

# SERVICE MANUAL



**C125A**  
**Super Cub**

## 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 C125A

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

Section 4 through 21 describe parts of the vehicle, grouped according to location.

If you are not familiar with this vehicle, read Technical Feature in Section 1.

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

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

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


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

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

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

You must use your own good judgment.

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

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

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

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

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

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

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

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## 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"><li>• Molykote® BR-2 plus manufactured by Dow Corning U.S.A.</li><li>• Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan</li></ul>
	Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent). Example: <ul style="list-style-type: none"><li>• Molykote® G-n Paste manufactured by Dow Corning U.S.A.</li><li>• Pro Honda M-77 Assembly Paste (Moly) (U.S.A. only)</li><li>• Rocol ASP manufactured by Rocol Limited, U.K.</li><li>• Rocol Paste manufactured by Sumico Lubricant, Japan</li></ul>
	Use silicone grease.
	Apply a locking agent. Use a medium strength locking agent unless otherwise specified.
	Apply sealant.
	Use DOT 3 or DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified.
	Use fork or suspension fluid.

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**MEMO**

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# 1. GENERAL INFORMATION

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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 vehicle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the vehicle. 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.

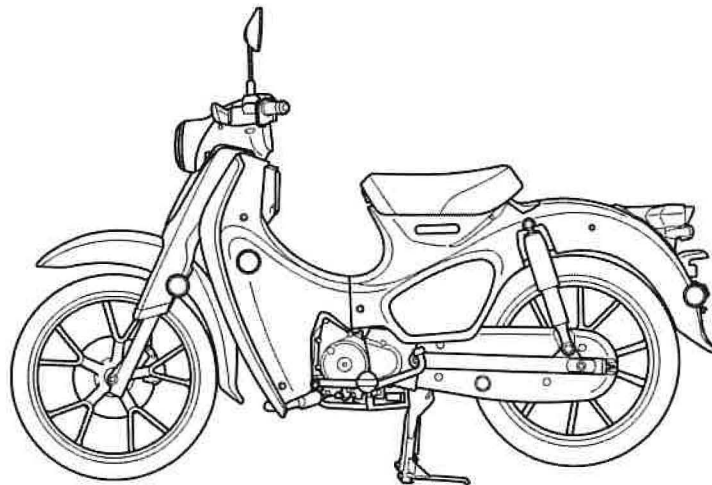
Abbrev. term	Full term
ABS	Anti-lock Brake System
CKP sensor	Crankshaft Position sensor
DLC	Data Link Connector
DTC	Diagnostic Trouble Code
ECM	Engine Control Module
EOT sensor	Engine Oil Temperature sensor
IAT sensor	Intake Air Temperature sensor
MIL	Malfunction Indicator Lamp
MCS	Motorcycle Communication System
PGM-FI	Programmed Fuel Injection
SCS service connector	Service Check Short connector
EEPROM	Electrically Erasable Programmable Read Only Memory
EVAP	Evaporative Emission
IACV	Idle Air Control Valve
MAP sensor	Manifold Absolute Pressure sensor
O <sub>2</sub> sensor	Oxygen sensor
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.

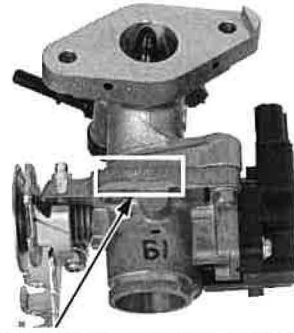
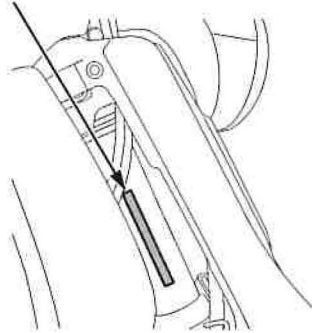
DESTINATION CODE	REGION
AC	50-State (meets California)

### MODEL IDENTIFICATION

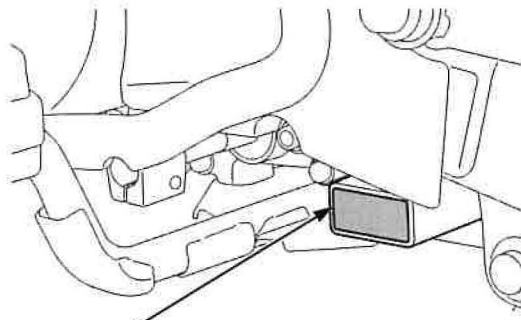


SERIAL NUMBER AND LABELS

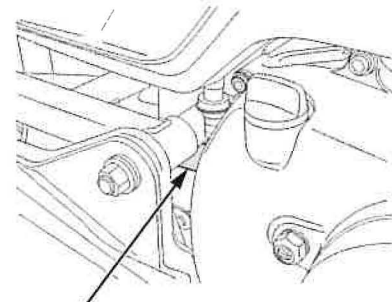
VEHICLE IDENTIFICATION NUMBER (V.I.N)



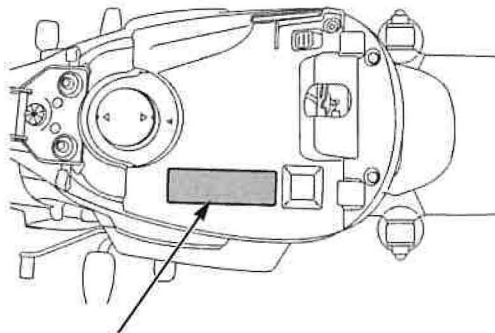
THROTTLE BODY IDENTIFICATION NUMBER



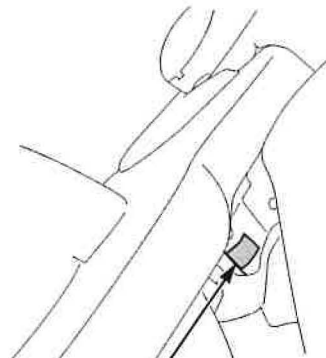
ENGINE SERIAL NUMBER



COLOUR LABEL



EMISSION INFORMATION LABEL



SAFETY CERTIFICATION LABEL

# GENERAL INFORMATION

## SPECIFICATIONS

### GENERAL SPECIFICATIONS

ITEM		SPECIFICATION		
DIMENSIONS	Overall length	1,915 mm (75.4 in)		
	Overall width	720 mm (28.3 in)		
	Overall height	1,000 mm (39.4 in)		
	Wheelbase	1,245 mm (49.0 in)		
	Seat height	780 mm (30.7 in)		
	Footpeg height	278 mm (10.9 in)		
	Ground clearance	125 mm (4.9 in)		
	Curb weight	109 kg (241 lbs)		
	Maximum weight capacity	106 kg (234 lbs)		
FRAME	Frame type	Back bone type		
	Front suspension	Telescopic fork		
	Front axle travel	90 mm (3.5 in)		
	Rear suspension	Swingarm		
	Rear axle travel	91 mm (3.6 in)		
	Tire size	Front	70/90-17M/C 38P	
		Rear	80/90-17M/C 50P	
	Tire brand	Front	NF63B YD (IRC)	
		Rear	NR94 (IRC)	
	Front brake	Hydraulic single disc		
	Rear brake	Mechanical leading trailing		
	Caster angle	26.5°		
	Trail length	71 mm (2.8 in)		
	Fuel tank capacity	3.7 liters (0.98 US gal, 0.81 Imp gal)		
ENGINE	Cylinder arrangement	Single cylinder inclined 80° from vertical		
	Bore and stroke	52.4 x 57.9 mm (2.06 x 2.28 in)		
	Displacement	125 cm <sup>3</sup> (7.6 cu-in)		
	Compression ratio	9.3:1		
	Valve train	Chain driven, OHC		
	Intake valve	opens	at 1.0 mm lift	2° BTDC
		closes	at 1.0 mm lift	25° ABDC
	Exhaust valve	opens	at 1.0 mm lift	34° BBDC
		closes	at 1.0 mm lift	0° TDC
	Lubrication system	Forced pressure and wet sump		
	Oil pump type	Trochoid		
	Cooling system	Air cooled		
	Air filtration	Viscous paper element		
	Engine dry weight	24.5 kg (54.0 lbs)		
FUEL DELIVERY SYSTEM	Type	PGM-FI		
	Throttle bore	24 mm (0.9 in)		
DRIVE TRAIN	Clutch system	Multi-plate, wet		
	Clutch operation system	Automatic centrifugal type		
	Transmission	Constant mesh, 4 speeds		
	Primary reduction	3.363 (74/22)		
	Final reduction	2.571 (36/14)		
	Gear ratio	1st	2.500 (35/14)	
		2nd	1.550 (31/20)	
		3rd	1.150 (23/20)	
		4th	0.923 (24/26)	
Gearshift pattern	Left foot down up system N - 1 - 2 - 3 - 4			
ELECTRICAL	Ignition system	Computer-controlled digital transistorized with electric advance		
	Starting system	Electric starter motor		
	Charging system	Single phase output alternator		
	Regulator/rectifier	SCR opened, single phase half-wave rectification		
	Lighting system	Battery		

**PGM-FI SYSTEM SPECIFICATIONS**

ITEM		SPECIFICATIONS
Engine idle speed		1,400 ± 100 min <sup>-1</sup>
EOT sensor resistance	(20°C/68°F)	2.5 – 2.8 kΩ
IAT sensor resistance	(40°C/104°F)	1.0 – 1.3 kΩ
Fuel injector resistance	(24°C/75°F)	11 – 13 Ω
IACV sensor resistance	(25°C/77°F)	110 – 150 Ω
EVAP purge control solenoid valve resistance	(20°C/68°F)	30 – 34 Ω

**IGNITION SYSTEM SPECIFICATIONS**

ITEM		SPECIFICATIONS
Spark plug	Standard	CPR6EA-9 (NGK)/U20EPR9 (DENSO)
	Optional	CPR7EA-9 (NGK)/U22EPR9 (DENSO)
Spark plug gap		0.8 – 0.9 mm (0.03 - 0.04 in)
Ignition coil peak voltage		100 V minimum
CKP sensor peak voltage		0.7 V minimum
Ignition timing		7° BTDC at idle speed

**FUEL SYSTEM SPECIFICATIONS**

ITEM		SPECIFICATIONS
Throttle body identification number		GQYFB
Throttle grip freeplay		2 – 6 mm (0.1 – 0.2 in)
Fuel pressure at idle		263 – 316 kPa (2.7 – 3.2 kgf/cm <sup>2</sup> , 38 – 46 psi)
Fuel pump flow (at 12 V)		82 cm <sup>3</sup> (2.8 US oz, 2.9 Imp oz) minimum/10 seconds

**LUBRICATION SYSTEM SPECIFICATIONS**

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	0.8 liter (0.8 US qt, 0.7 Imp qt)	–
	After disassembly	1.0 liter (1.1 US qt, 0.9 Imp qt)	–
Recommended engine oil		Pro Honda GN4 4-stroke oil (U.S.A. & Canada) or equivalent motorcycle oil API service classification: SG or higher JASO T903 standard: MA Viscosity: SAE 10W-30	–
Oil pump rotor	Tip clearance	–	0.15

Unit: mm (in)

## GENERAL INFORMATION

### CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression at 600 rpm			1,196 kPa (12.2 kgf/cm <sup>2</sup> , 173 psi)	—
Cylinder head warpage			—	0.10 (0.004)
Camshaft	Cam lobe height	IN	32.657 – 32.897 (1.2857 - 1.2952)	32.627 (1.2845)
		EX	32.481 – 32.721 (1.2788 - 1.2882)	32.451 (1.2776)
Valve, valve guide	Valve clearance	IN	0.10 ± 0.02 (0.004 ± 0.001)	—
		EX	0.17 ± 0.02 (0.007 ± 0.001)	—
	Valve stem O.D.	IN	4.975 – 4.990 (0.1959 - 0.1965)	4.965 (0.1955)
		EX	4.955 – 4.970 (0.1951 - 0.1957)	4.945 (0.1947)
	Valve guide I.D.	IN/EX	5.000 – 5.012 (0.1969 - 0.1973)	5.042 (0.1985)
	Valve guide projection	IN/EX	10.1 – 10.3 (0.40 - 0.41)	—
Valve seat width	IN/EX	0.7 (0.028)	1.5 (0.06)	
Valve spring free length			33.14 (1.305)	32.5 (1.280)

### CYLINDER/PISTON SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		52.405 – 52.415 (2.0632 - 2.0636)	52.500 (2.0669)
	Warpage		—	0.10 (0.004)
Piston, piston rings, piston pin	Piston O.D. at 6.5 (0.26) from bottom		52.380 – 52.395 (2.0622 - 2.0628)	52.300 (2.0591)
	Piston pin bore I.D.		13.002 – 13.008 (0.5119 - 0.5121)	13.02 (0.513)
	Piston pin O.D.		12.994 – 13.000 (0.5116 - 0.5118)	12.98 (0.511)
	Piston ring-to-ring groove clearance	Top	0.030 – 0.065 (0.0012 - 0.0026)	—
		Second	0.015 – 0.050 (0.0006 - 0.0020)	—
	Piston ring end gap	Top	0.10 – 0.25 (0.004 - 0.010)	0.35 (0.014)
Second		0.10 – 0.30 (0.004 - 0.012)	0.40 (0.016)	
Oil (side rail)		0.20 – 0.70 (0.008 - 0.028)	0.90 (0.035)	
Connecting rod small end I.D.			13.010 – 13.028 (0.5122 - 0.5129)	13.038 (0.5133)

### CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Manual clutch	Disc thickness		2.50 – 2.70 (0.098 - 0.106)	2.3 (0.09)
	Plate warpage		—	0.20 (0.008)
	Clutch spring free length		28.2 (1.11)	27.6 (1.09)
	Clutch outer I.D.		23.000 – 23.021 (0.9055 - 0.9063)	—
	Clutch outer guide	I.D.	16.991 – 17.009 (0.6689 - 0.6696)	—
		O.D.	22.959 – 22.980 (0.9039 - 0.9047)	—
Mainshaft O.D. at clutch outer guide		16.966 – 16.984 (0.6680 - 0.6687)	—	
Centrifugal clutch	Clutch drum I.D.		104.0 – 104.2 (4.09 - 4.10)	104.3 (4.1063)
	Clutch weight lining thickness		1.5 – 1.7 (0.06 - 0.07)	1.0 (0.04)
	One-way clutch drum I.D.		42.000 – 42.020 (1.6535 - 1.6543)	—
	One-way clutch roller O.D.		4.990 – 5.000 (0.1965 - 0.1969)	—
	Primary drive gear I.D.		21.030 – 21.058 (0.8280 - 0.8291)	—
	Crankshaft O.D. at primary drive gear		20.967 – 20.980 (0.8255 - 0.8260)	—

### ALTERNATOR/STARTER CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Starter driven gear	I.D.	26.987 – 27.008 (1.0625 - 1.0633)	—
	O.D.	45.660 – 45.673 (1.7976 - 1.7981)	—

**CRANKCASE/TRANSMISSION/CRANKSHAFT SPECIFICATIONS**

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance		0.10 – 0.35 (0.004 - 0.014)	0.45 (0.018)
	Connecting rod radial clearance		0 – 0.012 (0 - 0.0005)	0.05 (0.002)
	Runout		–	See page 13-6
Transmission	Gear I.D.	M2, M3	17.000 – 17.018 (0.6693 - 0.6700)	–
		C1	18.000 – 18.018 (0.7087 - 0.7094)	–
		C4	20.000 – 20.021 (0.7874 - 0.7882)	–
	Bushing O.D.	C1	17.966 – 17.984 (0.7073 - 0.7080)	–
	Bushing I.D.	C1	15.000 – 15.018 (0.5906 - 0.5913)	–
	Mainshaft O.D.	at M3	16.966 – 16.984 (0.6680 - 0.6687)	–
	Countershaft O.D.	at C1 bushing	14.966 – 14.984 (0.5892 - 0.5899)	–
Shift fork/ Shift drum	Shift fork I.D.		10.000 – 10.018 (0.3937 - 0.3944)	–
	Shift fork claw thickness		4.93 – 5.00 (0.194 - 0.197)	4.83 (0.190)
	Shift fork shaft O.D.		9.986 – 9.995 (0.3931 - 0.3935)	–

**FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS**

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cold tire pressure			200 kPa (2.0 kgf/cm <sup>2</sup> , 29 psi)	–
Axle runout			–	0.2 (0.01)
Wheel rim runout	Radial		–	2.0 (0.08)
	Axial		–	2.0 (0.08)
Fork	Spring free length		302.3 (11.90)	296.3 (11.67)
	Recommended fork fluid		Honda Ultra Cushion Oil 10W or equivalent	–
	Fluid level		79 (3.11)	–
	Fluid capacity		65 ± 1 cm <sup>3</sup> (2.20 ± 0.03 US oz, 2.29 ± 0.04 Imp oz)	–

**REAR WHEEL/BRAKE/SUSPENSION SPECIFICATIONS**

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cold tire pressure			225 kPa (2.3 kgf/cm <sup>2</sup> , 33 psi)	–
Axle runout			–	0.2 (0.008)
Wheel rim runout	Radial		–	2.0 (0.08)
	Axial		–	2.0 (0.08)
Drive chain	Size/link	DID	DID420AD2-106RB	–
		RK	RK420EL-106RJ	–
	Slack		25 – 35 (1.0 - 1.4)	50 (2.0)
Brake	Brake drum I.D.		110.0 – 110.2 (4.33 - 4.34)	111.0 (4.370)
	Brake pedal freeplay		20 – 30 (0.8 - 1.2)	–

**HYDRAULIC BRAKE SPECIFICATIONS**

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Specified brake fluid			DOT 3 or DOT4	–
Brake disc	Thickness		3.3 – 3.7 (0.13 - 0.15)	3.0 (0.12)
	Warpage		–	0.25 (0.010)
Master cylinder	Cylinder I.D.		11.000 – 11.043 (0.4331 - 0.4348)	–
	Piston O.D.		10.957 – 10.984 (0.4314 - 0.4324)	–
Caliper	Cylinder I.D.		33.96 – 34.01 (1.337- 1.339)	–
	Piston O.D.		33.878 – 33.928 (1.3338- 1.3357)	–

## GENERAL INFORMATION

### ANTI-LOCK BRAKE SYSTEM (ABS) SPECIFICATION

ITEM	STANDARD	SERVICE LIMIT
Air gap	0.1 – 1.4 mm (0.004 – 0.055 in)	–

### BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS	
Battery	Type	YTZ5S	
	Capacity	12 V - 3.5 Ah (10 HR)/3.7 Ah (20 HR)	
	Current leakage	0.9 mA max.	
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	0.4 A/5 – 10 h
Quick		3.0 A/0.5 h	
Alternator	Capacity	0.18 kW/5,000 rpm	
	Charging coil resistance (20°C/68°F)	0.2 – 1.0 Ω	

### LIGHTS/METERS/SWITCHES SPECIFICATIONS

ITEM		SPECIFICATIONS
Bulbs	Headlight (High/Low)	LED
	Position light	LED
	Brake/taillight	LED
	Turn signal light	LED
	License light	LED
	Instrument light	LED
	Turn signal indicator	LED
	High beam indicator	LED
	Neutral indicator	LED
	Alarm indicator	LED
	ABS indicator	LED
	Honda SMART Key indicator	LED
	MIL	LED
Fuse	Main fuse	15 A
	Sub fuse	10 A x 3
	ABS main fuse	15 A
	ABS sub fuse	10 A
Fuel level sensor resistance	Full	7 – 11 Ω
	Empty	384 – 396 Ω

# 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)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt (Include NSHF) and nut	12 (1.2, 9)
10 mm bolt and nut	34 (3.5, 25)	8 mm flange bolt and nut	27 (2.8, 20)
12 mm bolt and nut	54 (5.5, 40)	10 mm flange bolt and nut	39 (4.0, 29)

## ENGINE & FRAME TORQUE VALUES

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

### FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Shock absorber upper mounting cap nut	2	10	29 (3.0, 21)	
Right crankcase cover protector bolt	3	6	7.0 (0.7, 5.2)	
Exhaust pipe stud bolt	2	8	—	See page 2-19
Muffler nut	1	12	54 (5.5, 40)	
Muffler bolt	1	8	27 (2.8, 20)	
Exhaust pipe joint nut	2	8	27 (2.8, 20)	
Muffler cover socket bolt	2	6	9.0 (0.9, 6.6)	
Muffler stay nut	2	8	27 (2.8, 20)	
Drive chain case mounting socket bolt	4	6	7.0 (0.7, 5.2)	
Left crankcase rear cover socket bolt	2	6	12 (1.2, 9.0)	

### MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake hose oil bolt	2	10	34 (3.5, 25)	
Front master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Front axle nut	1	12	59 (6.0, 44)	Self-lock nut
Rear axle nut	1	12	59 (6.0, 44)	Self-lock nut
Clutch adjuster lock nut	1	8	12 (1.2, 9.0)	
Throttle cable A adjuster lock nut (throttle body side)	1	6	4.5 (0.5, 3.3)	
Throttle cable A adjuster lock nut (handlebar side)	1	7	3.8 (0.39, 2.8)	
Drive sprocket fixing plate bolt	2	6	12 (1.2, 9.0)	
Driven sprocket nut	4	8	32 (3.3, 24)	Self-lock nut
Spark plug	1	10	16 (1.6, 12)	
Oil drain bolt	1	12	24 (2.4, 18)	
Air cleaner housing cover screw	5	5	1.1 (0.1, 0.8)	
Centrifugal oil filter cover bolt	3	5	5.0 (0.5, 3.7)	Apply locking agent See page 3-10
Crankshaft hole cap	1	30	8.0 (0.8, 5.9)	
Timing hole cap	1	14	6.0 (0.6, 4.4)	
Valve adjusting screw lock nut	2	5	9.0 (0.9, 6.6)	Apply engine oil to the threads and seating surface.

### PGM-FI SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
O <sub>2</sub> sensor	1	12	25 (2.5, 18)	
EOT sensor	1	10	14 (1.4, 10)	
Sensor unit torx screw	2	4	2.1 (0.2, 1.5)	



## GENERAL INFORMATION

### 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)	

### ELECTRIC STARTER SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Starter motor terminal nut	1	6	7.0 (0.7, 5.2)	
Starter motor case bolt	2	–	4.9 (0.5, 3.6)	

### FUEL SYSTEM

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	4.5 (0.5, 3.3)	
Throttle cable B adjuster lock nut (throttle body side)	1	6	4.5 (0.5, 3.3)	
Sensor unit torx screw	2	4	2.1 (0.2, 1.5)	
Throttle cable holder mounting screw	1	5	3.4 (0.3, 2.5)	
Fuel pump setting plate nut	4	6	12 (1.2, 9.0)	See page 7-8

### LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil pump cover screw	2	5	5.2 (0.5, 3.8)	

### CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head side cover socket bolt	2	6	12 (1.2, 9.0)	
Cam sprocket bolt	1	8	27 (2.8, 20)	Apply engine oil to the threads and seating surface.
Cylinder head cap nut	4	8	24 (2.4, 18)	Apply engine oil to the threads and seating surface.
Cam chain tensioner arm pivot bolt	1	8	16 (1.6, 12)	
Cam chain tensioner sealing bolt	1	14	22 (2.2, 16)	
Cam chain guide lower roller pivot bolt	1	6	10 (1.0, 7.0)	

### CYLINDER/PISTON

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cam chain guide roller pin bolt	1	8	10 (1.0, 7.0)	
Cylinder stud bolt	4	8	–	See page 10-5

### CLUTCH/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Right crankcase cover protector socket bolt	3	6	7.0 (0.7, 5.2)	
Clutch center lock nut	1	14	64 (6.5, 47)	Apply engine oil to the threads and seating surface.
Centrifugal oil filter cover bolt	3	5	5.0 (0.5, 3.7)	Apply locking agent to the threads.
Gearshift cam plate socket bolt	1	6	10 (1.0, 7.0)	Apply locking agent to the threads.
Clutch lifter plate bolt	3	6	12 (1.2, 9.0)	
Centrifugal filter rotor lock nut	1	14	64 (6.5, 47)	Apply engine oil to the threads and seating surface.
Shift drum stopper arm bolt	1	6	12 (1.2, 9.0)	Apply locking agent to the threads.

**ALTERNATOR**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Starter clutch mounting torx bolt	6	6	16 (1.6, 12)	Apply locking agent to the threads.
Flywheel nut	1	12	64 (6.5, 47)	Apply engine oil to the threads and seating surface.

**ENGINE REMOVAL/INSTALLATION**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Engine hanger nut	3	10	59 (6.0, 44)	
Drive sprocket fixing plate bolt	2	6	12 (1.2, 9.0)	

**FRONT WHEEL/SUSPENSION/STEERING**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front axle nut	1	12	59 (6.0, 44)	Self-lock nut
Handlebar post nut	1	10	59 (6.0, 44)	Self-lock nut
Handlebar weight screw	2	6	12 (1.2, 9.0)	Apply locking agent to the threads.
Left handlebar switch screw	2	5	2.5 (0.3, 1.8)	
Right handlebar switch screw	2	5	2.5 (0.3, 1.8)	
Steering stem top thread	1	26	—	See page 15-22
Steering stem lock nut	1	26	83 (8.5, 61)	See page 15-22
Bottom bridge pinch bolt	4	10	64 (6.5, 47)	
Fork socket bolt	2	8	20 (2.0, 15)	Apply locking agent to the threads.
Caliper mounting bolt	2	8	30 (3.1, 22)	Pre-coated (ALOC) bolt, replace with a new one.
Front brake disc bolt	5	6	20 (2.0, 15)	Pre-coated (ALOC) bolt, replace with a new one.
Front wheel pulser ring bolt	3	5	7.0 (0.7, 5.2)	Pre-coated (ALOC) bolt, replace with a new one.

**REAR WHEEL/BRAKE/SUSPENSION**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Driven sprocket nut	4	8	32 (3.3, 24)	Self-lock nut
Driven sprocket stud bolt	4	8	—	Apply locking agent to the threads. See page 16-9
Rear axle nut	1	12	59 (6.0, 44)	Self-lock nut
Swingarm pivot nut	1	12	54 (5.5, 40)	
Shock absorber upper mounting cap nut	2	10	29 (3.0, 21)	
Shock absorber lower mounting cap nut	2	10	29 (3.0, 21)	
Rear brake arm nut	1	6	10 (1.0, 7.0)	Self-lock nut
Torque link nut	2	8	22 (2.2, 16)	

**HYDRAULIC BRAKE**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake caliper bleed valve	1	8	5.4 (0.6, 4.0)	
Brake lever pivot bolt	1	6	1.0 (0.1, 0.7)	
Brake lever pivot nut	1	6	5.9 (0.6, 4.4)	
Brake hose oil bolt	2	10	34 (3.5, 25)	
Front master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Brake pad hanger pin	1	10	17 (1.7, 13)	
Front brake caliper pin bolt	1	8	17 (1.7, 13)	
Front brake light switch screw	1	4	1.2 (0.1, 0.9)	
Caliper mounting bolt	2	8	30 (3.1, 22)	Pre-coated (ALOC) bolt, replace with a new one.
Front brake hose clamber bolt	1	6	12 (1.2, 9.0)	Apply locking agent to the threads.

## GENERAL INFORMATION

### ANTI-LOCK BRAKE SYSTEM

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

### LIGHTS/METERS/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear turn signal light nut	2	6	9.0 (0.9, 6.6)	
License light mounting screw	2	4	0.9 (0.1, 0.7)	

### Honda SMART Key SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Smart steering lock screw	2	6	9.0 (0.9, 6.6)	Pre-coated (ALOC) bolt, replace with a new one.

### OTHERS

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Shift return spring pin	1	8	30 (3.1, 22)	
Throttle cable A lock nut (handlebar side)	1	10	3.0 (0.3, 2.2)	
Throttle cable B lock nut (handlebar side)	1	12	3.0 (0.3, 2.2)	
Rear side reflector nut	2	6	1.5 (0.2, 1.1)	Self-lock nut

**LUBRICATION & SEAL POINTS****ENGINE**

MATERIAL	LOCATION	REMARKS
Engine oil	Oil pump inner and outer rotor sliding area	
	IN/EX valve stem outer surface and stem end	
	Rocker arm shaft hole inner surface	
	Rocker arm shaft whole surface	
	Rocker arm roller rolling area	
	Camshaft whole surface	
	Cam chain tensioner push rod inside	4.0 cm <sup>3</sup> minimum
	Cam chain whole surface	
	Gearshift spindle journal	
	Cylinder bore	
	Starter reduction gear both journal area	
	Starter clutch rolling surface	
	Piston rings	
	Piston outer surface and piston ring grooves	
	Piston pin hole inner surface	
	Piston pin outer surface	
	Clutch outer guide outer surface	
	Clutch discs	
	Connecting rod small end inner surface	
	Connecting rod big end	1.0 – 2.0 cm <sup>3</sup>
	Countershaft shift drum lock plate rotating area	Except U type
	Shift fork inner sliding surface	
	Shift drum whole surface	
	Fuel injector O-ring and seal ring	
	Gear teeth (primary, transmission)	
	Each bearing rolling surface	
	Each O-ring	
Locking agent	Mainshaft bearing set plate bolt threads	Coating width: 6.5 mm (0.26 in) from tip
	Oil centrifugal filter cover bolt threads	Coating width: 4.0 mm (0.16 in) from tip
	Shift drum stopper arm pivot bolt threads	Coating width: 6.5 mm (0.26 in) from tip
	Gearshift cam plate socket bolt threads	Coating width: 6.5 mm (0.26 in) from tip
	Starter clutch outer torx bolt threads	Coating width: 6.5 mm (0.26 in) from tip
Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	Decompressor cam and arm sliding area	
	Primary drive gear inner surface	
	Each transmission rotating gear inner surface	
	C1 gear bushing whole surface	
Sealant (TB1215 manufactured by Three Bond or equivalent)	M4, C3 gearshift fork groove	
	Left crankcase mating surface	See page 13-14
Multi-purpose grease	Alternator wire grommet seating surface	
	Gearshift spindle oil seal lip	
Degreasing	Countershaft oil seal lip	
	Flywheel and left crankshaft contact areas	

## GENERAL INFORMATION

### FRAME

MATERIAL	LOCATION	REMARKS
Urea based multipurpose grease with extreme pressure agent (example: EXCELITE EP2 manufactured by Kyodo Yushi, ALVANIA EP2 manufactured by Shell or equivalent)	Steering head bearing rolling surface	3 – 5 g (0.1 – 0.2 oz) each
	Steering head bearing dust seal lips	
Multi-purpose grease	Front/rear axle surface	
	Front wheel dust seal lips	
	Throttle grip pipe flange cable groove	0.1 – 0.2 g (0.004 – 0.007 oz)
	Rear wheel hub O-ring	
	Rear wheel driven flange dust seal lips	
	Rear brake panel anchor pin	0.03 – 0.05 g (0.0011 – 0.0018 oz)
	Rear brake cam sliding surface	0.2 – 0.3 g (0.007 – 0.010 oz)
	Rear brake cam brake shoe contact area	0.06 – 0.10 g (0.0021 – 0.0035 oz)
	Rear brake pedal/centerstand pivot sliding surface	
	Steering handle lock sliding area	
Silicone grease	Seat lock sliding area	
	Brake caliper bracket pin sliding surface	0.4 g (0.01 oz) minimum
	Front brake lever pivot bolt sliding surface	0.1 g (0.004 oz)
	Front brake lever-to-master piston contacting surface	0.1 g (0.004 oz)
	Pad pin stopper ring	
Brake fluid DOT 3 or DOT 4	Brake caliper dust seal	
	Brake master piston, spring and piston cups	
	Brake caliper piston	
Honda Bond A or Honda Hand Grip Cement (U.S.A. only)	Brake caliper piston seal	
	Handlebar grip rubber inside	
Honda Ultra Cushion Oil 10W or equivalent	Air cleaner housing-to-connecting hose mating area	
	Fork oil seal lips	
SAE #80 or 90 gear oil or drive chain lubricant	Fork dust seal lips	
	Fork cap O-ring	
Gear oil	Drive chain	
Engine oil	Rear brake cam felt seal	
	Fuel pump O-ring and packing seating area of fuel tank	0.1 g (0.004 oz) maximum
	Fuel filter O-ring	

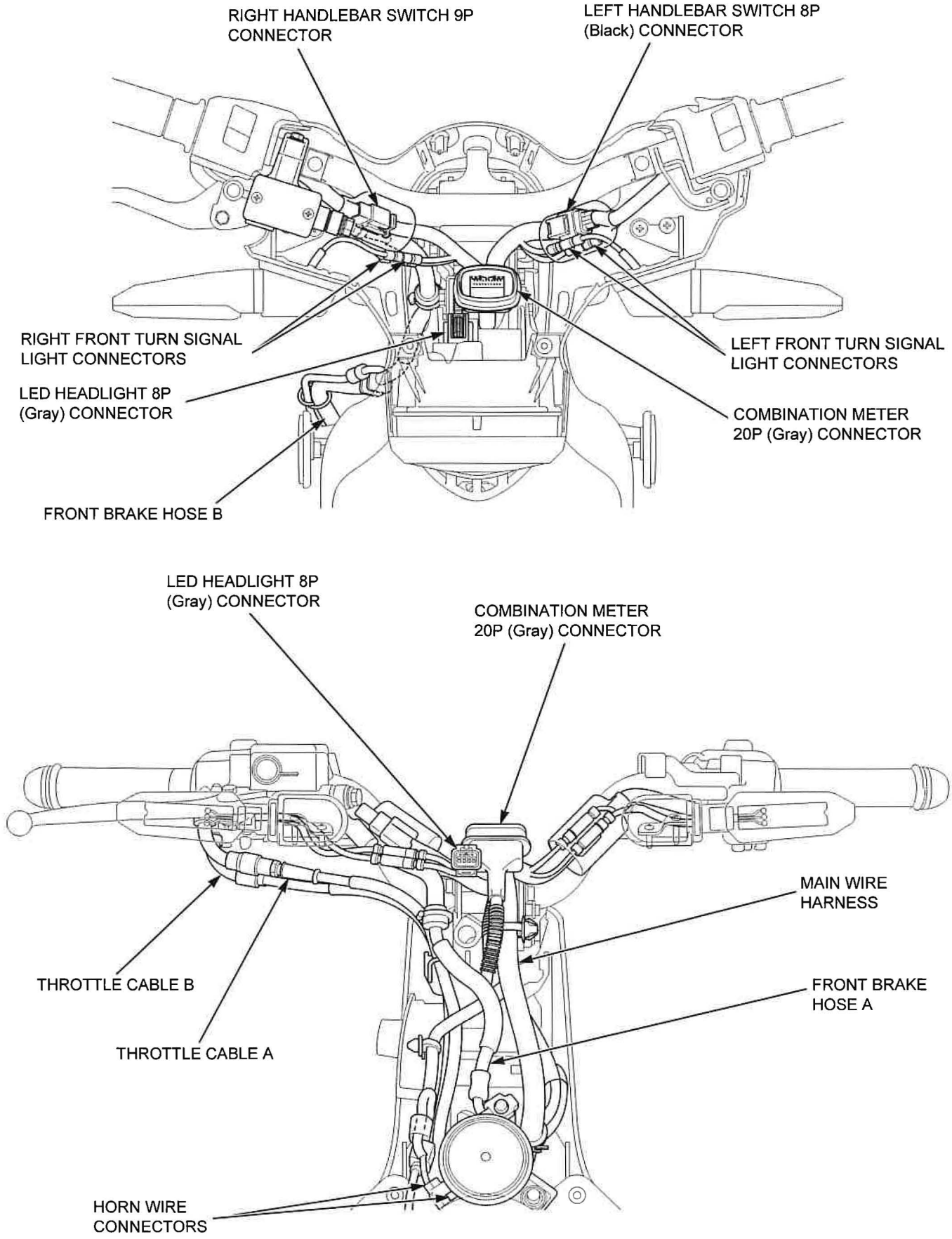
## SPECIAL TOOL LIST

TITLE	TOOL No	TOOL NAME	
MAINTENANCE	07708-0030400 or 07908-3290200 (U.S.A. only)	Valve adjusting wrench	
	07708-0030100 or equivalent commercially available in the U.S.A.	Lock nut wrench, 8 x 9	
PGM-FI SYSTEM	070PZ-ZY30100	SCS service connector	
	07ZAJ-RDJA110	Test probe (2 pack)	
	MTP07-0286 (U.S.A. only)	IgnitionMate peak voltage tester	
IGNITION SYSTEM	07HGJ-0020100 (Not available in the U.S.A.)	Peak voltage adaptor	
	07ZAJ-RDJA110	Test probe (2 pack)	
FUEL SYSTEM	07406-0040004 or 07406-004000C (U.S.A. only) or 07406-004000B (U.S.A. only)	Fuel pressure gauge set	
	070MJ-K260100 (Not available in the U.S.A.)	Fuel pressure gauge attachment set	
	07AMJ-HW3A100 (U.S.A. only)	Fuel pressure manifold hose	
	07AAJ-S6MA200 (U.S.A. only)	Fuel adaptor male B	
	07AMJ-K26A100 (U.S.A. only)	Fuel adaptor female 90°	
CYLINDER HEAD/ VALVES	07725-0030000	Universal holder	
	07757-0010000	Valve spring compressor	
	07959-KM30101	Valve spring compressor attachment	
	07942-MA60000	Valve guide driver, 5.0 mm	
	07743-0020000 (Not available in the U.S.A.)	Valve guide adjusting driver	
	07984-MA60001 or 07984-MA6000D (U.S.A. only)	Valve guide reamer, 5.0 mm	
	07781-0010400 or equivalent commercially available in the U.S.A.	Cutter holder, 5.0 mm	
	07780-0010200 or equivalent commercially available in the U.S.A.	Seat cutter, 27.5 mm (45° IN)	
	07780-0010701 or equivalent commercially available in the U.S.A.	Seat cutter, 22 mm (45° EX)	
	07780-0013300 or equivalent commercially available in the U.S.A.	Flat cutter, 27 mm (32° IN)	
	07780-0012601 or equivalent commercially available in the U.S.A.	Flat cutter, 22 mm (32° EX)	
	07780-0014500 or equivalent commercially available in the U.S.A.	Interior cutter, 26 mm (60° IN)	
	07780-0014202 or equivalent commercially available in the U.S.A.	Interior cutter, 22 mm (60° EX)	
	CLUTCH/ GEARSHIFT LINKAGE	07936-1660101 or 07936-166010A (U.S.A. only)	Bearing remover set, 12mm
		07936-1660120 (Not available in U.S.A.)	Bearing remover shaft, 12 mm
07936-1660110 (Not available in U.S.A.)		Bearing remover head, 12mm	
07741-0010201 or 07936-371020A or 07936-3710200		Remover weight	
07749-0010000		Driver	
07946-1870100		Attachment, 28 x 30 mm	
07746-0040200		Pilot, 12 mm	
07725-0030000		Universal holder	
07716-0020100		Lock nut wrench, 20 x 24 mm	
07716-0020500 or equivalent commercially available in the U.S.A.		Extension bar	
07724-0050002 or equivalent commercially available in the U.S.A.		Clutch center holder	
ALTERNATOR/ STARTER CLUTCH	07725-0040001	Flywheel holder	
	07KMC-HE00100	Flywheel puller, 30mm	

## GENERAL INFORMATION

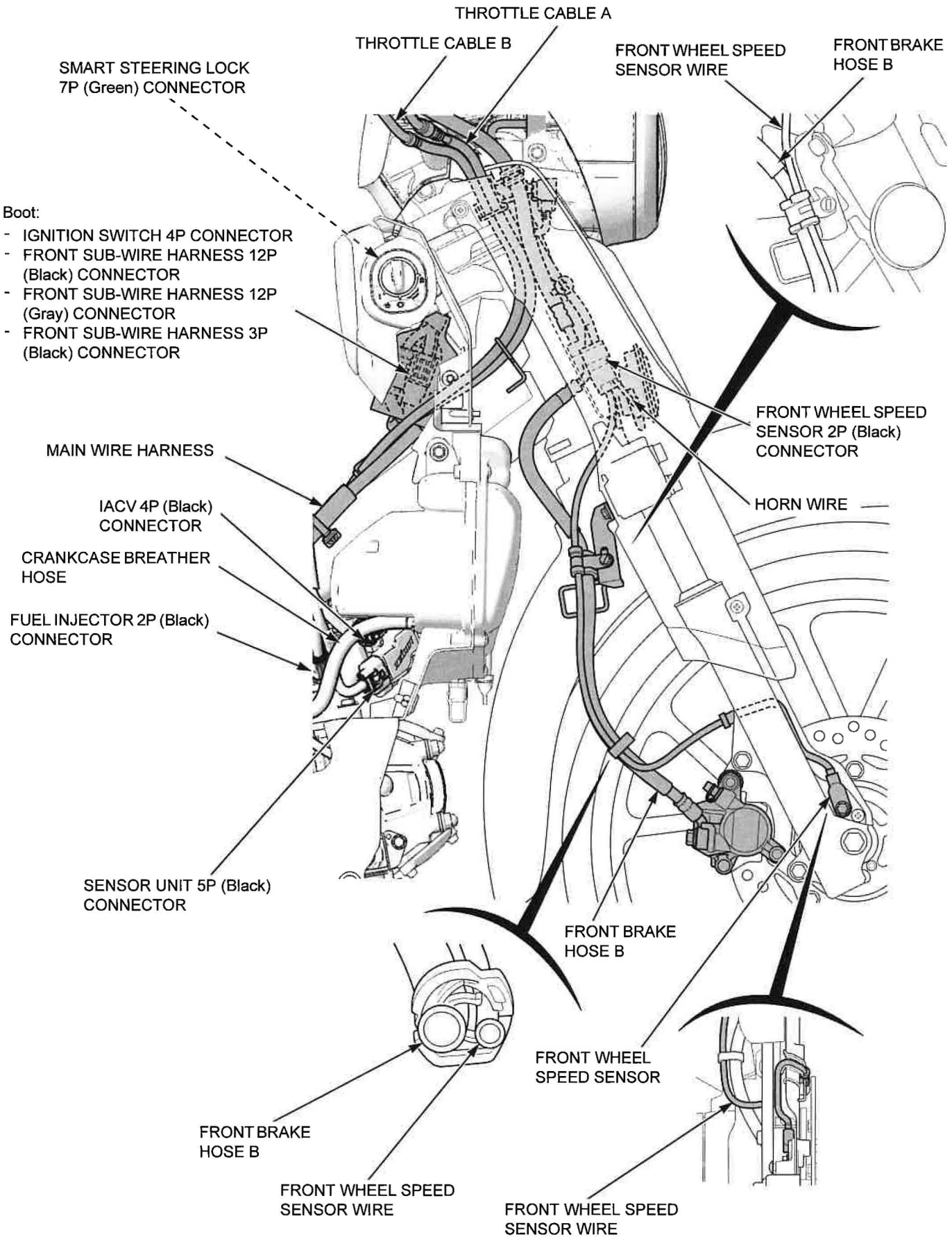
TITLE	TOOL No	TOOL NAME	
CRANK CASE/ TRANSMISSION/ CRANKSHAFT	07631-0010000 or equivalent commercially available in the U.S.A.	Universal bearing puller	
	07749-0010000	Driver	
	07746-0010400	Attachment, 52 x 55 mm	
	07746-0041000	Pilot, 22 mm	
	07JMF-KW70100 (Not available in U.S.A.)	Assembly set, 14 mm	
	07936-1660101 or 07936-166010A (U.S.A. only)	Bearing remover set, 12 mm	
	07936-1660120 (Not available in the U.S.A.)	Bearing remover shaft, 12 mm	
	07936-1660110 (Not available in the U.S.A.)	Bearing remover head, 12 mm	
	07741-0010201 or 07936-370102A or 07936-3710200	Remover weight	
	07946-1870100	Attachment, 28 x 30 mm	
	07746-0040200	Pilot, 12 mm	
	07746-0010200	Attachment, 37 x 40 mm	
	07746-0040400	Pilot, 17 mm	
	07746-0010100	Attachment, 32 x 35 mm	
	07931-ME4010B (U.S.A. only)	Installer shaft	
	07931-HB3010A (U.S.A. only)	Special nut	
	07AMF-K26A100 (U.S.A. only)	Threaded adapter	
	07YMF-KPB100 (U.S.A. only)	Assembly collar	
	FRONT WHEEL/ SUSPENSION/ STEERING	07746-0050300	Remover head, 12 mm
07746-0050100		Bearing remover shaft	
07749-0010000		Driver	
07746-0010100		Attachment, 32 x 35 mm	
07746-0010200		Attachment, 37 x 40 mm	
07746-0040200		Pilot, 12 mm	
07748-0010001 or equivalent commercially available in the U.S.A.		Oil seal remover	
07916-KM10000		Socket wrench	
07702-0020001		Pin spanner	
07916-3710101		Steering stem socket	
07GMD-KS40100		Ball race remover shaft	
07948-4630100		Ball race remover, 34.5 mm	
07746-0030400		Inner driver, 35 mm	
07946-6920100		Attachment, 45 x 50 mm	
07947-6340000		Oil seal driver, 54 mm	
REAR WHEEL/ SUSPENSION		07746-0050300	Remover head, 12 mm
		07746-0050100	Bearing remover shaft
	07749-0010000	Driver	
	07746-0010100	Attachment, 32 x 35 mm	
	07746-0010200	Attachment, 37 x 40 mm	
	07746-0040200	Pilot, 12 mm	
	07746-0040400	Pilot, 17 mm	
HYDRAULIC BRAKE	07914-SA50001	Snap ring pliers	
ANTI-LOCK BRAKE SYSTEM (ABS)	070PZ-ZY30100	SCS service connector	
	07ZAJ-RDJA110	Test probe (2 pack)	
LIGHT/METERS/ SWITCHES	07ZAJ-RDJA110	Test probe (2 pack)	
	07HGJ-0020100 (Not available in the U.S.A.)	Peak voltage adaptor	
HONDA SMART KEY SYSTEM	07ZAJ-RDJA110	Test probe (2 pack)	
	07XMZ-MBW0101	Inspection adaptor	
	07WPZ-0010100	SCS connector	

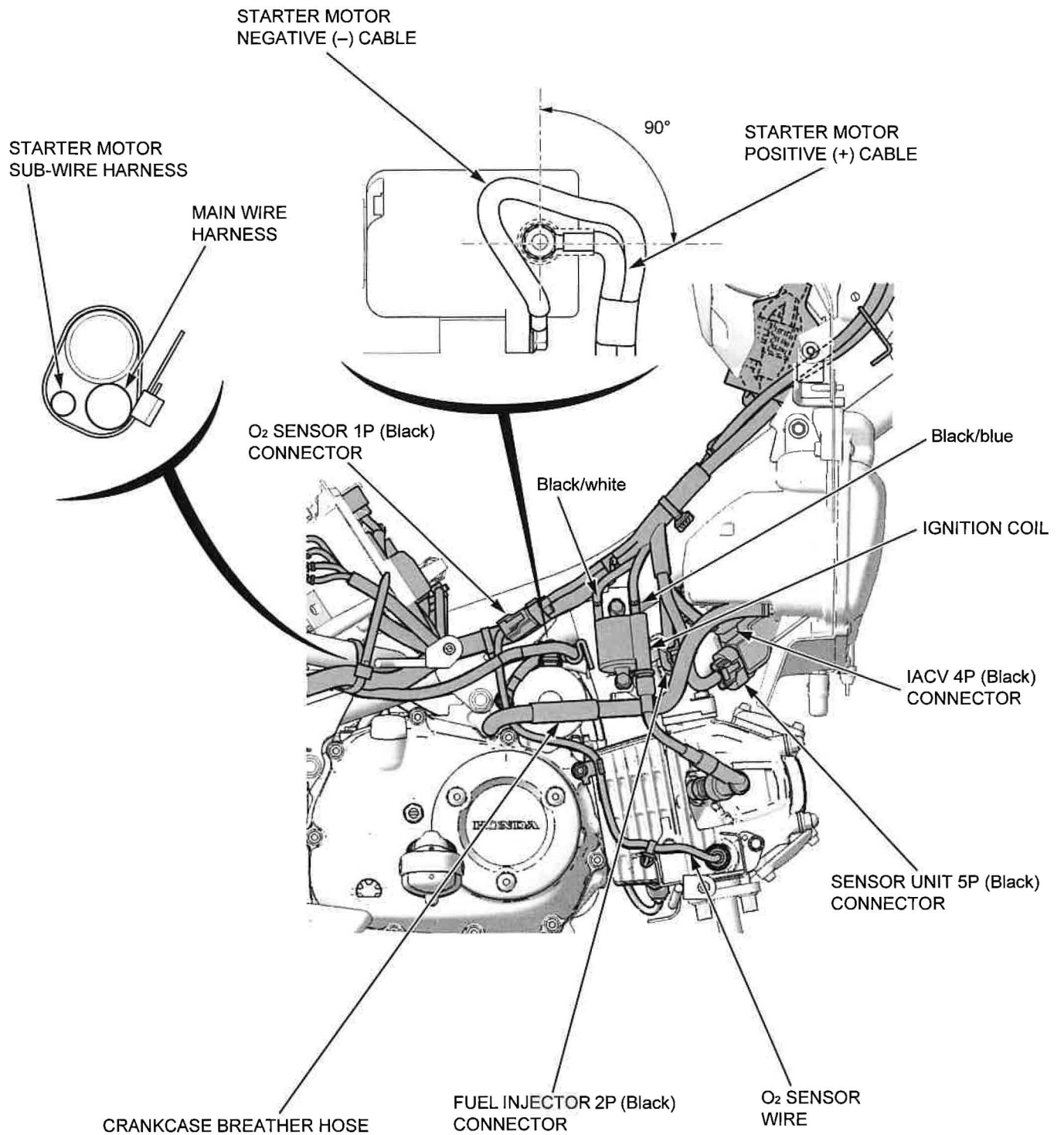
CABLE & HARNESS ROUTING





# GENERAL INFORMATION

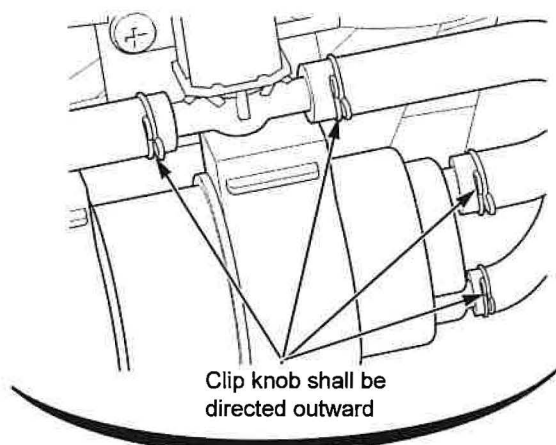




# GENERAL INFORMATION

Boot:

- VS SENSOR 3P CONNECTOR
- VS SENSOR WIRE CONNECTOR
- ALTERNATOR 4P CONNECTOR
- GEAR POSITION SWITCH 6P (Black) CONNECTOR



EVAP PURGE CONTROL SOLENOID VALVE 2P (Black) CONNECTOR

CANISTER-to-EVAP PURGE CONTROL SOLENOID VALVE HOSE

SEAT SWITCH 2P (Black) CONNECTOR

FUEL FEED HOSE

THROTTLE CABLE A

THROTTLE CABLE B

REGULATOR/RECTIFIRE 6P CONNECTOR

PURGE HOSE EOT SENSOR 2P (Black) CONNECTOR

EVAP CANISTER DRAIN HOSE FUEL TANK CHARGE HOSE

AIR INLET HOSE

MAIN WIRE HARNESS

EOT SENSOR WIRE GEAR POSITION SWITCH WIRE ALTERNATOR WIRE

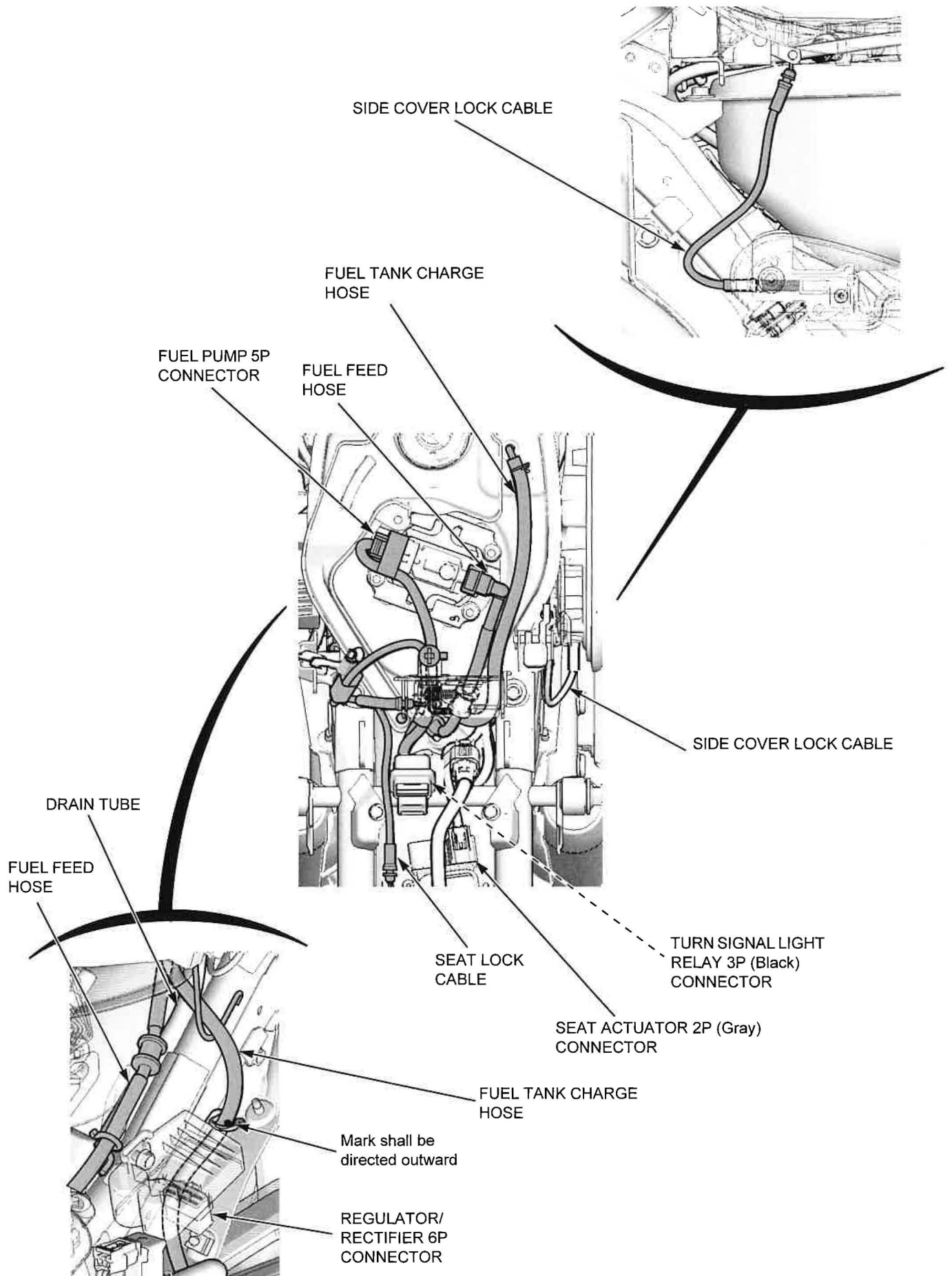
EOT SENSOR WIRE GEAR POSITION SWITCH WIRE

VS SENSOR WIRE

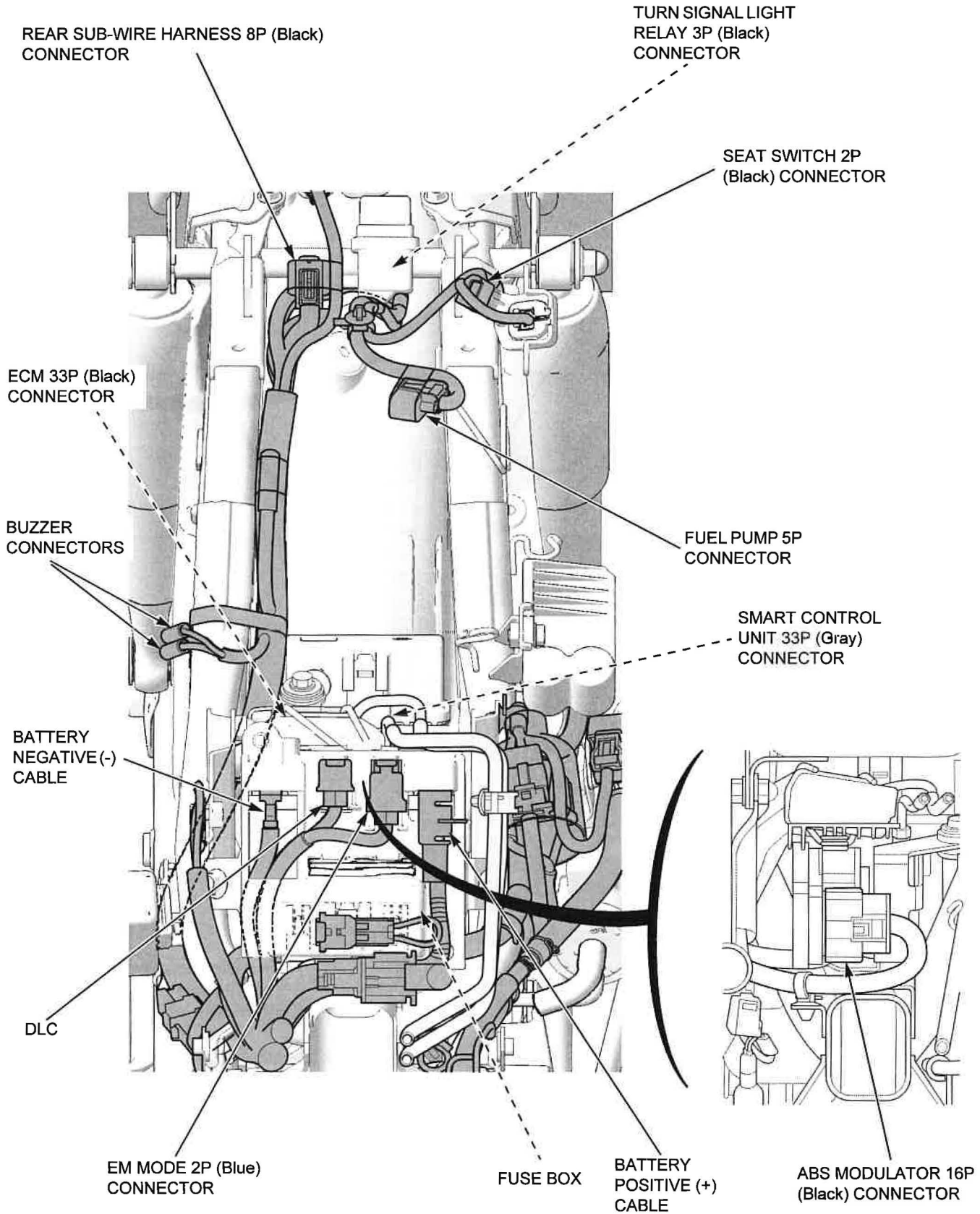
ALTERNATOR WIRE

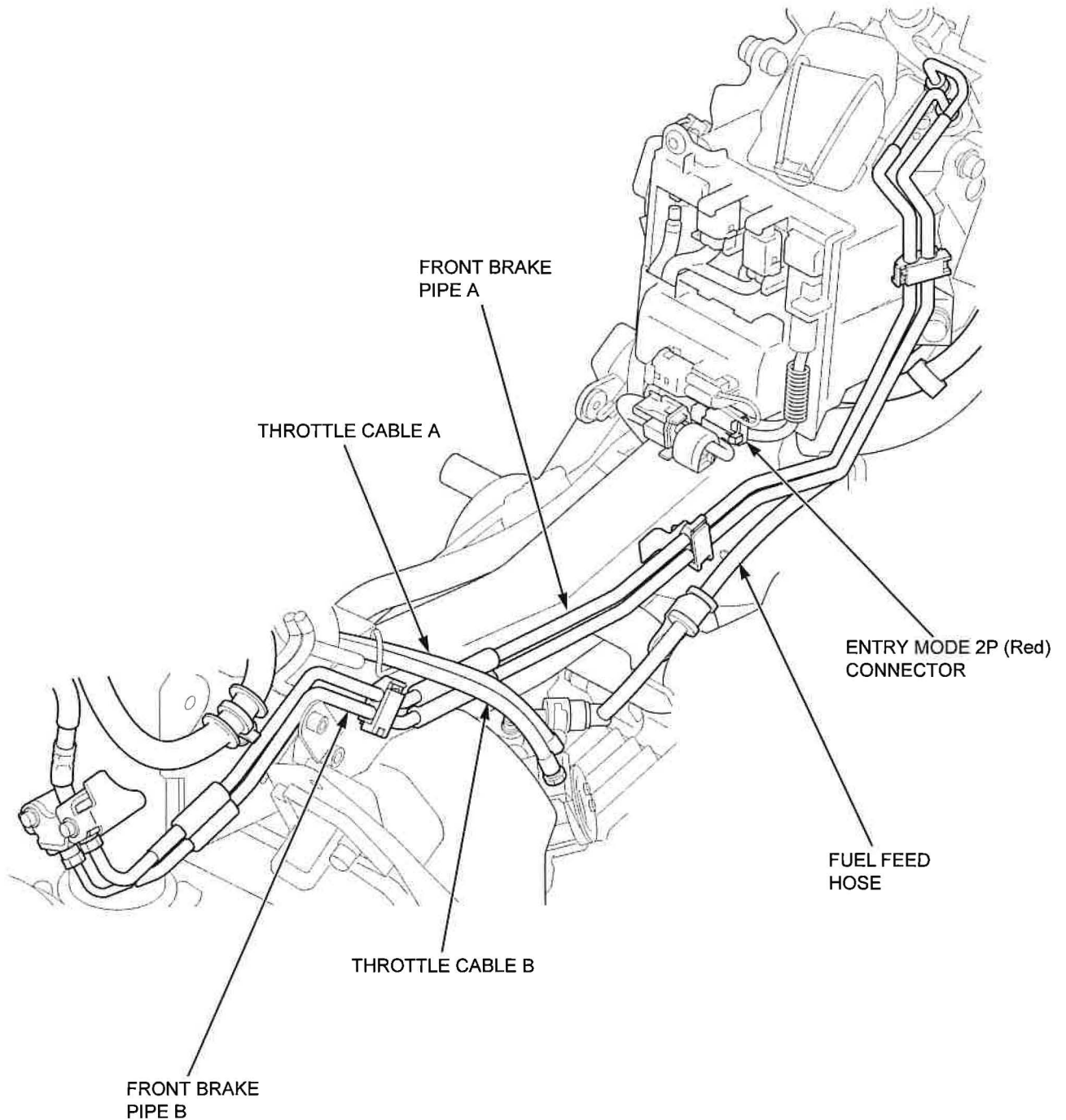
VS SENSOR WIRE

FUEL FEED HOSE

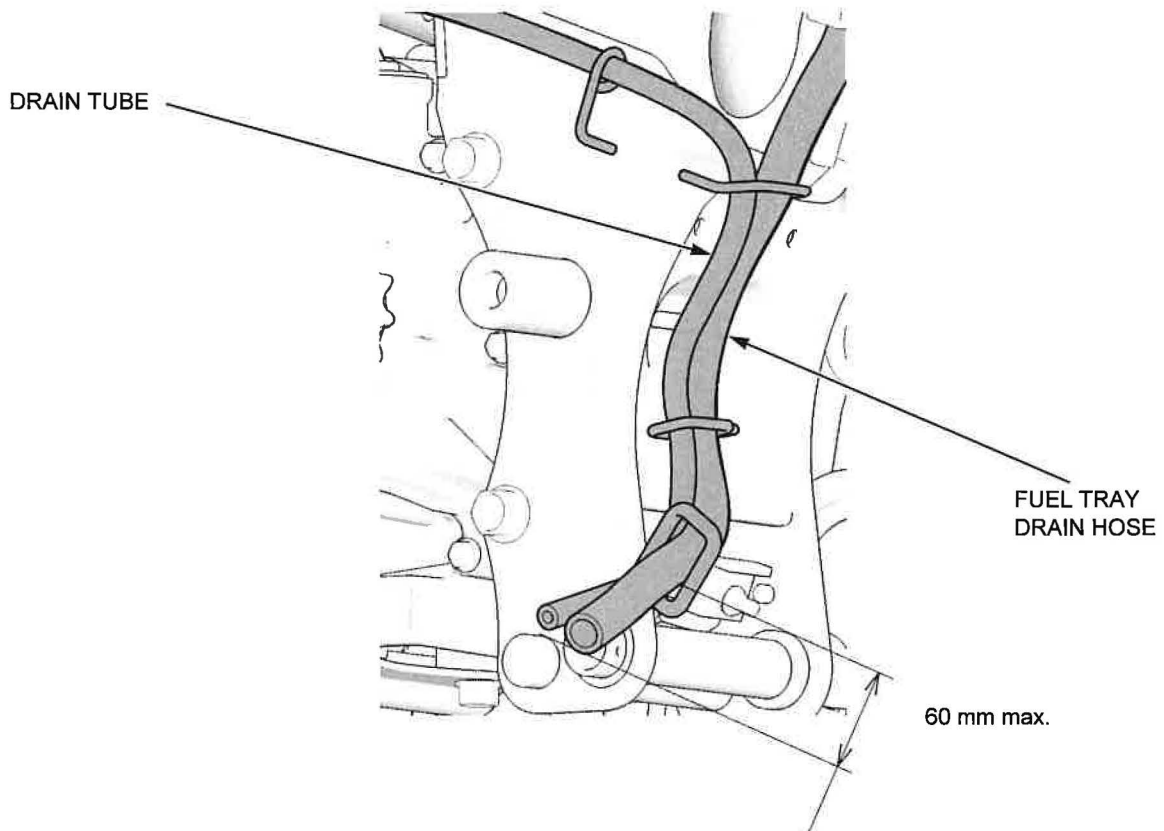
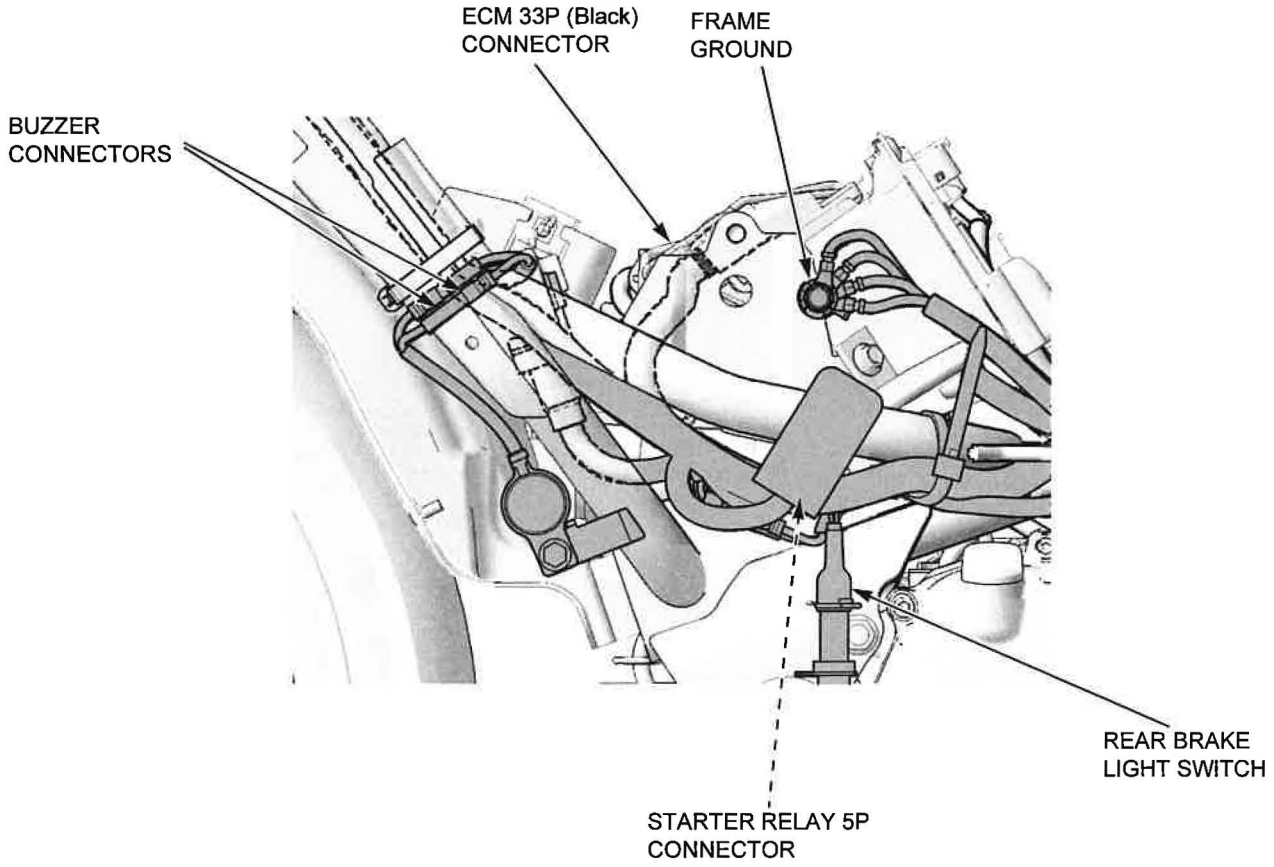


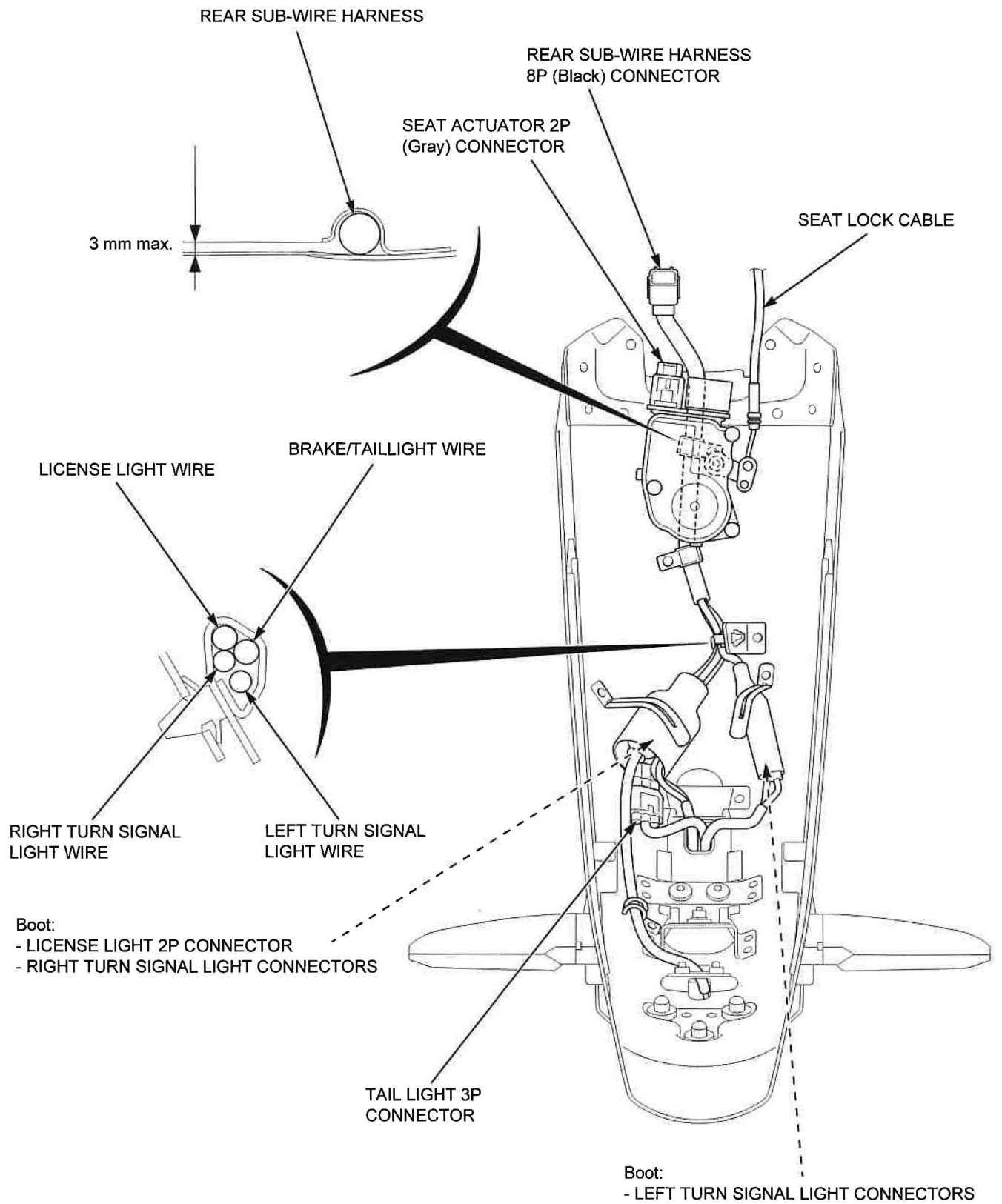
# GENERAL INFORMATION





# GENERAL INFORMATION







## GENERAL INFORMATION

# EMISSION CONTROL SYSTEMS

## EXHAUST EMISSION REQUIREMENT

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

## NOISE EMISSION REQUIREMENT

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

## WARRANTY COMPLIANCE

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

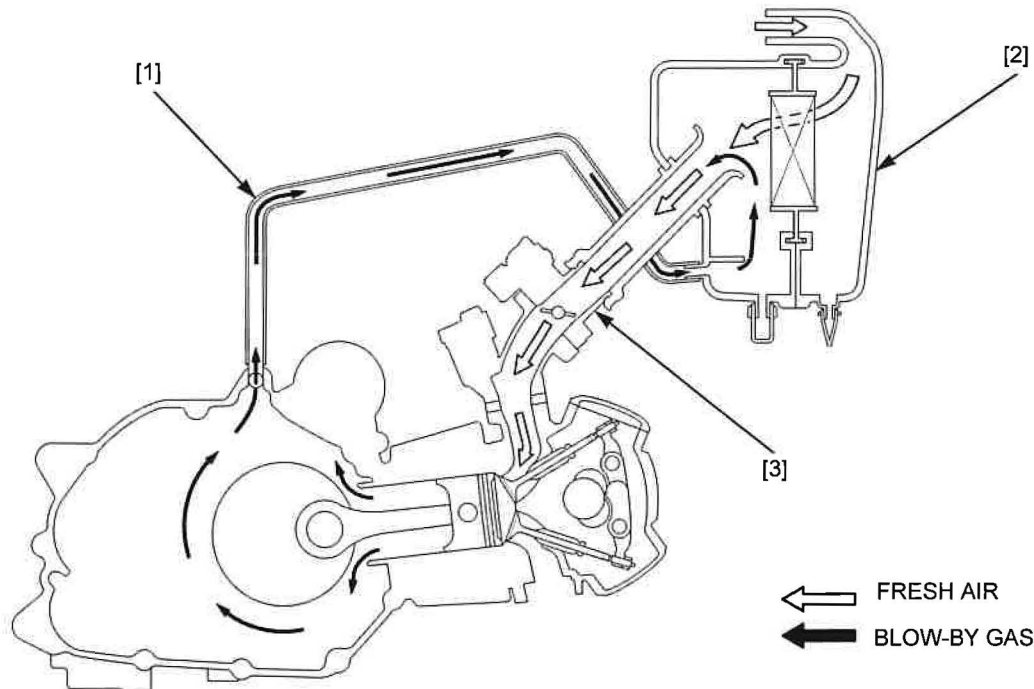
## SOURCE OF EMISSIONS

Fuel evaporation and the combustion process produces carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), and hydrocarbons (HC). The control of hydrocarbons and oxides of nitrogen is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but it is toxic. Uncontrolled fuel evaporation also releases hydrocarbons to the atmosphere.

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

## CRANKCASE EMISSION CONTROL SYSTEM

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



## EXHAUST EMISSION CONTROL SYSTEM

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

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

### 3-WAY CATALYTIC CONVERTER

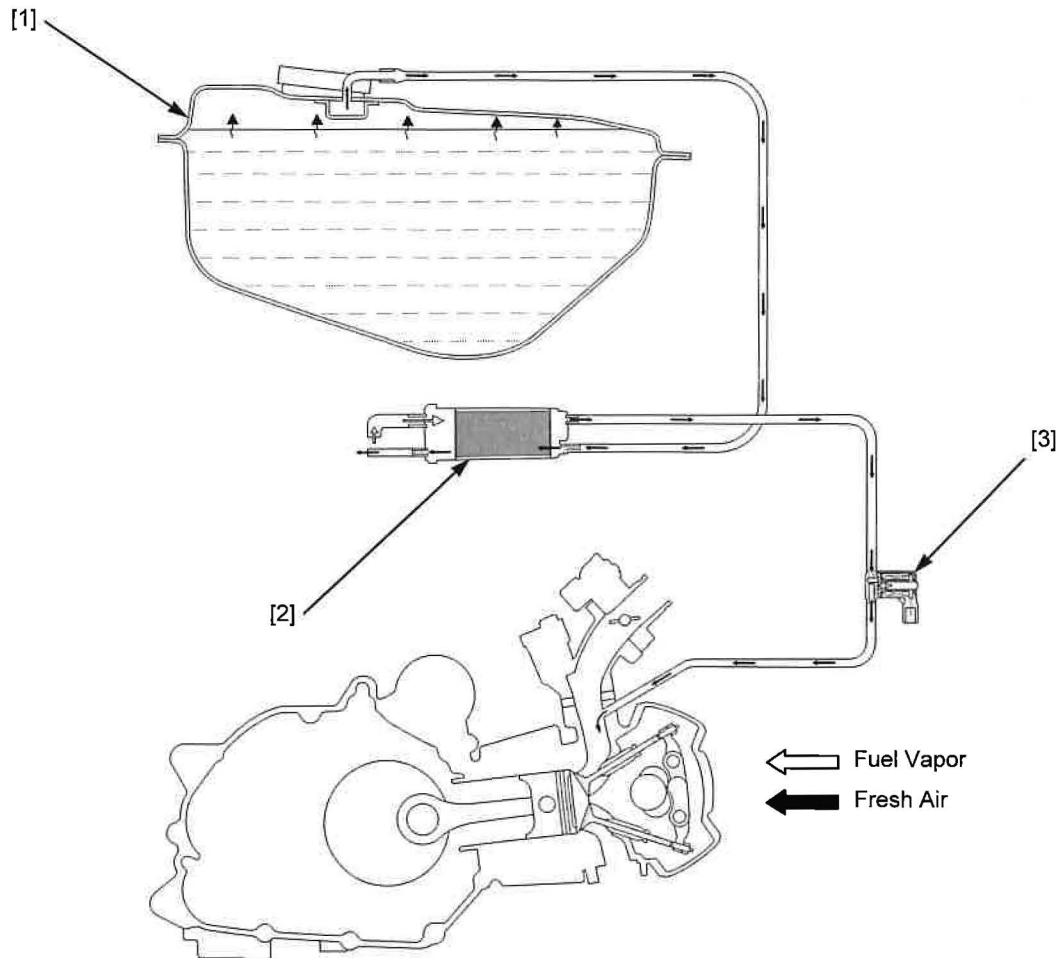
This motorcycle is equipped with a three-way catalytic converter.

The three-way catalytic converter is in the exhaust system. Through chemical reactions, it converts HC, CO, and NO<sub>x</sub> in the engine's exhaust to carbon dioxide (CO<sub>2</sub>), nitrogen (N<sub>2</sub>), and water vapor.

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

## EVAPORATIVE EMISSION CONTROL SYSTEM

This model complies with California Air Resources Board (CARB) evaporative emission requirements. Fuel vapor from the fuel tank [1] is routed into the EVAP canister [2] where it is absorbed and stored while the engine is stopped. When the engine is running and the EVAP purge control solenoid valve [3] is open, fuel vapor in the EVAP canister is drawn into the engine.



## NOISE EMISSION CONTROL SYSTEM

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

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

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

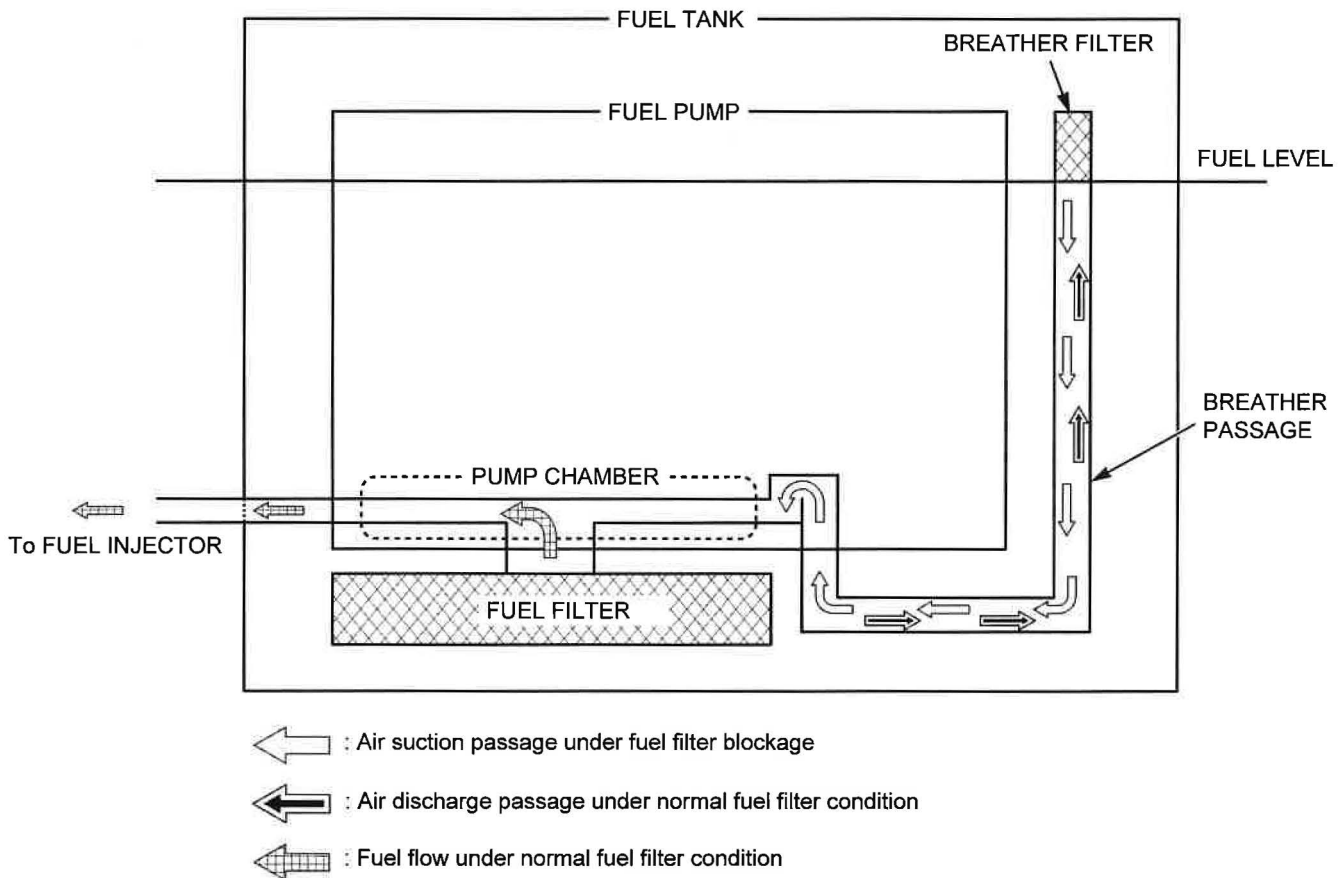
## FUEL PERMEATION EMISSION CONTROL SYSTEM

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

## GENERAL INFORMATION

# TECHNICAL FEATURES

## FUEL PUMP SYSTEM WITH A FUEL FILTER BLOCKAGE REMINDER FUNCTION



The fuel pump system of this model consists of the following components:

- Fuel pump chamber
- Fuel filter
- Breather passage
- Breather filter

Under normal condition, the fuel pump chamber sucks fuel through the fuel filter and then supplies it to the injector.

