for scoring, scratches or damage.

Measure the caliper cylinder I.D.

SERVICE LIMIT:

Upper: 25.460 mm (1.0024 in)

Center/lower: 22.710 mm (0.8941 in)

Check the caliper piston for scoring, scratches or damage.

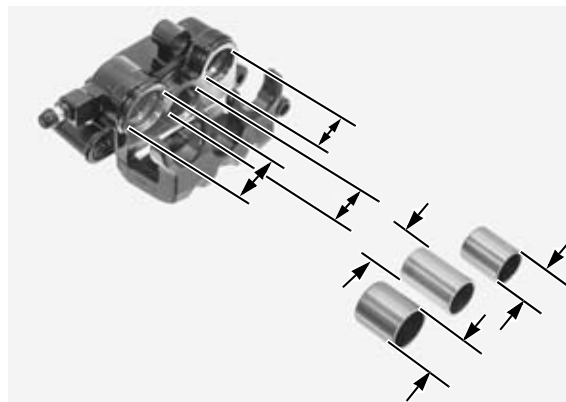
Measure the caliper piston O.D.

SERVICE LIMIT:

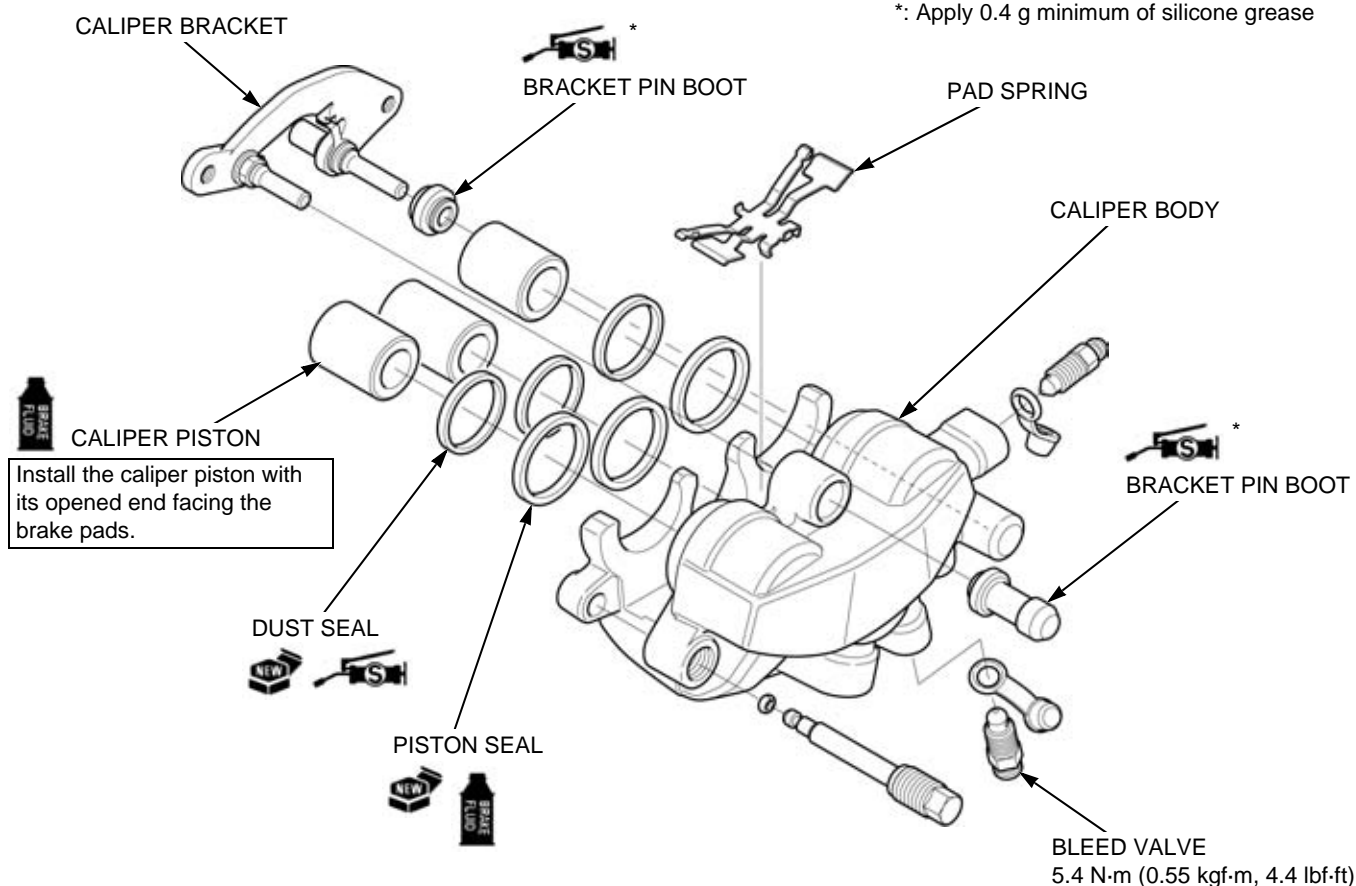
Upper: 25.31 mm (0.996 in)

Center/lower: 22.56 mm (0.8888 in)

ASSEMBLY



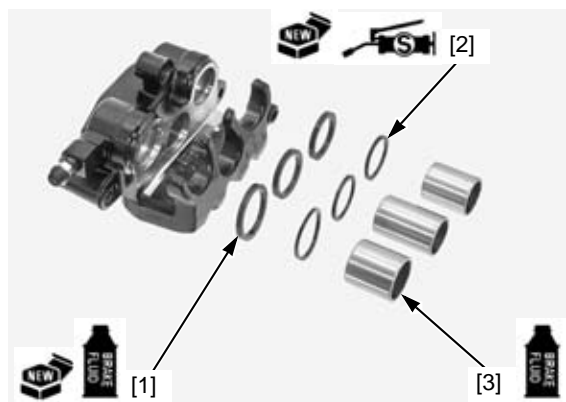
*: Apply 0.4 g minimum of silicone grease



Coat new piston seals [1] with clean brake fluid and install them into the caliper.

Coat new dust seals [2] silicone grease and install them into the seal grooves in the caliper.

Coat the caliper piston [3] with clean brake fluid and install them into the caliper cylinders with the open side toward the pads.

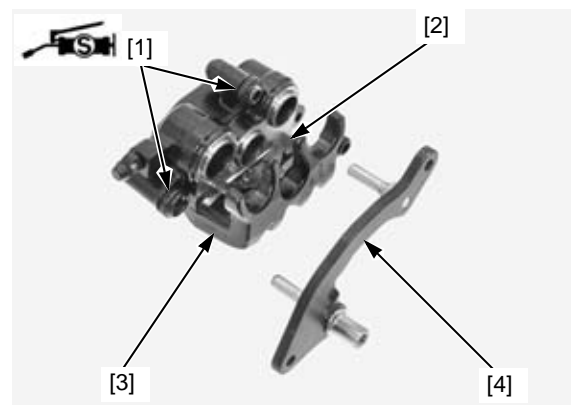


Check the pin boots [1] and replace them if they are hard, deteriorated or damaged.

Install the boot and pad spring [2] into the caliper [3].

Apply 0.4 g minimum of silicone grease to the inside of the boots and install the caliper bracket [4] over the caliper body.

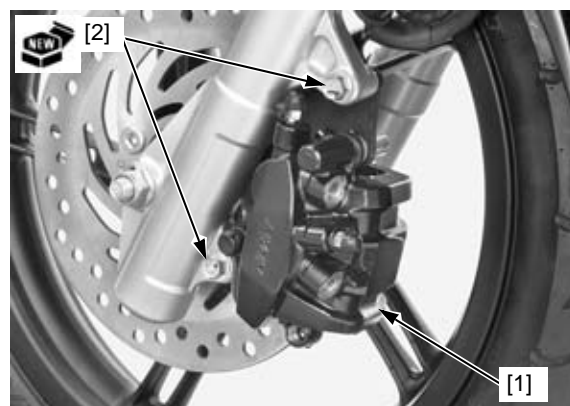
Make sure the boot ribs are seated into the boot grooves in the slide pins properly.



INSTALLATION

Install the front brake caliper [1] onto the left fork leg. Install the new front brake caliper mounting bolts [2] and tighten them to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



Connect the brake hoses [1] to the brake caliper with the oil bolts [2] and new sealing washers [3].

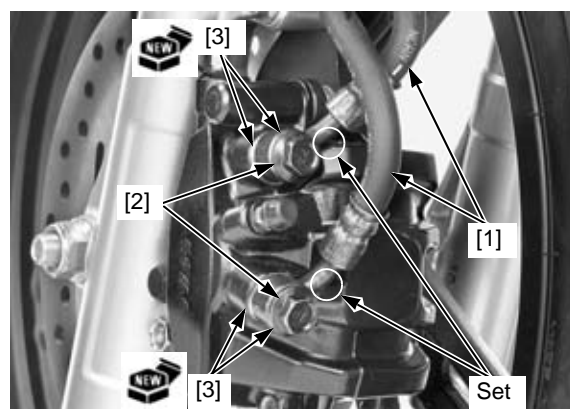
Set the hose eyelet joints onto the stoppers of the brake caliper and tighten the oil bolts to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the brake pads (page 19-10).

Fill and bleed the following lines of hydraulic systems:

- Front brake line (page 19-7)
- CBS brake line (page 19-8)



