

HOW TO USE THIS MANUAL

A Few Words About Safety

Service Information

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

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

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

For Your Customer's Safety

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

⚠ WARNING

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

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

For Your Safety

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

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

⚠ WARNING

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

Follow the procedures and precautions in this manual carefully.

Important Safety Precautions

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

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

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

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

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

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

How To Use This Manual

This manual describes the service procedures for the CRF250L.

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

Section 4 through 20 describe parts of the motorcycle, grouped according to location.

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

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

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

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

Refer to the troubleshooting in each section according to the malfunction or symptom. In case of an engine trouble, refer to PGM-FI section troubleshooting first.

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

You must use your own good 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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HOW TO USE THIS MANUAL

SYMBOLS

The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it would be explained specifically in the text without the use of the symbols.

	Replace the part(s) with new one(s) before assembly.
	Use the recommend engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).
	Use multi-purpose grease (lithium based multi-purpose grease NLGI #2 or equivalent).
	Use molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent). Example: <ul style="list-style-type: none">• Molykote® BR-2 plus manufactured by Dow Corning U.S.A.• Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan
	Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent). Example: <ul style="list-style-type: none">• Molykote® G-n Paste manufactured by Dow Corning U.S.A.• 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 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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MEMO

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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 motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown in the Cable and Harness Routing (page 1-17).
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
CKP sensor	Crankshaft Position sensor
DLC	Data Link Connector
DTC	Diagnostic Trouble Code
ECM	Engine Control Module
ECT sensor	Engine Coolant Temperature sensor
EEPROM	Electrically Erasable Programmable Read Only Memory
IACV	Idle Air Control Valve
IAT sensor	Intake Air Temperature sensor
MAP sensor	Manifold Absolute Pressure sensor
MIL	Malfunction Indicator Lamp
PAIR	Pulse Secondary Air Injection
PGM-FI	Programmed Fuel Injection
SCS connector	Service Check Short connector
TP sensor	Throttle Position sensor
VS sensor	Vehicle Speed sensor

DESTINATION CODE

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

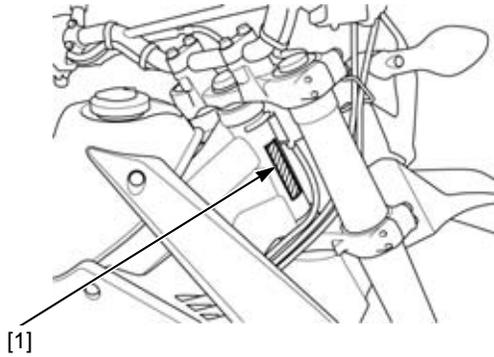
DESTINATION CODE	REGION
E	U.K.
F	France
ED	European direct sales
U	Australia, New Zealand

MODEL IDENTIFICATION

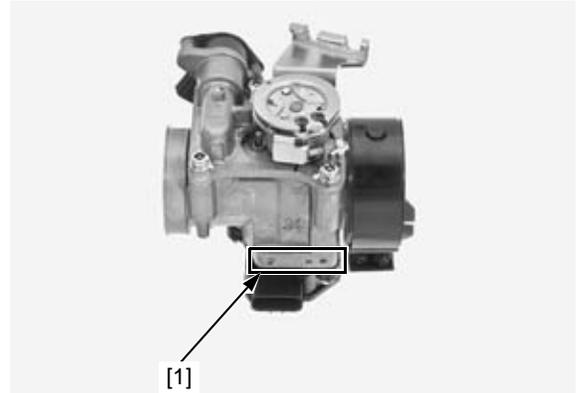


SERIAL NUMBERS/LABELS

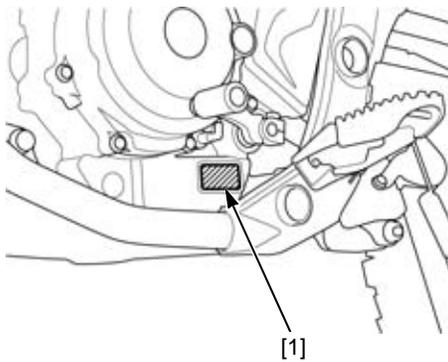
The Vehicle Identification Number (V.I.N.) [1] is stamped on the right side of the steering head.



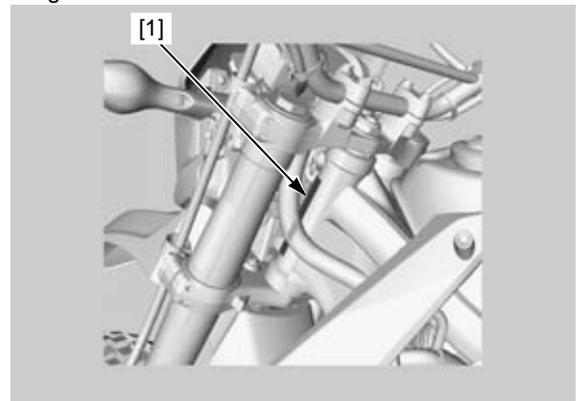
The throttle body identification number [1] is stamped on the lower left side of the throttle body.



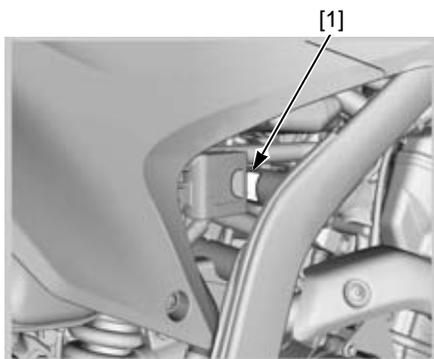
The engine serial number [1] is stamped on the lower left side of the crankcase.



The Registered Number Plate (except U type) /Compliance plate (U type) [1] is stamped on the left front side of the steering head.



The color label [1] is attached on the frame behind rear brake master cylinder reservoir. When ordering color-coded parts, always specify the designated color code.



GENERAL INFORMATION

SPECIFICATIONS

GENERAL SPECIFICATIONS

ITEM		SPECIFICATION		
DIMENSIONS	Overall length	2,195 mm (86.4 in)		
	Overall width	815 mm (32.1 in)		
	Overall height	1,195 mm (47.0 in)		
	Wheelbase	1,445 mm (56.9 in)		
	Seat height	875 mm (34.4 in)		
	Footpeg height	365 mm (14.4 in)		
	Ground clearance	255 mm (10.0 in)		
	Curb weight	143 kg (315 lbs)		
	Maximum weight capacity	159 kg (351 lbs)		
FRAME	Frame type	Twin tube		
	Front suspension	Telescopic fork		
	Front axle travel	222 mm (8.7 in)		
	Rear suspension	Swingarm		
	Rear axle travel	240 mm (9.4 in)		
	Tire size	Front	3.00-21 51P	
		Rear	120/80-18M/C 62P	
	Tire brand	Front	GP-21F Z (IRC)	
		Rear	GP-22R (IRC)	
	Front brake	Hydraulic single disc		
	Rear brake	Hydraulic single disc		
	Caster angle	27° 35'		
	Trail length	113 mm (4.4 in)		
	Fuel tank capacity	7.7 liter (2.03 US gal, 1.69 Imp gal)		
ENGINE	Cylinder arrangement	Single cylinder inclined 20° from vertical		
	Bore and stroke	76.0 x 55.0 mm (2.99 x 2.17 in)		
	Displacement	249.6 cm ³ (15.23 cu-in)		
	Compression ratio	10.7:1		
	Valve train	Chain driven DOHC with rocker arm		
	Intake valve	opens	at 1.0 mm (0.04 in) lift	20° BTDC
		closes	at 1.0 mm (0.04 in) lift	35° ABDC
	Exhaust valve	opens	at 1.0 mm (0.04 in) lift	40° BBDC
		closes	at 1.0 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	34.5 kg (76.1 lbs)		
FUEL DELIVERY SYSTEM	Type	PGM-FI		
	Throttle bore	36 mm (1.4 in)		
DRIVE TRAIN	Clutch system	Multi-plate, wet		
	Clutch operation system	Cable operating		
	Transmission	Constant mesh, 6 speeds		
	Primary reduction	2.807 (73/26)		
	Final reduction	2.857 (40/14)		
	Gear ratio	1st	3.333 (40/12)	
		2nd	2.117 (36/17)	
		3rd	1.571 (33/21)	
		4th	1.304 (30/23)	
		5th	1.115 (29/26)	
6th		0.962 (26/27)		
Gearshift pattern	Left foot operated return system 1 - N - 2 - 3 - 4 - 5 - 6			
ELECTRICAL	Ignition system	Computer-controlled digital transistorized with electric advance		
	Starting system	Electric starter motor		
	Charging system	Triple phase output alternator		
	Regulator/rectifier	SCR shorted, triple phase full-wave rectification		
	Lighting system	Battery		

PGM-FI SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Fuel injector resistance (20°C/68°F)	11 – 13 Ω

IGNITION SYSTEM SPECIFICATIONS

ITEM	SPECIFICATION
Spark plug	SIMR8A9 (NGK)
Spark plug gap	0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil peak voltage	100 V minimum
CKP sensor peak voltage	0.7 V minimum
Ignition timing ("F" mark)	10° BTDC at idle

ELECTRIC STARTER SPECIFICATION

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	11.8 – 12.3 (0.46 – 0.48)	6.5 (0.26)

FUEL SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Throttle body identification number	GQ32A
Engine idle speed	1,450 ± 100 min ⁻¹ (rpm)
Throttle grip freeplay	2 – 6 mm (0.08 – 0.24 in)
Fuel pressure at idle	343 kPa (3.5 kgf/cm ² , 50 psi)
Fuel pump flow (at 12 V)	83 cm ³ (2.81 US oz, 2.92 Imp oz) minimum/10 seconds
PAIR control solenoid valve resistance (20°C/68°F)	20 – 24 Ω

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	1.4 liters (1.5 US qt, 1.2 Imp qt)	–
	At oil filter change	1.5 liters (1.6 US qt, 1.3 Imp qt)	–
	At disassembly	1.8 liters (1.9 US qt, 1.6 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: MA	–
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.22 (0.006 – 0.009)	0.35 (0.014)
	Side clearance	0.02 – 0.09 (0.001 – 0.004)	0.10 (0.004)

GENERAL INFORMATION

COOLING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	1.02 liters (1.08 US qt, 0.90 Imp qt)
	At draining	0.74 liter (0.78 US qt, 0.65 Imp qt)
	Reserve tank	0.16 liter (0.17 US qt, 0.14 Imp qt)
Radiator cap relief pressure		93.2 – 122.6 kPa (0.95 – 1.25 kgf/cm ² , 13.5 – 17.8 psi)
Thermostat	Begin to open	81 – 84°C (178 – 183°F)
	Fully open	95°C (203°F)
	Valve lift	4.5 mm (0.18 in) minimum
Recommended coolant		High quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors
Standard coolant concentration		1:1 (mixture with distilled water)

CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Cylinder compression at 490 min ⁻¹ (rpm)		1,294 kPa (13.2 kgf/cm ² , 188 psi)	–	
Valve clearance	IN	0.16 ± 0.03 (0.006 ± 0.001)	–	
	EX	0.27 ± 0.03 (0.011 ± 0.001)	–	
Valve, valve guide	Valve stem O.D.	IN	4.475 – 4.490 (0.1762 – 0.1768)	4.46 (0.176)
		EX	4.465 – 4.480 (0.1758 – 0.1764)	4.45 (0.175)
	Valve guide I.D.	IN/EX	4.500 – 4.512 (0.1772 – 0.1776)	4.540 (0.1787)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.07 (0.003)
		EX	0.020 – 0.047 (0.0008 – 0.0019)	0.08 (0.003)
	Valve guide height	IN/EX	13.8 – 14.0 (0.54 – 0.55)	–
Valve seat width	IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.50 (0.059)	
Valve spring	Free length	Inner	34.58 (1.361)	32.85 (1.293)
		Outer	40.37 (1.589)	38.35 (1.510)
Rocker arm, rocker arm shaft	Arm I.D.	IN/EX	10.000 – 10.015 (0.3937 – 0.3943)	10.10 (0.398)
	Shaft O.D.	IN/EX	9.972 – 9.987 (0.3926 – 0.3932)	9.91 (0.390)
	Arm-to-shaft clearance	IN/EX	0.013 – 0.043 (0.0005 – 0.0017)	0.10 (0.004)
Camshaft	Cam lobe height	IN	30.931 – 31.171 (1.2178 – 1.2272)	30.911 (1.2170)
		EX	30.839 – 31.079 (1.2141 – 1.2236)	30.819 (1.2133)
	Camshaft journal O.D.		19.959 – 19.980 (0.7858 – 0.7866)	–
	Oil clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
Cylinder head	Camshaft journal area I.D.		20.000 – 20.021 (0.7874 – 0.7882)	–
	Warpage		–	0.05 (0.002)

CYLINDER/PISTON SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	76.000 – 76.010 (2.9921 – 2.9925)	76.04 (2.994)	
	Out-of-round	–	0.010 (0.0004)	
	Taper	–	0.010 (0.0004)	
	Warpage	–	0.05 (0.002)	
Piston, piston pin, piston ring	Piston O.D. at 11 mm (0.4 in) from bottom		75.960 – 75.980 (2.9905 – 2.9913)	75.89 (2.988)
	Piston pin hole I.D.		17.002 – 17.008 (0.6694 – 0.6696)	17.030 (0.6705)
	Piston pin O.D.		16.994 – 17.000 (0.6691 – 0.6693)	16.980 (0.6685)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.02 (0.001)
	Piston ring end gap	Top	0.28 – 0.38 (0.011 – 0.015)	0.40 (0.016)
		Second	0.40 – 0.55 (0.016 – 0.022)	0.70 (0.028)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)	1.10 (0.043)
	Piston ring-to-ring groove clearance	Top	0.040 – 0.080 (0.0016 – 0.0031)	0.10 (0.004)
Second		0.015 – 0.050 (0.0006 – 0.0020)	0.09 (0.004)	
Cylinder-to-piston clearance		0.020 – 0.050 (0.0008 – 0.0020)	0.09 (0.004)	
Connecting rod small end I.D.		17.016 – 17.034 (0.6699 – 0.6706)	17.06 (0.672)	
Connecting rod-to-piston pin clearance		0.016 – 0.040 (0.0006 – 0.0016)	0.10 (0.004)	

CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Clutch lever freeplay			10 – 20 (0.4 – 0.8)	–
Clutch	Spring free length		41.5 (1.63)	37.5 (1.48)
	Disc thickness	Disc A/B	2.30 – 2.50 (0.091 – 0.098)	2.27 (0.089)
	Plate warpage	Plate A/B	–	0.30 (0.012)
Clutch outer guide I.D.			20.000 – 20.021 (0.7874 – 0.7882)	20.04 (0.789)
Mainshaft O.D. at clutch outer guide			19.967 – 19.980 (0.7861 – 0.7866)	19.947 (0.7853)

ALTERNATOR/STARTER CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Starter driven gear	I.D.	34.000 – 34.013 (1.3386 – 1.3391)	34.033 (1.3399)
	O.D.	51.705 – 51.718 (2.0356 – 2.0361)	51.685 (2.0348)

CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Runout		–	0.03 (0.001)
	Connecting rod big end radial clearance		0.004 – 0.016 (0.0002 – 0.0006)	0.05 (0.002)
	Connecting rod big end side clearance		0.05 – 0.50 (0.002 – 0.020)	0.85 (0.033)
	Main journal oil clearance		0.018 – 0.045 (0.0007 – 0.0018)	0.075 (0.0030)
	Main journal O.D.		33.985 – 34.000 (1.3380 – 1.3386)	33.975 (1.3376)
Main journal bearing support I.D.			38.000 – 38.018 (1.4961 – 1.4968)	38.036 (1.4975)
Transmission	Gear I.D.	M5, M6	23.000 – 23.021 (0.9055 – 0.9063)	23.07 (0.908)
		C1	23.020 – 23.041 (0.9063 – 0.9071)	23.09 (0.909)
		C2	25.000 – 25.021 (0.9843 – 0.9851)	25.04 (0.986)
		C3, C4	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
		C1	22.984 – 23.005 (0.9049 – 0.9057)	22.47 (0.885)
	Bushing O.D.	M5, M6	22.959 – 22.980 (0.9039 – 0.9047)	22.91 (0.902)
		C1	22.984 – 23.005 (0.9049 – 0.9057)	22.47 (0.885)
		C2	24.959 – 24.980 (0.9826 – 0.9835)	24.90 (0.980)
		C3, C4	27.959 – 27.980 (1.1007 – 1.1016)	27.95 (1.100)
	Gear-to-bushing clearance	M5, M6, C2, C3, C4	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
		C1	0.015 – 0.057 (0.0006 – 0.0022)	0.10 (0.004)
	Bushing I.D.	M5, C1	20.000 – 20.021 (0.7874 – 0.7882)	20.05 (0.789)
		C2	22.000 – 22.021 (0.8661 – 0.8670)	22.07 (0.869)
		C3	25.000 – 25.021 (0.9843 – 0.9851)	25.04 (0.986)
	Mainshaft / countershaft O.D.	at M5 bushing	19.959 – 19.980 (0.7858 – 0.7866)	19.91 (0.784)
		at C1 bushing	19.959 – 19.980 (0.7858 – 0.7866)	19.91 (0.784)
at C2 bushing		21.959 – 21.980 (0.8645 – 0.8654)	21.91 (0.863)	
at C3 bushing		24.959 – 24.980 (0.9826 – 0.9835)	24.90 (0.980)	
Bushing-to-shaft clearance	M5, C1, C2, C3	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)	
Shift fork, shift fork shaft	Shift fork shaft O.D.		11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)
	Shift fork I.D.		12.000 – 12.018 (0.4724 – 0.4731)	12.05 (0.474)
	Shift fork claw thickness		4.93 – 5.00 (0.194 – 0.197)	4.82 (0.190)
Shift drum	Shift drum O.D.	Left side	13.966 – 13.984 (0.5498 – 0.5506)	13.94 (0.549)
	Shift drum journal I.D.	Left side	14.000 – 14.027 (0.5512 – 0.5522)	14.06 (0.554)
	Shift drum-to-shift drum journal clearance	Left side	0.016 – 0.061 (0.0006 – 0.0024)	0.08 (0.003)

GENERAL INFORMATION

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Minimum tire thread depth		–	3.0 (0.12)	
Cold tire pressure	Driver only	150 kPa (1.50 kgf/cm ² , 22 psi)	–	
	Driver and passenger	150 kPa (1.50 kgf/cm ² , 22 psi)	–	
Axle runout		–	0.2 (0.01)	
Wheel rim runout	Radial	–	2.0 (0.08)	
	Axial	–	2.0 (0.08)	
Wheel hub-to-rim distance		23.45 ± 1.0 (0.92 ± 0.04)	–	
Fork	Spring free length (Right side only)		575.0 (22.64)	
	Pipe runout		–	
	Recommended fork fluid		Honda ULTRA CUSHION OIL 10W or equivalent	
	Fluid level	Right	122 (4.8)	–
		Left	38 (1.5)	–
	Fluid capacity	Right	658 ± 2.5 cm ³ (22.3 ± 0.08 US oz, 23.2 ± 0.09 Imp oz)	–
Left		683 ± 2.5 cm ³ (23.1 ± 0.08 US oz, 24.0 ± 0.09 Imp oz)	–	
Steering head bearing pre-load		10.6 – 21.2 N (1.08 – 2.16 kgf, 2.38 – 4.77 lbf)	–	

REAR WHEEL/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire thread depth		–	3.0 (0.12)
Cold tire pressure	Driver only	150 kPa (1.50 kgf/cm ² , 22 psi)	–
	Driver and passenger	150 kPa (1.50 kgf/cm ² , 22 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel hub-to-rim distance		26.9 ± 1.0 (1.06 ± 0.04)	–
Drive chain	Size/link	DID520VF-106LE	–
	Slack	25 – 35 (1.0 – 1.4)	–

BRAKE SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Front	Specified brake fluid	DOT 3 or DOT 4	–
	Brake pad wear indicator	–	To groove
	Brake disc thickness	3.3 – 3.7 (0.13 – 0.15)	3.0 (0.12)
	Brake disc warpage	–	0.3 (0.01)
	Master cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Master piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
	Caliper cylinder I.D.	27.000 – 27.050 (1.0630 – 1.0650)	27.060 (1.0654)
	Caliper piston O.D.	26.935 – 26.968 (1.0604 – 1.0617)	26.89 (1.0587)
Rear	Specified brake fluid	DOT 3 or DOT 4	–
	Brake pad wear indicator	–	To groove
	Brake disc thickness	4.3 – 4.7 (0.17 – 0.19)	4.0 (0.16)
	Brake disc warpage	–	0.3 (0.01)
	Master cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Master piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
	Caliper cylinder I.D.	27.000 – 27.050 (1.0630 – 1.0650)	27.060 (1.0654)
	Caliper piston O.D.	26.935 – 26.968 (1.0604 – 1.0617)	26.89 (1.0587)
Brake pedal height		64 – 65 (2.52 – 2.56)	–

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS	
Battery	Type	YTX7L-BS	
	Capacity	12 V - 6 Ah (10 HR)	
	Current leakage	0.34 mA max.	
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	0.6 A/5 – 10 h
Quick		3 A/1 h	
Alternator	Capacity	0.34 kW/5,000 min ⁻¹ (rpm)	
	Charging coil resistance (20°C/68°F)	0.1 – 1.0 Ω	

LIGHTS/METERS/SWITCHES SPECIFICATIONS

ITEM		SPECIFICATION
Bulbs	Headlight	12 V - 60/55 W
	Position light	12 V - 5 W
	Brake/taillight	12 V - 21/5 W
	Front turn signal light	12 V - 21 W x 2
	Rear turn signal light	12 V - 21 W x 2
	Instrument light	LED
	Turn signal indicator	LED
	High beam indicator	LED
	Neutral indicator	LED
	MIL	LED
Fuse	Main fuse	30 A
	Sub fuse	10 A x 5, 5 A x 1

TORQUE VALUES

STANDARD TORQUE VALUES

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

GENERAL INFORMATION

ENGINE & FRAME TORQUE VALUES

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

FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Hook bolt	4	8	21 (2.1, 15)	
Left side cover assembly screw	2	4	0.9 (0.1, 0.7)	
Right fuel tank shroud assembly screw	4	4	0.9 (0.1, 0.7)	
Left fuel tank shroud assembly screw	2	4	0.9 (0.1, 0.7)	
Headlight cowl mounting bolt	4	6	8.5 (0.9, 6.3)	
Rear side reflector mounting nut (U type only)	2	6	1.5 (0.2, 1.1)	U-nut
Rear reflector mounting nut	1	5	1.5 (0.2, 1.1)	U-nut
Brake/taillight mounting screw	3	6	4.5 (0.5, 3.3)	
Exhaust pipe protector socket bolt	2	6	12 (1.2, 9)	
Muffler protector cover screw	5	4	1.5 (0.2, 1.1)	
Muffler front mounting bolt	1	8	32 (3.3, 24)	
Muffler band bolt	1	8	22.5 (2.3, 17)	
Exhaust pipe joint nut	2	8	18 (1.8, 13)	
Exhaust pipe stud bolt	2	8	–	See page 2-11
Air cleaner connecting hose band screw	1	4	1.5 (0.2, 1.1)	
Sub-frame upper mounting nut	2	8	27 (2.8, 20)	
Sub-frame lower mounting bolt	2	8	27 (2.8, 20)	
Rear master cylinder reservoir mounting bolt	1	6	10 (1.0, 7)	
Sidestand pivot bolt	1	10	10 (1.0, 7)	See page 2-14
Sidestand pivot lock nut	1	10	30 (3.1, 22)	U-nut, See page 2-14

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Throttle cable A adjuster lock nut (throttle body side)	1	6	3.0 (0.3, 2.2)	
Air cleaner cover screw	4	5	1.2 (0.1, 0.9)	
Spark plug	1	10	16 (1.6, 12)	
Crankshaft hole cap	1	30	8.0 (0.8, 5.9)	Apply engine oil to the threads.
Timing hole cap	1	14	6.0 (0.6, 4.4)	Apply engine oil to the threads.
Engine oil drain bolt	1	12	24 (2.4, 18)	
Drive chain adjuster lock nut	2	8	27 (2.8, 20)	UBS nut
Rear axle nut	1	16	88 (9.0, 65)	U-nut
Drive sprocket fixing plate bolt	2	6	10 (1.0, 7)	
Driven sprocket nut	6	10	50 (5.1, 37)	U-nut
Rear master cylinder reservoir mounting bolt	1	6	10 (1.0, 7)	
Master cylinder reservoir cover screw	4	4	1.5 (0.2, 1.1)	
Rear master cylinder push rod lock nut	1	8	17.2 (1.8, 13)	
Front spoke	36	BC 3.2	3.7 (0.4, 2.7)	
Rear spoke	32	BC 3.2	3.7 (0.4, 2.7)	

PGM-FI SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Sensor unit torx screw	3	5	3.4 (0.3, 2.5)	
ECT sensor	1	12	25 (2.5, 18)	
O ₂ sensor	1	12	25 (2.5, 18)	
Bank angle sensor mounting nut	2	6	9.0 (0.9, 6.6)	

IGNITION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Timing hole cap	1	14	6.0 (0.6, 4.4)	Apply engine oil to the threads.

ELECTRIC STARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Negative brush screw	1	5	3.7 (0.4, 2.7)	
Starter motor assembly bolt	2	5	4.9 (0.5, 3.6)	

FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Fuel pump mounting nut	6	6	12 (1.2, 9)	For tightening sequence (page 7-9).
Air cleaner housing mounting bolt	3	6	7.0 (0.7, 5.2)	
Insulator band screw	2	5	4.2 (0.4, 3.1)	See page 7-13
Air cleaner connecting hose band screw	1	4	1.5 (0.2, 1.1)	
Throttle cable stay screw	2	5	3.4 (0.3, 2.5)	
Clamp stay screw	1	5	3.4 (0.3, 2.5)	
Throttle cable A joint nut (grip side)	1	10	1.5 (0.2, 1.1)	
Throttle cable B joint nut (grip side)	1	12	1.5 (0.2, 1.1)	
Throttle cable B nut (throttle body side)	1	6	3.0 (0.3, 2.2)	
Injector joint mounting bolt	2	5	5.1 (0.5, 3.8)	
IACV setting plate torx screw	2	4	2.1 (0.2, 1.5)	
PAIR check valve cover bolt	2	5	5.2 (0.5, 3.8)	

COOLING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Water hose band screw	4	-	-	See page 9-7
Fan motor shroud mounting bolt	3	6	8.5 (0.9, 6.3)	
Fan motor screw	3	4	2.7 (0.3, 2.0)	
Cooling fan nut	1	3	1.0 (0.1, 0.7)	Apply locking agent to the threads.
Water pump impeller	1	7	10 (1.0, 7)	

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Cylinder head cover bolt	2	6	10 (1.0, 7)	
Camshaft holder mounting bolt	8	6	12 (1.2, 9)	Apply engine oil to the threads and seating surface.
Cylinder head mounting nut	4	10	45 (4.6, 33)	Apply engine oil to the threads and seating surface.
Cam chain tensioner lifter plug	1	6	4.2 (0.4, 3.1)	

CYLINDER/PISTON

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Cylinder stud bolt	4	10	-	See page 11-4
Cam chain tensioner lifter plug	1	6	4.2 (0.4, 3.1)	

GENERAL INFORMATION

CLUTCH/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Clutch center lock nut	1	16	108 (11.0, 80)	Lock nut; replace with a new one and stake. Apply engine oil to the threads and seating surface.
Clutch lifter plate bolt	5	6	12 (1.2, 9)	
Shift drum stopper plate bolt	1	6	10 (1.0, 7)	Apply locking agent to the threads.
Shift drum stopper arm bolt	1	6	10 (1.0, 7)	Apply locking agent to the threads.
Gearshift spindle return spring pin	1	8	30 (3.1, 22)	Apply locking agent to the threads.
Primary drive gear lock nut	1	16	108 (11.0, 80)	Apply engine oil to the threads and seating surface.

ALTERNATOR/STARTER CLUTCH

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 socket bolt	2	6	10 (1.0, 7)	Apply locking agent to the threads. Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) from tip
Flywheel bolt	1	12	128 (13.1, 94)	Apply engine oil to the threads and seating surface.
Starter clutch socket bolt	6	8	30 (3.1, 22)	Apply locking agent to the threads.

CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Balancer shaft nut	1	14	44 (4.5, 32)	Apply engine oil to the threads and seating surface.
Cam chain tensioner pivot bolt	1	6	10 (1.0, 7)	Apply locking agent to the threads. Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) from tip

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Rear engine mounting nut	2	10	45 (4.6, 33)	
Front engine mounting nut	2	10	55 (5.6, 41)	
Engine hanger plate bolt	2	8	27 (2.8, 20)	
Drive sprocket fixing plate bolt	2	6	10 (1.0, 7)	

FRONT WHEEL/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Front axle bolt	1	14	73.5 (7.5, 54)	
Front axle pinch bolt	2	8	20 (2.0, 15)	
Front brake disc bolt	6	6	20 (2.0, 15)	ALOC bolt; replace with a new one.
Front spoke	36	BC 3.2	3.7 (0.4, 2.7)	
Top bridge pinch bolt	4	8	32 (3.3, 24)	
Bottom bridge pinch bolt	4	8	32 (3.3, 24)	
Front brake hose guide bolt	2	6	10 (1.0, 7)	
Front brake hose clamp bolt	2	6	10 (1.0, 7)	
Fork protector socket bolt	6	6	7.0 (0.7, 5.2)	ALOC bolt; replace with a new one.
Front brake caliper mounting bolt	2	8	30 (3.1, 22)	ALOC bolt; replace with a new one.
Fork center bolt	1	8	20 (2.0, 15)	Apply locking agent to the threads.
Fork rod lock nut (Right side)	1	10	20 (2.0, 15)	
Fork inner damper rod lock nut (Left side)	1	10	20 (2.0, 15)	
Fork cap	2	50	35 (3.6, 26)	
Handlebar switch housing screw	4	5	2.5 (0.3, 1.8)	
Front master cylinder holder bolt	2	6	9.8 (1.0, 7.2)	
Steering stem adjusting nut	1	26	–	Apply engine oil to the threads. See page 16-24
Steering stem nut	1	24	103 (10.5, 76)	See page 16-24
Clutch lever pivot bolt	1	6	1.0 (0.1, 0.7)	Apply grease to the sliding surface.
Clutch lever pivot nut	1	6	5.9 (0.6, 4.4)	

REAR WHEEL/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Rear axle nut	1	16	88 (9.0, 65)	U-nut
Driven sprocket nut	6	10	50 (5.1, 37)	U-nut
Rear brake disc bolt	4	8	42 (4.3, 31)	ALOC bolt; replace with a new one.
Rear spoke	32	BC 3.2	3.7 (0.4, 2.7)	
Shock absorber upper mounting nut	1	10	54 (5.5, 40)	U-nut
Shock absorber lower mounting nut	1	10	44 (4.5, 32)	U-nut
Shock link nut	2	10	44 (4.5, 32)	U-nut
Shock arm-to-swingarm nut	1	12	74 (7.5, 55)	U-nut Apply engine oil to the threads.
Swingarm pivot nut	1	14	88 (9.0, 65)	U-nut
Rear brake hose guide mounting screw	2	5	1.2 (0.1, 0.9)	
Chain slider mounting screw	4	5	4.2 (0.4, 3.1)	ALOC screw; replace with a new one.
Chain case stay mounting screw	1	6	4.2 (0.4, 3.1)	ALOC screw; replace with a new one.
Chain guide mounting bolt	2	6	10 (1.0, 7)	ALOC bolt; replace with a new one.
Chain slider guide mounting nut	2	6	2.5 (0.3, 1.8)	U-nut

GENERAL INFORMATION

BRAKE SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Brake caliper bleed valve	2	8	5.4 (0.6, 4.0)	
Master cylinder reservoir cover screw	4	4	1.5 (0.2, 1.1)	
Rear master cylinder reservoir mounting bolt	1	6	10 (1.0, 7)	
Front brake pad pin	1	10	17.2 (1.8, 13)	
Rear brake pad pin	1	10	17.2 (1.8, 13)	
Brake hose oil bolt	4	10	34 (3.5, 25)	
Front master cylinder holder bolt	2	6	9.8 (1.0, 7.2)	
Front brake light switch screw	1	4	1.2 (0.1, 0.9)	
Rear master cylinder mounting bolt	2	6	14 (1.4, 10)	ALOC bolt; replace with a new one.
Rear master cylinder push rod lock nut	1	8	17.2 (1.8, 13)	
Brake lever pivot bolt	1	6	1.0 (0.1, 0.7)	Apply 0.1 g (0.004 oz) of silicone grease to the sliding surface.
Brake lever pivot nut	1	6	5.9 (0.6, 4.4)	
Front brake caliper mounting bolt	2	8	30 (3.1, 22)	ALOC bolt; replace with a new one.
Front brake caliper bracket pin	1	8	17.2 (1.8, 13)	
Rear brake reservoir stay mounting screw	1	6	1.5 (0.2, 1.1)	

BATTERY/CHARGING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Battery holder plate bolt	2	6	7.0 (0.7, 5.2)	

LIGHTS/METERS/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Headlight unit mounting screw	4	5	1.2 (0.1, 0.9)	
Turn signal unit mounting nut	4	10	21 (2.1, 15)	
Brake/taillight mounting screw	3	6	4.5 (0.5, 3.3)	
Hook bolt	4	8	21 (2.1, 15)	
Speedometer mounting screw	3	5	1.0 (0.1, 0.7)	
Ignition switch mounting bolt	2	8	24 (2.4, 18)	One-way bolt; replace with a new one.
Neutral switch	1	10	12 (1.2, 9)	
Sidestand switch mounting bolt	1	6	10 (1.0, 7)	ALOC bolt; replace with a new one.

LUBRICATION & SEAL POINTS

ENGINE

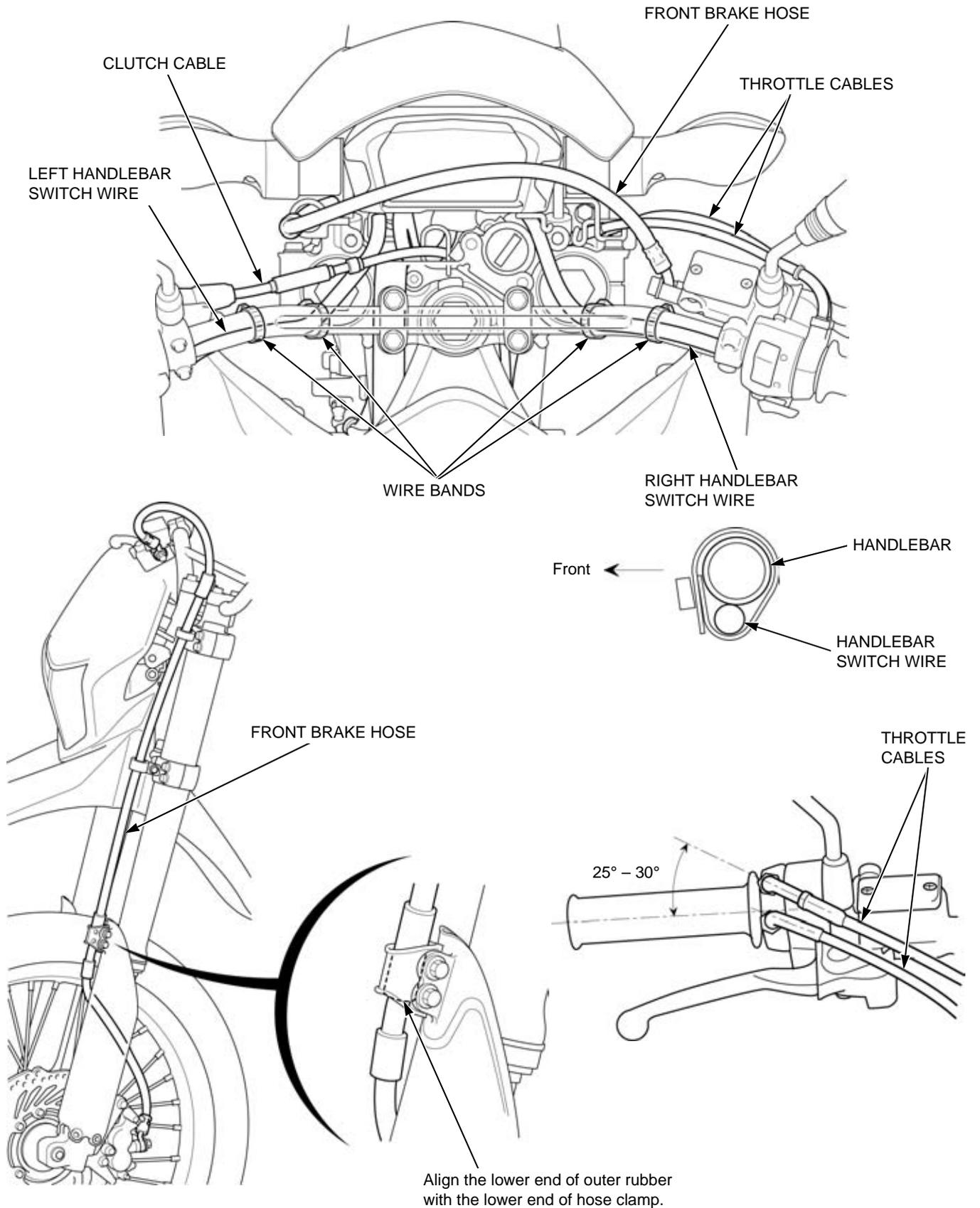
MATERIAL	LOCATION	REMARKS
Liquid sealant (Three bond 1207B, 1215 or equivalent)	Left crankcase mating surface	See page 14-18
	Alternator/CKP sensor wire grommet sealing surface	
Liquid sealant (Three bond 5211C, 1207B, 1215, SS KE45 or equivalent)	Cylinder head semi-circular cut-out	
Engine oil	Oil pump rotor entire surface	
	Oil pump shaft outer surface	
	Water pump shaft outer surface	
	Cam chain whole surface	
	Cylinder inner surface	
	Piston pin hole inner surface, ring groove and sliding surface	
	Piston ring entire surface	
	Clutch disc entire surface	
	Gearshift spindle shaft outer surface	
	Starter one-way clutch sprag	
	Starter driven gear sliding surface	
	Each oil seal lips	
	Each bearing rotating area	
	Each gear teeth	
Each O-ring		
Multi-purpose grease	Each oil seal lips (clutch lifter arm, gearshift spindle, countershaft, water pump)	
Molybdenum oil solution (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	Valve stem sliding surface	
	Camshaft lobes and journal	
	Rocker arm shaft outer surface	
	Rocker arm inner surface, roller surface and slipper surface	
	Piston pin outer surface	
	Clutch outer guide whole surface	
	Clutch lifter arm sliding surface	
	Starter reduction gear inner surface	
	Starter reduction gear shaft outer surface	
	Crankshaft main journal bearing sliding surface	
	Connecting rod big end sliding surface	
	Connecting rod small end inner surface	
	Left crankshaft needle bearing rotating surface	
	Balancer driven gear and sub gear sliding surface	
	Shift fork inner surface and guide pin	
	Shift fork shaft outer surface	
	Shift drum journal outer surface and grooves	
M5, C1, C2, C3 gear bushing entire surface		
M6, C4 gear bushing outer surface		
Locking agent	Mainshaft bearing setting plate bolt threads	Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) from tip

GENERAL INFORMATION

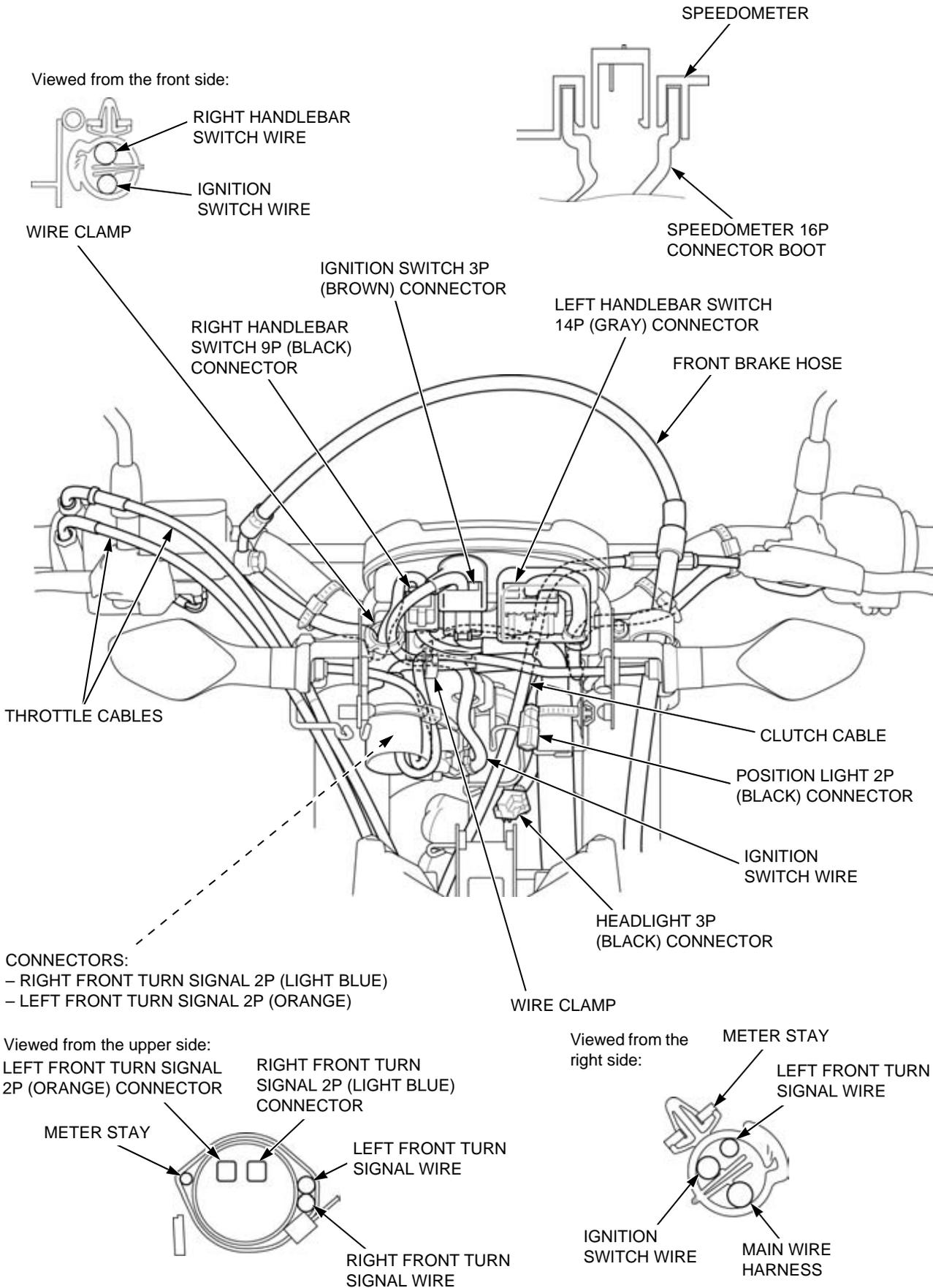
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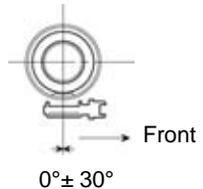
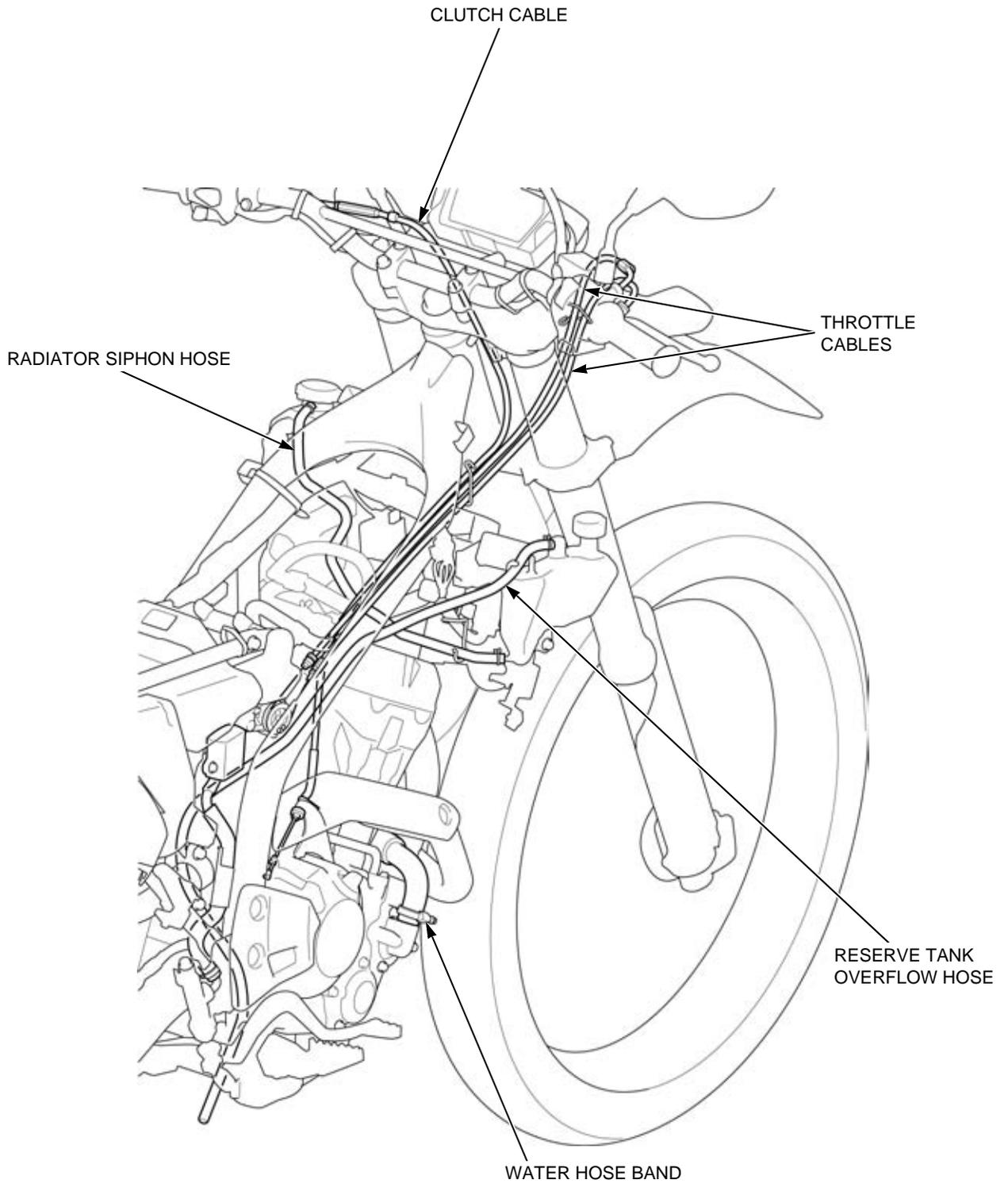
MATERIAL	LOCATION	REMARKS
Urea based multi-purpose grease with extreme pressure agent (example: Kyodo Yushi, EXCELITE EP2 or equivalent)	Steering head bearing inner race and outer race rolling surface	3 – 5 g (0.11 – 0.18 oz)
	Steering head bearing dust seal lips	
Multi-purpose grease	Sidestand pivot sliding surface	
	Axle outer surface	
	Throttle pipe flange cable groove	
	Shock linkage needle bearing rotating area	
	Shock linkage collar whole surface	
	Swingarm pivot needle bearing rotating area	
	Swingarm pivot collar whole surface	
	Swingarm pivot bolt outer surface	
	Swingarm cap lips	
	Gap between the swingarm caps, pivot collar and bearings	
	Brake pedal pivot sliding area	
	Main step pivot pin sliding area	
	Pillion step pivot pin sliding surface	
	Each dust seal lips	
	Each O-ring	
Silicone grease	Brake pad pin stopper ring surface	
	Brake caliper bracket pin boots	0.4 g (0.01 oz) minimum
	Brake caliper dust seal whole surface	
	Brake lever contacting area with master piston	0.1 g (0.004 oz)
	Rear master cylinder push rod contacting area with master cylinder piston and boot	0.1 g (0.004 oz)
	Master cylinder boot	0.1 g (0.004 oz)
DOT 3 or DOT 4 brake fluid	Brake master piston sliding area and piston cups	
	Rear master cylinder hose joint O-ring	
	Brake caliper piston sliding area and piston seal	
Fork fluid	Fork cap O-ring	
	Fork oil seal lips	
	Fork dust seal lips	
	Fork guide bushing and slider bushing surface	
Honda Bond A or equivalent	Left handlebar and throttle pipe outer surface (grip rubber contacting area)	
	Air cleaner connecting hose mating surface with air cleaner housing	
	Swingarm rubber cap mating surface with swingarm	

CABLE & HARNESS ROUTING

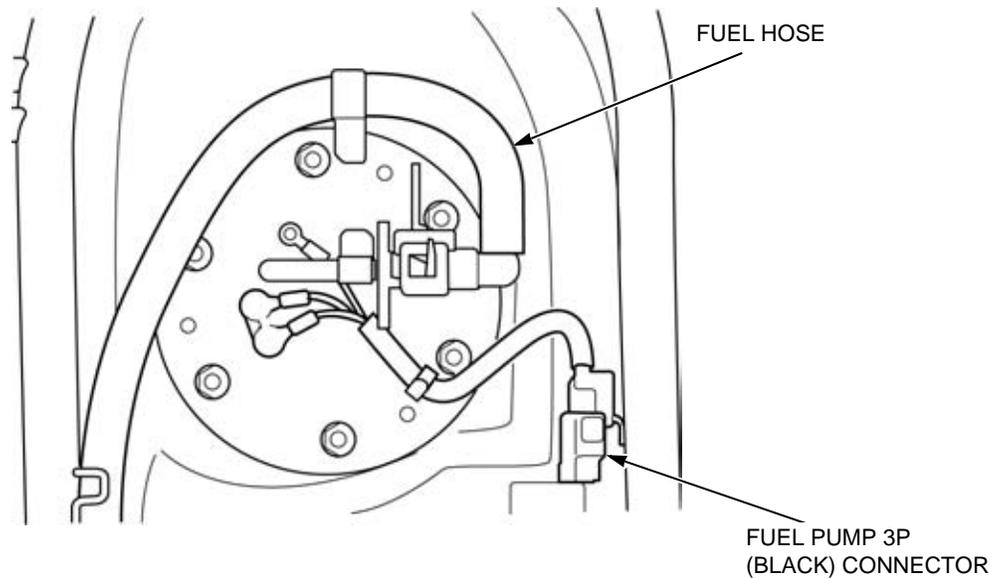
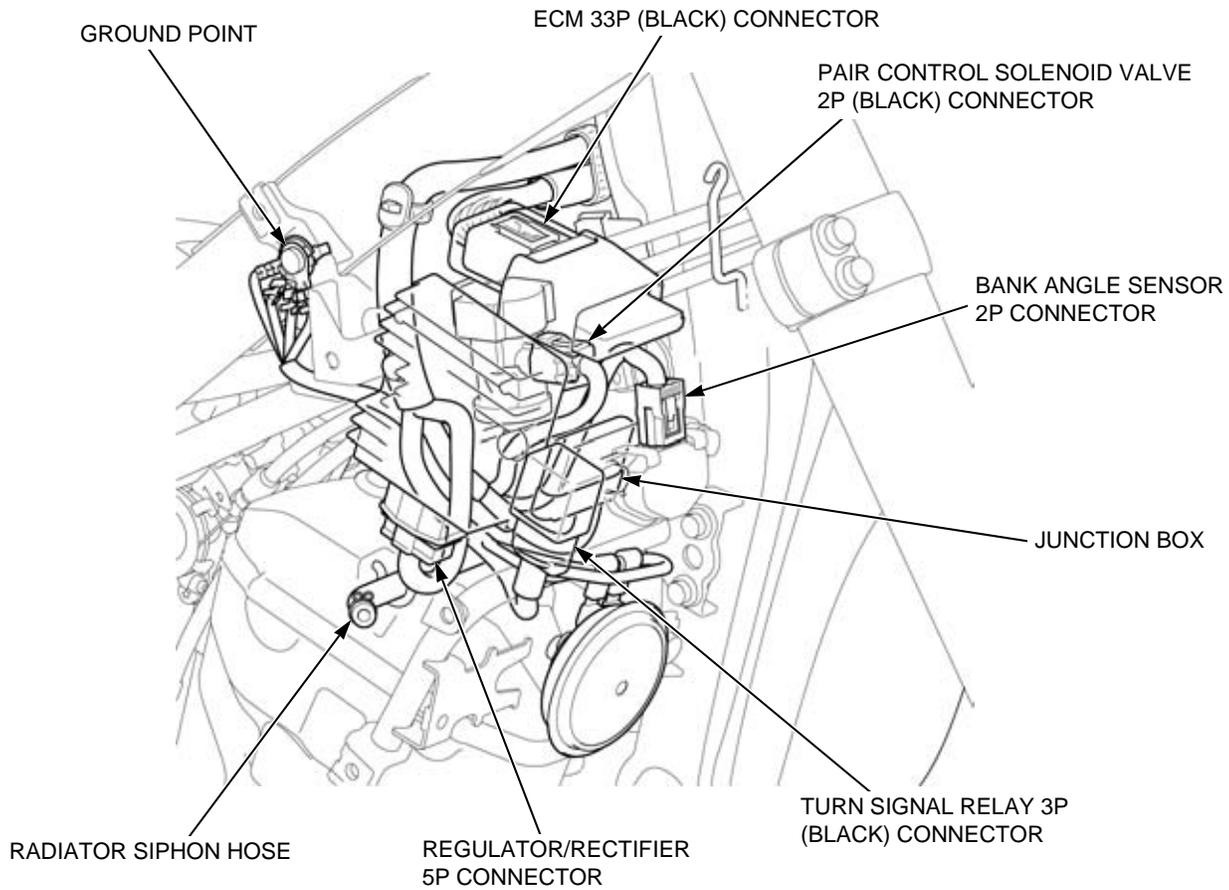


GENERAL INFORMATION

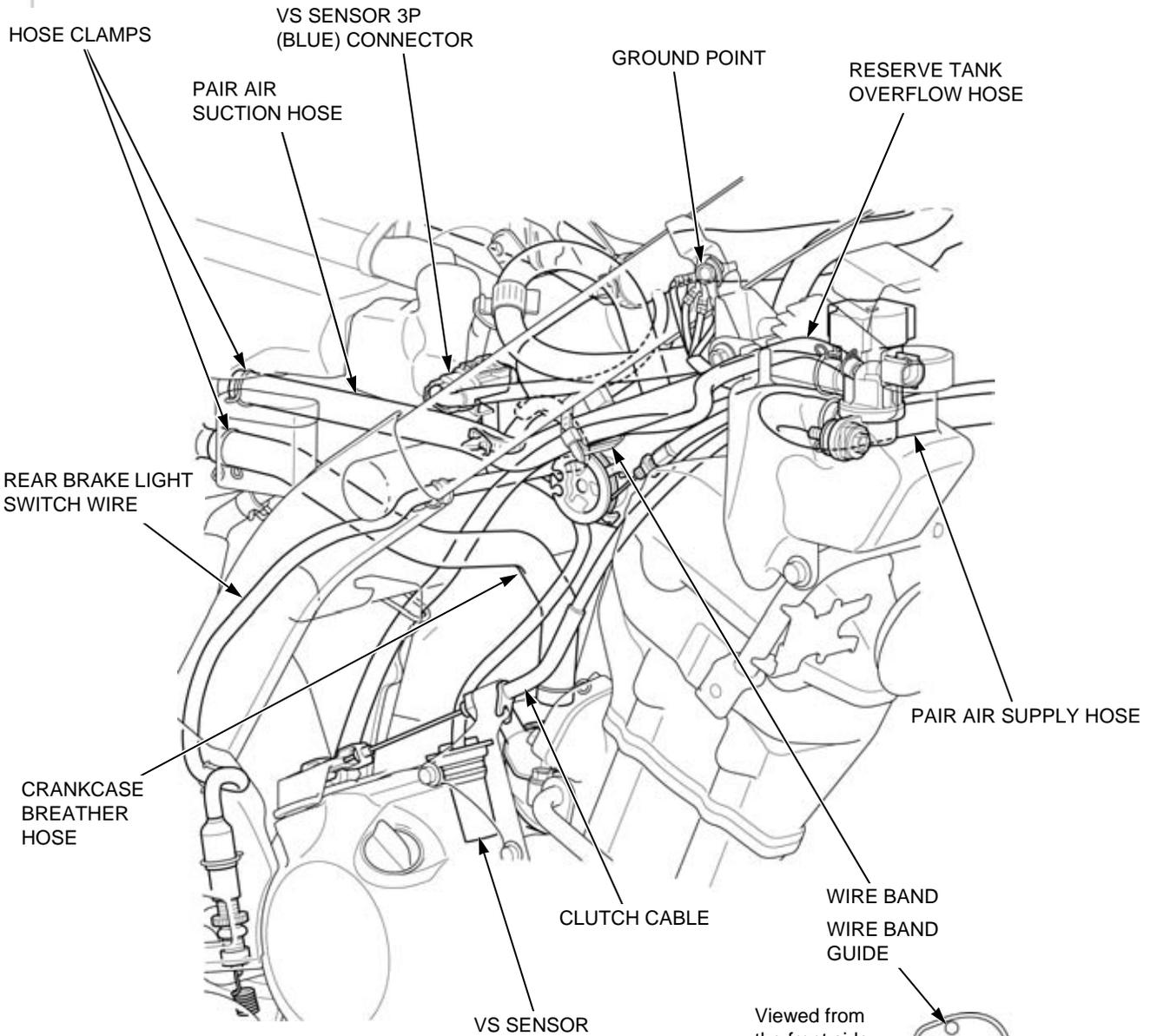
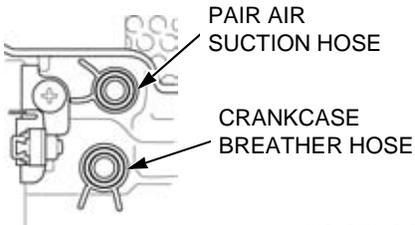




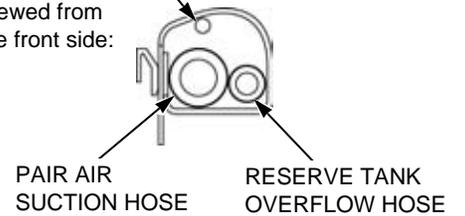
GENERAL INFORMATION



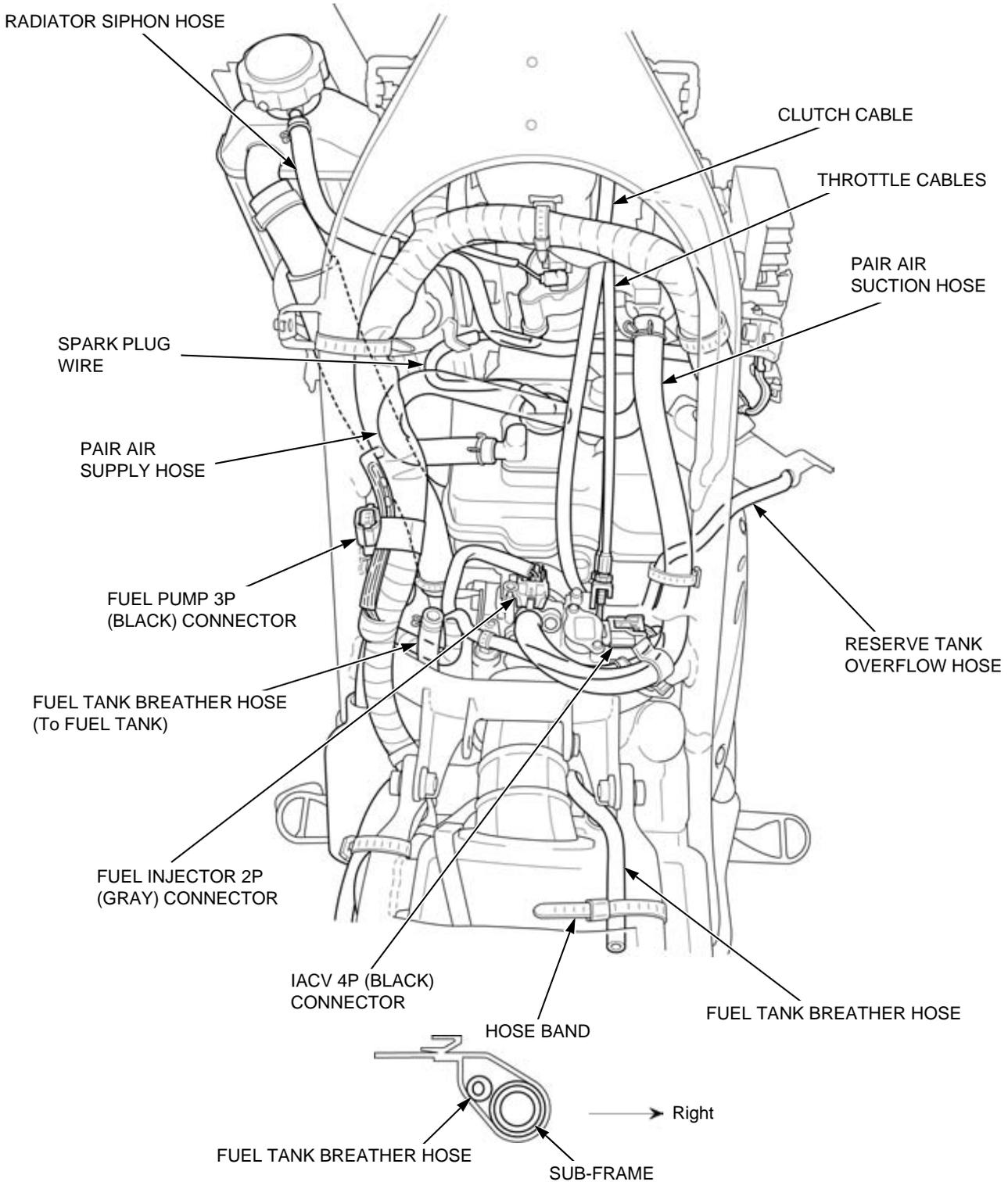
Viewed from the front side:

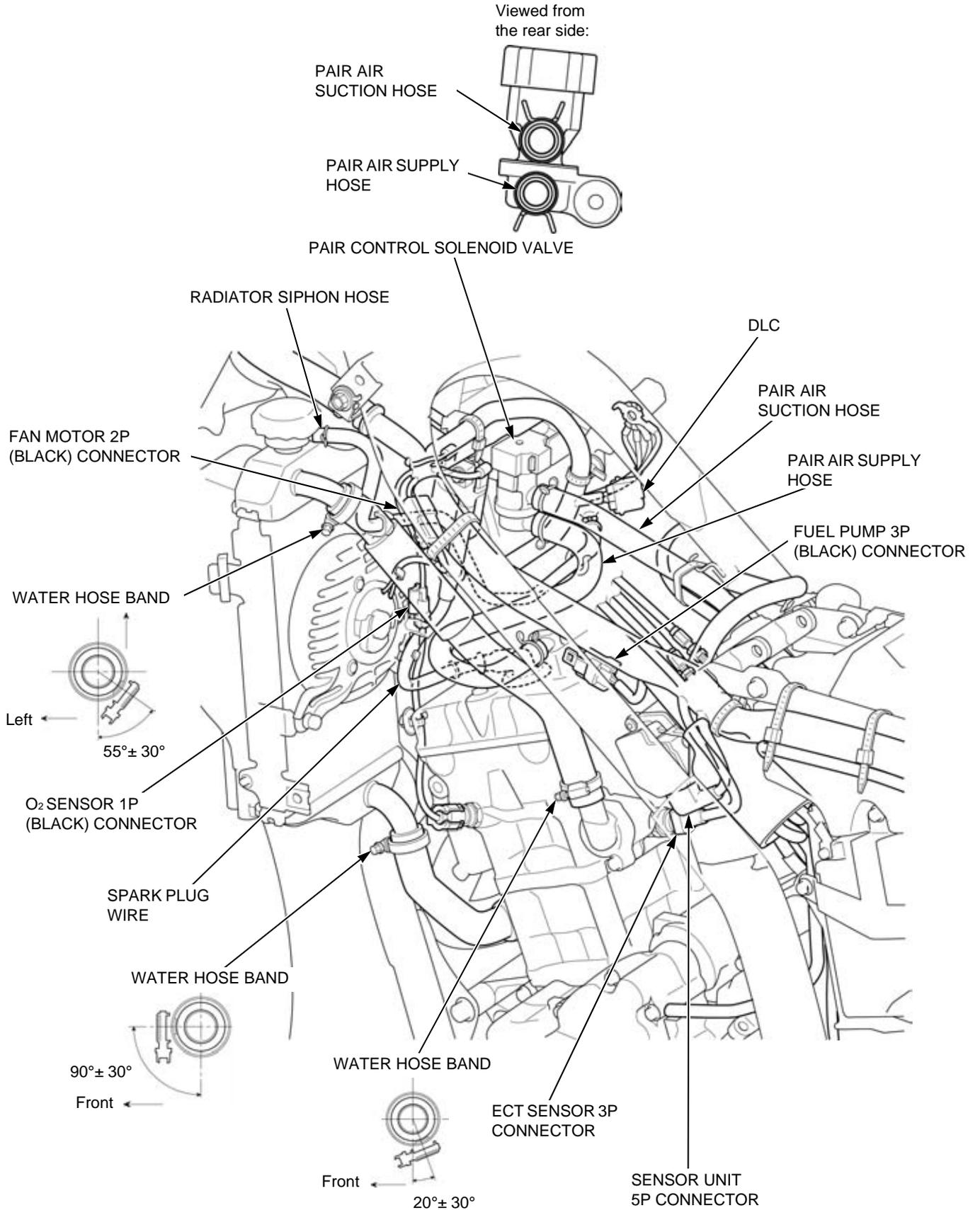


Viewed from the front side:



GENERAL INFORMATION





GENERAL INFORMATION

CONNECTORS:

- ALTERNATOR 3P
- REAR BRAKE LIGHT SWITCH 3P (BLACK)
- SIDESTAND SWITCH 3P (GREEN)
- CKP SENSOR/NEUTRAL SWITCH 3P (BLACK)

ECT SENSOR 3P CONNECTOR

STARTER MOTOR CABLE

BATTERY NEGATIVE (-) CABLE

CRANKCASE BREATHER HOSE

Viewed from the lower side:
 DRIVE SPROCKET COVER
 NEUTRAL SWITCH WIRE
 LEFT CRANKCASE COVER

FUEL TANK BREATHER HOSE

VS SENSOR 3P (BLUE) CONNECTOR

WIRE CLAMP
 Viewed from the upper side:
 BATTERY NEGATIVE (-) CABLE
 SIDESTAND SWITCH WIRE

ALTERNATOR WIRE

BATTERY CASE DRAIN HOSE

NEUTRAL SWITCH

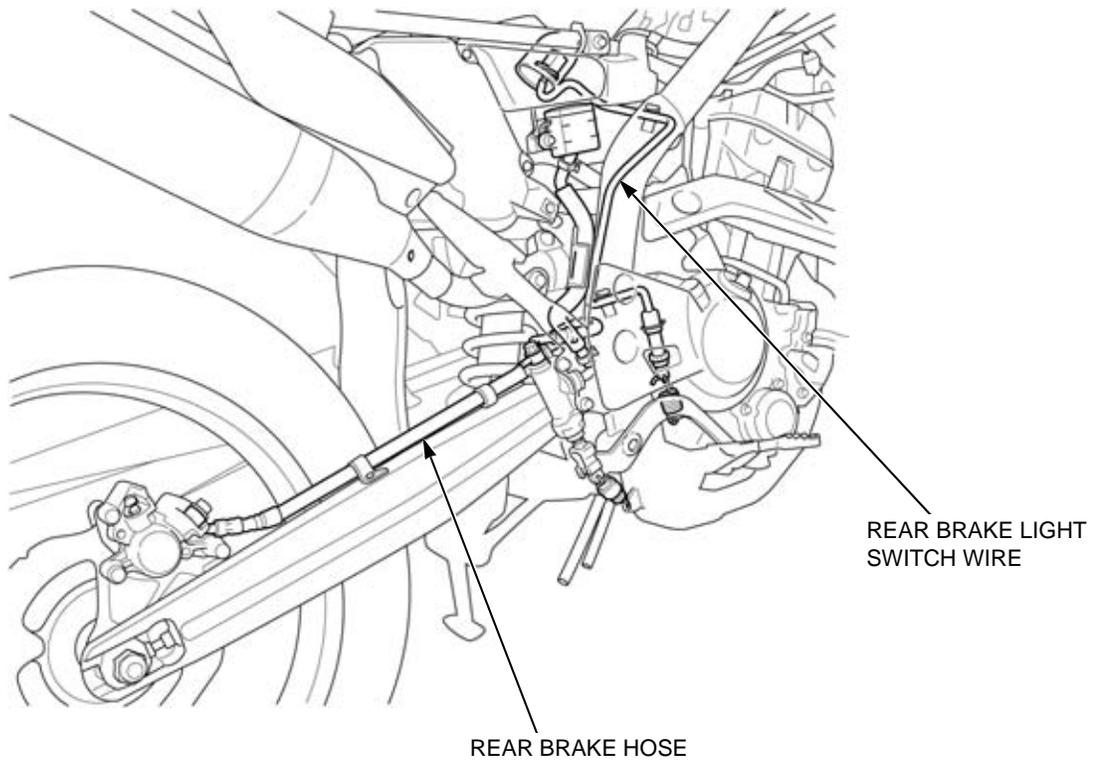
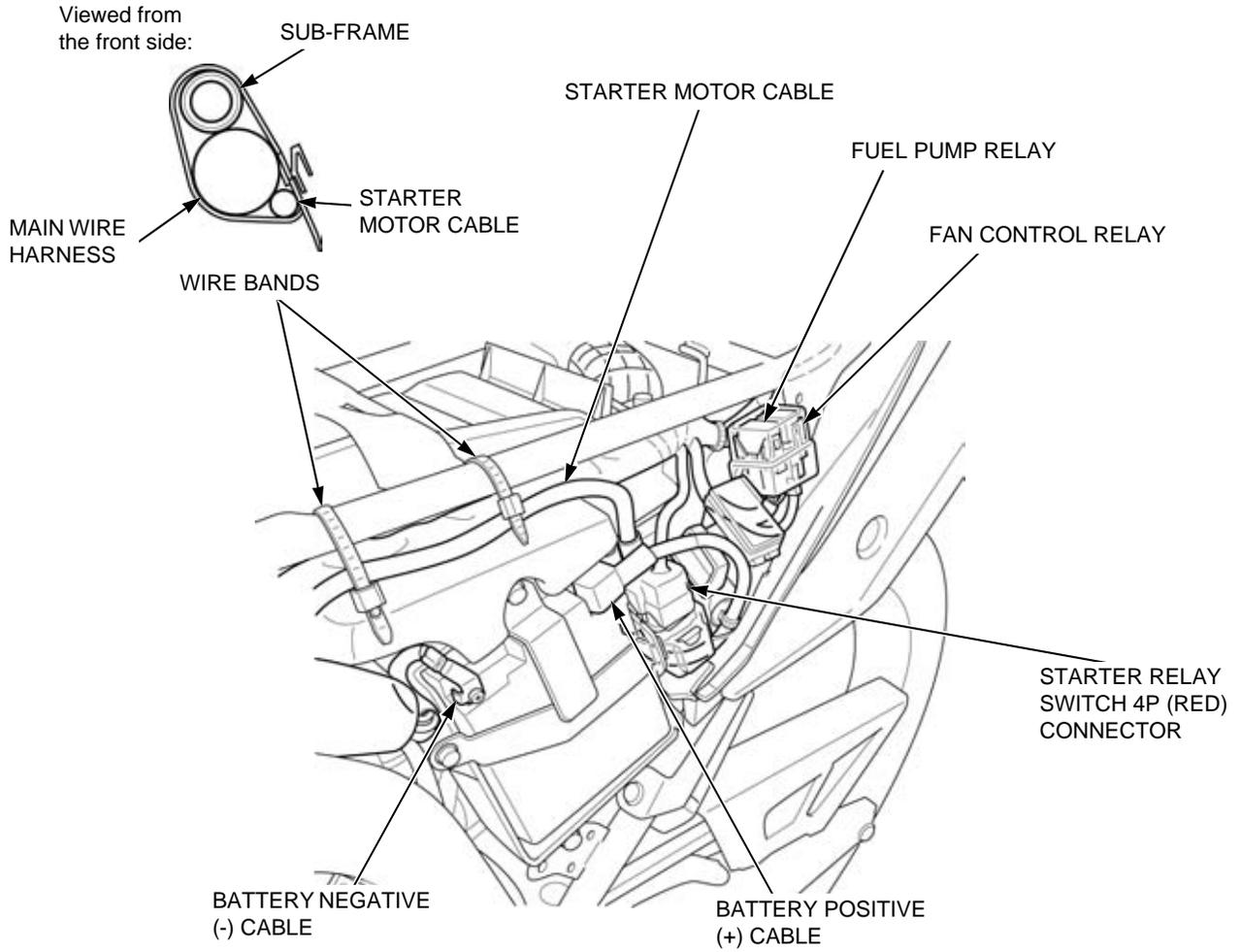
SIDESTAND SWITCH WIRE

SIDESTAND SWITCH WIRE

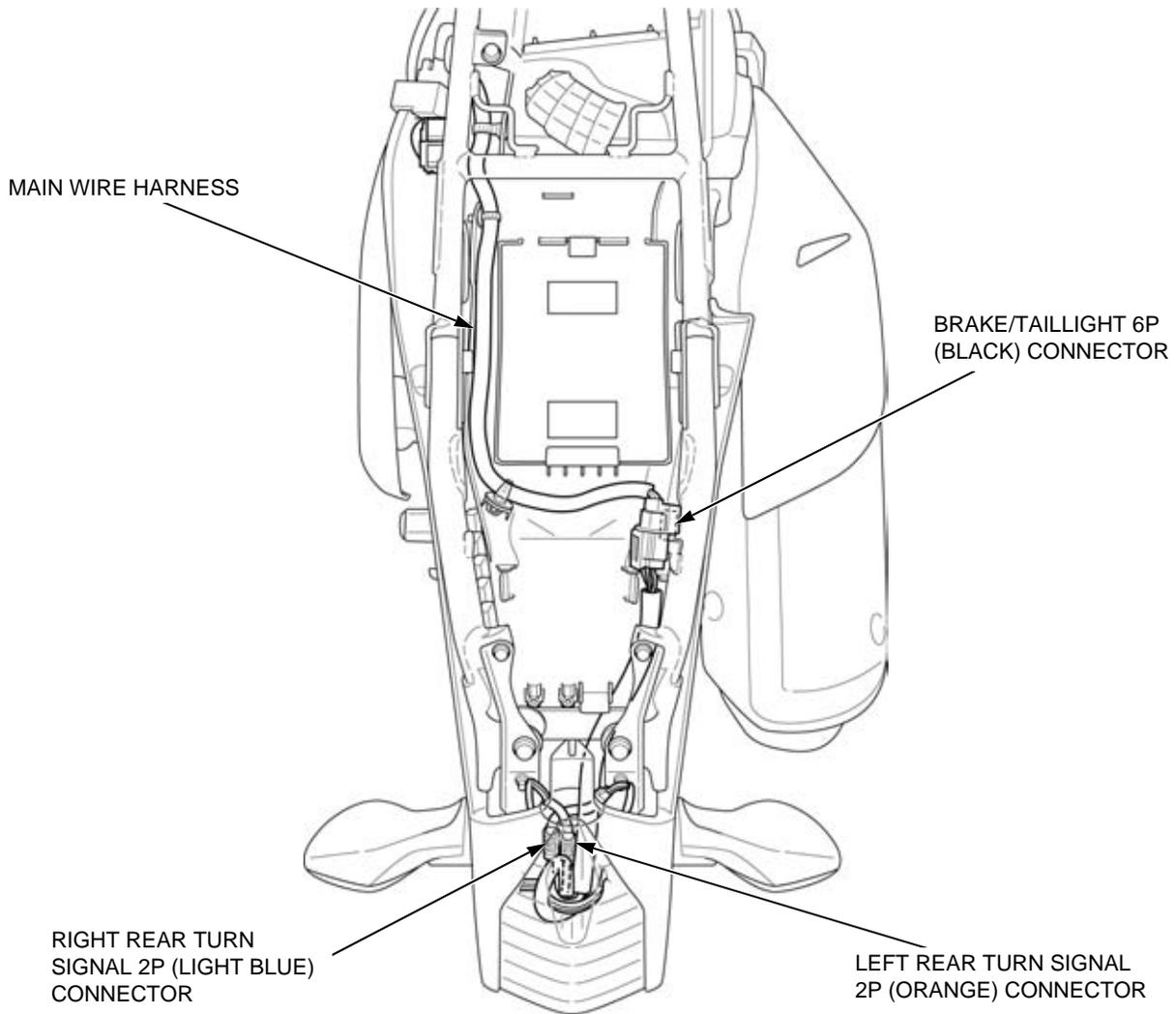
BATTERY CASE DRAIN HOSE

RESERVE TANK OVERFLOW HOSE

FUEL TANK BREATHER HOSE



GENERAL INFORMATION



EMISSION CONTROL SYSTEMS

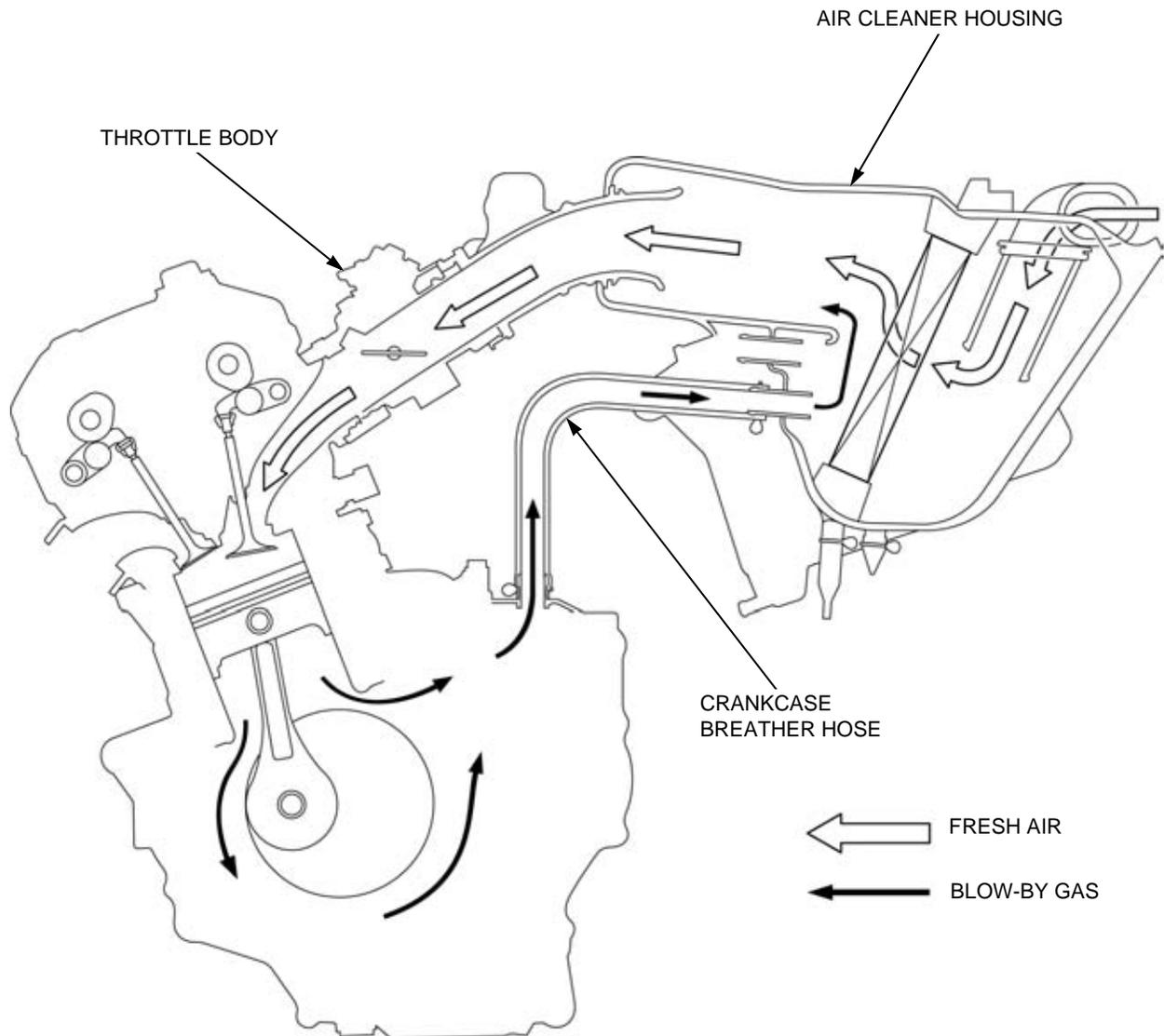
SOURCE OF EMISSIONS

The combustion process produces carbon monoxide (CO), oxides of nitrogen (NO_x) and hydrocarbons (HC). Control of 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 1-28) to reduce carbon monoxide, oxides of nitrogen and hydrocarbons.

CRANKCASE EMISSION CONTROL SYSTEM

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



GENERAL INFORMATION

EXHAUST EMISSION CONTROL SYSTEM

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

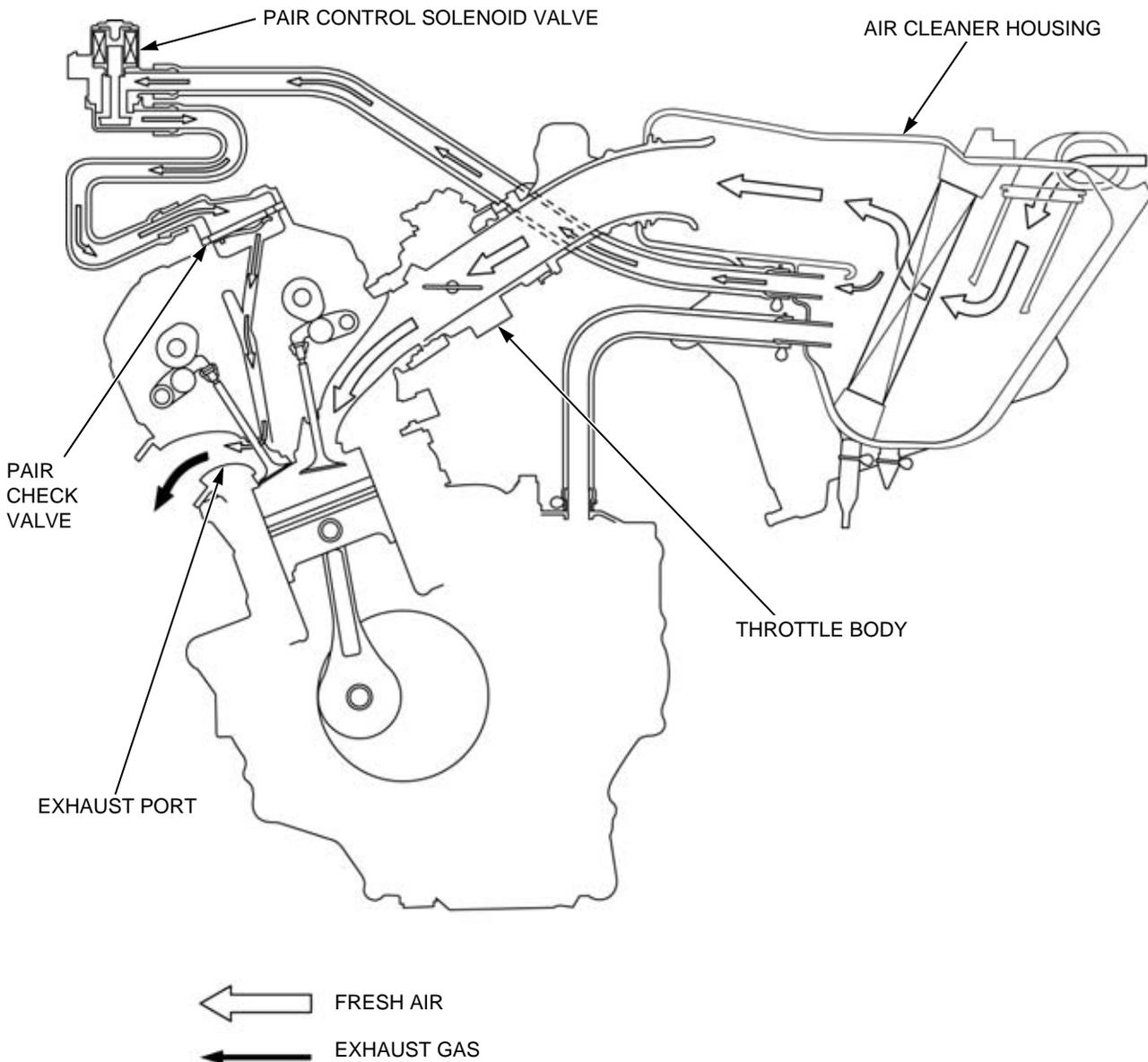
SECONDARY AIR SUPPLY SYSTEM

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

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

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

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



THREE-WAY CATALYTIC CONVERTER

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

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

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

NOISE EMISSION CONTROL SYSTEM

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

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

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

MEMO

2. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION.....	2-2	DRIVE SPROCKET COVER	2-6
TROUBLESHOOTING.....	2-2	DRIVE CHAIN COVER (U TYPE ONLY)	2-6
SEAT.....	2-3	TOOL BOX.....	2-7
SIDE COVER	2-3	REAR FENDER.....	2-7
RESERVE TANK COVER	2-4	REAR UPPER FENDER	2-8
FUEL TANK SHROUD	2-4	TAIL COVER/LIGHT UNIT.....	2-8
SKID PLATE.....	2-5	REAR LOWER FENDER	2-9
HEADLIGHT COWL	2-5	EXHAUST PIPE/MUFFLER	2-11
FRONT FENDER.....	2-5	SUB-FRAME	2-12
FRAME GUARD	2-6	SIDESTAND.....	2-14

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the body panels, sub-frame and exhaust system.
- Always replace the gaskets when removing the exhaust system.
- Always inspect the exhaust system for leaks after installation.

TROUBLESHOOTING

Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

SEAT

REMOVAL/INSTALLATION

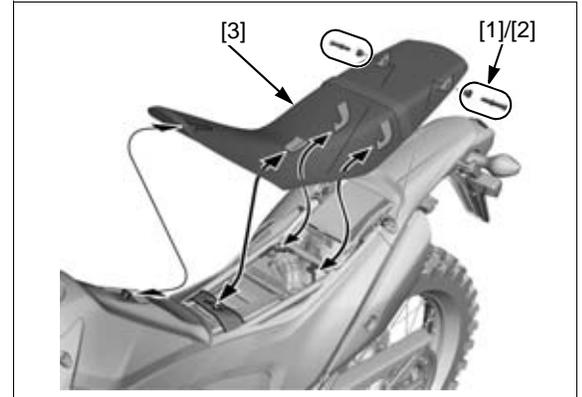
Remove the hook bolts [1] and collars [2].

Remove the seat [3] by pulling it rearward and releasing the hooks.

Installation is in the reverse order of removal.

TORQUE:

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



SIDE COVER

REMOVAL/INSTALLATION

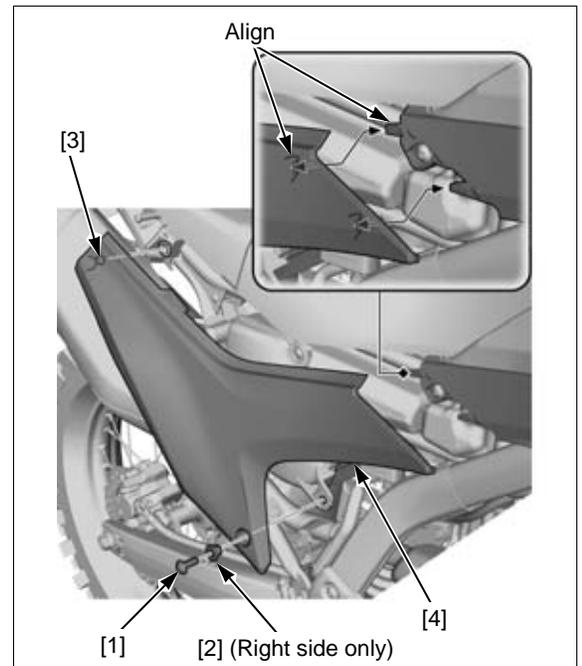
Right side: Remove the socket bolt [1] and collar [2].

Left side: Remove the socket bolt [1].

Release the boss [3] from the frame grommet, then remove the side cover [4] by pulling it rearward.

Installation is in the reverse order of removal.

- Align the cover grooves with the tabs of the fuel tank shroud.



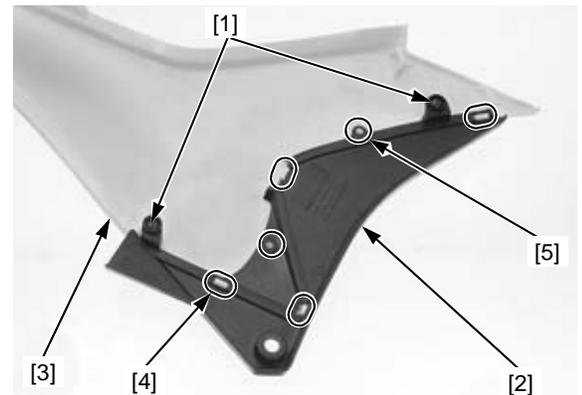
DISASSEMBLY/ASSEMBLY (LEFT SIDE ONLY)

Remove the screws [1] and separate the side lower cover [2] from the left side cover [3] by releasing its slots [4] and holes [5] from the hooks and bosses of the side cover.

Assembly is in the reverse order of disassembly.

TORQUE:

**Left side cover assembly screw:
0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)**



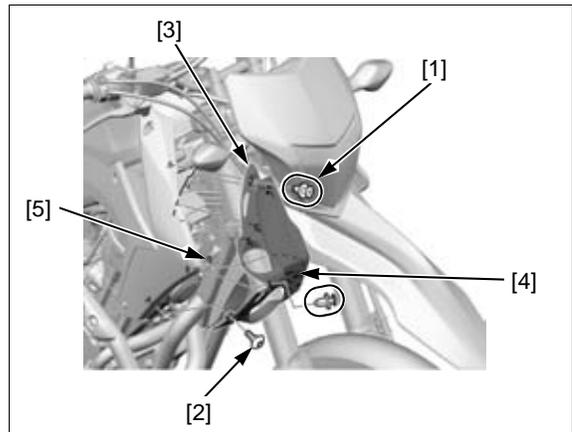
RESERVE TANK COVER

REMOVAL/INSTALLATION

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

Installation is in the reverse order of removal.

- Align the cover boss [4] with the hole [5] of the stay.



FUEL TANK SHROUD

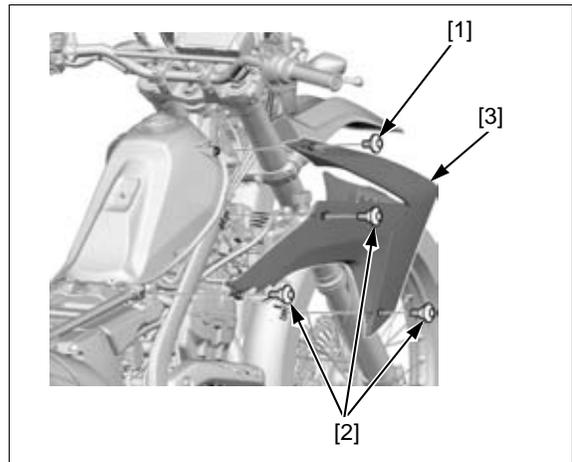
REMOVAL/INSTALLATION

Right side only: Remove the reserve tank cover (page 2-4).

Remove the side cover (page 2-3).

Remove the socket bolt A [1], socket bolts B [2] and fuel tank shroud [3].

Installation is in the reverse order of removal.



DISASSEMBLY/ASSEMBLY

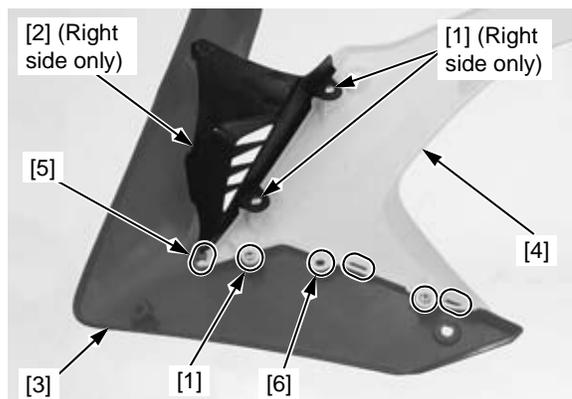
Right side: Remove the four screws [1] and separate the grille [2] and front shroud [3] from the rear shroud [4] by releasing its tabs [5] and boss [6] from the slots and hole of the rear shroud.

Left side: Remove the two screws [1] and separate the front shroud [3] from the rear shroud [4] by releasing its tabs [5] and boss [6] from the slots and hole of the rear shroud.

Assembly is in the reverse order of disassembly.

TORQUE:

**Fuel tank shroud assembly screw:
0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)**



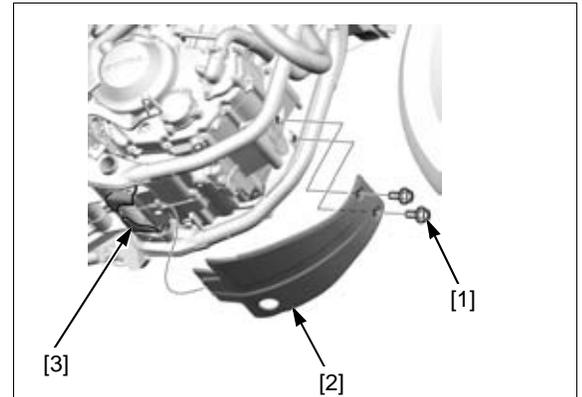
SKID PLATE

REMOVAL/INSTALLATION

Remove the two bolts [1] and skid plate [2].

Installation is in the reverse order of removal.

- Align the rear side of the skid plate with the frame slot [3].



HEADLIGHT COWL

REMOVAL/INSTALLATION

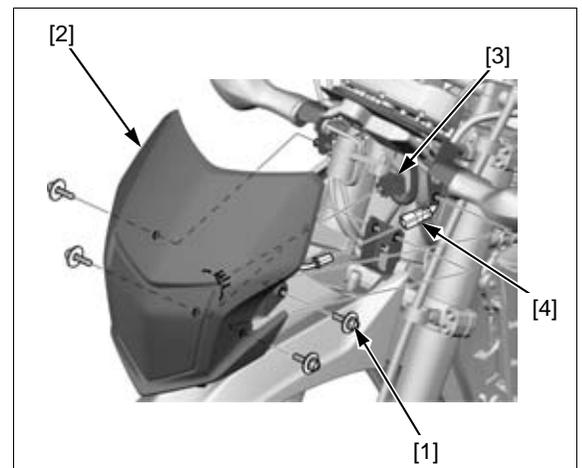
Remove the four bolt/washers [1] and headlight cowl [2].

Disconnect the headlight 3P (Black) connector [3] and position light 2P (Black) connector [4].

Installation is in the reverse order of removal.

TORQUE:

Headlight cowl mounting bolt:
8.5 N·m (0.9 kgf·m, 6.3 lbf·ft)

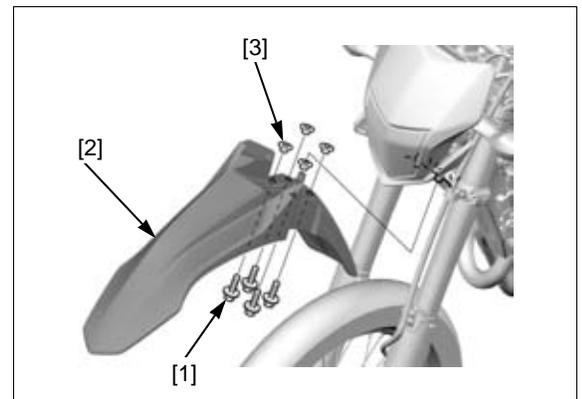


FRONT FENDER

REMOVAL/INSTALLATION

Remove the four bolt/washers [1], front fender [2] and collars [3].

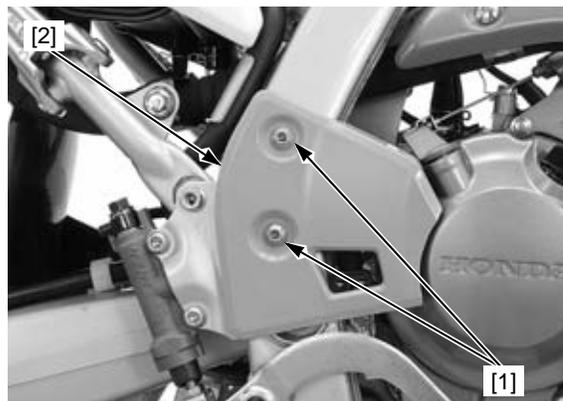
Installation is in the reverse order of removal.



FRAME GUARD

REMOVAL/INSTALLATION

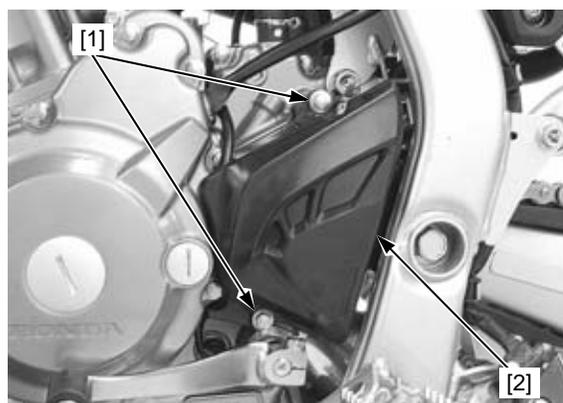
Remove the socket bolts [1] and frame guard [2].
Installation is in the reverse order of removal.



DRIVE SPROCKET COVER

REMOVAL/INSTALLATION

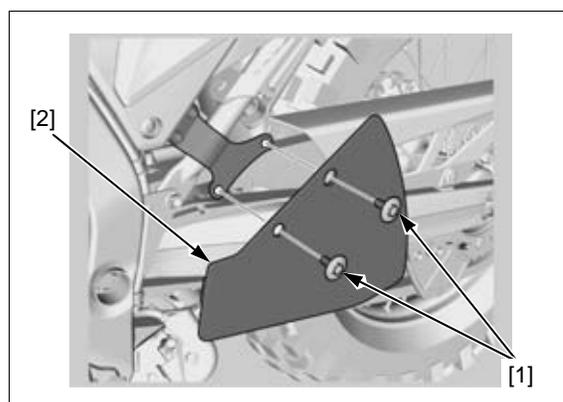
Remove the bolts [1] and drive sprocket cover [2].
Installation is in the reverse order of removal.



DRIVE CHAIN COVER (U TYPE ONLY)

REMOVAL/INSTALLATION

Remove the socket bolts [1] and drive chain cover [2].
Installation is in the reverse order of removal.



TOOL BOX

REMOVAL/INSTALLATION

Remove the following:

- Seat (page 2-3)
- Left side cover (page 2-3)

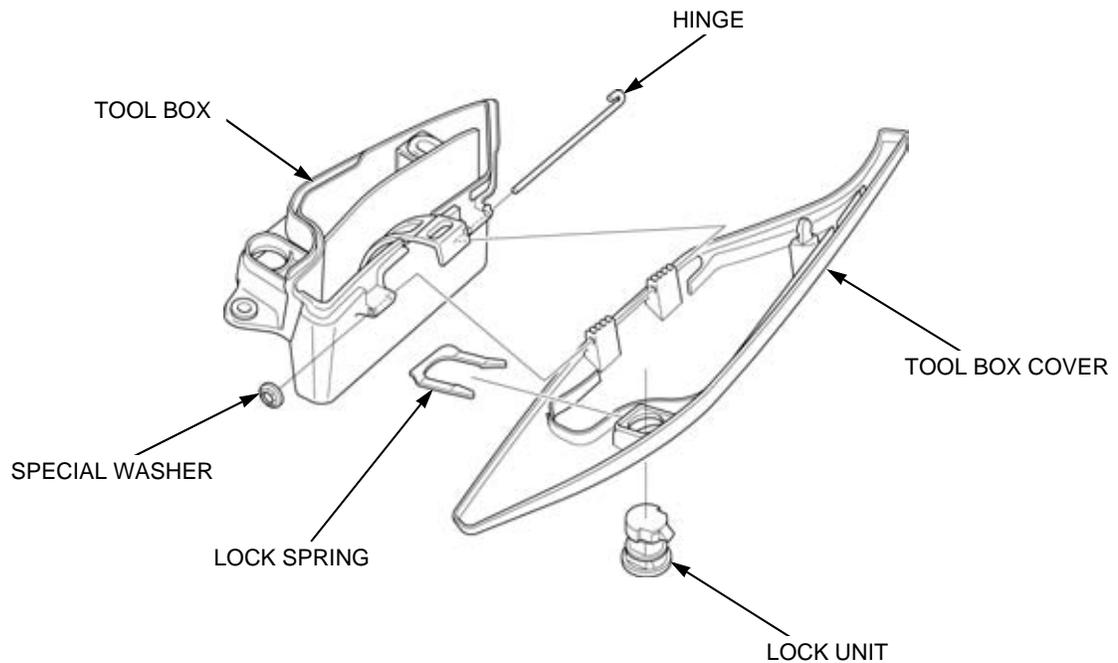
Remove the two mounting bolts [1] and tool box [2].

Installation is in the reverse order of removal.



DISASSEMBLY/ASSEMBLY

Disassemble and assemble the tool box as following illustration.

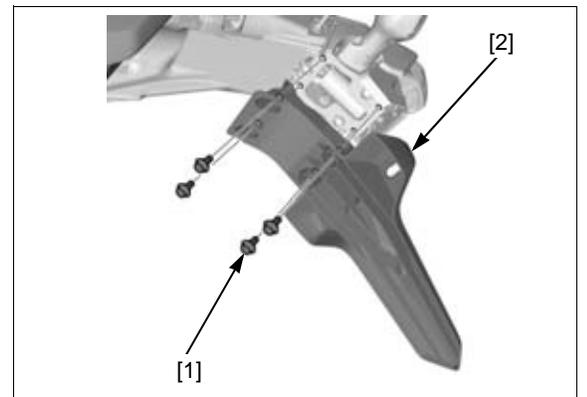


REAR FENDER

REMOVAL/INSTALLATION

Remove the bolts [1] and rear fender [2].

Installation is in the reverse order of removal.



FRAME/BODY PANELS/EXHAUST SYSTEM

DISASSEMBLY/ASSEMBLY (U TYPE ONLY)

Remove the nuts [1], bolts [2], collars [3], license holder plate [4] and license plate stay [5].

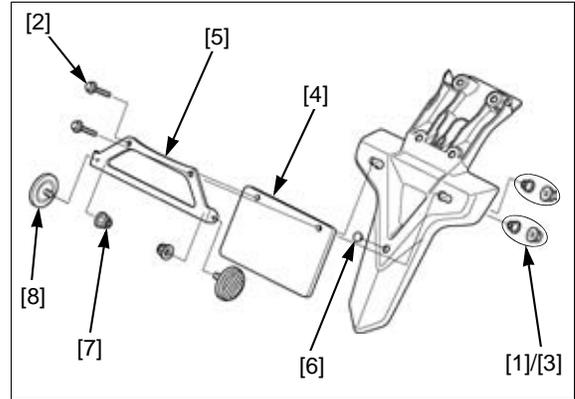
Remove the stopper rubber [6].

Remove the nuts [7] and rear side reflectors [8].

Assembly is in the reverse order of disassembly.

TORQUE:

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



REAR UPPER FENDER

REMOVAL/INSTALLATION

Remove the seat (page 2-3).

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

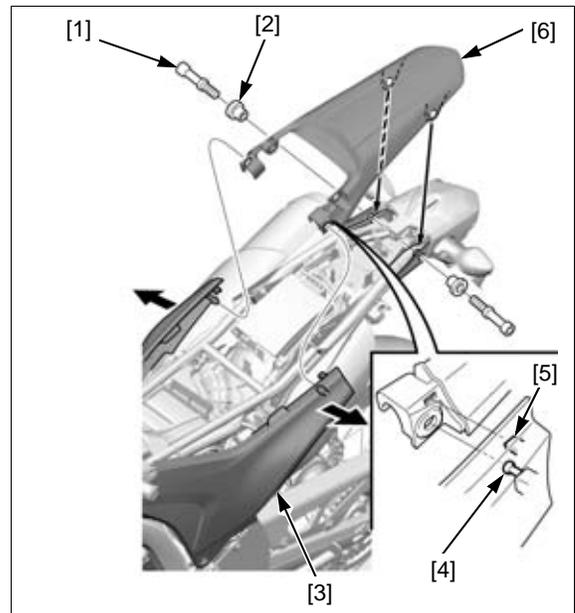
Slightly spread the side covers [3] and release the bosses [4] and tabs [5].

Remove the rear upper fender [6].

Installation is in the reverse order of removal.

TORQUE:

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



TAIL COVER/LIGHT UNIT

REMOVAL/INSTALLATION

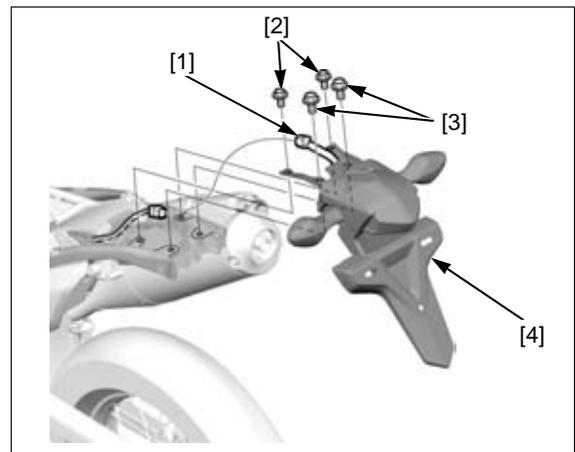
Remove the following:

- Rear upper fender (page 2-8)
- Rear fender (page 2-7)

Disconnect the brake/taillight 6P (Black) connector [1].

Remove the bolts A [2], bolts B [3] and tail cover/light unit [4].

Installation is in the reverse order of removal.

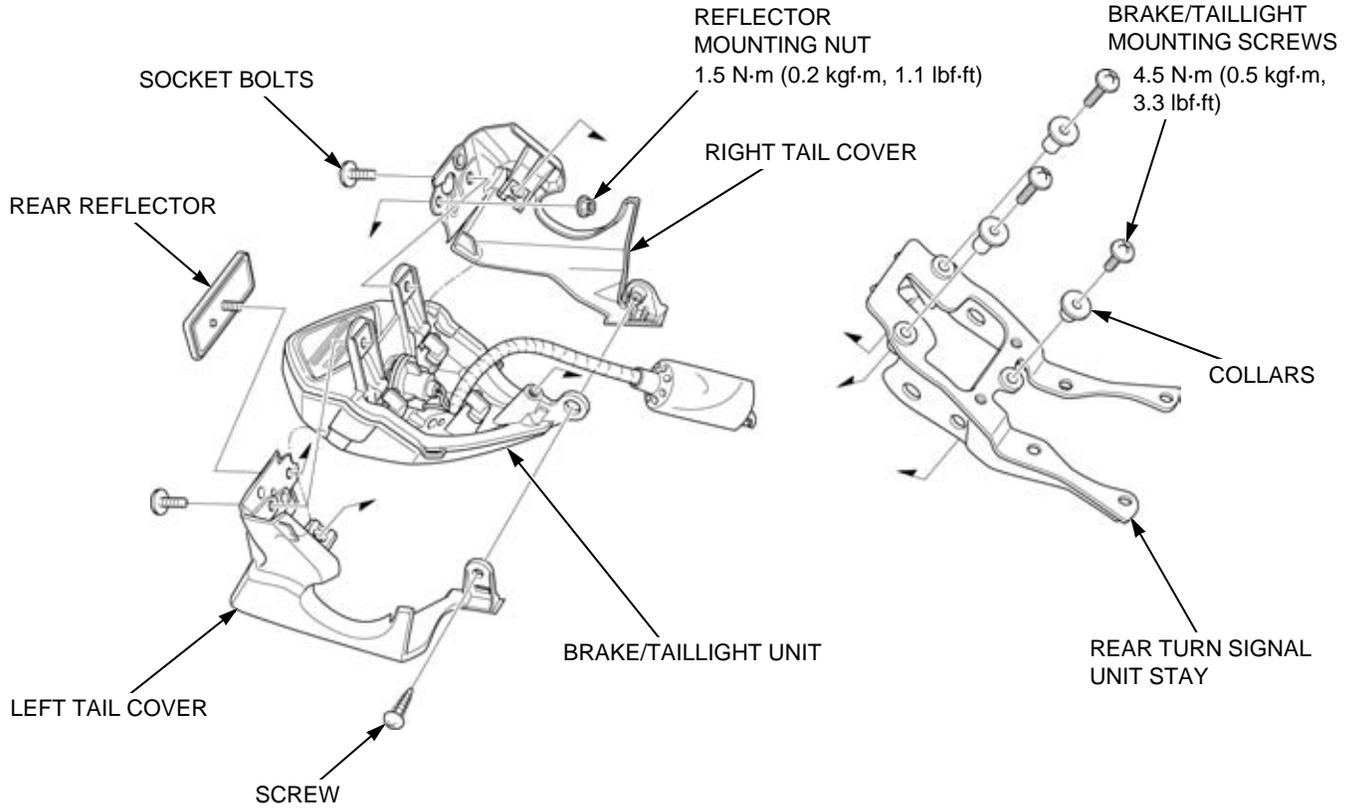


DISASSEMBLY/ASSEMBLY

Remove the following:

- Rear fender (page 2-7)
- Rear turn signal units (page 20-4)

Disassemble and assemble the tail cover/light unit as following illustration.



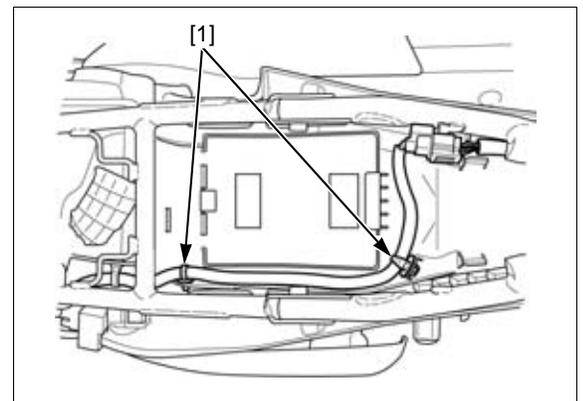
REAR LOWER FENDER

REMOVAL/INSTALLATION

Remove the following:

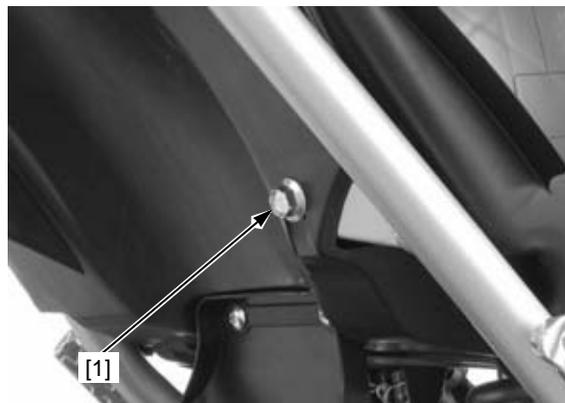
- Seat (page 2-3)
- Side covers (page 2-3)
- Tail cover/light unit (page 2-8)

Release the wire bands [1].



FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the rear lower fender mounting bolt [1].



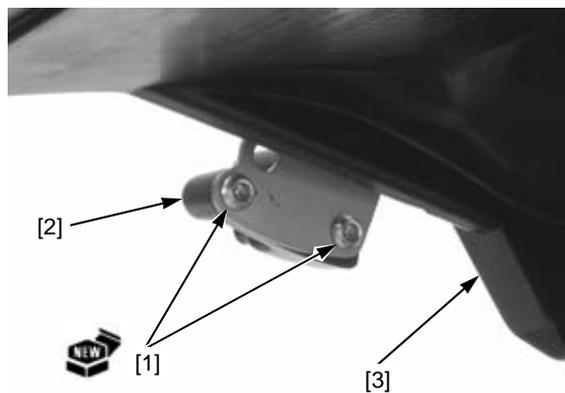
Remove the bolts [1], helmet holder [2] and rear lower fender [3].

NOTE:

Use a drill or an equivalent tool when removing the helmet holder mounting bolts.

Installation is in the reverse order of removal.

- Replace the helmet holder mounting bolts with new ones.



EXHAUST PIPE/MUFFLER

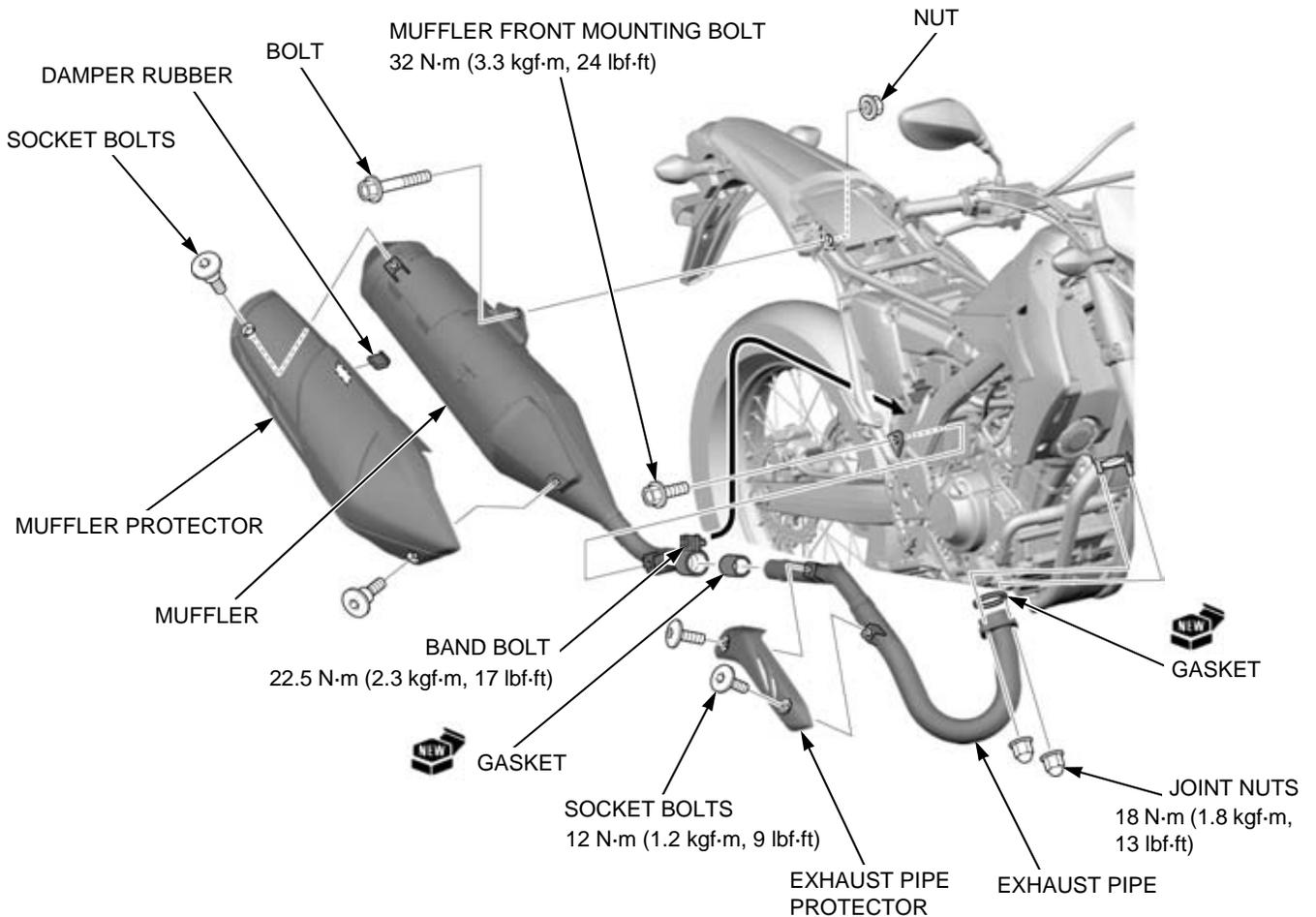
REMOVAL/INSTALLATION

Remove the following:

- Seat (page 2-3)
- Right side cover (page 2-3)

Remove the exhaust pipe/muffler as following illustration.

Installation is in the reverse order of removal.



STUD BOLT REPLACEMENT

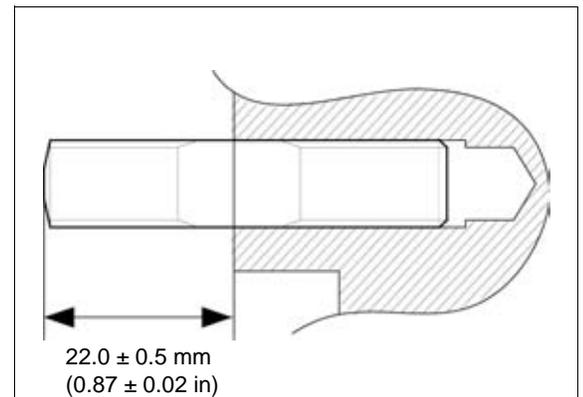
Remove the exhaust pipe (page 2-11).

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

Install and tighten new stud bolts to the specified torque.

TORQUE: 9.0 N·m (0.9 kgf·m, 6.6 lbf·ft)

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



SUB-FRAME

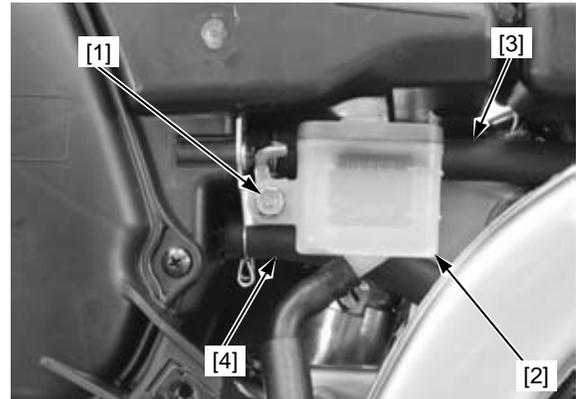
REMOVAL/INSTALLATION

Remove the following:

- Seat (page 2-3)
- Side covers (page 2-3)
- Muffler (page 2-11)
- Fuel tank (page 7-8)
- Battery (page 19-4)

Remove the bolt [1] and reservoir [2].

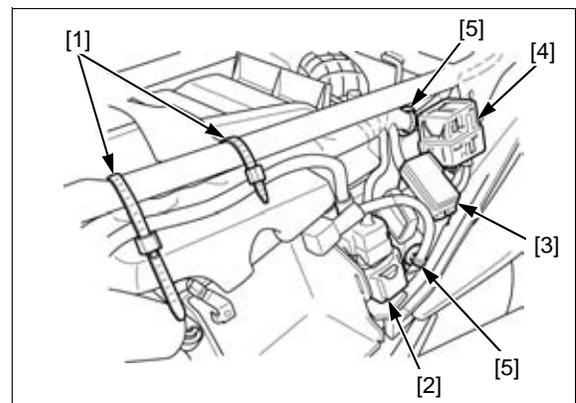
Disconnect the PAIR air suction hose [3] and crankcase breather hose [4] from the air cleaner housing.



Remove the wire bands [1].

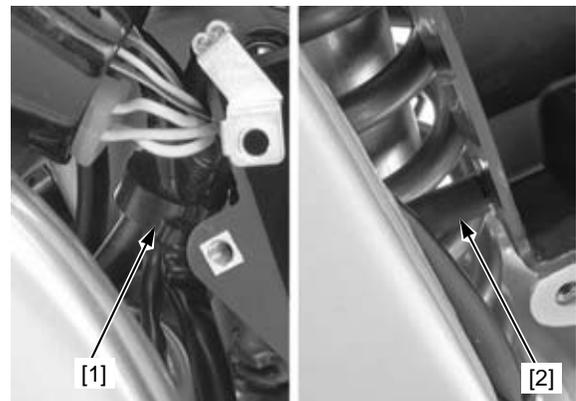
Remove the following from the air cleaner housing.

- Starter relay switch [2]
- Fuse box [3]
- Relay box [4]
- Wire clips [5]



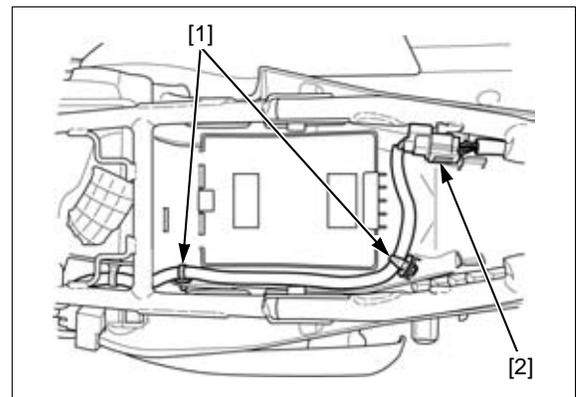
Open the harness band [1] and release the wires.

Disconnect the battery case drain hose [2].

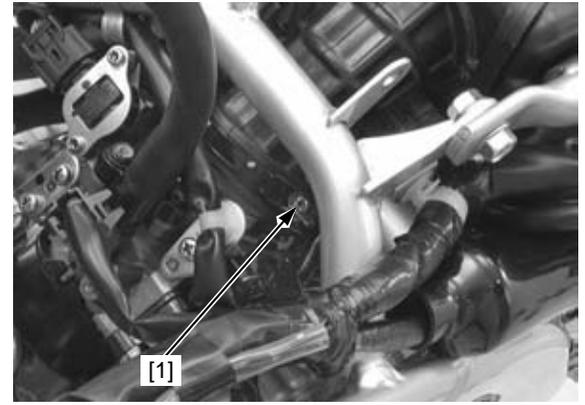


Release the wire bands [1].