When the fuel filter is clogged, the fuel is sucked into the pump chamber through the breather passage in order to keep the vehicle running. The breather filter is located in the upper inner side of fuel tank. When the fuel is consumed to the point where the breather filter is exposed above the fuel level, a certain amount of air will be drawn into the pump chamber via the breather filter and breather passage. This incoming air produces "a lack of fuel", which impairs engine performance in order to notify the rider of the fuel filter blockage. This symptom works as a reminder for the filter replacement.

This system eliminates the need of fuel filter replacement according to a fixed interval, as the rider will experience the symptom and notice the filter blockage during vehicle usage.

The driveability remains normal as long as the fuel level in tank is maintained above the breather filter because no air will be drawn into the pump chamber, even when the fuel filter is clogged.

If the fuel in tank is sufficient but such symptom as poor engine performance, lack of fuel, or engine start failure exist, perform the fuel supply test.

**MIL SYSTEM**

**MIL INDICATION**

In the previous generation PGM-FI system, if the PGM-FI system detects the malfunction at present, the MIL blinks the number of trouble code with idle engine speed.

But in this PGM-FI system, when the system detects the malfunction, it turns the MIL ON without blinking. To read out the DTC, connect the SCS service connector to the DLC as shown in DTC READOUT of Chapter 4.

**MIL indication**

	This PGM-FI			Existing PGM-FI		
	At Idle	Riding	SCS short	At Idle	Riding	SCS short
Current trouble	ON	ON	Blinking	Blinking	ON	Blinking
Past trouble	*ON	*ON	*Blinking	OFF	OFF	Blinking

\* This system turn off the MIL if the system does not detect the same trouble again in three driving cycle (three times repeat of ignition-ON, riding and ignition-OFF).

## GENERAL INFORMATION

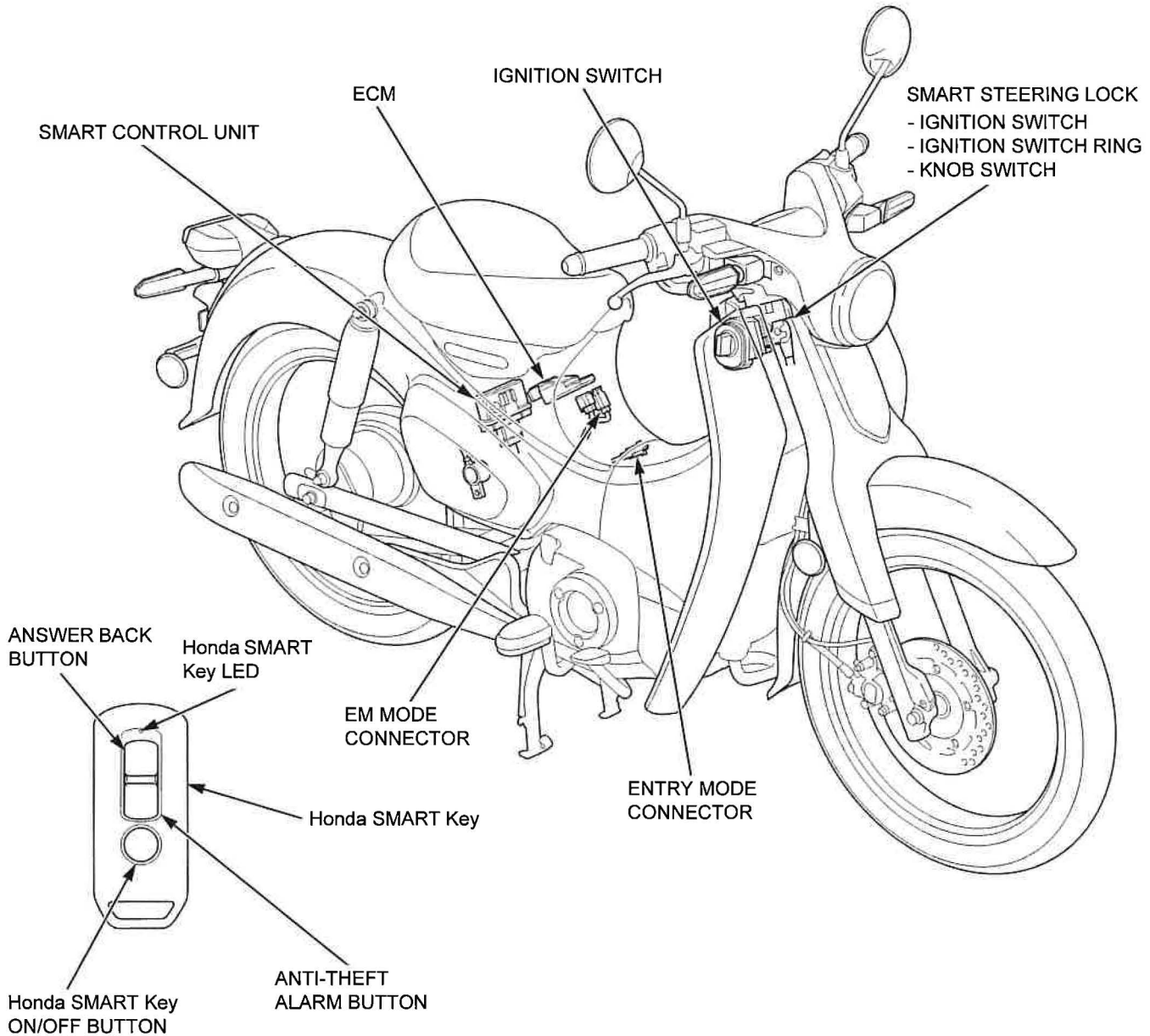
### Honda SMART Key SYSTEM

The Honda SMART Key system is composed of the Honda SMART Key, Smart steering lock and Smart Control Unit.

If a person carrying the Honda SMART Key gets within the communication range, the ID authentication (Smart authentication) is made between the Honda SMART Key and Smart Control Unit of the vehicle by radio communication. When the smart authentication is completed, the Smart steering lock is unlocked to enable the ignition switch operation.

Setting the ignition switch to ON makes the ID authentication (Immobilizer authentication) between the smart control unit and ECM. When the immobilizer authentication is completed, the engine can be started.

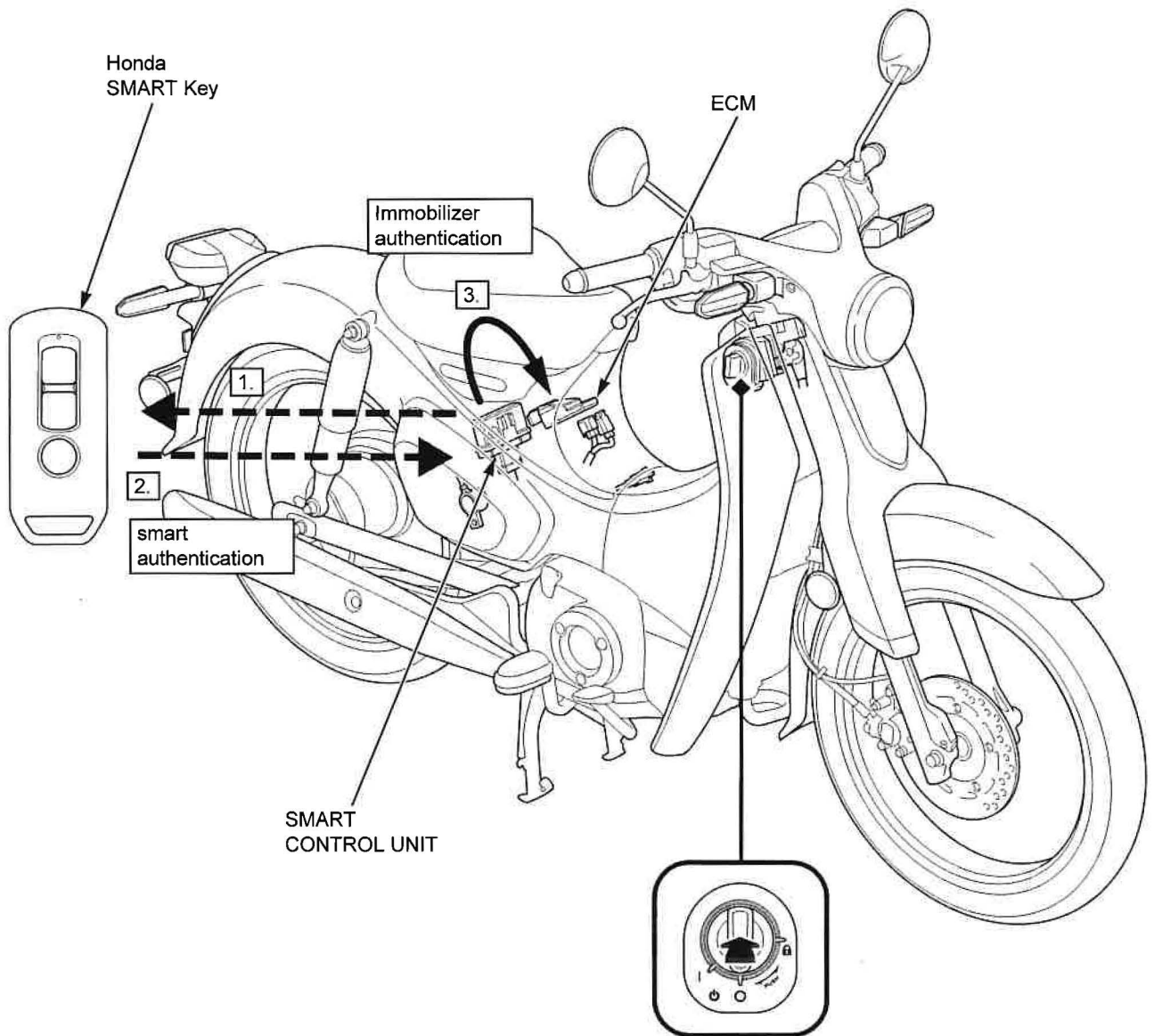
- The Smart Control Unit has not only the authentication ID with the Honda SMART Key but also the authentication ID with the ECM and provides the immobilizer function.



The moving parts are contained within the Smart steering lock and the communication and authentication functions are collected in the smart control unit. Furthermore, the authentication ID is individually provided between the Honda SMART Key and smart control unit (smart authentication) and between the smart control unit and ECM (immobilizer authentication). As a result of these features, a repair is accurately carried out by replacing the minimum parts in case of trouble.

### Details of the ID authentication at the time of engine starting

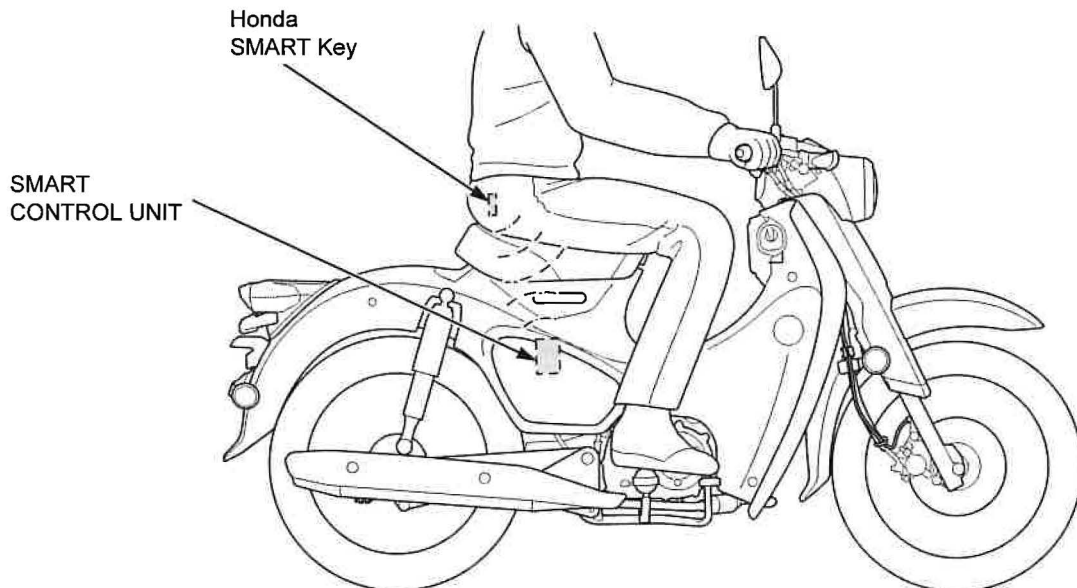
1. Press the ignition switch to start the CPU in the smart control unit. In this step, the transmitting antenna built in the smart control unit transmits the Honda SMART Key smart authentication ID registered in the Honda SMART Key in order.
2. When the Honda SMART Key is in the communication range (when the ON/OFF button of the Honda SMART Key is set to ON), if the received smart authentication ID is certified, the Honda SMART Key transmits a particular smart authentication ID to the smart control unit.
  - When the ON/OFF button of the Honda SMART Key is set to OFF, communication is not made even if the Honda SMART Key is in within the communication range.
  - When the smart authentication is completed, the ignition switch ring and Honda SMART Key indicator come on to unlock the ignition switch and the ignition switch can be turned
3. When the ignition switch is turned to ON position, the ignition switch ring and Honda SMART Key indicator go out and the smart control unit transmits the immobilizer ID to the ECM. When the immobilizer authentication ID received in the ECM is certified, the immobilizer authentication is completed and engine start is allowed.



## GENERAL INFORMATION

### Details of the ID authentication when driving

The Honda SMART Key and smart control unit periodically communicate after the smart authentication is completed to confirm the communication state of the Honda SMART Key and smart control unit continuously.

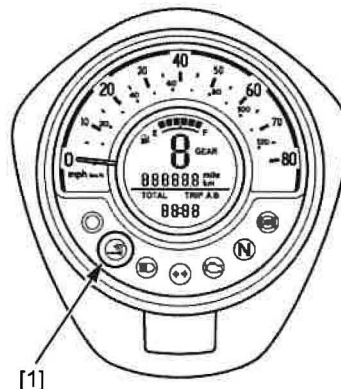


When the communication between the Honda SMART Key and smart control unit gets interrupted when driving, the Honda SMART Key indicator [1] starts blinking.

Based on this, possible causes of the interruption are lost Honda SMART Key due to the dropping when driving, loss of the battery power or a place with high intensity radio waves or noises.

- Driving is not impacted until the ignition switch is set to OFF, even if the Honda SMART Key indicator is blinking.

If the mutual communication is restored when driving, the Honda SMART Key indicator goes out.



### Details of the ID authentication at the time of dismounting

The ignition switch ring and Honda SMART Key indicator come on by setting the ignition switch to OFF, the Honda SMART Key and smart control unit make periodically mutual communication for a certain period of time. After the mutual communication is completed, the ignition switch ring and Honda SMART Key indicator go out to lock the ignition switch and steering. The hazard lamp blinks once to show that the ignition switch is locked.

If the communication error occurs because you press the ignition switch or set the Honda SMART Key ON/OFF button to OFF before a certain time passes after the ignition switch is set to OFF, or you move the Honda SMART Key out of the communication range, the mutual communication is terminated.

- If the ignition switch is set to ON, the ignition switch won't automatically set to OFF even if the Honda SMART Key is moved out of the communication range.
- The ignition switch and steering won't automatically be locked even if the Honda SMART Key is moved out of the communication.

### If the Honda SMART Key and smart control unit has communication error and you dismount

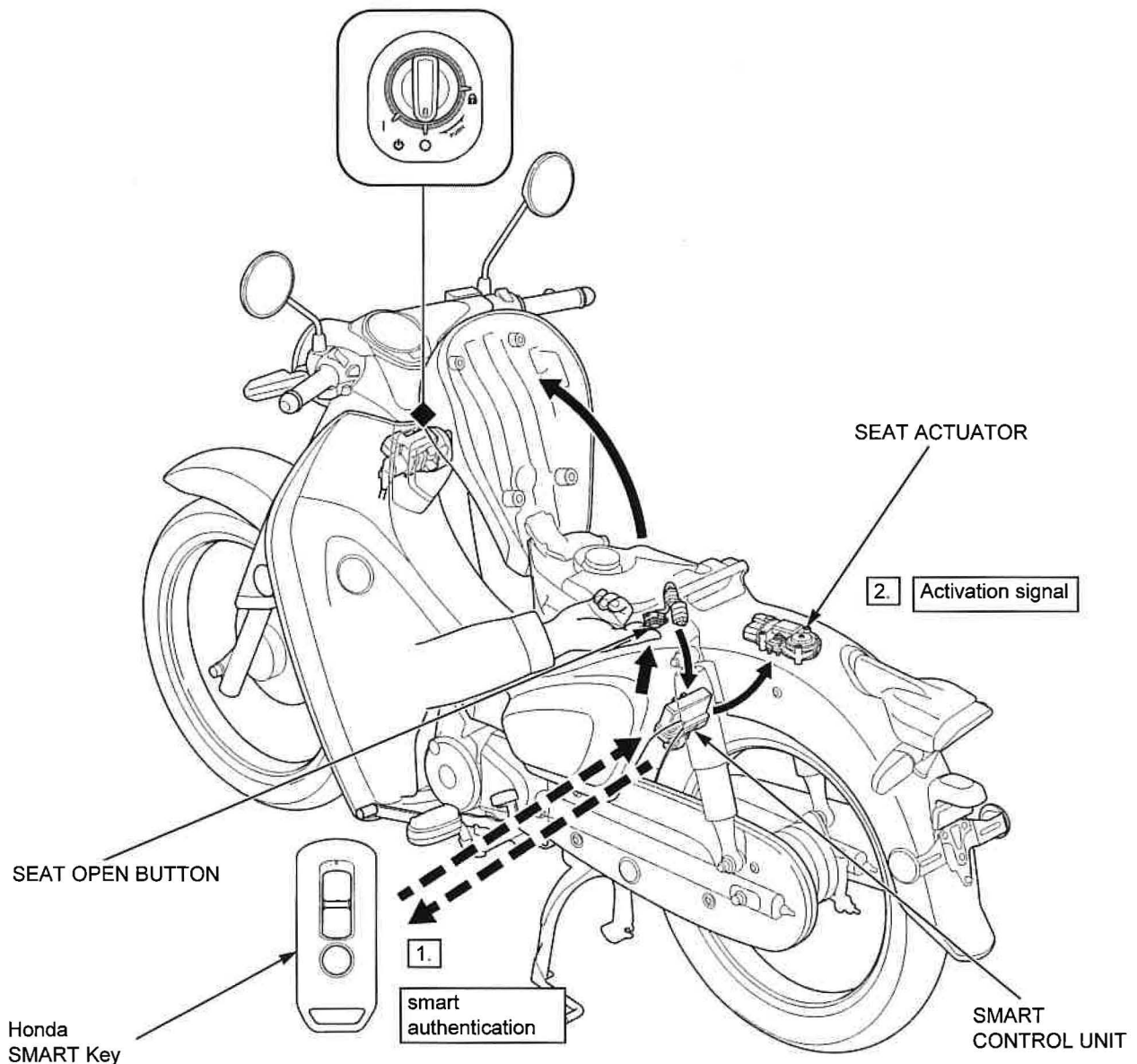
If you set the ignition switch to OFF while the Honda SMART Key indicator is blinking, the Honda SMART Key indicator will not go out, and the ignition switch ring and hazard lamp start blinking to show the communication error.

In this state, if 20 sec. or more passed after the ignition switch is set to OFF, the ignition switch ring and Honda SMART Key indicator go out, and the ignition switch and steering will be locked.

- If you set the ignition switch to ON again, the ignition switch ring and hazard lamp go out.

### Details of the ID authentication when opening the seat.

1. When the Honda SMART Key is in the communication range (when the ON/OFF button of the Honda SMART Key is set to ON), if the received smart authentication ID is certified, the Honda SMART Key transmits a particular smart authentication ID to the smart control unit.
  - When the ON/OFF button of the Honda SMART Key is set to OFF, communication is not made even if the Honda SMART Key is in the communication range.
  - When the smart authentication is completed, the ignition switch ring and Honda SMART Key indicator come on to unlock the ignition switch and the ignition switch can be turned
2. When the seat open button is pressed, the smart control unit transmits the activation signal to the seat actuator and opens the seat.
  - When the battery does not have enough voltage to start the engine, the seat may not open.





## GENERAL INFORMATION

### ANSWER BACK/ALARM SYSTEM

Answer back/alarm system has both of the following functions.

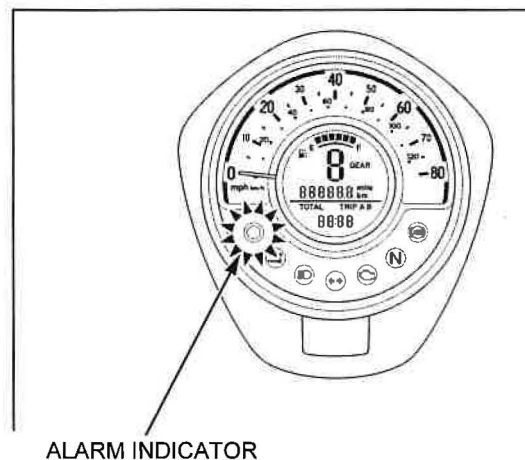
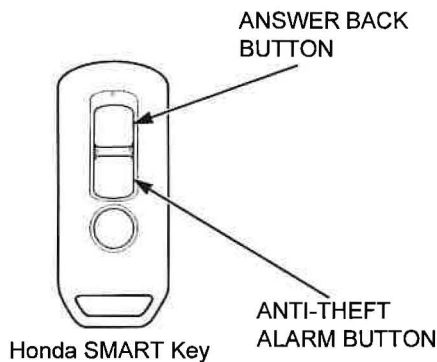
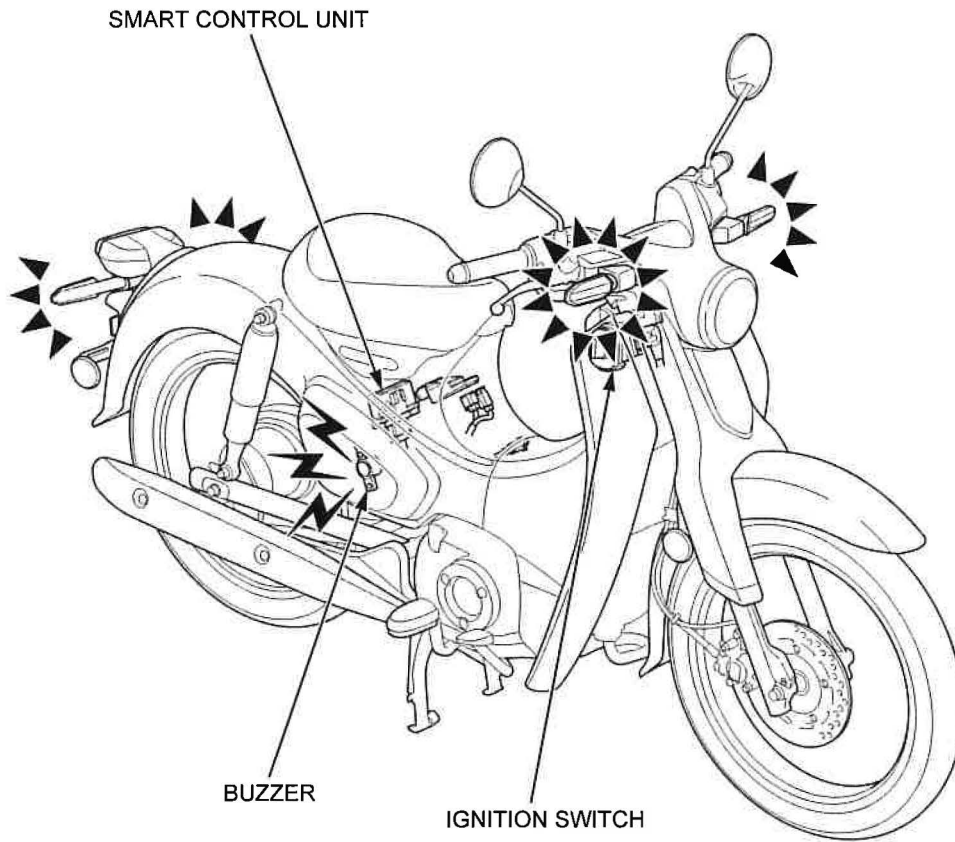
The answer back system shows location of the vehicle by turning on the turn signal lights, buzzer sound, and ignition switch LED (ring light) when the answer back button on the Honda SMART key is pushed.

The alarm system prevents theft of the vehicle by turning on the turn signal lights, buzzer sound, and ignition switch LED (ring light and alarm indicator) when detecting an impact to the vehicle body.

The alarm mode is activated when receiving the signal transmitted by pressing the alarm button on the Honda SMART key. (Pressing the alarm button cancels the alarm mode.)

The system's sound level, pattern and sensor sensitivity level can be customized.

- Temporary silent mode
- Sound level
- Sound pattern
- Sensor sensitivity level



# 2. FRAME/BODY PANELS/EXHAUST SYSTEM

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# SERVICE INFORMATION

## GENERAL

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

## TROUBLESHOOTING

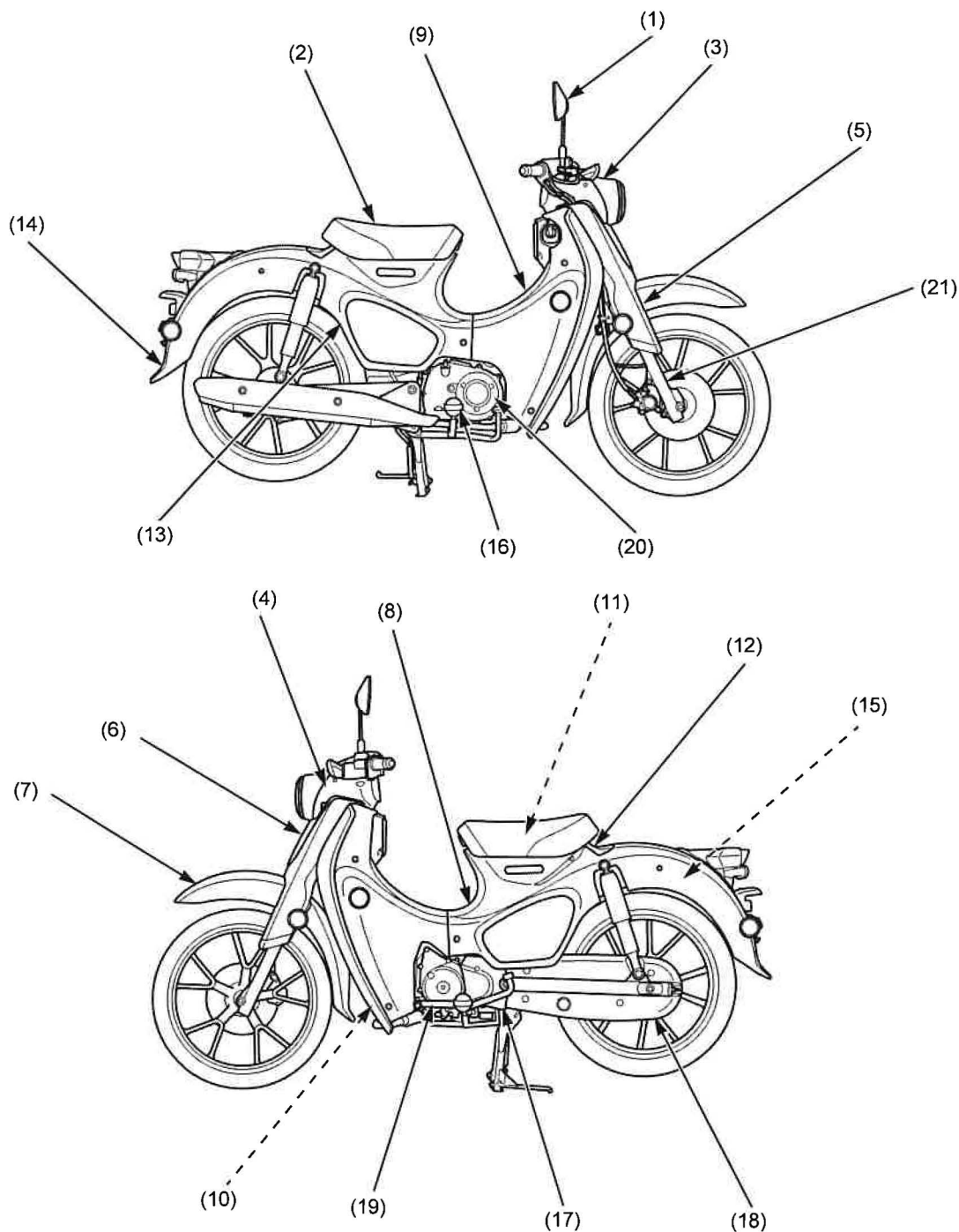
### Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

### Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

**BODY PANEL LOCATIONS**



(1) Rearview mirror (page 2-5)

(2) Seat (page 2-5)

(3) Handlebar upper cover (page 2-6)

(4) Handlebar lower cover (page 2-8)

(5) Fork cover (page 2-9)

(6) Front garnish (page 2-10)

(7) Front fender (page 2-10)

(8) Center cover (page 2-10)

(9) Leg shield (page 2-11)

(10) Inner leg shield (page 2-12)

(11) Fuel tank cover (page 2-12)

(12) Main stand grip (page 2-12)

(13) Body cover (page 2-13)

(14) Rear fender (page 2-15)

(15) Rear inner fender (page 2-16)

(16) Footpeg bar (page 2-16)

(17) Left crankcase rear cover (page 2-16)

(18) Chain case (page 2-17)

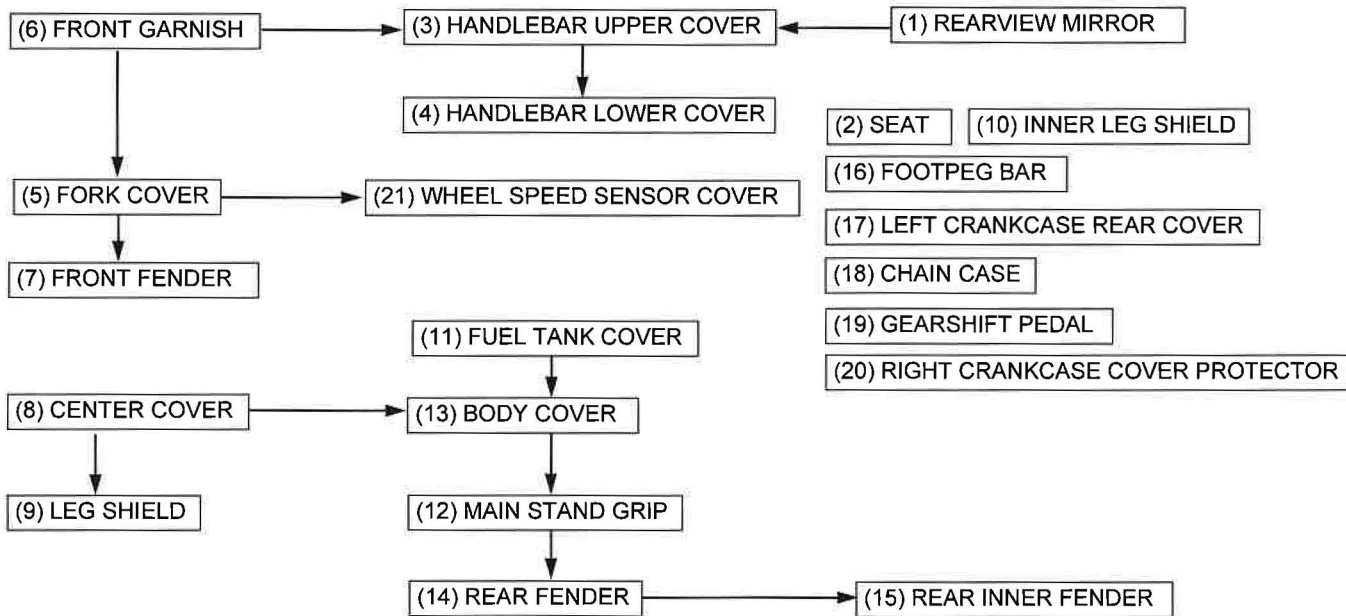
(19) Gearshift pedal (page 2-17)

(20) Right crankcase cover protector (page 2-18)

(21) Wheel speed sensor cover (page 2-18)

# BODY PANEL REMOVAL CHART

- This chart shows removal order of frame covers.



## REARVIEW MIRROR

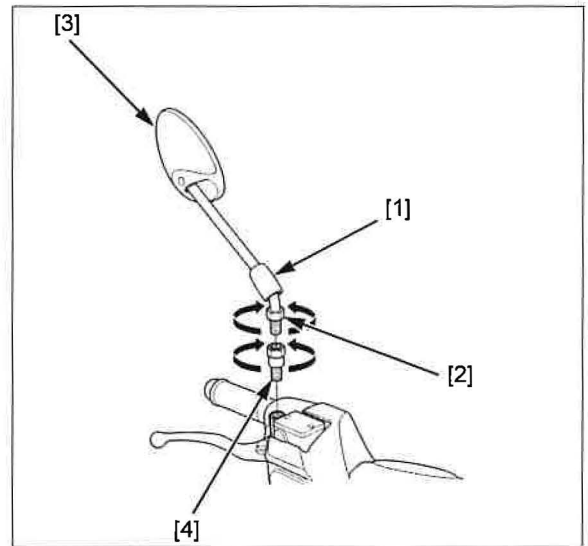
### REMOVAL/INSTALLATION

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

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

Remove the mirror adaptor bolt [4].

Installation is in the reverse order of removal.

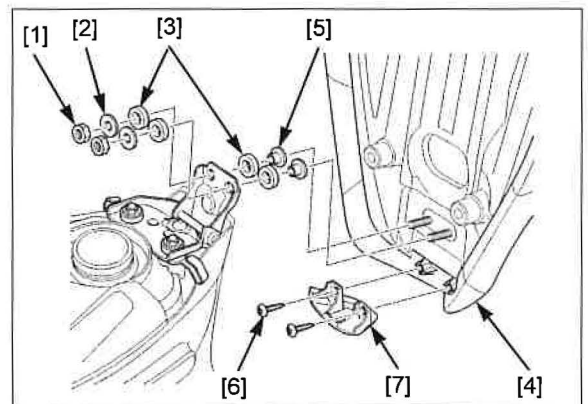


## SEAT

### REMOVAL/INSTALLATION

Remove the following:

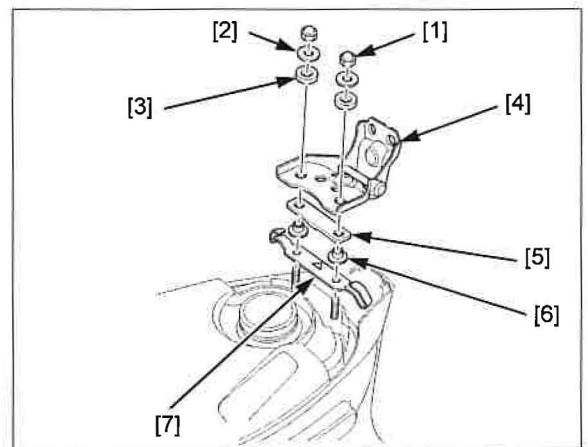
- Two nuts [1]
- Two washers [2]
- Four mounting rubbers [3]
- Seat [4]
- Two collars [5]
- Two screws [6]
- Seat hinge cover [7]



Remove the following:

- Two cap nuts [1]
- Two washers [2]
- Two mounting rubbers [3]
- Seat hinge [4]
- Cushion rubber [5]
- Two collars [6]
- Helmet hook [7]

Installation is in the reverse order of removal.



## HANDLEBAR UPPER COVER

### REMOVAL/INSTALLATION

Remove the following:

- Left rearview mirror (page 2-5)
- Front garnish (page 2-10)

Remove the screw [1].

Remove the headlight under cover [2] by releasing the two holes [3] from the handlebar upper cover bosses [4].

Remove the headlight rim [5] by releasing the three bosses [6] from the handlebar upper cover holes.

Remove the bolt [7].

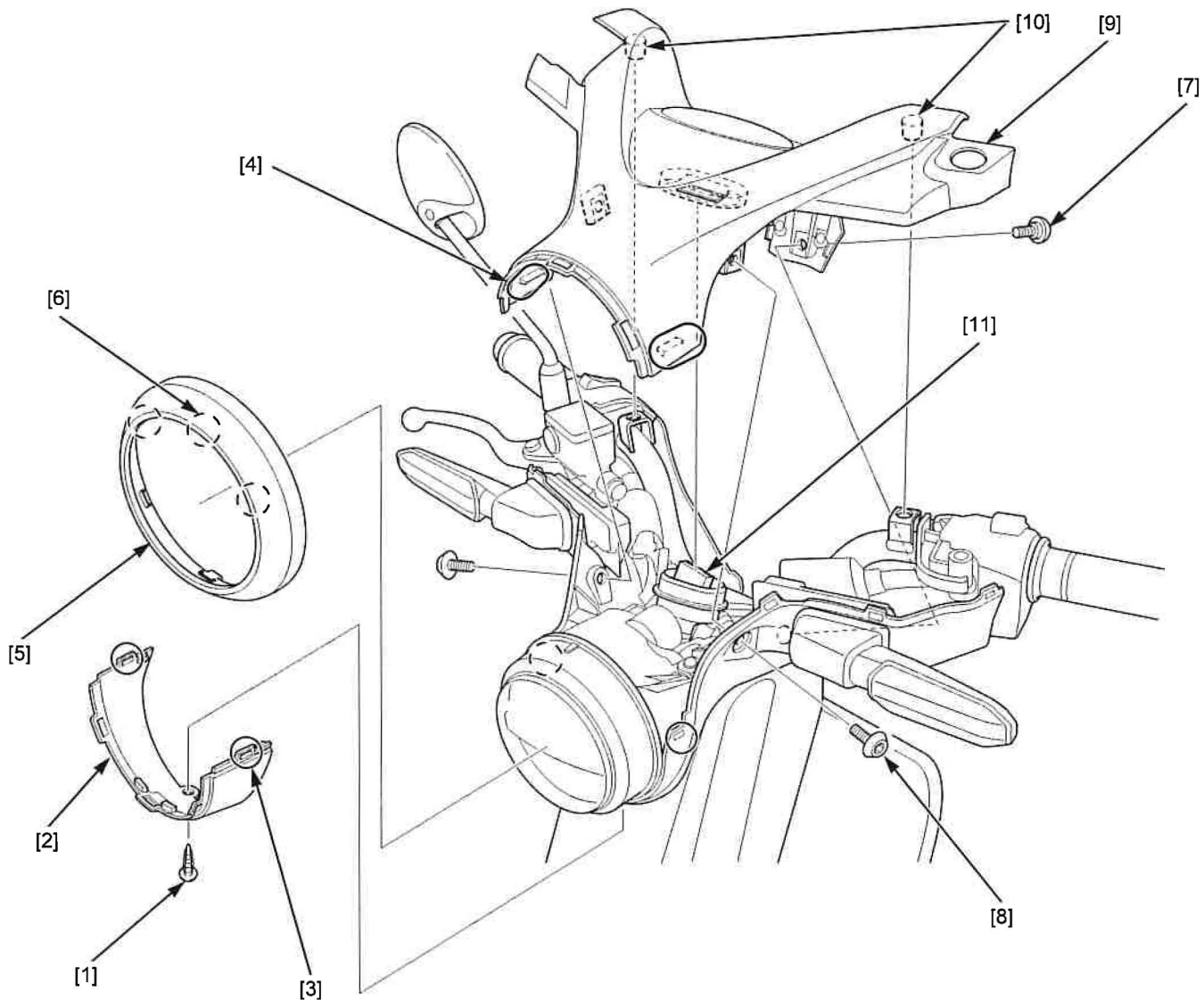
Remove the two socket bolt [8].

Remove the handlebar upper cover [9] by releasing the boss [10] from the handlebar and disconnect the combination meter 20P (Gray) connector [11].

Installation is in the reverse order of removal.

#### NOTE:

Route the wiring correctly according to the wiring diagram (page 1-17).

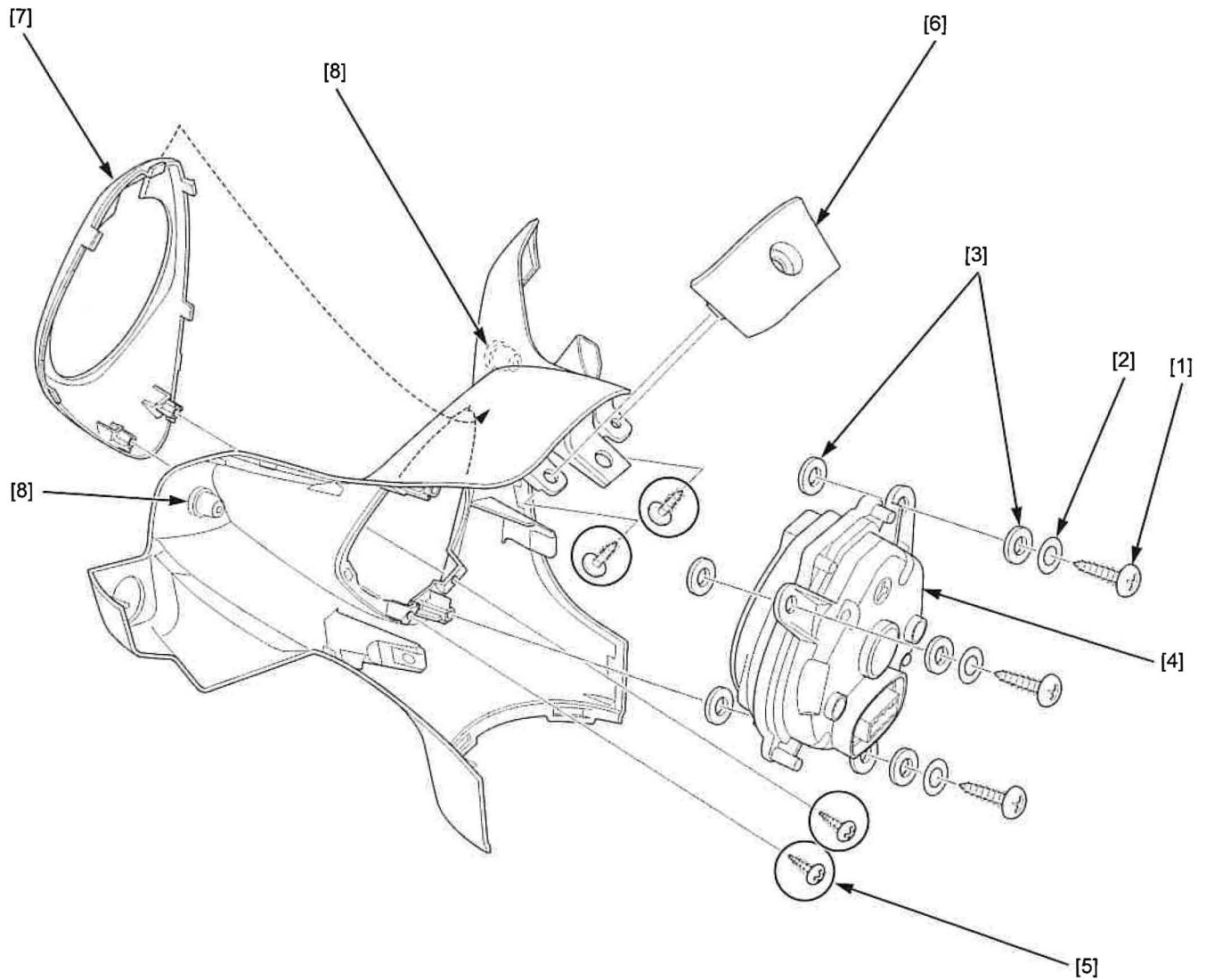


**DISASSEMBLY/ASSEMBLY**

Remove the following:

- Three screws [1]
- Three washers [2]
- Six mounting rubbers [3]
- Combination meter [4]
- Four screws [5]
- Handlebar rear cover [6]
- Meter cover [7]
- Two boots [8]

Installation is in the reverse order of removal.





**HANDLEBAR LOWER COVER**

**REMOVAL/INSTALLATION**

Remove the handlebar upper cover (page 2-6).

Remove the following:

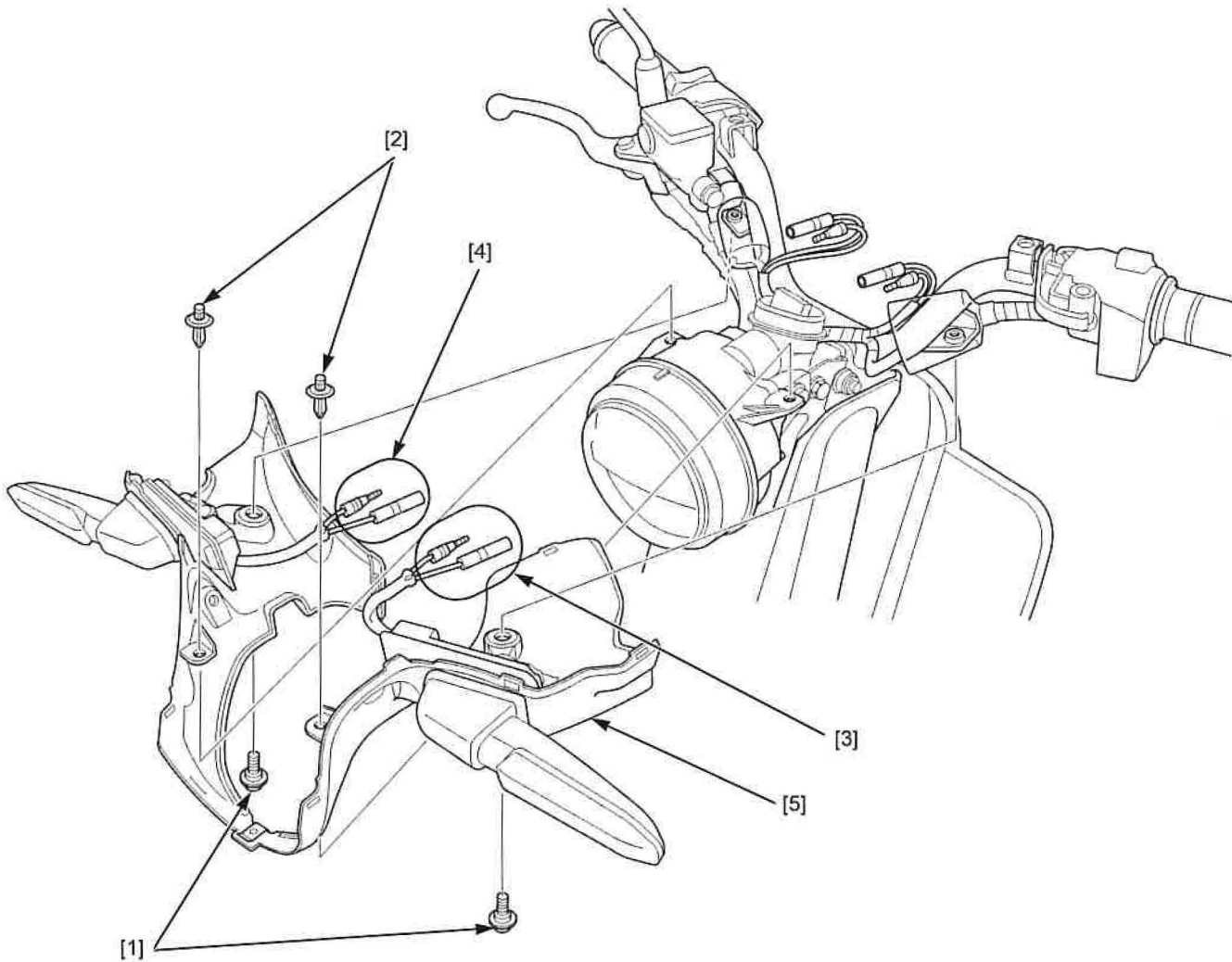
- Two special screw [1]
- Two trim clips [2]

Disconnect the left turn signal light connectors [3], right turn signal light connectors [4] and remove the handlebar rear cover [5].

Installation is in the reverse order of removal.

**NOTE:**

Route the wiring correctly according to the wiring diagram (page 1-17).



## FORK COVER

### REMOVAL/INSTALLATION

Remove the front garnish (page 2-10).

Remove the following:

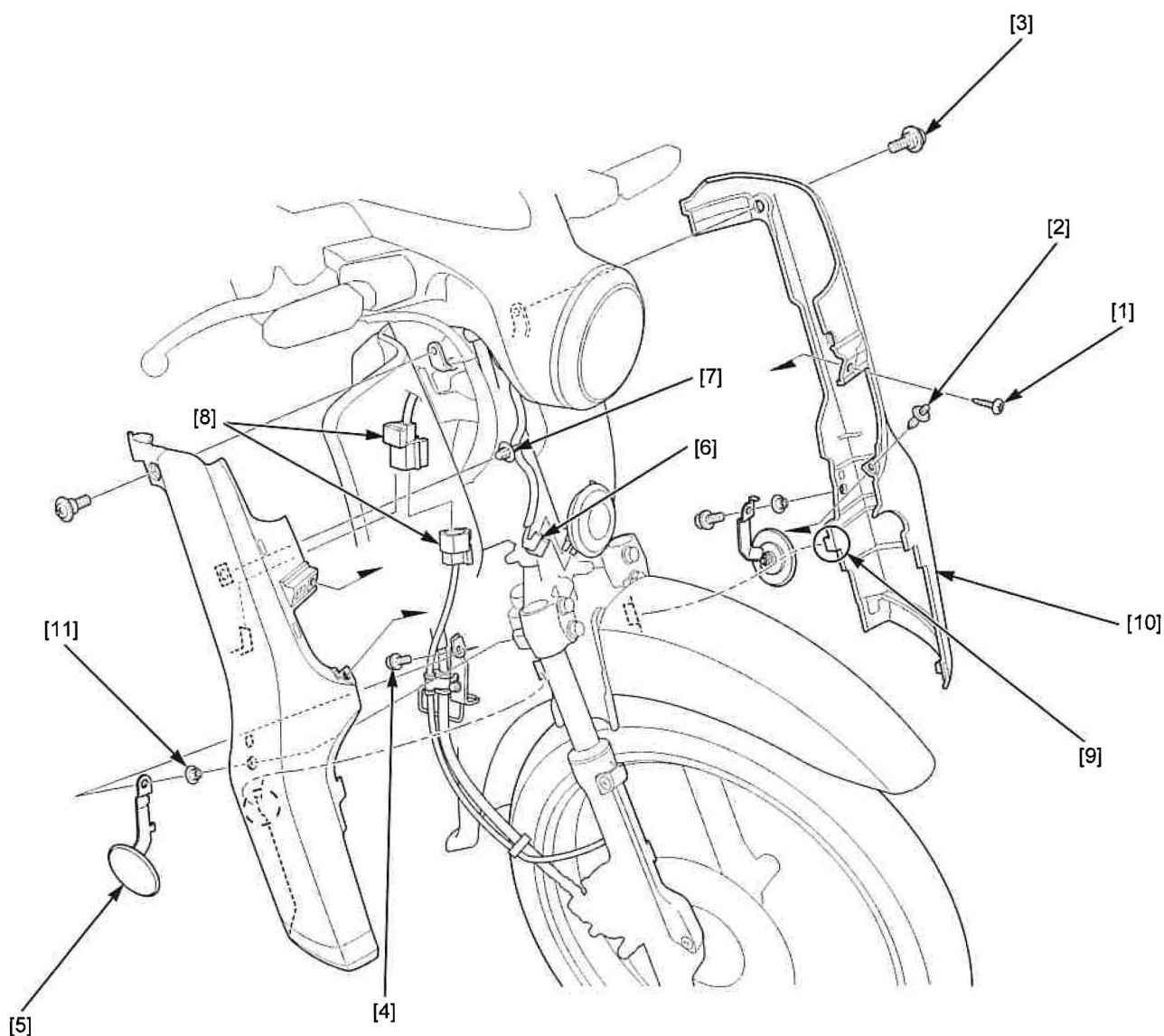
- Screw [1]
- Trim clip [2]
- Two special bolts [3]
- Two bolts [4]
- Two front side reflectors [5]
- Horn connectors [6]
- Wire clip [7]
- Front wheel speed sensor 2P (Black) connectors [8]

Release the front fork cover tabs [9] from the front fender hole and remove the front fork cover [10].

Remove the collars [11] from the front fork cover.

Installation is in the reverse order of removal.

- Be careful not to damage the front wheel speed sensor wire and horn wire.

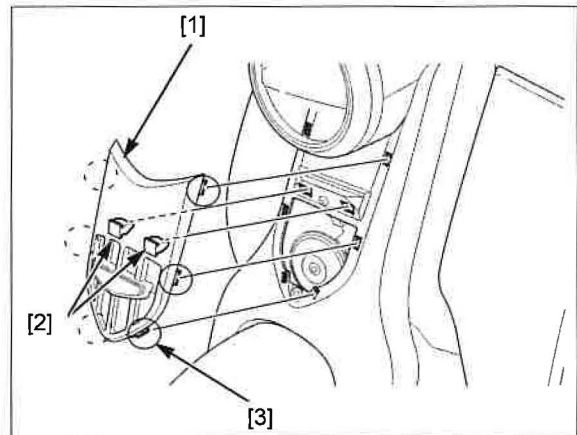


## **FRONT GARNISH**

### **REMOVAL/INSTALLATION**

Remove the front garnish [1] by releasing the two snap fit clips [2] and six tabs [3] from the fork cover.

Installation is in the reverse order of removal.



## **FRONT FENDER**

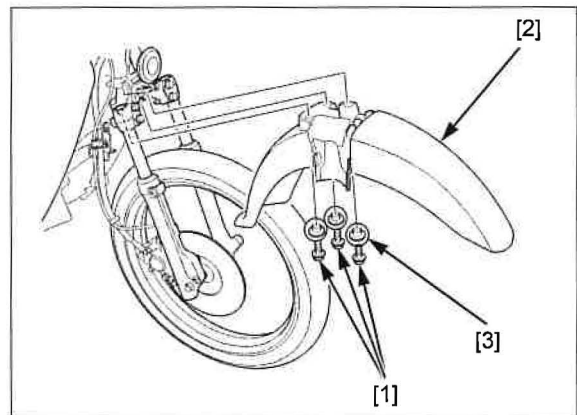
### **REMOVAL/INSTALLATION**

Remove the fork cover (page 2-9).

Remove the following:

- Three bolts [1]
- Front fender [2]
- Three collars [3]

Install in reverse order to removal.

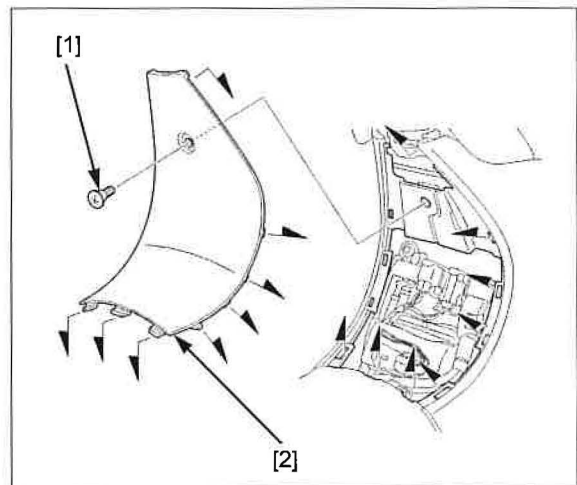


## **CENTER COVER**

### **REMOVAL/INSTALLATION**

Remove the special screw [1] and center cover [2] by releasing its tabs from the body cover.

Installation is in the reverse order of removal.



## LEG SHIELD

### REMOVAL/INSTALLATION

Remove the center cover (page 2-10).

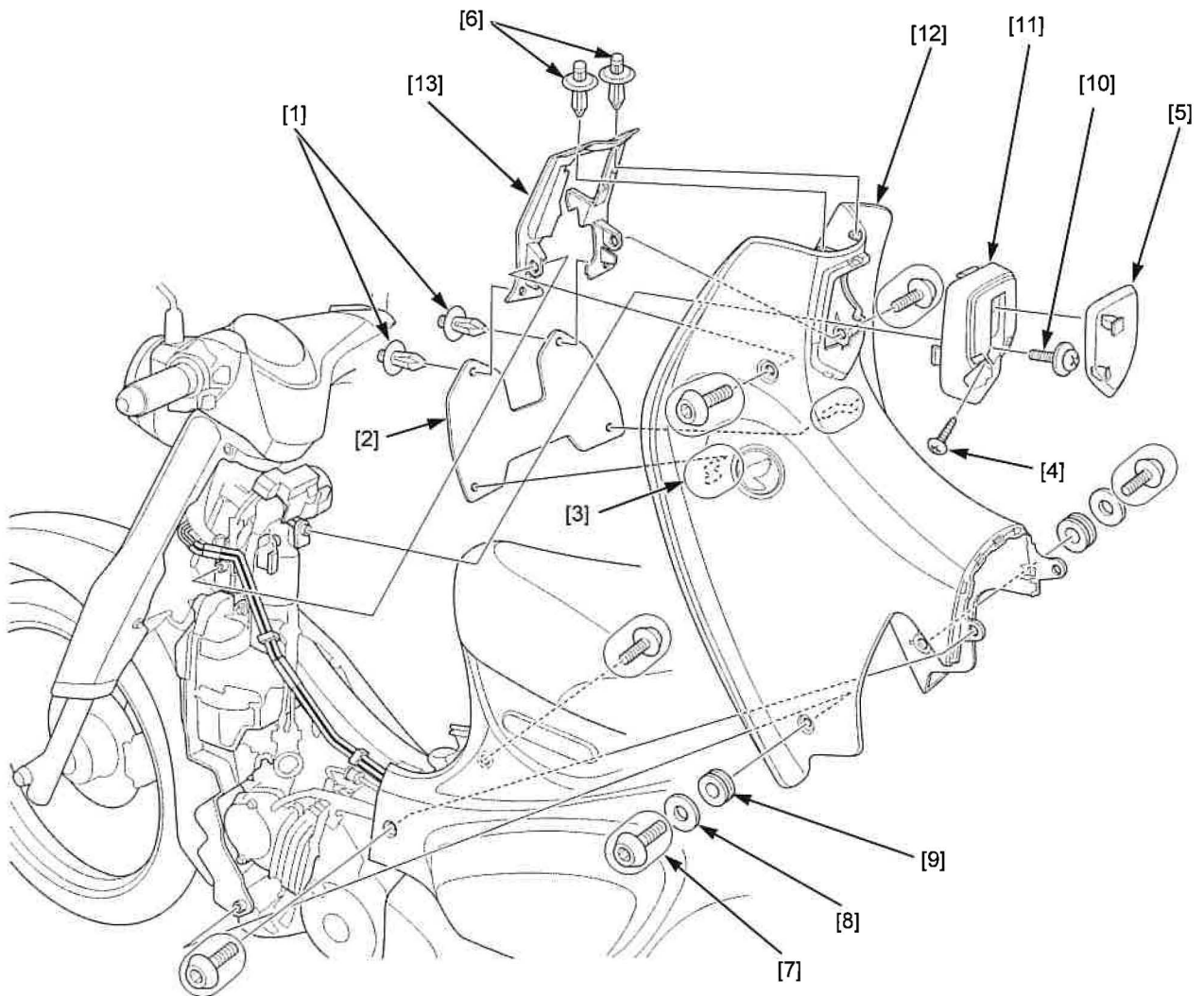
Remove the two trim clips [1] and release the slit of air cleaner guard rubber [2] from the hook of leg shield [3].

Remove the screw [4] and main switch top cover [5].

Remove the following parts:

- Two trim clips [6]
- Six socket bolts [7]
- Two washers [8]
- Two grommet [9]
- Bolt/washer [10]
- Main switch cover [11]
- Leg shield [12]
- Upper inner leg shield [13]

Install in reverse order to removal.



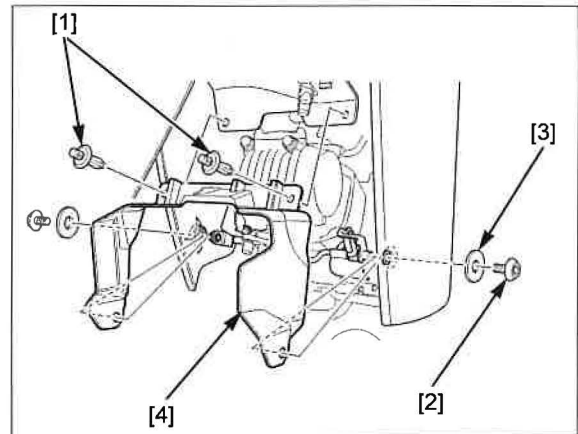
## **INNER LEG SHIELD**

### **REMOVAL/INSTALLATION**

Remove the following:

- Two trim clips [1]
- Two socket bolts [2]
- Two washers [3]
- Inner leg shield [4]

Installation is in the reverse order of removal.



## **FUEL TANK COVER**

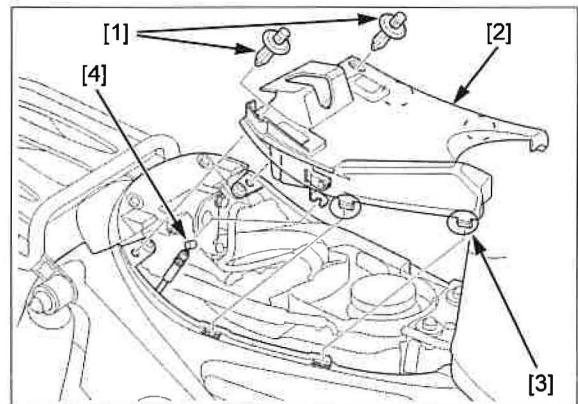
### **REMOVAL/INSTALLATION**

Remove the two trim clips [1].

Remove the fuel tank cover [2] by releasing the four tabs [3] from the body cover.

Remove the side cover lock cable [4] from the fuel tank cover.

Installation is in the reverse order of removal.



## **MAIN STAND GRIP**

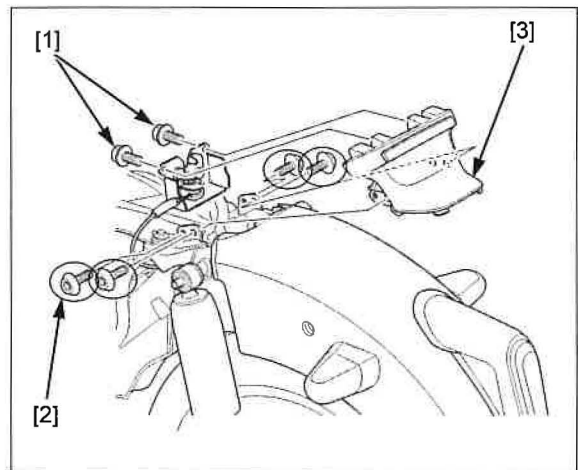
### **REMOVAL/INSTALLATION**

Remove the body cover (page 2-13).

Remove the following:

- Two bolts [1]
- Four socket bolts [2]
- Main stand grip [3]

Installation is in the reverse order of removal.



## BODY COVER

### REMOVAL/INSTALLATION

#### LEFT SIDE:

Remove the following:

- Center cover (page 2-10)
- Fuel tank cover (page 2-12)

Remove the following:

- Screw [1]
- Special screw [2]
- Socket bolt [3]
- Trim clip [4]
- Shock absorber upper mounting cap nut [5]
- Washer [6]

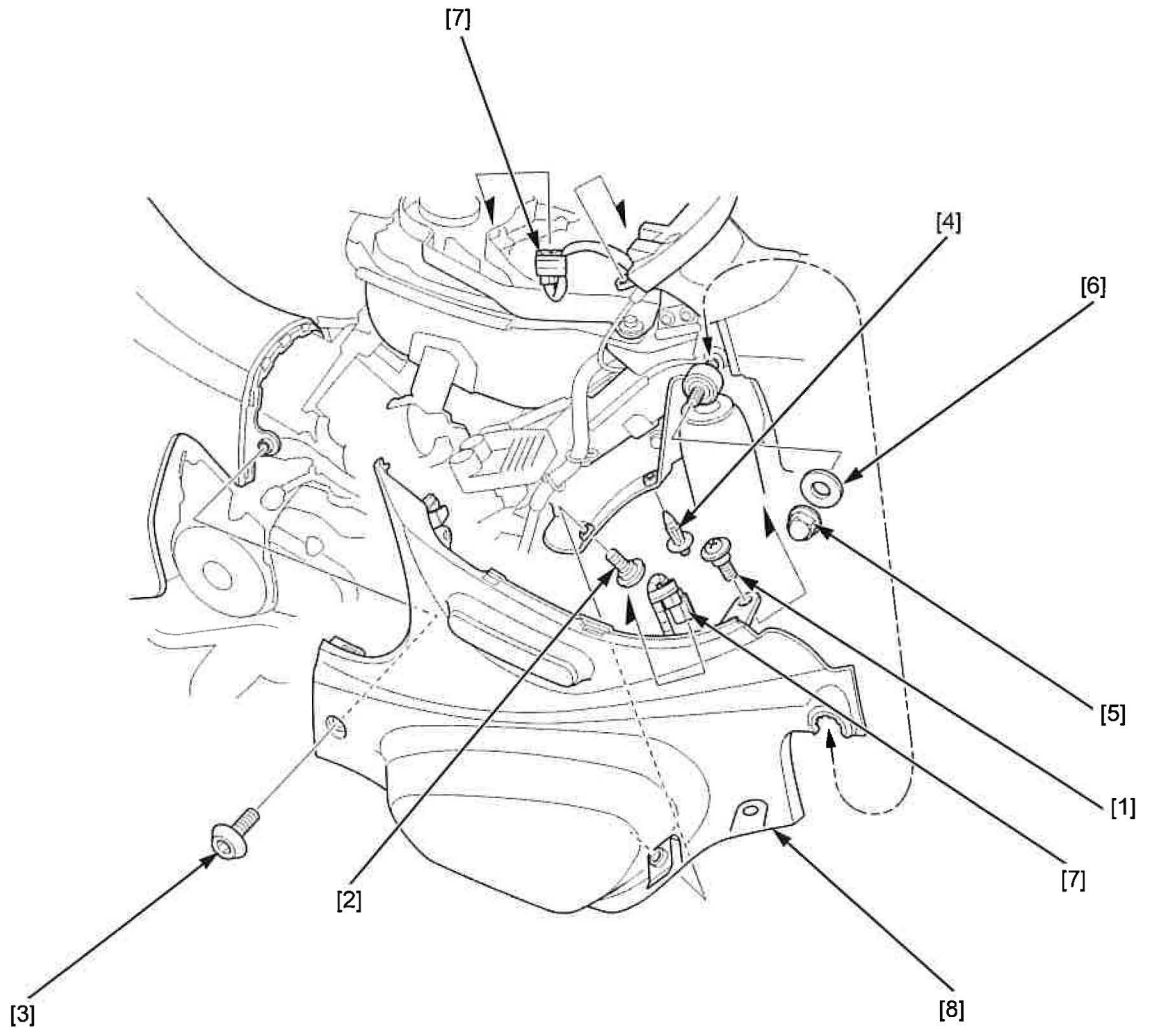
Disconnect the seat switch 2P (Black) [7] connector and remove the body cover [8].

Install in reverse order to removal.

#### NOTE:

Route the wiring correctly according to the wiring diagram (page 1-17).

**TORQUE: Shock absorber upper mounting cap nut**  
**29 N·m (3.0 kgf·m, 21 lbf·ft)**



## FRAME/BODY PANELS/EXHAUST SYSTEM

---

### RIGHT SIDE:

Remove the following:

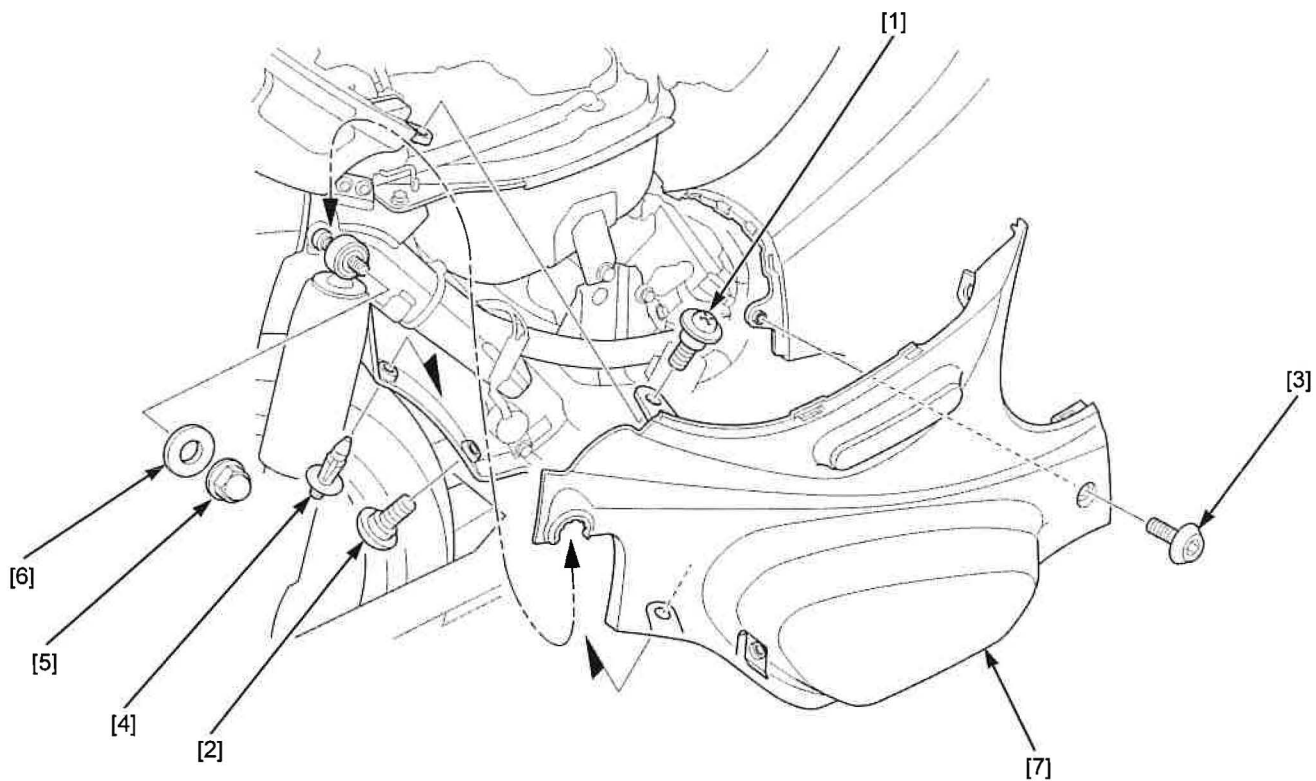
- Center cover (page 2-10)
- Fuel tank cover (page 2-12)

Remove the following:

- Screw [1]
- Special screw [2]
- Socket bolt [3]
- Trim clip [4]
- Shock absorber upper mounting cap nut [5]
- Washer [6]
- Body cover [7]

Install in reverse order to removal.

**TORQUE: Shock absorber upper mounting cap nut**  
**29 N·m (3.0 kgf·m, 21 lbf·ft)**

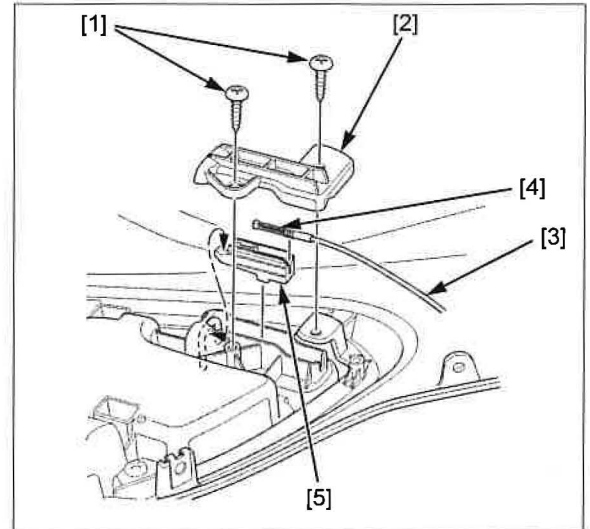


**SIDE COVER LOCK DISASSEMBLE:**

Remove the two screw [1] and slider cover [2]

Remove the side lock cable [3], spring [4] from the lid hinge slider [5].

Install in reverse order to removal.

**REAR FENDER****REMOVAL/INSTALLATION**

Remove the main stand grip (page 2-12).

Remove the following:

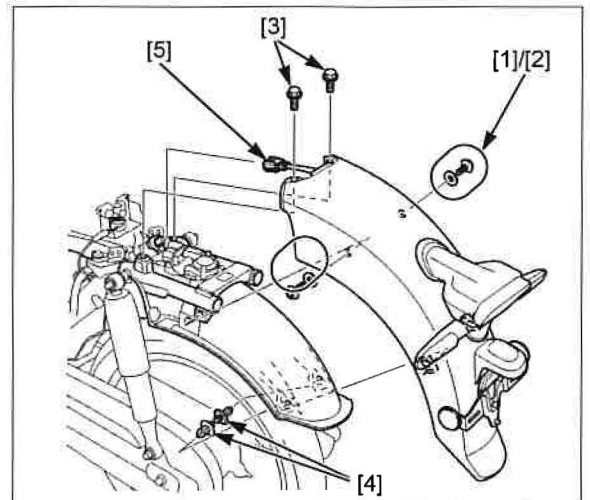
- Two socket bolts [1]
- Two washers [2]
- Two bolts [3]
- Two trim clips [4]

Disconnect the connector of the rear sub harness 8P (Black) [5] connector.

Install in reverse order to removal.

**NOTE:**

Route the wiring correctly according to the wiring diagram (page 1-17).





**REAR INNER FENDER**

**REMOVAL/INSTALLATION**

Remove the seat actuator (page 21-39).

Remove the following:

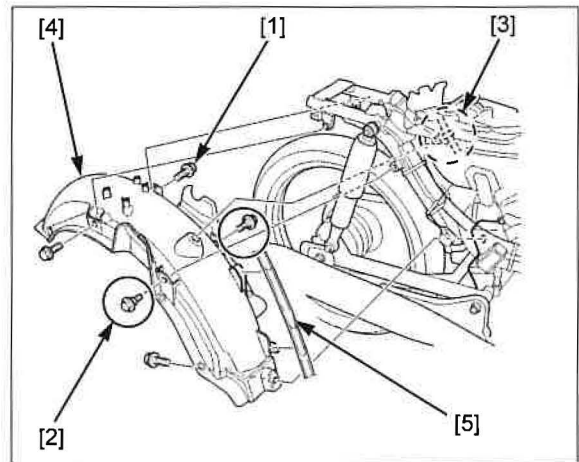
- Three bolts [1]
- Two special bolts [2]

Release the hose clip [3] from the rear inner fender [4]. Release the fuel tray drain hose [5] from the hose guides and remove the rear inner fender.

Installation is in the reverse order of removal.

**NOTE:**

Route the wiring and hose correctly according to the wiring diagram (page 1-17).



**FOOTPEG BAR**

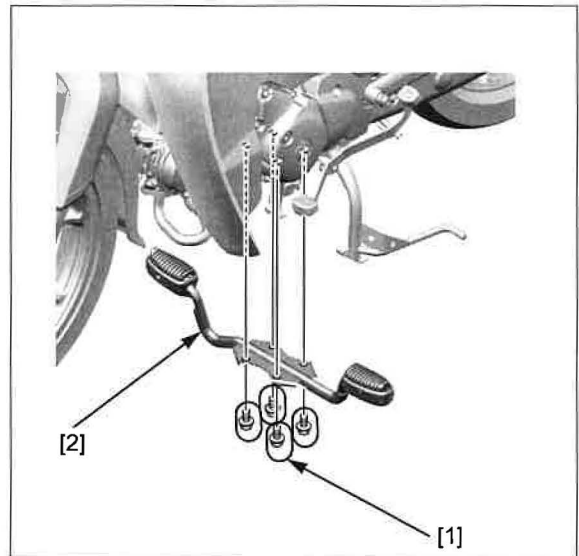
**REMOVAL/INSTALLATION**

Support the vehicle with its centerstand on a flat, level surface.

Remove the following:

- Four bolts [1]
- Footpeg bar [2]

Installation is in the reverse order of removal.



**LEFT CRANKCASE REAR COVER**

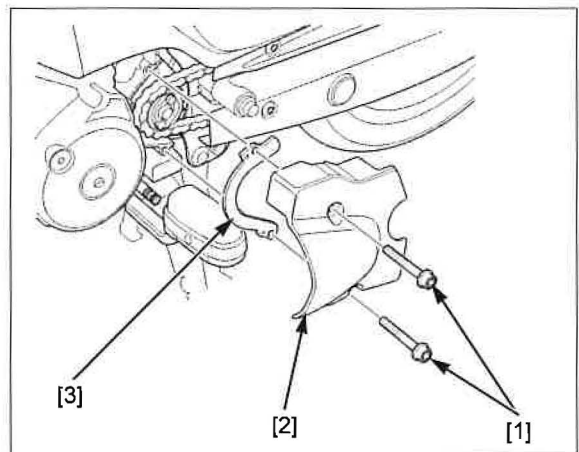
**REMOVAL/INSTALLATION**

Remove the bolts [1] and drive sprocket cover [2].

Remove the drive chain guide plate [3] from the drive sprocket cover.

Installation is in the reverse order of removal.

**TORQUE: Left crankcase rear cover socket bolt  
12 N·m (1.2 kgf·m, 9.0 lbf·ft)**



## CHAIN CASE

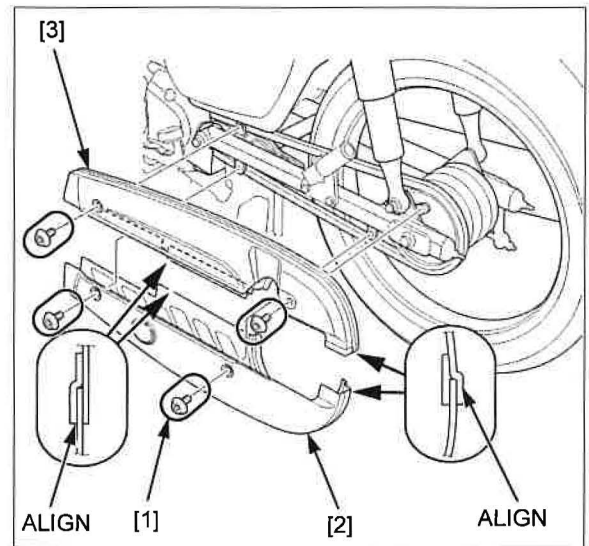
### REMOVAL/INSTALLATION

Remove the chain case mounting bolts [1].  
Remove the lower chain case [2] and upper chain case [3] from the swingarm.

Installation is in the reverse order of removal.

**TORQUE: Drive chain case mounting socket bolt**  
**7.0 N·m (0.7 kgf·m, 5.2 lbf·ft)**

- Install the drive chain case by aligning its tabs with slots as shown.



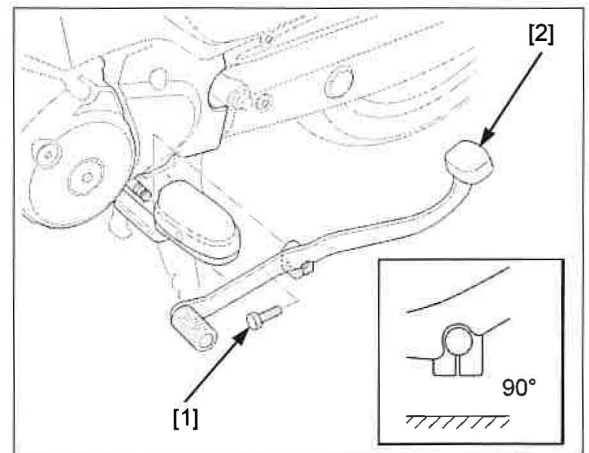
## GEARSHIFT PEDAL

### REMOVAL/INSTALLATION

Remove the bolt [1] and gearshift pedal [2].

Installation is in the reverse order of removal.

- Install the gearshift pedal so that the groove becomes perpendicular to ground as shown.



## **RIGHT CRANKCASE COVER PROTECTOR**

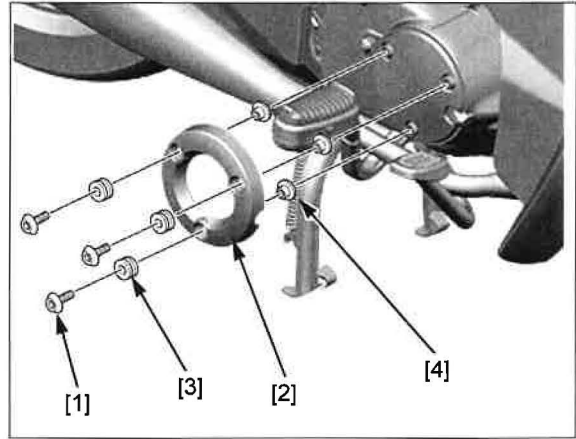
### **REMOVAL/INSTALLATION**

Remove the three socket bolts [1] and the right crankcase cover protector [2].