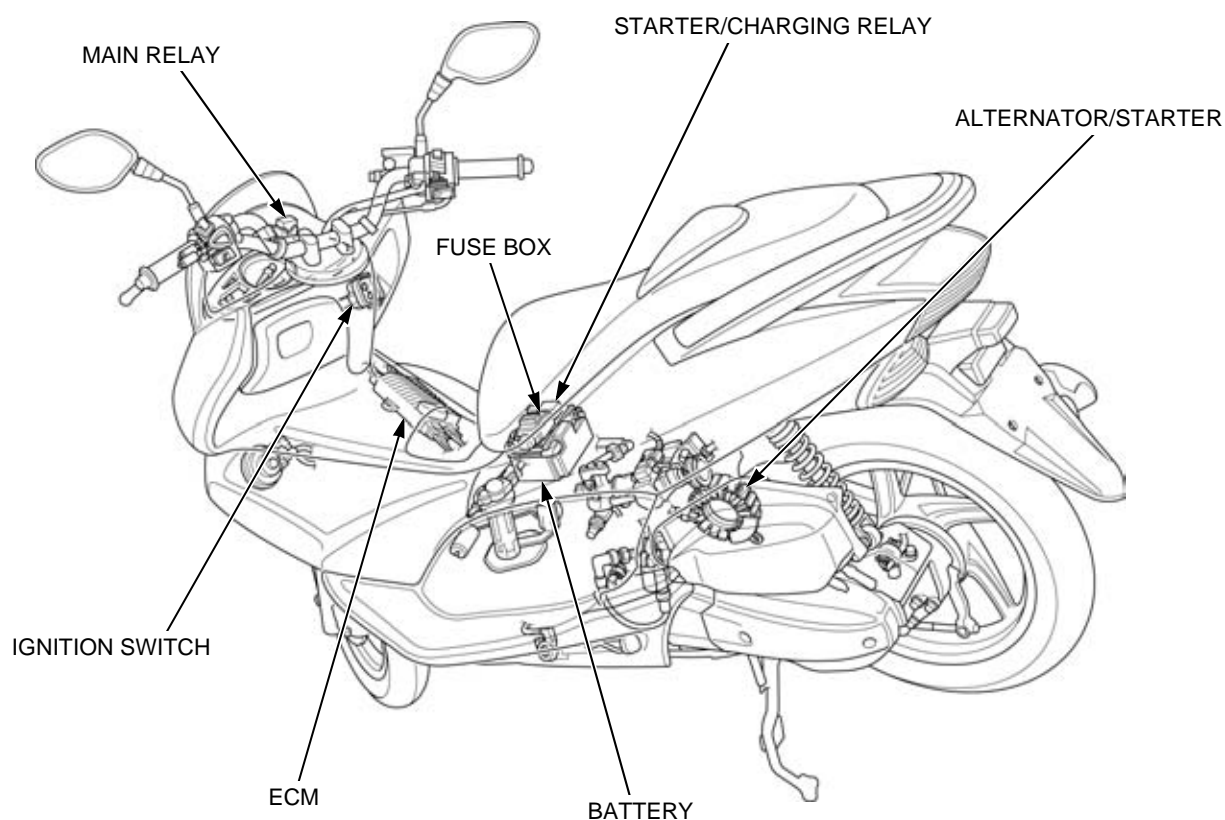
MEMO

20. BATTERY/CHARGING SYSTEM

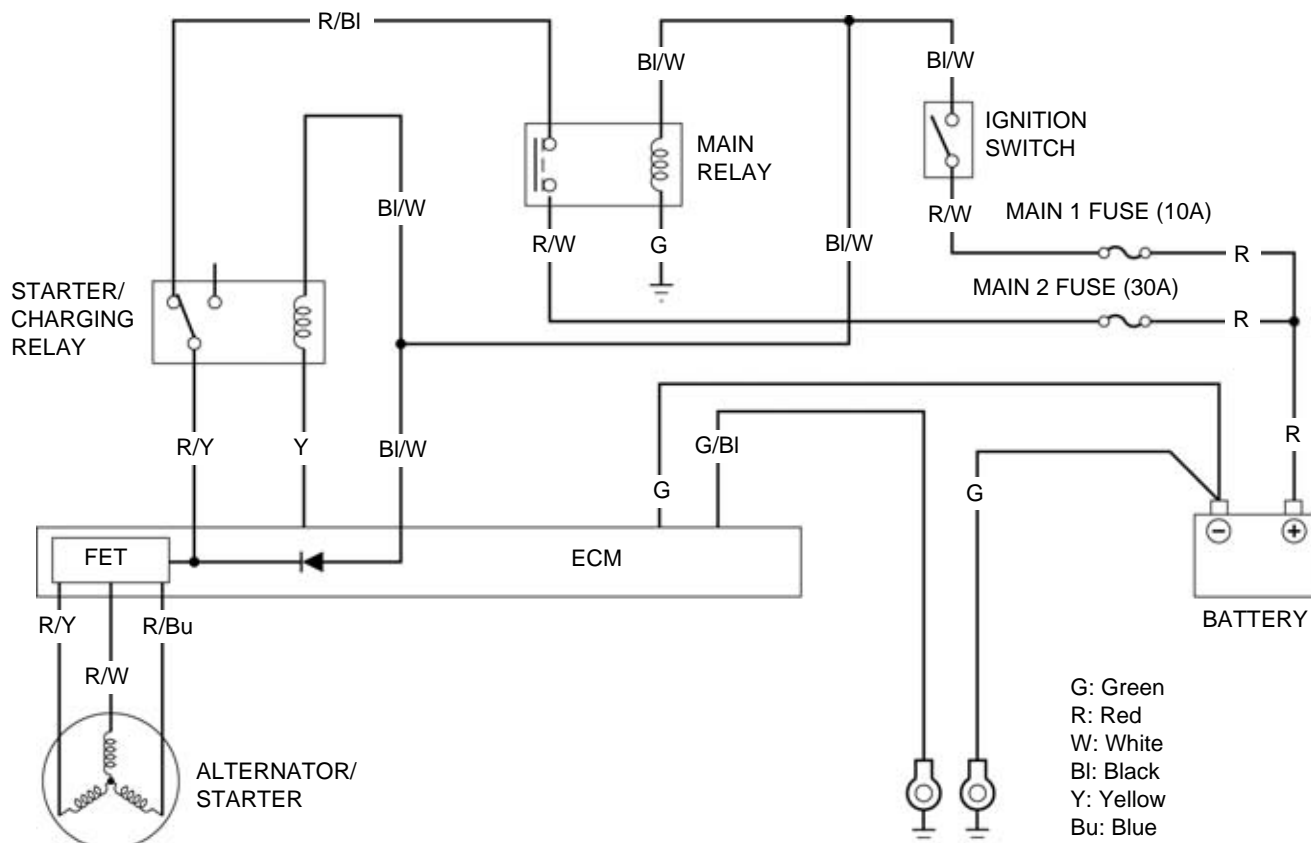
SYSTEM LOCATION.....	20-2	TROUBLESHOOTING	20-4
SYSTEM DIAGRAM	20-2	BATTERY	20-5
SERVICE INFORMATION	20-3	CHARGING SYSTEM	20-5

BATTERY/CHARGING SYSTEM

SYSTEM LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

⚠ WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
 - If electrolyte gets on your skin, flush with water.
 - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
 - If swallowed, drink large quantities of water or milk and call your local Poison Control Center or a call a physician immediately.

NOTICE

- *Always turn off the ignition switch before disconnecting any electrical component.*
- *Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.*
- This model comes with a maintenance free (MF) battery. Remember the following about MF batteries.
 - Use only the electrolyte that comes with the battery.
 - Use all of the electrolyte.
 - Seal the battery properly.
 - Never open the seals after installation.
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For a battery remaining in a stored scooter, 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 long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2-3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and taillight ON for long periods of time without riding the scooter.
- The battery will self-discharge when the scooter is not in use. For this reason, charge the battery every two weeks to prevent sulfation from occurring.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 20-4).
- For battery charging, do not exceed the charging current and time specified on the battery. Use of excessive current or charging time may damage the battery.
- The scooter has alternator/starter. The alternator/starter has alternator and starter functions.
- The regulator/rectifier is built into the ECM.
- The flywheel, alternator and CKP sensor services can be done with the engine installed in the frame (page 14-3).

BATTERY CHARGING

- Turn the 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.

SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Capacity		12 V – 6 Ah (10HR)
	Current leakage		0.1 mA max.
	Voltage	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.4 V
	Charging current	Normal	0.6 A/5 – 10 h
		Quick	3 A/1 h
Alternator	Capacity	WW125EX2	0.329 kW/5,000 min ⁻¹ (rpm)
		WW150	0.343 kW/5,000 min ⁻¹ (rpm)

TROUBLESHOOTING

BATTERY IS DAMAGED OR WEAK

1. Battery Test

Check the battery condition (page 3-12).

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 (page 20-5).

Is the current leakage below 0.1 mA?

YES – GO TO STEP 4.

NO – GO TO STEP 3.

3. Current Leakage Test Without Regulator/rectifier built in ECM

Disconnect the following connectors:

- ECM 3P (Black) connector (page 4-39)
- ECM 5P connector (page 4-39)

Recheck the battery current leakage.

Is the current leakage below 0.1 mA?

YES – Faulty regulator/rectifier in ECM.

NO –

- Shorted wire harness
- Faulty ignition switch

4. Charging Voltage Inspection

Measure and record the battery voltage using a digital multimeter (page 3-12).

Start the engine.

Measure the charging voltage (page 20-6).

Compare the measurements to result 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. Starter/charging Relay Operation Inspection

Check the starter/charging relay operation (page 20-7).

Is the operation normal?

YES – GO TO STEP 6.

NO – Faulty starter/charging relay.

6. Starter/charging Relay Line Inspection

Install the starter/charging relay (page 6-8).

Disconnect the ECM 5P connector (page 4-39).

Turn the ignition switch ON.

Measure the voltage at the ECM connector (page 20-6).

STANDARD: Battery voltage

Does the battery voltage exist?

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

NO –

- Loose or poor contacts of related terminal
- Open circuit in Red/black wire between the main relay and starter/charging relay.
- Open circuit in Red/yellow wire between the starter/charging relay and ECM.

BATTERY

REMOVAL/INSTALLATION

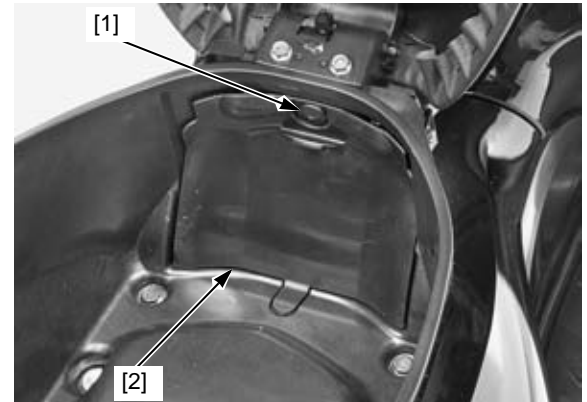
NOTE:

- Always turn the ignition switch OFF before removing the battery.

Unlock and open the seat.

Remove the trim clip [1].

Remove the battery maintenance lid [2] from the luggage box.

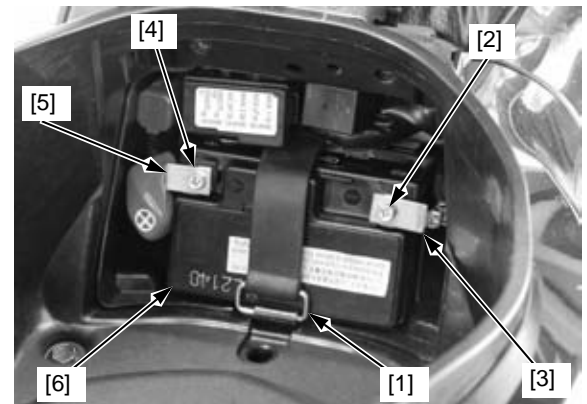


Release the battery band [1].

Remove the bolt [2] and disconnect the negative (-) cable [3].

Remove the bolt [4] and disconnect the positive (+) cable [5].

Remove the battery [6].



Connect the positive terminal first and then the negative terminal.

Install the battery in the reverse order of removal.

CHARGING SYSTEM

CURRENT LEAKAGE TEST

Remove the battery maintenance lid (page 20-5).