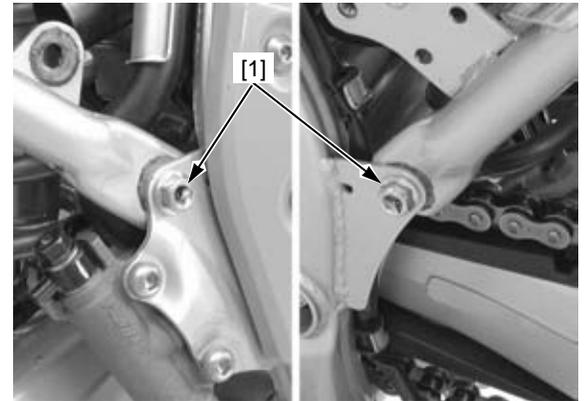
Disconnect the brake/taillight 6P (Black) connector [2].



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

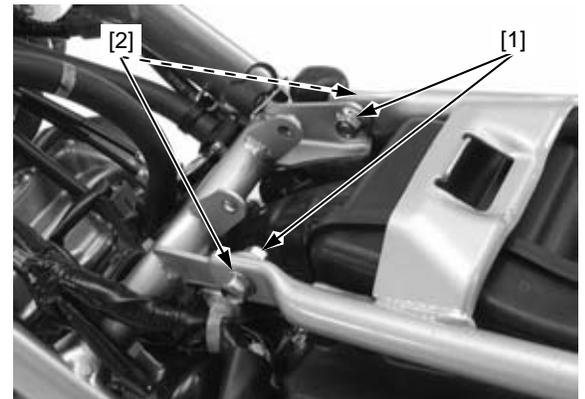


Remove the sub-frame lower mounting bolts [1].



Remove the sub-frame upper mounting nuts [1] and bolts [2].

Pull the sub-frame assembly rearward, then disconnect the air cleaner connecting hose from the throttle body. Remove the sub-frame.



Install the sub-frame in position, connect the air cleaner connecting hose to the throttle body. Tighten the band screw to the specified torque.

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

Loosely install all the mounting fasteners. Tighten the upper mounting nut first, then the lower bolts to the specified torque.

TORQUE:

Sub-frame upper mounting nut:

27 N·m (2.8 kgf·m, 20 lbf·ft)

Sub-frame lower mounting bolt:

27 N·m (2.8 kgf·m, 20 lbf·ft)

Install the removed parts in the reverse order of removal.

TORQUE:

Rear master cylinder reservoir mounting bolt:

10 N·m (1.0 kgf·m, 7 lbf·ft)

SIDESTAND

REMOVAL/INSTALLATION

Remove the sidestand switch (page 20-14).

Remove the return spring [1] and sub spring [2].

Remove the pivot lock nut [3], pivot bolt [4] and sidestand [5].

Apply grease to the sidestand pivot bolt sliding surface. Install the sidestand and pivot bolt, then tighten it to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

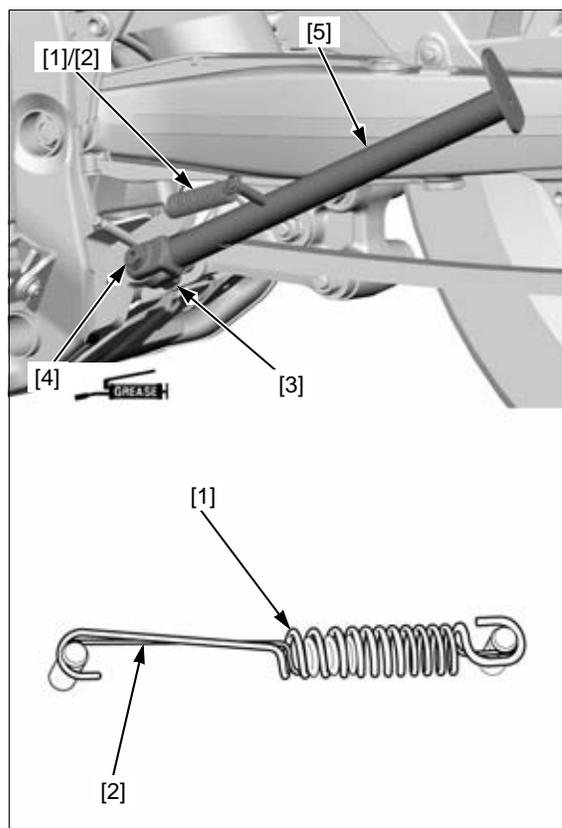
Turn the pivot bolt counterclockwise about 45° – 90°.

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

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Install the return spring and sub spring as shown.

Install the sidestand switch (page 20-14).



SERVICE INFORMATION.....	3-2	DRIVE CHAIN	3-12
MAINTENANCE SCHEDULE.....	3-2	DRIVE CHAIN SLIDER	3-14
FUEL LINE.....	3-3	BRAKE FLUID	3-15
THROTTLE OPERATION.....	3-3	BRAKE PADS WEAR	3-16
AIR CLEANER.....	3-4	BRAKE SYSTEM	3-17
CRANKCASE BREATHER	3-4	BRAKE LIGHT SWITCH	3-17
SPARK PLUG.....	3-5	HEADLIGHT AIM	3-18
VALVE CLEARANCE.....	3-6	CLUTCH SYSTEM	3-18
ENGINE OIL	3-9	SIDESTAND.....	3-19
ENGINE OIL FILTER.....	3-10	SUSPENSION	3-19
ENGINE IDLE SPEED.....	3-10	NUTS, BOLTS, FASTENERS	3-19
RADIATOR COOLANT	3-11	WHEELS/TIRES.....	3-20
COOLING SYSTEM.....	3-11	STEERING HEAD BEARINGS	3-20
SECONDARY AIR SUPPLY SYSTEM.....	3-11		

MAINTENANCE

SERVICE INFORMATION

GENERAL

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

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	NOTE	FREQUENCY (NOTE 1)					ANNUAL CHECK	REGULAR REPLACE	REFER TO PAGE
		x 1,000 km x 1,000 mi	1 0.6	12 8	24 16	36 24			
* FUEL LINE			I	I	I	I	I		3-3
* THROTTLE OPERATION			I	I	I	I	I		3-3
* AIR CLEANER	NOTE 2				R		R		3-4
CRANKCASE BREATHER	NOTE 3			C	C	C	C	C	3-4
* SPARK PLUG					I		R		3-5
* VALVE CLEARANCE			I		I		I		3-6
ENGINE OIL			R	R	R	R	R		3-9
ENGINE OIL FILTER			R	R	R	R	R		3-10
* ENGINE IDLE SPEED			I	I	I	I	I		3-10
RADIATOR COOLANT	NOTE 5			I	I	I	I	3 YEARS	3-11
* COOLING SYSTEM				I	I	I	I		3-11
* SECONDARY AIR SUPPLY SYSTEM				I	I	I	I		3-11
DRIVE CHAIN	NOTE 4		EVERY 1,000 km (600 mi) I, L						3-12
DRIVE CHAIN SLIDER	NOTE 4			I	I	I	I		3-14
BRAKE FLUID	NOTE 5			I	I	I	I	2 YEARS	3-15
BRAKE PADS WEAR				I	I	I	I		3-16
BRAKE SYSTEM			I	I	I	I	I		3-17
BRAKE LIGHT SWITCH				I	I	I	I		3-17
HEADLIGHT AIM				I	I	I	I		3-18
CLUTCH SYSTEM			I	I	I	I	I		3-18
SIDESTAND				I	I	I	I		3-19
* SUSPENSION				I	I	I	I		3-19
* NUTS, BOLTS, FASTENERS	NOTE 4		I	I	I	I	I		3-19
** WHEELS/TIRES	NOTE 4		I	EVERY 6,000 km (4,000 mi) I			I		3-20
** STEERING HEAD BEARINGS			I	I	I	I	I		3-20

* Should be serviced by a dealer, unless the owner has proper tools and service data and is mechanically qualified.

** In the interest of safety, we recommend these items be serviced only by a dealer.

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

NOTES:

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

FUEL LINE

INSPECTION

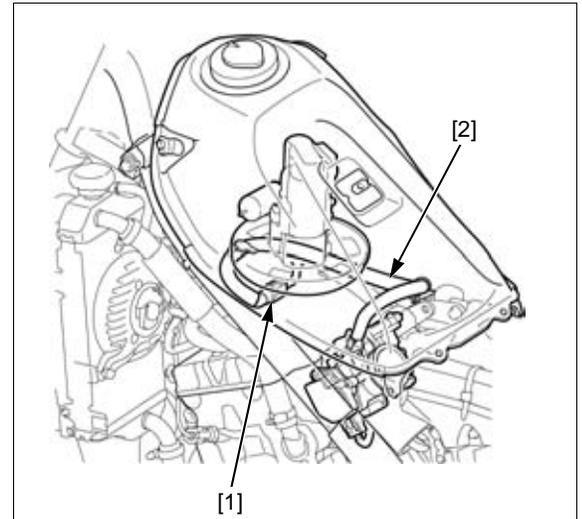
Remove the right fuel tank shroud (page 2-4).

Check the quick connect fitting [1] for looseness.

Check the fuel feed hose [2] for deterioration, damage or leakage.

Check the quick connect fitting for dirt, and clean if necessary.

Replace the fuel pump packing if necessary (page 7-9).



THROTTLE OPERATION

Check for any deterioration or damage to the throttle cable.

Check the throttle grip for smooth operation.

Check that the throttle opens and automatically closes in all steering positions.

If the throttle grip does not return properly, overhaul and lubricate the throttle grip housing.

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

With the engine idling, turn the handlebar all the way to the right and left to ensure that the idle speed does not change.

If idle speed increases, check the throttle grip freeplay and throttle cable connection.

Measure the throttle grip freeplay at the throttle grip flange.

FREEPLAY: 2 – 6 mm (0.08 – 0.24 in)

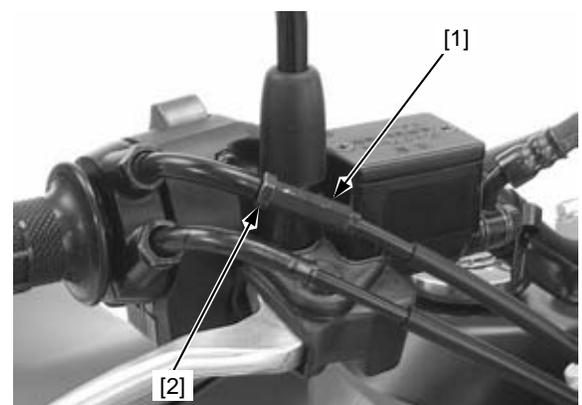
Throttle grip freeplay can be adjusted at either end of the throttle cable.

Minor adjustment is made with the upper adjuster [1] at throttle housing.

Loosen the lock nut [2] and turn the adjuster.

Tighten the lock nut securely while holding the adjuster.

Recheck the throttle operation.



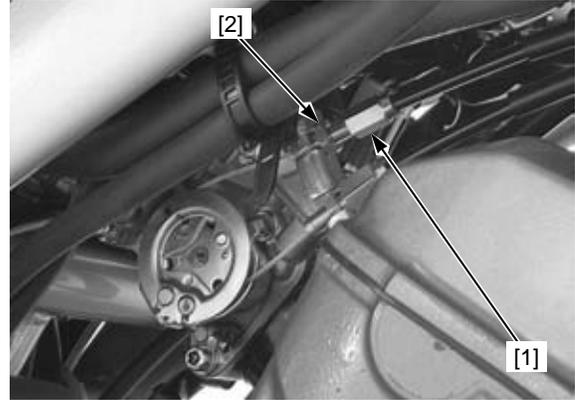
MAINTENANCE

Major adjustment is made with the lower adjuster [1] at the throttle body.

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

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

Recheck the throttle operation.



AIR CLEANER

REMOVAL/INSTALLATION

NOTE:

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

Remove the right side cover (page 2-3).

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

Remove the air cleaner element [3] by releasing its grooves from the housing.

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

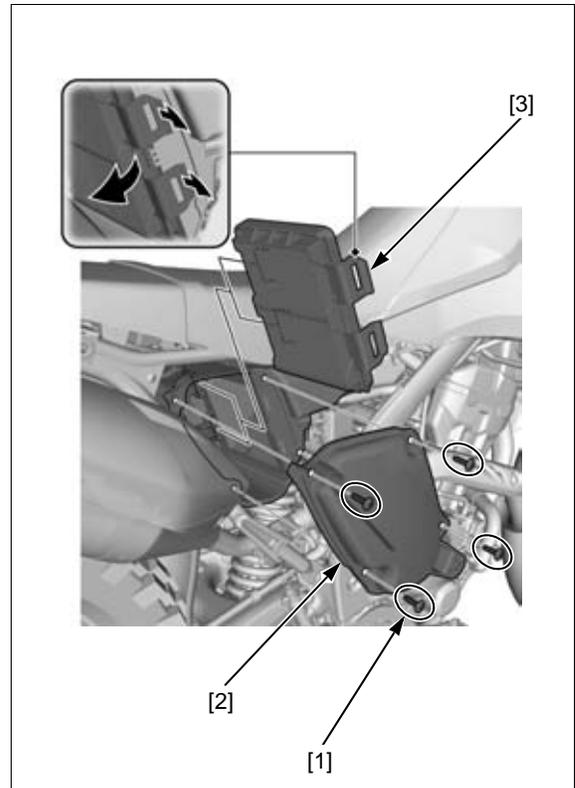
Install the air cleaner element in the reverse order of removal.

NOTE:

- After installing air cleaner element, make sure the air cleaner element grooves are secure.
- Check that the condition of the packings, replace them if necessary.

TORQUE:

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

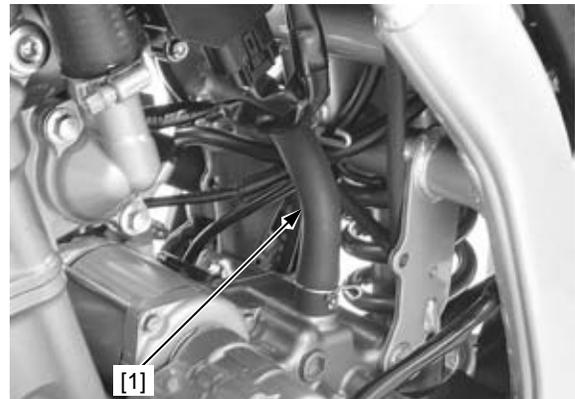


CRANKCASE BREATHER

Service more frequently when ridden in rain, at full throttle, or after the motorcycle is washed or overturned.

Check the crankcase breather hose [1] for deterioration, damage or loose connection. Make sure that the hoses are not kinked, pinched or cracked.

Replace the crankcase breather hose if necessary.



Service if the deposits level can be seen in the air cleaner housing drain plug.

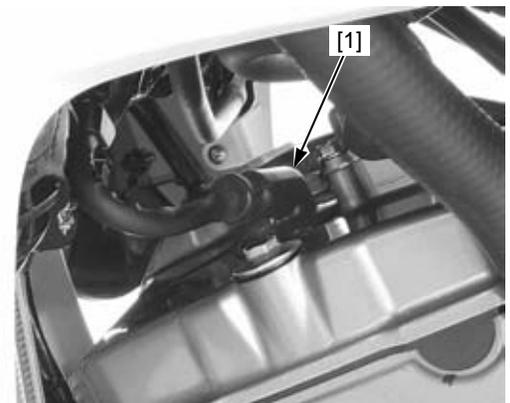
Check the air cleaner housing drain plug [1].
 If necessary, remove the drain plug from the air cleaner and drain the deposits into a suitable container.
 Reinstall the drain plug securely.



SPARK PLUG

REMOVAL/INSTALLATION

Disconnect the spark plug cap [1].



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

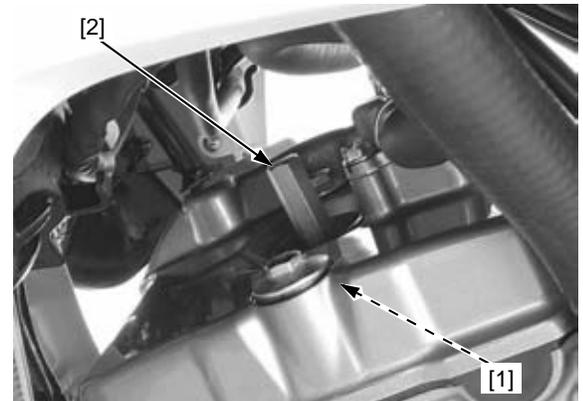
Remove the spark plug [1] using a spark plug wrench [2].

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

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

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Connect the spark plug cap securely.



INSPECTION

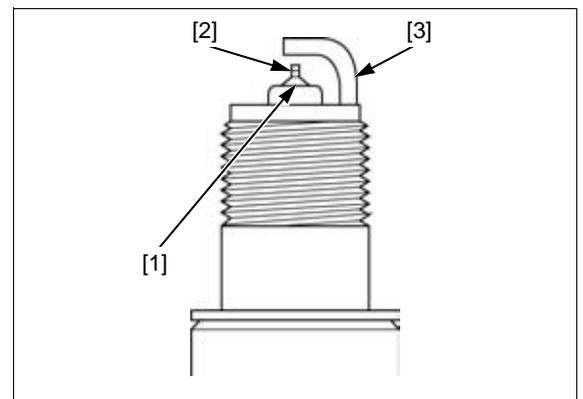
Check the following and replace if necessary (recommended spark plug: page 3-6).

NOTE:

- Insulator [1] for damage
- Center electrode [2] and side electrode [3] for wear
- Burning condition, coloration

This motorcycle's spark plug is equipped with an iridium center electrode. Replace the spark plug if the electrodes are contaminated.

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

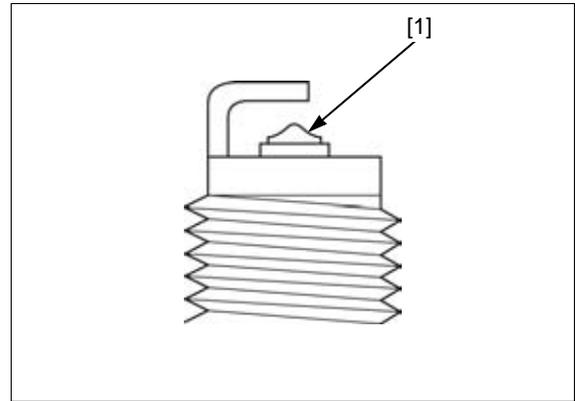


MAINTENANCE

Always use specified spark plugs on this motorcycle.

Replace the plug if the center electrode [1] is rounded as shown in the illustration.

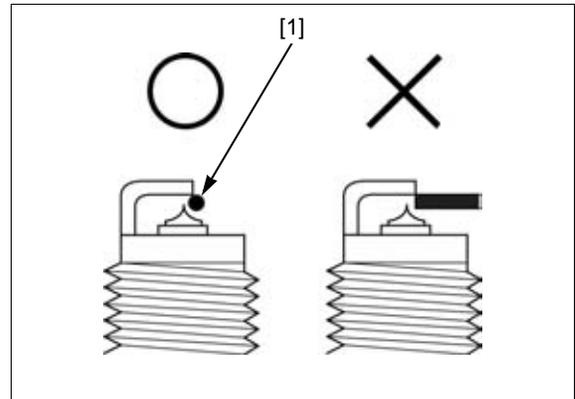
SPECIFIED SPARK PLUG:
NGK: SIMR8A9



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

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

Make sure that the Φ 1.0 mm (0.039 in) plug gauge does not insert between the gap.



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

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

VALVE CLEARANCE

INSPECTION

NOTE:

- Inspect and adjust the valve clearance while the engine is cold (below 35°C/95°F).
- After the valve clearance inspection, check the engine idle speed (page 3-10).
- Inspection and adjustment can be done with the engine installed in the frame.

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

Remove the timing hole cap [1] and crankshaft hole cap [2].

TOOL:

Timing cap wrench **07709-0010001**



Rotate the crankshaft counterclockwise and align the "T" mark [1] on the flywheel with the index notch [2] on the left crankcase cover.



Make sure that the outside index lines ("IN" [1] and "EX" [2] marks) on the cam sprockets are flush with the cylinder head top surface and facing outward as shown.

If the "IN" and "EX" marks are facing inward, turn the crankshaft counterclockwise one full turn (360°) and realign the "T" mark with the index notch.

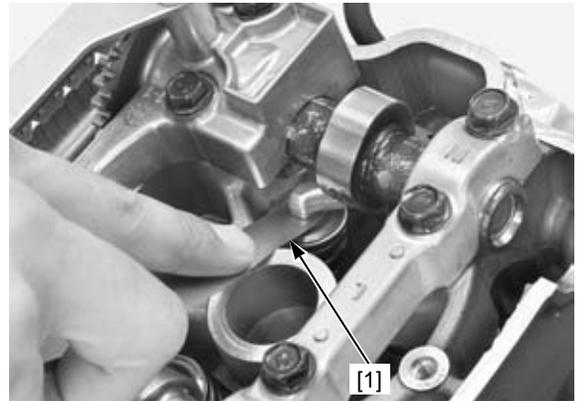


Check the valve clearance by inserting a feeler gauge [1] between the rocker arm and shim.

VALVE CLEARANCE:

IN: 0.16 ± 0.03 mm (0.006 ± 0.001 in)

EX: 0.27 ± 0.03 mm (0.011 ± 0.001 in)



ADJUSTMENT

NOTE:

- The valve clearances can be adjusted without removing the camshafts.
- The intake and exhaust valve clearance service procedures are the same.

Remove the bolt, sealing washer and rocker arm shaft (page 10-11).

Slide the rocker arm [1] and remove the shims [2].

NOTE:

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



MAINTENANCE

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

Measure the shim [1] thickness and record it.

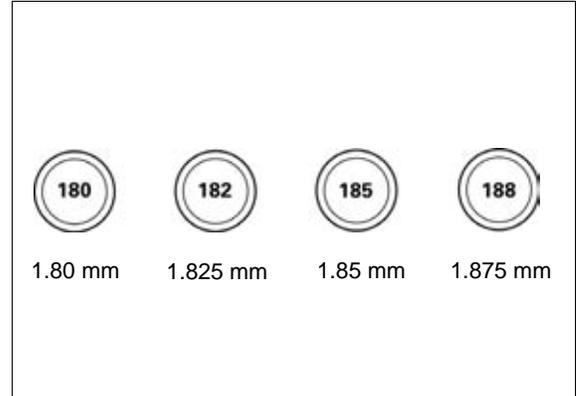
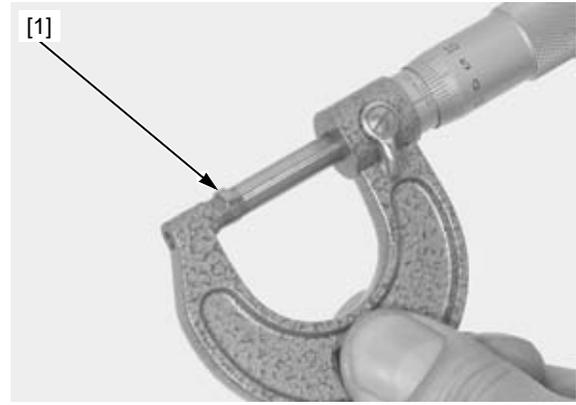
Calculate the new shim thickness using the equation below.

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

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

NOTE:

- Make sure of the correct shim thickness by measuring the shim by micrometer.
- Inspect the valve seat if the calculated dimension is over 2.900 mm.



Install the shims in their original locations

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

Install the rocker arm shaft while aligning the hole of the rocker arm [2] and cylinder head (page 10-11).

Rotate the camshafts by turning the crankshaft counterclockwise several times.
Recheck the valve clearance.



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

Apply engine oil to new O-rings [1] and install them to each hole cap.

Apply engine oil to timing hole cap [2] and crankshaft hole cap [3] threads.

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

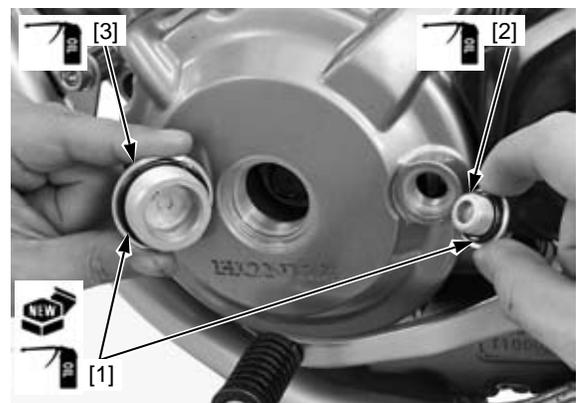
TOOL:

Timing cap wrench 07709-0010001

TORQUE:

Timing hole cap: 6.0 N-m (0.6 kgf-m, 4.4 lbf-ft)

Crankshaft hole cap: 8.0 N-m (0.8 kgf-m, 5.9 lbf-ft)



ENGINE OIL

OIL LEVEL INSPECTION

Hold the motorcycle in an upright position.

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

Check the oil level through the inspection window.

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

RECOMMENDED ENGINE OIL:

Honda "4-stroke motorcycle oil" or an equivalent
API classification: SG or higher (except oils labeled as energy conserving on the circular API service label)

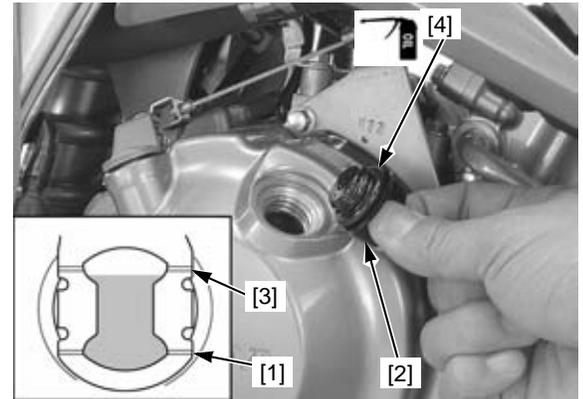
Viscosity: SAE 10W-30

JASO T 903 standard: MA

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

Apply engine oil to the O-ring.

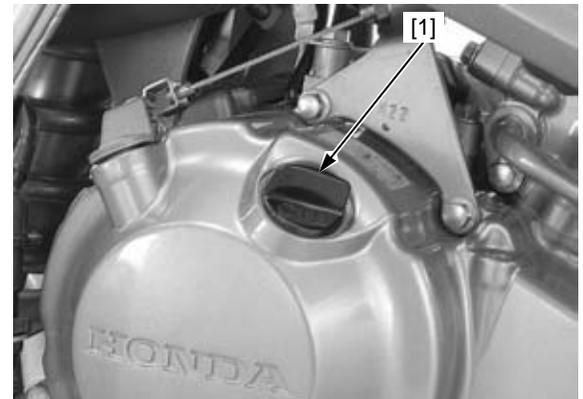
Install the oil filler cap.



ENGINE OIL CHANGE

Warm up the engine.

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



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

Drain the engine oil completely.

Install a new sealing washer onto the drain bolt.

Install and tighten the drain bolt to the specified torque.

TORQUE: 24 N·m (2.4 kgf·m, 18 lbf·ft)

Fill the engine with the recommended engine oil (page 3-9).

ENGINE OIL CAPACITY:

1.4 liters (1.5 US qt, 1.2 Imp qt) at draining

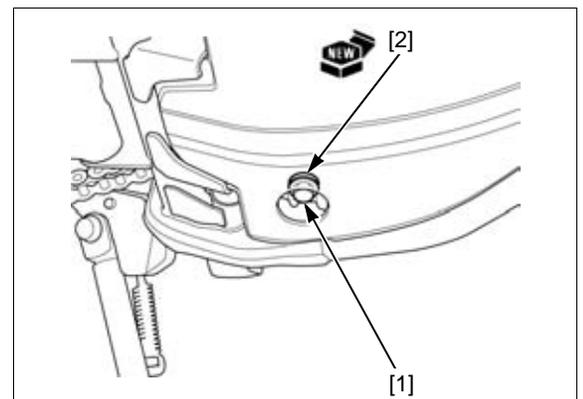
1.5 liters (1.6 US qt, 1.3 Imp qt) at oil filter change

1.8 liters (1.9 US qt, 1.6 Imp qt) at disassembly

Install the oil filler cap.

Check the oil level (page 3-9).

Make sure there are no oil leaks.



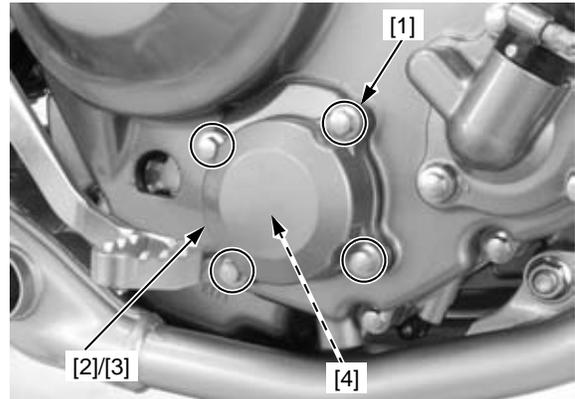
ENGINE OIL FILTER

REPLACEMENT

Drain the engine oil (page 3-9).

Remove the following:

- Bolts [1]
- Oil filter cover [2]
- Gasket [3]
- Spring [4]



Remove the oil filter [1].

Install a new oil filter with the "OUT-SIDE" mark [2] facing out.

NOTE:

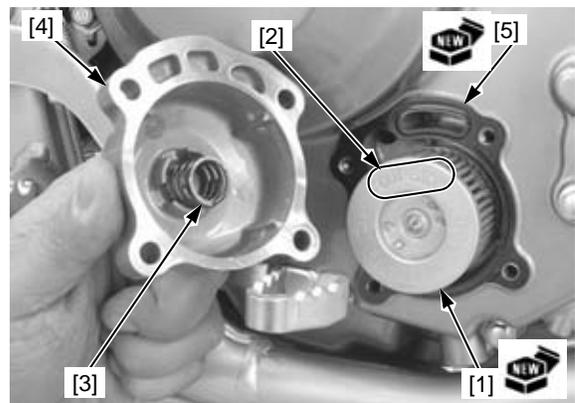
Installing the oil filter backwards will result in severe engine damage.

Install the oil filter spring [3] into the oil filter cover [4].

Install a new gasket [5] and oil filter cover.

Install the cover bolts and tighten them.

Fill the engine with the recommended engine oil (page 3-9).



ENGINE IDLE SPEED

NOTE:

- Inspect the idle speed after all other engine maintenance items have been performed and are within specifications.
- Before checking the idle speed, inspect the following items.
 - No MIL blinking
 - Spark plug condition (page 3-5)
 - Secondary air supply system condition (page 3-11)
 - Crankcase breather system condition (page 3-4)
 - Air cleaner element condition (page 3-4)
- The engine must be warm for accurate idle speed inspection.
- This system eliminates the need for manual idle speed adjustment compared to previous designs.

Start the engine and let it idle.

Check the idle speed.

IDLE SPEED: $1,450 \pm 100 \text{ min}^{-1}$ (rpm)

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

- Intake air leak or engine top-end problem (page 10-2)
- Throttle operation and freeplay (page 3-3)
- IACV operation (page 7-16)

RADIATOR COOLANT

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

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

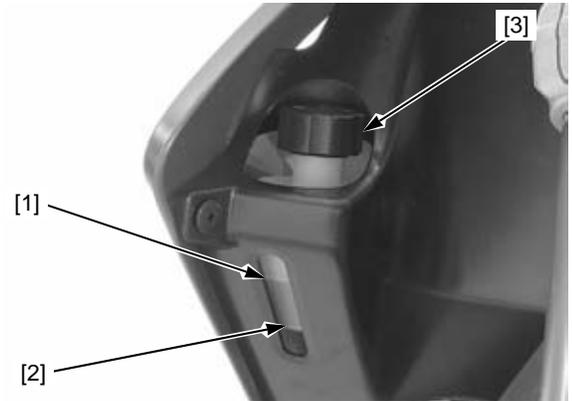
If the level is low, remove the reserve tank cap [3] and fill the tank to the "UPPER" level line with a 1:1 mixture of distilled water and antifreeze.

RECOMMENDED ANTIFREEZE:

High quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors

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

If the reserve tank becomes completely empty, there is a possibility of air getting into the cooling system. Be sure to remove any air from the cooling system (page 9-5).

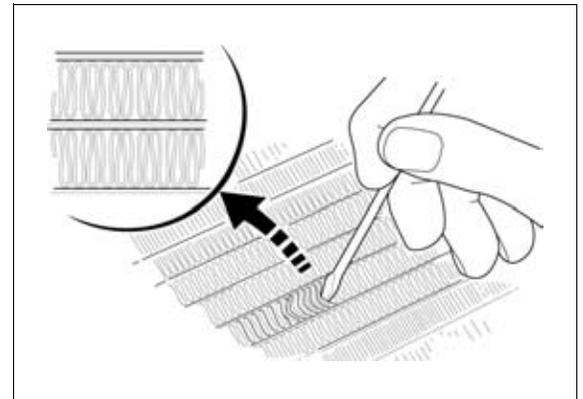


COOLING SYSTEM

Check the radiator air passages for clogging or damage.

Straighten bent fins, and remove insects, mud or other obstructions with compressed air or low water pressure. Replace the radiator if the air flow is restricted over more than 20% of the radiating surface.

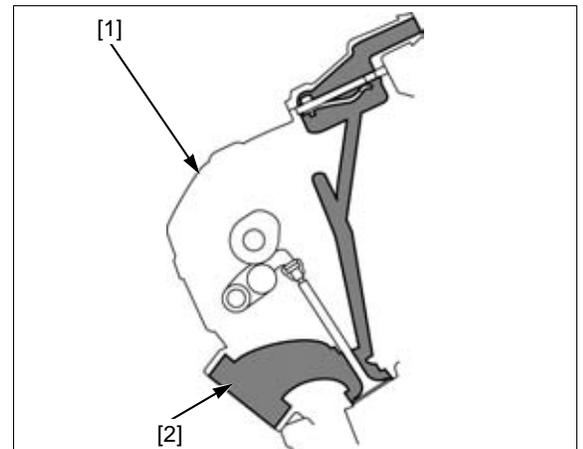
Inspect the water hoses for cracks or deterioration, and replace them if necessary. Check the tightness of all water hose band screws (page 9-7).



SECONDARY AIR SUPPLY SYSTEM

NOTE:

- This model is equipped with a built-in secondary air supply system. The pulse secondary air supply system is located on the cylinder head cover [1].
- The secondary air supply system introduces filtered air into exhaust gases in the exhaust port [2]. The secondary air is drawn into the exhaust port whenever there is negative pressure pulse in the exhaust system. This charged secondary air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water.



MAINTENANCE

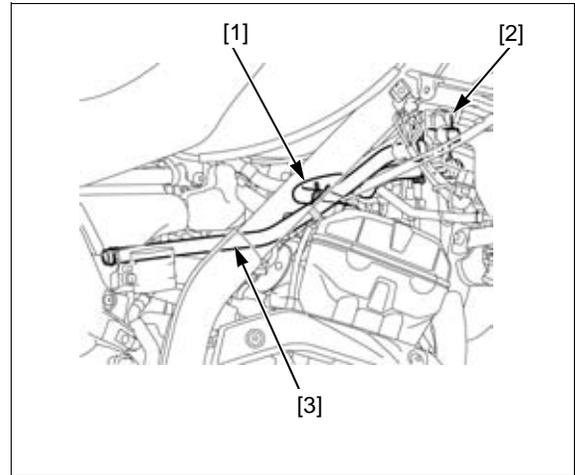
Remove the right fuel tank shroud (page 2-4).

If the hoses show any signs of heat damage, inspect the PAIR check valve in the cylinder head cover for damage (page 7-18).

Check the PAIR air supply hose [1] between the PAIR control solenoid valve [2] and cylinder head cover for deterioration, damage or loose connections. Make sure that the hoses are not cracked.

Check the air suction hose [3] between the air cleaner and PAIR control solenoid valve for deterioration, damage or loose connections.

Make sure that the hoses are not kinked, pinched or cracked.



DRIVE CHAIN

DRIVE CHAIN SLACK INSPECTION

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

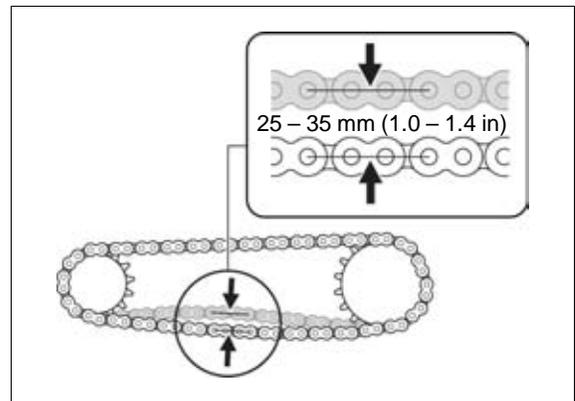
Turn the ignition switch OFF, support the motorcycle on its sidestand and shift the transmission into neutral.

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

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

NOTICE

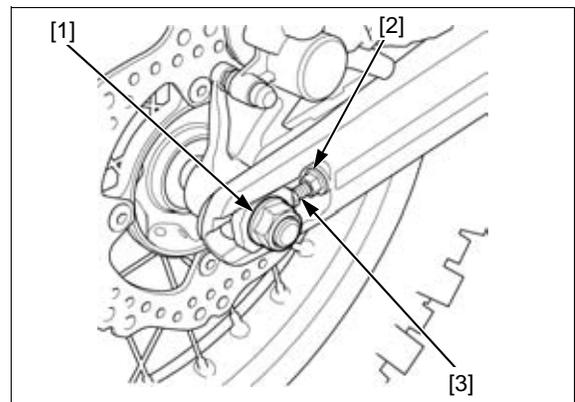
Excessive chain slack, 50 mm (2.0 in) or more, may damage the frame.



ADJUSTMENT

Loosen the rear axle nut [1].

Loosen the lock nuts [2] and turn the adjusters [3] until the correct drive chain slack is obtained.



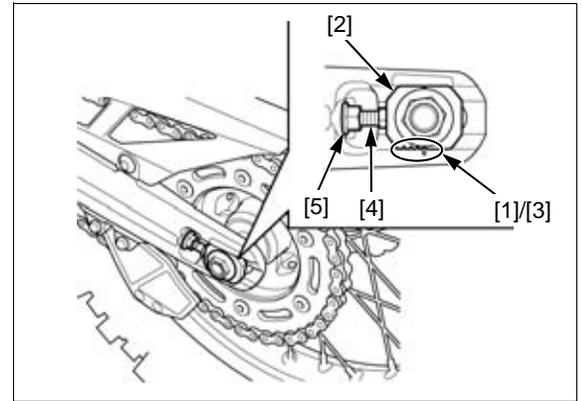
Make sure the same index lines [1] on both adjusting plates [2] are aligned with punch mark [3] in the swingarm.
Tighten the axle nut to the specified torque.

TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)

Hold the drive chain adjusters [4] and tighten the lock nuts [5] to the specified torque.

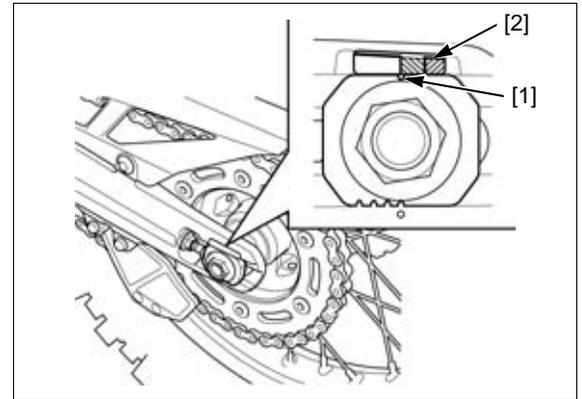
TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Recheck the drive chain slack and free wheel rotation.



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

If the drive chain adjuster cut-out [1] reaches red zone [2] of the indicator label, replace the drive chain with a new one.



CLEANING AND LUBRICATION

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

NOTICE

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

Inspect the drive chain for possible damage or wear.

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

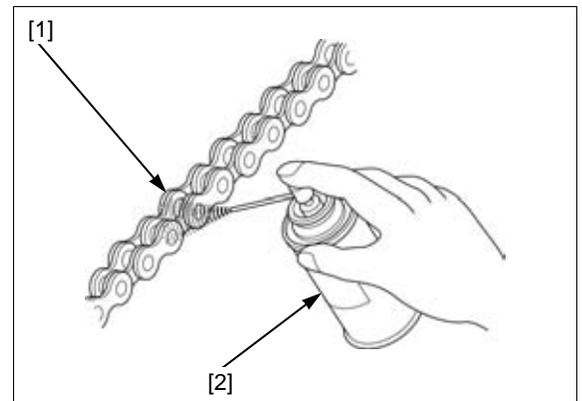
Be sure the drive chain has dried completely before lubricating.

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

NOTICE

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

Wipe off the excess oil or drive chain lubricant.



MAINTENANCE

SPROCKET INSPECTION

Remove the drive sprocket cover (page 2-6).

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

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

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

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

TORQUE:

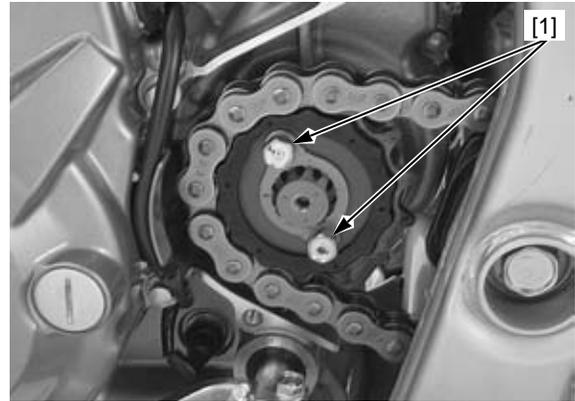
Drive sprocket fixing plate bolt [1]:

10 N·m (1.0 kgf·m, 7 lbf·ft)

Driven sprocket nut [2]:

50 N·m (5.1 kgf·m, 37 lbf·ft)

Install the drive sprocket cover (page 2-6).



DRIVE CHAIN SLIDER

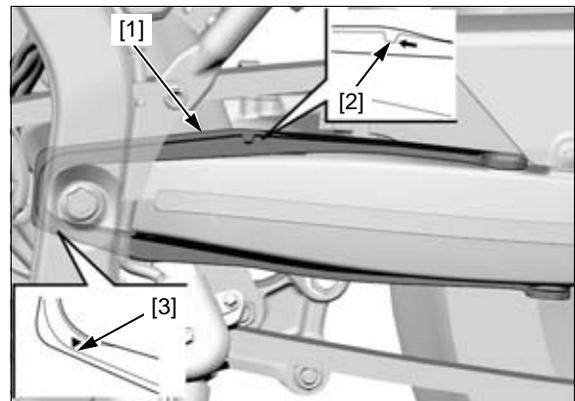
U type only: Remove the drive chain cover (page 2-6).

Remove the drive sprocket cover (page 2-6).

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

The drive chain slider must be replaced if it is worn to the wear limit indicator [2] or wear limit line [3].

For drive chain slider replacement (page 17-10).



BRAKE FLUID

NOTICE

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

NOTE:

- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.
- When the fluid level is low, check the brake pads for wear (page 3-16).
- A low fluid level may be due to wear of the brake pads. If the brake pads are worn and caliper pistons are pushed out, this accounts for a low fluid level. If the brake pads are not worn and fluid level is low, check the entire system for leaks (page 3-17).

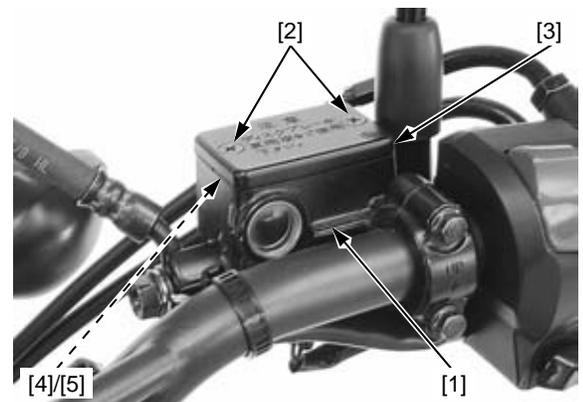
FRONT BRAKE

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

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

Remove the following:

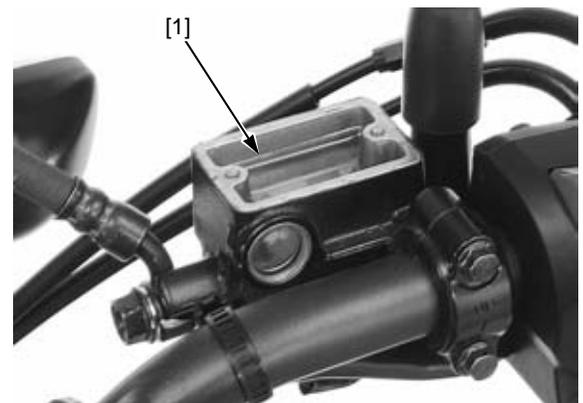
- Screws [2]
- Reservoir cover [3]
- Set plate [4]
- Diaphragm [5]



Add DOT 3 or DOT 4 brake fluid from a sealed container to the casting ledge [1].

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

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



MAINTENANCE

REAR BRAKE

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

Check the brake fluid level.

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

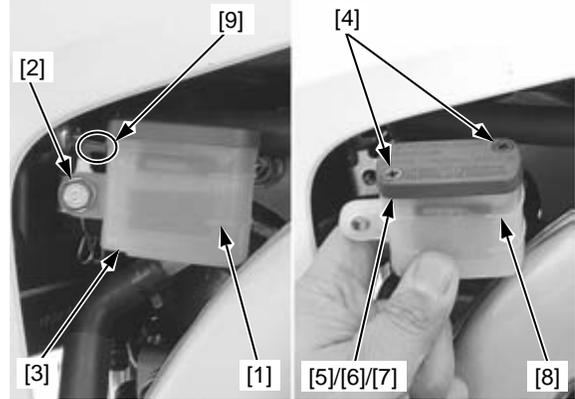
Remove the bolt [2] and reservoir [3].

Remove the cover screws [4], reservoir cover [5], set plate [6] and diaphragm [7].

Add DOT 3 or DOT 4 brake fluid from a sealed container to the "UPPER" level line [8].

Install the diaphragm, set plate and reservoir cover.

Install and tighten the cover screws to the specified torque.



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

Install the reservoir and tighten the bolt to the specified torque while pushing the reservoir against the stopper [9].

TORQUE: 10 N-m (1.0 kgf-m, 7 lbf-ft)

BRAKE PADS WEAR

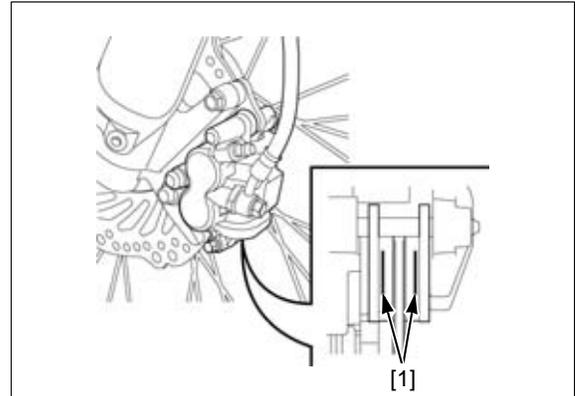
FRONT BRAKE PADS

Check the front brake pads for wear.

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

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

For front brake pad replacement (page 18-5).



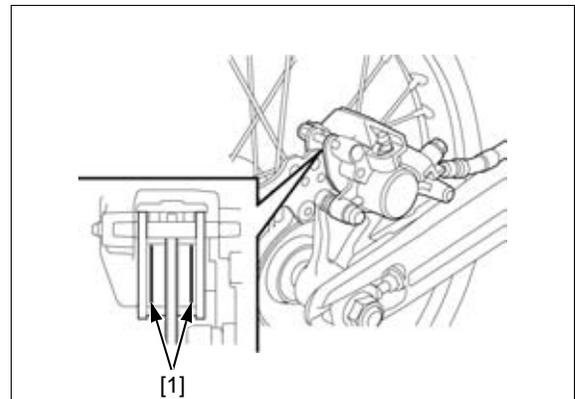
REAR BRAKE PADS

Check the rear brake pads for wear.

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

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

For rear brake pad replacement (page 18-6).



BRAKE SYSTEM

INSPECTION

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

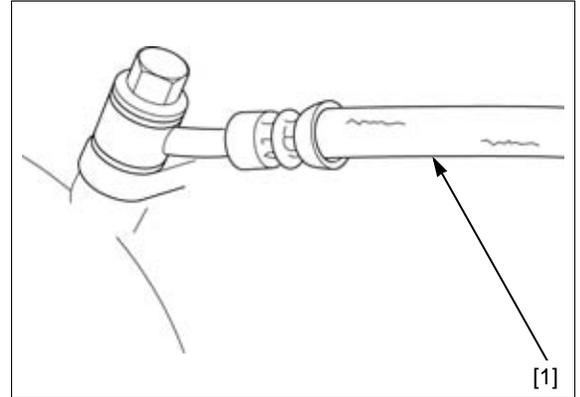
If the lever or pedal feels soft or spongy when operated, bleed the air from the system.

For brake air bleeding (page 18-4).

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

Tighten any loose fittings.

Replace hoses and fittings as required.



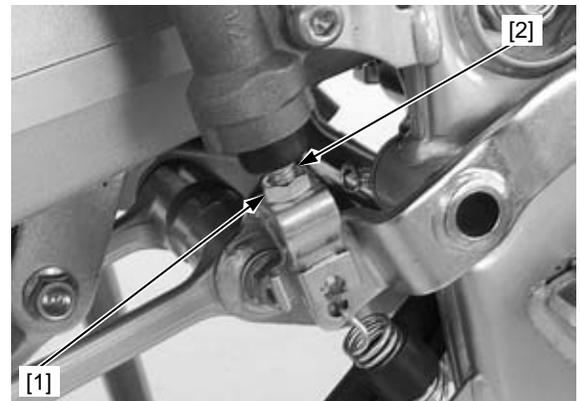
BRAKE PEDAL HEIGHT ADJUSTMENT

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

For standard push rod length (page 18-9).

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

TORQUE: 17.2 N·m (1.8 kgf·m, 13 lbf·ft)



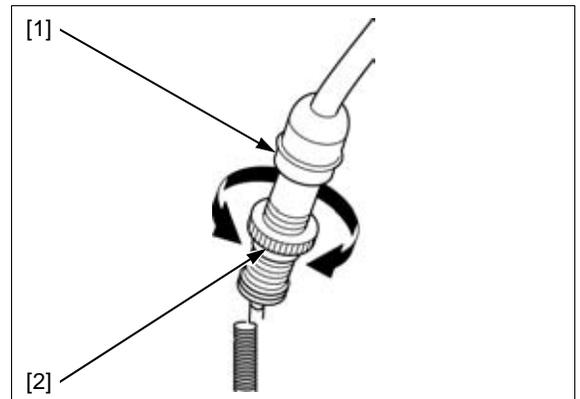
BRAKE LIGHT SWITCH

The front brake light switch does not require adjustment. Adjust the brake light switch [1] so that the brake light comes on just prior to the brake actually being engaged.

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

NOTE:

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

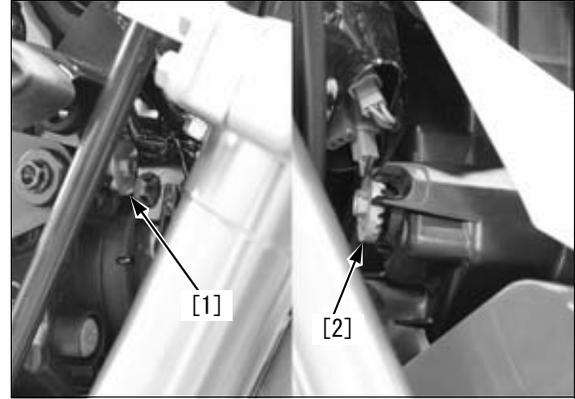


MAINTENANCE

HEADLIGHT AIM

Support the motorcycle in an upright position.

Adjust the headlight aim as specified by local laws and regulations. Adjust the headlight aim horizontally by turning the horizontal beam adjuster [1].
Adjust the headlight aim vertically by turning the vertical beam adjuster [2].

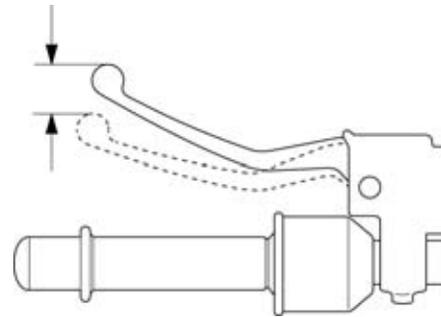


CLUTCH SYSTEM

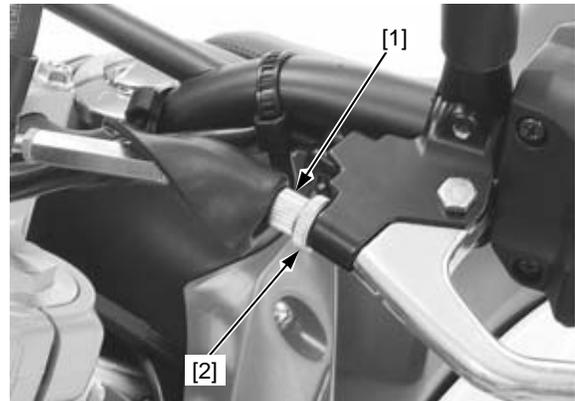
Measure the clutch lever freeplay at the end of the clutch lever.

FREEPLAY: 10 – 20 mm (0.4 – 0.8 in)

10 – 20 mm (0.4 – 0.8 in)



The adjuster may be damaged if it is positioned too far out, leaving minimal thread engagement. Minor adjustment is made with the minor adjuster [1] at the clutch lever.
Loosen the lock nut [2] and turn the adjuster.
Tighten the lock nut while holding the adjuster.
Recheck the clutch lever freeplay.

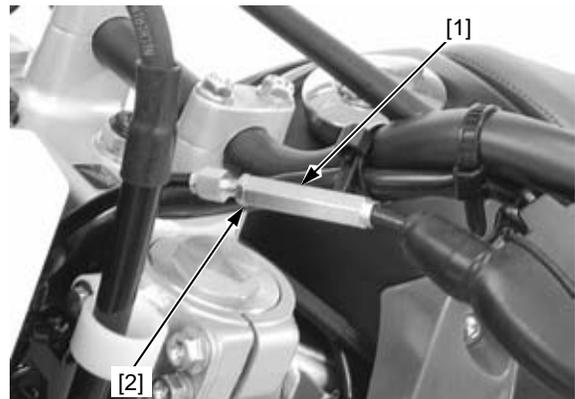


If the adjuster is threaded out near its limit and the correct freeplay cannot be obtained, turn the adjuster all the way in and back out one turn, then perform the adjustment at major adjuster as follows.

Major adjustment is made with the major adjuster [1] on the clutch cable.

Loosen the lock nut [2] and turn the adjuster to adjust the freeplay.
Tighten the lock nut while holding the adjuster.

If proper freeplay cannot be obtained, or the clutch slips during test ride, disassemble and inspect the clutch (page 12-9).



SIDESTAND

INSPECTION

Support the motorcycle using a safety stand or hoist.

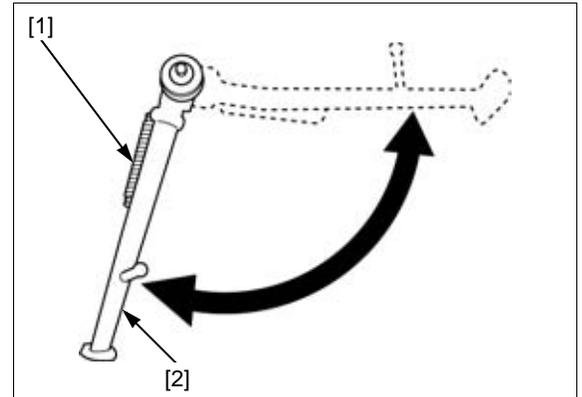
Check the sidestand spring [1] for damage or loss of tension.

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

Check the sidestand ignition cut-off system:

- Sit astride the motorcycle and retract the sidestand.
- Start the engine.
- Shift the transmission in gear and lower the sidestand.
- The engine should stop as the sidestand is lowered.

If there is a problem with the system, check the sidestand switch (page 20-13).



SUSPENSION

FRONT SUSPENSION INSPECTION

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.

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

For fork service (page 16-6).

REAR SUSPENSION INSPECTION

Check the action of the rear shock absorber by compressing the rear end several times.

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

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

For shock absorber service (page 17-6).

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

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

Replace the bearings if any looseness is noted.

For swingarm service (page 17-10).

NUTS, BOLTS, FASTENERS

Check that all chassis nuts, screws 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 motorcycle using a safety stand or hoist, raise the front wheel off the ground.

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

For front wheel service (page 16-4).

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

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

For rear wheel service (page 17-4).

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

- Front tire (page 1-8)
- Rear tire (page 1-8)

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

Check the front and rear wheels for trueness.

Measure the tread depth at the center of the tires.

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

- Front tire (page 1-8)
- Rear tire (page 1-8)

Inspect the wheel rims and spokes for damage.

Tighten any loose spokes to the specified torque using the special tool.

TOOL: Spoke wrench 5.8 x 6.1 mm 07701-0020300

TORQUE: 3.7 N·m (0.4 kgf·m, 2.7 lbf·ft)

STEERING HEAD BEARINGS

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

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

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

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 16-21).

SERVICE INFORMATION.....	4-2	DTC TROUBLESHOOTING.....	4-10
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PGM-FI SYSTEM

SERVICE INFORMATION

GENERAL

- A faulty PGM-FI system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- When disassembling the PGM-FI system parts, note the location of the O-rings. Replace them with new ones upon reassembly.
- Use a digital tester for PGM-FI system inspection.
- The following color codes are used throughout this section.

Bu = Blue
Bl = Black

G = Green
Gr = Gray

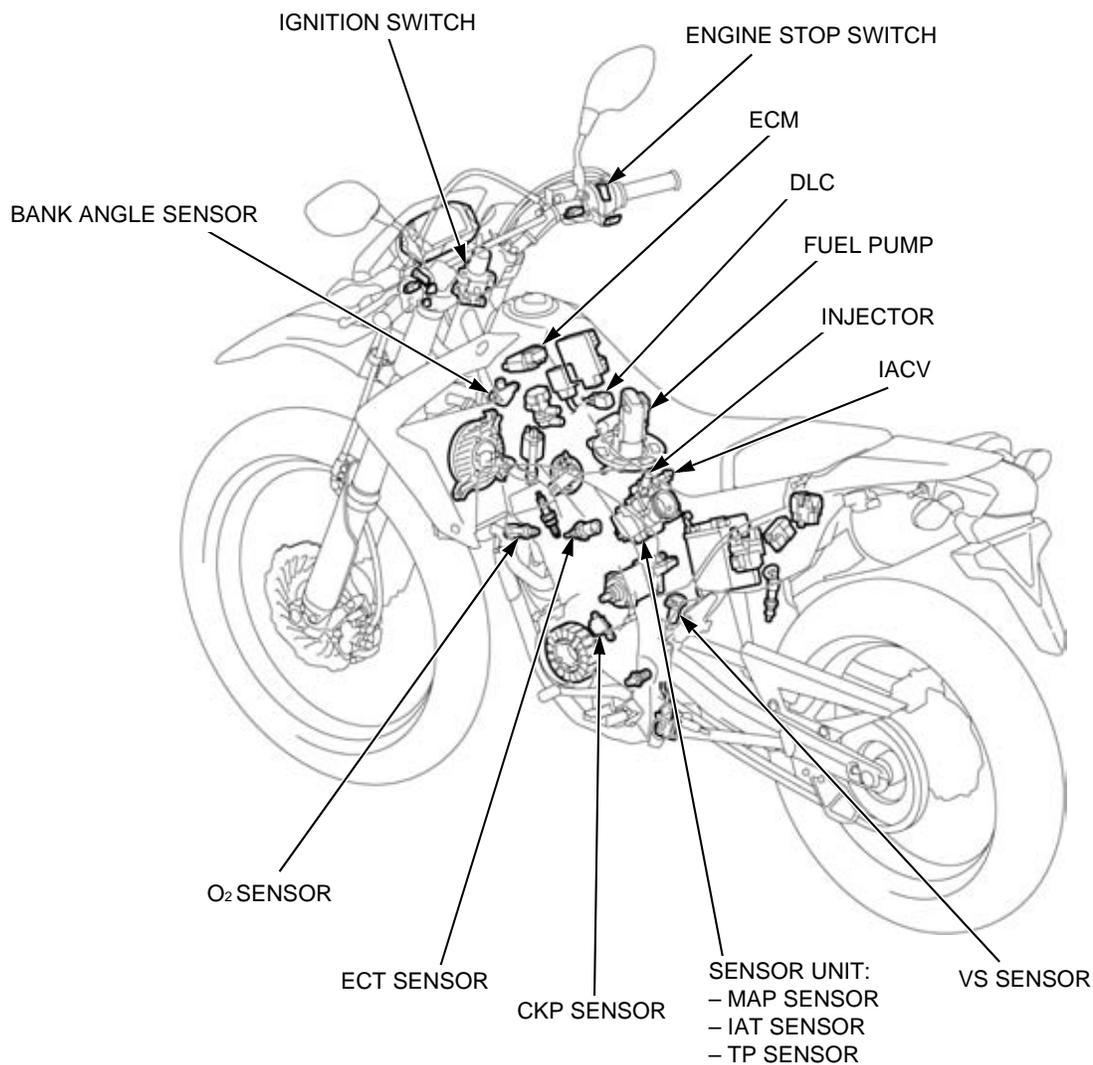
Lb = Light Blue
Lg = Light Green

O = Orange
P = Pink

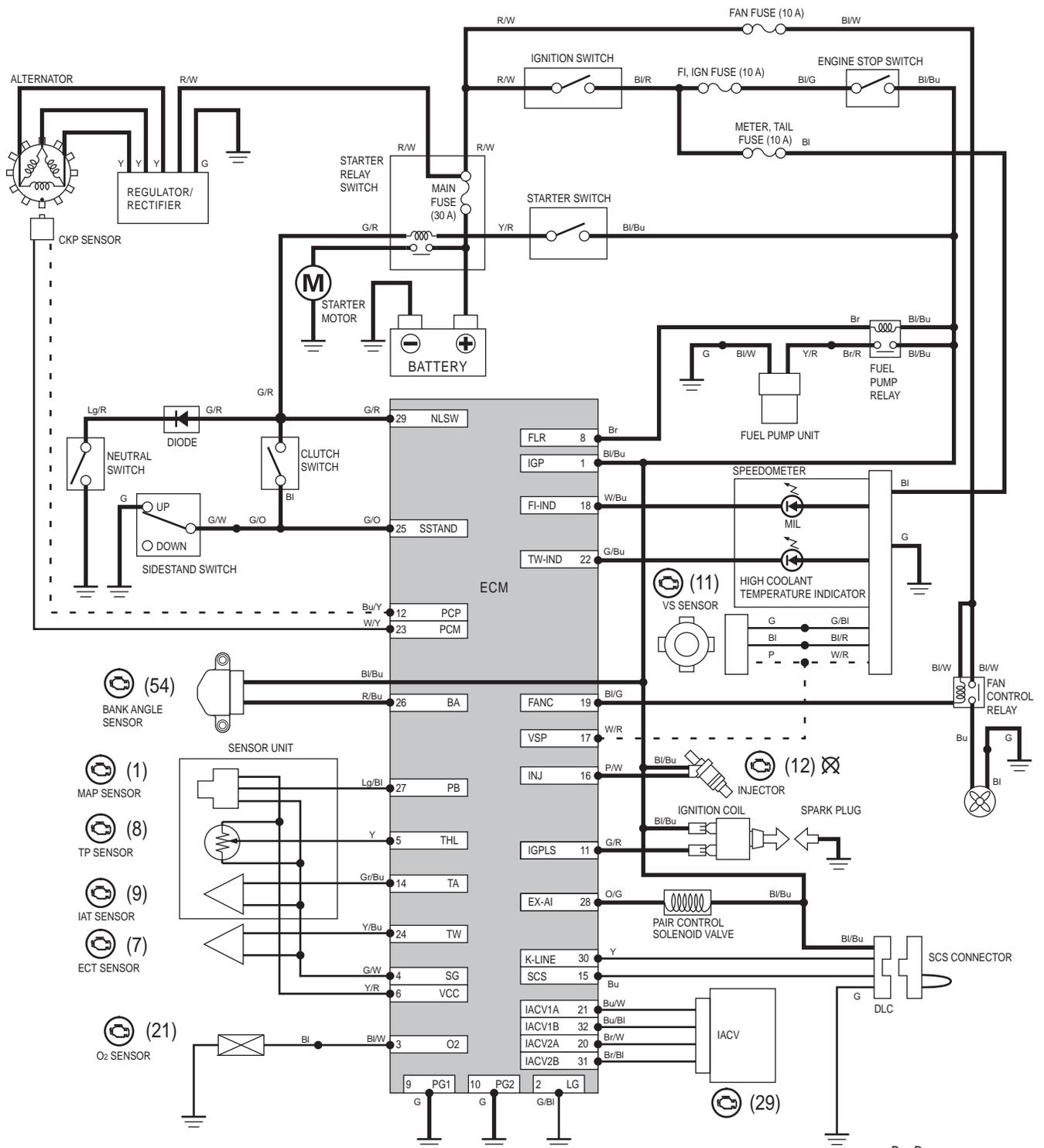
R = Red
W = White

Y = Yellow
Br = Brown

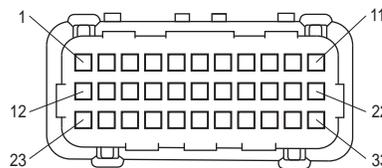
PGM-FI SYSTEM LOCATION



PGM-FI SYSTEM DIAGRAM



- () : MIL number
- : Engine does not start when detecting MIL
- : Short terminals for reading MIL



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

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 something mean something work, but not the way it's supposed to.

If the MIL has come on

Refer to DTC READOUT (page 4-5).

If the MIL did not stay on

If the MIL did not stay on, but there is a driveability problem, do the SYMPTOM TROUBLESHOOTING (page 4-6).

SYSTEM DESCRIPTION

SELF-DIAGNOSIS SYSTEM

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

FAIL-SAFE FUNCTION

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

MIL Blink Pattern

- DTC can be read from the ECM memory by the MIL blink pattern.
- The MIL will blink the current DTC, in case the ECM detects the problem at present, when the ignition switch ON and engine stop switch "C" or idling. The MIL will stay ON when the engine speed is over 2,100 min⁻¹ (rpm).
- The MIL has two types of blinks, a long blink and short blink. The long blinking lasts for 1.3 seconds, the short blinking lasts for 0.3 seconds. One long blink is the equivalent of ten short blinks. For example, when two long blinks are followed by five short blinks, the MIL is 25 (two long blinks = 20 blinks, plus five short blinks).
- When the ECM stores more than one DTC, the MIL will indicate them by blinking in the order from the lowest number to highest number.

MIL Check

When the ignition switch is turned ON and engine stop switch "C" the MIL will stay on for a few seconds, then go off. If the MIL does not come on, troubleshoot the MIL circuit (page 4-43).

CURRENT DTC/STORED 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 come on and the MIL will start to blink as its DTC when the sidestand is lowered. It is possible to readout 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 light and blink. If it is necessary to retrieve the past problem, readout the stored DTC by following the DTC readout procedure (page 4-5).

HDS POCKET TESTER INFORMATION

- The HDS pocket tester 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 [1] from the DLC [2].

Connect the HDS pocket tester to the DLC.

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

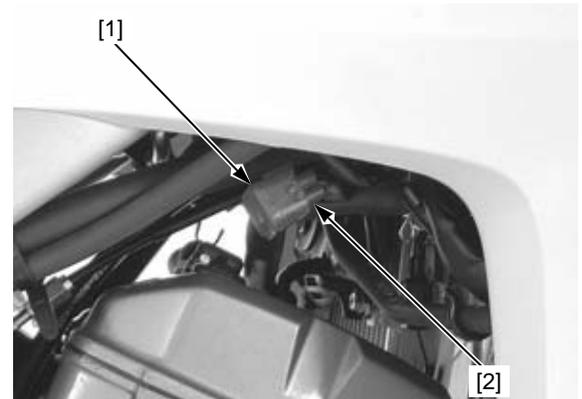
NOTE:

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

ECM reset

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

After the ECM reset, perform the TP sensor reset procedure (page 4-45).



DTC READOUT

Start the engine and check the MIL.

NOTE:

When the ignition switch is turned ON and engine stop switch "C", the MIL will stay on for a few seconds, then go off.

If the MIL stays on or blinks, read the DTC, freeze data and follow the troubleshooting index (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 dummy connector from the DLC [1].

Short the DLC terminals using the special tool.

TOOL:

[2] SCS connector 070PZ-ZY30100

Turn the ignition switch ON and engine stop switch "C", read, note the MIL blinks and refer to the DTC index (page 4-7).

NOTE:

If the ECM has any DTC in its memory, the MIL will start blinking.



ERASING DTC

1. Turn the ignition switch OFF.
2. Remove the dummy connector from the DLC [1].
Short the DLC terminals using the special tool.

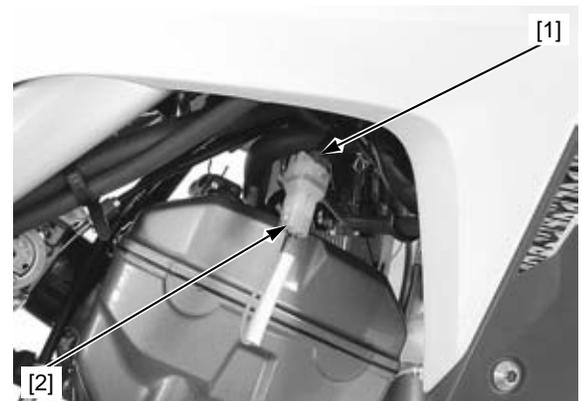
TOOL:

[2] SCS connector 070PZ-ZY30100

3. Turn the ignition switch ON and engine stop switch "C".
4. Remove the special tool from the DLC.
5. The MIL will light for approximately 5 seconds. While the MIL lights, short the DLC terminals again with the special tool. The self-diagnostic memory is erased if the MIL goes off and starts blinking.

NOTE:

- The DLC must be jumped while the MIL lights. If not, the MIL will not start blinking.
- Note that the self-diagnostic memory cannot be erased if the ignition switch is turned OFF before the MIL starts blinking.



PGM-FI SYSTEM

CIRCUIT INSPECTION

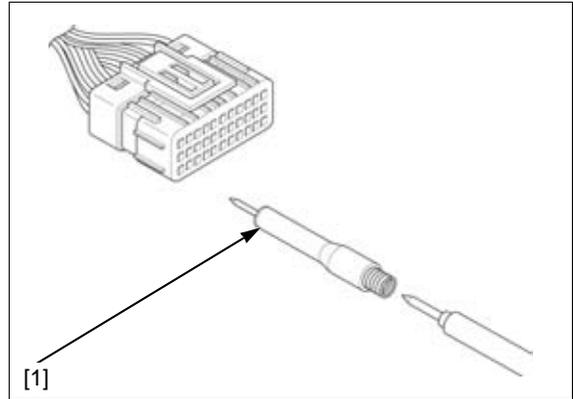
INSPECTION AT ECM CONNECTOR

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

TOOL:

[1] Test probe

07ZAJ-RDJA110



PGM-FI SYMPTOM TROUBLESHOOTING

When the motorcycle has one of these symptoms, check the MIL blinking, refer to the MIL code index (page 4-7) and begin the appropriate troubleshooting procedure. If there are 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 cranks but won't start (No MIL blinking)	<ol style="list-style-type: none"> 1. Inspect the IACV (page 7-16). 2. Inspect the fuel supply system (page 7-4). 3. Inspect the ignition system (page 5-4). 	<ul style="list-style-type: none"> • No fuel to injector <ul style="list-style-type: none"> – Clogged fuel filter – Pinched or clogged fuel feed hose – Faulty fuel pump – Faulty fuel pump circuits • Intake air leak • Contaminated/deteriorated fuel • Faulty injector
Engine cranks but won't start (No fuel pump operation sound when the turning the ignition ON)	<ol style="list-style-type: none"> 1. ECM power/ground circuits malfunction (page 4-49). 2. Inspect the fuel supply system (page 7-4). 	<ul style="list-style-type: none"> • Open circuit in the power input and/or ground wire of the ECM • Blown main fuse (30 A) • Blown FI, IGN fuse (10 A)
Engine stalls, hard to start, rough idling	<ol style="list-style-type: none"> 1. Inspect the engine idle speed (page 3-10). 2. Inspect the IACV (page 7-16). 3. Inspect the fuel supply system (page 7-4). 4. Inspect the battery charging system (page 19-4). 5. Inspect the ignition system (page 5-4). 	<ul style="list-style-type: none"> • Restricted fuel feed hose • Contaminated/deteriorated fuel • Intake air leak • Faulty MAP sensor • Restricted fuel tank breather hose
Afterburn when engine braking is used	<ol style="list-style-type: none"> 1. Inspect the PAIR system (page 7-17). 2. Inspect the ignition system (page 5-4). 	
Backfiring or misfiring during acceleration	Inspect the ignition system (page 5-4).	
Poor performance (driveability) and poor fuel economy	<ol style="list-style-type: none"> 1. Inspect the fuel supply system (page 7-4). 2. Inspect the air cleaner element (page 3-4). 3. Inspect the ignition system (page 5-4). 	<ul style="list-style-type: none"> • Faulty pressure regulator (fuel pump) • Faulty injector • Faulty MAP sensor
Idle speed is below specifications or fast idle too low (No MIL blinking)	<ol style="list-style-type: none"> 1. Inspect the engine idle speed (page 3-10). 2. Inspect the IACV (page 7-16). 3. Inspect the ignition system (page 5-4). 	
Idle speed is above specifications or fast idle too high (No MIL blinking)	<ol style="list-style-type: none"> 1. Inspect the engine idle speed (page 3-10). 2. Inspect the throttle operation and freeplay (page 3-3). 3. Inspect the IACV (page 7-16). 4. Inspect the ignition system (page 5-4). 	<ul style="list-style-type: none"> • Intake air leak • Engine top-end problem • Air cleaner element condition
MIL never comes ON at all	Inspect the MIL circuit (page 4-43).	
MIL stays ON (No DTC set)	<ol style="list-style-type: none"> 1. Inspect the DLC circuit (page 4-43). 2. Inspect the MIL circuit (page 4-43). 	

DTC INDEX

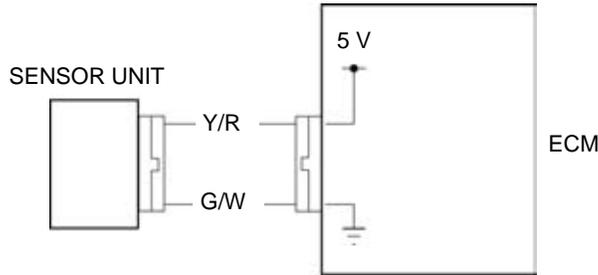
DTC (MIL blinks)	Function Failure	Symptom/Fail-safe function	Refer to (DTC)	Refer to (MIL)
1-1 (1)	MAP sensor circuit low voltage (less than 0.195 V) • MAP sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 525 mmHg/700 hPa	4-10	4-29
1-2 (1)	MAP sensor circuit high voltage (more than 3.848 V) • Loose or poor contact of the sensor unit connector • MAP sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 525 mmHg/700 hPa	4-11	
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: 80°C/176°F • Cooling fan turns on	4-13	4-30
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: 80°C/176°F • Cooling fan turns on	4-11	
8-1 (8)	TP sensor circuit low voltage (less than 0.215 V) • Loose or poor contact of the sensor unit connector • TP sensor or its circuit malfunction	• Poor engine acceleration • Pre-program value: 0°	4-15	4-32
8-2 (8)	TP sensor circuit high voltage (more than 4.922 V) • TP sensor or its circuit malfunction	• Poor engine acceleration • Pre-program value: 0°	4-16	
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	4-33
9-2 (9)	IAT sensor circuit high voltage (more than 4.922 V) • Loose or poor contact of the sensor unit connector • IAT sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 35°C/95°F	4-18	
11-1 (1)	VS sensor malfunction • Loose or poor contact of the VS sensor connector • VS sensor or its circuit malfunction	• Engine operates normally	4-18	4-35
12-1 (12)	Injector circuit 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	4-21	4-36
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	4-38
29-1 (29)	IACV circuit malfunction • Loose or poor contact of the IACV connector • IACV or its circuit malfunction	• Engine stalls, hard to start, rough idling	4-24	4-39
33-2 (-)	ECM EEPROM malfunction	• Engine operates normally	4-26	-
54-1 (54)	Bank angle sensor circuit low voltage (less than 0.35 V) • Bank angle sensor or its circuit malfunction	• Engine operates normally • Bank angle sensor does not operate. (The engine keeps running when the vehicle falls.)	4-27	4-41
54-2 (54)	Bank angle sensor circuit high voltage (more than 4.5 V) • Loose or poor contact of the bank angle sensor connector • Bank angle sensor or its circuit malfunction	• Engine operates normally • Bank angle sensor does not operate. (The engine keeps running when the vehicle falls.)	4-28	

SENSOR UNIT POWER LINE INSPECTION

BEFORE DTC TROUBLESHOOTING

NOTE:

- When the DTC displays 1-1, 1-2, 8-1, 8-2, 9-1 and 9-2, check the following before DTC troubleshooting.
- Before starting the inspection, check for loose or poor contact on the sensor unit 5P connector and ECM 33P (Black) connector.



Probable cause

- Open circuit in Yellow/red wire between the sensor unit and ECM
- Open circuit in Green/white wire between the sensor unit and ECM
- Faulty ECM

1. Sensor Unit Power Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the sensor unit 5P connector [1] (page 7-11).

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

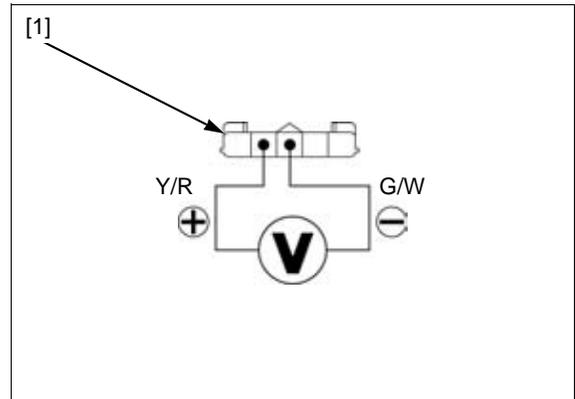
Measure the voltage at the wire harness side.

Connection: Yellow/red (+) – Green/white (-)
Standard: 4.75 – 5.25 V

If the voltage within 4.75 – 5.25 V?

YES – Turn the ignition switch OFF. Connect the sensor unit 5P connector and start the DTC troubleshooting (page 4-10).

NO – GO TO STEP 2.



2. Sensor Unit Input Voltage Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector [1] (page 4-50).

Check for continuity between the ECM 33P (Black) connector and sensor unit 5P connector [2] of the wire side.

Connection: Yellow/red – Yellow/red
Green/white – Green/white

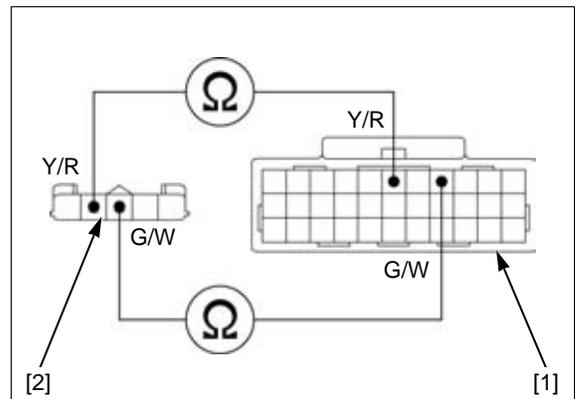
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

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

NO – • Open circuit in Yellow/red wire

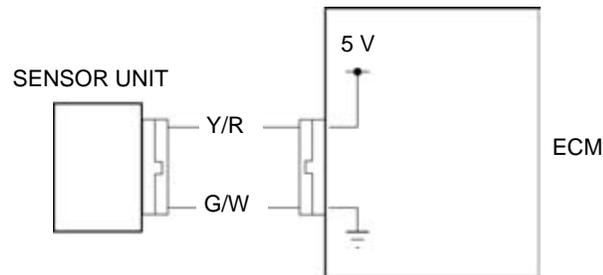


- Open circuit in Green/white wire

BEFORE MIL TROUBLESHOOTING

NOTE:

- When the MIL blinks 1, 8 and 9 times, check the following before MIL troubleshooting.
- Before starting the inspection, check for loose or poor contact on the sensor unit 5P connector and ECM 33P (Black) connector.



Probable cause

- Open circuit in Yellow/red wire between the sensor unit and ECM
- Open circuit in Green/white wire between the sensor unit and ECM
- Faulty ECM

1. Sensor Unit Power Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the sensor unit 5P connector [1] (page 4-44).

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

Measure the voltage at the wire harness side.

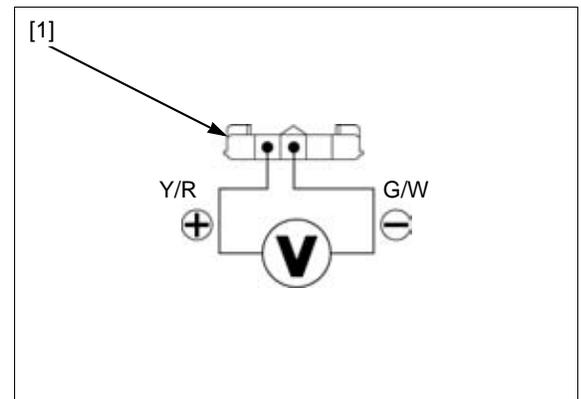
Connection: Yellow/red (+) – Green/white (-)

Standard: 4.75 – 5.25 V

If the voltage within 4.75 – 5.25 V?

YES – Turn the ignition switch OFF. Connect the sensor unit 5P connector and start the MIL troubleshooting (page 4-29).

NO – GO TO STEP 2.



2. Sensor Unit Input Voltage Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector [1] (page 4-50).

Check for continuities between the ECM 33P (Black) connector and sensor unit 5P connector [2] of the wire side.

**Connection: Yellow/red – Yellow/red
Green/white – Green/white**

TOOL:

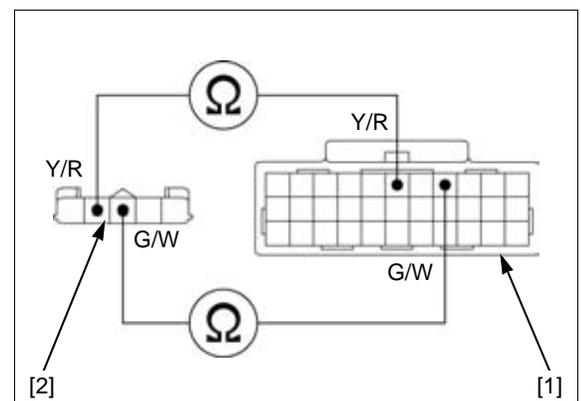
Test probe 07ZAJ-RDJA110

Is there continuity?

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

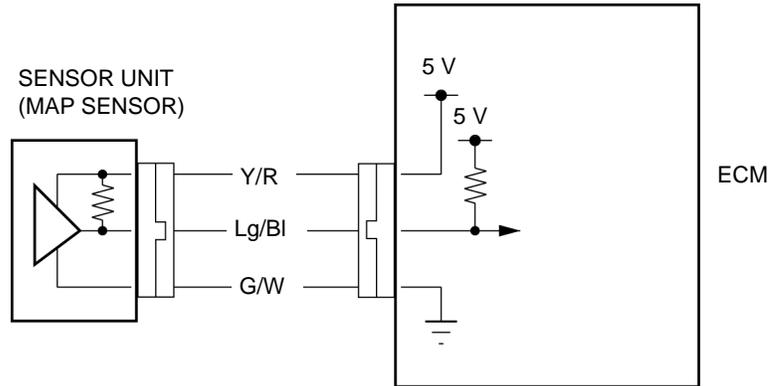
NO –

- Open circuit in Yellow/red wire
- Open circuit in Green/white wire



DTC TROUBLESHOOTING

DTC 1 (MAP SENSOR)



Probable cause

- Open circuit in Yellow/red wire between the sensor unit and ECM
- Open or short circuit in Light green/black wire between the sensor unit and ECM
- Open circuit in Green/white wire between the sensor unit and ECM
- Faulty sensor unit
- Faulty ECM

DTC 1-1 (MAP SENSOR LOW VOLTAGE)

1. MAP sensor system inspection

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

Check the MAP sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Sensor Unit Power Line Inspection

Check the sensor unit power line inspection (page 4-8).

Is the sensor unit power line normal?

YES – GO TO STEP 3.

NO – Replace or repair the abnormal circuit.

3. MAP Sensor Output Voltage Inspection

Turn the ignition switch OFF.

Connect the ECM 33P (Black) connector.
Disconnect the sensor unit 5P connector [1] (page 4-44).

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

Measure the voltage at the sensor unit 5P connector of the wire side.

Connection:

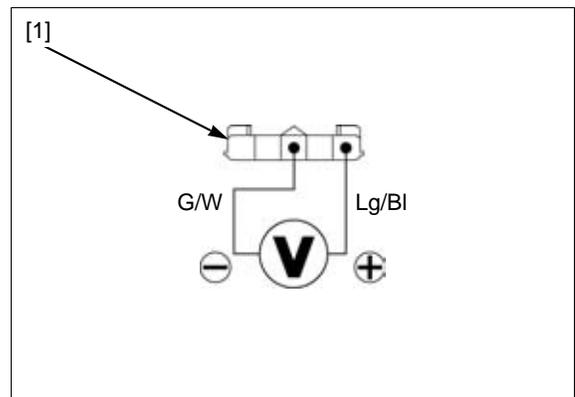
Light green/black (+) – Green/white (-)

Standard: 4.75 – 5.25 V

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 5.

NO – GO TO STEP 4.



4. MAP Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector.

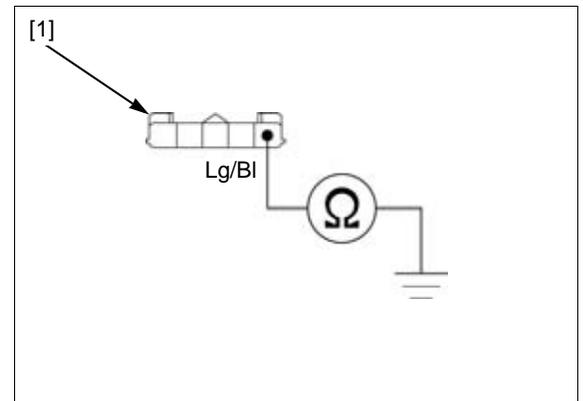
Check for continuity between the sensor unit 5P connector [1] terminal of the wire side and ground.

Connection: Light green/black – Ground

Is there continuity?

YES – Short circuit in Light green/black wire

NO – GO TO STEP 5.



5. MAP Sensor Inspection

Replace the sensor unit with a known good one (page 4-44).

Erase the DTC's (page 4-5).

Turn the ignition switch OFF.

Connect the sensor unit 5P connector.

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

Check the MAP sensor with the HDS pocket tester.

Is DTC 1-1 indicated?

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

NO – Faulty original sensor unit (MAP sensor)

DTC 1- 2 (MAP SENSOR HIGH VOLTAGE)

1. MAP Sensor System Inspection 1

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

Check the MAP 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 connector

2. Sensor Unit Power Line Inspection

Check the sensor unit power line inspection (page 4-8).

Is the sensor unit power line normal?

YES – GO TO STEP 3.

NO – Replace or repair the abnormal circuit.

3. MAP Sensor System Inspection 2

Turn the ignition switch OFF.

Disconnect the sensor unit 5P connector [1].

Connect the sensor unit 5P connector terminals at the wire side with a jumper wire [2].

Connection:

Light green/black – Green/white

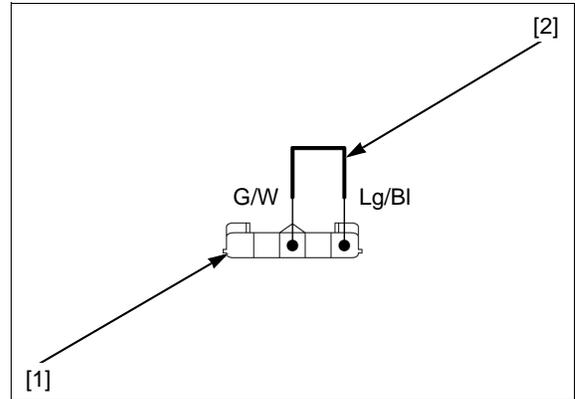
Turn the ignition switch ON and engine stop switch "G".

Check the MAP sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – Faulty sensor unit (MAP sensor)

NO – GO TO STEP 4.



4. MAP Sensor Output Line Open Circuit Inspection

Turn the ignition switch OFF.

Remove the jumper wire.

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

Check the continuity between the ECM 33P (Black) connector and sensor unit 5P connector [2] of the wire side.

Connection:

Light green/black – Light green/black

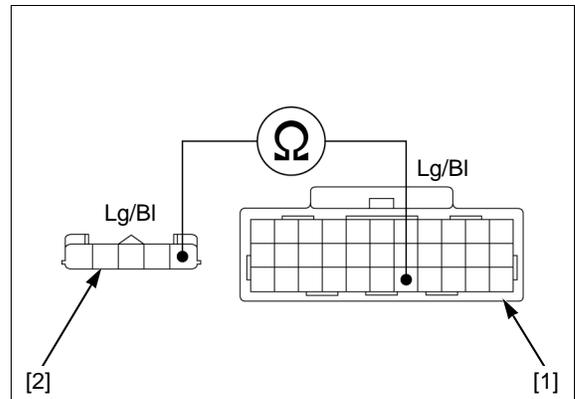
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

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

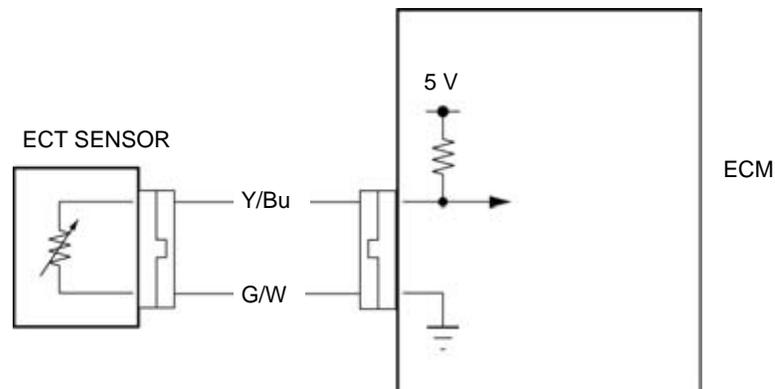
NO – Open circuit in Light green/black wire



DTC 7 (ECT SENSOR)

NOTE:

Before starting the inspection, check for loose or poor contact on the ECT sensor 3P connector and recheck the MIL blinking.



Probable cause

- Open or short circuit in Yellow/blue wire between the ECT sensor and ECM
- Open circuit in Green/white wire between the ECT sensor and ECM
- Faulty ECT sensor
- Faulty ECM

DTC 7-1 (ECT SENSOR LOW VOLTAGE)

1. ECT Sensor System Inspection

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

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 3P connector.

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

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.

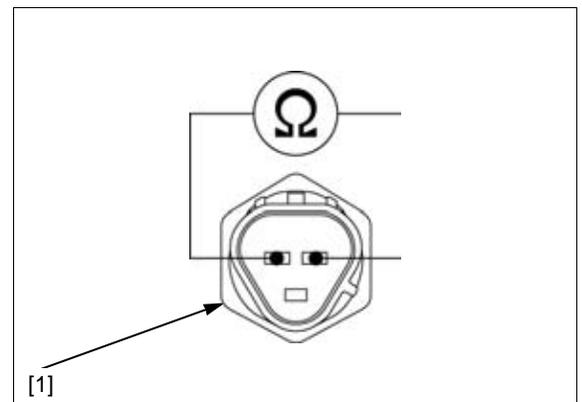
Measure the resistance at the ECT sensor [1] terminals.

Standard: 2.3 – 2.6 k Ω (20°C/68°F)

Is the resistance within 2.3 – 2.6 k Ω (20°C/68°F)?

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

NO – Faulty ECT sensor



4. ECT Sensor Short Circuit Inspection

Turn the ignition switch OFF.

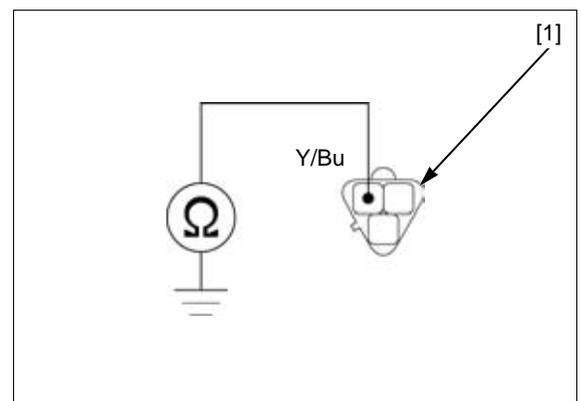
Check for continuity between the ECT sensor 3P connector [1] of the wire side and ground.

Connection: Yellow/blue – Ground

Is there continuity?

YES – Short circuit in Yellow/blue wire

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



DTC 7-2 (ECT SENSOR HIGH VOLTAGE)

1. ECT Sensor System Inspection

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

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 3P connector

2. ECT Sensor Inspection

Turn the ignition switch OFF.

Disconnect the ECT sensor 3P connector [1].

Connect the ECT sensor 3P connector terminals at the wire side with a jumper wire [2].

Connection: Yellow/blue – Green/white

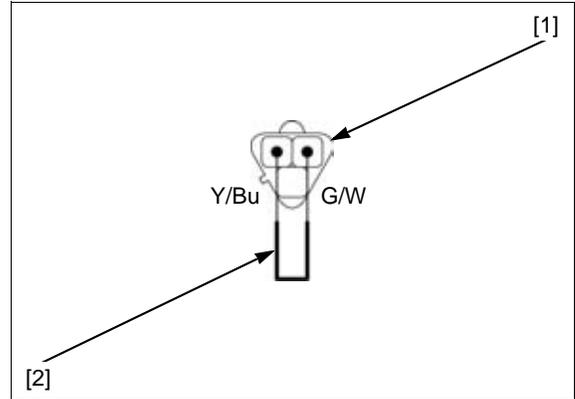
Turn the ignition switch ON and engine stop switch "G".

Check the ECT sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – Inspect the ECT sensor (page 4-46).

NO – GO TO STEP 3.



3. ECT Sensor Open Circuit Inspection

Turn the ignition switch OFF.

Remove the jumper wire.

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

Check the continuities between the ECM 33P (Black) connector and ECT sensor 3P connector [2] of the wire side.

Connection: Yellow/blue – Yellow/blue
Green/white – Green/white

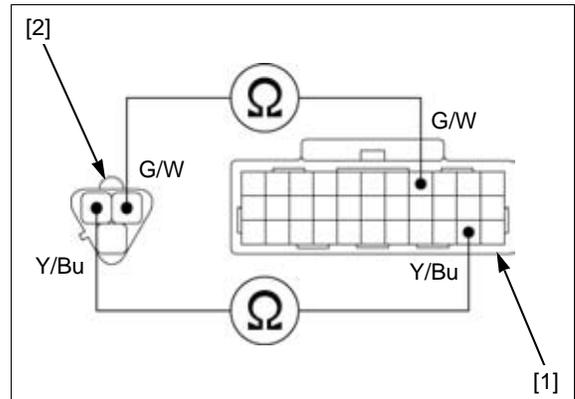
TOOL:

Test probe 07ZAJ-RDJA110

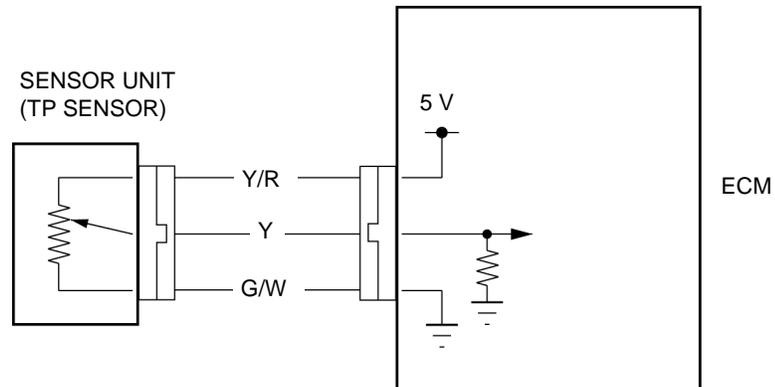
Is there continuity?

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

- NO** –
- Open circuit in Yellow/blue wire
 - Open circuit in Green/white wire



DTC 8 (TP SENSOR)



Probable cause

- Open circuit in Yellow/red wire between the sensor unit and ECM
- Open or short circuit in Yellow wire between the sensor unit and ECM
- Open circuit in Green/white wire between the sensor unit and ECM
- Faulty sensor unit
- Faulty ECM

DTC 8-1 (TP SENSOR LOW VOLTAGE)

1. TP Sensor System Inspection

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

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

Is about 0 V indicated?

- YES** –
- Intermittent failure
 - Loose or poor contact on the sensor unit 5P connector

NO – GO TO STEP 2.

2. Sensor Unit Power Line Inspection

Check the sensor unit power line inspection (page 4-8).

Is the sensor unit power line normal?

YES – GO TO STEP 3.

NO – Replace or repair the abnormal circuit.

3. TP Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the sensor unit 5P connector [1].

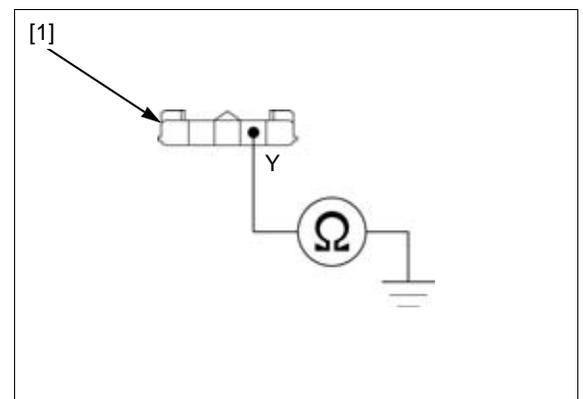
Check for continuity between the sensor unit 5P connector of the wire side and ground.

Connection: Yellow – Ground

Is there continuity?

YES – Short circuit in Yellow wire

NO – GO TO STEP 4.



4. TP Sensor Output Line Open Circuit Inspection

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

Check for continuity between the ECM 33P (Black) connector and sensor unit 5P connector [2] of the wire side.

Connection: Yellow – Yellow

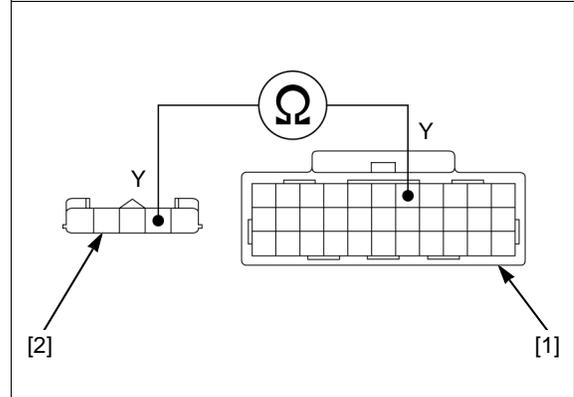
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in Yellow wire



5. TP Sensor Inspection

Replace the sensor unit with a known good one (page 4-44).

Connect the sensor unit 5P and ECM 33P (Black) connectors.

Erase the DTC's (page 4-5).

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

Check the TP sensor with the HDS pocket tester.

Is DTC 8-1 indicated?

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

NO – Faulty original sensor unit (TP sensor)

DTC 8-2 (TP SENSOR HIGH VOLTAGE)

1. TP Sensor System Inspection

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

Check the TP sensor with the HDS pocket tester.

Is about 5 V indicated?

YES – GO TO STEP 3.

NO – GO TO STEP 2.

2. TP Sensor Inspection

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

Is the voltage increase continuously?

YES – Intermittent failure

NO – Replace the TP sensor (sensor unit) with a known good one and recheck.

3. TP Sensor Resistance Inspection

Turn the ignition switch OFF.

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

Measure the resistance at the ECM 33P (Black) connector of the wire side.

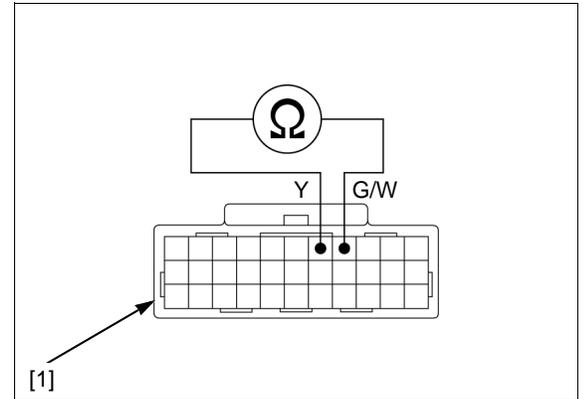
Connection: Yellow – Green/white

Standard: 0.29 – 0.71 Ω (20°C/68°F)

Is the resistance within 0.29 – 0.71 Ω ?

YES – GO TO STEP 4.

NO – Faulty sensor unit (TP sensor)



4. TP Sensor Power Input Voltage Inspection

Connect the ECM 33P (Black) connector.

Disconnect the sensor unit 5P connector [1].

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

Measure the voltage at the sensor unit 5P connector of the wire side.

Connection: Yellow/red (+) – Green/white (-)

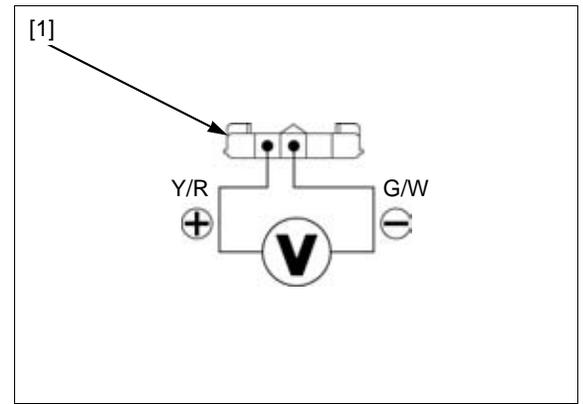
Standard: 4.75 – 5.25 V

Is the voltage within 4.75 – 5.25 V?

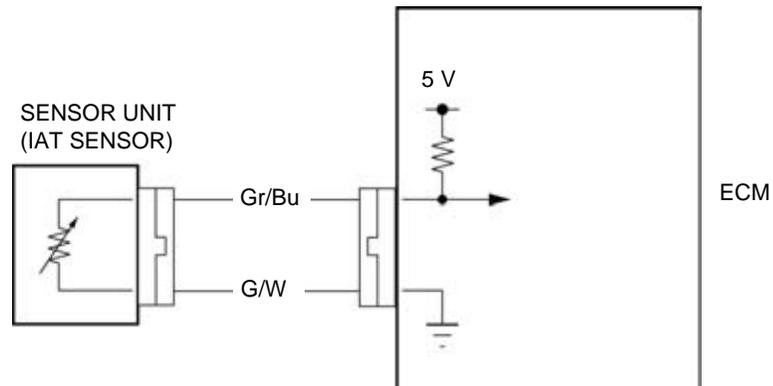
YES – Replace the ECM with a known good one, and recheck.

NO –

- Open circuit in Green/white wire
- Open circuit in Yellow/red wire



DTC 9 (IAT SENSOR)



Probable cause

- Open or short circuit in Gray/blue wire between the sensor unit and ECM
- Open circuit in Green/white wire between the sensor unit and ECM
- Faulty sensor unit
- Faulty ECM

DTC 9-1 (IAT SENSOR LOW VOLTAGE)

1. IAT Sensor System Inspection

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

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 connector.

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

Check the IAT sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – GO TO STEP 3.

NO – Faulty sensor unit (IAT sensor)

3. IAT Sensor Voltage Input Line Short Circuit Inspection

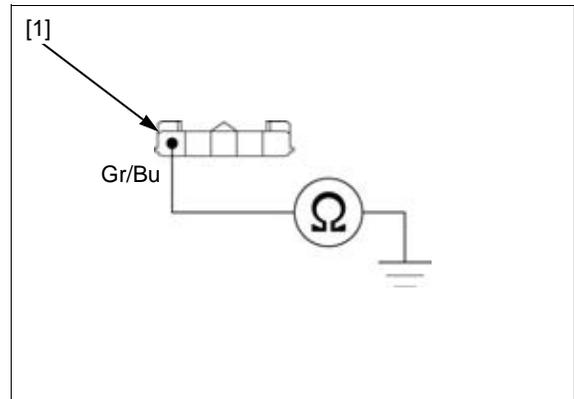
Check for continuity between the sensor unit 5P connector [1] of the wire side and ground.

Connection: Gray/blue – Ground

Is there continuity?

YES – Short circuit in Gray/blue wire

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



DTC 9-2 (IAT SENSOR HIGH VOLTAGE)

1. IAT Sensor System Inspection

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

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 connector

2. Sensor Unit Power Line Inspection

Check the sensor unit power line inspection (page 4-8).

Is the sensor unit power line normal?

YES – GO TO STEP 3.

NO – Replace or repair the abnormal circuit.

3. IAT Sensor Inspection

Turn the ignition switch OFF.

Disconnect the sensor unit 5P connector [1].

Connect the IAT sensor terminals at the wire side with a jumper wire [2].

Connection: Gray/blue – Green/white

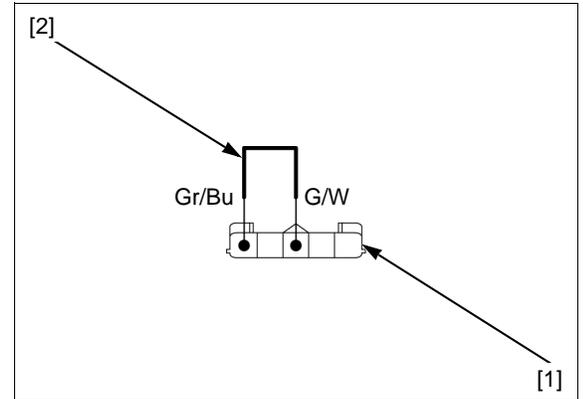
Turn the ignition switch ON and engine stop switch "G".

Check the IAT sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – Faulty sensor unit (IAT sensor)

NO – GO TO STEP 4.



4. IAT Sensor Voltage Input Line Open Circuit Inspection

Turn the ignition switch OFF.

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

Check for continuity between the ECM 33P (Black) connector and sensor unit 5P connector [2] of the wire side.

Connection: Gray/blue – Gray/blue

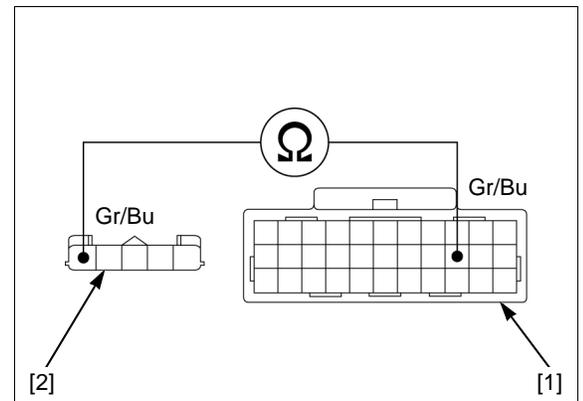
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

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

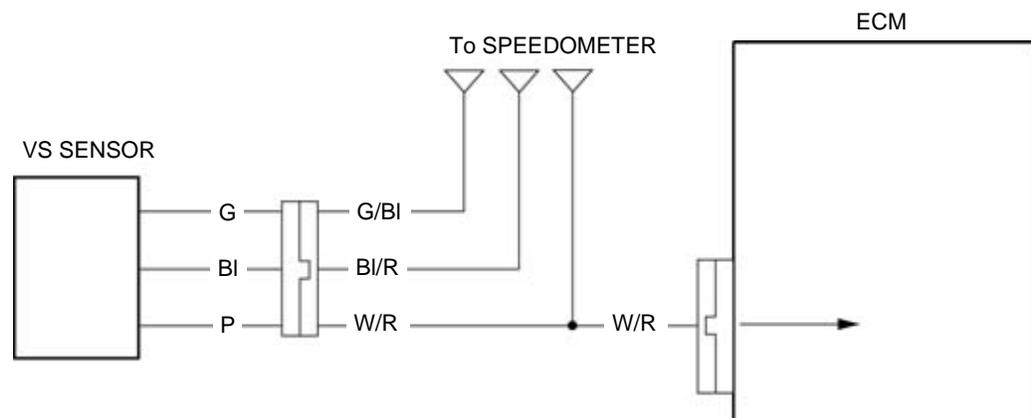
NO – Open circuit in Gray/blue wire



DTC 11 (VS SENSOR)

NOTE:

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



Probable cause

- Open or short circuit in Pink or White/red wire between the VS sensor and ECM
- Faulty VS sensor
- Faulty ECM

DTC 11-1 (VS SENSOR)

1. VS Sensor System Inspection

Erase the DTC's (page 4-5).
Test ride the motorcycle.
Stop the engine.

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

Check the VS sensor with the HDS.

Is DTC 11 - 1 indicated?

YES – GO TO STEP 2.

NO –

- Intermittent failure
- Loose or poor contact on the VS sensor 3P (Blue) connector

2. Speedometer Inspection

Inspect the speedometer (page 20-5).

Is the speedometer normal?

YES – GO TO STEP 3.

NO – Replace or repair the abnormal circuit.

3. VS Sensor Signal Line Inspection

Turn the ignition switch OFF.

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

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

Measure the voltage at the ECM 33P (Black) connector of the wire side.

Connection: White/red (+) – Ground (-)

TOOL:

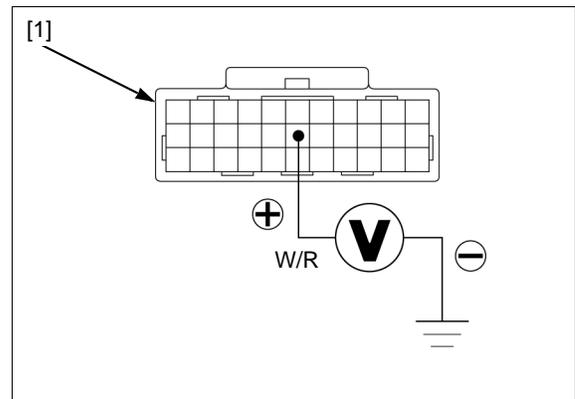
Test probe 07ZAJ-RDJA110

Slowly turn the rear wheel by hand.
There should be 0 V to 5 V pulse voltage.

Is there 0 – 5 V pulse voltage?

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

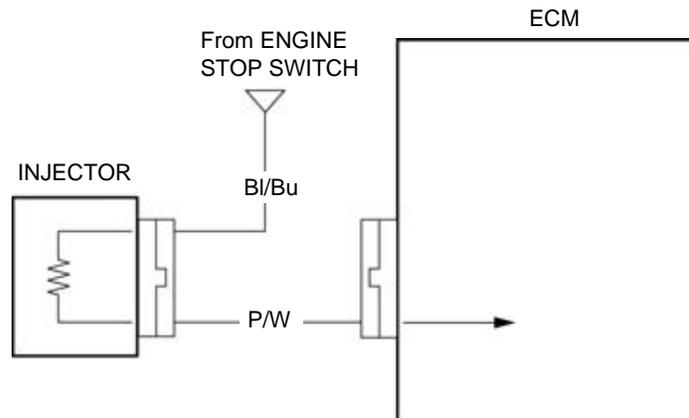
NO – Open or short circuit in White/red wire.



DTC 12 (INJECTOR)

NOTE:

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



Probable cause

- Open circuit in Black/blue wire between the engine stop switch and injector
- Open or short circuit in Pink/white wire between the injector and ECM
- Faulty injector
- Faulty ECM

DTC 12-1 (INJECTOR)

1. Injector System Inspection

Erase the DTC's (page 4-5).

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

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 (Gray) connector

2. Injector Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the injector 2P (Gray) connector [1].

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

Measure the voltage between the injector 2P (Gray) connector of the wire side and ground.

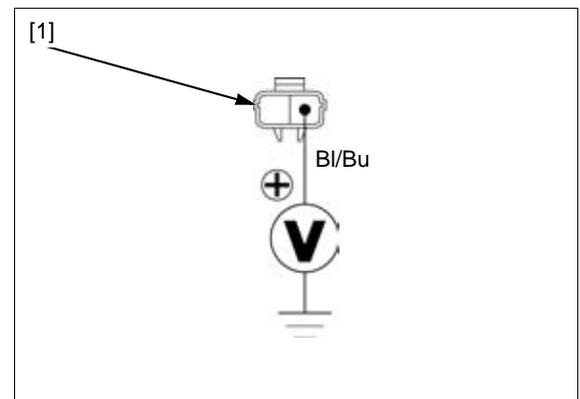
Connection: Black/blue (+) – Ground (–)

Standard: Battery voltage

Does the standard voltage exist?

YES – GO TO STEP 3.

- NO** – Open or short circuit in Black/blue wire



3. Injector Signal Line Short Circuit Inspection

Turn the ignition switch OFF.

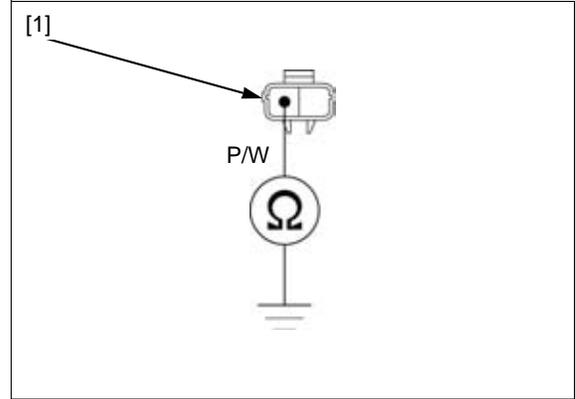
Check for continuity between the injector 2P (Gray) connector [1] of wire side and ground.

Connection: Pink/white – Ground

Is there continuity?

YES – Short circuit in Pink/white wire

NO – GO TO STEP 4.



4. Injector Resistance Inspection

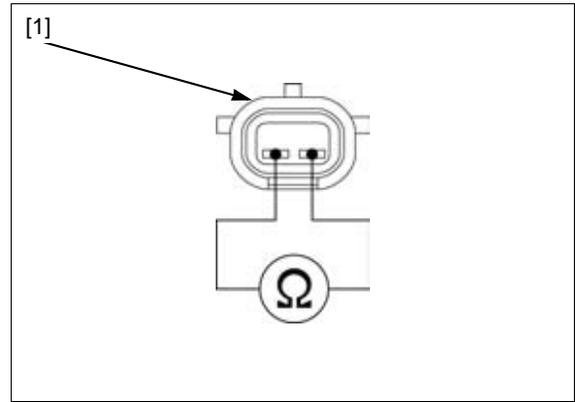
Measure the resistance between the injector 2P (Gray) connector [1] terminals.

Standard: 11 – 13 Ω (20°C/68°F)

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

YES – GO TO STEP 5.

NO – Faulty injector



5. Injector Signal Line Open Circuit Inspection

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

Check the continuity between the ECM 33P (Black) connector and injector 2P (Gray) connector [2] of the wire side.

Connection: Pink/white – Pink/white

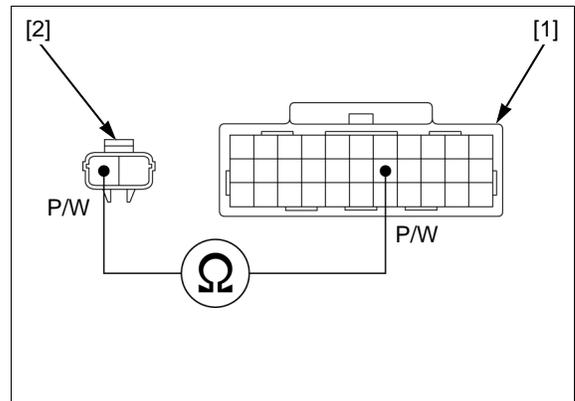
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

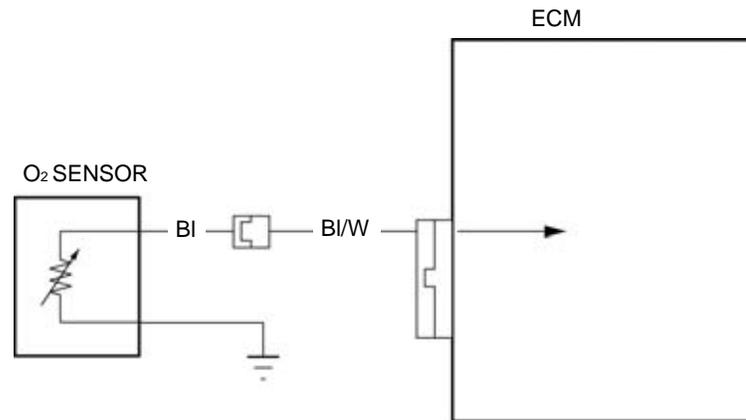
YES – Replace the ECM with a known good one and recheck.

NO – Open circuit in Pink/white wire



DTC 21 (O₂ SENSOR)**NOTE:**

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

**Probable cause**

- Open or short circuit in Black/white or Black wire between the O₂ sensor and ECM
- Faulty O₂ sensor
- Faulty ECM

DTC 21-1 (O₂ Sensor)**1. O₂ Sensor System Inspection**

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

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

Is the DTC 21-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. O₂ Sensor Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector (page 4-50).

Disconnect the O₂ sensor cap [1] (page 4-47).

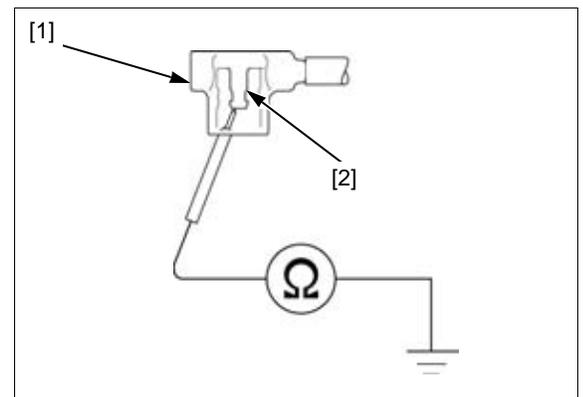
Check for continuity between the O₂ sensor cap terminal [2] and ground.

Connection: O₂ sensor cap terminal – Ground

Is there continuity?

YES – Short circuit in Black or Black/white wire

NO – GO TO STEP 3.



3. O₂ Sensor Open Circuit Inspection

Check for continuity between the ECM 33P (Black) connector [1] and O₂ sensor cap terminal [2] of the wire side.

Connection:

O₂ sensor cap terminal – Black/white

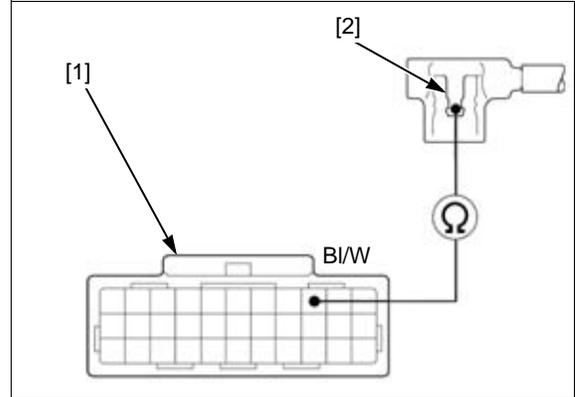
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in Black or Black/white wire



4. O₂ Sensor Inspection

Replace the O₂ sensor with a known good one (page 4-47).

Connect the ECM 33P (Black) connector.

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

Test-ride the motorcycle and recheck the O₂ sensor with the HDS pocket tester.

Is the DTC 21-1 indicated?

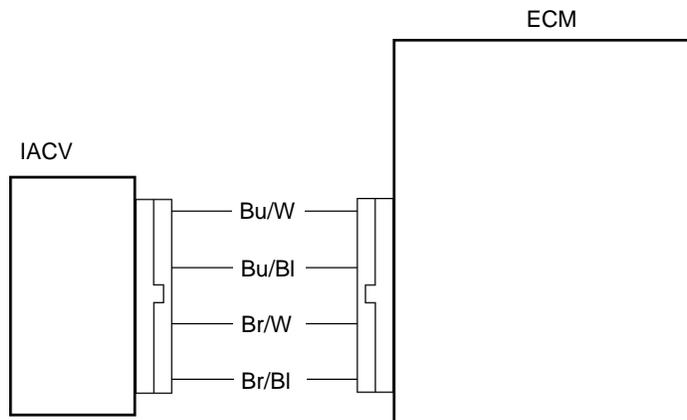
YES – Replace the ECM with a known good one and recheck.

NO – Faulty original O₂ sensor

DTC 29 (IACV)

NOTE:

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



Probable cause

- Open or short circuit in wires (Blue/white, Blue/black, Brown/white, Brown/black) between the IACV and ECM
- Faulty IACV
- Faulty ECM

1. Recheck DTC

Erase the DTC's (page 4-5).

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

Check the IACV with the HDS pocket tester.

Is the DTC 29-1 indicated?

YES – GO TO STEP 2.

- NO** –
- Intermittent failure
 - Loose or poor contact on the IACV 4P (Black) connector (Black)

2. IACV Short Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-50).

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

- Connection:**
- Blue/white – Ground**
 - Brown/white – Ground**
 - Brown/black – Ground**
 - Blue/black – Ground**

Is there continuity?