Remove the three grommets [3] and the three collars [4] from the right crankcase cover protector.

Installation is in the reverse order of removal.

**TORQUE: Right crankcase cover protector bolt**  
**7.0 N·m (0.7 kgf·m, 5.2 lbf·ft)**



## **WHEEL SPEED SENSOR COVER**

### **REMOVAL/INSTALLATION**

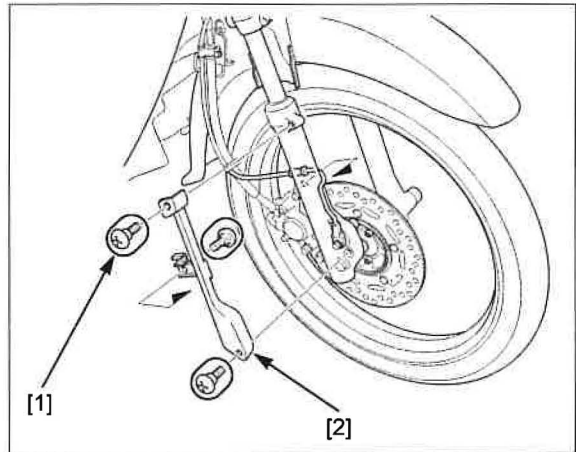
Remove the fork cover (page 2-9).

Remove the bolt [1] and ABS sensor cover [2].

Installation is in the reverse order of removal.

**NOTE:**

Route the wiring correctly according to the wiring diagram (page 1-17).



## EXHAUST PIPE/MUFFLER

### REMOVAL/INSTALLATION

Remove the following:

- Nut [1]
- Washer [2]
- Muffler bolt [3]
- Exhaust pipe joint nuts [4]
- Exhaust pipe/muffler [5] and gasket [6]

Installation is in the reverse order of removal.

- Replace the gasket with a new one.
- Temporarily install all the mounting fasteners.  
Tighten the joint nuts first, then the other fasteners.

#### TORQUE:

Exhaust pipe joint nut

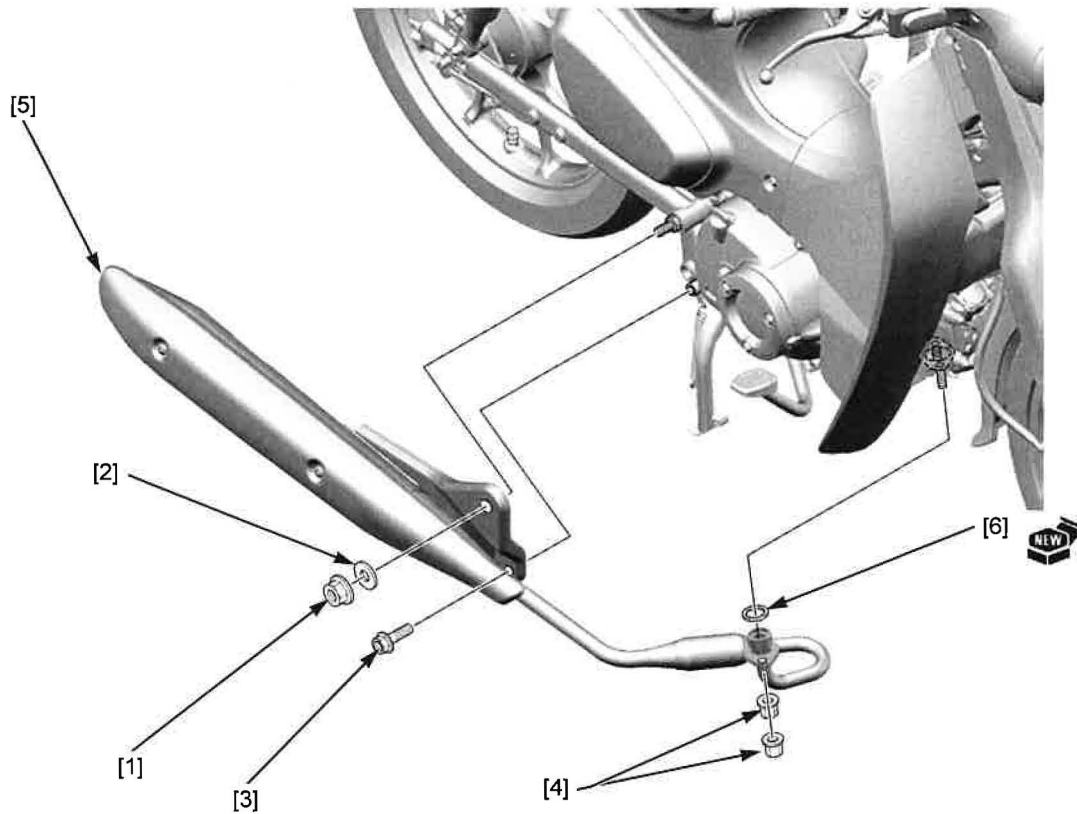
27 N·m (2.8 kgf·m, 20 lbf·ft)

Muffler nut

54 N·m (5.5 kgf·m, 40 lbf·ft)

Muffler bolt

27 N·m (2.8 kgf·m, 20 lbf·ft)



## FRAME/BODY PANELS/EXHAUST SYSTEM

### EXHAUST PIPE STUD BOLT

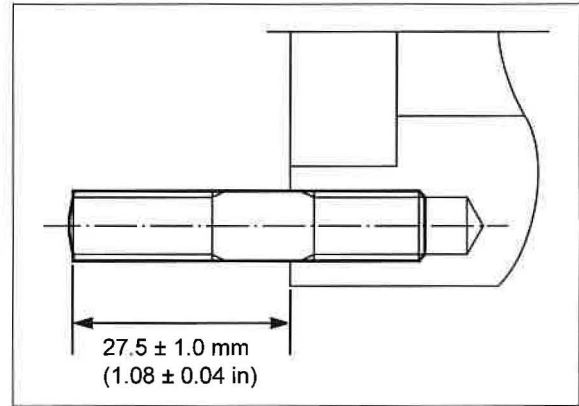
Remove the muffler (page 2-19)

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

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

**TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)**

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



### DISASSEMBLY/ASSEMBLY

Remove the muffler (page 2-19)

Remove the following:

- Two socket bolt [1]
- Two grommet [2]
- Muffler cover [3]
- Mounting rubber [4]
- Muffler stay nut [5]
- Muffler stay [6]
- Muffler [7]

Assembly is in the reverse order of disassembly.

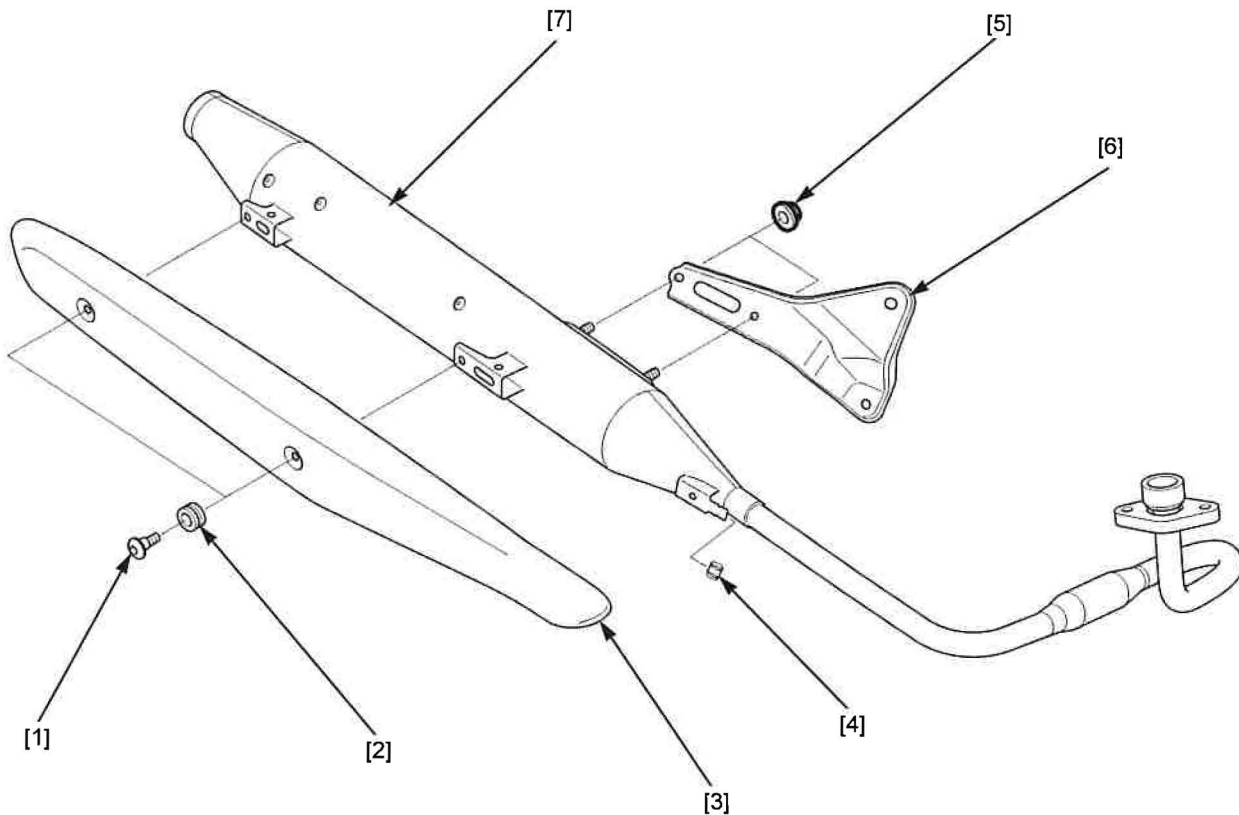
#### TORQUE:

**Muffler stay nut**

**27 N·m (2.8 kgf·m, 20 lbf·ft)**

**Muffler cover socket bolt**

**9.0 N·m (0.9 kgf·m, 6.6 lbf·ft)**



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## MAINTENANCE

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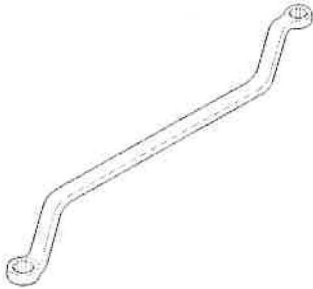
# SERVICE INFORMATION

## GENERAL

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

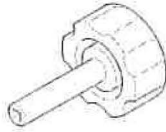
## TOOLS

Locknut Wrench 8 x 9 mm  
07708-0030100



Equivalent commercially available in the U.S.A.

Tappet Adjusting Wrench  
07708-0030400



07908-3290200 (U.S.A. only)

# MAINTENANCE SCHEDULE

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

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

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

ITEMS	NOTE	FREQUENCY (NOTE 1)									REGULAR REPLACE	REFER TO PAGE	
		x 1,000 km	1.0	6.4	12.8	19.2	25.6	32.0	38.4				
		x 1,000 mi	0.6	4	8	12	16	20	24				
* FUEL LINE				I	I	I	I	I	I			3-4	
* THROTTLE OPERATION				I	I	I	I	I	I			3-4	
AIR CLEANER	NOTE 2					R				R		3-5	
CRANKCASE BREATHER	NOTE 3			C	C	C	C	C	C			3-5	
SPARK PLUG				I	R	I	R	I	R			3-6	
* VALVE CLEARANCE				I	I	I	I	I	I			3-7	
ENGINE OIL			R	R	R	R	R	R	R	1 YEAR		3-9	
** ENGINE OIL STRAINER SCREEN					C		C		C			3-10	
** ENGINE OIL CENTRIFUGAL FILTER					C		C		C			3-10	
* ENGINE IDLE SPEED			I	I	I	I	I	I	I			3-11	
* EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE 4					I			I			3-12	
DRIVE CHAIN			EVERY 300 mi (500 km) I, L										3-12
BRAKE FLUID	NOTE 5			I	I	I	I	I	I	I	2 YEARS	3-15	
BRAKE SHOES/PADS WEAR				I	I	I	I	I	I			3-15	
BRAKE SYSTEM				I	I	I	I	I	I			3-16	
BRAKE LIGHT SWITCH				I	I	I	I	I	I			3-17	
HEADLIGHT AIM				I	I	I	I	I	I			3-17	
* CLUTCH SYSTEM			I	I	I	I	I	I	I			3-17	
* SUSPENSION				I	I	I	I	I	I			3-18	
* NUTS, BOLTS, FASTENERS					I		I		I			3-18	
** WHEELS/TIRES				I	I	I	I	I	I			3-18	
** STEERING HEAD BEARINGS					I		I		I			3-18	

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

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

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

**NOTES:**

1. At higher odometer readings, repeat at the frequency interval established here.
2. Service more frequently when riding in unusually wet or dusty areas.
3. Service more frequently when riding in rain or at full throttle.
4. 50-State (meets California)
5. Replacement requires mechanical skill.



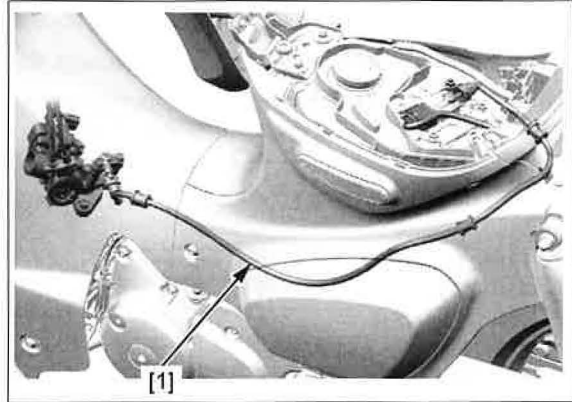
## MAINTENANCE

### FUEL LINE

Check the fuel feed hose [1] and quick connect fittings connecting area for deterioration, damage or leakage. Replace the fuel line if necessary.

Check the fuel pump unit mounting area for leakage. Replace the fuel pump packing and O-ring if necessary (page 7-8).

Install the removed parts in the reverse order of removal.



### THROTTLE OPERATION

#### INSPECTION

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

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

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

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

Measure the throttle grip freeplay at the grip flange.

**FREEPLAY: 2 – 6 mm (0.1 – 0.2 in)**

If the freeplay is out of specification, adjust as follows.

#### ADJUSTMENT

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

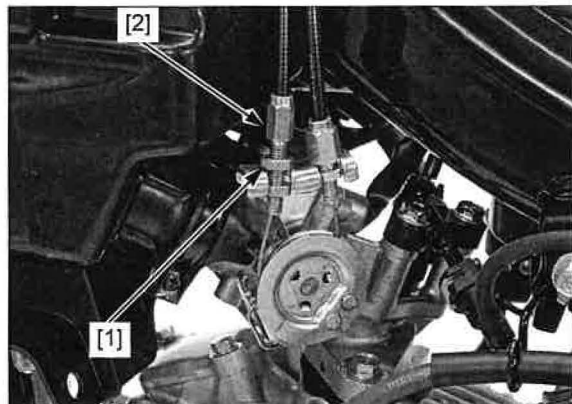
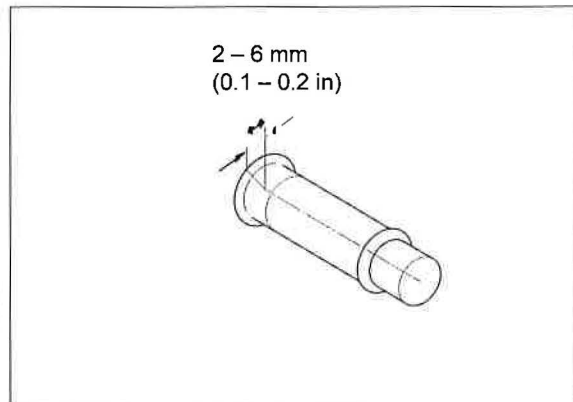
Major adjustment is made with the lower adjuster nut at the throttle body.

Remove the leg shield (page 2-11).

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

**TORQUE: 4.5 N·m (0.5 kgf·m, 3.3 lbf·ft)**

Recheck the throttle operation.



Minor adjustments are made with the upper adjuster.

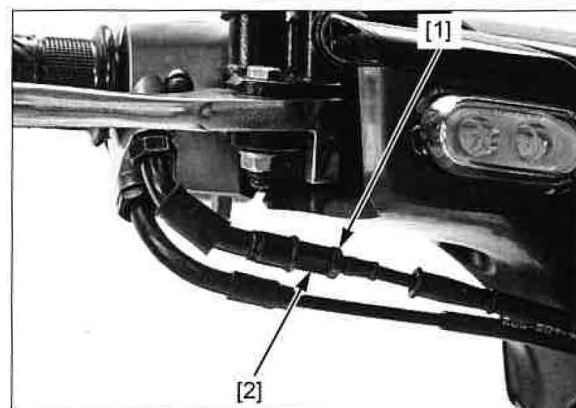
Adjust the freeplay by loosening the lock nut [1] and turning the adjuster [2].

Tighten the lock nut while holding the adjuster to the specified torque.

**TORQUE: 3.8 N·m (0.39 kgf·m, 2.8 lbf·ft)**

Reposition the dust cover properly on the adjuster.

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 vehicle is used in unusually wet or dusty areas, more frequent inspections are required.

Remove the inner leg shield (page 2-12).

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

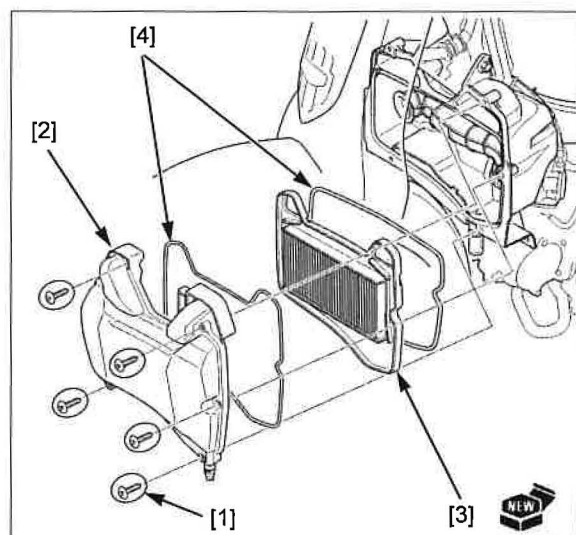
Remove and discard the air cleaner element [3] in accordance with the maintenance schedule (page 3-3).

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

Install the removed parts in the reverse order of removal.

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

*Make sure the seals [4] are properly positioned in the grooves on air cleaner housing and cover.*



## CRANKCASE BREATHER

NOTE:

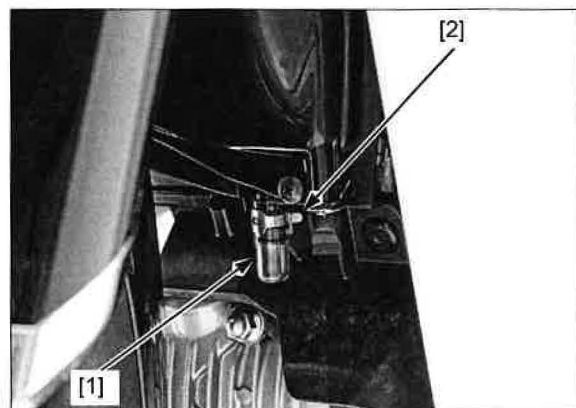
Service more frequently when ridden in rain, at full throttle, or after the vehicle is washed. Service if the deposit level can be seen in the drain cap.

Check the crankcase breather drain cap [1].

If deposits has collected, remove the clip [2] and crankcase breather drain cap.

Drain deposits into the suitable container.

Install the crankcase breather drain cap and clip.

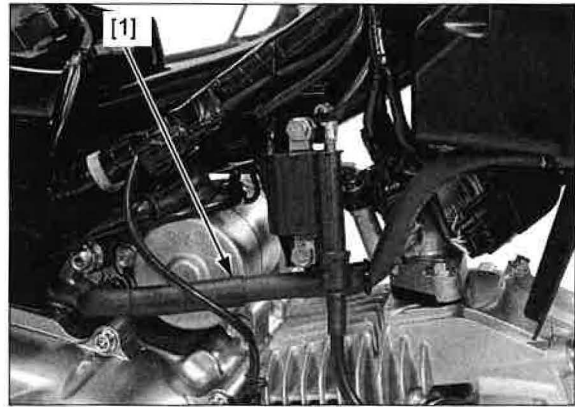


## MAINTENANCE

Remove the leg shield (page 2-11).

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

Install the removed parts in the reverse order of removal.



## SPARK PLUG

### REMOVAL/INSTALLATION

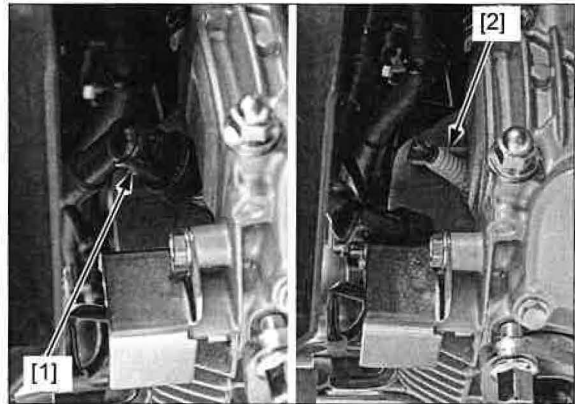
*Clean around the spark plug base with compressed air before removing the spark plug, and be sure that no debris is allowed to enter into the combustion chamber.*

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

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

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

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



### INSPECTION

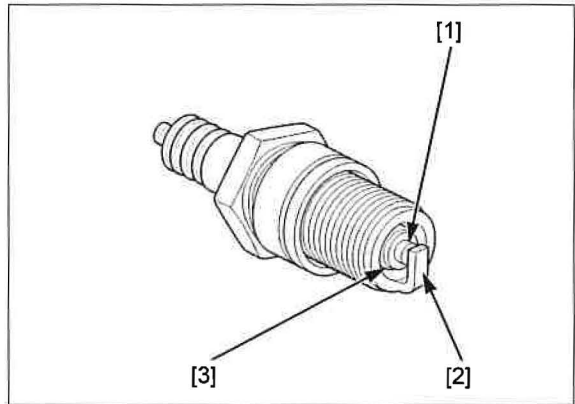
Clean the spark plug center electrode [1] and side electrode [2] with a wire brush or special plug cleaner. Check the insulator [3] for cracks or damage, and the electrodes for wear, fouling or discoloration.

#### SPECIFIED SPARK PLUG:

##### STANDARD:

**NGK: CPR6EA-9 (NGK)**

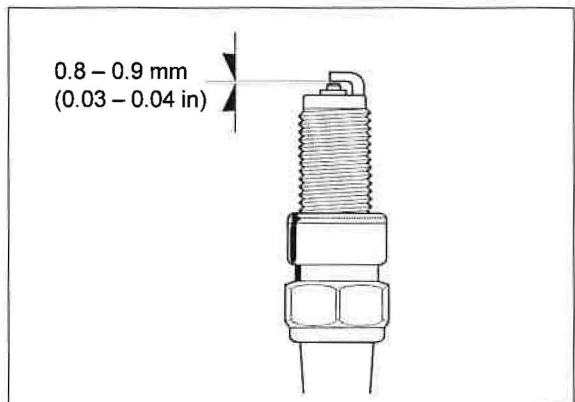
**DENSO: U20EPR9 (DENSO)**



Measure the spark gap between the center and side electrodes with a feeler gauge.

**SPARK PLUG GAP: 0.8 – 0.9 mm (0.03 - 0.04 in)**

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



# VALVE CLEARANCE

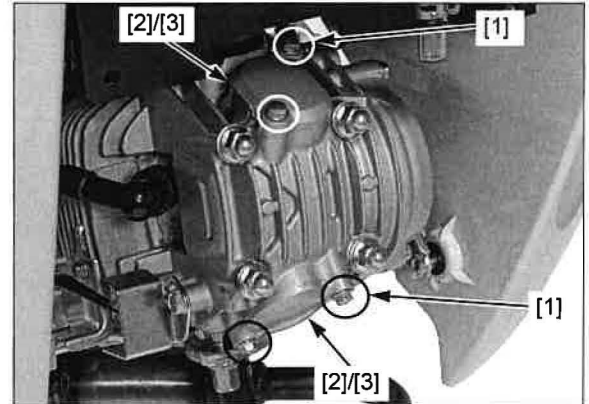
**NOTE:**

- Inspect and adjust the valve clearance while the engine is cold (below 35°C/95°F).
- Check the engine idle speed (page 3-11) after the valve clearance inspection.

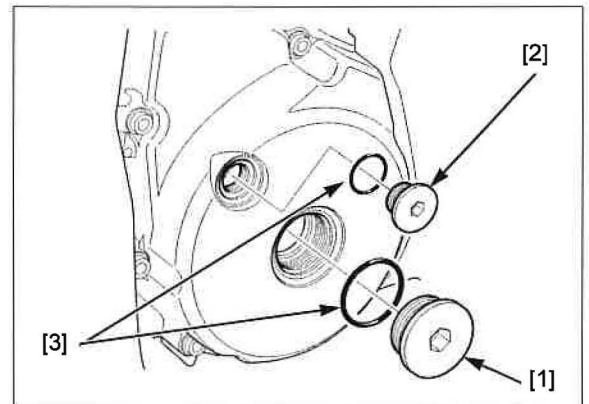
**INSPECTION**

Remove the inner leg shield (page 2-12).

Remove the bolts [1], valve adjusting hole caps [2] and O-rings [3].



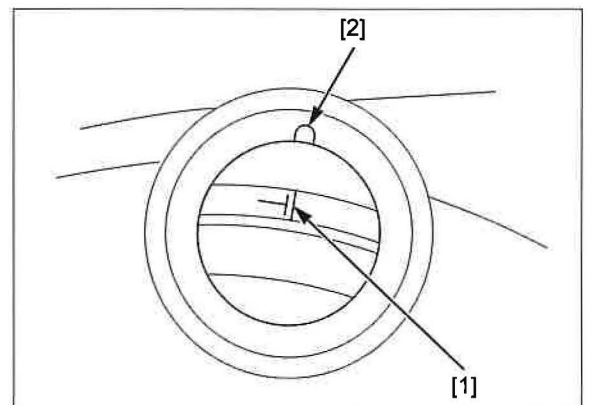
Remove the crankshaft hole cap [1], timing hole cap [2] and O-rings [3] from the left crankcase cover.



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

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

This position can be obtained by confirming that there is slack in the rocker arms. If there is no slack, turn the crankshaft again until the correct position is obtained.



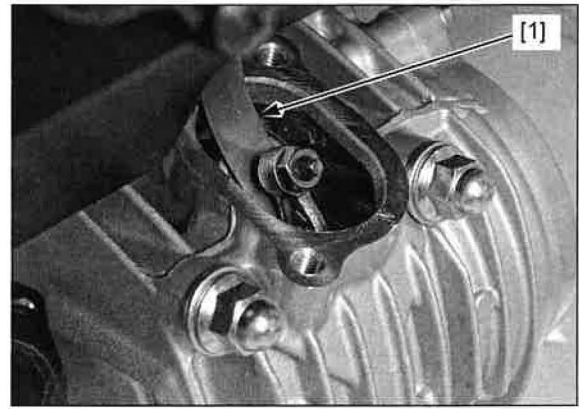
## MAINTENANCE

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

### VALVE CLEARANCE:

IN:  $0.10 \pm 0.02$  mm ( $0.004 \pm 0.001$  in)

EX:  $0.17 \pm 0.02$  mm ( $0.007 \pm 0.001$  in)



## ADJUSTMENT

Adjust by loosening the lock nut [1] and turning the adjusting screw [2] until there is a slight drag on a feeler gauge.

### TOOLS:

[3] Valve adjusting wrench, 3 mm 07708-0030400 or 07908-3290200 (U.S.A. only)

[4] Lock nut wrench, 8 x 9 07708-0030100

Apply engine oil to the lock nut.  
Hold the adjusting screw and tighten the lock nut to the specified torque.

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

Recheck the valve clearance.

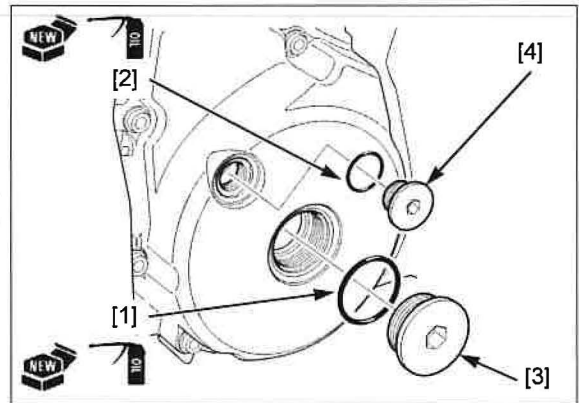
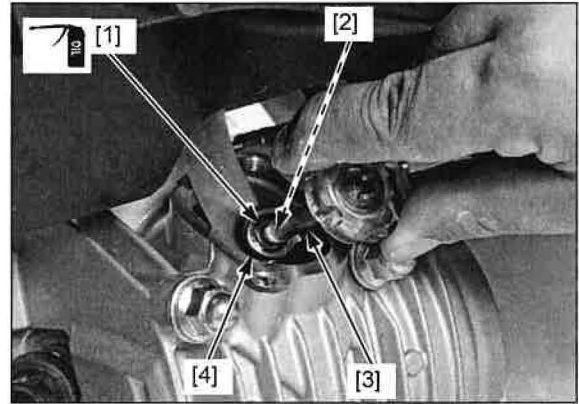
Apply engine oil to a new crankshaft hole cap O-ring [1] and timing hole cap O-ring [2], then install them to the caps.

Install and tighten the crankshaft hole cap [3] and timing hole cap [4] to the specified torque.

### TORQUE:

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

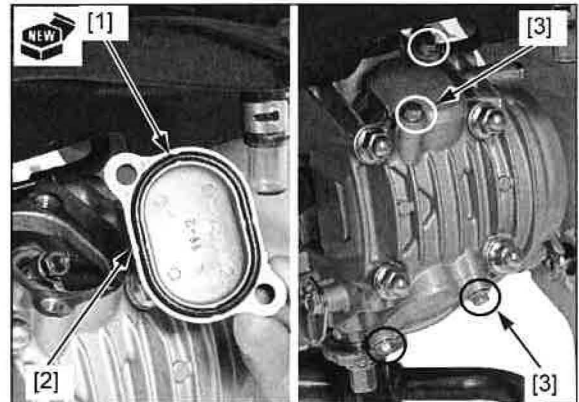
Timing hole cap 6.0 N·m (0.6 kgf·m, 4.4 lbf·ft)



Install the new O-rings [1] into grooves of the valve adjusting hole caps [2].

Install the valve adjusting hole caps to the cylinder head and tighten the bolts [3].

Install the inner leg shield (page 2-12).



# ENGINE OIL

## OIL LEVEL CHECK

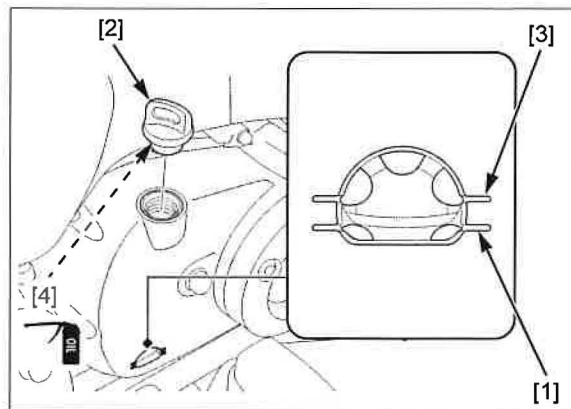
Support the vehicle with its centerstand on a level surface.

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 engine oil up to the upper level line [3].



## RECOMMENDED ENGINE OIL:

**Honda 4-stroke motorcycle oil or an equivalent motor oil**

**API service classification: SG or higher (except oils labeled as energy conserving on the circular API service label)**

**JASO T 903 standard: MA**

**Viscosity: SAE 10W-30**

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

Apply engine oil to the O-ring.

Install the filler cap.

## OIL CHANGE

Support the vehicle with its centerstand on a level surface.

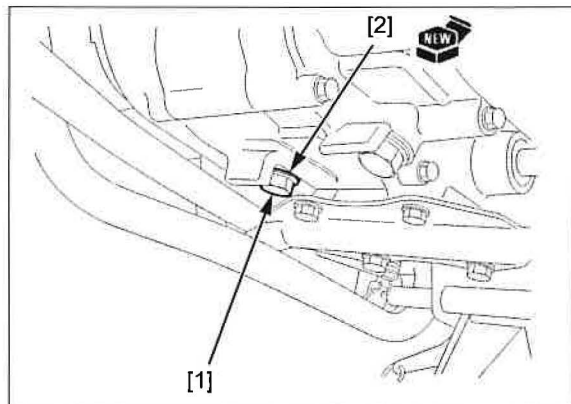
Warm up the engine.

Stop the engine and remove the oil filler cap.

Remove the oil drain bolt [1] and sealing washer [2] to drain the engine oil.

After draining the oil completely, install the drain bolt with a new sealing washer.

Tighten the drain bolt to the specified torque.



**TORQUE: 24 N·m (2.4 kgf·m, 18 lbf·ft)**

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

## ENGINE OIL CAPACITY:

**0.8 liters (0.8 US qt, 0.7 Imp qt) at draining**

**1.0 liters (1.1 US qt, 0.9 Imp qt) at disassembly**

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

Apply engine oil to the O-ring.

Install the filler cap.

Check the oil level (page 3-9).

Make sure there are no oil leaks.

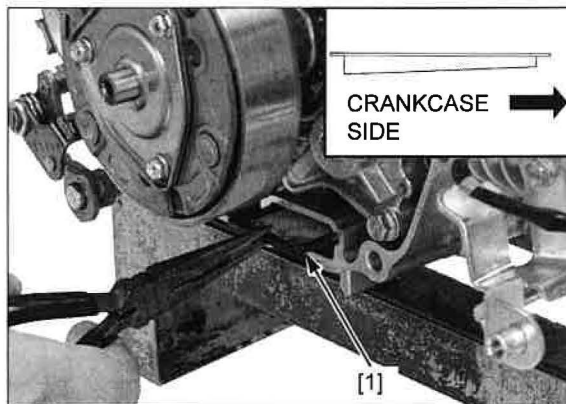
## ENGINE OIL STRAINER SCREEN

Remove the right crankcase cover (page 11-6).

Remove the oil strainer screen [1] and clean it in non-flammable or high flash point solvent.

Install the oil strainer screen with its tapered side facing the crankcase side and thinner edge facing up as shown.

Install the right crankcase cover (page 11-6).



## ENGINE OIL CENTRIFUGAL FILTER

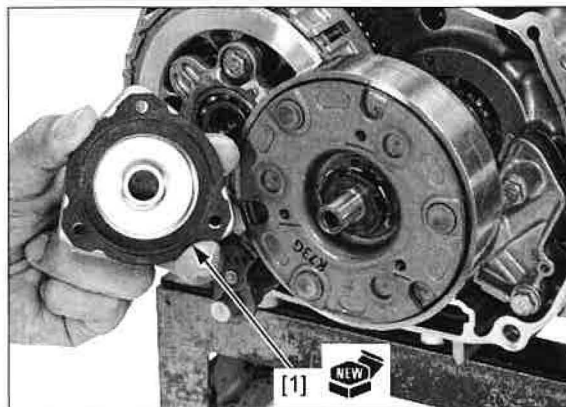
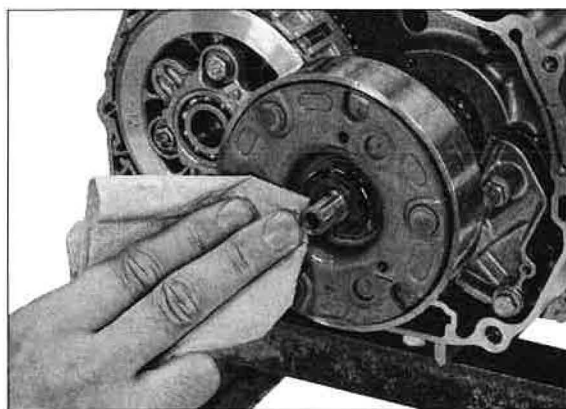
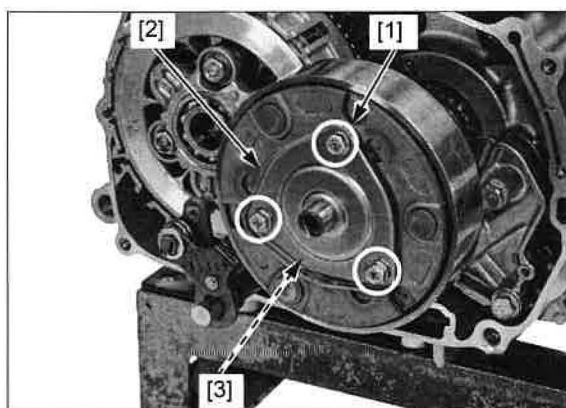
### CLEANING

Remove the right crankcase cover (page 11-6).

Remove the bolts [1], oil centrifugal filter cover [2] and gasket [3].

Clean the oil centrifugal filter cover and inside of the drive plate using a clean lint-free cloth.

Install a new gasket [1] with its sealed side facing the oil centrifugal filter cover.

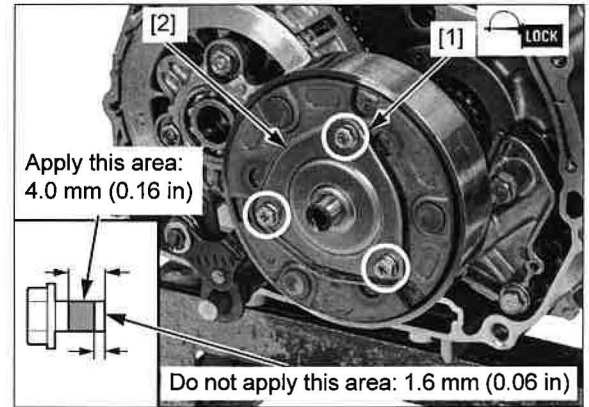


Apply locking agent to the oil centrifugal filter cover bolt [1] threads.

Install the oil centrifugal filter cover [2] and bolts. Tighten the bolts to the specified torque.

**TORQUE: 5.0 N·m (0.5 kgf·m, 3.7 lbf·ft)**

Install the right crankcase cover (page 11-6).



## ENGINE IDLE SPEED

- Inspect the idle speed after all other engine maintenance items have been performed and are within specifications.
- Before checking the idle speed, inspect the following items.
  - No MIL blinking
  - Spark plug condition (page 3-6)
  - Crankcase breather system condition (page 3-5)
  - Air cleaner element condition (page 3-5)
- The engine must be warm for accurate idle speed inspection.
- This system eliminates the need for manual idle speed adjustment compared to previous designs.

Support the vehicle with its centerstand and shift the transmission into neutral.

Start the engine and let it idle.

Check the idle speed.

**IDLE SPEED: 1,400 ± 100 rpm**

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

- Throttle operation and freeplay (page 3-4)
- Intake air leak or engine top-end problem
- IACV operation (page 7-15)



## EVAPORATIVE EMISSION CONTROL SYSTEM

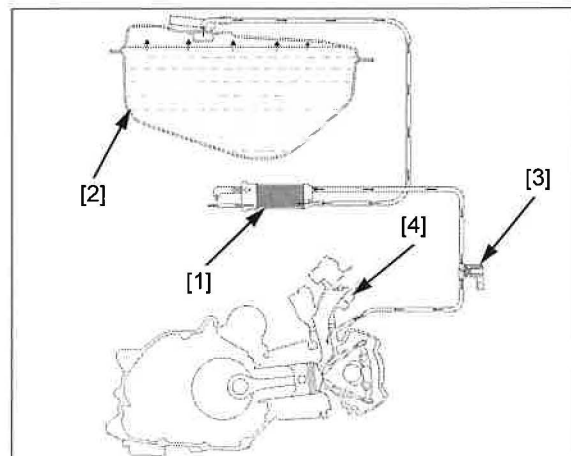
Remove the left body cover (page 2-13).

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

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

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

Refer to the Cable & Harness Routing for hose connections and routing (page 1-17).



## DRIVE CHAIN

### ⚠ WARNING

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

### DRIVE CHAIN SLACK INSPECTION

Support the vehicle with its centerstand and shift the transmission into neutral.

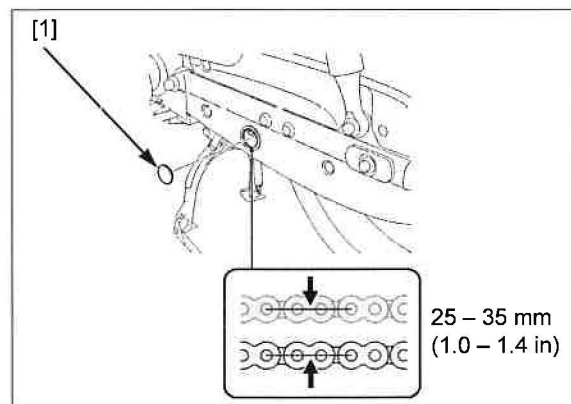
Remove the inspection hole cap [1].

Measure the drive chain slack.

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

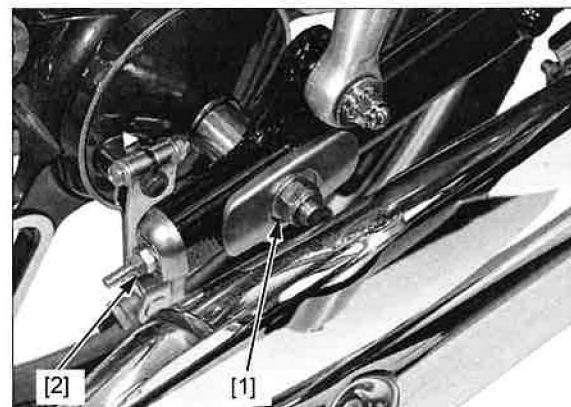
### NOTICE

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



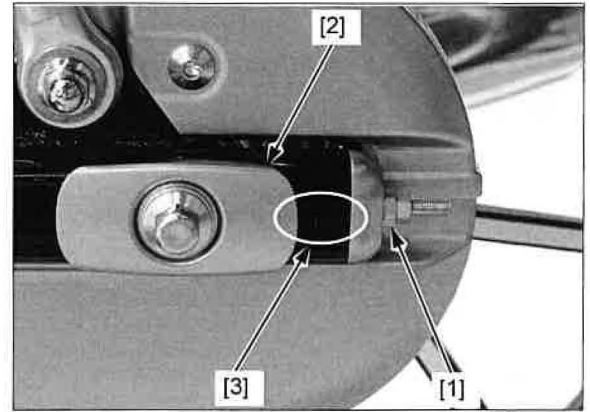
### ADJUSTMENT

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



Turn both drive chain adjuster nuts [1] until the correct drive chain slack is obtained.

Make sure the rear end of both adjuster plates [2] are aligned with the same index lines [3] on the swingarm.



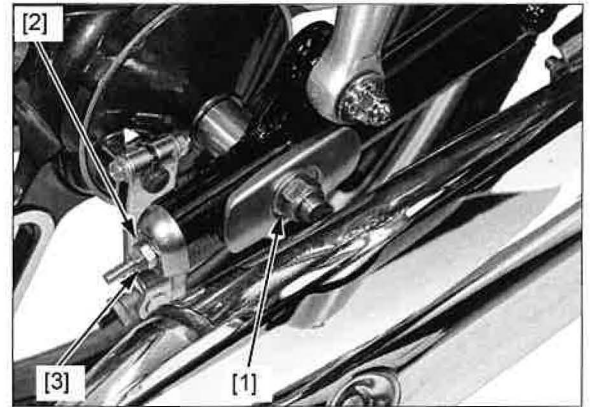
Tighten the rear axle nut [1] to the specified torque.

**TORQUE: 59 N·m (6.0 kgf·m, 4.4 lbf·ft)**

Tighten the both drive chain adjuster nuts [2] and lock nuts [3] securely.

Recheck the drive chain slack and free wheel rotation.

Check the rear brake pedal freeplay and adjust it if necessary (page 3-16).



### CLEANING, LUBRICATION AND INSPECTION

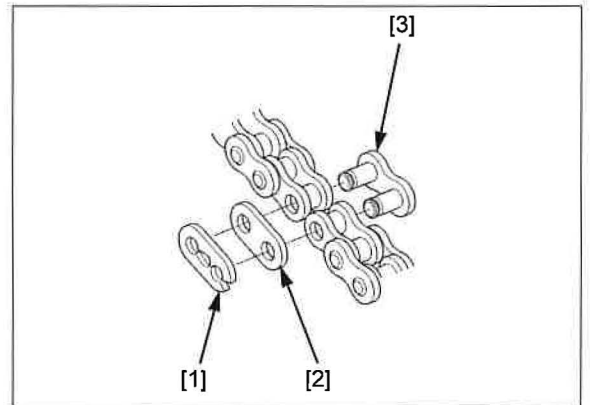
Support the vehicle with its centerstand and shift the transmission into neutral.

If the drive chain becomes extremely dirty, it should be removed and cleaned prior to lubrication.

Remove the following:

- Left crankcase rear cover (page 2-16).
- Chain case (page 2-17).

Carefully remove the retaining clip [1] with pliers. Remove the link plate [2] and master link [3], and disconnect the drive chain. Remove the drive chain.



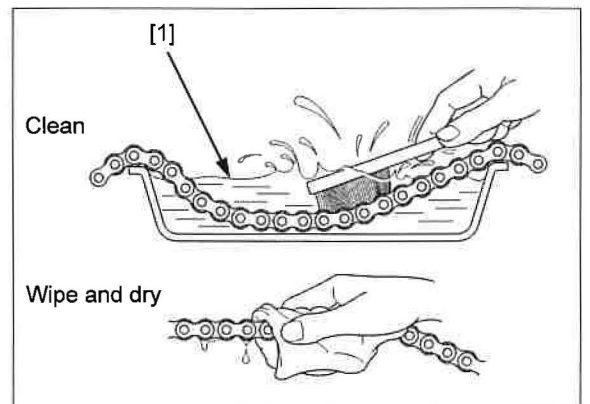
Clean the chain with non-flammable or high flash point solvent [1] and wipe it dry.

Be sure the chain has dried completely before lubricating.

Inspect the drive chain for possible damage or wear. Replace any chain that has damaged rollers, loose fitting links, or otherwise appears unserviceable. Installing a new chain on badly worn sprockets will cause the new chain to wear quickly. Inspect and replace the sprocket as necessary.

Lubricate the drive chain with #80 – 90 gear oil or drive chain lubricant. Wipe off any excess oil or chain lubricant.

Measure the distance between a span of 41 pins (40 links) from pin center to pin center by holding so that all links are straight.



## MAINTENANCE

### DRIVE CHAIN LENGTH (41 pins/40 links)

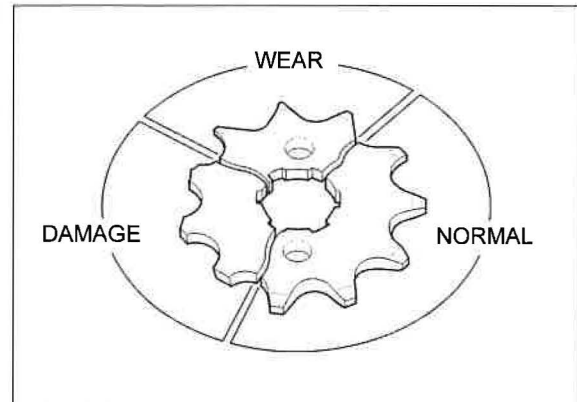
**STANDARD:** 508 mm (20 in)

**SERVICE LIMIT:** 518 mm (20.4 in)

### SPROCKET INSPECTION

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

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

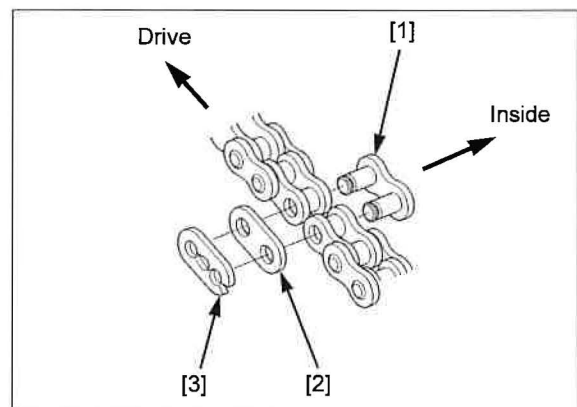


Install the drive chain onto the sprockets.  
Install the master link [1] and link plate [2].  
Install the retaining clip [3] with its open end opposite the direction of chain travel.

Install the following:

- Left crankcase rear cover (page 2-16).
- Chain case (page 2-17).

Adjust the drive chain slack (page 3-12).



## BRAKE FLUID

### NOTICE

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

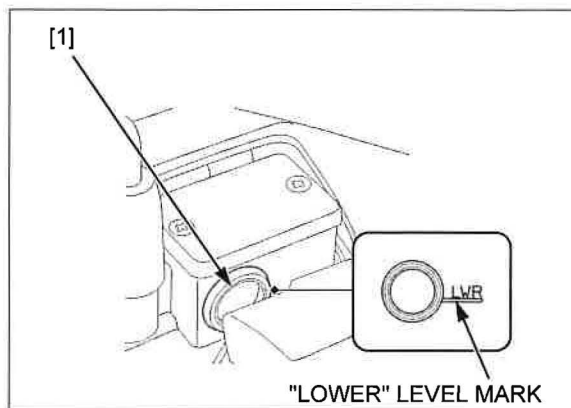
#### NOTE:

- 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.

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

When the front brake fluid level is low, check the brake pad wear (page 3-15).

A low fluid level may be due to wear of the brake pads. If the brake pads are worn the caliper pistons are pushed out, and this accounts for a low reservoir level. If the brake pads are not worn and the fluid level is low, check the entire system for leaks (page 3-16).



## BRAKE SHOES/PADS WEAR

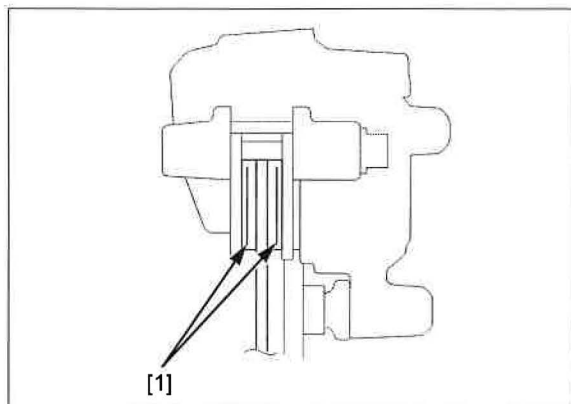
### FRONT BRAKE PADS

Check the brake pads for wear.

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

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

For brake pad replacement (page 17-6).

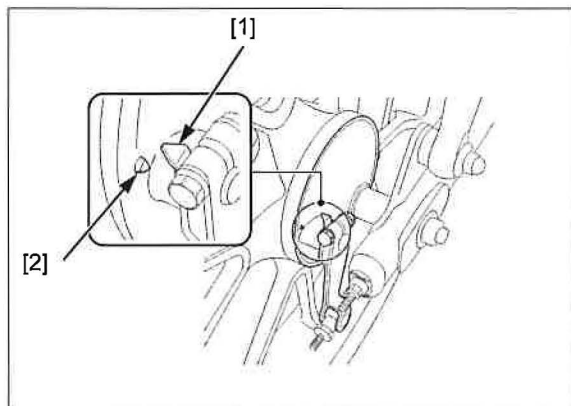


### REAR BRAKE SHOES

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

If the indicator plate [1] aligns with the triangle mark [2] on the brake panel, inspect the brake drum (page 16-11).

If the brake drum I.D. is within the service limit, replace the brake shoes (page 16-11).



## BRAKE SYSTEM

### FRONT DISC BRAKE INSPECTION

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

If the lever feels soft or spongy when operated, bleed the air from the system (page 17-5).

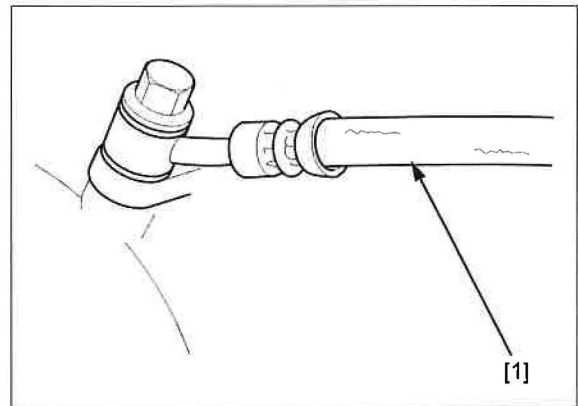
Remove the handlebar lower cover (page 2-8).

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

Tighten any loose fittings.

Replace hoses and fittings as required.

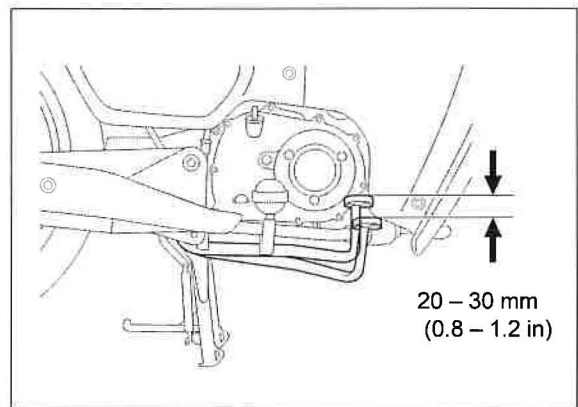
Install the handlebar lower cover (page 2-8).



### BRAKE PEDAL FREEPLAY

Measure the rear brake pedal freeplay at the tip of the brake pedal.

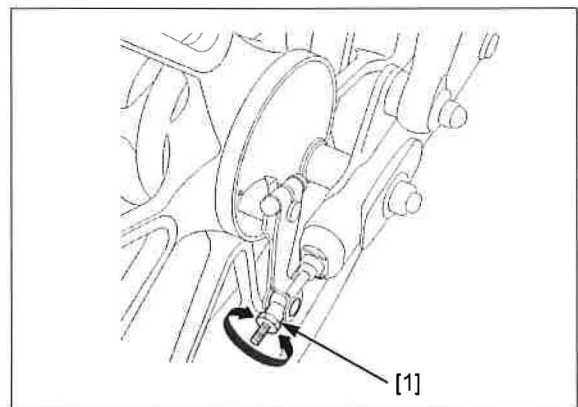
**FREEPLAY: 20 – 30 mm (0.8 – 1.2 in)**



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

Adjust the brake pedal freeplay by turning the adjusting nut [1].

Recheck the freeplay, then check and adjust the rear brake light switch (page 3-17).



## BRAKE LIGHT SWITCH

**NOTE:**

- The front brake light switch cannot be adjusted. If the front brake light switch actuation and brake engagement are not synchronized, either replace the switch unit or the malfunctioning parts of the system.
- Adjust the rear brake light switch after the brake pedal freeplay adjustment.

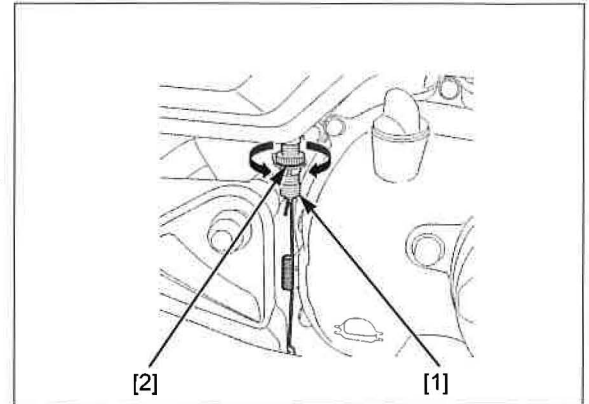
Check that the brake light comes on just prior to the brake actually being engaged.

*Hold the switch body and turn the adjusting nut. Do not turn the switch body while turning the adjusting nut.*

Adjust the switch [1] by turning the adjusting nut [2] so that the light comes on at the proper time.

Recheck the brake light switch operation.

Install the removed parts in the reverse order of removal.

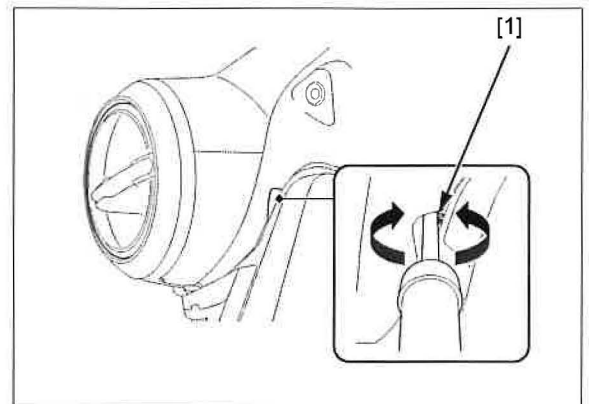


## HEADLIGHT AIM

Place the vehicle on the level ground using the centerstand.

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

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



## CLUTCH SYSTEM

Loosen the clutch adjuster lock nut [1] and turn the clutch adjuster [2] clockwise one full turn; do not turn excessively.

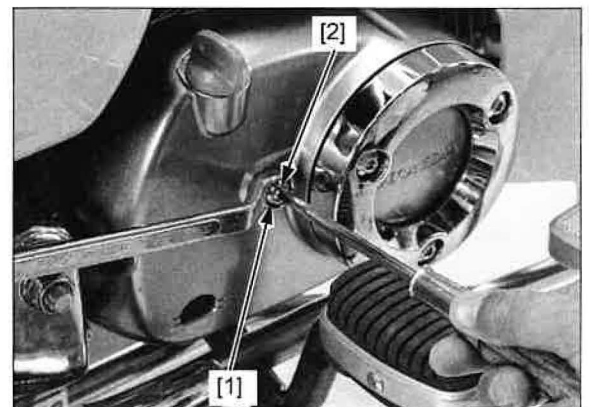
Slowly turn the adjuster counterclockwise until resistance is felt.

*Hold the adjuster while tightening the lock nut.*

From this point, turn the adjuster clockwise 1/8 turn, and tighten the lock nut to the specified torque.

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

- Check for clutch operation after adjustment.



# 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 vehicle stability and control.*

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

For fork service (page 15-11).

## REAR SUSPENSION INSPECTION

Check the action of the rear shock absorbers by compressing them several times.

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

Tighten all nuts and bolts.

For rear shock absorber service (page 16-15).

Support the vehicle with its centerstand.

Check for worn swingarm bushings by grabbing the rear ends of the swingarm and attempting to move the swingarm side to side.

Replace the swingarm bushings if any looseness is noted (page 16-12).

# NUTS, BOLTS, FASTENERS

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

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

# WHEELS/TIRES

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

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

Check for worn wheel bearings by holding the swingarm and move the rear wheel sideways.

Replace the wheel bearings if any looseness is noted.

- Front wheel (page 15-11)
- Rear wheel (page 16-5)

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

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

Check the front and rear wheels for trueness.

Measure the tread depth at the center of the tires.

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

**MINIMUM TIRE TREAD DEPTH: To indicator**

# STEERING HEAD BEARINGS

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

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

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

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 15-19).

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<b>SYSTEM DIAGRAM</b> .....	4-4	<b>SENSOR UNIT</b> .....	4-33
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## SERVICE INFORMATION

### GENERAL

- A faulty PGM-FI system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- The PGM-FI system is equipped with the self-diagnostic system. If the MIL blinks, follow the self-diagnostic procedures to remedy the problem.
- When checking the PGM-FI, always follow the steps in the troubleshooting flow chart.
- The PGM-FI system is provided with a fail-safe function to secure a minimum running capability even when there is any trouble in the system. When any abnormality is detected by the self-diagnosis function, running capability is secured by making use of the numerical values of a situation preset in the simulated program map.  
It must be remembered, however, that when any abnormality is detected in the fuel injector, the fail-safe function stops the engine to protect it from damage.
- Use a digital tester for PGM-FI system inspection.
- Refer to page 4-34 for the procedures for resetting the throttle opening initial learning.
- Refer to page 20-15 when inspecting the fuel level sensor.
- The following color codes are used throughout this section.

Bu = Blue  
Bl = Black

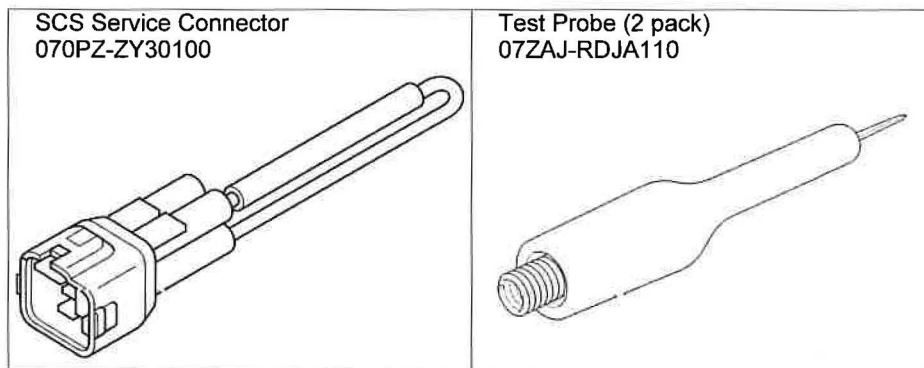
Br = Brown  
G = Green

Lg = Light Green  
O = Orange

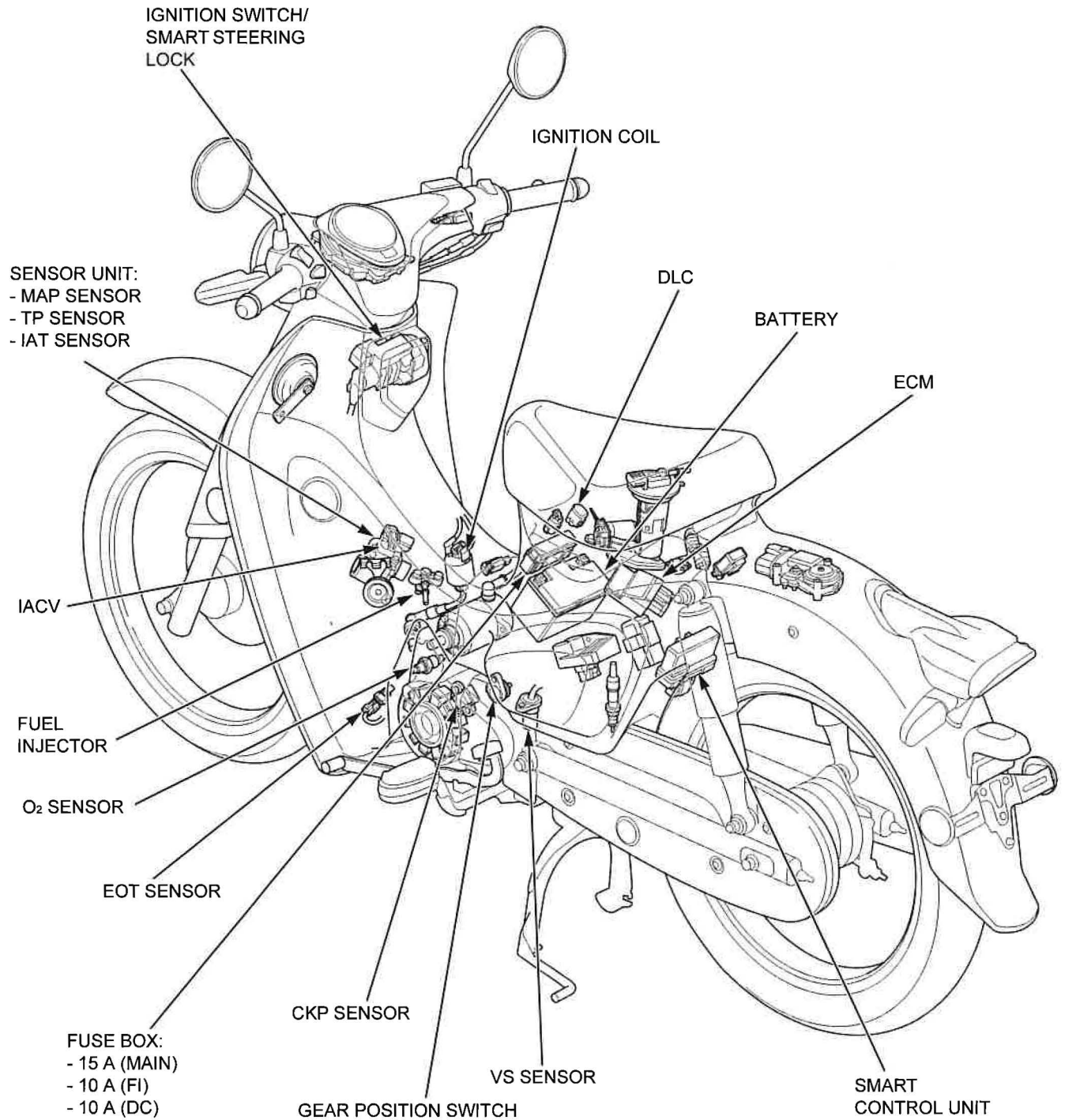
P = Pink  
R = Red

W = White  
Y = Yellow

### TOOLS

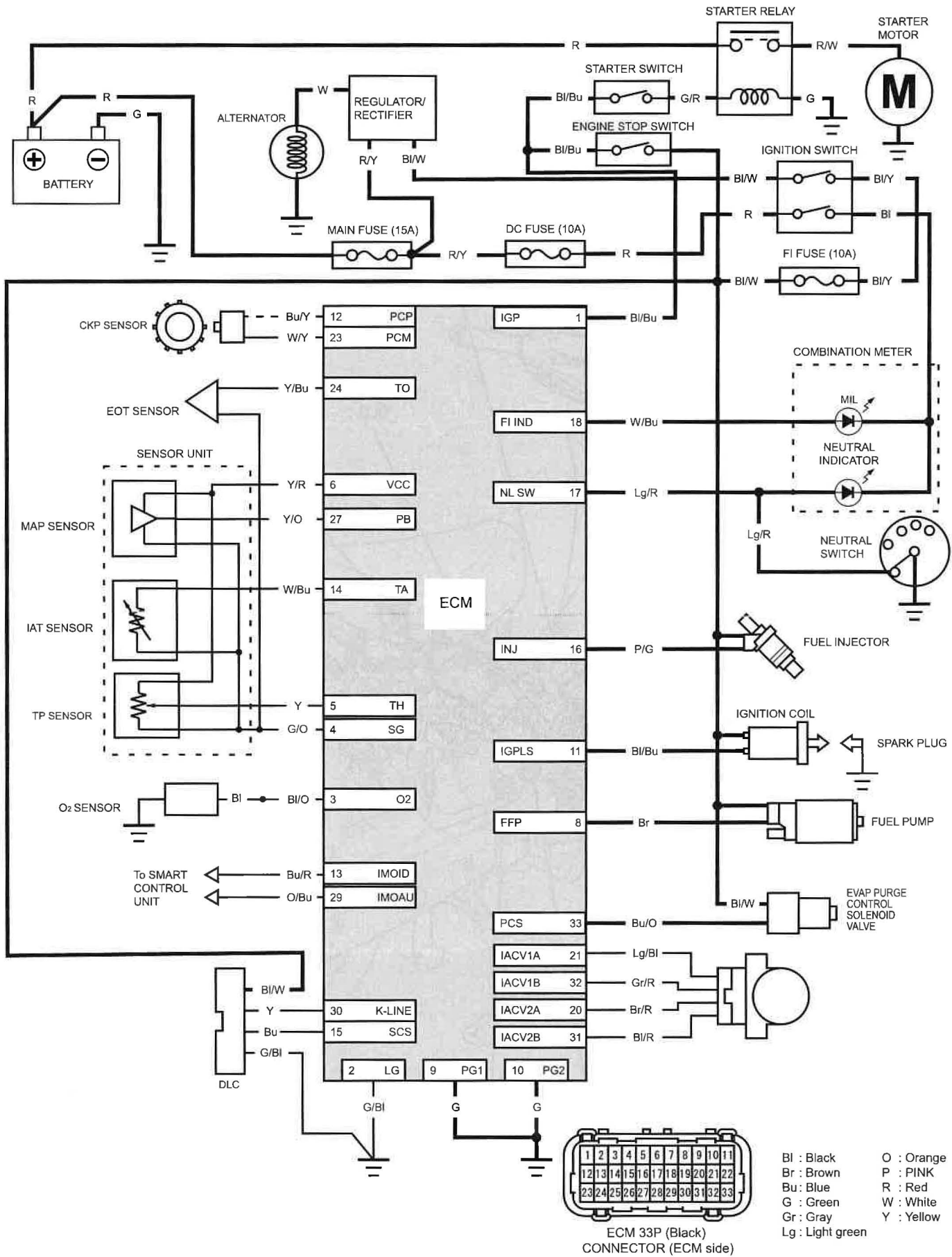


SYSTEM LOCATION



# PGM-FI SYSTEM

## SYSTEM DIAGRAM



## PGM-FI SYMPTOM TROUBLESHOOTING

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

Symptom	Diagnosis procedure	Also check for
Engine cranks but won't start (MIL not lighting)	<ol style="list-style-type: none"> <li>1. Crank the engine for more than ten seconds and check the MIL (page 4-6) and execute the troubleshooting according to the MIL.</li> <li>2. Inspect the ignition system (page 5-5).</li> <li>3. Inspect the fuel supply system (page 7-8).</li> <li>4. Check the spark plug condition (page 3-6).</li> <li>5. Check the cylinder compression (page 9-6).</li> </ol>	<ul style="list-style-type: none"> <li>• No fuel to fuel injector               <ul style="list-style-type: none"> <li>– Clogged fuel filter</li> <li>– Pinched or clogged fuel feed hose</li> </ul> </li> <li>– Faulty fuel pump</li> <li>– Faulty fuel pump circuits</li> <li>• Intake air leak</li> <li>• Contaminated/deteriorated fuel</li> <li>• Faulty fuel injector</li> <li>• IACV stuck</li> </ul>
Engine cranks but won't start (No fuel pump operation sound when turning the ignition ON)	<ol style="list-style-type: none"> <li>1. ECM power/ground circuits malfunction (page 4-31).</li> <li>2. Inspect the fuel pump system (page 7-8).</li> </ol>	<ul style="list-style-type: none"> <li>• Open circuit in the power input and/or ground wire of the ECM</li> <li>• Short circuit in the Sensor unit</li> </ul>
Engine stalls, hard to start, rough idling	<ol style="list-style-type: none"> <li>1. Check the idle speed (page 3-11).</li> <li>2. Check the IACV (page 7-15).</li> <li>3. Inspect the fuel supply system (page 7-8).</li> </ol>	<ul style="list-style-type: none"> <li>• Restricted fuel feed hose</li> <li>• Contaminated/deteriorated fuel</li> <li>• Intake air leak</li> <li>• Restricted fuel tank-to-EVAP canister hose</li> <li>• Faulty ignition system</li> </ul>
Afterburning when using the engine brake	Inspect the ignition system (page 5-5).	
Backfiring or misfiring during acceleration	Inspect the ignition system (page 5-5).	
Poor performance, lack of fuel, or engine start failure with sufficient fuel stored in tank	Perform the fuel supply test (page 7-8).	
Poor performance (driveability) and poor fuel economy	Inspect the fuel supply system (page 7-5).	<ul style="list-style-type: none"> <li>• Air cleaner element contaminated</li> <li>• Pinched or clogged fuel feed hose</li> <li>• Faulty pressure regulator (fuel pump)</li> <li>• Faulty injector</li> <li>• Faulty ignition system</li> </ul>
Idle speed is below specifications or fast idle too low (MIL not lighting)	<ol style="list-style-type: none"> <li>1. Check the idle speed (page 3-11).</li> <li>2. Check the IACV (page 7-15).</li> </ol>	<ul style="list-style-type: none"> <li>• Faulty fuel supply system</li> <li>• Faulty ignition system</li> </ul>
Idle speed is above specifications or fast idle too high (MIL not lighting)	<ol style="list-style-type: none"> <li>1. Check the idle speed (page 3-11).</li> <li>2. Check the throttle operation and freeplay (page 3-4).</li> <li>3. Check the IACV (page 7-15).</li> </ol>	<ul style="list-style-type: none"> <li>• Faulty ignition system</li> <li>• Intake air leak</li> <li>• Engine top-end problem</li> <li>• Air cleaner condition</li> </ul>
MIL stays ON but no DTCs set, or MIL never comes ON at all	Inspect the MIL circuit (page 4-30).	

# PGM-FI TROUBLESHOOTING INFORMATION

## GENERAL TROUBLESHOOTING

### INTERMITTENT FAILURE

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

### OPENS AND SHORTS

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

#### If the MIL has come on

Refer to DTC READOUT (page 4-7).

#### If the MIL did not stay on

If the MIL did not stay on, but there is a driveability problem, refer to the SYMPTOM TROUBLESHOOTING (page 4-5).

## SYSTEM DESCRIPTION

### SELF-DIAGNOSIS SYSTEM

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

### FAIL-SAFE FUNCTION

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

### DTC

- The DTC is composed of a main code and a sub code and it is displayed as a hyphenated number when retrieved from the ECM with the MCS  
The digits in front of the hyphen are the main code, they indicate the component of function failure.  
The digits behind the hyphen is the sub code, they detail the specific symptom of the component or function failure.  
For example, in the case of the TP sensor:
  - DTC 08-1 = (TP sensor voltage) – (lower than the specified value)
  - DTC 08-2 = (TP sensor voltage) – (higher than the specified value)
- The MAP, ECT, O<sub>2</sub>, and TP sensor diagnosis will be made according to the voltage output of the affected sensor.  
If a failure occurs, the ECM determines the function failure, compares the sensor voltage output to the standard value, and then outputs the corresponding DTC to the MCS.

### MIL BLINK PATTERN

- If the MCS is not available, DTC can be read from the ECM memory by the MIL blink pattern.
- The number of MIL blinks is the equivalent to the main code of the DTC (the sub code cannot be displayed by the MIL).
- The MIL will blink the current DTC, by shorting DLC circuit with SCS service connector.
- The MIL has two types of blinks, a long blink and a short blink. The long blinking lasts for 1.3 second, the short blinking lasts for 0.3 second. One long blink is the equivalent of ten short blinks. For example, when two long blinks are followed by nine short blinks, the DTC is 54 (five long blinks = 50 blinks, plus four 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 the highest number.

### MIL CHECK

When the ignition switch is turned ON, the MIL will stay on for a few seconds, then go off. If the MIL does not come on or stay on (No DTC set), inspect the MIL circuit (page 4-30).

### 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.
- In case the ECM does not detect any problem at present but has a problem stored in its memory, the MIL will not come on. If it is necessary to retrieve the past problem, read out the stored DTC by following the DTC Readout procedure (page 4-7)

## MCS INFORMATION

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

### How to connect the MCS

Turn the ignition switch OFF.

Remove the center cover (page 2-10).

Remove the DLC [1] from the battery case cover.

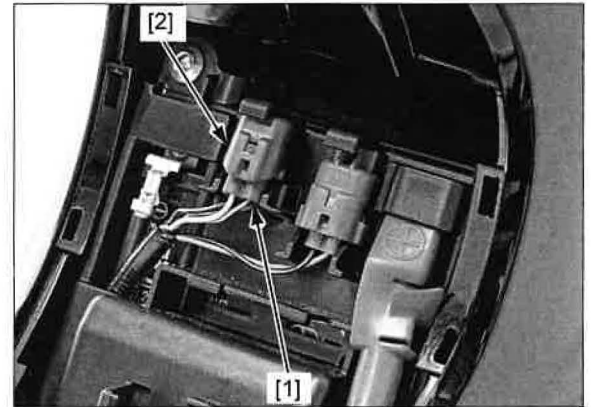
Remove the dummy connector [2] from the DLC and connect the MCS to the DLC.

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

Check the DTC and freeze data.

### NOTE:

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



## DTC READOUT

Start the engine and check the MIL.

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

If the MIL turns on, connect the MCS to the DLC, read the DTC, freeze data and follow the troubleshooting index (page 4-9).

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 center cover (page 2-10).

Remove the DLC [1] from the battery case cover.

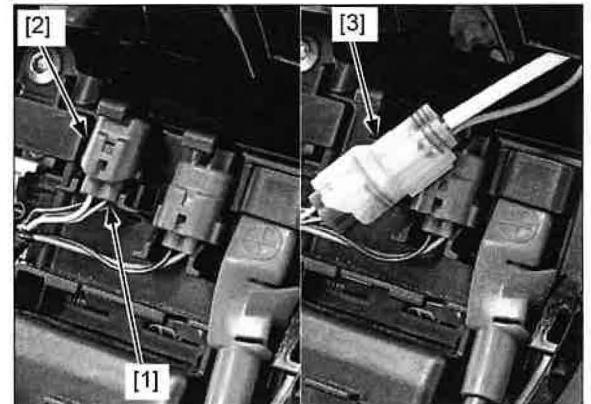
Remove the dummy connector [2] from the DLC and short the DLC terminals using the special tool.

### TOOL:

**SCS service connector [3] 070PZ-ZY30100**

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

- The main code of Honda code (the number in front of hyphen) can be indicated as MIL blinking.
- 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 0.5 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).



## PGM-FI SYSTEM

### ERASING DTC

Connect the MCS (page 4-7)

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

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

#### How to erase the DTC with SCS service connector

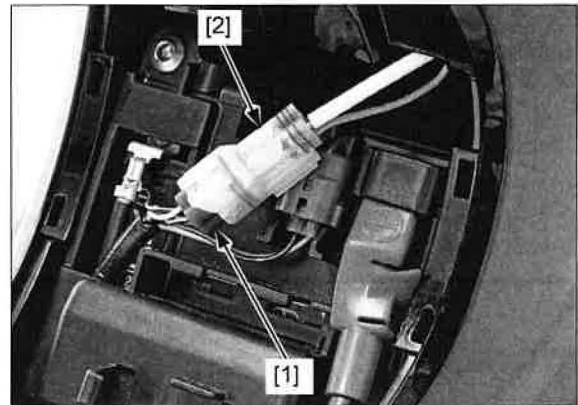
1. Turn the ignition switch OFF.
2. Remove the center cover (page 2-10).
3. Remove the DLC [1] from the battery case cover.  
Remove the dummy connector from the DLC and short the DLC terminals using the special tool.

#### TOOL:

**SCS service connector [2] 070PZ-ZY30100**

4. Turn the ignition switch ON with the engine stop switch "O".
5. Disconnect the SCS service connector from the DLC.  
Connect the SCS service connector to the DLC again while the MIL stays ON about 5 seconds (reset receiving pattern).
6. The stored DTC is erased if the MIL goes off and starts blinking (successful pattern).

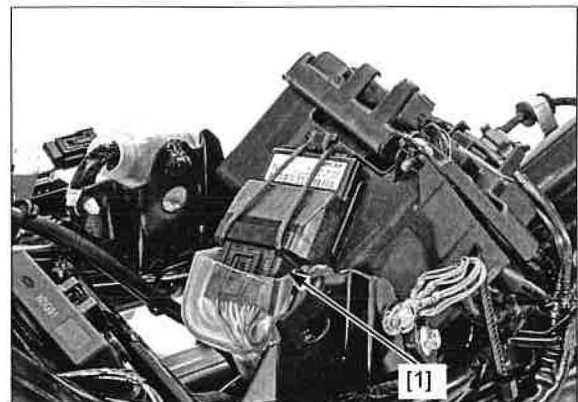
- The DLC must be jumped while the MIL lights. If not, the MIL will go off and stay on (unsuccessful pattern). In that case, turn the ignition switch OFF and try again from step 3.
- Note that the self-diagnostic memory cannot be erased if the ignition switch is turned "OFF" before the MIL starts blinking.



### CIRCUIT INSPECTION

#### INSPECTION AT ECM CONNECTOR

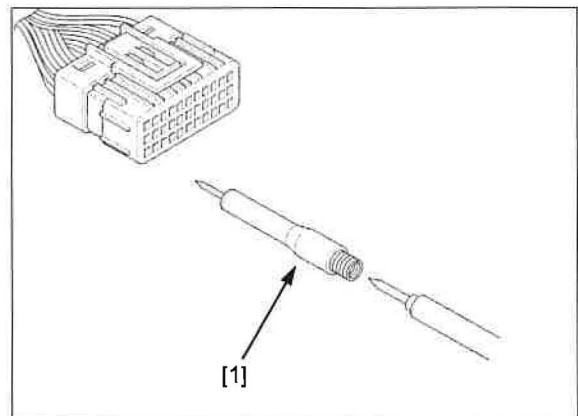
- To access the ECM 33P (Black) connector [1], remove the fuel tank (page 7-11).



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

#### TOOL:

**Test probe (2 pack) 07ZAJ-RDJA110**



## DTC INDEX

**NOTE:**

- If not using the MCS, perform all inspections according to the relevant main code.

DTC	Function Failure	Symptom/Fail-safe function	Refer to
1-1	MAP sensor circuit low voltage (less than 0.215 V) • MAP sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 68 kPa	4-10
1-2	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: 68 kPa	4-11
7-1	EOT sensor circuit low voltage (less than 0.078 V) • EOT sensor or its circuit malfunction	• Hard start at a low temperature • Pre-program value: 90°C/194°F	4-13
7-2	EOT sensor circuit high voltage (more than 4.922 V) • Loose or poor contact of the EOT sensor connector • EOT sensor or its circuit malfunction	• Hard start at a low temperature • Pre-program value: 90°C/194°F	4-13
8-1	TP sensor circuit low voltage (less than 0.215 V) • Loose or poor contact of the TP sensor connector • TP sensor or its circuit malfunction	• Poor engine acceleration • Pre-program value: 0°	4-15
8-2	TP sensor circuit high voltage (more than 4.922 V) • TP sensor or its circuit malfunction	• Poor engine acceleration • Pre-program value: 0°	4-17
9-1	IAT sensor circuit low voltage (more than 0.078 V) • IAT sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 35.2°C/ 95.4°F	4-18
9-2	IAT sensor circuit high voltage (less than 4.922 V) • Loose or poor contact of the IAT sensor connector • IAT sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 35.2°C/ 95.4°F	4-19
12-1	Fuel injector malfunction • Loose or poor contact of the fuel injector connector • Fuel injector or its circuit malfunction	• Engine does not start • Fuel injector, fuel pump and ignition coil shut down	4-21
21-1	O <sub>2</sub> sensor low voltage • Loose or poor contact of the O <sub>2</sub> sensor connector • O <sub>2</sub> sensor or its circuit malfunction	• Engine operates normally	4-22
21-2	O <sub>2</sub> sensor high voltage • Loose or poor contact of the O <sub>2</sub> sensor connector • O <sub>2</sub> sensor or its circuit malfunction	• Engine operates normally	4-24
29-1	IACV malfunction • Loose or poor contact of the IACV connector • IACV or its circuit malfunction	• Engine operates normally	4-25
33-2	EEPROM malfunction	• Engine stalls, hard to start, rough idling • Does not hold the self diagnosis data	4-26
88-1	EVAP purge control solenoid valve malfunction • Loose or poor contact of the EVAP purge control solenoid valve connector • EVAP purge control solenoid valve or its circuit malfunction	• Engine operates normally • Rough idling	4-27
91-1	Ignition coil primary circuit malfunction • Loose or poor contact of the ignition coil connector • Ignition coil or its circuit malfunction	• Fuel injector and ignition shut down	4-28



## DTC TROUBLESHOOTING

### DTC 1-1 (MAP SENSOR LOW VOLTAGE)

- Prior to troubleshooting, check the connectors for the sensor unit 5P (Black) connector and the ECM 33P (Black) connector for looseness and poor connection, then recheck the DTC.