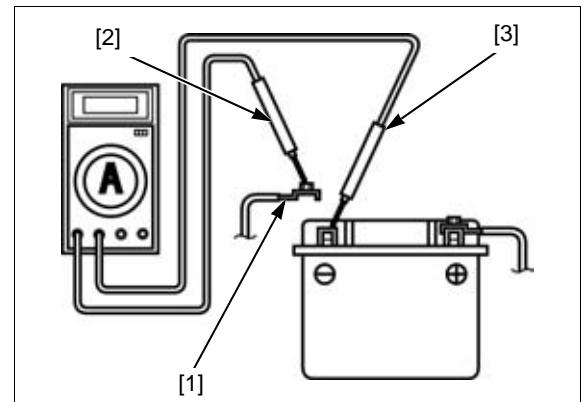
Turn the ignition switch to OFF and disconnect the negative (-) cable [1] from the battery.

Connect the ammeter (+) probe [2] to the negative (-) cable and ammeter (-) probe [3] to the battery (-) terminal.

With the ignition switch turned to OFF, check for current leakage.

NOTE:

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow the fuse in the tester.
- While measuring current, do not turn the ignition switch ON. A sudden surge of current may blow the fuse in the tester.



SPECIFIED CURRENT LEAKAGE: 0.1 mA max.

If current leakage exceeds the specified value, a shorted circuit is likely.

Locate the short by disconnecting connections one by one and measuring the current.

BATTERY/CHARGING SYSTEM

CHARGING VOLTAGE INSPECTION

NOTE:

- Make sure the battery is in good condition before performing this test.
- Do not disconnect the battery or any cable in the charging system without first switching the ignition switch to OFF. Failure to follow this precaution can damage the tester or electrical components.

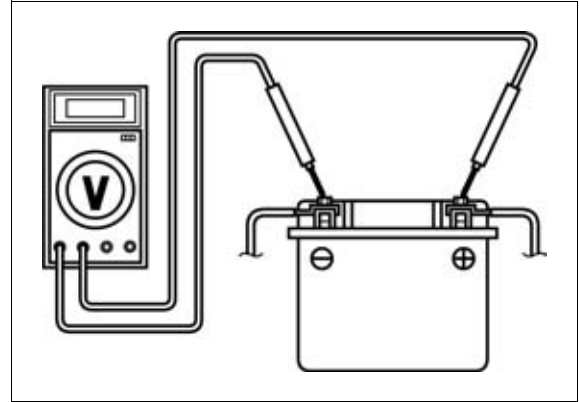
Warm up the engine to normal operating temperature.
Stop the engine.

To prevent a short, make absolutely certain which are the positive and negative terminals or cables.

Remove the battery maintenance lid (page 20-5) and connect the multimeter as shown.

Connect a tachometer.

With the headlight on high beam, restart the engine.
Measure the voltage on the multimeter when the engine runs at 5,000 min⁻¹ (rpm).



STANDARD:

Measured BV < Measured CV < 15.5 V

- BV = Battery Voltage (page 3-12)
- CV = Charging Voltage

CHARGING LINE INSPECTION

Disconnect the ECM 5P connector (page 4-39).

Turn the ignition switch ON.

Measure the voltage between the ECM 5P connector [1] of the wire harness side and ground.

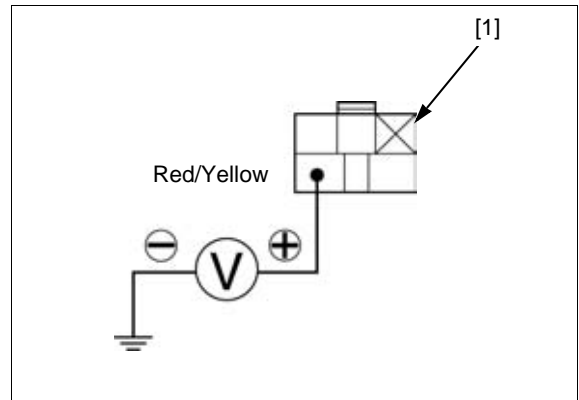
CONNECTION: Red/yellow (+) – ground (–)

STANDARD: Battery voltage

If there is battery voltage, charging line is normal.

If there is no voltage, inspect the following:

- Loose or poor contacts of related terminal.
- Open circuit in Red/black wire between the main relay and starter/charging relay.
- Open circuit in Red/yellow wire between the starter/charging relay and ECM.



STARTER/CHARGING RELAY INSPECTION

Remove the starter/charging relay (page 6-8).

Connect the ohmmeter to the following relay connector terminals.

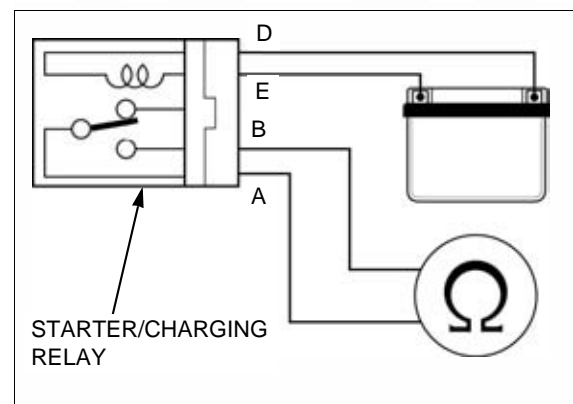
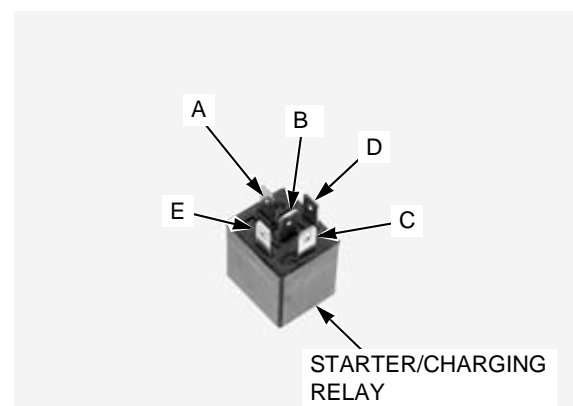
CONNECTION: A – B

Connect the 12V battery to the following relay connector terminals.

CONNECTION: D – E

There should be no continuity when the battery is connected and there should be continuity only when the battery is disconnected.

If the above inspection is abnormal, replace the starter/charging relay.

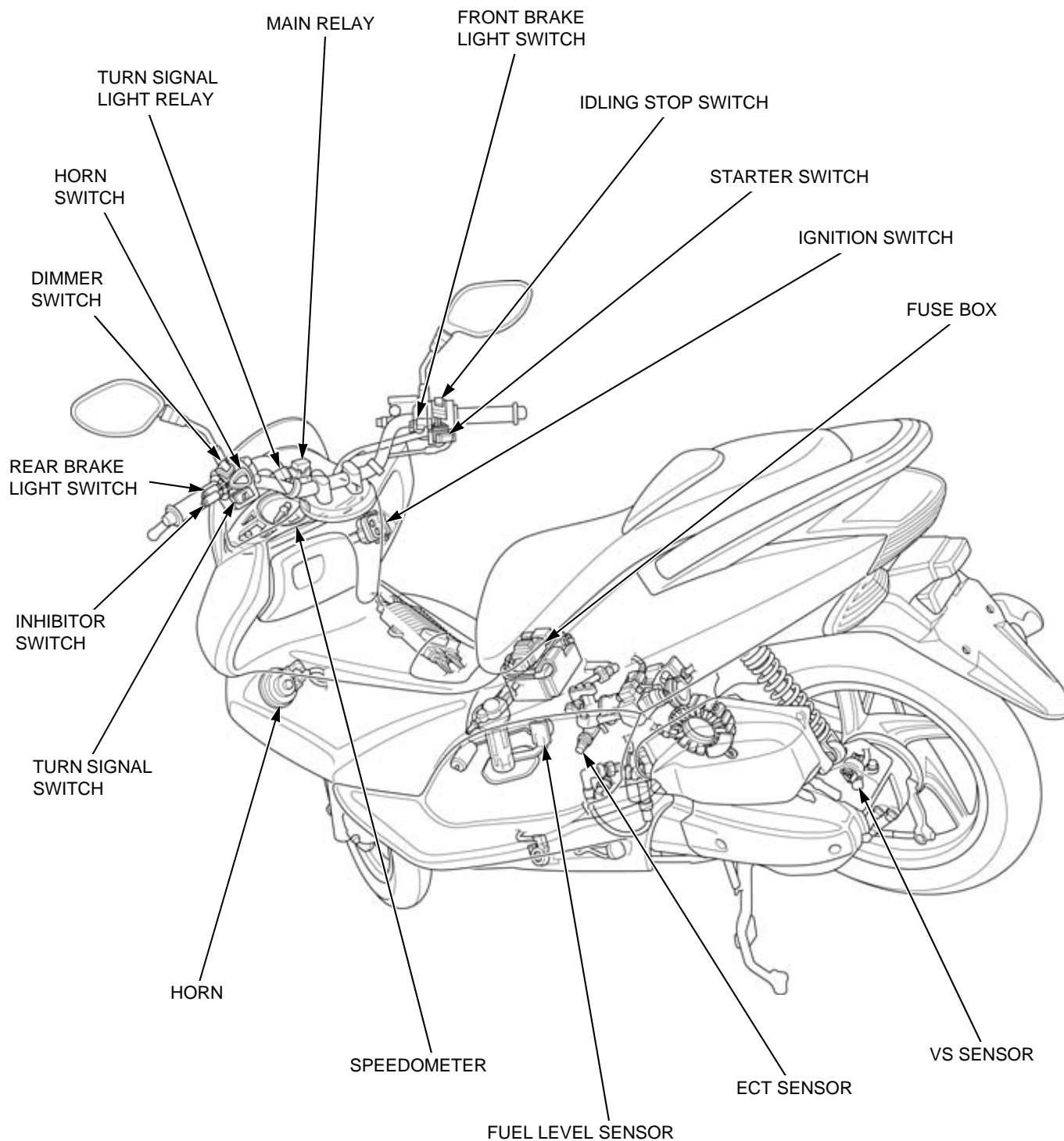


MEMO

21. LIGHTS/METERS/SWITCHES

ELECTRICAL SYSTEM LOCATION.....	21-2	FUEL METER/ FUEL LEVEL SENSOR.....	21-11
SERVICE INFORMATION	21-3	IGNITION SWITCH.....	21-12
HEADLIGHT/ FRONT TURN SIGNAL LIGHT	21-4	HANDLEBAR SWITCHES	21-14
TAIL/BRAKE LIGHT.....	21-5	BRAKE LIGHT SWITCH	21-15
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SPEEDOMETER.....	21-7	MAIN RELAY	21-16
VS SENSOR	21-8	TURN SIGNAL LIGHT RELAY	21-17
COOLANT TEMPERATURE INDICATOR	21-10		

ELECTRICAL SYSTEM LOCATION



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.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- 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.
- Use an electric heating element to heat the coolant for the ECT sensor inspection. Keep all 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 scooter.
- Route the wires and cables properly after servicing each component (page 1-15).
- Refer to the ECT sensor for PGM-FI systems inspection (page 4-6).
- The following color codes are used throughout this section.