- YES** –
- Short circuit in Blue/white or Brown/white wire
 - Short circuit in Brown/black or Blue/black wire

NO – GO TO STEP 3.

3. IACV Open Circuit Inspection

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

- Connection:**
- Brown/white – Brown/white**
 - Blue/white – Blue/white**
 - Brown/black – Brown/black**
 - Blue/black – Blue/black**

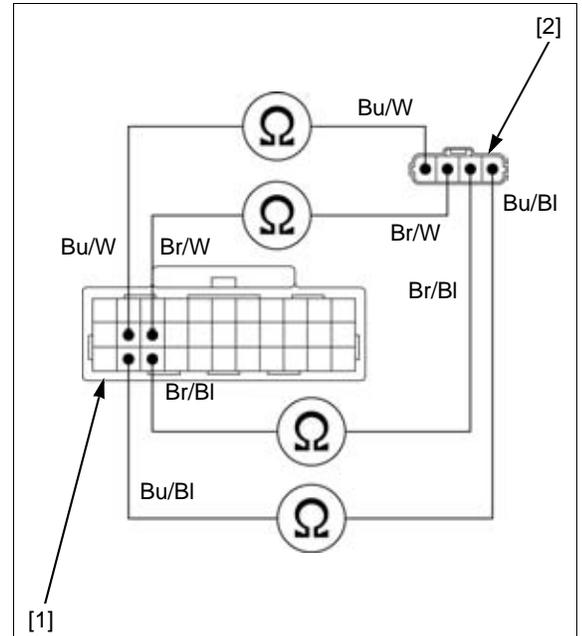
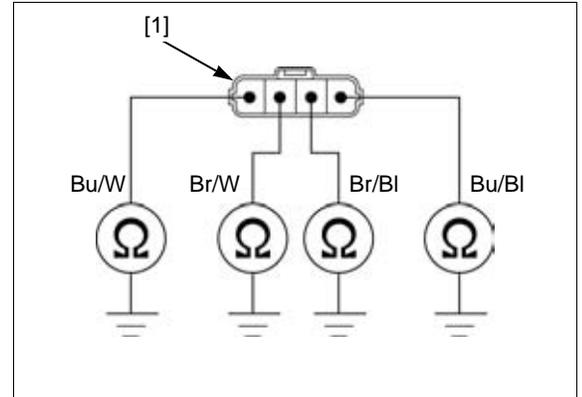
TOOL:

Test probe **07ZAJ-RDJA110**

Is there continuity?

YES – GO TO STEP 4.

- NO** –
- Open circuit in Blue/white or Brown/white wire
 - Open circuit in Brown/black or Blue/black wire



4. IACV Resistance Inspection

Turn the ignition switch OFF.

Disconnect the IACV 4P (Black) connector [1] (page 7-15).

Measure the resistance at the IACV side connector.

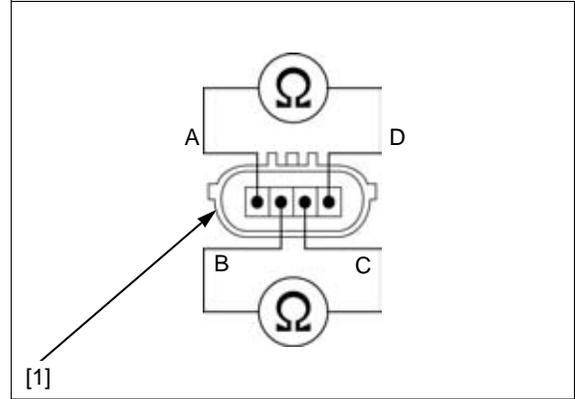
**Connection: A (Blue/black) – D (Blue/white)
B (Brown/black) – C (Brown/white)**

Standard: 110 – 150 Ω (25°C/77°F)

Is the resistance within 110 – 150 Ω (25°C/77°F)?

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

NO – Faulty IACV



DTC 33-2 (EEPROM)

1. Recheck DTC

Erase the DTC's (page 4-5).

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

Recheck the ECM EEPROM.

Is the DTC 33-2 indicated?

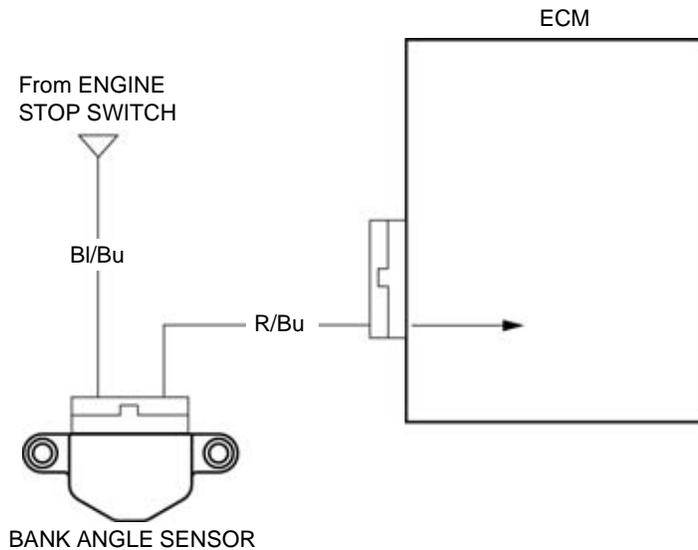
YES – Replace the ECM with a known good one and recheck.

NO – Intermittent failure

DTC 54 (BANK ANGLE SENSOR)

NOTE:

Before starting the inspection, check for loose or poor contact on the bank angle sensor 2P connector and recheck the MIL blinking.



Probable cause

- Open circuit in Black/blue wire between the engine stop switch and bank angle sensor
- Open or short circuit in Red/blue wire between the bank angle sensor and ECM
- Faulty bank angle sensor
- Faulty ECM

DTC 54-1 (BANK ANGLE SENSOR LOW VOLTAGE)

1. Recheck DTC

Erase the DTC's (page 4-5).

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

Check the bank angle sensor with the HDS pocket tester.

Is the DTC 54-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Bank Angle Sensor Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the bank angle sensor 2P connector [1] (page 4-48).

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

Measure the voltage between the bank angle sensor 2P connector of the wire side and ground.

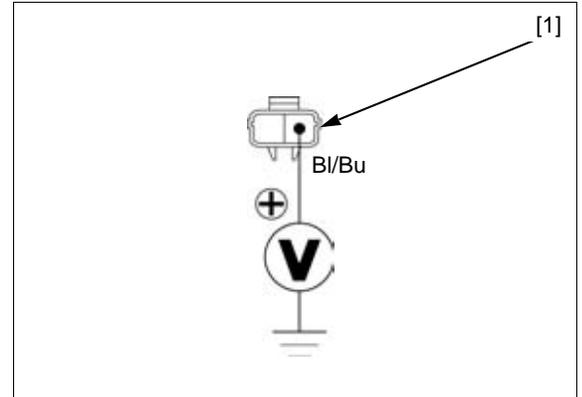
Connection: Black/blue (+) – Ground (-)

Standard: Battery voltage

Is there battery voltage?

YES – GO TO STEP 3.

NO – Open circuit in Black/blue wire



3. Bank Angle Sensor Signal Line Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector (page 4-50).

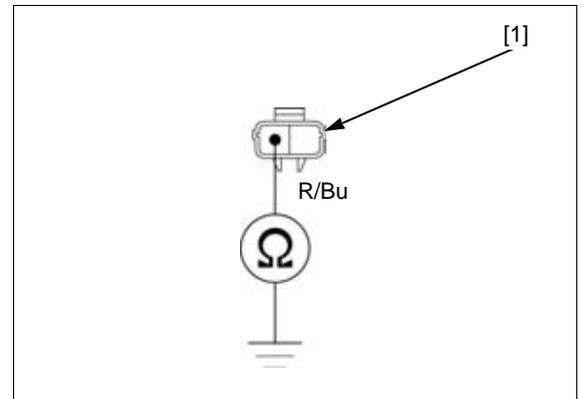
Check for continuity between the bank angle sensor 2P connector [1] of the wire side and ground.

Connection: Red/blue – Ground

Is there continuity?

YES – Short circuit in Red/blue wire

NO – GO TO STEP 4.



4. Bank Angle Sensor Signal Line Open Circuit Inspection

Turn the ignition switch OFF.

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

Connection: Red/blue – Red/blue

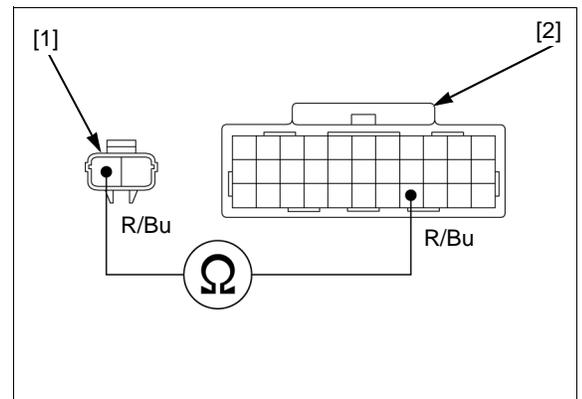
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in Red/blue wire



5. Bank Angle Sensor Inspection

Replace the bank angle sensor with a known good one (page 4-48).
 Connect the bank angle sensor 2P connector and ECM 33P (Black) connector.

Erase the DTC's (page 4-5).
 Turn the ignition switch ON and engine stop switch "G".

Check the bank angle sensor with the HDS pocket tester.

Is DTC 54-2 indicated?

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

DTC 54-2 (BANK ANGLE SENSOR HIGH VOLTAGE)

1. Recheck DTC

Erase the DTC's (page 4-5).
 Turn the ignition switch ON and engine stop switch "G".
 Check the bank angle sensor with the HDS pocket tester.

Is the DTC 54-2 indicated?

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

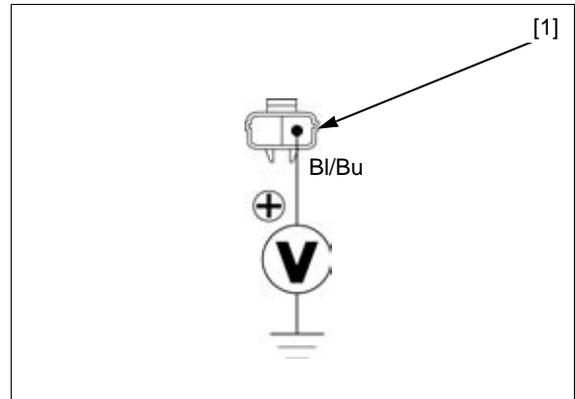
2. Bank Angle Sensor Input Voltage Inspection

Turn the ignition switch OFF.
 Disconnect the bank angle sensor 2P connector [1] (page 4-48).
 Turn the ignition switch ON and engine stop switch "G".
 Measure the voltage between the bank angle sensor 2P connector of the wire side and ground.

Connection: Black/blue (+) – Ground (-)
Standard: Battery voltage

Is there battery voltage?

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



3. Bank Angle Sensor Signal Line Open Circuit Inspection

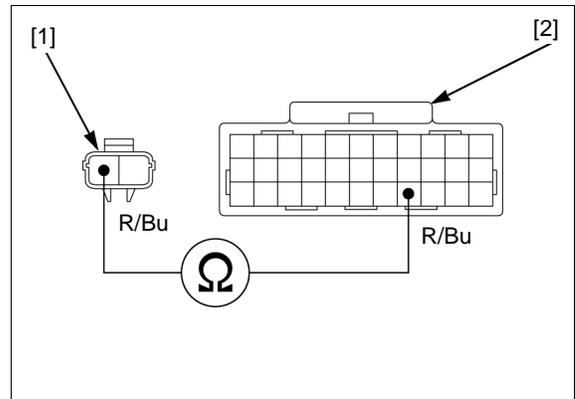
Turn the ignition switch OFF.
 Check for continuity between the bank angle sensor 2P connector [1] and ECM 33P (Black) connector [2] of the wire side.

Connection: Red/blue – Red/blue

TOOL:
Test probe 07ZAJ-RDJA110

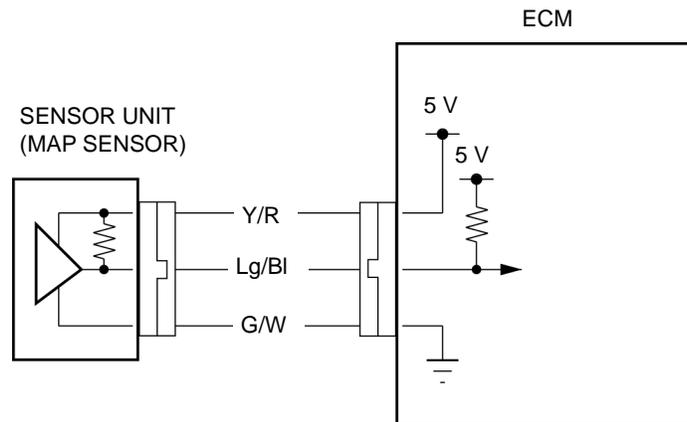
Is there continuity?

- YES** – Inspect the bank angle sensor (page 4-48).
- NO** – Open circuit in Red/blue wire



MIL TROUBLESHOOTING

MIL 1 BLINK (MAP SENSOR)



Probable cause

- Open circuit in Yellow/red wire between the sensor unit and ECM
- Open or short circuit in Light green/black wire between the sensor unit and ECM
- Open circuit in Green/white wire between the sensor unit and ECM
- Faulty sensor unit
- Faulty ECM

1. Sensor Unit Power Line Inspection

Check the sensor unit power line inspection (page 4-8).

Is the sensor unit power line normal?

YES – GO TO STEP 2.

NO – Replace or repair the abnormal circuit.

2. MAP Sensor Output Voltage Inspection

Turn the ignition switch OFF.

Connect the ECM 33P (Black) connector.
Disconnect the sensor unit 5P connector [1] (page 4-44).

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

Measure the voltage at the sensor unit 5P connector of the wire side.

Connection:

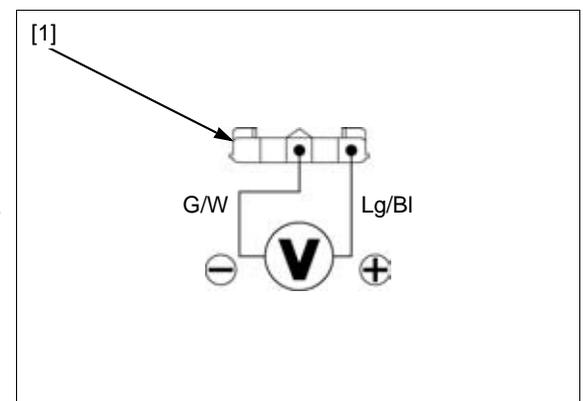
Light green/black (+) – Green/white (-)

Standard: 4.75 – 5.25 V

Is the voltage within 4.75 – 5.25 V?

YES – Faulty sensor unit (MAP sensor)

NO – GO TO STEP 3.



3. MAP Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector.

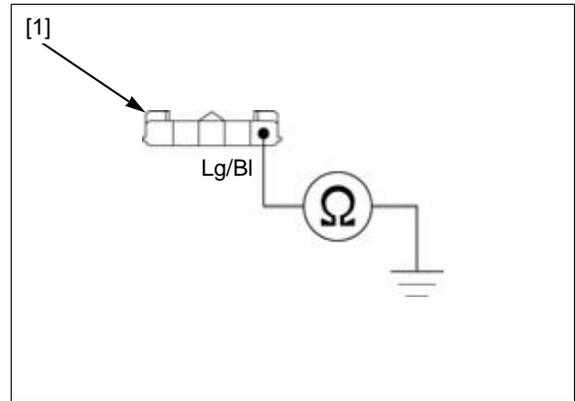
Check for continuity between the sensor unit 5P connector [1] terminal of the wire side and ground.

Connection: Light green/black – Ground

Is there continuity?

YES – Short circuit in Light green/black wire

NO – GO TO STEP 4.



4. MAP Sensor Output Line Open Circuit Inspection

Check for continuity between the ECM 33P (Black) connector [1] and sensor unit 5P connector [2] of the wire side.

Connection:

Light green/black – Light green/black

TOOL:

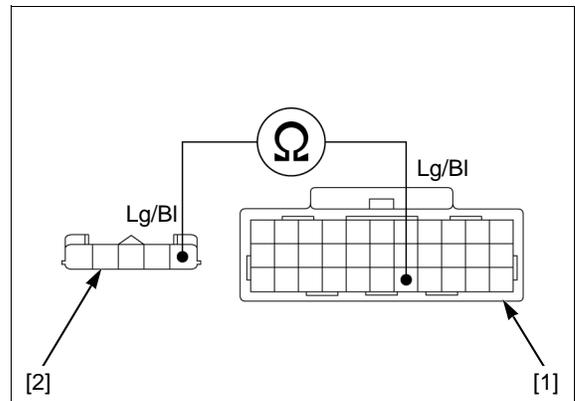
Test probe

07ZAJ-RDJA110

Is there continuity?

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

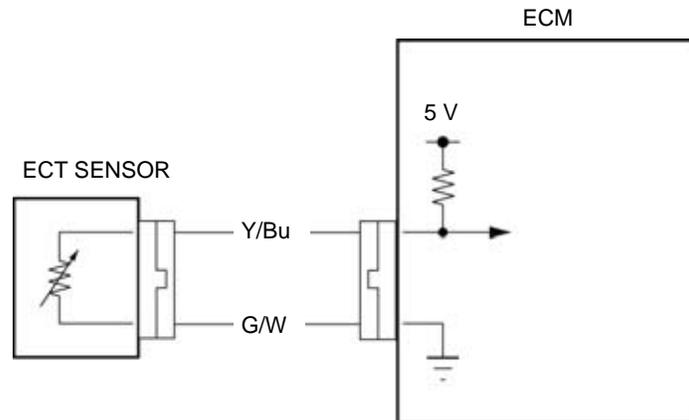
NO – Open circuit in Light green/black wire



MIL 7 BLINKS (ECT SENSOR)

NOTE:

Before starting the inspection, check for loose or poor contact on the ECT sensor 3P connector and recheck the MIL blinking.



Probable cause

- Open or short circuit in Yellow/blue wire between the ECT sensor and ECM
- Open circuit in Green/white wire between the ECT sensor and ECM
- Faulty ECT sensor
- Faulty ECM

1. ECT Sensor Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the ECT sensor 3P connector [1] (page 4-46).

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

Measure the voltage at the ECT sensor 3P connector of the wire side and ground.

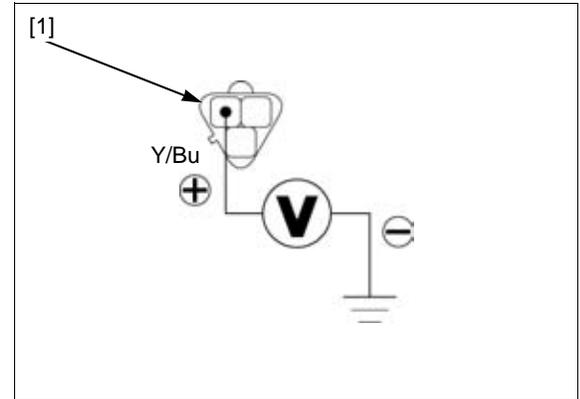
Connection: Yellow/blue (+) – Ground (-)

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. ECT Sensor Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector (page 4-50).

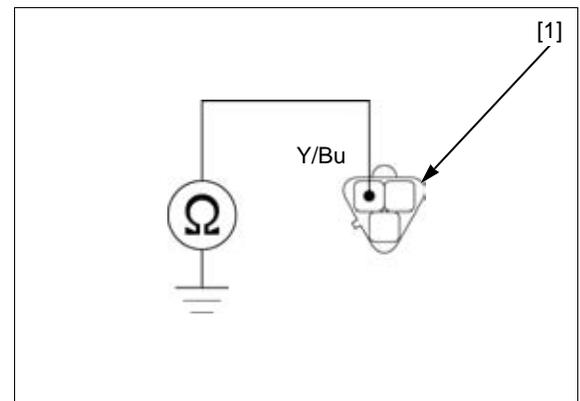
Check for continuity between the ECT sensor 3P connector [1] of the wire side and ground.

Connection: Yellow/blue – Ground

Is there continuity?

YES – Short circuit in Yellow/blue wire

NO – GO TO STEP 4.



3. ECT Sensor Resistance Inspection

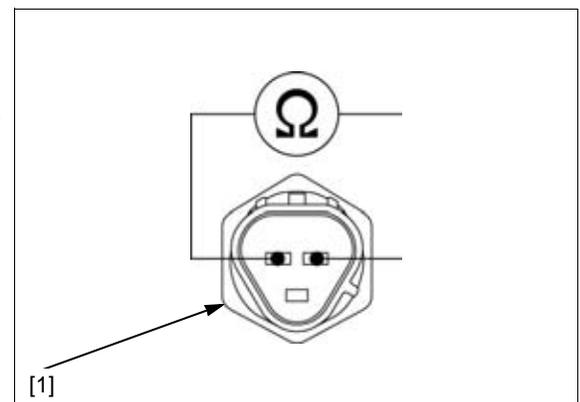
Measure the resistance at the ECT sensor [1] terminals.

Standard: 2.3 – 2.6 kΩ (20°C/68°F)

Is the resistance within 2.3 – 2.6 kΩ (20°C/68°F)?

YES – GO TO STEP 4.

NO – Faulty ECT sensor



4. ECT Sensor Open Circuit Inspection

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

**Connection: Yellow/blue – Yellow/blue
Green/white – Green/white**

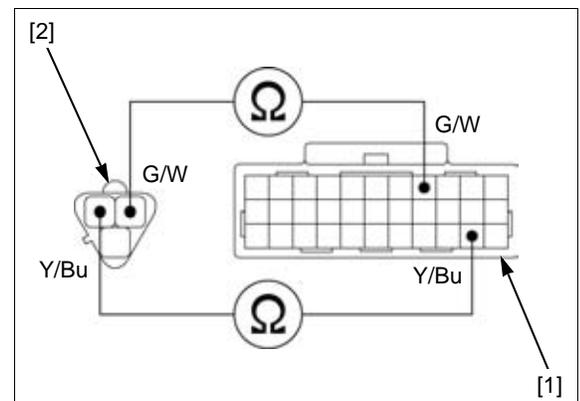
TOOL:

Test probe 07ZAJ-RDJA110

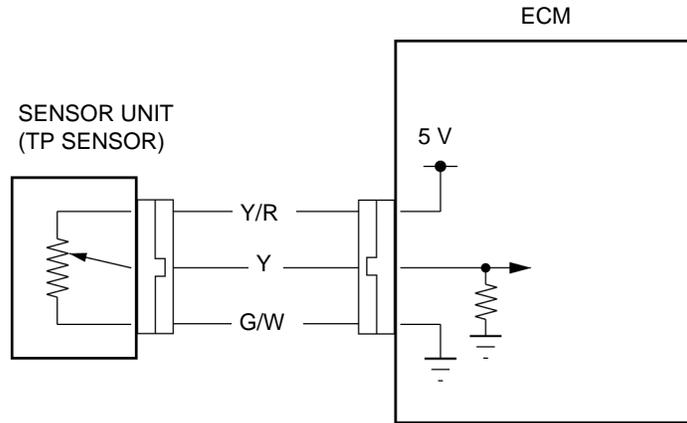
Is there continuity?

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

NO – • Open circuit in Yellow/blue wire
• Open circuit in Green/white wire



MIL 8 BLINKS (TP SENSOR)



Probable cause

- Open circuit in Yellow/red wire between the sensor unit and ECM
- Open or short circuit in Yellow wire between the sensor unit and ECM
- Open circuit in Green/white wire between the sensor unit and ECM
- Faulty sensor unit
- Faulty ECM

1. Sensor Unit Power Line Inspection

Check the sensor unit power line inspection (page 4-8).

Is the sensor unit power line normal?

YES – GO TO STEP 2.

NO – Replace or repair the abnormal circuit.

2. TP Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector and sensor unit 5P connector [1] (page 4-44).

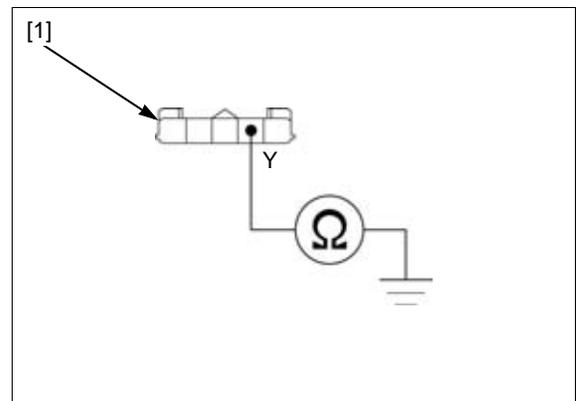
Check for continuity between the sensor unit 5P connector of the wire side and ground.

Connection: Yellow – Ground

Is there continuity?

YES – Short circuit in Yellow wire

NO – GO TO STEP 3.



3. TP Sensor Output Line Open Circuit Inspection

Check for continuity between the ECM 33P (Black) connector [1] and sensor unit 5P connector [2] of the wire side.

Connection: Yellow – Yellow

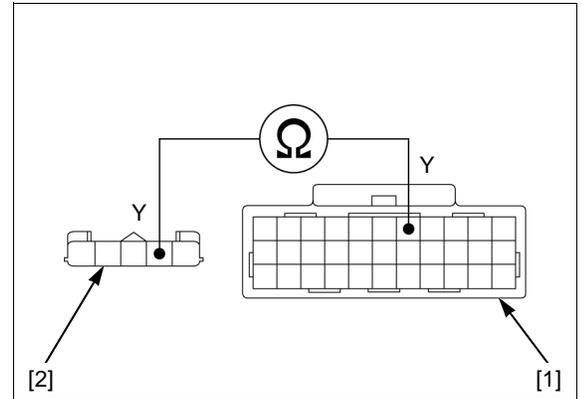
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in Yellow wire



4. TP Sensor Resistance Inspection

Connect the sensor unit 5P connector.

Check that the resistance varies in accordance with the throttle operation at the ECM 33P (Black) connector of the wire side.

Connection: Yellow – Green/white

Fully closed-Fully open position:

Resistance increases

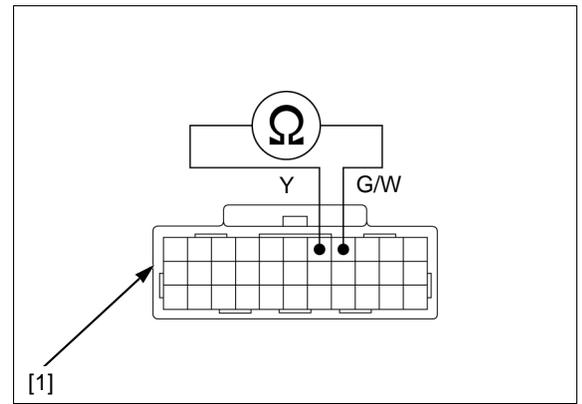
Fully open-Fully closed position:

Resistance decreases

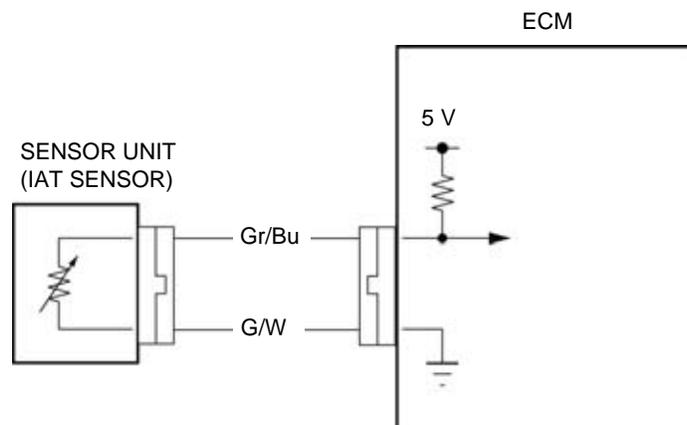
Is the resistance normal?

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

NO – Faulty sensor unit (TP sensor)



MIL 9 BLINKS (IAT SENSOR)



Probable cause

- Open or short circuit in Gray/blue wire between the sensor unit and ECM
- Open circuit in Green/white wire between the sensor unit and ECM
- Faulty sensor unit
- Faulty ECM

1. Sensor Unit Power Line Inspection

Check the sensor unit power line inspection (page 4-8).

Is the sensor unit power line normal?

YES – GO TO STEP 2.

NO – Replace or repair the abnormal circuit.

2. IAT Sensor Output Voltage Inspection

Turn the ignition switch OFF.

Connect the ECM 33P (Black) connector.
Disconnect the sensor unit 5P connector [1] (page 4-44).

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

Measure the voltage at the sensor unit 5P connector of the wire side.

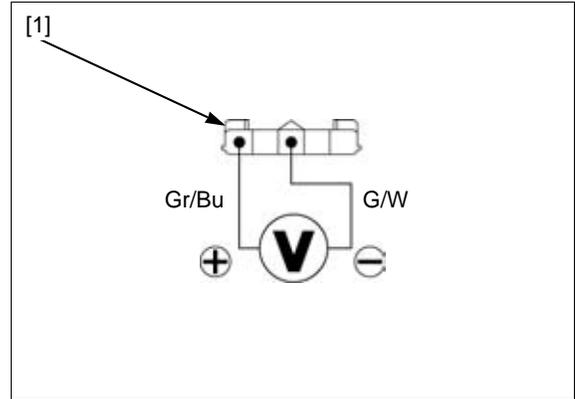
Connection: Gray/blue (+) – Green/white (-)

Standard: 4.75 – 5.25 V

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 5.

NO – GO TO STEP 3.



3. IAT Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector.

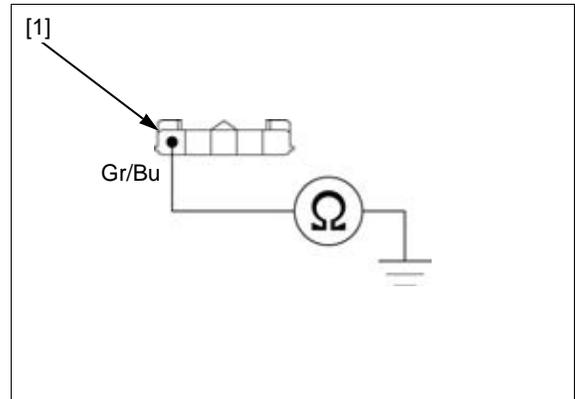
Check for continuity between the sensor unit 5P connector [1] of the wire side and ground.

Connection: Gray/blue – Ground

Is there continuity?

YES – Short circuit in Gray/blue wire

NO – GO TO STEP 4.



4. IAT Sensor Output Line Open Circuit Inspection

Check for continuity between the ECM 33P (Black) connector [1] and sensor unit 5P connector [2] of the wire side.

Connection: Gray/blue – Gray/blue

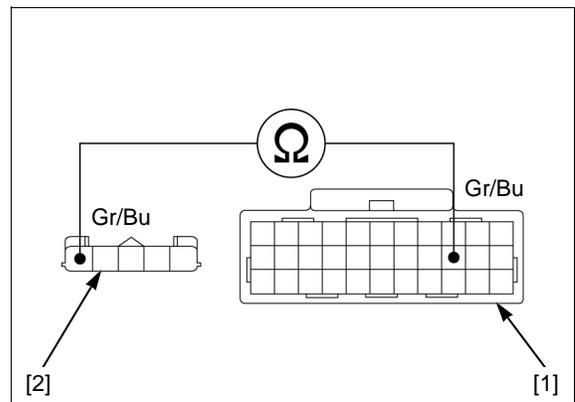
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

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

NO – Open circuit in Gray/blue wire



5. IAT Sensor Resistance Inspection

Turn the ignition switch OFF.

Connect the sensor unit 5P connector.
Disconnect the ECM 33P (Black) connector [1].

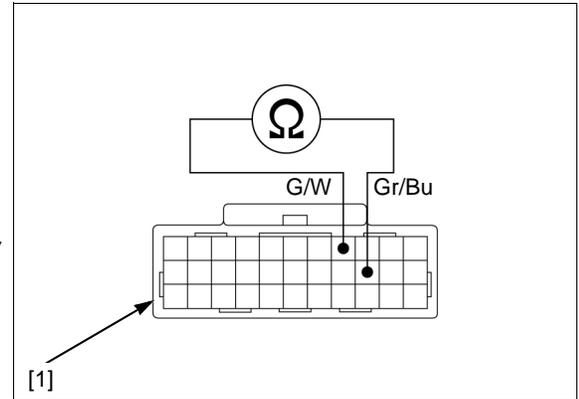
Measure the resistance at the ECM 33P (Black) connector of the wire side.

Connection: Gray/blue – Green/white
Standard: 1.13 – 1.88 kΩ (20°C/68°F)

Is the resistance within 1.13 – 1.88 kΩ (20°C/68°F)?

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

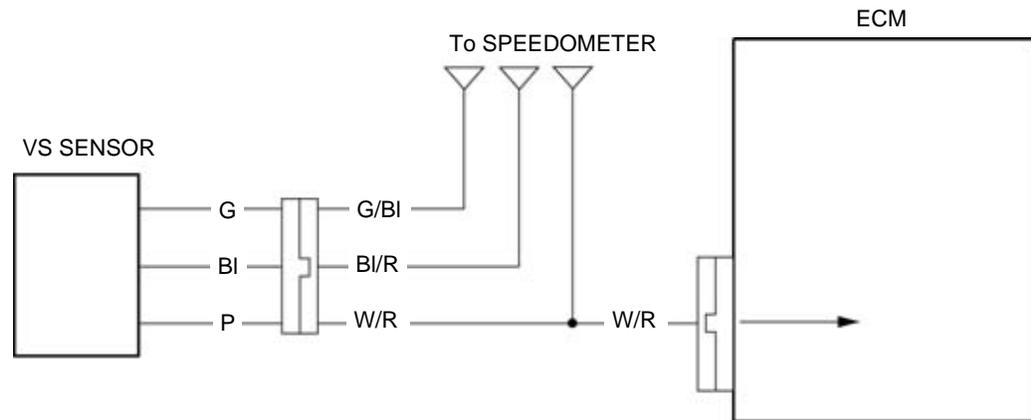
NO – Faulty sensor unit (IAT sensor)



MIL 11 BLINKS (VS SENSOR)

NOTE:

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



Probable cause

- Open or short circuit in Pink or White/red wire between the VS sensor and ECM
- Faulty VS sensor
- Faulty ECM

1. Speedometer Inspection

Inspect the speedometer (page 20-8).

Is the speedometer normal?

YES – GO TO STEP 2.

NO – Replace or repair the abnormal circuit.

2. VS Sensor Signal Line Inspection

Turn the ignition switch OFF.

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

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

Measure the voltage at the ECM 33P (Black) connector of the wire side.

Connection: White/red (+) – Ground (-)

TOOL:

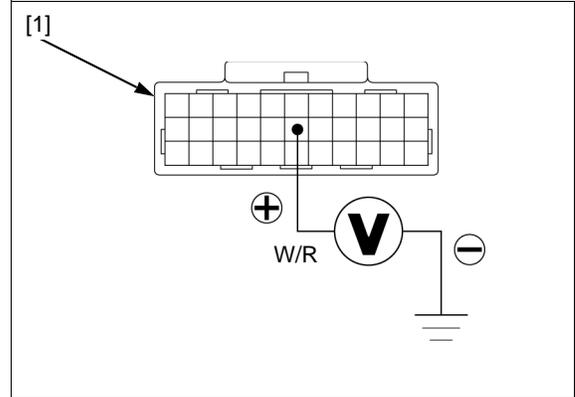
Test probe 07ZAJ-RDJA110

Slowly turn the rear wheel by hand.
There should be 0 V to 5 V pulse voltage.

Is there 0 – 5 V pulse voltage?

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

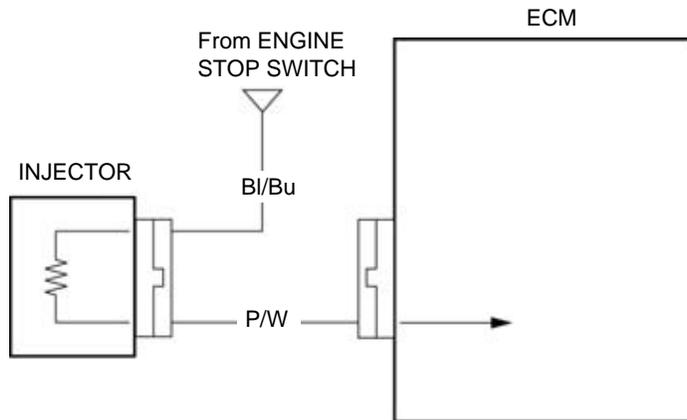
NO – Open or short circuit in White/red wire.



MIL 12 BLINKS (INJECTOR)

NOTE:

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



Probable cause

- Open circuit in Black/blue wire between the engine stop switch and injector
- Open or short circuit in Pink/white wire between the injector and ECM
- Faulty injector
- Faulty ECM

1. Injector Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the injector 2P (Gray) connector [1] (page 7-14).

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

Measure the voltage between the injector 2P (Gray) connector of the wire side and ground.

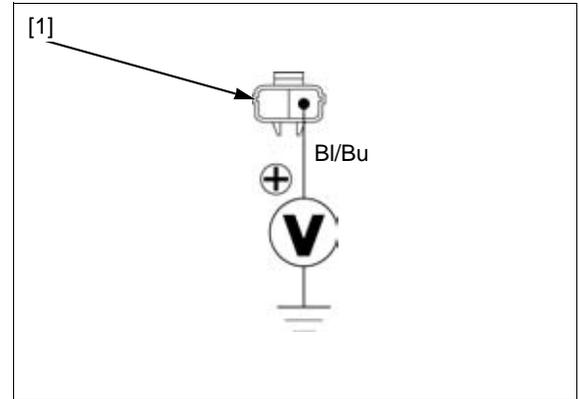
Connection: Black/blue (+) – Ground (-)

Standard: Battery voltage

Does the standard voltage exist?

YES – GO TO STEP 2.

NO – Open circuit in Black/blue wire



2. Injector Signal Line Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector.

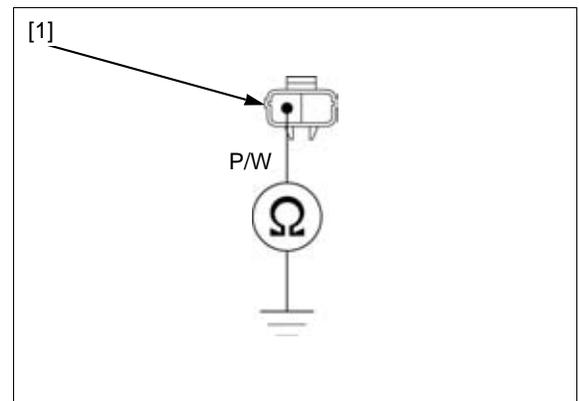
Check for continuity between the injector 2P (Gray) connector [1] of the wire side and ground.

Connection: Pink/white – Ground

Is there continuity?

YES – Short circuit in Pink/white wire

NO – GO TO STEP 3.



3. Injector Resistance Inspection

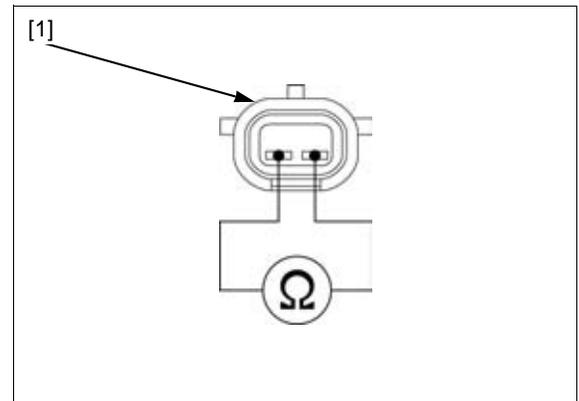
Measure the resistance between the injector side connector [1] terminals.

Standard: 11 – 13 Ω (20°C/68°F)

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

YES – GO TO STEP 4.

NO – Faulty injector



4. Injector Signal Line Open Circuit Inspection

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

Connection: Pink/white – Pink/white

TOOL:

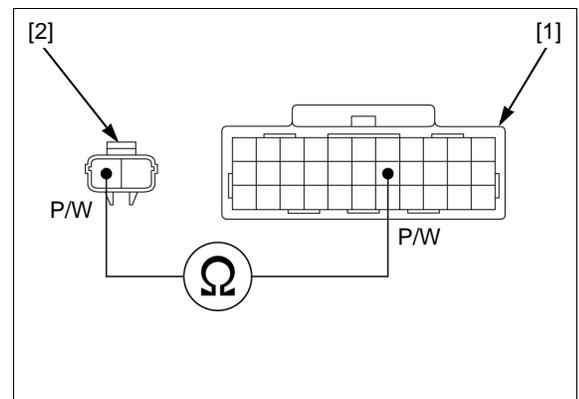
Test probe

07ZAJ-RDJA110

Is there continuity?

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

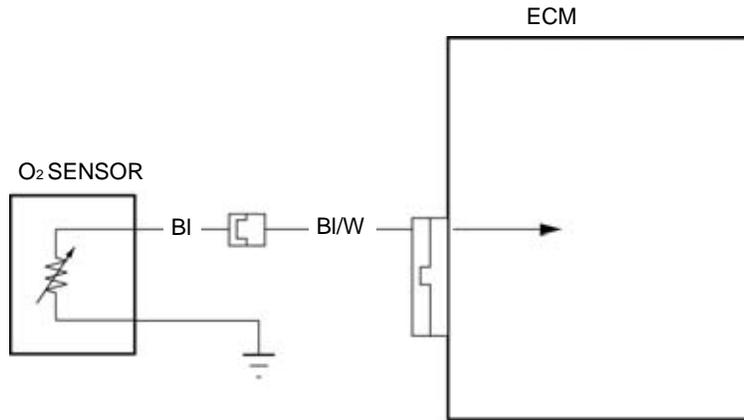
NO – Open circuit in Pink/white wire



MIL 21 BLINKS (O₂ SENSOR)

NOTE:

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



Probable cause

- Open or short circuit in Black/white or Black wire between the O₂ sensor and ECM
- Faulty O₂ sensor
- Faulty ECM

1. O₂ Sensor System Inspection

Start the engine and warm up the engine up to coolant temperature is 80°C/176°F.

Test-ride the motorcycle and recheck the MIL blinking.

Does the MIL blink 21 times?

YES – GO TO STEP 2.

NO – Intermittent failure

2. O₂ Sensor Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) connector (page 4-50).

Disconnect the O₂ sensor cap [1] (page 4-47).

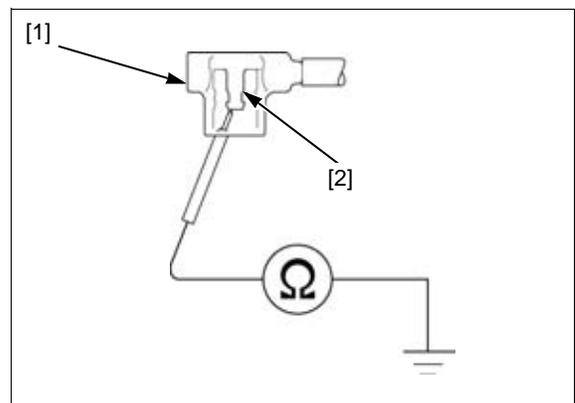
Check for continuity between the O₂ sensor cap terminal [2] and ground.

Connection: O₂ sensor cap terminal – Ground

Is there continuity?

YES – Short circuit in Black or Black/white wire

NO – GO TO STEP 3.



3. O₂ Sensor Open Circuit Inspection

Check for continuity between the ECM 33P (Black) connector [1] and O₂ sensor cap terminal [2] of the wire side.

Connection: O₂ sensor cap terminal – Black/white

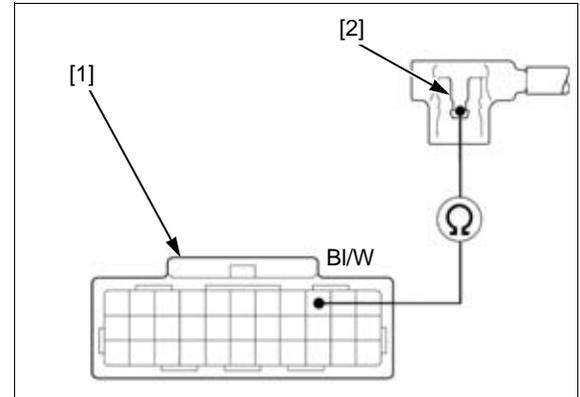
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in Black or Black/white wire



4. O₂ Sensor Inspection

Replace the O₂ sensor with a known good one (page 4-47).

Connect the ECM 33P (Black) connector.

Start the engine and warm up the engine up to coolant temperature is 80°C/176°F.

Test-ride the motorcycle and recheck the MIL blinking.

Does the MIL blink 21 times?

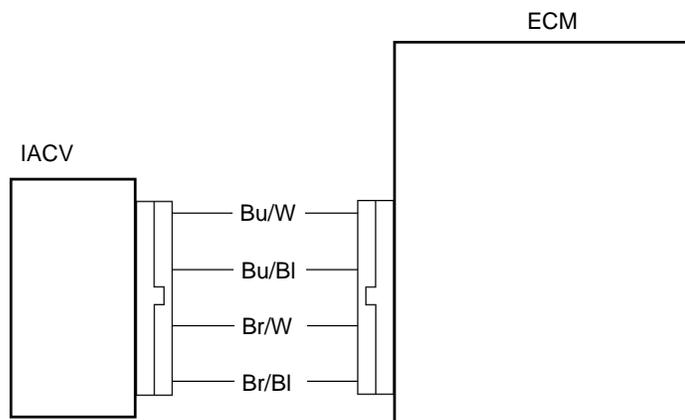
YES – Replace the ECM with a known good one, and recheck.

NO – Faulty original O₂ sensor

MIL 29 BLINKS (IACV)

NOTE:

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



Probable cause

- Open or short circuit in wires (Blue/white, Blue/black, Brown/white, Brown/black) between the IACV and ECM
- Faulty IACV
- Faulty ECM

1. IACV Resistance Inspection

Turn the ignition switch OFF.

Disconnect the IACV 4P (Black) connector [1] (page 7-15).

Measure the resistance at the IACV side connector.

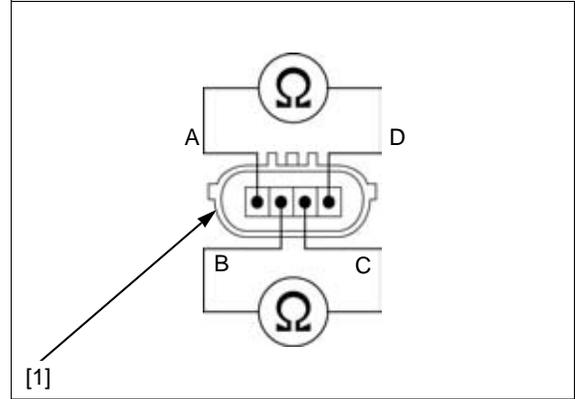
**Connection: A (Blue/black) – D (Blue/white)
B (Brown/black) – C (Brown/white)**

Standard: 110 – 150 Ω (25°C/77°F)

Is the resistance within 110 – 150 Ω (25°C/77°F)?

YES – GO TO STEP 2.

NO – Faulty IACV



2. IACV Short Circuit Inspection

Disconnect the ECM 33P (Black) connector (page 4-50).

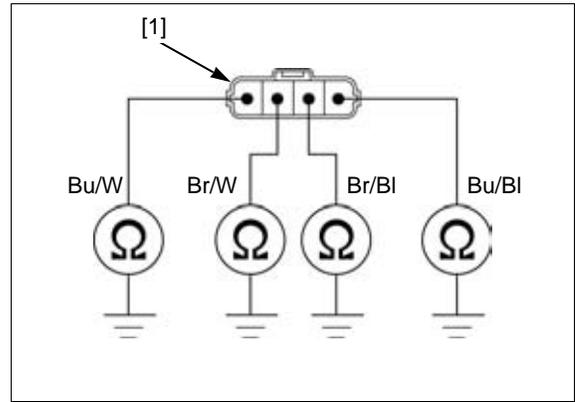
Check for continuity between the IACV 4P (Black) connector [1] of the wire side and ground.

**Connection: Blue/white – Ground
Brown/white – Ground
Brown/black – Ground
Blue/black – Ground**

Is there continuity?

- YES** –
- Short circuit in Blue/white or Brown/white wire
 - Short circuit in Brown/black or Blue/black wire

NO – GO TO STEP 3.



3. IACV Open Circuit Inspection

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

**Connection: Brown/white – Brown/white
Blue/white – Blue/white
Brown/black – Brown/black
Blue/black – Blue/black**

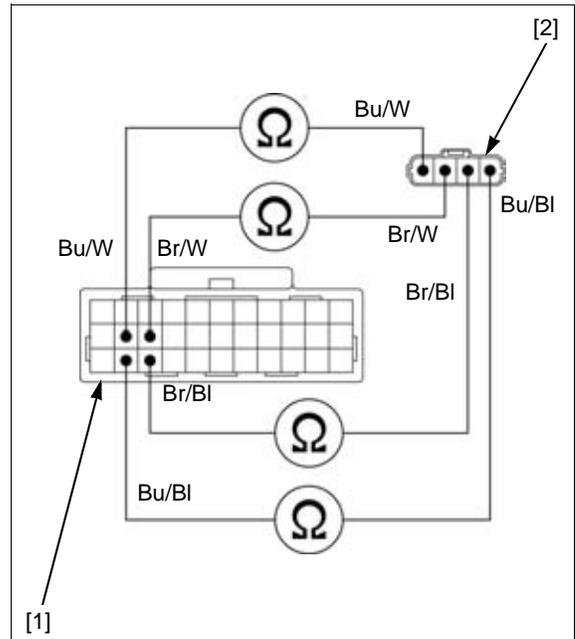
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

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

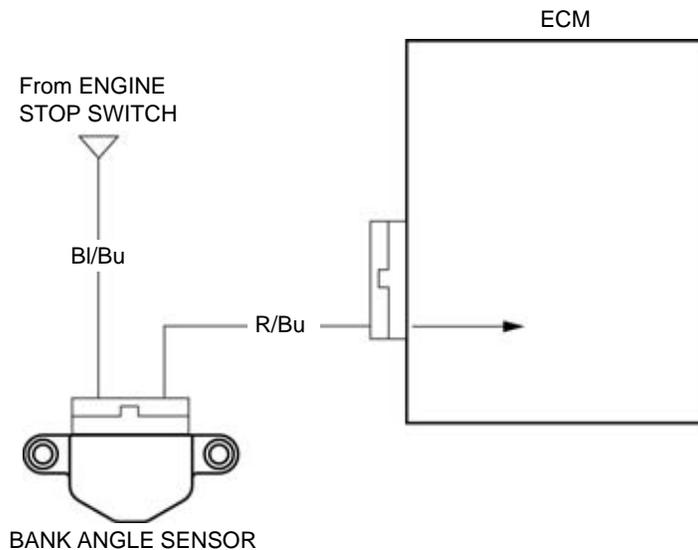
- NO** –
- Open circuit in Blue/white or Brown/white wire
 - Open circuit in Brown/black or Blue/black wire



MIL 54 BLINKS (BANK ANGLE SENSOR)

NOTE:

Before starting the inspection, check for loose or poor contact on the bank angle sensor 2P connector and recheck the MIL blinking.



Probable cause

- Open circuit in Black/blue wire between the engine stop switch and bank angle sensor
- Open or short circuit in Red/blue wire between the bank angle sensor and ECM
- Faulty bank angle sensor
- Faulty ECM

1. Bank Angle Sensor Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the bank angle sensor 2P connector [1] (page 4-48).

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

Measure the voltage between the bank angle sensor 2P connector of the wire side and ground.

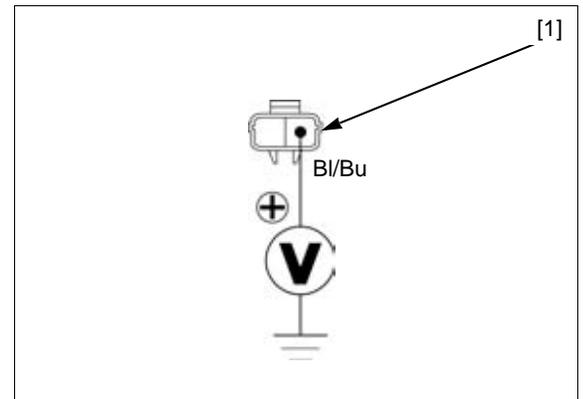
Connection: Black/blue (+) – Ground (-)

Standard: Battery voltage

Is there battery voltage?

YES – GO TO STEP 2.

NO – Open circuit in Black/blue wire



2. Bank Angle Sensor Signal Line Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector (page 4-50).

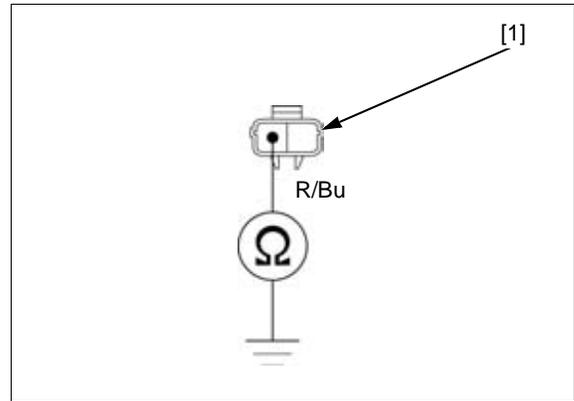
Check for continuity between the bank angle sensor 2P connector [1] of the wire side and ground.

Connection: Red/blue – Ground

Is there continuity?

YES – Short circuit in Red/blue wire

NO – GO TO STEP 3.



3. Bank Angle Sensor Signal Line Open Circuit Inspection

Turn the ignition switch OFF.

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

Connection: Red/blue – Red/blue

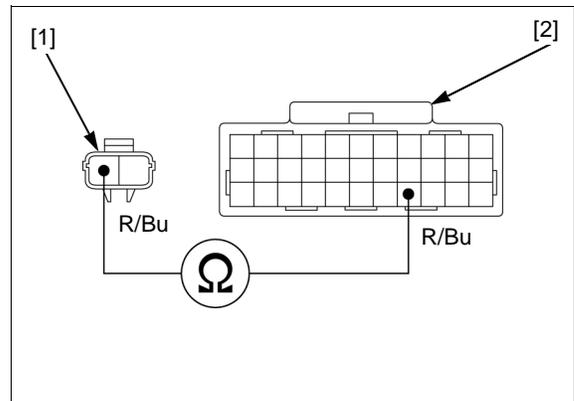
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in Red/blue wire



4. Bank Angle Sensor Inspection

Replace the bank angle sensor with a known good one (page 4-48).

Connect the bank angle sensor 2P connector and ECM 33P (Black) connector.

Erase the DTC's (page 4-5).

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

Check if the MIL blinks.

Does the MIL blink 54 times?

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

NO – Faulty original the bank angle sensor.

MIL CIRCUIT TROUBLESHOOTING

NOTE:

Before starting the inspection, check the speedometer power input line (page 20-6).

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

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

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector (page 4-50).

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

CONNECTION: White/blue – Ground

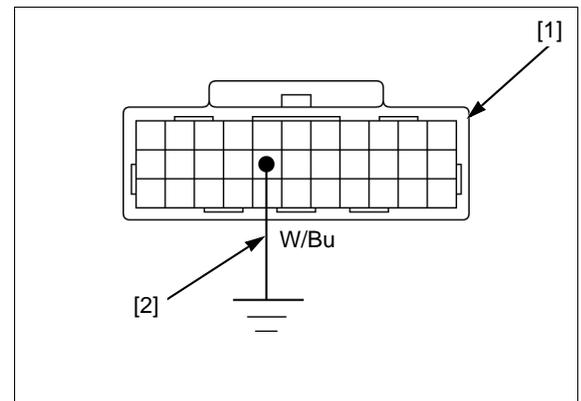
TOOL:

Test probe

07ZAJ-RDJA110

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

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



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

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector (page 4-50).

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

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

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

CONNECTION: Blue – Ground

STANDARD: No continuity

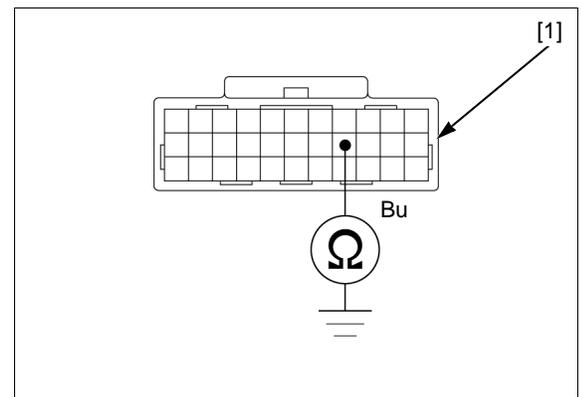
TOOL:

Test probe

07ZAJ-RDJA110

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

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



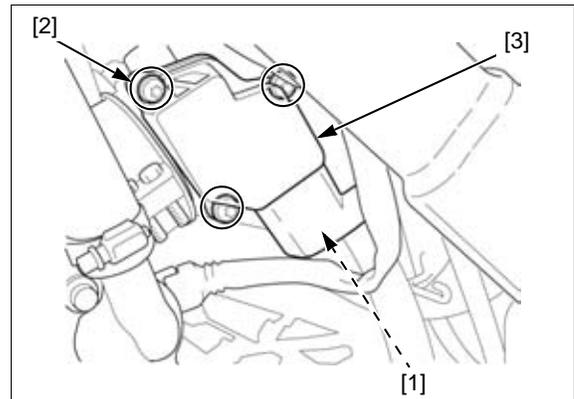
SENSOR UNIT

REMOVAL/INSTALLATION

Remove the left fuel tank shroud (page 2-4).

Disconnect the sensor unit 5P connector [1].

Remove the torx screws [2] and sensor unit [3] from the throttle body.



Remove the O-ring [1].

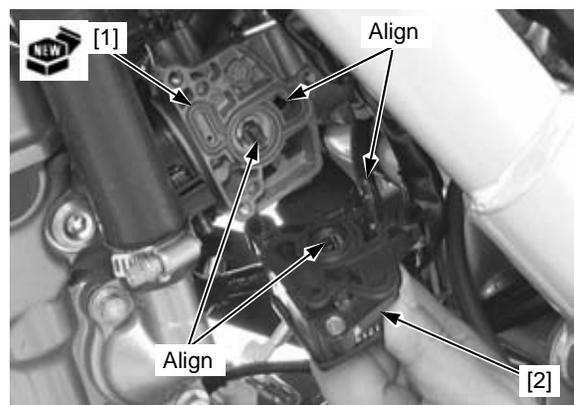
Install a new O-ring to the throttle body properly.

NOTE:

If the O-ring is not installed properly, the idle air will leak and engine idle speed will be unstable.

Install the sensor unit [2] to the throttle body by aligning the following:

- Clip of the TP sensor with the boss of the throttle valve
- IAT sensor of the sensor unit with the hole of the throttle body



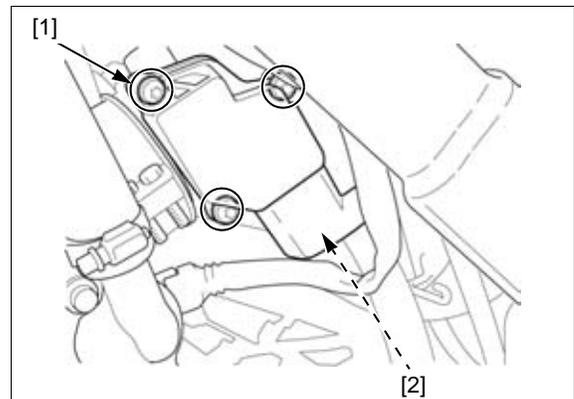
Install and tighten the sensor unit torx screws [1] to the specified torque.

TORQUE: 3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)

Connect the sensor unit 5P connector [2].

Install the left fuel tank shroud (page 2-4).

Perform the TP sensor reset procedure (page 4-45).



TP SENSOR RESET PROCEDURE

NOTE:

If the sensor unit is removed, reset the throttle valve fully closed position as following.

1. Erase the DTC (page 4-5).
2. Turn the ignition switch OFF.
3. Remove the dummy connector.
4. Short the DLC [1] using the special tool.

TOOL:

[2] SCS connector 070PZ-ZY30100

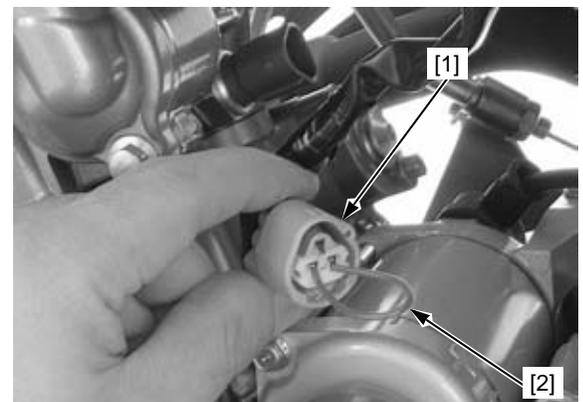


5. Disconnect the ECT sensor 3P connector [1].
Short the ECT sensor 3P connector terminals of the wire harness side with a jumper wire [2].

Connection: Yellow/blue – Green/white

6. Turn the ignition switch ON and engine stop switch "O", then MIL will start blinking.

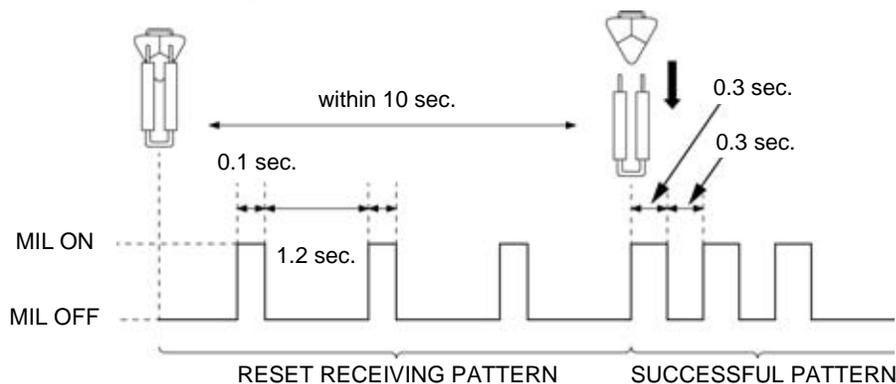
Disconnect the jumper wire while the MIL blinking (within 10 seconds).



7. After disconnection of the jumper wire, the MIL will start short blinking.

Check if the MIL blinks.

If the MIL begins short blink (0.3 seconds), the TP sensor is reset successfully.



If the MIL remains ON, the TP sensor is not reset, repeat the reset procedure from step 1.

8. Turn the ignition switch OFF.
9. Connect the ECT sensor 3P connector.
10. Install the dummy connector to the DLC.

ECT SENSOR

REMOVAL/INSTALLATION

Drain the coolant (page 9-5).

Remove the ECT sensor while the engine is cold.

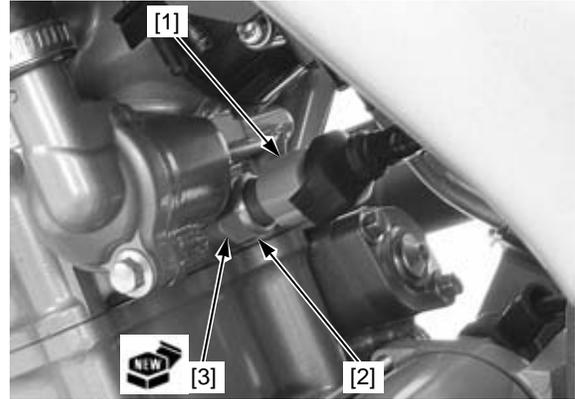
Disconnect the ECT sensor 3P connector [1].
Remove the ECT sensor [2] and sealing washer [3].
Installation is in the reverse order of removal.

- Replace the sealing washer with a new one.

TORQUE:

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

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



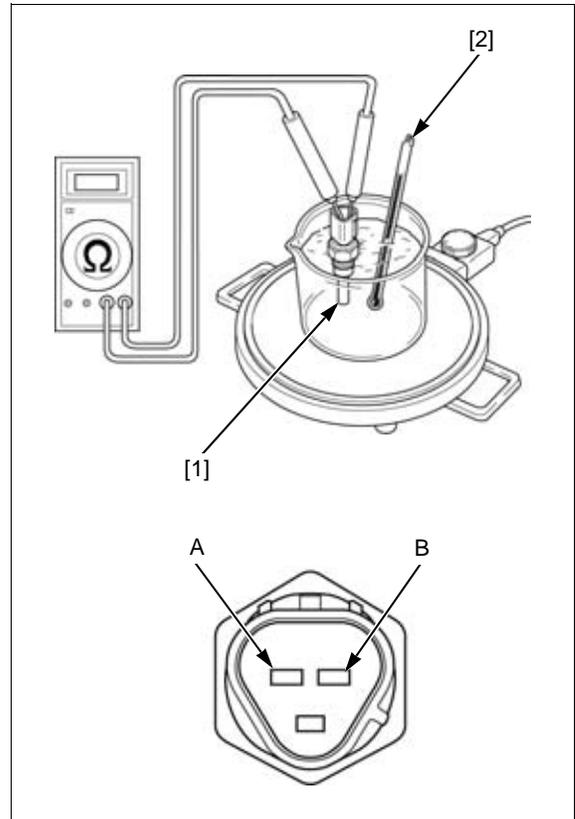
INSPECTION

Remove the ECT sensor [1] (page 4-46).

*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 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 (1.6 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	20 °C/68°F	80 °C/176°F
Resistance	2.3 – 2.6 kΩ	0.31 – 0.33 kΩ

Replace the ECT sensor if it is out of specifications by more than 10%.

Install the ECT sensor (page 4-46).

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/INSTALLATION

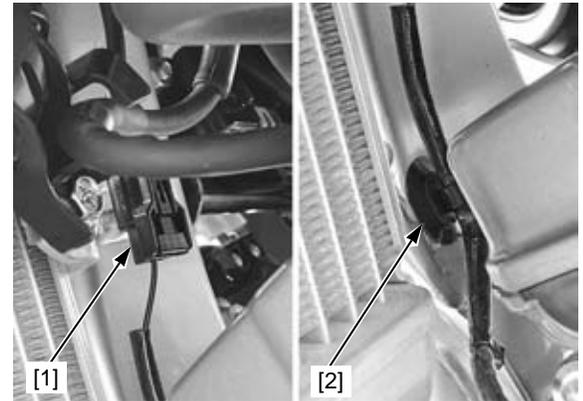
NOTE:

- Handle the O₂ sensor with care.
- Do not service the O₂ sensor while it is hot.
- Do not use an impact wrench while removing or installing the O₂ sensor, or it may be damaged.

Remove the left fuel tank shroud (page 2-4).

Disconnect the O₂ sensor 1P (Black) connector [1].

Remove the wire band [2] from the frame.



Disconnect the O₂ sensor cap [1].

Remove the O₂ sensor [2].

Installation is in the reverse order of removal.

TORQUE:

O₂ sensor: 25 N·m (2.5 kgf·m, 18 lbf·ft)

- Take care not to tilt the O₂ sensor cap when connecting the cap to the O₂ sensor.
- Do not turn the O₂ sensor cap after connecting it.



BANK ANGLE SENSOR

REMOVAL/INSTALLATION

Remove the reserve tank cover (page 2-4).

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

Remove the bank angle sensor mounting nuts [2], bolts [3], bank angle sensor [4] and plate [5].

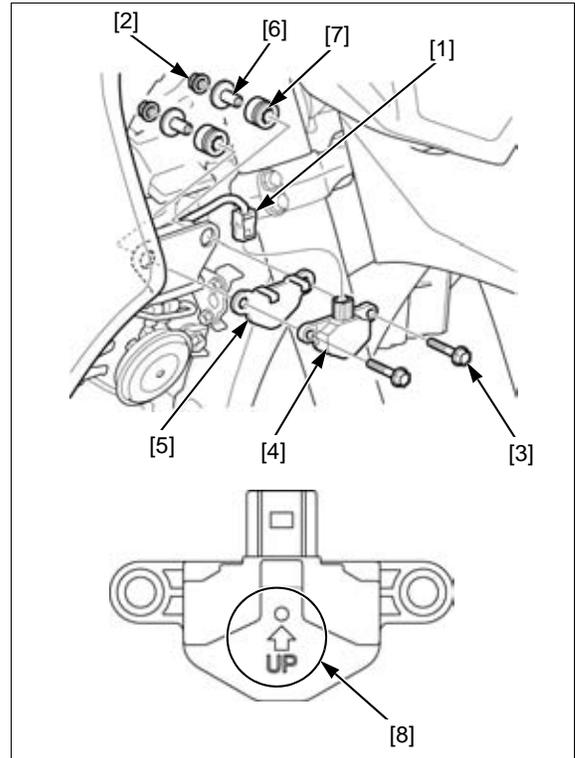
Remove the collars [6] and mounting rubbers [7] from the bracket.

Installation is in the reverse order of removal.

- Install the bank angle sensor with its "UP" mark [8] facing up.

TORQUE:

Bank angle sensor mounting nut
9.0 N·m (0.9 kgf·m, 6.6 lbf·ft)



SYSTEM INSPECTION

Remove the bank angle sensor (page 4-48).

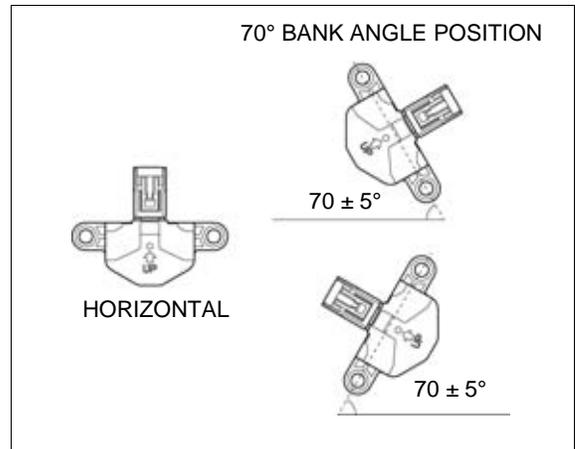
Connect the bank angle sensor 2P connector.

Place the bank angle sensor horizontal as shown.

Start the engine.

Incline the bank angle sensor $70 \pm 5^\circ$ to the left or right.

The bank angle sensor is normal if the engine stops.



ECM

ECM POWER/GROUND LINE INSPECTION

NOTE:

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

ENGINE DOES NOT START (MIL does not blink)

1. ECM Power Input Voltage Inspection

Disconnect the ECM 33P (Black) connector [1] (page 4-50).

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

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

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

Standard: Battery voltage

TOOL:

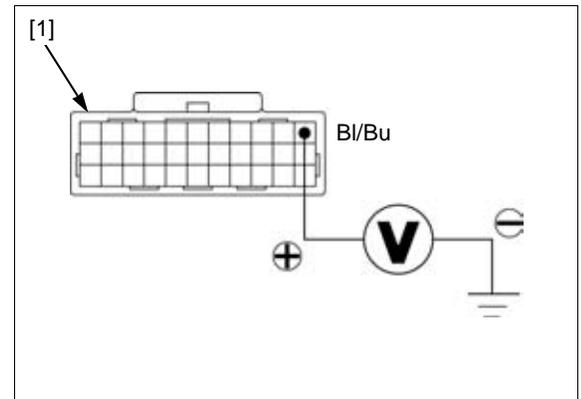
Test probe 07ZAJ-RDJA110

Does the standard voltage exist?

YES – GO TO STEP 2.

NO –

- Open circuit in Black/blue wire
- Faulty ignition switch
- Blown main fuse (30 A)
- Blown FI, IGN fuse (10 A)
- Faulty engine stop switch



2. Sensor Unit Power Line Inspection

Turn the ignition switch OFF.

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

Connection: Yellow/red – Ground

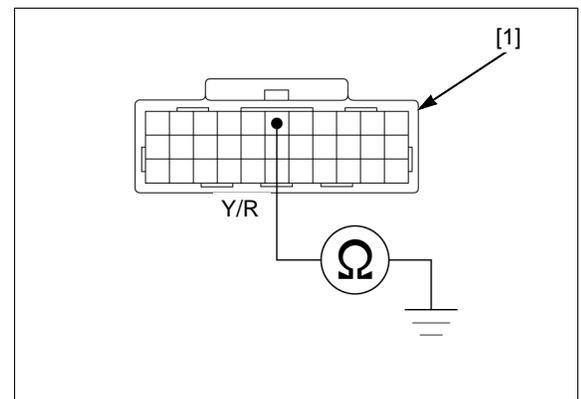
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

YES – Short circuit in Yellow/red wire

NO – GO TO STEP 3.



3. ECM Ground Line Inspection

Turn the ignition switch OFF.

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

Connection: Green/black – Ground
Green – Ground
Green – Ground

TOOL:

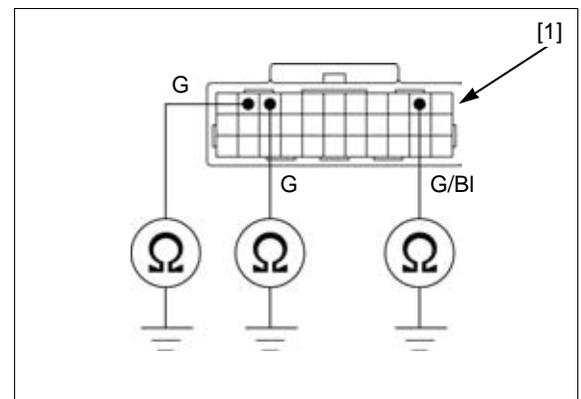
Test probe 07ZAJ-RDJA110

Is there continuity?

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

NO –

- Open circuit in Green/black wire
- Open circuit in Green wires



REMOVAL/ INSTALLATION

Remove the reserve tank cover (page 2-4).

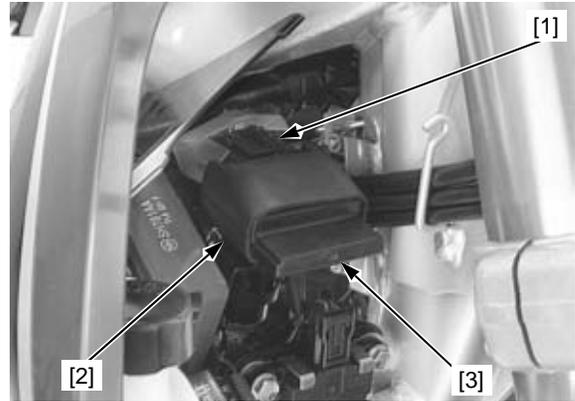
Turn the ignition switch OFF.

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

Remove the rubber holder [2] and ECM [3].

Remove the ECM from the rubber holder.

Installation is in the reverse order of removal.



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

IGNITION SYSTEM

SERVICE INFORMATION

GENERAL

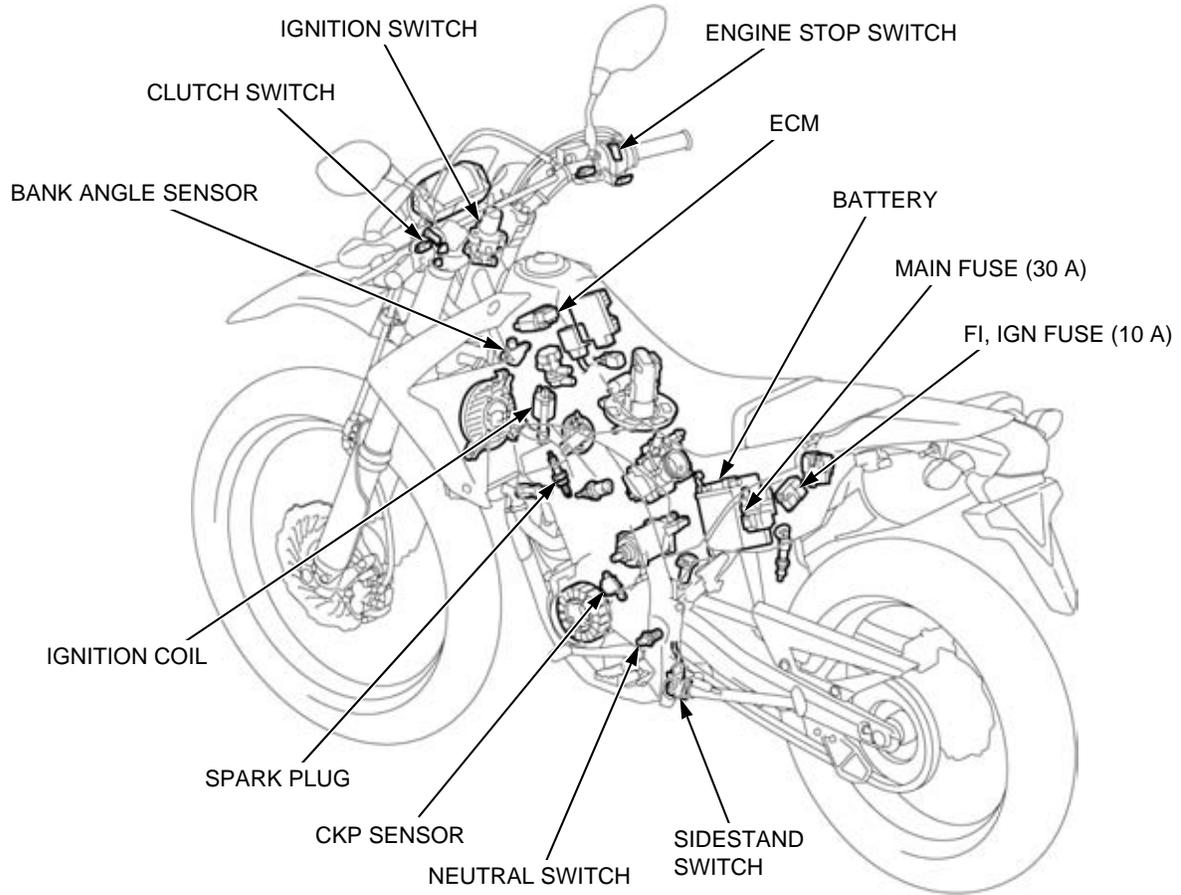
- When servicing the ignition system, always follow the steps in the troubleshooting table (page 5-2).
- A faulty ignition system is often related to poorly connected or corroded connections. Check those connections before proceeding.

TROUBLESHOOTING

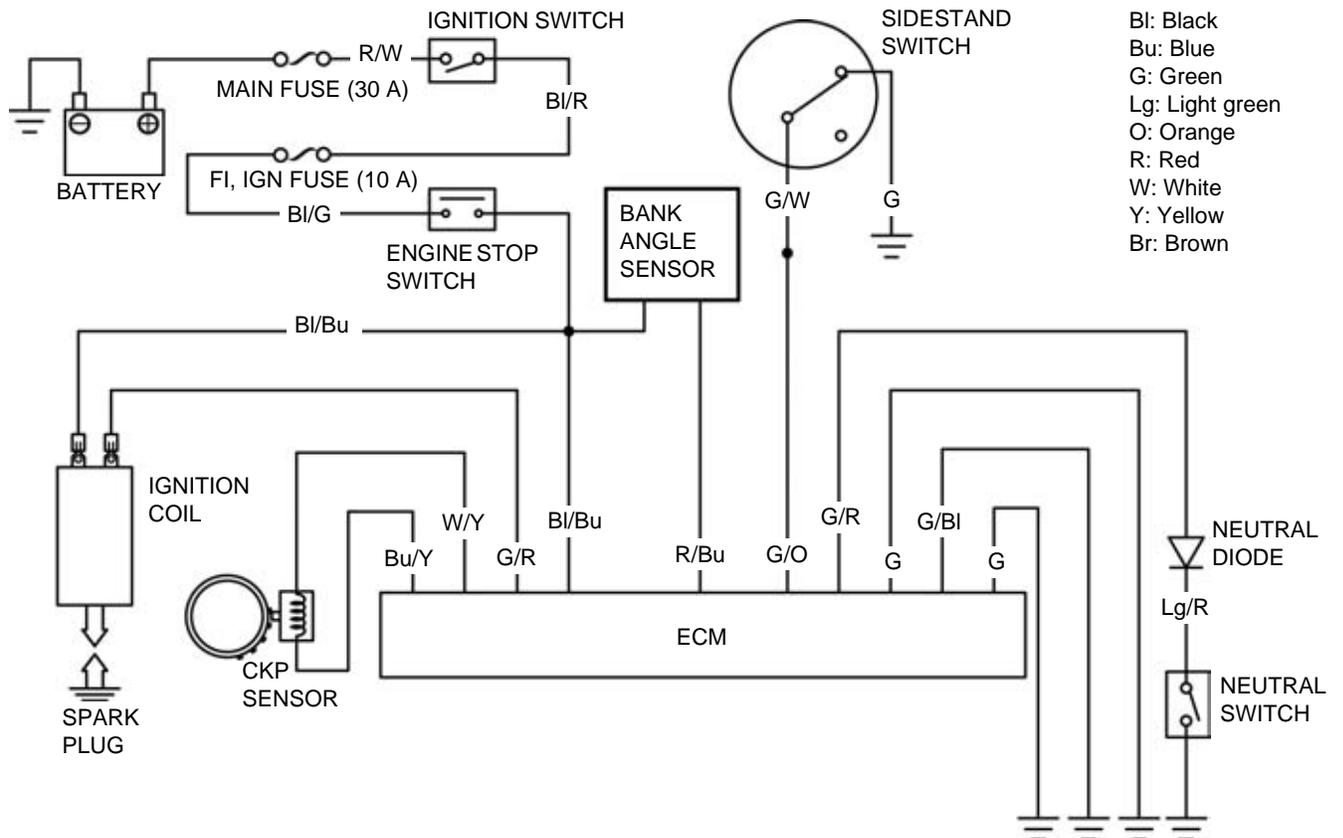
- Inspect the following before diagnosing the system.
 - Faulty spark plug
 - Loose spark plug cap or spark plug wire connection
 - Water got into the spark plug cap (Leaking the ignition coil secondary voltage)
- "Initial voltage" of the ignition primary coil is the battery voltage with the ignition switch turned ON and engine stop switch "⊘" (The engine is not cranked by the starter motor).

Unusual condition		Probable cause (Check in numerical order)
Ignition coil primary voltage	No initial voltage with the ignition switch turned ON and engine stop switch "⊘" (Other electrical components are normal).	1. Faulty ignition switch 2. An open circuit in Black/blue wire between the ignition coil and engine stop switch 3. An open circuit in Black/green or Black/red wires between the engine stop switch and ignition switch 4. Loose or poor connection of the primary terminal, or an open circuit in the primary coil 5. Faulty ECM (in case when the initial voltage is normal with the ECM connector disconnected). 6. Faulty engine stop switch
	Initial voltage is normal, but it drops by 2 – 4 V while cranking the engine.	1. Incorrect peak voltage adaptor connections (System is normal if measured voltage is over the specifications with reverse connections). 2. Battery is undercharged (Voltage drops largely when the engine is started). 3. No voltage between the Black/blue (+) wire and body ground (–) at the ECM connector or poor connection of the ECM connector 4. An open circuit or loose connection in Green or Green/black wire at the ECM 5. An open circuit or loose connection in Green/red wire between the ignition coil and ECM 6. Faulty sidestand switch or neutral switch or related wires 7. Faulty CKP sensor (Measure peak voltage) 8. Faulty ECM (in case when above No. 1 through 7 are normal).
	Initial voltage is normal but there is no peak voltage while cranking the engine.	1. Incorrect peak voltage adaptor connections 2. Faulty peak voltage adaptor 3. Faulty CKP sensor 4. Faulty ECM (in case when above No. 1 through 3 are normal).
	Initial voltage is normal but peak voltage is lower than the standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too slow (Battery is undercharged). 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). 4. Faulty ECM (in case when above No. 1 through 3 are normal).
	Initial and peak voltages are normal but no spark jumps.	1. Faulty spark plug or leaking ignition coil secondary current 2. Faulty ignition coil
CKP sensor	Peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too low. (Battery is undercharged.) 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). 4. Faulty CKP sensor (in case when above No.1 through 3 are normal).
	No peak voltage	1. Faulty peak voltage adapter 2. Faulty CKP sensor

SYSTEM LOCATION



SYSTEM DIAGRAM



IGNITION SYSTEM INSPECTION

NOTE:

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

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

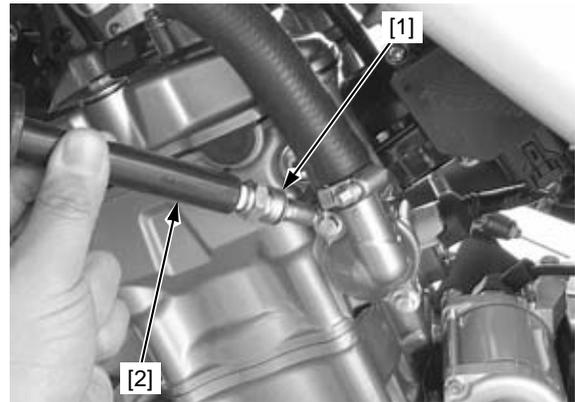
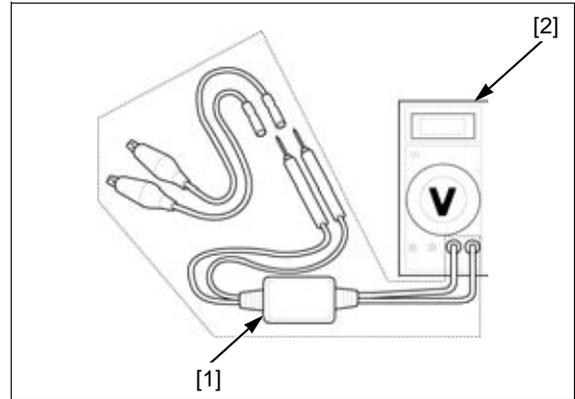
TOOL:

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

IGNITION COIL PRIMARY PEAK VOLTAGE

Shift the transmission into neutral and disconnect the spark plug cap (page 3-5).

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



With the ignition coil primary wire connected, connect the peak voltage adaptor or Imrie tester to the ignition coil primary terminal [1] and ground.

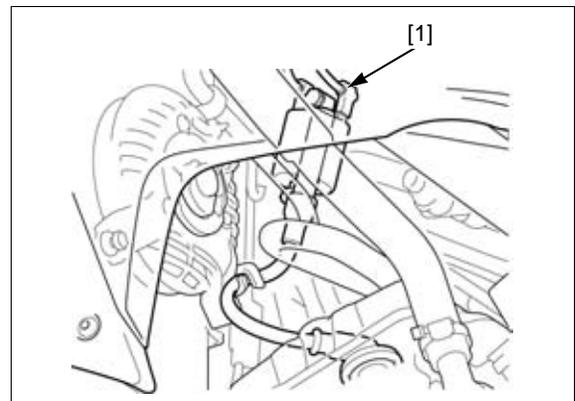
TOOL:

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

CONNECTION: Green/red (+) – Ground (-)

Shift the transmission into neutral.

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



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

Crank the engine with the starter motor with the throttle grip fully opened and read ignition coil primary peak voltage.

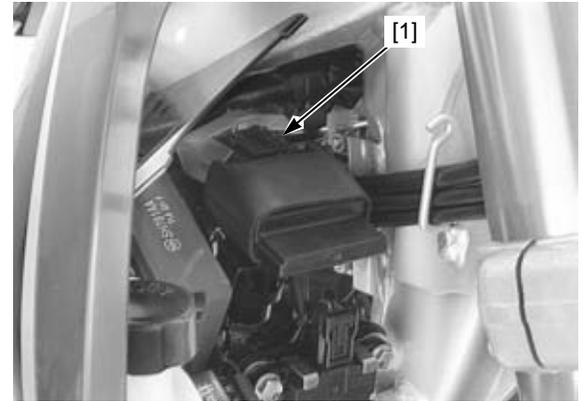
PEAK VOLTAGE: 100 V minimum

If the peak voltage is abnormal, follow the checks described in the troubleshooting table (page 5-2).

CKP SENSOR PEAK VOLTAGE

Remove the reserve tank cover (page 2-4).

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



Connect the peak voltage tester or adaptor probes to the ECM 33P (Black) connector [1] terminals of the wire harness side.

TOOLS:

**Imrie diagnostic tester (model 625) or
Peak voltage adaptor [2] 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 MΩ/DCV minimum)
Test probe 07ZAJ-RDJA110**

CONNECTION: Blue/yellow (+) – White/yellow (-)

Shift the transmission into neutral.

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

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

PEAK VOLTAGE: 0.7 V minimum

If the peak voltage measured at the ECM 33P (Black) connector is abnormal, measure the peak voltage at the CKP sensor connector.

Turn the ignition switch OFF.

Remove the left side cover (page 2-3).

Disconnect the CKP sensor/neutral switch 3P (Black) connector [1] and connect the tester probes to the connector terminals of the CKP sensor side.

CONNECTION: Blue/yellow (+) – White/yellow (-)

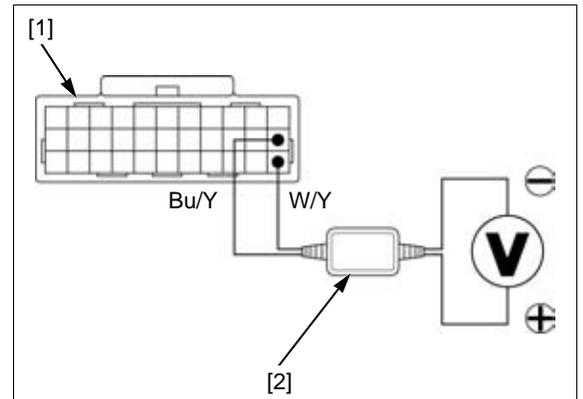
In the same manner as at the ECM 33P (Black) connector, measure the peak voltage and compare it to the voltage measured at the ECM 33P (Black) connector.

NOTE:

- If the peak voltage measured at the ECM is abnormal and the one measured at the CKP sensor is normal, the wire harness has an open or short circuit or loose connection.
- If the peak voltage of the CKP sensor side is lower than standard value, follow the checks described in the troubleshooting table (page 5-2).

For CKP sensor replacement (page 13-4).

Install the removed parts in the reverse order of removal.



IGNITION SYSTEM

IGNITION TIMING

Warm up the engine.

Stop the engine and remove the timing hole cap using the special tool.

TOOL:

Timing cap wrench **07709-0010001**

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

Start the engine and let it idle.

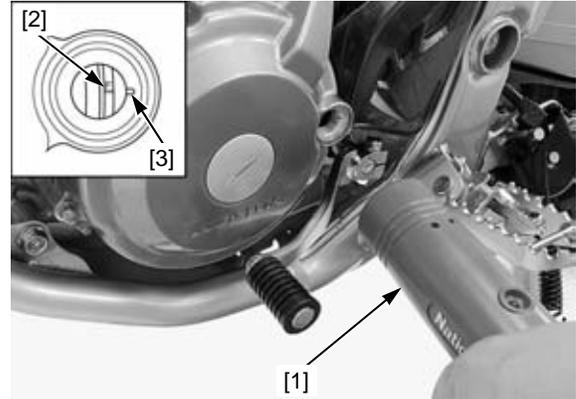
IDLE SPEED: 1,450 ± 100 min⁻¹ (rpm)

The ignition timing is correct if the "F" mark [2] on the flywheel aligns with the index notch [3] on the left crankcase cover.

Apply engine oil to a new O-ring and install it to the timing hole cap.

Apply engine oil to the timing hole cap threads. Install and tighten the timing hole cap to the specified torque.

TORQUE: 6.0 N·m (0.6 kgf·m, 4.4 lbf·ft)



IGNITION COIL

REMOVAL/INSTALLATION

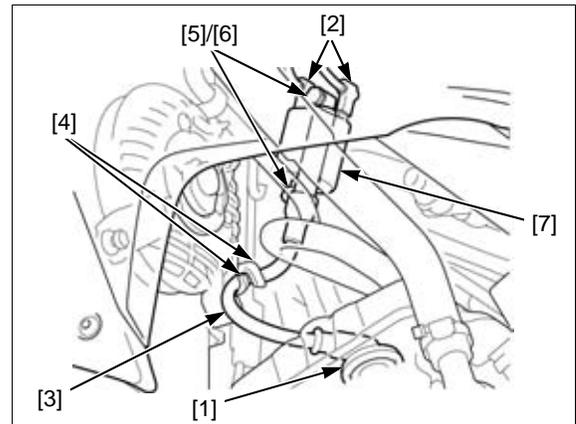
Disconnect the spark plug cap [1].

Disconnect the primary wire connectors [2] from the ignition coil.

Release the spark plug wire [3] from the guides [4] on the fan motor shroud.

Remove the bolts [5], spacers [6] and ignition coil [7].

Installation is in the reverse order of removal.



6. ELECTRIC STARTER SYSTEM

SERVICE INFORMATION.....	6-2	STARTER MOTOR	6-4
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ELECTRIC STARTER SYSTEM

SERVICE INFORMATION

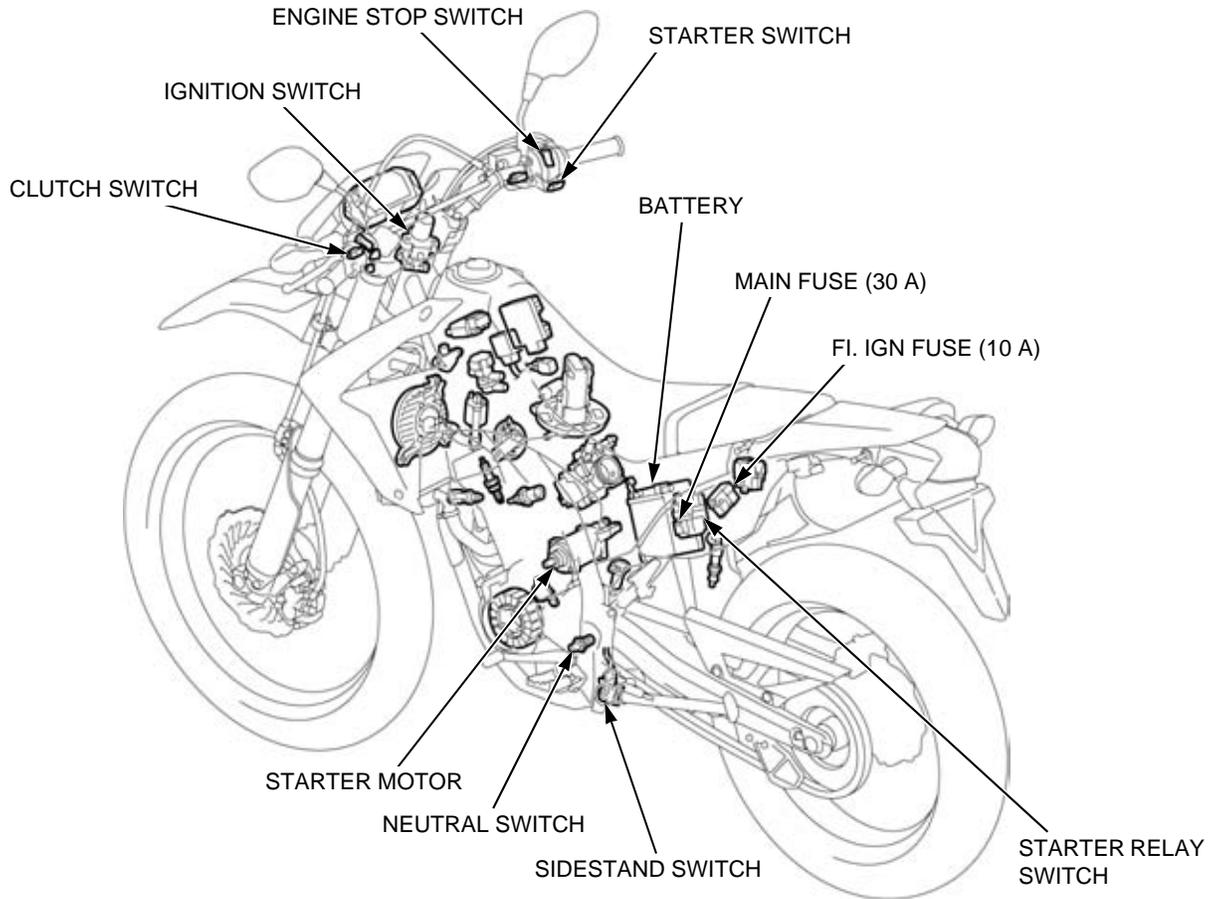
GENERAL

- When servicing the starter system, always follow the steps in the troubleshooting flow chart (page 6-2).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.

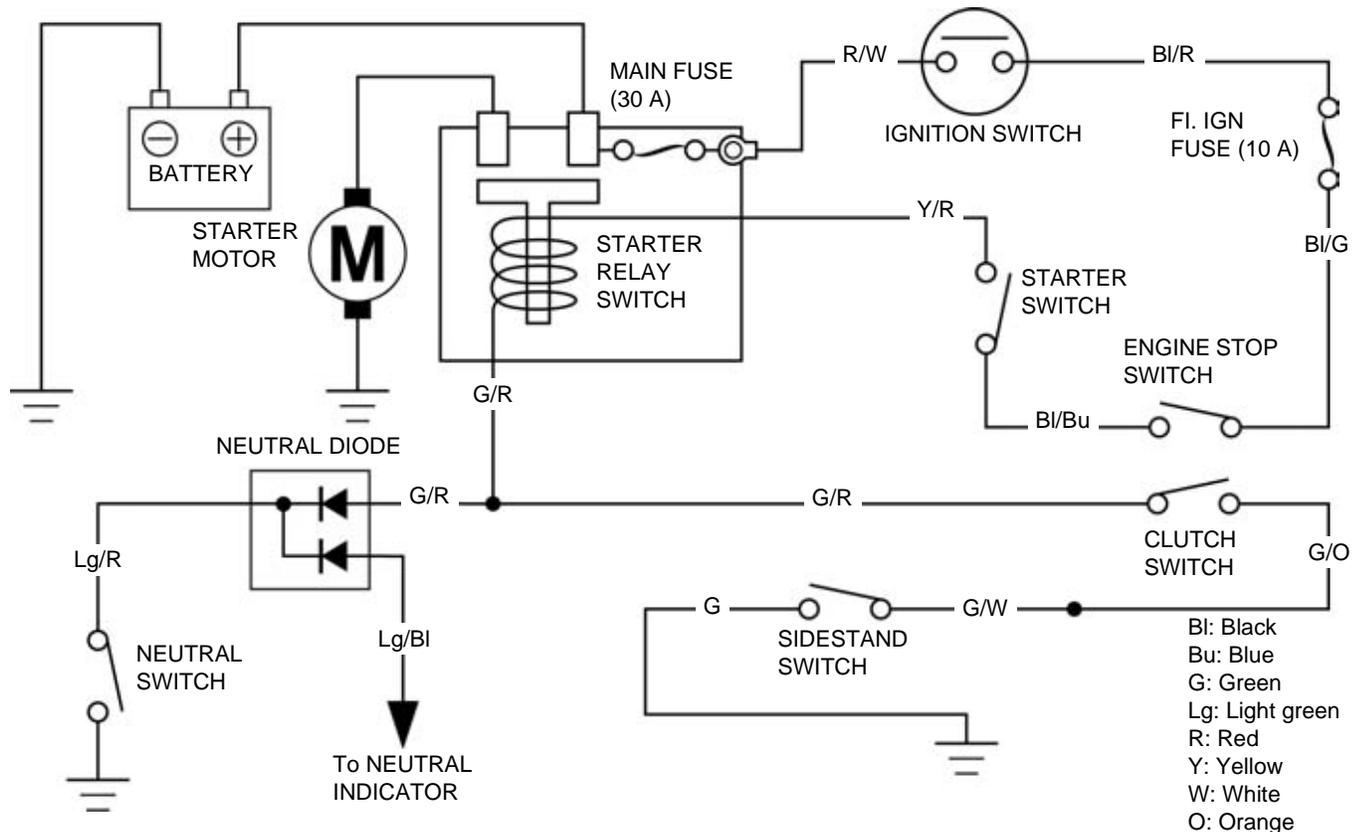
TROUBLESHOOTING

	Unusual condition	Probable cause (Check in numerical order)
Starter motor	Starter motor does not turn	<ol style="list-style-type: none">1. Loose or poor contact on related connectors and terminals2. Blown fuse3. Weak battery4. Faulty starter relay switch5. Faulty starter motor6. Faulty engine stop switch7. Loose connection, open or short circuit in starter motor cable8. Faulty starter switch9. Open circuit in starter relay switch ground circuit10. Open or short circuit in starter relay switch power circuit11. Loose contact or open circuit in related wires
	Starter motor turns only when the transmission is in neutral (Starter motor does not turn when the transmission is in any gear with the sidestand retracted and clutch lever pulled in)	<ol style="list-style-type: none">1. Loose or poor contact on related connectors and terminals2. Faulty clutch switch3. Faulty sidestand switch4. Loose contact or open circuit in related wires
	Starter motor turns only when the transmission is in any gear with the sidestand retracted and clutch lever pulled in (Starter motor does not turn when the transmission is in neutral with the sidestand lowered and clutch lever released)	<ol style="list-style-type: none">1. Loose or poor contact on related connectors and terminals2. Faulty neutral diode3. Faulty neutral switch4. Loose contact or open circuit in related wires
	Starter motor turns slowly	<ol style="list-style-type: none">1. Low battery voltage2. Poorly connected battery terminal cable3. Poorly connected starter motor cable4. Faulty starter motor5. Poorly connected battery ground cable
	Starter motor turns, but engine does not turn	<ol style="list-style-type: none">1. Starter motor is running backwards<ul style="list-style-type: none">– Case assembled improperly– Terminals connected improperly2. Faulty starter clutch3. Damaged or faulty starter idle gear and/or reduction gear
	Starter relay switch "Clicks", but engine does not turn over	<ol style="list-style-type: none">1. Crankshaft does not turn due to engine problems

SYSTEM LOCATION



SYSTEM DIAGRAM



STARTER MOTOR

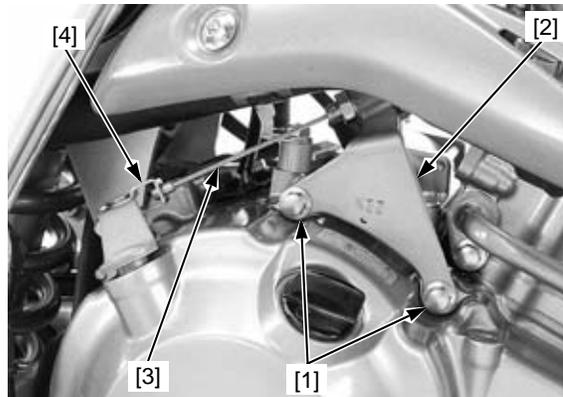
REMOVAL/INSTALLATION

- Always turn the ignition switch "OFF" before servicing the starter motor. The motor could suddenly start, causing serious injury.

Remove the cam chain tensioner lifter (page 11-7).

Remove the bolts [1] and clutch cable guide [2].

Disconnect the clutch cable [3] from the clutch lifter arm [4].

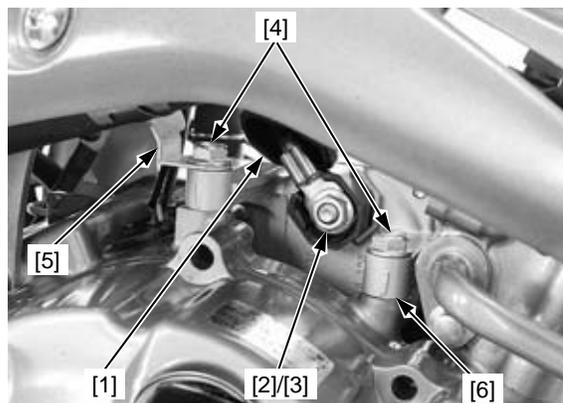


Release the rubber cap [1].

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

Remove the stator motor mounting bolts [4] and ground terminal [5].

Remove the starter motor [6].



Remove the O-ring [1].

Installation is in the reverse order of removal.

- Apply engine oil to a new O-ring.

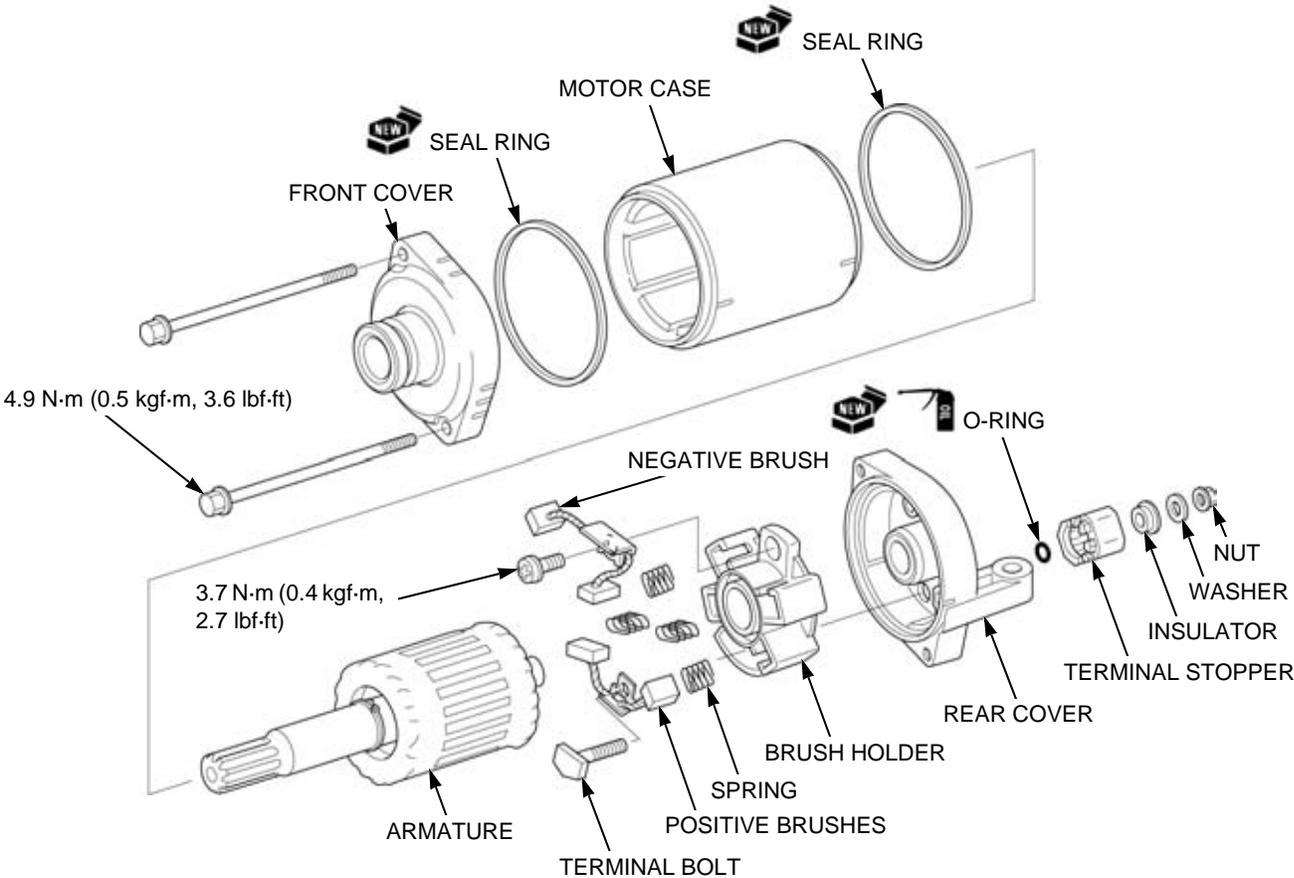


DISASSEMBLY/ASSEMBLY

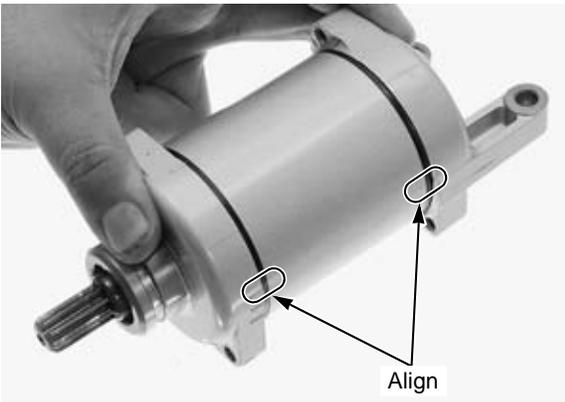
Disassemble and assemble the starter motor as following illustration.

NOTICE

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



Upon assembly, align the index lines on the covers and motor case.

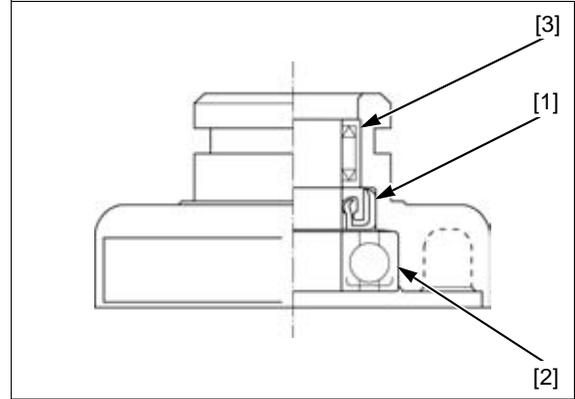


ELECTRIC STARTER SYSTEM

INSPECTION

Check the oil seal [1] of the front cover for deterioration or damage.
Check the bearing [2] and needle bearing [3] for wear or damage.

Replace the starter motor as an assembly if necessary.



Do not use emery or sand paper on the commutator.

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

Check the commutator bars of the armature for discoloration, wear or damage.

Replace the starter motor as an assembly if necessary.



Check for continuity between pair of commutator bars [1].

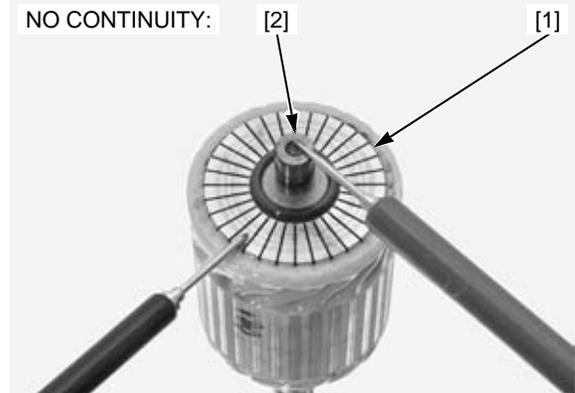
There should be continuity.

CONTINUITY:



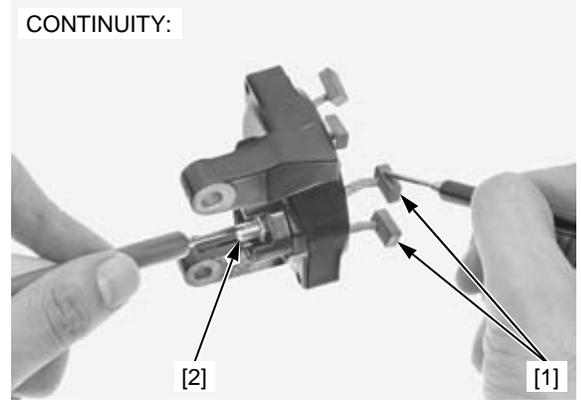
Check for continuity between each individual commutator bar [1] and the armature shaft [2].
There should be no continuity.

NO CONTINUITY:



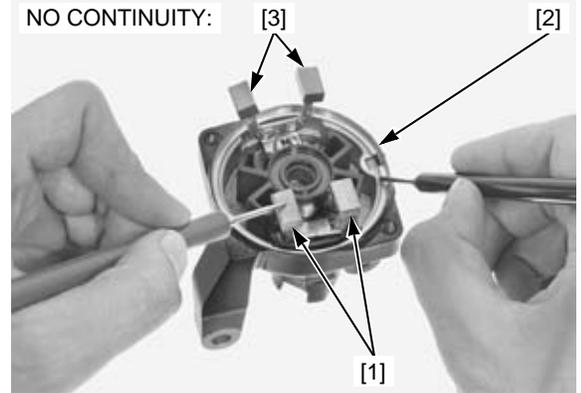
Check for continuity between the positive brushes [1] and cable terminal [2].
There should be continuity.

CONTINUITY:



Check for continuity between the positive brushes [1] and rear cover [2].
There should be no continuity.

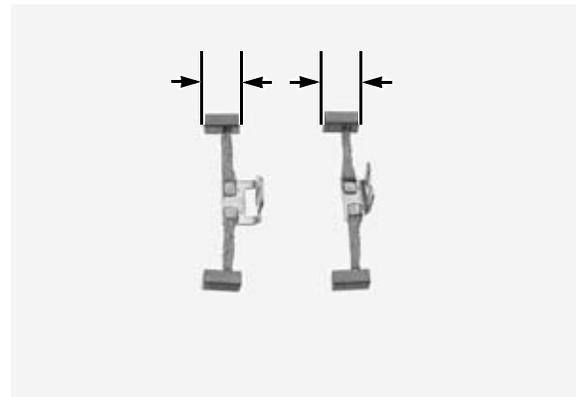
NO CONTINUITY:



Check for continuity between the positive and negative brushes [3].
There should be no continuity.

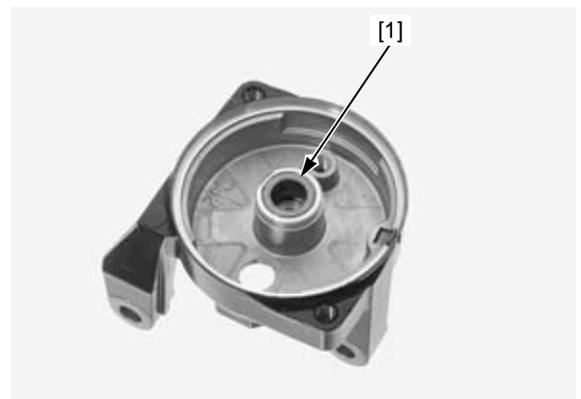
Measure the brush length.

SERVICE LIMIT: 6.5 mm (0.26 in)



Check the bushing [1] of the rear cover for wear or damage.

Replace the starter motor as an assembly if necessary.



STARTER RELAY SWITCH

INSPECTION

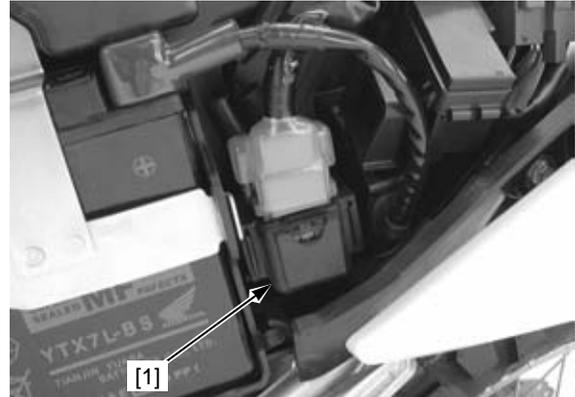
Remove the left side cover (page 2-3).

Shift the transmission into neutral.

Turn the ignition switch ON and engine stop switch "O".
Push the starter switch.

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

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



GROUND LINE

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

Check for continuity between the following terminal of the wire harness side and ground when the starter switch is pushed.

CONNECTION: Green/red – Ground

If there is continuity under following conditions, the ground circuit is normal.

- When the transmission is in neutral (In neutral, there is a slight resistance due to the diode.)
- When the transmission is in gear with the clutch lever pulled in and sidestand retracted



STARTER RELAY INPUT VOLTAGE

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

Measure the voltage between the following terminal at the starter relay switch 4P (Red) connector and ground.

CONNECTION: Yellow/red (+) – Ground (-)

STANDARD: Battery voltage

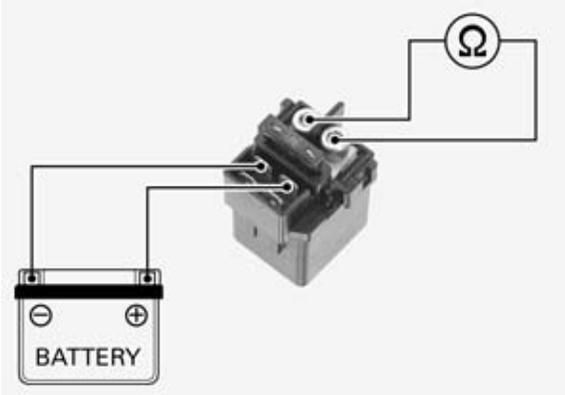
If the battery voltage appears only when the starter switch is pushed with the ignition switch ON and engine stop switch "O", the starter relay input voltage is normal.



OPERATION CHECK

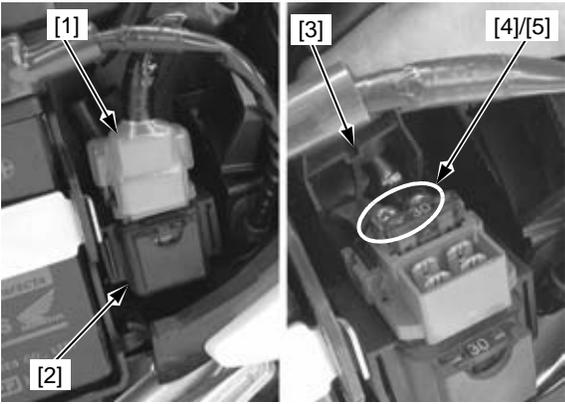
Remove the starter relay switch (page 6-9).
Connect a fully charged 12 V battery to the starter relay switch as shown.

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



REMOVAL/INSTALLATION

Remove the left side cover (page 2-3).
Disconnect the battery negative (-) terminal (page 19-4).
Disconnect the starter relay switch 4P (Red) connector [1].
Release the starter relay switch [2] from the air cleaner housing.
Pull back the rubber cover [3].
Remove the bolts [4] and cables [5].
Remove the starter relay switch from the stays with the shock rubber.
Remove the starter relay switch from the shock rubber.
Installation is in the reverse order of removal.



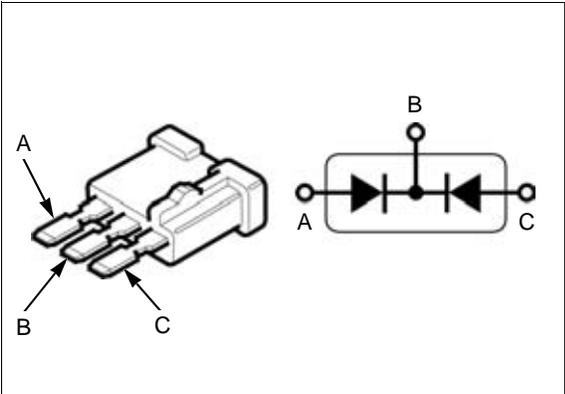
NEUTRAL DIODE

INSPECTION

Remove the left side cover (page 2-3).
Open the fuse box cover and remove the neutral diode [1].



Check for continuity between the neutral diode terminals.
When there is continuity, a small resistance value will register.
If there is continuity, in direction shown by the arrow, the neutral diode is normal.



MEMO

SERVICE INFORMATION.....	7-2	FUEL PUMP RELAY.....	7-10
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FUEL LINE INSPECTION.....	7-4	INJECTOR.....	7-14
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SERVICE INFORMATION

GENERAL

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- 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.
- Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.
- Do not damage the throttle body. It may cause incorrect throttle valve 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.
- 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.
- For fuel level sensor inspection (page 20-15).
- Before disconnecting the fuel feed hose, relieve fuel pressure from the system by disconnecting the quick connect fitting from the system (page 7-4).