#### 1. Check the MAP sensor system

Check the MAP sensor with the MCS.

**Was the voltage at about 0V?**

**YES** – GO TO STEP 2.

**NO** – Intermittent Failures

#### 2. Check the input voltage of the sensor unit

Turn the ignition switch OFF.

Remove the leg shield (page 2-11).

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

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

Measure the voltage between the sensor unit 5P (Black) connector terminals on the wire harness side.

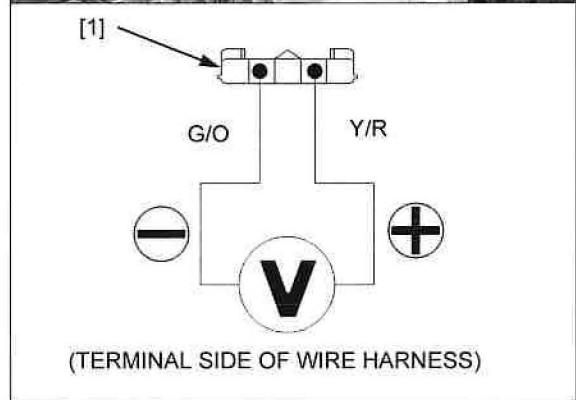
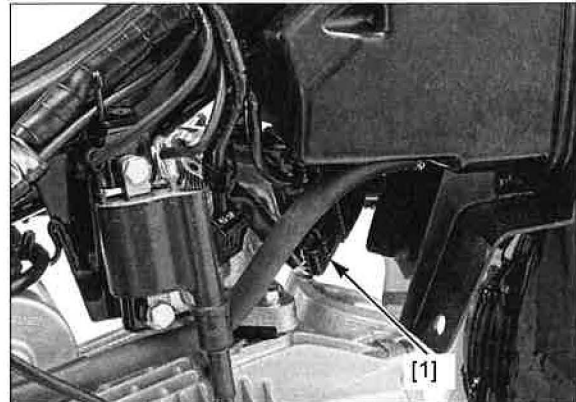
**Connection: Yellow/red (+) – Green/orange (-)**

**Standard value: 4.75 – 5.25 V**

**Is the voltage within the standard value range?**

**YES** – GO TO STEP 4.

**NO** – GO TO STEP 3.



#### 3. Check for a short in sensor unit input circuit

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector (page 4-8).

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

**TOOL:**

**Test probe (2 pack)**

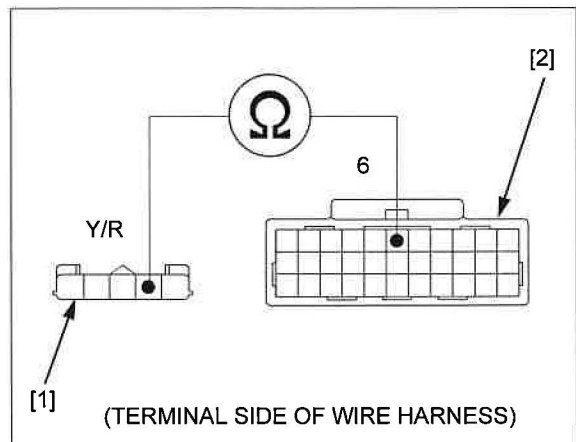
**07ZAJ-RDJA110**

**Connection: Yellow/red (+) – 6**

**Is there continuity?**

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

**NO** – Open circuit on the yellow/red lead



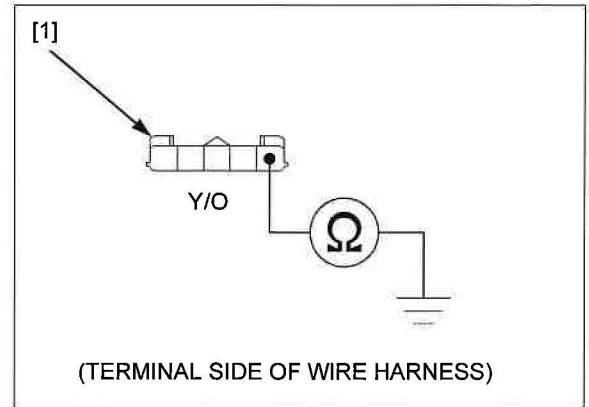
**4. Check for a short in the MAP sensor signal circuit**

Turn the ignition switch OFF.  
 Disconnect the ECM 33P (Black) connector (page 4-8).  
 Check for continuity between the sensor unit 5P (Black) connector [1] terminal and the ground.

**Connection: Yellow/orange – Ground**

**Is there continuity?**

- YES** – Short circuit in yellow/orange lead
- NO** – GO TO STEP 5.



**5. Check the MAP sensor**

Replace the sensor unit with a good one (page 4-33).  
 Connect the ECM 33P (Black) connector.  
 Erase the DTC.(page 4-8)  
 Check the MAP sensor with the MCS.

**Is DTC 1-1 indicated?**

- YES** – Replace the ECM with a known, good unit and recheck.
- NO** – The original sensor unit is faulty (MAP sensor)

**DTC 1-2 (MAP SENSOR HIGH VOLTAGE)**

- Prior to troubleshooting, check the connectors for the sensor unit 5P (Black) connector and the ECM 33P (Black) connector for looseness and poor connection, then recheck the DTC.

**1. Check the MAP sensor system**

Check the MAP sensor with the MCS.

**Was the voltage at about 5 V?**

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

**2. Check the input voltage of the sensor unit**

Turn the ignition switch OFF.  
 Remove the leg shield (page 2-11).  
 Disconnect the sensor unit 5P (Black) connector [1].  
 Turn the ignition switch ON with the engine stop switch "O".  
 Measure the voltage between the sensor unit 5P (Black) connector terminals on the wire harness side.

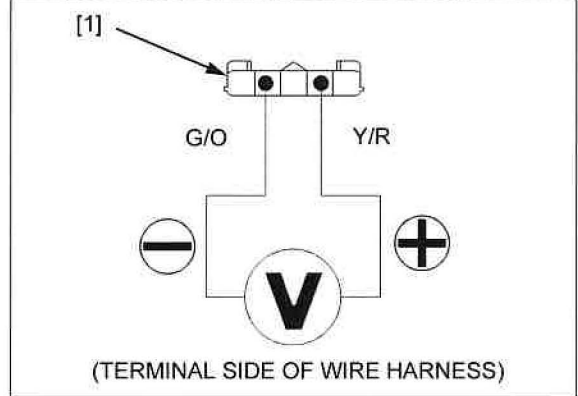
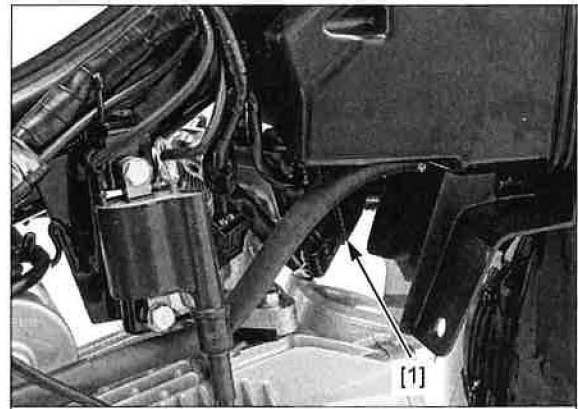
**Connection: Yellow/red (+) – Green/orange (-)**

**Standard value: 4.75 – 5.25 V**

**Is the voltage within the standard value range?**

**YES** – GO TO STEP 3.

**NO** – Open circuit on the green/orange lead



**3. Check the MAP sensor system using a jumper lead**

Turn the ignition switch OFF.  
 Measure the voltage between the sensor unit 5P (Black) connector [1] terminals on the wire harness side using a jumper lead [2].

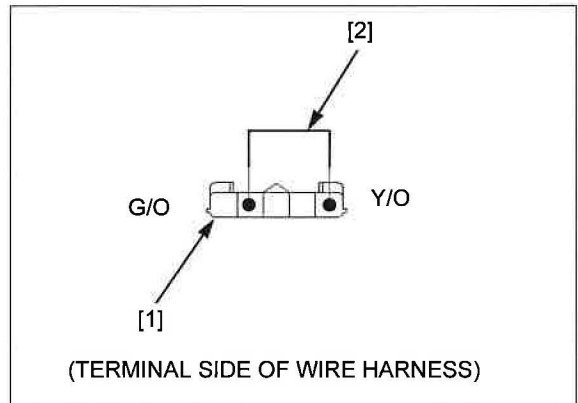
**Connection: Yellow/orange – Green/orange**

Check the MAP sensor with the MCS.

**Was the voltage at about 0V?**

**YES** – The sensor unit is faulty (MAP sensor)

**NO** – GO TO STEP 4.



**4. Check for an open circuit in the MAP sensor signal circuit**

Turn the ignition switch OFF.  
 Disconnect the ECM 33P (Black) connector (page 4-8).

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

**TOOL:**

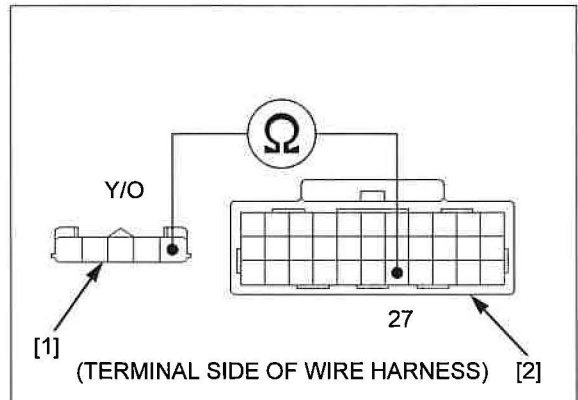
**Test probe (2 pack) 07ZAJ-RDJA110**

**Connection: Yellow/orange – 27**

**Is there continuity?**

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

**NO** – Open circuit in light yellow/orange line



## DTC 7-1 (EOT SENSOR LOW VOLTAGE)

- Prior to troubleshooting, check the connectors for the EOT sensor 2P (Black) and the ECM 33P (Black) for looseness and poor connection, then recheck the DTC.

### 1. Check the EOT sensor system

Check the EOT sensor with the MCS.

**Was the voltage at about 0V?**

**YES** – GO TO STEP 2.

**NO** – Intermittent Failures

### 2. Check the EOT sensor system with the connector disconnected

Turn the ignition switch OFF.

Remove the leg shield (page 2-11).

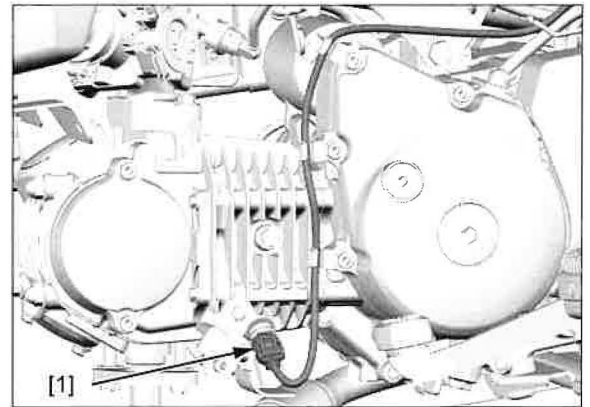
Disconnect the EOT sensor 2P (Black) connector [1].

Check the EOT sensor with the MCS.

**Was the voltage at about 0V?**

**YES** – GO TO STEP 3.

**NO** – EOT sensor defect



### 3. Check the EOT sensor output for a short circuit

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector (page 4-8).

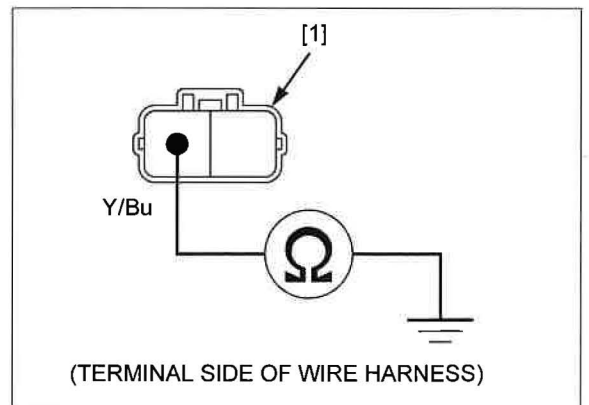
Check for continuity between the ground and the terminal on the wire harness side EOT sensor 2P (Black) connector [1].

**Connection: Yellow/blue – Ground**

**Is there continuity?**

**YES** – Short-circuit in yellow/blue lead

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



## DTC 7-2 (EOT SENSOR HIGH VOLTAGE)

- Prior to troubleshooting, check the connectors for the EOT sensor 2P (Black) and the ECM 33P (Black) for looseness and poor connection, then recheck the DTC.

### 1. Check the EOT sensor system

Check the EOT sensor with the MCS.

**Was the voltage at about 5 V?**

**YES** – GO TO STEP 2.

**NO** – Intermittent Failures

**2. Check the EOT sensor system using a jumper lead**

Turn the ignition switch OFF.  
 Remove the leg shield (page 2-11).  
 Disconnect the EOT sensor 2P (Black) connector [1].  
 Measure the voltage between the EOT sensor 2P (Black) connector terminals on the wire harness side using a jumper lead [2].

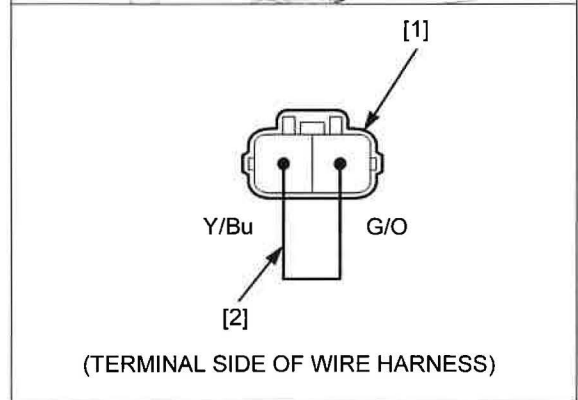
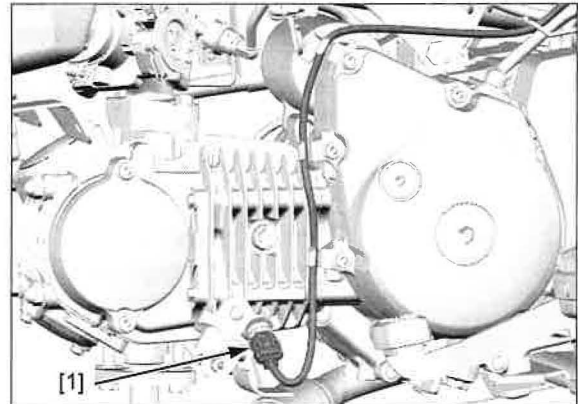
**Connection: Yellow/blue – Green/orange**

Check the EOT sensor with the MCS.

**Was the voltage at about 0V?**

**YES** – GO TO STEP 4.

**NO** – GO TO STEP 3.



**3. Check the EOT sensor line for an open circuit**

Turn the ignition switch OFF.  
 Disconnect the ECM 33P (Black) connector (page 4-8).  
 Check for continuity between the EOT sensor 2P (Black) connector [1] on the wire harness side and the ECM 33P (Black) connector [2] terminal.

**TOOL:**

**Test probe (2 pack) 07ZAJ-RDJA110**

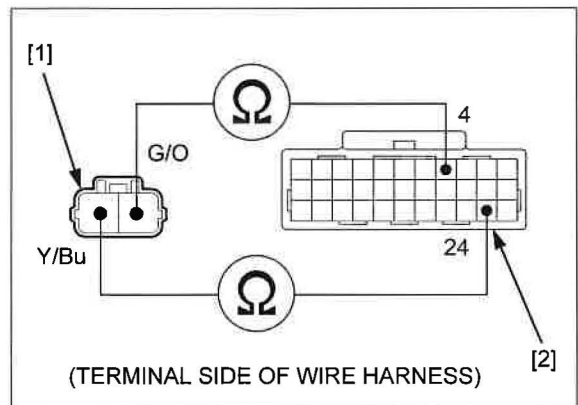
**Connection:**

- Yellow/blue – 24**
- Green/orange – 4**

**Is there continuity?**

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

- NO** –
- Open circuit on the yellow/blue lead
  - Open circuit on the green/orange lead



**4. Check the EOT sensor resistance**

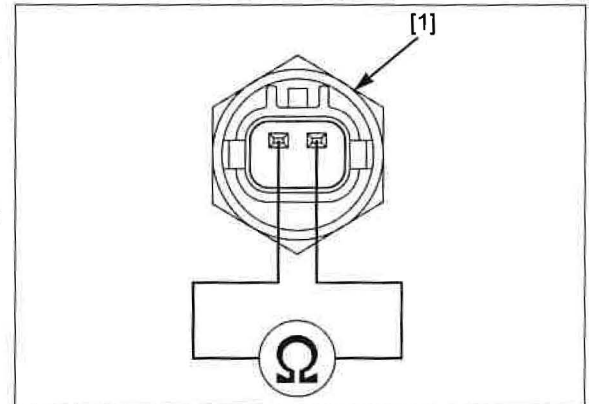
Turn the ignition switch OFF.  
Remove the EOT sensor (page 4-35).  
Measure the resistance between the 2P terminals of the EOT sensor [1].

**Standard: 2.5 – 2.8 kΩ (20°C/68°F)**

**Is the resistance within the standard range?**

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

**NO** – EOT sensor defect



**DTC 8-1 (TP SENSOR LOW VOLTAGE)**

- Prior to troubleshooting, check the connectors for the sensor unit 5P (Black) connector and the ECM 33P (Black) connector for looseness and poor connection, then recheck the DTC.

**1. Check the TP sensor system**

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

**Was the voltage at about 0V?**

**YES** – GO TO STEP 2.

**NO** – Intermittent Failures

**2. Check the input voltage of the sensor unit**

Turn the ignition switch OFF.  
Remove the leg shield (page 2-11).  
Disconnect the sensor unit 5P (Black) connector [1].  
Turn the ignition switch ON with the engine stop switch "O".

Measure the voltage between the sensor unit 5P (Black) connector terminals on the wire harness side.

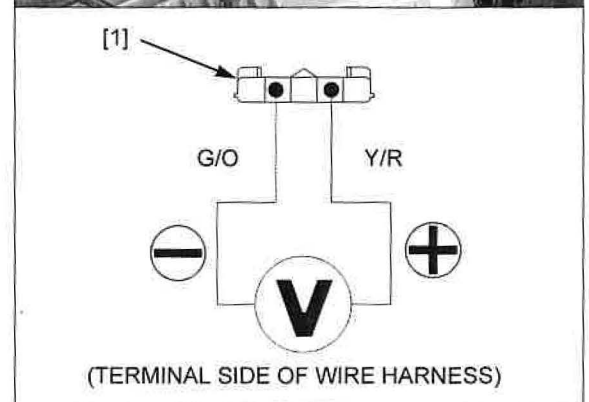
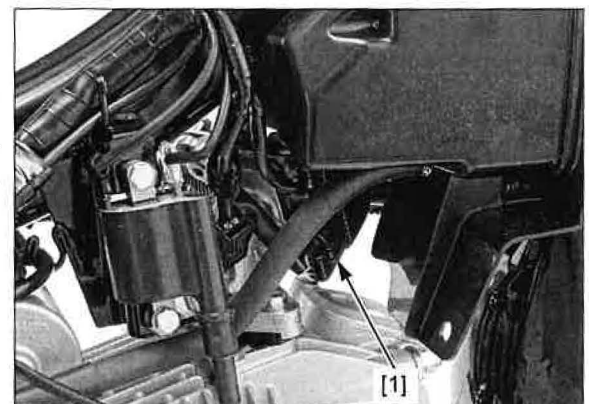
**Connection: Yellow/red (+) – Green/orange (-)**

**Standard value: 4.75 – 5.25 V**

**Is the voltage within the standard value range?**

**YES** – GO TO STEP 4.

**NO** – GO TO STEP 3.



**3. Check for a short in sensor unit input circuit**

Turn the ignition switch OFF.  
Disconnect the ECM 33P (Black) connector (page 4-8).

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

**TOOL:**

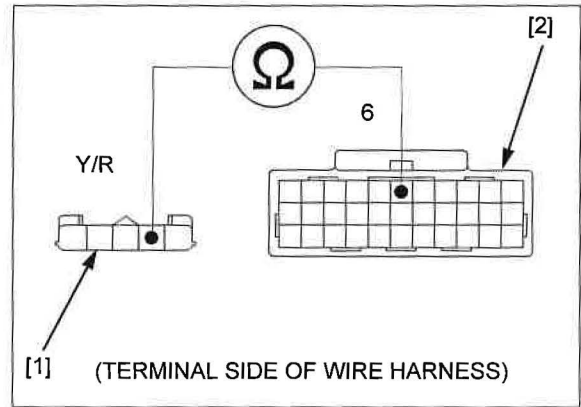
**Test probe (2 pack) 07ZAJ-RDJA110**

**Connection: Yellow/red (+) – 6**

**Is there continuity?**

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

**NO** – Open circuit on the yellow/red lead



**4. Check the TP sensor signal circuit for an open circuit**

Turn the ignition switch OFF.  
Disconnect the ECM 33P (Black) connector (page 4-8).

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

**TOOL:**

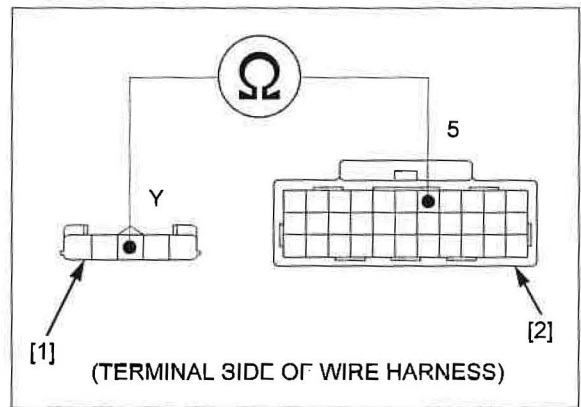
**Test probe (2 pack) 07ZAJ-RDJA110**

**Connection: Yellow – 5**

**Is there continuity?**

**YES** – GO TO STEP 5.

**NO** – Open circuit in the yellow lead



**5. Check for a short in the TP sensor signal circuit**

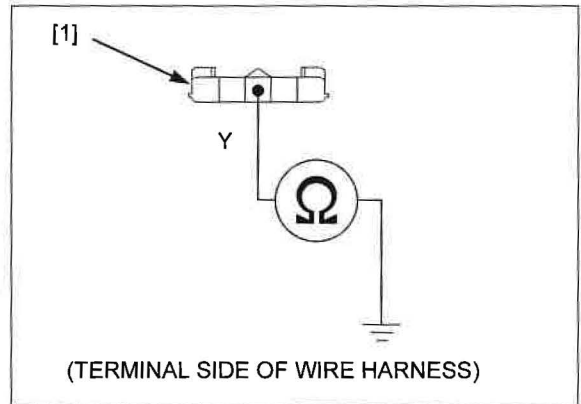
Check for continuity between the ground and the terminal on the wire harness side of sensor unit 5P (Black) connector [1].

**Connection: Yellow – Ground**

**Is there continuity?**

**YES** – Short-circuit in yellow lead

**NO** – GO TO STEP 6.



**6. Check the TP sensor**

Replace the sensor unit with a good one (page 4-33).

Connect the ECM 33P (Black) connector.

Erase the DTC (page 4-8).

Check the TP sensor with the MCS.

**Is DTC 8-1 indicated?**

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

**NO** – The original sensor unit is faulty (TP sensor)

**DTC 8-2 (TP SENSOR HIGH VOLTAGE)**

- Prior to troubleshooting, check the connectors for the sensor unit 5P (Black) connector and the ECM 33P (Black) connector for looseness and poor connection, then recheck the DTC.

**1. Check the TP sensor system**

Check the TP sensor with the MCS.

**Was the voltage at about 5 V?**

**YES** – GO TO STEP 3.

**NO** – GO TO STEP 2.

**2. Check the TP sensor system while operating the throttle**

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

**Does the voltage increase intermittently?**

**YES** – Intermittent Failures

**NO** – The sensor unit is faulty (TP sensor)

**3. Check the input voltage of the sensor unit**

Turn the ignition switch OFF.

Remove the leg shield (page 2-11).

Disconnect the sensor unit 5P (Black) connector [1].  
Turn the ignition switch ON with the engine stop switch "O".

Measure the voltage between the sensor unit 5P (Black) connector terminals on the wire harness side.

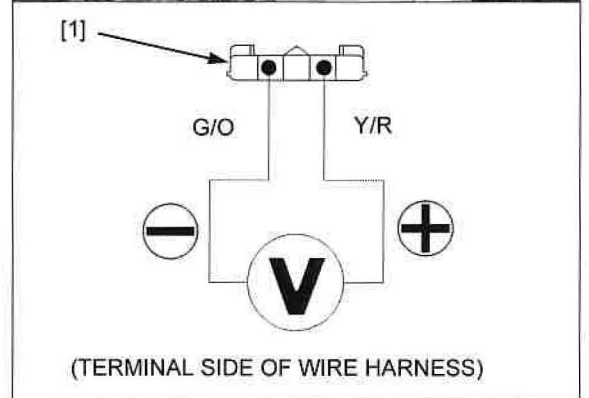
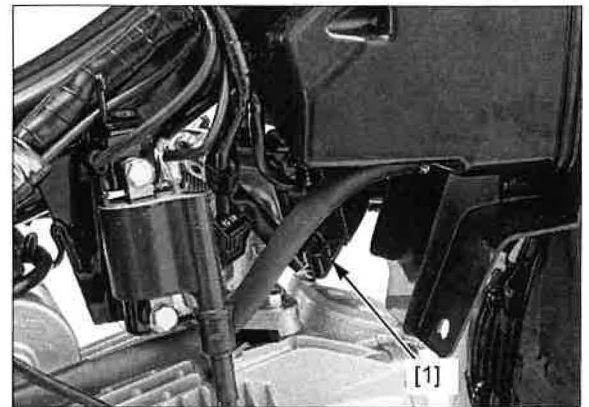
**Connection: Yellow/red (+) – Green/orange (-)**

**Standard value: 4.75 – 5.25 V**

**Is the voltage within the standard value range?**

**YES** – GO TO STEP 4.

**NO** – Open circuit on the green/orange lead





**4. Inspection of Short-circuit on TP Sensor Circuit**

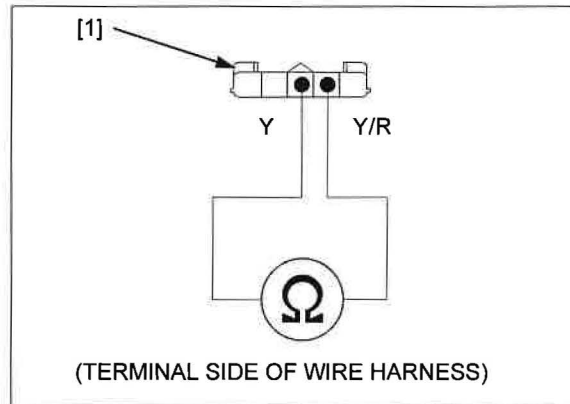
Turn the ignition switch OFF.  
 Disconnect the ECM 33P (Black) connector (page 4-8).  
 Check for continuity between the terminals on the wire harness side of sensor unit 5P (Black) connector [1].

**Connection: Yellow/red – Yellow**

**Is there continuity?**

**YES** – Short-circuit in yellow/red and yellow lead

**NO** – GO TO STEP 5.



**5. Check the TP sensor**

Replace the sensor unit with a good one (page 4-33).  
 Connect the ECM 33P (Black) connector.  
 Erase the DTC (page 4-8).  
 Use an MCS to check the TP sensor.

**Is DTC 8-2 indicated?**

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

**NO** – The original sensor unit is faulty (TP sensor)

**DTC 9-1 (IAT SENSOR LOW VOLTAGE)**

- Prior to troubleshooting, check the connectors for the sensor unit 5P (Black) connector and the ECM 33P (Black) connector for looseness and poor connection, then recheck the DTC.

**1. Check the IAT sensor system**

Check the IAT sensor with the MCS.

**Was the voltage at about 0V?**

**YES** – GO TO STEP 2.

**NO** – Intermittent Failures

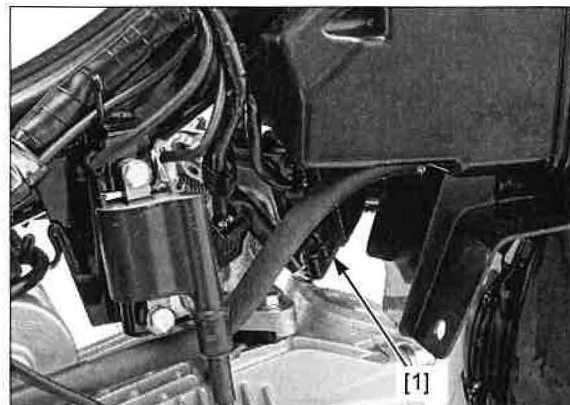
**2. Check the IAT sensor system with the wire of the connector disconnected**

Turn the ignition switch OFF.  
 Remove the leg shield (page 2-11).  
 Disconnect the sensor unit 5P (Black) connector [1].  
 Check the IAT sensor with the MCS.

**Was the voltage at about 0V?**

**YES** – GO TO STEP 3.

**NO** – The sensor unit is faulty (IAT sensor)



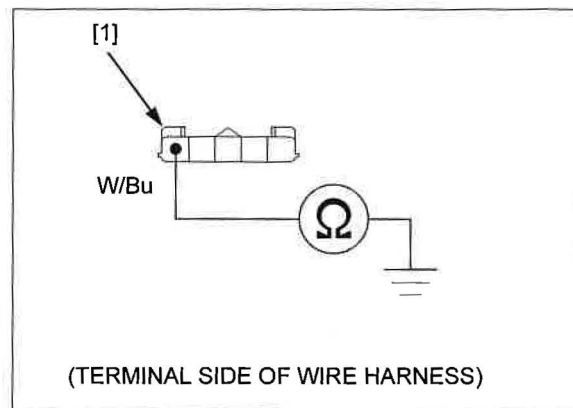
**3. Check the IAT sensor output for a short circuit**

Turn the ignition switch OFF.  
 Disconnect the ECM 33P (Black) connector (page 4-8).  
 Check for continuity between the ground and the terminal on the wire harness side of sensor unit 5P (Black) connector [1].

**Connection: White/blue – Ground**

**Is there continuity?**

- YES** – Short-circuit in White/blue lead
- NO** – Replace the ECM with a known, good unit and recheck.



**DTC 9-2 (IAT SENSOR HIGH VOLTAGE)**

- Prior to troubleshooting, check the connectors for the sensor unit 5P (Black) connector and the ECM 33P (Black) connector for looseness and poor connection, then recheck the DTC.

**1. Check the IAT sensor system**

Check the IAT sensor with the MCS.

**Was the voltage at about 5 V?**

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

**2. Check the IAT sensor system using a jumper lead**

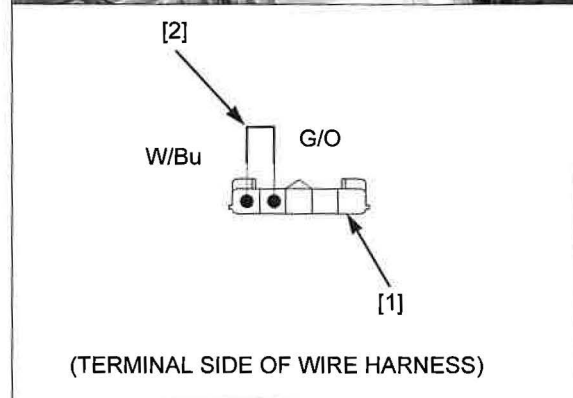
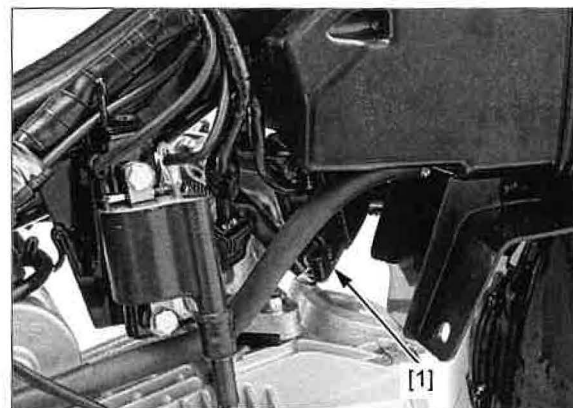
Turn the ignition switch OFF.  
 Remove the leg shield (page 2-11).  
 Disconnect the sensor unit 5P (Black) connector [1].  
 Measure the voltage between the sensor unit 5P (Black) connector terminals on the wire harness side using a jumper lead [2].

**Connection: White/blue – Green/orange**

Check the IAT sensor with the MCS.

**Was the voltage at about 0V?**

- YES** – The sensor unit is faulty (IAT sensor)
- NO** – GO TO STEP 3.



**3. Check the IAT sensor line for an open circuit**

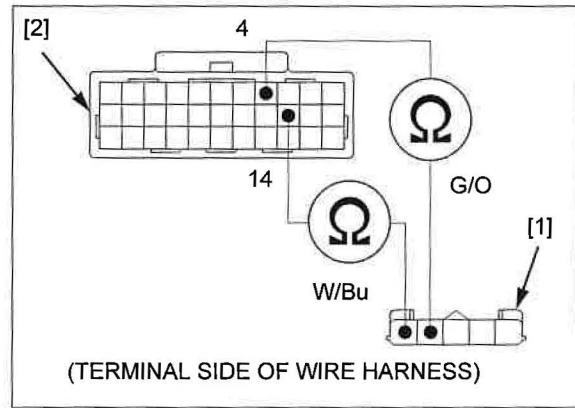
Turn the ignition switch OFF.  
 Disconnect the ECM 33P (Black) connector (page 4-8).  
 Check for continuity between the sensor unit 5P (Black) connector [1] on the wire harness side and the ECM 33P (Black) connector [2] terminal.

**TOOL:**  
 Test probe (2 pack)                      **07ZAJ-RDJA110**

**Connection:**  
 Green/orange – 4  
 White/blue – 14

**Is there continuity?**

- YES** – GO TO STEP 4.  
**NO** – • Open circuit on the White/blue lead  
           • Open circuit on the green/orange lead



**4. Check the IAT sensor resistance**

Connect the sensor unit 5P (Black) connector.  
 Measure the resistance between the ECM 33P (Black) connector [1] terminals on the wire harness side.

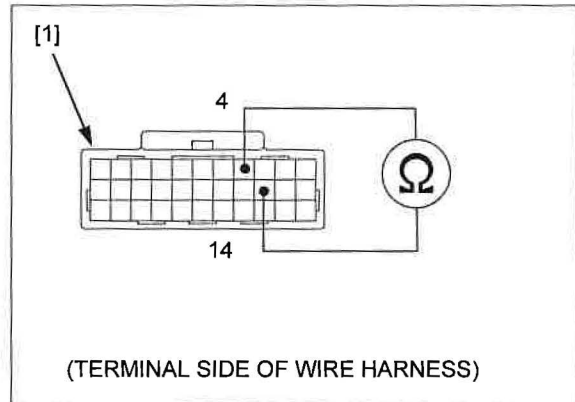
**TOOL:**  
 Test probe (2 pack)                      **07ZAJ-RDJA110**

**Connection: 4 – 14**

**Standard: 1.0 – 1.3 k $\Omega$  (40°C/104°F)**

**Is the resistance within the standard range?**

- YES** – Replace the ECM with a known, good unit and recheck.  
**NO** – The sensor unit is faulty (IAT sensor)



**DTC 12-1 (FUEL INJECTOR)**

- Prior to troubleshooting, check the connectors of the fuel injector 2P (Black) connector and the ECM 33P (Black) connector for looseness and poor connection, then recheck the DTC.

**1. Recheck the DTC**

Erase the DTC (page 4-8).

Start the engine and check the fuel injector with the MCS.

**Is the DTC 12-1 indicated?**

**YES** – GO TO STEP 2.

**NO** – Intermittent Failures

**2. Check the input voltage of the fuel injector**

Turn the ignition switch OFF.

Remove the leg shield (page 2-11).

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

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

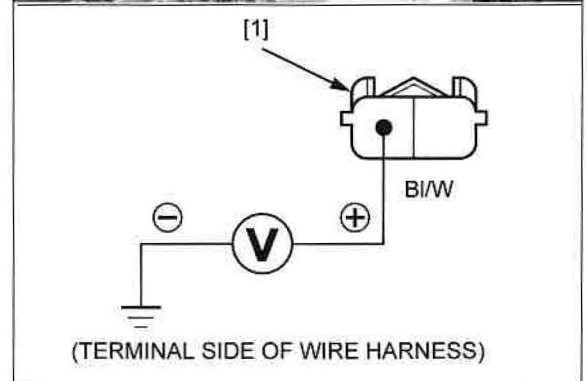
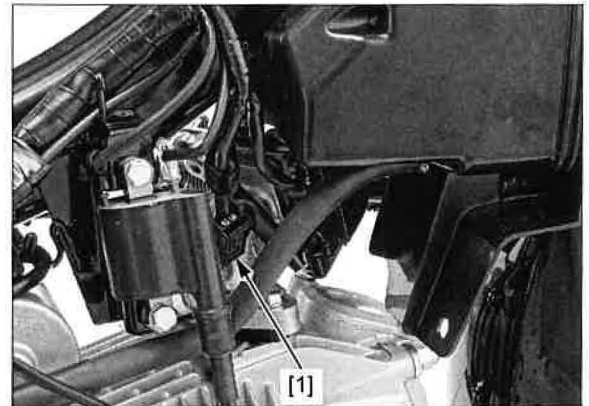
Check for continuity between the ground and the terminal on the wire harness side injector 2P (Black) connector.

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

**Is it the battery voltage?**

**YES** – GO TO STEP 3.

**NO** – Open circuit in the Black/white lead

**3. Check the fuel injector resistance**

Turn the ignition switch OFF.

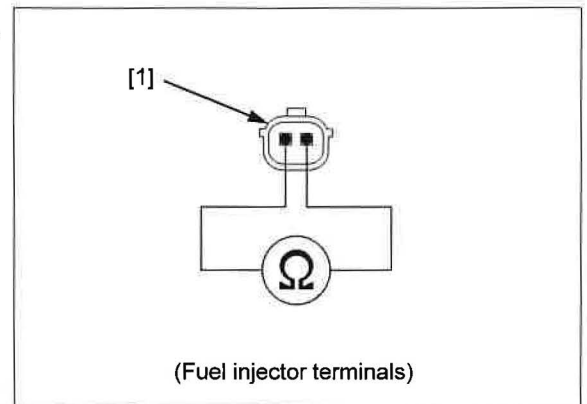
Measure the resistance between the 2P terminals of the fuel injector connector [1].

**Standard: 11 – 13  $\Omega$  (24°C/75°F)**

**Is the resistance within the standard range?**

**YES** – GO TO STEP 4.

**NO** – Fuel injector defect



**4. Check for an open circuit in the fuel injector signal circuit**

Disconnect the ECM 33P (Black) connector (page 4-8).

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

**TOOL:**

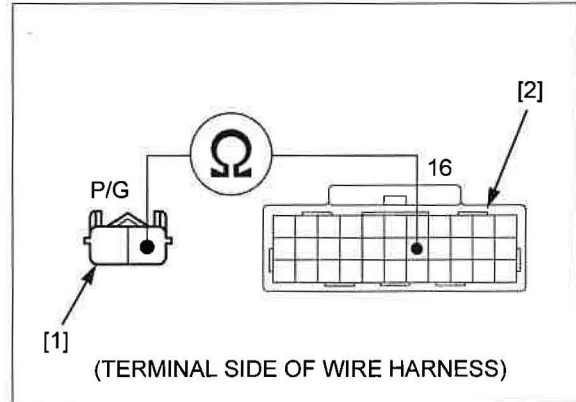
**Test probe (2 pack) 07ZAJ-RDJA110**

**Connection: Pink/green – 16**

**Is there continuity?**

**YES** – GO TO STEP 5.

**NO** – Open circuit in the pink/green lead



**5. Check for short in the fuel injector signal circuit**

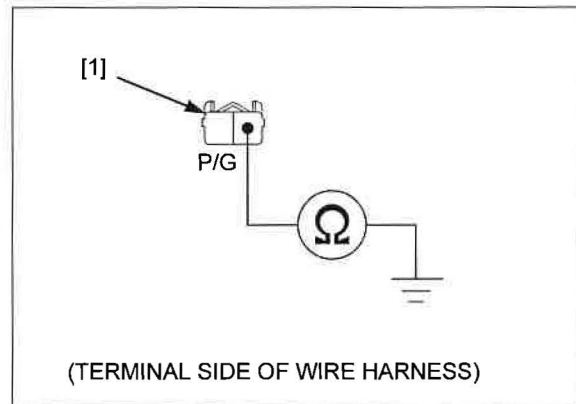
Check for continuity between the ground and the terminals on the wire harness side injector 2P (Black) connector [1].

**Connection: Pink/green – Ground**

**Is there continuity?**

**YES** – Short-circuit on pink/green lead

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



**DTC 21-1 (O<sub>2</sub> SENSOR LOW VOLTAGE)**

**1. Recheck the DTC**

Erase the DTC.(page 4-8)

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

Test-ride the vehicle and check the O<sub>2</sub> sensor with the MCS.

**Is DTC 21-1 indicated?**

**YES** – GO TO STEP 2.

**NO** – Intermittent Failures

**2. Inspection of Short-circuit on O<sub>2</sub> Sensor Circuit**

Turn the ignition switch OFF.

Disconnect the following parts.

- ECM 33P (Black) connector (page 4-30)
- O<sub>2</sub> sensor 1P (Black) connector (page 4-35)

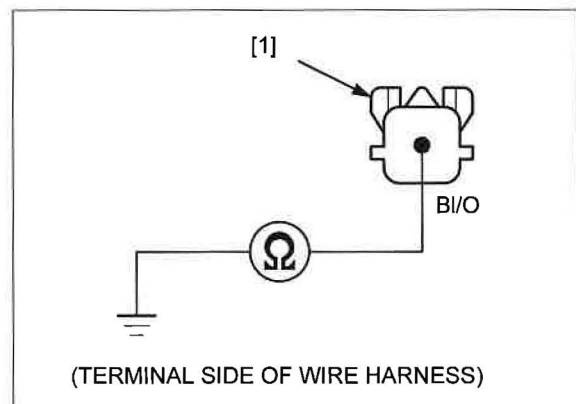
Check for continuity between the ground and O<sub>2</sub> sensor 1P (Black) connector [1].

**Connection: Black/orange – Ground**

**Is there continuity?**

**YES** – Short-circuit in Black/orange lead

**NO** – GO TO STEP 3.



**3. Fuel pressure check 1**

Measure the fuel pressure (page 7-7).

**Standard value: 263 – 316 kPa**

***Is the fuel pressure within the standard range?***

**YES** – GO TO STEP 5.

**NO** – GO TO STEP 4.

**4. Fuel pressure check 2**

Check whether the fuel pressure gauge (special tool) indicates a constant value without the needle fluttering around.

***Is the fuel pressure gauge (special tool) needle stable?***

**YES** – Replace the fuel pump unit (page 7-8).

**NO** – Replace the fuel filter (page 7-9).

**5. CHECKING FUEL FLOW**

Adjust the fuel in the tank until the fuel gauge is positioned the specified range [1].

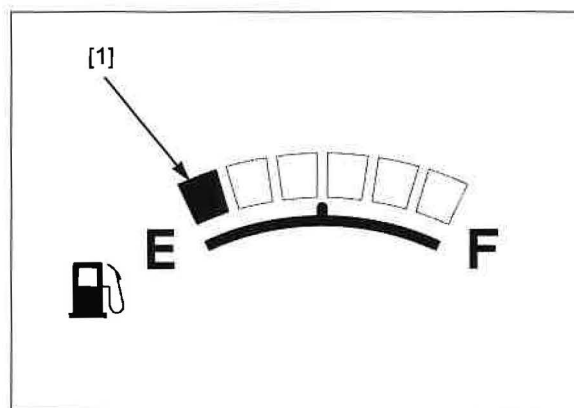
Check the amount discharged by the fuel pump. (page 7-8)

**Standard fuel flow: 82 cm<sup>3</sup> or more/10 secs**

***Is the amount discharged within the standard range?***

**YES** – GO TO STEP 6.

**NO** – Replace the fuel filter (page 7-9).



**6. Check the O<sub>2</sub> sensor**

Replace the O<sub>2</sub> sensor with a good one (page 4-35).

Connect the ECM 33P (Black) connector.

Erase the DTC (page 4-8).

Start the engine to warm it up.

Test drive the vehicle.

Stop the engine and check the O<sub>2</sub> sensor with the MCS.

***Is the DTC 21-1 indicated?***

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

**NO** – Original O<sub>2</sub> sensor faulty

**DTC 21-2 (O<sub>2</sub> SENSOR HIGH VOLTAGE)**

- Prior to troubleshooting, check the connectors for the O<sub>2</sub> sensor 1P (Black) connector and the ECM 33P (Black) connector for looseness and poor connection, then recheck the DTC.

**1. Recheck the DTC**

Erase the DTC (page 4-8).  
 Start the engine to warm it up.  
 Test drive the vehicle.  
 Stop the engine.  
 Check the O<sub>2</sub> sensor with the MCS.

**Is the DTC 21-2 indicated?**

**YES** – GO TO STEP 2.

**NO** – Intermittent Failures

**2. Check for an open O<sub>2</sub> sensor circuit**

Disconnect the following parts.

- ECM 33P (Black) connector (page 4-8)
- O<sub>2</sub> sensor 1P (Black) connector (page 4-35)

Check for continuity between the ECM 33P (Black) connector [1] on the wire harness side and the O<sub>2</sub> sensor 1P (Black) connector [2].

**TOOL:**

**Test probe (2 pack) 07ZAJ-RDJA110**

**Connection: Black/orange – 3**

**Is there continuity?**

**YES** – GO TO STEP 3.

**NO** – Open circuit in Black/orange lead

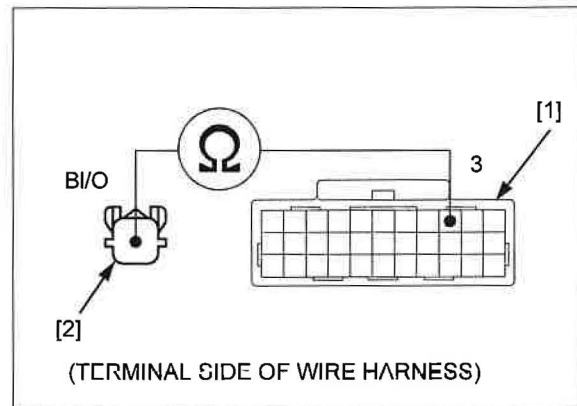
**3. Check the O<sub>2</sub> sensor**

Replace the O<sub>2</sub> sensor with a good one (page 4-35).  
 Connect the ECM 33P (Black) connector.  
 Erase the DTC (page 4-8).  
 Start the engine to warm it up.  
 Test drive the vehicle.  
 Stop the engine and check the O<sub>2</sub> sensor with the MCS.

**Is the DTC 21-2 indicated?**

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

**NO** – Original O<sub>2</sub> sensor faulty



**DTC 29-1 (IACV)**

- Prior to troubleshooting, check the connectors for the IACV 4P (Black) connector and the ECM 33P (Black) connector for looseness and poor connection, then recheck the DTC.

**1. Recheck the DTC**

Erase the DTC (page 4-8).  
Check the IACV with the MCS.

**Is the DTC 29-1 indicated?**

**YES** – GO TO STEP 2.

**NO** – Intermittent Failures

**2. Check the IACV resistance**

Turn the ignition switch OFF.  
Remove the leg shield (page 2-11).  
Disconnect the IACV 4P (Black) connector [1].  
Measure the resistance between the 4P terminals of the IACV sensor [2].

**TOOL:**

**Test probe (2 pack) 07ZAJ-RDJA110**

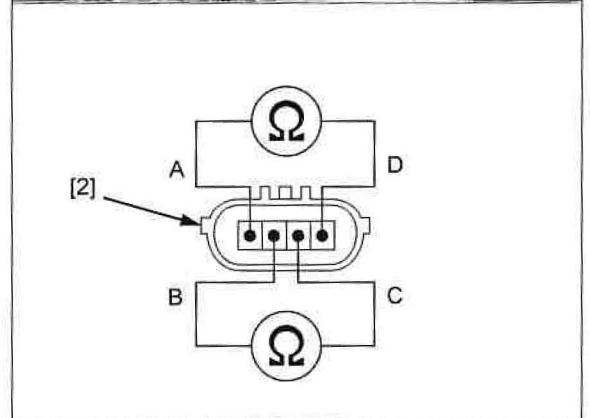
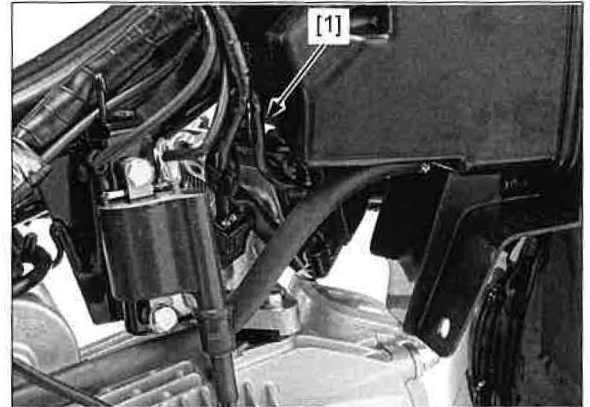
**Connection: A - D  
B - C**

**Standard value: 110 – 150  $\Omega$  (25°C/77°F)**

**Is the resistance within the standard range?**

**YES** – GO TO STEP 3.

**NO** – IACV faulty

**3. Check for a short in the IACV circuit**

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

**TOOL:**

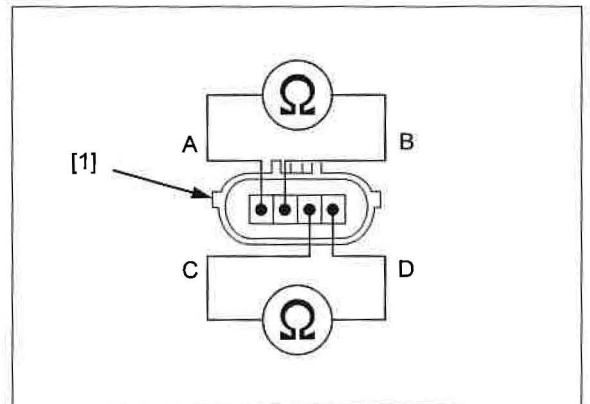
**Test probe (2 pack) 07ZAJ-RDJA110**

**Connection: A - B  
C - D**

**Is there continuity?**

**YES** – IACV faulty

**NO** – GO TO STEP 4.





**4. Check for an open circuit in the IACV circuit**

Disconnect the ECM 33P (Black) connector (page 4-8).

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

**TOOL:**

**Test probe (2 pack) 07ZAJ-RDJA110**

**Connection:**

**Light green/black – 21**

**Gray/red – 32**

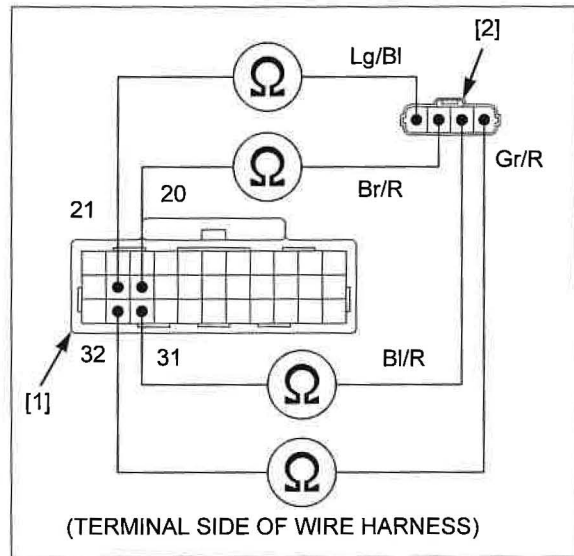
**Brown/red – 20**

**Black/red – 31**

**Is there continuity?**

**YES** – GO TO STEP 5.

**NO** – • Open circuit in Light green/black or Gray/red lead  
• Open circuit in Brown/red or Black/red lead



**5. Check for short in IACV circuit**

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

**TOOL:**

**Test probe (2 pack) 07ZAJ-RDJA110**

**Connection:**

**Light green/black – Ground**

**Gray/red – Ground**

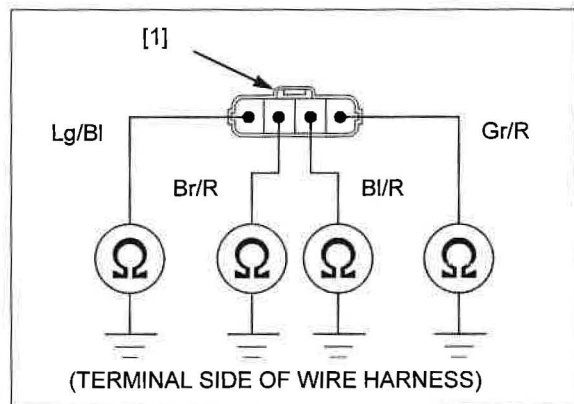
**Brown/red – Ground**

**Black/red – Ground**

**Is there continuity?**

**YES** – • Short circuit in Light green/black or Gray/red lead  
• Short circuit in Brown/red or Black/red lead

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



**DTC 33-2 (ECM EEPROM)**

**1. Recheck the DTC**

Erase the DTC (page 4-8).

Check the ECM EEPROM with the MCS.

**Is the DTC 33-2 indicated?**

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

**NO** – Intermittent Failures

## DTC 88-1 (EVAP PURGE CONTROL SOLENOID VALVE)

### NOTE:

- Before starting the inspection, check for loose or poor contact on the EVAP purge control solenoid valve 2P (Black) connector and ECM 33P (Black) connector, then recheck the DTC.

### 1. EVAP Purge Control Solenoid Valve System Inspection

Erase the DTC (page 4-8).

Start the engine and check the EVAP purge control solenoid valve with the MCS.

**Is the DTC 88-1 indicated?**

**YES** – GO TO STEP 2.

**NO** – Intermittent failure

### 2. EVAP Purge Control Solenoid Valve Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the EVAP purge control solenoid valve 2P (Black) connector [1] (page 4-36).

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

Measure the voltage between the EVAP purge control solenoid valve 2P (Black) connector of the wire harness side and ground.

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

**Does the battery voltage exist?**

**YES** – GO TO STEP 3.

**NO** – Open circuit in Black/white wire

### 3. EVAP Purge Control Solenoid Valve Resistance Inspection

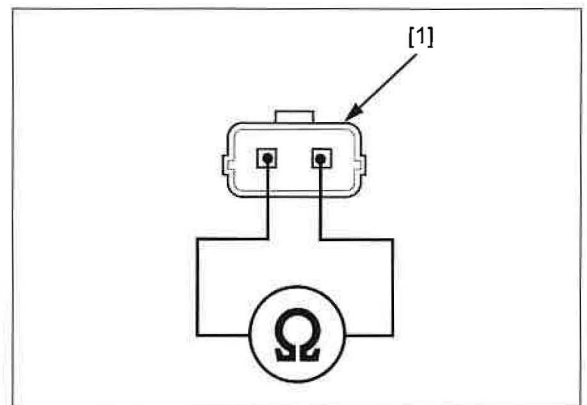
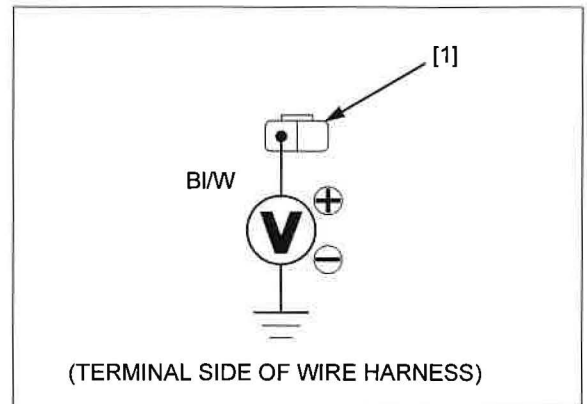
Turn the ignition switch OFF.

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

**Is the resistance within 30 – 34  $\Omega$  (20°C/68°F)?**

**YES** – GO TO STEP 4.

**NO** – Faulty EVAP purge control solenoid valve



**4. EVAP Purge Control Solenoid Valve Signal Line Open Circuit Inspection**

Disconnect the ECM 33P (Black) connector [1] (page 4-31).  
Check the continuity between the EVAP purge control solenoid valve 2P (Black) connector [2] and ECM 33P (Black) connector of the wire harness side.

**CONNECTION: Blue/orange – 33**

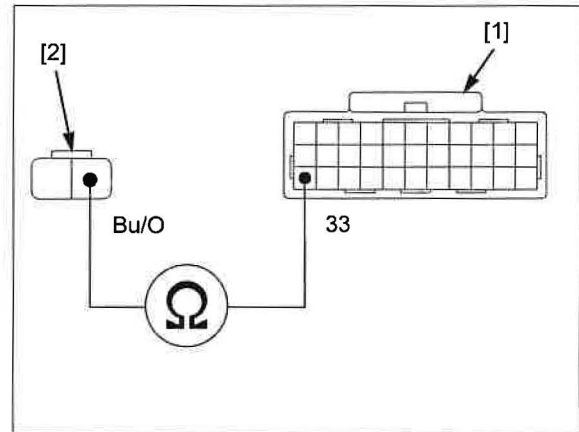
**TOOL:**

Test probe (2 pack) **07ZAJ-RDJA110**

*Is there continuity?*

**YES** – GO TO STEP 5.

**NO** – Open circuit in Blue/orange wire



**5. EVAP Purge Control Solenoid Valve Signal Line Short Circuit Inspection**

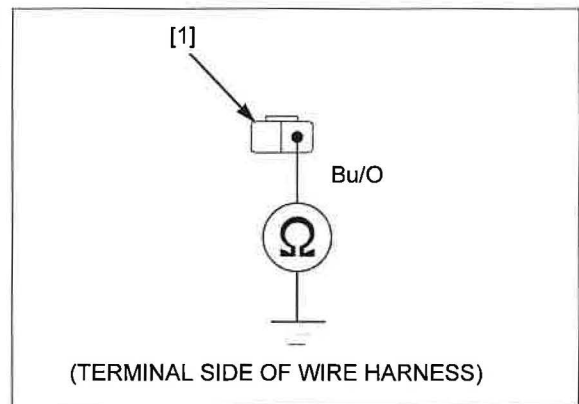
Check for continuity between the EVAP purge control solenoid valve 2P (Black) connector [1] and ground with the ECM 33P (Black) connector disconnected.

**CONNECTION: Blue/orange – Ground**

*Is there continuity?*

**YES** – Short circuit in Blue/orange wire

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



**DTC 91-1 (IGNITION COIL PRIMARY CIRCUIT)**

**1. Recheck the DTC**

Erase the DTC (page 4-8).

Start the engine and check the ignition coil primary circuit with the MCS.

*Is the DTC 91-1 indicated?*

**YES** – GO TO STEP 2.

**NO** – Intermittent Failures

**2. Check the ignition coil primary side input voltage**

Turn the ignition switch OFF.

Disconnect the ignition coil primary terminal [1] (page 5-7).

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

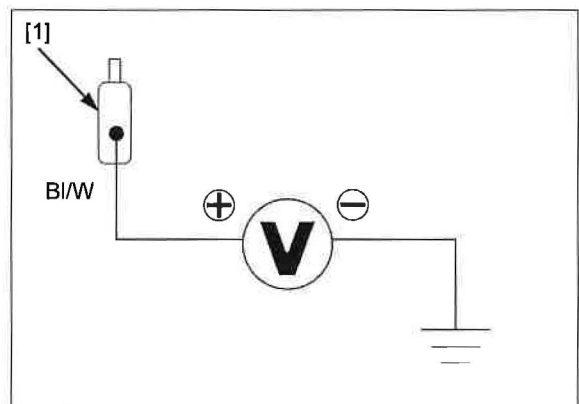
Measure the voltage between ground and the ignition coil primary terminal on the wire harness side.

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

*Is it at battery voltage?*

**YES** – GO TO STEP 3.

**NO** – Open circuit in the Black/white lead



**3. Check for open circuit in the primary signal circuit of the ignition coil**

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector [1] (page 4-8).

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

**Connection: Black/blue – 11**

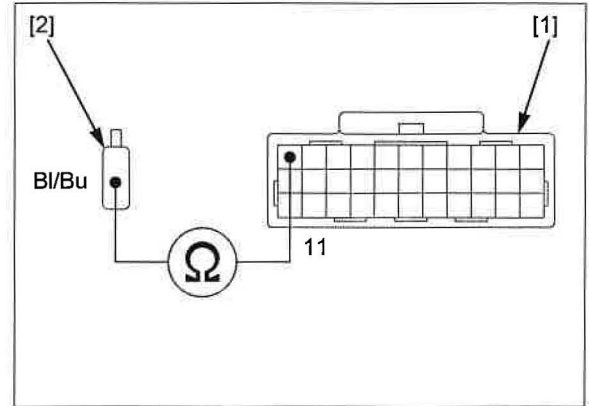
**TOOL:**

**Test probe (2 pack) 07ZAJ-RDJA110**

**Is there continuity?**

**YES** – GO TO STEP 4.

**NO** – Open circuit in Black/blue lead



**4. Check for short circuit in the primary signal circuit of the ignition coil**

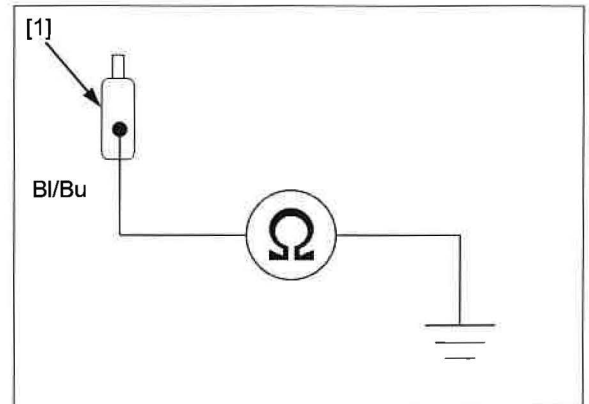
Check for continuity between the ground and the ignition coil wire connector [1].

**Connection: Black/blue – Ground**

**Is there continuity?**

**YES** – Short-circuit in Black/blue lead

**NO** – GO TO STEP 5.



**5. Check the ignition coil primary side voltage**

Connect the ECM 33P (Black) connector.

Check the ignition coil primary side voltage (page 5-5).

**Is the primary voltage normal?**

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

**NO** – GO TO STEP 6.

**6. Check the ignition coil**

Replace the ignition coil with a good one (page 5-7).

Erase the DTC (page 4-8).

Check the ignition coil with the MCS.

**Is DTC 91-1 indicated?**

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

**NO** – Original ignition coil is faulty

## MIL CIRCUIT INSPECTION

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

Turn the ignition switch OFF.  
 Disconnect the ECM 33P (Black) connector (page 4-8).  
 Ground the ECM 33P (Black) connector [1] terminal of the wire harness side with a jumper wire [2].

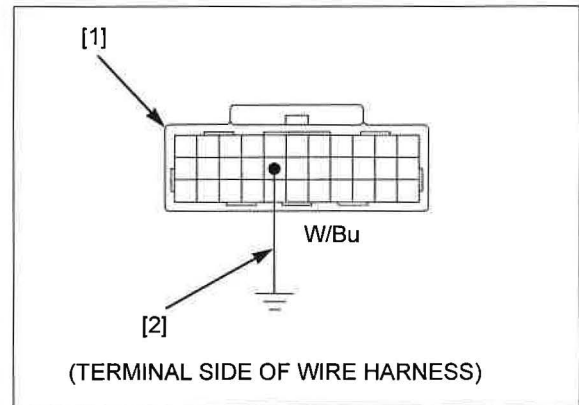
**CONNECTION: White/blue – Ground**

**TOOL:**

**Test probe (2 pack)                      07ZAJ-RDJA110**

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

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



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

Turn the ignition switch OFF.  
 Disconnect the ECM 33P (Black) connector (page 4-8).  
 Turn the ignition switch ON, the MIL should turn off.

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

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

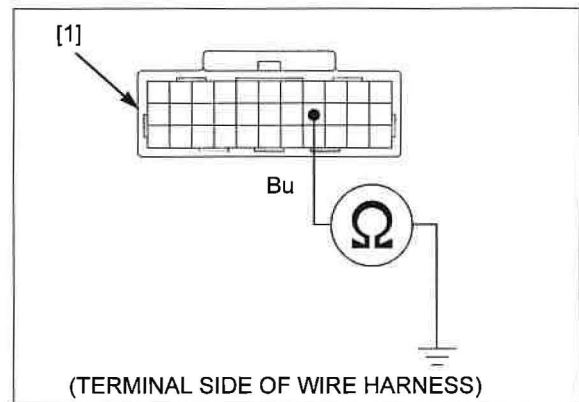
**CONNECTION: Blue – Ground**

**STANDARD: No continuity**

**TOOL:**

**Test probe (2 pack)                      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 new one, and recheck.



## ECM

## REMOVAL/INSTALLATION

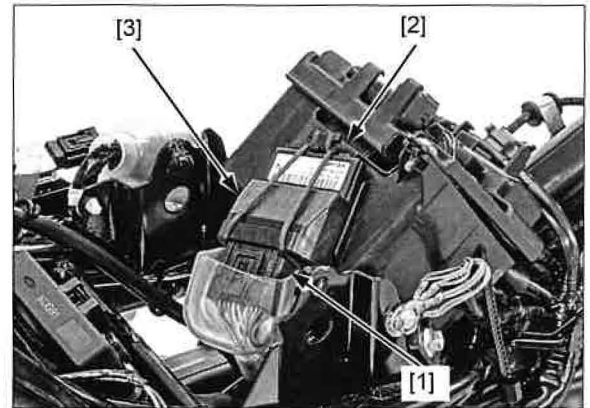
Turn the ignition switch OFF.

Remove the fuel tank (page 7-11).

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

Unhook the band [2] and remove the ECM [3].

Install in reverse order to removal.



## ECM POWER/GROUND LINE INSPECTION

## NOTE:

Prior to troubleshooting, check the connector of the ECM 33P (Black) for looseness and poor connection, then recheck the DTC.

## 1. Check the power supply input circuit

Disconnect the ECM 33P (Black) connector [1] (page 4-31).

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

Measure the voltage between the ground and the ECM 33P (Black) connector [1] terminal on the wire harness side.

**Connection:** 1 (+) – Ground

## TOOL:

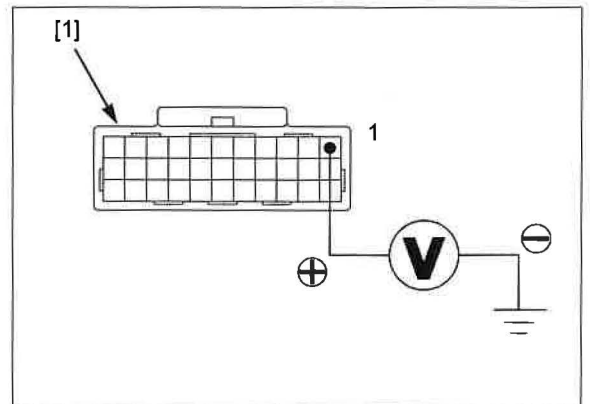
Test probe (2 pack)                      07ZAJ-RDJA110

Turn the ignition switch ON and check whether the battery voltage is output normally.

**Does the battery voltage exist?**

**YES** – GO TO STEP 2.

**NO** – • Open circuit in the Black/blue lead



**2. Check the ground line**

Turn the ignition switch OFF.

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

**Connection:**

**2 – Ground**

**9 – Ground**

**10 – Ground**

**TOOL:**

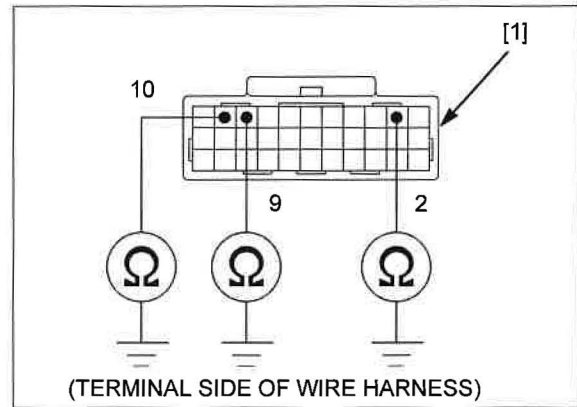
**Test probe (2 pack)**

**07ZAJ-RDJA110**

**Is there continuity?**

**YES** – GO TO STEP 3.

**NO** – • Open circuit in the green/black lead  
• Open circuit in the green lead



**3. Check the sensor unit circuit**

Turn the ignition switch OFF.

Remove the leg shield (page 2-11).

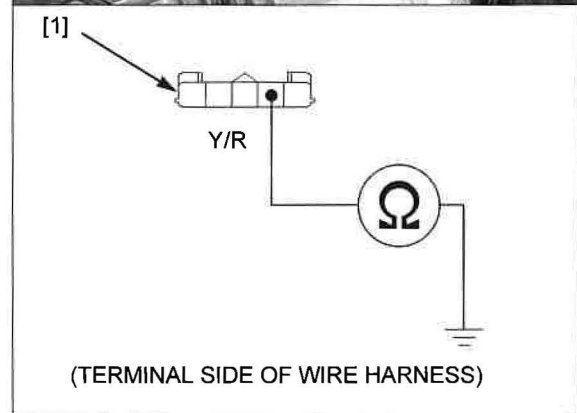
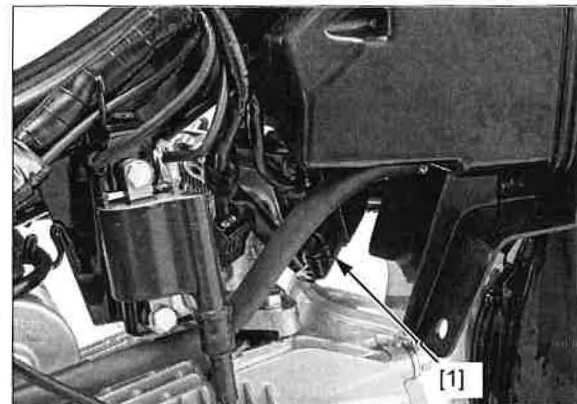
Disconnect the sensor unit 5P (Black) connector [1]. Check for continuity between the ground and the terminal on the wire harness side of sensor unit 5P (Black) connector.

**Connection: Yellow/red – Ground**

**Is there continuity?**

**YES** – Short-circuit in the yellow/red lead

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



## SENSOR UNIT

### NOTE:

- The MAP sensor, TP sensor and IAT sensor are integrated into the sensor unit.
- When the sensor unit is replaced, always perform resetting the TP sensor initial learning.
- Do not remove the sensor unit except to replace it.

### REMOVAL

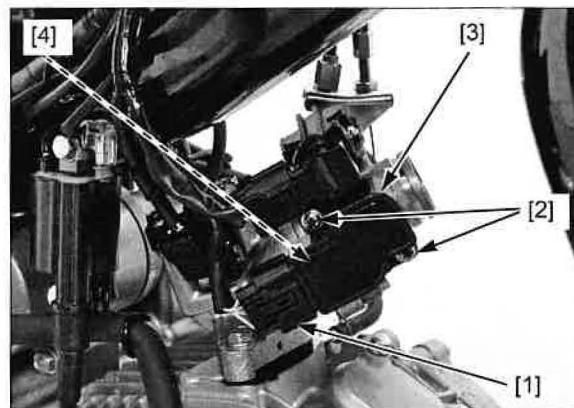
Remove the air cleaner housing (page 7-11).

Use compressed air to clean around the sensor unit.

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

Remove the two screws [2] and the sensor unit [3].

Remove the O-ring [4].



### INSTALLATION

Install the new O-ring [1] in the groove of the throttle body.

### NOTE:

Incorrect installation of the O-ring will cause idling trouble.

Install the sensor unit [2] on the throttle body while aligning the clip of the TP sensor with the protruding part of the throttle valve.

### NOTE:

When installing the sensor unit on the throttle body, there will be a slight resistance because the clip of the TP sensor sandwiches the protruding part of the throttle valve.

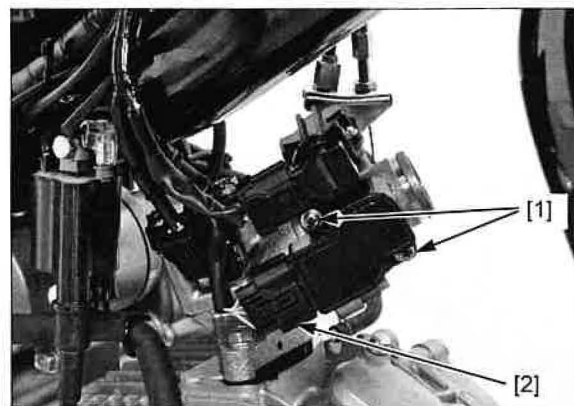
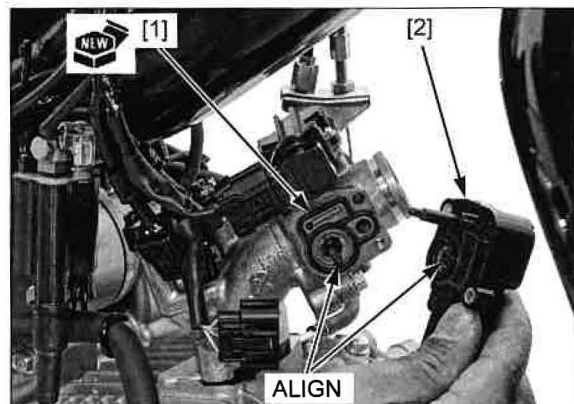
Install and tighten the two screws [1] to the specified torque.

**TORQUE: 2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)**

Connect the sensor unit 5P (Black) connector [2].

Perform resetting the TP sensor initial learning (page 4-34).

Install the air cleaner housing (page 7-11).





## TP SENSOR RESET PROCEDURE

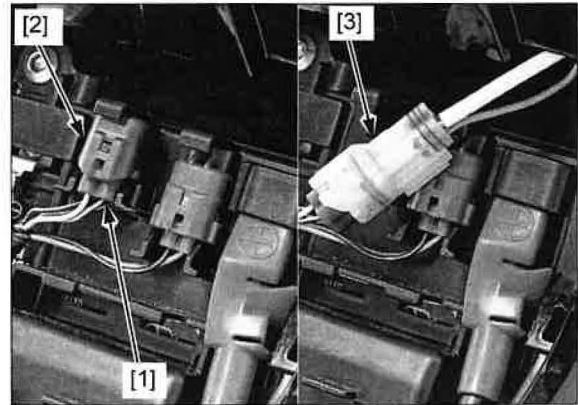
- Make sure that DTC is not stored in ECM. If the DTC is stored in ECM, TP sensor reset mode won't start by following the procedure below.
- Perform this procedure when throttle body is replaced with a new one.

1. Turn the ignition switch "OFF".
2. Remove the center cover (page 2-10).
3. Remove the DLC [1] from the dummy connector [2] and short the DLC using the special tool.

**TOOL:**

**[3] SCS service connector 070PZ-ZY30100**

**CONNECTION: Blue – Green/black**



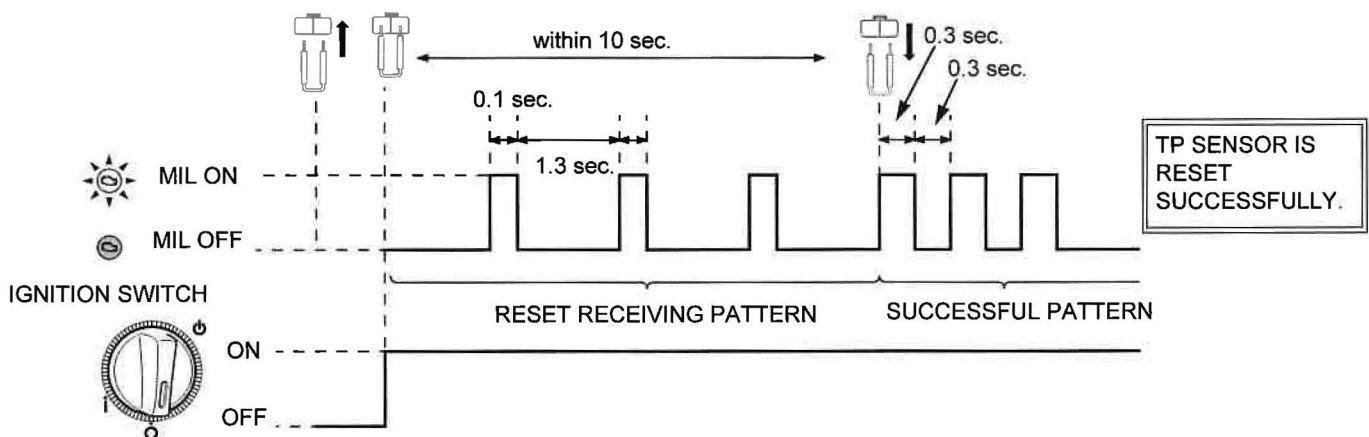
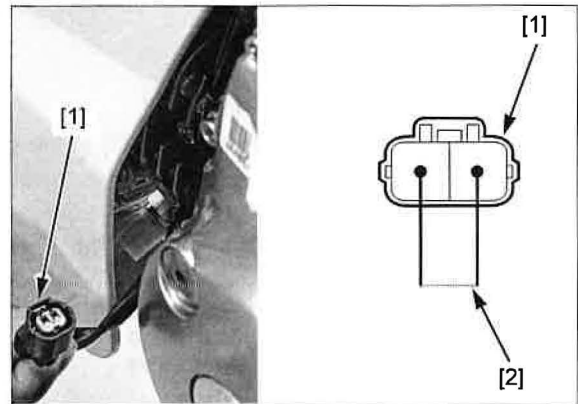
4. Disconnect the EOT sensor 2P (Black) connector [1].

Short the wire side connector terminals with jumper wire [2].

5. Turn the ignition switch "ON" then disconnect the jumper wire from the EOT sensor 2P (Black) connector while the MIL is blinking (reset receiving pattern) for 10 seconds.

6. Check if the MIL blinks.

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



If the jumper wire is connected for more than 10 seconds, the MIL will stay ON (unsuccessful pattern). Try again from the step 3.

7. Turn the ignition switch "OFF".
8. Disconnect the SCS connector and install the DLC to the dummy connector.  
Install the removed parts.
9. Check the idle speed (page 3-11).

## EOT SENSOR

### REMOVAL/INSTALLATION

Remove the leg shield (page 2-11).

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

*As oil will flow out, cover around the sensor with a shop towel.*

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

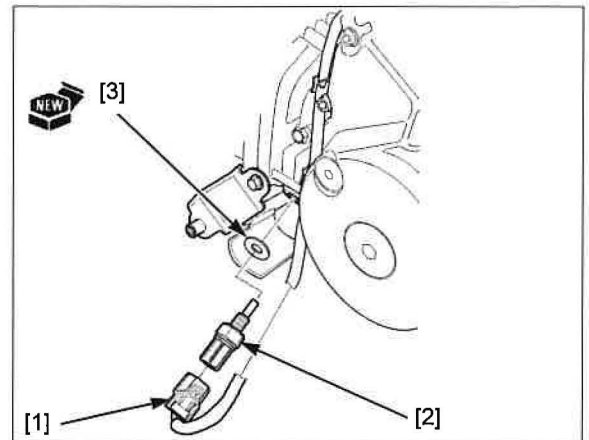
Using a new sealing washer to install the EOT sensor and then tighten it to its torque.

**TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)**

Connect the EOT sensor 2P (Black) connector.

Install the leg shield (page 2-11).

Check the engine oil level (page 3-9).



## O2 SENSOR

### NOTICE

- Take care to prevent grease, oil or other fluids from getting on the air hole of the O<sub>2</sub> sensor.
- Do not subject the O<sub>2</sub> sensor to impact. Handle it with care. If it is dropped or subjected to impact in other ways, replace with a new sensor.
- As it may damage the sensor, do not use an impact wrench when removing or installing the O<sub>2</sub> sensor.

### NOTE:

- Be careful not to damage the O<sub>2</sub> sensor wires.
- Remove/install the O<sub>2</sub> sensor when the engine is cold.

### REMOVAL/INSTALLATION

Put the vehicle on its main stand in a flat place and support it securely.

Remove the leg shield (page 2-11).

Disconnect the O<sub>2</sub> sensor 1P (Black) connector [1].

Remove the wire clip [2] from the stay.

Remove the O<sub>2</sub> sensor wire from the clamp [3].

Use the special tool to remove the O<sub>2</sub> sensor [4] from the cylinder head.

### TOOL:

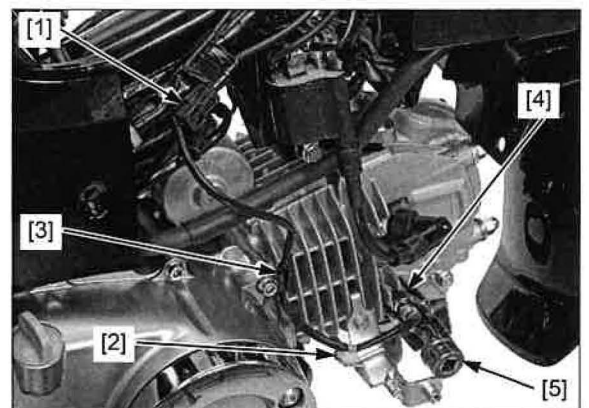
**[5] FRXM17 (Snap-on) or equivalent**

Install the O<sub>2</sub> sensor, and tighten it to the specified torque.