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

SPECIFICATIONS

ITEM		SPECIFICATIONS
Bulbs	Headlight	12 V – 35/30 W x 2
	Position light	12 V – 5 W x 2
	Tail/brake light	12 V – 5 W/21W
	License light	12 V – 5 W
	Front turn signal light	12 V – 21 W x 2
	Rear turn signal light	12 V – 21 W x 2
	Instrument light	LED
	PGM-FI malfunction indicator lamp (MIL)	LED
	High beam indicator	LED
	Turn signal indicator	LED
	Coolant temperature indicator	LED
	Idling stop indicator	LED
Fuse	Main fuse 1	10 A
	Main fuse 2	30 A
	Sub fuse	10 A x 3, 15 A x 1

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear turn signal light lens screw	4	4	0.9 (0.09, 0.6)	
License light lens screw	2	4	1 (0.1, 0.7)	
License light unit mounting nut	2	5	4.3 (0.44, 3.2)	U-nut
Speedometer mounting screw	4	5	1.1 (0.11, 0.8)	
Speedometer screw	8	3	0.54 (0.06, 0.4)	
VS sensor protector socket bolt	2	6	10 (1.0, 7)	Apply locking agent to the threads.
Fuel lid/seat opener lower cover screw	1	4	1.1 (0.11, 0.8)	
Key shutter socket bolt	1	5	5.1 (0.52, 3.8)	
Ignition switch mounting screw	2	6	9 (0.9, 6.6)	

HEADLIGHT/FRONT TURN SIGNAL LIGHT

BULB REMOVAL/INSTALLATION

HEADLIGHT

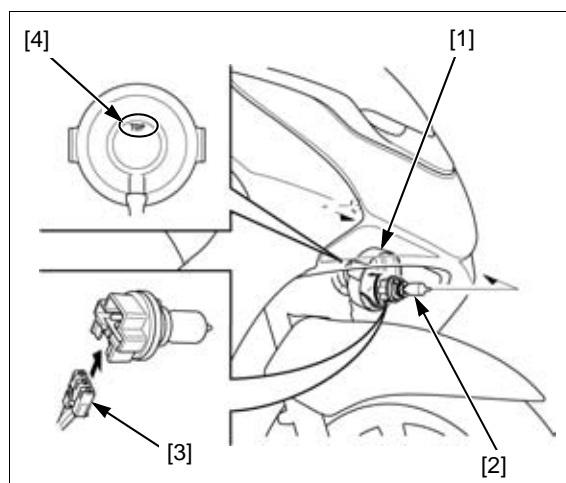
Pull the dust cover [1].
Turn the headlight bulb [2] counterclockwise and remove it from the headlight case.
Disconnect the bulb from the 3P connector [3].

NOTICE

Avoid touching the halogen headlight bulb. Finger prints can create hot spots that cause a bulb to break.

Installation is in the reverse order of removal.

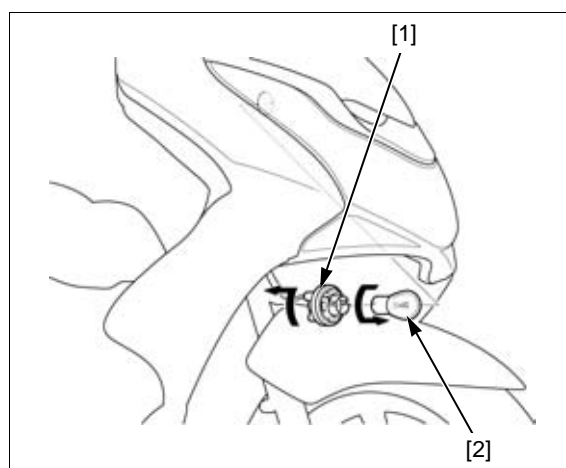
- Install the dust cover with its "TOP" mark [4] facing up.



FRONT TURN SIGNAL LIGHT

Turn the front turn signal light bulb socket [1] counterclockwise and pull it out from the light unit.
Slightly push and turn the turn signal light bulb [2] counterclockwise, then remove it from the bulb socket.

Installation is in the reverse order of removal.



HEADLIGHT INSPECTION

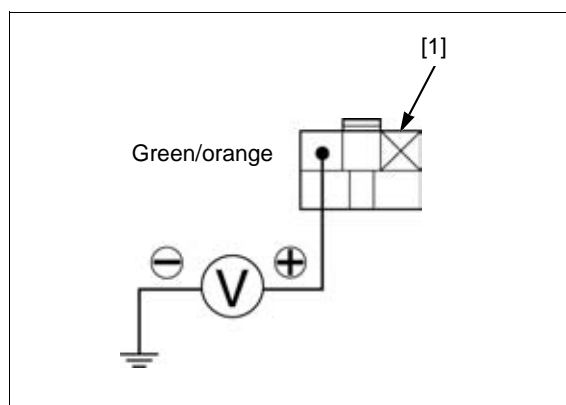
Disconnect the ECM 5P connector (page 4-39).

Turn the ignition switch ON.
Measure the voltage between the ECM 5P connector [1] of the wire harness side and ground.

CONNECTION: Green/orange (+) – ground (–)
STANDARD: Battery voltage

If there is battery voltage, headlight line is normal.
If there is no voltage, inspect the following:

- Blown HEAD LIGHT fuse (15A)
- Loose or poor contacts of related terminal
- Open circuit in Green/orange wire between the headlight and ECM
- Open circuit in Blue or White wire between the headlight and dimmer switch
- Open circuit in Black/red wire between the dimmer switch and fuse box
- Faulty dimmer switch (Inspect the dimmer switch: (page 21-14))

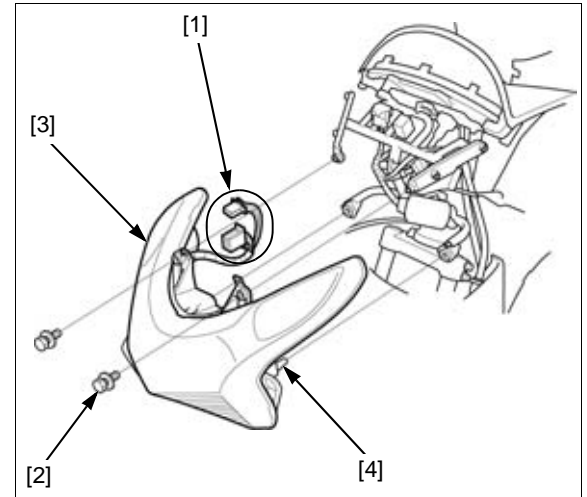


REMOVAL/INSTALLATION

Remove the front cover (page 2-9).

Disconnect the headlight 6P and 3P connectors [1]. Remove the bolts [2] and headlight unit [3] while releasing the bosses [4] from the frame grommets.

Installation is in the reverse order of removal.



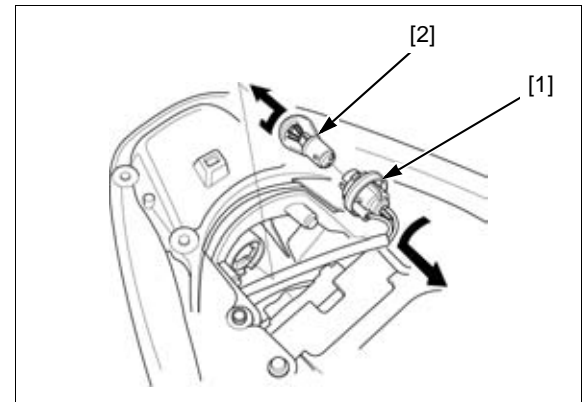
TAIL/BRAKE LIGHT

BULB REMOVAL/INSTALLATION

Remove the grab rail cover (page 2-10).

Turn the tail/brake light bulb socket [1] counterclockwise and pull it out from the light unit. Slightly push and turn the tail/brake light bulb [2] counterclockwise, then remove it from the bulb socket. Replace the tail/brake light bulb with a new one.

Installation is in the reverse order of removal.



REAR TURN SIGNAL LIGHT

BULB REMOVAL/INSTALLATION

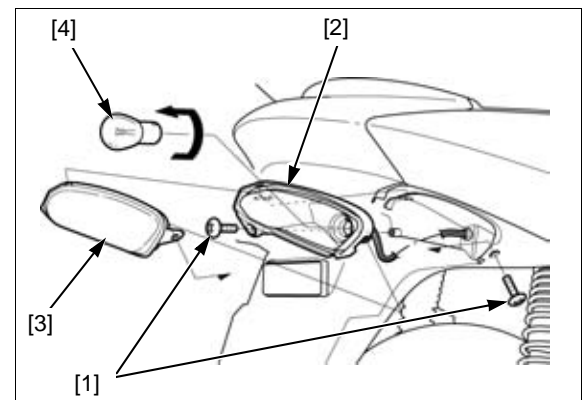
Remove the screws [1] and rear turn signal light unit [2] from the rear fender.

Remove the rear turn signal light lens [3] from the turn signal light unit.

Slightly push and turn the rear turn signal light bulb [4] counterclockwise, then remove it from the turn signal light unit.

Installation is in the reverse order of removal.

TORQUE: Rear turn signal light lens screw:
0.9 N-m (0.09 kgf-m, 0.6 lbf-ft)



LIGHTS/METERS/SWITCHES

REMOVAL/INSTALLATION

Remove the body cover (page 2-11).

Disconnect the following wire connectors [1]:

Right side:

- Light blue wire connector
- Green wire connector

Left side:

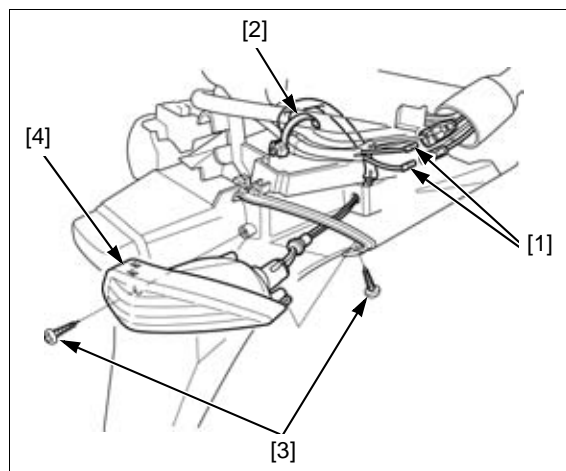
- Orange wire connector
- Green wire connector

Release the wire band [2].

Remove the two screws [3] and turn signal light unit [4].

Installation is in the reverse order of removal.