TROUBLESHOOTING

Engine won't start

- Deteriorated fuel
- Bent or kinked fuel hose/fuel tank breather hose
- Clogged fuel filter
- Faulty fuel pump or its drive circuit
- Intake air leak
- Faulty injector
- Faulty IACV
- Faulty ignition system
- Faulty ECM
- Faulty bank angle sensor or its related circuit
- Faulty fuel pump relay or its related circuit
- Faulty engine stop switch or its related circuit
- Blown FI, IGN fuse (10 A)

Engine stall, hard to start, rough idling

- Deteriorated fuel
- Bent or kinked fuel hose/fuel tank breather hose
- Faulty IACV
- Intake air leak
- Faulty ignition system
- Faulty MAP sensor
- Faulty charging system

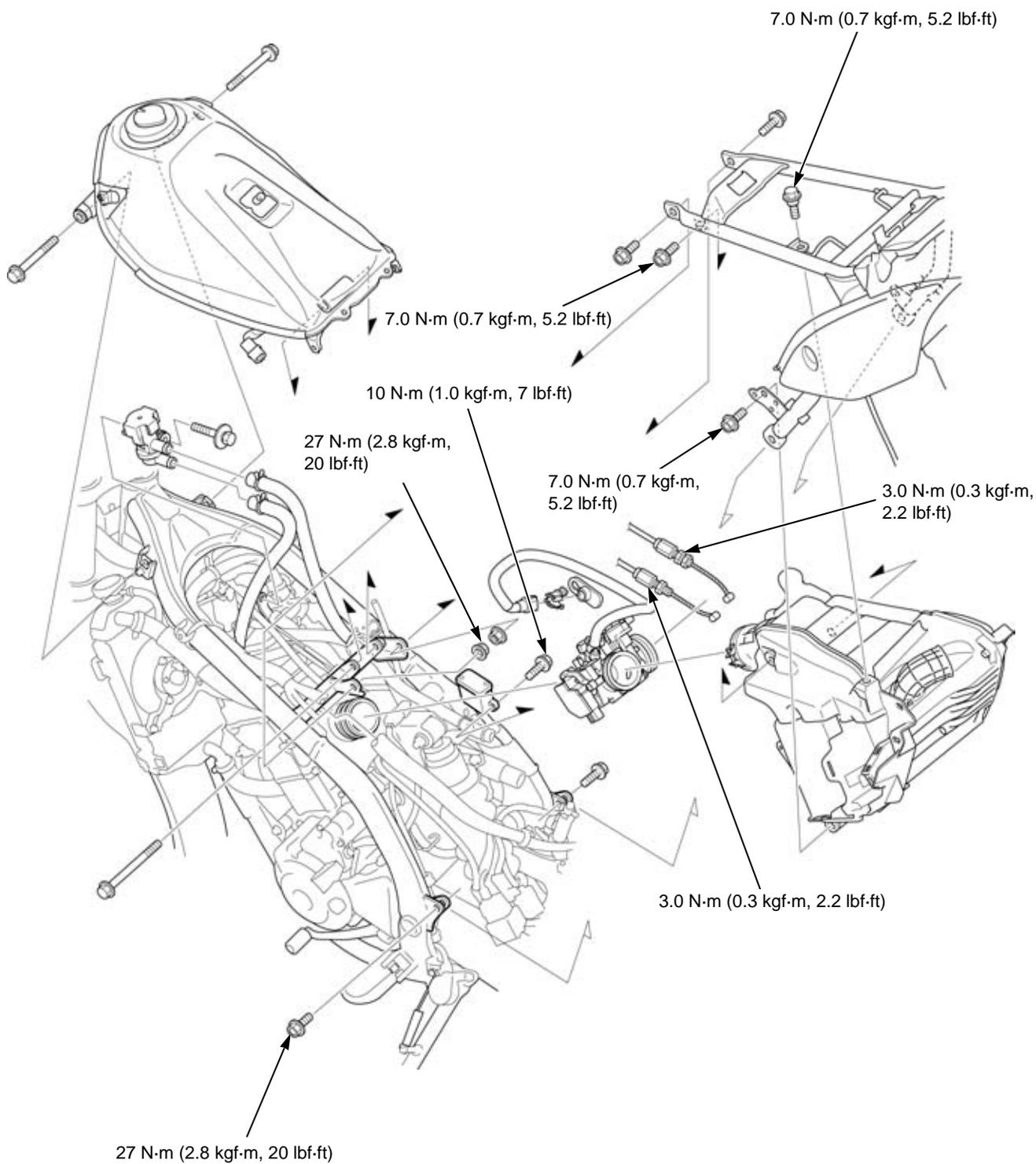
Backfiring or misfiring during acceleration

- Faulty ignition system

Engine lacks power

- Bent or kinked fuel hose/fuel tank breather hose
- Clogged fuel filter
- Faulty fuel pump or its drive circuit
- Faulty injector
- Faulty ignition system
- Clogged air cleaner element

COMPONENT LOCATION



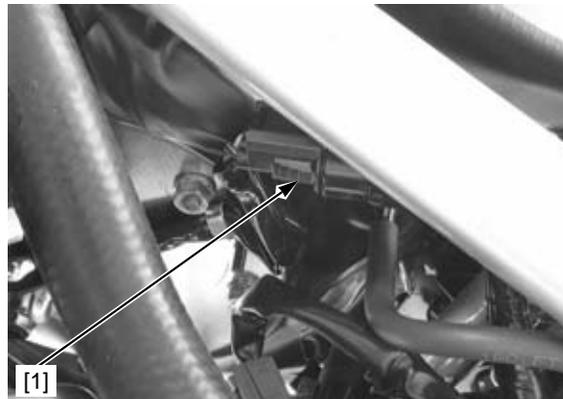
FUEL LINE INSPECTION

FUEL PRESSURE RELIEVING

NOTE:

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

1. Turn the ignition switch OFF.
2. Disconnect the fuel pump 3P (Black) connector [1].
3. Start the engine, and let it idle until the engine stalls.
4. Turn the ignition switch OFF.
5. Disconnect the battery negative (-) cable (page 19-4).

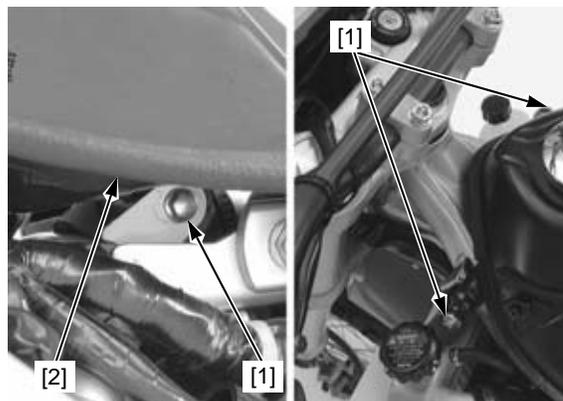


QUICK CONNECT FITTING REMOVAL

NOTE:

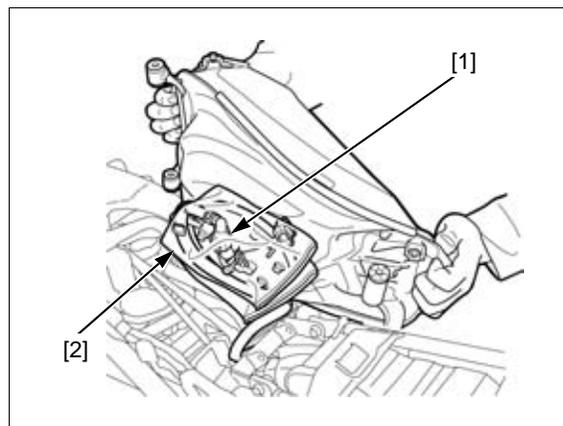
Do not bend or twist fuel feed hose.

1. Relieve the fuel pressure (page 7-4).
2. Remove the three bolts [1] and lift up the fuel tank [2] from the frame.



3. Check the fuel quick connect fitting [1] for dirt, and clean if necessary.

Place a shop towel [2] over the quick connect fitting.

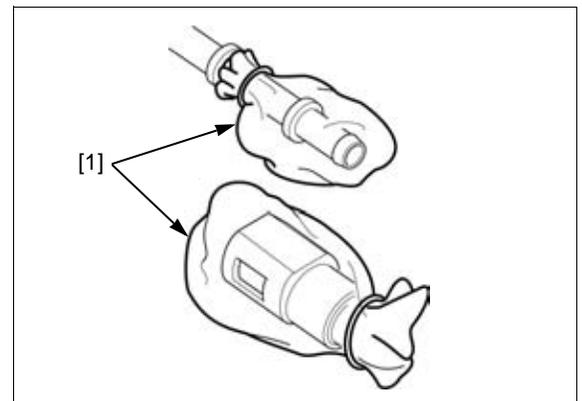
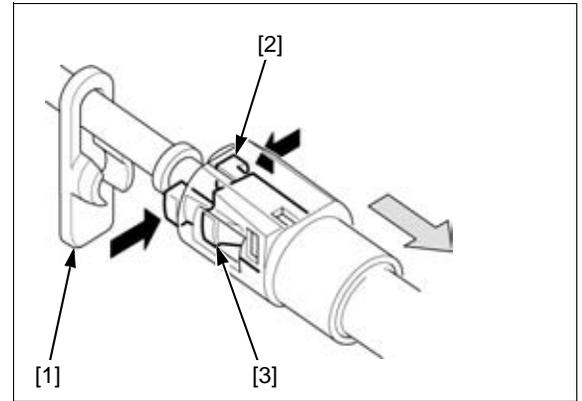


4. Pull and release the joint rubber [1] from the retainer.
5. Hold the connector with one hand and squeeze the retainer tabs [2] with the other hand to release the locking pawls [3].

Pull the connector off and remove the retainer.

NOTE:

- Absorb the remaining fuel in the fuel feed hose from flowing out with a shop towel.
 - Be careful not to damage the hose or other parts.
 - Do not use tools.
 - If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.
6. To prevent damage and keep foreign matter out, cover the disconnected connector and pipe end with the plastic bags [1].



QUICK CONNECT FITTING INSTALLATION

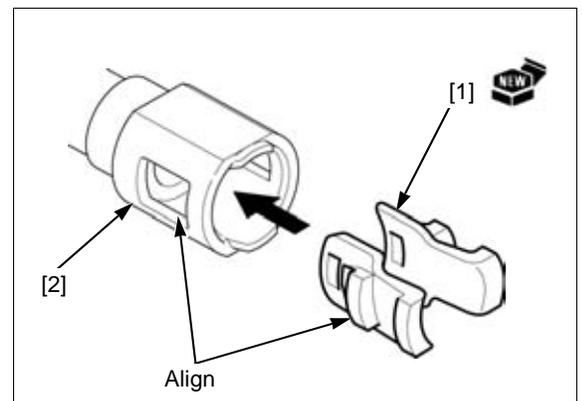
NOTE:

- Always replace the retainer and joint rubber of the quick connect fitting when the fuel feed hose is disconnected.
- Replace the retainer and joint rubber with the same manufacturer's item that was removed.
- Do not bent or twist fuel feed hose.

1. Insert a new retainer [1] into the connector [2].

NOTE:

- Align new retainer locking pawls with the connector grooves.



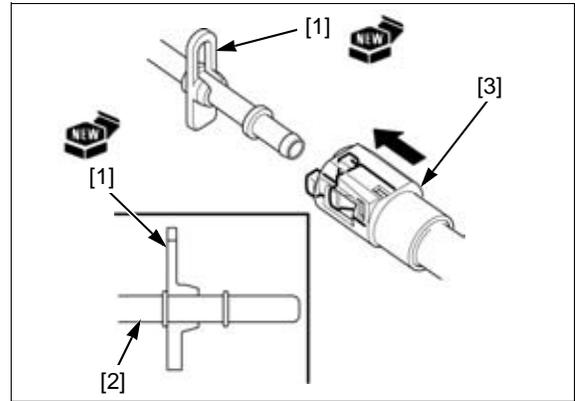
FUEL SYSTEM

2. Set a new joint rubber [1] to the joint [2] as shown.

Press the quick connect fitting [3] onto the pipe until both retainer pawls lock with a "CLICK".

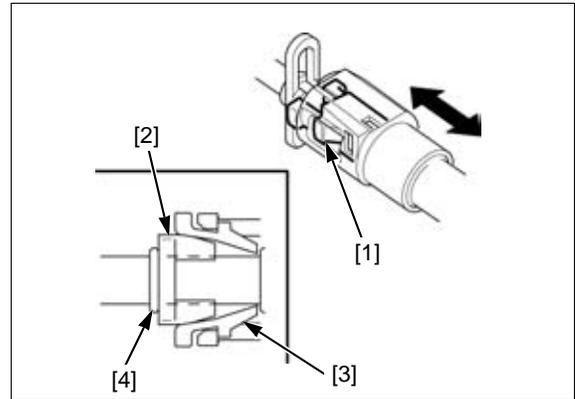
NOTE:

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

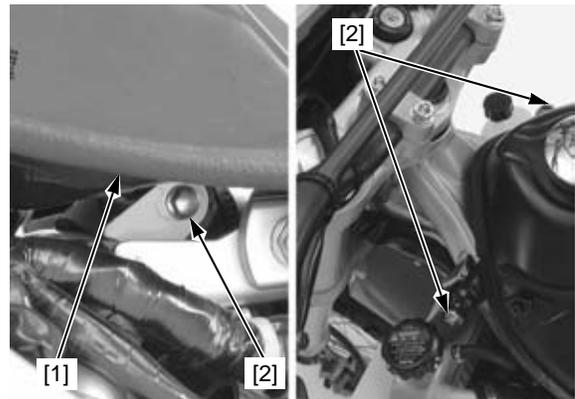


3. Make sure the connection is secure and that the pawls [1] are firmly locked into place; check visually and by pulling the connector.

4. Make sure the joint rubber [2] is positioned between the retainer [3] and joint flange [4] as shown.



5. Reposition the fuel tank [1] and tighten the three bolts [2].



FUEL PRESSURE NORMALIZATION

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

Connect the battery negative (-) cable (page 19-4).

2. Turn the ignition switch ON and engine stop switch "O".

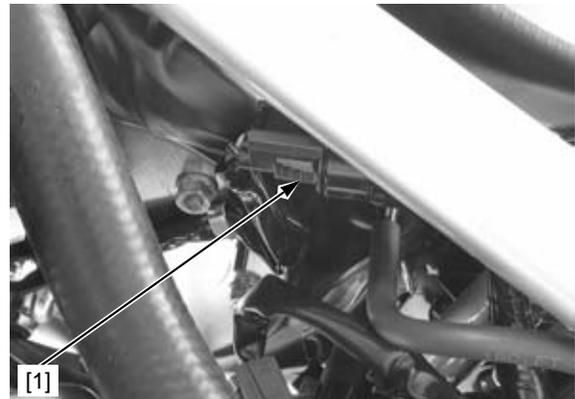
NOTE:

- 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.

Turn the ignition switch OFF.



FUEL PRESSURE TEST

Relieve the fuel pressure and disconnect the quick connect fitting (page 7-4).

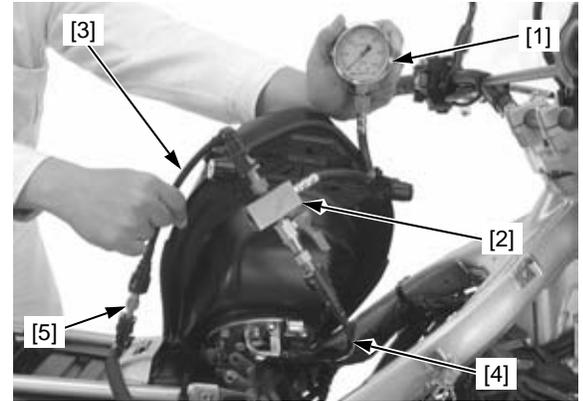
Attach the special tools as follows:

TOOLS:

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

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

Start the engine and let it idle.
Read the fuel pressure.



STANDARD: 343 kPa (3.5 kgf/cm², 50 psi)

If the fuel pressure is higher than specified, replace the fuel pump assembly.

If the fuel pressure is lower than specified, inspect the following:

- Fuel line leaking
- Pinched or clogged fuel feed hose or fuel tank breather hose
- Fuel pump unit (page 7-8)
- Clogged fuel filter

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

Remove the fuel pressure gauge, attachment and manifold from the fuel pump.

Connect the quick connect fitting (page 7-5).

FUEL FLOW INSPECTION

Relieve the fuel pressure and disconnect the quick connect fitting (page 7-4).

Wipe off spilled out gasoline.

Connect the special tool to the fuel pump joint.

TOOL:

[1] Hose attachment, 8 mm/9 mm	07ZAJ-S7C0100
--------------------------------	---------------

Place the end of the hose into an approved gasoline container.

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

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

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.

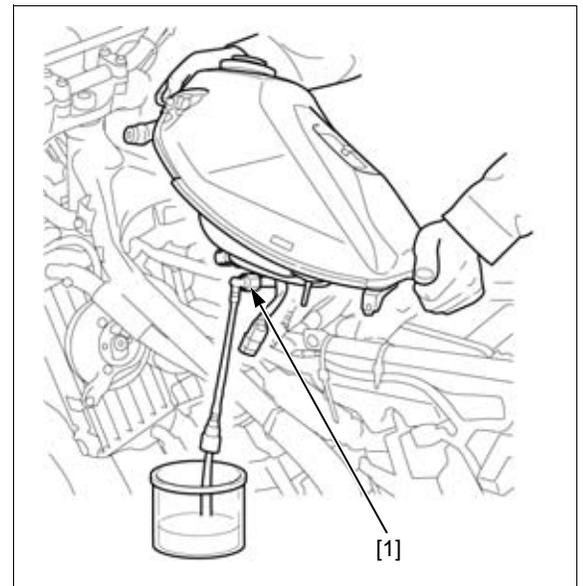
Amount of fuel flow:

**83 cm³ (2.81 US oz, 2.92 Imp oz) minimum/
10 seconds at 12 V**

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

- Fuel pump unit (page 7-8)
- Clogged fuel filter

Connect the quick connect fitting (page 7-5).



FUEL SYSTEM

FUEL TANK

REMOVAL/INSTALLATION

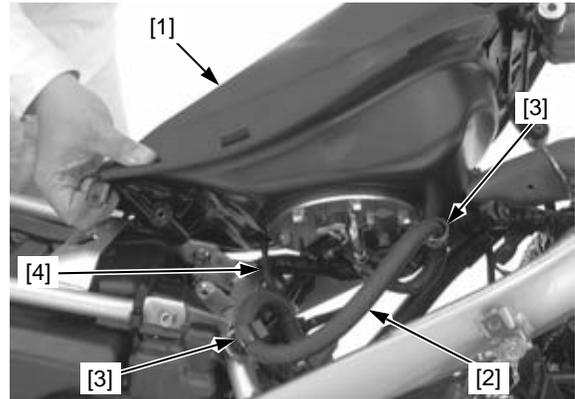
Relieve the fuel pressure and disconnect the quick connect fitting (page 7-4).

Lift up the fuel tank [1] and release the fuel feed hose [2] from the hose clamps [3].

Disconnect the fuel tank breather hose [4] and remove the fuel tank.

Install the fuel tank in the reverse order of removal.

Connect the quick connect fitting (page 7-5).



FUEL PUMP UNIT

SYSTEM INSPECTION

Turn the ignition switch ON and engine stop switch "C" 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 3P (Black) connector [1].

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

Measure the voltage at the fuel pump 3P (Black) connector terminals of the wire side.

CONNECTION: Brown/red (+) – Green (-)

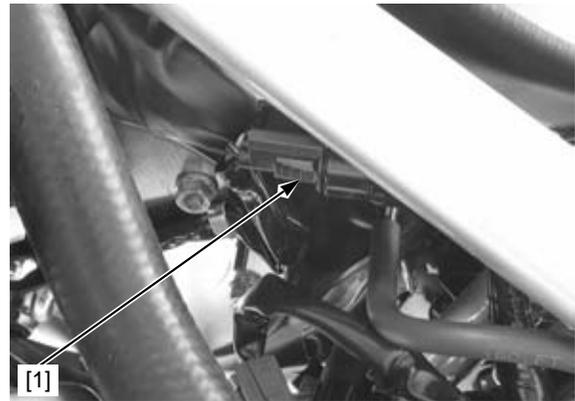
STANDARD: Battery voltage

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:

- Main fuse (30 A)
- FI, IGN fuse (10 A)
- Ignition switch (page 20-11)
- Engine stop switch (page 20-11)
- Fuel pump relay (page 7-10)
- Open circuit in Brown/red or Green wire



REMOVAL/INSTALLATION

NOTE:

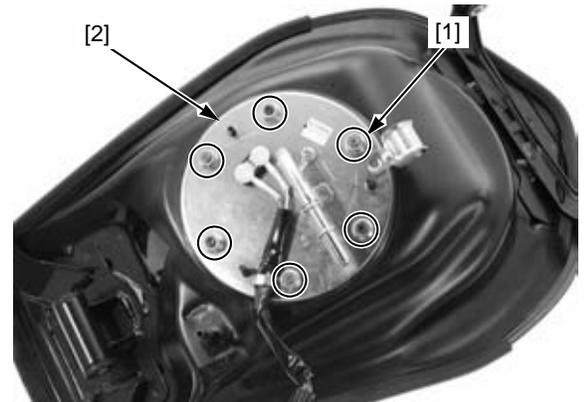
Do not disassemble the fuel pump.

Remove the fuel tank (page 7-8).

Clean around the fuel pump.

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

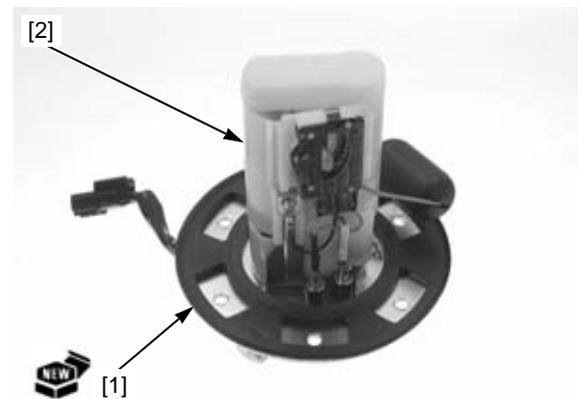
Remove the fuel pump unit [2] from the fuel tank, being careful not to damage the fuel level sensor float arm.



Remove the packing [1] from the fuel pump unit [2].

Install a new packing onto the fuel pump unit.

- Always replace the packing with a new one.
- Be careful not to pinch the dirt and debris between the fuel pump unit and packing.

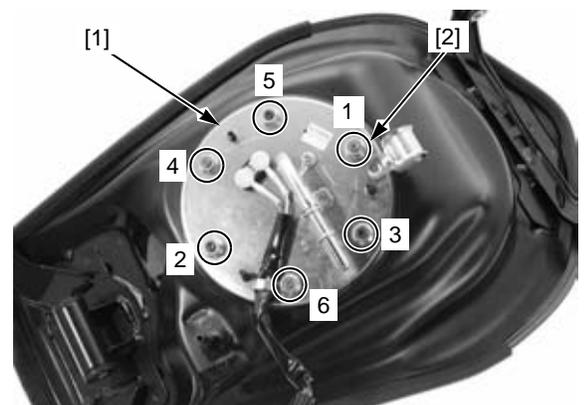


Install the fuel pump [1] into the fuel tank.

Install and tighten the fuel pump mounting nuts [2] to the specified torque in the sequence as shown.

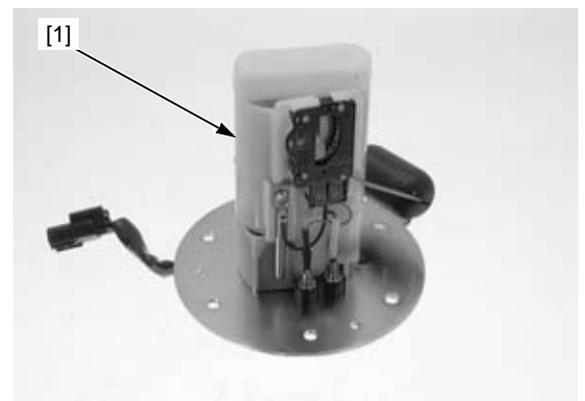
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the fuel tank (page 7-8).



INSPECTION

Check the fuel pump unit [1] for wear or damage, replace it if necessary.



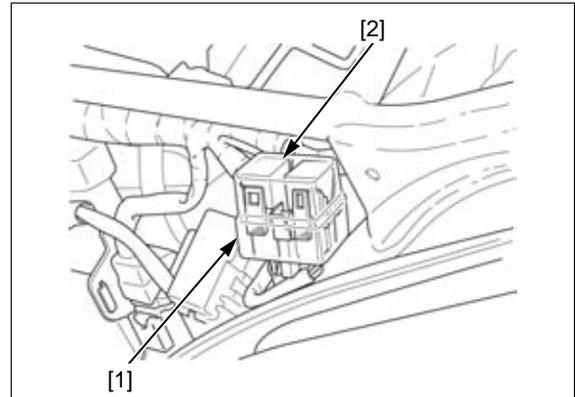
FUEL PUMP RELAY

INSPECTION

Remove the left side cover (page 2-3).

Remove the dust cover [1]

Remove the fuel pump relay [2].

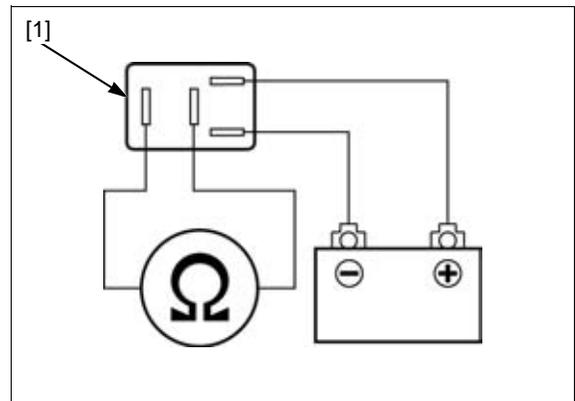


Connect a ohmmeter to the fuel pump relay [1] terminals.

Connect a 12 V battery to the fuel pump relay terminals as shown.

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

If there is no continuity when the 12 V battery is connected, replace the fuel pump relay.



AIR CLEANER HOUSING

REMOVAL/INSTALLATION

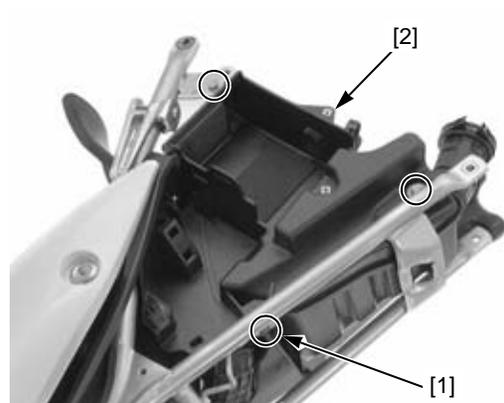
Remove the sub-frame (page 2-12).

Remove the bolts [1] and air cleaner housing.

Installation is in the reverse order of removal.

TORQUE:

**Air cleaner housing mounting bolt:
7.0 N·m (0.7 kgf·m, 5.2 lbf·ft)**

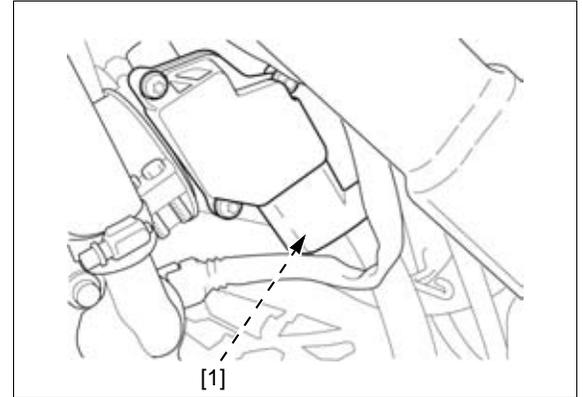


THROTTLE BODY

REMOVAL

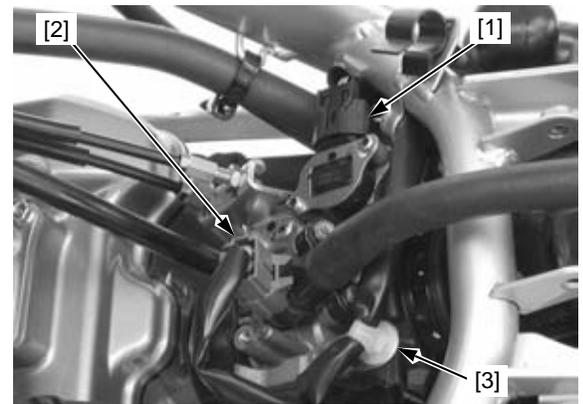
Remove the fuel tank (page 7-8).

Disconnect the sensor unit 5P connector [1].



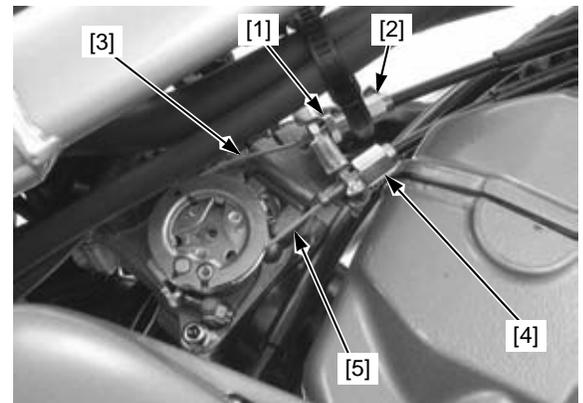
Disconnect the IACV 4P (Black) connector [1] and injector 2P (Gray) connector [2].

Release the wire band [3] from the clamp stay.

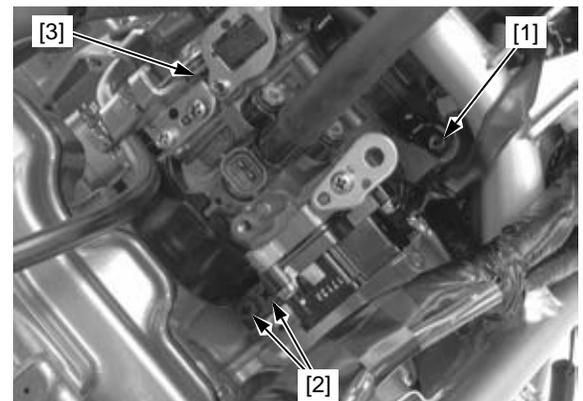


Loosen the throttle cable A adjuster lock nut [1] and adjuster [2] then disconnect the throttle cable A [3] from the throttle drum and cable stay.

Loosen the throttle cable B nut [4] then disconnect the throttle cable B [5] from the throttle drum and cable stay.



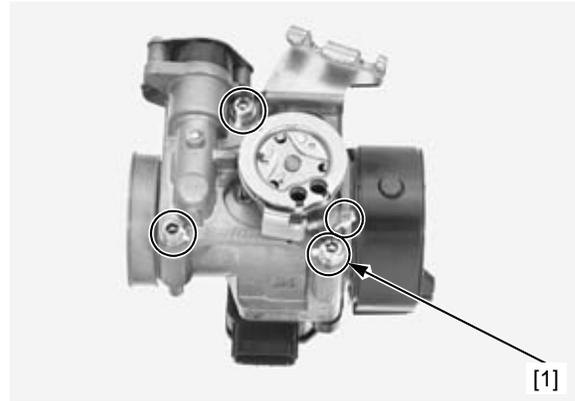
Loosen the connecting hose band screw [1] and insulator band screws [2], then remove the throttle body assembly [3].



DISASSEMBLY/ASSEMBLY

NOTICE

- Do not remove the sensor unit unless it is replaced.
- The throttle body/sensor unit 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 and screw [1] of the throttle body. Loosening or tightening it can cause throttle valve and idle control failure.
- Always clean around the throttle body before each sensor removal to prevent dirt and debris from entering the air passage.



Remove the following

- Sensor unit (page 4-44)
- Injector (page 7-14)
- IACV (page 7-15)

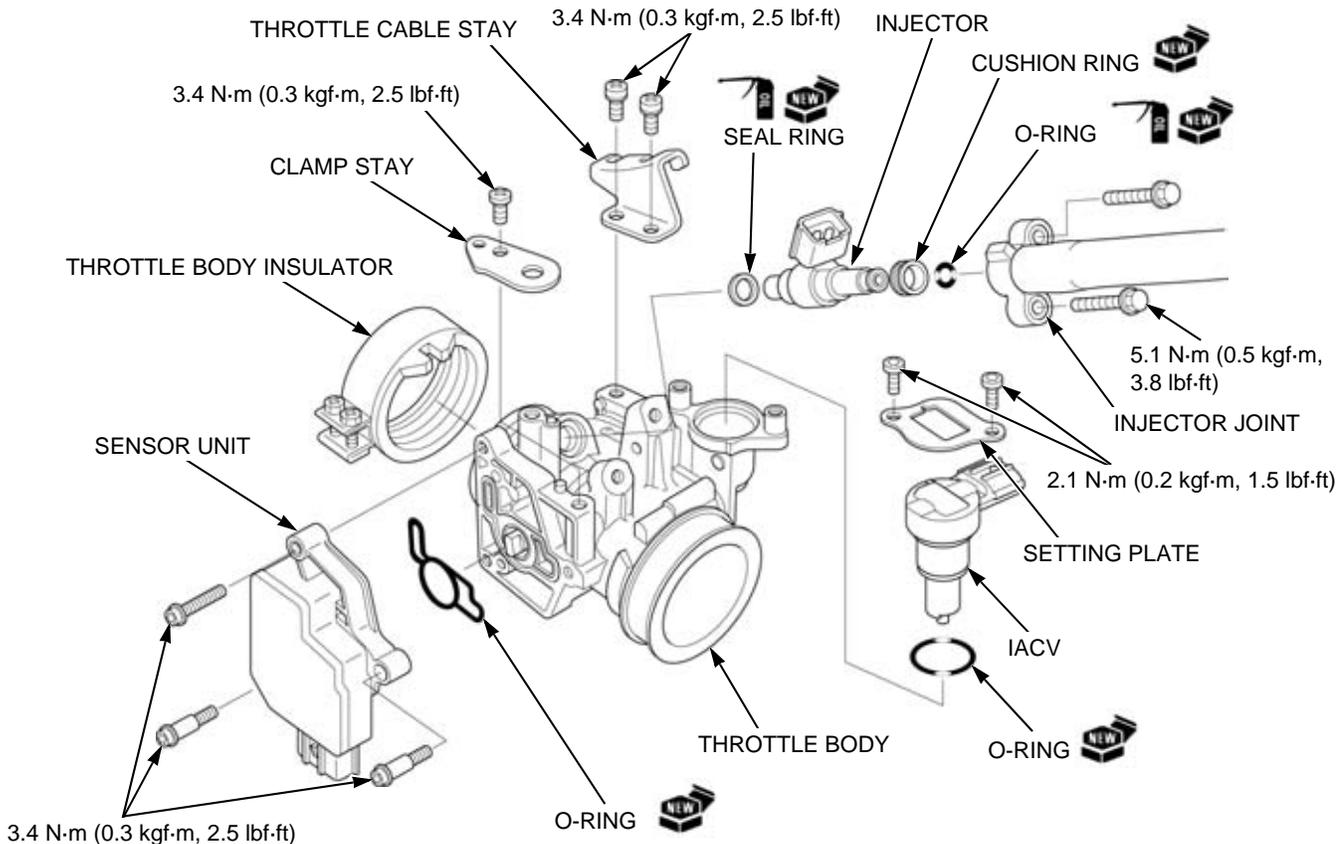
Clean the air passage of the throttle body using compressed air.

- Cleaning the air passages and sensor hole with a piece of wire will damage the throttle body.

Check the air passage for clogs.



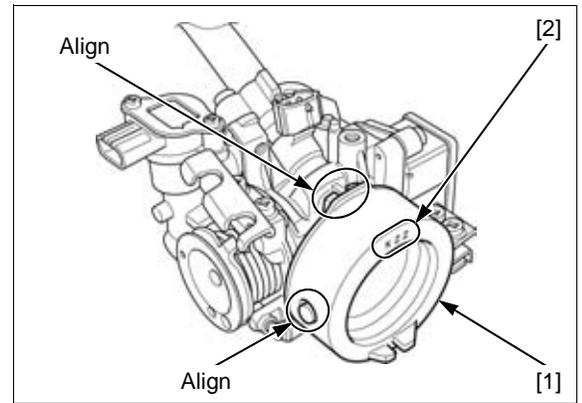
Disassemble and assemble the throttle body as following illustration.



Install the throttle body insulator [1] to the throttle body by aligning the tab of the throttle body with the groove of the throttle body insulator.

NOTE:

- Install the throttle body insulator with "KZZ" mark [2] facing the cylinder head.
- Align the insulator band hole with the insulator boss.



INSTALLATION

Install the throttle body assembly [1] to the cylinder head by aligning the tab of the cylinder head with the groove of the throttle body insulator.

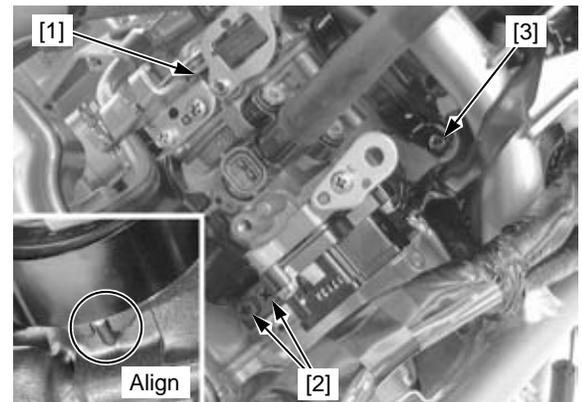
Tighten the insulator band screws [2] to the specified torque.

TORQUE: 4.2 N-m (0.4 kgf-m, 3.1 lbf-ft)

After tightening the insulator band screws, check that the band ends are seated with each other.

Tighten the air cleaner connecting hose band screw [3] to the specified torque.

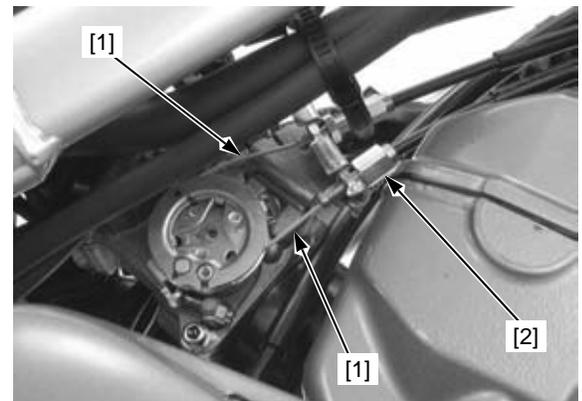
TORQUE: 1.5 N-m (0.2 kgf-m, 1.1 lbf-ft)



Connect the throttle cables [1] to the throttle drum and throttle cable stay.

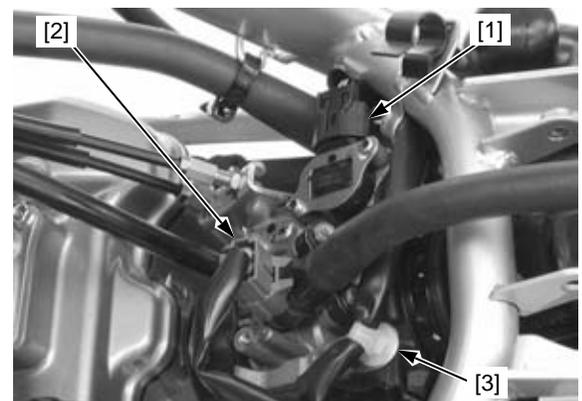
Tighten the throttle cable B nut [2] to the specified torque.

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



Connect the IACV 4P (Black) connector [1] and injector 2P (Gray) connector [2].

Install the wire band [3] to the clamp stay.



FUEL SYSTEM

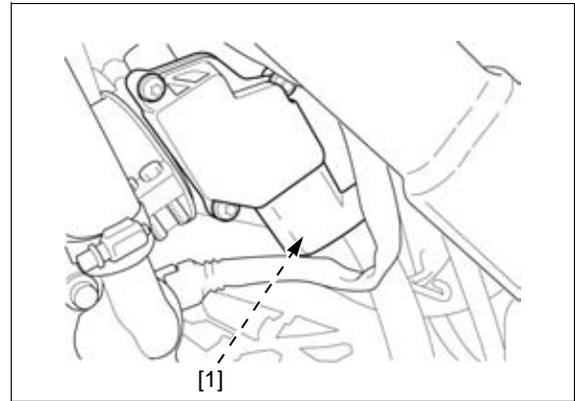
Connect the sensor unit 5P connector [1].

Install the fuel tank (page 7-8).

Adjust the throttle grip freeplay (page 3-3).

NOTE:

If the sensor unit is removed, perform the TP sensor reset procedure (page 4-45).



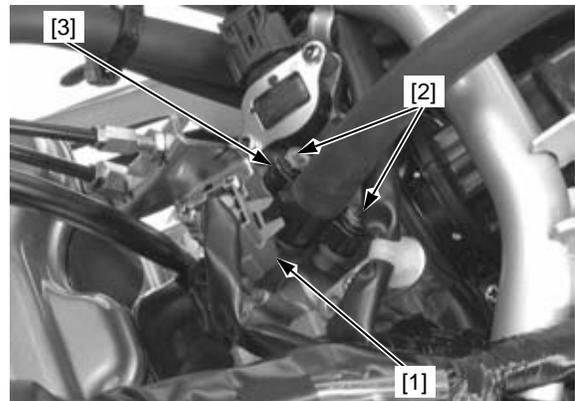
INJECTOR

REMOVAL

Remove the fuel tank (page 7-8).

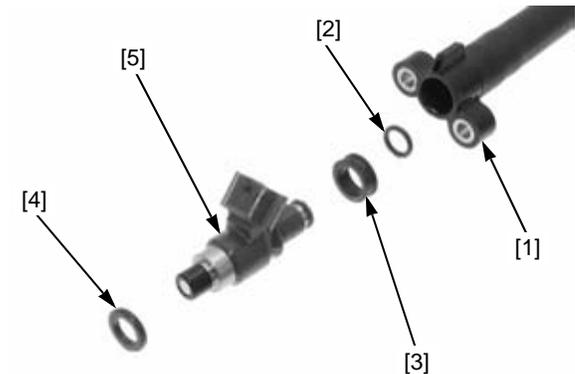
Disconnect the injector 2P (Gray) connector [1].

Remove the bolts [2] and injector assembly [3] from the throttle body.



Remove the injector joint [1], O-ring [2], cushion ring [3] and seal ring [4] from the injector [5].

Check the removed parts for wear or damage and replace them if necessary.

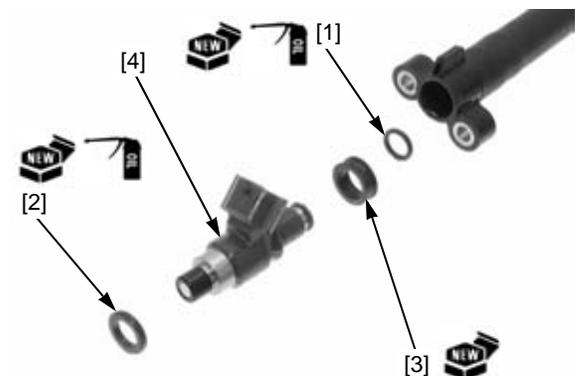


INSTALLATION

Apply engine oil to a new O-ring [1] and a new seal ring [2].

Install a new cushion ring [3] and seal ring to the injector [4], being careful not to damage them.

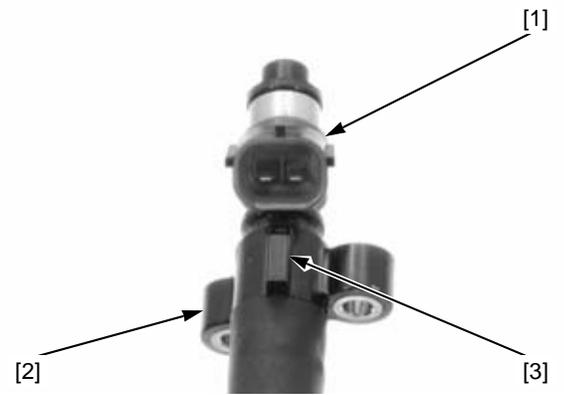
Install the O-ring to the injector.



Install the injector [1] into the injector joint [2], being careful not to damage the O-ring.

NOTE:

Align the injector body with the injector joint tab [3] as shown.



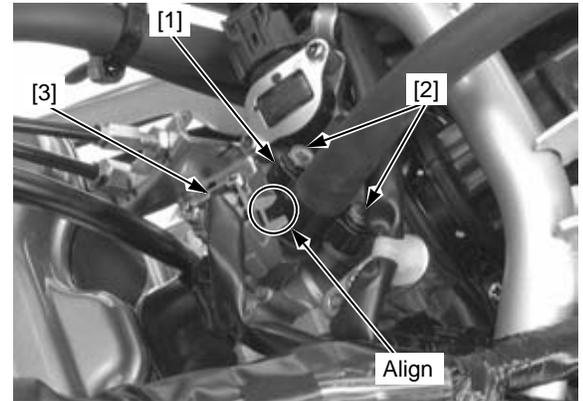
Be careful not to damage the seal ring.

Install the injector assembly [1] to the throttle body. Install and tighten the injector joint mounting bolts [2] alternately to the specified torque.

TORQUE: 5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)

Connect the injector 2P (Gray) connector [3] while aligning its groove with the tab of the injector joint.

Install the fuel tank (page 7-8).



IACV

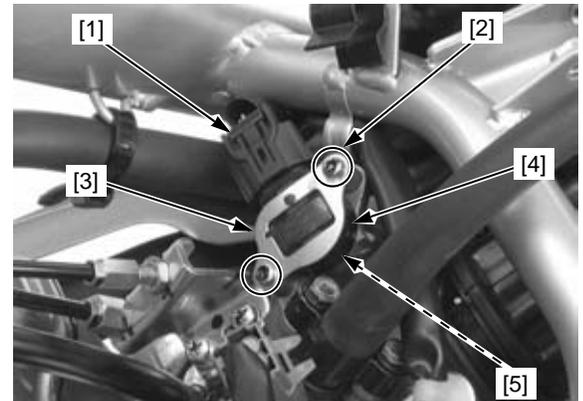
REMOVAL

Remove the fuel tank (page 7-8).

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

Remove the IACV torx screws [2], set plate [3] and IACV [4].

Remove the O-ring [5] from the IACV.



INSTALLATION

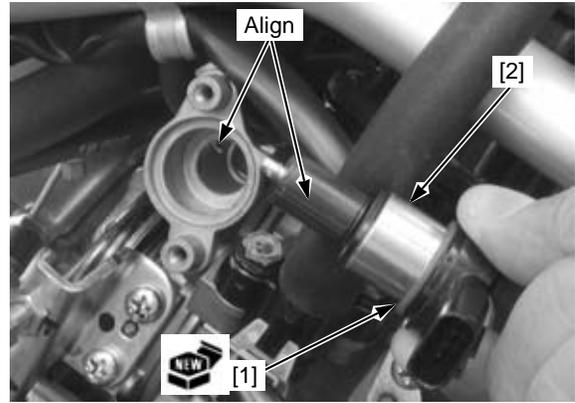
Turn the slide valve [1] clockwise until lightly seated on IACV.



FUEL SYSTEM

Install a new O-ring [1] to the IACV [2].

Install the IACV by aligning its slide valve slot with the pin in the throttle body.

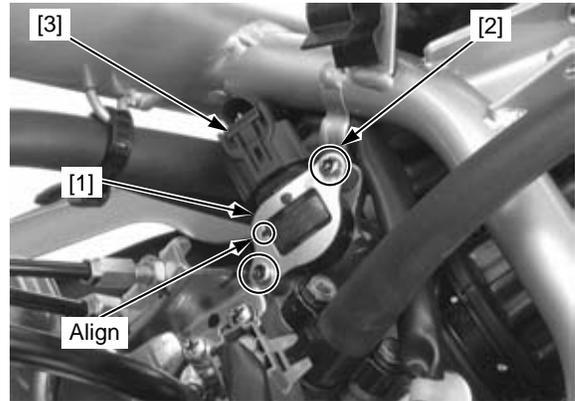


Install the set plate [1] by aligning its slot with the IACV tab, then tighten the torx screws [2] to the specified torque.

TORQUE: 2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)

Connect the IACV 4P (Black) connector [3].

Install the fuel tank (page 7-8).



INSPECTION

NOTE:

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 and engine stop switch "G".

If the IACV does not sound with no MIL blinking, inspect as follows:

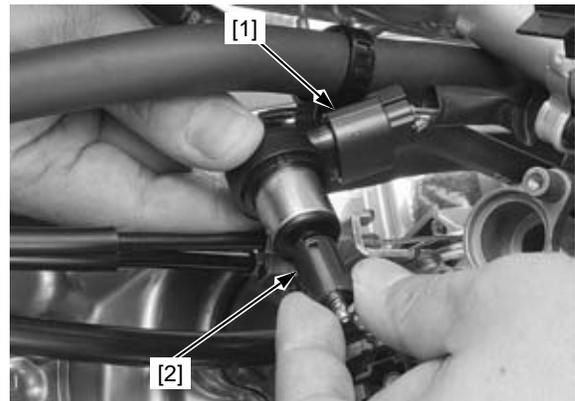
Remove the IACV (page 7-15).

If the idling is unstable, check the condition of the O-ring.

Temporarily connect the IACV 4P (Black) connector [1].

Turn the ignition switch ON and engine stop switch "G" while holding the slide valve [2] as shown. The slide valve should move back and forth.

Install the IACV (page 7-15).



SECONDARY AIR SUPPLY SYSTEM

SYSTEM INSPECTION

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

Stop the engine.

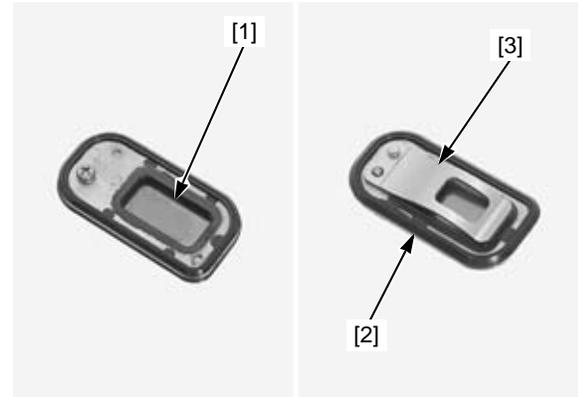
Remove the PAIR check valve (page 7-18).

Check that the reed valve [1] is clean and free of carbon deposits.

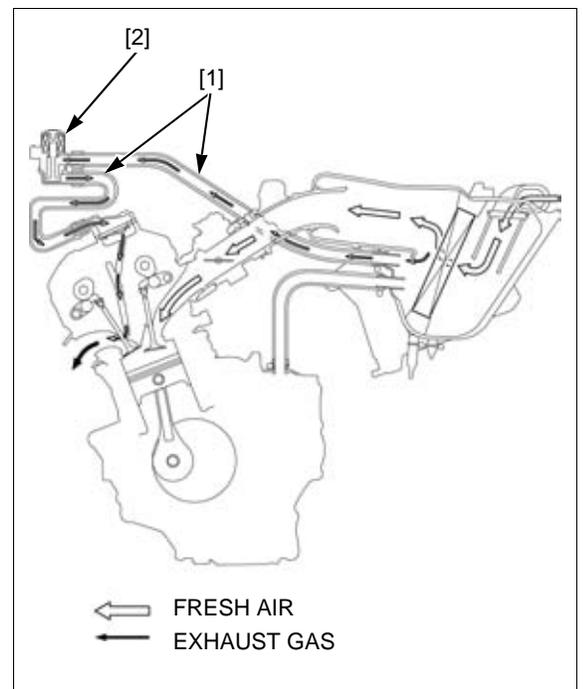
If the reed valve is carbon fouled, inspect the following:

- Reed valve for deterioration or damage
- Rubber seat [2] for crack, deterioration or damage
- Reed valve stopper [3] for damage or deformation

Replace the PAIR check valve if necessary.



Start the engine and open the throttle slightly to be certain that air is sucked in through the air supply hose. If the air is not drawn in, check the air supply hoses [1] for clogs. If the hoses are normal, inspect the PAIR control solenoid valve [2] (page 7-17).

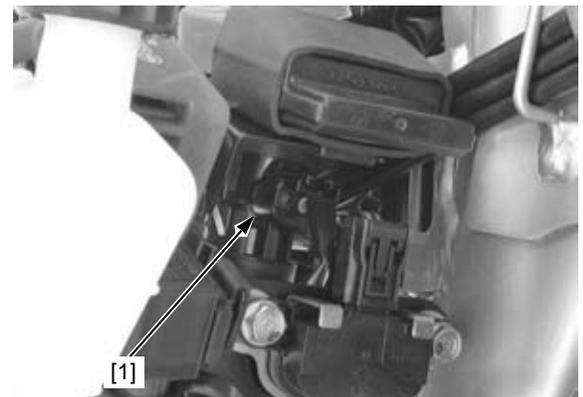


PAIR CONTROL SOLENOID VALVE

REMOVAL/INSTALLATION

Remove the right fuel tank shroud (page 2-4).

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

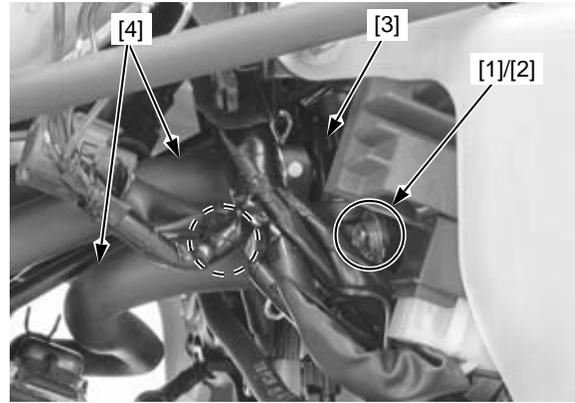


FUEL SYSTEM

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

Disconnect the air supply hoses [4] from the PAIR control solenoid valve.

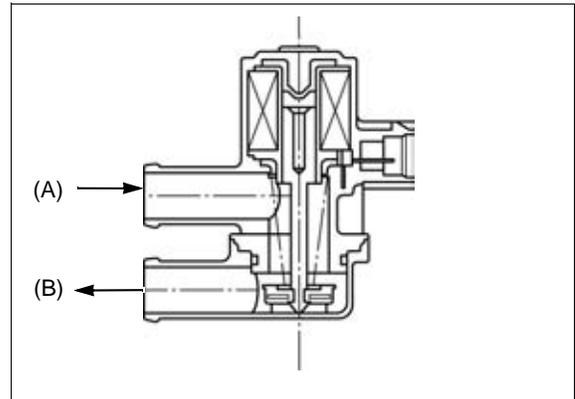
Installation is in the reverse order of removal.



INSPECTION

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

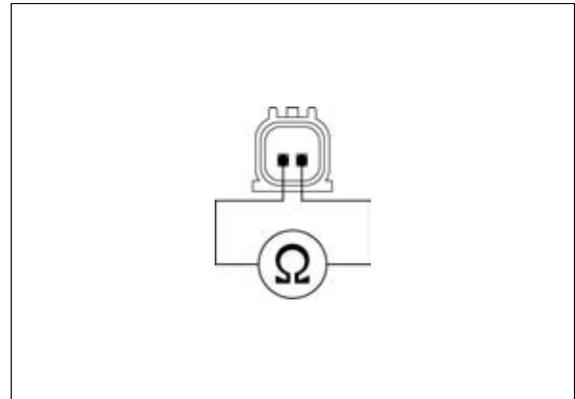
Check that air does not flow (A) to (B) when the 12 V battery is connected to the PAIR control solenoid valve terminals. Air should flow (A) to (B) when there is no voltage applied to the PAIR control solenoid valve terminals.



Measure the resistance between the connector terminals.

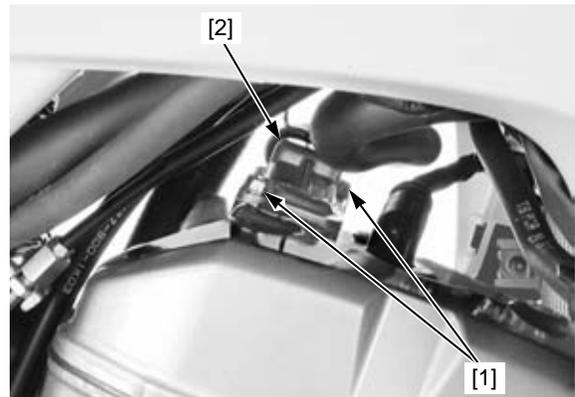
STANDARD: 20 – 24 Ω (20°C/68°F)

If it is out of standard, replace the PAIR control solenoid valve.



PAIR CHECK VALVE REMOVAL/ INSTALLATION

Remove the bolts [1] and PAIR check valve cover [2].

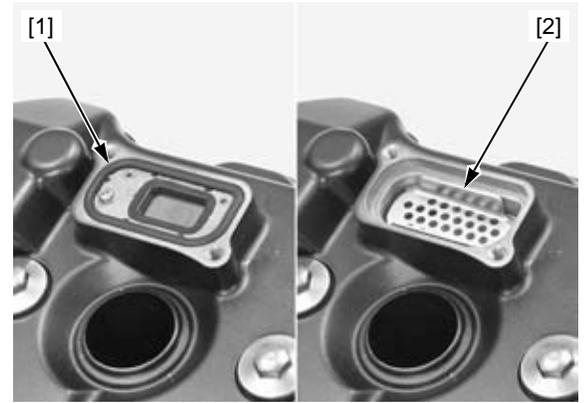


Remove the PAIR check valve [1] and baffle plate [2] from the cylinder head cover.

Installation is in the reverse order of removal.

TORQUE:

PAIR check valve cover bolt:
5.2 N·m (0.5 kgf·m, 3.8 lbf·ft)



MEMO

8. LUBRICATION SYSTEM

SERVICE INFORMATION.....	8-2	ENGINE OIL STRAINER SCREEN.....	8-4
TROUBLESHOOTING.....	8-2	OIL PUMP	8-4
LUBRICATION SYSTEM DIAGRAM	8-3	PRESSURE RELIEF VALVE	8-7

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.

TROUBLESHOOTING

Engine oil level too low, high oil consumption

- Oil consumption
- External oil leaks
- Worn valve guide or stem seal
- Worn piston rings
- Improperly installed piston rings
- Worn cylinder

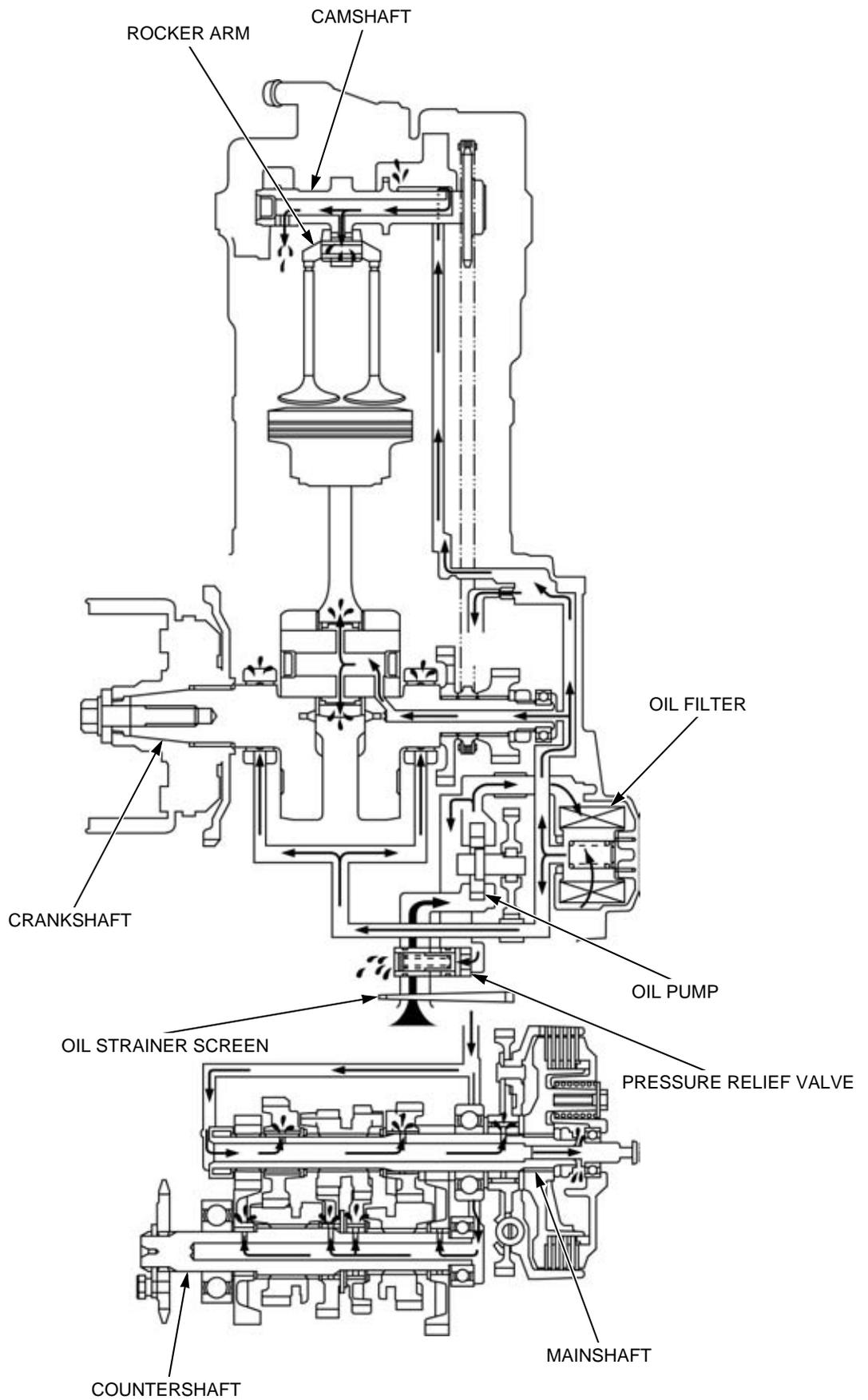
Engine oil contamination

- Oil not changed often enough
- Worn valve guide or stem seal
- Worn piston rings
- Improperly installed piston rings
- Worn cylinder

Oil emulsification

- Faulty cylinder head gasket
- Leaky coolant passage
- Entry of water
- Faulty water pump mechanical seal

LUBRICATION SYSTEM DIAGRAM



LUBRICATION SYSTEM

ENGINE OIL STRAINER SCREEN

REMOVAL/INSTALLATION

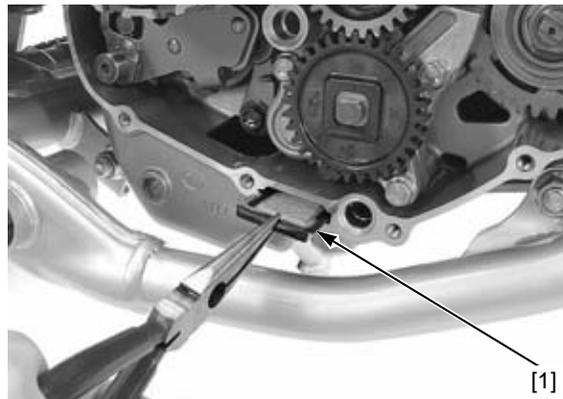
Remove the right crankcase cover (page 12-4).

Be careful not to damage the oil strainer screen.

Pull the oil strainer screen [1] out of the crankcase.

Wash the oil strainer screen thoroughly in nonflammable or high flash point solvent until all accumulated dirt has been removed.

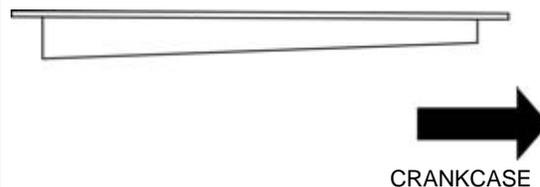
Blow dry it with compressed air to clean completely. Before installing the strainer, it should be examined closely for damage, and make sure the sealing rubber is in good condition.



Install the oil strainer screen with the thin edge facing in and flange side facing up as shown.

Install the right crankcase cover (page 12-8).

OIL STRAINER SCREEN DIRECTION:



OIL PUMP

REMOVAL/DISASSEMBLY

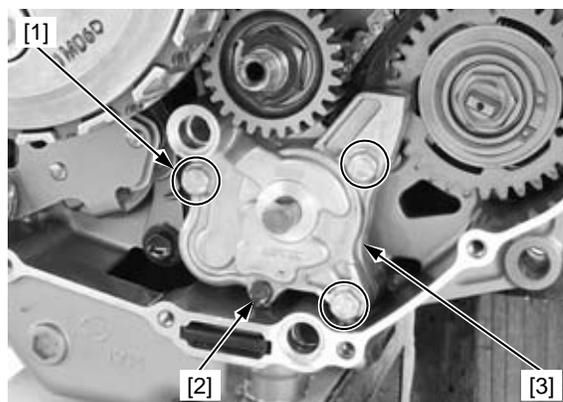
Remove the right crankcase cover (page 12-4).

Remove the oil pump driven gear [1].



Remove the oil pump mounting bolts [1] and oil pump assembly bolt [2].

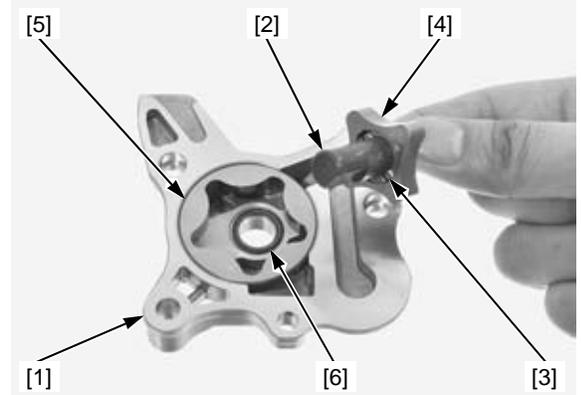
Remove the oil pump cover assembly [3].



Remove the inner rotor assembly from the oil pump cover [1] while holding oil pump shaft [2].

Remove the oil pump shaft and lock pin [3] from the inner rotor [4].

Remove the outer rotor [5] and washer [6].

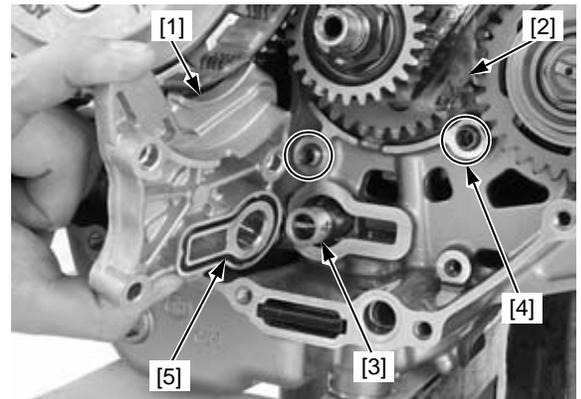


Remove the dowel pins [1] from the oil pump body [2].



Remove the oil pump body [1] by releasing it from the cam chain guide hook [2] and pressure relief valve [3].

Remove the dowel pins [4] and O-ring [5].



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation or burning.

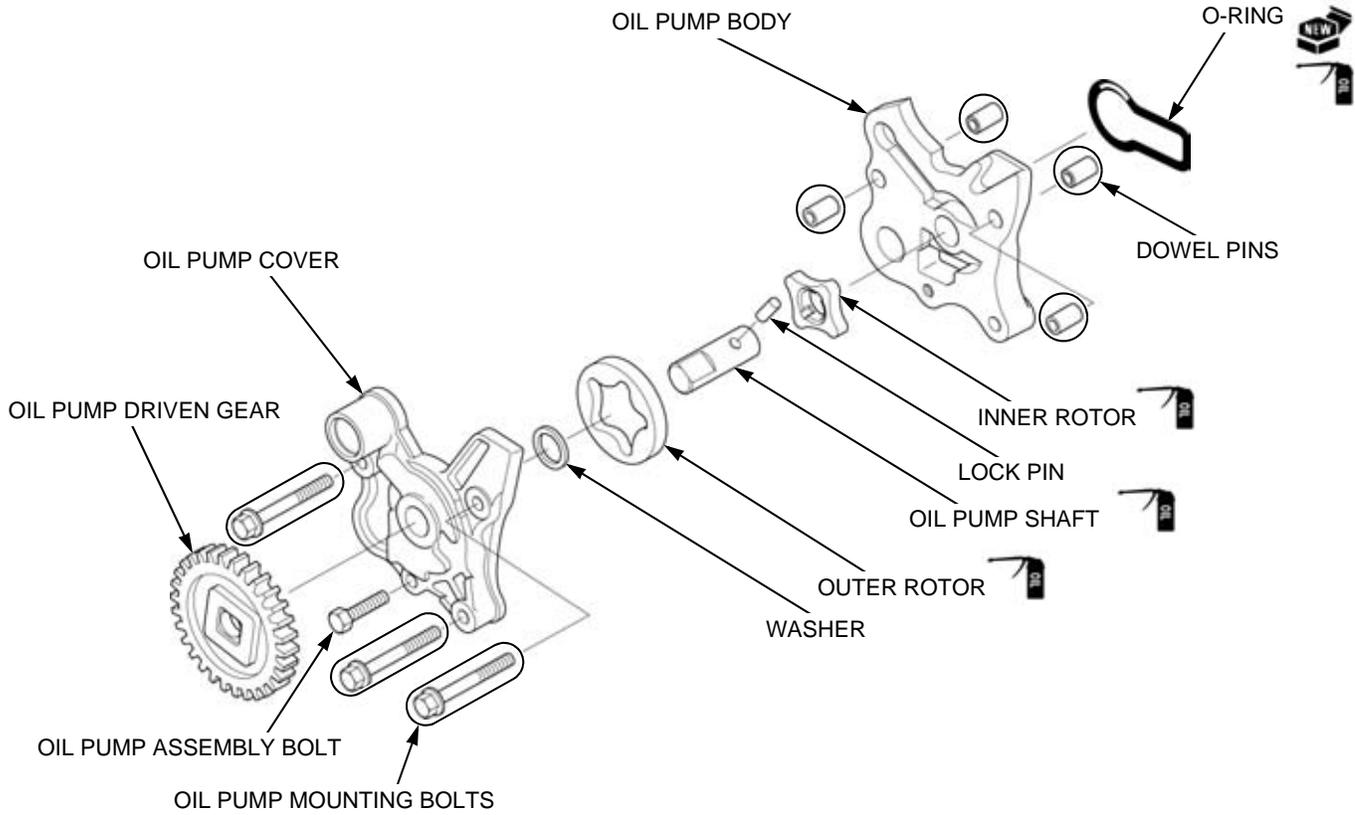
- Oil pump driven gear
- Oil pump shaft
- Lock pin
- Inner rotor
- Outer rotor
- Oil pump body

Measure the oil pump clearances according to LUBRICATION SYSTEM SPECIFICATIONS (page 1-5).

If any of the measurement is out of the service limit, replace the oil pump as an assembly.

LUBRICATION SYSTEM

ASSEMBLY



INSTALLATION

Install the dowel pins [1].

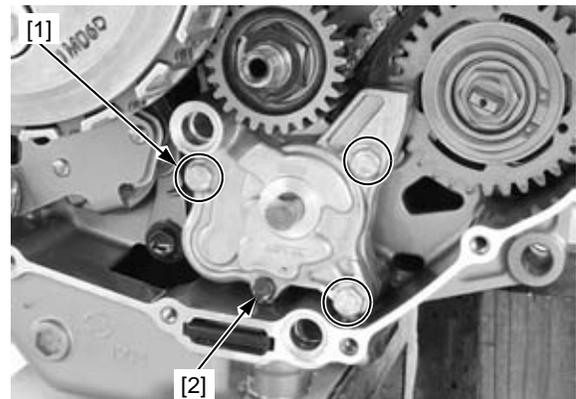
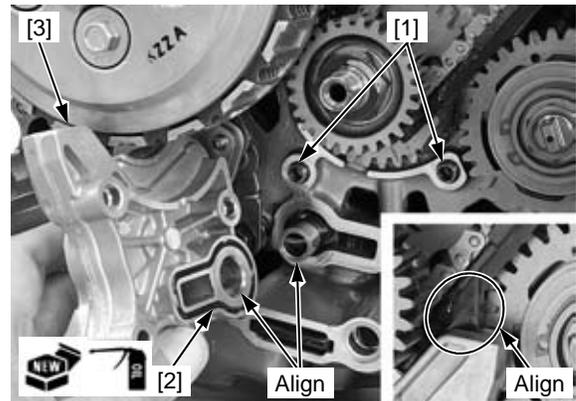
Apply engine oil to a new O-ring [2].

Install the O-ring to the oil pump assembly [3].

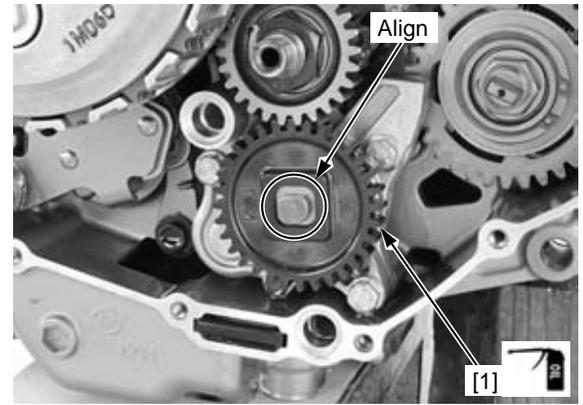
Install the oil pump assembly while aligning its slit with cam chain guide hook and its hole with the pressure relief valve.

Install and tighten the oil pump mounting bolts [1].

If the oil pump was disassembled, tighten the oil pump assembly bolt [2].



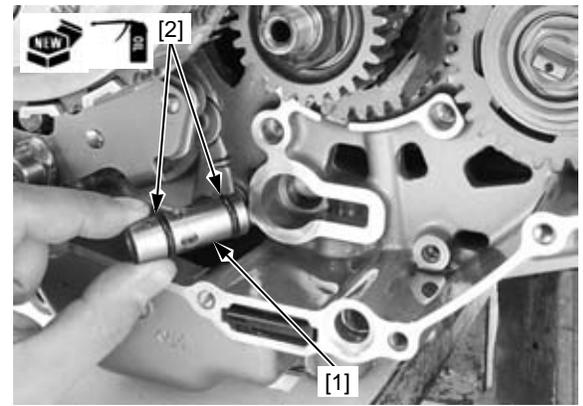
Apply engine oil to the oil pump driven gear [1] teeth.
 Install the oil pump driven gear while aligning the flats of the oil pump driven gear and oil pump shaft.
 Install the right crankcase cover (page 12-8).



PRESSURE RELIEF VALVE

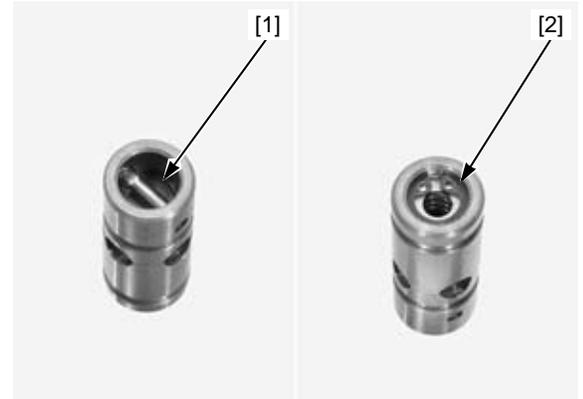
REMOVAL/INSTALLATION

Remove the oil pump (page 8-4).
 Remove the oil pressure relief valve [1] and O-rings [2].
 Apply engine oil to new O-rings.
 Install the O-rings to the oil pressure relief valve grooves.
 Install the oil pressure relief valve into the right crankcase with the piston side facing outside.
 Install the oil pump (page 8-6).



PRESSURE RELIEF VALVE INSPECTION

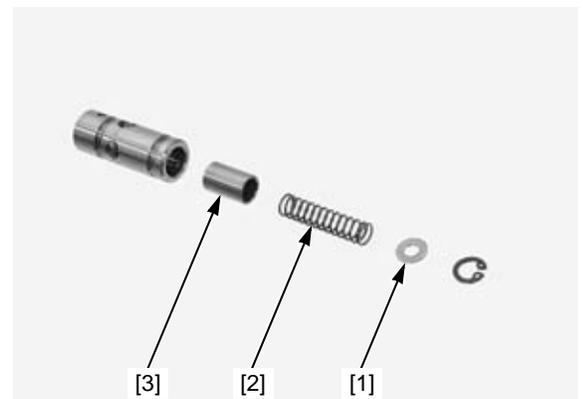
Check the operation of the pressure relief valve by pushing on the piston [1].
 Disassemble the pressure relief valve by removing the snap ring [2].



Remove the washer [1], spring [2] and piston [3].
 Check the piston for wear, sticking or damage.
 Check the spring for fatigue or damage.
 Assemble the pressure relief valve in the reverse order of disassembly.

NOTE:

- Install the snap ring with the chamfered edges facing the thrust load side.
- Make sure the snap ring is seated in the groove.



MEMO

SERVICE INFORMATION.....	9-2	RADIATOR/COOLING FAN.....	9-6
TROUBLESHOOTING.....	9-2	WATER PUMP	9-8
SYSTEM FLOW PATTERN.....	9-3	RADIATOR RESERVE TANK.....	9-12
SYSTEM TESTING.....	9-4	FAN CONTROL RELAY	9-12
COOLANT REPLACEMENT	9-5	WATER PIPE	9-13
THERMOSTAT	9-5		

COOLING SYSTEM

SERVICE INFORMATION

GENERAL

WARNING

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

NOTICE

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

- Add cooling system at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done with the engine installed in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.

TROUBLESHOOTING

Engine temperature too high

- Faulty indicator or ECT sensor
- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passage blocked in radiator, hoses or water jacket
- Air in system
- Faulty cooling fan motor
- Faulty fan control relay
- Faulty water pump

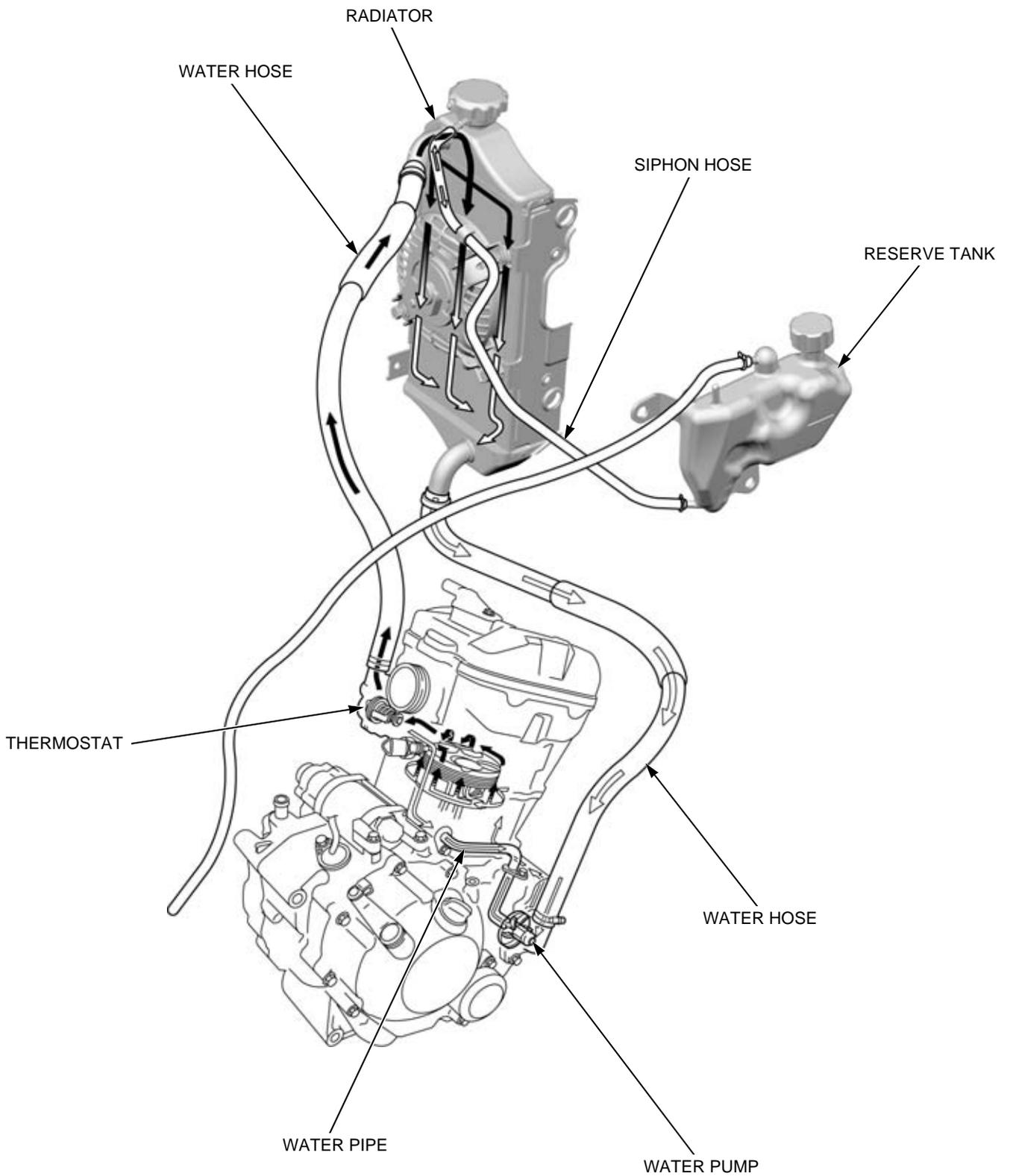
Engine temperature too low

- Thermostat stuck open
- Faulty fan control relay

Coolant leak

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

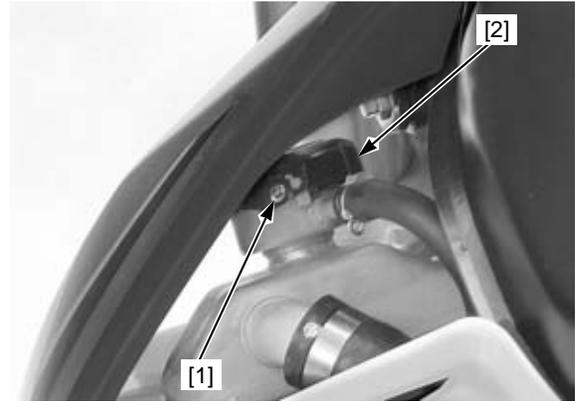
SYSTEM FLOW PATTERN



SYSTEM TESTING

RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Loosen the cap screw [1] and remove the radiator cap [2].

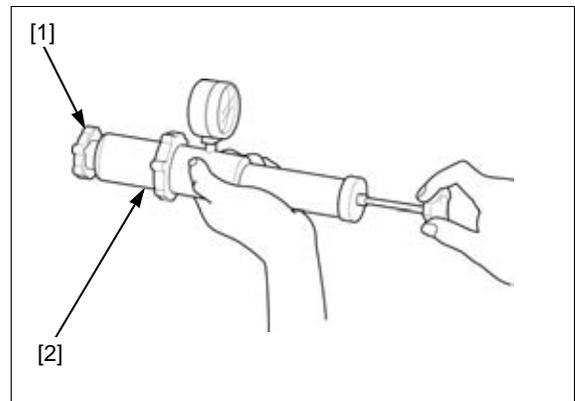


Wet the sealing surfaces of the radiator cap [1], then install the cap onto the tester [2].

Pressurize the cap using the tester. Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low. It must hold the specified pressure for at least 6 seconds.

RADIATOR CAP RELIEF PRESSURE:
93.2 – 122.6 kPa
(0.95 – 1.25 kgf/cm², 13.5 – 17.8 psi)

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



NOTICE

Excessive pressure can damage the cooling system components. Do not exceed 122.6 kPa (1.25 kgf/cm², 17.8 psi).

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

Remove the tester.

Install the radiator cap and tighten the screw.

COOLANT REPLACEMENT

REPLACEMENT/AIR BLEEDING

Remove the radiator cap (page 9-4).

Remove the drain bolt [1] and sealing washer [2] on the water pump cover and drain the coolant from the system.

Install and tighten the drain bolt with a new sealing washer.

When filling the system or reserve tank with a coolant (checking coolant level), support the motorcycle on a level surface.

Fill the system with the recommended coolant through the filler opening.

RECOMMENDED ANTIFREEZE:

High quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors

STANDARD COOLANT CONCENTRATION:

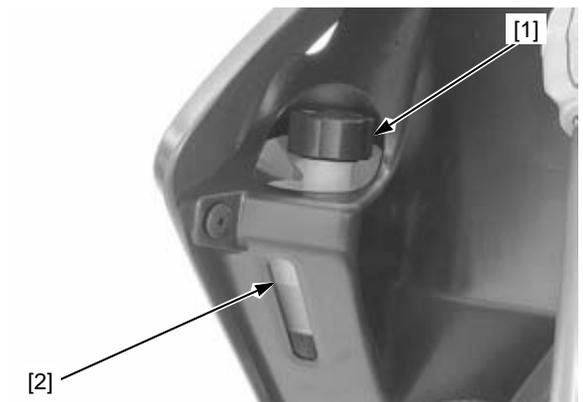
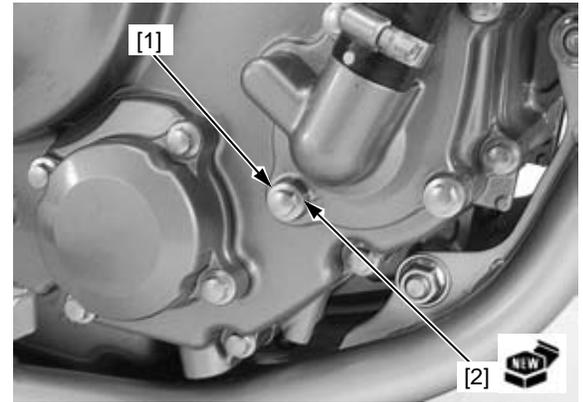
1:1 (mixture with distilled water)

Bleed air from the system as follows:

1. Shift the transmission into neutral.
Start the engine and let it idle for 2 – 3 minutes.
2. Snap the throttle 3 – 4 times to bleed air from the system.
3. Stop the engine and add the coolant.
4. Install the radiator cap and tighten the cap screw.

Remove the reserve tank cap [1] and fill the reserve tank to the "UPPER" level line [2].

Install the reserve tank cap.

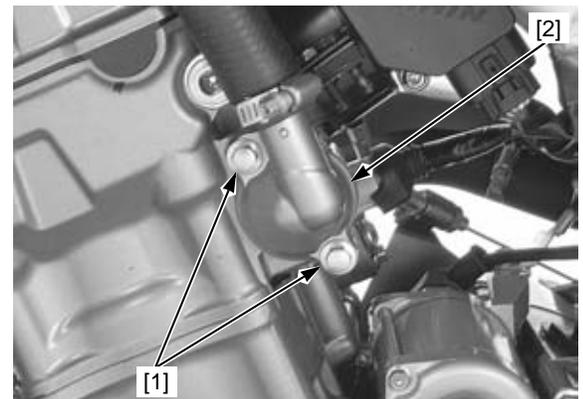


THERMOSTAT

REMOVAL/INSTALLATION

Drain the coolant (page 9-5).

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



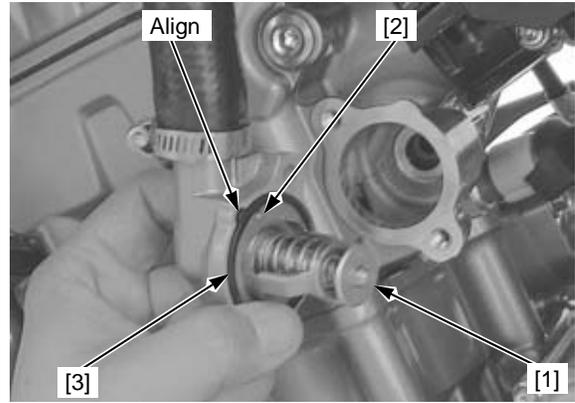
COOLING SYSTEM

Remove the thermostat [1] from the cylinder head.
Installation is in the reverse order of removal.

NOTE:

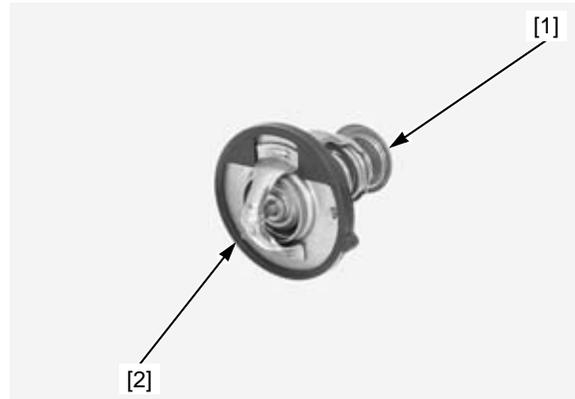
- Install the thermostat with the bleed hole [2] facing up.
- When installing the thermostat, align the tab of the seal ring [3] with the groove of the thermostat cover.

Fill and bleed the cooling system (page 9-5).



INSPECTION

Visually inspect the thermostat [1] for damage.
Check the seal ring [2] for damage and replace if necessary.



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

Heat the water with an electric heating element to operating temperature for 5 minutes.
Suspend the thermostat [1] in heated water to check its operation.

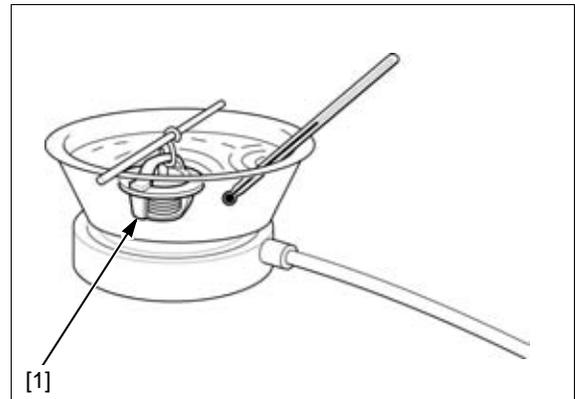
THERMOSTAT BEGIN TO OPEN:

81 – 84°C (178 – 183°F)

VALVE LIFT:

4.5 mm (0.18 in) minimum at 95°C (203°F)

Replace the thermostat if the valve open at a temperatures other than those specified.



RADIATOR/COOLING FAN

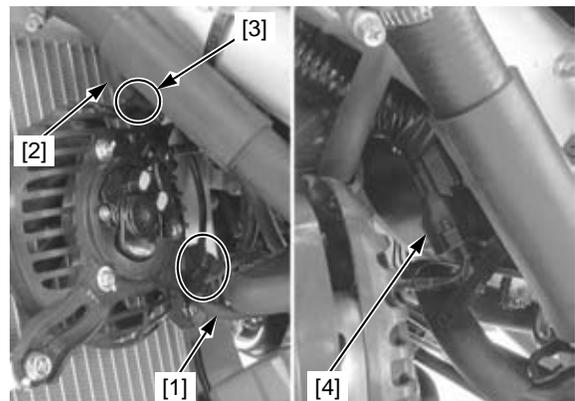
REMOVAL/INSTALLATION

Drain the coolant (page 9-5).

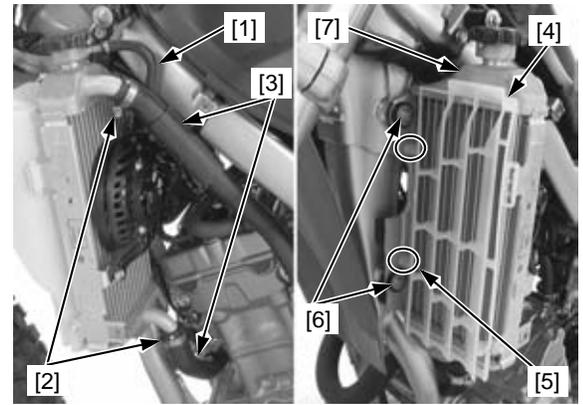
Remove the left fuel tank shroud (page 2-4).

Release the spark plug wire [1] and radiator siphon hose [2] from the guides [3].

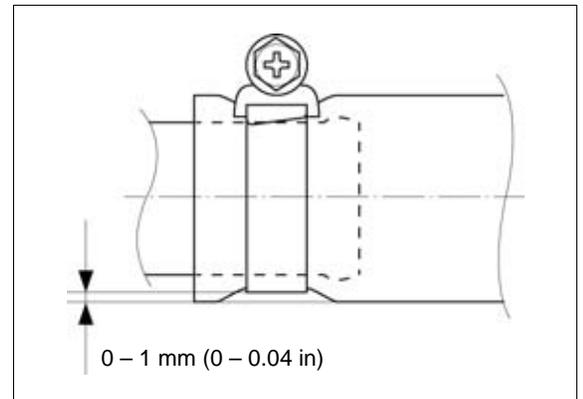
Disconnect the fan motor 2P (Black) connector [4].



Disconnect the siphon hose [1] from the radiator.
 Loosen the water hose band screws [2] and disconnect the upper and lower water hoses [3].
 Remove the radiator guard [4] by releasing the bosses [5].
 Remove the radiator mounting bolts [6] and radiator [7].

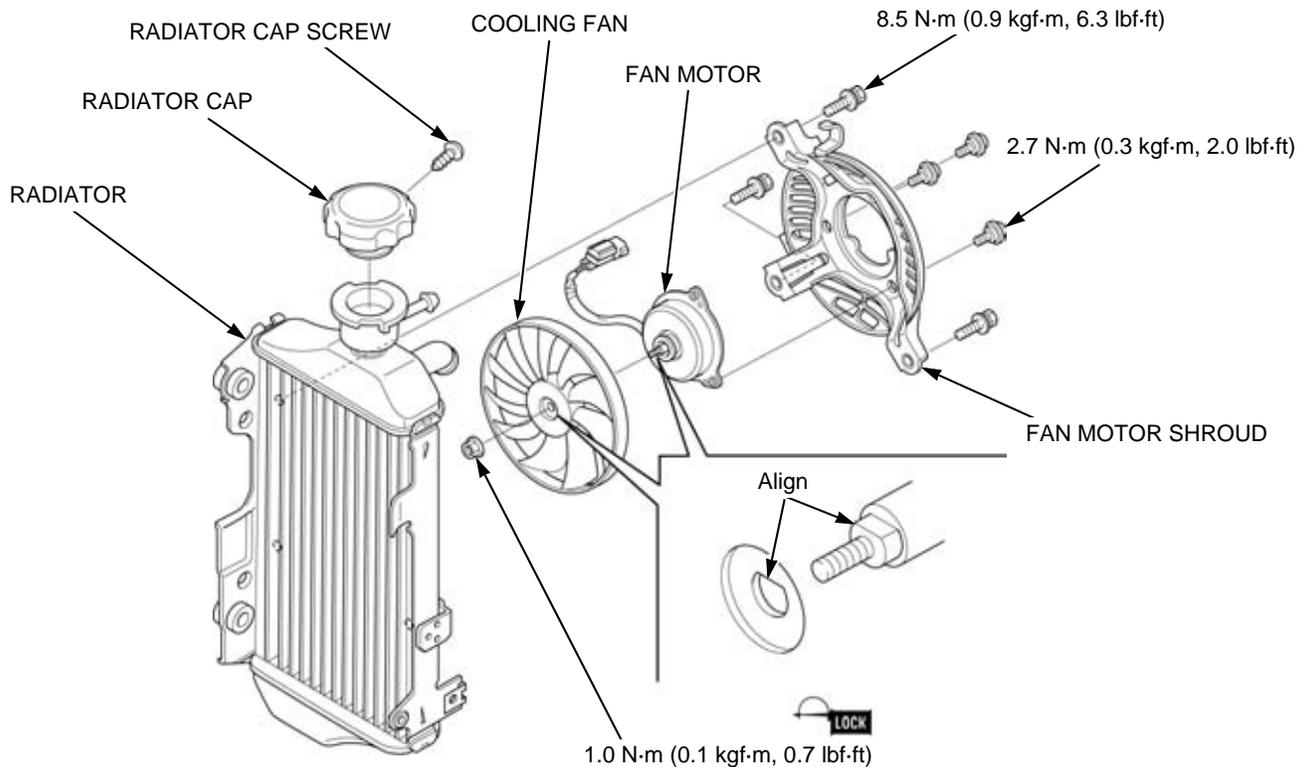


Installation is in the reverse order of removal.
 Tighten the hose band screw to the specified range.
 Fill the system with the recommended coolant (page 9-5).



DISASSEMBLY/ASSEMBLY

Disassemble and assemble the radiator as following illustration.



WATER PUMP

MECHANICAL SEAL INSPECTION

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

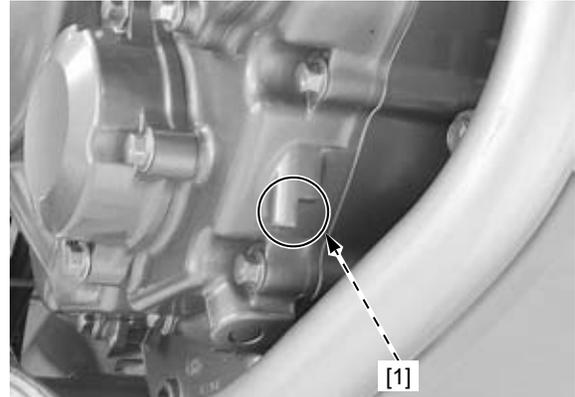
If water leaks through the bleed hole, replace the mechanical seal (page 9-9).

If oil leaks through the bleed hole, replace the oil seal (page 9-9).

Make sure that there are no continuous coolant leakage from the bleed hole while operating the engine.

NOTE:

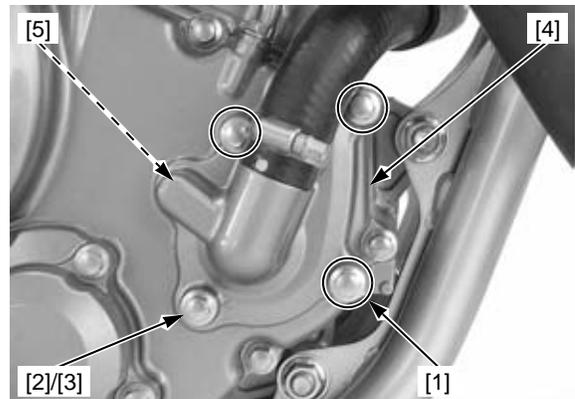
A small amount of weeping from the bleed hole is normal.



REMOVAL

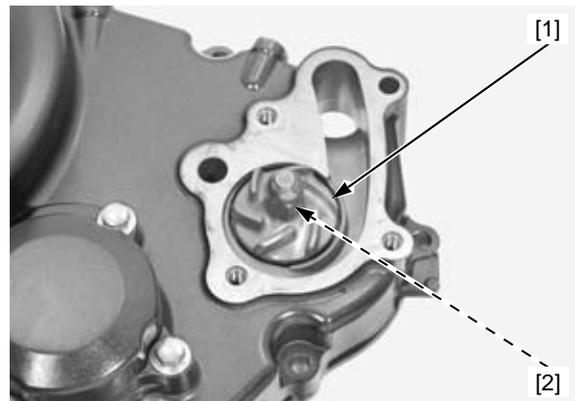
Drain the coolant (page 9-5).

Remove the bolts [1], drain bolt [2], sealing washer [3], water pump cover [4] and O-ring [5].

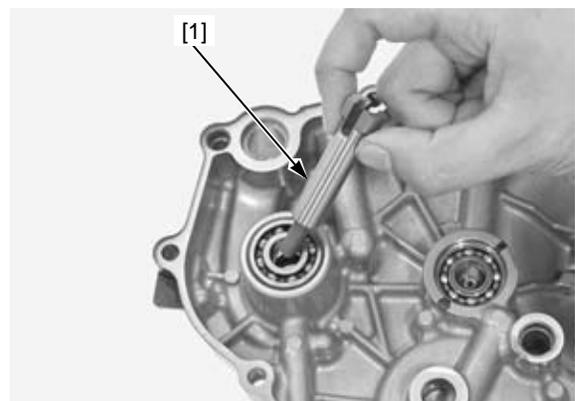


Remove the right crankcase cover (page 12-4).

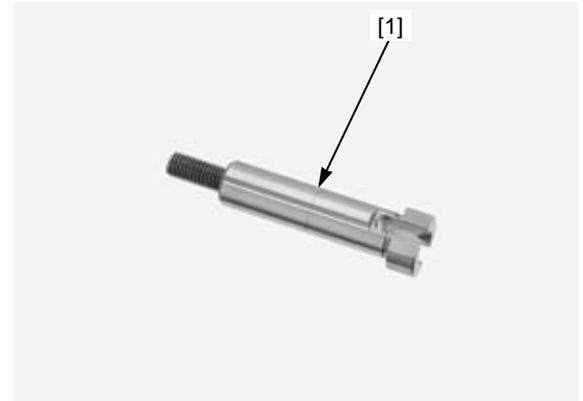
Hold the water pump shaft and remove the impeller [1] and plain washer [2].



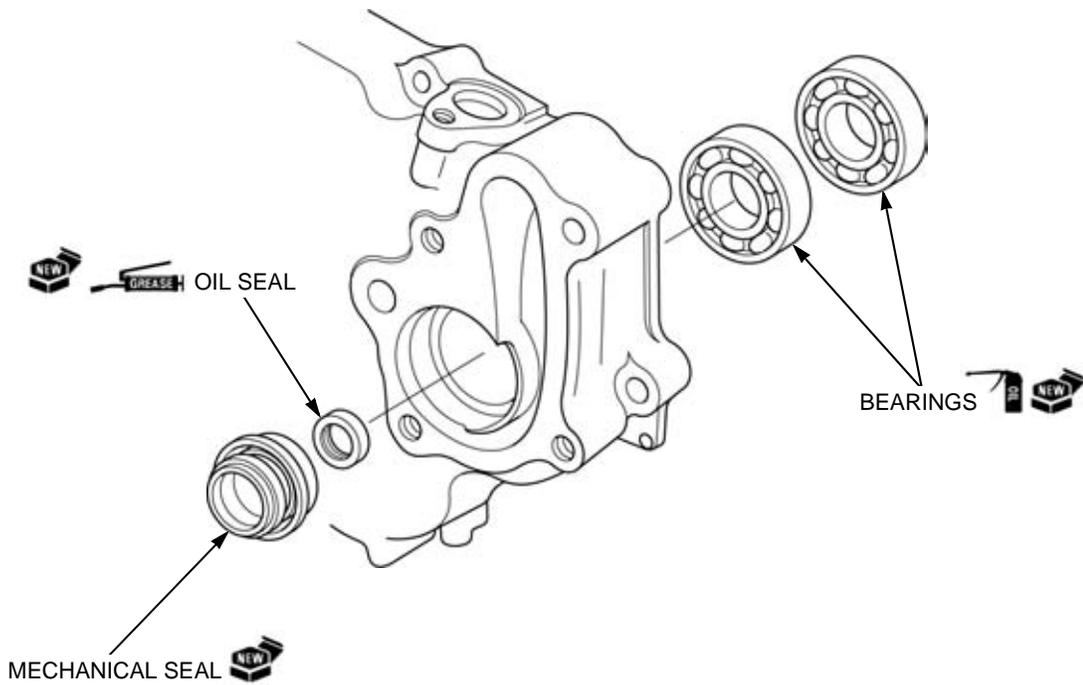
Remove the water pump shaft [1] from the right crankcase cover.



Check the water pump shaft [1] for wear or damage, replace it if necessary.

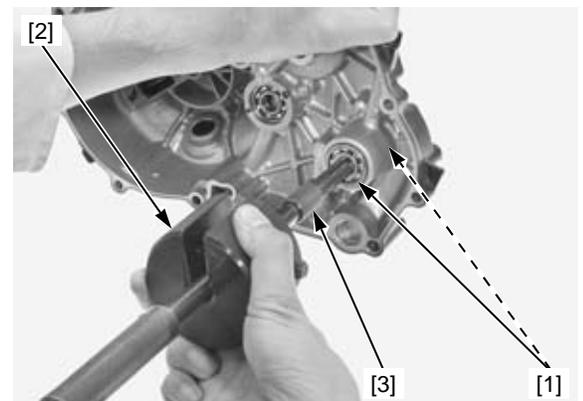


BEARING/MECHANICAL SEAL/OIL SEAL REPLACEMENT



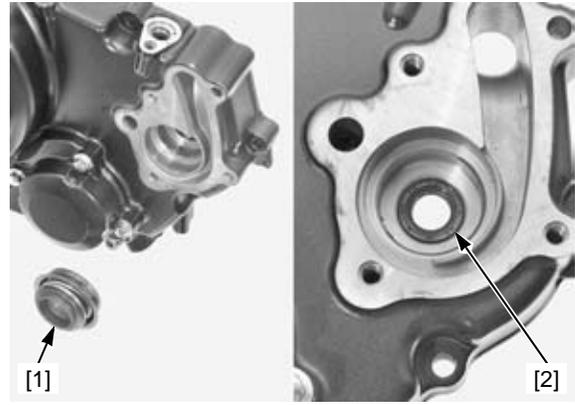
Remove the water pump shaft bearings [1] using the special tools.

- TOOLS:**
 [2] Remover weight **07741-0010201**
 [3] Bearing remover set, 12 mm **07936-1660101**



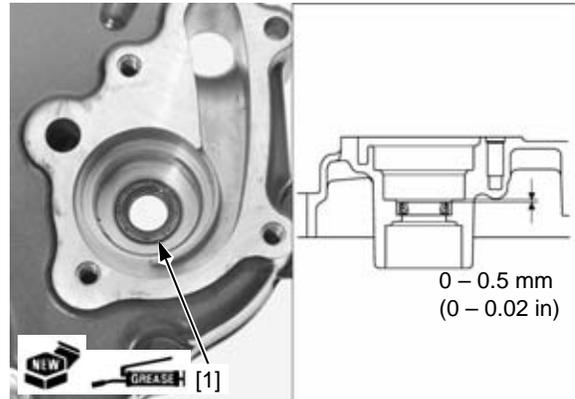
COOLING SYSTEM

Remove the mechanical seal [1] and oil seal [2] from the right crankcase cover.



Apply grease to a new oil seal [1] lips.

Install the oil seal to the right crankcase cover as shown.



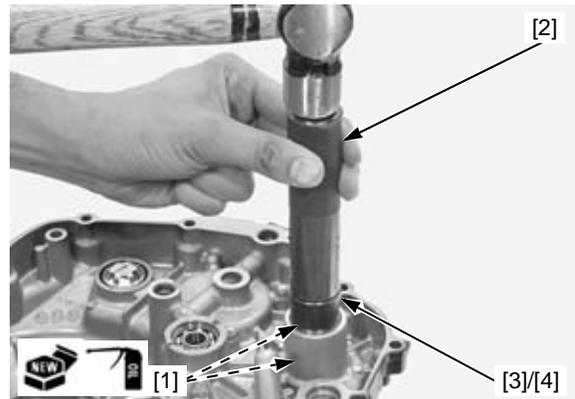
Drive in a new bearing squarely with the marking side facing up.

Drive in new bearings [1] into the right crankcase cover using the special tools as shown.

TOOLS:

- | | |
|----------------------------|---------------|
| [2] Driver | 07749-0010000 |
| [3] Attachment, 28 x 30 mm | 07946-1870100 |
| [4] Pilot, 12 mm | 07746-0040200 |

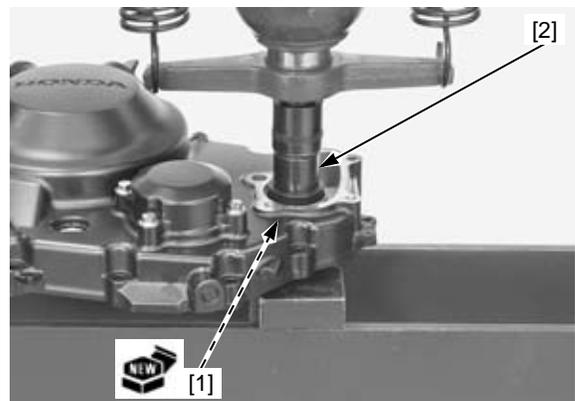
After installing the bearing, lubricate it with engine oil.



Press a new mechanical seal [1] until it is fully seated to the right crankcase cover using the hydraulic press and special tool.

TOOL:

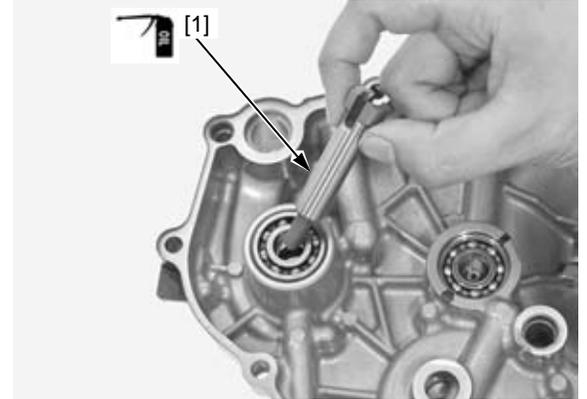
- | | |
|---------------------------------|---------------|
| [2] Oil seal driver, 30 x 36 mm | 07HMF-KR10101 |
|---------------------------------|---------------|



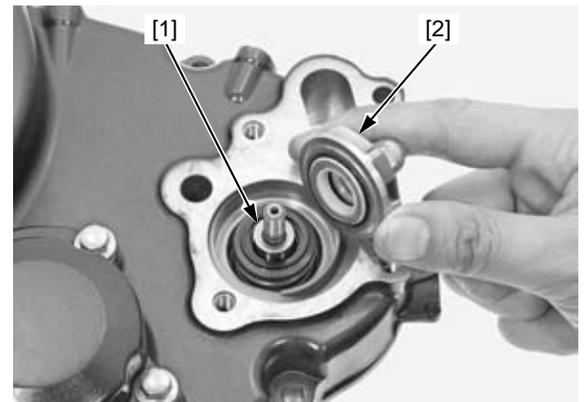
INSTALLATION

Apply engine oil to the water pump shaft [1] outer surface.

Install the water pump shaft to the right crankcase cover.



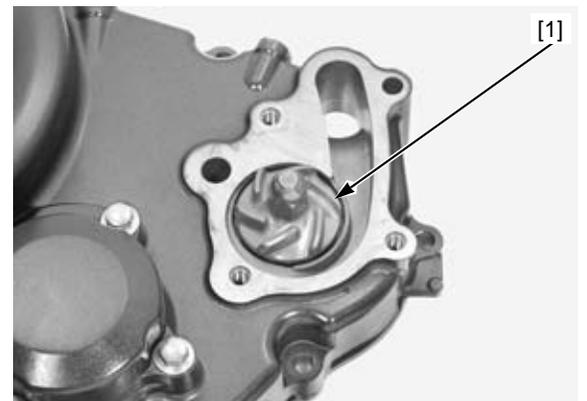
Install the plain washer [1] and impeller [2] to the water pump shaft.



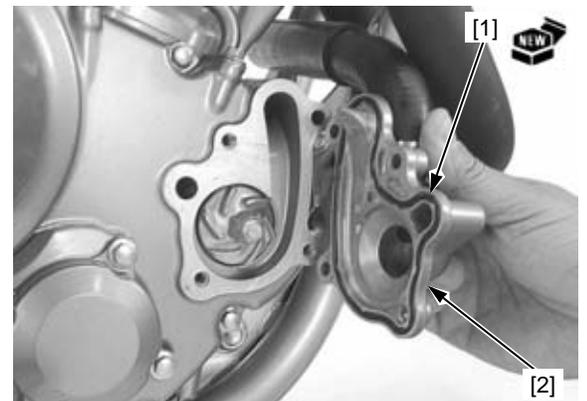
Hold the water pump shaft and tighten the water pump impeller [1] to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the right crankcase cover (page 12-8).



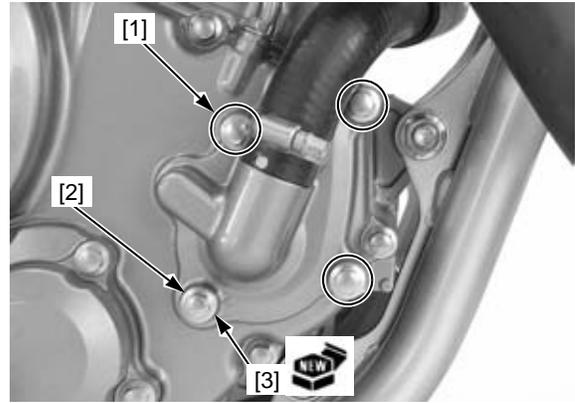
Install a new O-ring [1] to the water pump cover [2].
Install the water pump cover.



COOLING SYSTEM

Install and tighten the bolts [1], drain bolt [2] and a new sealing washer [3] securely.

Fill the recommended coolant and bleed the air (page 9-5).



RADIATOR RESERVE TANK

REMOVAL/INSTALLATION

Remove the right fuel tank shroud (page 2-4).

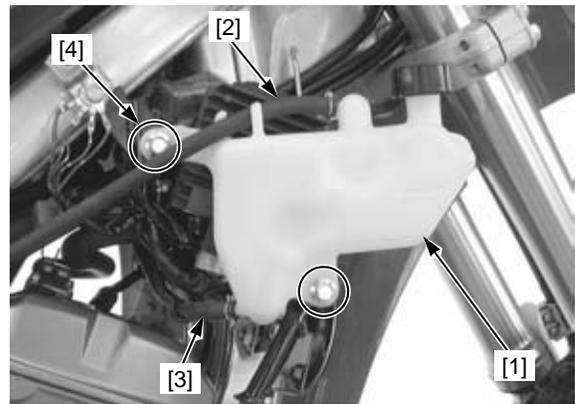
Place an approved container under the radiator reserve tank [1].

Disconnect the overflow hose [2] and siphon hose [3] from the reserve tank.

Remove the bolts [4] and radiator reserve tank

Installation is in the reverse order of removal.

Fill the reserve tank with coolant (page 9-5).



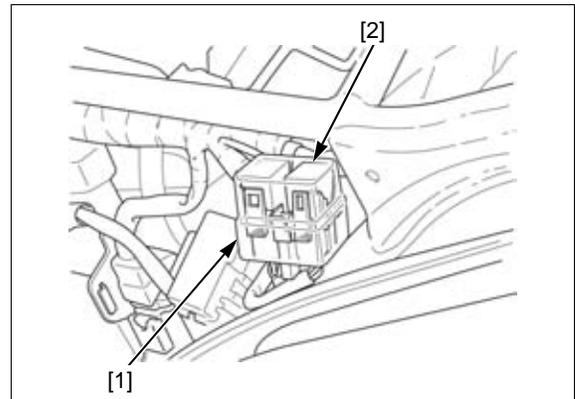
FAN CONTROL RELAY

INSPECTION

Remove the left side cover (page 2-3).

Remove the dust cover [1]

Remove the fan control relay [2].

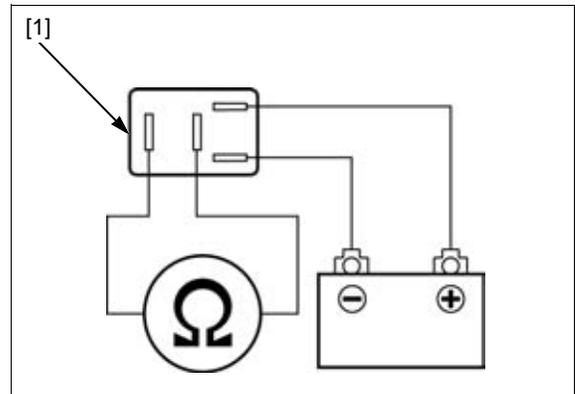


Connect a ohmmeter to the fan control relay [1] terminals.

Connect a 12 V battery to the fan control relay terminals as shown.

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

If there is no continuity when the 12 V battery is connected, replace the fan control relay.

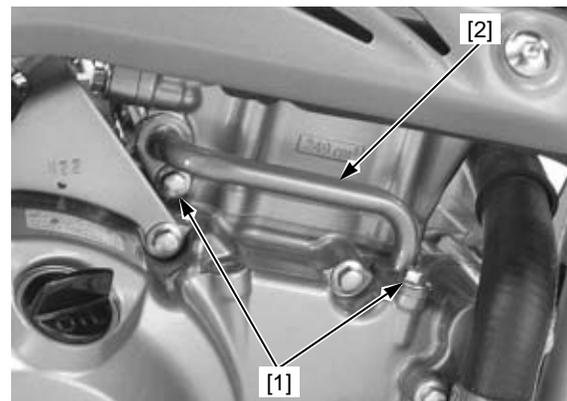


WATER PIPE

REMOVAL/INSTALLATION

Drain the coolant (page 9-5).

Remove the bolts [1] and water pipe [2].

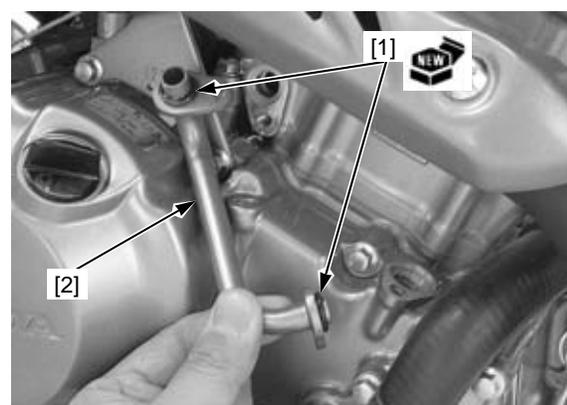


Remove the O-rings [1] from the water pipe [2].

Installation is in the reverse order of removal.

- Replace the O-ring with new ones.

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



MEMO

10. CYLINDER HEAD/VALVES

SERVICE INFORMATION.....	10-2	CYLINDER HEAD COVER	10-4
TROUBLESHOOTING.....	10-2	CAMSHAFT.....	10-6
COMPONENT LOCATION	10-3	ROCKER ARM	10-11
CYLINDER COMPRESSION.....	10-4	CYLINDER HEAD	10-13

SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves, rocker arms and camshaft.
- The camshaft and rocker arm service can be done with the engine installed in the frame. The cylinder head service requires engine removal.
- 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.
- 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 passage in the cylinder head (stud bolt hole) and camshaft holder. Clean the oil passage before assembling them.

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problems can be diagnosed by a compression test, or by tracing top-end noise 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 rings.

Compression too low, hard starting or poor performance at low speed

- Valves:
 - Incorrect valve adjustment
 - Burned or bent valve
 - Incorrect valve timing
 - Weak valve spring
 - Uneven valve seating
 - Valve stuck open
- Cylinder head:
 - Leaking or damaged cylinder head gasket
 - Warped or cracked cylinder head
 - Loose spark plug
- Faulty cylinder, piston or piston rings (page 11-3).

Compression too high, over-heating or knocking

- Excessive carbon build-up on piston head or combustion chamber

Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Faulty cylinder, piston or piston rings (page 11-3).

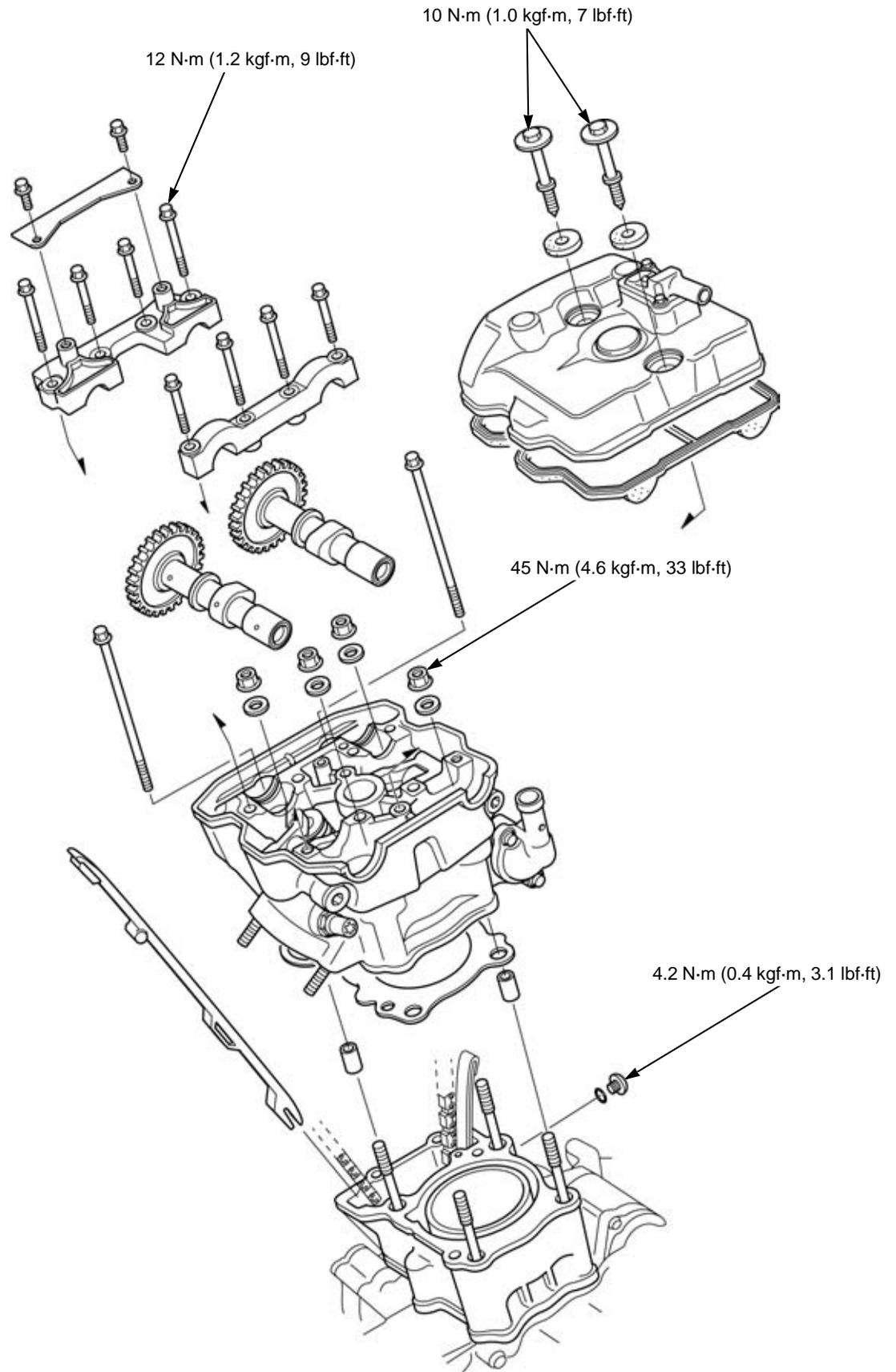
Excessive noise

- Incorrect valve adjustment
- Sticking valve or broken valve spring
- Worn or damaged camshaft
- Worn rocker arm and/or shaft
- Worn rocker arm and valve stem end
- Worn cam sprocket teeth
- Worn and loose cam chain
- Worn or damaged cam chain tensioner
- Faulty cylinder, piston or piston rings (page 11-3).

Rough idle

- Low cylinder compression
- Faulty fuel system

COMPONENT LOCATION



CYLINDER HEAD/VALVES

CYLINDER COMPRESSION

Warm the engine to normal operating temperature.

Stop the engine.

Remove the spark plug (page 3-5).

Install the compression gauge [1] into the spark plug hole.

Turn the ignition switch ON and engine stop switch "O". Shift the transmission into neutral.

Open the throttle all the way and crank the engine with the starter motor until the gauge reading stops rising.

To avoid discharging the battery, do not operate the starter motor for more than 7 seconds.

STANDARD:

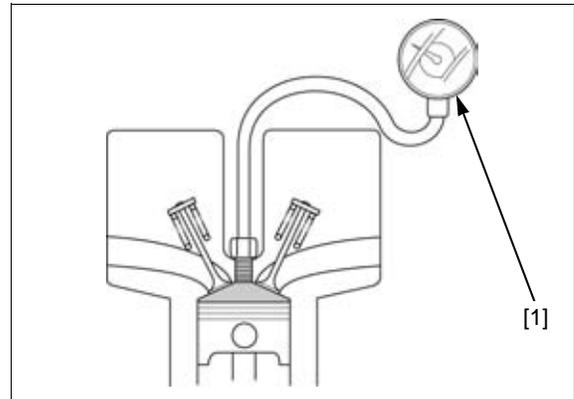
1,294 kPa at 490 min⁻¹ (rpm) (13.2 kgf/cm², 188 psi)

Low compression can be caused by:

- Blown cylinder head gasket
- Improper valve adjustment
- Valve leakage
- Worn piston ring or cylinder

High compression can be caused by:

- Carbon deposits in combustion chamber or on piston head



CYLINDER HEAD COVER

REMOVAL

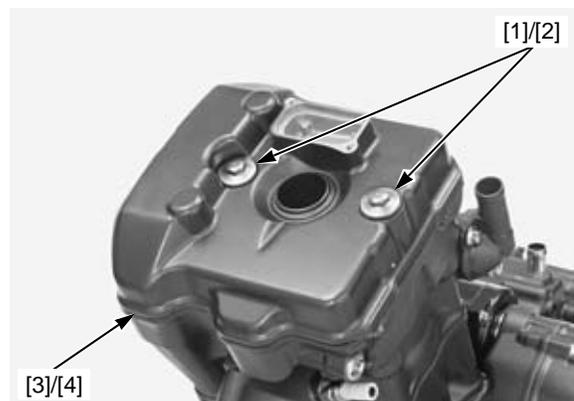
Remove the following:

- Spark plug cap (page 3-5)
- PAIR check valve (page 7-18)
- Fuel tank (page 7-8)
- Ignition coil (page 5-6)

Remove the three bolts [1] and ground terminal [2] from the radiator reserve tank stay.