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

Make sure there are no exhaust leaks around the O<sub>2</sub> sensor.

Install the removed parts in reverse order to removal.



## EVAP PURGE CONTROL SOLENOID VALVE

### REMOVAL/INSTALLATION

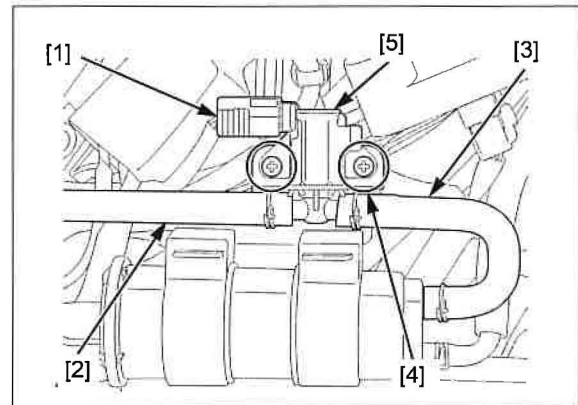
Remove the left body cover (page 2-13).

Disconnect the following:

- EVAP purge control solenoid valve 2P (Black) connector [1]
- Purge hose [2]
- Canister-to-EVAP purge control solenoid valve hose [3]

Remove the screws [4] and the EVAP purge control solenoid valve [5].

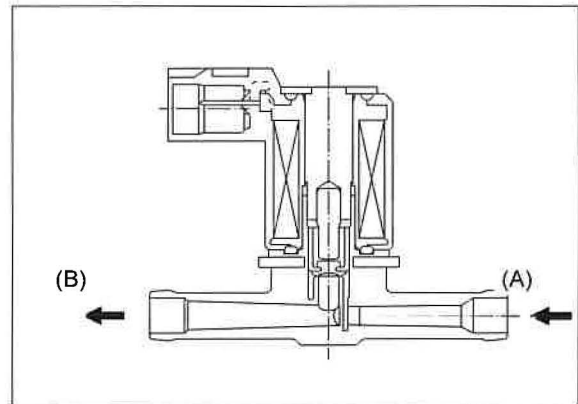
Installation is in the reverse order of removal.



### INSPECTION

Remove the EVAP purge control solenoid valve.

Check that air should flow (A) to (B), only when a 12 V battery is connected to the EVAP purge control solenoid valve terminals.



<b>SERVICE INFORMATION</b> .....	<b>5-2</b>	<b>IGNITION SYSTEM INSPECTION</b> .....	<b>5-5</b>
<b>TROUBLESHOOTING</b> .....	<b>5-3</b>	<b>IGNITION COIL</b> .....	<b>5-7</b>
<b>SYSTEM LOCATION</b> .....	<b>5-4</b>	<b>IGNITION TIMING</b> .....	<b>5-8</b>
<b>SYSTEM DIAGRAM</b> .....	<b>5-4</b>		

## IGNITION SYSTEM

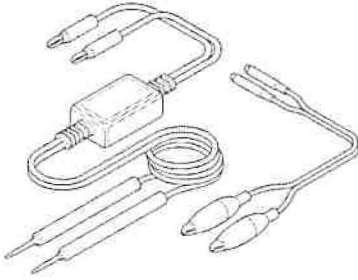
# SERVICE INFORMATION

### GENERAL

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON position and current is present.
- A faulty ignition system is often related to poorly connected or corroded connectors. Check those connections before proceeding.

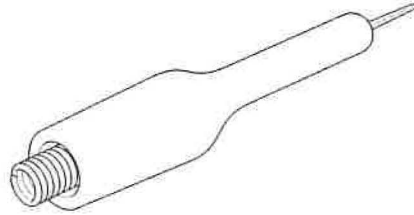
### TOOLS

Peak Voltage Adaptor  
07HGJ-0020100

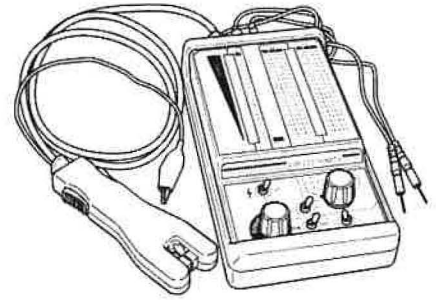


Not available in the U.S.A.

Test Probe (2 pack)  
07ZAJ-RDJA110



IgnitionMate peak voltage tester  
MTP07-0286 (U.S.A. only)



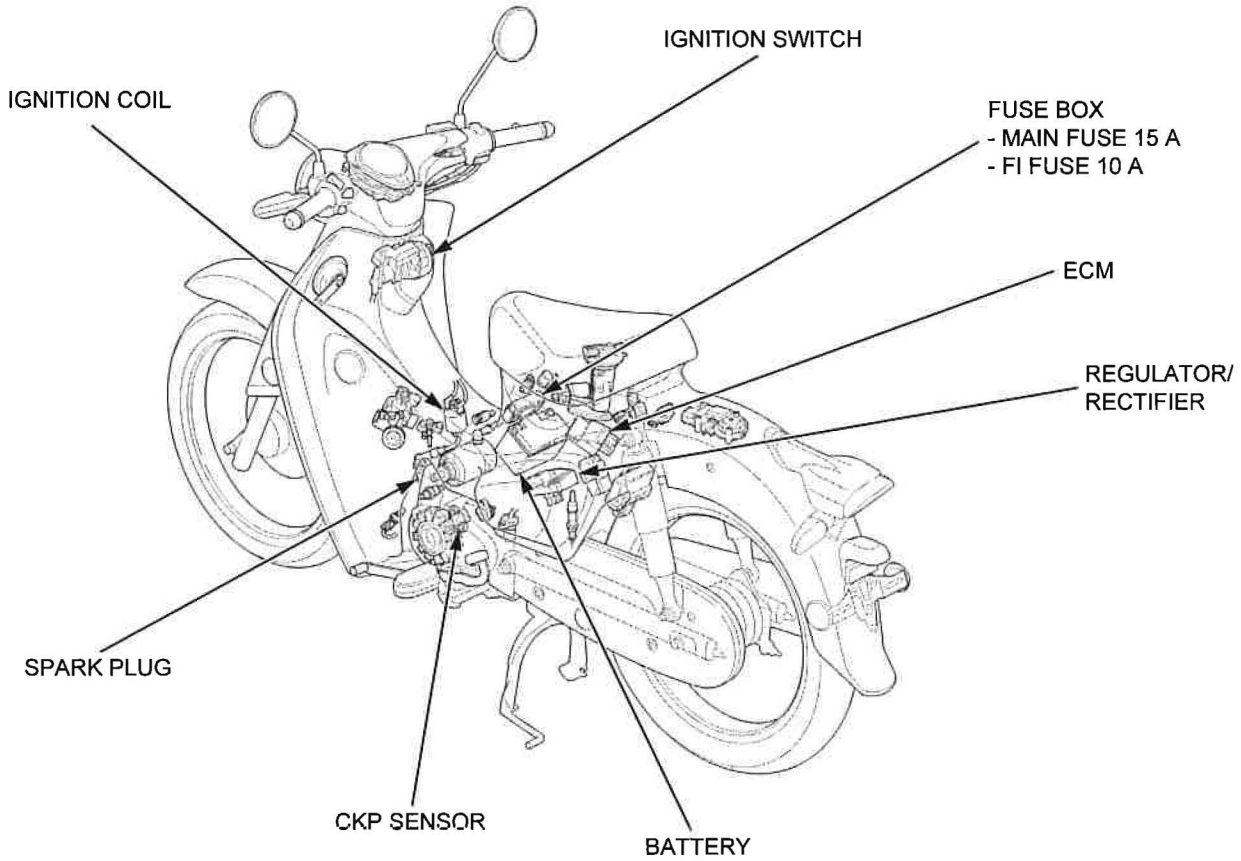
## TROUBLESHOOTING

- 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)
- If there is no spark at cylinder, temporarily exchange the ignition coil with a known-good one and perform the spark test. If there is spark, the original ignition coil is faulty.
- "Initial voltage" of the ignition primary coil is the battery voltage with the ignition switch turned ON.

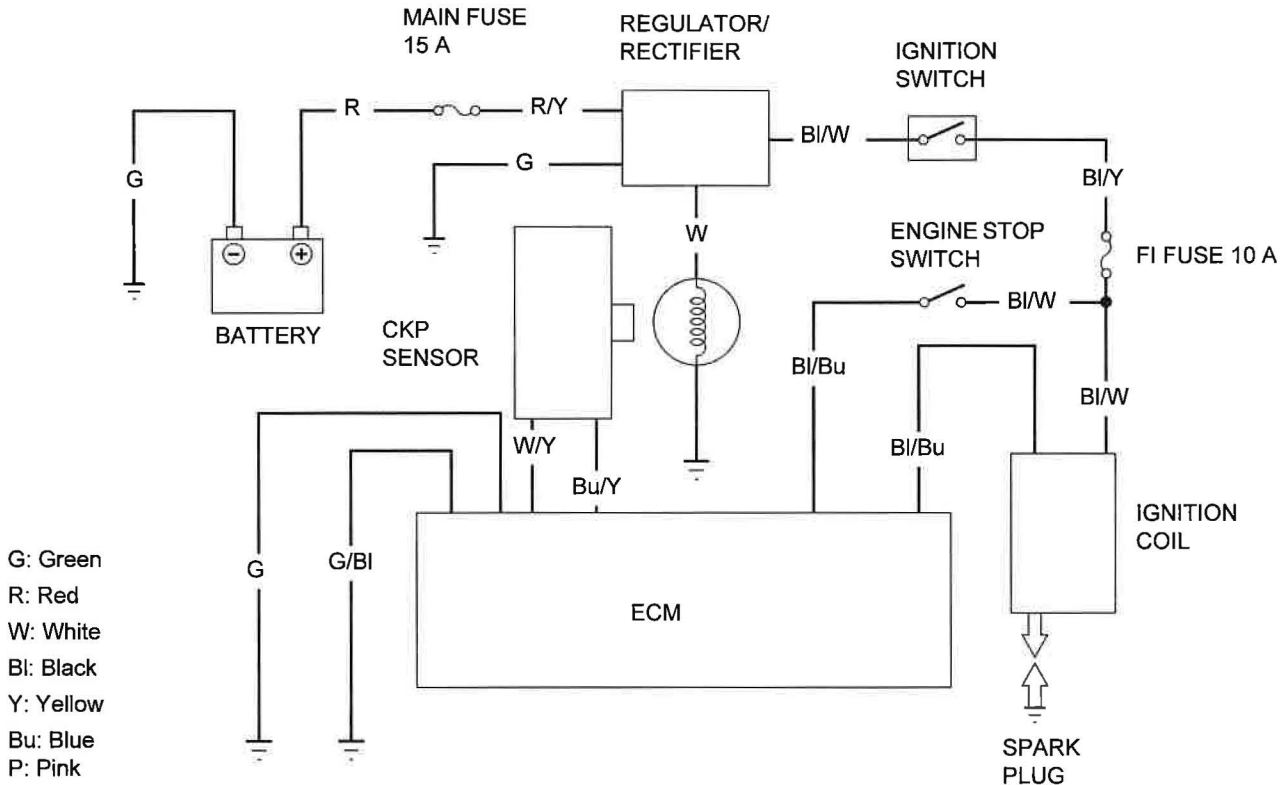
Unusual condition		Probable cause (Check in numerical order)
Ignition coil primary voltage	No initial voltage with the ignition switch turned ON (Other electrical components are normal).	<ol style="list-style-type: none"> <li>1. An open circuit in Black/white wire between the ignition coil and ignition switch</li> <li>2. Loose or poor connection of the primary terminal, or an open circuit in the primary coil</li> <li>3. Faulty ECM (in case when the initial voltage is normal with the ECM connector disconnected).</li> </ol>
	Initial voltage is normal, but it drops by 2 – 4 V while cranking the engine.	<ol style="list-style-type: none"> <li>1. Incorrect peak voltage adaptor connections (System is normal if measured voltage is over the specifications with reverse connections).</li> <li>2. Battery is undercharged (Voltage drops largely when the engine is started).</li> <li>3. No voltage between the Black/white (+) wire and body ground (-) at the ECM connector or poor connection of the ECM connector</li> <li>4. An open circuit or loose connection in Green or Green/black wire at the ECM</li> <li>5. An open circuit or loose connection in Black/blue wire between the ignition coil and ECM</li> <li>6. Faulty CKP sensor (Measure peak voltage)</li> <li>7. Faulty ECM (in case when above No. 1 through 6 are normal).</li> </ol>
	Initial voltage is normal but there is no peak voltage while cranking the engine.	<ol style="list-style-type: none"> <li>1. Incorrect peak voltage adaptor connections</li> <li>2. Faulty CKP sensor</li> <li>3. Faulty ECM (in case when above No. 1 through 2 are normal).</li> </ol>
	Initial voltage is normal but peak voltage is lower than the standard value.	<ol style="list-style-type: none"> <li>1. The multimeter impedance is too low; below 10 MΩ/DCV.</li> <li>2. Cranking speed is too slow (Battery is undercharged).</li> <li>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).</li> <li>4. Faulty ignition coil</li> <li>5. Faulty ECM (in case when above No. 1 through 4 are normal).</li> </ol>
	Initial and peak voltages are normal but no spark jumps.	<ol style="list-style-type: none"> <li>1. Faulty spark plug or leaking ignition coil secondary current</li> <li>2. Faulty ignition coil</li> </ol>
CKP sensor	Peak voltage is lower than standard value.	<ol style="list-style-type: none"> <li>1. The multimeter impedance is too low; below 10 MΩ/DCV.</li> <li>2. Cranking speed is too low. (Battery is undercharged.)</li> <li>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).</li> <li>4. Faulty CKP sensor (in case when above No.1 through 3 are normal).</li> </ol>
	No peak voltage	<ol style="list-style-type: none"> <li>1. Faulty peak voltage adapter</li> <li>2. Faulty CKP sensor</li> </ol>

# IGNITION SYSTEM

## SYSTEM LOCATION



## SYSTEM DIAGRAM



## IGNITION SYSTEM INSPECTION

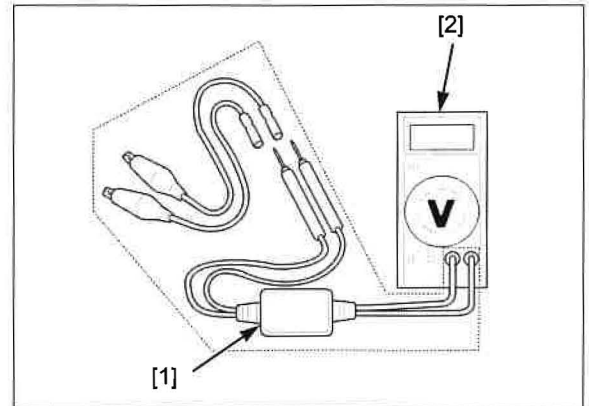
**NOTE:**

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

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

**TOOLS:**

**Peak voltage adaptor** 07HGJ-0020100 or  
**IgnitionMate peak voltage tester** MTP07-0286  
 (U.S.A. only)  
 with commercially available digital multimeter  
 (impedance 10 M $\Omega$ /DCV minimum)



### IGNITION COIL PRIMARY PEAK VOLTAGE

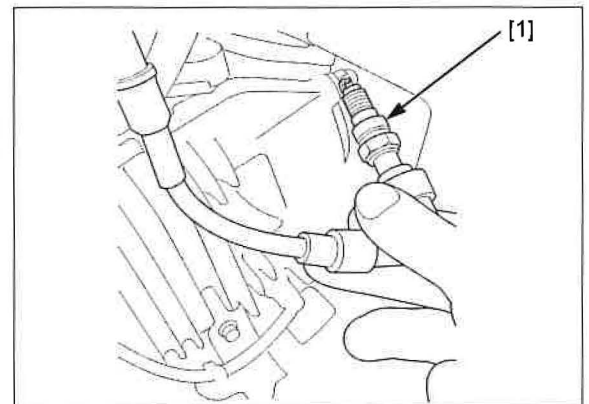
**NOTE:**

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

Support the vehicle with its centerstand.

Remove the leg shield (page 2-11).

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





## IGNITION SYSTEM

*Do not disconnect the ignition coil primary wire.* With the ignition coil primary wire connected, connect the peak voltage adaptor [1] or Imrie tester to the ignition coil primary terminal and ground.

### TOOLS:

**Peak voltage adaptor** 07HGJ-0020100 or  
**IgnitionMate peak voltage tester** MTP07-0286  
(U.S.A. only)

with commercially available digital multimeter  
(impedance 10 M $\Omega$ /DCV minimum)

### CONNECTION:

**Black/blue terminal (+) – Body ground (-)**

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

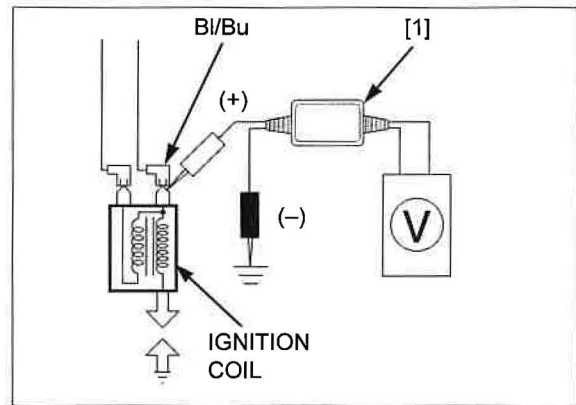
Shift the transmission into neutral.

*Avoid touching the spark plug and tester probes to prevent electric shock.* Crank the engine with the electric starter with the throttle grip fully opened and read the ignition coil primary peak voltage.

**PEAK VOLTAGE: 100 V minimum**

If the peak voltage is abnormal, refer to the troubleshooting on page 5-3.

Install the removed parts in the reverse order of removal.



## CKP SENSOR PEAK VOLTAGE

### NOTE:

- Check cylinder compression and check that the spark plug is installed correctly.

Disconnect the ECM 33P (Black) connector (page 4-8).

Connect the peak voltage adaptor or Imrie diagnostic tester to the ECM 33P (Black) connector [1] terminals.

### TOOLS:

**Peak voltage adaptor** 07HGJ-0020100 or  
**IgnitionMate peak voltage tester** MTP07-0286  
(U.S.A. only)

with commercially available digital multimeter  
(impedance 10 M $\Omega$ /DCV minimum)

**Test probe (2 pack)** 07ZAJ-RDJA110

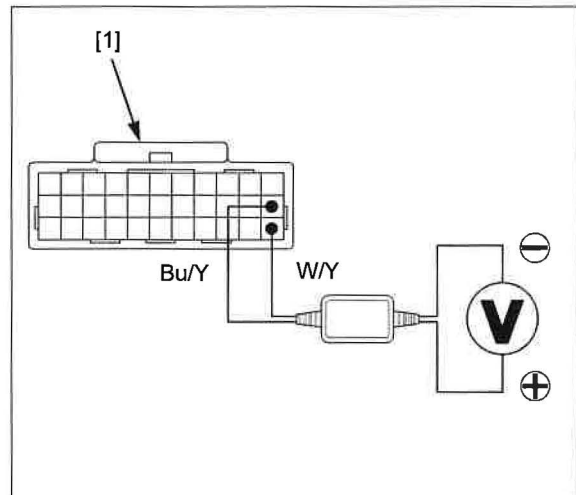
**CONNECTION: Blue/yellow (+) – White/yellow (-)**

Turn the ignition switch ON and shift the transmission in neutral.

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

**PEAK VOLTAGE: 0.7 V minimum**

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



Turn the ignition switch OFF.

Remove the left body cover (page 2-13).

Disconnect the alternator/CKP sensor 4P connector [1] and connect the peak voltage tester or adaptor probes to the connector terminals of the CKP sensor side.

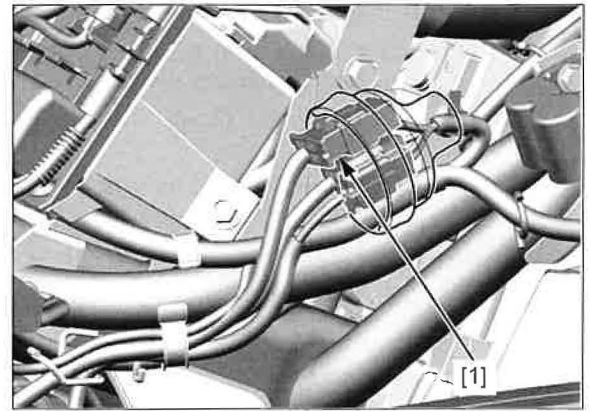
**CONNECTION: Blue/yellow (+) – White/yellow (-)**

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.

- 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 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 on page 5-3.

If the CKP sensor is faulty, replace the CKP sensor (page 12-4).

Install the removed parts in the reverse order of removal.



## IGNITION COIL

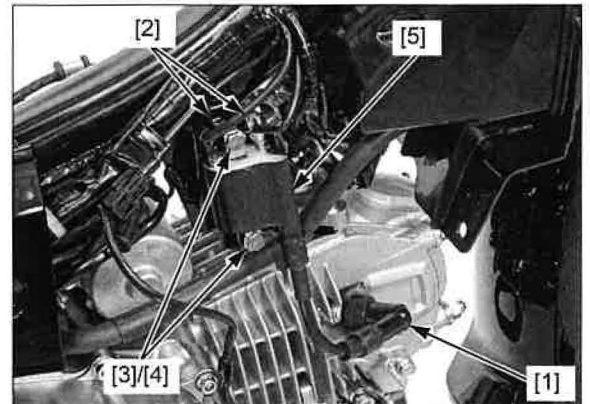
### REMOVAL/INSTALLATION

Remove the leg shield (page 2-11).

Disconnect the spark plug cap [1] from the spark plug.

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

Installation is in the reverse order of removal.



## IGNITION SYSTEM

### IGNITION TIMING

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

Remove the timing hole cap from the left crankcase cover.

Start the engine, let it idle for about 20 minutes and warm it up to the operating temperature.

*Read the instructions for timing light operation.*

Stop the engine and connect a timing light [1] to the spark plug wire.

Start the engine and let it idle.

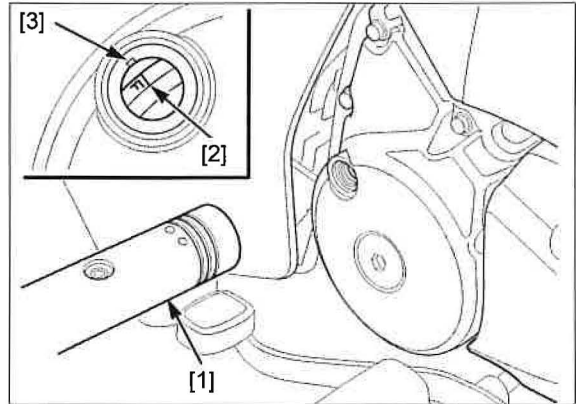
**IDLE SPEED: 1,400 ± 100 rpm**

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

If the ignition timing is incorrect, replace the ECM with a known-good one and recheck.

Apply engine oil to a new timing hole cap O-ring.  
Install and tighten the timing hole cap to the specified torque.

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



# 6. ELECTRIC STARTER SYSTEM

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<b>SERVICE INFORMATION</b> .....	<b>6-2</b>	<b>SYSTEM DIAGRAM</b> .....	<b>6-3</b>
<b>TROUBLESHOOTING</b> .....	<b>6-2</b>	<b>STARTER MOTOR</b> .....	<b>6-4</b>
<b>SYSTEM LOCATION</b> .....	<b>6-3</b>	<b>STARTER RELAY</b> .....	<b>6-8</b>

## ELECTRIC STARTER SYSTEM

# SERVICE INFORMATION

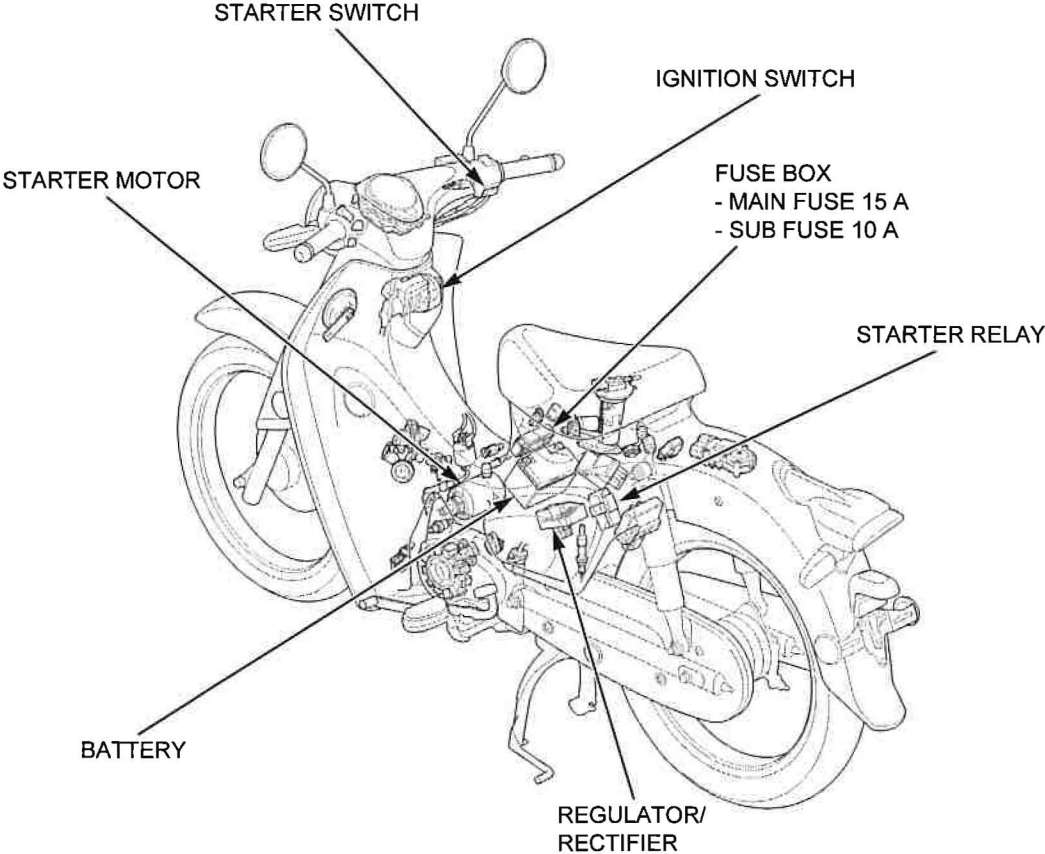
### GENERAL

- Always turn the ignition switch "OFF" before servicing the starter motor. The motor could suddenly start, causing serious injury.
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- The starter motor can be serviced with the engine in the frame.
- When checking the starter system, always follow the steps in the troubleshooting (page 6-2).
- If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.
- Refer to the following component information.
  - Ignition switch (page 21-37)
  - Starter switch (page 20-11)
  - Engine stop switch (page 20-11)

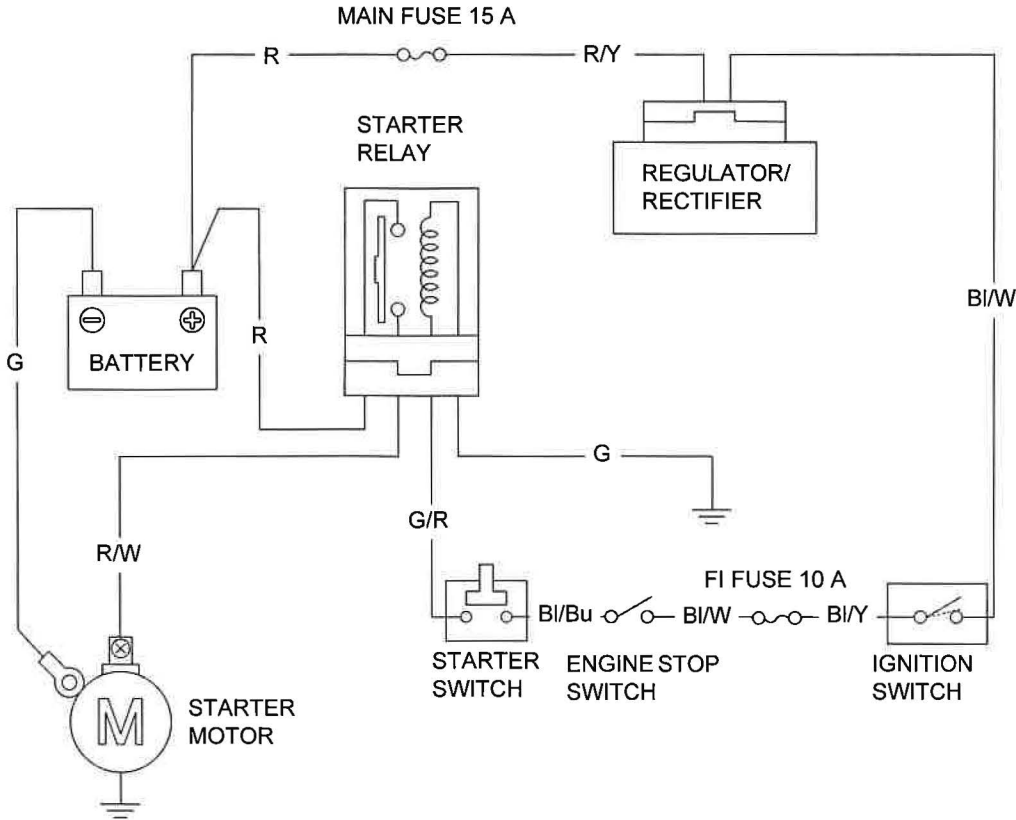
### TROUBLESHOOTING

	<b>Unusual condition</b>	<b>Probable cause (Check in numerical order)</b>
Starter motor	Starter motor does not turn	<ol style="list-style-type: none"><li>1. Loose or poor contact on related connectors and terminals</li><li>2. Blown fuse</li><li>3. Weak battery</li><li>4. Faulty starter relay switch</li><li>5. Faulty starter motor</li><li>6. Loose connection, open or short circuit in starter motor cable</li><li>7. Faulty starter switch</li><li>8. Open circuit in starter relay switch ground circuit</li><li>9. Open or short circuit in starter relay switch power circuit</li><li>10. Loose contact or open circuit in related wires</li></ol>
	Starter motor turns slowly	<ol style="list-style-type: none"><li>1. Low battery voltage</li><li>2. Poorly connected battery terminal cable</li><li>3. Poorly connected starter motor cable</li><li>4. Faulty starter motor</li><li>5. Poorly connected battery ground cable</li></ol>
	Starter motor turns, but engine does not turn	<ol style="list-style-type: none"><li>1. Starter motor is running backwards<ul style="list-style-type: none"><li>– Case assembled improperly</li><li>– Terminals connected improperly</li></ul></li><li>2. Faulty starter clutch</li><li>3. Damaged or faulty starter idle gear and/or reduction gear</li></ol>
	Starter relay switch "Clicks", but engine does not turn over	<ol style="list-style-type: none"><li>1. Crankshaft does not turn due to engine problems</li></ol>

SYSTEM LOCATION



SYSTEM DIAGRAM



# ELECTRIC STARTER SYSTEM

## STARTER MOTOR

### REMOVAL/INSTALLATION

Remove the leg shield (page 2-11).

Disconnect the battery negative (-) terminal.

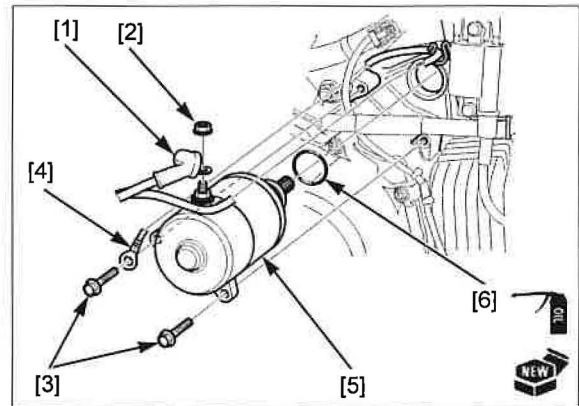
Remove the rubber cap [1] and terminal nut [2], then disconnect the starter motor cable.

Remove the bolts [3], ground cable [4] and starter motor [5] from the engine.

Remove the O-ring [6].

Installation is in the reverse order of removal.

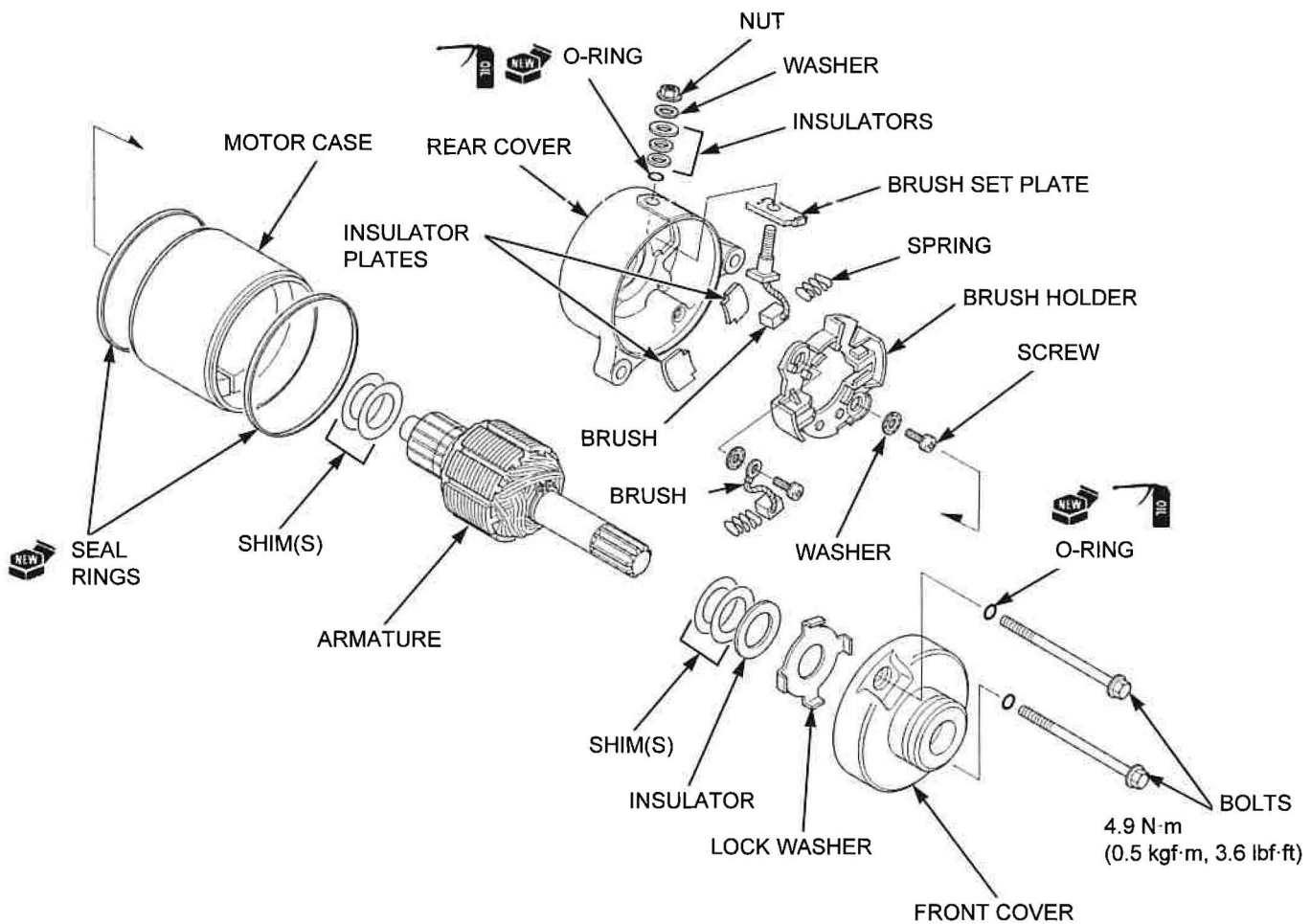
- Coat a new O-ring with engine oil



### DISASSEMBLY

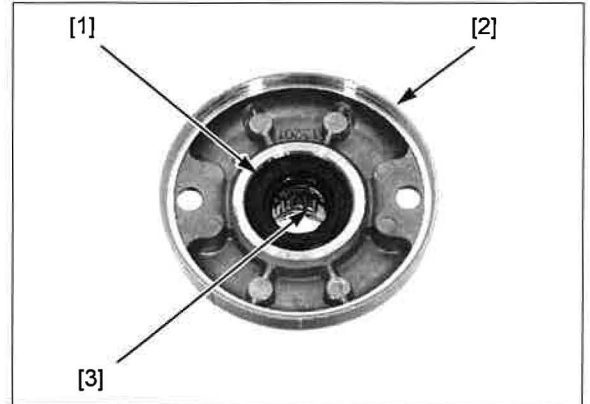
Disassemble the starter motor according to the illustration.

- Record the location and number of shims.



## INSPECTION

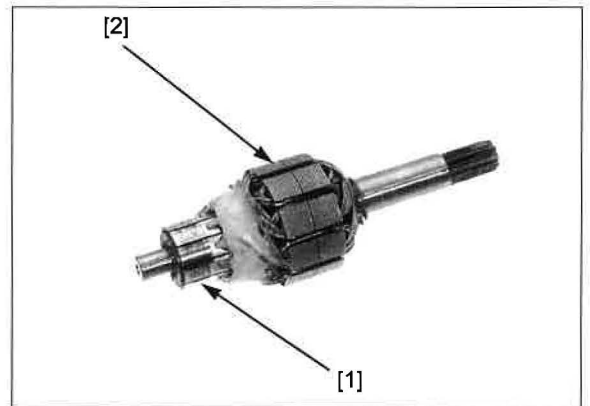
Check the oil seal [1] of the front cover [2] for deterioration or damage, and needle bearing [3] for wear or damage.



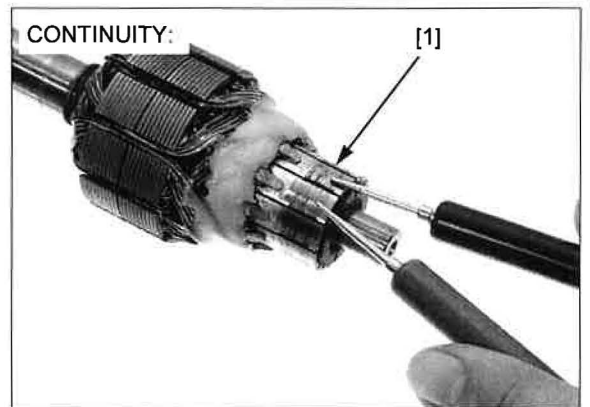
Check the commutator bars [1] of the armature [2] for discoloration, wear or damage.

*Do not use emery or sand paper on the commutator.*

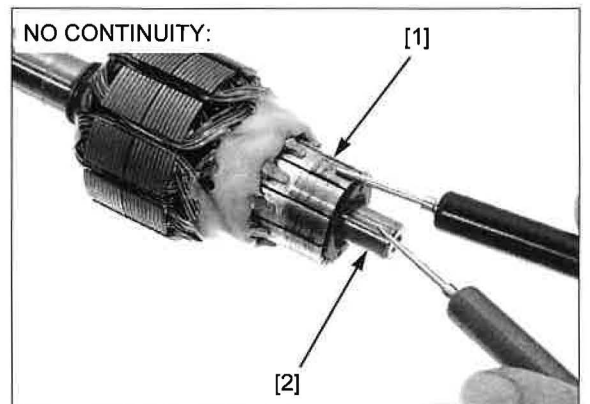
Clean the metallic debris off between commutator bars.  
Replace the armature with a new one if necessary.



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



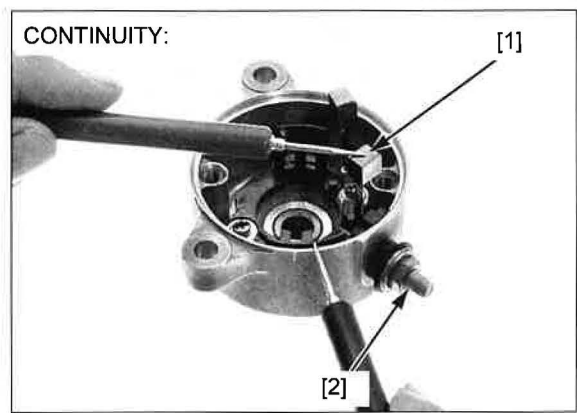
Check for continuity between each commutator bar [1] and the armature shaft [2].  
There should be no continuity.



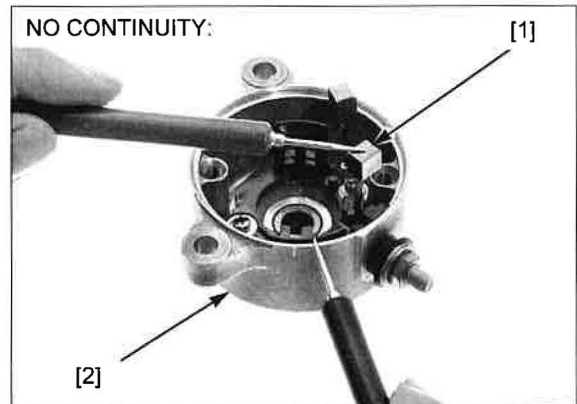


## ELECTRIC STARTER SYSTEM

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

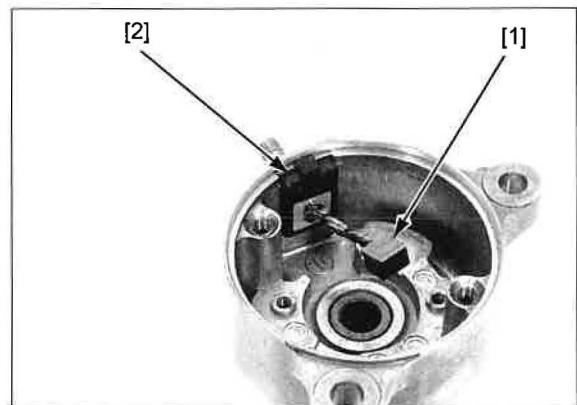


Check for continuity between the insulated brush [1] and rear cover [2].  
There should be no continuity.

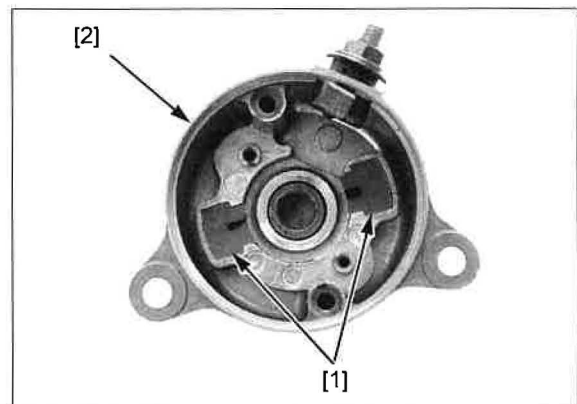


### ASSEMBLY

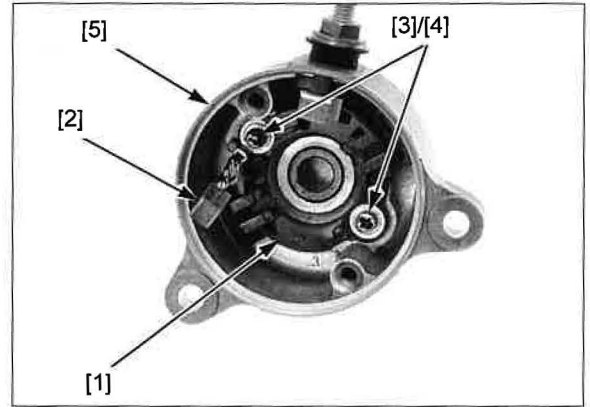
Install the brush [1] and brush set plate [2] into the rear cover.



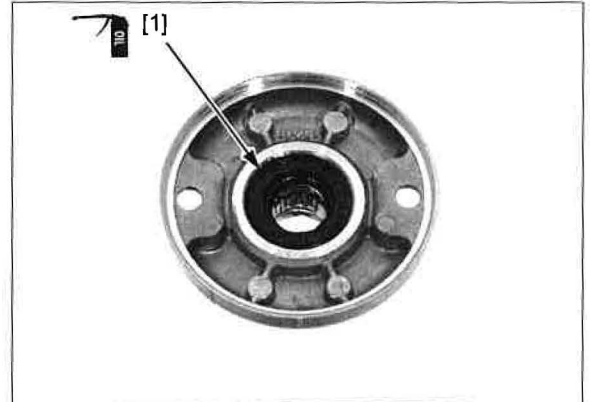
Install the insulator plates [1] onto the rear cover [2].



Install the brush holder [1], brush [2], washers [3] and screws [4] into the rear cover [5] as shown.



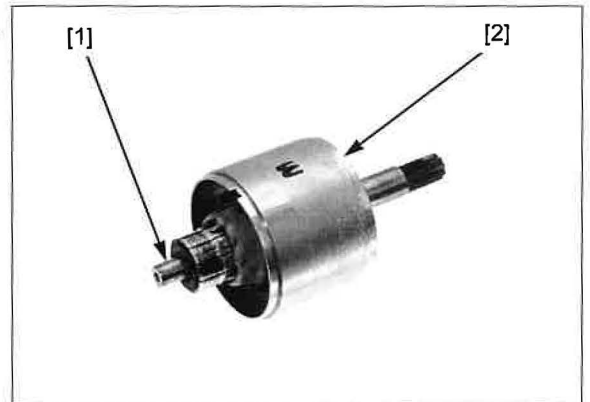
Apply oil to the oil seal lips [1].



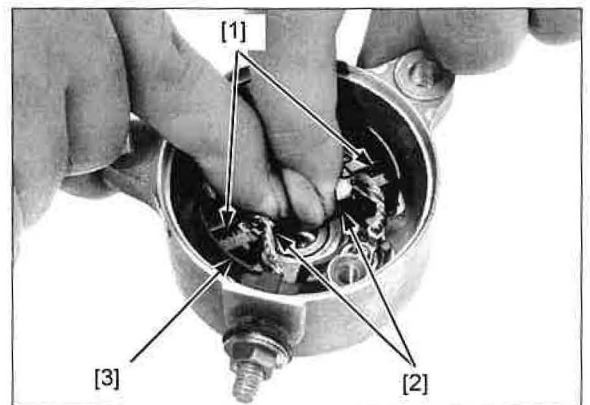
Install the armature [1] into the motor case [2] while holding the armature shaft tightly to keep the magnet of the motor case from pulling the armature shaft against it.

## NOTICE

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



Install the springs [1] and brushes [2] into the brush holder [3].



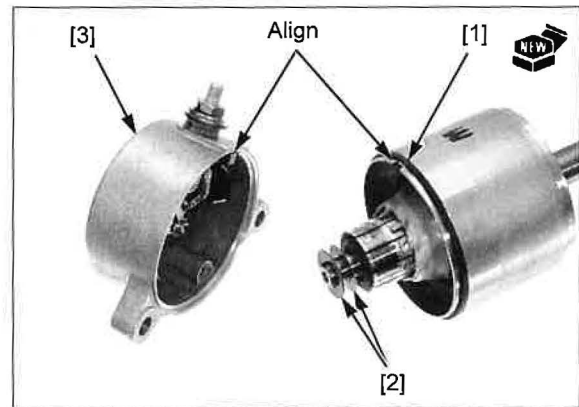
## ELECTRIC STARTER SYSTEM

Install a new seal ring [1].

*Install the same number of shims in the same locations as noted during disassembly.*

Install the shims [2] onto the armature shaft.

Install the rear cover [3] while pushing the brushes into the brush holder and aligning the brush set plate tab with the motor case groove.



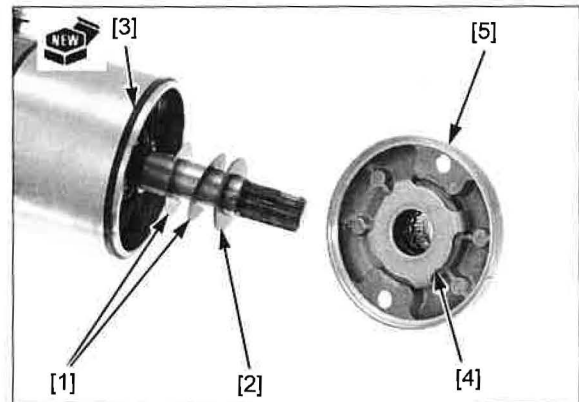
*Install the same number of shims in the same locations as noted during disassembly.*

Install the shims [1], insulator [2] and a new seal ring [3].

Install the lock washer [4] to the front cover [5].

Install the front cover.

- When installing the front cover, take care to prevent damaging the oil seal lip with the armature shaft.

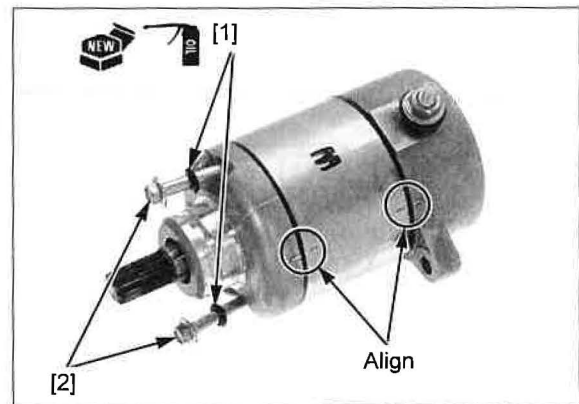


Align the index lines on the covers and motor case.

Apply oil to new O-rings [1] and install them onto the motor case bolts [2].

Install and tighten the starter motor case bolts to the specified torque.

**TORQUE: 4.9 N·m (0.5 kgf·m, 3.6 lbf·ft)**



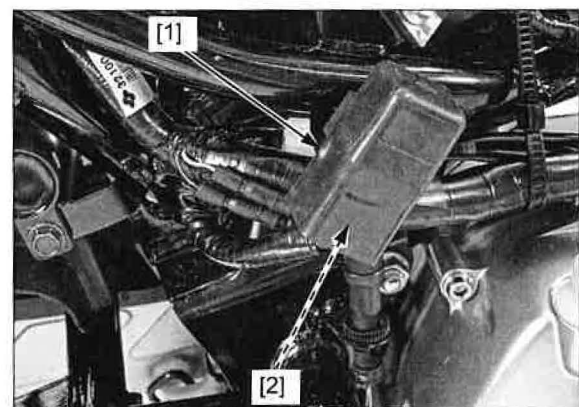
## STARTER RELAY

### REMOVAL/INSTALLATION

Remove the right body cover (page 2-13).

Remove the starter relay [1] from the stay.  
Disconnect the starter relay 5P connector [2].

Installation is in the reverse order of removal.



**OPERATION INSPECTION**

Remove the right body cover (page 2-13).

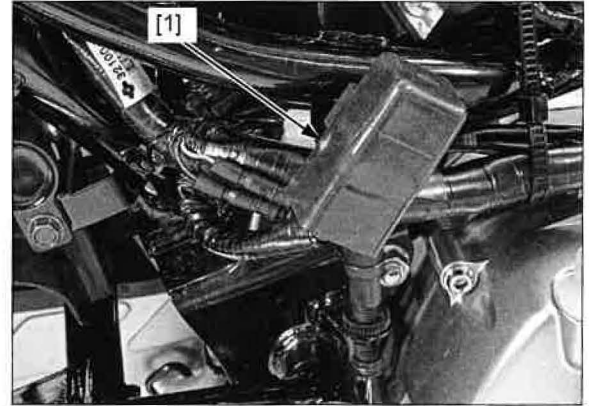
Shift the transmission in neutral.

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

Push the starter switch.

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

If you hear the relay "CLICK", but starter does not turn or If you don't hear the relay "CLICK", inspect the starter relay continuity (page 6-9).



**STARTER POWER LINE INSPECTION**

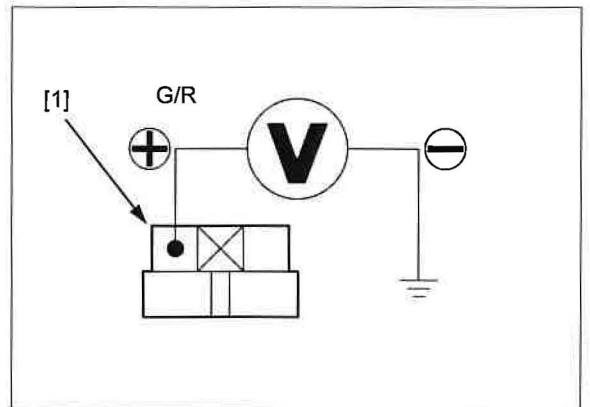
Remove the starter relay (page 6-8).

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

Measure the Voltage between the starter relay 5P connector [1] of the wire harness side and ground.

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

If the battery voltage appears only when the starter switch is pressed, the circuit is normal.



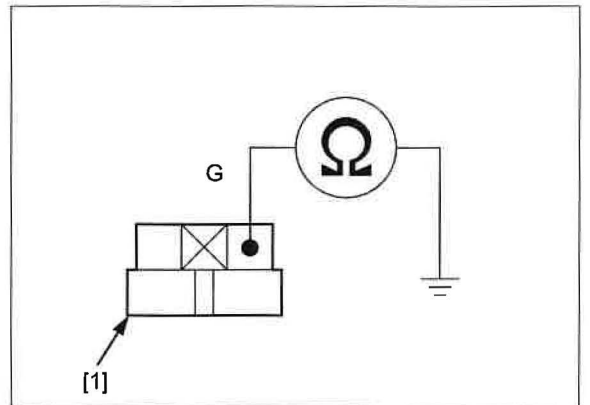
**STARTER GROUND LINE CIRCUIT INSPECTION**

Remove the starter relay (page 6-8).

Measure the continuity between the starter relay 5P connector [1] of the wire harness side and ground

**CONNECTION: Green – Ground**

If there is continuity, the circuit is normal.



## ELECTRIC STARTER SYSTEM

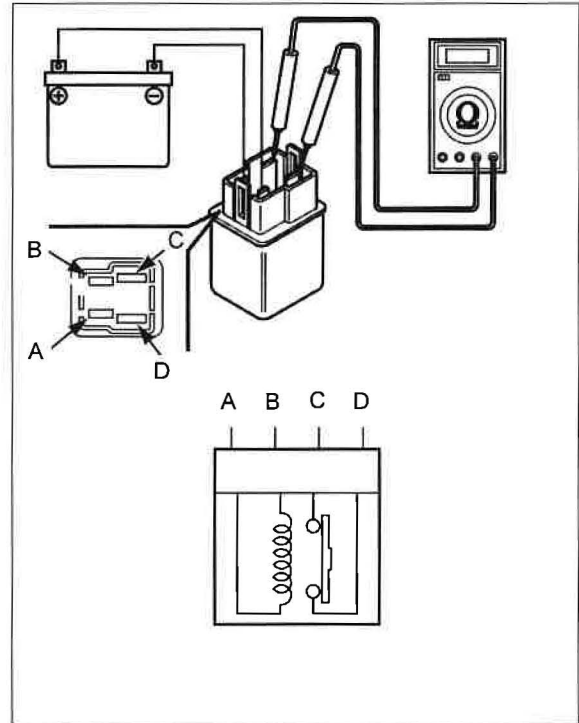
### STARTER RELAY CONTINUITY INSPECTION

Remove the starter relay (page 6-8).

Connect a fully charged 12 V battery positive wire to the relay switch terminal A and negative wire to the terminal B.

Check for continuity at the terminal C and terminal D.

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



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FUEL SYSTEM COMPONENT LOCATION .....	7-4	AIR CLEANER HOUSING .....	7-11
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FUEL SUPPLY TEST.....	7-8	FUEL INJECTOR .....	7-14
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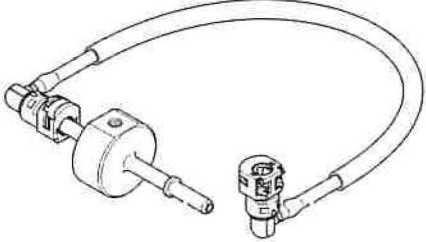
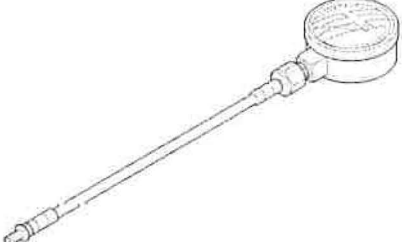
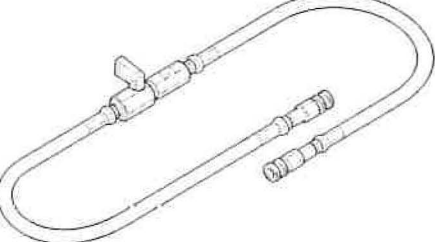
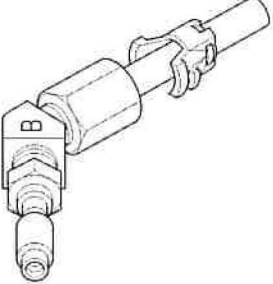

## FUEL SYSTEM

# SERVICE INFORMATION

## GENERAL

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- 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 7-5).

## TOOLS

<p>Fuel Pressure Gauge Attachment Set 070MJ-K260100</p>  <p>Fuel Adapter Male "B" 07AAJ-S6MA200, quantity 2. Use with fuel line P/N: 17570-K26-901 (U.S.A. only)</p>	<p>Fuel Pressure Gauge Set 07406-0040004</p>  <p>07406-004000C or 07406-004000B (U.S.A. only)</p>	<p>Fuel Pressure Manifold Hose 07AMJ-HW3A100 (U.S.A. only)</p> 
<p>Fuel Adapter Male "B" 07AAJ-S6MA200 (U.S.A. only)</p> 	<p>Fuel Adapter Female 90° 07AMJ-K26A100 (U.S.A. only)</p> 	

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## TROUBLESHOOTING

### Engine won't start

- Deteriorated fuel
- Bent or kinked fuel hose
- Clogged fuel tank breather hole
- Clogged fuel filter
- Faulty fuel pump or its drive circuit
- Intake air leak
- Faulty fuel injector
- Faulty ignition system
- Faulty ECM
- Faulty fuel pump relay or its related circuit

### Engine stall, hard to start, rough idling

- Deteriorated fuel
- Bent or kinked fuel hose
- Clogged fuel tank breather hole
- Clogged fuel filter
- Restricted idle air port/dirty idle air screw
- Intake air leak
- Faulty ignition system
- Faulty charging system

### Backfiring or misfiring during acceleration

- Faulty ignition system

### Engine lacks power

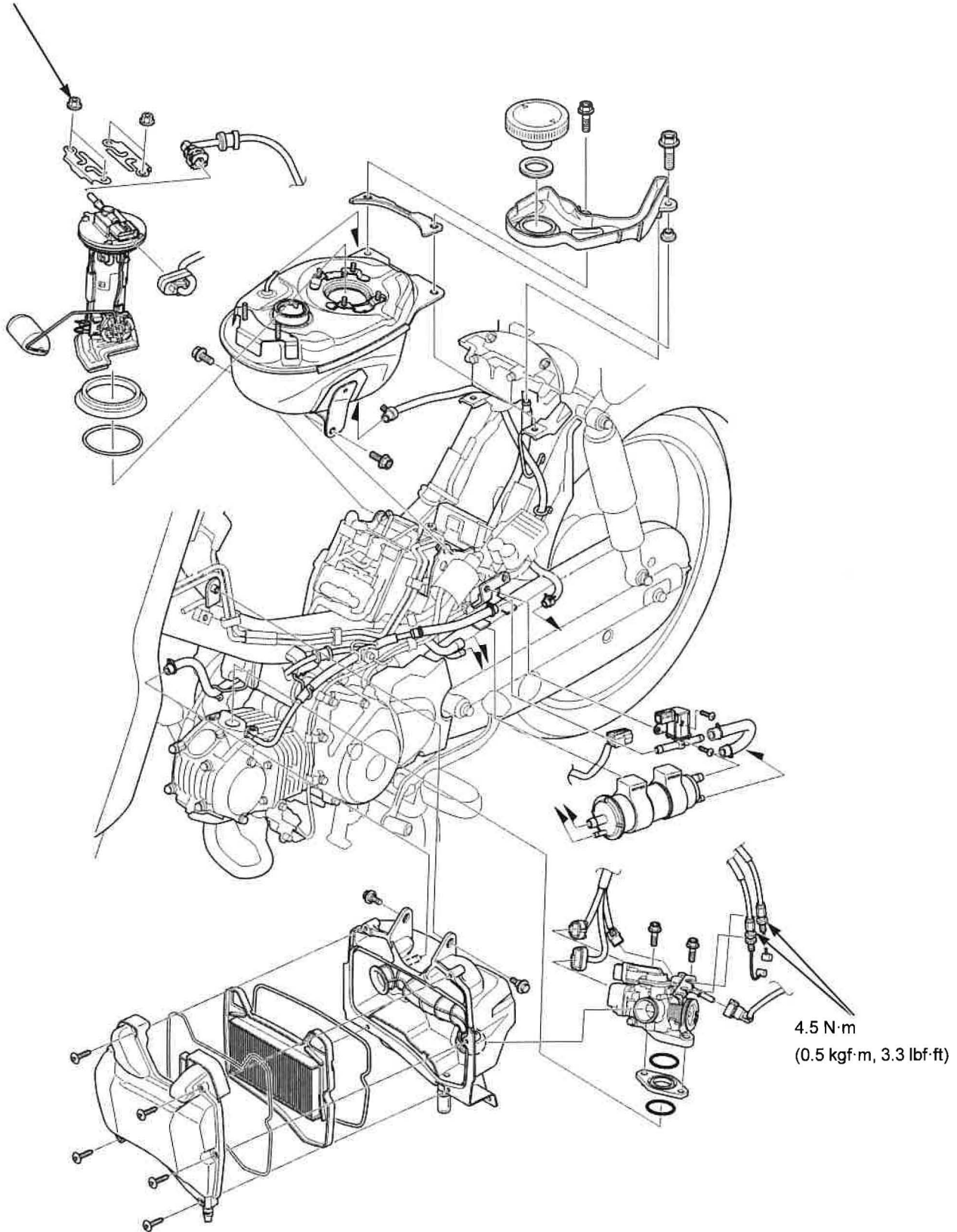
- Bent or kinked fuel hose
- Clogged fuel tank breather hole
- Clogged fuel filter
- Faulty fuel pump or its drive circuit
- Faulty fuel injector
- Faulty ignition system
- Clogged air cleaner element



# FUEL SYSTEM

## FUEL SYSTEM COMPONENT LOCATION

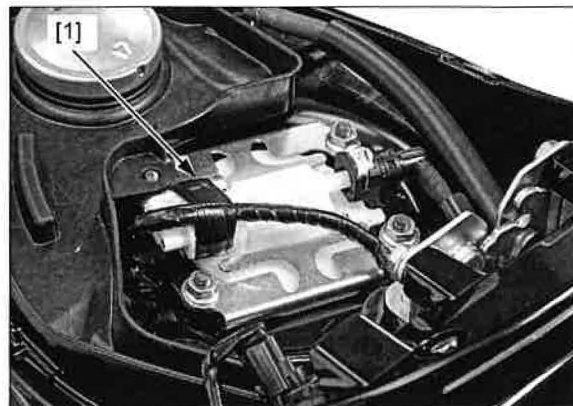
12 N·m  
(1.2 kgf·m, 9.0 lbf·ft)



## FUEL LINE INSPECTION

### FUEL PRESSURE RELIEVING/QUICK CONNECT FITTING REMOVAL

- Before disconnecting fuel feed hose, relieve pressure from the system by following the procedures below.
  - This vehicle uses resin for the part of materials in the fuel feed hose. Do not bend or twist the fuel feed hose.
1. Turn the ignition switch OFF.
  2. Remove the fuel tank cover (page 2-12).
  3. Disconnect the fuel pump 5P connector [1].
  4. Start the engine and let it idle until the engine stalls.
  5. Turn the ignition switch OFF.
  6. Disconnect the battery negative (-) cable (page 19-5).

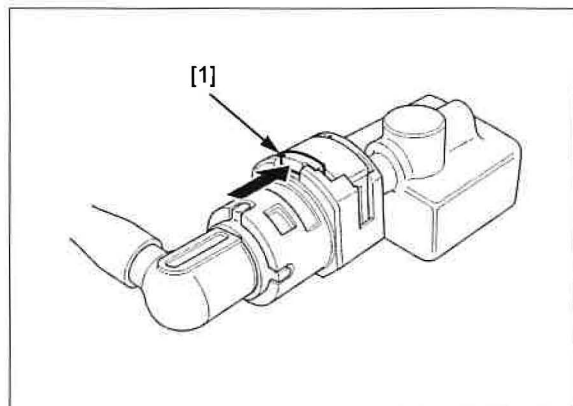


### QUICK CONNECT FITTING REMOVAL

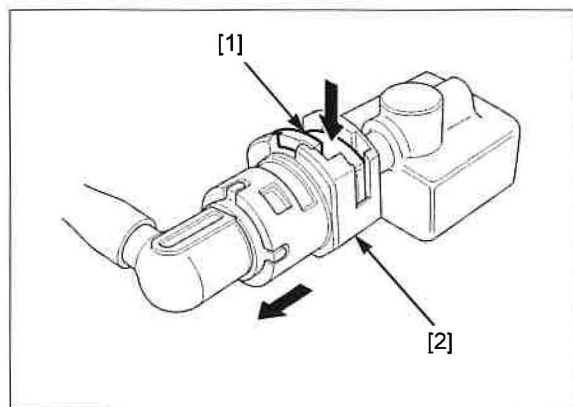
**NOTE:**

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

1. Relieve the fuel pressure (page 7-5).
2. Disconnect the negative (-) cable from the battery (page 19-5).
3. Place a shop towel over the quick connect fitting.
4. Push the retainer tab [1] forward.



5. Press down the retainer [1] and hold.  
Disconnect the connector [2] from the fuel pump joint/fuel injector joint.  
Check the retainer condition and replace it if necessary.



**NOTE:**

- Prevent the remaining fuel in the fuel feed hose from flowing out, using a shop towel.
  - Be careful not to damage the hose or other parts.
  - Do not use tools.
  - If the connector does not move, alternately pull and push the connector until it comes off easily.
6. To prevent damage and keep foreign matter out, cover the disconnected connector and pipe end with the plastic bags.

### QUICK CONNECT FITTING INSTALLATION

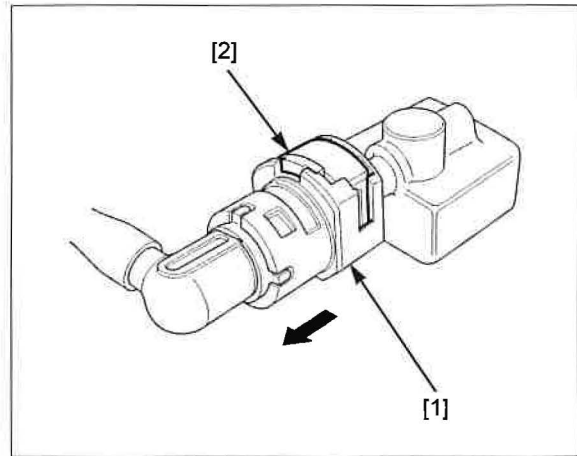
**NOTE:**

- Do not bend or twist the fuel feed hose.
- Align the quick connect fitting with the pipe.

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

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

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



### FUEL PRESSURE NORMALIZATION

1. Be sure the fuel pump 5P connector [1] is connected.
2. Connect the positive (+) cable to the battery (page 19-5).
3. Turn the ignition switch ON with the engine stop switch "O".

**NOTE:**

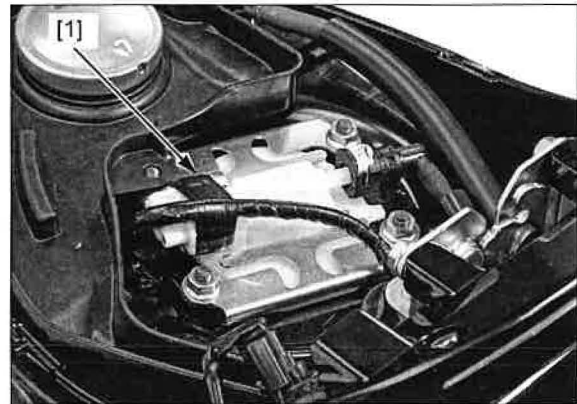
- Do not start the engine.

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

Turn the ignition switch OFF.

Repeat step 2 two or three times, and check that there is no leakage.

4. Install the fuel tank (page 7-11).



## FUEL PRESSURE TEST

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

Attach the fuel pressure gauge and attachments.

### TOOLS:

- [1] Fuel pressure gauge set 07406-0040004  
 [2] Pressure gauge attachment set 070MJ-K260100

### U.S.A. TOOLS:

- Fuel Pressure Gauge 07406-004000C  
 Fuel Pressure Manifold Hose 07AMJ-HW3A100  
 Fuel Adapter Male "B" 07AAJ-S6MA200  
 Fuel Adapter Female 90° 07AMJ-K26A100

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

Start the engine and let it idle.

Read the fuel pressure.

### STANDARD:

263 – 316 kPa (2.7 – 3.2 kgf/cm<sup>2</sup>, 38 – 46 psi)

If the fuel pressure is higher than specified pressure, replace the fuel pump unit.

If the fuel pressure is lower than specified pressure, inspect the following:

- Fuel line for leakage
- Fuel filter for clogs
- Fuel pump (page 7-8)

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

Disconnect the negative (-) cable from the battery (page 19-5).

Remove the special tools.

Reconnect the quick connect fitting and normalize the fuel pressure (page 7-7).

## FUEL FLOW INSPECTION

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

Connect the special tool to the fuel pump joint.

### TOOLS:

- [1] Pressure gauge attachment set 070MJ-K260100

### U.S.A. TOOLS:

- Fuel Pressure Manifold Hose 07AMJ-HW3A100  
 Fuel Adapter Female 90° 07AMJ-K26A100

Place the end of the hose into an approved gasoline container.

Temporarily connect the positive cable and negative cable to the battery and fuel pump 5P connector.

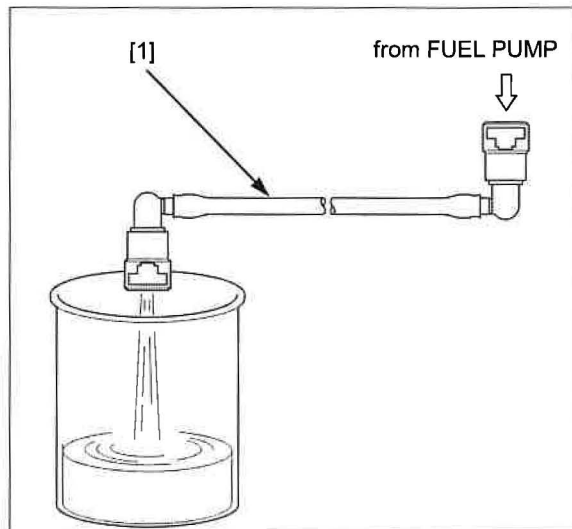
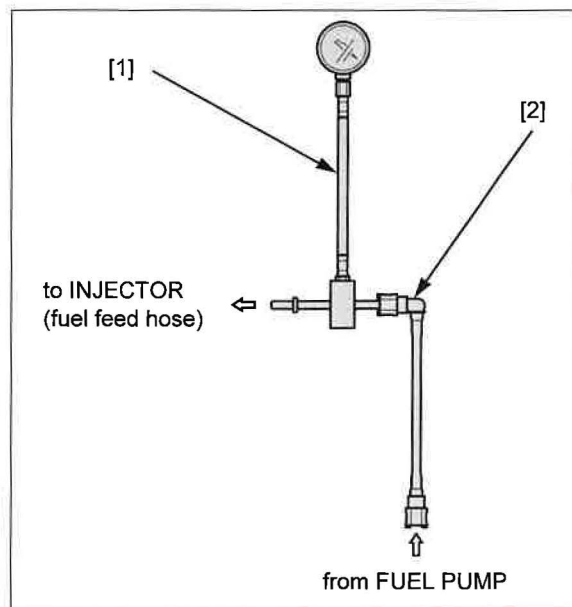
Turn the ignition switch ON with the engine stop switch "O".

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 once inspection has been completed.

Wipe off spilled out gasoline.



## FUEL SYSTEM

### Amount of fuel flow:

82 cm<sup>3</sup> (2.8 US oz, 2.9 Imp oz) minimum/  
10 seconds at 12 V

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

- Fuel line for leakage
- Fuel filter for clogs
- Fuel pump (page 7-8)

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

## FUEL SUPPLY TEST

### 1. Fuel Pressure Test 1.

Perform the fuel pressure test (page 7-7).

#### STANDARD:

263 – 316 kPa (2.7 – 3.2 kgf/cm<sup>2</sup>, 38 – 46 psi)

*Is the fuel pressure within specification?*

YES – GO TO STEP 3.

NO – GO TO STEP 2.

### 2. Fuel Pressure Test 2.

Check that there is any erratic swing or vibration of the gauge needle in the pressure gauge reading.

*Is there any erratic swing or vibration of the gauge needle?*

YES – Replace the fuel filter (page 7-9).

NO – Replace the fuel pump unit (page 7-8).

### 3. Fuel Flow Test

Adjust the fuel in the tank until the lowest segment [1] of the fuel level gauge is illuminated.

#### SPECIFIED RANGE:

THE LOWEST SEGMENT IS ILLUMINATED. (No blinking)

Inspect the fuel flow (page 7-7).

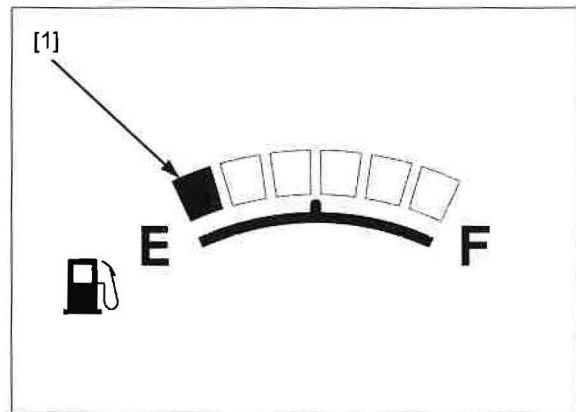
#### AMOUNT OF FUEL FLOW:

82 cm<sup>3</sup> (2.8 US oz, 2.9 Imp oz) minimum/  
10 seconds at 12 V

*Is the fuel flow above specification?*

YES – Check for other malfunctioning parts.

NO – Replace the fuel filter (page 7-9).



## FUEL PUMP UNIT

### SYSTEM INSPECTION

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

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

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

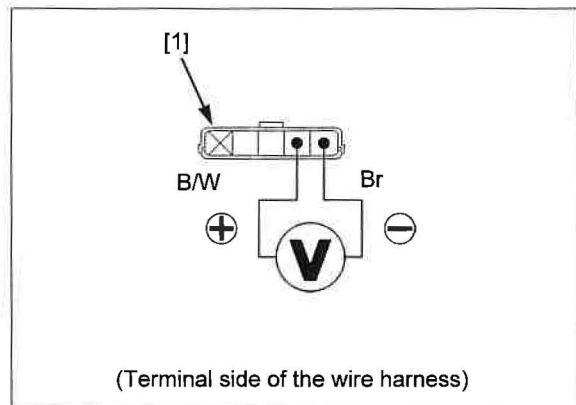
**CONNECTION:** Black/white (+) – Brown (-)

**STANDARD:** Battery voltage for a few seconds after the ignition switch is turned on

If there is battery voltage, the related circuit is normal.

If there is no voltage, inspect the following:

- Open circuit in the Black/white wire
- ECM (page 4-31)



## REMOVAL/INSTALLATION

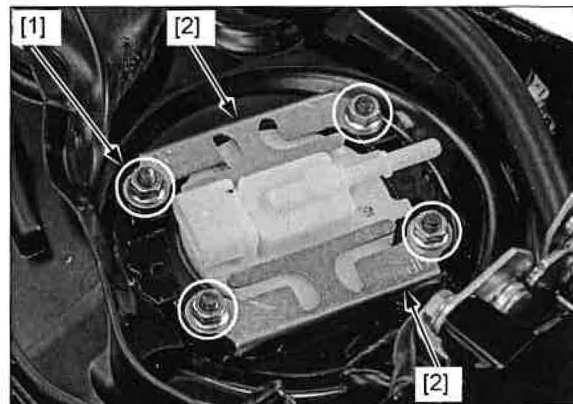
- This vehicle uses resin for the part of materials in the fuel hose. Do not bend or twist the fuel hose.

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

Clean around the fuel pump.

Loosen the four nuts [1] in a criss-cross pattern in several steps.

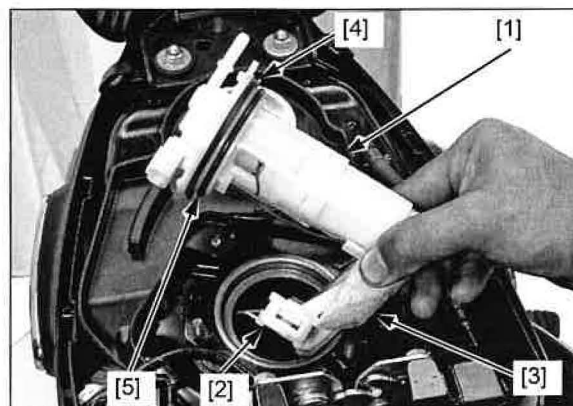
Remove the nuts and set plates [2].



Pull up the fuel pump unit [1] until the fuel level sensor [2] comes out of the hole while folding the filter [3] to prevent damage as shown.

Remove the dust seal [4] and O-ring [5] from the fuel pump unit.

- Check the fuel pump unit for damage, replace it if necessary.
- Be careful not to deform the float arm of the fuel level sensor.

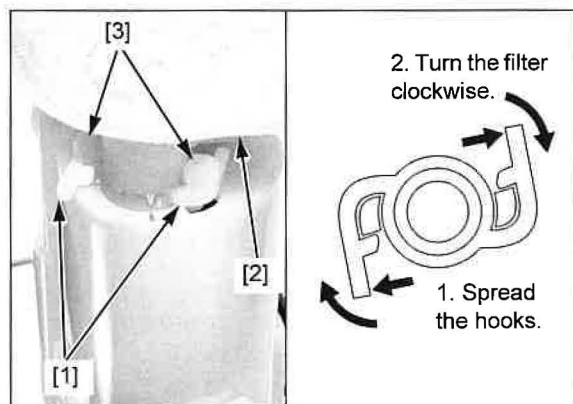


## FUEL FILTER REPLACEMENT

Remove the fuel pump unit (page 7-8).

Release the hooks [1] of the fuel filter [2] from the stoppers [3] by slightly spreading the hooks, then turn the filter clockwise.

Pull up the filter and remove it from the fuel pump.



Remove the O-ring [1].

Apply a small amount of engine oil to a new O-ring and install it.

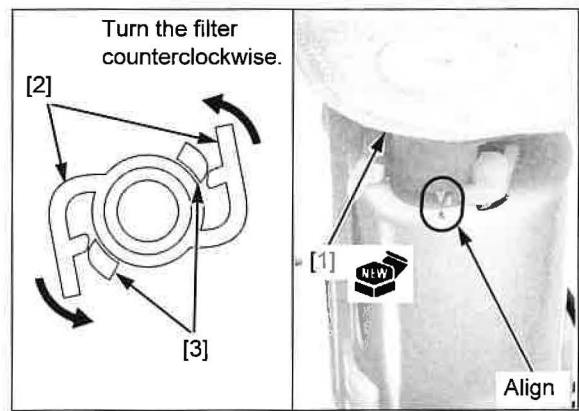


## FUEL SYSTEM

Install a new filter [1] in the correct direction so that the triangle marks on the filter and fuel pump body will be aligned when it is hooked.

Turn the filter counterclockwise until the hooks [2] are completely secured by the stoppers [3], being careful not to damage them.

Install the fuel pump unit (page 7-8).



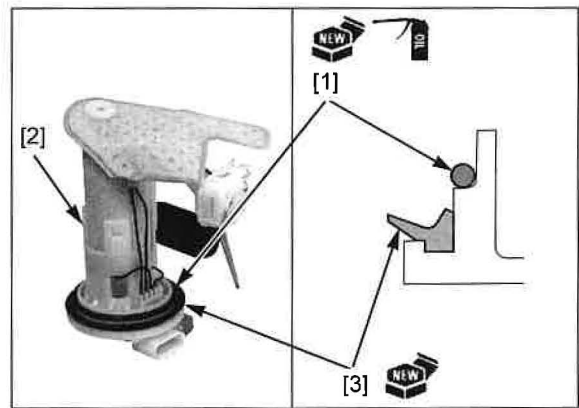
## INSTALLATION

*Always replace the O-ring and dust seal with new ones.*

*Be careful not to pinch the dirt and debris between the fuel pump unit, O-ring and dust seal.*

Apply a small amount of engine oil to a new O-ring [1] and install it onto the fuel pump unit [2].

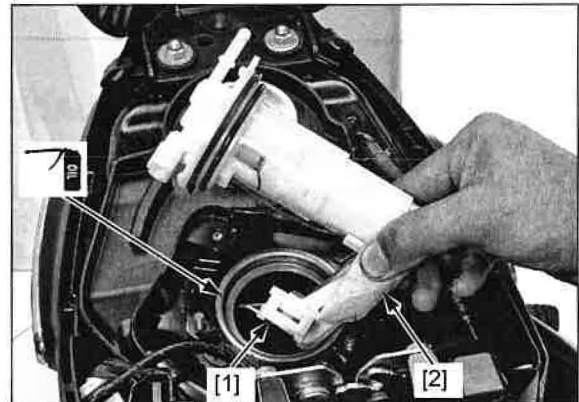
Install a new dust seal [3] in the correct direction as shown.



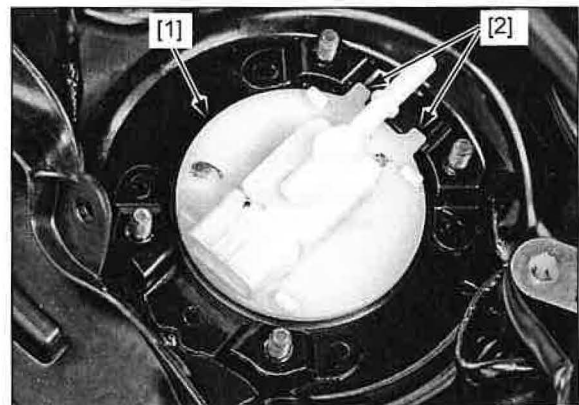
Apply a small amount of engine oil to the O-ring and dust seal seating area of the fuel tank.