TORQUE: Rear turn signal light lens screw:
0.9 N·m (0.09 kgf·m, 0.6 lbf·ft)



LICENSE LIGHT

BULB REMOVAL/INSTALLATION

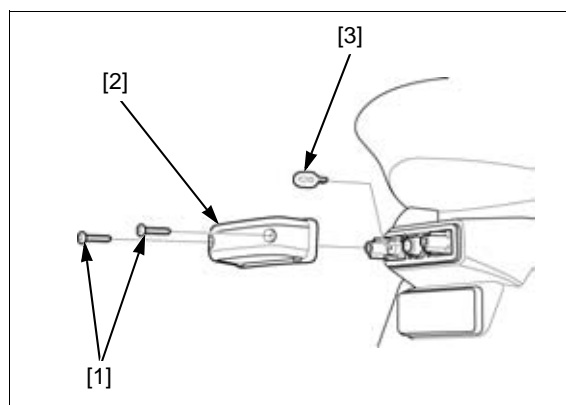
Remove the screws [1].

Remove the license light lens [2] backward.

Remove the license light bulb [3] from the socket.

Installation is in the reverse order of removal.

TORQUE: License light lens screw:
1 N·m (0.1 kgf·m, 0.7 lbf·ft)



REMOVAL/INSTALLATION

Remove the body cover (page 2-11).

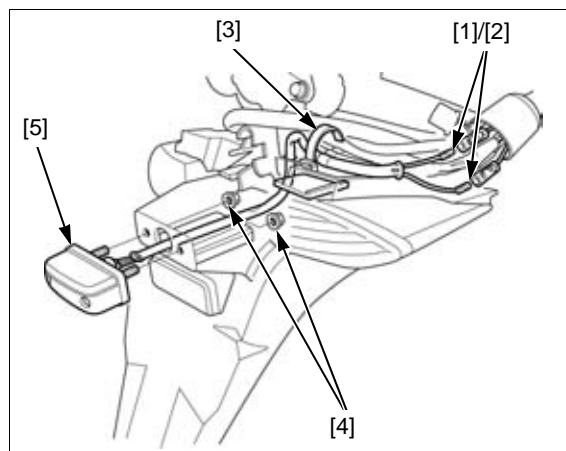
Disconnect the Brown wire connector [1] and Green wire connector [2].

Release the wire band [3].

Remove the two nuts [4] and license light unit [5].

Installation is in the reverse order of removal.

TORQUE: License light unit mounting nut:
4.3 N·m (0.44 kgf·m, 3.2 lbf·ft)



SPEEDOMETER

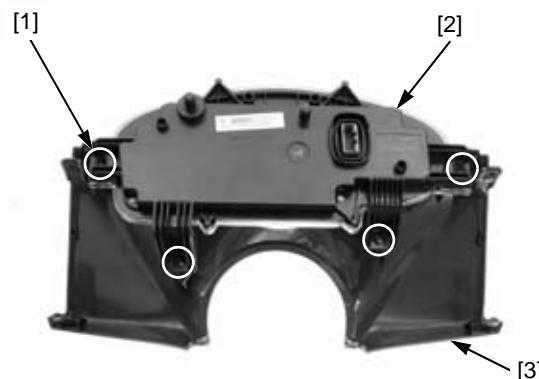
REMOVAL/INSTALLATION

Remove the rear meter panel (page 2-8).

Remove the four screws [1] and speedometer [2] from the rear meter panel [3].

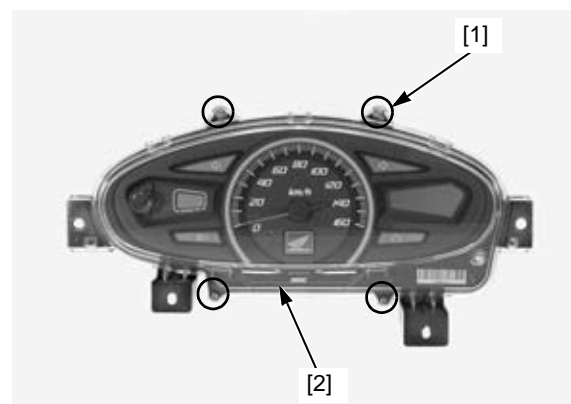
Installation is in the reverse order of removal.

TORQUE: Speedometer mounting screw:
1.1 N·m (0.11 kgf·m, 0.8 lbf·ft)

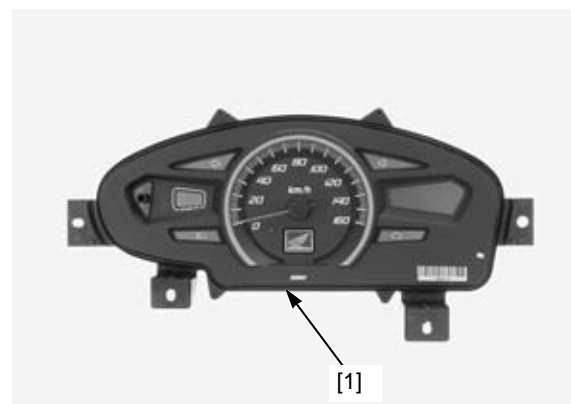


DISASSEMBLY/ASSEMBLY

Remove the four screws [1] and meter lens [2].



Remove the meter packing [1].

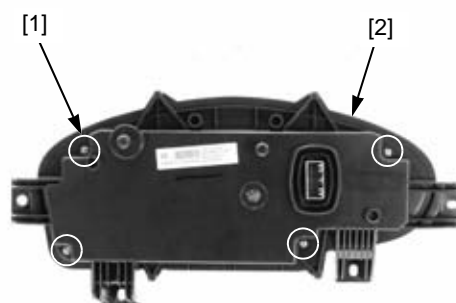


Remove the four screws [1] and speedometer panel from the lower case [2].

Assembly is in the reverse order of disassembly.

- Make sure the meter packing is in good condition and replace it if necessary.

TORQUE: Speedometer screw:
0.54 N·m (0.06 kgf·m, 0.4 lbf·ft)



INSPECTION

POWER/GROUND LINE

Remove the front meter panel (page 2-5).

Disconnect the speedometer 20P connector [1].

Turn the ignition switch ON.

Measure the voltage between the speedometer 20P connector of the wire harness side.

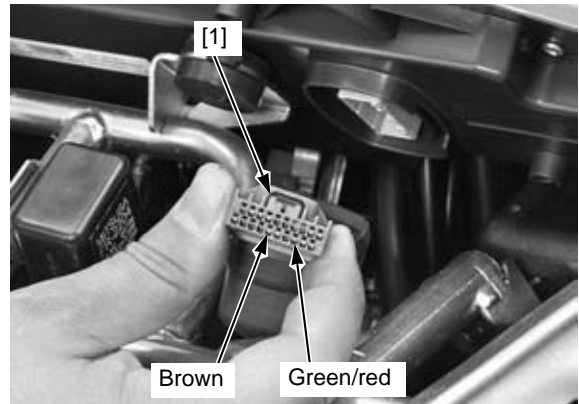
CONNECTION: Brown (+) – Green/red (–)

STANDARD: Battery voltage

If there is battery voltage, meter power/ground line is normal.

If there is no voltage, inspect the following:

- Blown SPEEDOMETER TAIL fuse (10A).
- Loose or poor contacts of related terminal.
- Open circuit in Brown wire between the fuse box and speedometer.
- Open circuit in Green/red wire between the speedometer and ground.



BACK-UP LINE

Remove the front meter panel (page 2-5).

Disconnect the speedometer 20P connector [1].

Measure the voltage between the speedometer 20P connector of the wire harness side and ground.

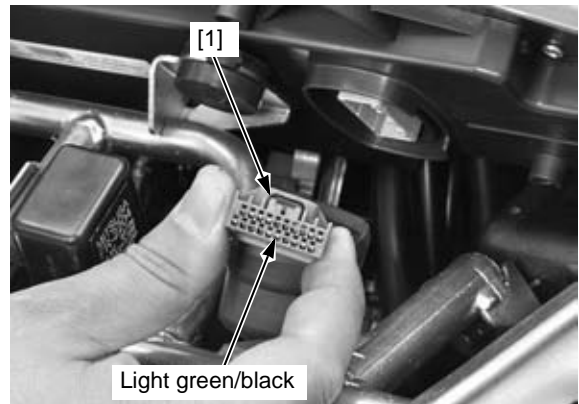
CONNECTION: Light green/black (+) – Ground (–)

STANDARD: Battery voltage

If there is battery voltage at all time, back-up line is normal.

If there is no voltage, inspect the following:

- Blown BACK UP fuse (10A).
- Loose or poor contacts of related terminal.
- Open circuit in Light green/black wire between the fuse box and speedometer.



VS SENSOR

REMOVAL/INSTALLATION

Remove the air cleaner housing (page 7-10).

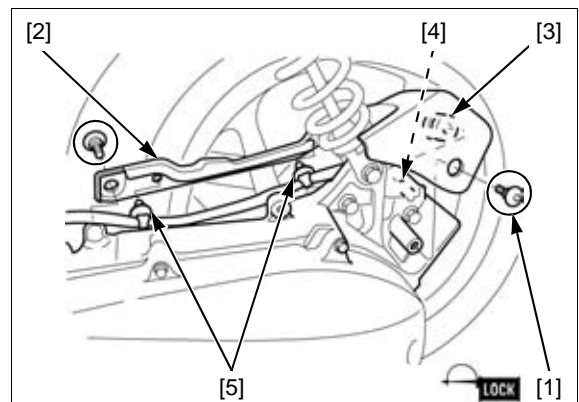
Remove the two socket bolts [1] from the sensor protector [2].

Remove the sensor protector while releasing the grommet [3] of the protector from the boss [4] of the left crankcase.

Release the wire band bosses [5] from the sensor protector.

- When installing the socket bolt, clean the threads and apply locking agent to the bolt threads.

TORQUE: VS sensor protector socket bolt:
10 N·m (1.0 kgf·m, 0.7 lbf·ft)

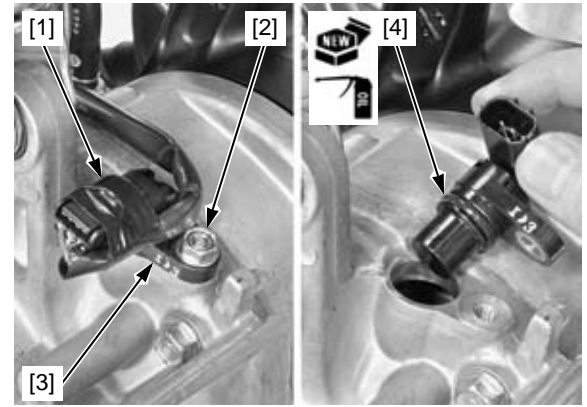


Disconnect the VS sensor 3P (Black) connector [1].
Remove the bolt [2] and VS sensor [3].

Remove the O-ring [4] from the VS sensor groove.

Installation is in the reverse order of removal.