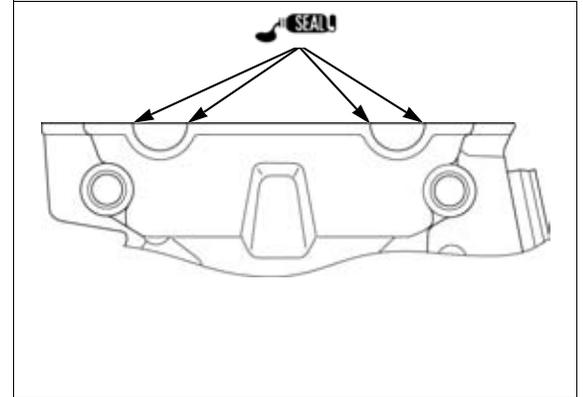


Remove the cylinder head cover bolts [1], rubber seals [2], cylinder head cover [3] and packing [4].

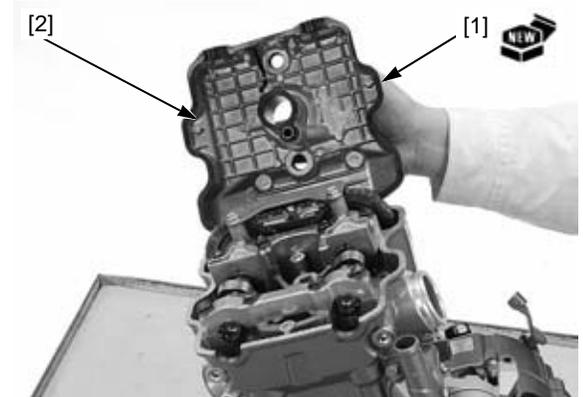


INSTALLATION

Apply sealant (Three bond 5211C, 1207B, 1215, SS KE45 or equivalent) to the cylinder head semi-circular cut-outs as shown.

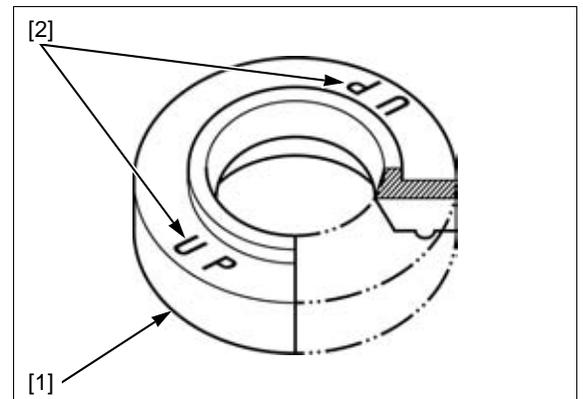


Install a new packing [1] into the cylinder head cover [2] groove.
Install the cylinder head cover onto the cylinder head.



Check the rubber seals [1] are in good condition, replace them if necessary.

Install the rubber seals to the cylinder head cover with their "UP" marks [2] facing up.



Install and tighten the cylinder head cover bolts [1] to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



CYLINDER HEAD/VALVES

Set the radiator reserve tank stay and ground terminal [1] in position.
Install and tighten the three bolts [2].

Install the following:

- Ignition coil (page 5-6)
- PAIR check valve (page 7-18)
- Fuel tank (page 7-8)
- Spark plug cap (page 3-5)



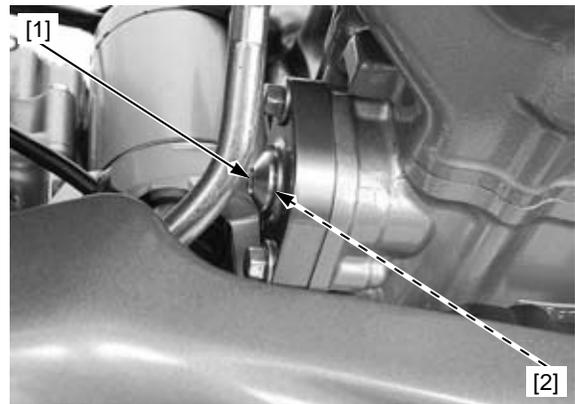
CAMSHAFT

REMOVAL

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

Make sure the piston is at TDC (Top Dead Center) on the compression stroke (page 3-6).

Remove the cam chain tensioner lifter plug [1] and O-ring [2].

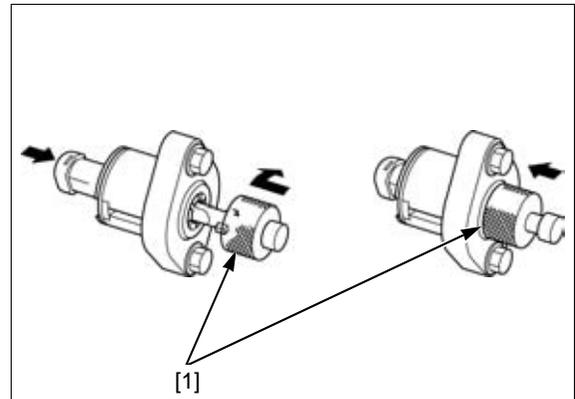


Turn the cam chain tensioner lifter shaft fully in (clockwise) and secure it using a tensioner stopper [1] to prevent damaging the cam chain.

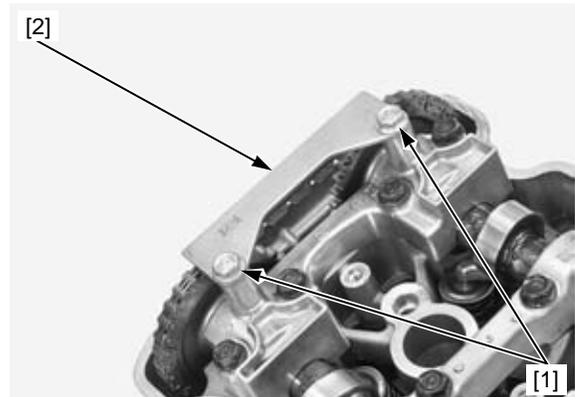
TOOL:

Tensioner stopper

070MG-0010100



Be careful not to let the cam chain guide bolts fall into the crankcase. Remove the bolts [1] and cam chain guide B [2].

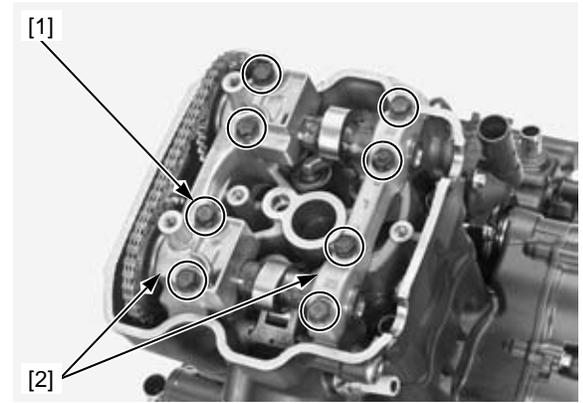


Be careful not to let the camshaft holder bolts fall into the crankcase.

Remove the bolts [1] and camshaft holders [2].

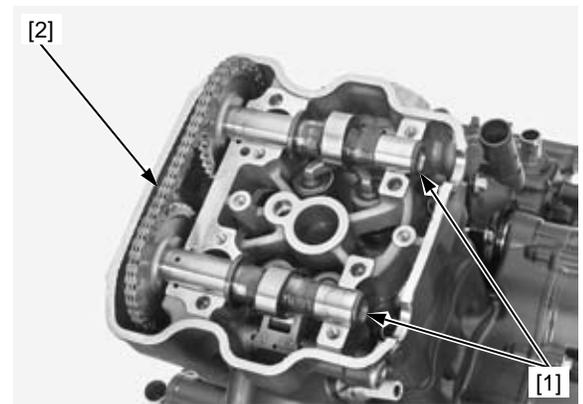
NOTE:

From outside to inside, loosen the bolts in a crisscross pattern in several steps or the camshaft holder might break.



Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.

Remove the camshafts [1] by removing the cam chain [2] from the cam sprockets.

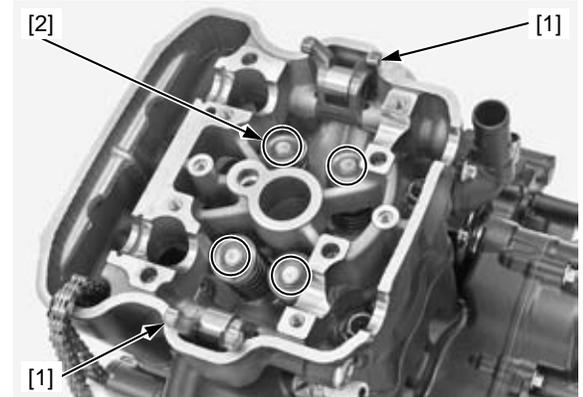


Lift the rocker arms [1].

Remove the shims [2].

NOTE:

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



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning or clogs in oil passages.

- Cam sprocket
- Camshaft
- Camshaft holder/dowel pin
- Cam chain guide B

Measure each part according to CYLINDER HEAD/ VALVES SPECIFICATIONS (page 1-6).

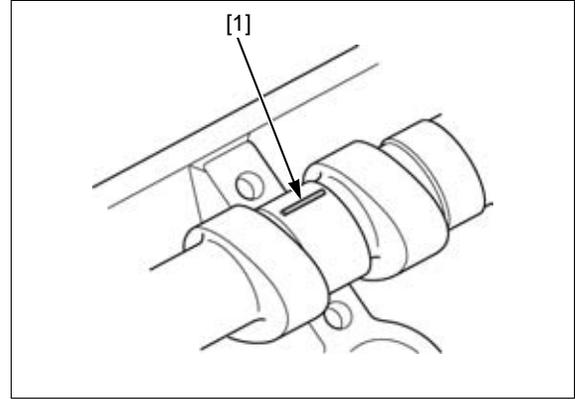
Replace any part if it is out of service limit.

CYLINDER HEAD/VALVES

CAMSHAFT OIL CLEARANCE

Do not rotate the camshaft when using plastigauge.

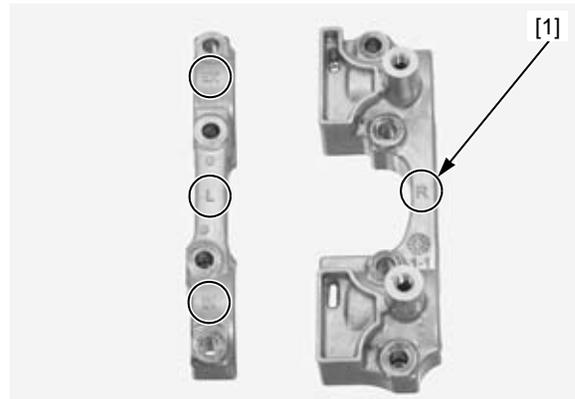
Wipe any oil from the journals of the camshaft, cylinder head and camshaft holders.
Lay a strip of plastigauge [1] lengthwise on top of each camshaft journal.



Be sure the dowel pins in the camshaft holder align the holes in the cylinder head.

Install each camshaft holder to the correct locations with the identification marks [1].

- "R" mark: right camshaft holder
- "L" mark: left camshaft holder
- "IN" mark: intake side
- "EX" mark: exhaust side



Apply engine oil to the camshaft holder mounting bolt [1] threads and seating surface.

NOTICE

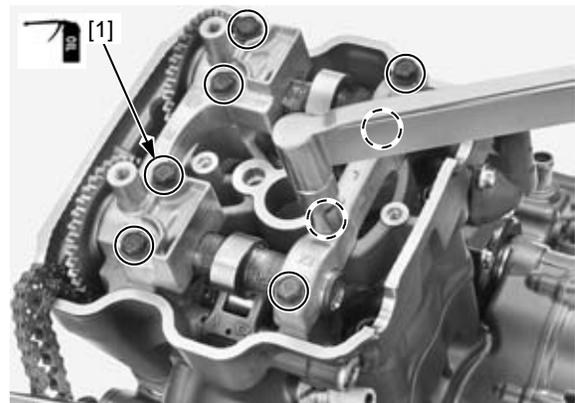
Failure to tighten the camshaft holder in a crisscross pattern may cause a camshaft holder to break.

Tighten all camshaft holder mounting bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:

From inside to outside, tighten the bolts in a crisscross pattern in several steps.



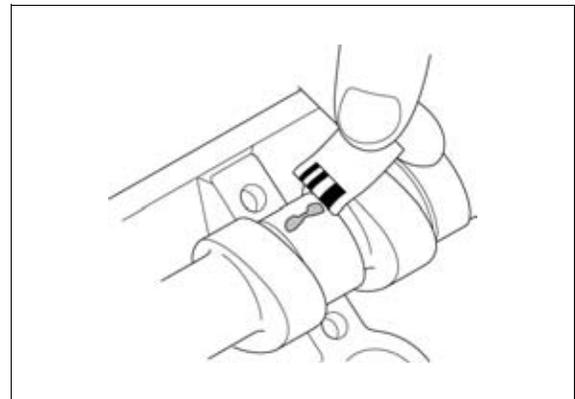
Remove the camshaft holders and measure the width of each plastigauge.

The widest thickness determines the oil clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)

When the service limit is exceeded, measure the camshaft journal O.D. and camshaft journal area I.D. of cylinder head and camshaft holders, then compare the measurement with the standard value (page 1-6).

- Replace the cylinder head and camshaft holders as a set if the difference from the standard value is larger than that of the camshaft.
- Replace the camshaft if the difference from the standard value is larger than that of the cylinder head and camshaft holders.



INSTALLATION

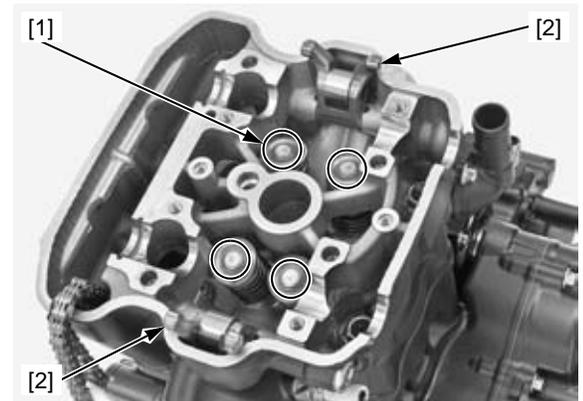
Be careful not to jam the cam chain and timing sprocket on the crankshaft when rotating the crankshaft.

Rotate the crankshaft counterclockwise, and align the "T" mark [1] on the flywheel with the index notch [2] on the left crankcase cover.



Be careful not to let the shims fall into the crankcase.

Install the shims [1] in their original locations on the valve retainer. Lower the rocker arms [2].



Each camshaft has an identification mark.

- "IN" mark [1]: intake camshaft
- "EX" mark [2]: exhaust camshaft



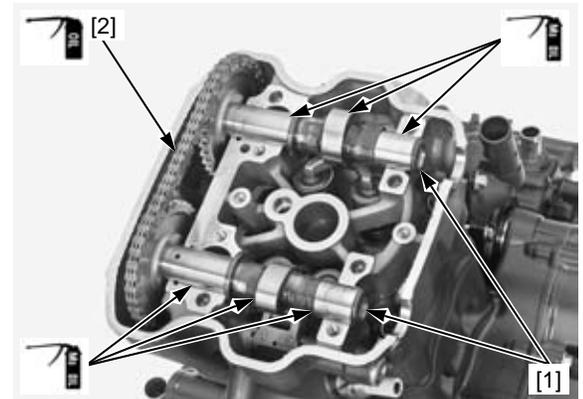
Apply molybdenum oil solution to the camshaft [1] lobes and journal surfaces.

Apply engine oil to the cam chain [2] whole surface.

Install the camshafts into the cylinder head while installing cam chain onto the cam sprockets.

NOTE:

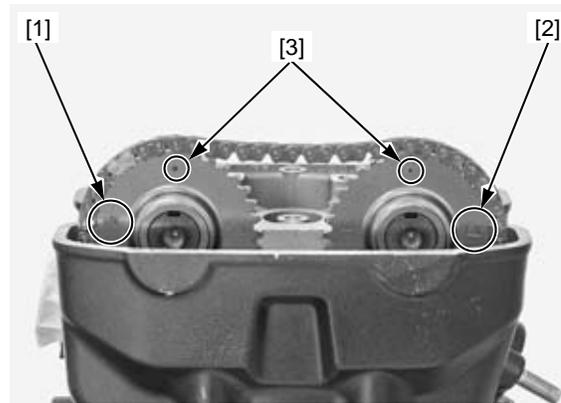
Install the camshaft with its lobes facing up.



CYLINDER HEAD/VALVES

Align the outside index line ("IN" [1] and "EX" [2] marks) on the cam sprockets with the cylinder head top surface as shown.

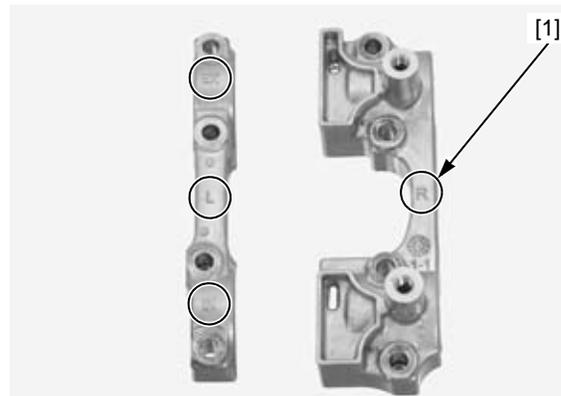
- Check that the punch marks [3] of the cam sprockets is facing up as shown.



Install the camshaft holders.

Note the correct locations with the identification marks [1] as shown.

- "R" mark: right camshaft holder
- "L" mark: left camshaft holder
- "IN" mark: intake side
- "EX" mark: exhaust side



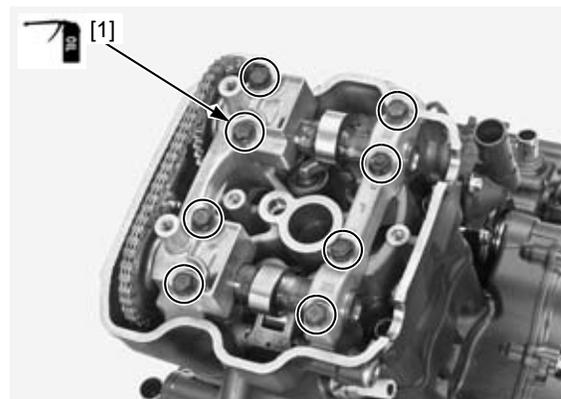
Apply engine oil to the camshaft holder mounting bolt [1] threads and seating surface.

Install and tighten the camshaft holder mounting bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:

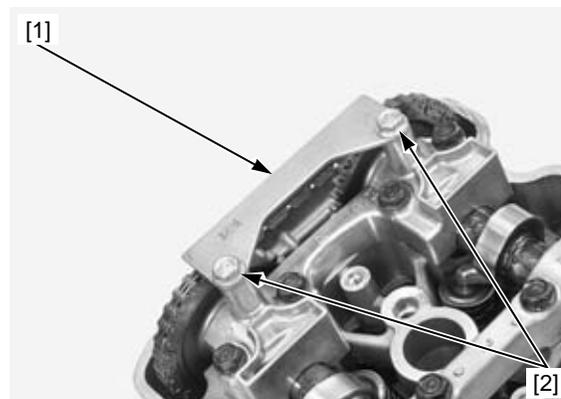
From inside to outside, tighten the bolts in a crisscross pattern in several steps.



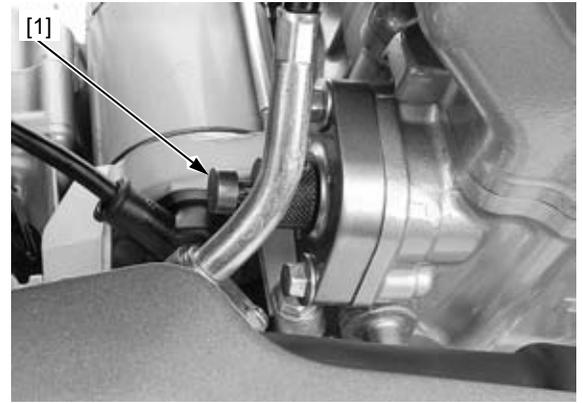
Be careful not to let the cam chain guide bolts fall into the crankcase.

Install the cam chain guide B [1] and bolts [2].

Tighten the cam chain guide bolts securely.



Remove the tensioner stopper [1] from the cam chain tensioner lifter.



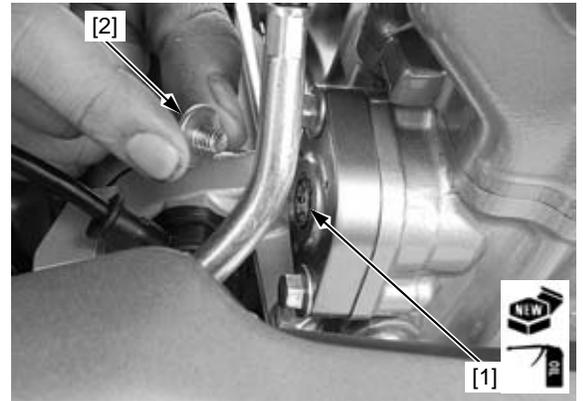
Apply engine oil to a new O-ring [1] and install it to the cam chain tensioner lifter.

Install and tighten the cam chain tensioner lifter plug [2] to the specified torque.

TORQUE: 4.2 N-m (0.4 kgf-m, 3.1 lbf-ft)

Inspect the valve clearance (page 3-6).

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



ROCKER ARM

NOTE:

- The rocker arm can be serviced with the engine installed in the frame.
- The intake and exhaust rocker arm service procedures are the same.

REMOVAL/INSTALLATION

Remove the camshafts (page 10-6).

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



CYLINDER HEAD/VALVES

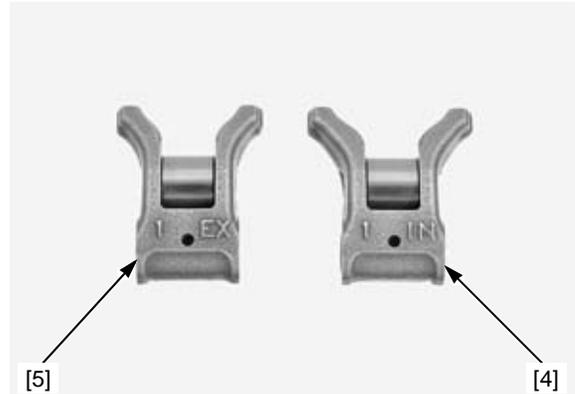
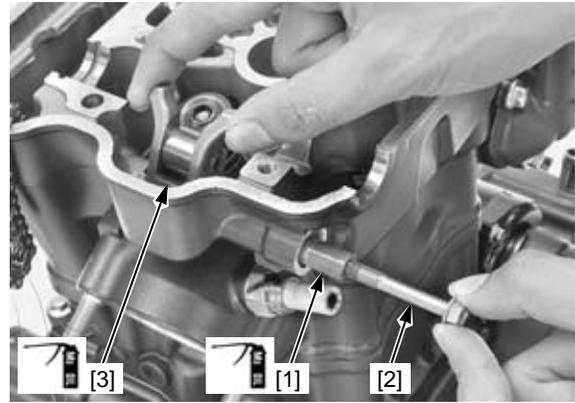
Remove the rocker arm shaft [1] using a 6 mm bolt [2] while holding the rocker arm [3].
Remove the rocker arm.

Apply molybdenum oil solution to the rocker arm inner surface, roller surface, slipper surface and rocker arm shaft outer surface.

Install the rocker arm and rocker arm shaft.

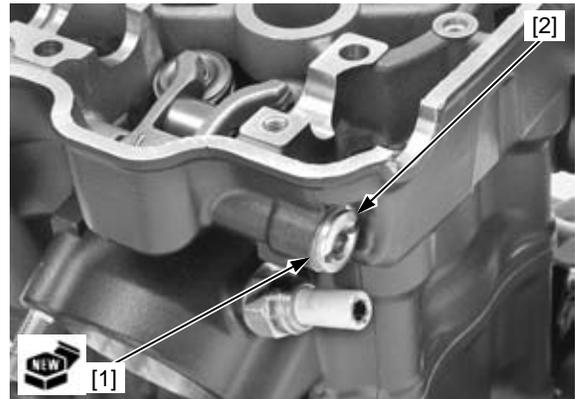
NOTE:

- The rocker arms are identified by the stamped marks:
 - "IN": Intake rocker arm [4]
 - "EX": Exhaust rocker arm [5]



Install a new sealing washer [1] and bolt [2].

Install the camshafts (page 10-9).



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning or clogs in oil passages.

- Rocker arm
- Rocker arm shaft

Measure each part and clearance according to CYLINDER HEAD/VALVES SPECIFICATIONS (page 1-6).

Replace any part if it is out of service limit.

CYLINDER HEAD

REMOVAL

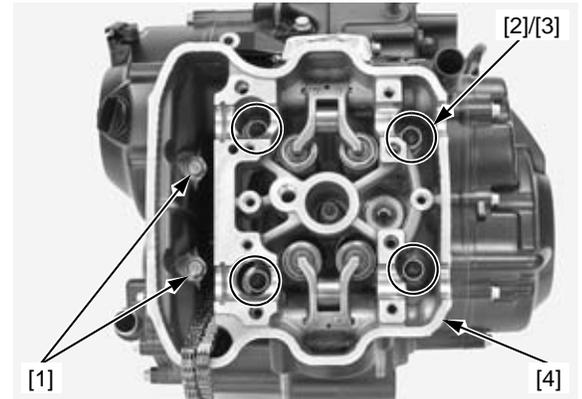
Remove the following:

- Engine (page 15-4)
- Camshaft (page 10-6)

Be careful not to let the cylinder head bolts and nuts fall into the crankcase. Remove the cylinder head bolts [1], nuts [2], washers [3] and cylinder head [4].

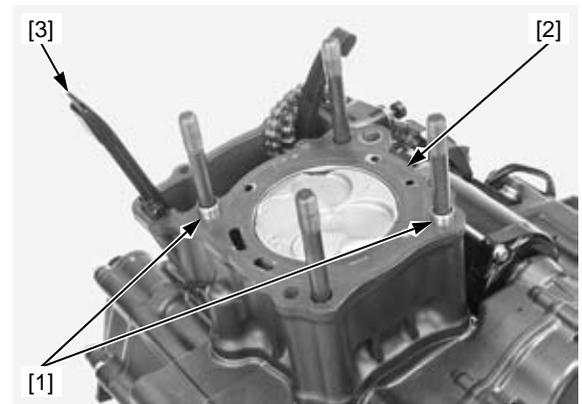
NOTE:

- Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.
- Do not tap the cylinder head too hard and do not damage the mating surface with a screwdriver.



Remove the following:

- Dowel pins [1]
- Gasket [2]
- Cam chain guide A [3]



DISASSEMBLY

Remove the following:

- Spark plug (page 3-5)
- O₂ sensor (page 4-47)
- Rocker arm (page 10-11)

To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters. Remove the valve spring cotters [1] using the special tools.

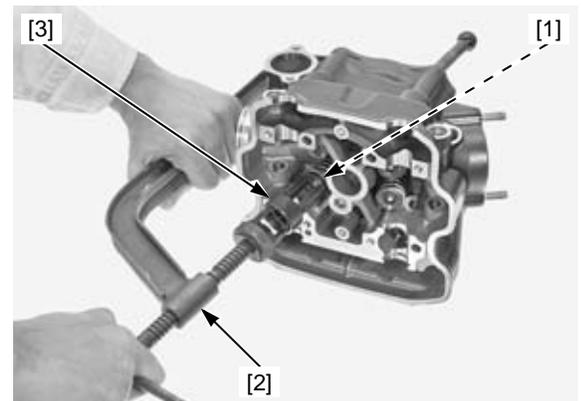
TOOLS:

- [2] Valve spring compressor 07757-0010000
- [3] Valve spring compressor attachment 07959-KM30101

Mark all parts during disassembly so they can be installed in their original locations.

Remove the following:

- Spring retainer
- Outer/inner valve springs
- Valve
- Stem seal
- Spring seat



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning or clogs in oil passages.

- Cylinder head
- Inner/outer valve springs
- Valves
- Valve guides
- Cam chain guide A

Measure each part and clearance according to CYLINDER HEAD/VALVES SPECIFICATIONS (page 1-6).

Replace any part if it is out of service limit.

CYLINDER HEAD/VALVES

VALVE GUIDE REPLACEMENT

NOTE:

Refinish the valve seats whenever the valve guides are replaced to prevent uneven seating.

Chill new valve guides in a freezer section of refrigerator for about an hour.

Do not use a torch to heat the cylinder head; it may cause warping.

Heat the cylinder head to 130 – 140°C (266 – 284°F) with a hot plate or oven. Do not heat the cylinder head beyond 150°C (302°F). Use temperature indicator sticks, available from welding supply stores, to be sure the cylinder head is heated to the proper temperature.

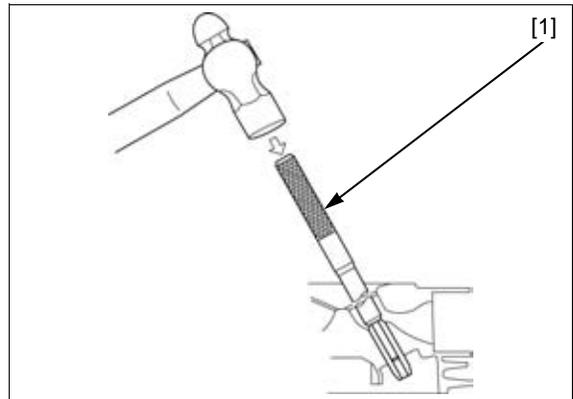
To avoid burns, wear insulated gloves when handling the heated cylinder head.



Support the cylinder head and drive out the valve guides from the combustion chamber side of the cylinder head.

TOOL:

[1] Valve guide driver 07HMD-ML00101



While the cylinder head is still heated, take off a new valve guides [1] from the freezer. Adjust the valve guide driver to the valve guide height and drive in the valve guide from the camshaft side.

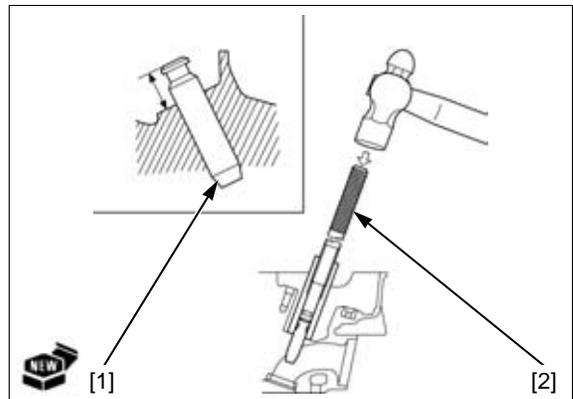
TOOL:

[2] Valve guide driver 07743-0020000

SPECIFIED HEIGHT:

IN/EX: 13.8 – 14.0 mm (0.54 – 0.55 in)

Let the cylinder head cool to room temperature.



Ream a new valve guides.

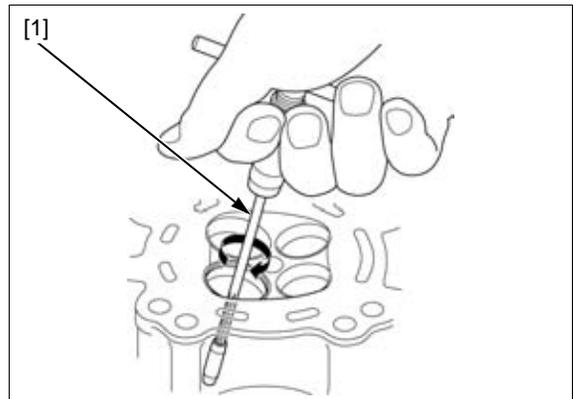
TOOL:

[1] Valve guide reamer, 4.5 mm 07HMH-ML00101

NOTE:

- Use cutting oil on the reamer during this operation.
- Take care not to tilt or lean the reamer in the guide while reaming. Otherwise, the valves may be installed slanted, causing oil leakage from the stem seal and improper valve seat contact. This may prevent valve seat refacing
- Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat (page 10-15).



VALVE SEAT INSPECTION/REFACING

INSPECTION

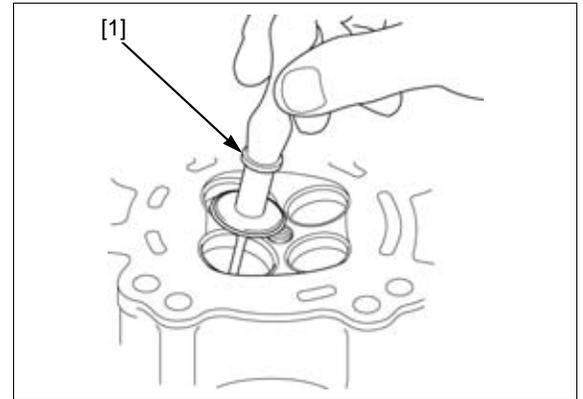
Clean the intake and exhaust valves thoroughly to remove carbon deposits.

Apply a light coat of Prussian Blue to the valve seats. Tap the valve against the valve seat several times using a hand-lapping tool [1], without rotating the valve to make a clear pattern.

Remove the valve and inspect the valve seat face width.

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 area):
 - Reface the valve seat



REFACING

Reface the valve seat using the following tools.

TOOLS:

Cutter holder, 4.5 mm	07781-0010600
Seat cutter, 27.5 mm (45° EX)	07780-0010200
Seat cutter, 33 mm (45° IN)	07780-0010800
Flat cutter, 27 mm (32° EX)	07780-0013300
Flat cutter, 30 mm (32° IN)	07780-0012200
Interior cutter, 30 mm (60° EX)	07780-0014000
Interior cutter, 37.5 mm (60° IN)	07780-0014100

VALVE SEAT WIDTH:

0.90 – 0.10 mm (0.035 – 0.043 in)

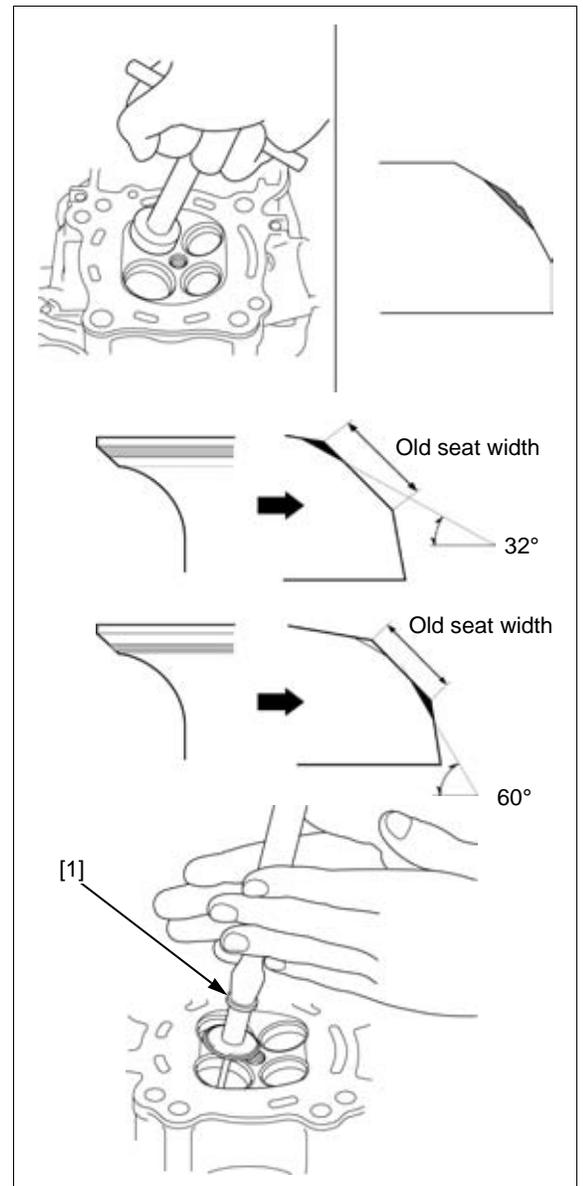
NOTE:

- Follow the refacer manufacturer's operating instructions.
 - Be careful not to grind the seat more than necessary.
1. Use a 45° seat cutter, remove any roughness or irregularities from the seat.
 2. Use a 32° flat cutter, remove the top 1/4 of the existing valve seat material.
 3. Use a 60° interior cutter, remove the bottom 1/4 of the existing valve seat material.
 4. Using a 45° seat cutter, cut the seat to the proper width.
 5. After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

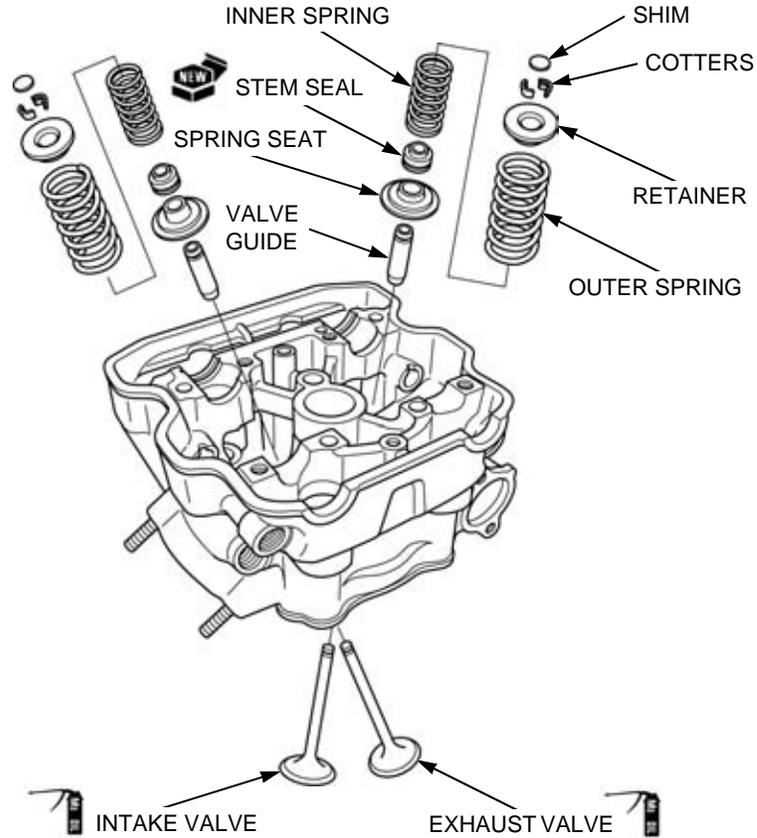
NOTE:

- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool [1] frequently to prevent uneven seat wear.
- Do not allow lapping compound to enter the guides.

After lapping, wash any residual compound off the cylinder head and valve and recheck the seat contact.



CYLINDER HEAD/VALVES ASSEMBLY



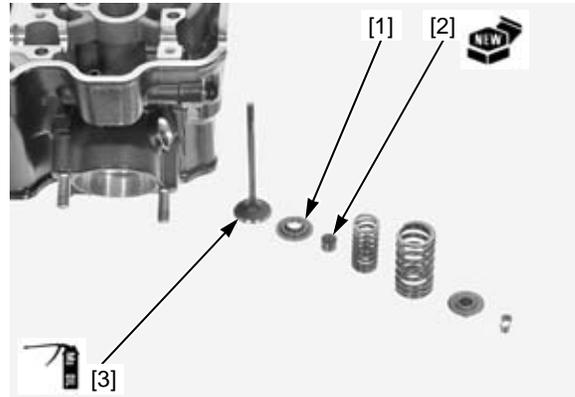
Clean the cylinder head assembly with solvent and blow through all oil passages with compressed air.

Install the spring seats [1] and new valve stem seals [2].

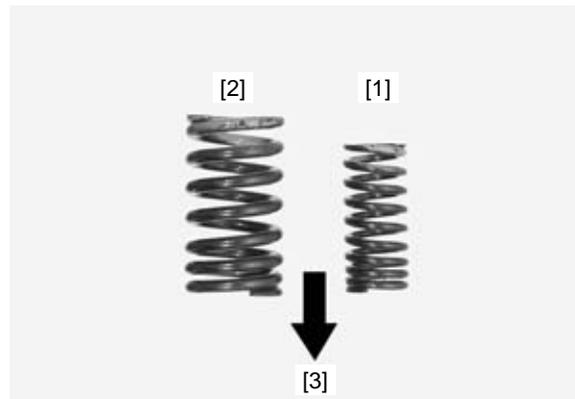
Apply molybdenum oil solution to each valve stem sliding surface.

Insert the intake and exhaust valves [3] into the valve guides.

To avoid damage to the seal, turn the valve slowly when inserting.



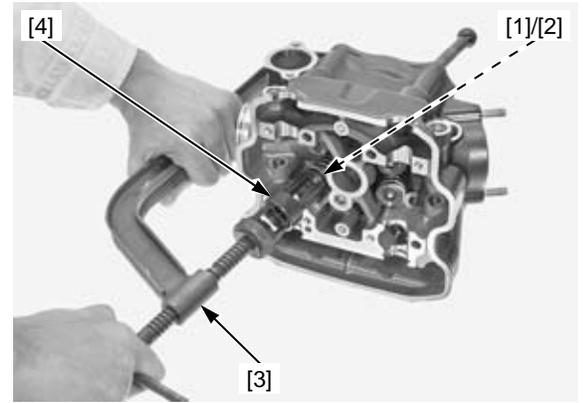
Install the inner valve spring [1] and outer valve spring [2] with the tightly wound coils should facing the combustion chamber [3].



Grease the cotters to ease installation. To prevent loss of tension, do not compress the valve spring more than necessary.

Install the spring retainer [1].
Compress the valve spring using the special tools and install the valve cotters [2].

TOOLS:
[3] Valve spring compressor **07757-0010000**
[4] Valve spring compressor attachment **07959-KM30101**

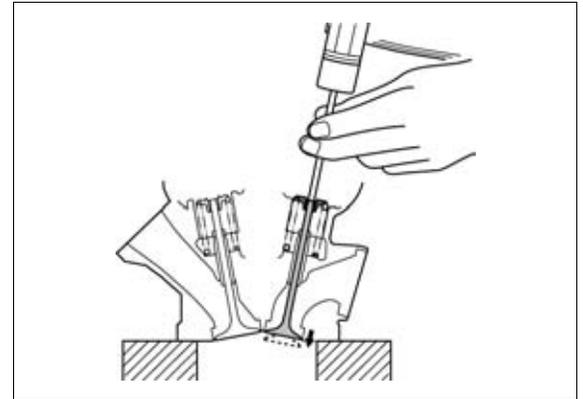


Support the cylinder head above the work bench surface to prevent valve damage.

Tap the valve stems gently with two plastic hammer to firmly seat the cotters firmly.

Install the following:

- Spark plug (page 3-5)
- O₂ sensor (page 4-47)
- Rocker arm (page 10-11)



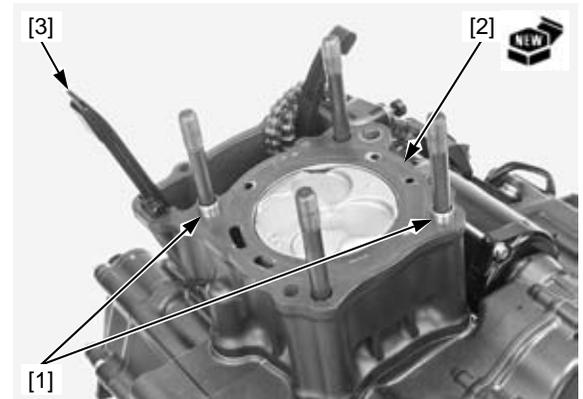
INSTALLATION

Do not allow dust and dirt to enter the crankcase.

Clean any gasket material from the cylinder mating surfaces.

Install the following:

- Dowel pins [1]
- New gasket [2]
- Cam chain guide A [3]



Route the cam chain through the cylinder head and install the cylinder head [1] onto the cylinder.

Apply engine oil to the new cylinder head mounting nut [2] threads and seating surface.

Be careful not to let the cylinder head bolts, washers and nuts fall into the crankcase.

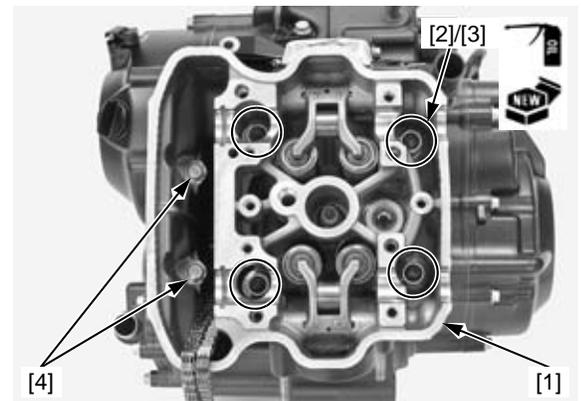
Install and tighten the new cylinder head mounting nuts with new washers [3] in a crisscross pattern in two or three steps to the specified torque.

TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)

Install and tighten the cylinder head bolts [4] securely.

Install the following:

- Camshaft (page 10-9)
- Engine (page 15-7)



MEMO

11. CYLINDER/PISTON

SERVICE INFORMATION.....	11-2	CYLINDER/PISTON.....	11-3
TROUBLESHOOTING.....	11-2	CAM CHAIN TENSIONER	11-7
COMPONENT LOCATION.....	11-2		

CYLINDER/PISTON

SERVICE INFORMATION

GENERAL

- This section covers maintenance of the cylinder and piston. To service these parts, the engine must be removed from the frame.
- Take care not to damage the cylinder wall and piston.
- Be careful not to damage the mating surfaces when removing the cylinder. Do not tap the cylinder too hard during removal.
- Camshaft and rocker arm lubricating oil is fed through an oil passage in the cylinder. Clean the oil passage before installing cylinder.
- Clean all disassembled parts with cleaning solvent before inspection, use compressed air to dry the parts.

TROUBLESHOOTING

Compression too low, hard starting or poor performance at low speed

- Leaking or damaged cylinder head gasket
- Worn, stuck or broken piston rings
- Worn or damaged cylinder and piston
- Loose spark plug

Compression too high, overheating or knocking

- Excessive carbon built-up on piston or combustion chamber

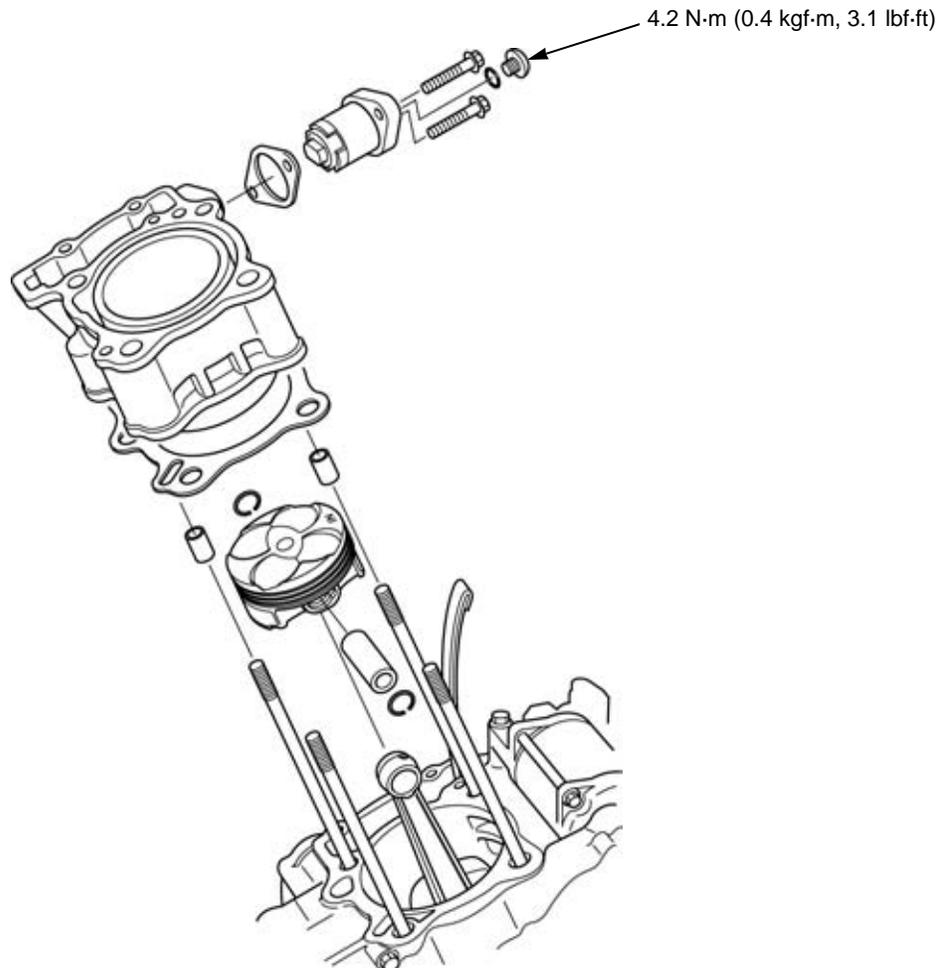
Excessive smoke

- Faulty cylinder, piston and piston rings
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

Abnormal noise (piston)

- Worn piston pin or piston pin hole
- Worn or damaged cylinder, piston or piston ring
- Worn connecting rod small end

COMPONENT LOCATION



CYLINDER/PISTON

CYLINDER REMOVAL

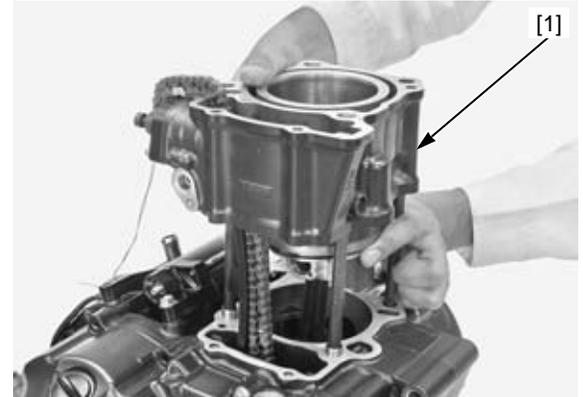
Remove the following:

- Water pipe (page 9-13)
- Cylinder head (page 10-13)

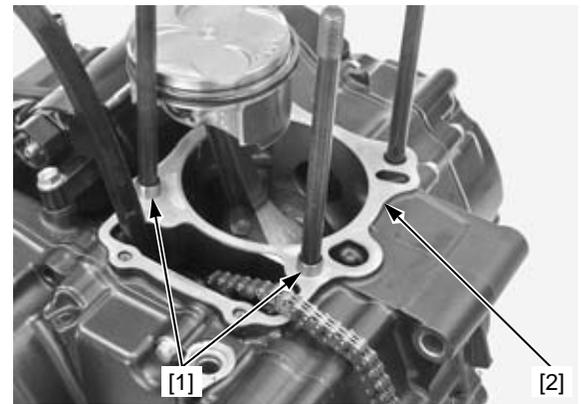
Lift the cylinder [1] and remove it, being careful not to damage the piston with the stud bolts.

NOTE:

- Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.
- Do not tap the cylinder too hard and do not damage the mating surface with a screwdriver.



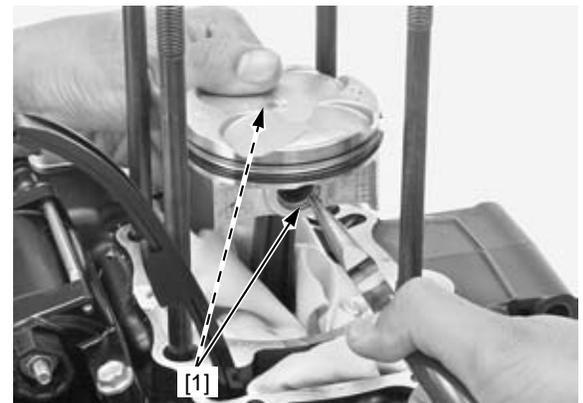
Remove the dowel pins [1] and gasket [2].



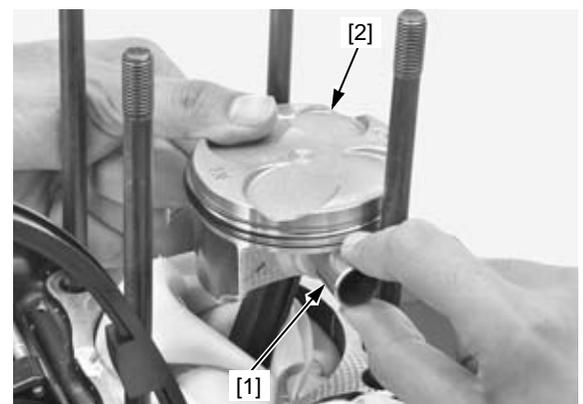
PISTON REMOVAL

Place a clean shop towel over the crankcase to prevent the piston pin clips from falling into the crankcase.

Remove the piston pin clips [1] with pliers.



Push the piston pin [1] out of the piston [2] and connecting rod, and remove the piston.

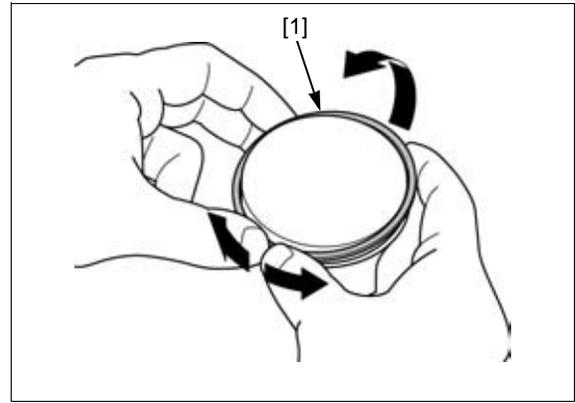


CYLINDER/PISTON

Spread each piston ring [1] and remove it by lifting up a point opposite the gap.

NOTE:

- Do not damage the piston ring by spreading the ends too far.
- Be careful not to damage the piston when removing the piston ring.



INSPECTION

Inspect the following parts for scratch, damage, abnormal wear, deformation, burning or clogs in oil passages.

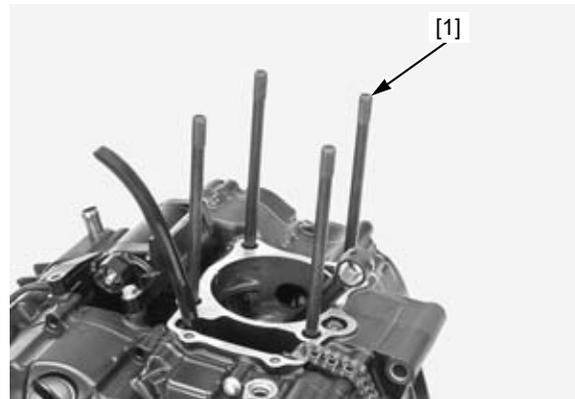
- Cylinder
- Piston
- Piston rings
- Piston pin
- Connecting rod small end

Measure each part and calculate the clearance according to CYLINDER/PISTON SPECIFICATIONS (page 1-6).

Replace any part if it is out of service limit.

STUD BOLT REPLACEMENT

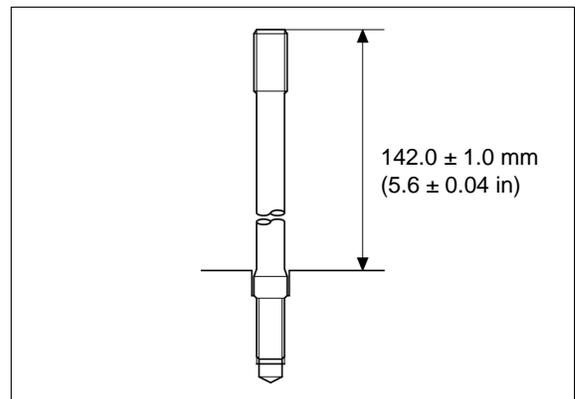
Thread two nuts onto the stud bolt [1] and tighten them together, and use a wrench on them to turn the stud bolt out.



Install new stud bolts into the crankcase and tighten them to the specified torque.

TORQUE: 9.0 N·m (0.9 kgf·m, 6.6 lbf·ft)

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



PISTON INSTALLATION

Apply engine oil to the piston ring grooves.
Apply engine oil to the piston ring entire surface.

Be careful not to damage the piston and rings.

Carefully install the piston rings into the piston ring grooves with the markings [1] facing up.

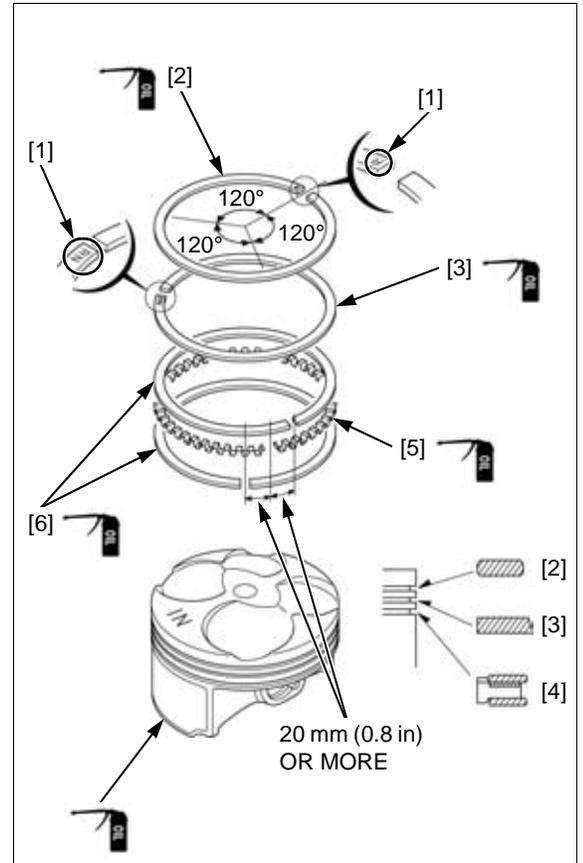
NOTE:

- Do not confuse the top ring [2] and second ring [3].
- To install the oil ring [4], 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.

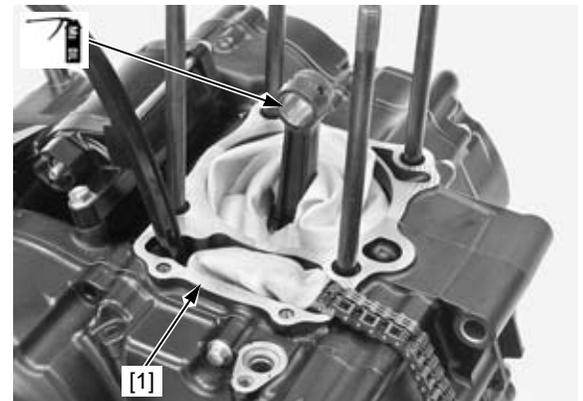
Apply engine oil to the piston pin hole inner surface and sliding surface.



When cleaning the cylinder mating surface, place a shop towel over the cylinder opening to prevent dust or dirt enter the crankcase.

Clean any gasket material from the cylinder mating surface [1] of the crankcase.

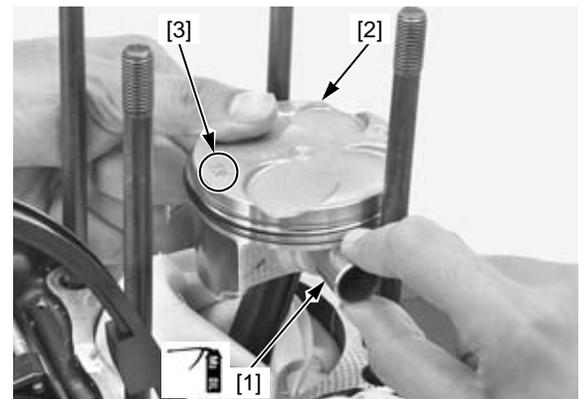
Apply molybdenum oil solution to the connecting rod small end inner surfaces.



Apply molybdenum oil solution to the piston pin [1] outer surfaces.

Install the piston [2] with its "IN" mark [3] facing intake side.

Install the piston pin.

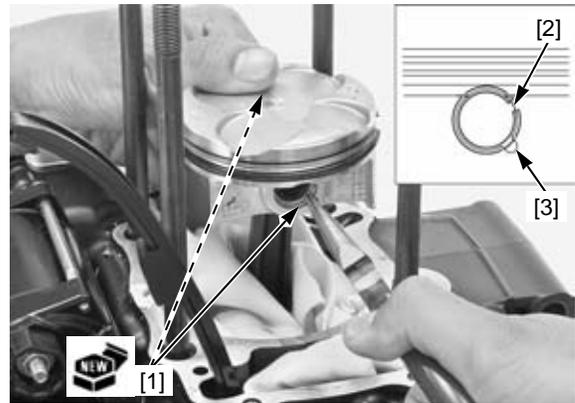


CYLINDER/PISTON

Install new piston pin clips [1] into the grooves of the piston pin hole.

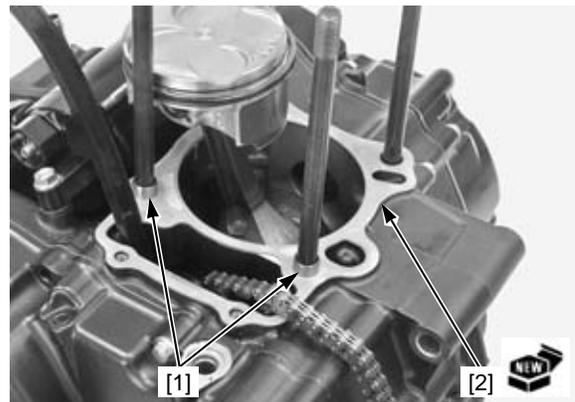
NOTE:

- Always use new piston pin clips. Reinstalling used piston pin clips may lead to serious engine damage.
- Set the piston pin clip in the groove properly.
- Do not align the clip's end gap [2] with the piston cut-out [3].



CYLINDER INSTALLATION

Install the dowel pins [1] and a new gasket [2].



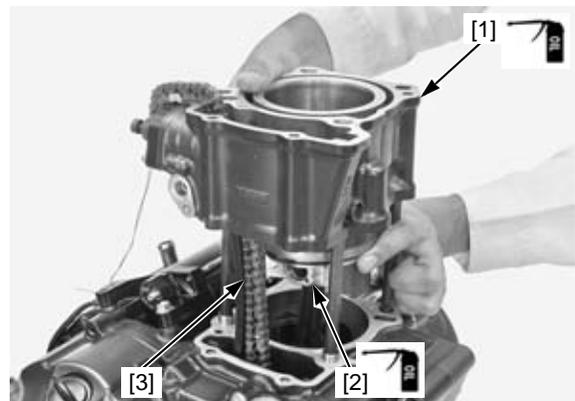
Apply engine oil to the cylinder [1] inner surface and piston [2] sliding surface.

Be careful not to damage the piston rings and cylinder wall.

Route the cam chain [3] through the cylinder and install the cylinder over the piston while compressing the piston rings with your fingers.

Install the following:

- Cylinder head (page 10-17)
- Water pipe (page 9-13)



CAM CHAIN TENSIONER

REMOVAL/INSTALLATION

Remove the cam chain tensioner lifter plug [1] and O-ring [2].

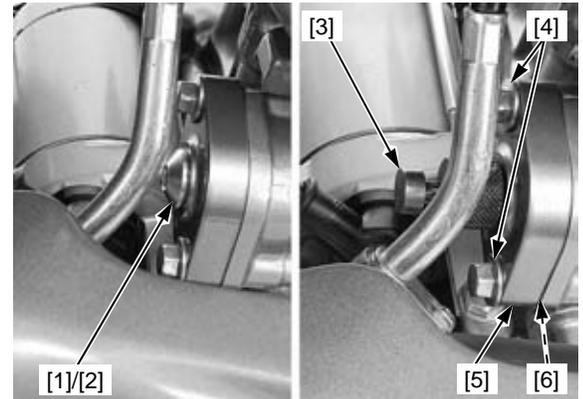
Turn the cam chain tensioner lifter shaft fully in (clockwise) and secure it using the special tool.

TOOL:

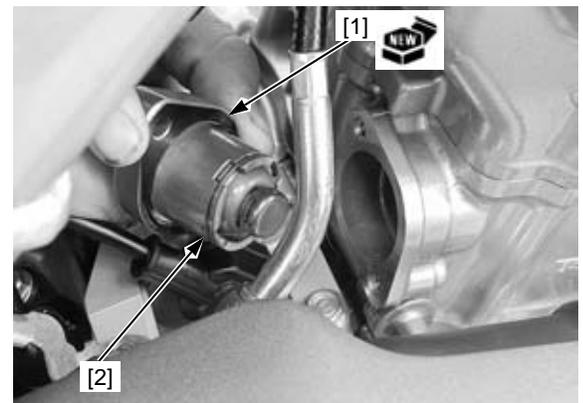
[3] Tensioner stopper 070MG-0010100

Remove the cam chain tensioner lifter mounting bolts [4].

Remove the cam chain tensioner lifter [5] and gasket [6].



Install a new gasket [1] on the cam chain tensioner lifter [2] and install them to the cylinder.



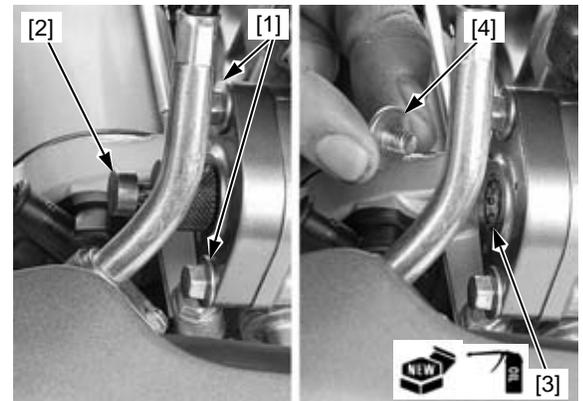
Install and tighten the cam chain tensioner lifter mounting bolts [1].

Remove the tensioner stopper [2] from the cam chain tensioner lifter.

Apply engine oil to a new O-ring [3] and install it to the cam chain tensioner lifter.

Install and tighten the cam chain tensioner lifter plug [4] to the specified torque.

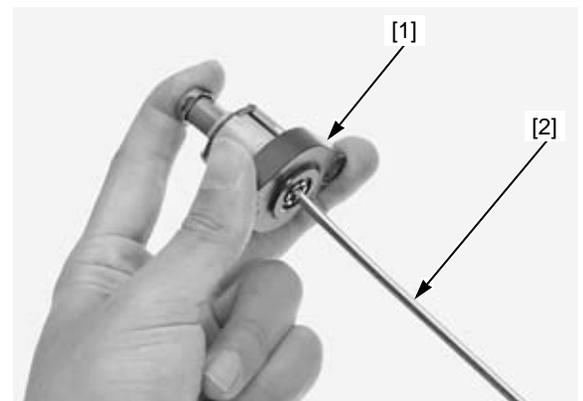
TORQUE: 4.2 N·m (0.4 kgf·m, 3.1 lbf·ft)



INSPECTION

Check the cam chain tensioner lifter [1] operation:

- The cam chain tensioner lifter shaft should not go into the cam chain tensioner lifter body when it is pushed.
- When it is turned clockwise with a tensioner stopper or a screwdriver [2], the cam chain tensioner lifter shaft should be pulled into the cam chain tensioner lifter body. The cam chain tensioner lifter shaft should spring out of the cam chain tensioner lifter body as soon as the stopper tool is released.



MEMO

12. CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION	12-2	CLUTCH	12-9
TROUBLESHOOTING.....	12-2	GEARSHIFT LINKAGE	12-14
COMPONENT LOCATION	12-3	PRIMARY DRIVE GEAR	12-17
RIGHT CRANKCASE COVER	12-4		

CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION

GENERAL

- This section covers service of the clutch and gearshift linkage. All services can be done with the engine installed in the frame.
- Engine oil viscosity and level have an effect on clutch disengagement. Oil additives also effect clutch performance and are not recommended. When the clutch does not disengage or the motorcycle creeps with the clutch lever pulled in, inspect the engine oil level before servicing the clutch system.

TROUBLESHOOTING

Faulty clutch operation can usually be corrected by adjusting the freeplay.

Clutch lever too hard to pull in

- Damaged, kinked or dirty clutch cable
- Improperly routed clutch cable
- Damaged clutch lifter mechanism
- Faulty clutch lifter plate bearing

Clutch will not disengage or motorcycle creeps with clutch disengaged

- Excessive clutch lever freeplay
- Clutch plate warped
- Engine oil level too high, improper oil viscosity or additive used
- Loose clutch center lock nut

Clutch slips

- Clutch lifter sticking
- Worn clutch discs
- Weak clutch springs
- No clutch lever freeplay
- Engine oil level too low or oil additive used

Hard to shift

- Misadjusted clutch cable
- Damaged or bent shift fork
- Bent shift fork shaft
- Incorrect engine oil viscosity
- Bent or damaged gearshift spindle
- Damaged shift drum stopper plate
- Damaged shift drum guide grooves (page 14-11)

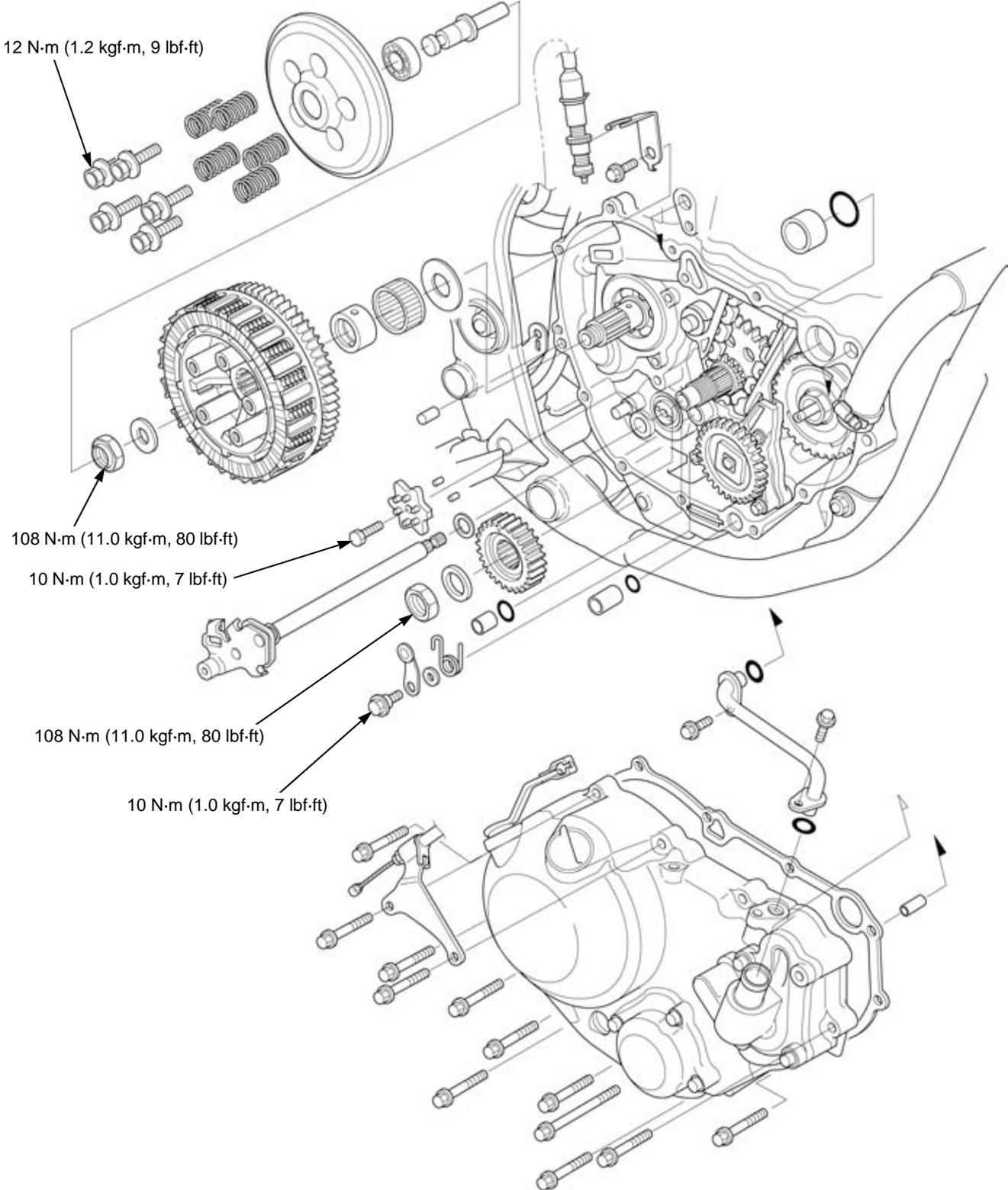
Transmission jumps out of gear

- Worn shift drum stopper arm
- Worn or broken gearshift spindle return spring
- Bent shift fork shaft
- Worn or damaged shift drum stopper plate
- Damaged shift drum guide grooves (page 14-11)
- Worn gear dogs or dog holes (page 14-11)

Gearshift pedal will not return

- Weak or broken gearshift spindle return spring
- Bent gearshift spindle

COMPONENT LOCATION



RIGHT CRANKCASE COVER

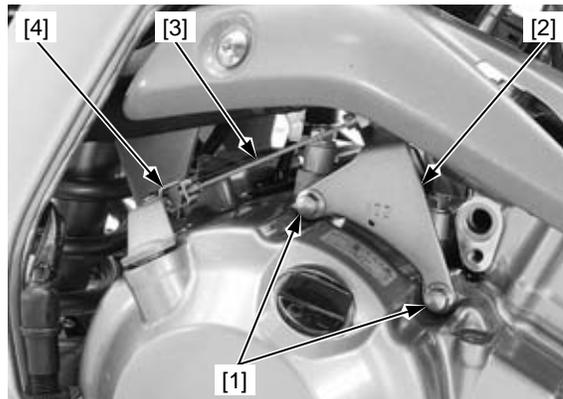
REMOVAL

Drain the engine oil (page 3-9).
Drain the coolant (page 9-5).

Remove the following:

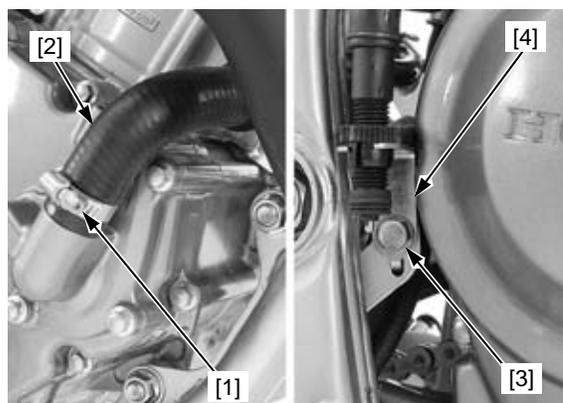
- Water pipe (page 9-13)
- Frame guard (page 2-6)
- Brake pedal (page 18-12)

Remove the bolts [1] and clutch cable guide [2], then disconnect the clutch cable [3] from the clutch lifter arm [4].



Loosen the water hose band screw [1] and disconnect the water hose [2].

Remove the bolt [3] and rear brake light switch holder [4].



Loosen the right crankcase cover bolts [1] in a crisscross pattern in 2 or 3 steps and remove the bolts.

Be careful not to let the return spring fall into the crankcase.

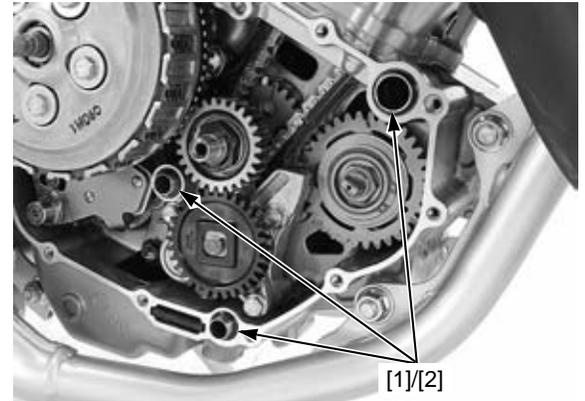
Remove the right crankcase cover [2] while turning the clutch lifter arm [3] counterclockwise to disengage the lifter arm spindle from the lifter piece.



Remove the dowel pin A [1], dowel pin B [2] and gasket [3].



Remove the collars [1] and O-rings [2].



DISASSEMBLY

Remove the return spring [1] from the right crankcase cover.



Remove the clutch lifter arm [1] from the right crankcase cover.



INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

- Oil seal
- Clutch lifter arm needle bearing
- Clutch lifter arm
- Return spring
- Crankshaft bearing

CLUTCH/GEARSHIFT LINKAGE

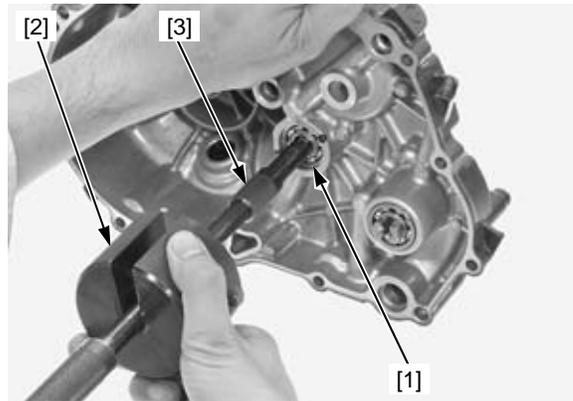
BEARING REPLACEMENT

CRANKSHAFT BEARING

Remove the crankshaft bearing [1] using the special tools.

TOOLS:

- [2] Remover weight 07741-0010201
- [3] Bearing remover set, 12 mm 07936-1660101

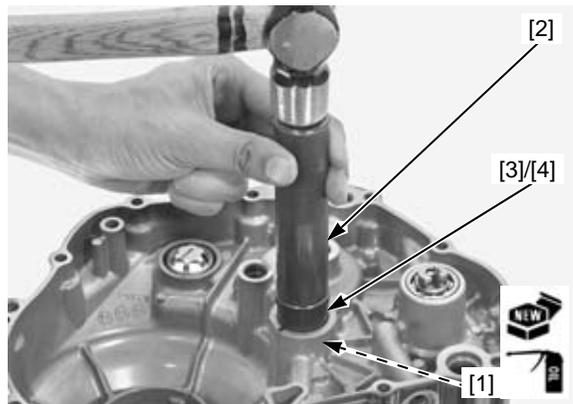


Drive in a new crankshaft bearing [1] into the right crankcase cover with the marked side facing up until it is fully seated using the special tools.

TOOLS:

- [2] Driver 07749-0010000
- [3] Attachment, 28 x 30 mm 07946-1870100
- [4] Pilot, 12 mm 07746-0040200

After installation, apply engine oil to the bearing.



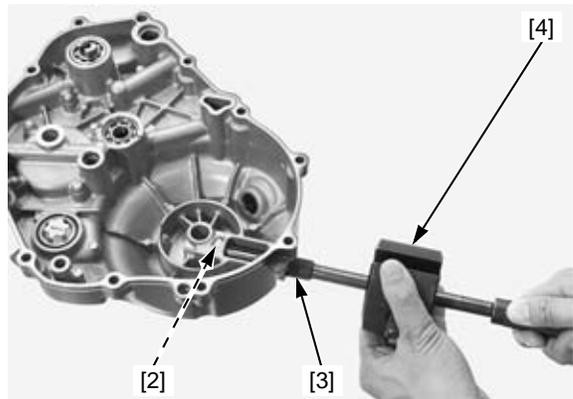
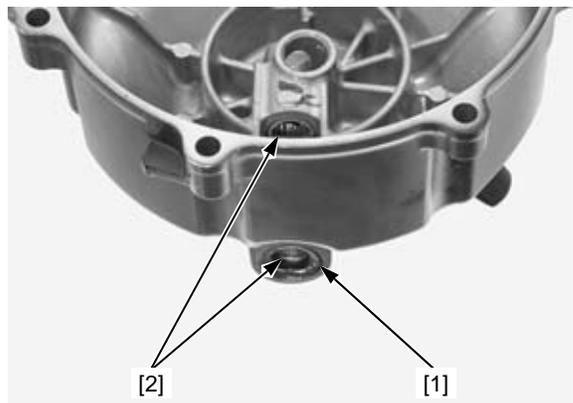
CLUTCH LIFTER ARM NEEDLE BEARING

Remove the oil seal [1] from the right crankcase cover.

Remove the clutch lifter arm needle bearings [2] using the special tools.

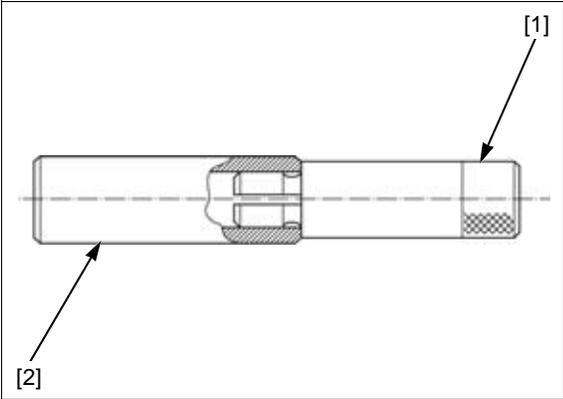
TOOLS:

- [3] Bearing remover set, 12 mm 07936-1660101
- [4] Remover weight 07741-0010201



Install the bearing remover head [1] to the pilot collar [2] as shown.

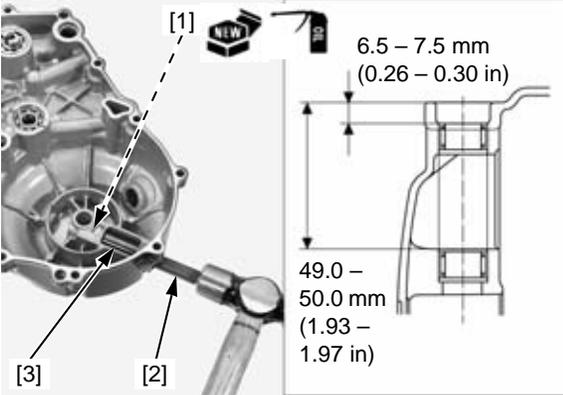
- TOOLS:**
[1] Bearing remover head, 10 mm 07746-0050200
[2] Pilot collar, 16 mm 07PAF-0010620



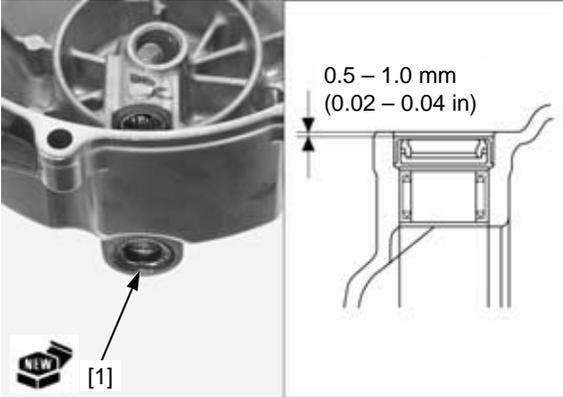
Drive in a new clutch lifter arm needle bearings [1] until the specified depth, using the special tools as shown.

- TOOLS:**
[2] Bearing remover head, 10 mm 07746-0050200
[3] Pilot collar, 16 mm 07PAF-0010620

After installation, apply engine oil to the bearing.



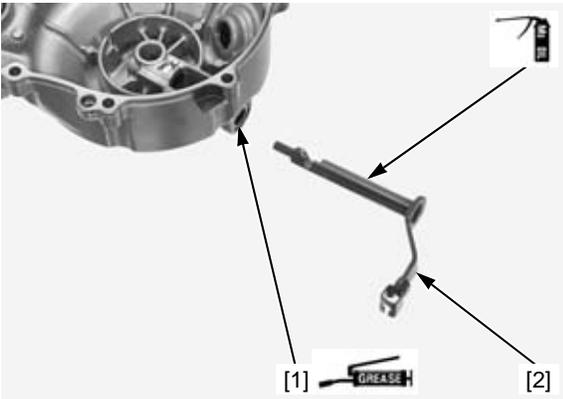
Install a new oil seal [1] to the right crankcase cover as shown.



ASSEMBLY

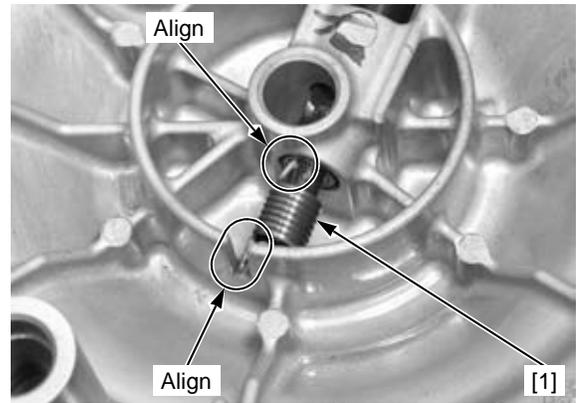
Apply grease to the clutch lifter arm oil seal lips [1].
Apply molybdenum oil solution to the clutch lifter arm [2] sliding surface.

Install the clutch lifter arm to the right crankcase cover.



CLUTCH/GEARSHIFT LINKAGE

Install the return spring [1] to the right crankcase cover by aligning the spring short end with the hole of the clutch lifter arm and long end with the groove of the right crankcase cover.



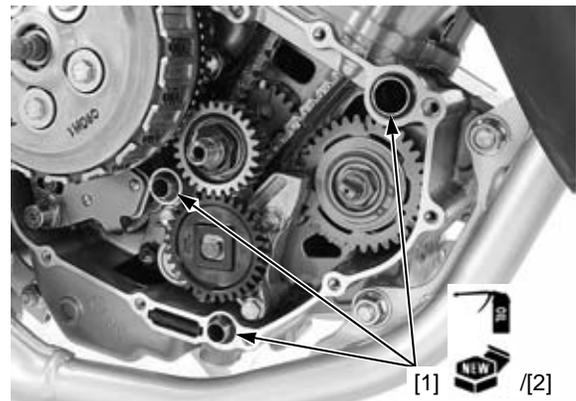
INSTALLATION

Be careful not to damage the mating surfaces.

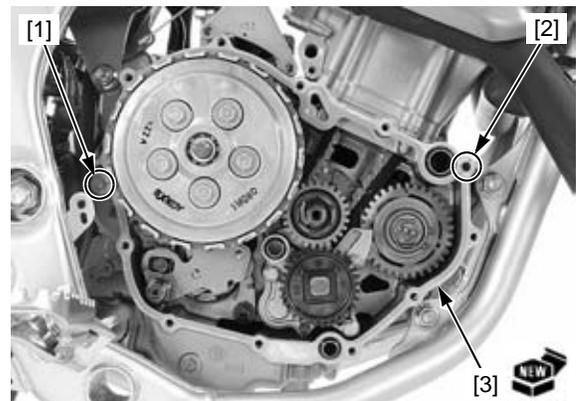
Clean any gasket material from the mating surfaces of the right crankcase and cover.

Apply engine oil to new O-rings [1].

Install the collars [2] and O-rings.



Install the dowel pin A [1], dowel pin B [2] and a new gasket [3].



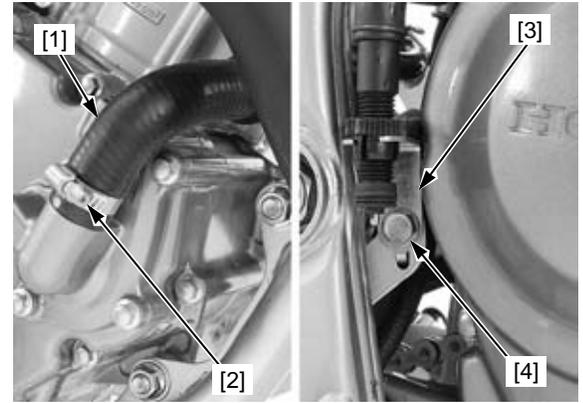
Be careful not to let the return spring fall into the crankcase.

Install the right crankcase cover [1] while turning the clutch lifter arm [2] clockwise to engage the lifter arm spindle groove with the lifter piece flange.

Install and tighten the bolts [3] in a crisscross pattern in 2 or 3 steps.



Connect the water hose [1] and tighten the water hose band screw [2] (page 9-7).
 Install the rear brake light switch holder [3] and tighten the bolt [4].



Connect the clutch cable [1] to the clutch lifter arm [2].
 Install the clutch cable guide [3] and bolts [4].
 Tighten the bolts securely.

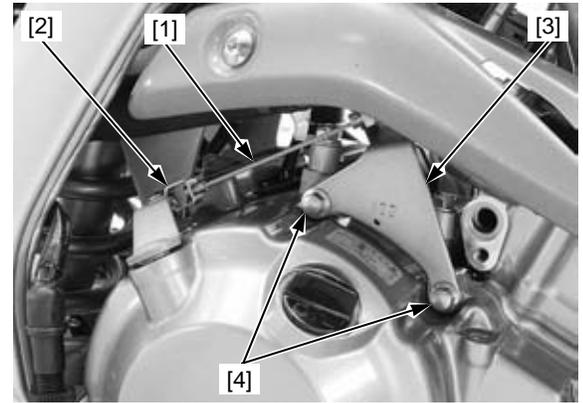
Install the following:

- Brake pedal (page 18-12)
- Frame guard (page 2-6)
- Water pipe (page 9-13)

Adjust the clutch lever freeplay (page 3-18).

Fill the engine with the recommended engine oil (page 3-9).

Fill the recommended coolant and bleed the air (page 9-5).



CLUTCH

REMOVAL

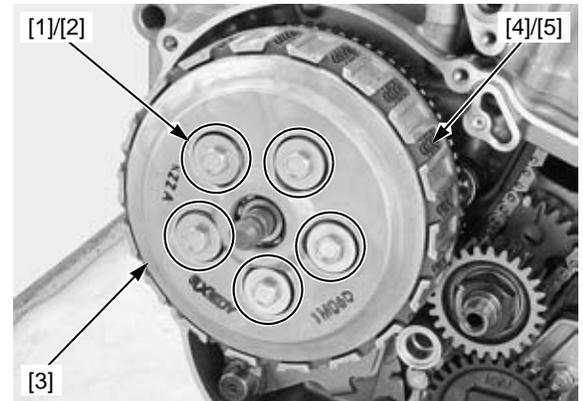
Remove the right crankcase cover (page 12-4).

Loosen the clutch lifter plate bolts [1] in a crisscross pattern in 2 or 3 steps.

Remove the clutch lifter plate bolts and clutch springs [2].

Remove the clutch lifter plate [3].

Remove the clutch discs [4] and plates [5].

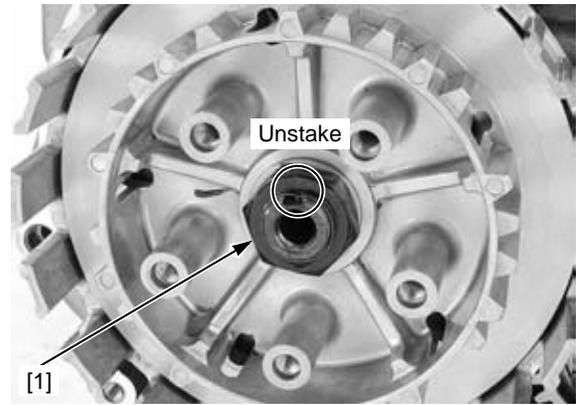


Remove the clutch lifter piece [1], judder spring [2] and spring seat [3].



CLUTCH/GEARSHIFT LINKAGE

Unstake the clutch center lock nut [1].

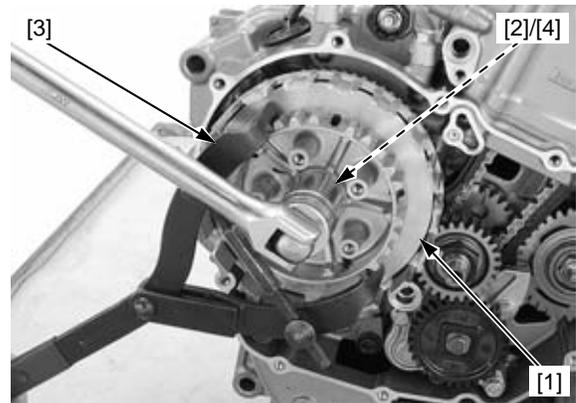


Hold the clutch center [1] with the special tool and loosen the clutch center lock nut [2].

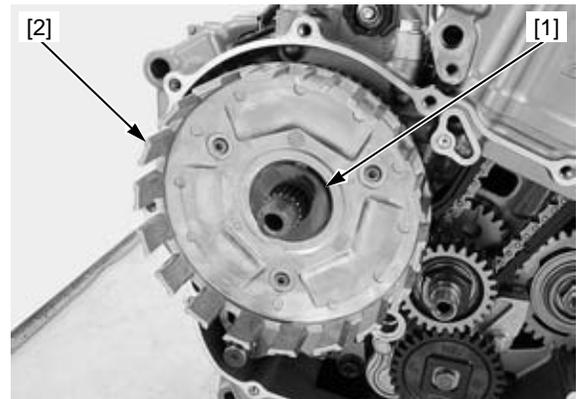
TOOL:

[3] Clutch center holder **07724-0050002**

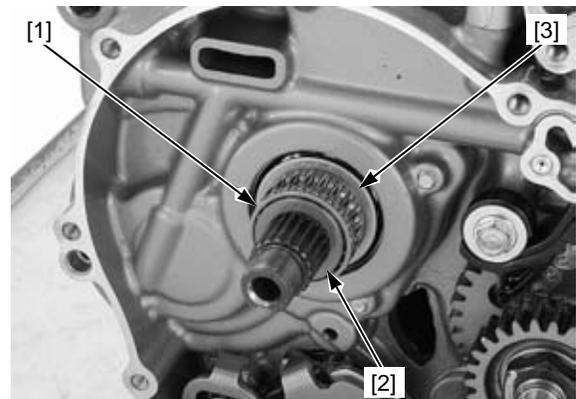
Remove the clutch center lock nut and washer [4].



Remove the washer [1] and clutch outer [2].



Remove the needle bearing [1], clutch outer guide [2] and washer [3] from the mainshaft.



INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

- Clutch lifter bearing
- Clutch springs
- Clutch center
- Clutch discs/plates
- Clutch outer
- Clutch outer guide/needle bearing
- Mainshaft

Measure each part according to CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS (page 1-7).

Replace any part if it is out of service limit.

- Replace the clutch springs as a set.
- Replace the clutch discs and plates as a set.

CLUTCH LIFTER BEARING REPLACEMENT

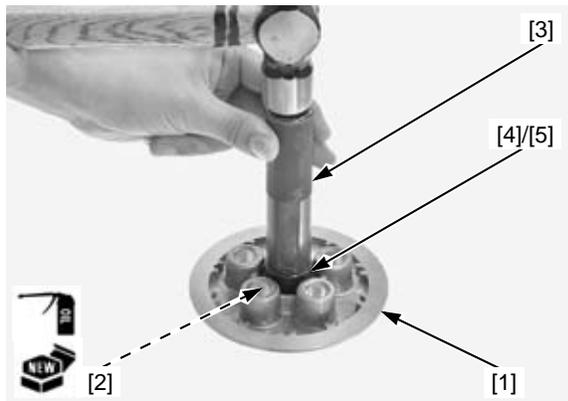
Drive out the old bearing from the clutch lifter plate [1].

Drive in a new bearing [2] squarely with its marked side facing up.

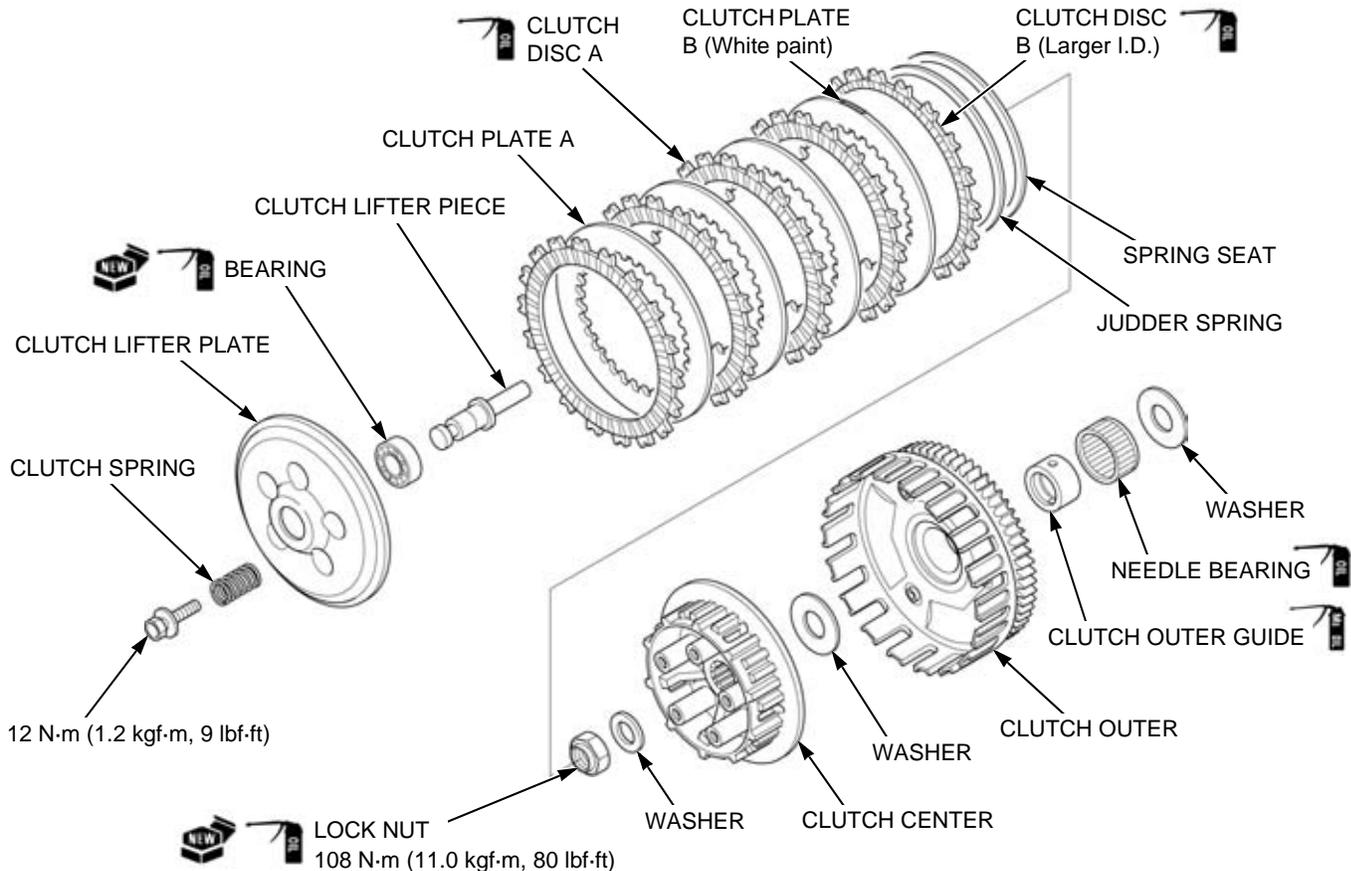
TOOLS:

- [3] Driver **07749-001000**
- [4] Attachment, 28 x 30 mm **07946-1870100**
- [5] Pilot, 12 mm **07746-0040200**

After installation, apply engine oil to the bearing.



INSTALLATION

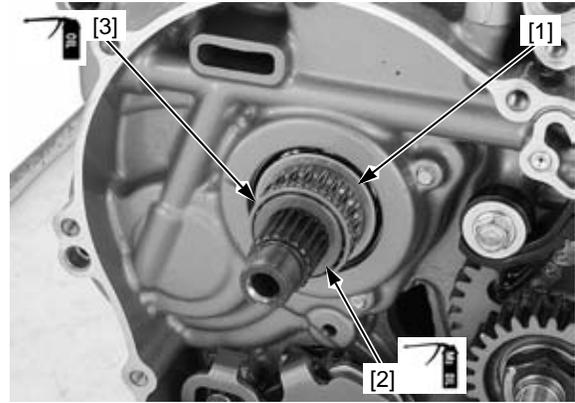


CLUTCH/GEARSHIFT LINKAGE

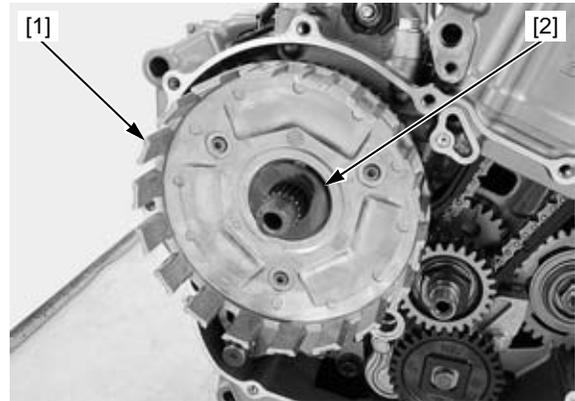
Install the washer [1] to the mainshaft.

Apply molybdenum oil solution to the clutch outer guide [2] whole surface and install it to the mainshaft.

Apply engine oil to the needle bearing [3] rotating area and install it to the clutch outer guide.

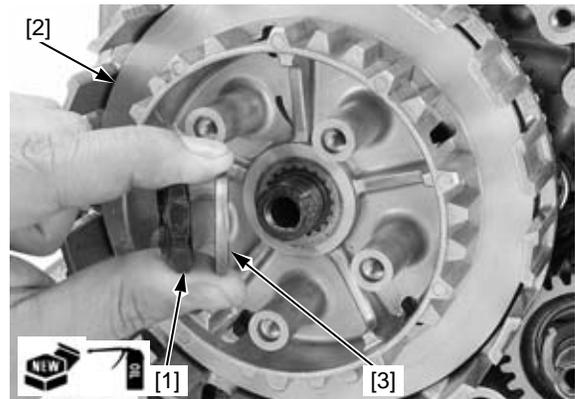


Install the clutch outer [1] and washer [2].



Apply engine oil to a new clutch center lock nut [1] threads and seating surface.

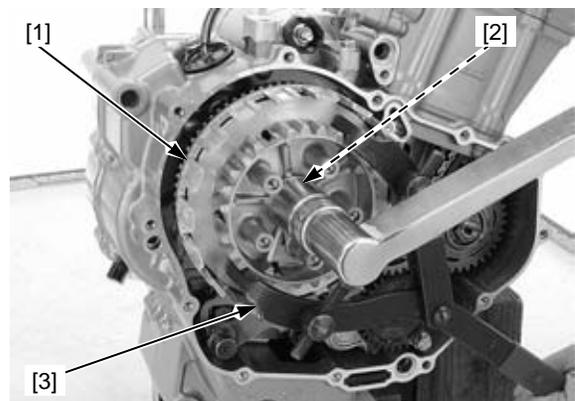
Install the clutch center [2], washer [3] and lock nut.



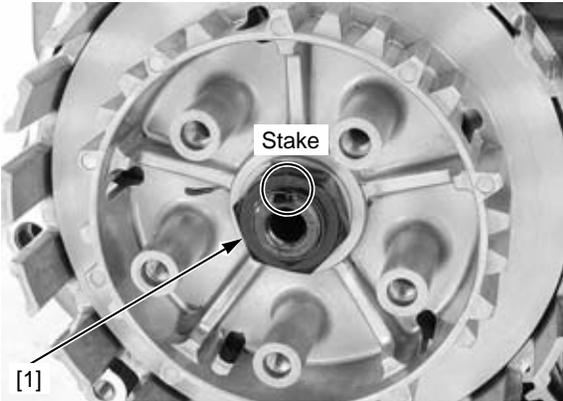
Hold the clutch center [1] with the special tool and tighten the lock nut [2] to the specified torque.

TOOL:
[3] Clutch center holder 07724-0050002

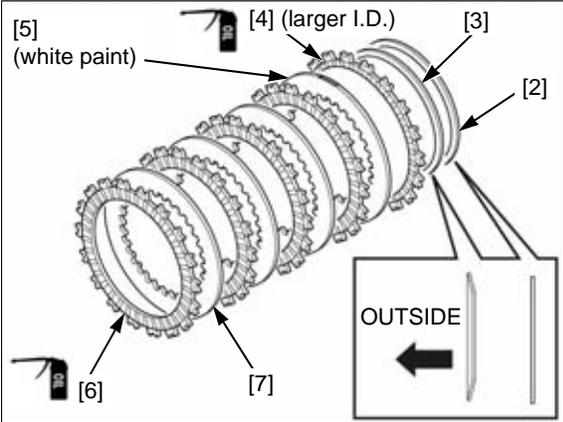
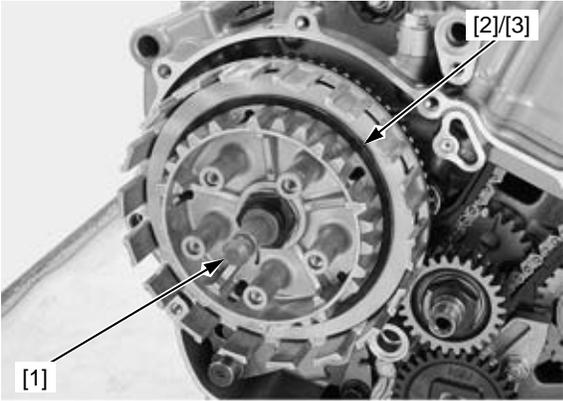
TORQUE: 108 N·m (11.0 kgf·m, 80 lbf·ft)



Be careful not to damage the mainshaft threads. Stake the lock nut [1] into the mainshaft groove.



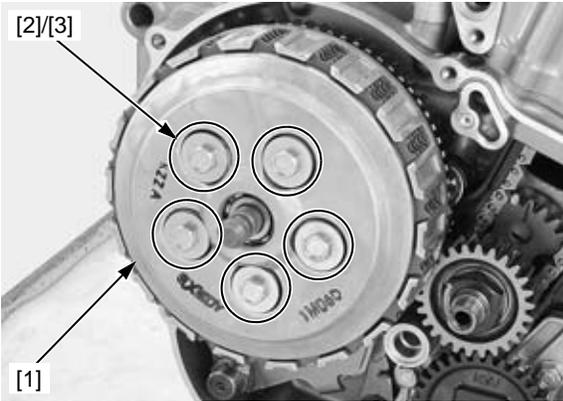
Install the clutch lifter piece [1].
Install the spring seat [2] and judder spring [3] in the direction as shown.
Apply engine oil to the entire surface of clutch discs.
Install the clutch disc B [4] and clutch plate B [5].
• Clutch disc B: larger I.D.
• Clutch plate B: white paint on outer circumference
Install the clutch discs A [6] and plates A [7] alternately, starting with the clutch disc.



Install the clutch lifter plate [1].
Install the clutch springs [2] and bolts [3].
Tighten the clutch lifter plate bolts to the specified torque in a crisscross pattern in 2 or 3 steps.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the right crankcase cover (page 12-8).



CLUTCH/GEARSHIFT LINKAGE

GEARSHIFT LINKAGE

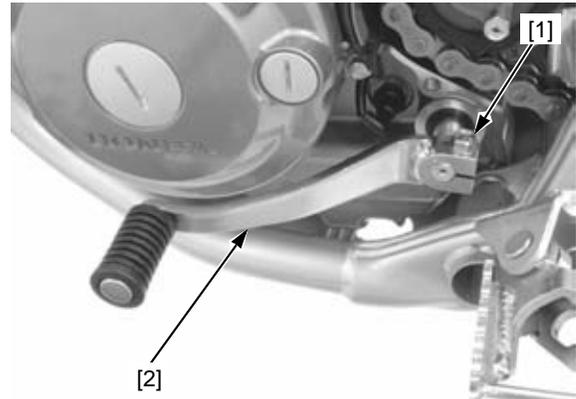
REMOVAL

Remove the following:

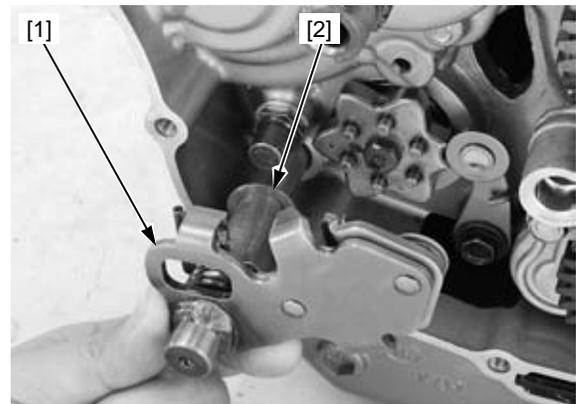
- Drive sprocket cover (page 2-6)
- Clutch assembly (page 12-9)

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

Clean off any dirt from the gearshift spindle serration.



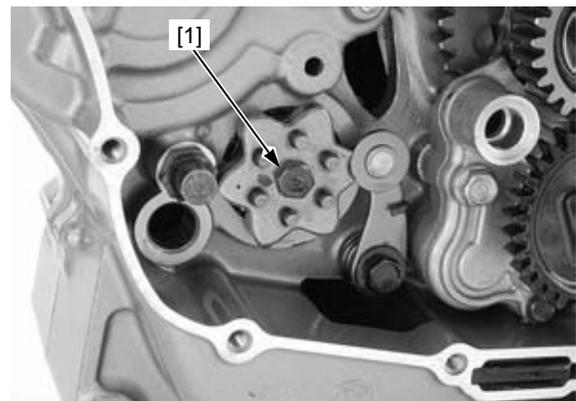
Pull out the gearshift spindle assembly [1] and washer [2] from the crankcase.



Remove the gearshift spindle oil seal [1].



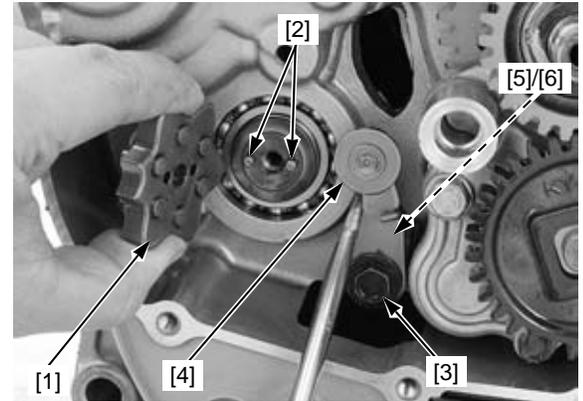
Be careful not to let the removed parts fall into the crankcase. Remove the shift drum stopper plate bolt [1].



Be careful not to let the removed parts fall into the crankcase.

Remove the following:

- Shift drum stopper plate [1]
- Dowel pins [2]
- Shift drum stopper arm bolt [3]
- Shift drum stopper arm [4]
- Washer [5]
- Return spring [6]

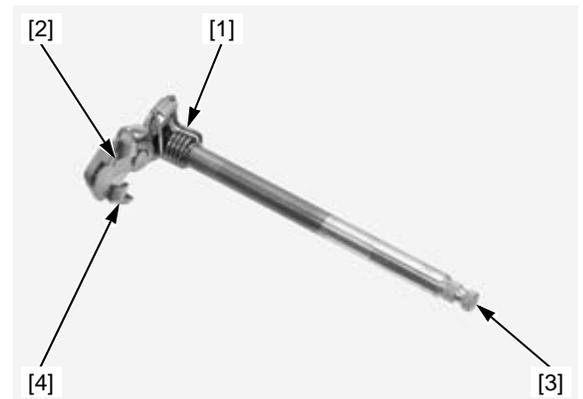


INSPECTION

Check the return spring [1] and spindle arm spring [2] for fatigue or damage replace them if necessary. Check the gearshift spindle [3] for wear or bend. Check the spindle arm [4] for wear, damage or deformation.

Replace the gearshift spindle as an assembly if necessary.

Inspect the gearshift spindle needle bearing and replace if necessary.

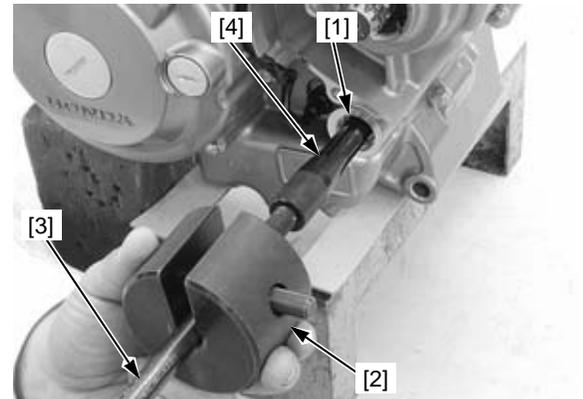


GEARSHIFT SPINDLE NEEDLE BEARING REPLACEMENT

Remove the gearshift spindle needle bearing [1] using the special tools.

TOOLS:

- [2] Remover weight **07741-0010201**
- [3] Bearing remover shaft, 15 mm **07936-KC10100**
- [4] Bearing remover head, 14 mm **07WMC-KFG0100**

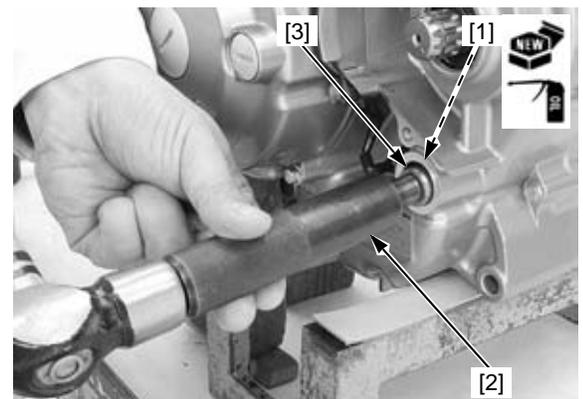


Drive in a new gearshift spindle needle bearing [1] into the left crankcase with the marked side facing up until it is fully seated using the special tools.

TOOLS:

- [2] Driver **07749-0010000**
- [3] Pilot, 20 mm **07746-0040500**

After installation, apply engine oil to the bearing.



CLUTCH/GEARSHIFT LINKAGE

INSTALLATION

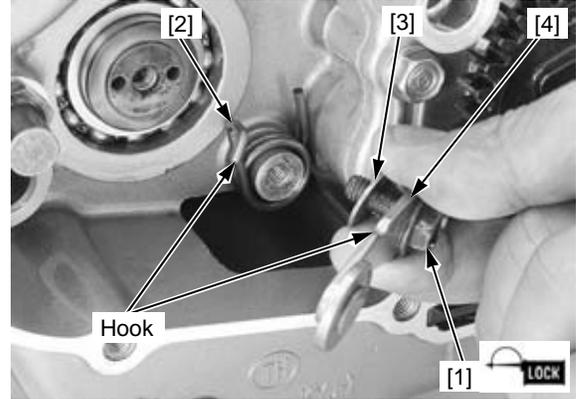
Apply locking agent to the shift drum stopper arm bolt [1] threads.

Install the return spring [2], washer [3] and stopper arm [4] while hooking the return spring at the stopper arm groove.

Install and tighten the bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

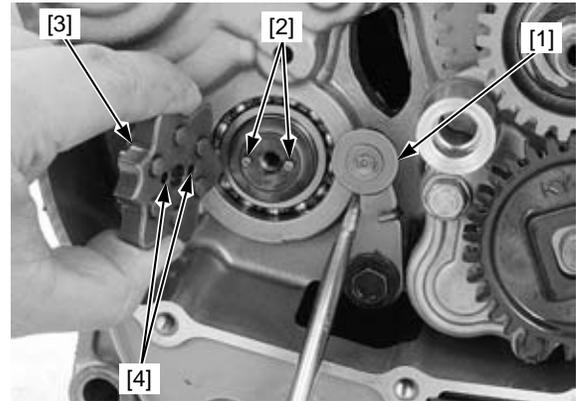
Check the stopper arm for proper operation.



Move the stopper arm [1] out of the way using a screwdriver.

Install the dowel pins [2] into the shift drum holes.

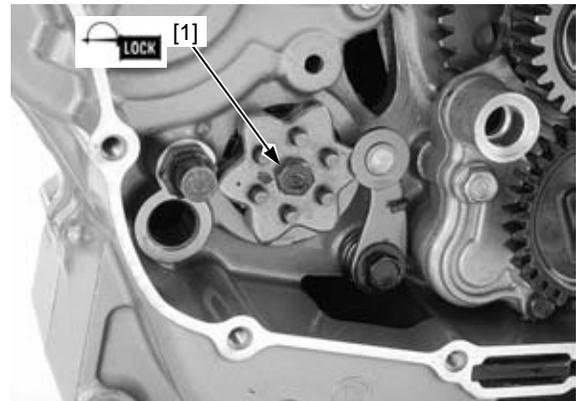
Install the shift drum stopper plate [3] while aligning its pin holes [4] with the dowel pins.



Apply locking agent to the shift drum stopper plate bolt [1] threads.

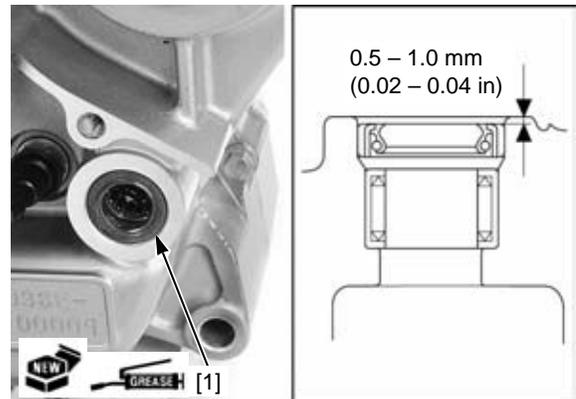
Install and tighten the shift drum stopper plate bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



Apply grease to a new gearshift spindle oil seal lip [1].

Install the gearshift spindle oil seal to the specified depth as shown.

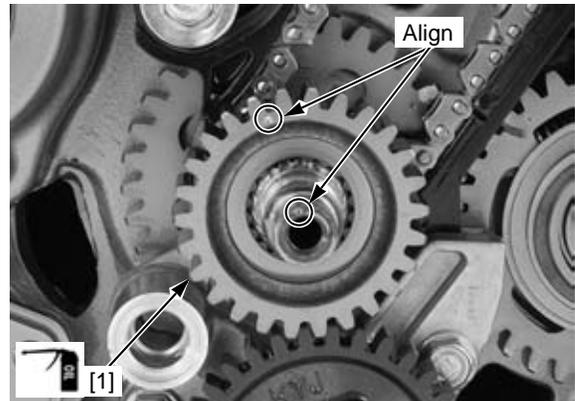


CLUTCH/GEARSHIFT LINKAGE

INSTALLATION

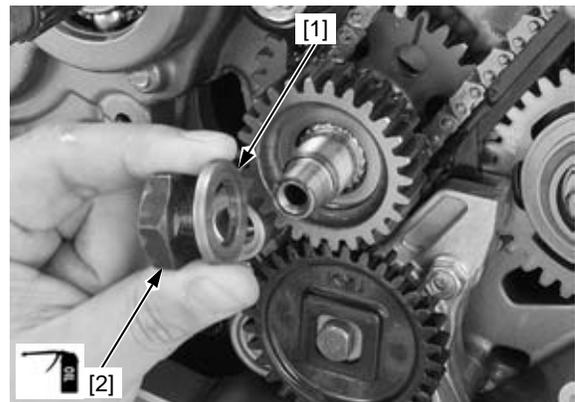
Apply engine oil to the primary drive gear [1] teeth.

Install the primary drive gear while aligning its punch mark with the crankshaft punch mark.



Install the washer [1].

Apply engine oil to the primary drive gear lock nut [2] threads and seating surface, then install it.



Temporarily install the washer [1], clutch outer guide [2], needle bearing [3] and clutch outer [4].

Insert the gear holder [5] between the primary drive and driven gears.

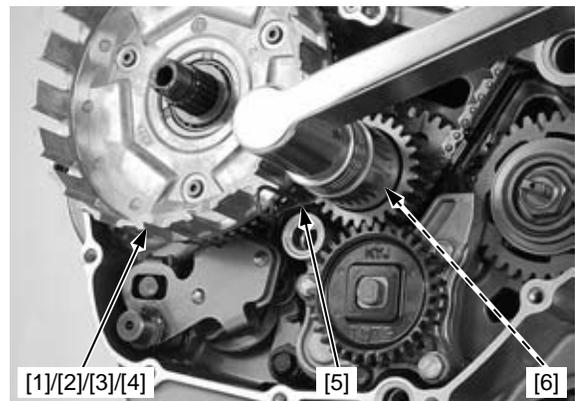
TOOL:

Gear holder, M1.5 **07724-0010200**

Tighten the primary drive gear lock nut [6] to the specified torque.

TORQUE: 108 N·m (11.0 kgf·m, 80 lbf·ft)

Install the clutch assembly (page 12-11).



13. ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION	13-2	STATOR/CKP SENSOR	13-4
TROUBLESHOOTING.....	13-2	FLYWHEEL	13-5
COMPONENT LOCATION	13-2	STARTER CLUTCH	13-7
LEFT CRANKCASE COVER	13-3		

ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION

GENERAL

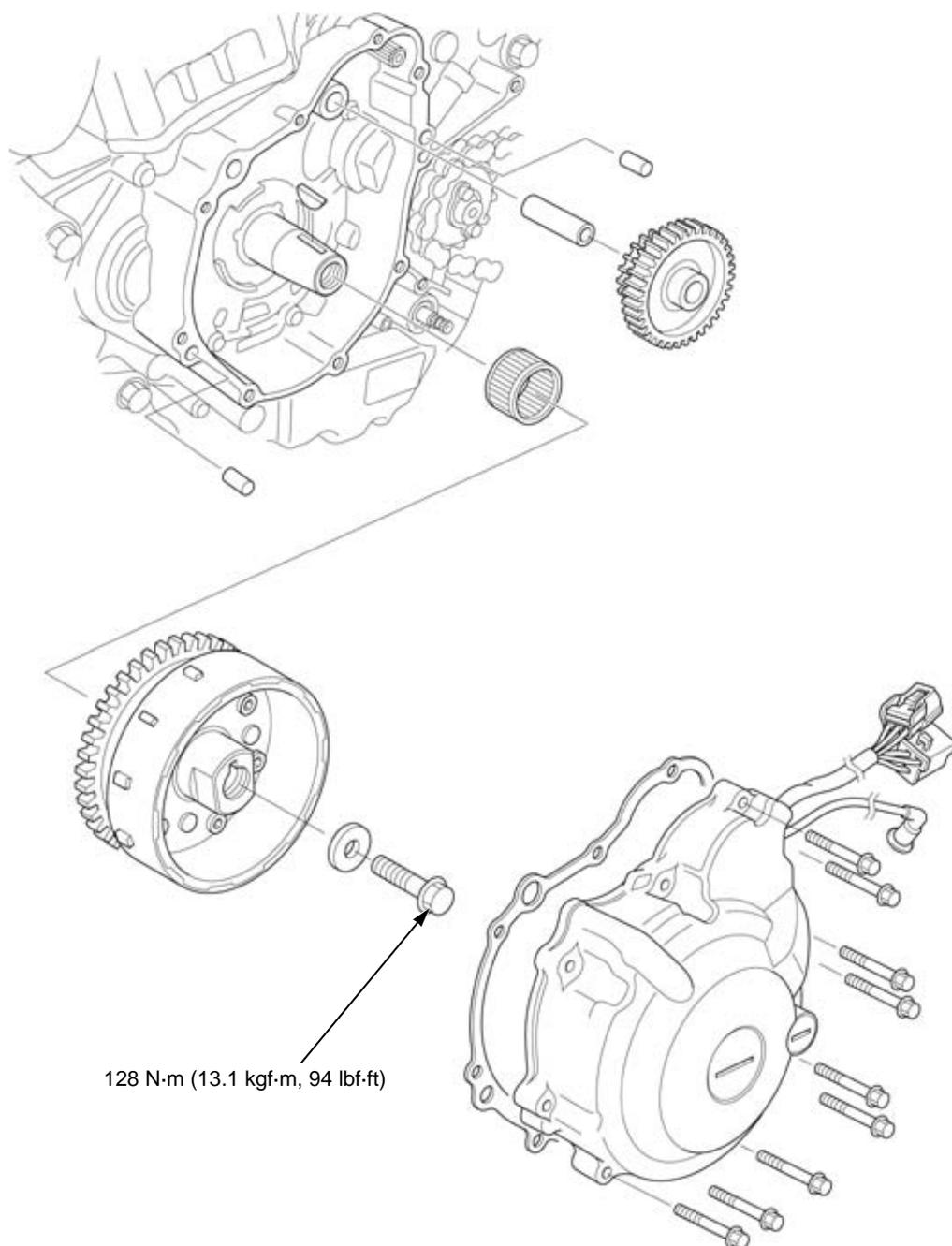
- This section covers the removal and installation of the flywheel, alternator and starter clutch. These services can be done with the engine installed in the frame.

TROUBLESHOOTING

Starter motor turns, but engine does not turn

- Faulty starter clutch
- Damaged reduction gear
- Damaged starter driven gear
- Damaged or faulty starter motor pinion gear

COMPONENT LOCATION



128 N·m (13.1 kgf·m, 94 lbf·ft)

LEFT CRANKCASE COVER

REMOVAL

Drain the engine oil (page 3-9).

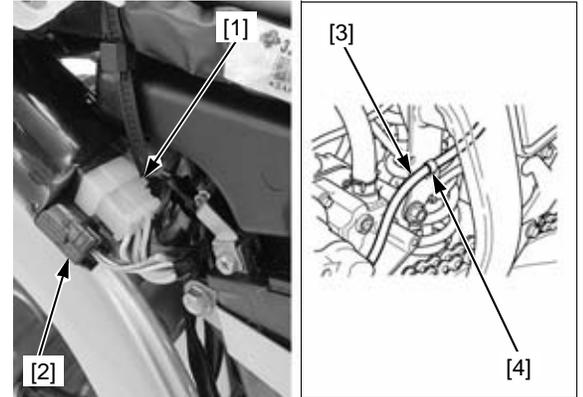
Remove the following:

- Left side cover (page 2-3)
- Drive sprocket cover (page 2-6)
- Gearshift pedal (page 12-14)

Disconnect the following:

- Alternator 3P connector [1]
- CKP sensor/neutral switch 3P (Black) connector [2]

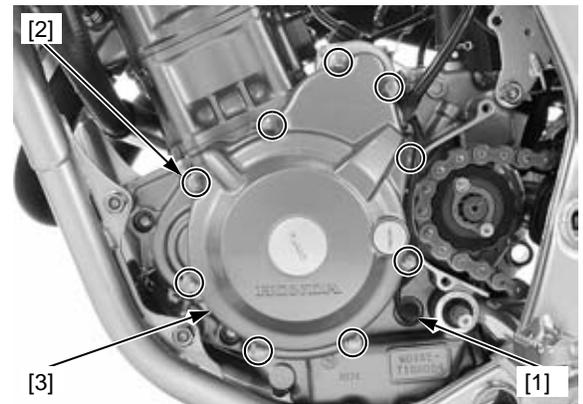
Release the alternator wire [3] from the clamp [4].



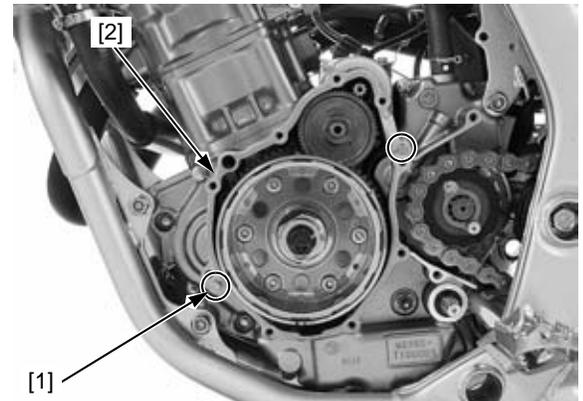
Disconnect the neutral switch connector [1] and release the wire from the left crankcase cover groove.

The left crankcase cover (stator) is magnetically attracted to the flywheel, be careful during removal.

Loosen the left crankcase cover bolts [2] in a crisscross pattern in 2 or 3 steps and remove the bolts and left crankcase cover [3].



Remove the dowel pins [1] and gasket [2].

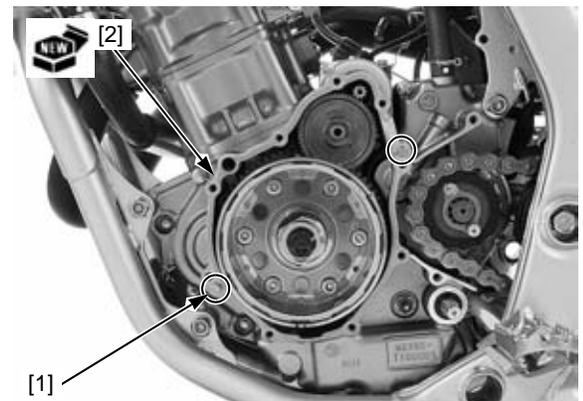


INSTALLATION

Be careful not to damage the mating surfaces.

Clean any gasket material from the mating surfaces of the left crankcase and cover.

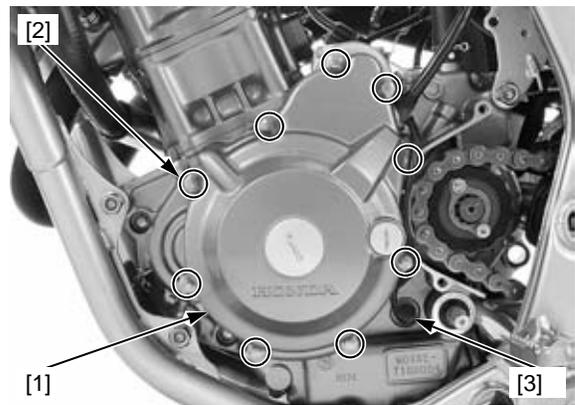
Install the dowel pins [1] and a new gasket [2].



ALTERNATOR/STARTER CLUTCH

The left crankcase cover (stator) is magnetically attracted to the flywheel, be careful during installation.

Install the left crankcase cover [1] and bolts [2].
Tighten the bolts in a crisscross pattern in 2 or 3 steps.
Connect the neutral switch connector [3] and set the wire into the left crankcase cover groove.



Connect the following:

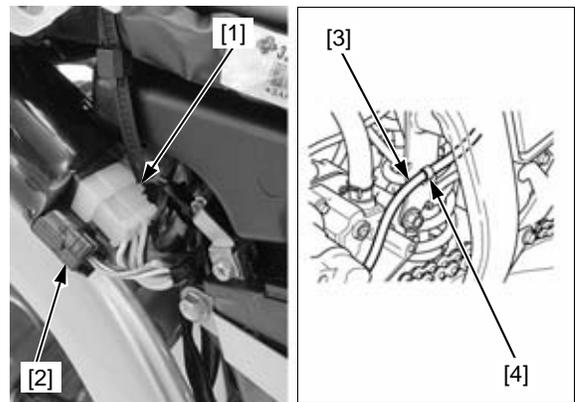
- Alternator 3P connector [1]
- CKP sensor/neutral switch 3P (Black) connector [2]

Secure the alternator wire [3] with the clamp [4].

Install the following:

- Gearshift pedal (page 12-17)
- Drive sprocket cover (page 2-6)
- Left side cover (page 2-3)

Fill the engine with the recommended engine oil (page 3-9).

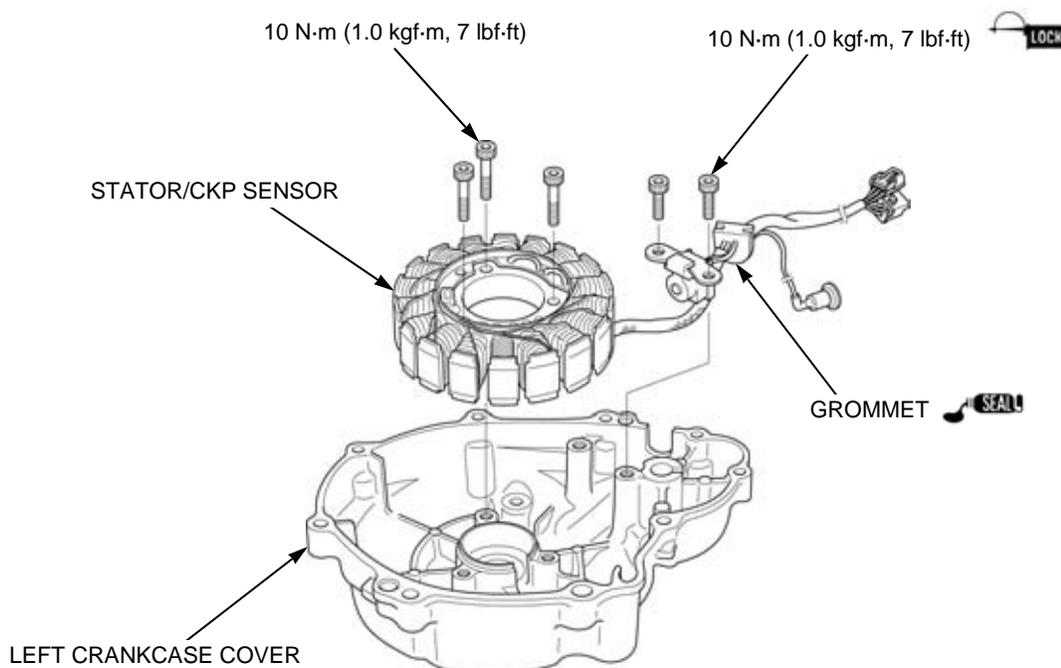


STATOR/CKP SENSOR

REMOVAL/INSTALLATION

Remove and install the stator/CKP sensor as following illustration.

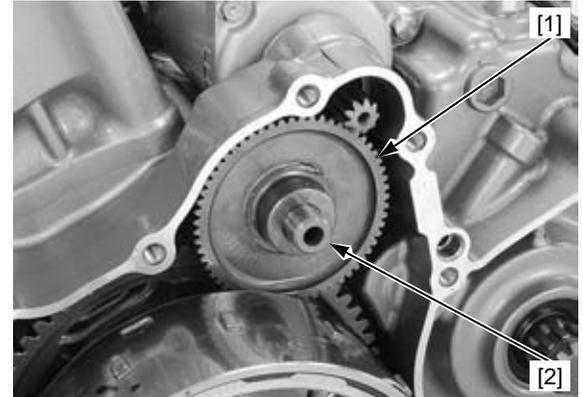
- Apply locking agent to the CKP sensor mounting bolt threads as specified (page 1-12).
- Apply sealant to the alternator/CKP sensor wire grommet sealing surface (page 1-15).



FLYWHEEL

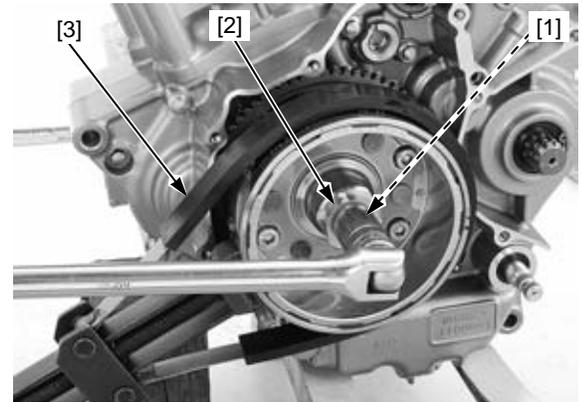
REMOVAL

Remove the left crankcase cover (page 13-3).
 Remove the starter reduction gear [1] and shaft [2].



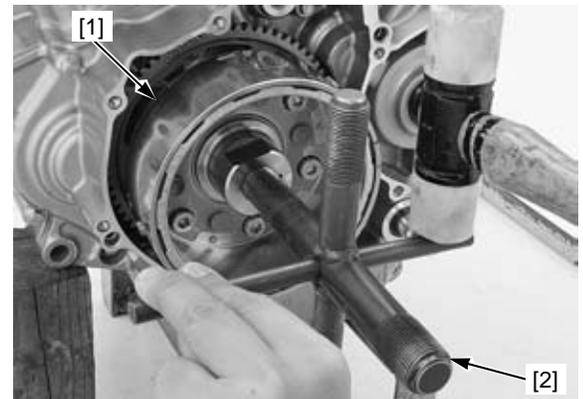
Hold the flywheel with the special tool and remove the flywheel bolt [1] and washer [2].

TOOL:
 [3] Flywheel holder **07725-0040001**



Remove the flywheel [1] using the special tool.

TOOL:
 [2] Flywheel puller **07733-0020001**



Remove the needle bearing [1].

Be careful not to damage the key groove and crankshaft.

Remove the woodruff key [2].



ALTERNATOR/STARTER CLUTCH

INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

- Starter reduction gear shaft
- Starter reduction gear
- Woodruff key
- Needle bearing

INSTALLATION

Apply molybdenum oil solution to the needle bearing [1] rotating area.

Install the needle bearing onto the crankshaft.

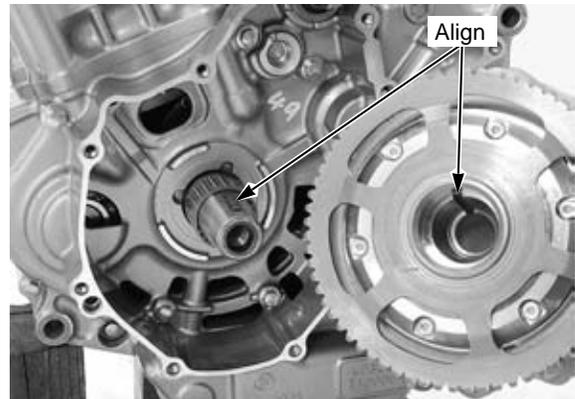
Clean any oil from the crankshaft taper surface.

Install the woodruff key [2] onto the crankshaft.

Be careful not to damage the key groove and crankshaft.



Install the flywheel while aligning the woodruff key on the crankshaft with flywheel keyway.



Apply engine oil to the flywheel bolt [1] threads and seating surface.

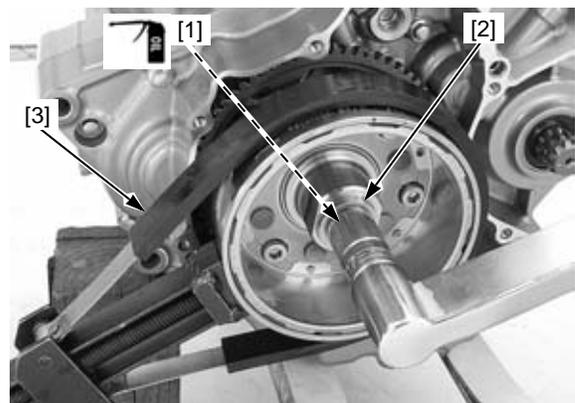
Install the washer [2] and bolt.

Hold the flywheel with a special tool and tighten the bolt to the specified torque.

TOOL:

[3] Flywheel holder 07725-0040001

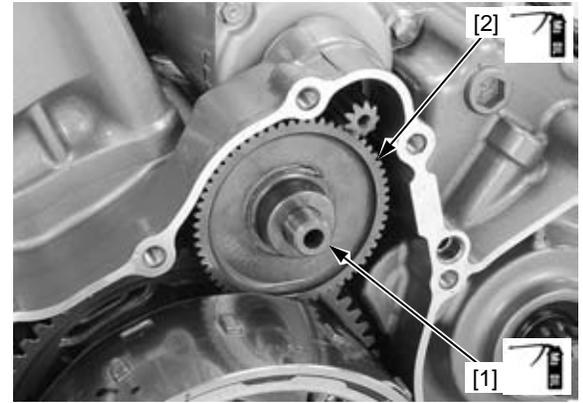
TORQUE: 128 N-m (13.1 kgf-m, 94 lbf-ft)



Apply molybdenum oil solution to the starter reduction gear shaft [1] outer surface and starter reduction gear [2] inner surface.

Install the shaft and starter reduction gear.

Install the left crankcase cover (page 13-3).



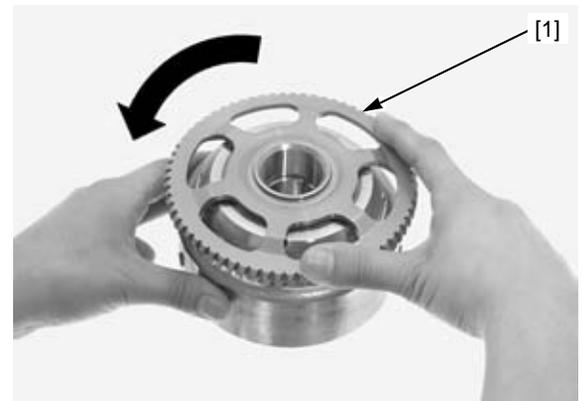
STARTER CLUTCH

REMOVAL

Remove the flywheel (page 13-5).

Make sure that the starter driven gear [1] turns counterclockwise smoothly and does not turn clockwise.

Remove the starter driven gear while turning it counterclockwise.



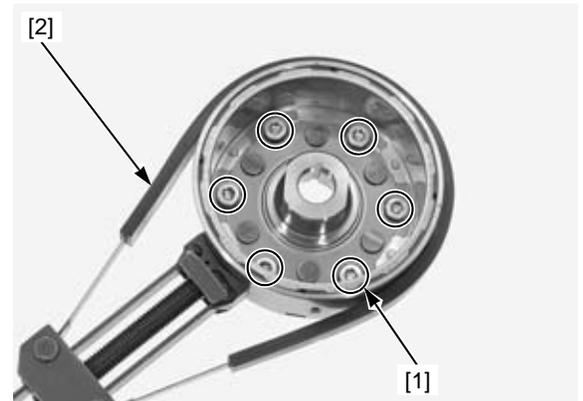
Hold the flywheel with a special tool and remove the starter clutch socket bolt [1].

TOOL:

[2] Flywheel holder

07725-0040001

Remove the starter clutch outer and starter one-way clutch.



INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

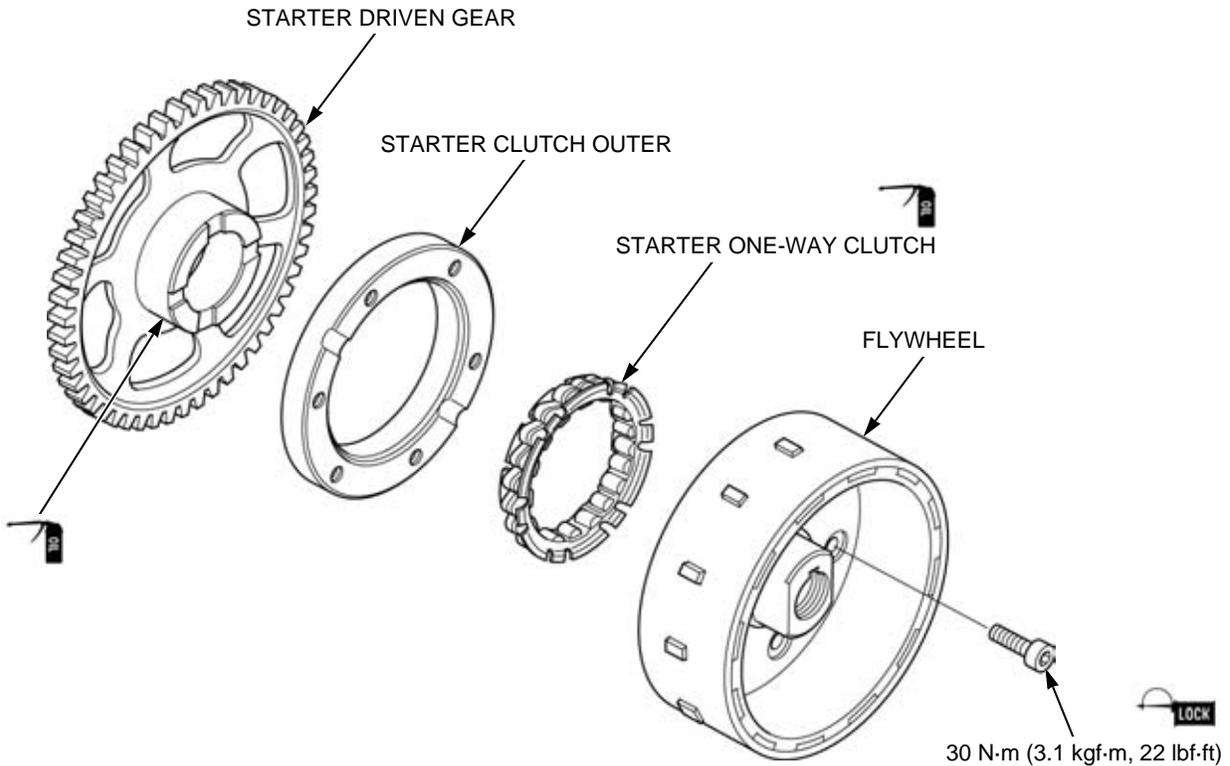
- Starter driven gear

Measure each part according to ALTERNATOR/STARTER CLUTCH SPECIFICATIONS (page 1-7).

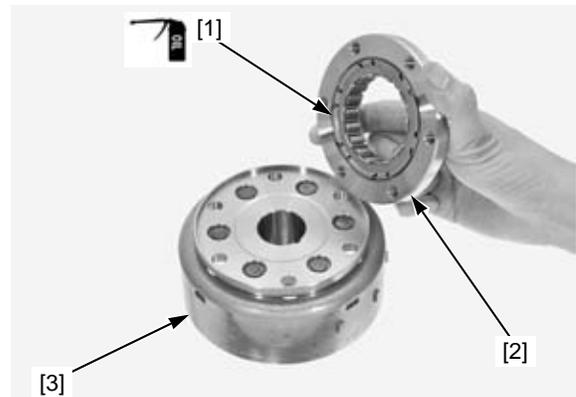
Replace any part if it is out of service limit.

ALTERNATOR/STARTER CLUTCH

INSTALLATION



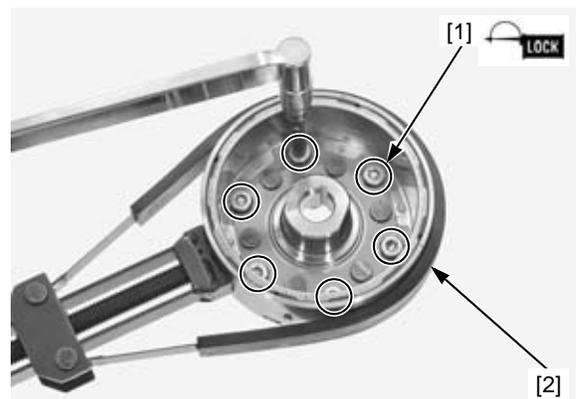
Apply engine oil to the starter one-way clutch [1] sprag.
Install the starter one-way clutch to the starter clutch outer [2].
Install the starter clutch assembly to the flywheel [3] as shown.



Apply locking agent to the starter clutch socket bolts [1] threads.
Install the starter clutch socket bolts.
Hold the flywheel with a special tool and tighten the socket bolts to the specified torque.

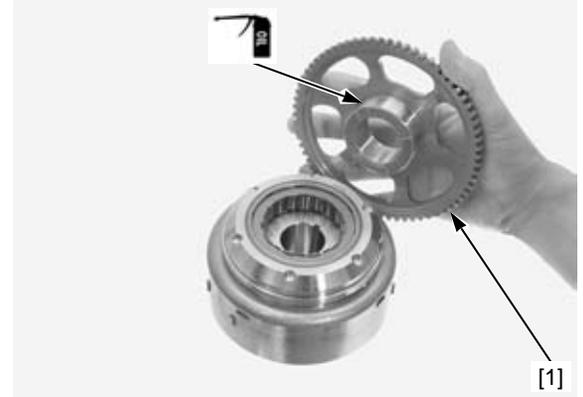
TOOL:
[2] Flywheel holder 07725-0040001

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



Apply engine oil to the starter driven gear [1] sliding surface.

Install the starter driven gear while turning it counterclockwise.



Make sure that the starter driven gear turns counterclockwise smoothly and does not turn clockwise.

Install the flywheel (page 13-6).



MEMO

14. CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

SERVICE INFORMATION.....	14-2	MAIN JOURNAL BEARING.....	14-7
TROUBLESHOOTING.....	14-2	TRANSMISSION	14-10
COMPONENT LOCATION	14-3	BALANCER.....	14-14
CRANKCASE SEPARATION.....	14-4	CRANKCASE BEARING REPLACEMENT	14-15
CRANKSHAFT	14-6	CRANKCASE ASSEMBLY	14-18

SERVICE INFORMATION

GENERAL

- This section covers crankcase separation for service of the crankshaft, transmission and balancer.
- The crankcase must be separated to service the crankshaft, balancer and transmission. To service these parts, the engine must be removed from the frame.
- The following components must be removed before separating the crankcase.
 - Camshaft (page 10-6)
 - Cylinder head (page 10-13)
 - Cylinder/piston (page 11-3)
 - Clutch (page 12-9)
 - Gearshift linkage (page 12-14)
 - Oil pump (page 8-4)
 - Primary drive gear (page 12-17)
 - Flywheel (page 13-5)
 - Neutral switch (page 20-13)
 - Starter motor (page 6-4)
 - Engine (page 15-4)
- Be careful not to damage the crankcase mating surfaces when servicing.
- Clean the oil passages before assembling the crankcase halves.
- Prior to assembling the crankcase halves, apply sealant to their mating surfaces. Wipe off excess sealant thoroughly.
- The main journal bearing inserts are select fit and are identified by color codes. Select replacement bearing from the code tables. After selecting a new bearing, recheck the oil clearance. Incorrect oil clearance can cause major engine damage.

TROUBLESHOOTING

Excessive engine noise

- Worn, seized or chipped transmission gear
- Worn or damaged transmission bearing
- Worn or damaged connecting rod big end bearing
- Worn main journal bearing
- Worn connecting rod small end
- Worn balancer shaft bearing
- Improper balancer timing

Hard to shift

- Bent shift fork
- Bent shift fork shaft
- Damaged shift drum guide groove
- Damaged shift fork guide pin
- Bent shift fork claw
- Damaged gearshift spindle
- Loose shift drum stopper arm bolt

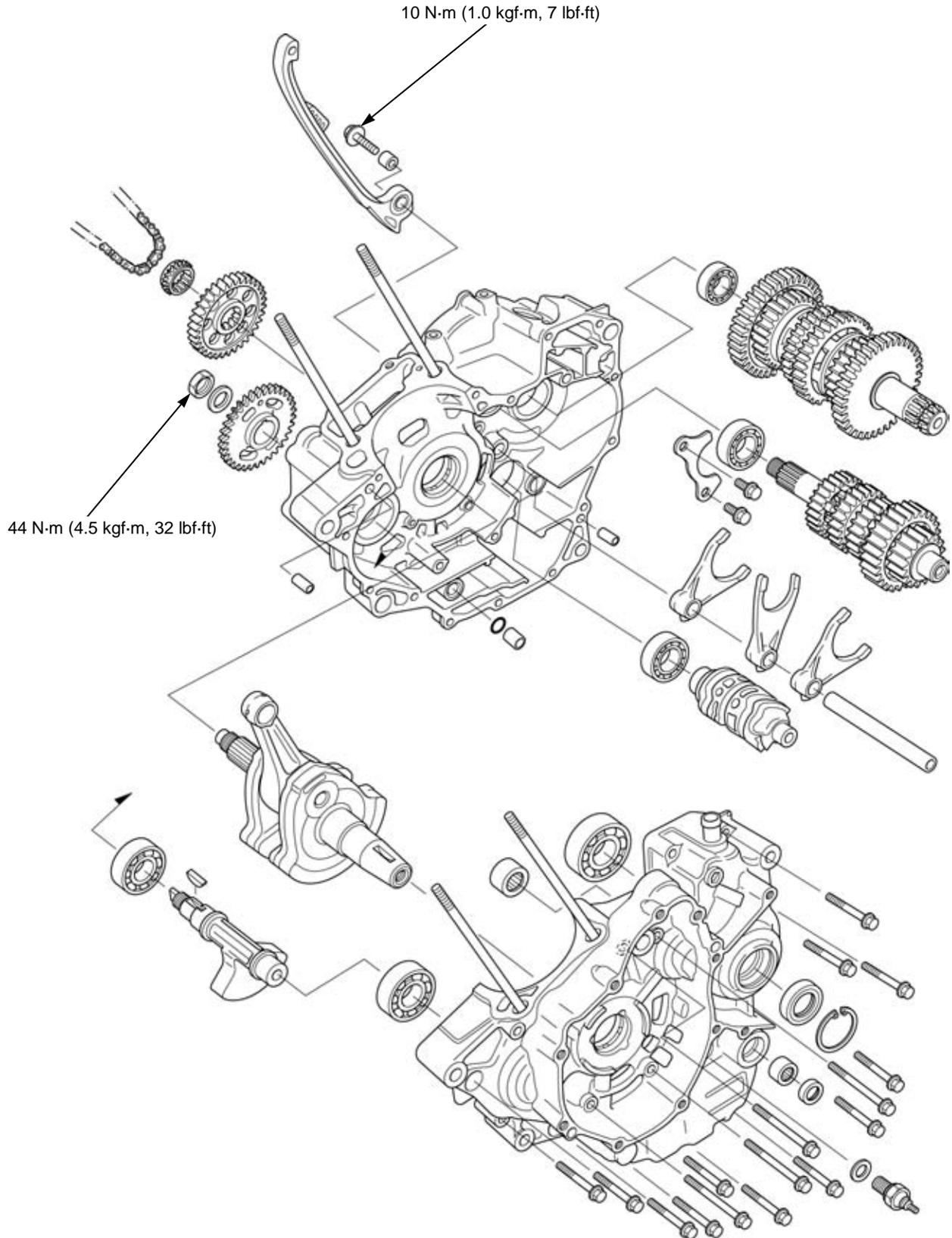
Transmission jumps out of gear

- Worn gear dogs or dog holes
- Damaged shift drum guide groove
- Worn shift fork guide pin
- Worn shift fork groove in gear
- Worn shift fork shaft
- Bent shift fork shaft
- Weak or broken gearshift spindle return spring

Engine vibration

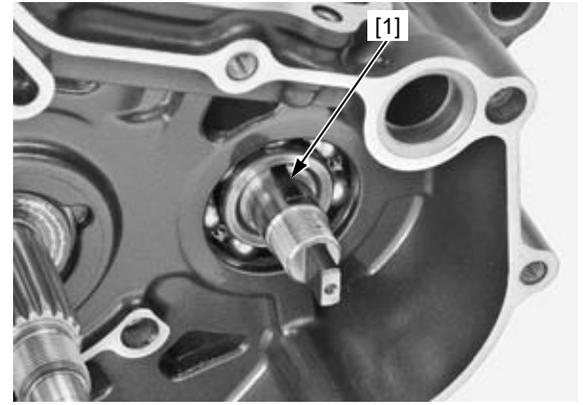
- Excessive crankshaft runout
- Improper balancer timing

COMPONENT LOCATION

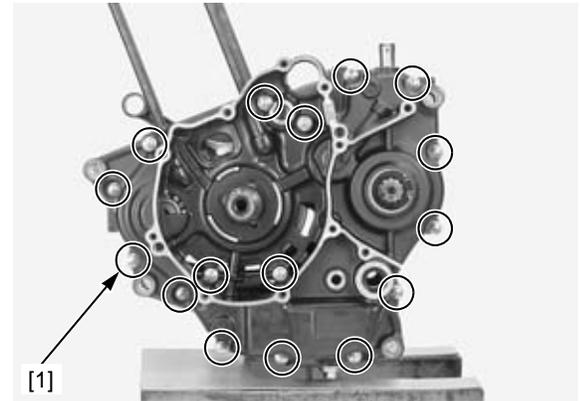


CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

Remove the woodruff key [1] from the balancer shaft.



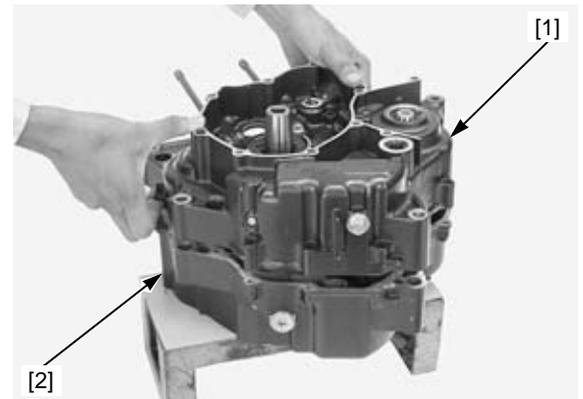
Loosen the crankcase bolts [1] in a crisscross pattern in 2 or 3 steps, and remove the bolts.



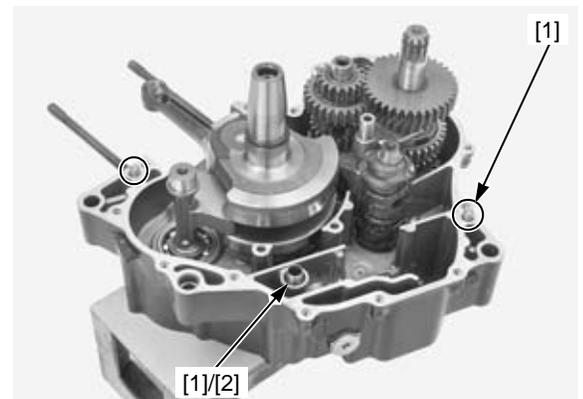
Place the crankcase assembly with the right crankcase down.

Do not pry the crankcase halves with a screwdriver.

Carefully separate the left crankcase [1] from the right crankcase [2] while tapping them at several locations with a plastic hammer.



Remove the dowel pins [1] and O-ring [2].

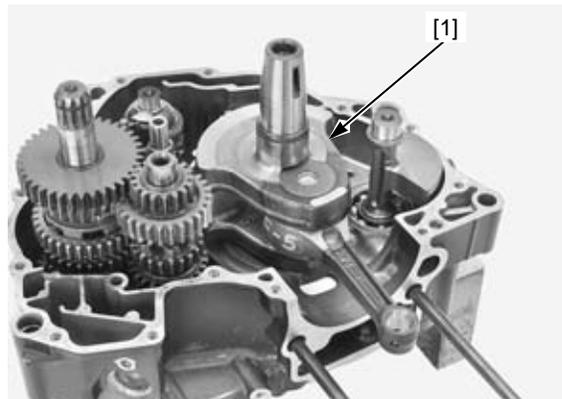


CRANKSHAFT

REMOVAL

Separate the crankcase halves (page 14-4).

Remove the crankshaft [1] from the right crankcase.



INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

- Crankshaft
- Connecting rod
- Timing sprocket

Measure each part according to CRANKCASE/CRANKSHAFT/TRANSMISSION BALANCER SPECIFICATIONS (page 1-7).

Replace any part if it is out of service limit.

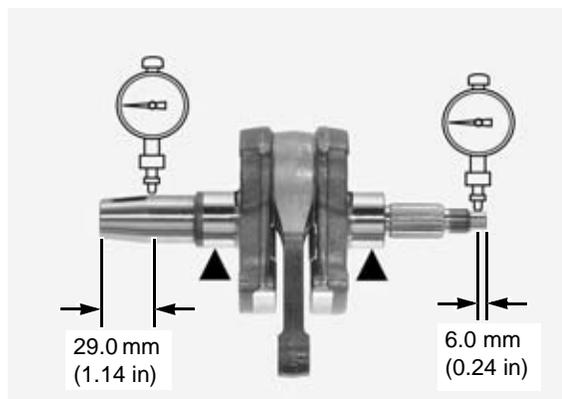
CRANKSHAFT RUNOUT

Place the crankshaft on V-blocks.

Set the dial indicator on the crankshaft.

Rotate the crankshaft two revolutions (720°) and read the runout.

SERVICE LIMIT: 0.03 mm (0.001 in)



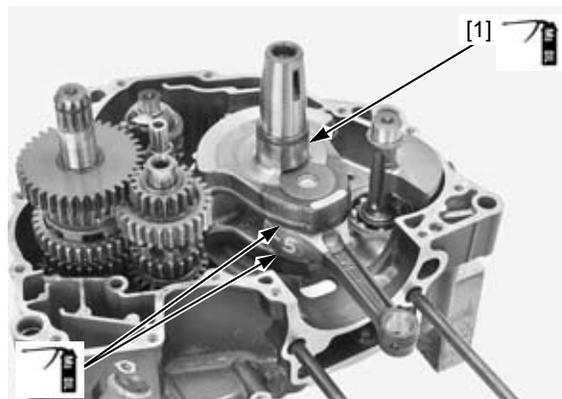
INSTALLATION

Apply molybdenum oil solution to the connecting rod big end sliding surface.

Apply molybdenum oil solution to the crankshaft main journal bearing sliding surface.

Install the crankshaft [1] into the right crankcase.

Assemble the crankcase (page 14-18).



MAIN JOURNAL BEARING

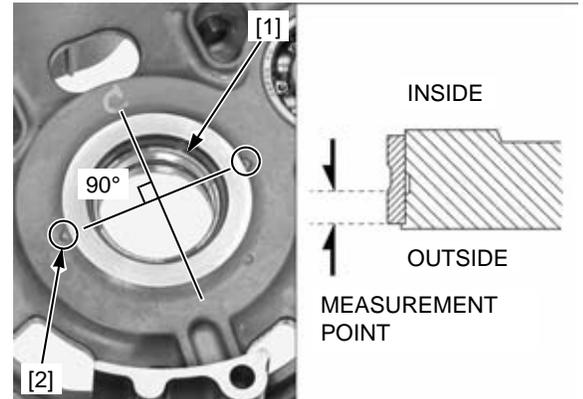
BEARING INSPECTION

Remove the following:

- Crankshaft (page 14-6)
- Transmission (page 14-10)
- Balancer shaft (page 14-14)

Clean off any oil from the bearings.

Check the main journal bearings [1] for unusual wear, damage or peeling and replace them if necessary.



MAIN JOURNAL OIL CLEARANCE

Measure and record the main journal bearing I.D. at between the bearing groove and crankcase outside end of the bearing, and 90 degrees to the index mark [2].

Clean off any oil from the crankshaft journals.

Measure and record the crankshaft main journal O.D.

SERVICE LIMIT: 33.975 mm (1.3376 in)

Calculate the oil clearance between the crankshaft main journal and main journal bearing.

SERVICE LIMIT: 0.075 mm (0.0030 in)

If the clearance exceeds the service limit, select the main journal bearing (page 14-7).



BEARING SELECTION

Remove the following:

- Crankshaft (page 14-6)
- Transmission (page 14-10)
- Balancer shaft (page 14-14)

Set a special tool and hydraulic press on the outside of the crankcase.

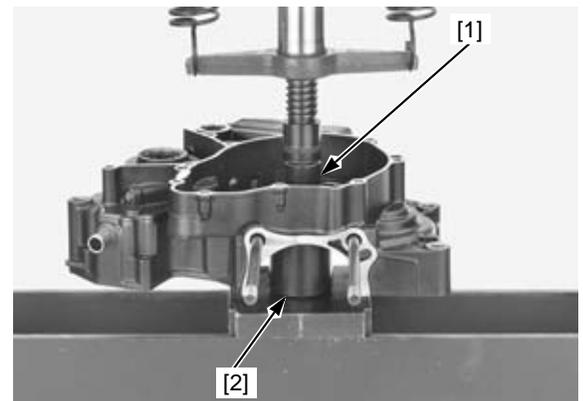
TOOLS:

[1] Driver, 30 x 36 mm

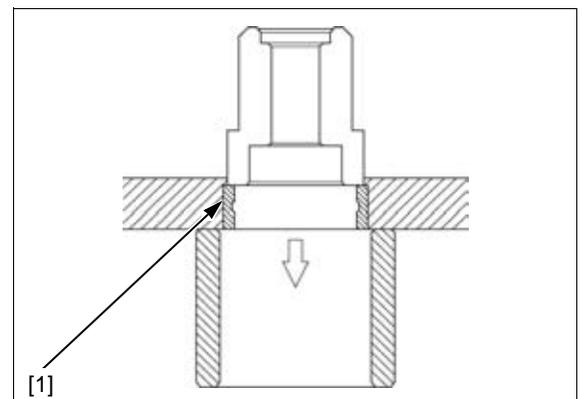
07HMF-KR10101

[2] Base, 42 mm

07GAF-SD40200



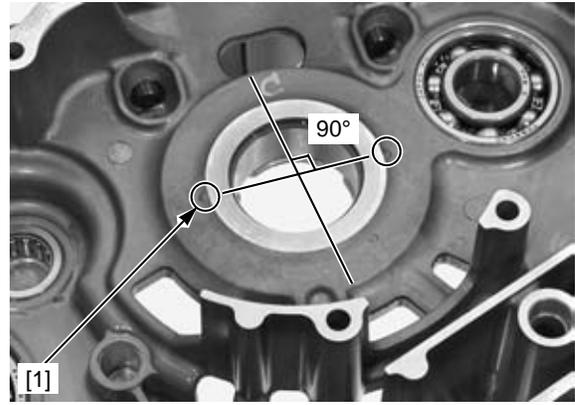
Press the main journal bearings [1] toward the inside of the crankcase.



CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

Measure and record the crankcase main journal bearing support I.D. at 90 degrees to the index mark [1].

SERVICE LIMIT: 38.036 mm (1.4975 in)



Depending upon the results of the above measurements there are four possible scenarios for main journal bearing selection:

- Crankshaft and crankcase are replaced
- Crankcase only is replaced
- Crankshaft only is replaced
- Main journal bearings only are replaced

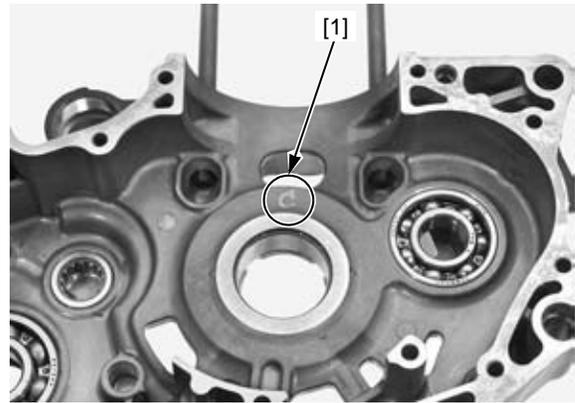
Carefully refer to the following instructions and tables for main journal bearing selection.

Record the bearing support I.D. code [1] letter.

NOTE:

Letters A, B or C on each crankcase is the code for the crankcase main journal bearing support I.D.

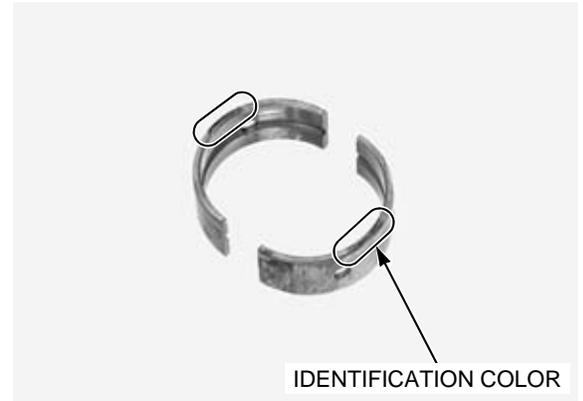
Cross-reference the crankshaft and crankcase codes to determine the replacement bearing color.



BEARING SUPPORT I.D. CODE (Crankcase replaced)	BEARING SUPPORT I.D.	MAIN JOURNAL O.D.	
		33.985 – 34.000 mm (1.3380 – 1.3386 in) (Crankshaft replaced)	33.975 – 33.985 mm (1.3376 – 1.3380 in)
A	38.000 – 38.006 mm (1.4961 – 1.4963 in)	C (Brown) 1.996 – 1.999 mm (0.0786 – 0.0787 in)	B (Black) 1.999 – 2.002 mm (0.0787 – 0.0788 in)
B	38.006 – 38.012 mm (1.4963 – 1.4965 in)	B (Black) 1.999 – 2.002 mm (0.0787 – 0.0788 in)	A (Blue) 2.002 – 2.005 mm (0.0788 – 0.0789 in)
C	38.012 – 38.018 mm (1.4965 – 1.4968 in)	A (Blue) 2.002 – 2.005 mm (0.0788 – 0.0789 in)	O.S. G (Pink) 2.005 – 2.008 mm (0.0789 – 0.0791 in)
–	38.018 – 38.024 mm (1.4968 – 1.4970 in)	O.S. G (Pink) 2.005 – 2.008 mm (0.0789 – 0.0791 in)	O.S. F (Yellow) 2.008 – 2.011 mm (0.0791 – 0.0792 in)
–	38.024 – 38.030 mm (1.4970 – 1.4972 in)	O.S. F (Yellow) 2.008 – 2.011 mm (0.0791 – 0.0792 in)	O.S. E (Green) 2.011 – 2.014 mm (0.0792 – 0.0793 in)
–	38.030 – 38.036 mm (1.4972 – 1.4975 in)	O.S. E (Green) 2.011 – 2.014 mm (0.0792 – 0.0793 in)	O.S. D (Red) 2.014 – 2.020 mm (0.0792 – 0.0795 in)

BEARING THICKNESS:

- O.S. D (Red): Thick
- O.S. E (Green): ↑
- O.S. F (Yellow): ↓
- O.S. G (Pink): Middle
- A (Blue): ↓
- B (Black): Thin
- C (Brown): Thin



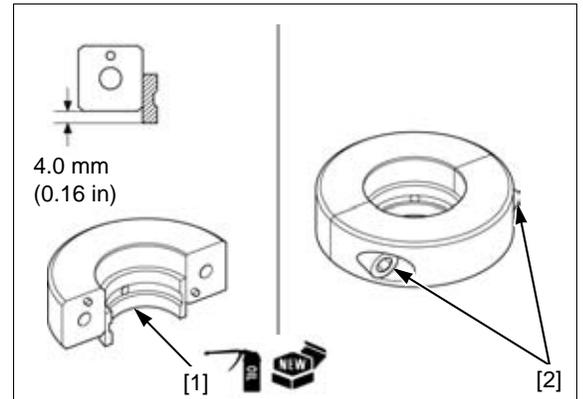
BEARING INSTALLATION

Apply engine oil to new bearing [1] surface.
Set new bearings to the metal installer as shown.

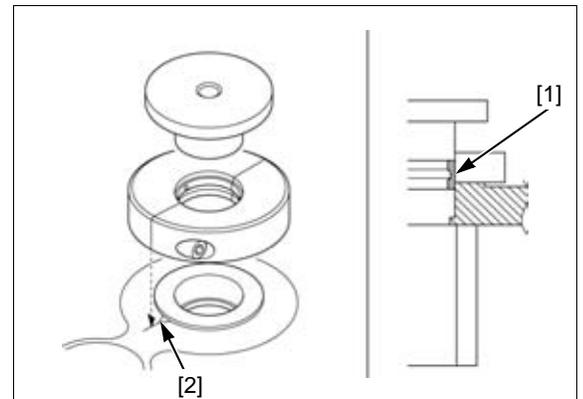
TOOL:

Metal installer set **070MF-KYJ0100**

Tighten the bolts [2] alternately in several steps.



Set the bearings [1] and special tools assembly on inside of the crankcase, fitting the bearing edge in the crankcase main journal.
Align the mating line of the bearings with the index mark [2] on the crankcase as shown.

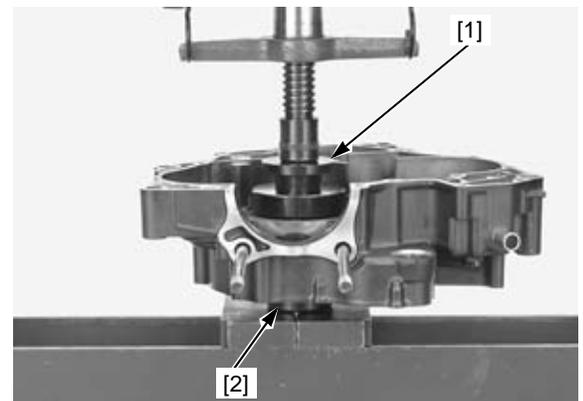


Set the crankcase and special tools on the hydraulic press.

TOOLS:

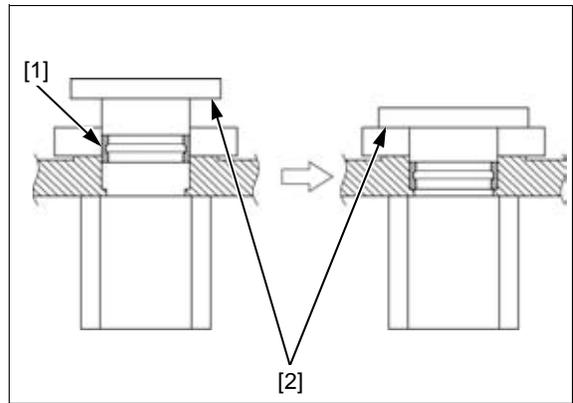
[1] Metal installer set **070MF-KYJ0100**
[2] Base, 42 mm **07GAF-SD40200**

Make sure the metal installer mating line is aligned with the index mark on the crankcase.



CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

Press the bearings [1] until the metal installer flange [2] is fully seated.



Make sure the bearing mating line is aligned with the index mark on the crankcase.

Check the oil clearance (page 14-7).

NOTE:

After selecting new bearings, recheck the oil clearance. Incorrect clearance can cause severe engine damage.

Install the following:

- Crankshaft (page 14-6)
- Transmission (page 14-11)
- Balancer shaft (page 14-14)



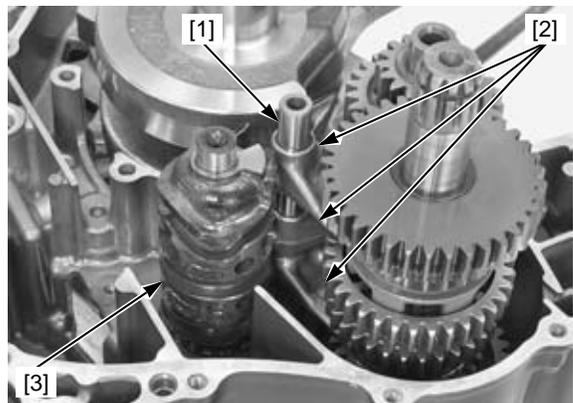
TRANSMISSION

REMOVAL/DISASSEMBLY

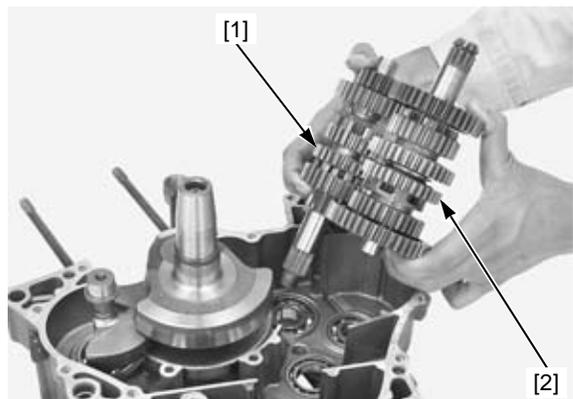
Separate the crankcase halves (page 14-4).

Pull the shift fork shaft [1] and remove it from the shift forks.

Remove the shift forks [2] and shift drum [3].



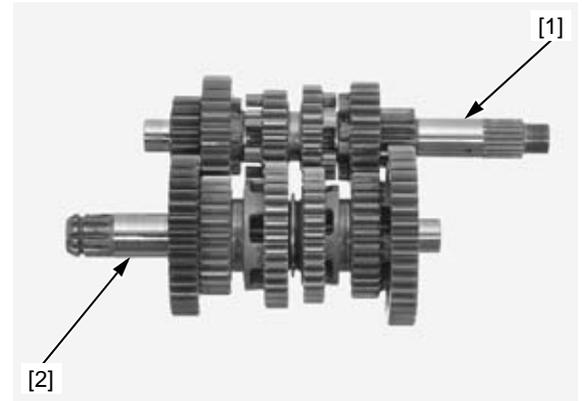
Remove the mainshaft assembly [1] and countershaft assembly [2] together.



Disassemble the mainshaft assembly [1] and countershaft assembly [2].

NOTE:

- Keep track of the disassembled parts (gears, bushings, washers, and snap rings) by sliding them onto a tool or a piece of wire.
- Do not expand the snap ring more than necessary for removal. To remove a snap ring, expand the snap ring and pull it off using the gear behind it.



INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

- Transmission gears
- Transmission bushings
- Transmission bearings
- Shift drum/journal
- Shift forks
- Shift fork shaft

Measure each part and calculate the clearance according to CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER SPECIFICATIONS (page 1-7). Replace any part if it is out of service limit.

ASSEMBLY/INSTALLATION

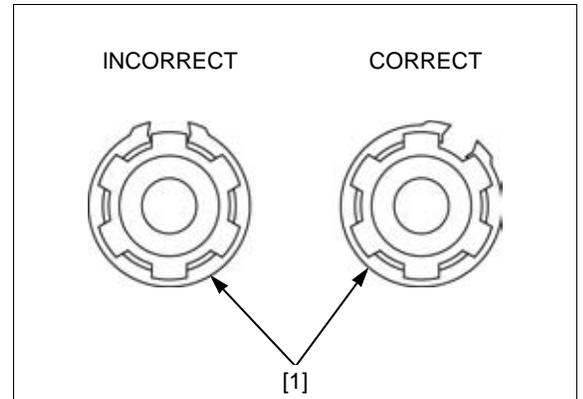
Clean all parts in solvent, and dry them thoroughly.

Apply molybdenum oil solution to the gear bushing entire surface (M5, C1, C2, C3), gear bushing outer surface (M6, C4) to ensure initial lubrication.

Assemble all parts into their original positions.

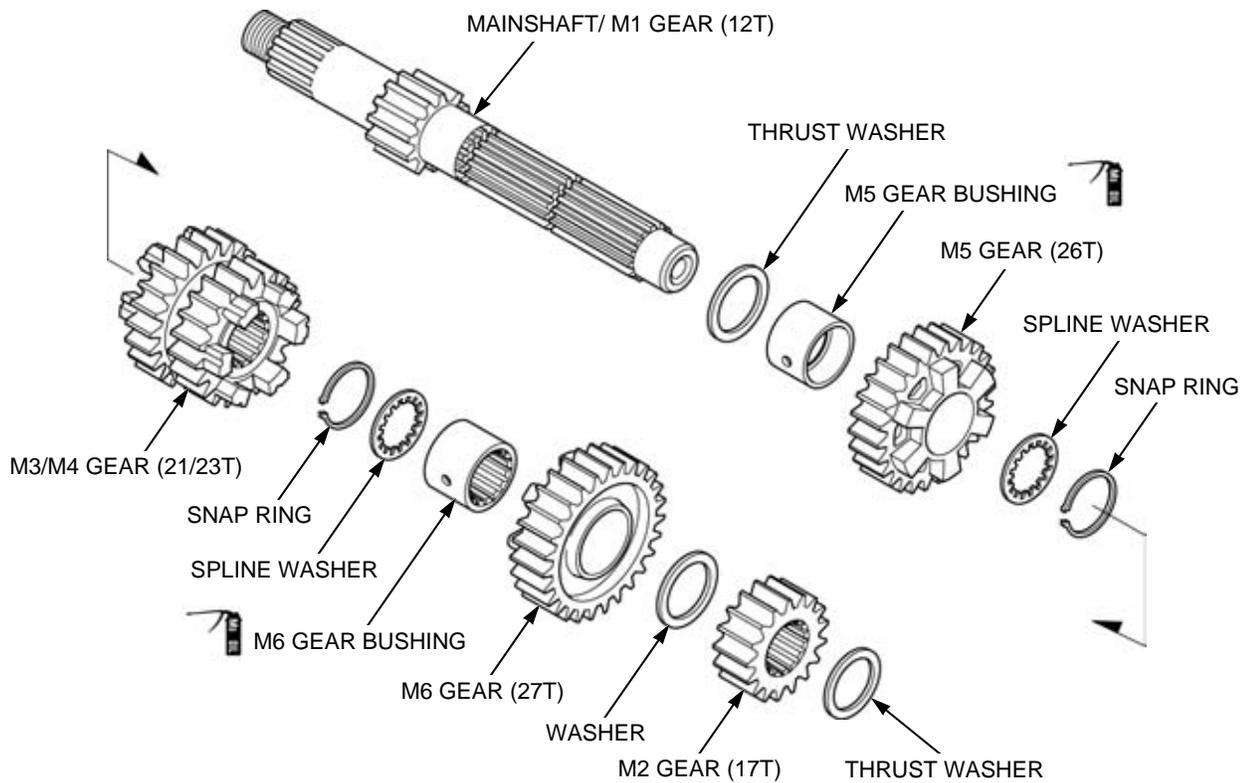
NOTE:

- Install the washers and snap rings [1] with the chamfered edge facing the thrust load side. Confirm the inner side of snap rings and washer when you detect the chamfered side.
- Do not reuse worn snap ring which could easily spin in the groove.
- Check that the snap rings are seated in the grooves and align their end gaps with the grooves of the spline.

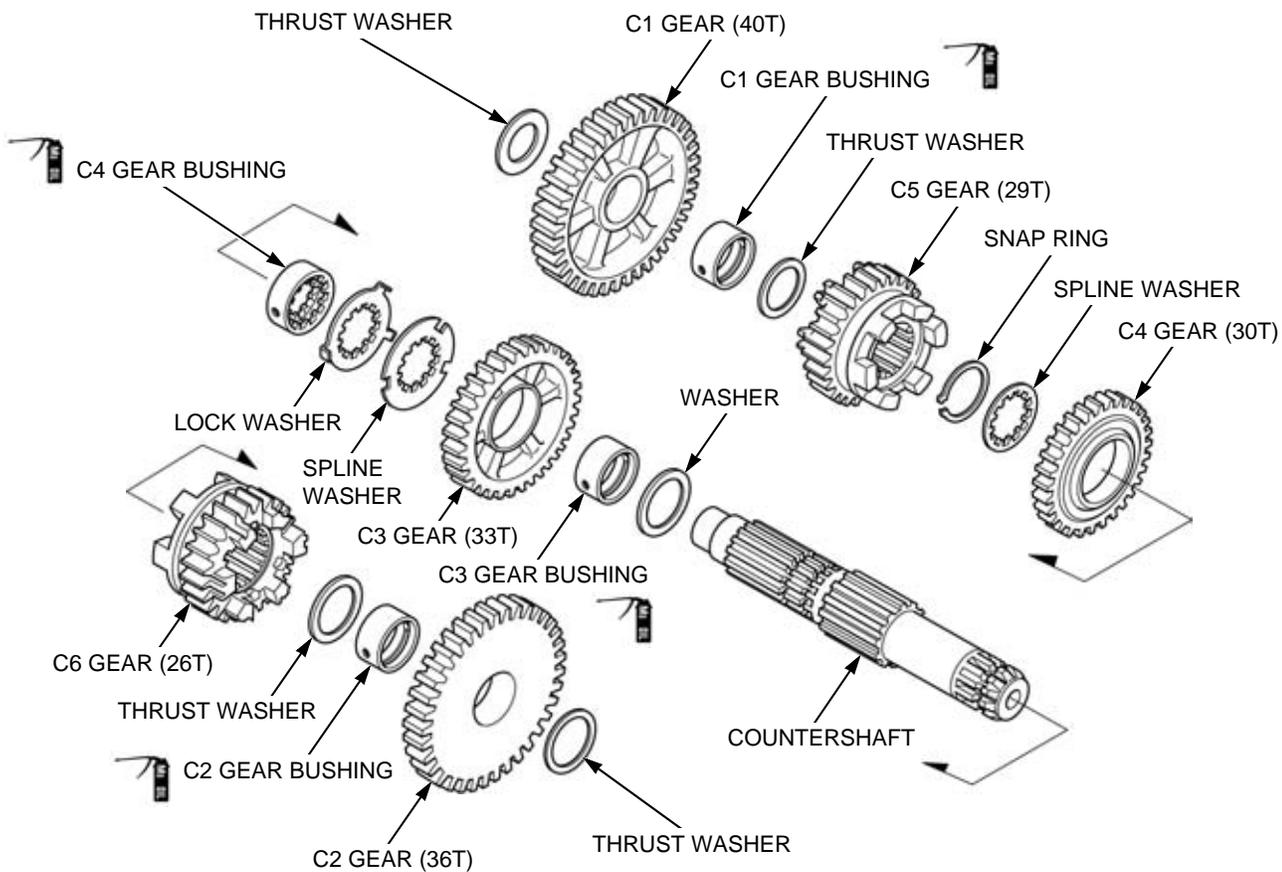


CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

MAINSHAFT



COUNTERSHAFT

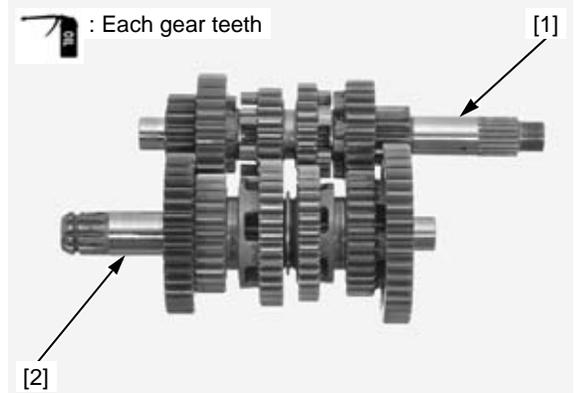


CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

Check the gears for freedom of movement or rotation on each shaft.

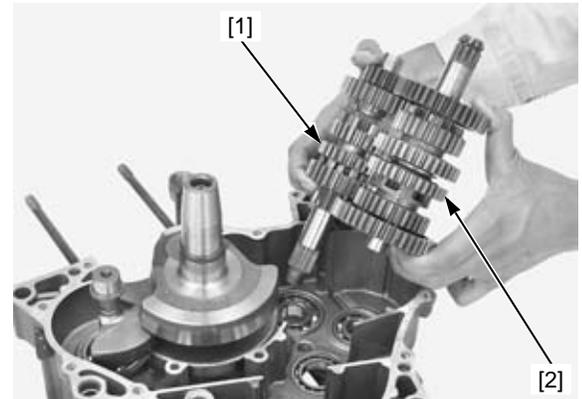
Apply engine oil to the transmission gear teeth.

Engage the mainshaft assembly [1] and countershaft assembly [2].

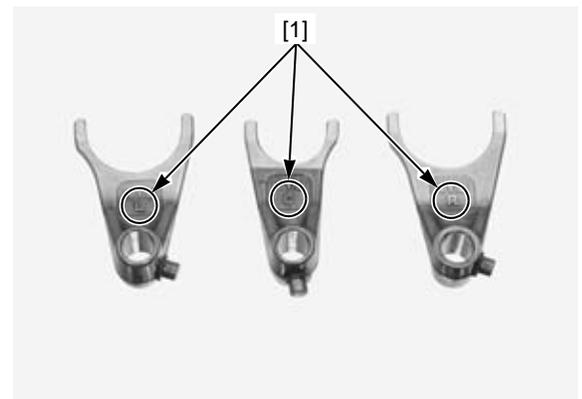


Install the mainshaft assembly [1] and countershaft assembly [2] together into the right crankcase.

Make sure the three thrust washers are installed (mainshaft; left only/countershaft; both ends).



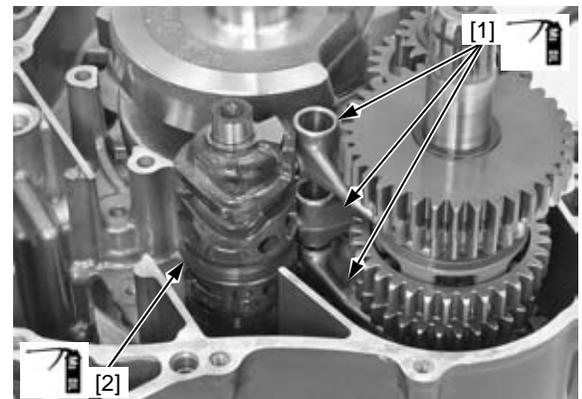
Each shift fork has an identification marks [1], "R" is for the right shift fork, "L" is the left shift fork and "C" is for the center shift fork.



Apply molybdenum oil solution to the shift fork inner surfaces and guide pins.

Install the shift forks [1] into the shifter gear grooves with the identification marks facing up (left crankcase side).

Apply molybdenum oil solution to the shift drum [2] journal outer surface and grooves, then install it while aligning the shift fork guide pins with the guide grooves.

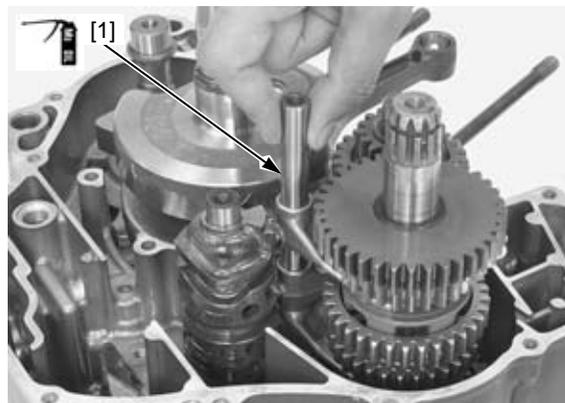


CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

Apply molybdenum oil solution to the shift fork shaft [1] outer surface and insert it through the shift forks into the right crankcase.

After installation, check for smooth transmission operation.

Assemble the crankcase (page 14-18).



BALANCER

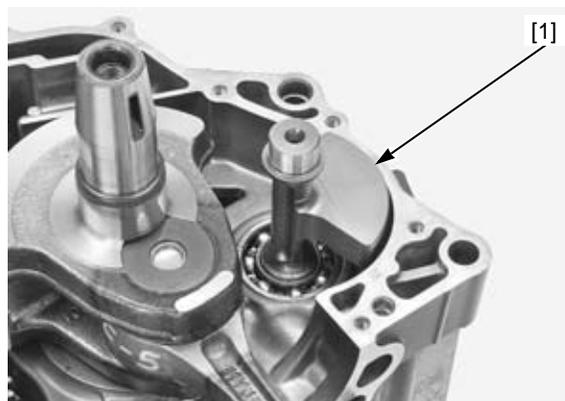
BALANCER SHAFT REMOVAL/INSTALLATION

Separate the crankcase halves (page 14-4).

Remove the balancer shaft [1] from the right crankcase.

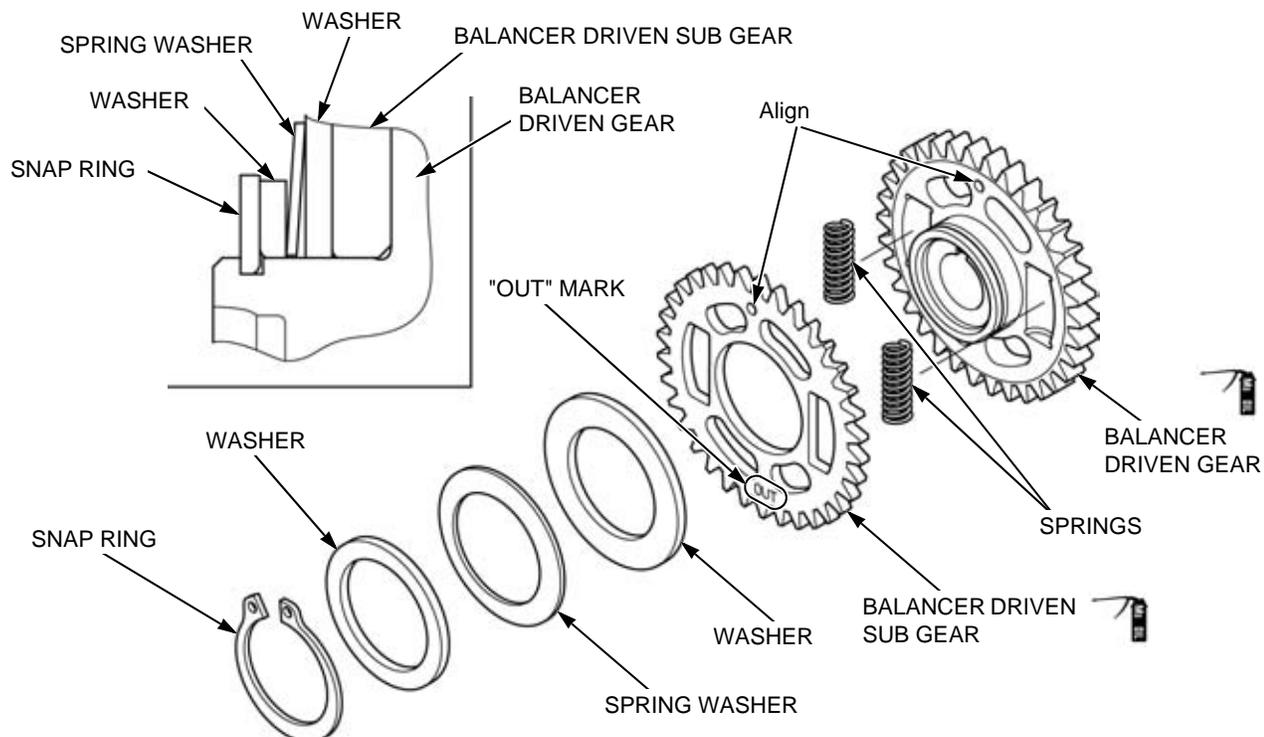
Install the balancer shaft into the right crankcase.

Assemble the crankcase (page 14-18).



BALANCER DRIVEN GEAR DISASSEMBLY/ASSEMBLY

Disassemble and assemble the balancer driven gear as following illustration.



INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

- Balancer driven gear
- Balancer driven sub gear
- Springs
- Balancer shaft
- Balancer drive gear

CRANKCASE BEARING REPLACEMENT

BALANCER/TRANSMISSION BEARING

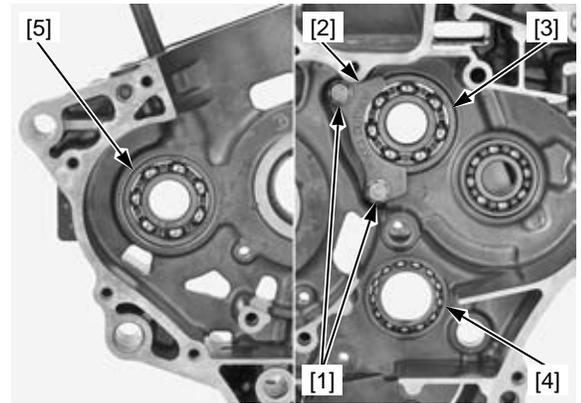
Remove the following:

- Crankshaft (page 14-6)
- Balancer shaft (page 14-14)
- Transmission (page 14-10)

RIGHT CRANKCASE SIDE

Remove the bolts [1] and mainshaft bearing setting plate [2].

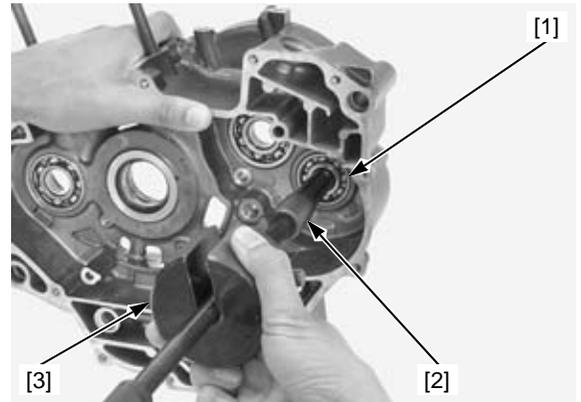
Drive out the mainshaft bearing [3], shift drum bearing [4] and balancer shaft bearing [5].



Remove the countershaft bearing [1] using the special tools.

TOOLS:

- [2] Bearing remover set, 17 mm 07936-3710300
- Remover handle 07936-3710100
- [3] Remover weight 07741-0010201

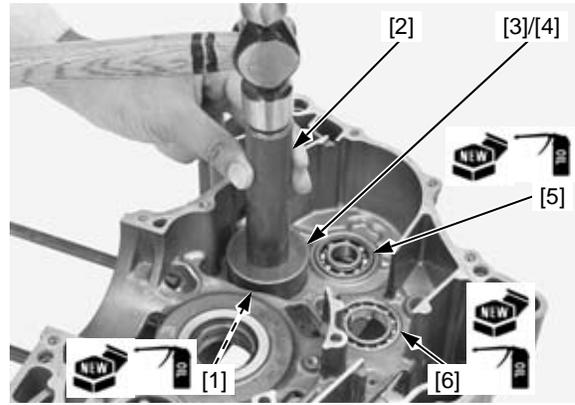


CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

Drive in new bearings into the right crankcase until they are fully seated using the special tools.

TOOLS:

- [1] Mainshaft bearing (marked side facing up):
[2] Driver 07749-0010000
[3] Attachment, 52 x 55 mm 07746-0010400
[4] Pilot, 20 mm 07746-0040500
[5] Countershaft bearing (sealed side facing down):
Driver 07749-0010000
Attachment, 37 x 40 mm 07746-0010200
Pilot, 17 mm 07746-0040400
[6] Shift drum bearing (marked side facing up):
Driver 07749-0010000
Attachment, 42 x 47 mm 07746-0010300



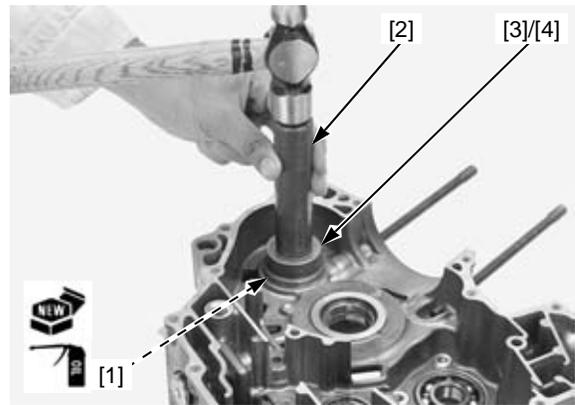
After installation, apply engine oil to each bearing rotating area.

Drive in a new balancer shaft bearing into the right crankcase until it is fully seated using the special tools.

TOOLS:

- [1] Balancer shaft bearing (marked side facing up):
[2] Driver 07749-0010000
[3] Attachment, 42 x 47 mm 07746-0010300
[4] Pilot, 20 mm 07746-0040500

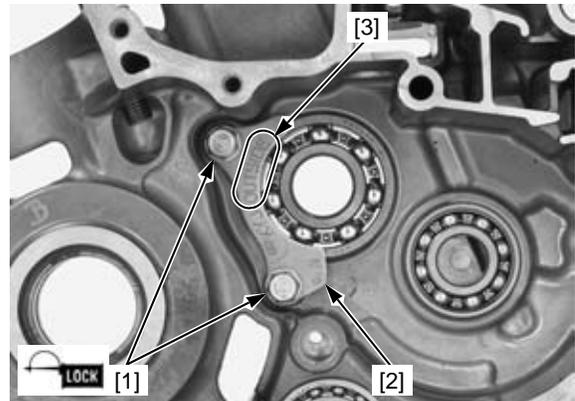
After installation, apply engine oil to the bearing rotating area.



Apply locking agent to the mainshaft bearing setting plate bolt [1] threads (page 1-15).

Install the setting plate [2] with its "OUTSIDE" mark [3] facing out.

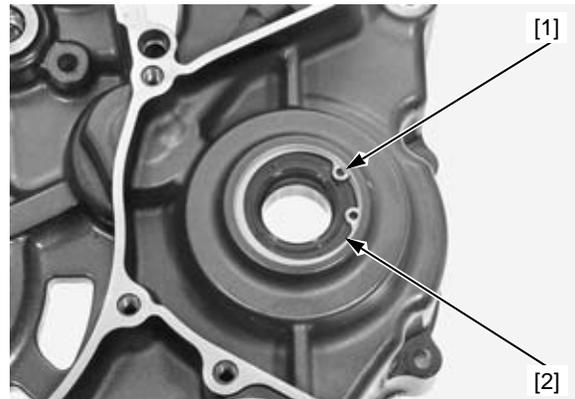
Install and tighten the bolts securely.



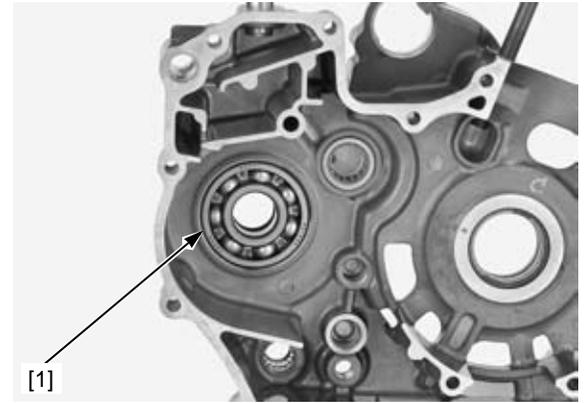
LEFT CRANKCASE SIDE

Remove the snap ring [1].

Remove the countershaft oil seal [2] from the left crankcase.



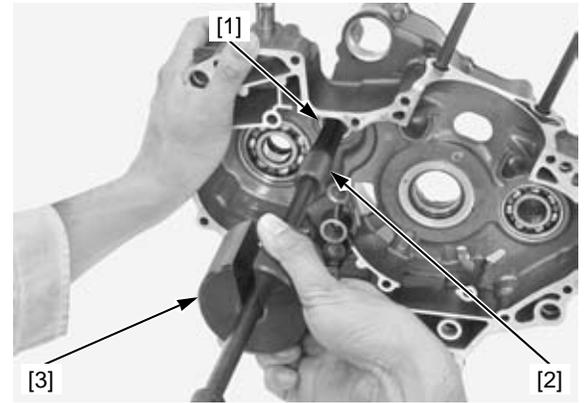
Drive out the countershaft bearing [1].



Remove the mainshaft needle bearing [1] using the special tools.

TOOLS:

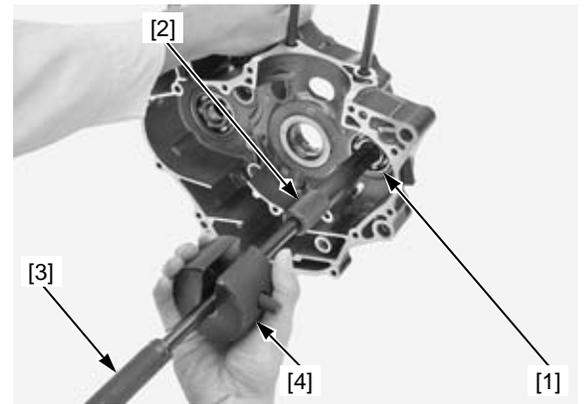
- [2] Bearing remover set, 17 mm 07936-3710300
- Remover handle 07936-3710100
- [3] Remover weight 07741-0010201



Remove the balancer shaft bearing [1] using the special tools.

TOOLS:

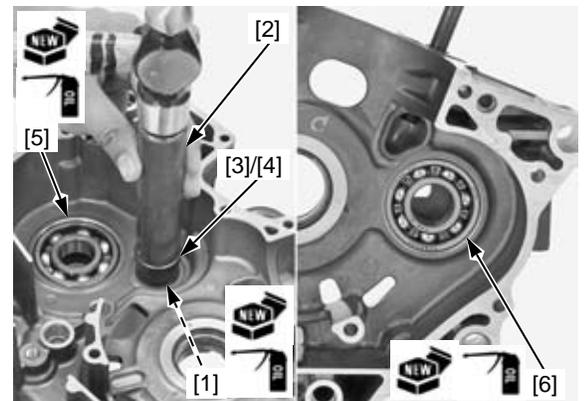
- [2] Bearing remover set, 20 mm 07936-3710600
- [3] Remover handle 07936-3710100
- [4] Remover weight 07741-0010201



Drive in new bearings into the left crankcase until they are fully seated using the special tools.

TOOLS:

- [1] Mainshaft needle bearing:
 - [2] Driver 07749-0010000
 - [3] Attachment, 28 x 30 mm 07946-1870100
 - [4] Pilot, 17 mm 07746-0040400
- [5] Countershaft bearing (marked side facing up):
 - Driver 07749-0010000
 - Attachment, 52 x 55 mm 07746-0010400
 - Pilot, 22 mm 07746-0041000
- [6] Balancer shaft bearing (marked side facing up):
 - Driver 07749-0010000
 - Attachment, 42 x 47 mm 07746-0010300
 - Pilot, 20 mm 07746-0040500



After installation, apply engine oil to each bearing rotating area.

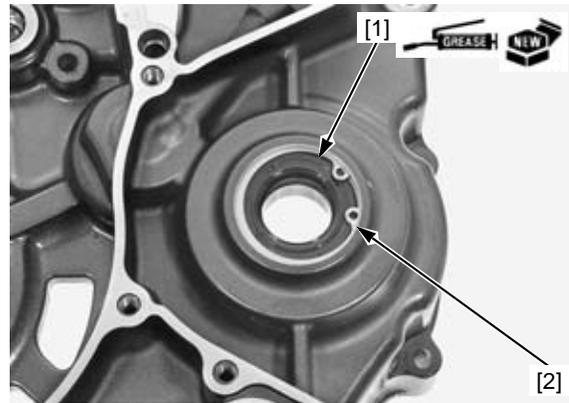
CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

Apply grease to a new countershaft oil seal [1] lips.

Install the countershaft oil seal with its marked side facing up, until it is flush with the snap ring groove.

Make sure the snap ring is firmly seated in the groove.

Install the snap ring [2].



CRANKCASE ASSEMBLY

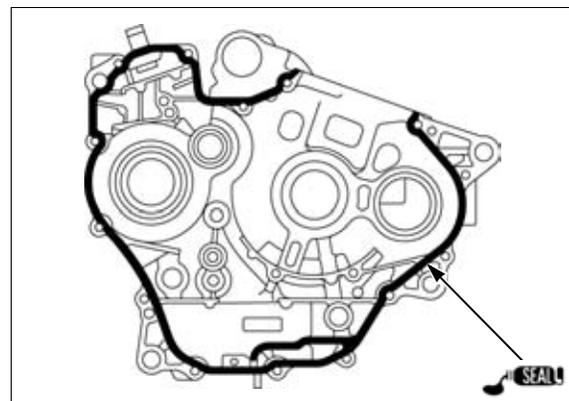
Clean the oil passages of each crankcase using a compressed air.

Check the oil passage for clogs.



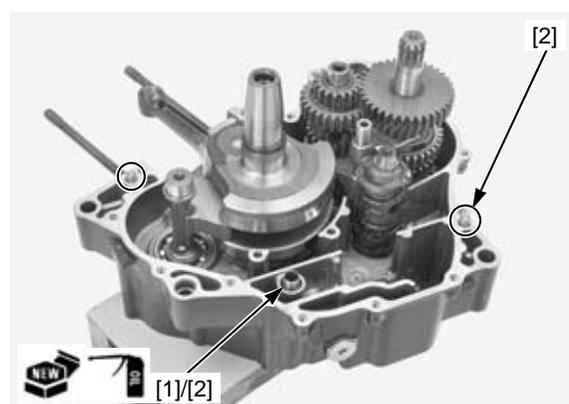
Clean the left and right crankcase mating surfaces thoroughly, being careful not to damage them and check for damage.

Apply a light but thorough coating of sealant (Three bond 1207B, 1215 or equivalent) to left crankcase mating surface except the oil passage area.



Apply engine oil to a new O-ring [1].

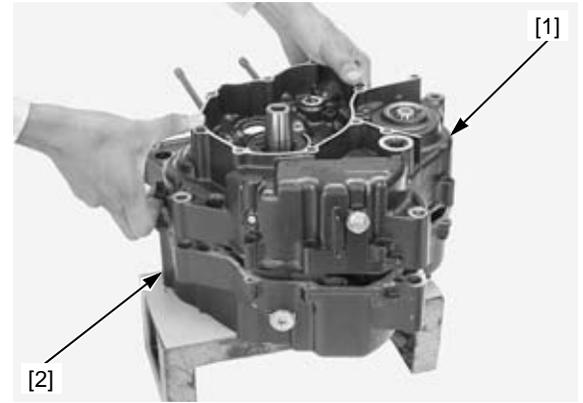
Install the dowel pins [2] and O-ring.



CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

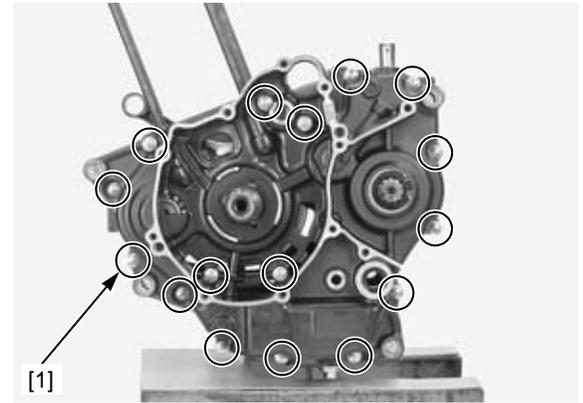
Do not force the crankcase halves together. If there is excessive force required, something is wrong. Remove the left crankcase and check for misaligned parts.

Install the left crankcase [1] on the right crankcase [2], being careful not to damage the oil seal lips.



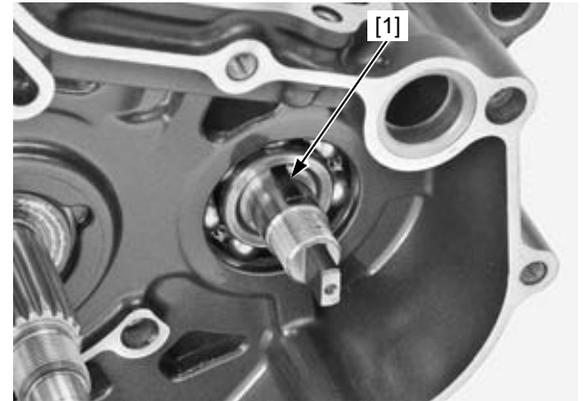
Install the crankcase bolts [1].

Tighten the bolts in a crisscross pattern in 2 or 3 steps.

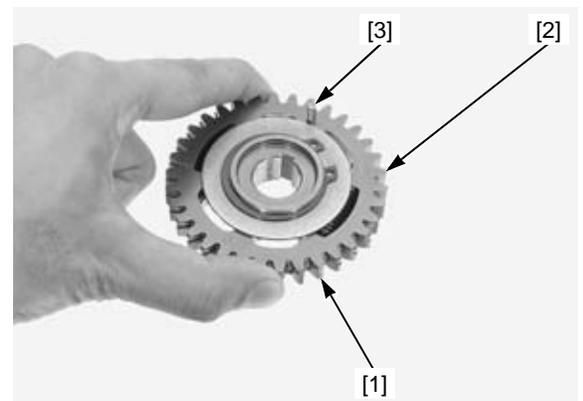


Be careful not to damage the key groove and balancer shaft.

Install the woodruff key [1] into the balancer shaft groove.

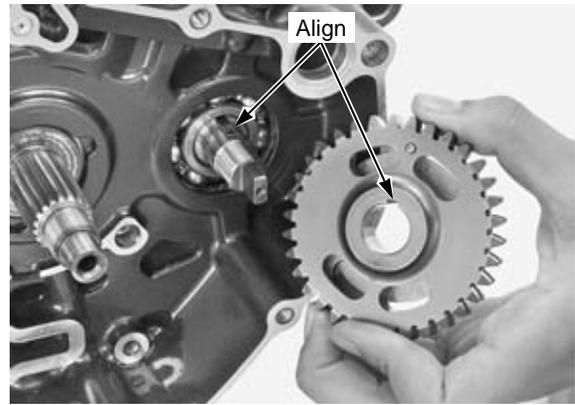


Align the balancer gear [1] and balancer sub gear [2] holes and install a 3 mm (0.12 in) pin [3] into the hole.



CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

Install the balancer driven gear assembly while aligning the woodruff key on the balancer shaft with balancer driven gear keyway.



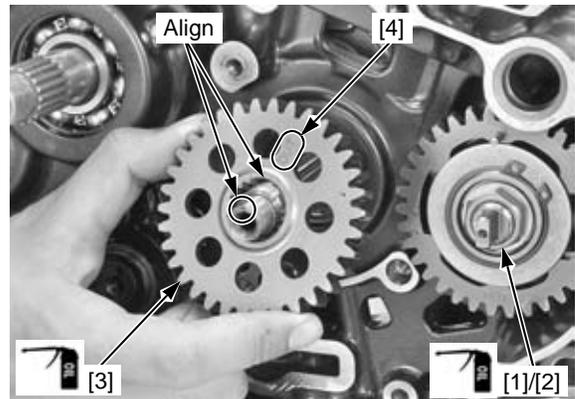
Apply engine oil to the balancer shaft nut [1] threads and seating surface.

Install the washer [2] and balancer shaft nut.

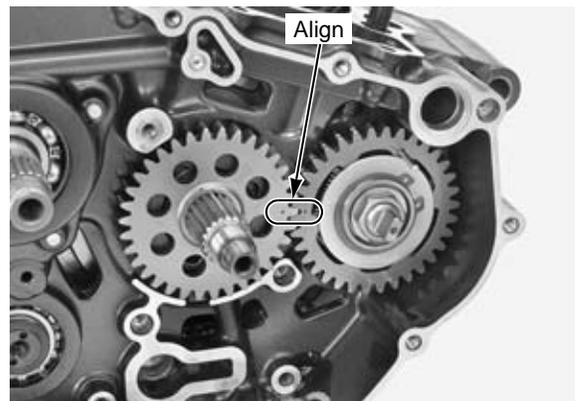
Apply engine oil to the balancer drive gear [3] teeth and install it while aligning its wide groove with the punch mark on the crankshaft.

NOTE:

Install the balancer drive gear with its "OUT" mark [4] facing out.



Align the punch marks of the balancer drive gear and balancer driven gear.



Insert the gear holder [1] between the balancer drive gear [2] and balancer driven gear [3].

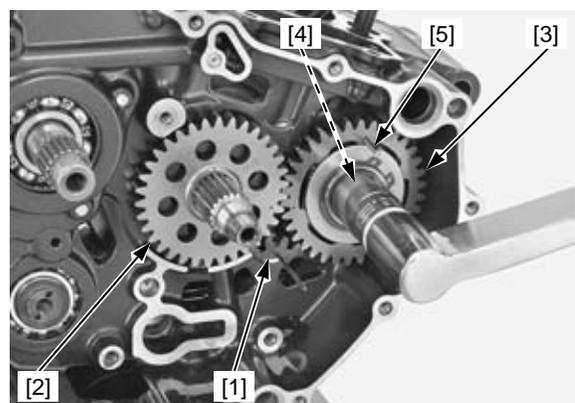
TOOL:

[1] Gear holder, M2.5 07724-0010100

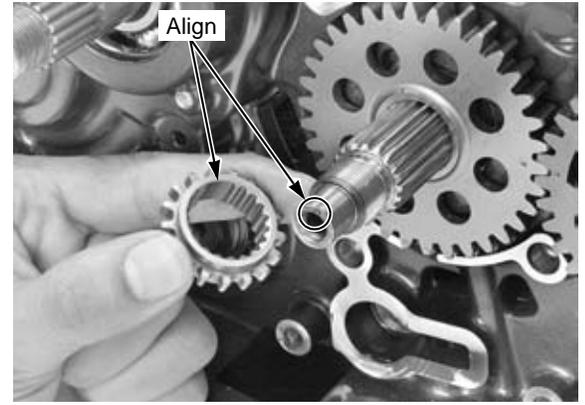
Tighten the balancer shaft nut [4] to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)

Remove a 3 mm (0.12 in) O.D. pin [5] from the balancer driven gear assembly.



Install the timing sprocket while aligning its wide groove with the punch mark on the crankshaft.

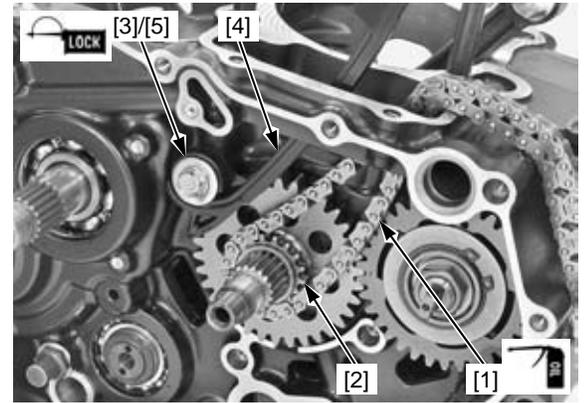


Apply engine oil to the cam chain [1] whole surface.
Install the cam chain through the crankcase.
Install the cam chain over the timing sprocket [2].

Apply locking agent to the cam chain tensioner pivot bolt [3] threads (page 1-12).
Install the cam chain tensioner [4], collar [5] and cam chain tensioner pivot bolt.
Tighten the cam chain tensioner pivot bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the removed parts (page 14-2) in the reverse order of removal.



MEMO

15. ENGINE REMOVAL/INSTALLATION

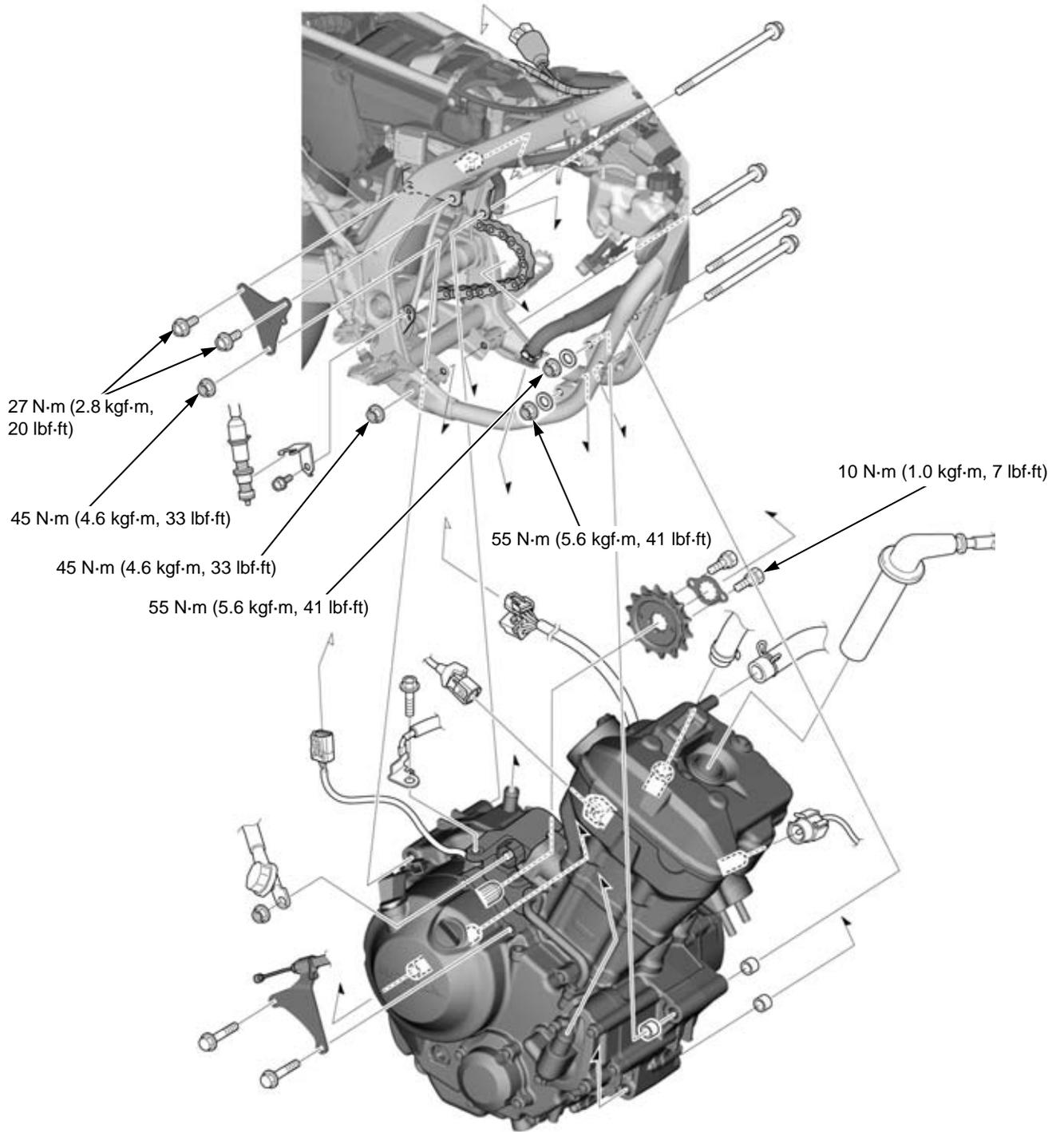
SERVICE INFORMATION	15-2	ENGINE REMOVAL	15-4
COMPONENT LOCATION	15-3	ENGINE INSTALLATION.....	15-7

SERVICE INFORMATION

GENERAL

- When removing/installing the engine, tape the frame around the engine beforehand for frame protection.
- When installing the engine, be sure to tighten the engine mounting fasteners to the specified torque in the specified sequence. If you make mistake in torque or sequence, loosen all mounting fasteners, then tighten them again to the specified torque in the correct sequence.
- The following components can be serviced with the engine installed in the frame.
 - Oil pump (page 8-4)
 - Throttle body (page 7-11)
 - Camshaft (page 10-6)
 - Water pump (page 9-8)
 - Clutch (page 12-9)
 - Gearshift linkage (page 12-14)
 - Stator/CKP sensor (page 13-4)
 - Flywheel (page 13-5)
 - Starter motor (page 6-4)
- The following components require engine removal for service.
 - Cylinder head/valves (page 10-13)
 - Cylinder/piston (page 11-3)
 - Crankshaft (page 14-6)
 - Transmission (page 14-10)
 - Balancer (page 14-14)

COMPONENT LOCATION



ENGINE REMOVAL/INSTALLATION

ENGINE REMOVAL

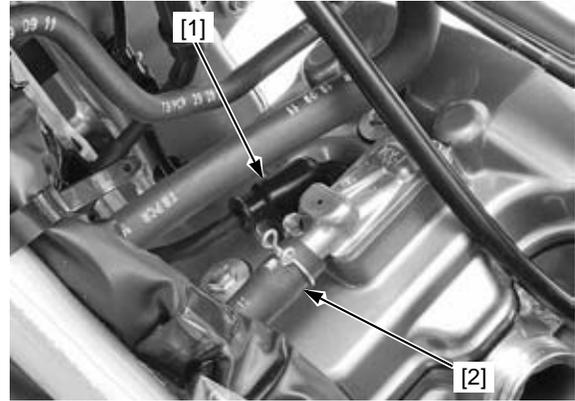
Drain the engine oil (page 3-9).
Drain the coolant (page 9-5).

Remove the following:

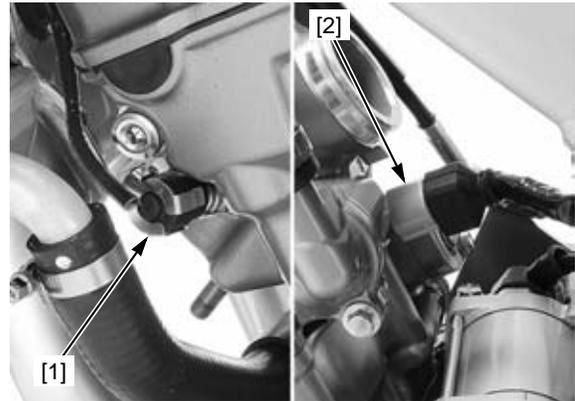
- Frame guard (page 2-6)
- Skid plate (page 2-5)
- Throttle body (page 7-11)
- Exhaust pipe/muffler (page 2-11)
- Gearshift pedal (page 12-14)
- Brake pedal (page 18-12)

Disconnect the following:

- Spark plug cap [1]
- PAIR air supply hose [2]



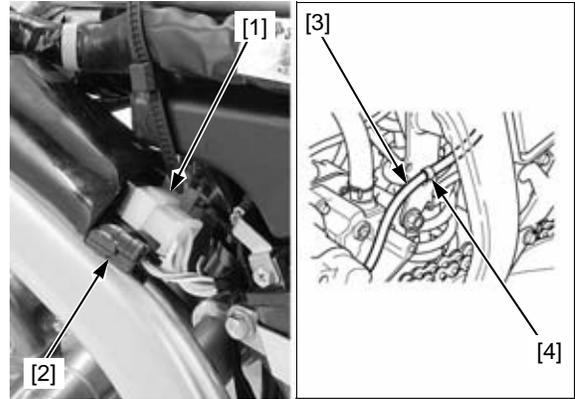
Disconnect the O₂ sensor cap [1] and ECT sensor 3P connector [2].



Disconnect the following:

- Alternator 3P connector [1]
- CKP sensor/neutral switch 3P (Black) connector [2]

Release the alternator wire [3] from the clamp [4].



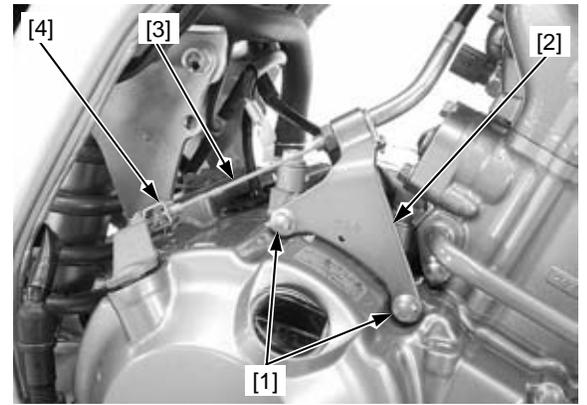
Open the harness band [1] and release the wires.

Disconnect the VS sensor 3P (Blue) connector [2].



ENGINE REMOVAL/INSTALLATION

Remove the bolts [1] and clutch cable guide [2], then disconnect the clutch cable [3] from the clutch lifter arm [4].

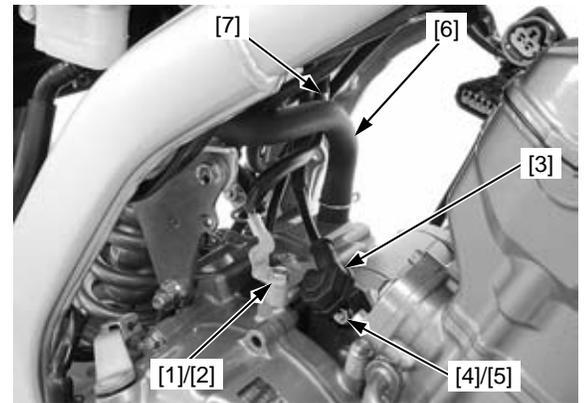


Remove the starter motor mounting bolt [1] and ground terminal [2].

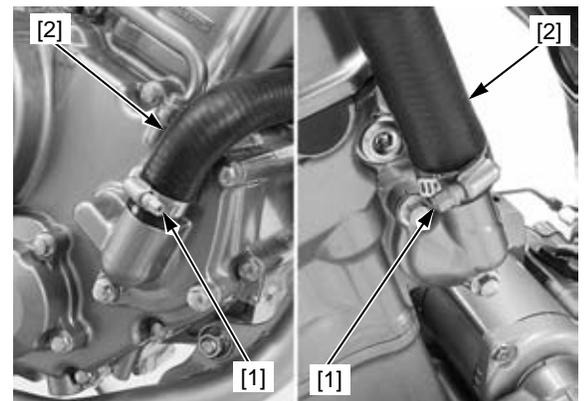
Release the rubber cap [3].

Remove the starter motor terminal nut [4] and starter motor cable terminal [5].

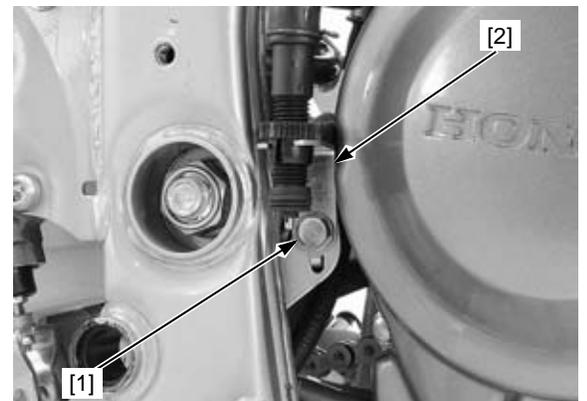
Disconnect the crankcase breather hose [6].
Release the VS sensor wire from the guide [7].



Loosen the water hose band screws [1] and disconnect the water hoses [2].



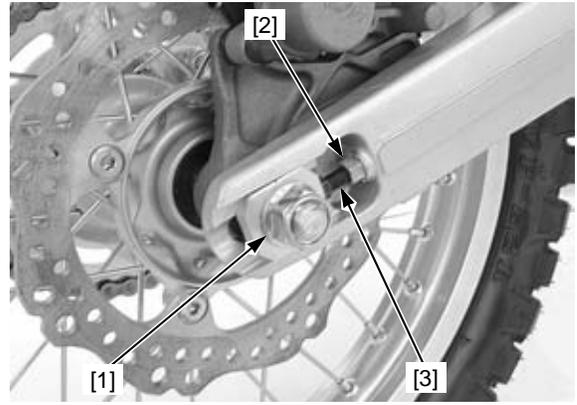
Remove the bolt [1] and rear brake light switch holder [2].



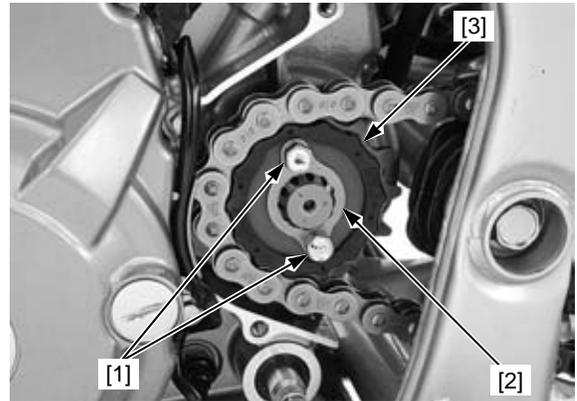
ENGINE REMOVAL/INSTALLATION

Loosen the rear axle nut [1], lock nuts [2] and drive chain adjusters [3].

Push the rear wheel forward and make the drive chain slack fully.

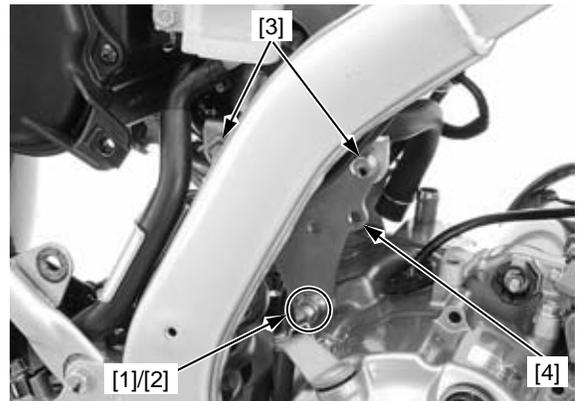


Remove the bolts [1], fixing plate [2] and drive sprocket [3].



Remove the rear engine hanger upper mounting nut [1] and bolt [2].

Remove the bolts [3] and engine hanger plate [4].



The jack height must be continually adjusted to relieve stress for ease of bolt removal.

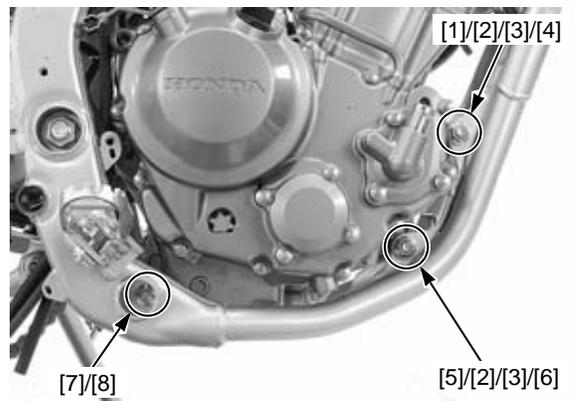
Support the engine using a jack or other adjustable support to ease of engine hanger bolts removal.

Remove the following:

- Front upper engine mounting nut [1]/washer [2]/two collars [3]/bolt [4]
- Front lower engine mounting nut [5]/washer/collar/bolt [6]
- Rear lower engine mounting nut [7]/bolt [8]

During engine removal, hold the engine securely and be careful not to damage the frame and engine.

From the right side of the vehicle, slightly lift up the engine and turn its lower rear side out of the frame, then remove the engine from the frame.



ENGINE INSTALLATION

During engine installation, hold the engine securely and be careful not to damage the frame and engine.

Place the engine in the frame, then loosely install all the bolts [1], collars [2], washers [3] and nuts.

Tighten the rear lower engine mounting nut [4] to the specified torque.

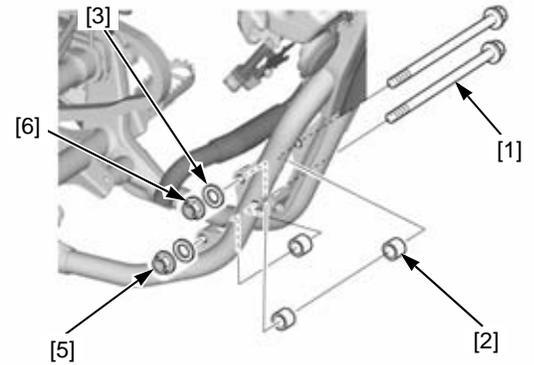
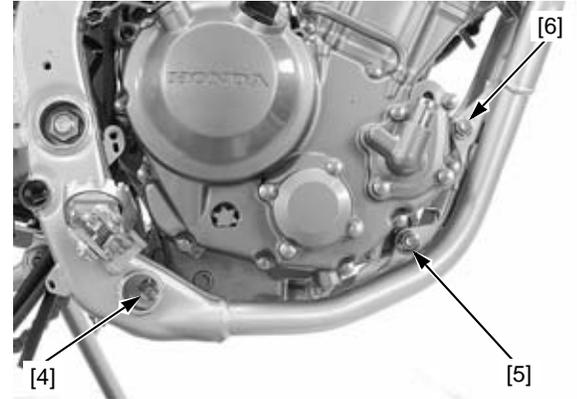
TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)

Tighten the front lower engine mounting nut [5] to the specified torque.

TORQUE: 55 N·m (5.6 kgf·m, 41 lbf·ft)

Tighten the front upper engine mounting nut [6] to the specified torque.

TORQUE: 55 N·m (5.6 kgf·m, 41 lbf·ft)

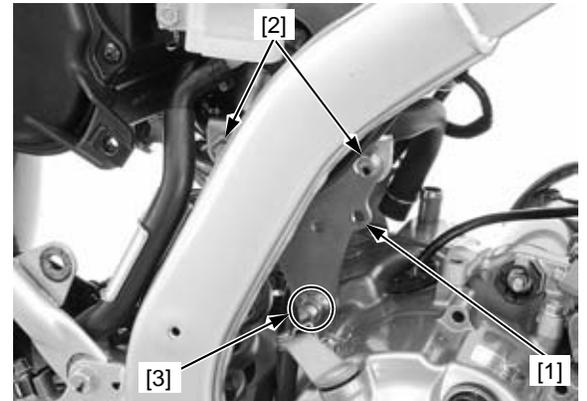


With the engine hanger plate [1] in position, tighten the engine hanger plate bolts [2] to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Tighten the rear engine hanger upper mounting nut [3] to the specified torque.

TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)



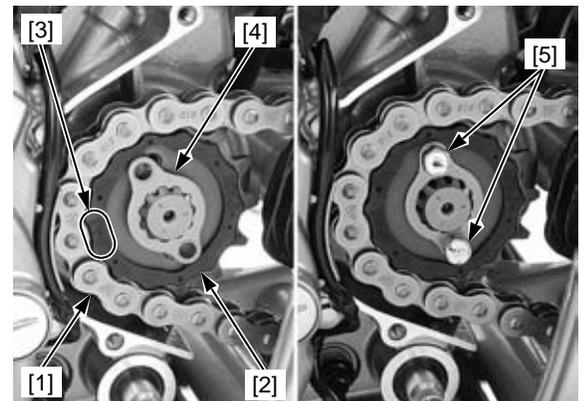
Install the drive chain [1] over the drive sprocket [2] with the "14T" mark [3] of the sprocket facing out.

Install the fixing plate [4].

Rotate the fixing plate and align the holes in the plate with the bolt holes in the sprocket.

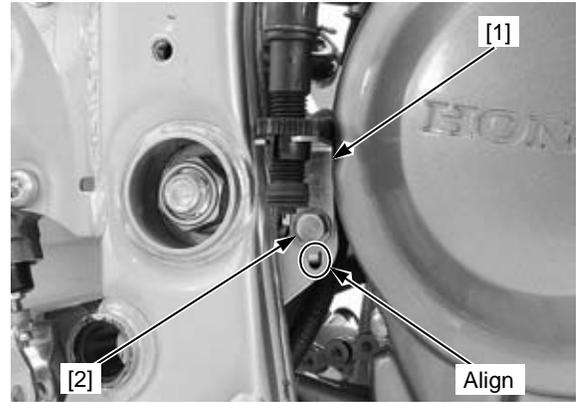
Install and tighten the drive sprocket fixing plate bolts [5] to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

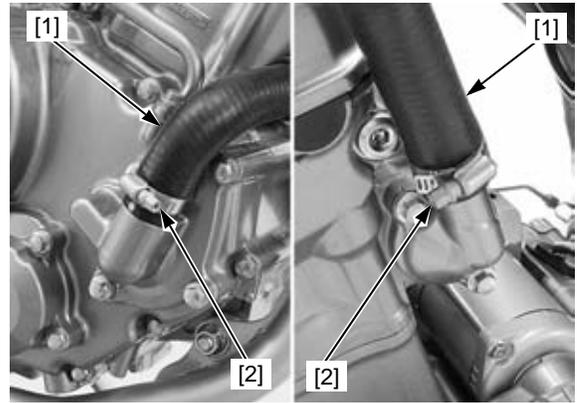


ENGINE REMOVAL/INSTALLATION

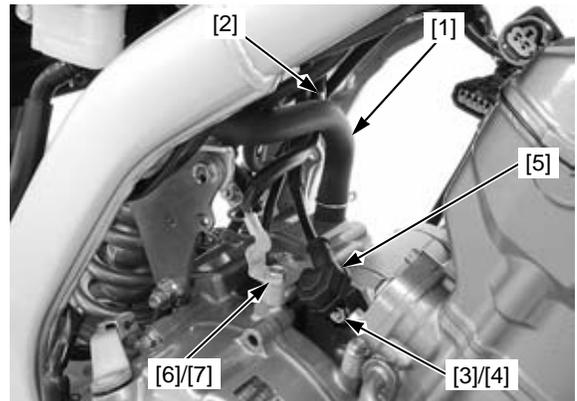
Install the rear brake light switch holder [1] while aligning its tab with the frame hole. Install and tighten the bolt [2].



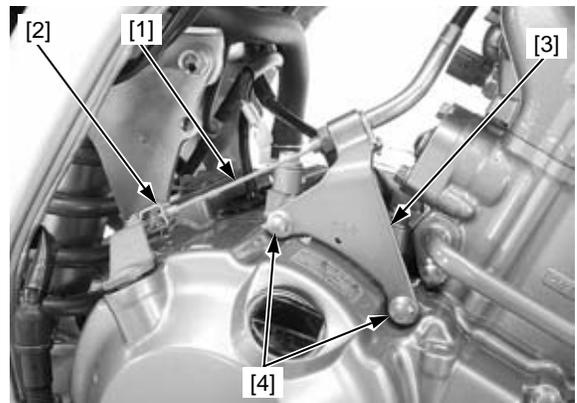
Connect the water hoses [1] and tighten the water hose band screws [2] (page 9-7).



Connect the crankcase breather hose [1].
Route the VS sensor wire through the guide [2].
Install and tighten the starter motor terminal nut [3] with starter motor cable terminal [4].
Install the rubber cap [5].
Install and tighten the starter motor mounting bolt [6] with ground terminal [7].



Connect the clutch cable [1] to the clutch lifter arm [2].
Install clutch cable guide [3] and tighten the bolts [4].



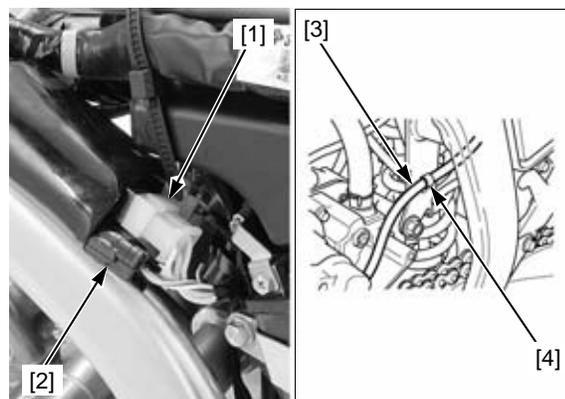
Close the harness band [1] and secure the wires.
Connect the VS sensor 3P (Blue) connector [2].



Connect the following:

- Alternator 3P connector [1]
- CKP sensor/neutral switch 3P (Black) connector [2]

Secure the alternator wire [3] with the clamp [4].

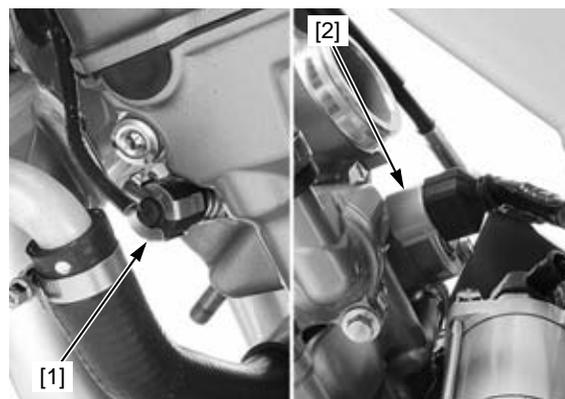


Connect the O₂ sensor cap [1].

NOTICE

- Take care not to tilt the O₂ sensor cap when connecting the cap to the O₂ sensor.
- Do not turn the O₂ sensor cap after connecting it.

Connect the ECT sensor 3P connector [2].



Connect the following:

- Spark plug cap [1]
- PAIR air supply hose [2]

Install the following:

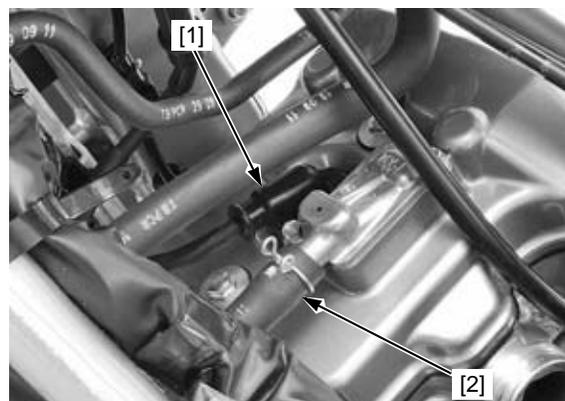
- Brake pedal (page 18-12)
- Gearshift pedal (page 12-17)
- Exhaust pipe/muffler (page 2-11)
- Throttle body (page 7-13)
- Skid plate (page 2-5)
- Frame guard (page 2-6)

Inspect the following:

- Drive chain slack (page 3-12)
- Throttle grip freeplay (page 3-3)
- Clutch lever freeplay (page 3-18)

Fill the engine with the recommended engine oil (page 3-9).

Fill the recommended coolant and bleed the air (page 9-5).