Insert the float into the fuel tank hole.

Insert the fuel level sensor [1] into the tank while bending the fuel filter [2] as shown, being careful not to damage the filter and float arm.



Push the fuel pump unit [1] into the fuel tank so that the pump tabs [2] are positioned between the ribs as shown.



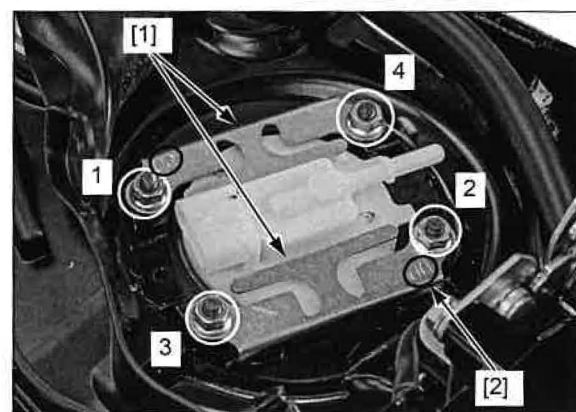
Install the two set plates [1] with their "UP" marks [2] facing up while pushing down the fuel pump unit.

Install and tighten the fuel pump set plate nuts to the specified torque in the specified sequence as shown.

**TORQUE: 12 N·m (1.2 kgf·m, 9.0 lbf·ft)**

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

Perform the TP sensor reset procedure (page 4-34).



## FUEL TANK

### REMOVAL/INSTALLATION

Remove the following:

- Seat (page 2-5)
- Body cover (page 2-13)

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

Disconnect the fuel tank charge hose [1] and fuel drain hose [2] from the fuel tank [3].

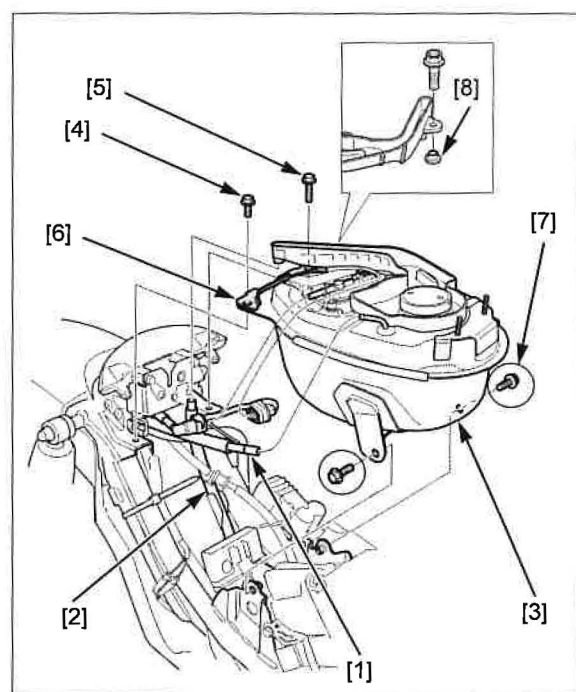
Remove the following:

- Bolt, 6 x 16 mm [4]
- Bolt, 6 x 20 mm [5]
- Fuel tank plate [6]
- Two bolts [7]
- Fuel tank

Installation is in the reverse order of removal.

**NOTE:**

- If removed the collar [8], install the collar according to the illustration.



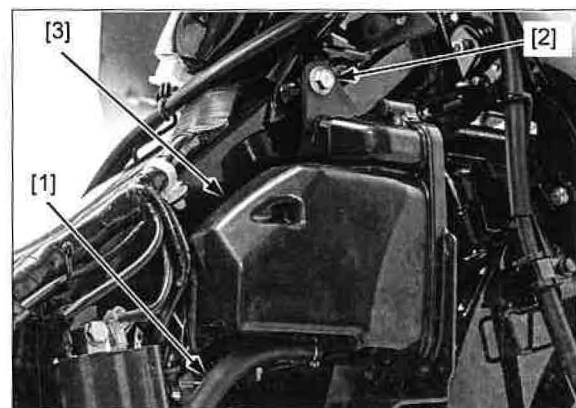
## AIR CLEANER HOUSING

### REMOVAL/INSTALLATION

Remove the following:

- Leg shield (page 2-11)
- Inner leg shield (page 2-12)

Disconnect the crankcase breather hose [1] and remove the bolt [2] from the air cleaner housing [3].

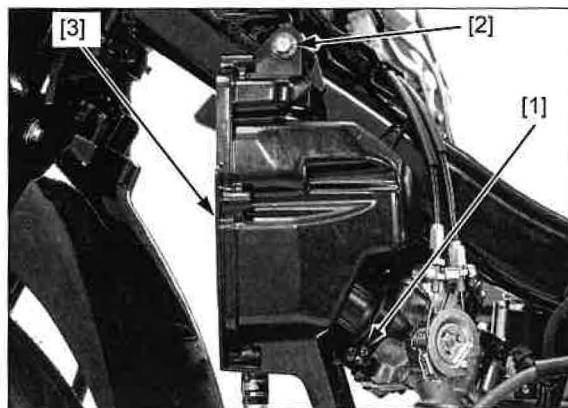




## FUEL SYSTEM

Loosen the connecting hose band screw [1].  
Remove the bolt [2] and air cleaner housing [3].  
Installation is in the reverse order of removal.

- Connect the connecting hose to the throttle body while aligning its groove with the boss of the throttle body.



## THROTTLE BODY/INTAKE PIPE

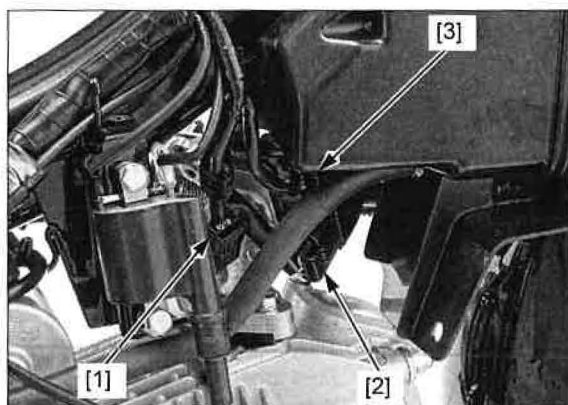
### REMOVAL/INSTALLATION

- If the throttle body/intake pipe is to be disassembled, or replaced with a new one, perform the TP sensor reset procedure (page 4-34).

Remove the leg shield (page 2-11).

Disconnect the following connectors:

- Fuel injector 2P (Black) [1]
- Sensor unit 6P (Black) [2]
- IACV 4P (Black) [3]



*Be careful not to damage the threads of throttle cables.*

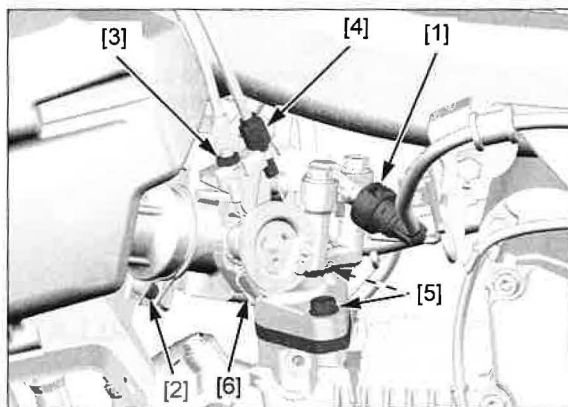
Relieve the fuel pressure and disconnect the injector side quick connect fitting [1] (page 7-5)

Loosen the connecting hose band screw [2].  
Loosen the throttle cable A lock nut [3].  
Remove the throttle cable A from the cable holder and throttle drum.

Loosen the throttle cable B nut [4].  
Remove the throttle cable B from the cable holder and throttle drum.

Remove the two bolts [5].

Disconnect the air cleaner connecting hose and remove the throttle body [6].



Remove the Insulator [1].

Remove the O-rings [2] from the Insulator.

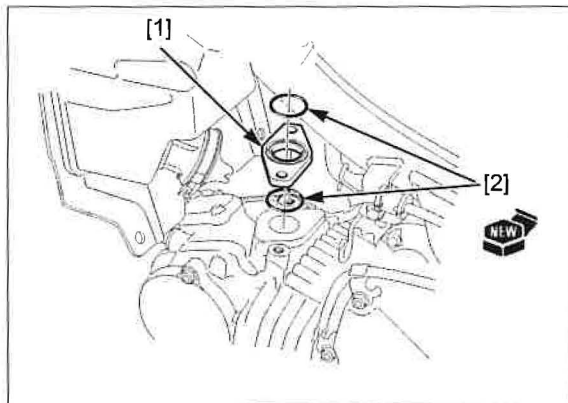
Installation is in the reverse order of removal.

### TORQUE:

**Throttle cable A nut: 4.5 N·m (0.5 kgf·m, 3.3 lbf·ft)**

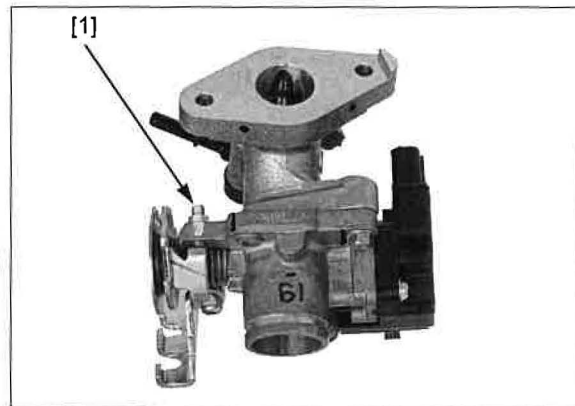
**Throttle cable B nut: 4.5 N·m (0.5 kgf·m, 3.3 lbf·ft)**

- Replace the O-ring with a new one.
- Adjust the throttle grip freeplay (page 3-4).
- Connect the fuel injector side quick connect fitting (page 7-6).



**DISASSEMBLY/ASSEMBLY**

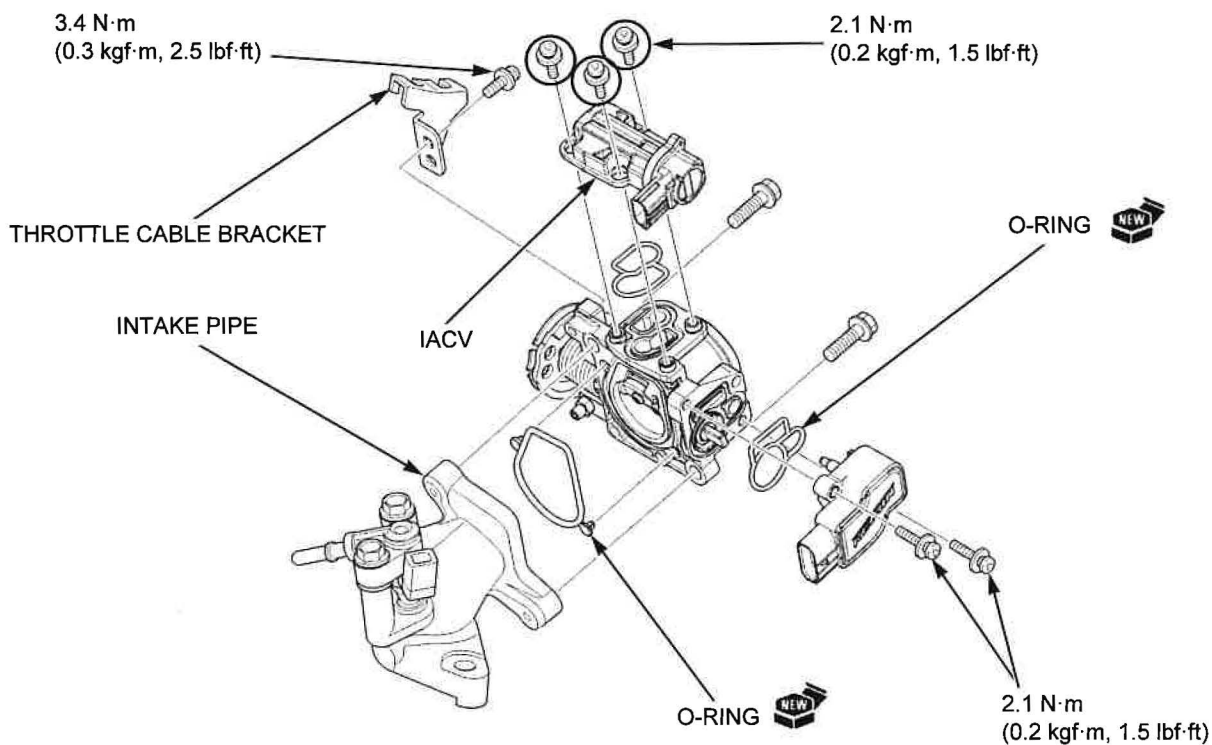
- The throttle body is factory pre-set. Do not disassemble in a way other than shown in this manual.
- Do not snap the throttle valve from full open to full close after the throttle cables are removed. It may cause incorrect idle operation.
- Do not damage the throttle body. It may cause incorrect throttle valve operation.
- Do not loosen or tighten the white painted nut [1] of the throttle drum. Loosening or tightening it can cause throttle body malfunction.



Disassemble and assemble the throttle body according to the illustration.

After installation, perform the following:

- TP sensor reset procedure (page 4-34)

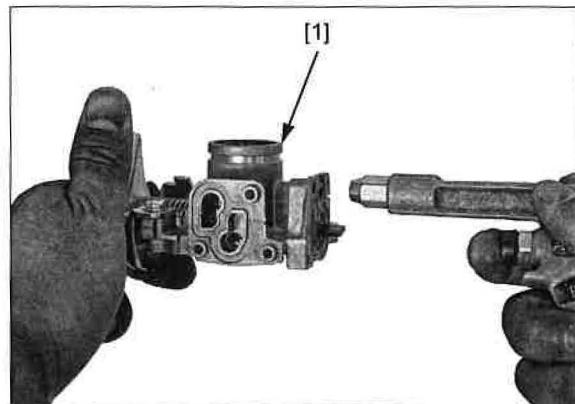


**CLEANING**

Disassemble the throttle body/intake pipe (page 7-13).

Blow open each air passage in the throttle body [1] with the compressed air.

- Do not use high pressure air or bring the nozzle too close to the throttle body.
- Cleaning the air passages with a piece of wire will damage the throttle body.



## FUEL INJECTOR

### REMOVAL

- This vehicle uses resin for the part of materials in the fuel feed hose. Do not bend or twist the fuel feed hose.

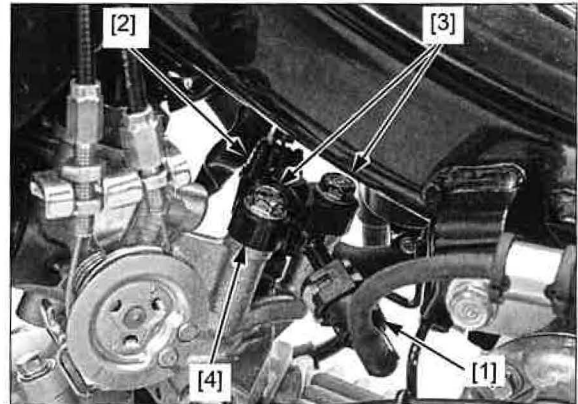
Remove the leg shield (page 2-11)

Relieve the fuel pressure and disconnect the fuel injector side quick connect fitting [1] (page 7-5).

Before removal, clean around the fuel injector.

Disconnect the fuel injector 2P (Black) connector [2].

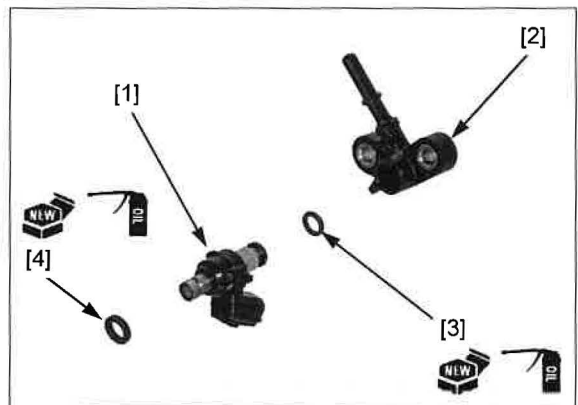
Remove the fuel injector joint mounting bolts [3] and fuel injector/injector joint [4] from the intake pipe.



Remove the following from the fuel injector [1].

- Fuel injector joint [2]
- O-ring [3]
- Seal ring [4]

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



### INSTALLATION

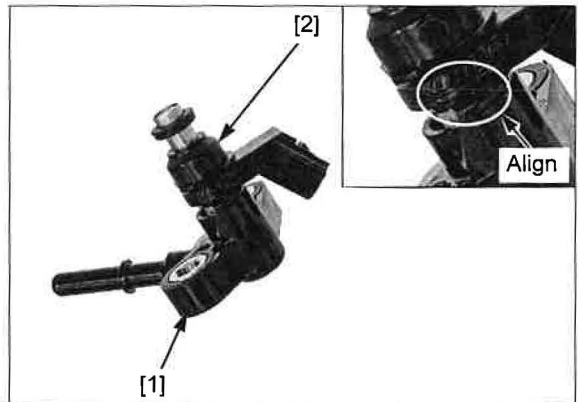
Coat the new O-ring and seal ring with engine oil.

Install the O-ring and seal ring to the fuel injector.

Install the fuel injector joint [1] to the fuel injector [2] by aligning their stoppers.

#### NOTICE

*Be careful not to allow dirt and debris between the fuel injector joint and O-ring.*



Install the fuel injector assembly [1] to the intake pipe.

#### NOTICE

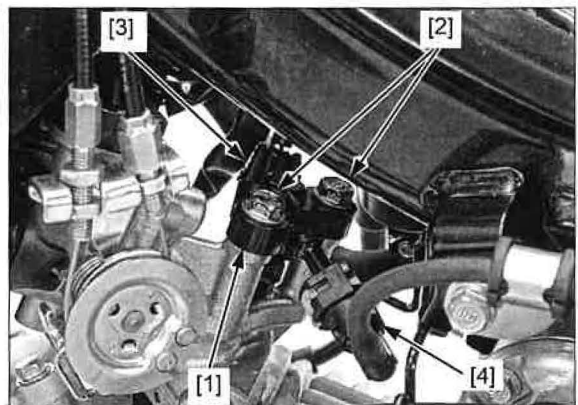
*Be careful not to damage the seal ring.*

Install and tighten the fuel injector joint mounting bolts [2] alternately.

Connect the fuel injector 2P (Black) connector [3].

Connect the fuel injector side quick connect fitting [4] (page 7-6).

Install the leg shield (page 2-11).



## IACV

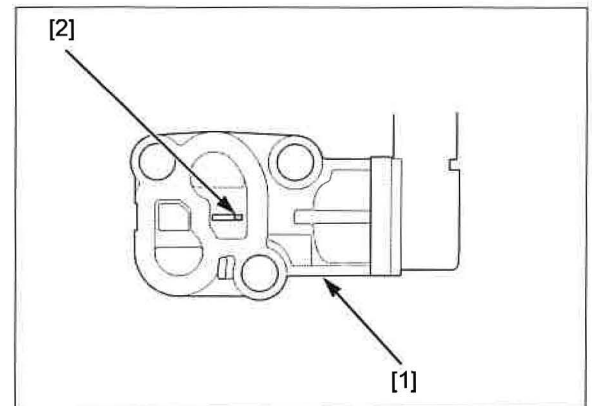
### INSPECTION

Remove the IACV (page 7-12)

Check the IACV [1] for wear or damage.

The IACV operation can be checked visually as follows:

1. Connect the IACV 4P (Black) connector.
2. Turn ignition switch ON, check the slide piece [2] operation.



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**MEMO**

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# 8. LUBRICATION SYSTEM

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SERVICE INFORMATION .....	8-2	OIL PUMP .....	8-4
TROUBLESHOOTING .....	8-2	OIL PUMP DRIVE GEAR .....	8-5
LUBRICATION SYSTEM DIAGRAM .....	8-3		

# SERVICE INFORMATION

## GENERAL

### **⚠ CAUTION**

Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.

- This section covers service of the oil pump.
- 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

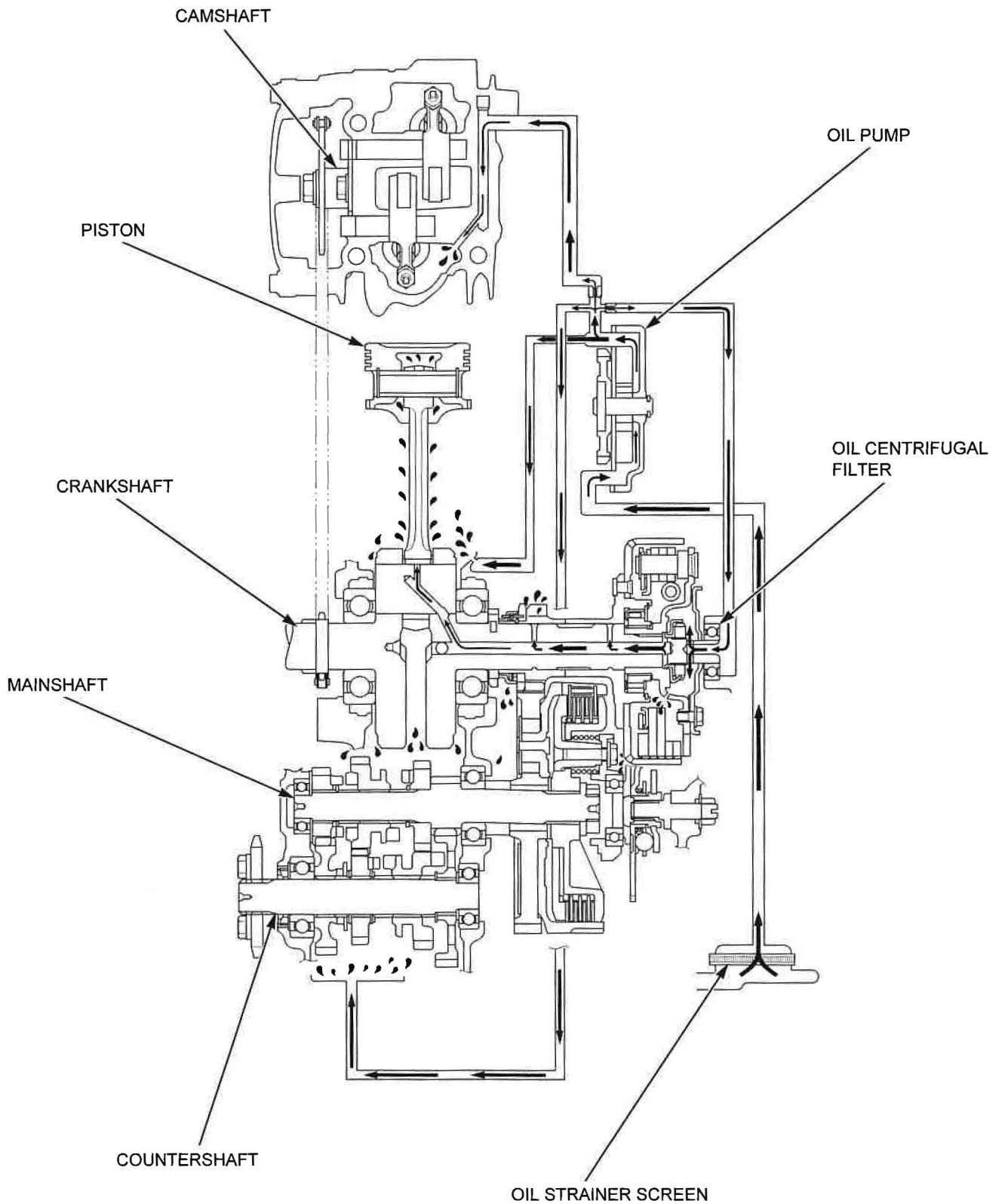
### **Engine oil level too low**

- Oil consumption
- External oil leak
- Worn piston rings (page 10-5)
- Improperly installed piston rings (page 10-6)
- Worn valve guide or stem seal (page 9-10)
- Worn cylinder (page 10-5)

### **Oil contamination**

- Worn piston rings (page 10-5)
  - Improperly installed piston rings (page 10-6)
  - Worn valve guide or stem seal (page 9-10)
  - Oil not changed frequently enough
  - Clogged oil strainer screen (page 3-10)
-

LUBRICATION SYSTEM DIAGRAM



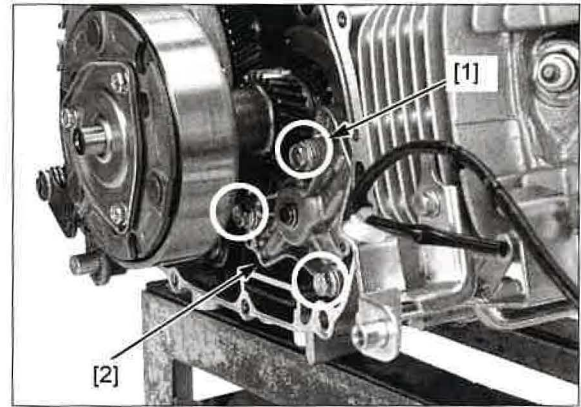


## LUBRICATION SYSTEM

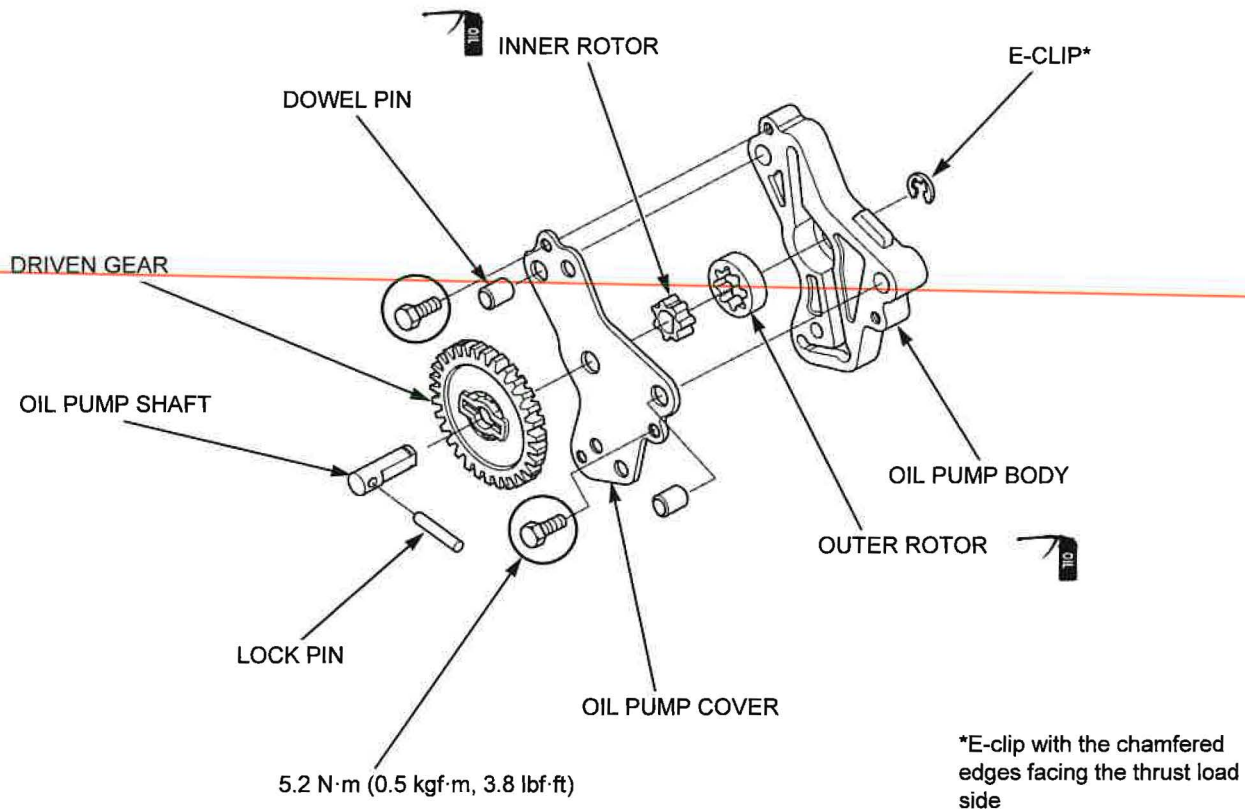
### OIL PUMP

#### REMOVAL/INSTALLATION

Remove the right crankcase cover (page 11-6).  
Remove the bolts [1] and oil pump assembly [2].  
Installation is in the reverse order of removal.



#### DISASSEMBLY/ASSEMBLY



#### 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.

## OIL PUMP DRIVE GEAR

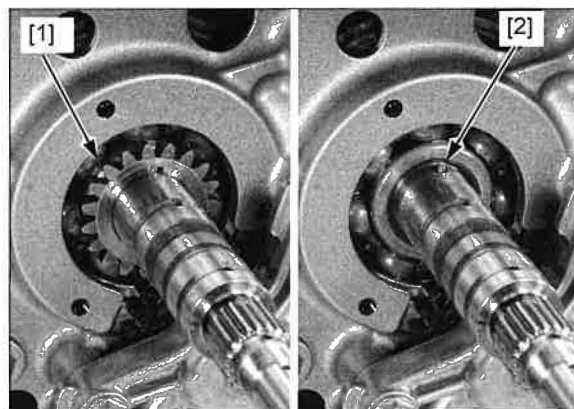
### REMOVAL/INSTALLATION

Remove the clutch assembly (page 11-9).

Remove the oil pump drive gear [1] and pin [2].  
Check the oil pump drive gear for damage and replace it if necessary.

Installation is in the reverse order of removal.

- Install the oil pump drive gear by aligning the gear groove with the pin.



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**MEMO**

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# 9. CYLINDER HEAD/VALVES

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<b>SERVICE INFORMATION</b> .....	<b>9-2</b>	<b>CAMSHAFT/ROCKER ARM</b> .....	<b>9-6</b>
<b>TROUBLESHOOTING</b> .....	<b>9-4</b>	<b>CYLINDER HEAD</b> .....	<b>9-10</b>
<b>COMPONENT LOCATION</b> .....	<b>9-5</b>	<b>CAM CHAIN TENSIONER</b> .....	<b>9-17</b>
<b>CYLINDER COMPRESSION TEST</b> .....	<b>9-6</b>		

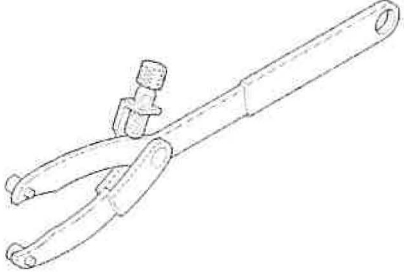
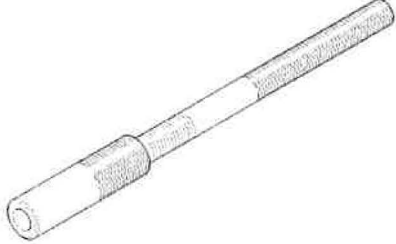
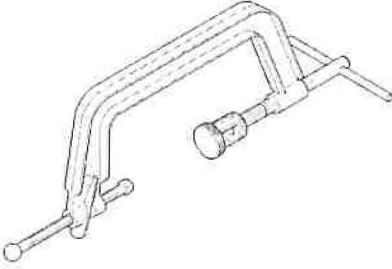



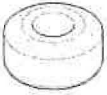


## CYLINDER HEAD/VALVES

### SERVICE INFORMATION

#### GENERAL

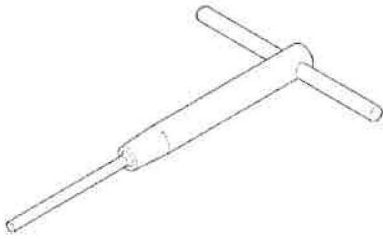
- This section covers service of the cylinder head, valves, camshaft and cam chain tensioner.
- The cylinder head, valves, camshaft and cam chain tensioner services can be done with the engine installed in the frame.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling cylinder head.
- Be careful not to damage the mating surfaces when removing the cylinder head.

#### TOOLS

<p>Universal holder 07725-0030000</p> 	<p>Valve guide adjusting driver 07743-0020000</p>  <p>Not available in U.S.A.</p>	<p>Valve spring compressor 07757-0010000</p> 
<p>Seat cutter, 27.5 mm (45° IN) 07780-0010200</p> 	<p>Seat cutter, 22 mm (45° EX) 07780-0010701</p> 	<p>Flat cutter, 22 mm (32° EX) 07780-0012601</p> 
<p>Equivalent commercially available in the U.S.A.</p>	<p>Equivalent commercially available in the U.S.A.</p>	<p>Equivalent commercially available in the U.S.A.</p>
<p>Flat cutter, 27 mm (32° IN) 07780-0013300</p>  <p>Equivalent commercially available in the U.S.A.</p>	<p>Interior cutter, 22 mm (60° EX) 07780-0014202</p>  <p>Equivalent commercially available in the U.S.A.</p>	<p>Interior cutter, 26 mm (60° IN) 07780-0014500</p>  <p>Equivalent commercially available in the U.S.A.</p>

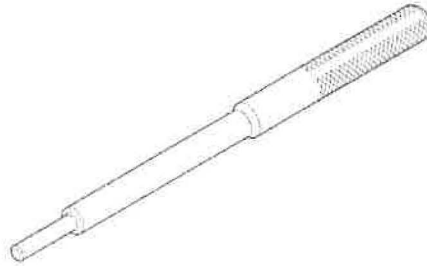
## CYLINDER HEAD/VALVES

Cutter holder, 5.0 mm  
07781-0010400

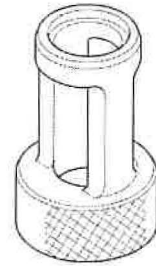


Equivalent commercially available in  
the U.S.A.

Valve guide driver, 5.0 mm  
07942-MA60000



Valve spring compressor attachment  
07959-KM30101



Valve guide reamer, 5.0 mm  
07984-MA60001



07984-MA6000D (U.S.A. only)

## CYLINDER HEAD/VALVES

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### TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problem can be diagnosed by a compression test or by tracing engine noises to the top-end with a sounding rod stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather hose. If the hose is smoky, check for a seized piston ring (page 10-5).

#### **Compression too low, hard starting or poor performance at low speed**

- Valves:
  - Incorrect valve clearance
  - Burned or bent valves
  - Incorrect valve timing
  - Broken valve spring
  - Valve stuck open
- Cylinder head:
  - Uneven valve seating
  - Leaking or damaged cylinder head gasket
  - Warped or cracked cylinder head
- Worn cylinder, piston or piston rings (page 10-5)

#### **Compression too high, overheating or knocking**

- Excessive carbon build-up on piston head or combustion chamber

#### **Excessive smoke**

- Cylinder head:
  - Worn valve stem or valve guide
  - Damaged stem seal
- Worn cylinder, piston or piston rings (page 10-5)

#### **Excessive noise**

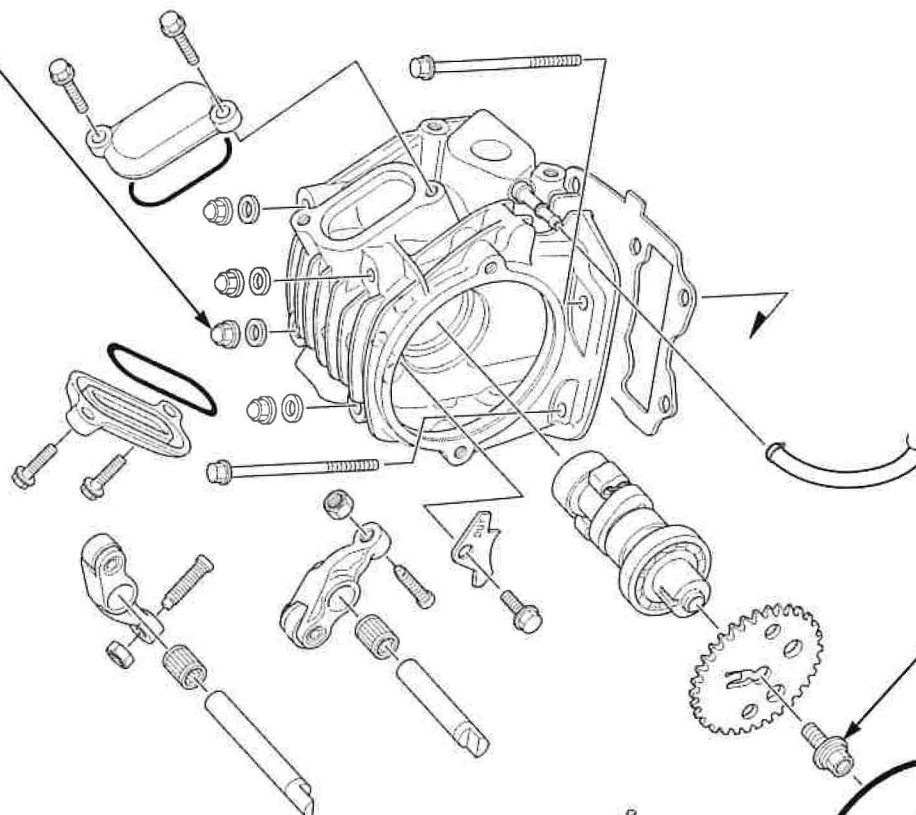
- Cylinder head:
  - Incorrect valve clearance
  - Sticking valve or broken valve spring
  - Damaged or worn camshaft
  - Loose or worn cam chain
  - Worn or damaged cam chain guide roller/sprocket
  - Worn or damaged cam chain tensioner
  - Worn cam sprocket teeth
  - Worn rocker arm and/or shaft
- Worn cylinder, piston or piston rings (page 10-5)

#### **Rough idle**

- Low cylinder compression
- Faulty fuel system (page 7-3)

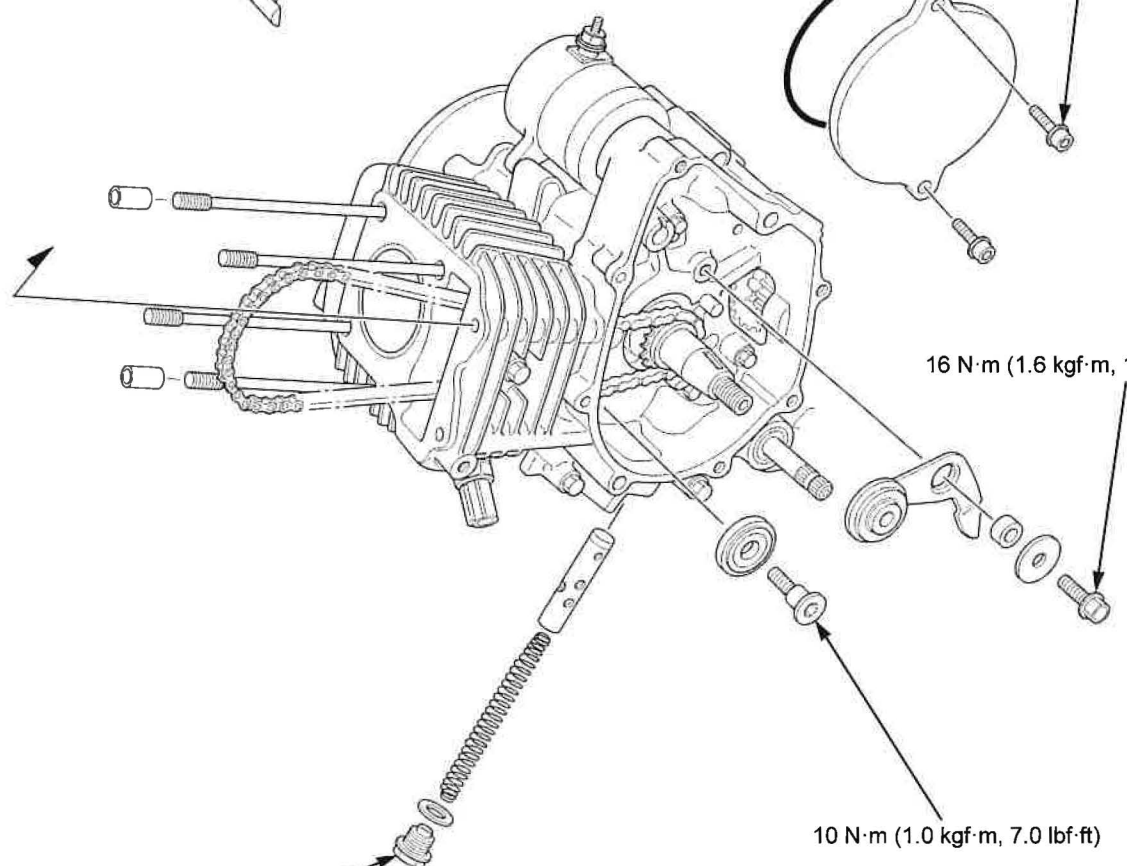
COMPONENT LOCATION

24 N·m (2.4 kgf·m, 18 lbf·ft)



27 N·m (2.8 kgf·m, 20 lbf·ft)

12 N·m (1.2 kgf·m, 9.0 lbf·ft)



16 N·m (1.6 kgf·m, 12 lbf·ft)

10 N·m (1.0 kgf·m, 7.0 lbf·ft)

22 N·m (2.2 kgf·m, 16 lbf·ft)



## CYLINDER HEAD/VALVES

### CYLINDER COMPRESSION TEST

Warm up the engine to normal operating temperature.

Stop the engine and disconnect the spark plug cap.

Remove the spark plug (page 3-6).

Install the compression gauge [1] in the spark plug hole.

Turn the ignition switch ON.

Shift the transmission into neutral.

Open the throttle all the way and crank the engine with the electric starter until the gauge reading stops rising.

#### STANDARD:

**1,196 kPa (12.2 kgf/cm<sup>2</sup>, 173 psi) at 600 rpm**

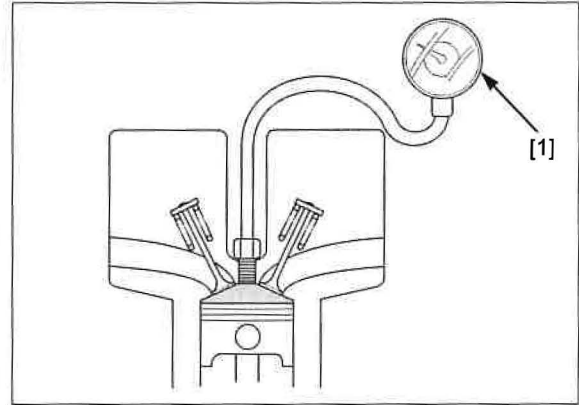
If compression is high, it indicates that carbon deposits have accumulated on the combustion chamber and/or the piston head.

If compression is low, pour 3 – 5 cm<sup>3</sup> of engine oil into the cylinder through the spark plug hole and recheck the compression.

If the compression increases from the previous value, check the cylinder, piston and piston rings for the following:

- Leaking cylinder head gasket
- Worn piston ring
- Worn cylinder and piston

If the compression is the same as the previous value, check the valves for leakage.

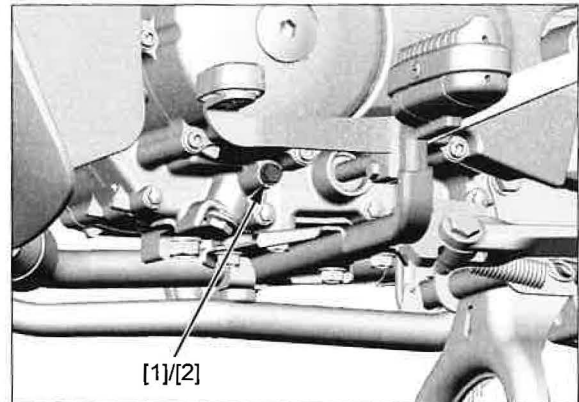


## CAMSHAFT/ROCKER ARM

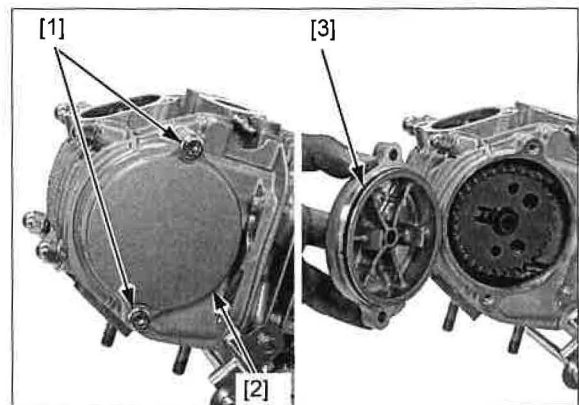
### REMOVAL

Remove the valve adjusting hole caps and set the piston to the TDC (Top Dead Center) on the compression stroke (page 3-7).

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



Remove the bolts [1], cam sprocket cover [2] and O-ring [3].



Hold the cam sprocket [1] by using the special tool.

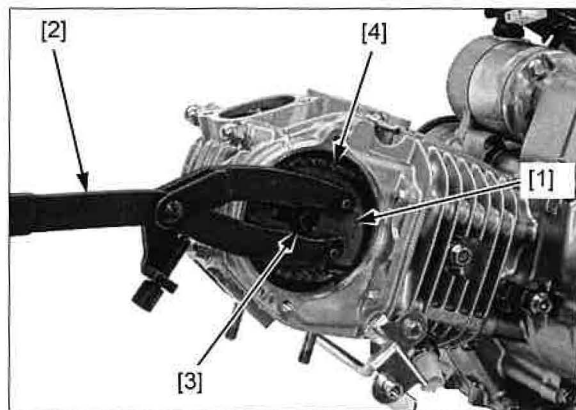
**TOOLS:**

**Universal holder [2]**

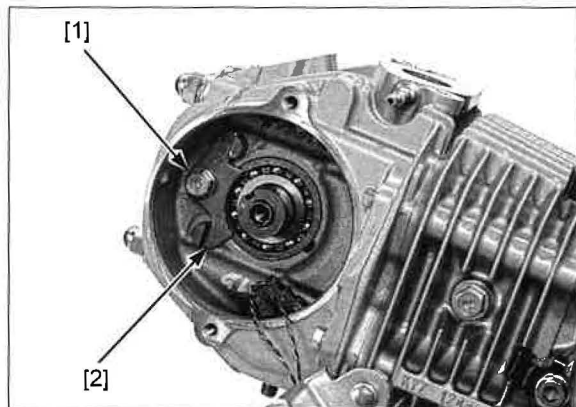
**07725-0030000**

Remove the washer bolt [3], cam sprocket from the camshaft and cam chain [4] off the cam sprocket.

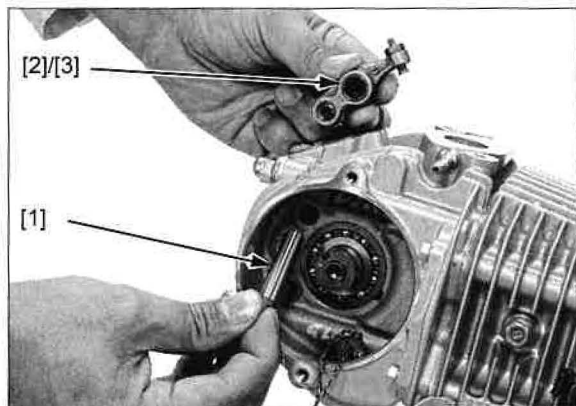
Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.



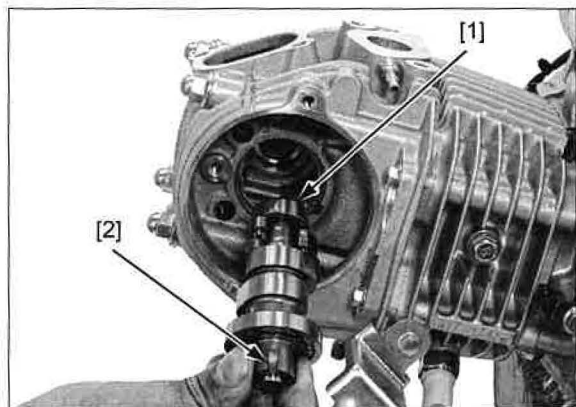
Remove the bolt [1] and rocker arm shaft set plate [2] from the cylinder head.



Remove the rocker arm shafts [1], rocker arms [2] and needle bearings [3].



Remove the camshaft [1] from the cylinder head while turning so its groove [2] is facing up as shown.

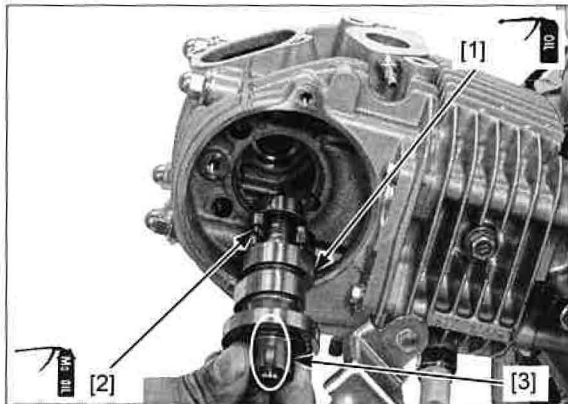


## CYLINDER HEAD/VALVES

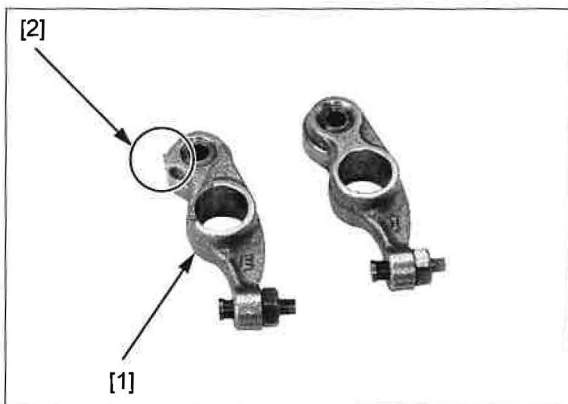
### INSTALLATION

Apply engine oil to the camshaft [1] whole surface.  
Apply molybdenum disulfide oil to the decompressor cam and arm sliding area [2].

Install the camshaft into the cylinder head with its groove [3] facing upward as shown.



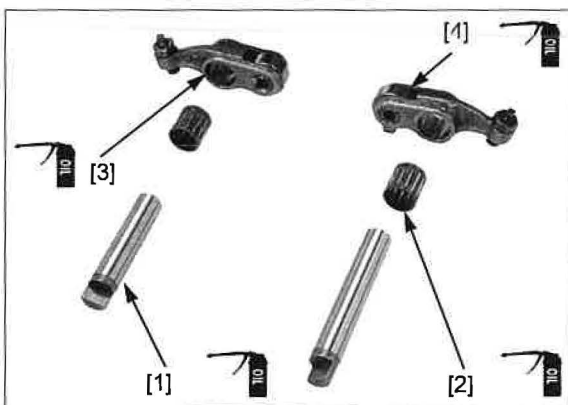
The exhaust rocker arm [1] has a projection [2] to push the decompressor cam.



Apply engine oil to the sliding surfaces of the rocker arm shafts [1] and needle bearings [2].

Apply engine oil to the inner surfaces of the rocker arms [3] and sliding surfaces of the rollers [4].

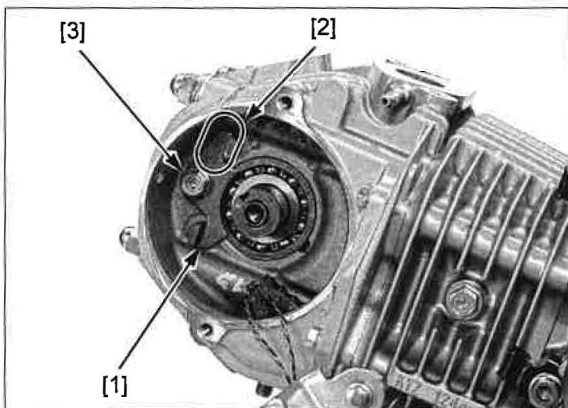
- The exhaust rocker arm shaft is longer than the intake rocker arm shaft.



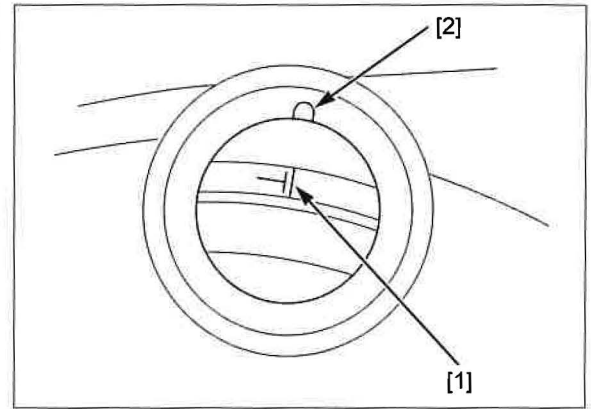
Install the rocker arms, needle bearings and rocker arm shafts into the cylinder head.

Install the rocker arm shaft set plate [1] with its "OUT" mark [2] facing out as shown.

Install and tighten the bolt [3].



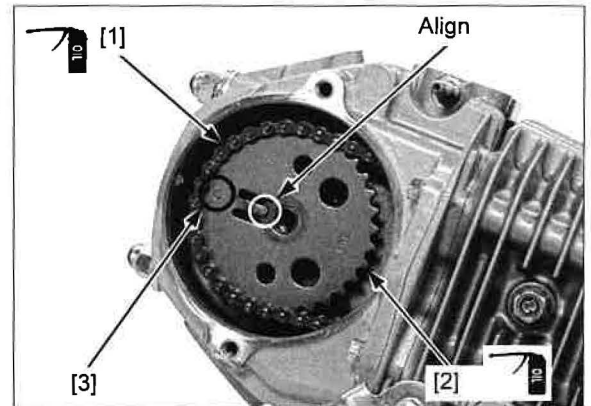
Rotate the crankshaft counterclockwise until the "T" mark [1] on the flywheel is aligned with the index notch [2] on the left crankcase cover.



Apply engine oil to the cam chain [1] and cam sprocket [2] teeth.

Install the cam chain on the cam sprocket with its "O" mark [3] facing out as shown by aligning its tab with the groove of the camshaft.

Install the cam sprocket to the camshaft.



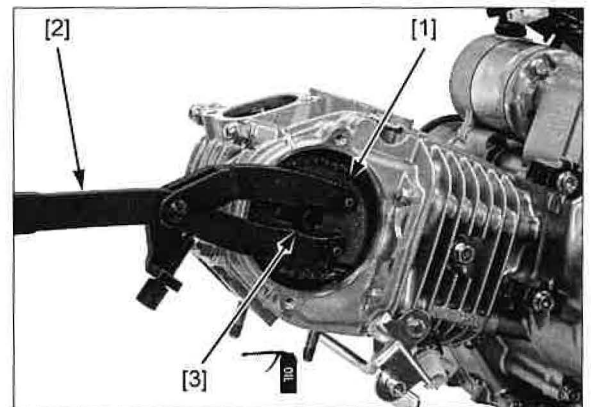
Hold the cam sprocket [1] by using the special tool.

**TOOL:**  
**Universal Holder [2] 07725-0030000**

Apply engine oil to the cam sprocket washer bolt [3] threads and seating surface.

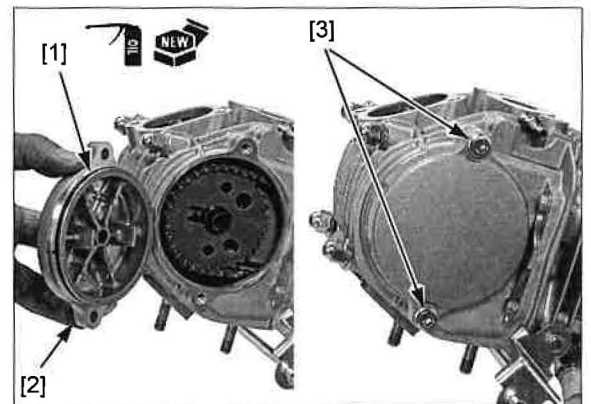
Install and tighten the cam sprocket washer bolt to specified torque.

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



Apply engine oil to a new O-ring [1] and install it into the cam sprocket cover [2] groove.

Install the cam sprocket cover and tighten the bolts [3].



## CYLINDER HEAD/VALVES

Pour 4.0 cm<sup>3</sup> minimum of engine oil into the push rod.

Install a new sealing washer [1] and bolt [2], then tighten it.

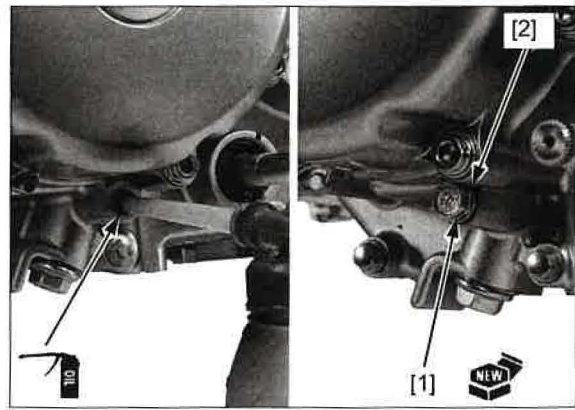
Apply engine oil to the new crankshaft hole cap O-ring and timing hole cap O-ring, then install them to the caps.

Install the crankshaft hole cap and timing hole cap to the left crankcase cover.

### TORQUE:

**Crankshaft hole cap** 8.0 N·m (0.8 kgf·m, 5.9 lbf·ft)  
**Timing hole cap** 6.0 N·m (0.6 kgf·m, 4.4 lbf·ft)

Install the valve adjusting hole caps (page 3-7).



### INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning or clogs in oil passages.

- Rocker arms/shafts/needle bearings
- Cam sprocket
- Camshaft
- Camshaft bearings

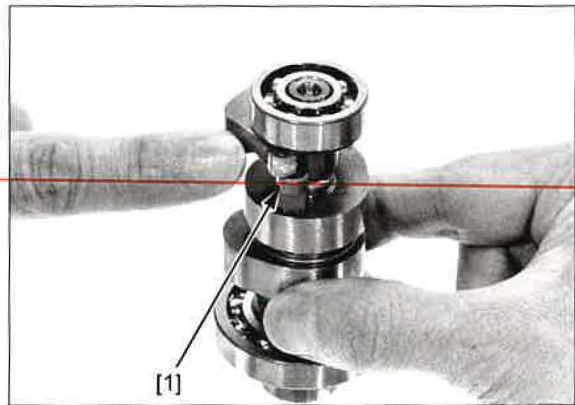
Measure each part according to CYLINDER HEAD/VALVES SPECIFICATIONS (page 1-6).

Replace any part if it is out of service limit.

### DECOMPRESSOR SYSTEM

Turn the decompressor weight [1] with your finger. Make sure the decompressor operates smoothly and returns to the original position by the spring.

If the decompressor is faulty, replace the camshaft as an assembly.



## CYLINDER HEAD

### REMOVAL

- Perform the TP sensor reset procedure if the cylinder head is replaced or is overhauled (page 4-34)

Remove the following:

- Cam sprocket (page 9-6)
- Exhaust pipe/muffler (page 2-19)
- O<sub>2</sub> sensor (page 4-35)
- Air cleaner housing mounting bolt (page 7-11)
- Intake pipe mounting bolt/ insulator/ O-ring (page 7-12)

Disconnect the spark plug cap.

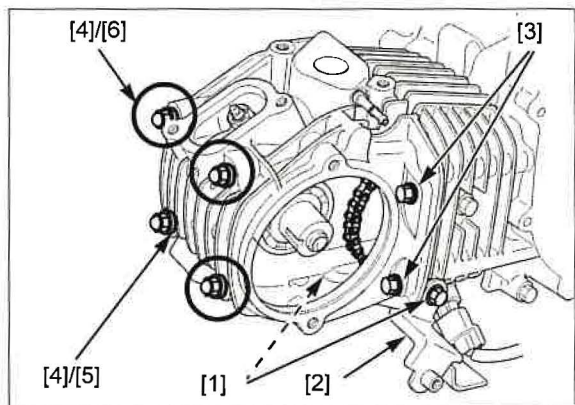
Remove the bolts [1] and leg shield stay [2].

Remove the cylinder head bolts [3].

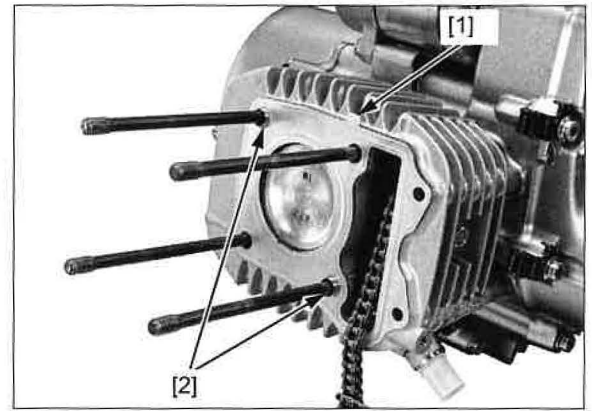
Loosen the cylinder head nuts [4] in a crisscross pattern in two or three steps.

Remove the four nuts, copper washer [5] and three washers [6].

Remove the cylinder head.

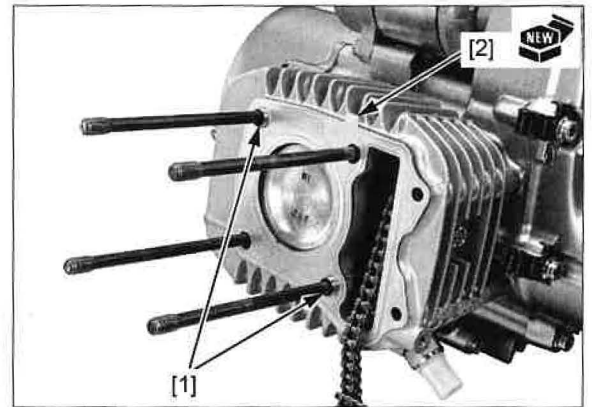


Remove the gasket [1] and dowel pins [2].



**INSTALLATION**

Clean the cylinder and cylinder head mating surface. Install the dowel pins [1] and a new gasket [2] onto the cylinder.



Install the cylinder head [1] onto the cylinder.

Apply engine oil to the seating surface and threads of the cylinder head nuts [2].

Install new copper washer [3], three washers [4] and tighten the cylinder head nuts to the specified torque in a crisscross pattern.

**TORQUE: 24 N·m (2.4 kgf·m, 18 lbf·ft)**

Install and tighten the cylinder head mounting bolts [5].

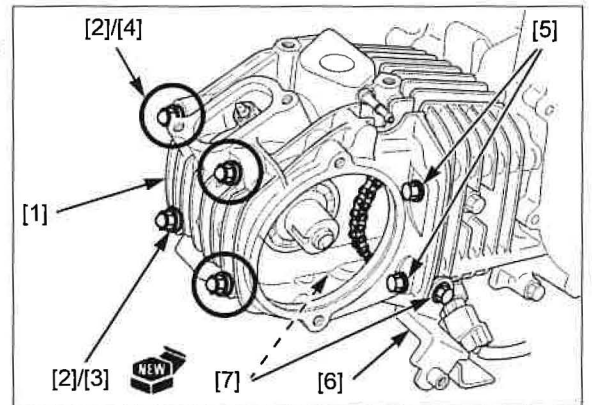
Install the leg shield stay [6] and bolts [7].

Connect the spark plug cap.

Install the following:

- Cam sprocket (page 9-6)
- Exhaust pipe/muffler (page 2-19)
- O<sub>2</sub> sensor (page 4-35)
- Air cleaner housing mounting bolt (page 7-11)
- Intake pipe mounting bolt/ insulator/ O-ring (page 7-12)

Perform the TP sensor reset procedure if the cylinder head is replaced or is overhauled (page 4-34)



## CYLINDER HEAD/VALVES

### DISASSEMBLY

Remove the following:

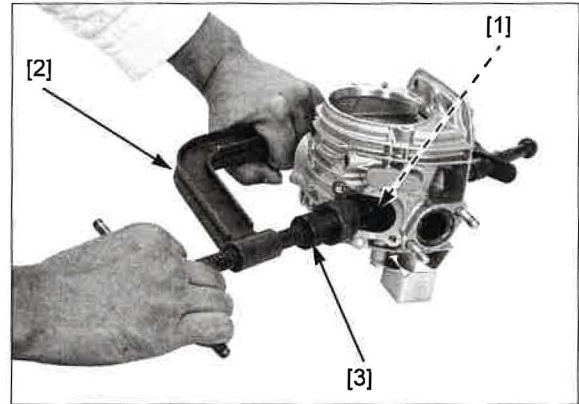
- Spark plug (page 3-6)
- Camshaft/rocker arm (page 9-6)

*To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.*

Remove the valve cotters [1] using the special tools.

#### TOOLS:

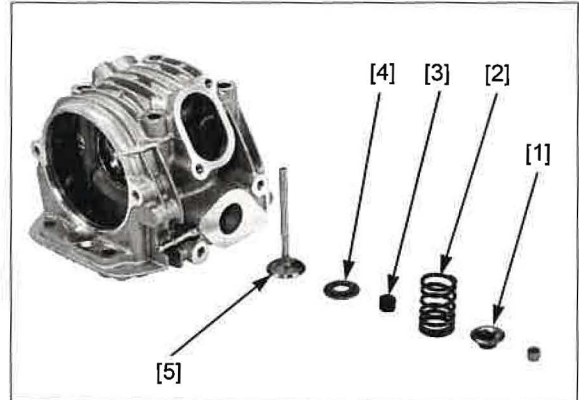
- Valve spring compressor [2]** 07757-0010000
- Valve spring compressor attachment [3]** 07959-KM30101



*Mark all parts during disassembly so they can be placed back in their original locations.*

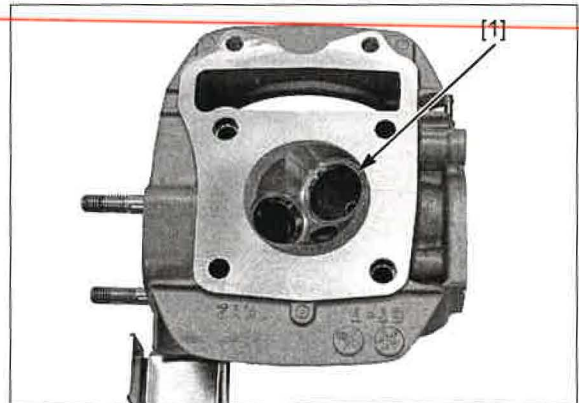
Remove the valve spring compressor and remove the following:

- Valve spring retainers [1]
- Valve springs [2]
- Valve stem seals [3]
- Valve spring seats [4]
- Valves [5]



*Avoid damaging the mating surface and valve seat surfaces.*

~~Remove the carbon deposits from the combustion chamber [1] and clean off the cylinder head gasket surface.~~



### INSPECTION

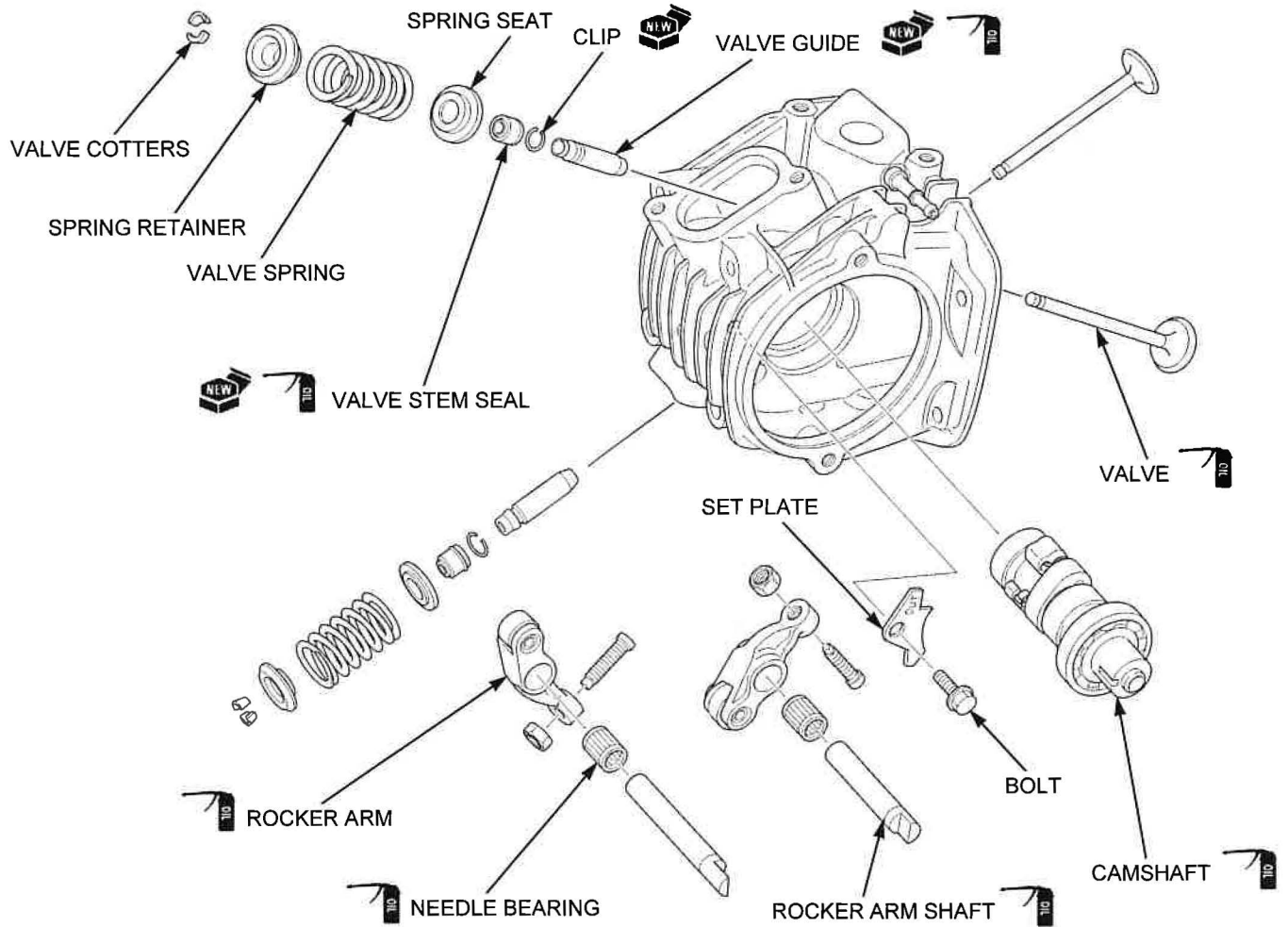
Inspect the following parts for damage, abnormal wear, deformation, burning or clogs in oil passages.

- Cylinder head
- Valve spring
- Valves
- Valve guides

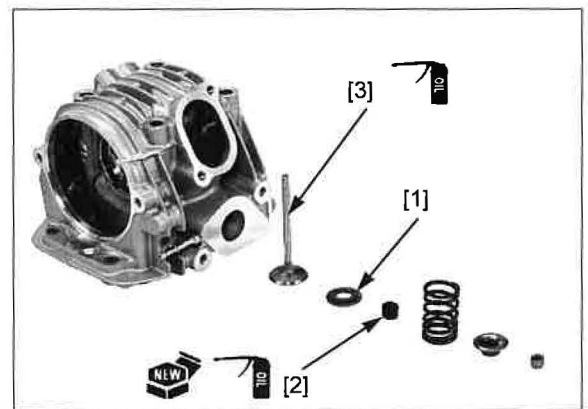
Measure each part and clearance according to CYLINDER HEAD/VALVES SPECIFICATIONS (page 1-6).

Replace any part if it is out of service limit.

ASSEMBLY



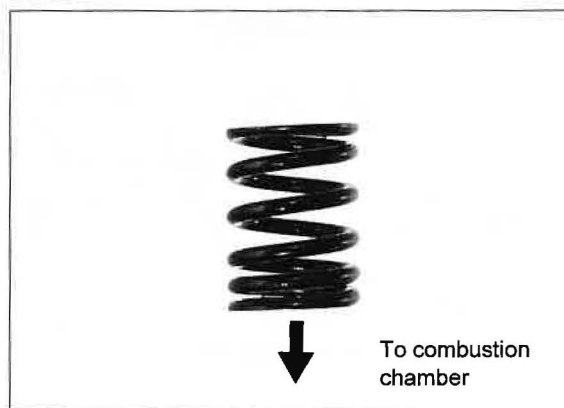
Blow through the oil passage in the cylinder head with compressed air.  
 Install the valve spring seats [1].  
 Apply engine oil to the new valve stem seals [2] and install them.  
 Apply engine oil to the valve stem [3] outer surface and stem end.  
 Insert the valves into the valve guides while turning them slowly to avoid damage to the valve stem seals.





## CYLINDER HEAD/VALVES

Install the valve springs with the tightly wound coils facing the combustion chamber.



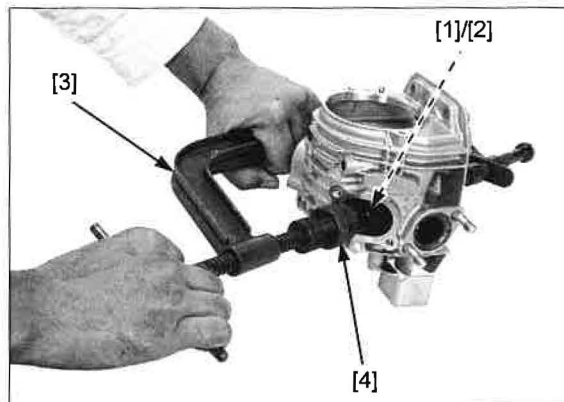
Install the valve spring retainer [1].

*To prevent loss of tension, do not compress the valve spring more than necessary to install the cotters.*

Install the valve cotters [2] using the special tools.

### TOOLS:

**Valve spring compressor [3]**      07757-0010000  
**Valve spring compressor attachment [4]**      07959-KM30101



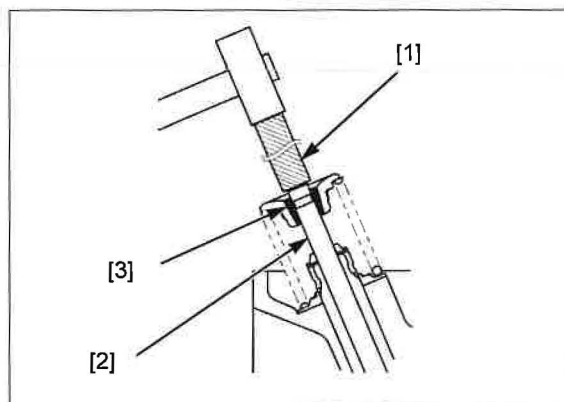
*Support the cylinder head above the work bench surface to prevent valve damage.*

Place a suitable tool [1] onto the valve stem [2].

Tap the tool gently to seat the cotters [3] firmly using a plastic hammer.

Install the following:

- Camshaft/rocker arm (page 9-6)
- Spark plug (page 3-6)



**VALVE GUIDE REPLACEMENT**

Chill new valve guides in a freezer for about 1 hour.

**NOTE:**

- Be sure to wear heavy gloves to avoid burns when handling the heated cylinder head.
- Using a torch to heat the cylinder head may cause warpage.
- Drive new guides from the camshaft side while the cylinder head is still heated.
- Perform the TP sensor reset procedure if the valve guide is replaced with a new one (page 4-34).

Heat the cylinder head to 130 – 140°C (275 – 290°F) with a hot plate or oven. Do not heat the cylinder head beyond 150°C (300°F). Use temperature indicator sticks, available from welding supply stores, to be sure the cylinder head is heated to the proper temperature.

Support the cylinder head and drive the valve guides [1] out of the cylinder head from the combustion chamber side.

**TOOL:**

**Valve guide driver, 5.0 mm [2] 07942-MA60000**

Take out new valve guides from the freezer.

Drive new clips [1] and valve guides [2] into the cylinder head to the specified height from the cylinder head.

**TOOL:**

**Valve guide adjusting driver [3] 07743-0020000 (Not available in the U.S.A)**

**VALVE GUIDE PROJECTION:**

**IN/EX: 10.1 – 10.3 mm (0.40 – 0.41 in)**

Let the cylinder head cool to room temperature.

Ream new valve guides after installation.

**NOTE:**

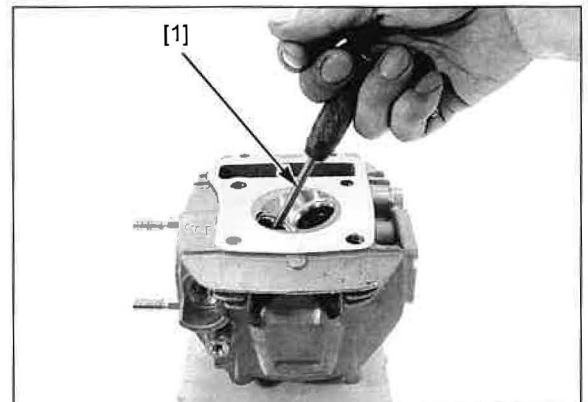
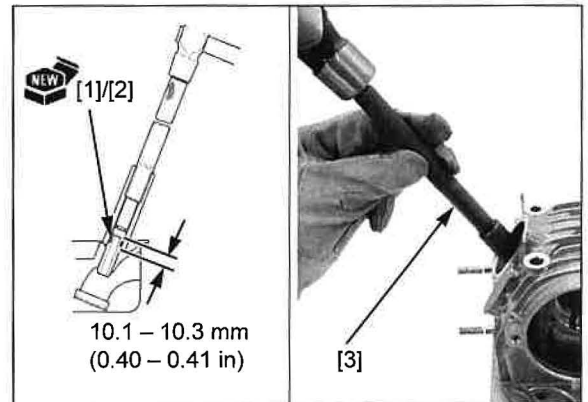
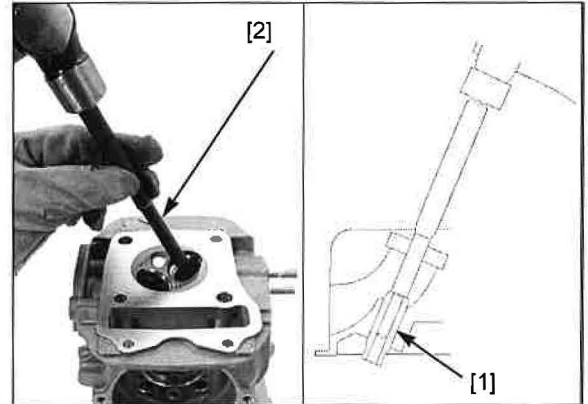
- Take care not to tilt or lean the reamer in the guide while reaming.
- Use cutting oil on the reamer during this operation.

Insert the reamer from the combustion chamber side of the cylinder head and always rotate the reamer clockwise.

**TOOL:**

**Valve guide reamer, 5.0 mm [1] 07984-MA60001 or 07984-MA6000D (U.S.A. only)**

Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat (page 9-16).



## VALVE SEAT INSPECTION/REFACING

### INSPECTION

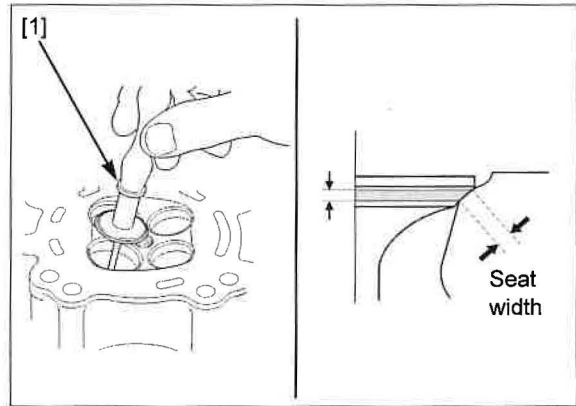
Clean the intake and exhaust valves thoroughly to remove carbon deposits.

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, 5.0 mm	07781-0010400
Seat cutter, 27.5 mm (45° IN)	07780-0010200
Seat cutter, 22 mm (45° EX)	07780-0010701
Flat cutter, 27 mm (32° IN)	07780-0013300
Flat cutter, 22 mm (32° EX)	07780-0012601
Interior cutter, 26 mm (60° IN)	07780-0014500
Interior cutter, 22 mm (60° EX)	07780-0014202

or equivalent commercially available in the U.S.A.

**VALVE SEAT WIDTH: 0.7 mm (0.028 in)**

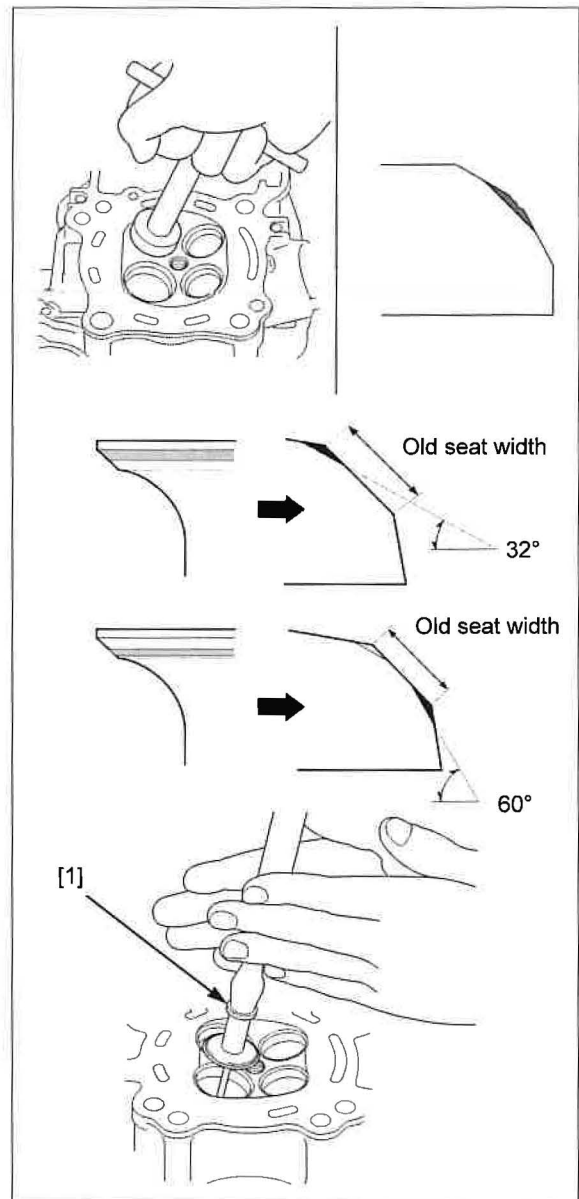
#### NOTE:

- 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.