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



INSPECTION

SPEEDOMETER NEEDLE DOES NOT MOVE

- Before performing the troubleshooting, check that the MIL is not blinking.

Remove the following:

- Front meter panel (page 2-5)
- VS sensor protector (page 21-8)

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

Turn the ignition switch ON.

Measure the voltage between the 3P (Black) connector of the wire harness side.

CONNECTION: Black/white (+) – Blue/green (–)

STANDARD: Battery voltage

If there is battery voltage, power/ground line is normal.

If there is no voltage, inspect the following:

- Loose or poor contacts of related terminal.
- Open circuit in Black/white wire between the ignition switch and VS sensor.
- Open circuit in Blue/green wire between the ECM and VS sensor.

Turn the ignition switch OFF.

Disconnect the speedometer 20P connector [1].

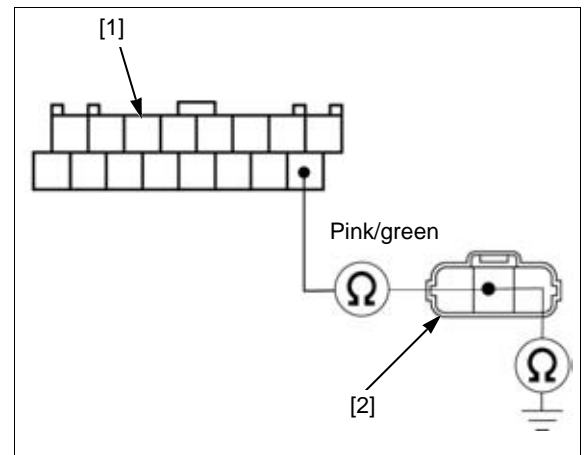
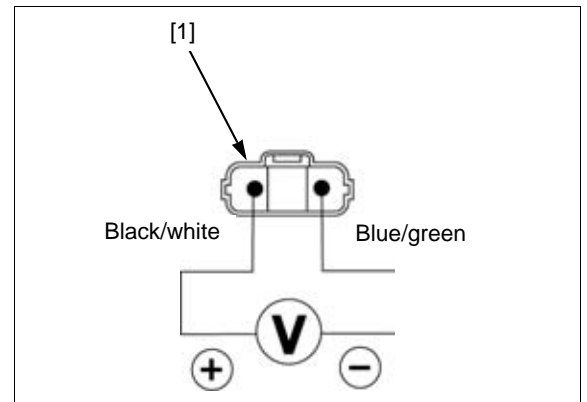
Check the continuity between the speedometer 20P connector and VS sensor 3P (Black) connector [2] of the wire harness side.

Check the continuity between the VS sensor 3P (Black) connector of the wire harness side and ground.

CONNECTION	STANDARD
Pink/green – Pink/green	Continuity
Pink/green – Ground	No Continuity

If the above inspection are abnormal, check the open or short circuit in Pink/green wire.

If the above inspection are normal, replace the speedometer panel with a new one and recheck.



COOLANT TEMPERATURE INDICATOR

SYSTEM INSPECTION

- Coolant temperature indicator turns on when the coolant temperature becomes higher and lower than certain temperature.
- Before performing the system inspection, make sure that the following item are normal.
 - Cooling system flow
 - Other meter indicators
 - No MIL blinking (page 4-6)

Turn the ignition switch ON and check the coolant temperature indicator.

When the engine is cold, the indicator should not come on.

Turn the ignition switch OFF.

Disconnect the ECM 21P (Black) connector (page 4-39).

Turn the ignition switch ON and check the indicator.
The indicator should not come on.

If the indicator comes on, check the following:

- Light green/red wire between the meter and ECM for short circuit
- speedometer panel for internal short circuit

If the indicator goes off with the connector disconnected, check the following:

Short the ECM 21P (Black) connector [1] terminal of the wire harness side and ground with the jumper wire [2].

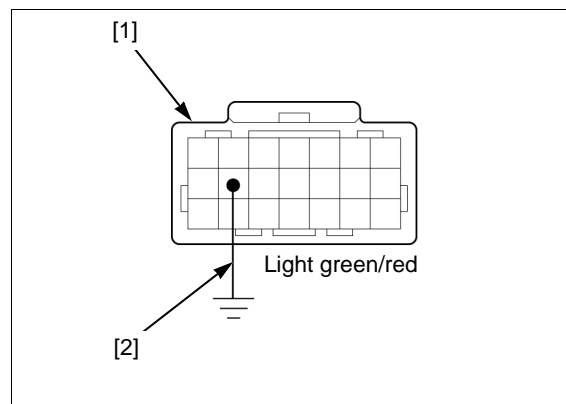
CONNECTION: Light green/red – Ground

Turn the ignition switch ON and check the indicator.
The indicator should come on.

If the indicator does not come on, check the following:

- Light green/red wire between the meter and ECM for open circuit
- speedometer panel for internal open circuit

If above inspections are normal, replace the ECM with a new one and recheck.



FUEL METER/FUEL LEVEL SENSOR

SYSTEM INSPECTION

WHEN THE FUEL METER BLINKS RAPIDLY

Before performing the system inspection, check the following:

- Battery condition
- Burned fuse

Disconnect the fuel pump 5P connector (page 7-4).

Short the fuel pump 5P connector [1] terminals of the wire harness side with the jumper wire [2].

CONNECTION: Yellow/white – Blue/green

Do not leave the terminals connected with jumper wire for a long time, as it causes damage to the fuel meter.

Turn the ignition switch ON and check the fuel meter. The fuel meter blinks slowly if the system circuit is normal.

In that case, check the fuel level sensor (page 21-11).

If the meter blinks rapidly, check the following:

- Yellow/white wire between the fuel pump/fuel level sensor and speedometer for open circuit
- Blue/green wire between the fuel pump/fuel level sensor and ECM for open circuit

If the wire is normal, replace the speedometer panel with a new one, and recheck.

WHEN THE FUEL METER BLINKS SLOWLY

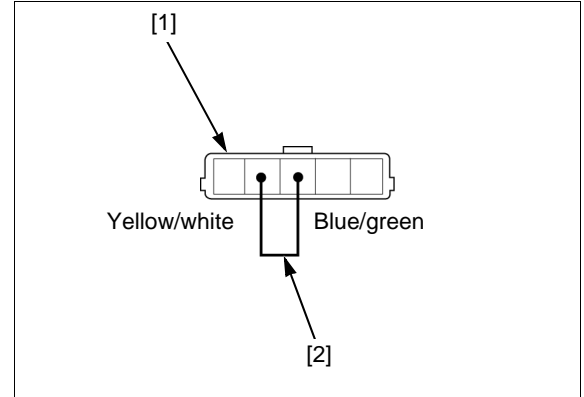
Disconnect the fuel pump 5P connector (page 7-4).

Turn the ignition switch ON and check the fuel meter. The fuel meter blinks rapidly if the system circuit is normal.

In that case, check the fuel level sensor (page 21-11).

If the meter blinks slowly, check the Yellow/white wire between the fuel pump/fuel level sensor and speedometer for short circuit

If the wire is normal, replace the speedometer panel with a new one, and recheck.



FUEL LEVEL SENSOR INSPECTION

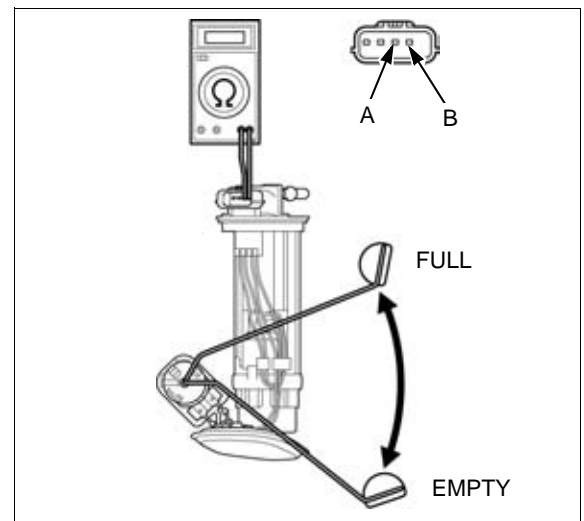
Remove the fuel pump unit (page 7-7).

Measure the resistance between the connector terminals at the float upper (full) and lower (empty) positions.

CONNECTION: A – B

	(20 °C/68 °F)	
FLOAT POSITION	FULL	EMPTY
RESISTANCE	6 – 10 Ω	90 – 100 Ω

Replace the fuel level sensor if it is out of specification (page 21-12).

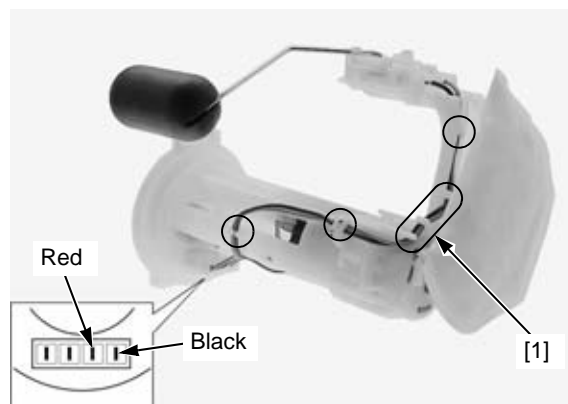


FUEL LEVEL SENSOR REMOVAL/INSTALLATION

Remove the fuel pump unit (page 7-7).

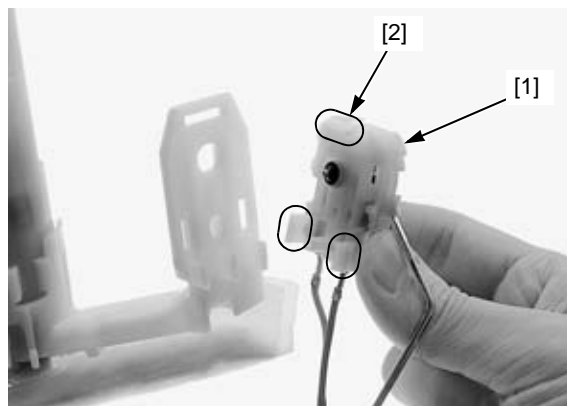
Disconnect the fuel level sensor Red and Black wire connectors.

Release the wires from the guides [1] of the fuel pump unit.



Remove the fuel level sensor [1] from the fuel pump unit by releasing the three hooks [2].

Installation is in the reverse order of the removal.

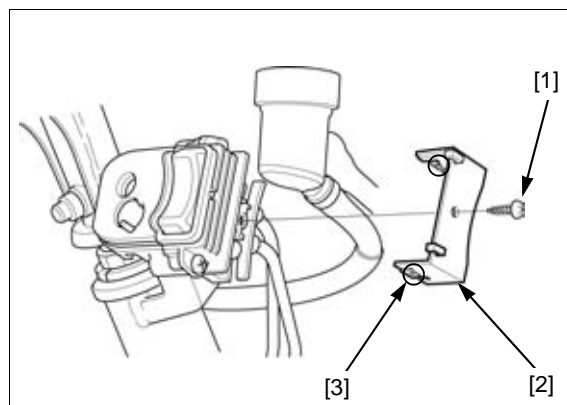


IGNITION SWITCH

FUEL LID/SEAT OPENER REMOVAL/INSTALLATION

Remove the inner cover (page 2-8).