MEMO

16. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION.....	16-2	FORK.....	16-6
TROUBLESHOOTING.....	16-2	HANDLEBAR	16-16
COMPONENT LOCATION	16-3	STEERING STEM	16-21
FRONT WHEEL.....	16-4		

SERVICE INFORMATION

GENERAL

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Raise the front wheel off the ground by supporting the frame securely when servicing.
- For hydraulic brake system service (page 18-3).
- After the front wheel installation, check the brake operation by applying the brake lever.

TROUBLESHOOTING

Hard steering

- Steering bearing fork pipe too tight
- Worn or damaged steering head bearings
- Worn or damaged steering head bearing races
- Damaged steering stem
- Insufficient tire pressure
- Faulty front tire

Steers to one side or does not track straight

- Bent fork leg
- Damaged or loose steering head bearings
- Worn wheel bearings
- Bent front axle
- Wheel installed incorrectly
- Bent frame
- Worn swingarm pivot components (page 17-10)

Front wheel wobbles

- Bent rim
- Worn or damaged wheel bearings
- Faulty front tire
- Low tire pressure
- Loose or broken spokes
- Loose front axle fasteners

Wheel turns hard

- Faulty wheel bearings
- Bent axle
- Brake drag (page 18-2)

Soft suspension

- Weak fork springs
- Low fluid level in fork
- Wrong type of fluid in fork
- Low tire pressure

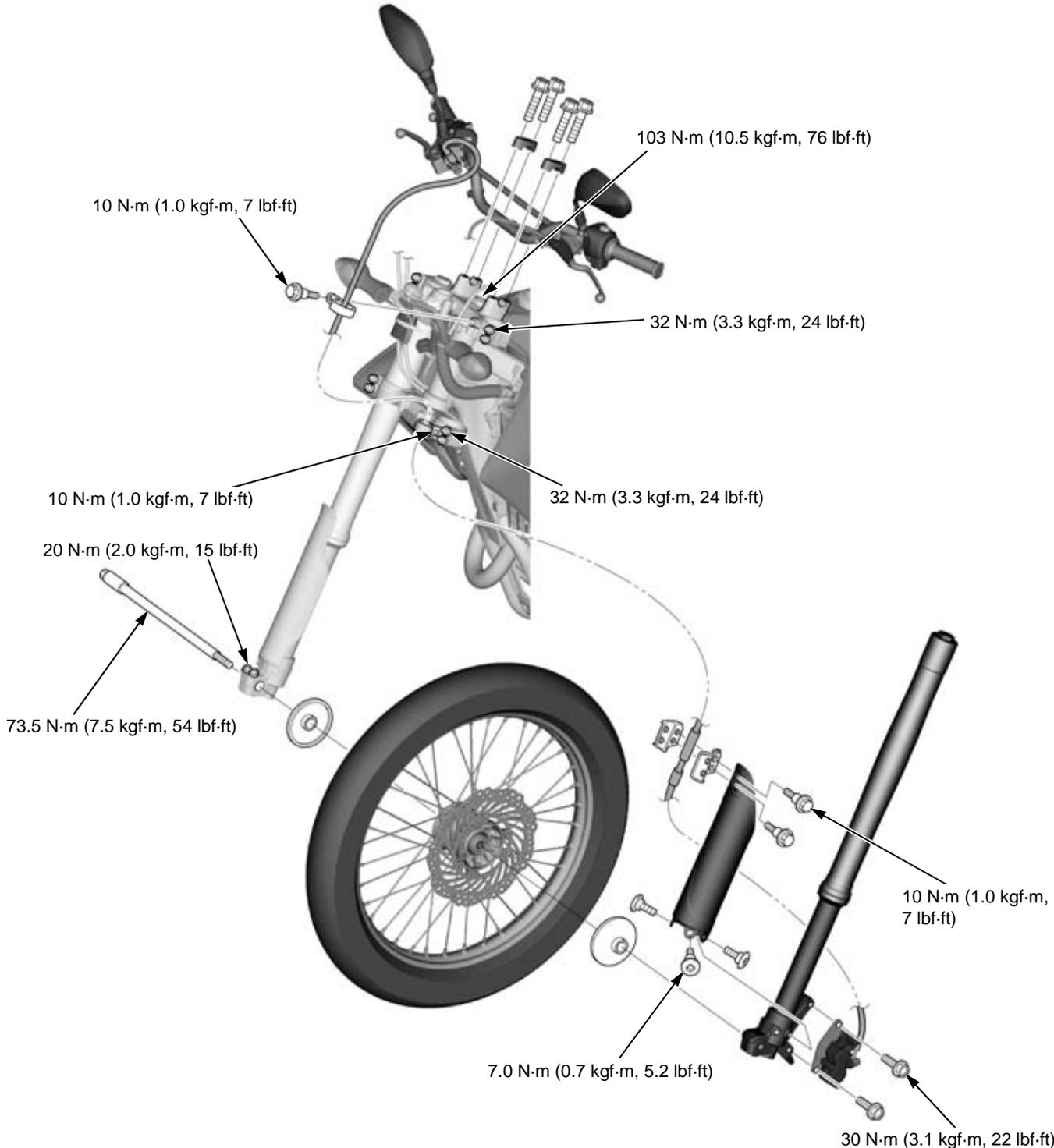
Stiff suspension

- Bent fork pipes
- Fork pipe binds
- High fluid level in fork
- Incorrect fluid weight (high viscosity)
- Clogged fork fluid passage
- High tire pressure

Front suspension noise

- Loose fork fasteners
- Worn slider or fork pipe bushing
- Low fluid level in fork

COMPONENT LOCATION



FRONT WHEEL

REMOVAL/INSTALLATION

Raise the front wheel off the ground by placing a work stand or box under the frame.

Loosen the axle pinch bolts [1] on the right fork leg and remove the front axle [2].

Remove front wheel and side collars [3].

NOTE:

- Do not operate the brake lever after removing the wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.

Apply thin coat of grease to the axle outer surface.
Install the side collars to the both sides of the wheel.

Place the wheel between the fork legs while inserting the brake disc between the brake pads.

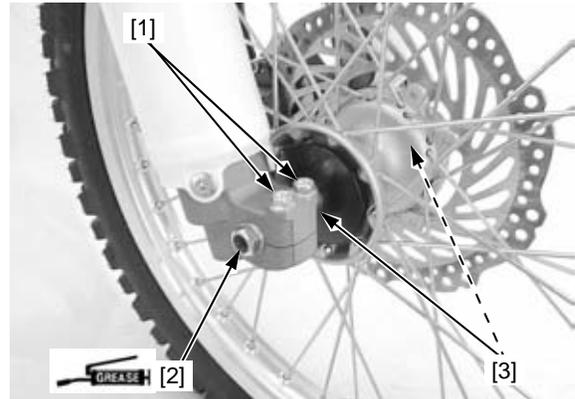
Install the front axle from the right side of the vehicle, then tighten it to the specified torque.

TORQUE: 73.5 N·m (7.5 kgf·m, 54 lbf·ft)

With the front brake applied, pump the forks up and down several times to seat the axle and check the brake operation.

Tighten the axle pinch bolts to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



INSPECTION

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

Replace the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub.

Inspect the following parts for damage, abnormal wear, deformation, looseness or bend.

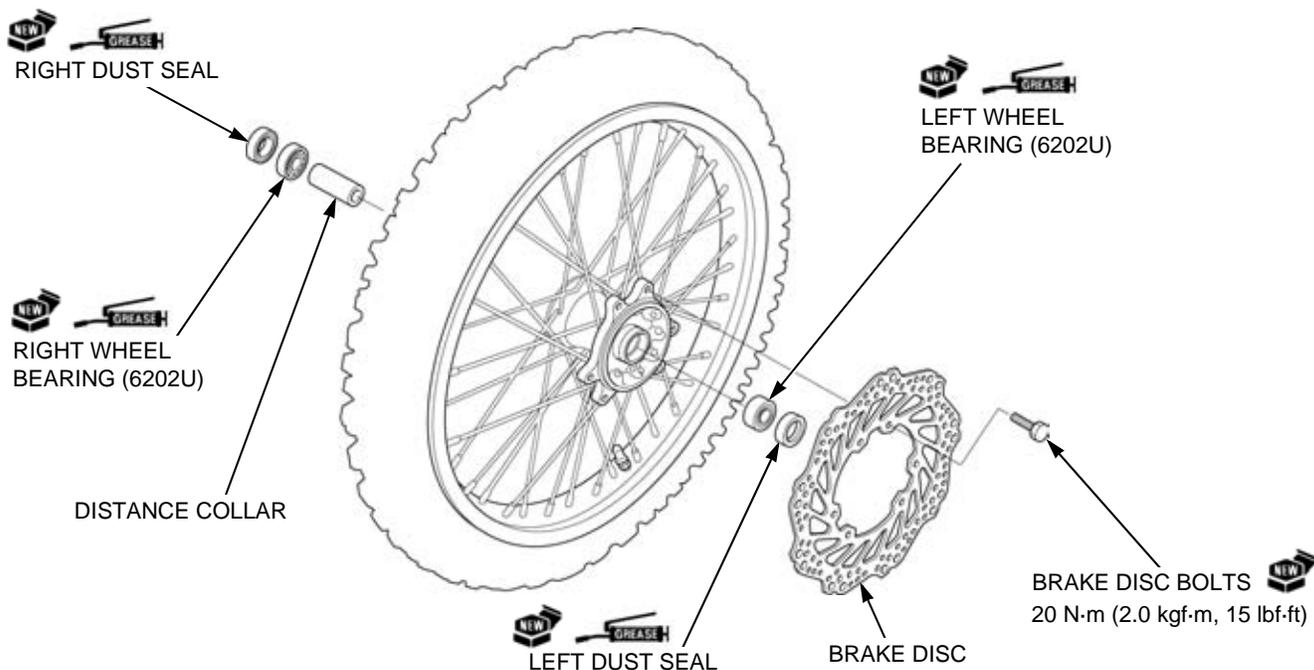
- Front axle
- Spoke
- Wheel rim

Measure each part according to FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS (page 1-8).

Replace any part if it is out of service limit.

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the front wheel as following illustration.

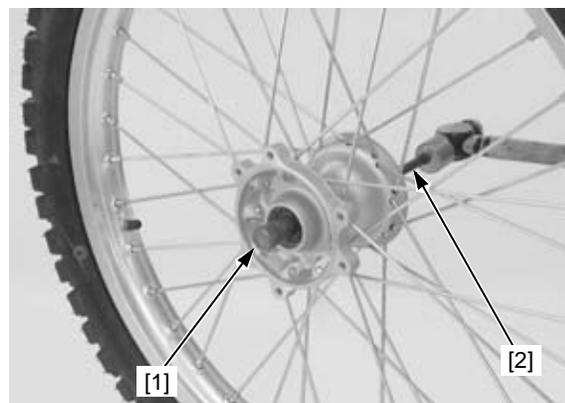


BEARING REPLACEMENT

Install the remover head [1] into the bearing.
 From the opposite side of the wheel, install the remover shaft [2] and drive the bearing out of the wheel hub.
 Remove the distance collar and drive out the other bearing.

TOOLS:

- [1] Bearing remover head, 15 mm 07746-0050400
- [2] Bearing remover shaft 07746-0050100



Pack new bearing cavities with grease.

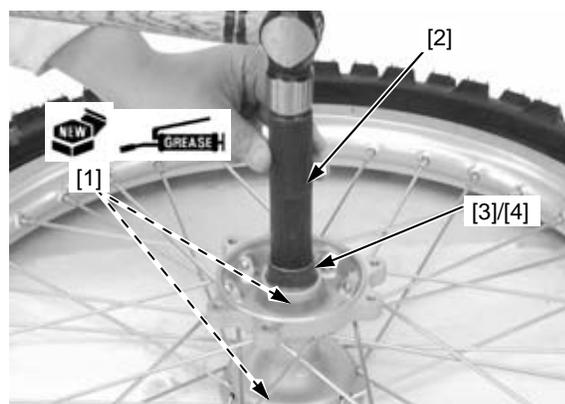
Drive in a new left side (brake disc side) bearing [1] squarely with the sealed side facing up until it is fully seated.

TOOLS:

- [2] Driver 07749-0010000
- [3] Attachment, 32 x 35 mm 07746-0010100
- [4] Pilot, 15 mm 07746-0040300

Install the distance collar.

Drive in a new right side bearing with the sealed side facing up until its inner race is fully seated on the distance collar.



FRONT WHEEL/SUSPENSION/STEERING

WHEEL CENTER ADJUSTMENT

Adjust the hub position so that the distance from the left end surface [1] of the hub center to the side of rim [2] is within the following specification as shown.

WHEEL HUB-TO-RIM DISTANCE:

23.45 ± 1.0 mm (0.92 ± 0.04 in)

WHEEL RIM RUNOUT:

Radial: 2.0 mm (0.08 in) or less

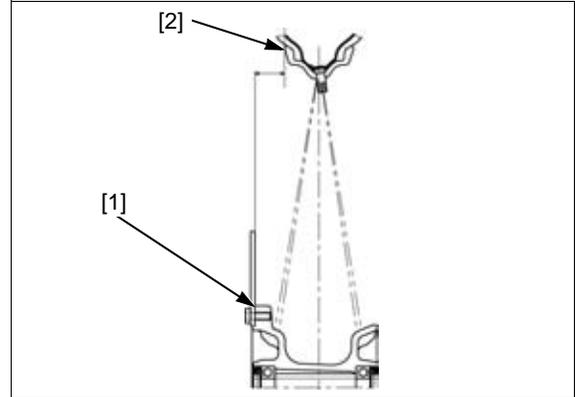
Axial: 2.0 mm (0.08 in) or less

Tighten the spokes in 2 or 3 progressive steps.

TOOL:

Spoke wrench, 5.8 x 6.1 mm 07701-0020300

TORQUE: 3.7 N·m (0.4 kgf·m, 2.7 lbf·ft)



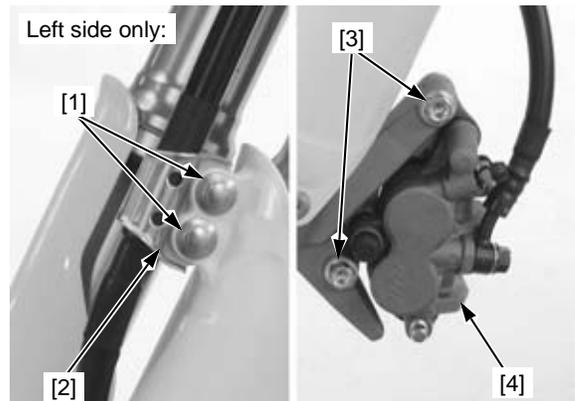
FORK

REMOVAL

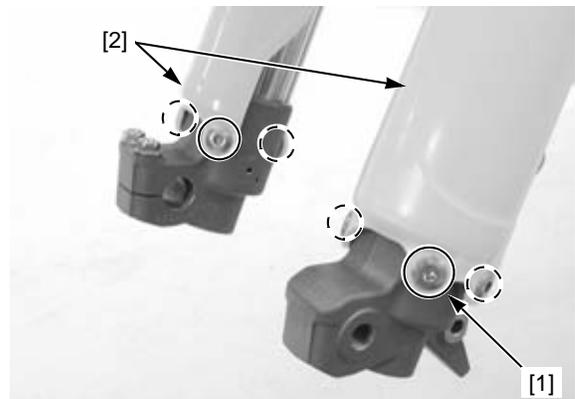
Remove the front wheel (page 16-4).

Remove the following from the left fork leg:

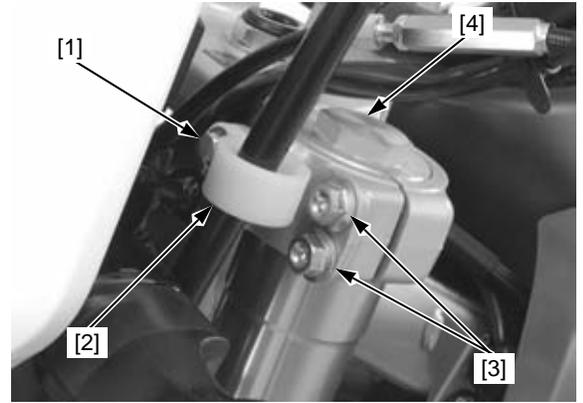
- Bolts [1]
- Brake hose clamp [2]
- Brake caliper mounting bolts [3]
- Brake caliper [4]



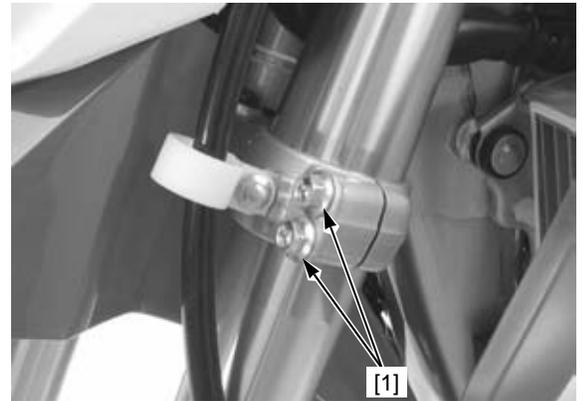
- Socket bolts [1]
- Fork protectors [2]



Left side: Remove the bolt [1] and brake hose guide [2].
Loosen the fork top bridge pinch bolts [3].
If you will disassemble the fork, loosen the fork cap [4],
but do not remove it.



Loosen the fork bottom pinch bolts [1] while supporting the fork leg.
Pull the fork leg down and remove it out of the fork bridges.



INSTALLATION

Install the outer tube into the bottom and top bridges.
Align the top of the outer tube with the upper surface of the top bridge.

Tighten the bottom bridge pinch bolts [1] to the specified torque.

TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

Tighten the fork cap [2] to the specified torque if it was removed.

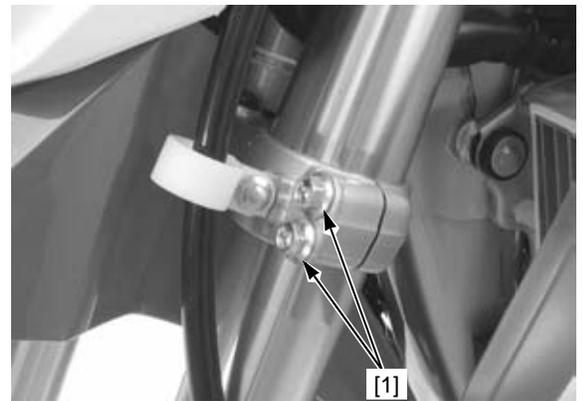
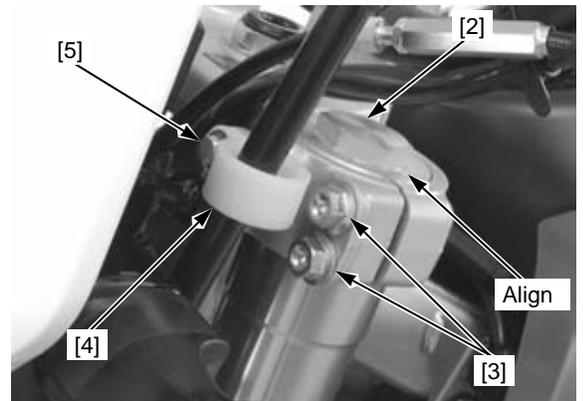
TORQUE: 35 N·m (3.6 kgf·m, 26 lbf·ft)

Tighten the top bridge pinch bolts [3] to the specified torque.

TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

Left side: Install the brake hose guide [4] and tighten the bolt [5] to the specified torque.

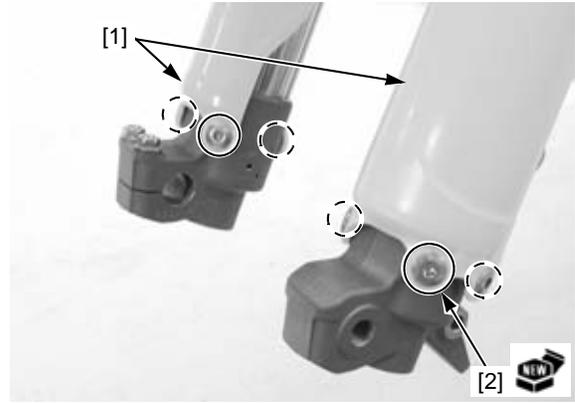
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



FRONT WHEEL/SUSPENSION/STEERING

Install the fork protectors [1].
Install and tighten the new socket bolts [2] to the specified torque.

TORQUE: 7.0 N·m (0.7 kgf·m, 5.2 lbf·ft)



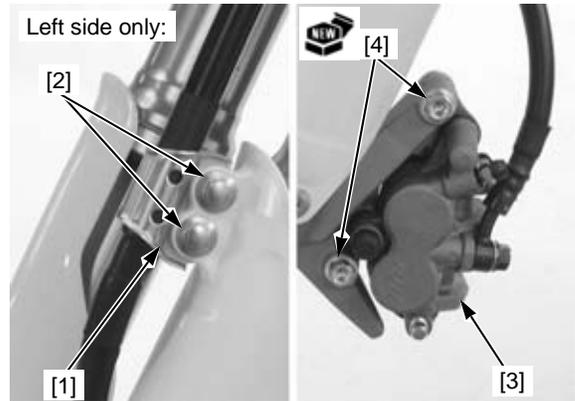
Install the brake hose clamp [1] to the left fork leg and tighten the bolts [2] to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the brake caliper [3] with new mounting bolts [4] and tighten them to the specified torque.

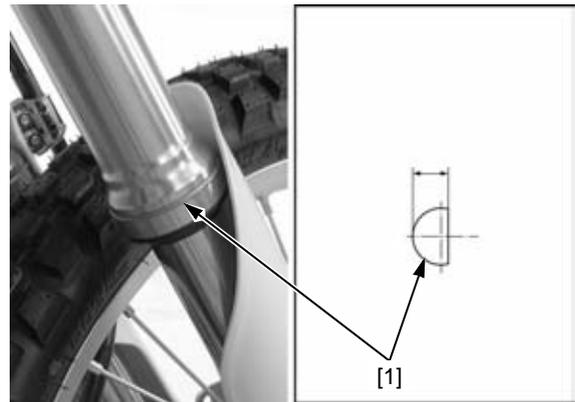
TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Install the front wheel (page 16-4).



Inspect the wear rings [1] for wear or damage.

Replace the wear ring, if it is 1.5 mm (0.06 in) or flat with the outer tube.



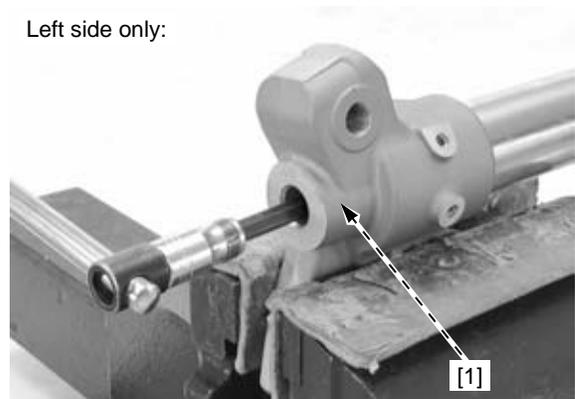
DISASSEMBLY

NOTE:

- Clean the fork assembly, the sliding surface of the fork pipe and bottom of the slider around the center bolt before disassembling the fork.

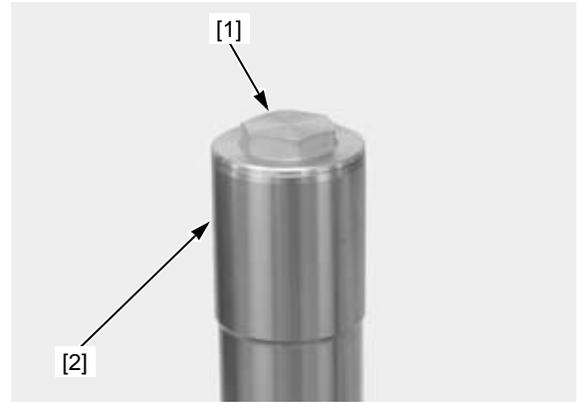
Left side: Hold the fork pipe in a vise with soft jaws or shop towels.

Loosen the fork center bolt [1], but do not remove it yet.



FRONT WHEEL/SUSPENSION/STEERING

Right side fork cap bolt is under spring pressure; use care when loosening it. Completely loosen the fork cap bolt [1] and lower the outer tube [2].

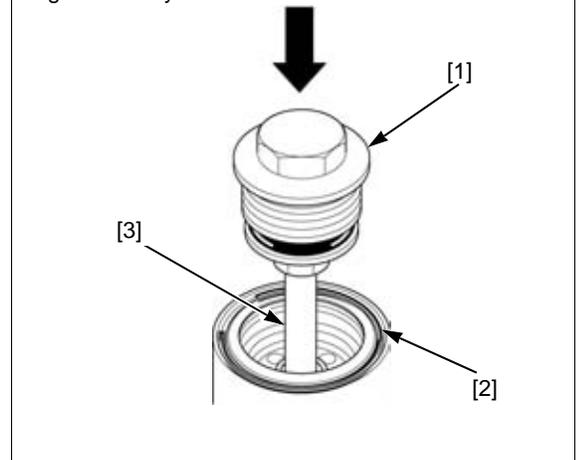


Pour out the fork fluid by pumping the fork pipe up and down several times.



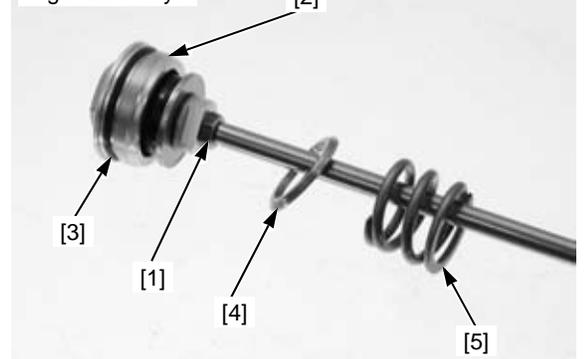
Right side: Push the fork cap [1] down and compress the fork spring, then remove the stopper ring [2] from the groove in the fork pipe.
Remove the fork rod assembly [3].

Right side only:



Right side: Loosen the lock nut [1] while holding the fork cap [2] with a wrench, then remove the fork cap.
Remove the O-ring [3] from the fork cap groove.
Remove the spring seat [4] and rebound spring [5].

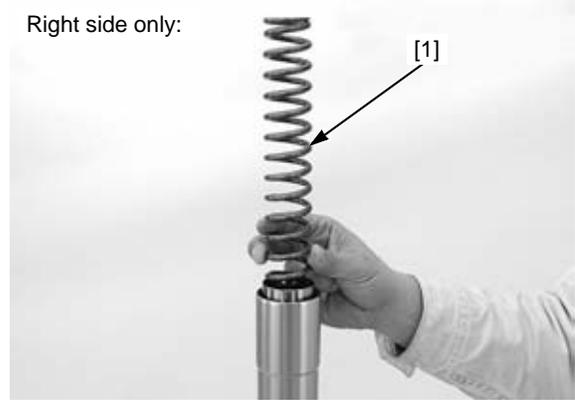
Right side only:



FRONT WHEEL/SUSPENSION/STEERING

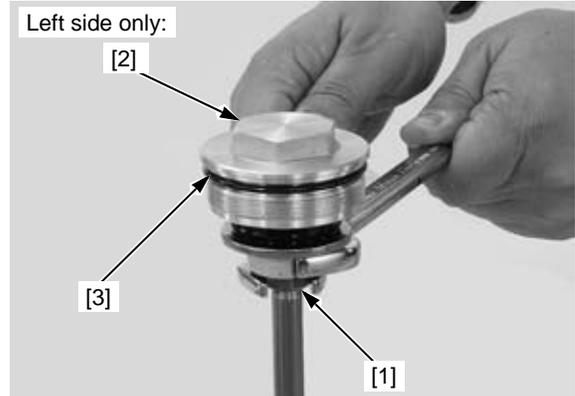
Right side: Remove the fork spring [1].

Right side only:



Left side: Loosen the lock nut [1] while holding the fork cap [2] with a wrench, then remove the fork cap.
Remove the O-ring [3] from the fork cap groove.

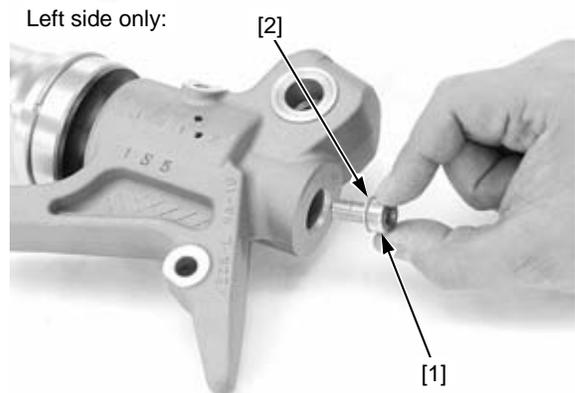
Left side only:



Left side: Remove the following:

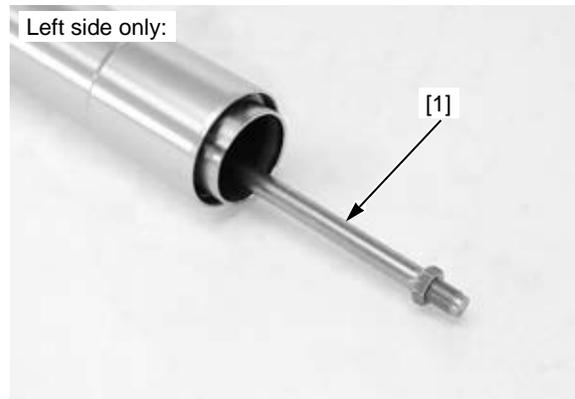
- Fork center bolt [1]
- Sealing washer [2]

Left side only:



Left side: - Inner damper [1]

Left side only:

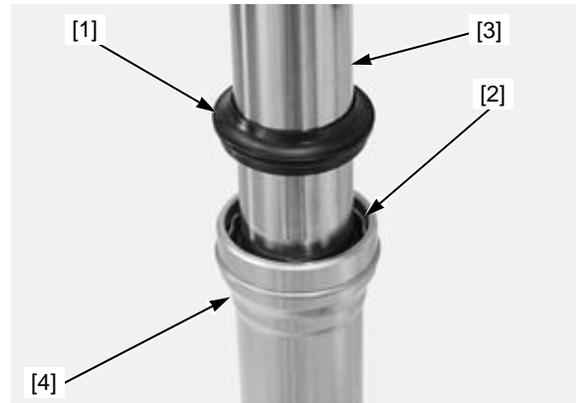


Be careful not to scratch the fork pipe sliding surface.

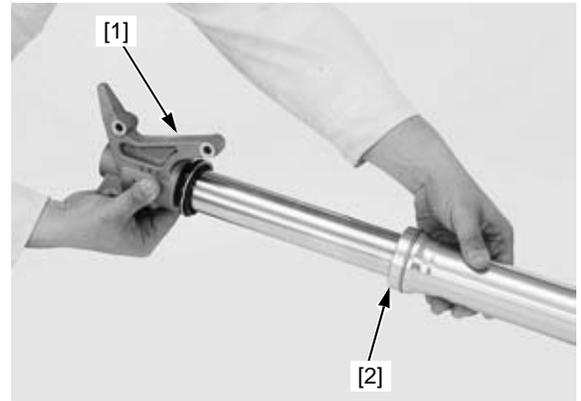
- Dust seal [1]
- Stopper ring [2]

Check that the fork pipe [3] moves smoothly in the outer tube [4].

If the movement is not smooth, check the fork pipe for bend or bushing for wear or damage. If they are normal, inspect the outer tube.



Using quick successive motions, pull the fork pipe [1] out of the outer tube [2]. The guide bushing will be forced out by the fork pipe bushing.

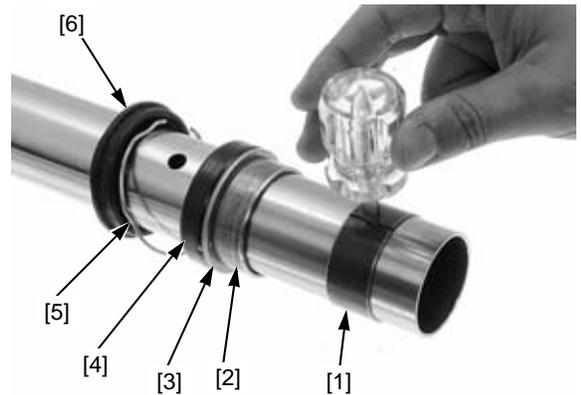


Do not damage the slider bushing, especially the sliding surface. To prevent loss of tension, do not open the slider bushing more than necessary.

Carefully remove the slider bushing [1] by prying the slot with a screwdriver until the slider bushing can be pulled off by hand.

Remove the following:

- Guide bushing [2]
- Back-up ring [3]
- Oil seal [4]
- Stopper ring [5]
- Dust seal [6]



INSPECTION

Inspect the following parts for damage, abnormal wear, bend, deformation, scoring and teflon coating wear

- Fork pipes
- Outer tubes
- Fork spring
- Slider bushings
- Guide bushings
- Back-up rings

Measure each part according to FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS (page 1-8).

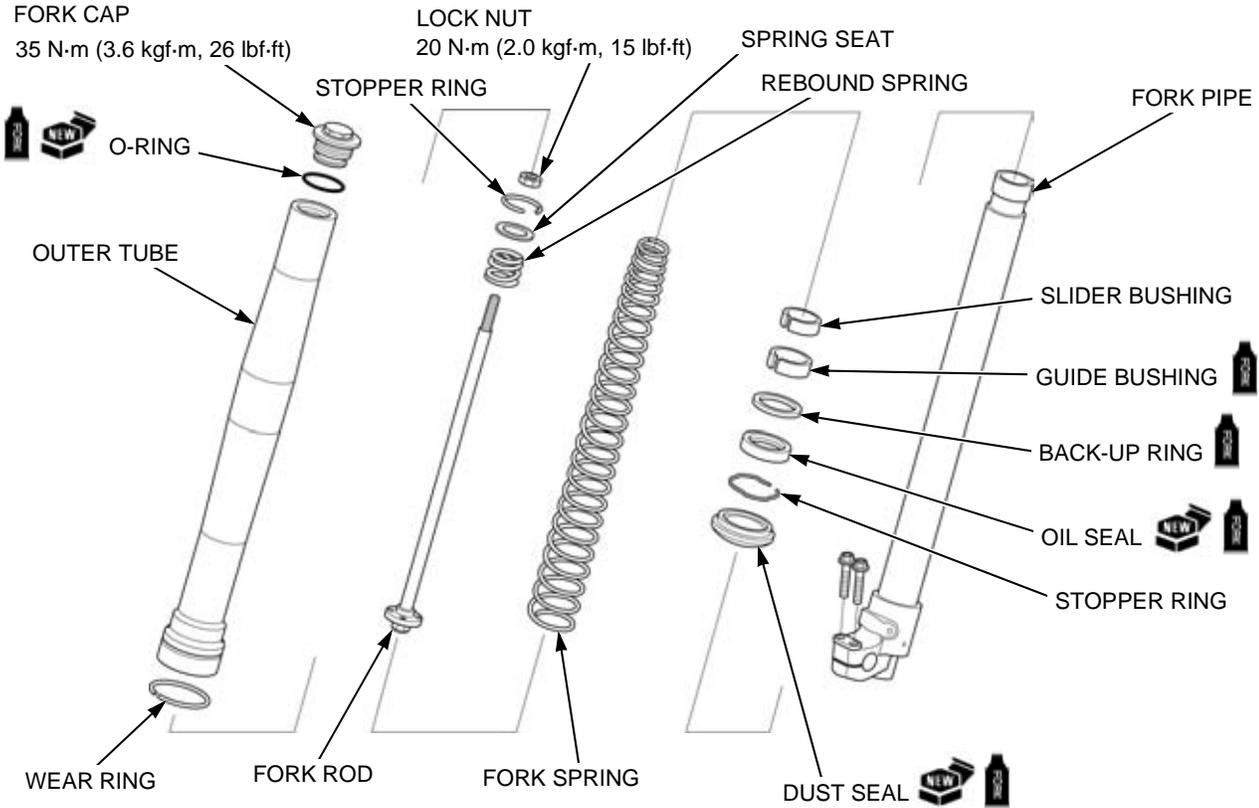
Replace any part if it is out of service limit.

FRONT WHEEL/SUSPENSION/STEERING

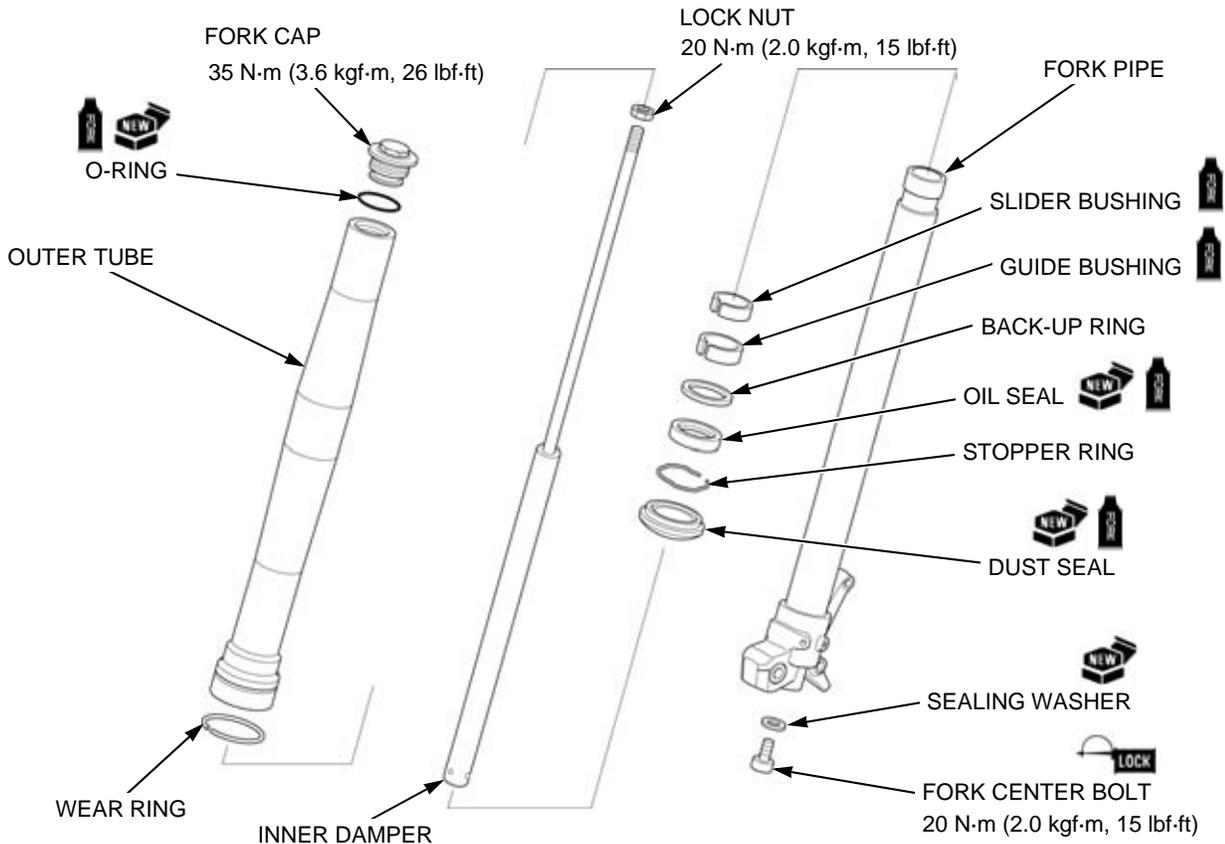
ASSEMBLY

Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them off completely.

RIGHT SIDE



LEFT SIDE

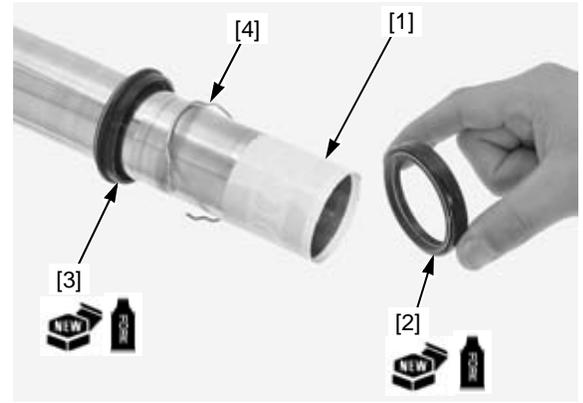


Wrap the end of the fork pipe with tape [1].
Coat new fork oil seal [2] and dust seal [3] lips with recommended fork oil.

Install the dust seal and stopper ring [4] onto the fork pipe.

Install the oil seal onto the fork pipe with its marked side facing the dust seal.

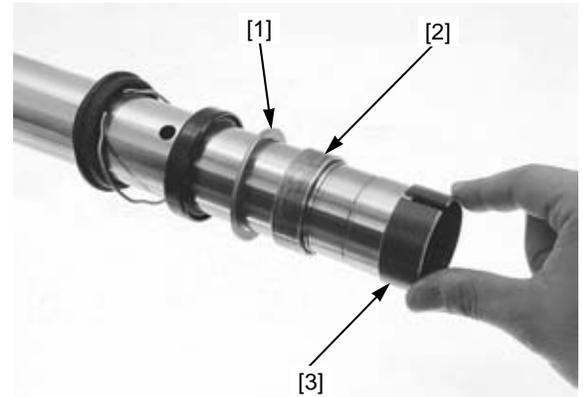
Remove the tape from the end of the fork pipe.



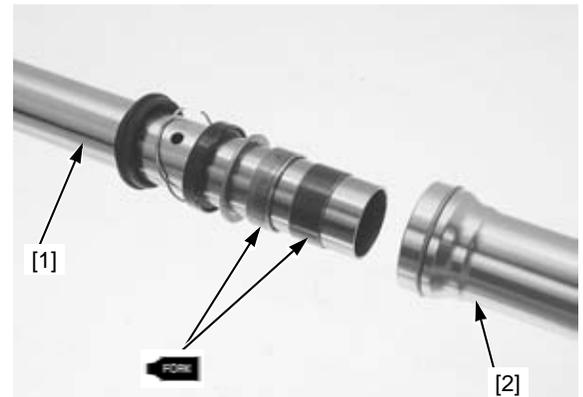
Install the back-up ring [1], guide bushing [2] and slider bushing [3].

NOTE:

- Be careful not to damage the slider bushing coating. Do not open the slider bushing more than necessary.
- Install the back-up ring with its flange side facing toward the guide bushing.
- Remove the burrs from the bushing mating surface, being careful not to peel off the coating.



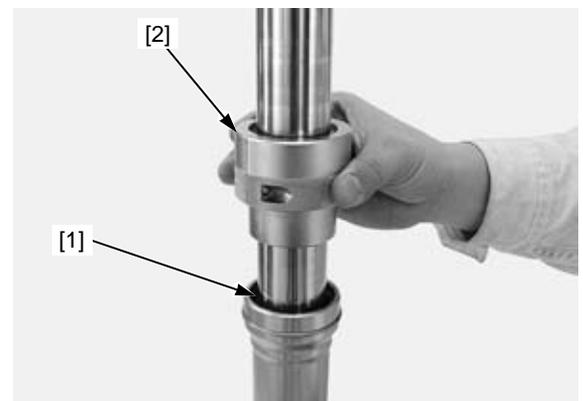
Coat the guide bushing and slider bushing with recommended fork oil, and install the fork pipe [1] into the outer tube [2].



Drive in the oil seal [1] into the outer tube using the special tool.

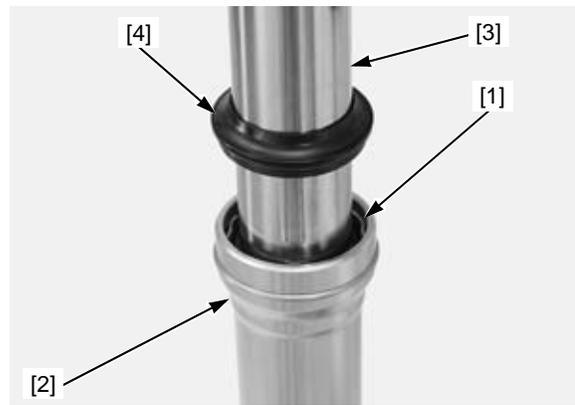
TOOL:

[2] Fork seal driver, 43.2 mm 07YMD-MCF0100

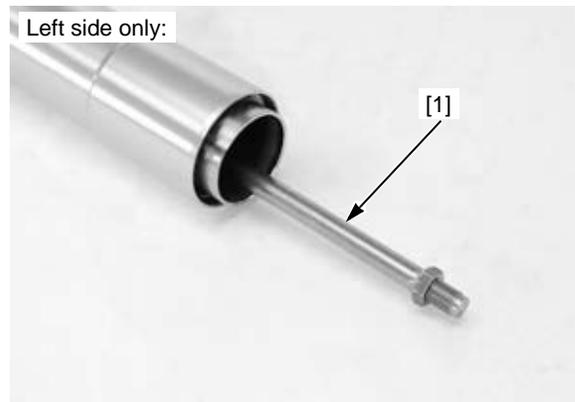


FRONT WHEEL/SUSPENSION/STEERING

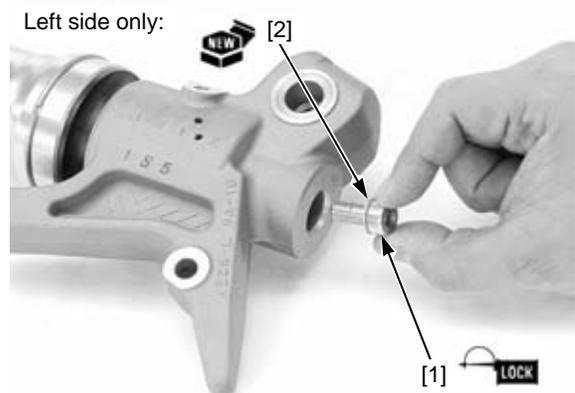
Install the stopper ring [1] into the groove in the outer tube [2], being careful not to scratch the fork pipe [3].
Install the dust seal [4] into the outer tube.



Left side: Install the inner damper [1] into the fork pipe.



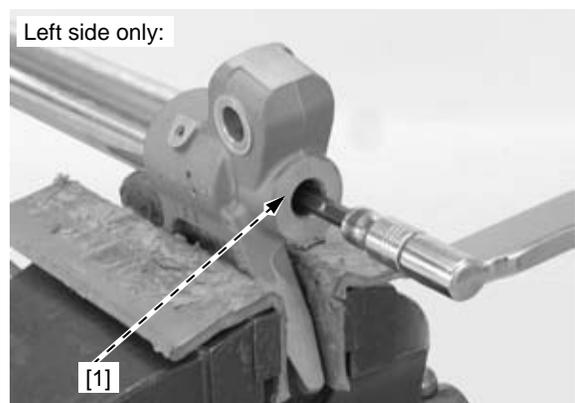
Left side: Apply locking agent to the fork center bolt [1] threads and install it with a new sealing washer [2].



Left side: Hold the left fork pipe in a vise with soft jaws or shop towels.

Tighten the fork center bolt [1] to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



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:

Right side:

658 ± 2.5 cm³ (22.3 ± 0.08 US oz, 23.2 ± 0.09 Imp oz)

Left side:

683 ± 2.5 cm³ (23.1 ± 0.08 US oz, 24.0 ± 0.09 Imp oz)

Slowly pump the fork pipe several times to remove the trapped air from the lower portion of the fork pipe.

Compress the fork pipe fully and leave it for 5 minutes to remove air bubbles from the fluid.

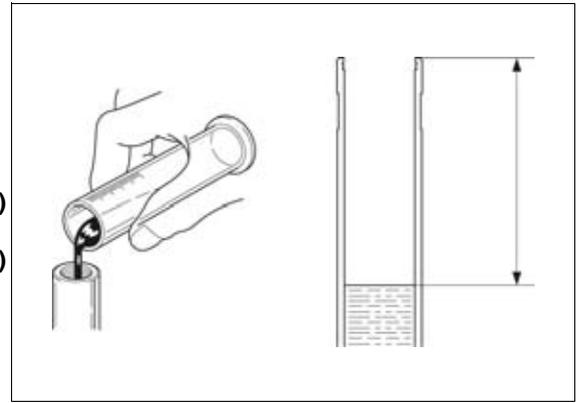
Measure the oil level from the top of the fork pipe by supporting the fork leg vertically.

FORK OIL LEVEL:

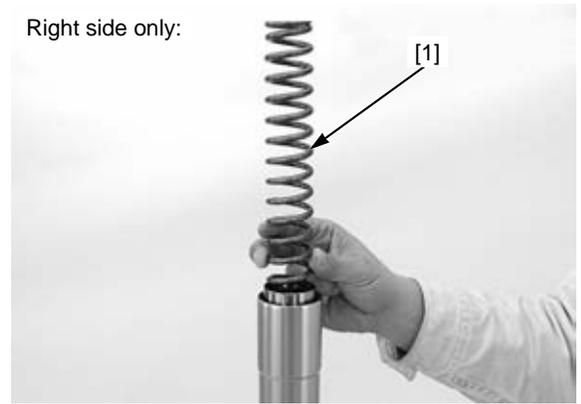
Right side: 122 mm (4.8 in)

Left side: 38 mm (1.5 in)

Right side: Install the fork spring [1] with the tapered side facing up.



Right side only:



Right side: Loosen the lock nut [1] until it stops.

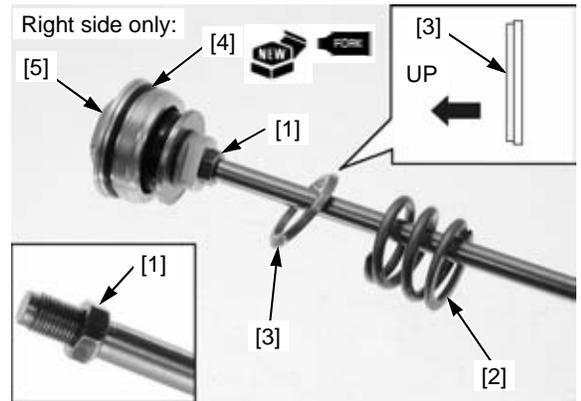
Install the rebound spring [2] to the fork rod.
Install the spring seat [3] in the shown direction.

Apply recommended fork oil to a new O-ring [4], and install it to the fork cap [5].

Install the fork cap to the fork rod and tighten it until it stops.

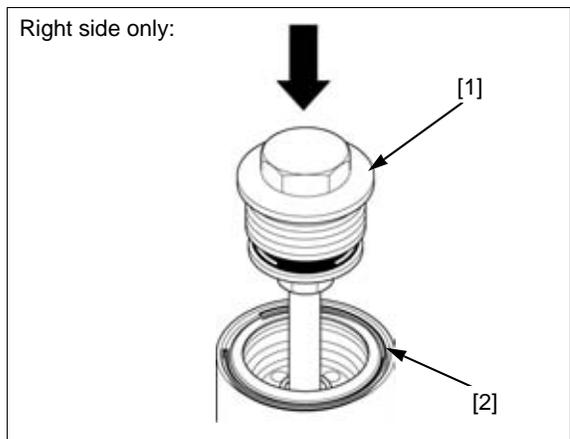
Hold the fork cap with a wrench, then tighten the lock nut to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



FRONT WHEEL/SUSPENSION/STEERING

Right side: Push the fork cap [1] down and compress the fork spring, then install the stopper ring [2] into the groove in the fork pipe.



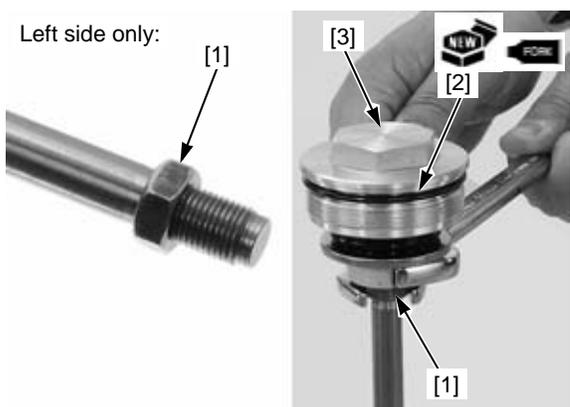
Left side: Loosen the lock nut [1] until it stops.

Apply recommended fork oil to a new O-ring [2], and install it to the fork cap [3].

Install the fork cap to the inner damper and tighten it until it stops.

Hold the fork cap with a wrench, then tighten the lock nut to the specified torque.

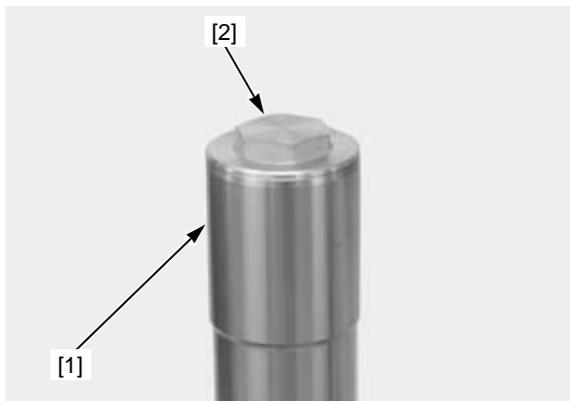
TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



Completely extend the outer tube [1].

Install and tighten the fork cap [2] into the outer tube.

Tighten the fork cap to the specified torque after installing the fork leg into the steering stem (page 16-7).

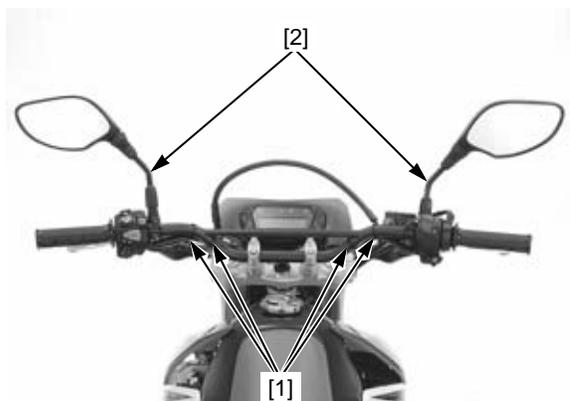


HANDLEBAR

REMOVAL

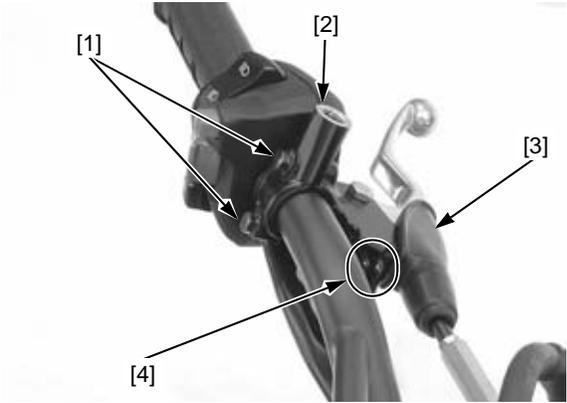
Remove the following:

- Wire bands [1]
- Rearview mirrors [2]

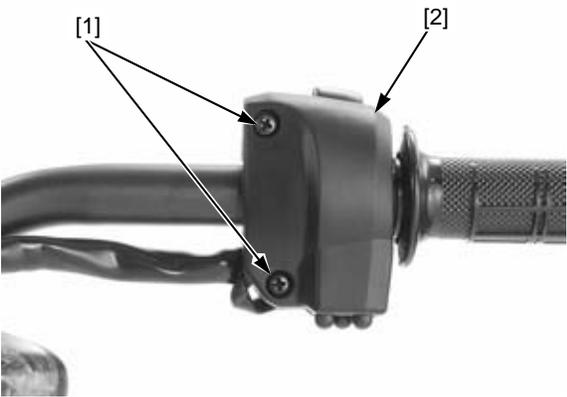


FRONT WHEEL/SUSPENSION/STEERING

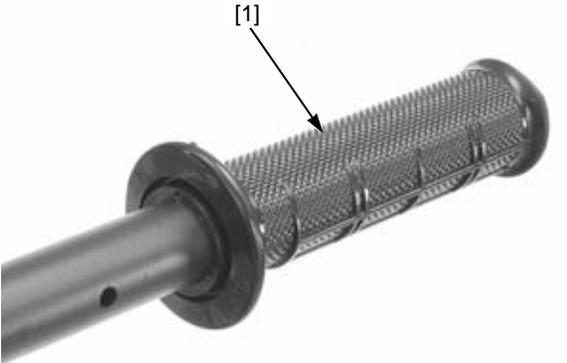
- Bolts [1]
- Bracket holder [2]
- Clutch lever bracket [3]
- Clutch switch connectors [4]



- Screws [1]
- Left handlebar switch housing [2]

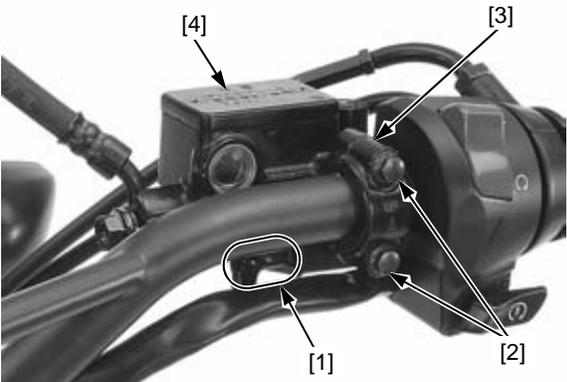


- Left handlebar grip [1]



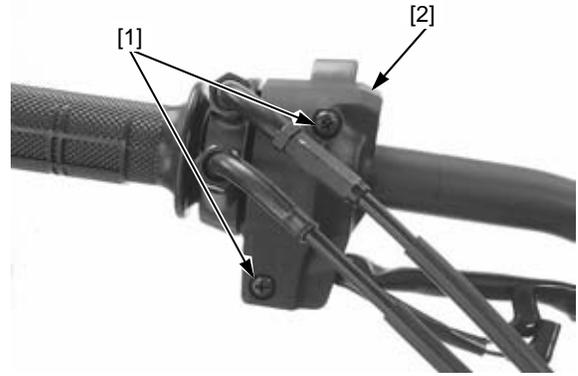
Keep the reservoir upright to prevent air from entering the hydraulic system.

- Brake light switch connectors [1]
- Bolts [2]
- Master cylinder holder [3]
- Brake master cylinder [4]

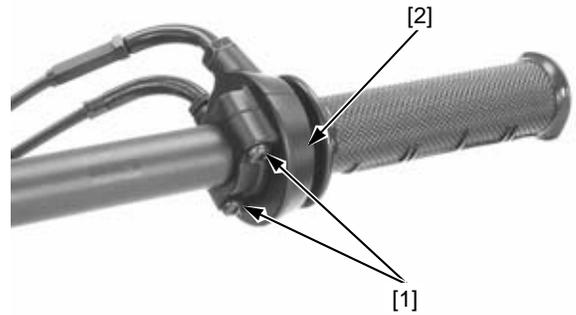


FRONT WHEEL/SUSPENSION/STEERING

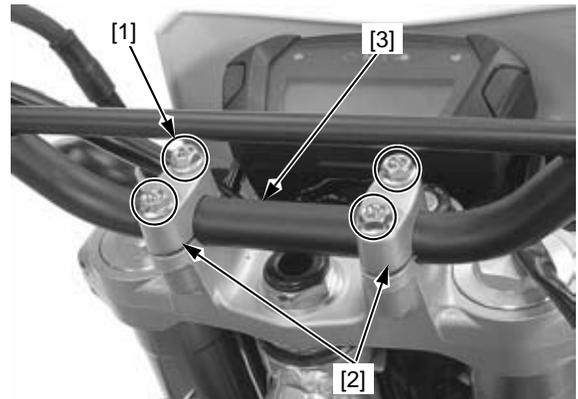
- Screws [1]
- Right handlebar switch [2]



- Screws [1]
- Throttle housing cover [2]



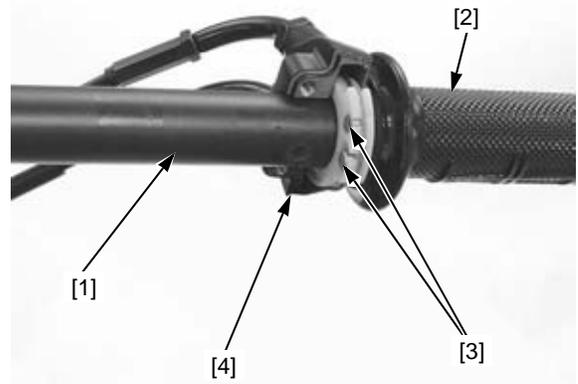
- Bolts [1]
- Handlebar upper holders [2]
- Handlebar [3]



Pull out the handlebar [1] from the throttle pipe [2].

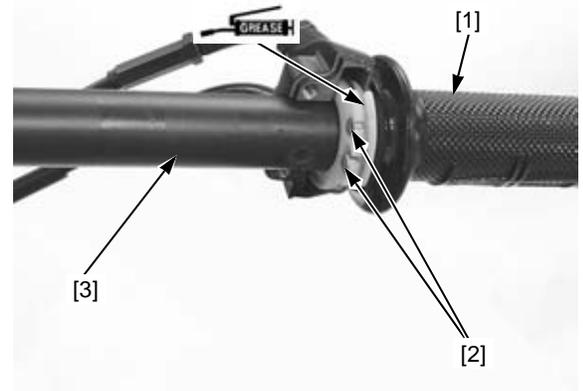
Remove the following:

- Throttle cables [3]
- Throttle pipe
- Throttle housing [4]

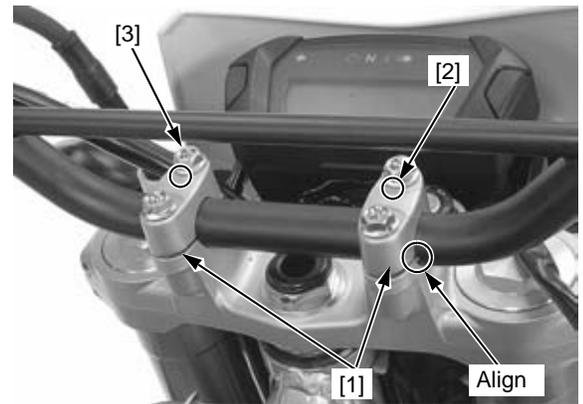


INSTALLATION

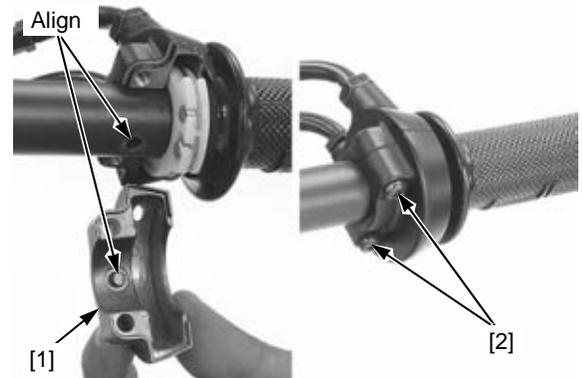
Apply grease to the cable rolling area of the throttle pipe [1] flange.
 Connect the throttle cables [2] to the throttle pipe.
 Insert the handlebar [3] into the throttle pipe.



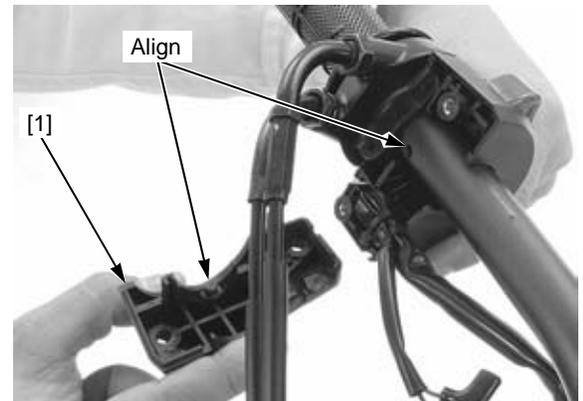
Align the punch mark on the handlebar with the top edge of the lower holder. Install the handlebar and upper holders [1] with the punch marks [2] facing forward. Install the bolts [3], tighten the front bolts first, then tighten the rear bolts securely.



Install the throttle housing cover [1] by aligning its boss with the hole of the handlebar.
 Install the screws [2], tighten the upper screw first, then tighten the lower screw.
 Check the throttle grip for smooth operation.



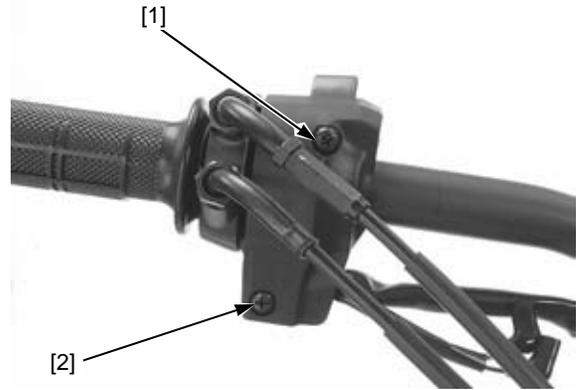
Install the right handlebar switch cover [1] by aligning its boss with the hole of the handlebar.



FRONT WHEEL/SUSPENSION/STEERING

Install and tighten the upper screw [1] first, then tighten the lower screw [2] to the specified torque.

TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)

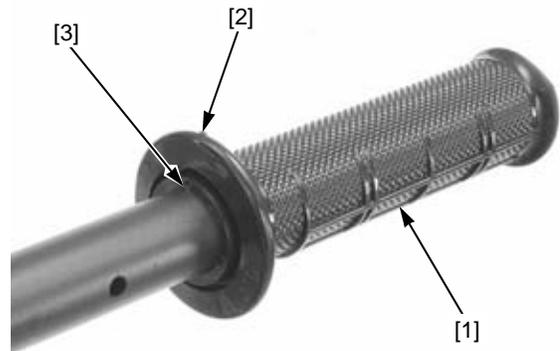


If the left handlebar grip [1] was removed, apply Honda Bond A or equivalent to the inside surface of the grip and to the clean surface of the handlebar.

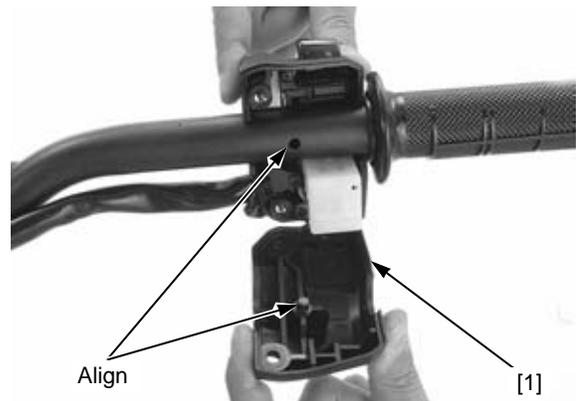
Allow the adhesive to dry for 1 hour before using.

Wait 3 – 5 minutes and install the grip. Rotate the grip for even application of the adhesive.

Position the handlebar grip so that the projection [2] of the grip is aligned with the punch mark [3] of the handlebar.



Install the left handlebar switch cover [1] by aligning its boss with the hole of the handlebar.



Install and tighten the upper screw [1] first, then tighten the lower screw [2] to the specified torque.

TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)



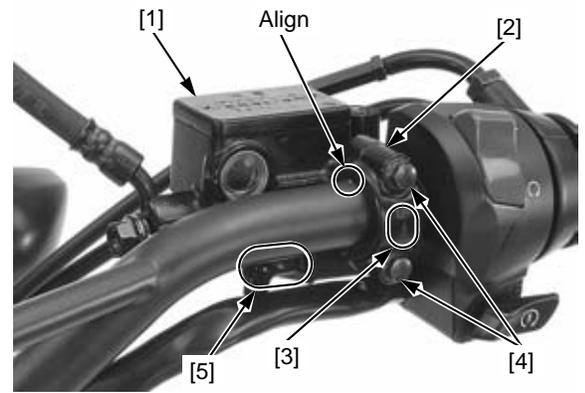
FRONT WHEEL/SUSPENSION/STEERING

Align the edge of the master cylinder with the punch mark on the handlebar.

Install the brake master cylinder [1] and holder [2] with the "UP" mark [3] facing up. Install the bolts [4] and tighten the upper bolt first, then tighten the lower bolt to the specified torque.

TORQUE: 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

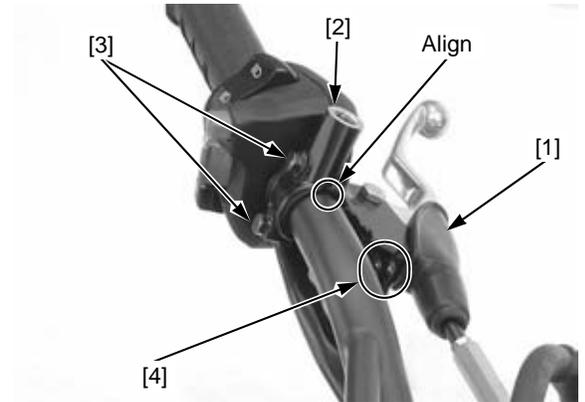
Connect the brake light switch connectors [5].



Align the edge of the bracket with the punch mark on the handlebar.

Install the clutch lever bracket [1] and holder [2]. Install the bolts [3] and tighten the upper bolt first, then tighten the lower bolt.

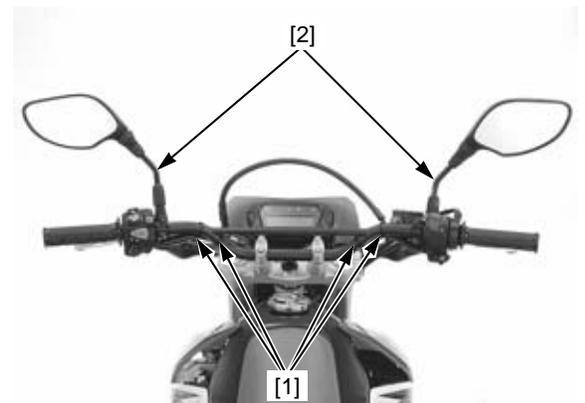
Connect the clutch switch wire connectors [4].



Secure the wires with the wire bands [1].

Install each rearview mirror [2] and tighten the lock nut.

Check the throttle grip freeplay (page 3-3).



STEERING STEM

REMOVAL

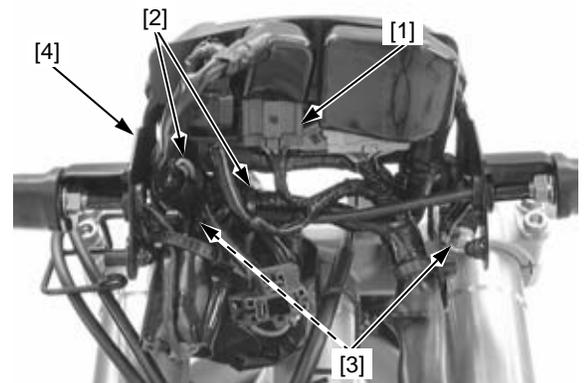
Remove the following:

- Front fender (page 2-5)
- Headlight cowl (page 2-5)
- Handlebar (page 16-16)
- Front wheel (page 16-4)

Disconnect the ignition switch 3P (Brown) connector [1].

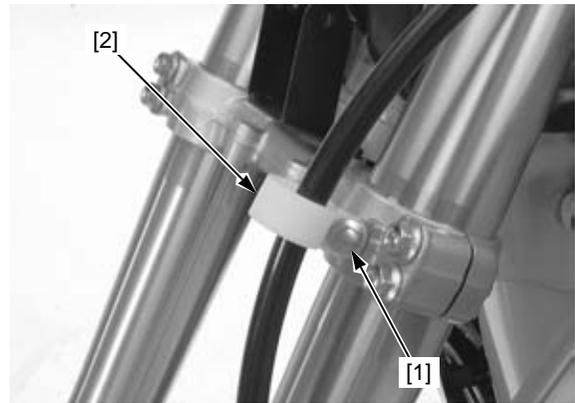
Release the ignition switch wire from the harness bands [2].

Remove the bolts [3] and meter stay [4].



FRONT WHEEL/SUSPENSION/STEERING

Remove the bolt [1] and brake hose guide [2].

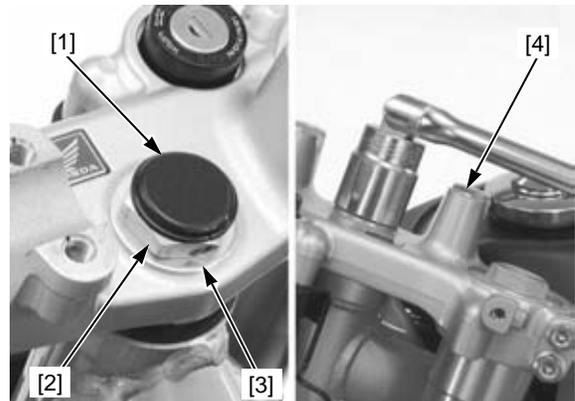


Remove the steering stem cap [1].

Loosen the steering stem nut [2].

Remove the fork legs (page 16-6).

Remove the stem nut, washer [3] and top bridge [4].

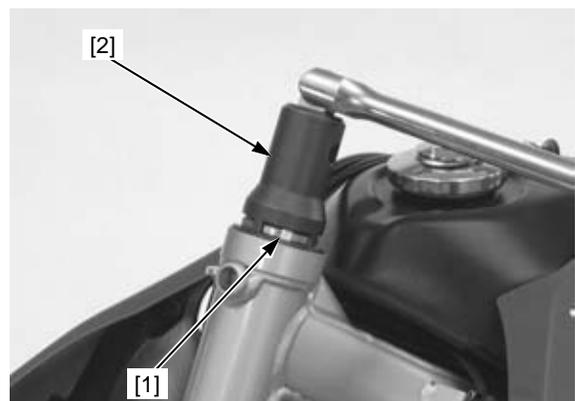


Loosen the steering stem adjusting nut [1] using the special tool.

TOOL:

[2] Stem socket wrench 07916-KA50100

While holding the steering stem, remove the adjusting nut.

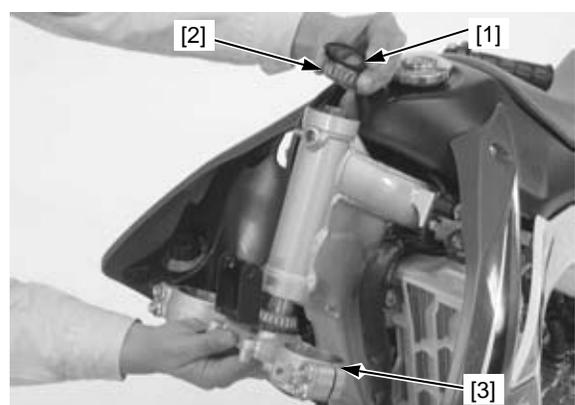


Remove the following:

- Upper dust seal [1]
- Upper steering bearing [2]
- Steering stem [3]

Inspect the bearings and outer races for wear or damage.

If necessary, replace them as a set (page 16-23).

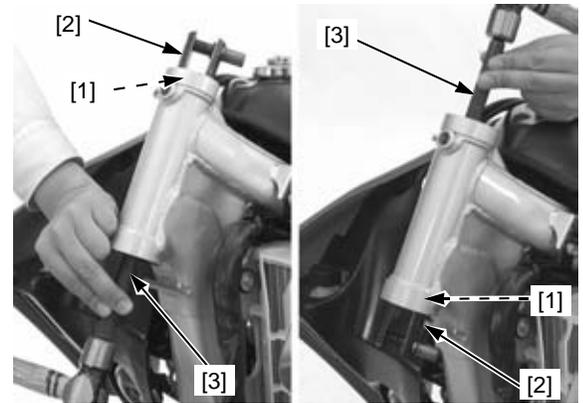


BEARING REPLACEMENT

Always replace the bearings and races as a set.

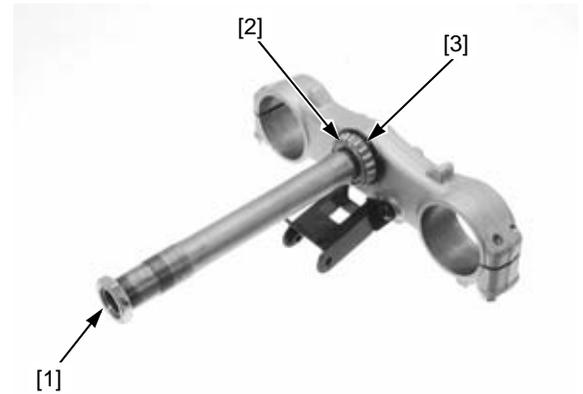
Remove the upper and lower bearing outer races [1] using the special tools.

- TOOLS:**
 [2] Ball race remover 07948-4630100
 [3] Remover shaft 07953-KA50000



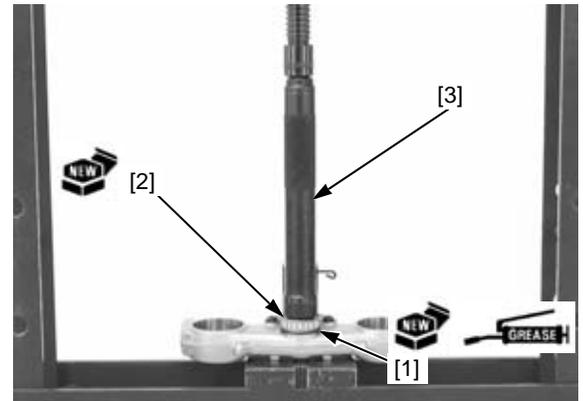
Install the stem nut [1] onto the stem to prevent the threads from being damaged when removing the lower bearing [2].

Remove the lower bearing and lower dust seal [3] with a chisel or equivalent tool, being careful not to damage the stem.



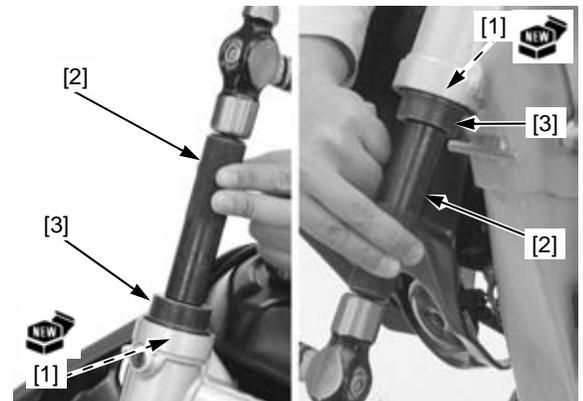
Apply specified grease (page 16-24) to a new lower dust seal [1] lip and install it over the steering stem. Press a new lower bearing [2] using a special tool.

- TOOL:**
 [3] Driver, 28 mm 07946-4300101



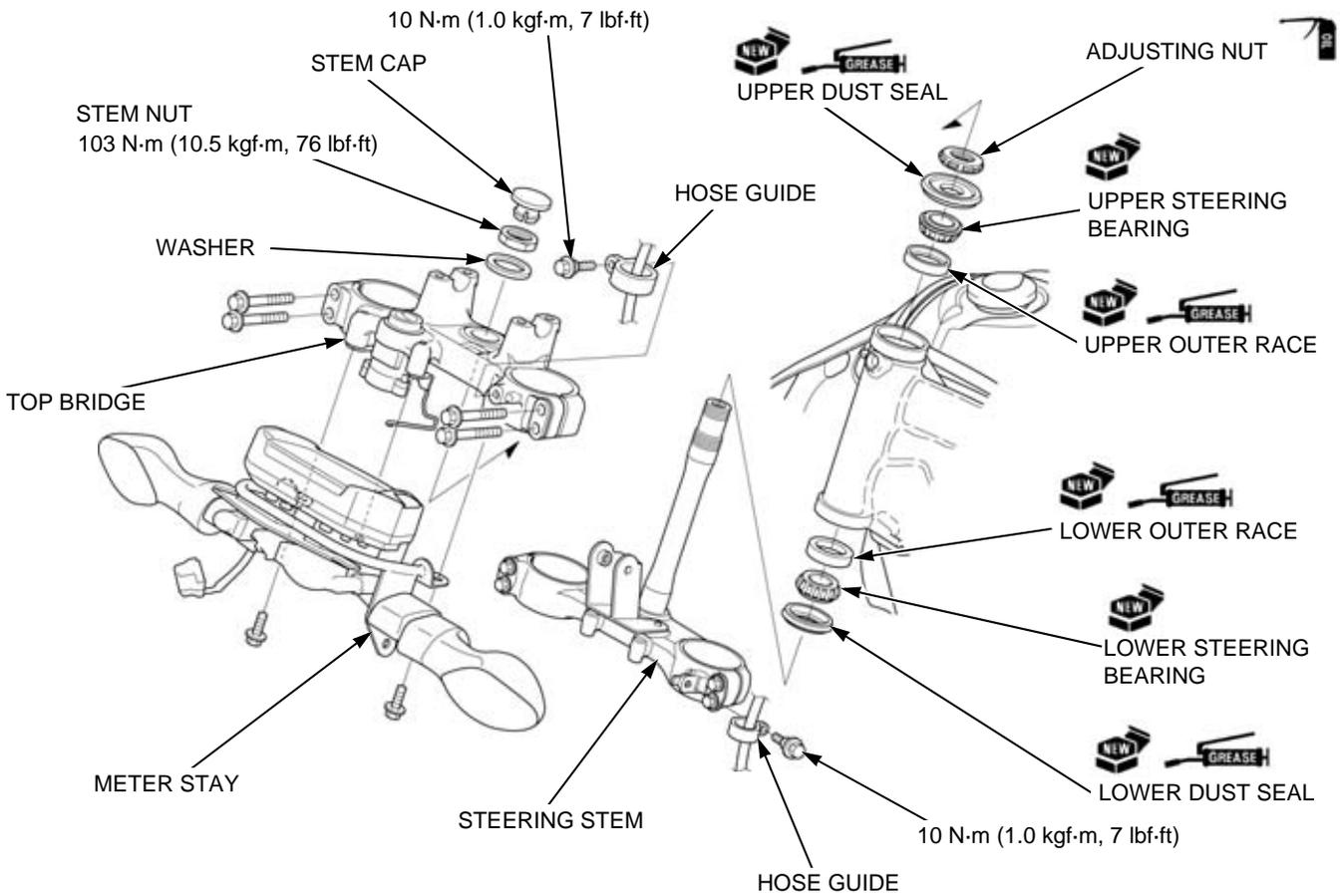
Drive in new upper and lower bearing outer races [1] into the steering head pipe.

- TOOLS:**
 [2] Driver 07749-0010000
 [3] Driver attachment, 42 x 47 mm 07746-0010300



FRONT WHEEL/SUSPENSION/STEERING

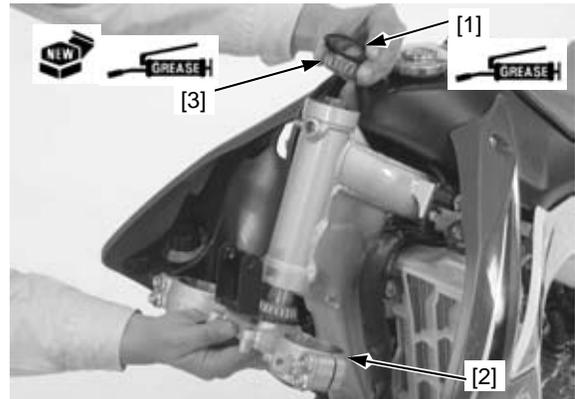
INSTALLATION



Apply 3 - 5 g (0.11 - 0.18 oz) of specified grease (Urea based multi-purpose grease with extreme pressure agent (example: Kyodo Yushi, EXCELITE EP2 or equivalent)) to each new bearing and fill it up. Apply specified grease to a new upper dust seal [1] lip.

Insert the steering stem [2] into the steering head pipe, and install the following while holding the stem.

- upper steering bearing [3]
- upper dust seal



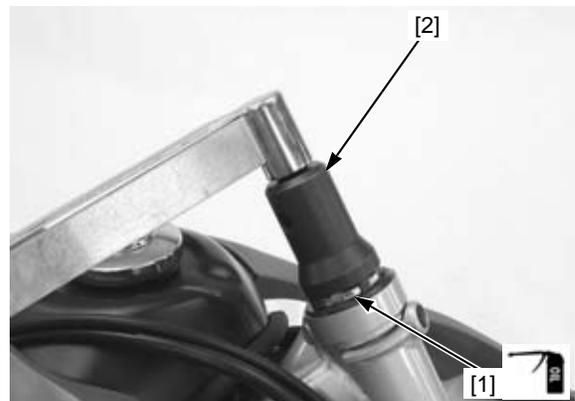
Apply engine oil to the steering stem adjusting nut [1] threads.

Install and tighten the adjusting nut to the initial torque using the special tool.

TOOL:

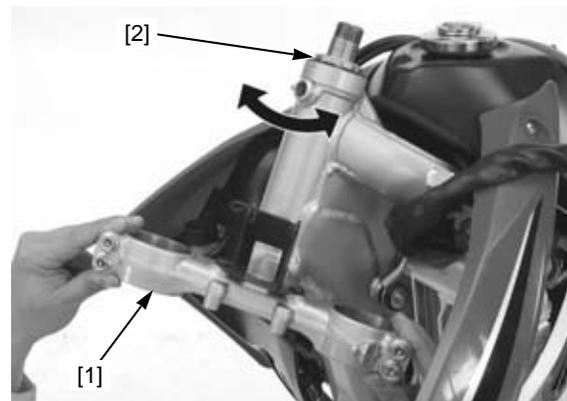
[2] Stem socket wrench 07916-KA50100

TORQUE: 29.5 N-m (3.0 kgf-m, 22 lbf-ft)



Turn the steering stem [1] right and left, lock-to-lock several times to seat the bearings.

Completely loosen the adjusting nut [2].

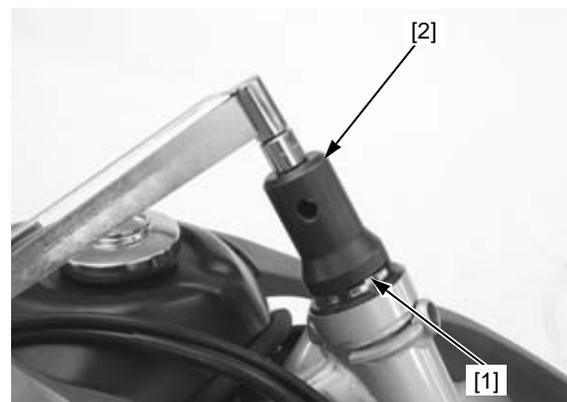


Retighten the adjusting nut [1] to the specified torque using the special tool.

TOOL:

[2] Stem socket wrench 07916-KA50100

TORQUE: 6.5 N·m (0.7 kgf·m, 4.8 lbf·ft)



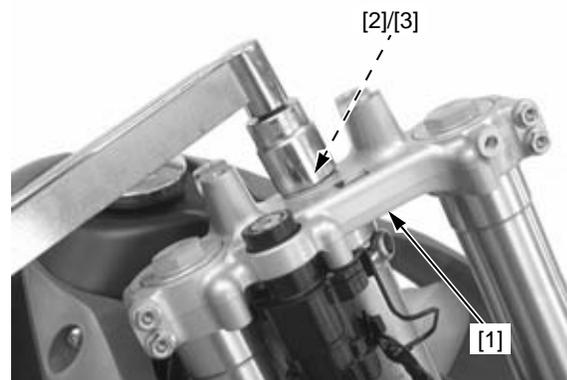
Install the top bridge [1], washer [2] and stem nut [3].

Temporarily install the outer tube into the bottom and top bridges.

Tighten the stem nut to the specified torque.

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

Make sure the steering stem moves smoothly without play or binding.



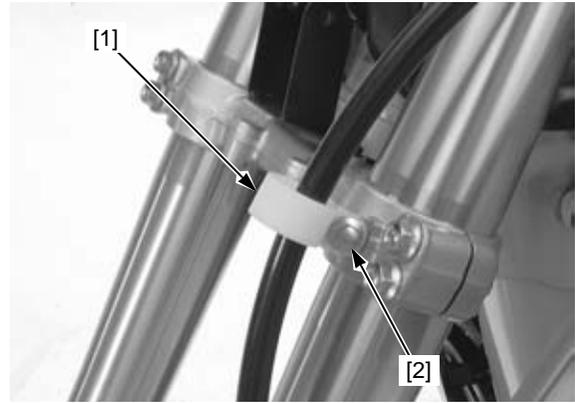
Install the steering stem cap [1].



FRONT WHEEL/SUSPENSION/STEERING

Install brake hose guide [1] and tighten the bolt [2] to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



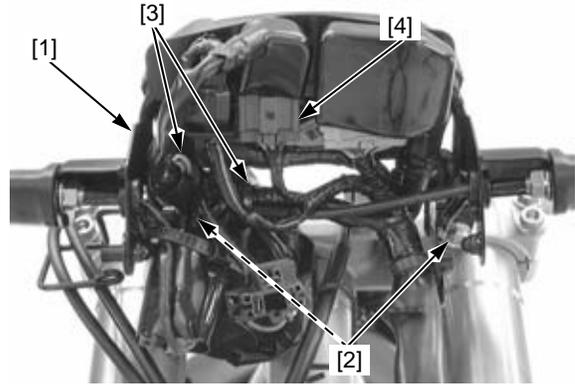
Install the meter stay [1] and tighten the bolts [2].

Secure the ignition switch wire with the harness bands [3].

Connect the ignition switch 3P (Brown) connector [4].

Install the following:

- Front wheel (page 16-4)
- Handlebar (page 16-19)
- Headlight cowl (page 2-5)
- Front fender (page 2-5)



STEERING BEARING PRE-LOAD

Raise the front wheel off the ground by placing a work stand or box under the frame.

Position the steering stem straight ahead.

Hook a spring scale to the outer tube between the fork top and bottom bridges.

Make sure there is no cable, wire harness or hose interference.

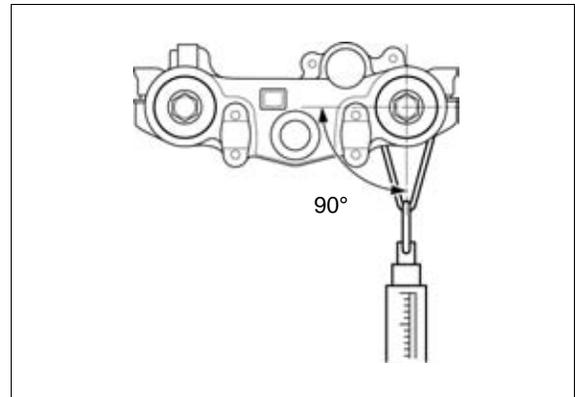
Pull the spring scale keeping it at a right angle to the steering stem.

Read the scale at the point where the steering stem just starts to move.

STEERING BEARING PRE-LOAD:

10.6 – 21.2 N (1.08 – 2.16 kgf, 2.38 – 4.77 lbf)

If the readings do not fall within the limits, readjust the steering bearing.



17. REAR WHEEL/SUSPENSION

SERVICE INFORMATION.....	17-2	SHOCK ABSORBER	17-6
TROUBLESHOOTING.....	17-2	SHOCK LINKAGE.....	17-7
COMPONENT LOCATION	17-3	SWINGARM	17-10
REAR WHEEL	17-4	DRIVE CHAIN GUIDE	17-12

REAR WHEEL/SUSPENSION

SERVICE INFORMATION

GENERAL

- Raise the rear wheel off the ground by supporting the frame securely when servicing. A box or work stand is required to support the motorcycle.
- The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock absorber.
- Before disposal of the shock absorber, release the nitrogen (page 17-7).
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Use only Honda Genuine replacement bolts and nuts for all suspension linkage and swingarm pivot mounting points; ordinary bolts lack adequate strength for these applications. Also take note of the installation direction of these bolts since they must be installed correctly.
- For hydraulic brake system service (page 18-3).
- After the rear wheel installation, check the brake operation by applying the brake pedal.
- For drive chain information (page 3-12).

TROUBLESHOOTING

Soft suspension

- Incorrect suspension adjustment
- Weak shock absorber spring
- Oil leakage from damper unit
- Low tire pressure

Stiff suspension

- Incorrect suspension adjustment
- Bent shock absorber damper rod
- Damaged suspension or swingarm pivot bearings
- Bent swingarm pivot or frame
- High tire pressure

Steers to one side or does not track straight

- Drive chain adjusters not adjusted equally
- Bent axle
- Bent frame
- Worn swingarm pivot components

Rear suspension noise

- Loose suspension fasteners
- Worn or damaged suspension pivot bearings
- Faulty shock absorber

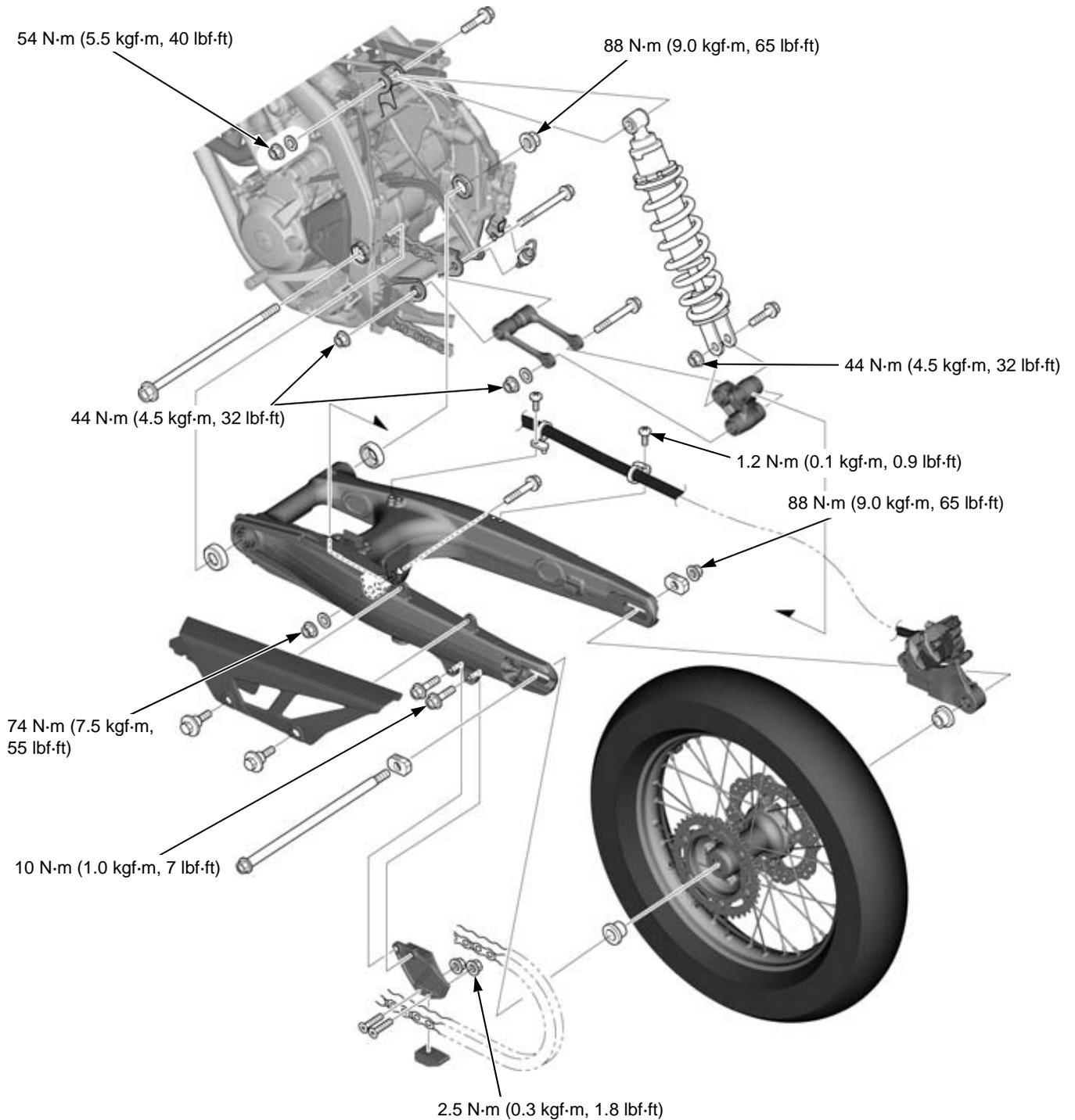
Rear wheel wobbles

- Bent rim
- Worn or damaged rear wheel bearings
- Faulty rear tire
- Low tire pressure
- Loose or broken spokes
- Worn or damaged swingarm bearings
- Bent frame or swingarm
- Axle fastener not tightened properly

Wheel turns hard

- Faulty wheel bearings
- Bent axle
- Drive chain too tight (page 3-12)
- Brake drag (page 18-2)

COMPONENT LOCATION



REAR WHEEL/SUSPENSION

REAR WHEEL

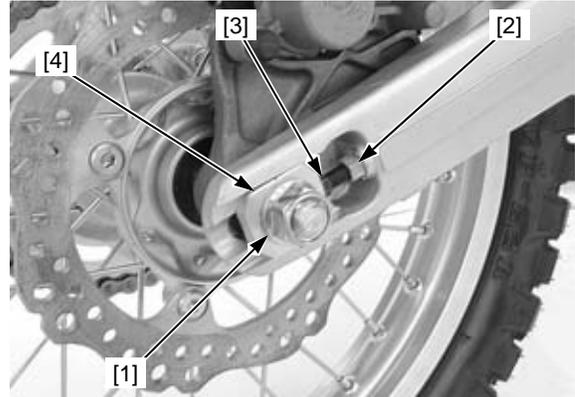
REMOVAL/INSTALLATION

Loosen the axle nut [1].

Raise the rear wheel off the ground by placing a work stand or box under the frame.

Loosen the lock nuts [2] and turn in the drive chain adjusters [3] completely.

Remove the axle nut and right drive chain adjuster plate [4].



Push the wheel forward and derail the drive chain [1] from the driven sprocket.

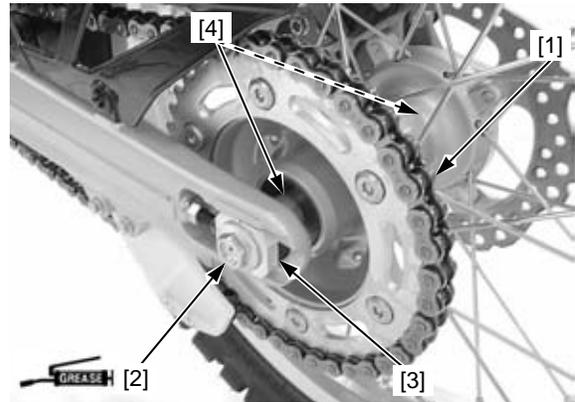
Support the caliper so it does not hang from the brake hose. Do not twist the brake hose.

Remove the following:

- Axle [2]
- Left chain adjuster plate [3]
- Rear wheel
- Side collars [4]

NOTE:

- Do not operate the brake pedal after removing the wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.

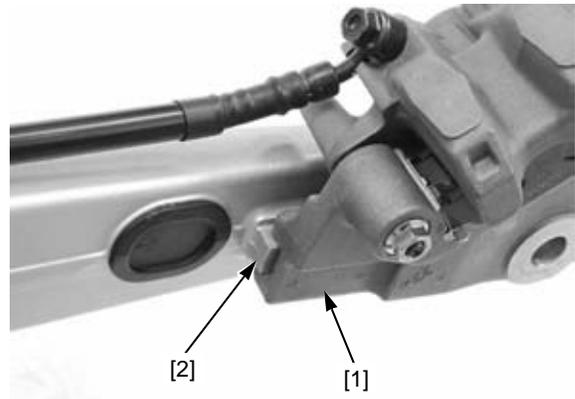


Remove the rear brake caliper bracket [1] from the guide rail [2] of the swingarm.

Install the rear wheel in the reverse order of removal.

- Apply thin coat of grease to the axle outer surface.

Adjust the drive chain slack (page 3-12).



INSPECTION

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

Replace the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub.

Inspect the following parts for damage, abnormal wear, deformation, looseness or bend.

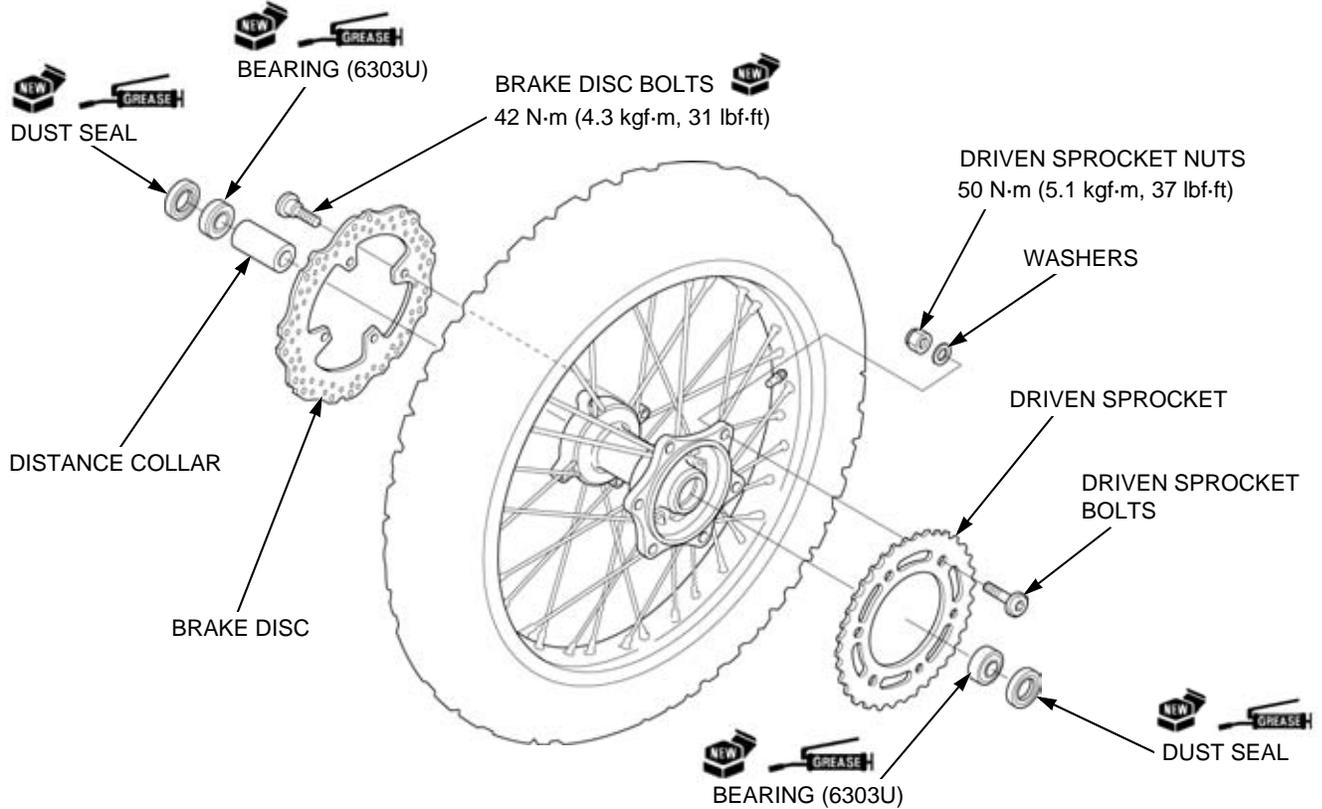
- Rear axle
- Spoke
- Wheel rim

Measure each part according to REAR WHEEL/SUSPENSION SPECIFICATIONS (page 1-8).

Replace any part if it is out of service limit.

DISASSEMBLY/ASSEMBLY

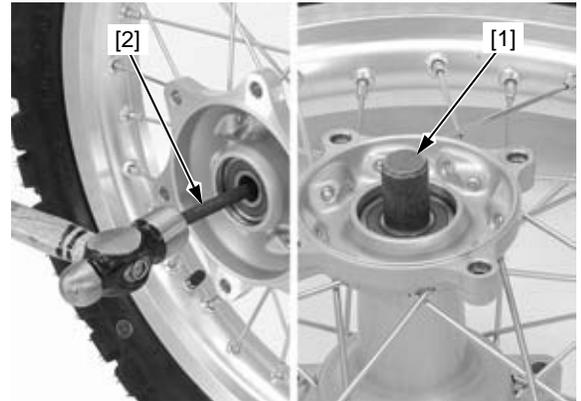
Disassemble and assemble the rear wheel as following illustration.



BEARING REPLACEMENT

Install the remover head [1] into the bearing.
 From the opposite side of the wheel, install the bearing remover shaft [2] and drive the bearing out of the wheel hub.
 Remove the distance collar and drive out the other bearing.

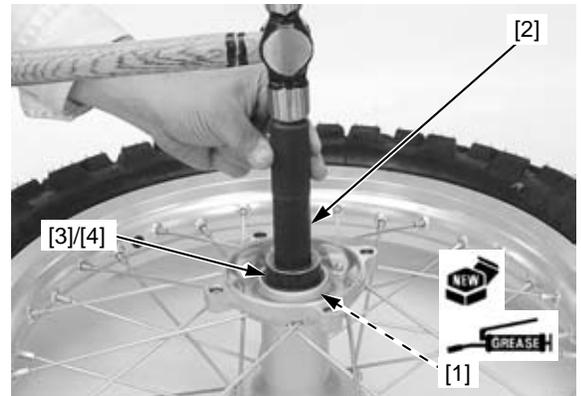
- TOOLS:**
- [1] Bearing remover head, 17 mm **07746-0050500**
 - [2] Bearing remover shaft **07746-0050100**



Pack new bearing cavities with grease.
 Drive in a new right side (brake disc side) bearing [1] squarely with the sealed side facing up until it is fully seated.

- TOOLS:**
- [2] Driver **07749-0010000**
 - [3] Attachment, 42 x 47 mm **07746-0010300**
 - [4] Pilot, 17 mm **07746-0040400**

Install the distance collar.
 Drive in a new left side bearing with the sealed side facing up until its inner race is fully seated on the distance collar.



REAR WHEEL/SUSPENSION

WHEEL CENTER ADJUSTMENT

Adjust the hub position so that the distance from the right end surface [1] of the hub center to the side of rim [2] is within the following specification as shown.

WHEEL HUB-TO-RIM DISTANCE:

26.9 ± 1.0 mm (1.06 ± 0.04 in)

WHEEL RIM RUNOUT:

Radial: 2.0 mm (0.08 in) or less

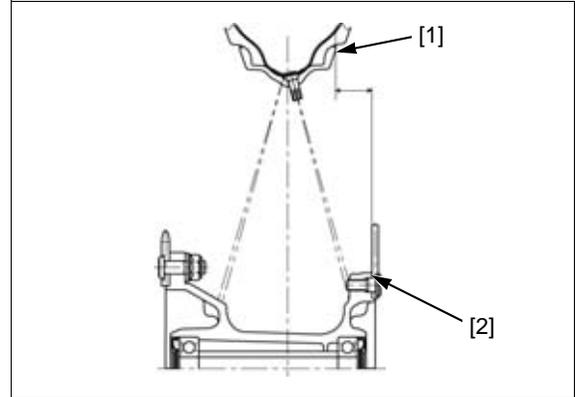
Axial: 2.0 mm (0.08 in) or less

Tighten the spokes in 2 or 3 progressive steps.

TOOL:

Spoke wrench, 5.8 x 6.1 mm 07701-0020300

TORQUE: 3.7 N·m (0.4 kgf·m, 2.7 lbf·ft)



SHOCK ABSORBER

REMOVAL/INSTALLATION

Raise the rear wheel off the ground by placing a work stand or box under the frame.

Remove the sub-frame (page 2-12).

Remove the upper mounting nut [1] and bolt [2].
Remove the lower mounting nut [3], bolt [4] and shock absorber [5].

Installation is in the reverse order of removal.

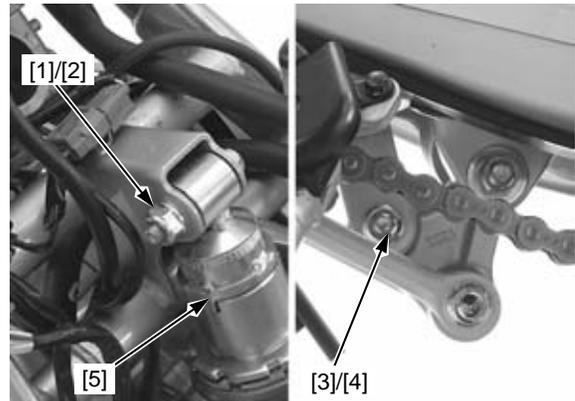
TORQUE:

Shock absorber upper mounting nut:

54 N·m (5.5 kgf·m, 40 lbf·ft)

Shock absorber lower mounting nut:

44 N·m (4.5 kgf·m, 32 lbf·ft)



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, oil leakage or bend.

- Damper rod
- Damper unit
- Bushing

If the shock absorber is replaced, refer to shock absorber disposal procedure (page 17-7).

SHOCK ABSORBER DISPOSAL PROCEDURE

Center punch the damper case to mark the drilling point as shown.

Wrap the shock absorber [1] inside a plastic bag. Support the shock absorber upright in a vise as shown. Through the open end of the bag, insert a hand drill with a sharp 3 mm drill bit.

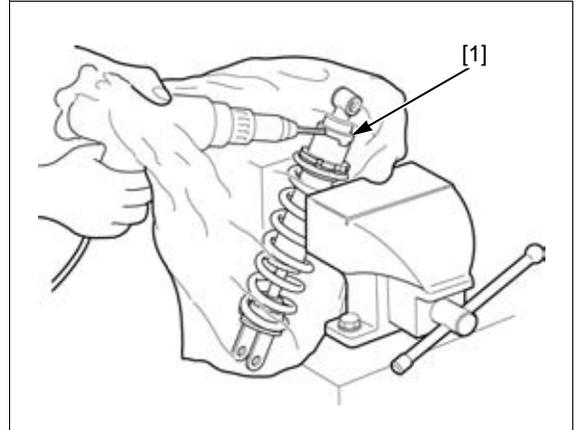
NOTE:

- Point the drill hole away from you to prevent debris getting in your eyes.

Hold the bag around the hand drill and briefly run it inside the bag; this will inflate the bag with air from the motor and help keep the bag from getting caught in the bit when you start.

Drill into the shock absorber at the center punch mark to purge the nitrogen gas.

Once all the nitrogen gas has been purged from the shock absorber and it is no longer under pressure, the item can be disposed of.

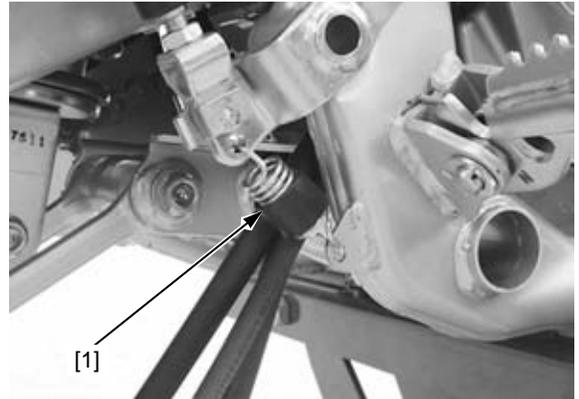


SHOCK LINKAGE

REMOVAL/INSTALLATION

Raise the rear wheel off the ground by placing a work stand or box under the frame and support the swingarm.

Remove the rear brake pedal return spring [1].

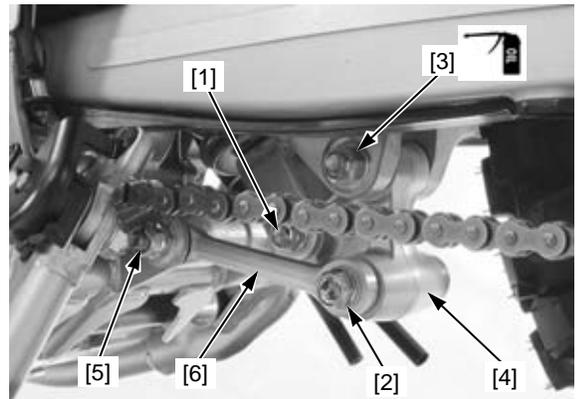


Remove the following:

- Shock absorber lower mounting nut/bolt [1]
- Shock link-to-shock arm nut/bolt/washer [2]
- Shock arm-to-swingarm nut/bolt/washer [3]
- Shock arm [4]
- Shock link-to-frame nut/bolt [5]
- Shock link [6]

Installation is in the reverse order of removal.

- Apply engine oil to the shock arm-to-swingarm nut threads.
- Before tightening the nuts to the specified torque, install all the nuts, bolts and washers.



TORQUE:

Shock link-to-frame nut:

44 N·m (4.5 kgf·m, 32 lbf·ft)

Shock arm-to-swingarm nut:

74 N·m (7.5 kgf·m, 55 lbf·ft)

Shock link-to-shock arm nut:

44 N·m (4.5 kgf·m, 32 lbf·ft)

Shock absorber lower mounting nut:

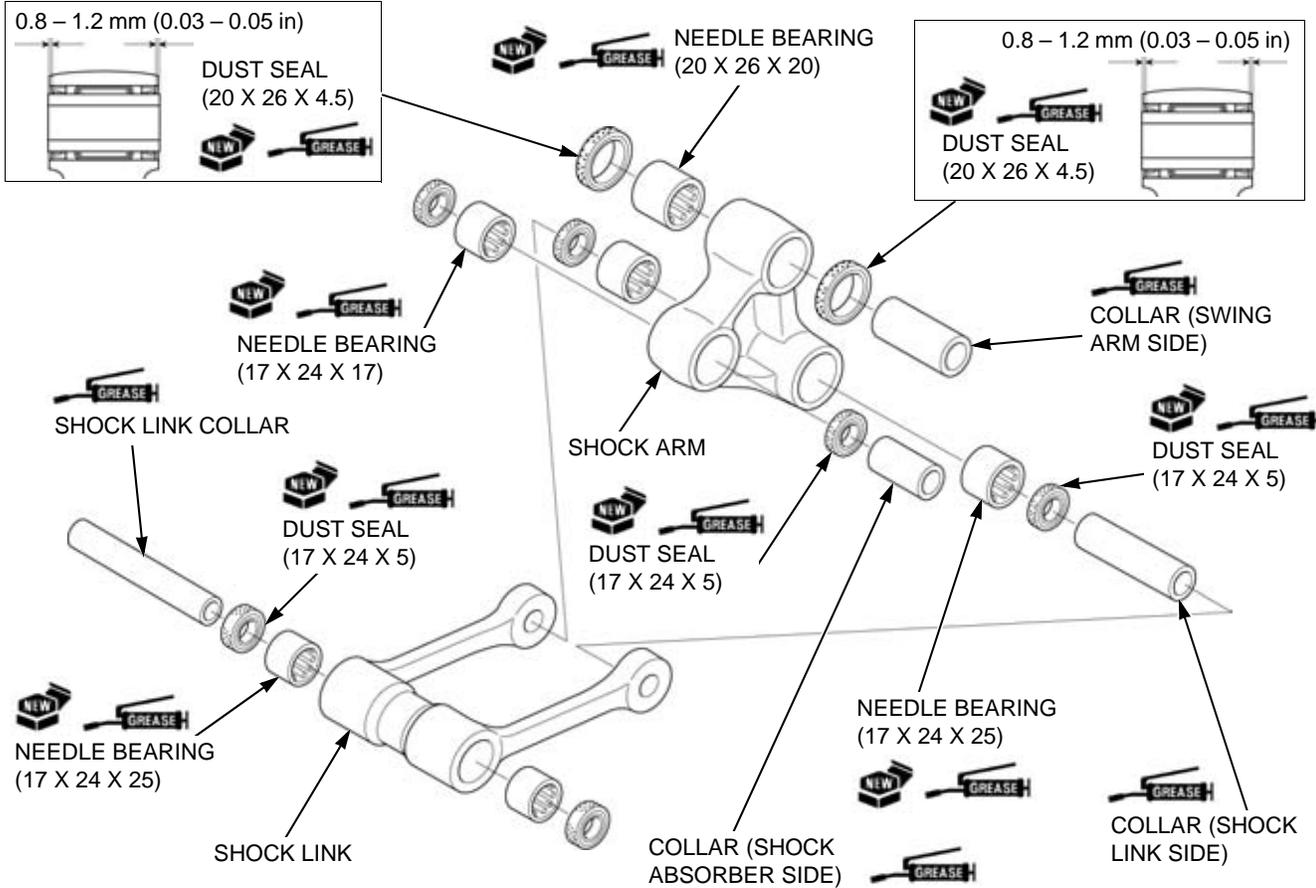
44 N·m (4.5 kgf·m, 32 lbf·ft)

REAR WHEEL/SUSPENSION

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the shock linkage as following illustration.

- Install the swingarm side shock arm dust seals to the specified depth.
- Install other dust seals until they are fully seated on the bearings.



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation or crack.

- Collars
- Shock arm
- Needle bearings
- Shock link

BEARING REPLACEMENT

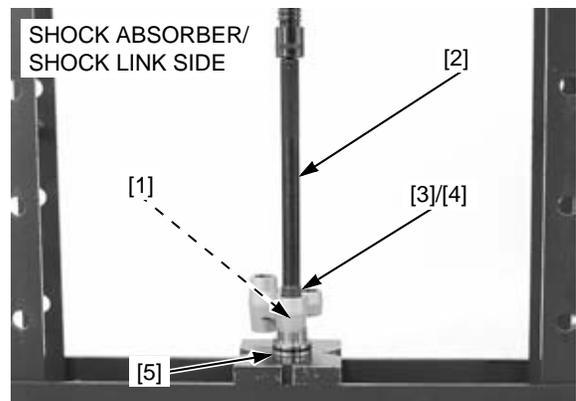
SHOCK ARM

Press the shock absorber and shock link side needle bearings [1] out of the shock arm using the special tool.

TOOLS:

Shock link and shock absorber side:

- | | |
|--|---------------|
| [2] Driver | 07949-3710001 |
| [3] Attachment, 22 x 24 mm | 07746-0010800 |
| [4] Pilot 17 mm | 07746-0040400 |
| [5] Fork seal driver attachment, 27.2 mm | 07746-0010300 |

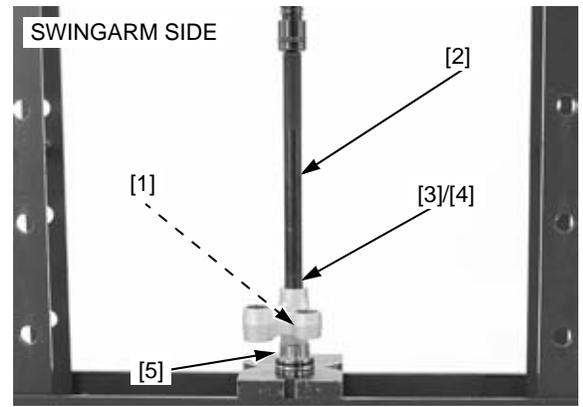


Press the swingarm side needle bearings [1] out of the shock arm using the special tool.

TOOLS:

Swingarm side:

- [2] Driver 07949-3710001
- [3] Attachment, 24 x 26 mm 07746-0010700
- [4] Pilot, 20 mm 07746-0040500
- [5] Fork seal driver attachment, 27.2 mm 07746-0010300



Apply grease to the needle rollers of new bearings [1].

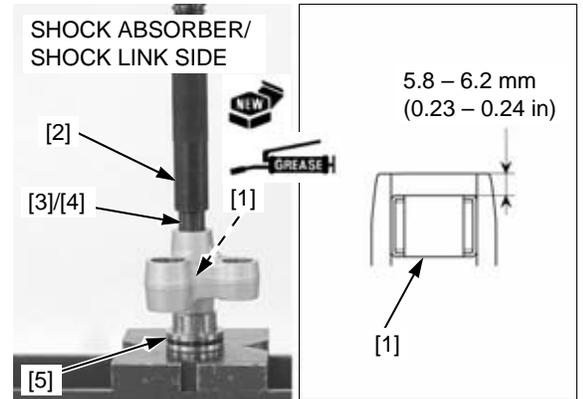
Press in the bearing with the marked side facing up.

Carefully press each needle bearing in the pivot until the depth from the arm outer surface is 5.8 – 6.2 mm (0.23 – 0.24 in).

TOOLS:

Shock Link and Shock Absorber side:

- [2] Driver 07749-0010000
- [3] Attachment, 22 x 24 mm 07746-0010800
- [4] Pilot, 17 mm 07746-0040400
- [5] Fork seal driver attachment, 27.2 mm 07746-0010300



Apply grease to the needle rollers of new bearings [1].

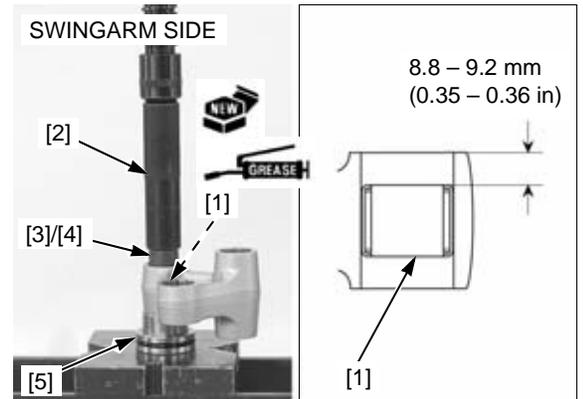
Press in the bearing with the marked side facing up.

Carefully press each needle bearing in the pivot until the depth from the arm outer surface is 8.8 – 9.2 mm (0.35 – 0.36 in).

TOOLS:

Swingarm side:

- [2] Driver 07749-0010000
- [3] Attachment, 24 x 26 mm 07746-0010700
- [4] Pilot, 20 mm 07746-0040500
- [5] Fork seal driver attachment, 27.2 mm 07746-0010300

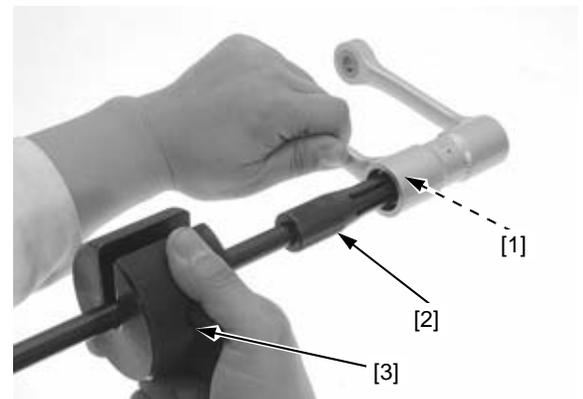


SHOCK LINK

Remove the needle bearing [1] from the shock link using the special tools.