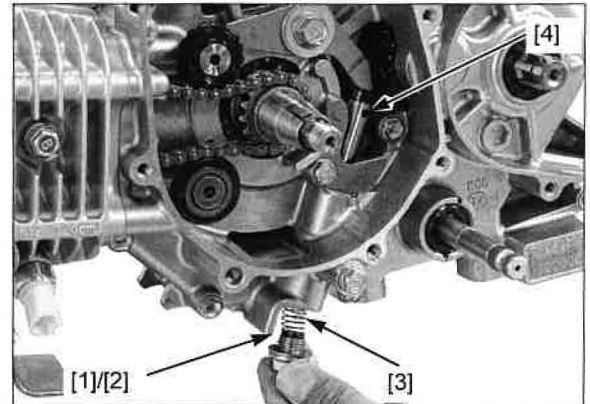
## CAM CHAIN TENSIONER

### REMOVAL

Remove the flywheel (page 12-5).

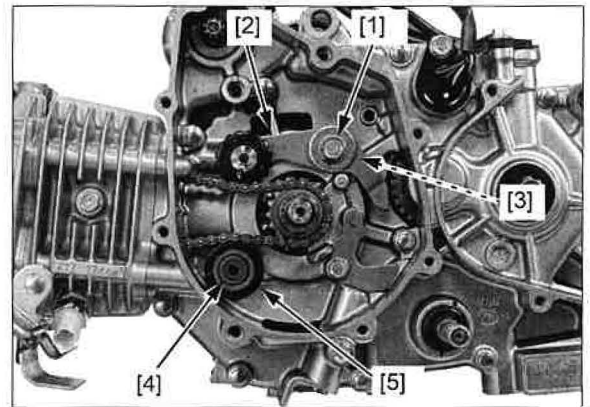
Remove the following:

- Cam chain tensioner sealing bolt [1] and washer [2]
- Tensioner spring [3]
- Push rod [4]



Remove the following:

- Pivot bolt/washer [1]
- Tensioner arm/upper roller [2] and collar [3]
- Bolt [4] and lower roller [5]



### INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning or clogs in oil passages.

- Tensioner spring
- Push rod
- Upper roller/lower roller

Measure each part and clearance according to CYLINDER HEAD/VALVES SPECIFICATIONS (page 1-6).

Replace any part if it is out of service limit.

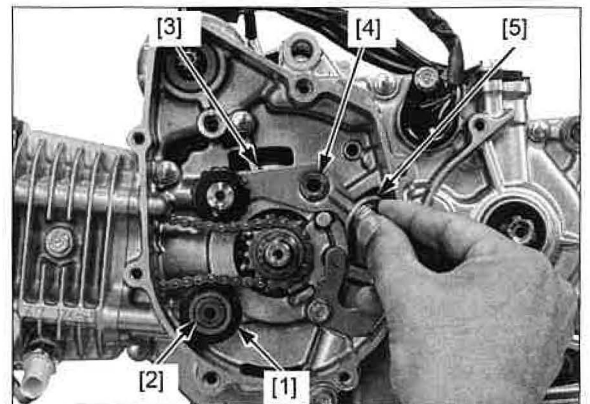
### INSTALLATION

Install the cam chain tensioner lower roller [1] and tighten the pivot bolt [2] to the specified torque.

**TORQUE: 10 N·m (1.0 kgf·m, 7.0 lbf·ft)**

Install the cam chain tensioner arm/upper roller [3], collar [4], and pivot bolt/washer [5], then tighten it to the specified torque.

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



## CYLINDER HEAD/VALVES

Install the following:

- Push rod [1]
- Tensioner spring [2]

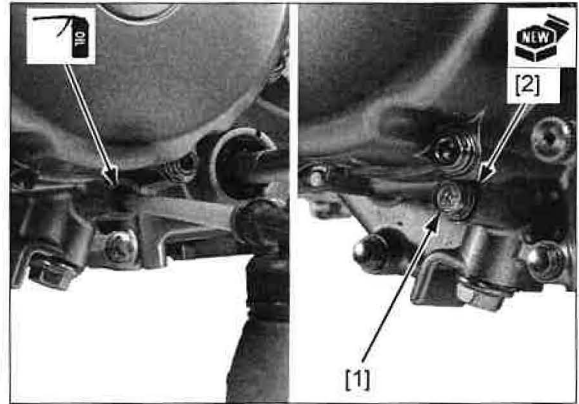
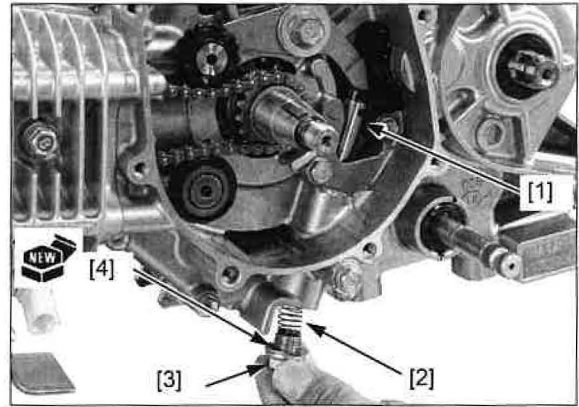
Install and tighten the sealing bolt [3] with a new sealing washer [4] to the specified torque.

**TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)**

Install the following:

- Flywheel (page 12-5)
- Left crankcase cover (page 12-4)

Remove the bolt [1] and sealing washer [2].  
Pour 4.0 cm<sup>3</sup> minimum of engine oil into the push rod.  
Install and tighten the bolt with a new sealing washer.



# 10. CYLINDER/PISTON

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<b>SERVICE INFORMATION</b> .....	<b>10-2</b>	<b>COMPONENT LOCATION</b> .....	<b>10-3</b>
<b>TROUBLESHOOTING</b> .....	<b>10-2</b>	<b>CYLINDER/PISTON</b> .....	<b>10-4</b>

## CYLINDER/PISTON

---

# SERVICE INFORMATION

### GENERAL

- This section covers service of the cylinder and piston. These services can be performed with the engine installed in 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.
- 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.

## TROUBLESHOOTING

### Compression too low, hard starting or poor performance at low speed

- Leaking cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston
- Bent connecting rod

### Compression too high, overheating or knocking

- Excessive carbon built-up on piston head or combustion chamber

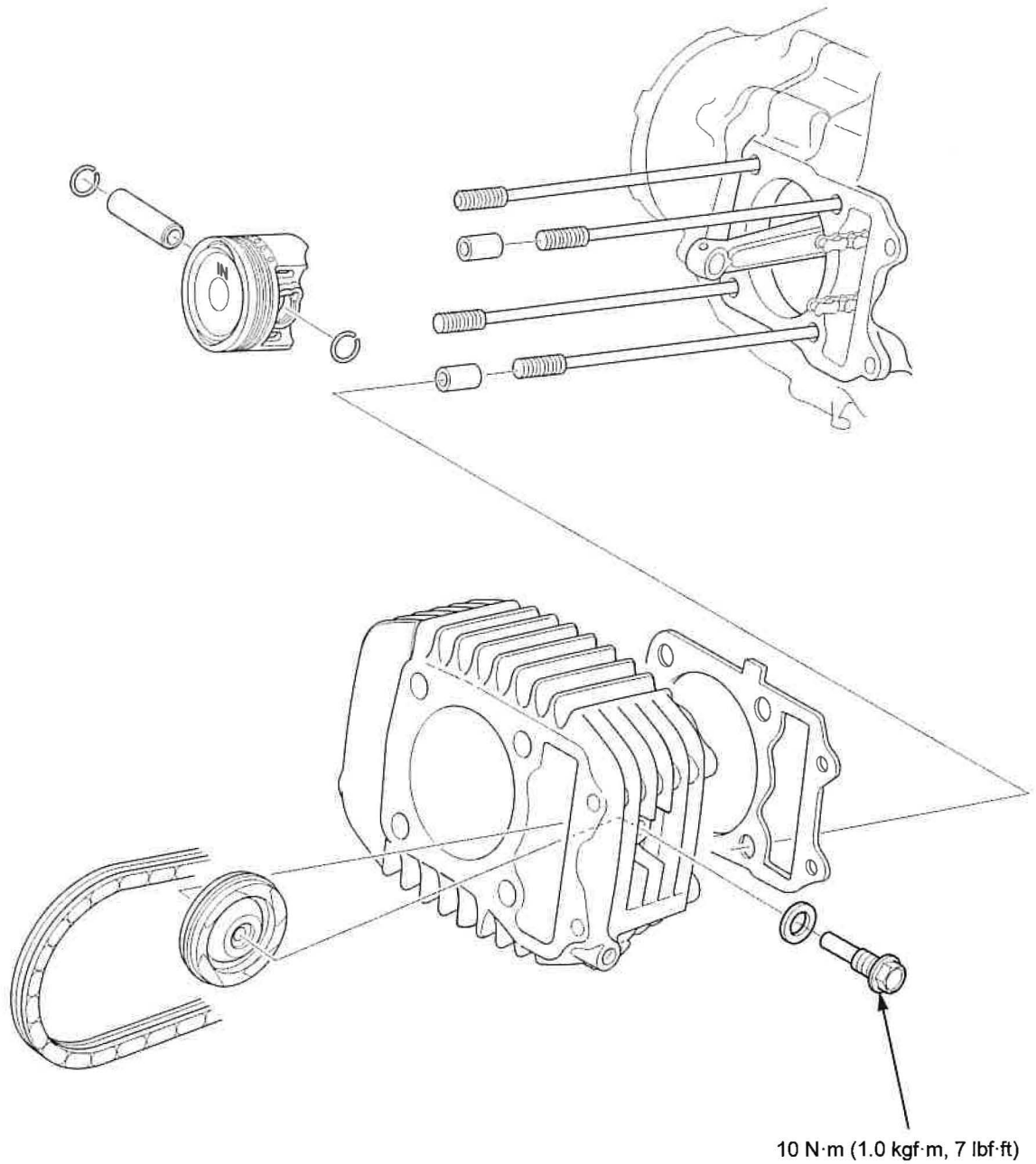
### Excessive smoke

- Worn cylinder, piston or piston rings
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall
- Cylinder head/valve problem (page 9-4)

### Abnormal noise

- Worn piston pin or piston pin hole
- Worn cylinder, piston or piston rings
- Worn connecting rod small end

COMPONENT LOCATION





## CYLINDER/PISTON

## CYLINDER/PISTON

### CYLINDER REMOVAL

**NOTE:**

- Cylinder and piston can be serviced with the engine installed on the frame.

Remove the cylinder head (page 9-10).

*Be careful not to drop the guide roller into the crankcase.*

Remove the following:

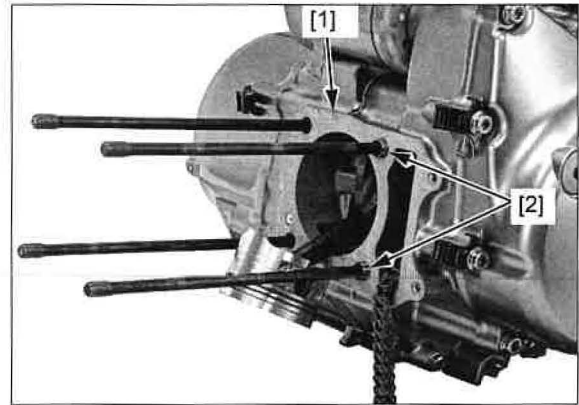
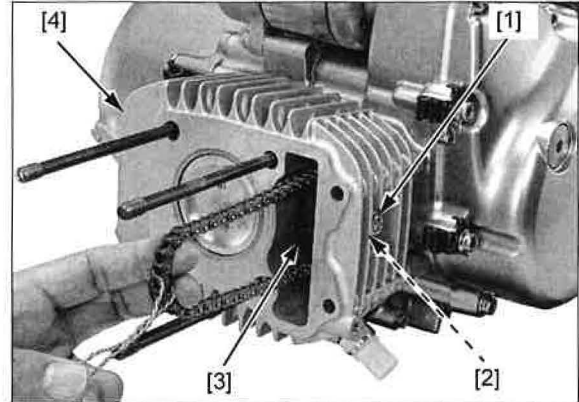
- Cam chain guide roller pin bolt [1] and sealing washer [2]
- Guide roller [3]

Remove the cylinder [4].

**NOTE:**

- 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.

Remove the gasket [1] and dowel pins [2].



## PISTON REMOVAL

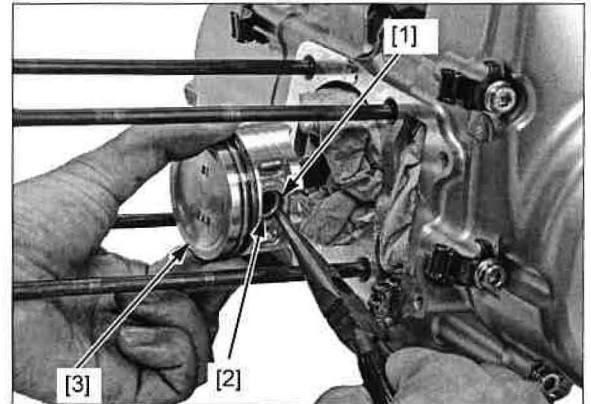
- Perform the TP sensor reset procedure if the cylinder is replaced or is overhauled (page 4-34).

Remove the piston pin clip [1] with pliers.

### NOTE:

- Place a clean shop towel over the crankcase to prevent the clip from falling into the crankcase.

Push the piston pin [2] out of the piston [3] and connecting rod, and remove the piston.



Spread each piston ring [1] and remove it by lifting it up at a point just opposite the gap.

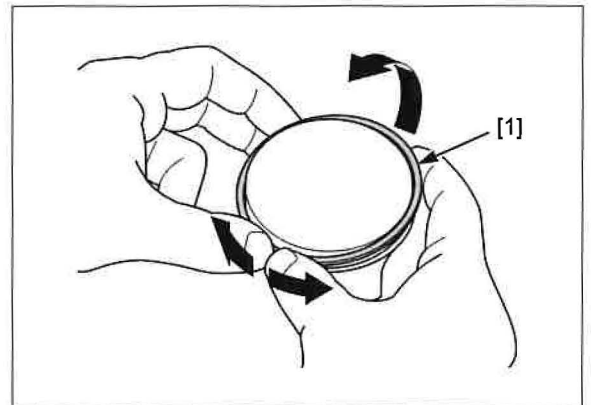
### NOTE:

- Do not damage the piston ring by spreading the ends too far.

Clean carbon deposits from the piston ring grooves with a used piston ring that will be discarded. Blow the oil passage with compressed air, if necessary.

### NOTE:

- Never use a wire brush; it will damage the groove.



## INSPECTION

Inspect the following parts for scratch, damage, abnormal wear, deformation, burning or clogs in oil passages.

- Cylinder
- Piston
- Piston rings
- Piston pin
- Connecting rod small end

Measure each part and calculate the clearance according to CYLINDER/PISTON SPECIFICATIONS (page 1-6).

Replace any part if it is out of service limit.

## CYLINDER STUD BOLT REPLACEMENT

If replacing the cylinder stud bolts, be sure to install them as shown.

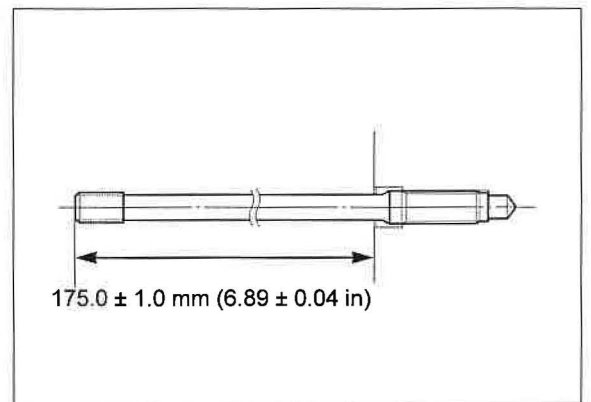
Thread two nuts onto the stud bolt, and tighten them together, then use a wrench on them to turn the stud bolt out.

Install and tighten new stud bolts to the specified torque.

**TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)**

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

**STANDARD: 175 ± 1 mm (6.89 ± 0.04 in)**



## CYLINDER/PISTON

### PISTON INSTALLATION

Clean the piston heads, ring grooves and skirts.

Apply engine oil to the piston ring surface and the ring grooves.

Carefully install the piston rings onto the piston with their markings facing up.

#### NOTE:

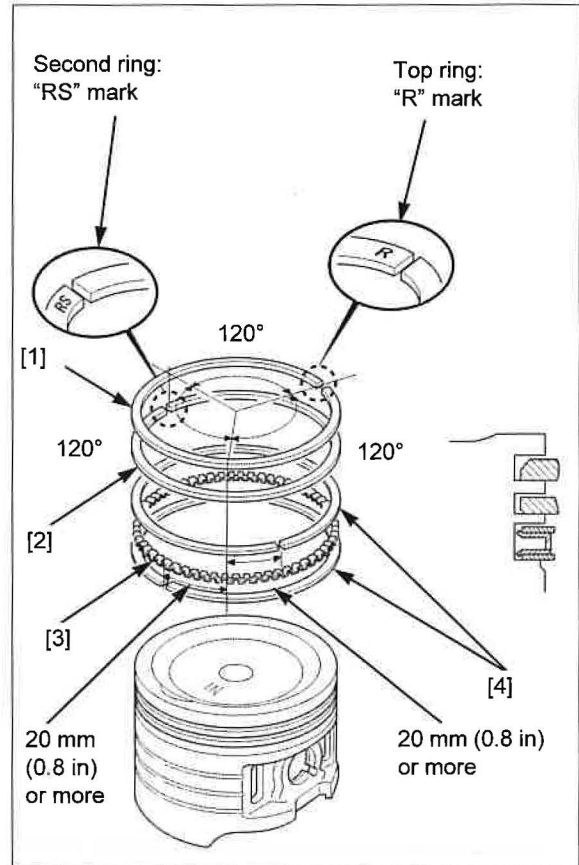
- Be careful not to damage the piston and piston rings during installation.
- Do not confuse the top ring [1] and second ring [2].
- When installing the oil ring [3], install the spacer first and then the side rails [4].

*Do not align the gaps of the oil ring side rails.*

Stagger the piston ring end gaps 120 degrees apart from each other as shown.

Stagger the side rails gaps as shown.

After installation, the piston rings should be free to rotate in the groove.



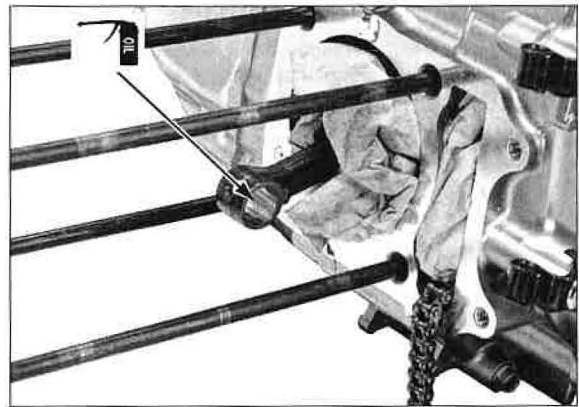
### PISTON INSTALLATION

Place a clean shop towel over the crankcase to prevent the dirt, dust or piston pin clips from entering the crankcase.

*Be careful not to damage the gasket mating surfaces.*

Clean the gasket mating surfaces of the crankcase and cylinder thoroughly.

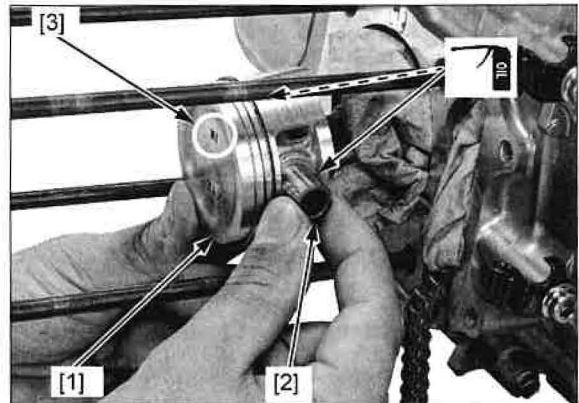
Apply oil to the connecting rod small end inner surface.



Apply oil to the piston [1] pin hole inner surface and piston pin [2] outer surface.

Install the piston with the "IN" mark [3] facing the intake side.

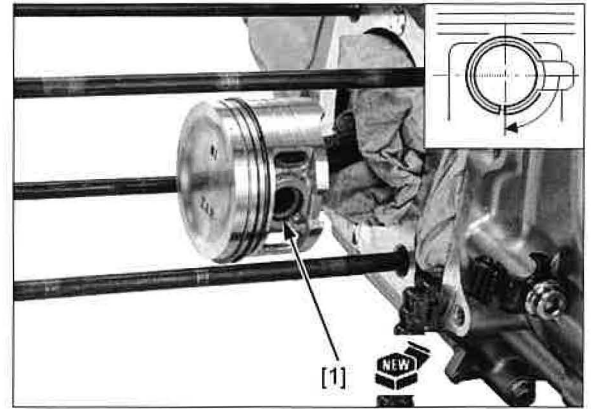
Install the piston pin.



Install the new piston pin clip [1].

**NOTE:**

- Make sure the piston pin clips are seated securely.
- Do not align the piston pin clip end gap with the piston cutout.

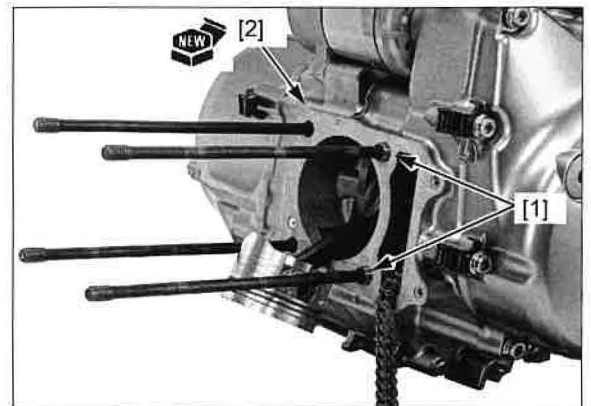


**CYLINDER INSTALLATION**

Install the dowel pins [1] and a new gasket [2].

**NOTE:**

- Be careful not to damage the mating surface.
- Place a clean shop towel over the crankcase to prevent the gasket materials from falling into the crankcase.
- Make sure that the oil passage is free from contamination.

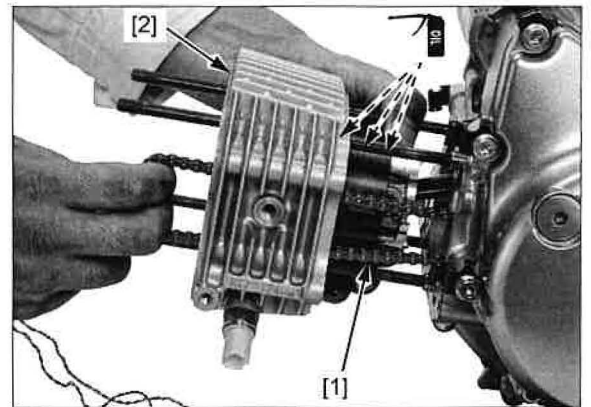


Apply oil to the cylinder bore, piston sliding area, piston ring grooves and piston rings whole surface. Route the cam chain [1] through the cylinder [2].

**NOTE:**

- Be careful not to damage the piston rings and cylinder bore.

Install the cylinder over the piston while compressing the piston rings with your fingers.



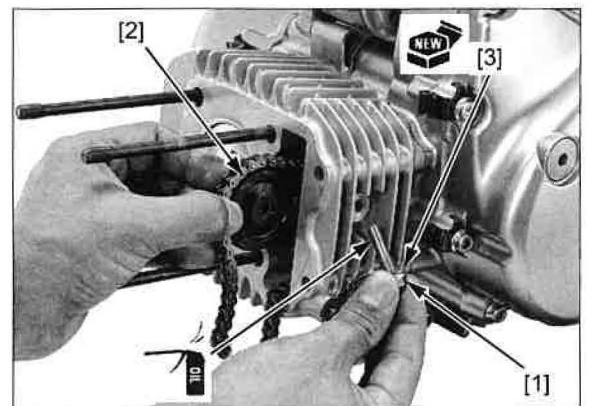
Apply engine oil to the sliding surface of the cam chain guide roller pin bolt [1].

Install the cam chain guide roller [2], new sealing washer [3] and cam chain guide roller pin bolt.

Tighten the roller pin bolt to the specified torque.

**TORQUE: 10 N·m (1.0 kgf·m, 7.0 lbf·ft)**

Install the cylinder head (page 9-10).



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**MEMO**

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# 11. CLUTCH/GEARSHIFT LINKAGE

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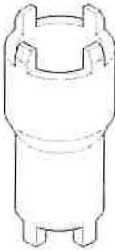
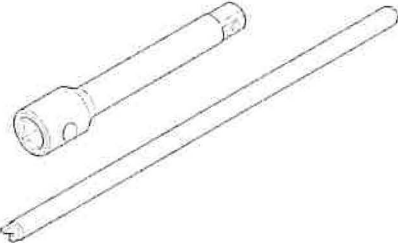
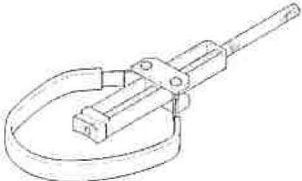
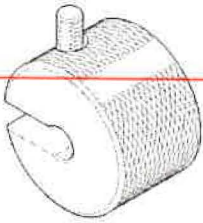

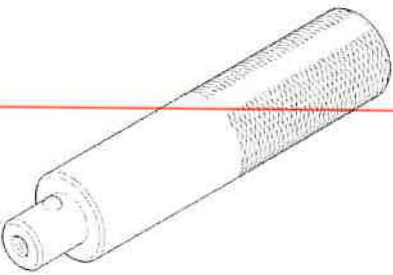
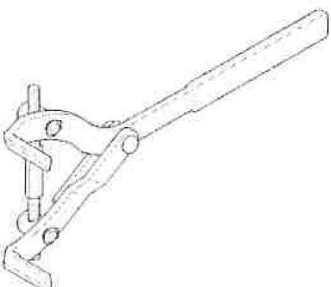
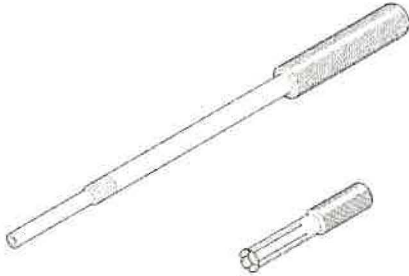
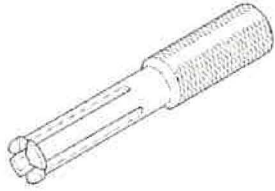
## CLUTCH/GEARSHIFT LINKAGE

# SERVICE INFORMATION

### GENERAL

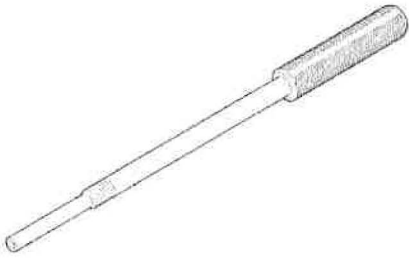
- This section covers service of the clutch (centrifugal clutch and manual clutch) and gearshift linkage. These service can be done with the engine installed in the frame.
- Engine oil viscosity, oil level and the use of oil additives have an effect on clutch operation. Oil additives of any kind are specifically not recommended. When the clutch does not disengage or the vehicle creeps with clutch disengaged, inspect the engine oil and oil level before servicing the clutch system.

### TOOLS

<p>Locknut wrench, 20 x 24 mm 07716-0020100</p> 	<p>Extension bar 07716-0020500</p>  <p>Equivalent commercially available in the U.S.A.</p>	<p>Flywheel holder 07725-0040001</p> 
<p>Remover weight 07741-0010201</p>  <p>07936-371020A or 07936-3710200</p>	<p>Pilot, 12 mm 07746-0040200</p> 	<p>Driver 07749-0010000</p> 
<p>Clutch center holder 07724-0050002</p>  <p>Equivalent commercially available in the U.S.A.</p>	<p>Bearing remover set, 12 mm 07936-1660101</p>  <p>07936-166010A (U.S.A. only)</p>	<p>Bearing remover head, 12 mm 07936-1660110</p>  <p>Not available in U.S.A.</p>

## CLUTCH/GEARSHIFT LINKAGE

Bearing remover shaft, 12 mm  
07936-1660120

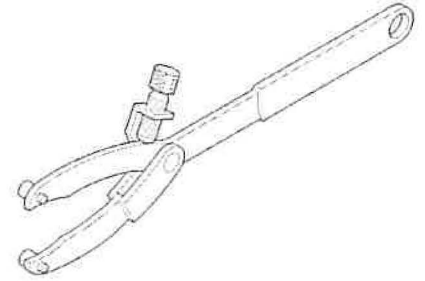


Not available in U.S.A.

Attachment, 28 x 30 mm  
07946-1870100



Universal holder  
07725-0030000





## CLUTCH/GEARSHIFT LINKAGE

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### TROUBLESHOOTING

Faulty clutch operation can usually be corrected by adjusting the clutch system.

#### **Clutch slips when accelerating**

- Incorrect clutch adjustment
- Worn clutch disc
- Weak clutch springs
- Faulty clutch weight
- Molybdenum or graphite additive

#### **Vehicle creeps with clutch disengaged**

- Incorrect clutch adjustment
- Clutch plate warped
- Faulty clutch lifter
- Faulty clutch weight

#### **Hard to shift**

- Damaged gearshift spindle
- Damaged stopper plate and pin
- Loose stopper plate bolt
- Incorrect clutch adjustment
- Loose gearshift cam plate bolt

#### **Transmission jumps out of gear**

- Damaged stopper arm
- Damaged gearshift cam plate
- Loose gearshift cam plate bolt

#### **Gearshift pedal will not return**

- Weak or broken gearshift spindle return spring
- Bent gearshift spindle

COMPONENT LOCATION

12 N·m (1.2 kgf·m, 9.0 lbf·ft)

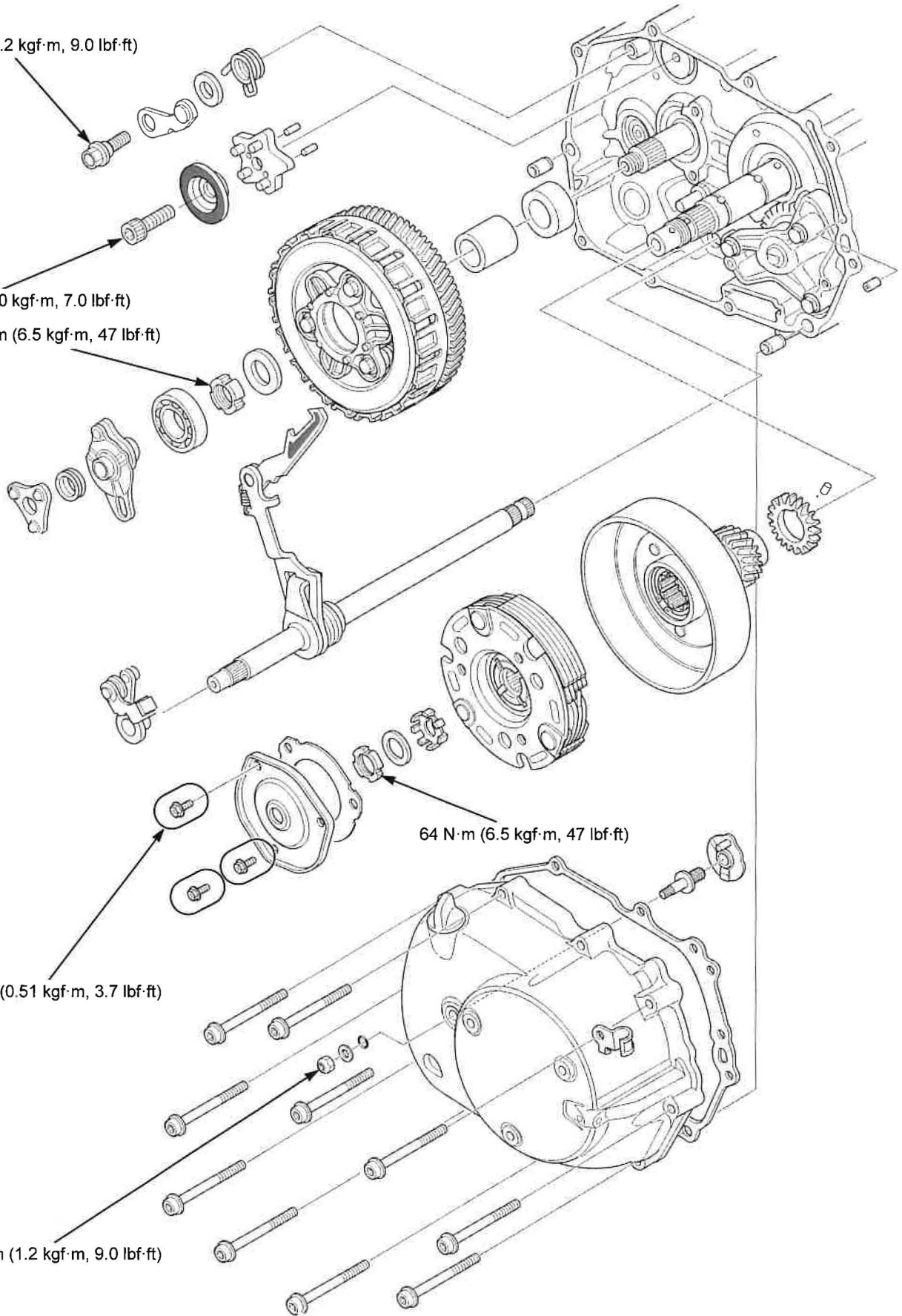
10 N·m (1.0 kgf·m, 7.0 lbf·ft)

64 N·m (6.5 kgf·m, 47 lbf·ft)

64 N·m (6.5 kgf·m, 47 lbf·ft)

5 N·m (0.51 kgf·m, 3.7 lbf·ft)

12 N·m (1.2 kgf·m, 9.0 lbf·ft)



**RIGHT CRANKCASE COVER**

**REMOVAL/INSTALLATION**

Drain the engine oil (page 3-9).

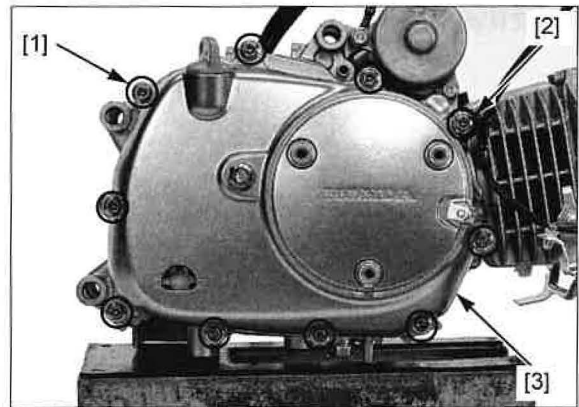
Remove the following:

- Gearshift pedal (page 2-17)
- Exhaust pipe/muffler (page 2-19)
- Right crankcase cover protector (page 2-18)

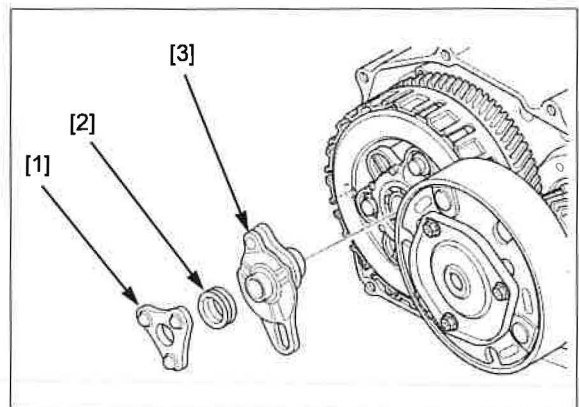
Remove the bolts [1] and wire clamp [2] in a crisscross pattern in several steps.

*Be careful not to damage the mating surface.*

Remove the right crankcase cover [3].



Remove the ball lifter [1], spring [2] and clutch lifter cam plate [3].



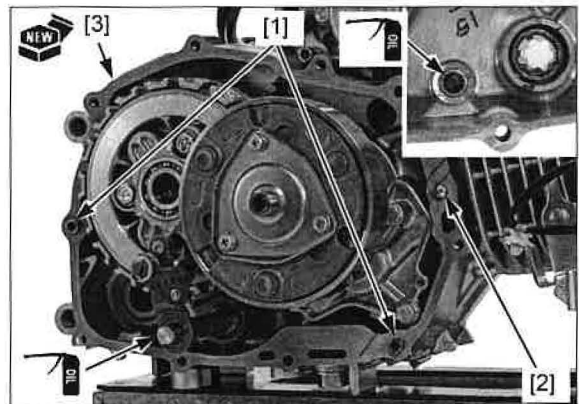
Remove the dowel pins [1], orifice [2] and gasket [3].

**INSTALLATION**

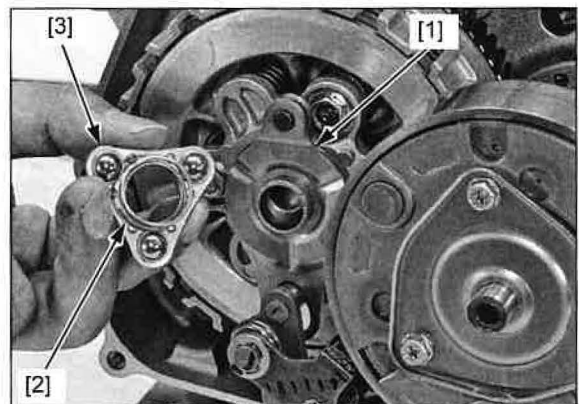
Clean the gasket mating surface of the crankcase and right crankcase cover, being careful not to damage them.

Install the dowel pins, orifice and a new gasket onto the crankcase.

Apply engine oil to the gearshift spindle journal area.



Install the clutch lifter cam plate [1] onto the gearshift spindle as shown. Install the spring [2] and ball lifter [3] onto the clutch lifter bearing.



Install the right crankcase cover [1].

Install the clamp [2] and tighten the right crankcase cover bolts [3] in a crisscross pattern in several steps.

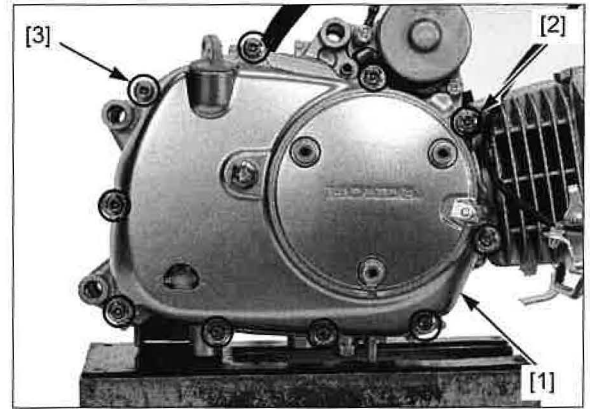
Install the following:

- Gearshift pedal (page 2-17)
- Exhaust pipe/muffler (page 2-19)
- Right crankcase cover protector (page 2-18)

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

Make sure there are no oil leaks.

Check the clutch system adjustment (page 3-17).

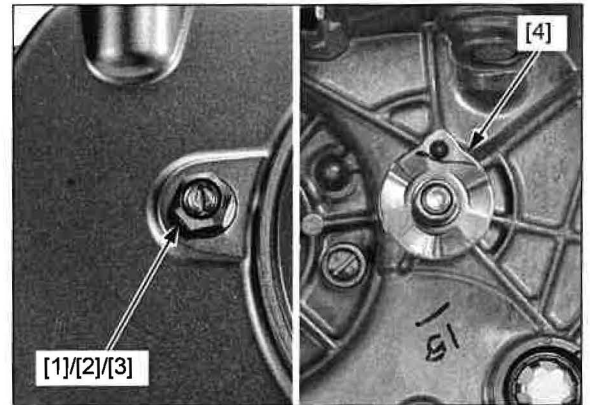


### DISASSEMBLY

#### CLUTCH LIFTER

Remove the following:

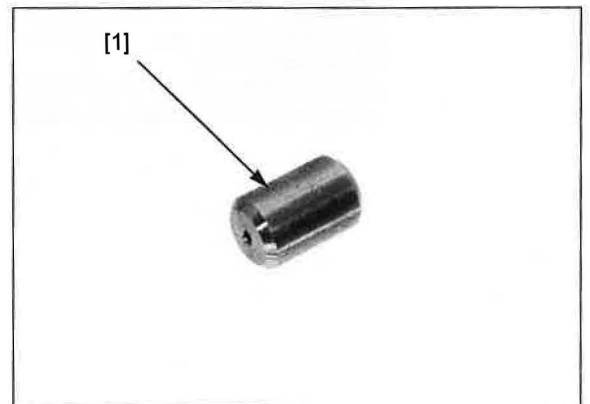
- Clutch adjuster lock nut [1]
- Washer [2]
- O-ring [3]
- Clutch adjuster/lifter boss [4]



#### OIL PASSAGES

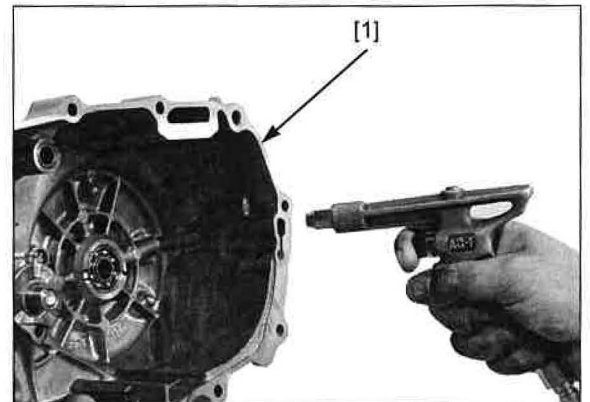
Blow open the oil passage of the orifice [1] with compressed air.

Check the oil passage for clog or damage.



Blow open the oil passage of the right crankcase cover [1] with compressed air.

Check the oil passage for clog or damage.



## CLUTCH/GEARSHIFT LINKAGE

### CRANKSHAFT BEARING REPLACEMENT

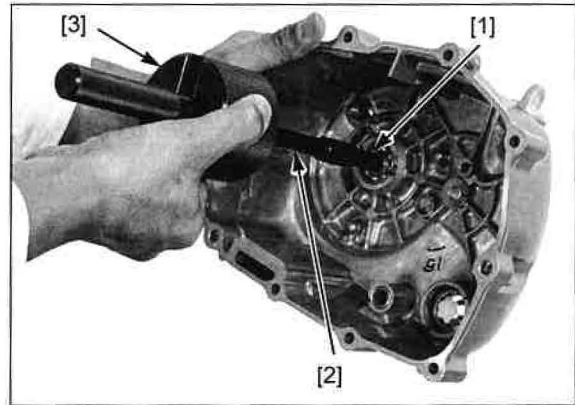
Remove the crankshaft bearing [1] using the special tools as shown.

**TOOLS:**

- [2] Bearing remover set, 12mm 07936-1660101
- Bearing remover shaft, 12 mm 07936-1660120
- Bearing remover head, 12mm 07936-1660110
- [3] Remover weight 07741-0010201

**U.S.A. TOOLS:**

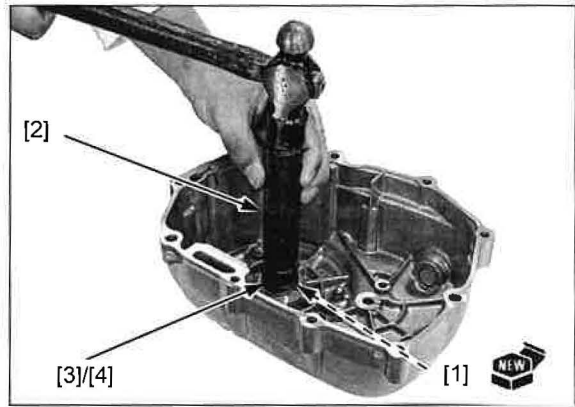
- Bearing Remover, 12mm 07936-166010A
- Remover Handle 07936-3710100
- Remover Weight 07936-371020A



Install a new crankshaft bearing [1] with its sealed side facing down 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

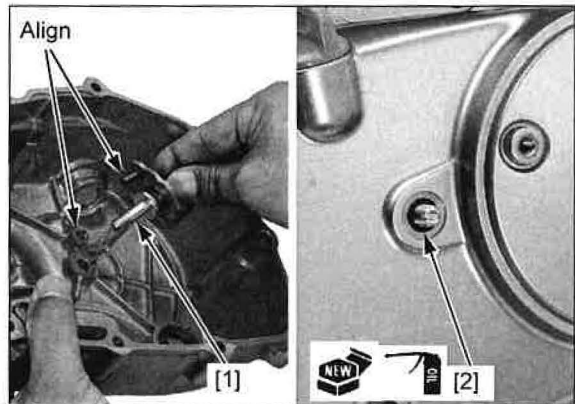


### ASSEMBLY

Install the clutch adjuster/lifter boss [1] into the right crankcase cover aligning its boss with the hole in the crankcase cover.

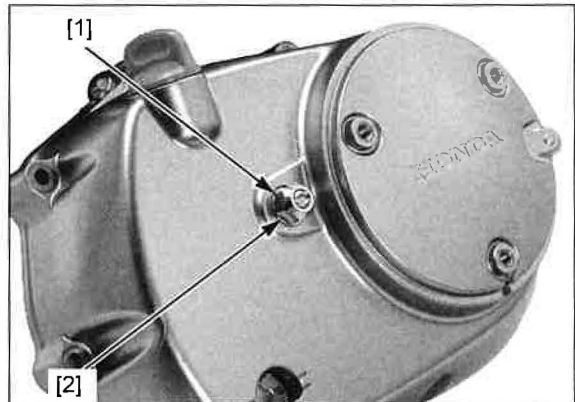
Apply engine oil to a new O-ring [2].

Install the O-ring to the clutch adjuster/lifter boss.



Install the washer [1] and clutch adjuster lock nut [2].

Adjust the clutch system (page 3-17) after installing the right crankcase cover.

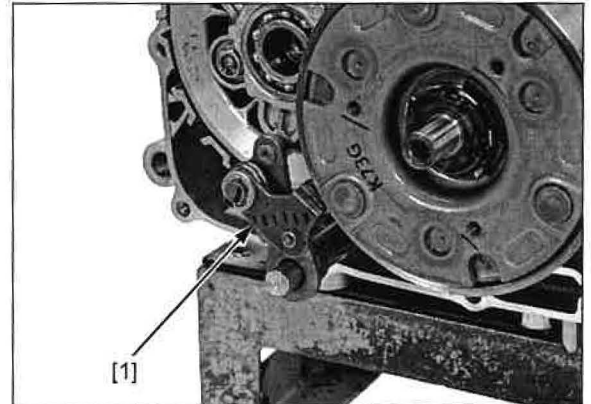


**CLUTCH****REMOVAL****NOTE:**

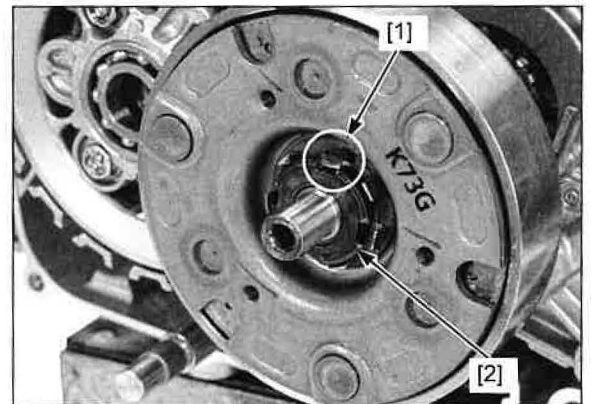
- Clutch system can be serviced with the engine installed on the frame.

Remove the engine oil centrifugal filter cover (page 3-10).

Remove the clutch brake/lever assembly [1].



Bend up the tab [1] of the lock washer to clear the lock nut [2] groove.



Remove the centrifugal clutch lock nut [1] using the special tools.

**TOOLS:**

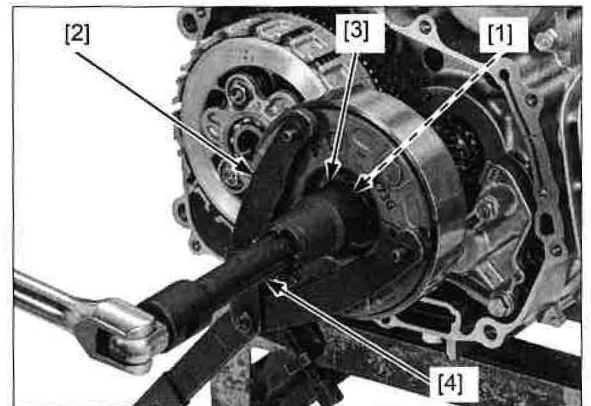
[2] Universal holder

07725-0030000

[3] Lock nut wrench, 20 x 24 mm

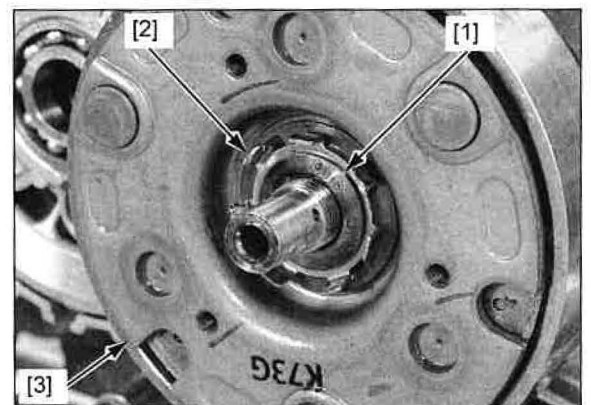
07716-0020100

[4] Extension bar  
07716-0020500 or  
equivalent  
commercially  
available in the  
U.S.A.



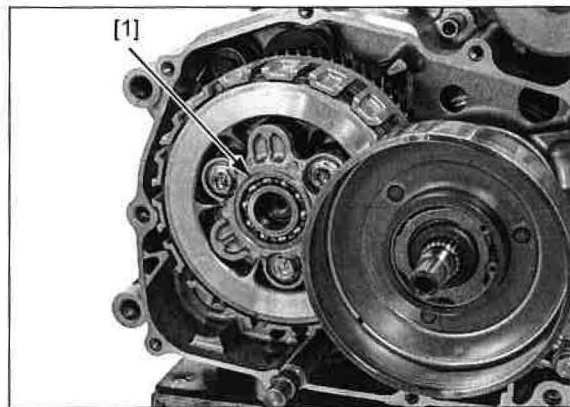
Remove the washer [1] and lock washer [2].

Remove the clutch weight assembly [3].



## CLUTCH/GEARSHIFT LINKAGE

Remove the clutch lifter bearing [1].



Remove the clutch center lock nut [1] and washer [2] using the special tools.

### TOOLS:

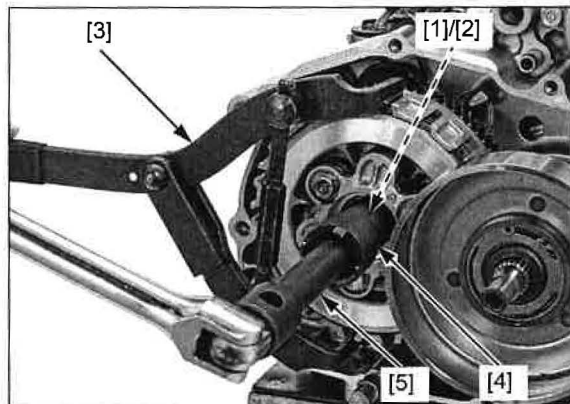
[3] Clutch center holder

07724-0050002 or equivalent commercially available in the U.S.A.

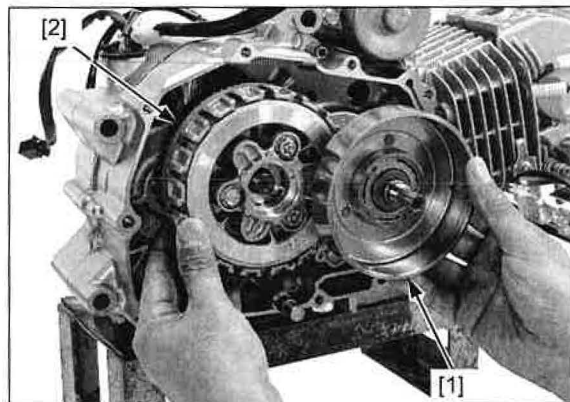
[4] Lock nut wrench, 20 x 24 mm 07716-0020100

[5] Extension bar

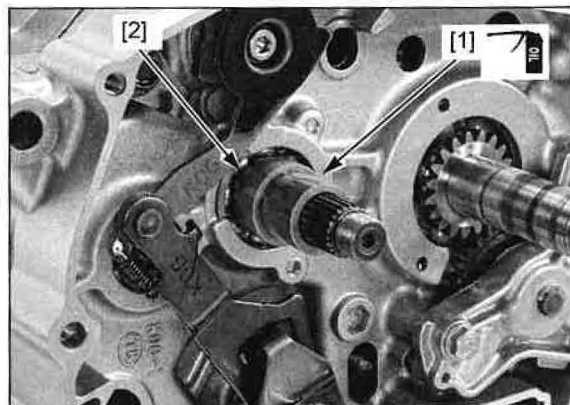
07716-0020500 or equivalent commercially available in the U.S.A.



Remove the centrifugal clutch outer [1] and manual clutch [2] as an assembly.



Remove the clutch outer guide [1] and collar [2] from the mainshaft.

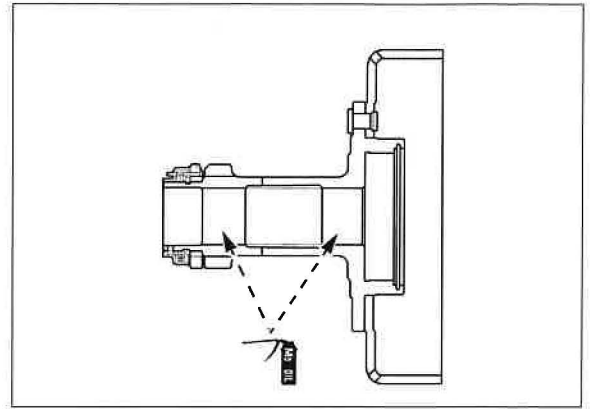


## INSTALLATION

Install the collar to the mainshaft.

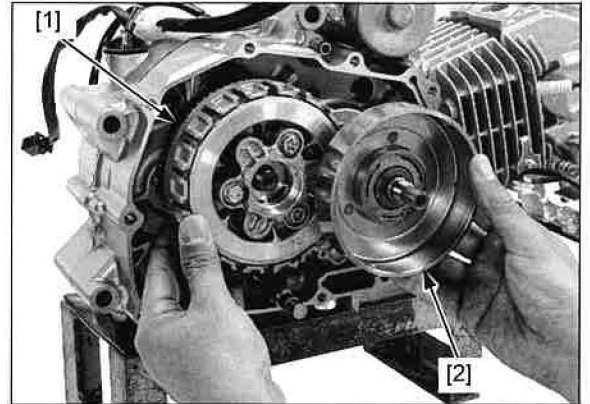
Apply engine oil to the clutch outer guide outer surface.  
Install the clutch outer guide to the mainshaft.

Apply molybdenum disulfide oil to the primary drive gear inner surface.



Align the cut-outs of the primary drive gear and sub-gear, then engage the primary drive/driven gears.

Install the manual clutch [1] and centrifugal clutch outer [2] as an assembly.



Install the washer [1] onto the mainshaft.  
Apply engine oil to the clutch center lock nut [2] threads and seating surface.  
Install the clutch center lock nut.  
Hold the primary drive and driven gear, then tighten the clutch center lock nut to the specified torque using the special tools.

**TOOLS:**

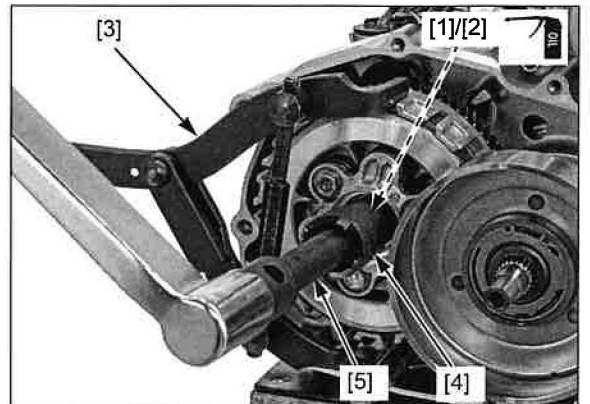
[3] Clutch center holder

07724-0050002 or equivalent commercially available in the U.S.A.

[4] Lock nut wrench, 20 x 24 mm 07716-0020100

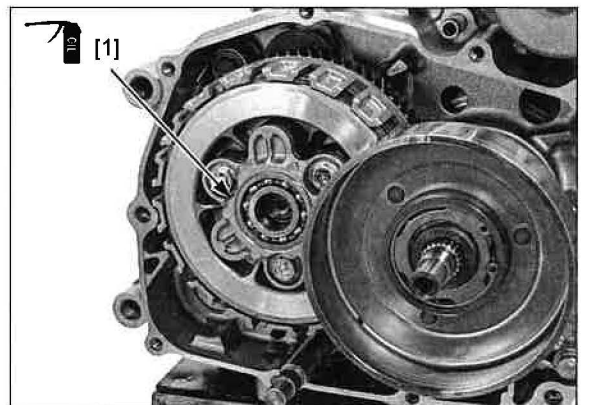
[5] Extension bar

07716-0020500 or equivalent commercially available in the U.S.A.



**TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)**

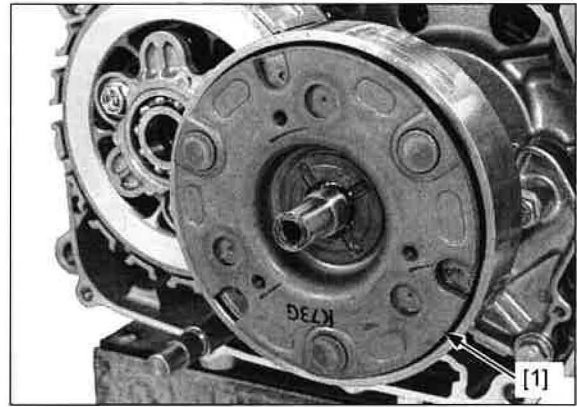
Apply engine oil to the clutch lifter bearing [1] and install it with its marked side facing out.



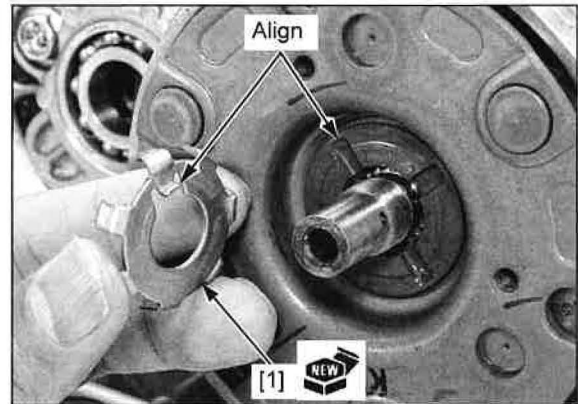


## CLUTCH/GEARSHIFT LINKAGE

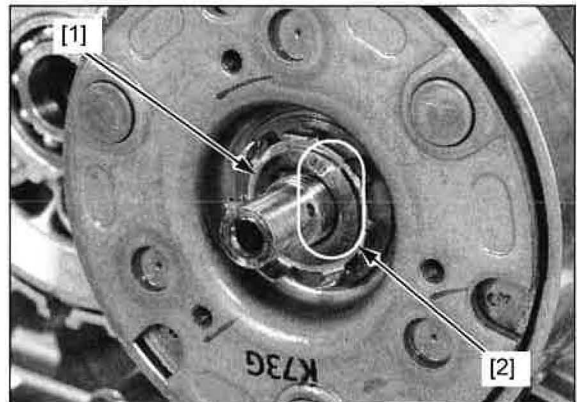
Install the clutch weight assembly [1] into the clutch outer while aligning the splines of the clutch weight assembly and crankshaft.



Install a new lock washer [1] onto the crankshaft aligning its inner tab with the groove of the clutch weight assembly.



Install the washer [1] with its "OUT SIDE" mark [2] facing out.

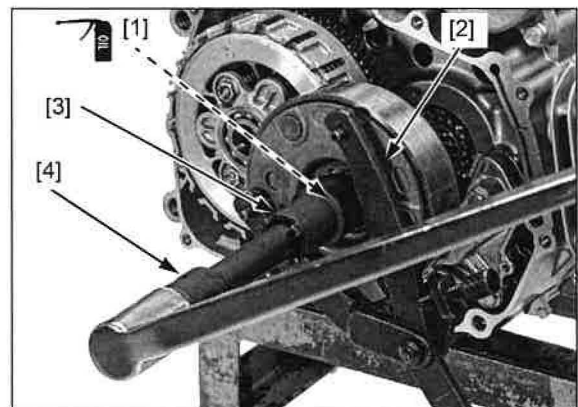


Apply engine oil to the centrifugal clutch lock nut [1] threads and seating surface.

Install and tighten the centrifugal clutch lock nut to the specified torque using the special tools.

### TOOLS:

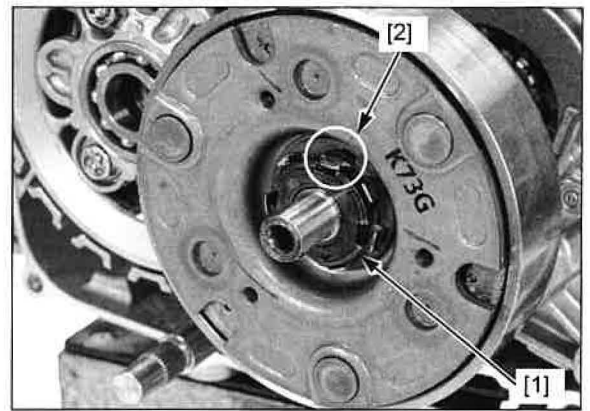
- |                                 |  |
|---------------------------------|--|
| [2] Universal holder            | 07725-0030000  |
| [3] Lock nut wrench, 20 x 24 mm | 07716-0020100  |
| [4] Extension bar               | 07716-0020500 or equivalent commercially available in the U.S.A. |



**TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)**

If any of the centrifugal clutch lock nut [1] groove is not aligned with the lock washer tab [2], further tighten the centrifugal clutch lock nut and align the centrifugal clutch lock nut groove with the lock washer tab.

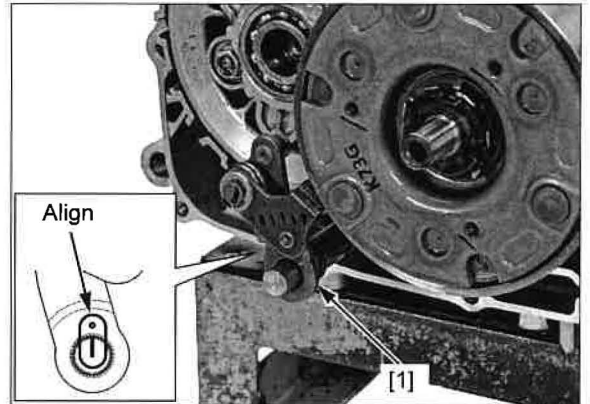
Bend the lock washer tab against the centrifugal clutch lock nut groove.



Install the clutch brake/lever assembly [1] by aligning its punch mark with the index line on the gearshift spindle.

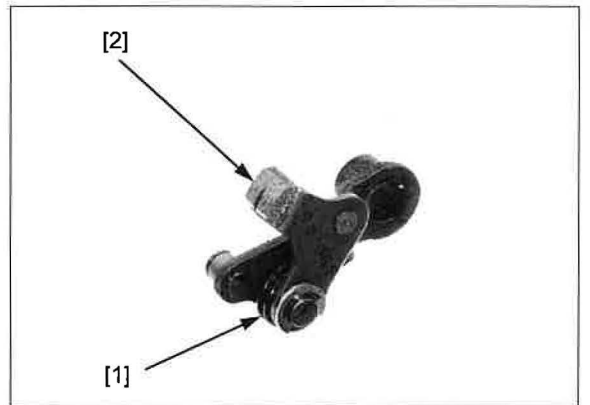
Install the following:

- Engine oil centrifugal filter cover (page 3-10)
- Right crankcase cover (page 11-6)



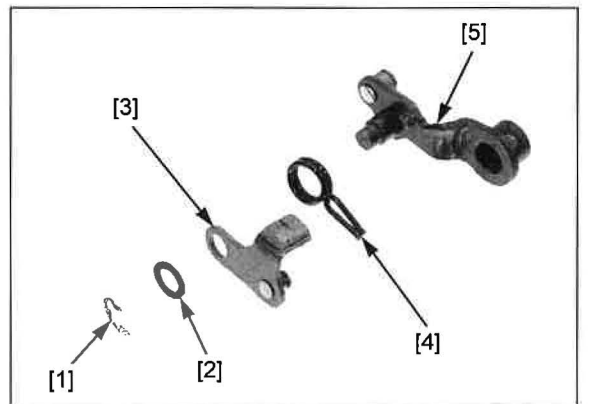
### CLUTCH BRAKE/LEVER DISASSEMBLY/INSPECTION

Check the return spring [1] and the clutch brake lining [2] for fatigue or other damage.



Remove the E-clip [1] and washer [2].

Remove the clutch brake plate [3] and return spring [4] from the clutch lever [5].



## CLUTCH/GEARSHIFT LINKAGE

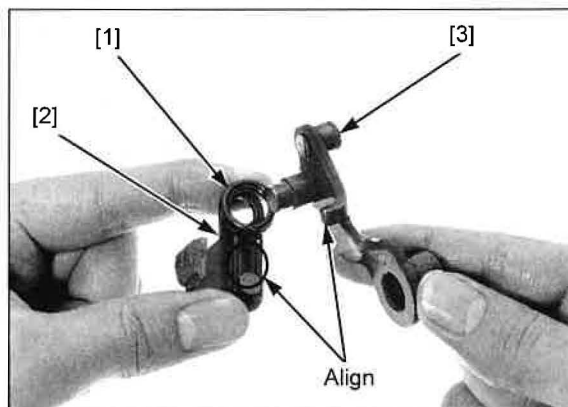
Set the brake plate return spring [1] to the clutch brake plate [2].

Install the clutch brake plate to the clutch lever [3] by aligning the spring ends with the boss on the clutch lever.

Install the washer and E-clip.

### NOTE:

- Install the E-clip with the chamfered edges facing the thrust load side.
- Check that the E-clip is seated in the groove.



## CENTRIFUGAL CLUTCH DISASSEMBLY/INSPECTION

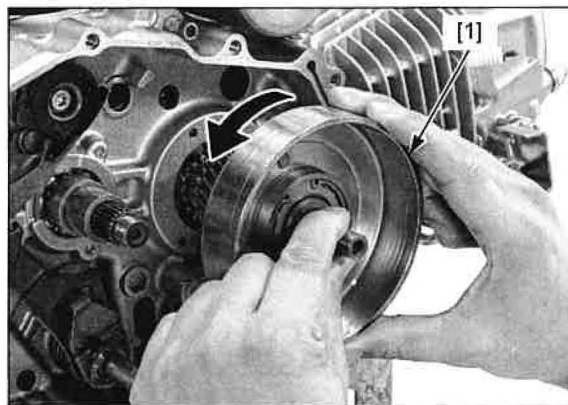
### ONE-WAY CLUTCH

Temporarily install the centrifugal clutch outer [1] to the crankshaft.

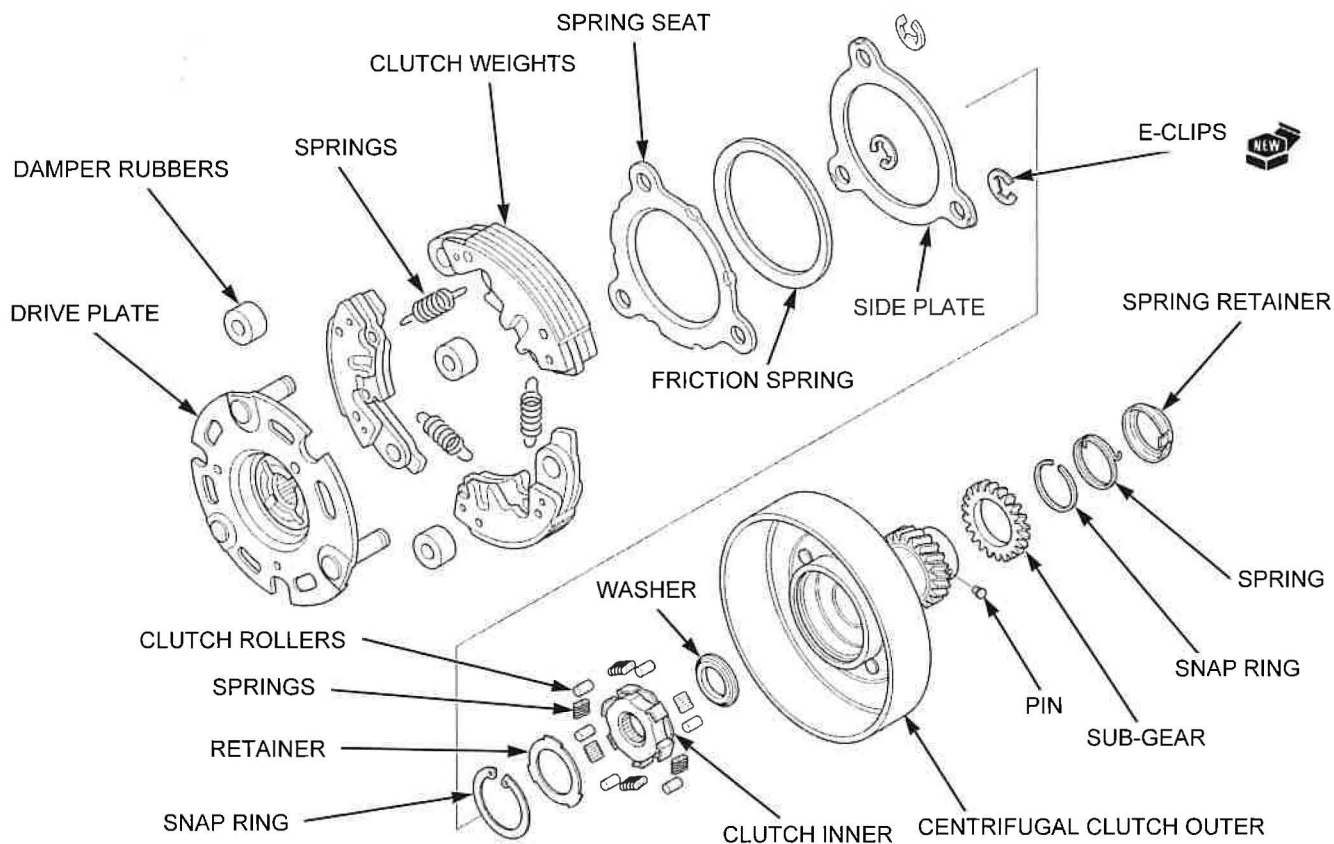
Hold the crankshaft and turn the centrifugal clutch outer by hand.

Make sure that the centrifugal clutch outer only turns counterclockwise as shown and does not turn clockwise.

Remove the centrifugal clutch outer from the crankshaft.



Disassemble and assemble the centrifugal clutch according to the illustration.



**INSPECTION**

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

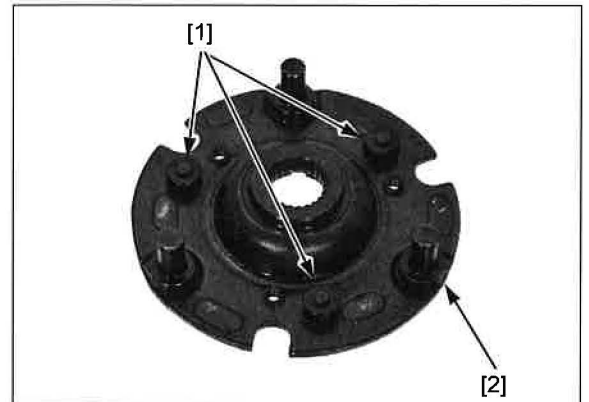
- One-way clutch roller
- Springs
- One way inner clutch
- Sub-gear
- Centrifugal clutch outer drum
- Primary drive gear (crankshaft sliding area)
- Crankshaft (primary drive gear sliding area)
- Clutch weights
- Drive plate

Measure each part according to CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS (page 1-6).  
Replace any part if it is out of service limit.

**CENTRIFUGAL CLUTCH ASSEMBLY**

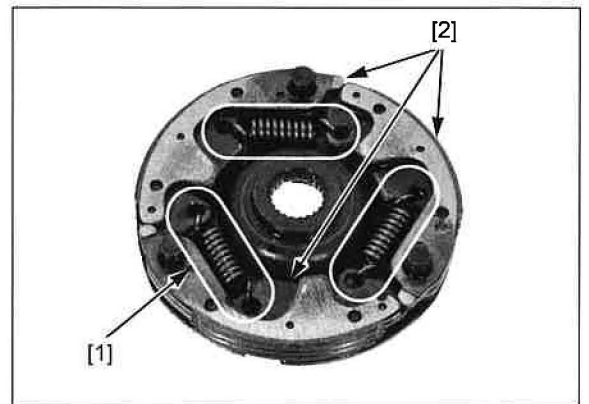
**CLUTCH WEIGHT**

Install the damper rubbers [1] to the drive plate [2].

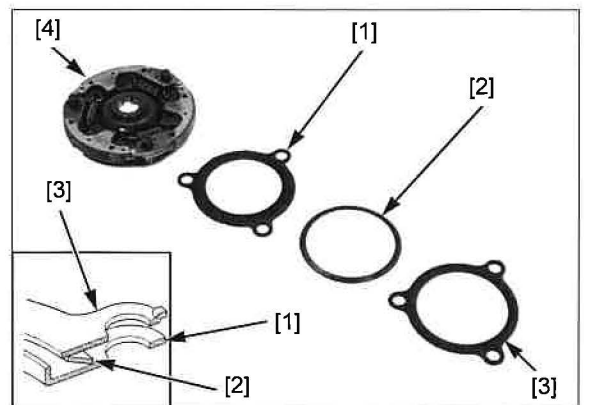


Hook the springs [1] to the clutch weights [2] so that their open ends facing the drive plate side.

Install the clutch weights and springs onto the drive plate as shown.



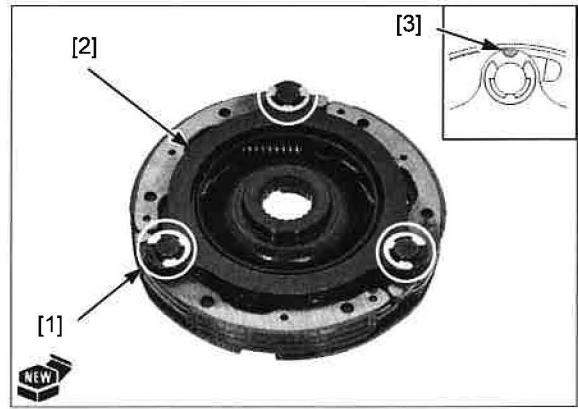
Install the spring seat [1], friction spring [2] and side plate [3] to the clutch weight assembly [4] as shown.



## CLUTCH/GEARSHIFT LINKAGE

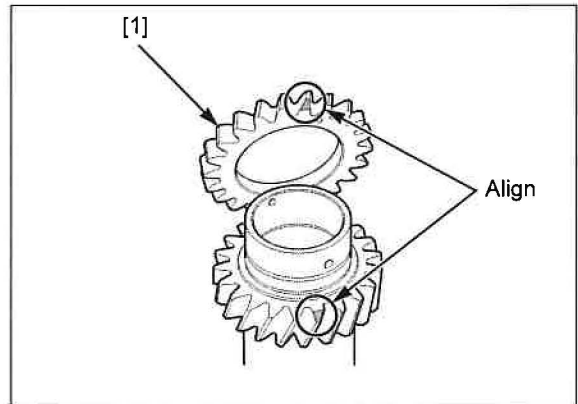
Align the open end of the E-clips and bosses [3] of the side plate.

Install the new E-clips [1] while compressing the side plate [2].



### CLUTCH OUTER/SUB-GEAR

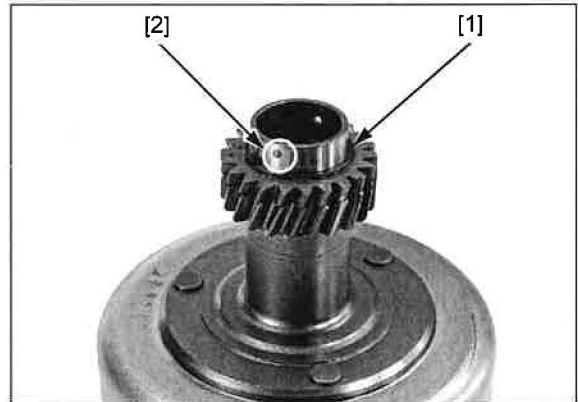
Install the sub-gear [1] by aligning its hole and primary drive gear cut-out.



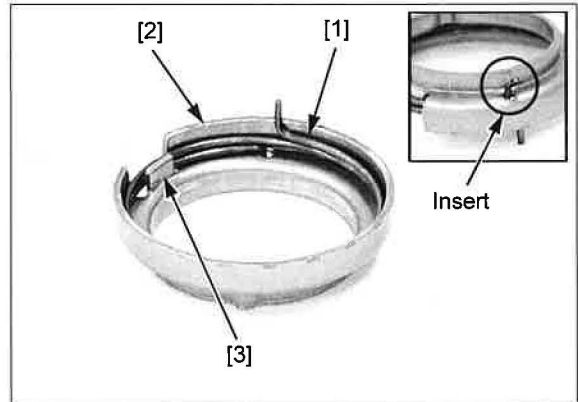
Check that the snap ring is seated in the groove.  
Be careful not to lose the pin.

Install the snap ring [1].

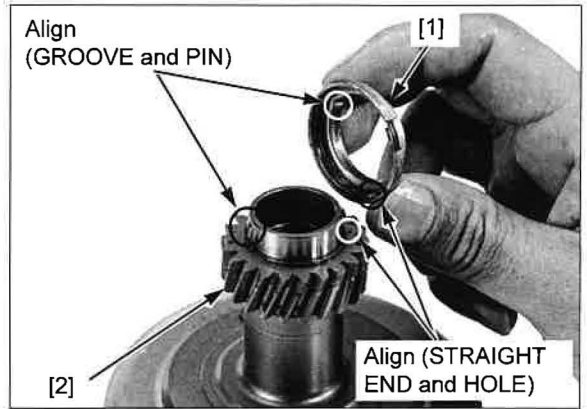
Install the pin [2].



Insert the bent end of the spring [1] into the hole on the spring retainer [2].  
Coil the spring into the spring retainer, making sure that the spring is set between the retainer and tab [3].



Install the spring retainer/spring [1] to the clutch outer while aligning the straight end of spring into the hole on the sub-gear [2] and aligning the retainer groove with the pin.

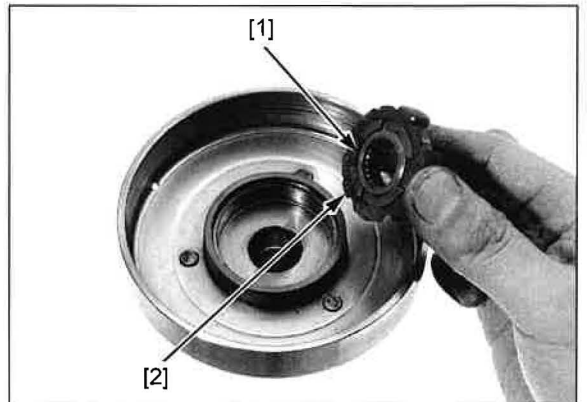


Check the sub-gear [1] operation by moving it and make sure that it returns without binding.

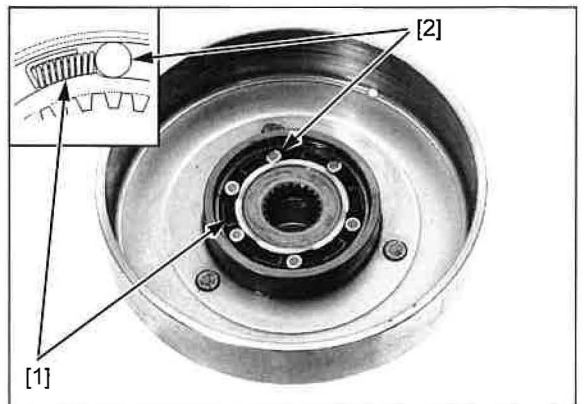


## ONE-WAY CLUTCH

Install the washer [1] and one-way clutch inner [2] into the centrifugal clutch outer.



Install the springs [1] and rollers [2] as shown.



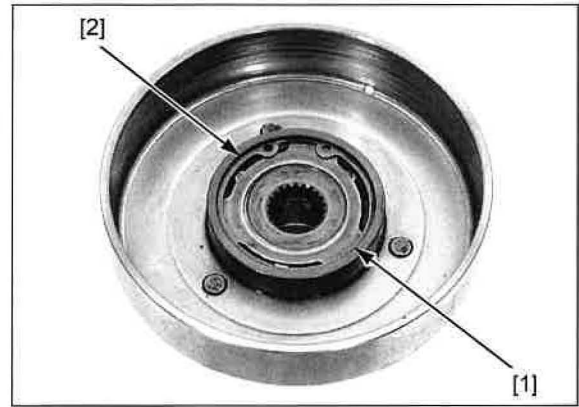
## CLUTCH/GEARSHIFT LINKAGE

Install the retainer [1].

Check that the snap ring is seated in the groove.

Install the snap ring [2] into the groove of the one-way clutch outer securely.

After adjusting it, make sure the one-way clutch is working properly (page 11-14).



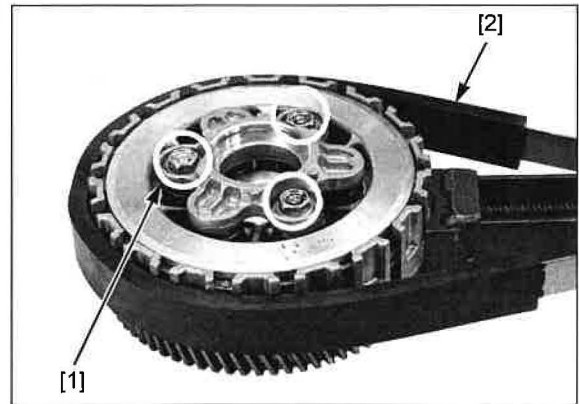
## MANUAL CLUTCH DISASSEMBLY

Hold the clutch outer using the special tool and loosen the bolts [1] in several steps.