Remove the screw [1] and fuel lid/seat opener lower cover [2] by releasing its hooks [3].



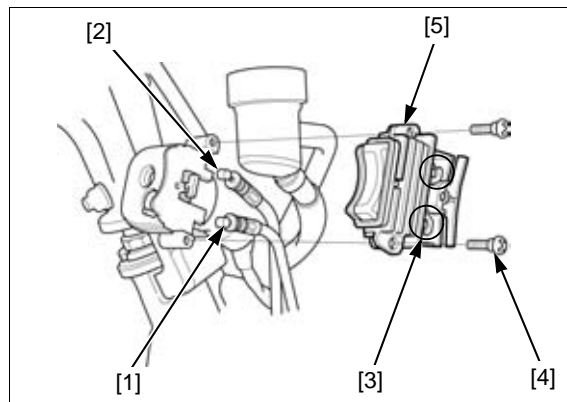
Disconnect the fuel lid cable [1] and seat opener cable [2] from the cable levers [3].

Remove the two screws [4] and fuel lid/seat opener [5] from the ignition switch.

Installation is in the reverse order of removal.

TORQUE:

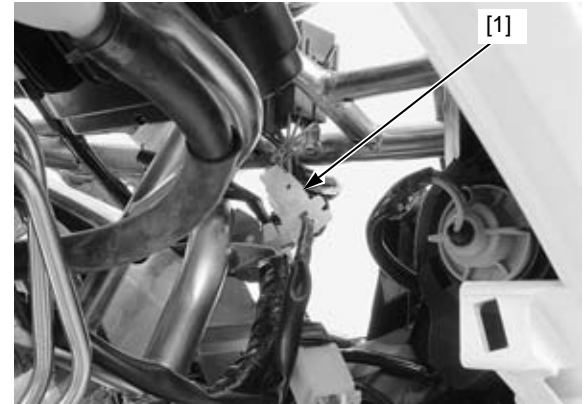
Fuel lid/seat opener lower cover screw:
1.1 N·m (0.11 kgf·m, 0.8 lbf·ft)



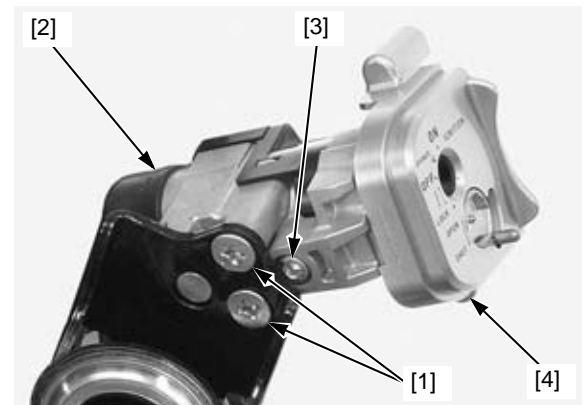
IGNITION SWITCH REMOVAL

Remove the steering stem (page 17-23).

Disconnect the ignition switch 2P connector [1].



Remove the screws [1] and ignition switch [2].
Remove the socket bolt [3] and key shutter [4].

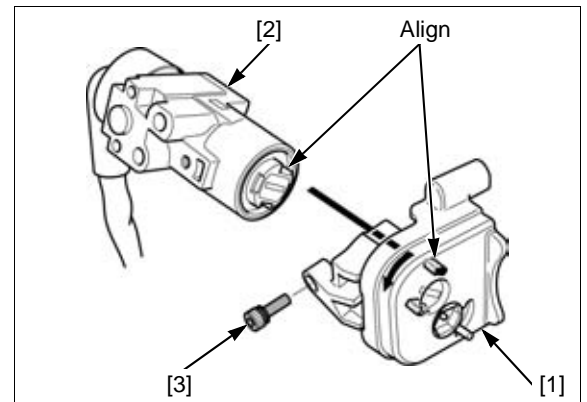


INSTALLATION

Install the key shutter [1] while aligning the tabs with the grooves of the ignition switch [2].
Turn the ignition switch as shown.

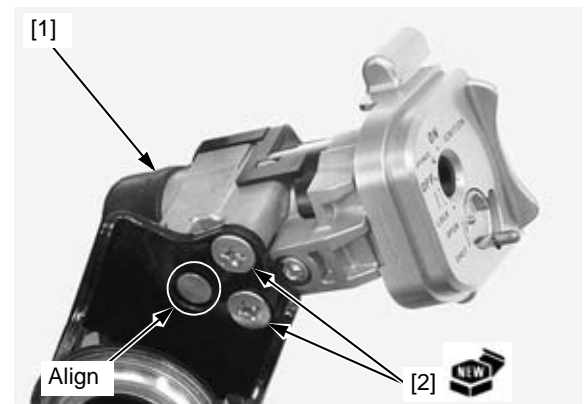
Install and tighten the socket bolt [3] to the specified torque.

TORQUE: 5.1 N·m (0.52 kgf·m, 3.8 lbf·ft)



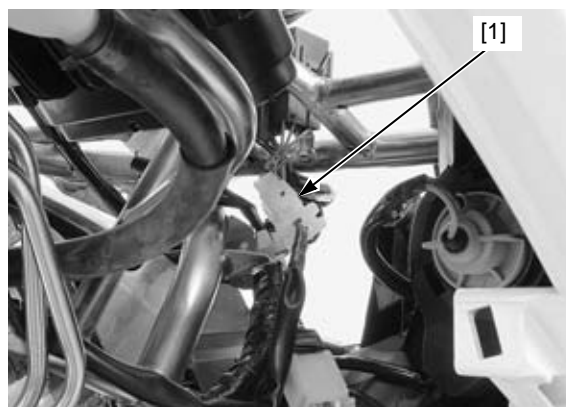
Install the ignition switch [1] by aligning the boss and hole of the frame.
Install and tighten a new screws [2] to the specified torque.

TORQUE: 9 N·m (0.9 kgf·m, 6.6 lbf·ft)



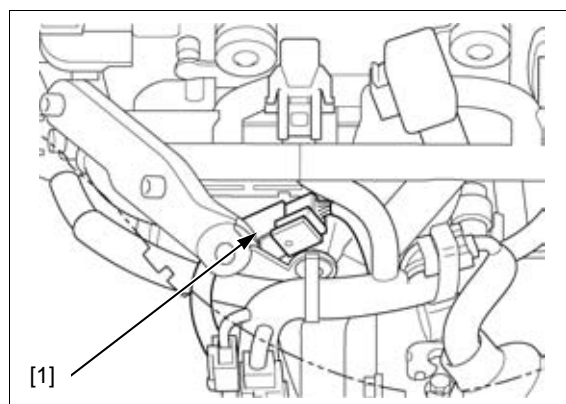
LIGHTS/METERS/SWITCHES

Connect the ignition switch 2P connector [1].
Install the steering stem (page 17-26).



INSPECTION

Remove the front meter panel (page 2-5).
Disconnect the ignition switch 2P connector [1].
Check for continuity between the connector terminals in each switch position according to the chart (page 22-2).



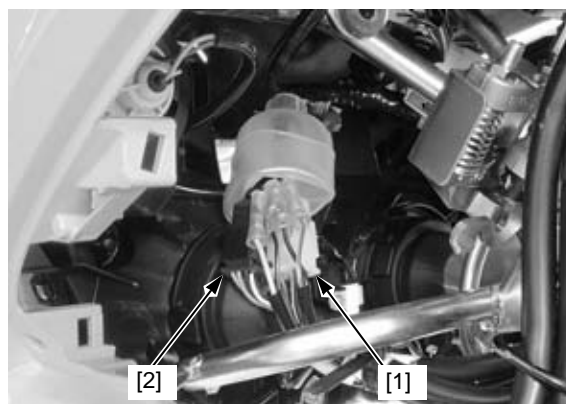
HANDLEBAR SWITCHES

HANDLEBAR SWITCH INSPECTION

Remove the inner cover (page 2-8).
Disconnect the following:

- Right handlebar switch 9P connector [1]
- Left handlebar switch 9P (Black) connector [2]

Check for continuity between the connector terminals in each switch position according to the chart (page 22-2).



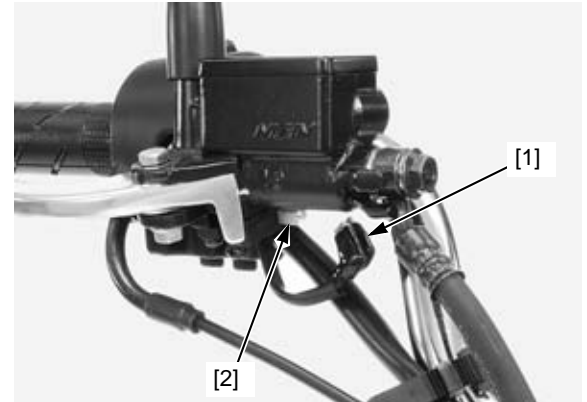
BRAKE LIGHT SWITCH

INSPECTION

FRONT

Disconnect the front brake light switch wire connectors [1] and check for continuity of the switch side terminals [2].

There should be continuity with the front brake lever squeezed, and there should be no continuity when the front brake lever is released.



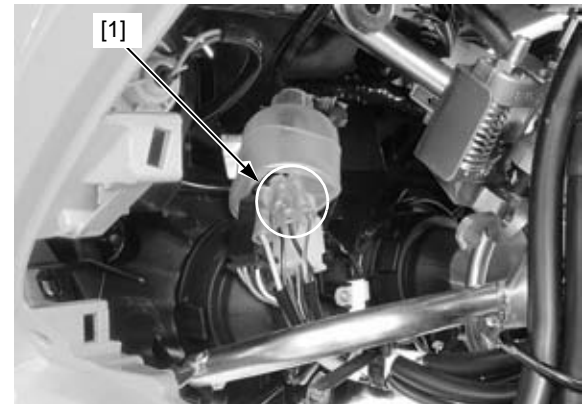
REAR

Remove the front meter panel (page 2-5).

Disconnect the rear brake light switch wire connectors [1] and check for continuity at the wire connector terminals of the switch side.

CONNECTION: Black/brown – Green/yellow

There should be continuity with the rear brake lever squeezed, and there should be no continuity when the rear brake lever is released.