TOOLS:

- [2] Bearing remover, 17 mm 07936-3710300
- [3] Remover weight 07741-0010201
- Remover handle 07936-3710100



REAR WHEEL/SUSPENSION

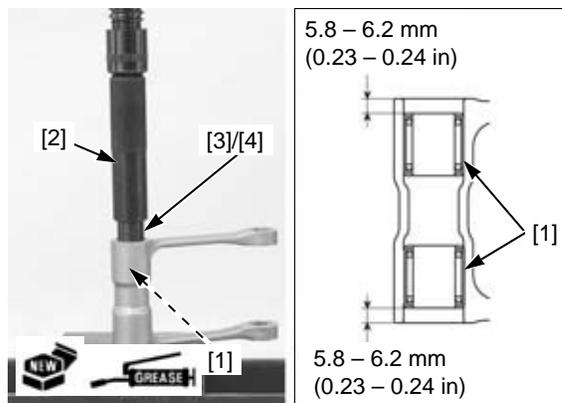
Apply grease to the needle rollers of new bearings.

Press in the bearing with the marked side facing up.

Carefully press the needle bearing in the pivot until the depth from the link outer surface is 5.8 – 6.2 mm (0.23 – 0.24 in).

TOOLS:

[2] Driver	07749-0010000
[3] Attachment, 22 x 24 mm	07746-0010800
[4] Pilot, 17 mm	07746-0040400



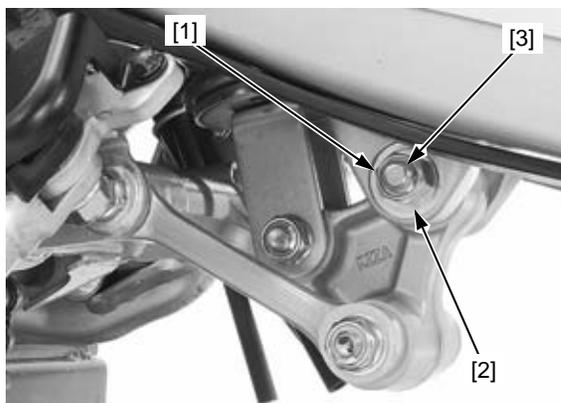
SWINGARM

REMOVAL/INSTALLATION

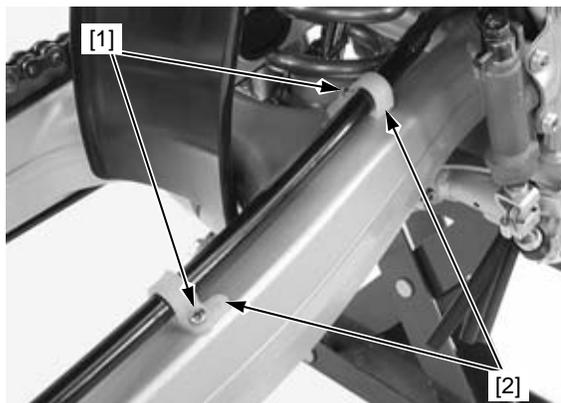
Remove the following:

- Rear wheel (page 17-4)
- Drive chain guide (page 17-12)

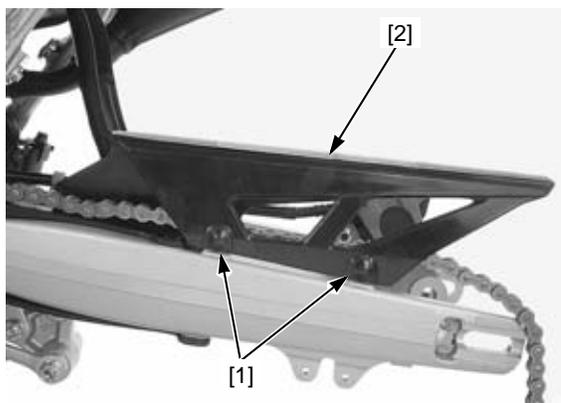
Remove the shock arm-to-swingarm nut [1], washer [2] and bolt [3].



Remove the screws [1] and brake hose guides [2].

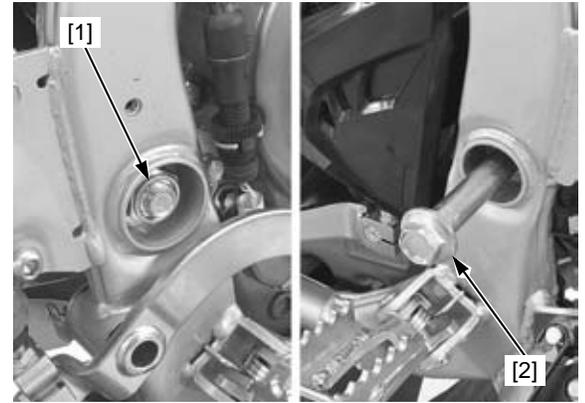


Remove the bolts [1] and drive chain case [2].



Remove the swingarm pivot nut [1].

Remove the swingarm pivot bolt [2], then remove the swingarm from the frame.



Remove the swingarm dust seal caps [1].

Installation is in the reverse order of removal.

- Apply thin coat of grease to the pivot bolt outer surface.
- Apply grease to the dust seal cap lips and fill the gap between the caps, collar and needle bearings with grease.
- Align the drive chain case slot with the swingarm hook.
- Apply engine oil to the threads of shock arm-to-swingarm nut.



TORQUE:

Swingarm pivot nut:

88 N·m (9.0 kgf·m, 65 lbf·ft)

Shock arm-to-swingarm nut:

74 N·m (7.5 kgf·m, 55 lbf·ft)

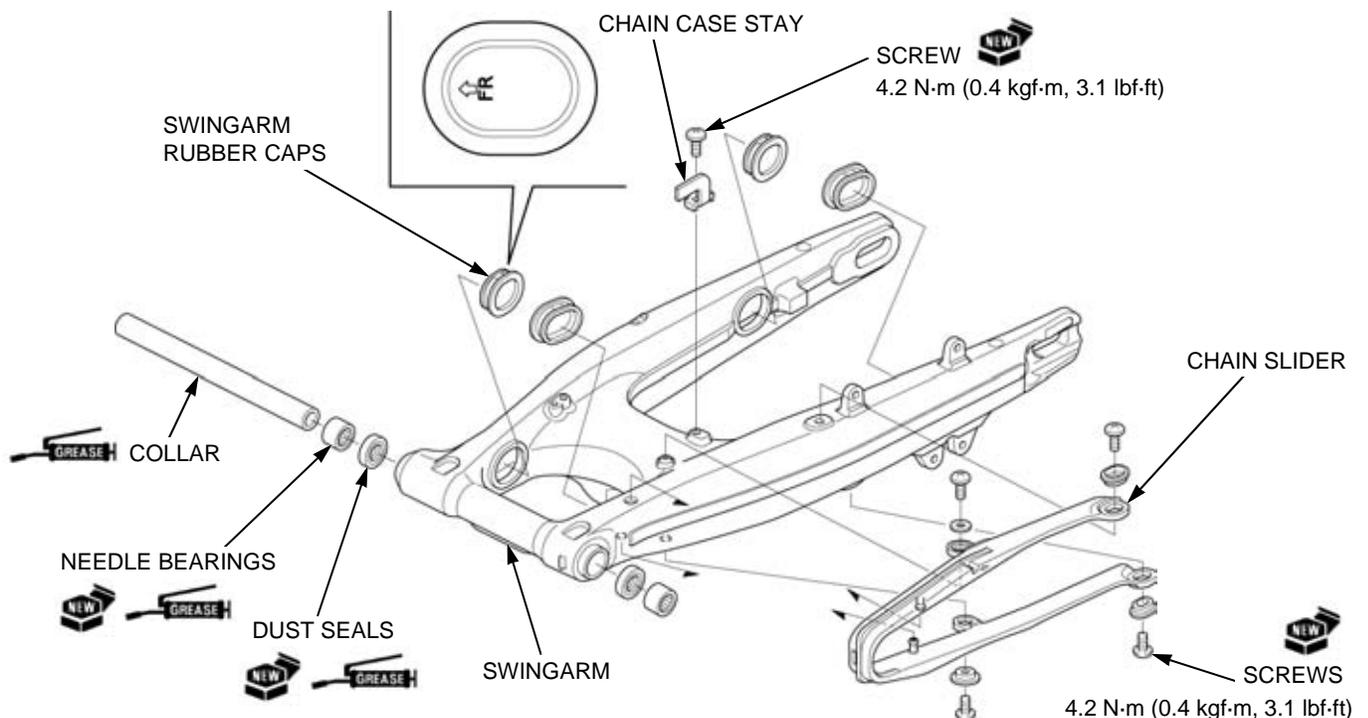
Rear brake hose guide mounting screw:

1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the swingarm as following illustration.

- Apply Honda Bond A or equivalent to the swingarm rubber cap mating surface with swingarm.



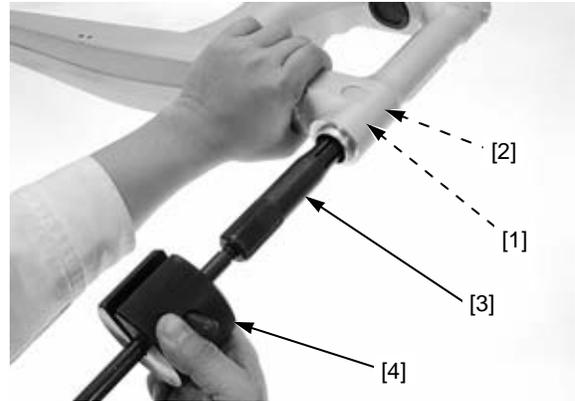
REAR WHEEL/SUSPENSION

BEARING REPLACEMENT

Remove the pivot bearings [1] and dust seals [2] using the special tool.

TOOLS:

[3] Bearing remover, 20 mm 07936-3710600
[4] Remover weight 07741-0010201
Remover handle 07936-3710100



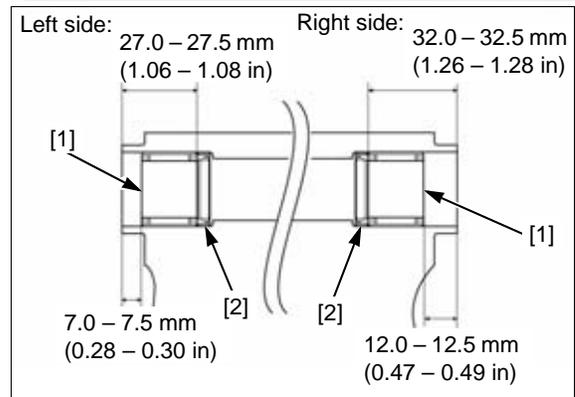
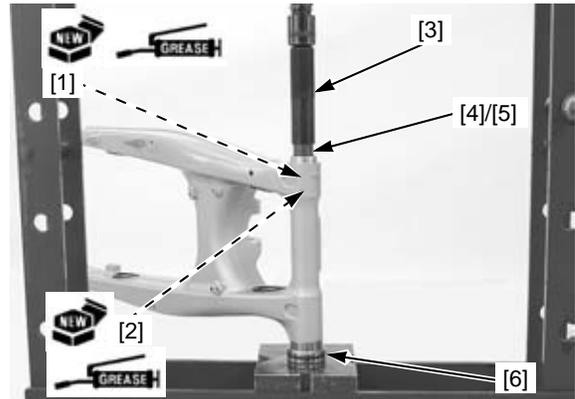
Apply grease to the needle rollers of new bearings [1] and new dust seal [2] lips.

Install the dust seals to the specified depth with the marked side facing in.

Press the needle bearings to the specified depth with the marked side facing up, using the special tools.

TOOLS:

[3] Driver 07949-3710001
[4] Attachment, 24 x 26 mm 07746-0010700
[5] Pilot 20 mm 07746-0040500
[6] Fork seal driver attachment, 20 mm 07747-0010400



DRIVE CHAIN GUIDE

REMOVAL/INSTALLATION

Remove the two nuts [1], screws [2] and chain slider guide [3].

Remove the bolts [4] and drive chain guide [5].

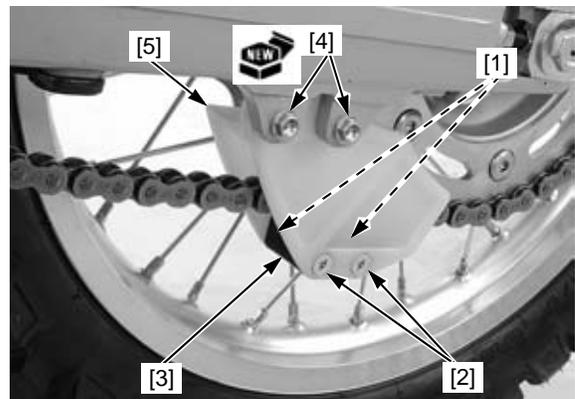
Installation is in the reverse order of removal.

- Replace the chain guide mounting bolts with new ones.

TORQUE:

Chain guide mounting bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)

Chain slider guide mounting nut:
2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)



18. BRAKE SYSTEM

SERVICE INFORMATION.....	18-2	FRONT MASTER CYLINDER.....	18-7
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BRAKE SYSTEM

SERVICE INFORMATION

GENERAL

⚠ CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

NOTICE

Spilled brake fluid will severely damage the plastic parts 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.
- 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 as they may not be compatible.
- Never allow contaminants (dirt, water, etc.) to enter an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always check brake operation before riding the motorcycle.

TROUBLESHOOTING

Brake lever/pedal soft or spongy

- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- 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/pedal

Brake lever/pedal hard

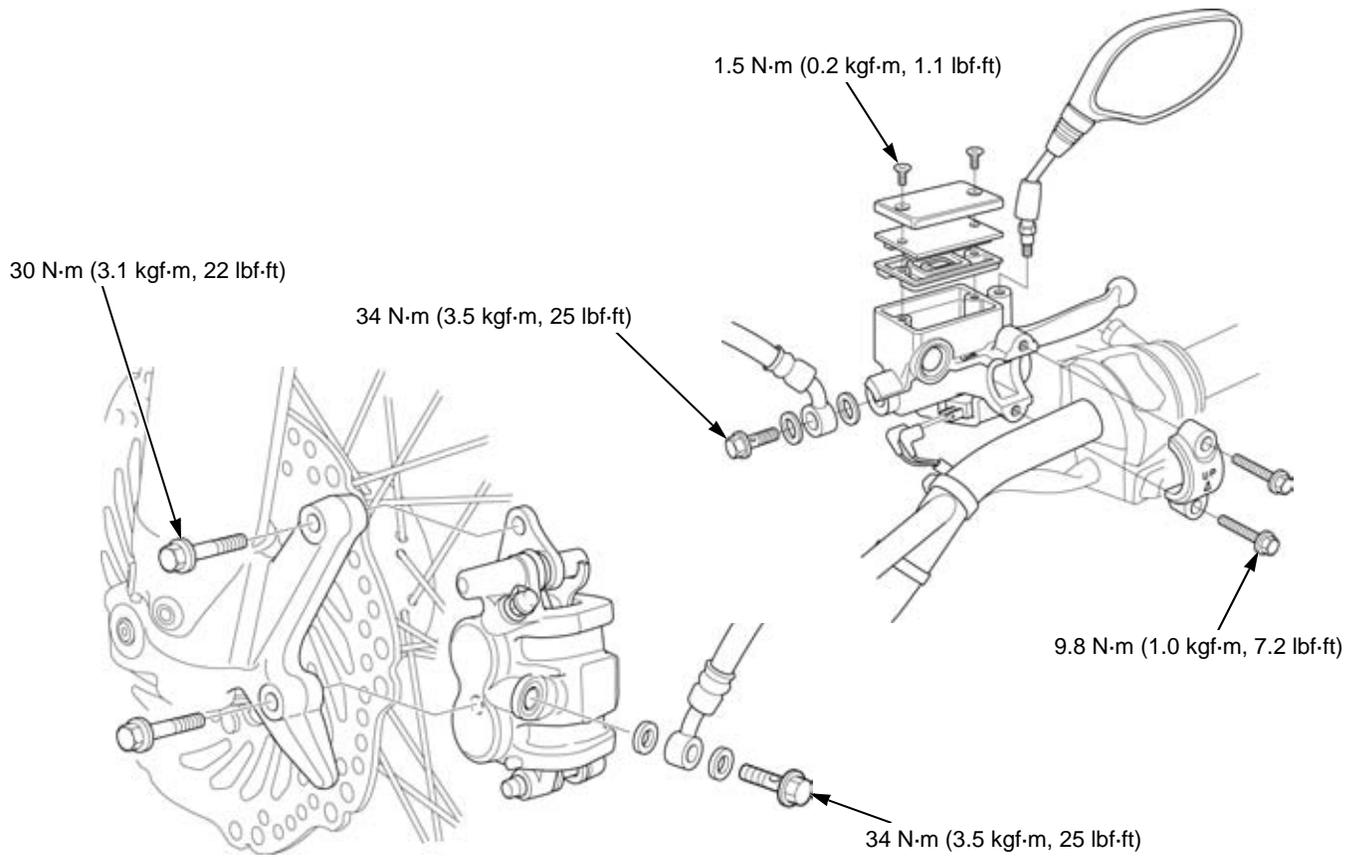
- Clogged/restricted brake system
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Caliper not sliding properly
- Warped/deformed brake disc
- Bent brake lever/pedal

Brake drags

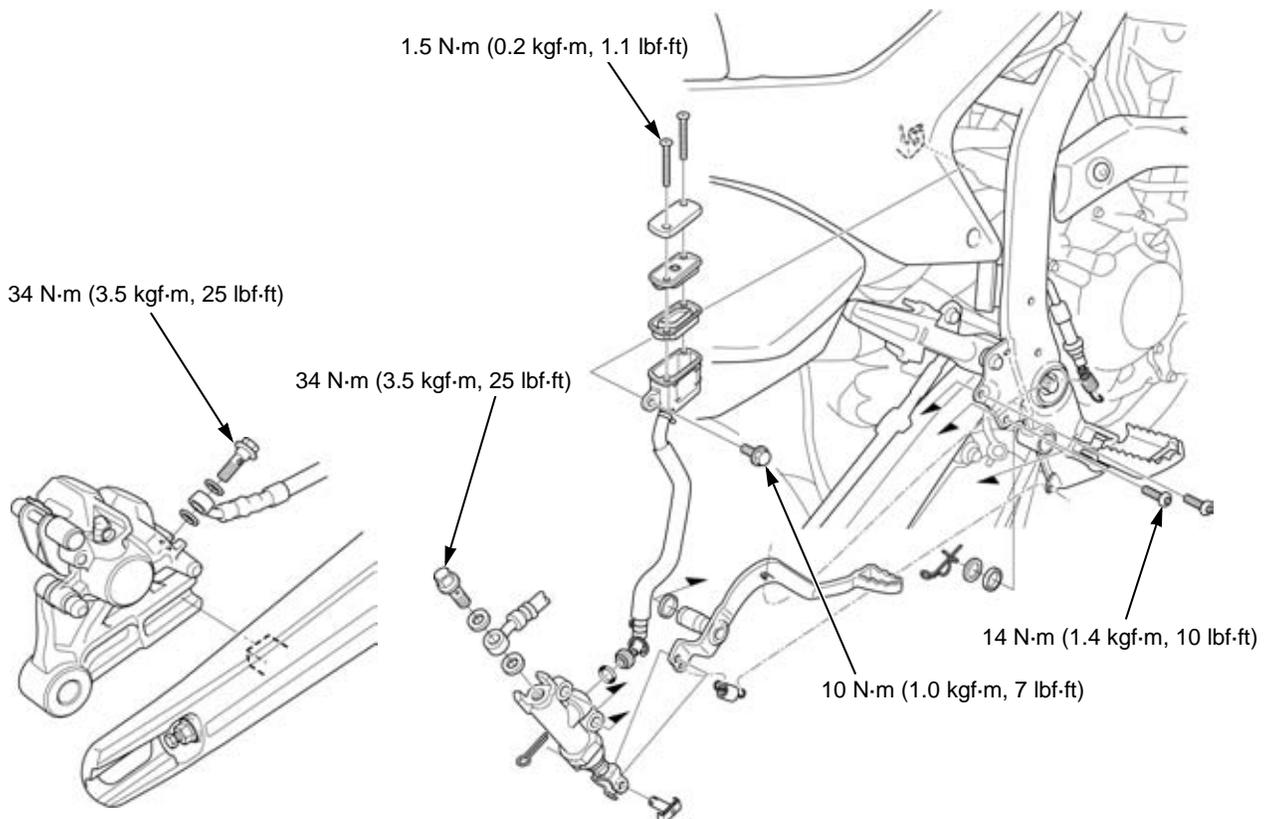
- Contaminated brake pad/disc
- Misaligned wheel
- Badly worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Sticking caliper piston

COMPONENT LOCATION

FRONT:



REAR:

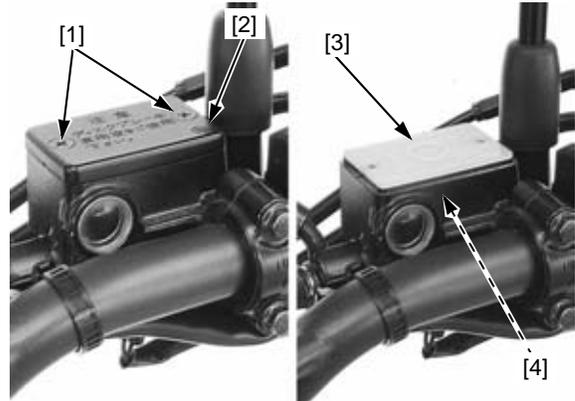


BRAKE SYSTEM

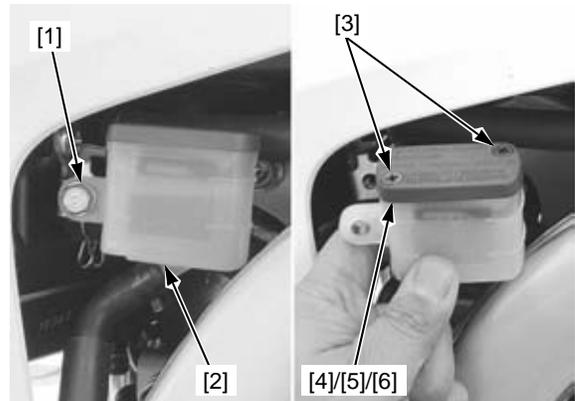
BRAKE FLUID REPLACEMENT/AIR BLEEDING

BRAKE FLUID DRAINING

For front brake: Turn the handlebar until the master cylinder reservoir is level before removing the reservoir cap. Remove the screws [1], reservoir cap [2], set plate [3], and diaphragm [4].



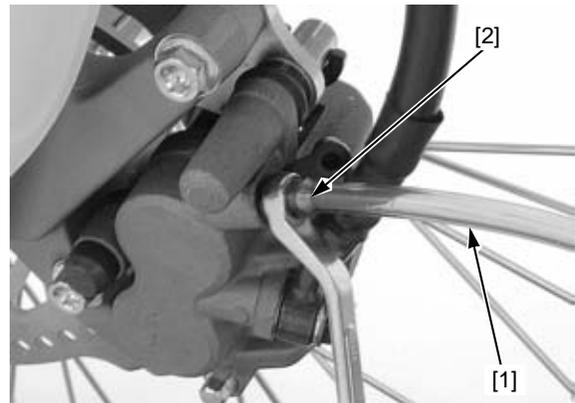
For rear brake: Remove the bolt [1] and reservoir [2]. Remove the cover screws [3], reservoir cover [4], set plate [5] and diaphragm [6].



Connect a bleed hose [1] to the bleed valve [2].

Loosen the bleed valve and pump the brake lever or pedal until no more fluid flows out of the bleed valve. Tighten the bleed valve.

TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)



BRAKE FLUID FILLING/AIR BLEEDING

Close the bleed valve.

Fill the reservoir to the upper level line [1] with DOT 3 or DOT 4 brake fluid from a sealed container.

Connect a commercially available brake bleeder to the bleed valve.

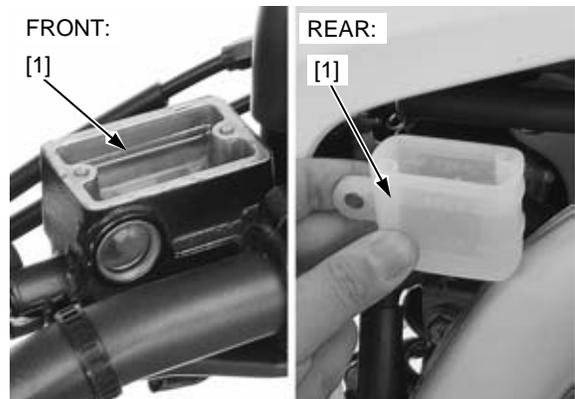
Operate the brake bleeder and loosen the bleed valve.

Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.

If an automatic refill system is not used, add fluid when the fluid level in the reservoir is low.

Perform the bleeding procedure until the system is completely flushed/bled.

Close the bleed valve and operate the brake lever or pedal. If it still feels spongy, bleed the system again.



If a brake bleeder is not available, use the following procedure:

Connect a bleed hose to the bleed valve.

Pressurize the system with the brake lever or pedal until lever or pedal resistance is felt.

Do not release the lever or pedal until the bleed valve has been closed.

1. Squeeze the brake lever or depress the brake pedal, open the bleed valve 1/4 turn and then close it.
2. Release the brake lever or pedal slowly and wait several seconds after it reaches the end of its travel.
3. Repeat the steps 1 and 2 until there are no air bubbles in the bleed hose.

After bleeding the system completely, tighten the bleed valve to the specified torque.

TORQUE: 5.4 N-m (0.6 kgf-m, 4.0 lbf-ft)

Fill the reservoir to the upper level line with DOT 3 or DOT 4 brake fluid.

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

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

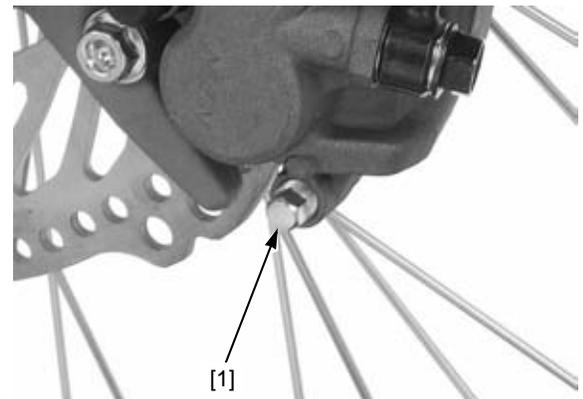
For rear brake: Install the reservoir and bolt, then tighten it to the specified torque while pushing the reservoir against the stopper.

TORQUE: 10 N-m (1.0 kgf-m, 7 lbf-ft)

BRAKE PAD/DISC

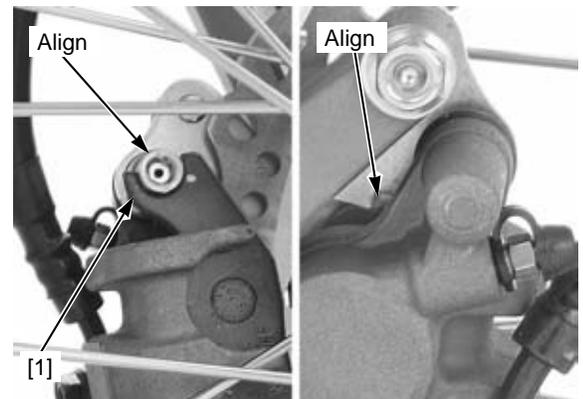
FRONT BRAKE PAD REMOVAL/INSTALLATION

Remove the pad pin [1].



Pull the pad pin out of the caliper body while pushing in the pads against the pad spring. Remove the brake pads [1].

Install the brake pads into the caliper so their ends rest into the pad retainer on the bracket properly.



BRAKE SYSTEM

Apply silicone grease to a new stopper ring [1] and install it into the pad pin [2] groove.

Make sure the pad spring is installed correctly.

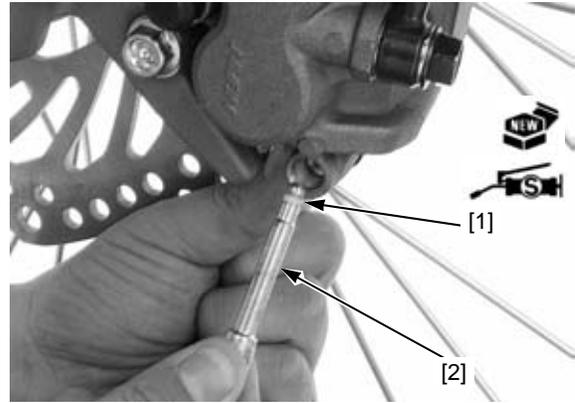
Always replace the brake pads in pairs to ensure even disc pressure.

Install the pad pin by pushing in the pads against the pad spring to align the pad pin holes in the pads and caliper body.

Tighten the pad pin to the specified torque.

TORQUE: 17.2 N-m (1.8 kgf-m, 13 lbf-ft)

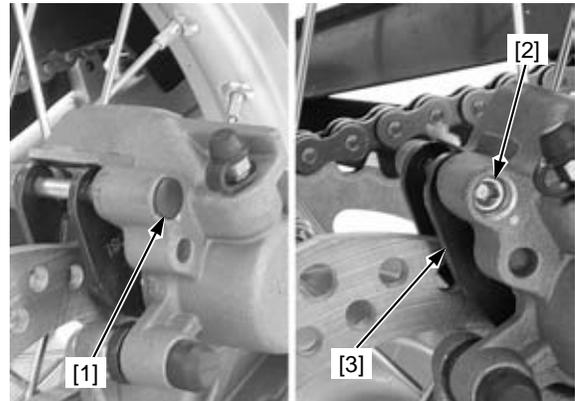
Operate the brake lever to seat the caliper pistons against the pads.



REAR BRAKE PAD REMOVAL/INSTALLATION

Remove the pad pin plug [1] and pad pin [2].

Remove the brake pads [3].



Apply silicone grease to a new stopper ring [1] and install it into the pad pin [2] groove.

Install the brake pads [3] into the caliper.

Make sure the pad spring is installed correctly.

Always replace the brake pads in pairs to ensure even disc pressure.

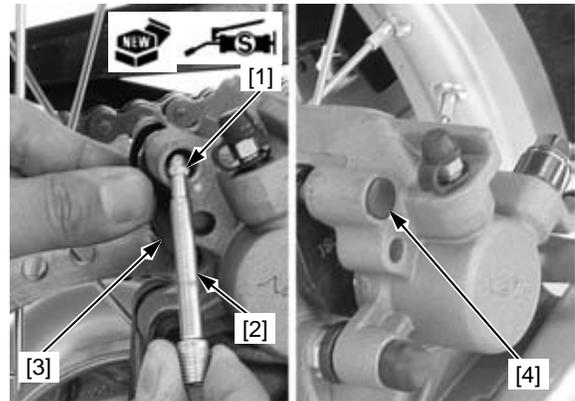
Install the pad pin by pushing in the pads against the pad spring to align the pad pin holes in the pads and caliper body.

Tighten the pad pin to the specified torque.

TORQUE: 17.2 N-m (1.8 kgf-m, 13 lbf-ft)

Install the pad pin plug [4].

Operate the brake pedal to seat the caliper pistons against the pads.



BRAKE DISC INSPECTION

Visually inspect the brake disc for damage or cracks.

Measure the brake disc according to BRAKE SYSTEM SPECIFICATIONS (page 1-8) and replace if necessary.

FRONT MASTER CYLINDER

REMOVAL/INSTALLATION

Drain the brake fluid from the front brake hydraulic system (page 18-4).

Remove the following:

- When removing the oil bolt, cover the end of the hose to prevent contamination.*
- Right rearview mirror [1]
 - Oil bolt [2]
 - Sealing washers [3]
 - Brake hose [4]
 - Brake light switch connectors [5]

- Bolts [1]
- Master cylinder holder [2]
- Master cylinder [3]

Installation is in the reverse order of removal.

- Replace the sealing washers with new ones.
- Align the edge of the master cylinder with the punch mark on the handlebar.
- Install the master cylinder and holder with its "UP" mark [4] facing up.
- Tighten the upper bolt first, then tighten the lower bolt.

TORQUE:

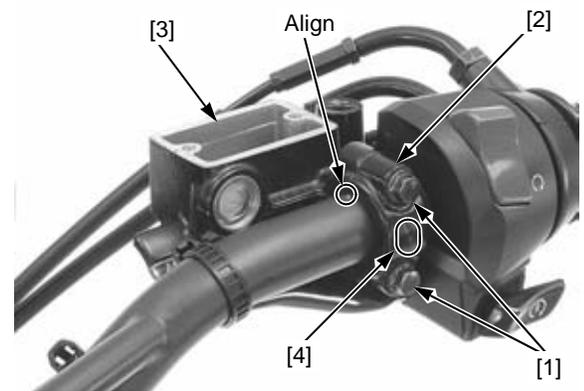
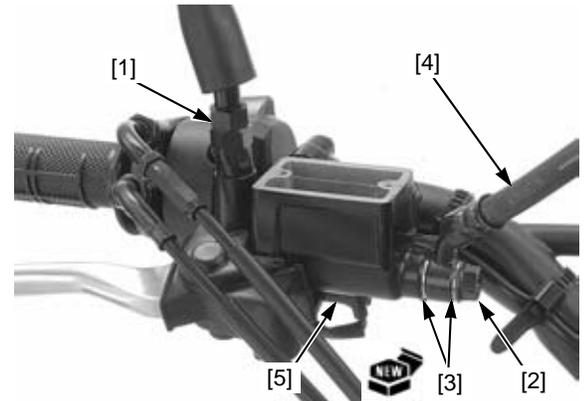
Front master cylinder holder bolt:

9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

Oil bolt:

34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the hydraulic system (page 18-4).

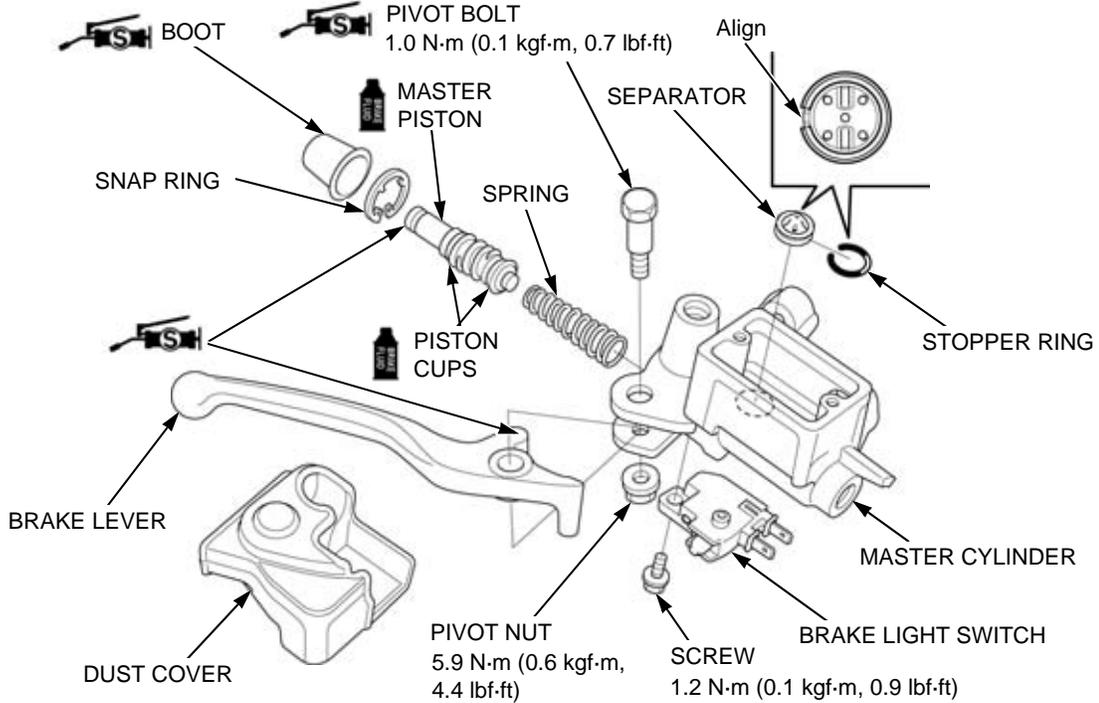


BRAKE SYSTEM

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the front brake master cylinder as following illustration.

- Replace the master piston, spring, piston cups and snap ring as a set.
- Do not allow the piston cup lips to turn inside out.
- Be certain the snap ring is firmly seated in the groove.



INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

- Master cylinder
- Master piston
- Piston cups
- Spring
- Boot

Measure the parts according to BRAKE SYSTEM SPECIFICATIONS (page 1-8) and replace if necessary.

REAR MASTER CYLINDER

REMOVAL/INSTALLATION

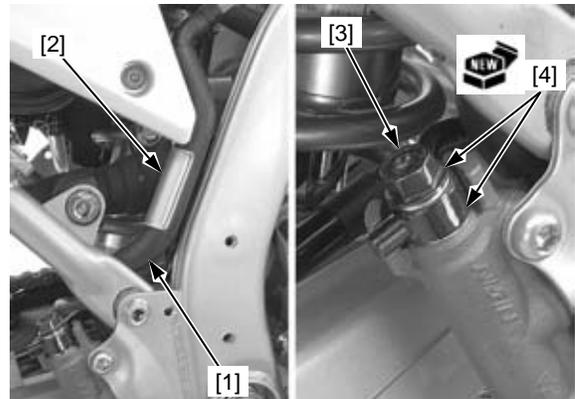
Drain the brake fluid from the rear brake hydraulic system (page 18-4).

Release the reservoir hose [1] from the clamp [2].

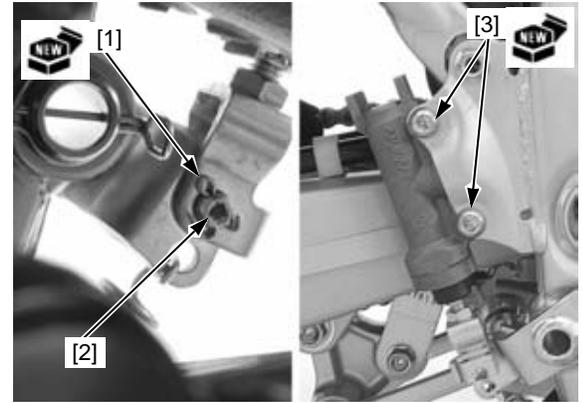
When removing the oil bolt, cover the end of the hose to prevent contamination.

Remove the following:

- Oil bolt [3]
- Sealing washers [4]
- Brake hose



- Cotter pin [1]
- Joint pin [2]
- Master cylinder mounting bolts [3]



- Snap ring [1]
- Hose joint [2]
- O-ring [3]
- Rear master cylinder [4]

Installation is in the reverse order of removal.

- Replace the O-ring, master cylinder mounting bolts, cotter pin and sealing washers with new ones.
- Apply brake fluid to the joint O-ring.

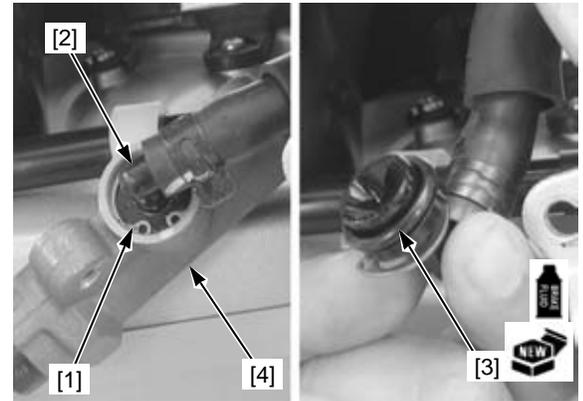
TORQUE:

Rear master cylinder mounting bolt:

14 N·m (1.4 kgf·m, 10 lbf·ft)

Oil bolt:

34 N·m (3.5 kgf·m, 25 lbf·ft)



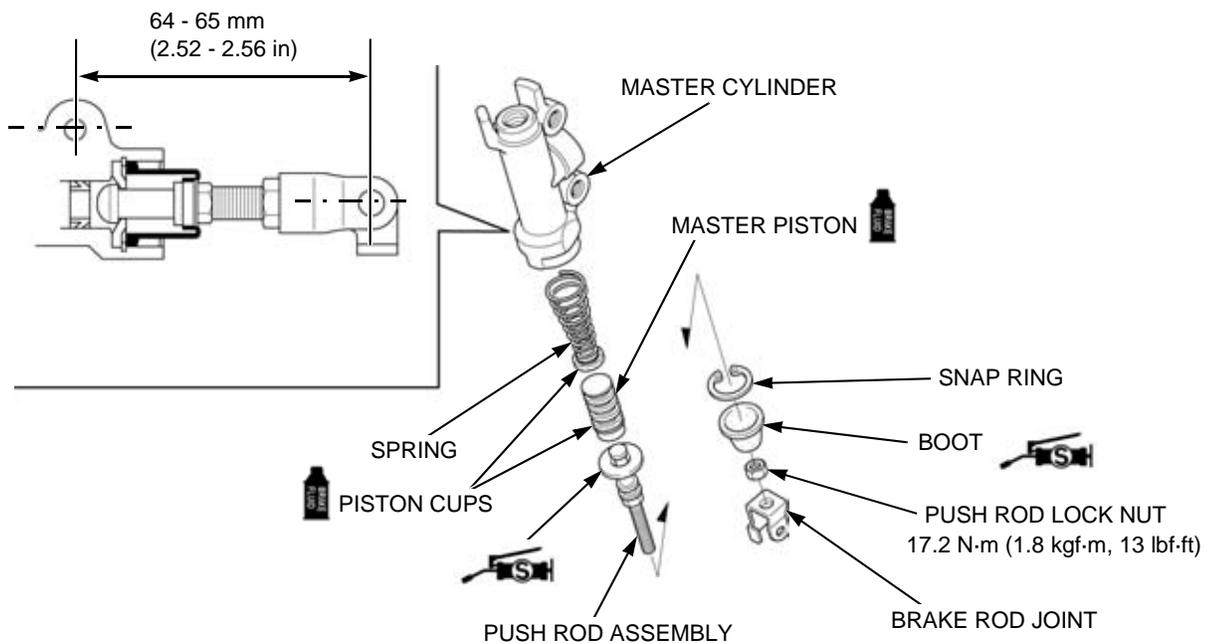
Fill and bleed the hydraulic system (page 18-4).

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the rear brake master cylinder as following illustration.

- Replace the master piston, spring, piston cups and snap ring as a set.
- Do not allow the piston cup lips to turn inside out.
- Be certain the snap ring is firmly seated in the groove.

Standard push rod length:



BRAKE SYSTEM

INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

- Master cylinder
- Master piston
- Piston cups
- Spring

Measure the parts according to BRAKE SYSTEM SPECIFICATIONS (page 1-8) and replace if necessary.

FRONT BRAKE CALIPER

REMOVAL/INSTALLATION

Drain the brake fluid from the front brake hydraulic system (page 18-4).

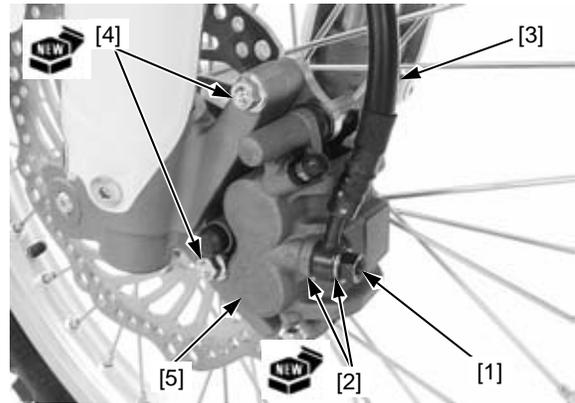
When removing the oil bolt, cover the end of the hose to prevent contamination.

Remove the following:

- Oil bolt [1]
- Sealing washers [2]
- Brake hose [3]
- Brake caliper mounting bolts [4]
- Brake caliper [5]

Installation is in the reverse order of removal.

- Replace the brake caliper mounting bolts and sealing washers with new ones.



TORQUE:

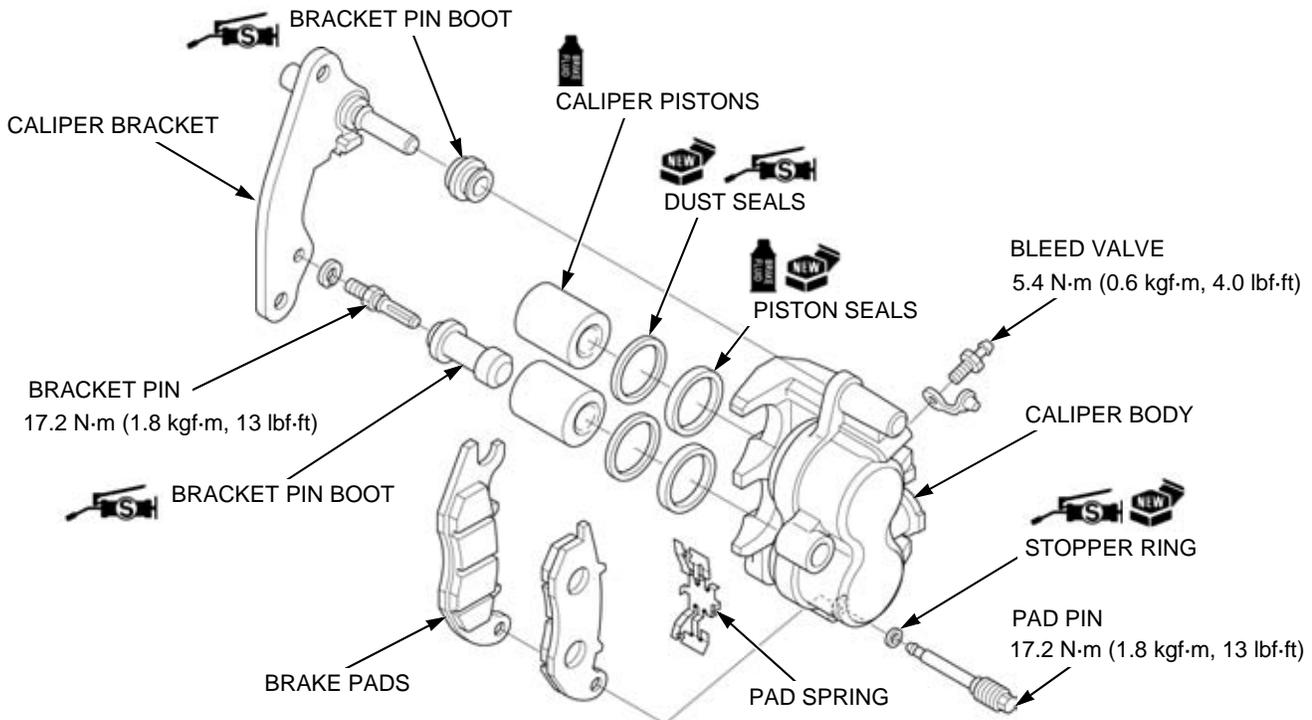
Brake caliper mounting bolt:
30 N·m (3.1 kgf·m, 22 lbf·ft)

Oil bolt:
34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the hydraulic system (page 18-4).

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the front brake caliper as following illustration.



INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

- Caliper cylinders
- Caliper pistons

Measure the parts according to BRAKE SYSTEM SPECIFICATIONS (page 1-8) and replace if necessary.

REAR BRAKE CALIPER

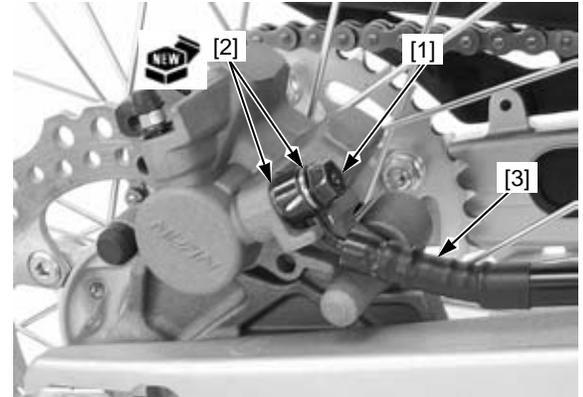
REMOVAL/INSTALLATION

Drain the brake fluid from the rear brake hydraulic system (page 18-4).

When removing the oil bolt, cover the end of the hose to prevent contamination.

Remove the oil bolt [1], sealing washers [2], and brake hose [3].

Remove the rear wheel (page 17-4).



Remove the rear brake caliper [1] from the slide rail [2] of swingarm.

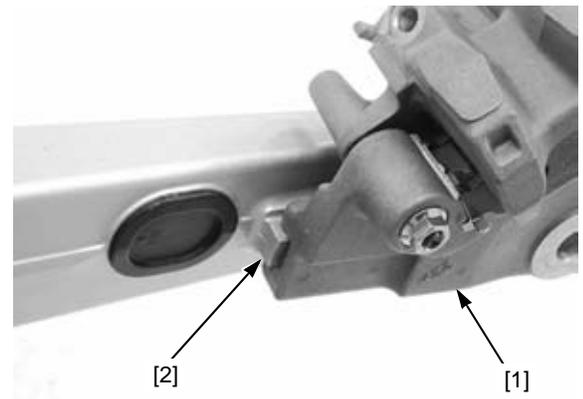
Installation is in the reverse order of removal.

- Replace the sealing washers with new ones.

TORQUE:

Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

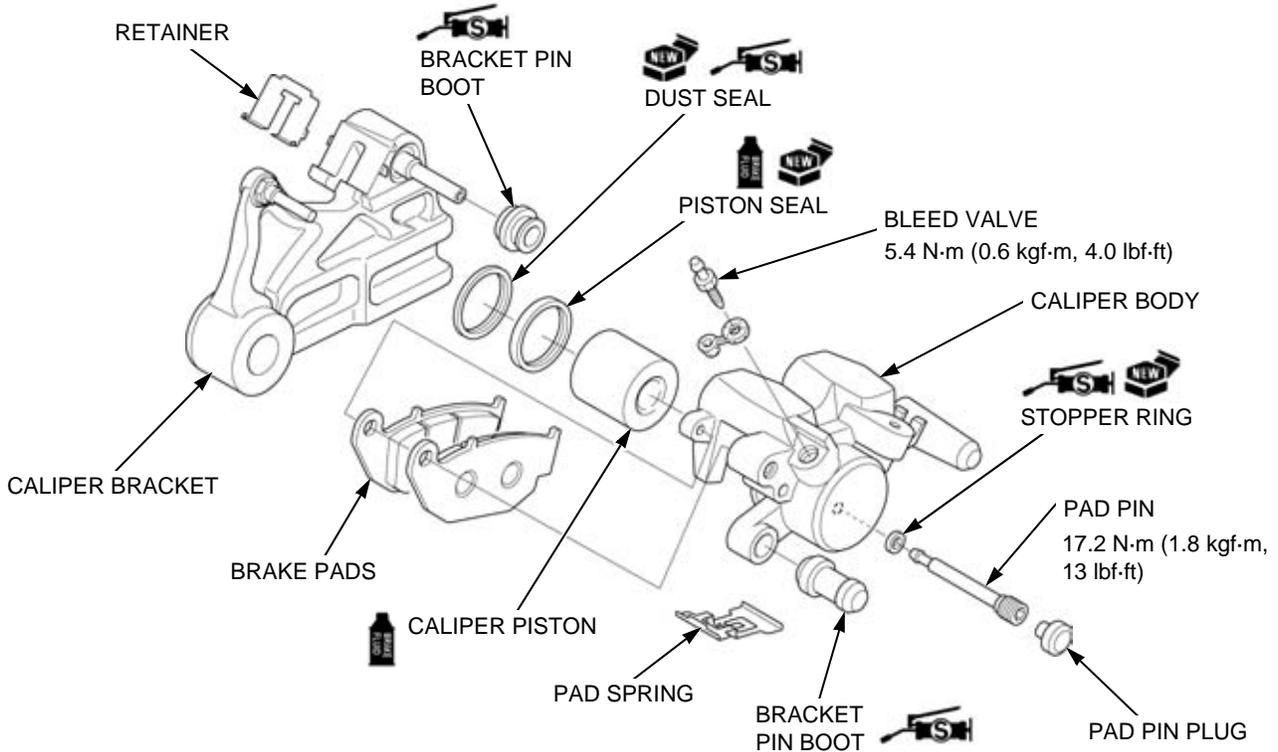
Fill and bleed the hydraulic system (page 18-4).



BRAKE SYSTEM

DISASSEMBLY/ASSEMBLY

Disassemble and assemble the rear brake caliper as following illustration.



INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

- Caliper cylinder
- Caliper piston

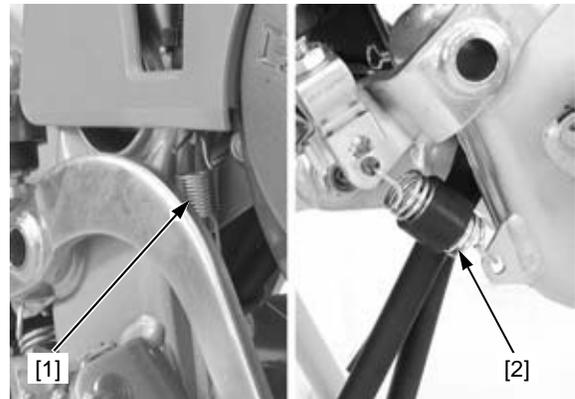
Measure the parts according to BRAKE SYSTEM SPECIFICATIONS (page 1-8) and replace if necessary.

BRAKE PEDAL

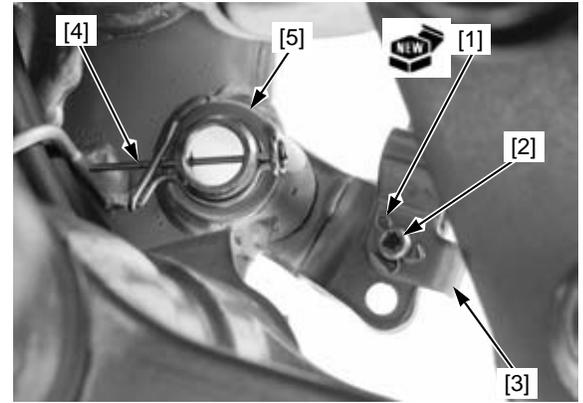
REMOVAL/INSTALLATION

Remove the following:

- Brake light switch return spring [1]
- Brake pedal return spring [2]



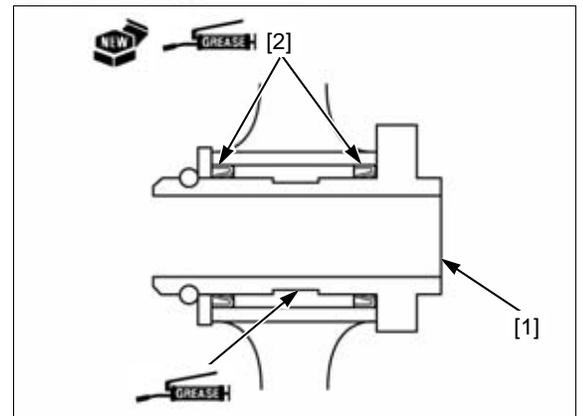
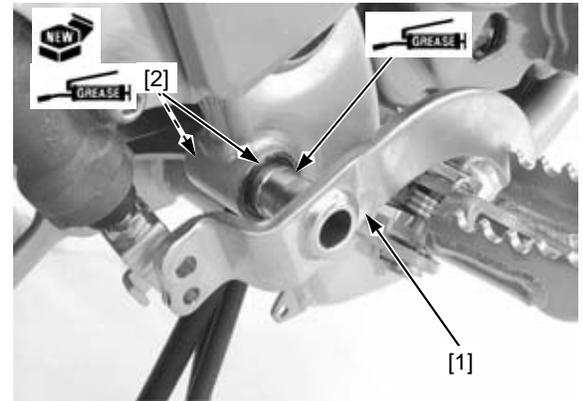
- Cotter pin [1]
- Joint pin [2]
- Brake rod joint [3]
- Stopper pin [4]
- Washer [5]



- Brake pedal [1]
- Dust seals [2]

Installation is in the reverse order of removal.

- Replace the dust seals and cotter pin with new ones.
- Install the dust seals in shown direction.
- Apply grease to the brake pedal pivot sliding surface and dust seal lips.



MEMO

19. BATTERY/CHARGING SYSTEM

SERVICE INFORMATION.....	19-2	BATTERY.....	19-4
TROUBLESHOOTING.....	19-2	CHARGING SYSTEM INSPECTION	19-4
SYSTEM LOCATION.....	19-3	ALTERNATOR CHARGING COIL	19-5
SYSTEM DIAGRAM	19-3	REGULATOR/RECTIFIER	19-6

BATTERY/CHARGING SYSTEM

SERVICE INFORMATION

GENERAL

⚠ WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
 - If electrolyte gets on your skin, flush with water.
 - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
 - If swallowed, drink large quantities of water or milk and call your local Poison Control Center or a physician immediately.

NOTICE

- *Always turn OFF the ignition switch before disconnecting any electrical component.*
- *Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.*
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every 2 weeks.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.
- The maintenance free battery must be replaced when it reaches the end of its service life.
- The battery can be damaged if overcharged or undercharged, or if left to discharge for a long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2 – 3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and taillight ON for long periods of time without riding the motorcycle.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every 2 weeks to prevent sulfation from occurring.
- For alternator removal (page 13-4).

BATTERY CHARGING

- Turn power ON/OFF at the charger, not at the battery terminal.
- For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.
- Quick charging should only be done in an emergency; slow charging is preferred.

BATTERY TESTING

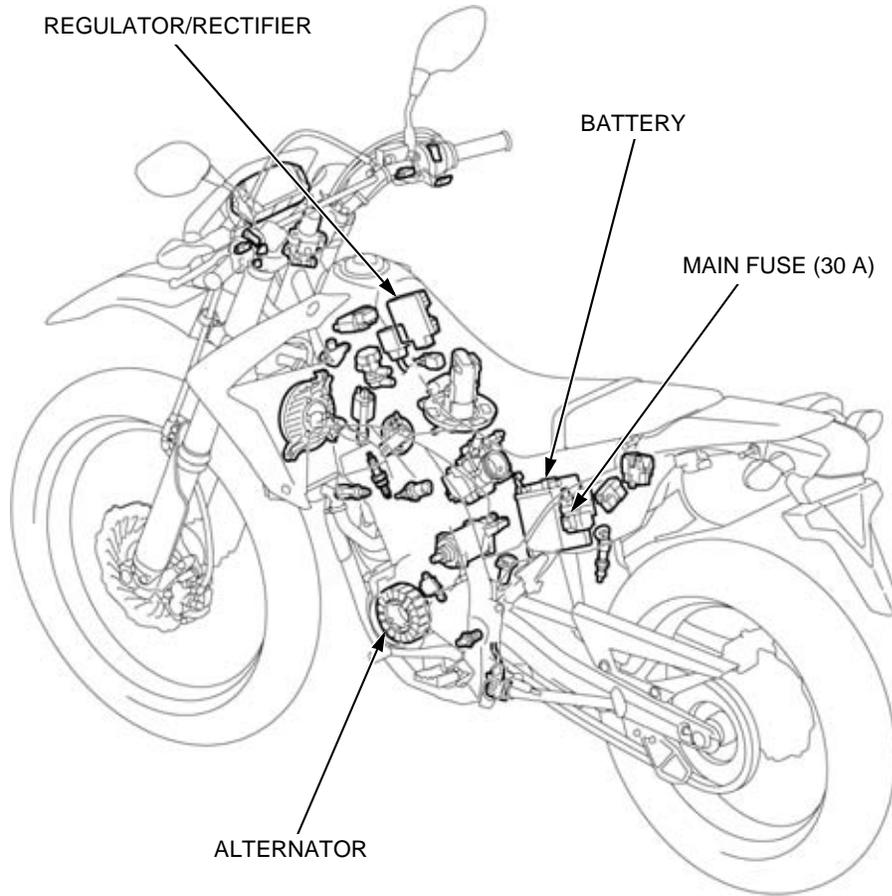
Refer to the instruction of the Operation Manual for the recommended battery tester for details about battery testing. The recommended battery tester puts a "load" on the battery so the actual battery condition can be measured.

RECOMMENDED BATTERY TESTER: BM-210 or BATTERY MATE or equivalent

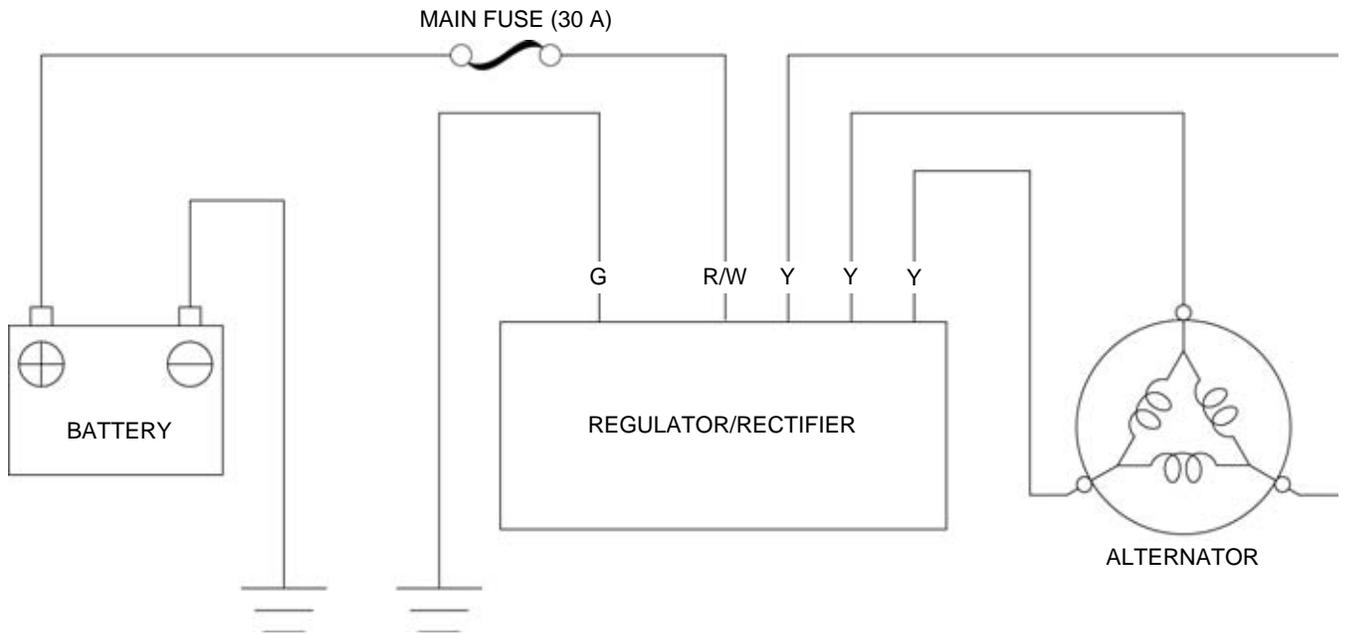
TROUBLESHOOTING

Unusual condition		Probable cause (Check in numerical order)
Battery	Battery is damaged or weak	<ol style="list-style-type: none">1. Faulty battery2. Current leakage higher than specified value<ul style="list-style-type: none">– Faulty ignition switch– Shorted wire harness3. Faulty alternator charging coil4. Faulty regulator/rectifier5. Open circuit or loose connection in the wire harness

SYSTEM LOCATION



SYSTEM DIAGRAM



Y: Yellow
G: Green
R: Red
W: White

BATTERY

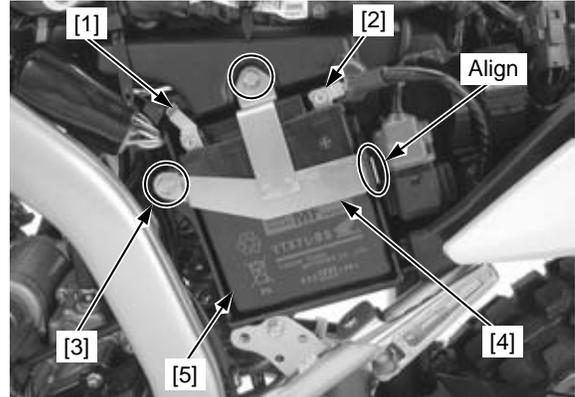
REMOVAL/INSTALLATION

Remove the left side cover (page 2-3).

Turn the ignition switch OFF.

Disconnect the negative (-) cable [1] first and then the positive (+) cable [2].

Remove the bolt [3], battery holder plate [4] and battery [5].



Install the battery in the reverse order of removal.

TORQUE:

Battery holder plate bolt:
7.0 N·m (0.7 kgf·m, 5.2 lbf·ft)

NOTE:

- Install the battery holder plate by aligning its hook with the slit of the battery case.
- For digital clock setting procedure (page 20-7).

VOLTAGE INSPECTION

Measure the battery voltage using a commercially available digital multimeter.

VOLTAGE (20°C/68°F):

Fully charged: 13.0 – 13.2 V

Under charged: Below 12.3 V

If the battery voltage is below 12.3 V, charge the battery.



BATTERY TESTING

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

TOOL:

Battery tester

**BM-210 or
BATTERY MATE
or equivalent**

CHARGING SYSTEM INSPECTION

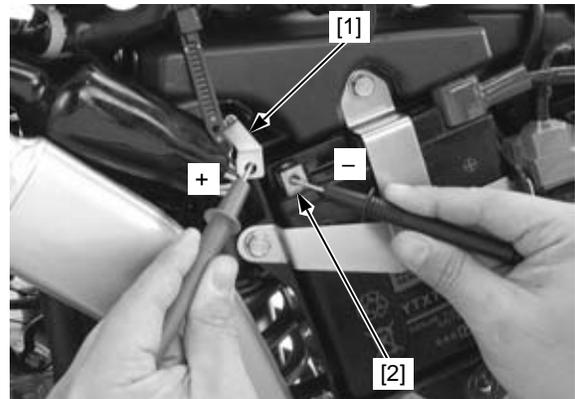
CURRENT LEAKAGE INSPECTION

Remove the left side cover (page 2-3).

With the ignition switch turned OFF, disconnect the negative (-) cable [1].

Connect the ammeter (+) probe to the wire harness negative (-) cable and ammeter (-) probe to the battery negative (-) terminal [2].

With the ignition switch turned OFF, check for current leakage.



NOTE:

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow the fuse in the tester.
- While measuring current, do not turn the ignition switch ON and engine stop switch to "O". A sudden surge of current may blow the fuse in the tester.

SPECIFIED CURRENT LEAKAGE: 0.34 mA max.

If current leakage exceeds the specified value, a shorted circuit is likely.
 Locate the short by disconnecting connections one by one and measuring the current.

CHARGING VOLTAGE INSPECTION

Remove the left side cover (page 2-3).

Be sure the battery is in good condition before performing this test.

Warm up the engine to normal operating temperature. Connect the multimeter between the battery positive (+) terminal [1] and negative (-) terminal [2].

NOTE:

- To prevent a short, make absolutely certain which are the positive (+) and negative (-) terminal or cable.
- Do not disconnect the battery or any cable in the charging system without first turning the ignition switch OFF. Failure to follow this precaution can damage the tester or electrical components.

With the headlight high beam, measure the voltage on the multimeter when the engine runs at 5,000 min⁻¹ (rpm).

STANDARD:

Measured BV < Measured CV < 15.5 V

- **BV = Battery Voltage**
- **CV = Charging Voltage**



ALTERNATOR CHARGING COIL

INSPECTION

Remove the left side cover (page 2-3).

Disconnect the alternator 3P connector [1].

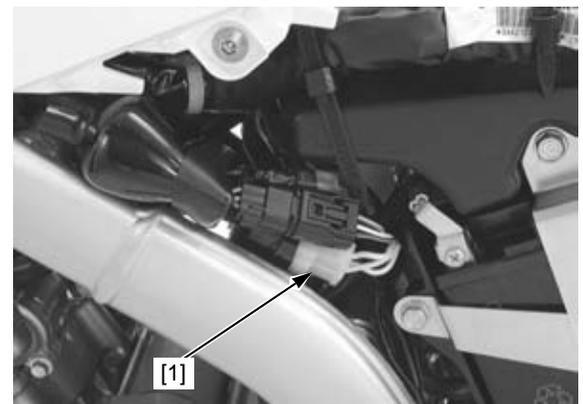
Measure the resistance between the Yellow wire terminals of the alternator side connector.

STANDARD: 0.1 – 1.0 Ω (20°C/68°F)

Check for continuity between each wire terminal of the alternator/stator side connector and ground. There should be no continuity.

Replace the alternator stator if the resistance is out of specification, or if any wire has continuity to ground.

For stator replacement (page 13-4).



BATTERY/CHARGING SYSTEM

REGULATOR/RECTIFIER

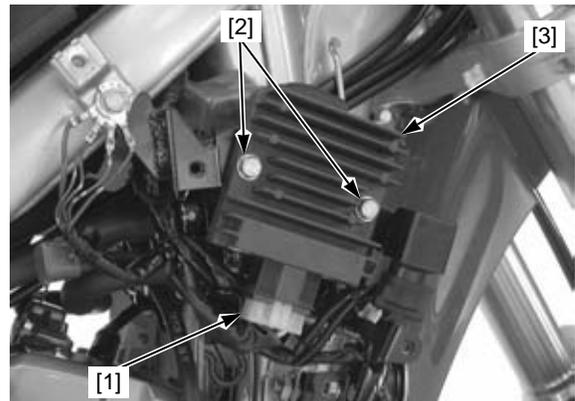
REMOVAL/INSTALLATION

Remove the radiator reserve tank (page 9-12).

Disconnect the regulator/rectifier 5P connector [1].

Remove the bolts [2] and regulator/rectifier [3] from the reserve tank stay.

Install the regulator/rectifier in the reverse order of removal.



SYSTEM INSPECTION

Remove the right fuel tank shroud (page 2-4).

Turn the ignition switch OFF.

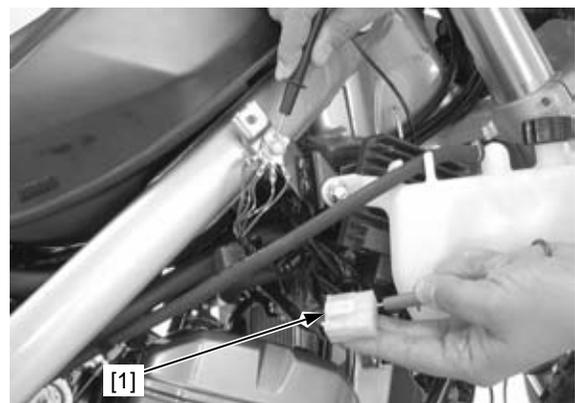
Disconnect the regulator/rectifier 5P connector [1], and check it for loose contacts or corroded terminals.



If the charging voltage reading (page 19-5) is out of the specification, check the following at the wire harness side connector [1]:

Item	Terminal	Specification
Battery charging line	Red/white (+) and ground (-)	Battery voltage should register
Charging coil line	Yellow and Yellow	0.1 – 1.0 Ω at (20°C/68°F)
Ground line	Green and ground	Continuity should exist

If all components of the charging system are normal and there are no loose connections at the regulator/rectifier connector, replace the regulator/rectifier unit.



20. LIGHTS/METERS/SWITCHES

SERVICE INFORMATION.....	20-2	IGNITION SWITCH.....	20-10
SYSTEM LOCATION.....	20-2	HANDLEBAR SWITCH.....	20-11
HEADLIGHT	20-3	BRAKE LIGHT SWITCH	20-12
POSITION LIGHT	20-3	NEUTRAL SWITCH	20-12
TURN SIGNAL LIGHT.....	20-4	SIDESTAND SWITCH.....	20-13
BRAKE/TAILLIGHT.....	20-5	CLUTCH SWITCH.....	20-14
SPEEDOMETER.....	20-5	FUEL GAUGE/FUEL LEVEL SENSOR.....	20-14
VS SENSOR	20-8	HORN	20-15
HIGH COOLANT TEMPERATURE INDICATOR	20-9	TURN SIGNAL RELAY	20-15

SERVICE INFORMATION

GENERAL

NOTICE

- Note the following when replacing the halogen headlight bulb.
 - Wear clean gloves while replacing the bulb. Do not put fingerprints on the headlight bulb, as they may create hot spots on the bulb and cause it to fail.
 - If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
- Be sure to install the dust cover after replacing the headlight bulb.
- A halogen headlight bulb becomes very hot while the headlight is ON, and remains hot for a while after it is turned OFF. Be sure to let it cool down before servicing.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.
- The following color codes are used throughout this section.

Bu = Blue
Bl = Black

G = Green
Gr = Gray

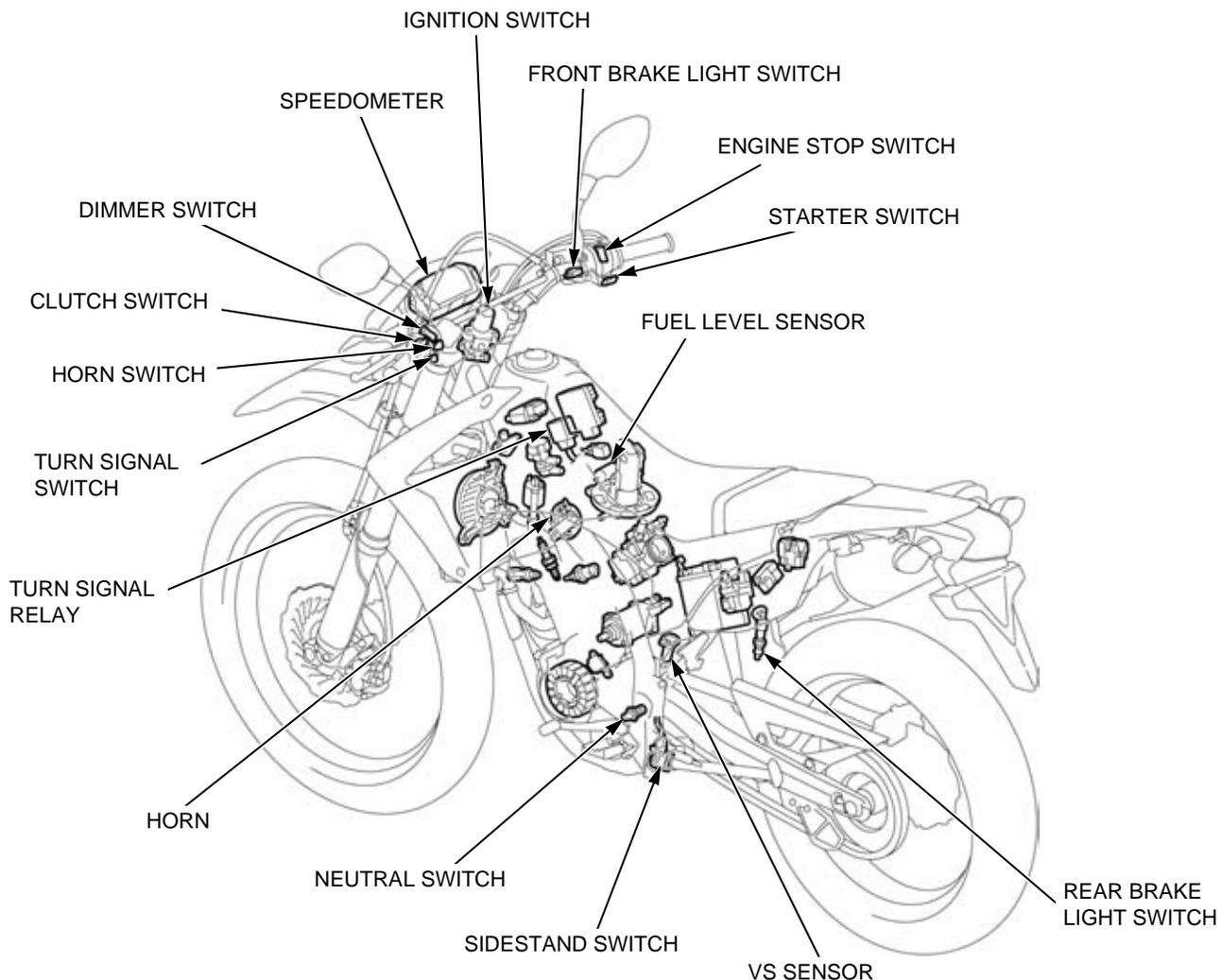
Lb = Light Blue
Lg = Light Green

O = Orange
P = Pink

R = Red
W = White

Y = Yellow

SYSTEM LOCATION



HEADLIGHT

BULB REMOVAL/INSTALLATION

Remove the headlight cowl (page 2-5).

Remove the dust cover [1].

Unhook the bulb retainer [2] and remove the headlight bulb [3].

NOTICE

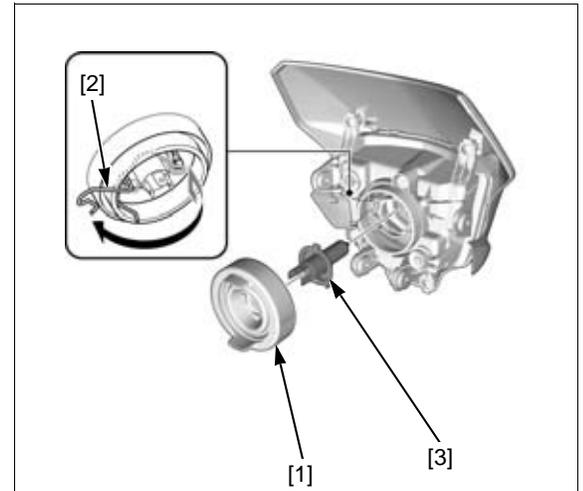
Avoid touching halogen headlight bulb. Fingerprints can create hot spots that cause a bulb to break.

Install the bulb while aligning its tabs with the slots of the headlight unit.

Hook the bulb retainer into the headlight unit groove.

Install the dust cover tightly against the headlight unit.

Install the headlight cowl (page 2-5).



HEADLIGHT UNIT REMOVAL/INSTALLATION

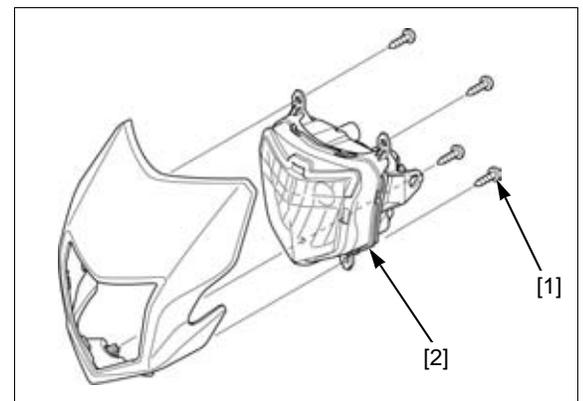
Remove the headlight cowl (page 2-5).

Remove the screws [1] and headlight unit [2] from the headlight cowl.

Installation is in the reverse order of removal.

TORQUE:

Headlight unit mounting screw:
1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)



POSITION LIGHT

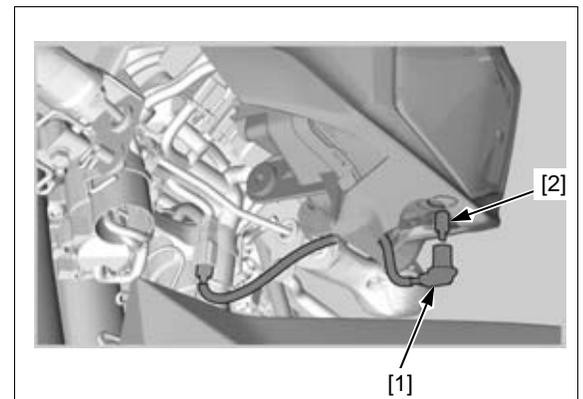
BULB REMOVAL/INSTALLATION

Remove the headlight cowl (page 2-5).

Pull out the bulb socket [1] from the headlight case.

Remove the bulb [2] from the socket.

Installation is in the reverse order of removal.



TURN SIGNAL LIGHT

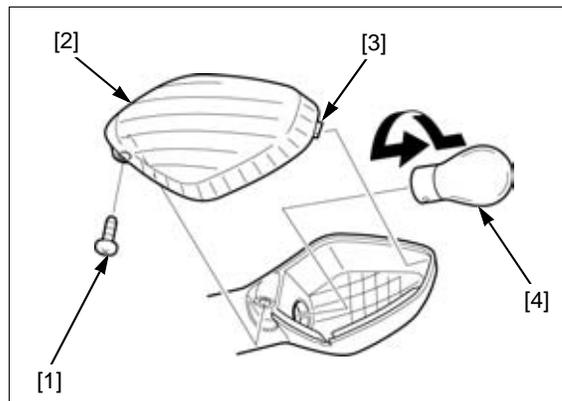
BULB REMOVAL/INSTALLATION

Remove the screw [1] and turn signal light lens [2] by releasing its tab [3].

While pushing in the bulb [4], turn it counterclockwise to remove it.

Installation is in the reverse order of removal.

Check that the packing is installed in position and is in good condition, replace it with a new one if necessary.



FRONT TURN SIGNAL UNIT REMOVAL/INSTALLATION

Remove the headlight cowl (page 2-5).

Disconnect the front turn signal 2P connector [1].

- Right side: Light blue
- Left side: Orange

Release the wire from the wire band [2].

Left side only: Release the wire from the wire band [3].

Remove the nut [4] and front turn signal unit [5].

Installation is in the reverse order of removal.

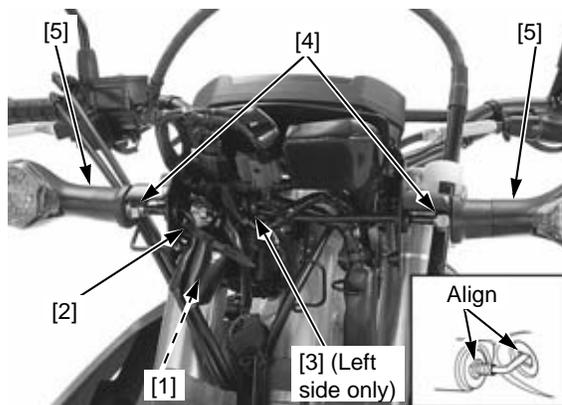
TORQUE:

Turn signal unit mounting nut:

21 N·m (2.1 kgf·m, 15 lbf·ft)

NOTE:

Align the flats of the turn signal unit and speedometer stay.



REAR TURN SIGNAL UNIT REMOVAL/INSTALLATION

Remove the rear fender (page 2-7).

Disconnect the rear turn signal 2P connector [1].

- Right side: Light blue
- Left side: Orange

Remove the nut [2] and rear turn signal unit [3].

Installation is in the reverse order of removal.

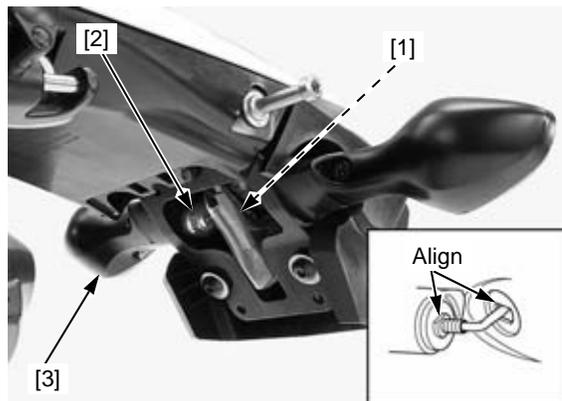
TORQUE:

Turn signal unit mounting nut:

21 N·m (2.1 kgf·m, 15 lbf·ft)

NOTE:

Align the flats of the turn signal unit and turn signal unit stay.



BRAKE/TAILLIGHT

NOTE:

For brake/taillight removal/installation (page 2-8).

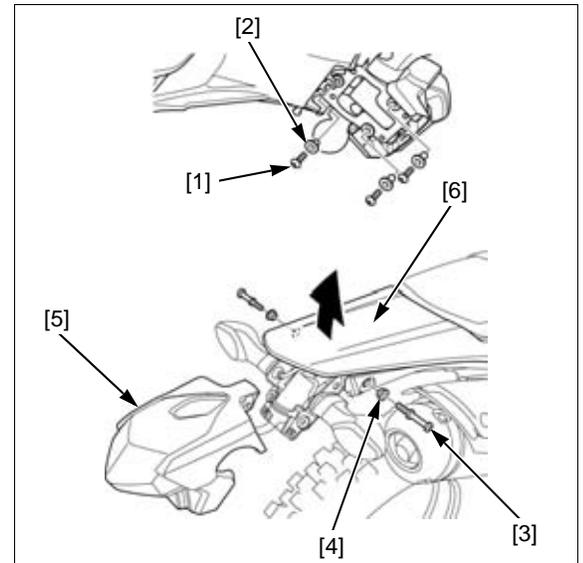
BULB REMOVAL/INSTALLATION

Remove the rear fender (page 2-7).

Remove the brake/taillight mounting screws [1] and collars [2].

Remove the hook bolts [3] and collars [4].

Pull the tail cover/light unit [5] rearward while pulling up the rear upper fender [6].



Turn the bulb socket [1] counterclockwise and remove it.

While pushing in the bulb [2], turn it counterclockwise to remove it.

Installation is in the reverse order of removal.

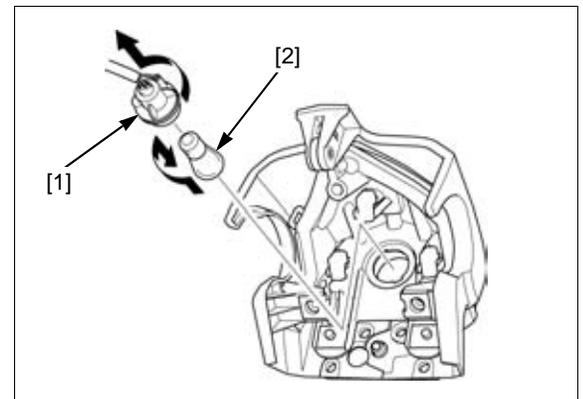
TORQUE:

Hook bolt:

21 N·m (2.1 kgf·m, 15 lbf·ft)

Brake/taillight mounting screw:

4.5 N·m (0.5 kgf·m, 3.3 lbf·ft)



SPEEDOMETER

REMOVAL/INSTALLATION

Remove the headlight cowl (page 2-5).

Release the wire bands [1] from the meter stay.

Remove the screws [2], washers [3] and speedometer [4] by disconnecting the speedometer 16P connector [5].

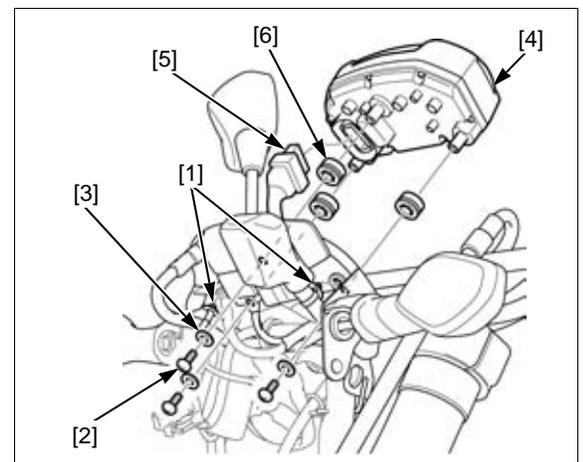
Remove the mounting rubbers [6].

Installation is in the reverse order of removal.

TORQUE:

Speedometer mounting screw:

1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)



SYSTEM INSPECTION

NOTE:

Check for loose or poor contact terminals at the speedometer 16P connector.

When the ignition switch is turned ON, check that the meter segments turn on.

If the speedometer does not show the initial function, perform the power and ground line inspection of the speedometer (page 20-6).

If the speedometer shows the initial function but speedometer does not move when running, check the speedometer/Vs sensor system inspection (page 20-8).



POWER/GROUND LINES INSPECTION

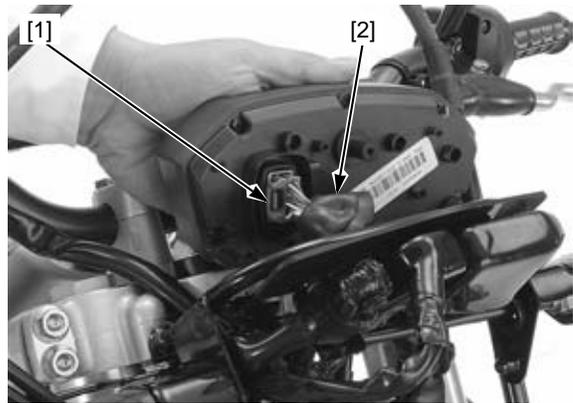
Remove the speedometer (page 20-5).

NOTE:

- Do not disconnect the speedometer 16P connector [1] during inspection.
- After inspection, reposition the dust cover [2] securely.

Remove the dust cover.

With the speedometer 16P connector connected, check the following at the wire harness side connector.



POWER INPUT LINE

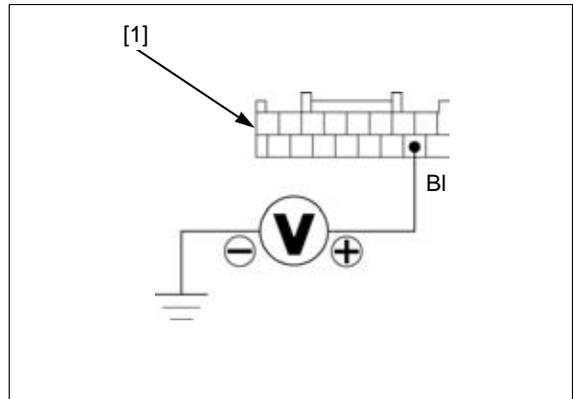
Measure the voltage between the speedometer 16P connector [1] and ground.

CONNECTION: Black (+) – Ground (-)

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

If there is no battery voltage, check the following:

- Open circuit in the Black wire
- Open circuit in Black/red wire between the fuse box and ignition switch
- Blown METER, TAIL fuse (10 A)



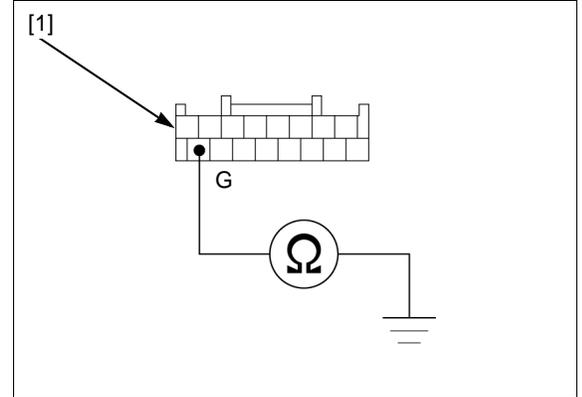
GROUND LINE

Check for continuity between the speedometer 16P connector [1] and ground.

CONNECTION: Green – Ground

There should be continuity at all times.

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



BACK-UP VOLTAGE LINE

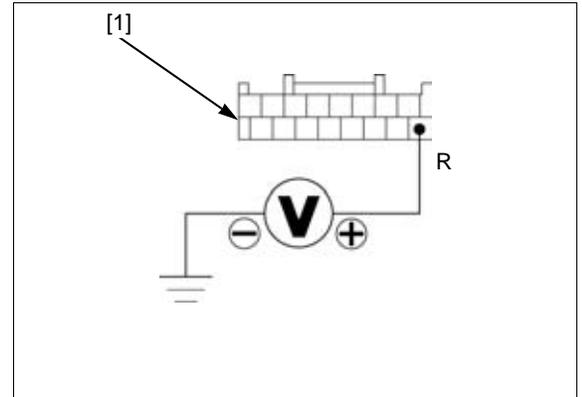
Measure the voltage between the speedometer 16P connector [1] and ground.

CONNECTION: Red (+) – Ground (-)

There should be battery voltage at all times.

If there is no battery voltage, check the following:

- Open circuit in the Red wire
- Blown ODO, CLOCK fuse (5 A)
- Blown main fuse (30 A)
- Open circuit in Red/white wire between the fuse box and starter relay switch



SPEEDOMETER DIGITAL CLOCK SET PROCEDURE

E TYPE:

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

Push and hold both the A button [1] and B button [2] until the speed and mileage units [3] start blinking.

Push the B button to select either "mph" & "mile", or "km/h" & "km" for the speedometer, odometer and trip meter.

Push the A button to confirm the unit setting, and then the display moves to the clock setting.

The hour digits [4] will start blinking. Push the B button until the desired hour is displayed.

NOTE:

Push and hold to advance the hour fast.

Push the A button, then the minute digits [5] start blinking.

Push the B button until the desired minute is displayed.

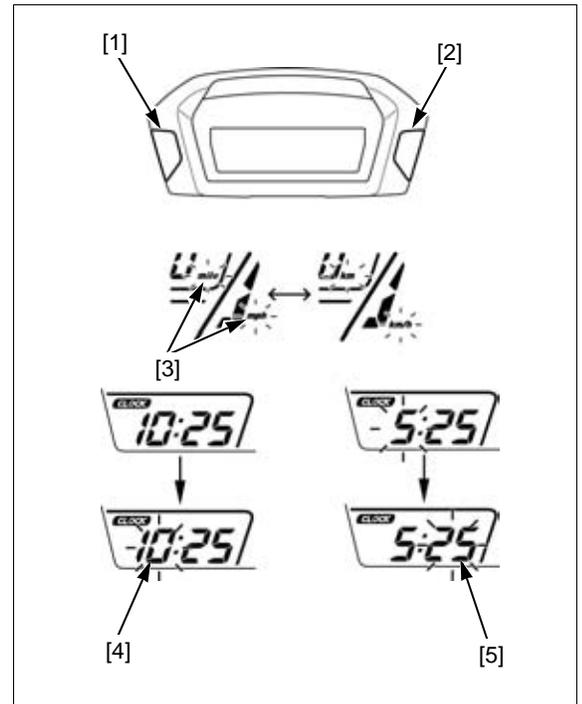
NOTE:

Push and hold to advance the minute fast.

Push both the A button and B button to complete the setting.

NOTE:

The time can also be set by turning the ignition switch OFF.



LIGHTS/METERS/SWITCHES

EXCEPT E TYPE:

Turn the ignition switch ON and engine stop switch "G".
Push and hold both the A button [1] and B button [2] until the hour digits [3] start blinking.

Push the B button until the desired hour is displayed.

NOTE:

Push and hold to advance the hour fast.

Push the A button, then the minute digits [4] start blinking.

Push the B button until the desired minute is displayed.

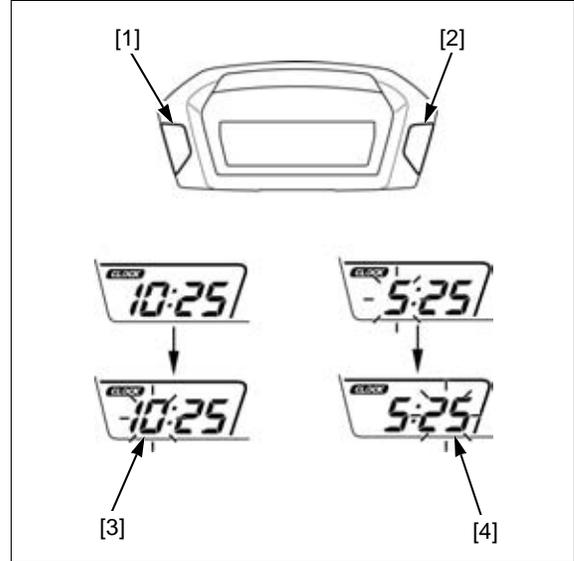
NOTE:

Push and hold to advance the minute fast.

Push both the A button and B button to complete the setting.

NOTE:

The time can also be set by turning the ignition switch OFF.



VS SENSOR

SYSTEM INSPECTION

NOTE:

- Before starting this inspection, check for speedometer system inspection (page 20-5).
- Do not disconnect the speedometer 16P connector during inspection.
- After inspection, reposition the dust cover securely.

Shift the transmission into neutral.

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

With the speedometer 16P connector [1] connected, measure the voltage between the speedometer 16P connector terminals.

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

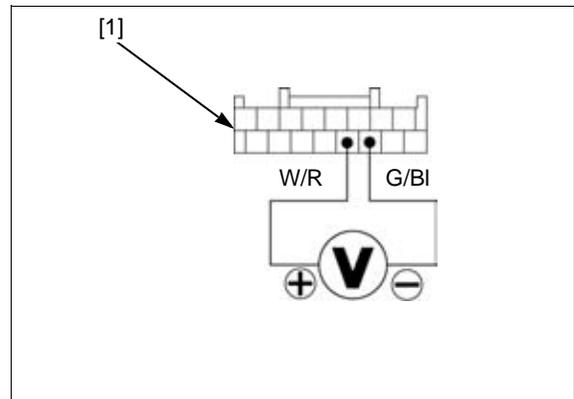
Slowly turn the rear wheel by hand.

There should be 0 V to 5 V pulse voltage.

If pulse voltage appears, replace the speedometer (page 20-5).

If pulse voltage does not appear, check the following:

- White/red wire for open or short circuit
- Green/black wire for open circuit
- If the wires are OK, check the VS sensor (page 20-9).



VS SENSOR INSPECTION

Remove the left side cover (page 2-3).

Check for loose or poor contact of the VS sensor 3P (Blue) connector [1].

Disconnect the VS sensor 3P (Blue) connector.

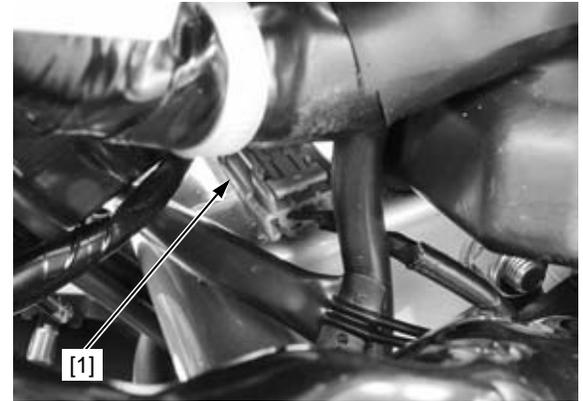
Turn the ignition switch ON and engine stop switch "O". Measure the voltage between the VS sensor 3P (Blue) connector terminals at the wire side.

CONNECTION: Black/red (+) – Green/black (-)
STANDARD: Battery voltage

If battery voltage appears, replace the VS sensor.

If there is no voltage, check the following:

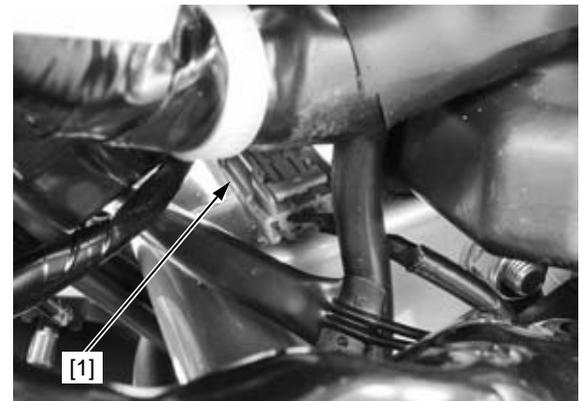
- Black/red wire for open circuit
- Green/black wire for open circuit
- Speedometer (page 20-5)



REMOVAL/INSTALLATION

Remove the left side cover (page 2-3).

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

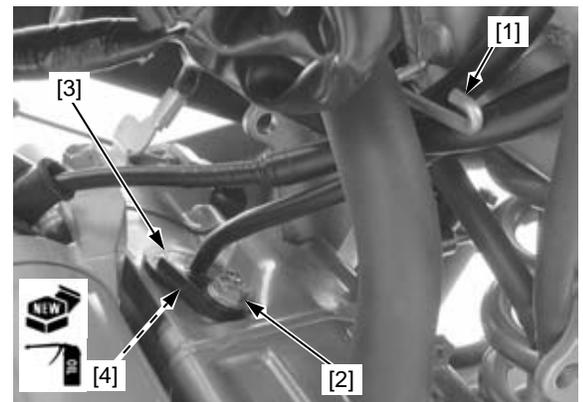


Remove the VS sensor wire from the guide [1].

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

Installation is in the reverse order of removal.

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



HIGH COOLANT TEMPERATURE INDICATOR

SYSTEM INSPECTION

- Before starting the inspection, check for loose or poor contact on the speedometer 16P connector, ECT sensor 3P connector and ECM 33P (Black) connector.

Turn the ignition switch ON and engine stop switch "C". Check that the high coolant temperature indicator [1] comes ON.

If the high coolant temperature indicator blinks, follow the PGM-FI troubleshooting for ECT sensor (page 4-30).



If the high coolant temperature indicator does not come ON at all or remains ON, inspect as follows.

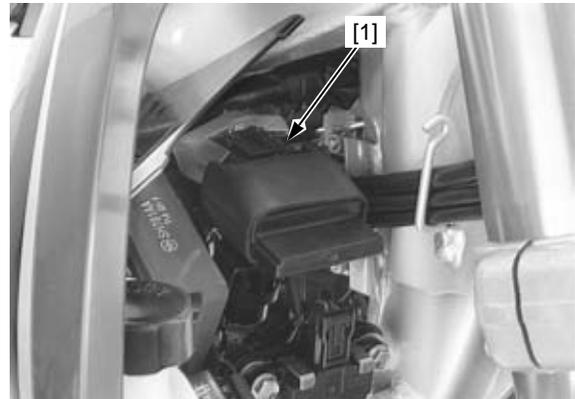
Remove the reserve tank cover (page 2-4).

Turn the ignition switch OFF.

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

Turn the ignition switch ON and engine stop switch "C". Check that the high coolant temperature indicator remains OFF.

- If the indicator comes ON, check for short circuit in the Green/blue wire between the speedometer and ECM.
- If the wire is OK, replace the speedometer with a known good one and recheck.



Turn the ignition switch OFF.

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

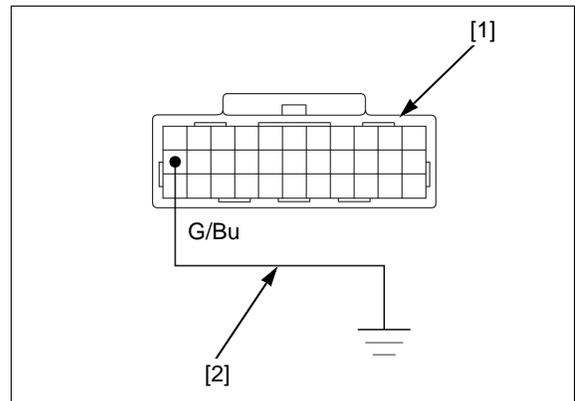
CONNECTION: Green/blue – Ground

TOOL:

Test probe 07ZAJ-RDJA110

Turn the ignition switch ON and engine stop switch "C" the high coolant temperature indicator should come on.

- If the indicator does not come ON, check for open circuit in the Green/blue wire between the speedometer and ECM.
- If the indicator comes on with the Green/blue wire grounded but does not come ON with the ECM 33P (Black) connector connected, replace the ECM with a known good one and recheck.



IGNITION SWITCH

INSPECTION

Remove the headlight cowl (page 2-5).

Disconnect the ignition switch 3P (Brown) connector [1].

Check for continuity between the switch side connector terminals in each switch position according to the chart (page 21-2).



REMOVAL/INSTALLATION

Remove the top bridge (page 16-21).

Remove the ignition switch mounting bolts [1] and ignition switch [2].

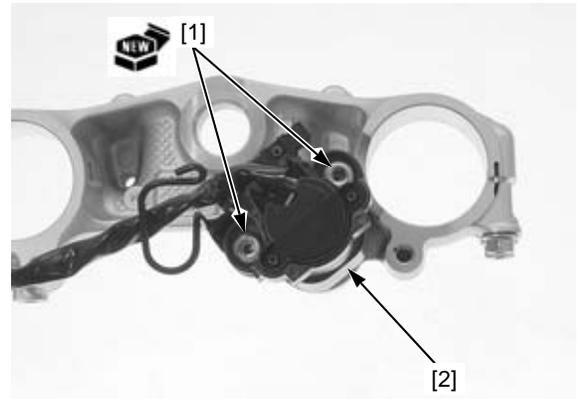
NOTE:

Use a drill or an equivalent tool when removing the ignition switch mounting bolts.

Install the ignition switch onto the top bridge. Install and tighten new ignition switch mounting bolts to the specified torque.

TORQUE: 24 N·m (2.4 kgf·m, 18 lbf·ft)

Install the top bridge (page 16-24).



HANDLEBAR SWITCH

RIGHT HANDLEBAR SWITCH

Remove the headlight cowl (page 2-5).

Disconnect the right handlebar switch 9P (Black) connector [1].

Check for continuity between the switch side connector terminals in each switch position according to the chart (page 21-2).



LIGHTS/METERS/SWITCHES

LEFT HANDLEBAR SWITCH

Remove the headlight cowl (page 2-5).

Disconnect the left handlebar switch 14P (Gray) connector [1].

Check for continuity between the switch side connector terminals in each switch position according to the chart (page 21-2).



BRAKE LIGHT SWITCH

FRONT

Disconnect the front brake light switch connectors and check for continuity between the switch terminals [1].

There should be continuity with the brake lever squeezed, and no continuity with the brake lever released.



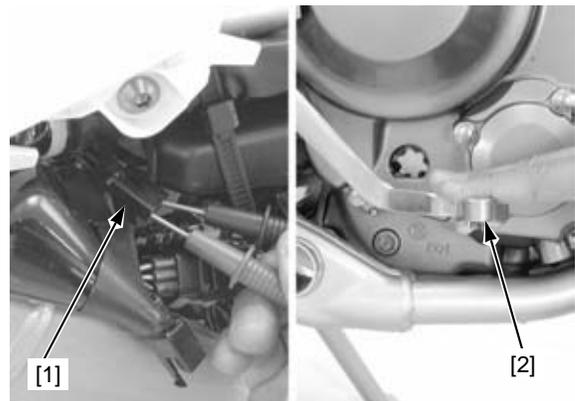
REAR

Remove the left side cover (page 2-3).

Disconnect the rear brake light switch 3P (Black) connector [1].

Check for continuity between the switch side terminals.

There should be continuity with the brake pedal [2] depressed, and no continuity when the brake pedal released.



NEUTRAL SWITCH

REMOVAL/INSTALLATION

Drain the engine oil (page 3-9).

Remove the gearshift pedal (page 12-14).

Disconnect the neutral switch wire connector [1].

Remove the neutral switch [2] and sealing washer [3].

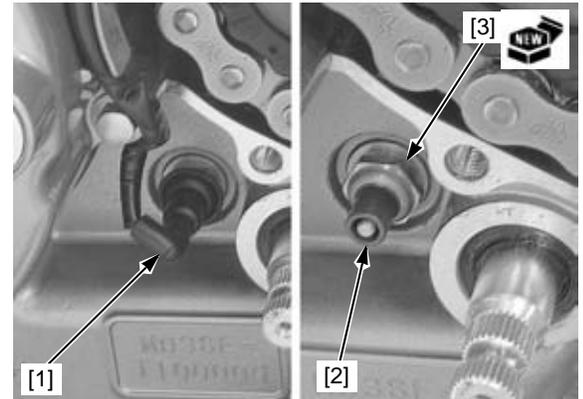
Installation is in the reverse order of removal.

- Replace the sealing washer with a new one.

TORQUE:

Neutral switch: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Fill the engine with the recommended engine oil (page 3-9).



INSPECTION

Make sure that the neutral indicator come on with the ignition switch ON and transmission is in neutral.

If the neutral indicator does not come on, inspect as follows:

Remove the drive sprocket cover (page 2-6).

Disconnect the neutral switch wire connector.

Check for continuity between the switch terminal and engine ground.

There should be continuity with the transmission is in neutral, and no continuity when the transmission is into gear.

If the continuity inspection is normal, check for open circuit in Light green/red wire between neutral switch wire connector and neutral indicator.

If the continuity inspection is abnormal, replace the neutral switch (page 20-13).



SIDESTAND SWITCH

INSPECTION

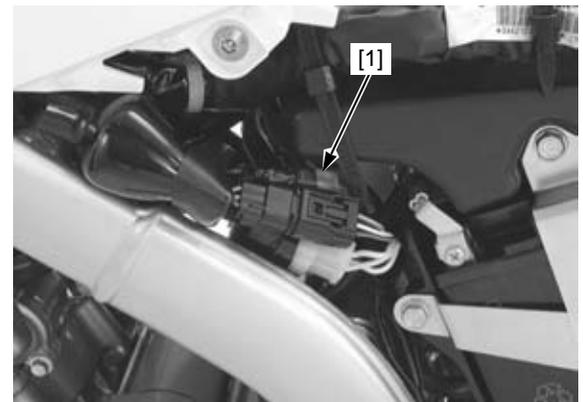
Remove the left side cover (page 2-3).

Disconnect the sidestand switch 3P (Green) connector [1].

Check the continuity between the following terminals of the switch side connector.

CONNECTION: Green/white – Green

The switch is normal if there is continuity when the sidestand is retracted, and no continuity when the sidestand is lowered.



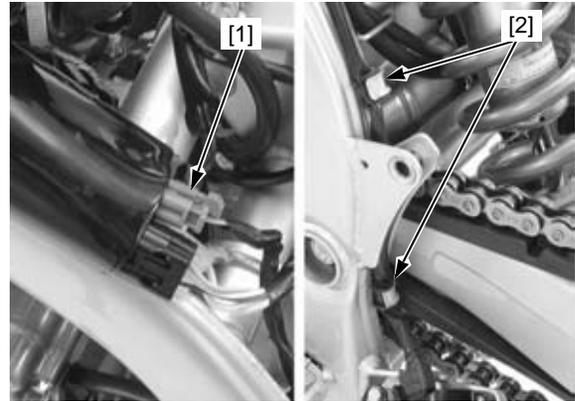
LIGHTS/METERS/SWITCHES

REMOVAL/INSTALLATION

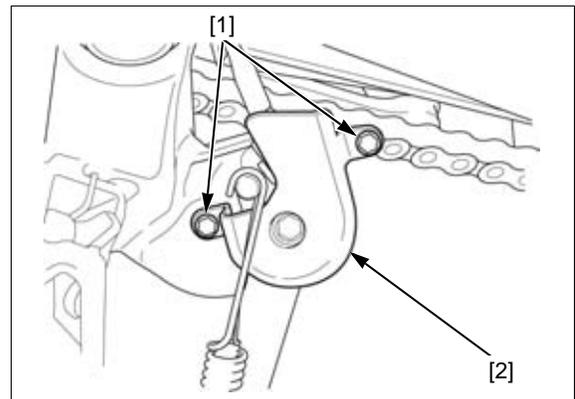
Remove the sub-frame (page 2-12).

Disconnect the sidestand switch 3P (Green) connector [1].

Release the wire from the clamps [2].



Remove the two bolts [1] and switch cover [2].



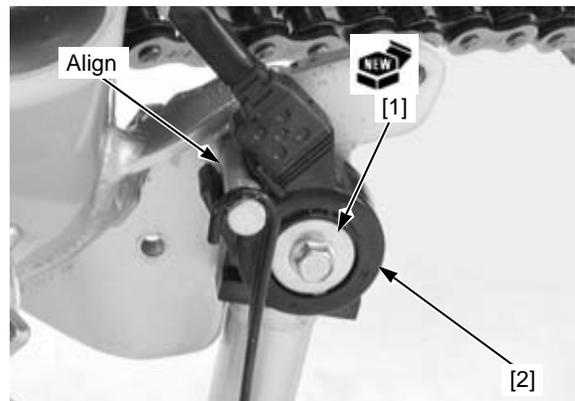
Remove the mounting bolt [1] and sidestand switch [2].

Installation is in the reverse order of removal.

- Replace the sidestand switch mounting bolt with a new one.
- Align the switch groove with the spring pin of the frame.

TORQUE:

Sidestand switch mounting bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)



CLUTCH SWITCH

Disconnect the clutch switch wire connectors and check for continuity between the switch terminals [1].

There should be continuity with the clutch lever squeezed and no continuity with the clutch lever released.

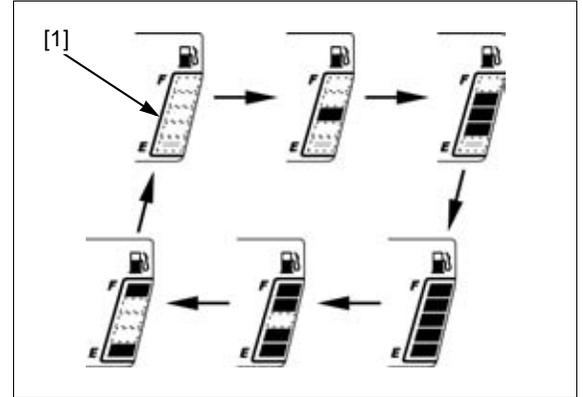


FUEL GAUGE/FUEL LEVEL SENSOR

FUEL GAUGE INSPECTION

If the fuel gauge [1] is indicated as shown, check for an open circuit in wire harness and the fuel level sensor.

If the wire harness and fuel level sensor are good, replace the speedometer assembly (page 20-5).



FUEL LEVEL SENSOR INSPECTION

Remove the fuel pump unit (page 7-9).

Connect the ohmmeter to the following terminals of fuel pump 3P connector.

CONNECTION: Red/black – Black/white

Inspect the resistance of the float at the full and empty positions.

Float position	FULL	EMPTY
Resistance	9 – 11 Ω	213 – 219 Ω

Replace the fuel pump unit if fuel level sensor is out of specification.

Install the fuel pump unit (page 7-9).



HORN

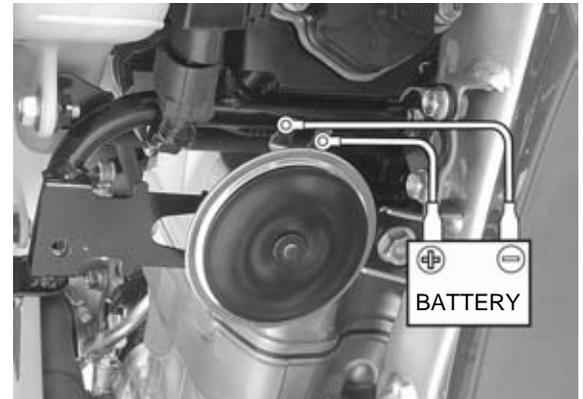
INSPECTION

Remove the reserve tank cover (page 2-4).

Disconnect the connectors from the horn.

Connect a 12 V battery to the horn terminals.

The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.



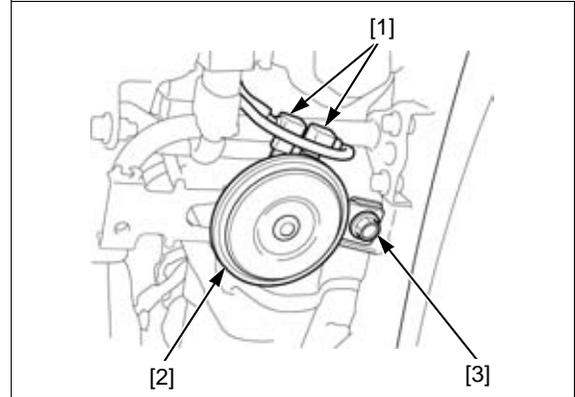
LIGHTS/METERS/SWITCHES

REMOVAL/INSTALLATION

Remove the reserve tank cover (page 2-4).

Disconnect the wire connectors [1] from the horn [2].
Remove the bolt [3] and horn.

Installation is in the reverse order of removal.



TURN SIGNAL RELAY

INSPECTION

STANDARD INSPECTION

Check the following:

- Battery condition
- Burned out bulb or non-specified wattage
- Blown TURN, HORN, STOP fuse (10 A)
- Ignition switch and turn signal switch function
- Loose connector

If above items are normal, remove the reserve tank cover (page 2-4).

INPUT VOLTAGE INSPECTION

Disconnect the turn signal relay 3P (Black) connector [1] from the relay.

Turn the ignition switch ON and check the voltage between the following terminals of the wire harness side connector.

CONNECTION: Black/orange (+) – Green (-)

STANDARD: Battery voltage

If there is no battery voltage, inspect the following:

- Open circuit in Green wire
- Open circuit in Black/orange wire between the turn signal relay 3P (Black) connector and fuse box

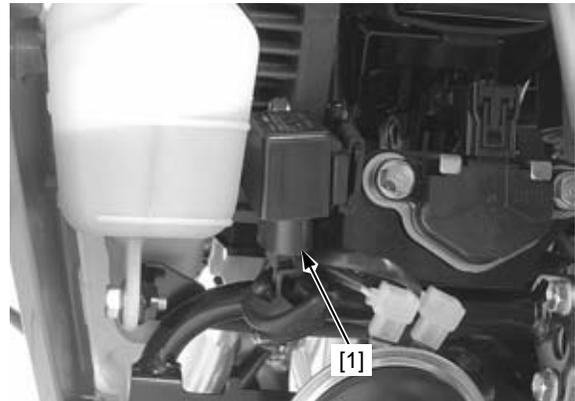
SIGNAL LINE INSPECTION

Short the following terminals of the turn signal relay 3P (Black) connector with a jumper wire.

CONNECTION: Black/orange – Gray

Turn the ignition switch and turn signal switch ON.
Check that the turn signal lights come ON.

- If the turn signal lights do not come ON, check for open circuit in Gray wire.
- If the turn signal lights come ON, replace the turn signal relay with a known-good one and recheck.



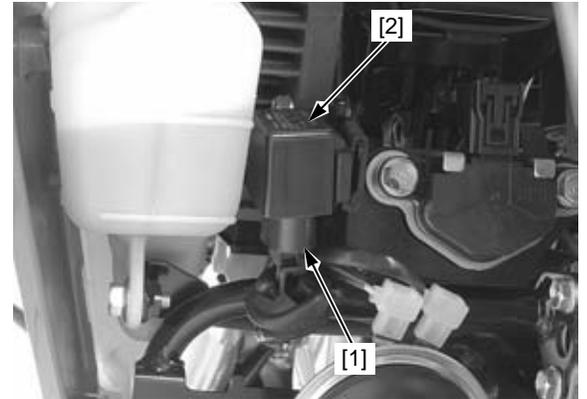
REMOVAL/INSTALLATION

Remove the reserve tank cover (page 2-4).

Disconnect the turn signal relay 3P (Black) connector [1] from the turn signal relay [2].

Remove the turn signal relay from the frame.

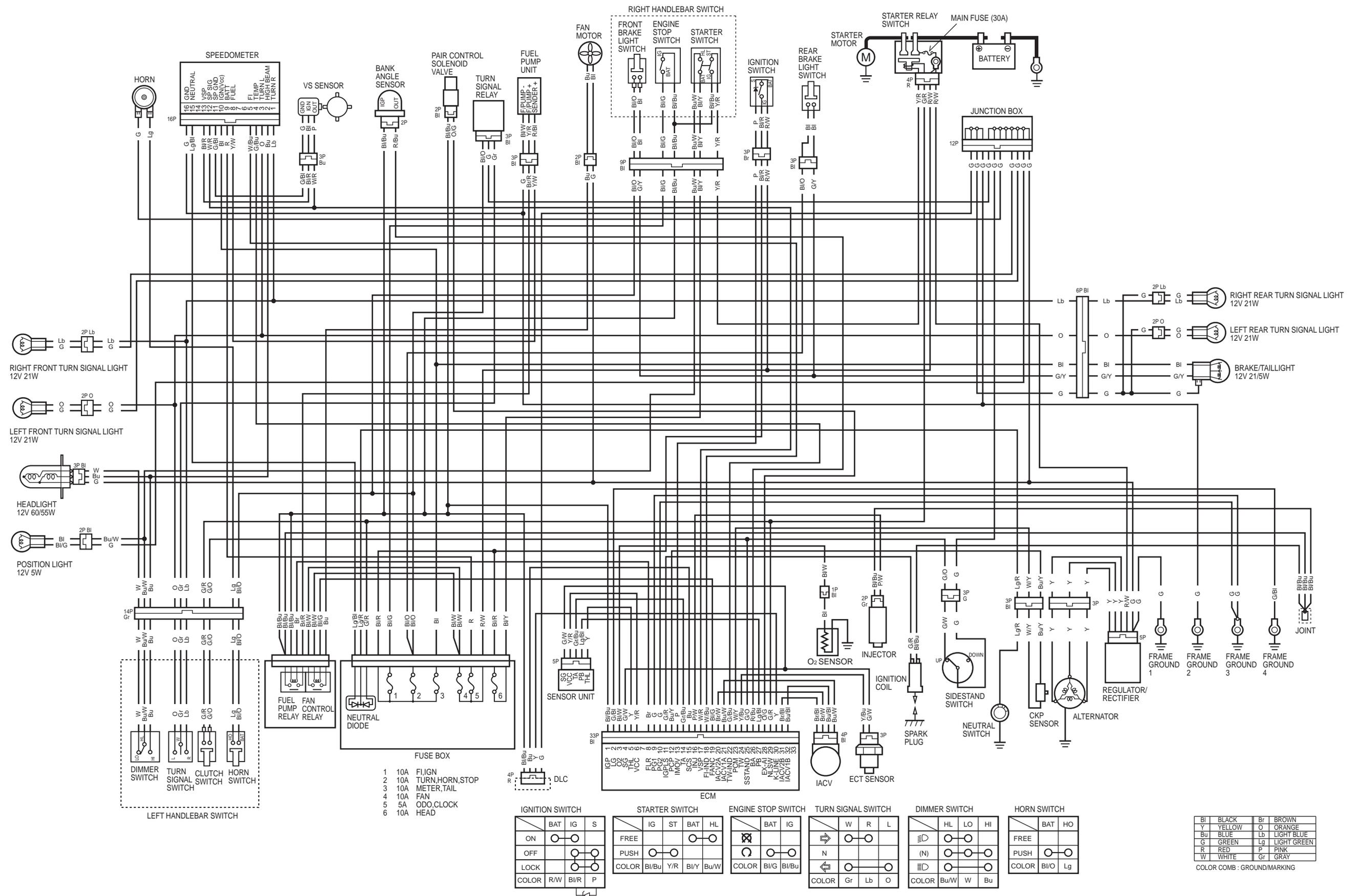
Installation is in the reverse order of removal.



MEMO

WIRING DIAGRAM.....21-2

WIRING DIAGRAM



MEMO

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