INHIBITOR SWITCH

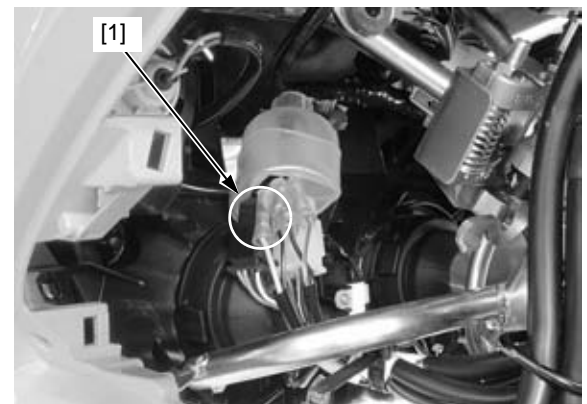
INSPECTION

Remove the front meter panel (page 2-5).

Disconnect the inhibitor switch wire connectors [1] and check for continuity at the wire connector terminals of the switch side.

CONNECTION: Black/brown – Pink

There should be continuity with the rear brake lever squeezed, and there should be no continuity when the rear brake lever is released.



HORN

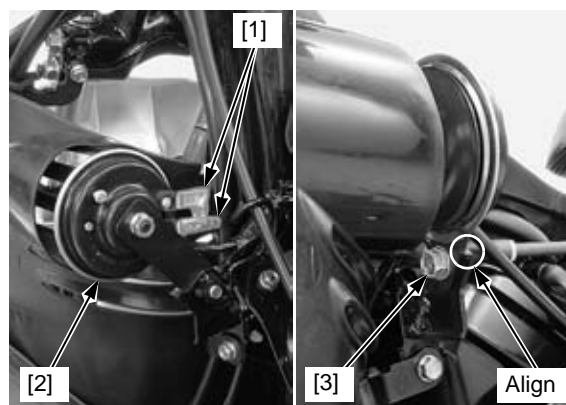
REMOVAL/INSTALLATION

Remove the left front cover (page 2-9).

Disconnect the horn connectors [1] from the horn [2].
Remove the bolt [3] and horn.

Installation is in the reverse order of removal.

- Align the horn bracket with the stopper of the frame bracket.

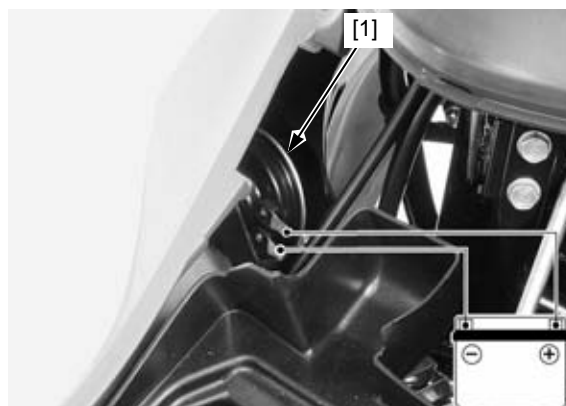


INSPECTION

Remove the inner cover (page 2-8).

Disconnect the horn connectors from the horn [1].

Connect a 12 V battery to the horn terminals.
The horn is normal if it sounds when the 12 V battery is connected to the horn terminals.



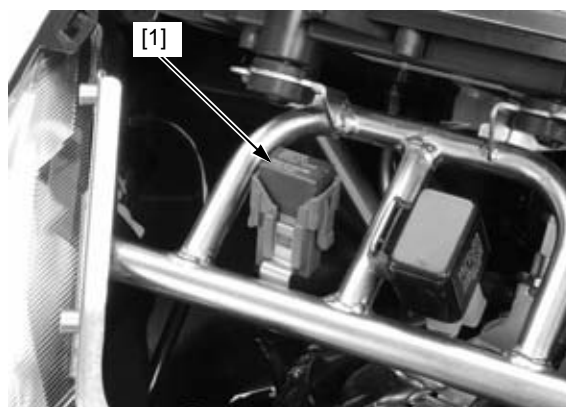
MAIN RELAY

REMOVAL/INSTALLATION

Remove the front meter panel (page 2-5).

Remove the main relay [1].

Installation is in the reverse order of removal.



CONTINUITY INSPECTION

Turn the ignition switch OFF.

Remove the main relay (page 21-16).

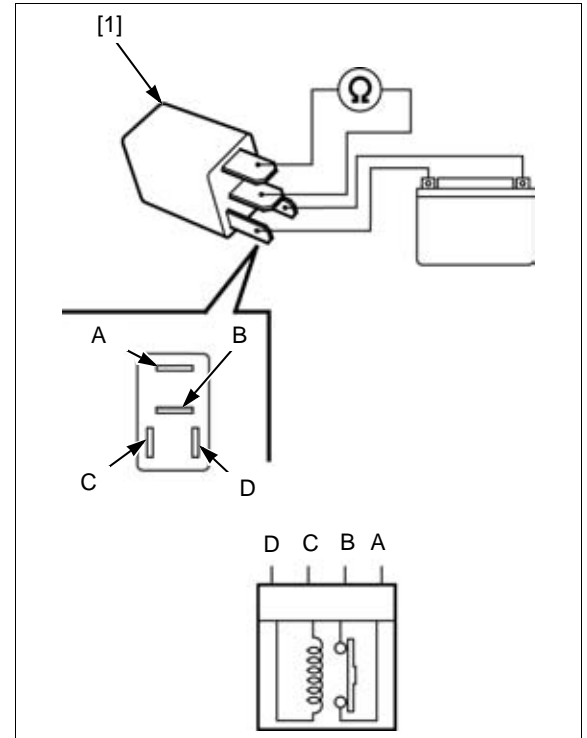
Connect the ohmmeter to the following relay [1] terminals.

Connection: A – B

Connect the 12 V battery to the following relay terminals.

Connection: C – D

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



TURN SIGNAL LIGHT RELAY

INSPECTION

Before performing the inspection, check the following:

- Battery condition
- Burned out bulb or non-specified wattage
- Blown WINKER, STOP HORN fuse (10A)
- Turn signal switch function
- Loose connector
- Horn operation

Remove the front meter panel (page 2-5).

Disconnect the turn signal light relay 2P connector [1] from the relay [2].

Short the turn signal light relay 2P connector terminals of the wire harness side with a jumper wire.

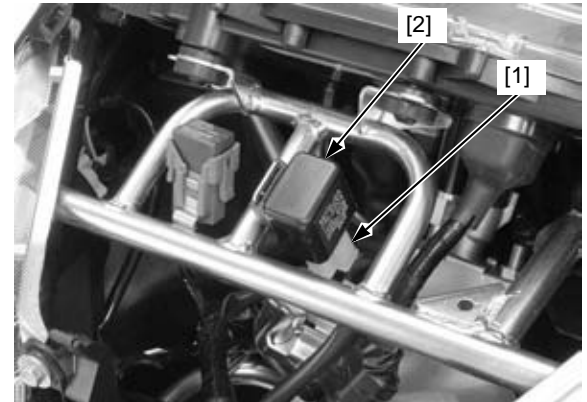
CONNECTION: Black/brown – Gray

Turn the ignition switch ON.

Check the turn signal light by turning the switch ON.

If the light comes on, the turn signal light relay is faulty or connector has poor connection.

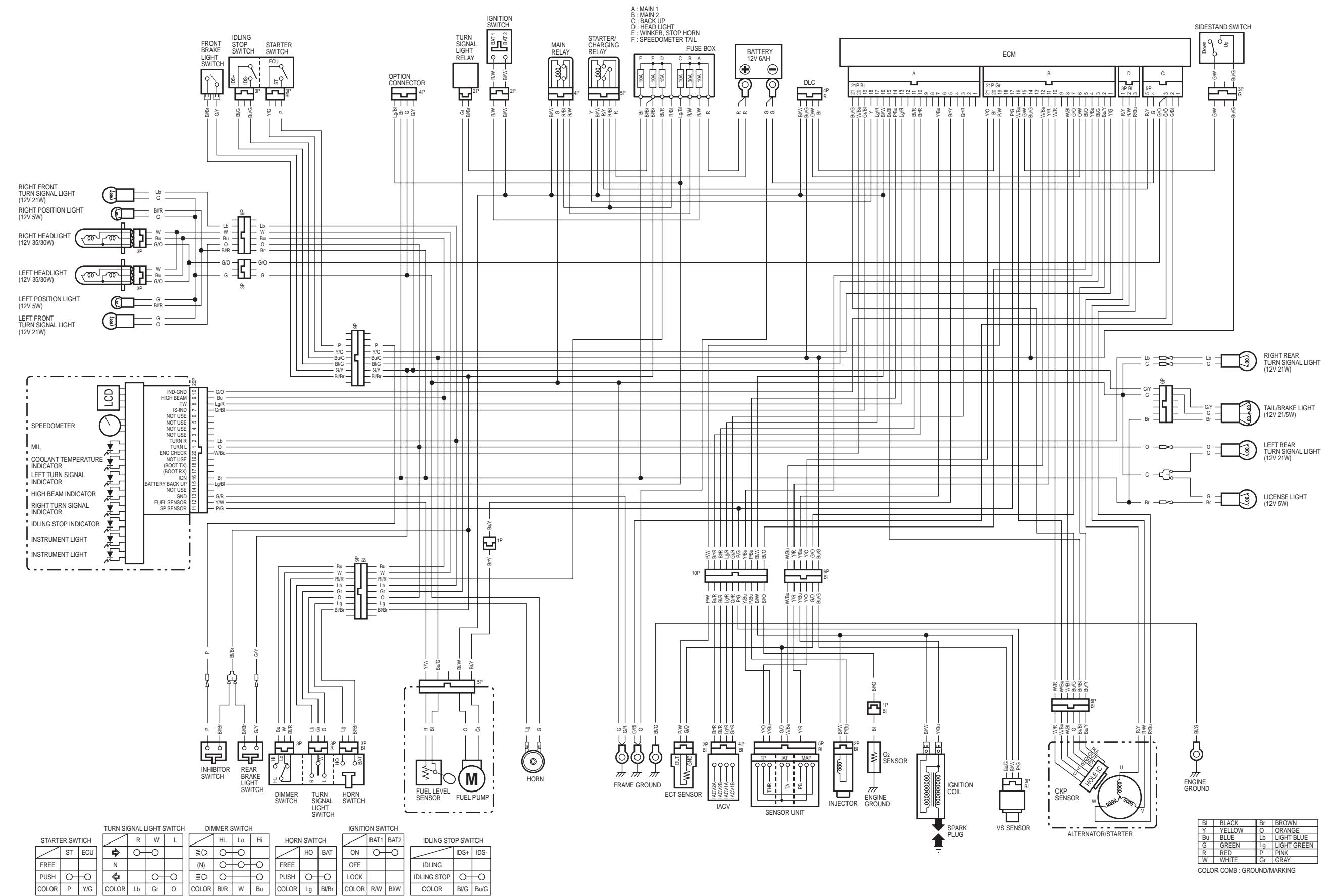
If the light does not come on, the wire harness is broken.



MEMO

WIRING DIAGRAM.....22-2

WIRING DIAGRAM



MEMO

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