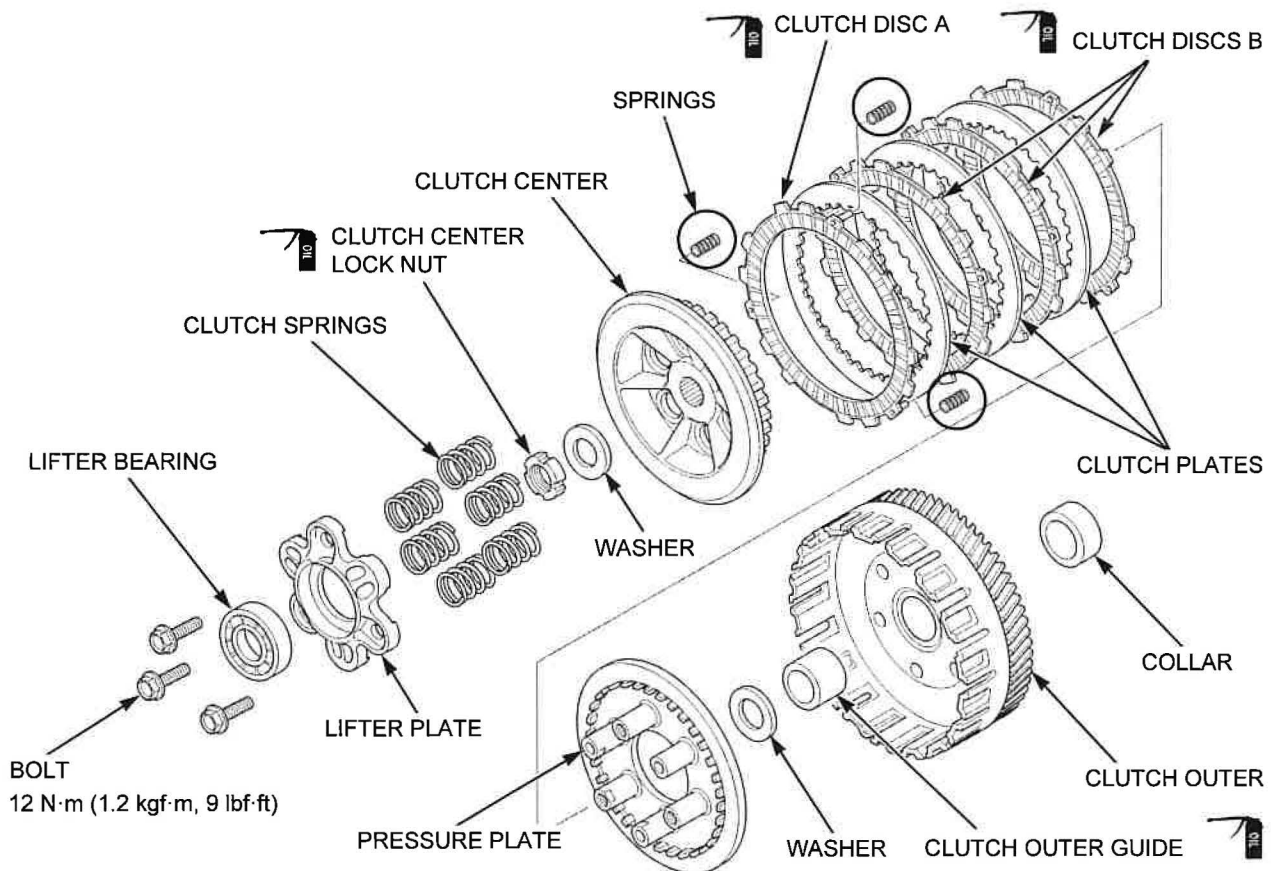
**TOOL:**

[2] Flywheel holder

07725-0040001



Disassemble and assemble the clutch according to the illustration.



**INSPECTION**

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

- Clutch lifter bearing
- Clutch springs
- Clutch center
- Clutch disc A
- Clutch discs B
- Clutch plates
- Clutch outer
- Clutch outer guide
- Pressure plate
- Mainshaft

Measure each part according to CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS (page 1-6).

Replace any part if it is out of service limit.

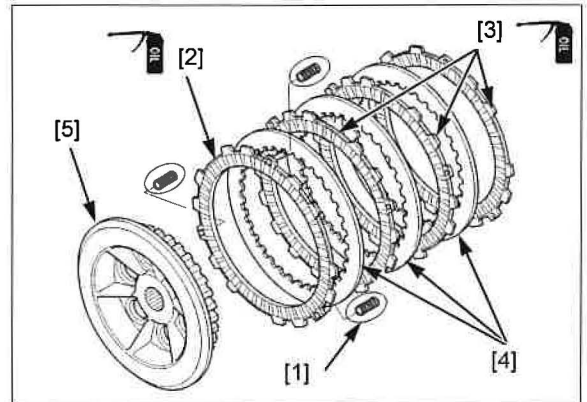
- Replace the clutch springs as a set.
- Replace the clutch disc A, discs B and plates as a set.

**MANUAL CLUTCH ASSEMBLY**

Coat the clutch discs with oil.

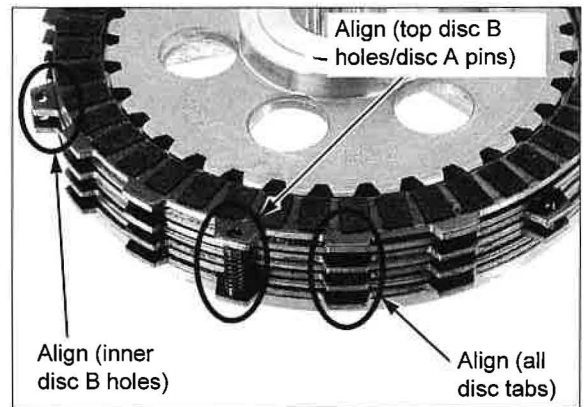
Install the three springs [1] to the pins of the clutch disc A [2].

Install the clutch disc A, three clutch discs B [3] and three plates [4] alternately onto the clutch center [5].



Turn the clutch discs so their tabs are lined up as follows:

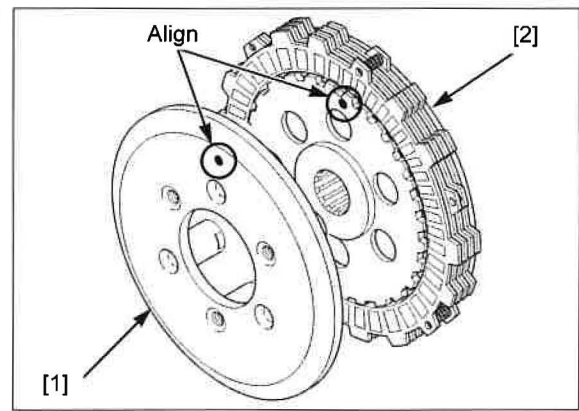
- Align the spring pins of disc A with the holes of the disc B on the top.
- Align the holes of inner two discs B.
- Align the tabs of all clutch discs.



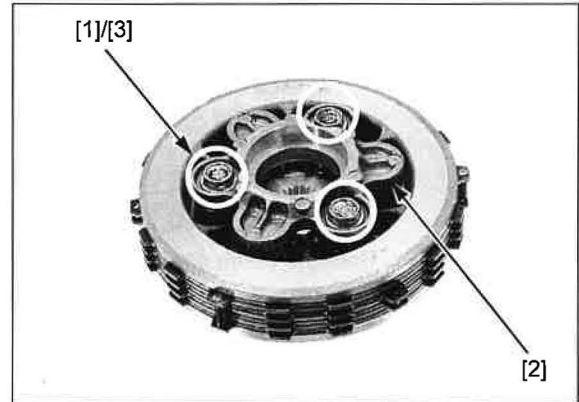


## CLUTCH/GEARSHIFT LINKAGE

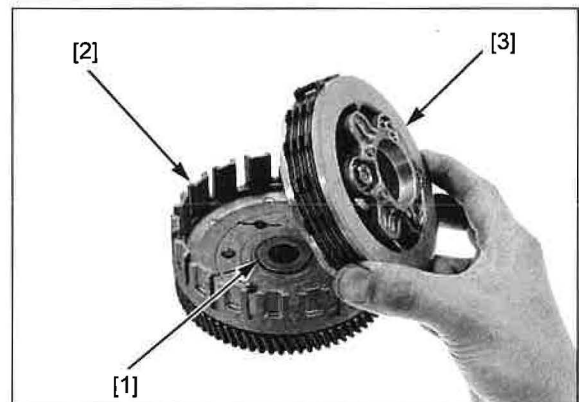
Install the pressure plate [1] onto the clutch center [2] by aligning the "O" marks of the clutch center and pressure plate.



Install the springs [1] and clutch lifter plate [2]. Temporarily install the bolts [3].



Install the washer [1] onto the clutch outer [2]. Install the clutch center assembly [3] into the clutch outer.



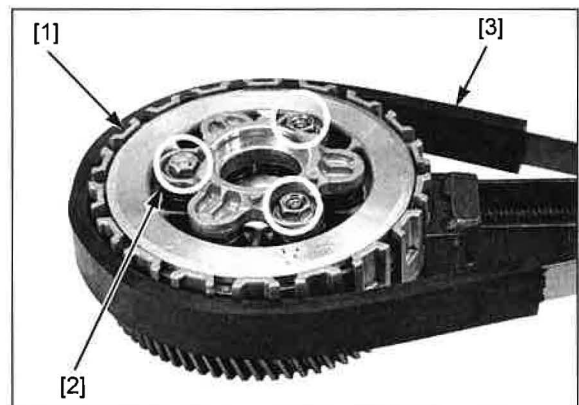
Hold the clutch outer [1] using the special tool, then tighten the clutch lifter plate bolts [2] to the specified torque in several steps.

### TOOL:

[3] Flywheel holder

07725-0040001

**TORQUE: 12 N•m (1.2 kgf•m, 9.0 lbf•ft)**



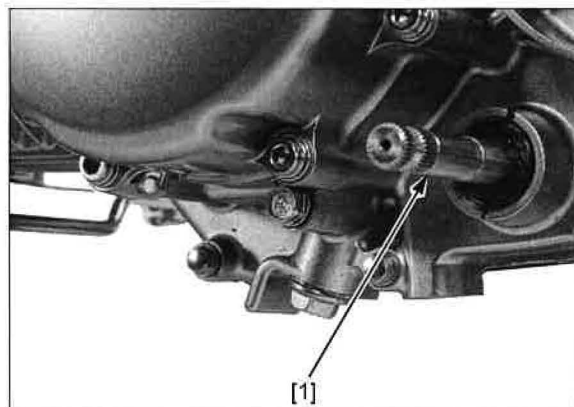
## GEARSHIFT LINKAGE

### REMOVAL

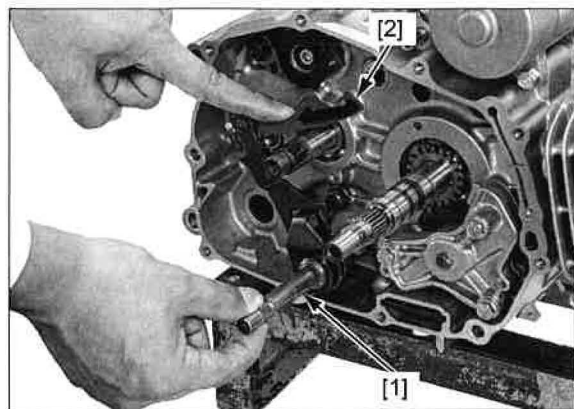
Remove the following:

- Clutch (page 11-9)
- Gearshift pedal (page 2-17)

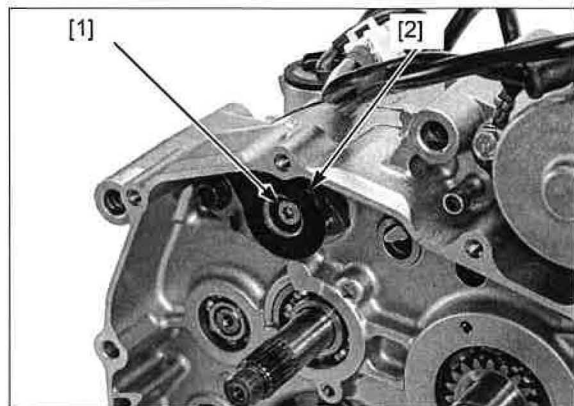
Clean the gearshift spindle [1] thoroughly to prevent the dirt or dust from entering the engine.



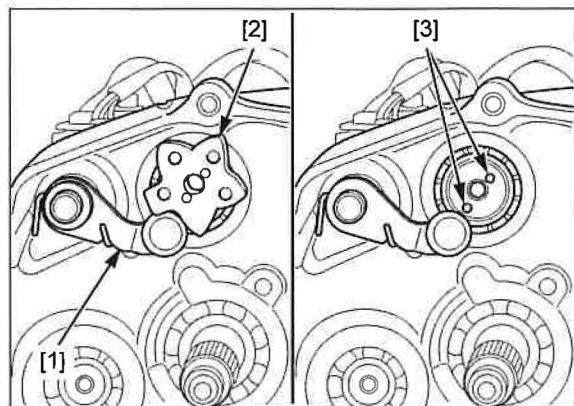
Remove the gearshift spindle [1] by holding down the arm [2] of the gearshift spindle as shown.



Remove the gearshift cam plate socket bolt [1] and washer [2].



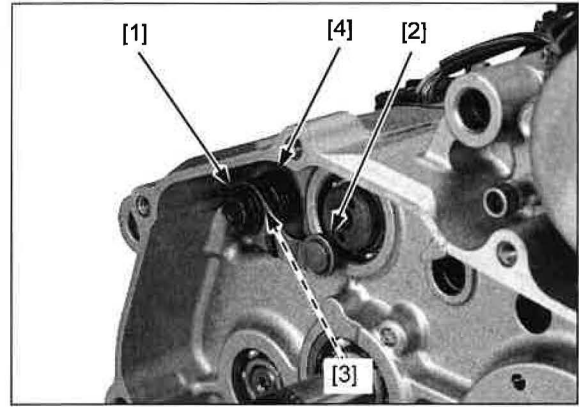
Lower and hold the stopper arm [1], then remove the gearshift cam plate [2].  
Remove the gearshift drum pins [3].



## CLUTCH/GEARSHIFT LINKAGE

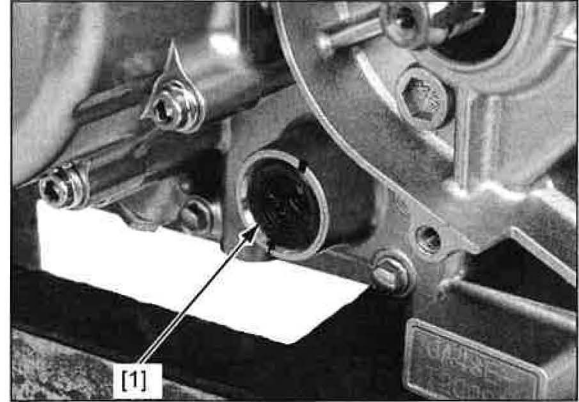
Remove the following:

- Shift drum stopper arm bolt [1]
- Stopper arm [2]
- Washer [3]
- Return spring [4]



Inspect the gearshift spindle oil seal [1] for deterioration or damage, replace if necessary.

If replacing the oil seal, install it until it is fully seated.



### INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

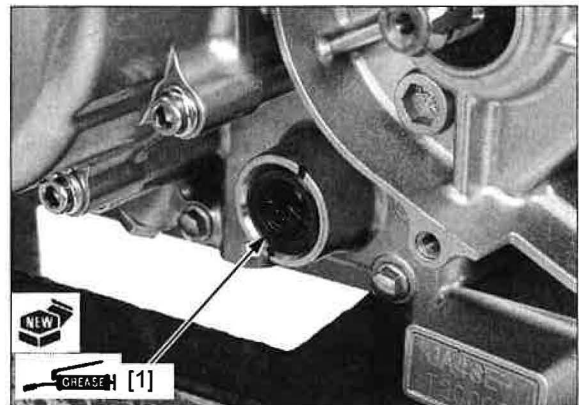
- Gearshift spindle
- Gearshift stopper arm spring
- Gearshift stopper arm
- Return spring

Measure each part according to CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS (page 1-6).

Replace any part if it is out of service limit.

### INSTALLATION

Apply grease to a new gearshift spindle oil seal [1] lips.

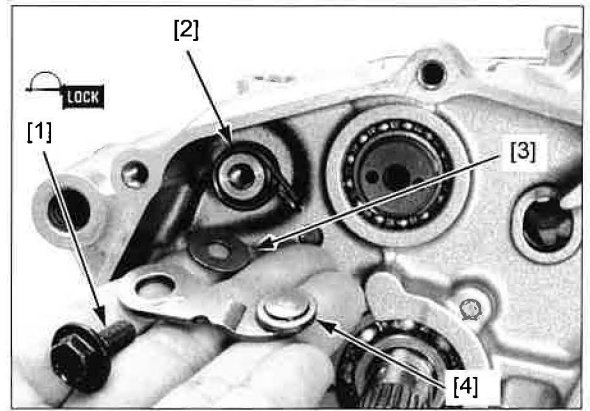


Apply locking agent to the threads of the shift drum stopper arm bolt [1].

Install the return spring [2], washer [3], stopper arm [4] and bolt.

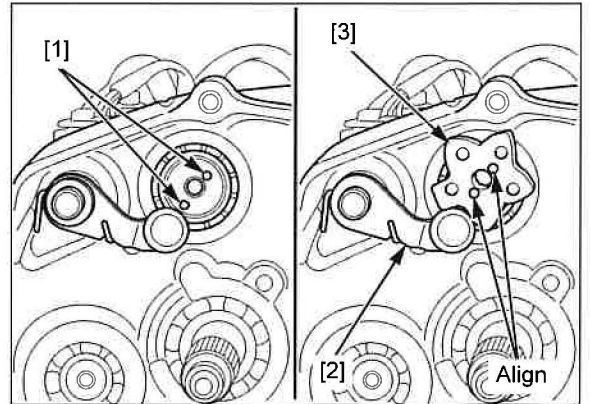
Tighten the shift drum stopper arm bolt to the specified torque.

**TORQUE: 12 N·m (1.2 kgf·m, 9.0 lbf·ft)**



Install the gearshift drum pins [1] into the holes on the gearshift drum.

Hold the stopper arm [2] with a screwdriver and install the gearshift cam plate [3] by aligning the holes in the plate with the gearshift drum pins.

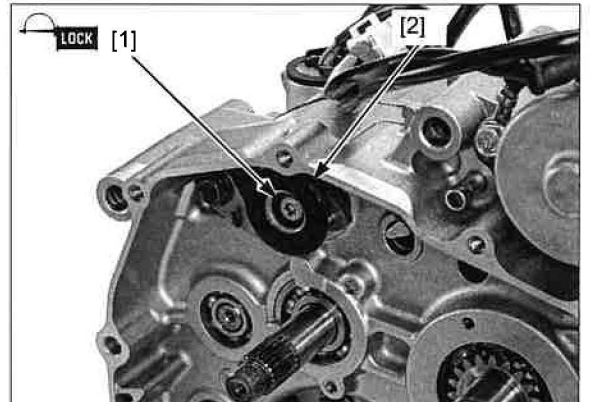


Apply locking agent to the threads of the gearshift cam plate socket bolt [1].

Install the washer [2] and bolt.

Tighten the bolt to the specified torque.

**TORQUE: 10 N·m (1.0 kgf·m, 7.0 lbf·ft)**



Apply engine oil to the gearshift spindle journal [1].

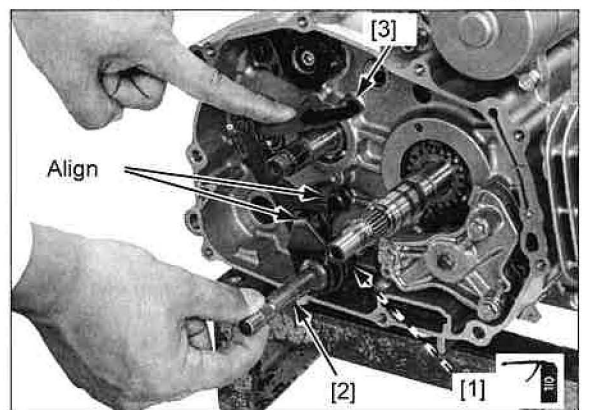
*Be careful not to damage the oil seal.*

Install the gearshift spindle [2] by aligning its return spring ends with the shift return spring pin.

Hold down the arm [3] of the gearshift spindle as shown and engage it with the shift drum pins between the cam plate and gearshift drum.

Install the following:

- Clutch (page 11-9)
- Gearshift pedal (page 2-17)



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**MEMO**

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# 12. ALTERNATOR/STARTER CLUTCH

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<b>SERVICE INFORMATION</b> .....	<b>12-2</b>	<b>STATOR</b> .....	<b>12-4</b>
<b>COMPONENT LOCATION</b> .....	<b>12-3</b>	<b>FLYWHEEL/STARTER CLUTCH</b> .....	<b>12-5</b>
<b>LEFT CRANKCASE COVER</b> .....	<b>12-4</b>		

## ALTERNATOR/STARTER CLUTCH

---

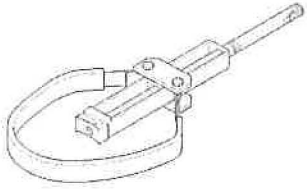
### SERVICE INFORMATION

#### GENERAL

- These services can be done with the engine installed in the frame.

#### TOOLS

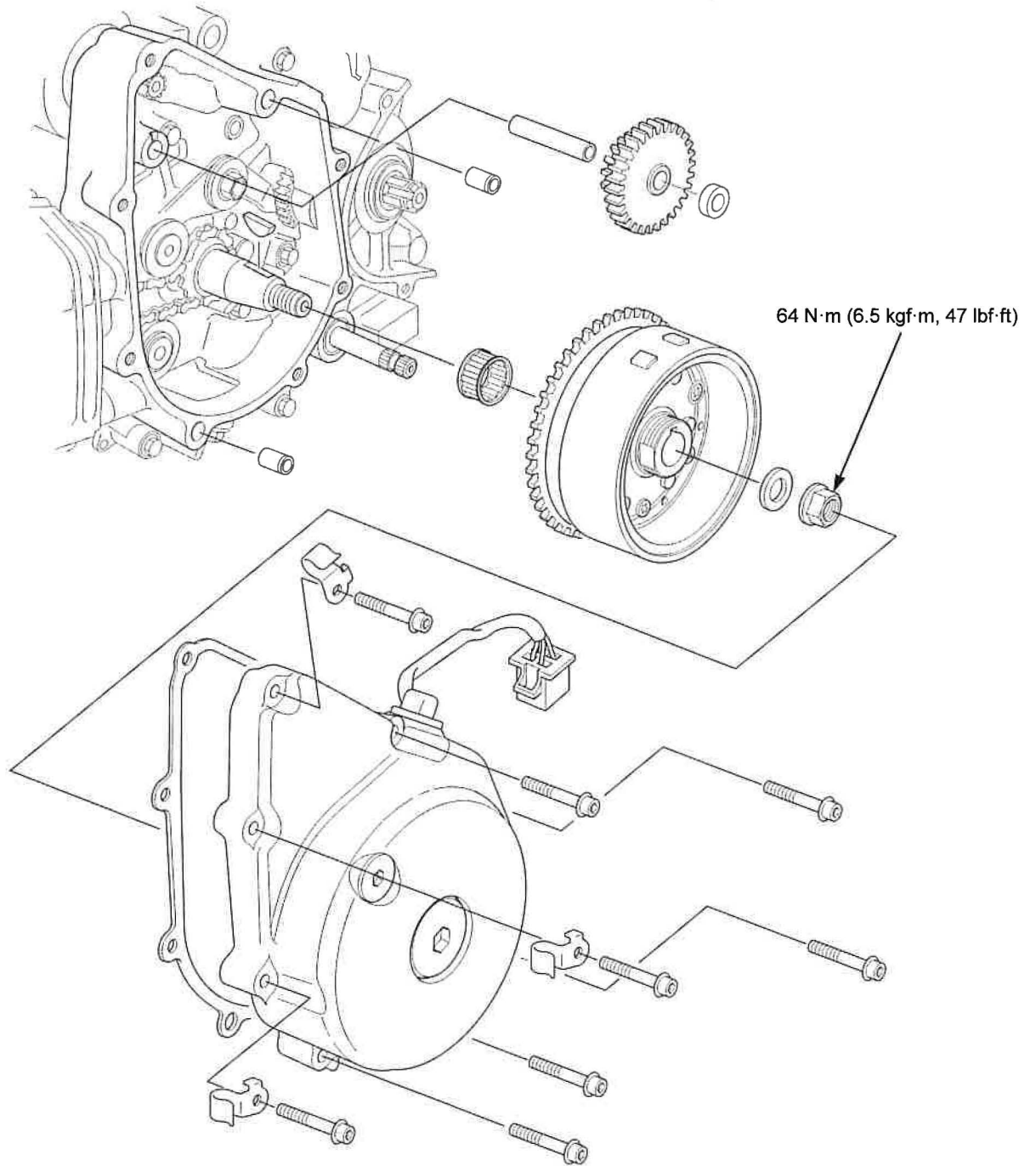
Flywheel holder  
07725-0040001



Flywheel puller, 30 mm  
07KMC-HE00100



COMPONENT LOCATION





# LEFT CRANKCASE COVER

### REMOVAL/INSTALLATION

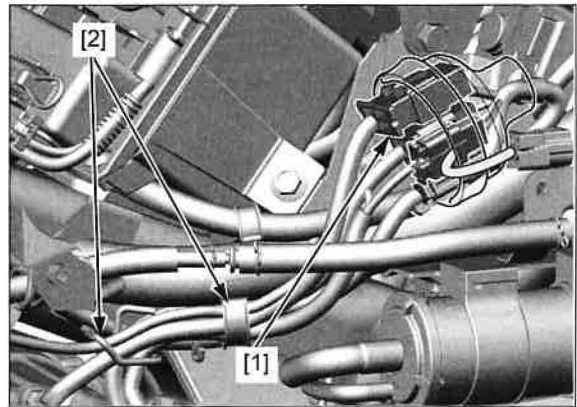
Drain the engine oil (page 3-9).

Remove the following:

- Left body cover (page 2-13)
- Left crankcase rear cover (page 2-16)

Pull back the connector cover and disconnect the alternator/CKP sensor 4P connector [1].

Release the wire from the guides [2].



Loosen the bolts [1] in a crisscross pattern in several steps.

Remove the bolts, wire clamps [2].

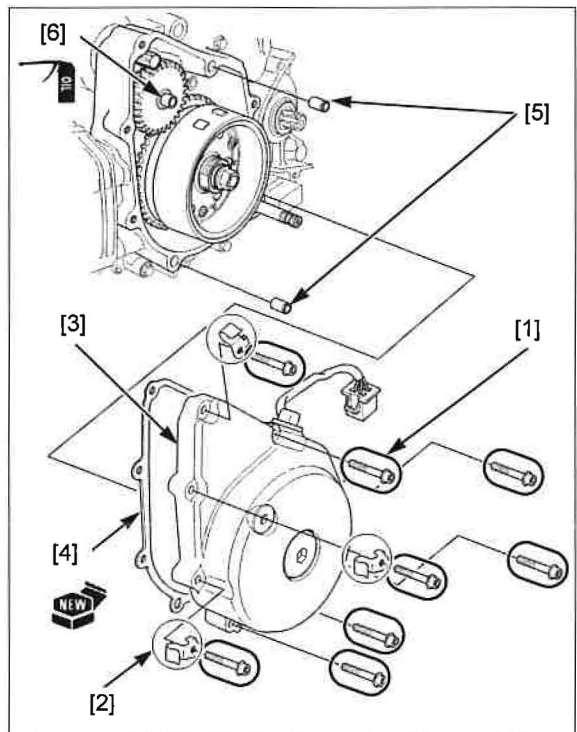
Remove the left crankcase cover [3].

Remove the gasket [4] and dowel pins [5].

Installation is in the reverse order of removal.

#### NOTE:

- The left crankcase cover (stator) is magnetically attached to the flywheel, be careful during removal.
- Replace the gasket with a new one.
- Apply engine oil to the starter reduction gear journal [6].

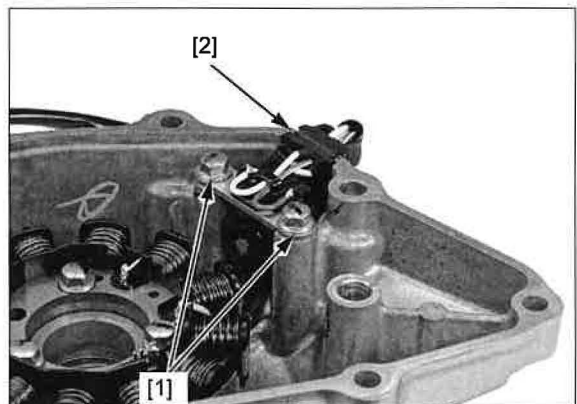


## STATOR

### REMOVAL/INSTALLATION

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

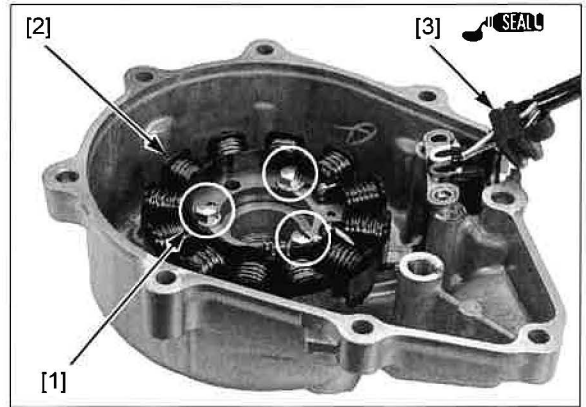
Remove the CKP sensor mounting bolts [1] and release the wire grommet [2] from the left crankcase cover.



Remove the stator mounting bolts [1], then remove the stator [2] from the left crankcase cover.

Installation is in the reverse order of removal.

- Apply liquid sealant (TB1215 manufactured by Three Bond or equivalent) to the wire grommet seating surface and install the grommet [3] into the cover groove.

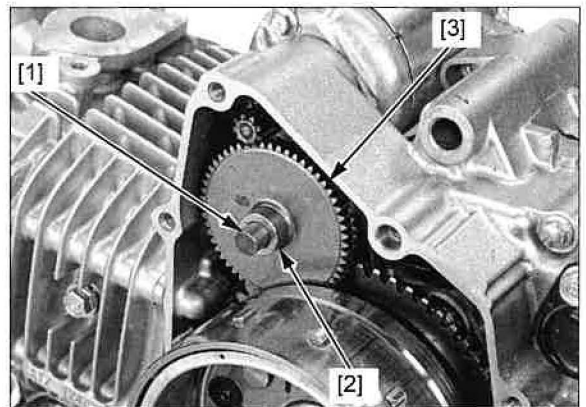


## FLYWHEEL/STARTER CLUTCH

### REMOVAL

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

Remove the shaft [1], collar [2] and starter reduction gear [3].

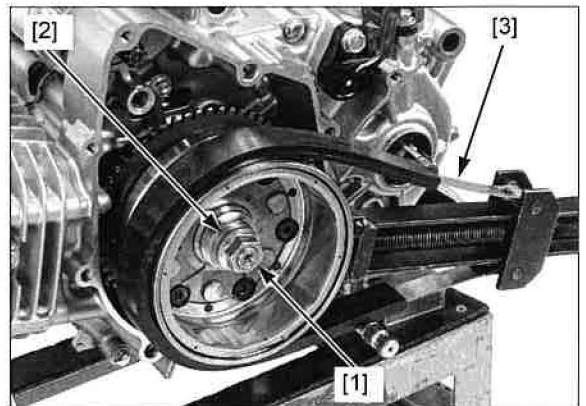


Remove the flywheel nut [1] and washer [2] using the special tool.

### TOOL:

[3] Flywheel holder

07725-0040001

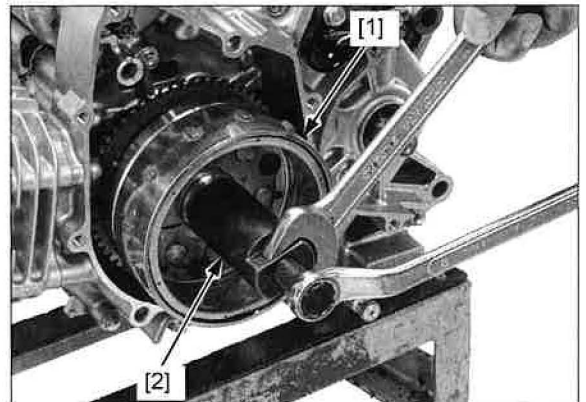


Remove the flywheel/starter clutch [1] using the special tool.

### TOOL:

[2] Flywheel puller, 30 mm

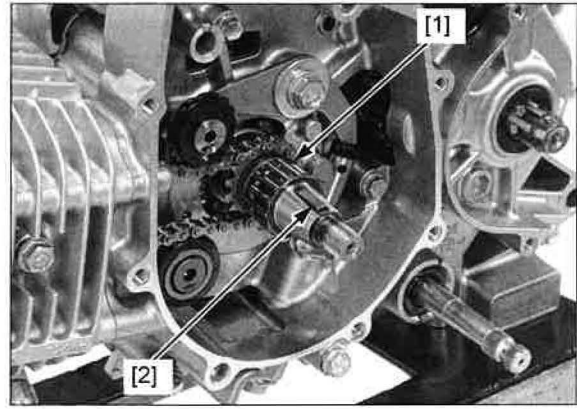
07KMC-HE00100



## ALTERNATOR/STARTER CLUTCH

*Be careful not to damage the key groove and crankshaft.*

Remove the needle bearing [1].  
Remove the woodruff key [2].



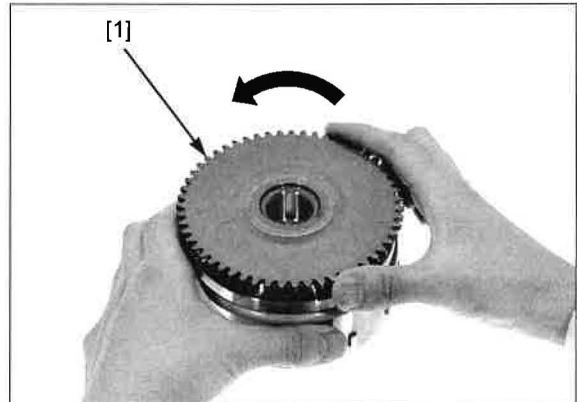
### STARTER CLUTCH DISASSEMBLY

Remove the flywheel/starter clutch (page 12-5).

Check the operation of the one way clutch by turning the driven gear.

You should be able to turn the driven gear [1] counterclockwise smoothly, but the gear should not turn clockwise.

Remove the starter driven gear from the flywheel/starter clutch while turning the driven gear counterclockwise.

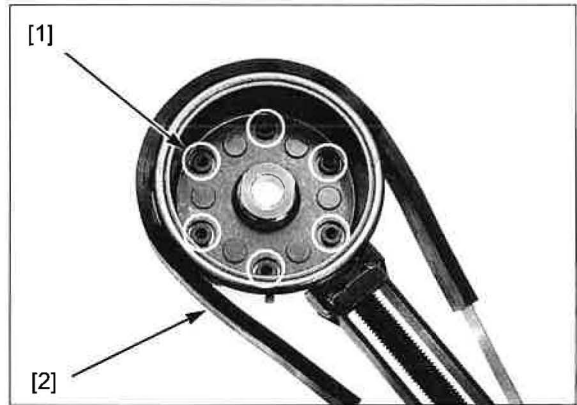


Hold the flywheel using the special tool and remove the starter clutch mounting torx bolts [1].

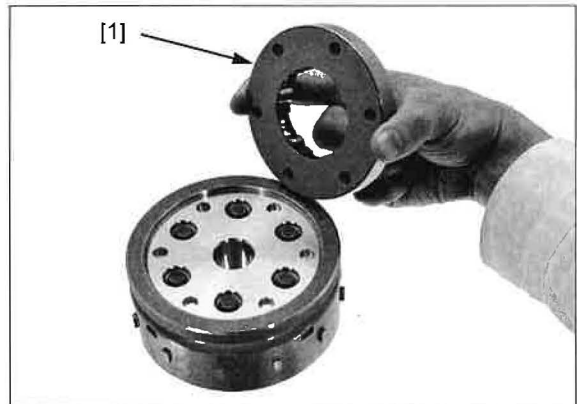
**TOOL:**

[2] Flywheel holder

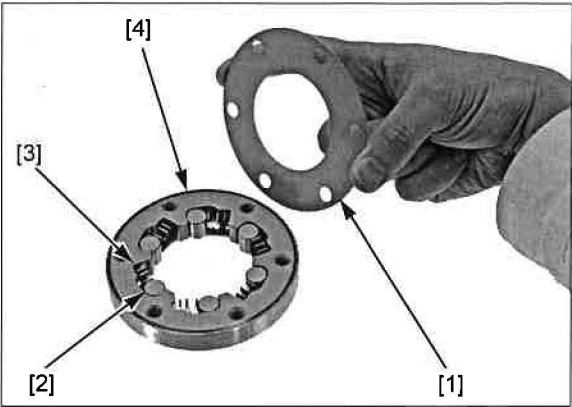
07725-0040001



Remove the starter clutch assembly [1].



Remove the plate [1], rollers [2] and springs [3] from the starter clutch outer [4].



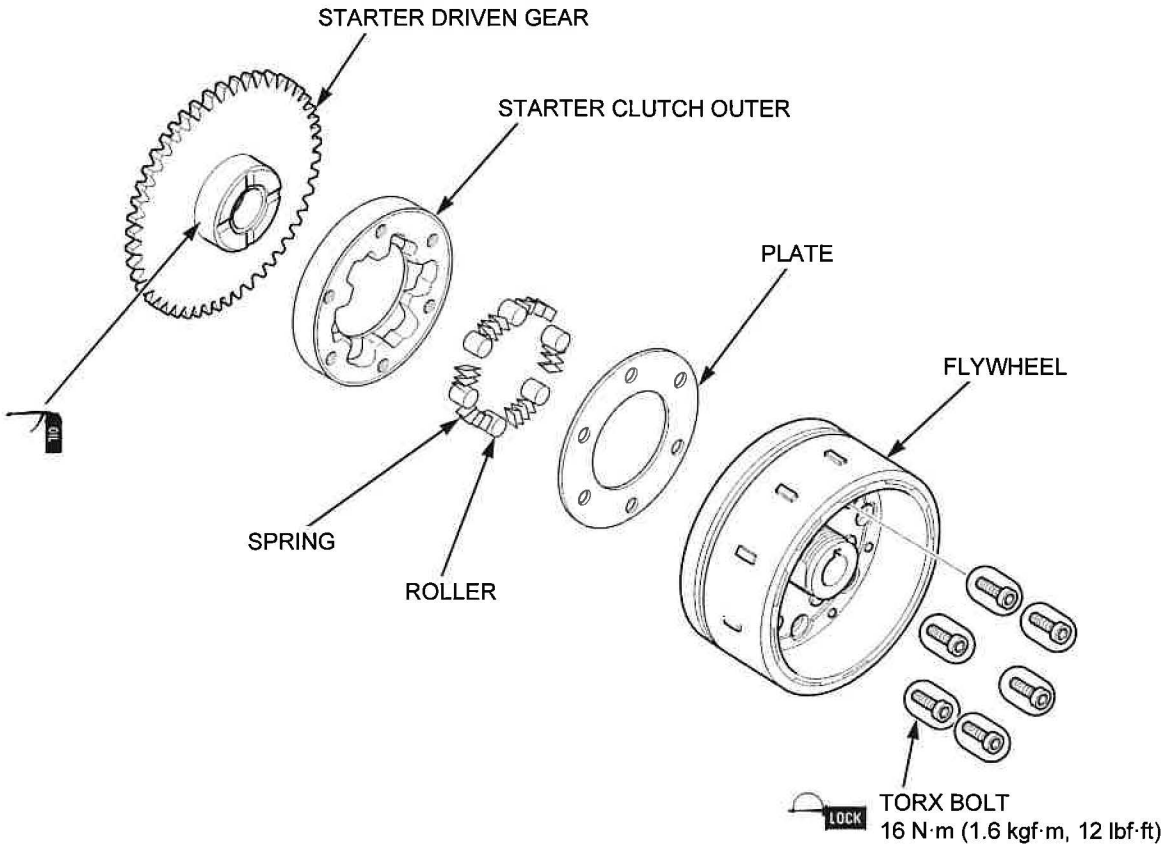
**INSPECTION**

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
- Rollers and springs
- Starter clutch outer

Measure each part according to ALTERNATOR/STARTER CLUTCH SPECIFICATIONS (page 1-6).  
Replace any part if it is out of service limit.

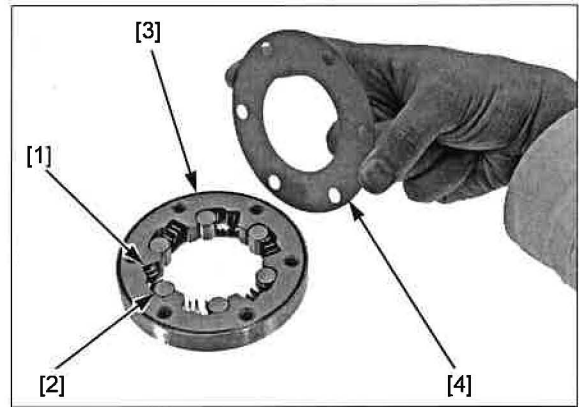
**STARTER CLUTCH ASSEMBLY**



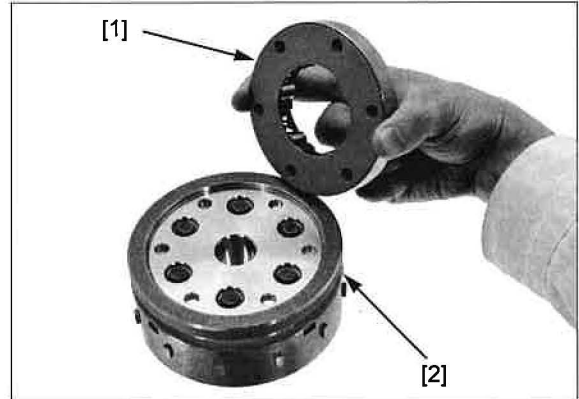
## ALTERNATOR/STARTER CLUTCH

Install the springs [1] and rollers [2] into the starter clutch outer [3] as shown.

Install the plate [4].



Install the starter clutch assembly [1] onto the flywheel [2].

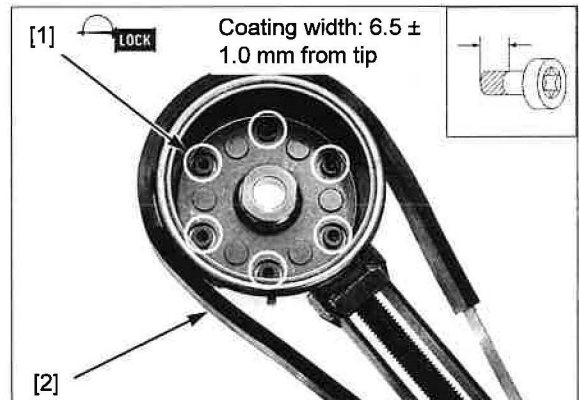


Apply a locking agent to the starter clutch mounting torx bolt [1] threads as specified. Hold the flywheel using the special tool and tighten the bolts to the specified torque.

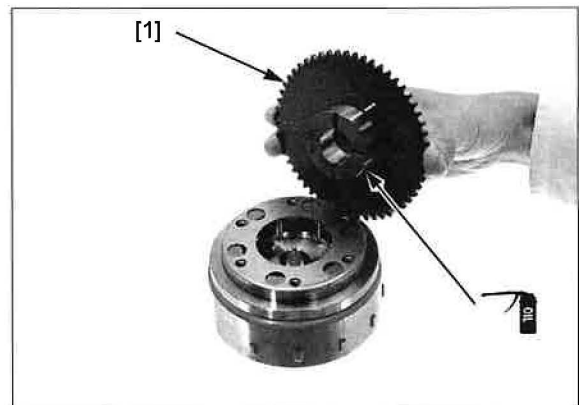
### TOOL:

[2] Flywheel holder 07725-0040001

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



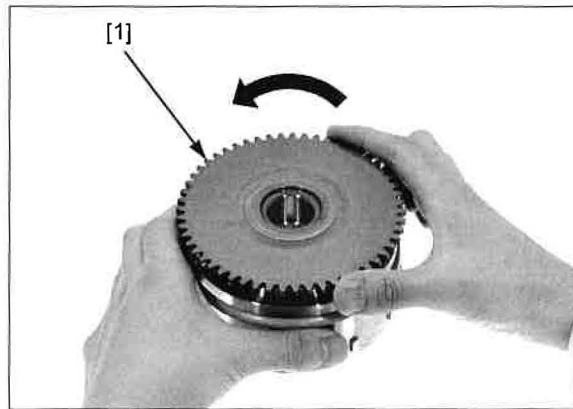
Apply engine oil to the starter clutch rolling surface of the driven gear [1].



Install the starter driven gear [1] to the flywheel/starter clutch while turning it counterclockwise.

Make sure that the starter driven gear turns counterclockwise smoothly and does not turn clockwise.

Install the flywheel/starter clutch (page 12-5).

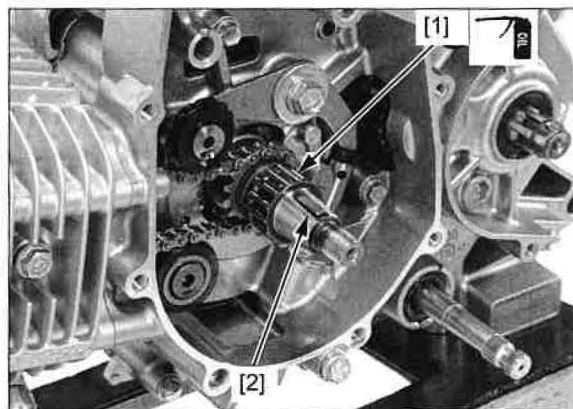


## INSTALLATION

Apply engine oil to the needle bearing [1] whole surface and install it to the crankshaft.

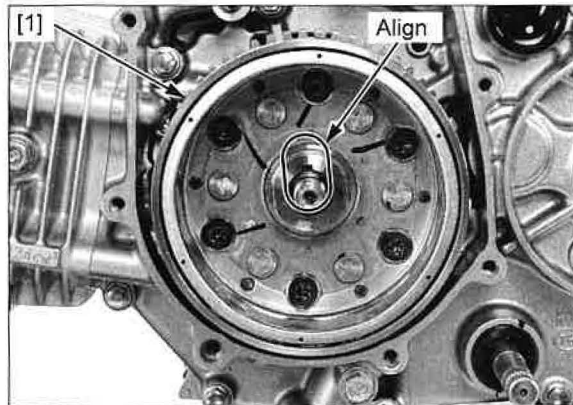
*Be careful not to damage the key groove or crankshaft.*

Install the woodruff key [2] in the crankshaft key groove.



Wipe any oil off the mating surface of the crankshaft and flywheel.

Install the flywheel/starter clutch [1] to the crankshaft, aligning the key way with the woodruff key.



Install the washer [1].

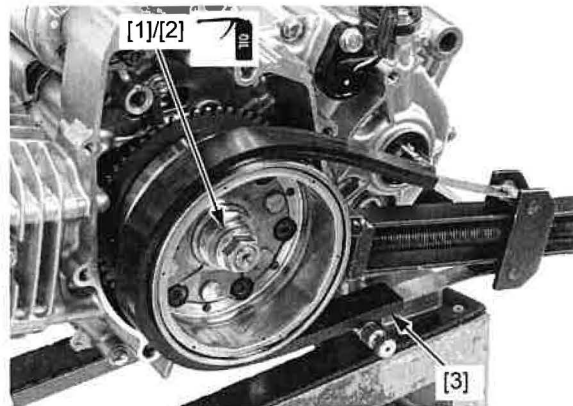
Apply engine oil to the flywheel nut [2] threads and seating surface, then install it.

Hold the flywheel using the special tool and tighten the flywheel nut to the specified torque.

### TOOL:

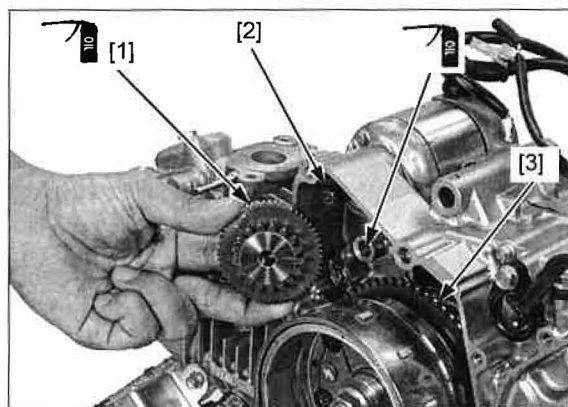
[3] Flywheel holder 07725-0040001

**TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)**

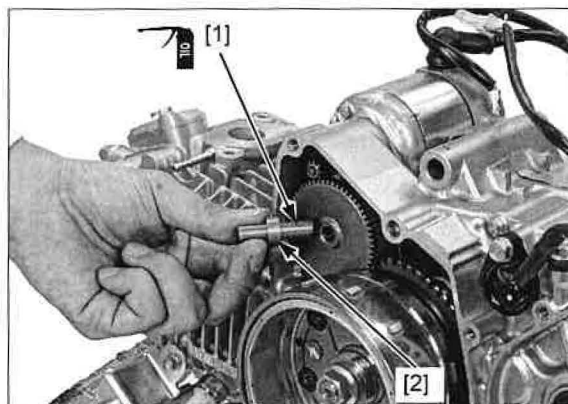


## ALTERNATOR/STARTER CLUTCH

Apply engine oil to the starter reduction gear [1] journal area and gear teeth.  
Install the starter reduction gear by aligning with the starter drive gear [2] and starter driven gear [3].



Apply engine oil to the starter reduction gear shaft [1] whole surface.  
Install the shaft and collar [2] into the reduction gear.  
Install the left crankcase cover (page 12-4).



# 13. CRANKCASE/TRANSMISSION/CRANKSHAFT

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<b>SERVICE INFORMATION</b> .....	<b>13-2</b>	<b>CRANKSHAFT</b> .....	<b>13-6</b>
<b>TROUBLESHOOTING</b> .....	<b>13-3</b>	<b>TRANSMISSION</b> .....	<b>13-8</b>
<b>COMPONENT LOCATION</b> .....	<b>13-4</b>	<b>CRANKCASE ASSEMBLY</b> .....	<b>13-14</b>
<b>CRANKCASE SEPARATION</b> .....	<b>13-5</b>		

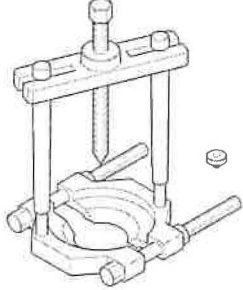
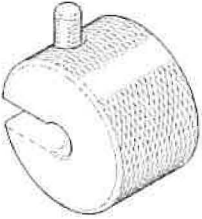


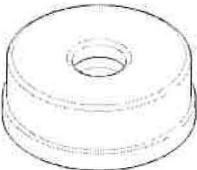



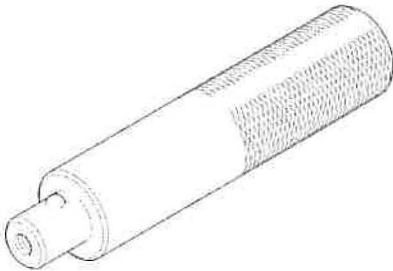



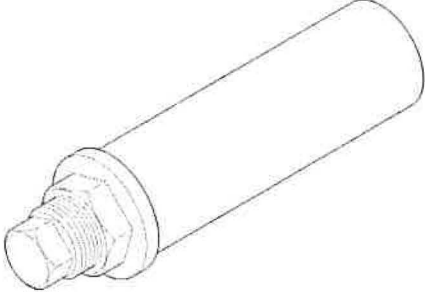
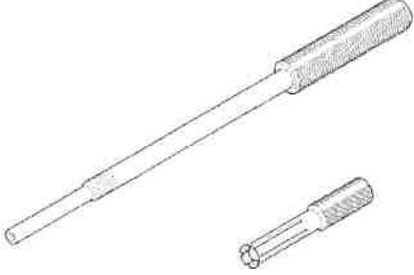
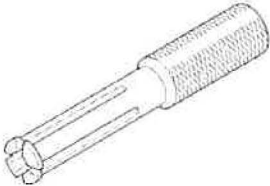
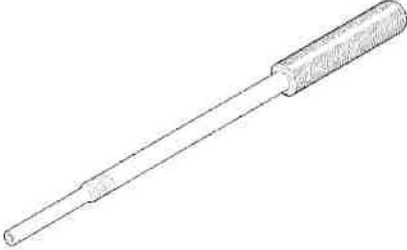
**SERVICE INFORMATION**

**GENERAL**

- The crankcase must be separated to service the crankshaft and transmission.
- The following parts must be removed before separating the crankcase.
  - Engine (page 14-4)
  - Stator (page 12-4)
  - Flywheel (page 12-5)
  - Clutch (page 11-9)
  - Gearshift linkage (page 11-21)
  - Cam chain tensioner (page 9-17)
  - Cylinder head (page 9-10)
  - Cylinder/piston (page 10-4)
  - Oil pump (page 8-4)
  - Starter motor (page 6-4)
  - Gear position switch (page 20-12)
- Be careful not to damage the crankcase mating surfaces when servicing.
- Prior to assembling the crankcase halves, apply sealant to the mating surface. Wipe off excess sealant thoroughly.
- Clean all disassembled parts with clean solvent and dry them using compressed air before inspection.

**TOOLS**

<p>Universal bearing puller 07631-0010000</p>  <p>Equivalent commercially available in U.S.A.</p>	<p>Remover Weight 07741-0010201</p>  <p>07936-371020A or 07936-3710200</p>	<p>Attachment, 32 x 35 mm 07746-0010100</p> 
<p>Attachment, 37 x 40 mm 07746-0010200</p> 	<p>Attachment, 52 x 55 mm 07746-0010400</p> 	<p>Pilot, 12 mm 07746-0040200</p> 
<p>Pilot, 17 mm 07746-0040400</p> 	<p>Pilot, 22 mm 07746-0041000</p> 	<p>Driver 07749-0010000</p> 

<p>Attachment, 28 x 30 mm 07946-1870100</p> 	<p>Assembly set, 14 mm 07JMF-KW70100</p>  <p>or 07931-ME4010B and 07931-HB3010A and 07AMF-K26A100 and 07YMF-KPB0100</p>	<p>Bearing remover set, 12 mm 07936-1660101</p>  <p>07936-166010A U.S.A. only</p>
<p>Bearing remover head, 12 mm 07936-1660110</p>  <p>Not available in the U.S.A.</p>	<p>Bearing remover shaft, 12 mm 07936-1660120</p>  <p>Not available in the U.S.A.</p>	

## TROUBLESHOOTING

### Hard to shift

- Incorrect clutch adjustment (page 3-17)
- Bent shift forks
- Bent gearshift spindle (page 11-21)
- Damaged shift drum cam grooves
- Incorrect engine oil viscosity

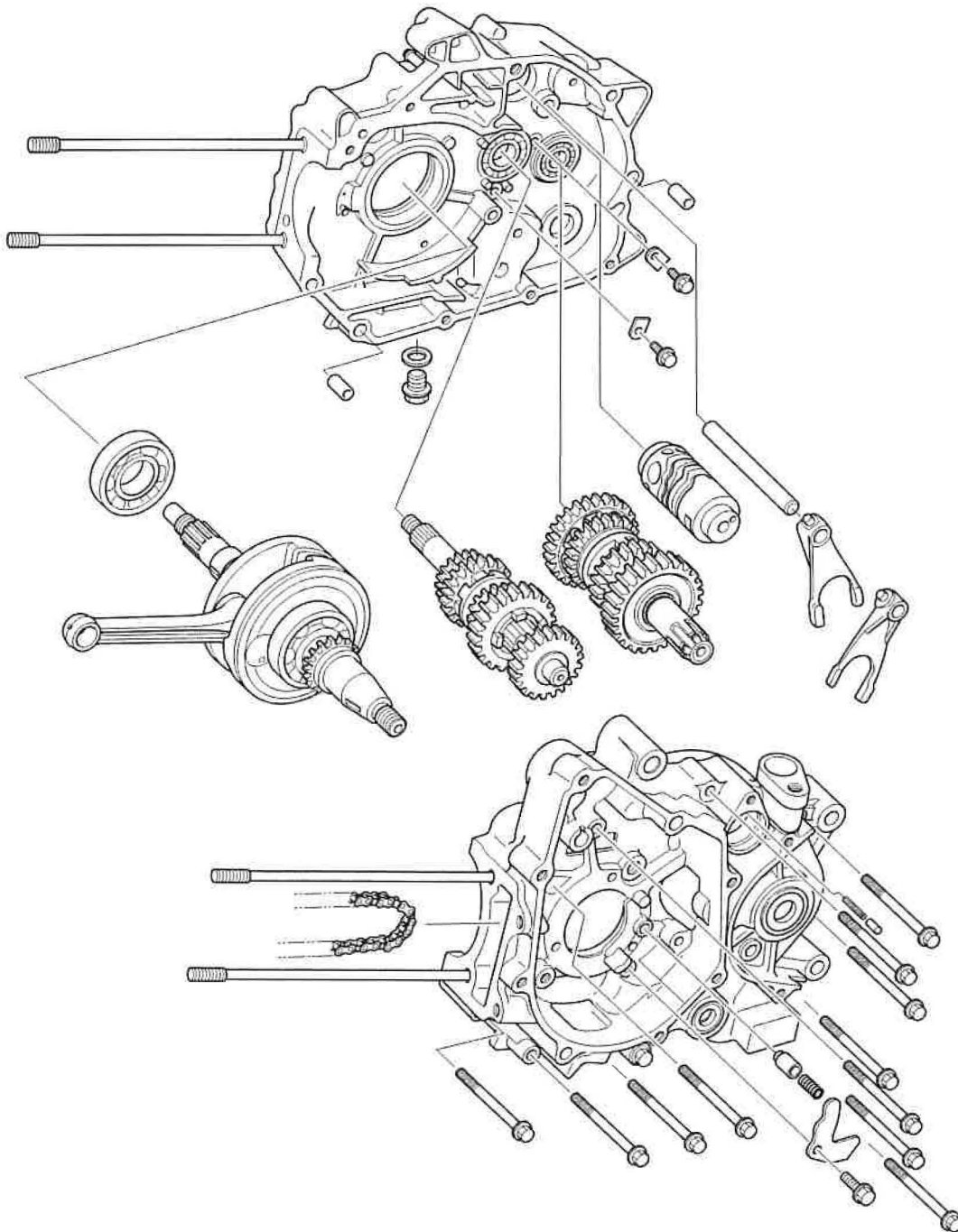
### Transmission jumps out of gear

- Worn gear dogs and dog holes
- Broken shift drum stopper arm
- Broken drum stopper arm spring (page 11-21)
- Broken gearshift spindle return spring (page 11-21)
- Worn or bent shift forks
- Worn gear shifter groove

### Excessive noise

- Worn connecting rod big end bearing
- Worn crankshaft bearing
- Worn transmission bearing
- Worn or damaged transmission gears

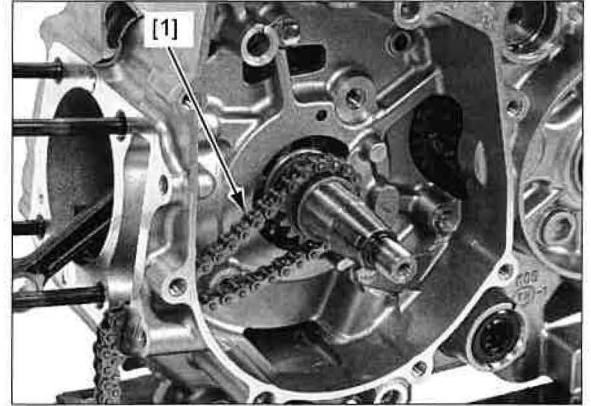
COMPONENT LOCATION



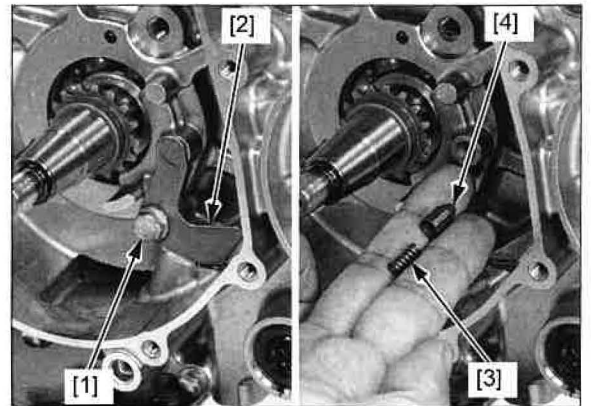
## CRANKCASE SEPARATION

Refer to Service Information (page 13-2) for removal of necessary parts before separating the crankcase.

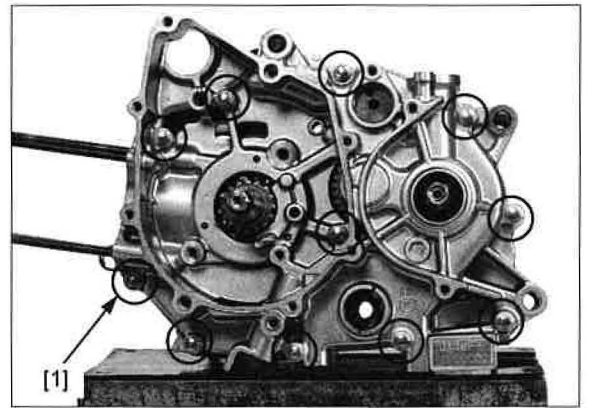
Remove the cam chain [1] from the timing sprocket.



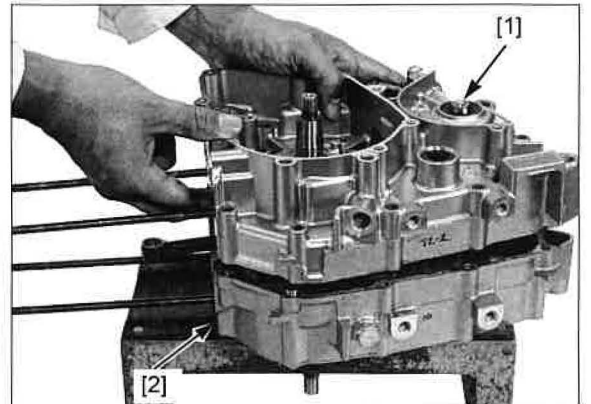
Remove the bolt [1], holder plate [2], spring [3] and bearing push plug [4].



Loosen and remove the crankcase bolts [1] in a crisscross pattern in several steps.



Place the left crankcase up.  
Carefully separate the left crankcase [1] from the right crankcase [2] while tapping them at several locations with a soft hammer.

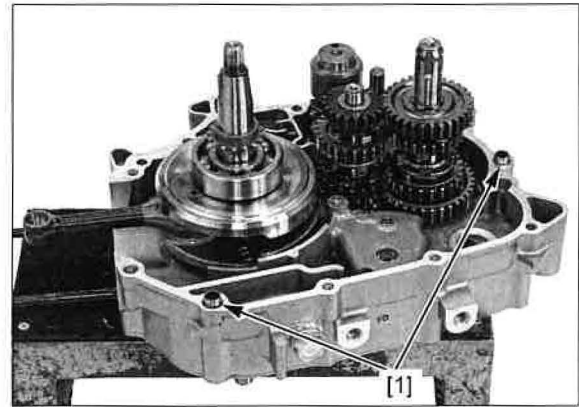


## CRANKCASE/TRANSMISSION/CRANKSHAFT

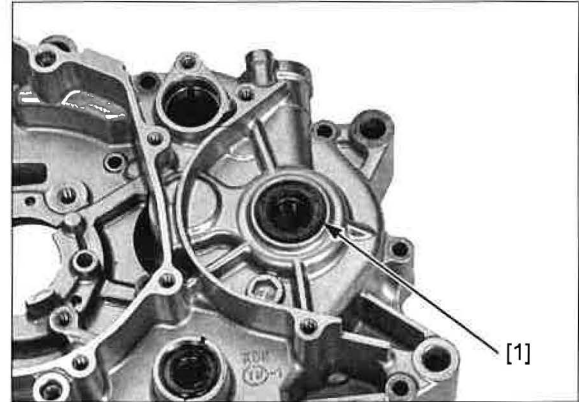
Remove the dowel pins [1].

*Be careful not to damage the mating surfaces.*

Clean off the sealant from the left and right crankcase mating surfaces.



Remove the countershaft oil seal [1] from the left crankcase.



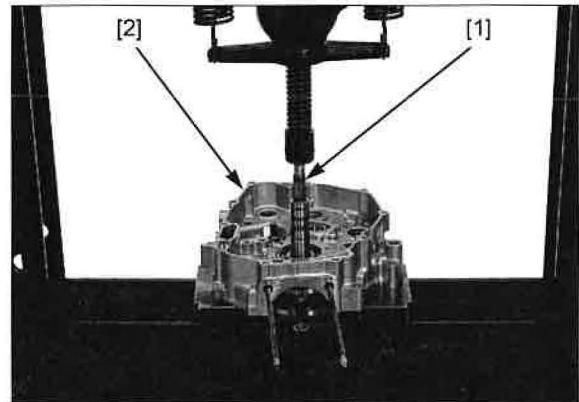
## CRANKSHAFT

### REMOVAL

Remove the transmission (page 13-8).

*Be careful not to drop the crankshaft.*

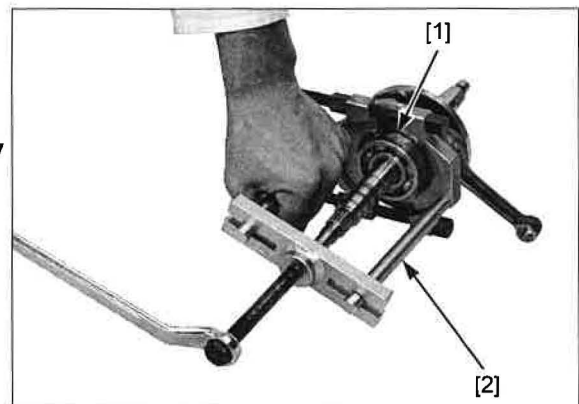
Remove the crankshaft [1] from the right crankcase [2] using a hydraulic press.



If the crankshaft bearing [1] remains on the crankshaft, remove it using a special tool as shown.

### TOOL:

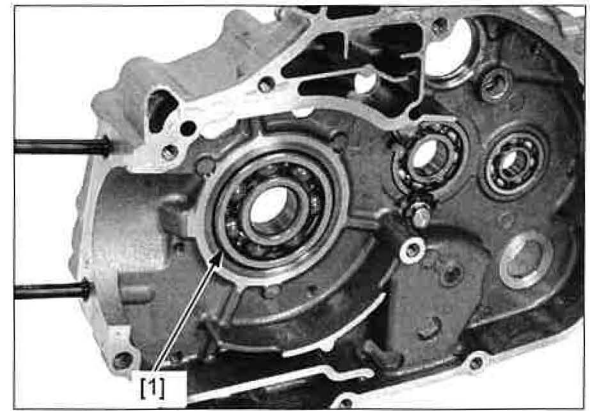
[2] Universal bearing puller 07631-0010000 or equivalent commercially available in the U.S.A.



If the bearing [1] remains in the right crankcase, drive it out from the outside.

**NOTE:**

- Do not reuse the bearing.



**INSPECTION**

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

- Crankshaft
- Connecting rod
- Timing sprocket
- Left crankshaft bearing

Measure each part according to CRANKCASE/TRANSMISSION/CRANKSHAFT SPECIFICATIONS (page 1-7).

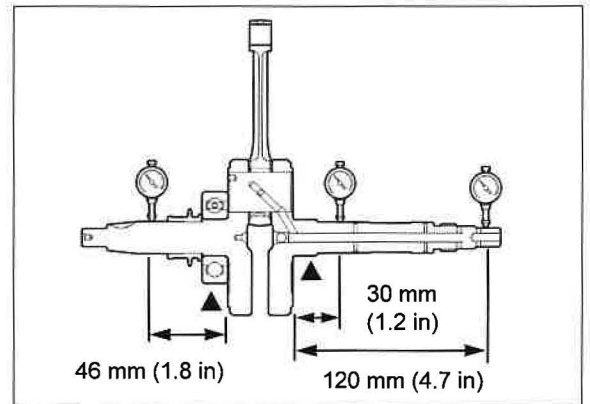
Replace any part if it is out of service limit.

Place the crankshaft on a stand or V-blocks and measure the runout using a dial gauge.

The measuring locations are shown in the illustration.

**SERVICE LIMITS:**

- Right inner side: 0.02 mm (0.0008 in)
- Right outer side: 0.10 mm (0.0039 in)
- Left side: 0.03 mm (0.0012 in)



**BEARING REPLACEMENT**

Apply oil to a new right crankshaft bearing [1] rolling surface.

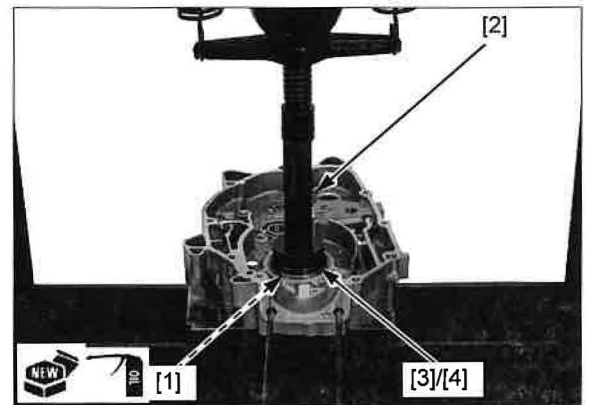
*Be careful not to damage the crankcase.*

Drive in the right crankshaft bearing with its marked side facing up until it is fully seated, using the special tools.

**TOOLS:**

- [2] Driver 07749-0010000
- [3] Attachment, 52 x 55 mm 07746-0010400
- [4] Pilot, 22 mm 07746-0041000

For transmission bearing replacement (page 13-8).



## CRANKCASE/TRANSMISSION/CRANKSHAFT

### INSTALLATION

Apply 1.0 – 2.0 cm<sup>3</sup> of oil to the connecting rod [1] big end.

*Be sure that the connecting rod is located in the crankcase opening.*

Pull the crankshaft [2] into the right crankcase [3] bearing inner race using the special tool.

#### TOOLS:

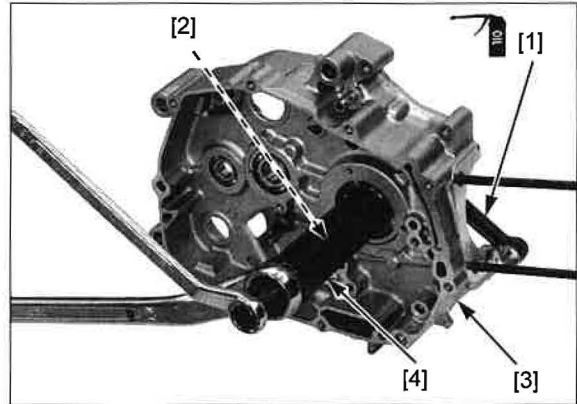
[4] Assembly set, 14 mm                      07JMF-KW70100

#### U.S.A. TOOLS:

Assembly Shaft                                      07931-ME4010B  
Special Nut    07931-HB3010A  
Threaded Adapter                                07AMF-K26A100  
Assembly Collar                                    07YMF-KPB0100

Install the transmission (page 13-8).

Assemble the crankcase (page 13-14).

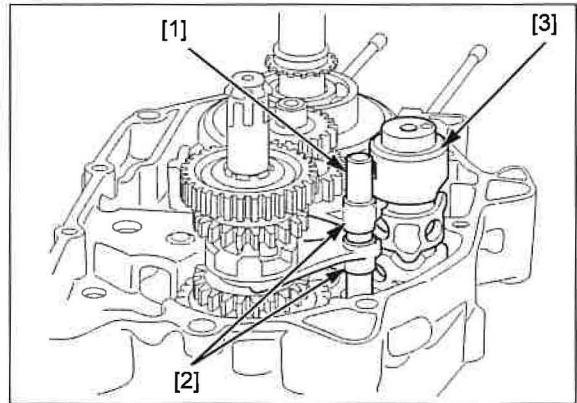


## TRANSMISSION

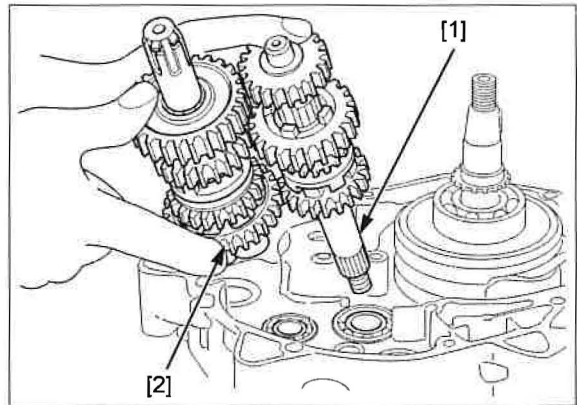
### REMOVAL

Separate the crankcase (page 13-14).

Remove the shift fork shaft [1], shift forks [2] and shift drum [3].



Remove the mainshaft [1] and countershaft [2] as an assembly.



## INSPECTION

Inspect the following parts for scratch, damage, abnormal wear and deformation. Replace if necessary.

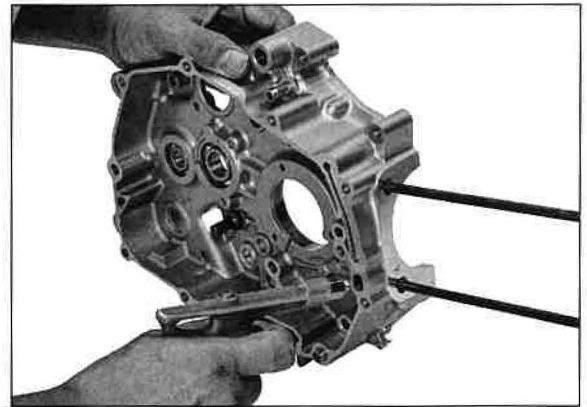
- Transmission gears
- Transmission bushings
- Transmission bearings
- Shift drum/journal
- Shift forks
- Shift fork shaft
- Mainshaft
- Countershaft
- Gear shift spindle journal

Measure each part and calculate the clearance according to CRANKCASE/TRANSMISSION/CRANKSHAFT SPECIFICATIONS (page 1-7). Replace any part if it is out of service limit.

## OIL PASSAGES

Blow open the oil passages of the right crankcase with compressed air.

Check the oil passages for clog or damage.



## ASSEMBLY

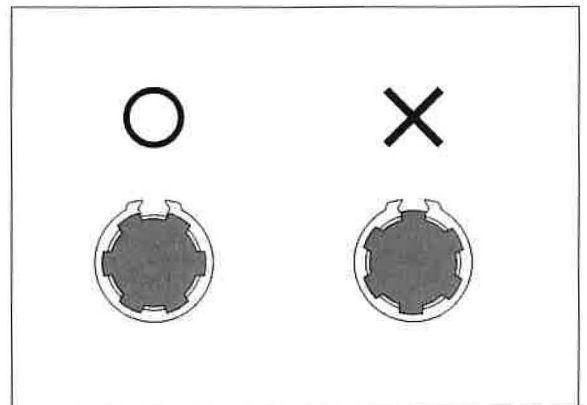
Clean all parts in solvent and dry them thoroughly.

Apply molybdenum disulfide oil to the each rotating gear inner surface and C1 bushing whole surface to ensure initial lubrication.

Assemble all parts into their original positions.

### NOTE:


- Check the gears for freedom of movement or rotation on the shaft.
- Install the washers and snap rings with the chamfered edges facing the thrust load side.
- Do not reuse a 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.
- Check the special washers are seated in the shaft grooves.




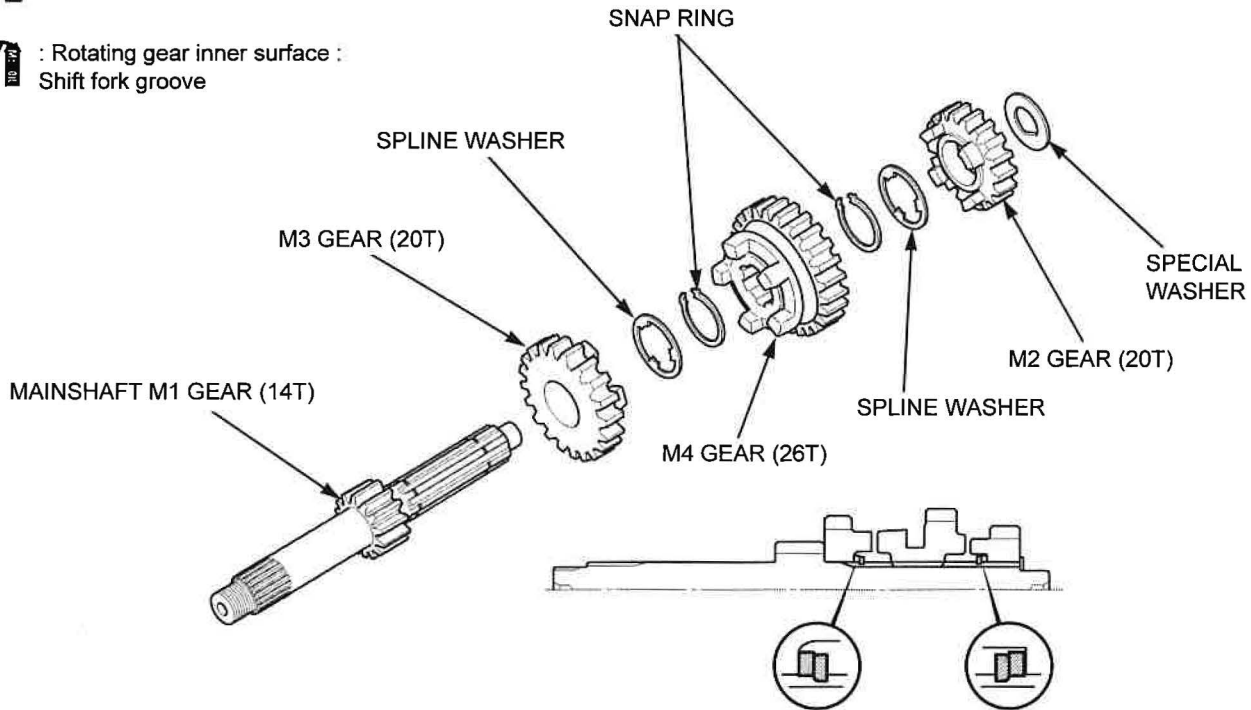


# CRANKCASE/TRANSMISSION/CRANKSHAFT


## MAINSHAFT:


 : Gear teeth

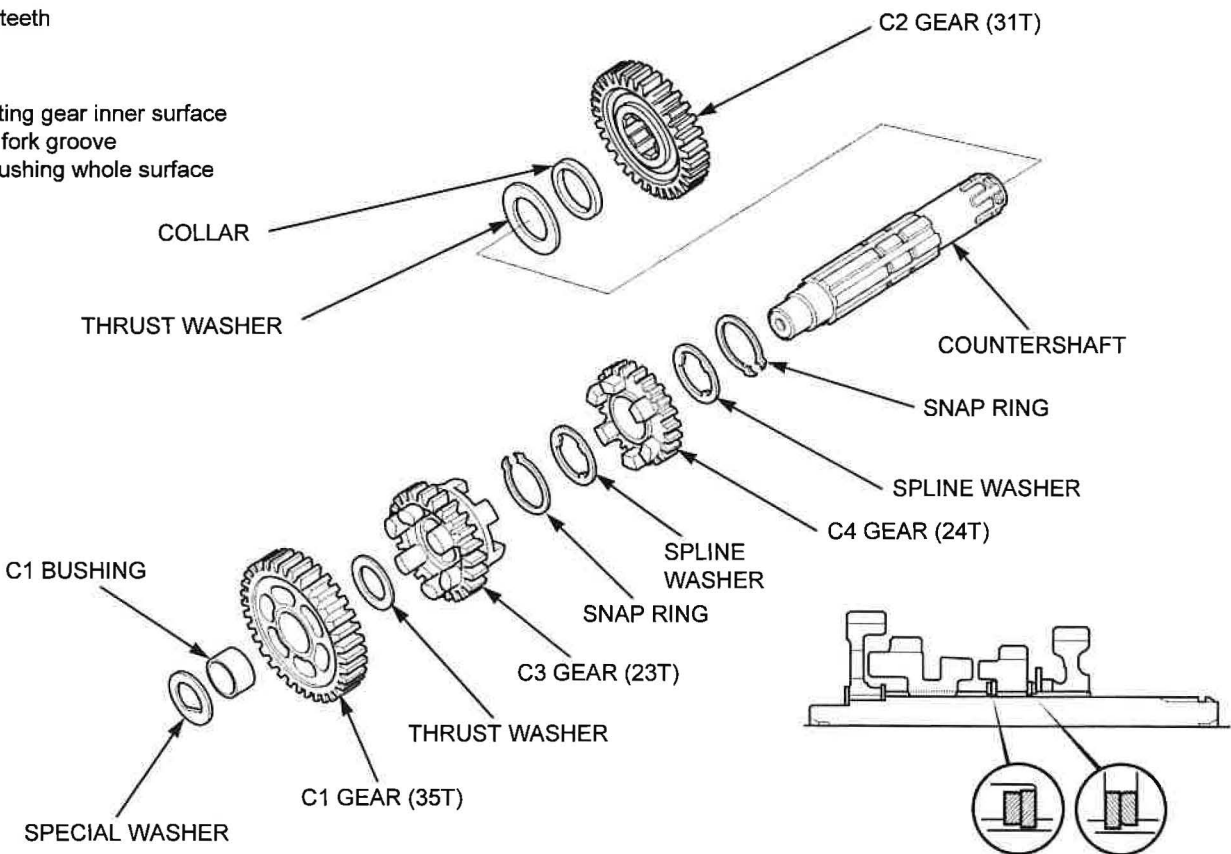
 : Rotating gear inner surface :  
Shift fork groove



## COUNTERSHAFT:

 : Gear teeth

 : Rotating gear inner surface  
Shift fork groove  
C1 bushing whole surface

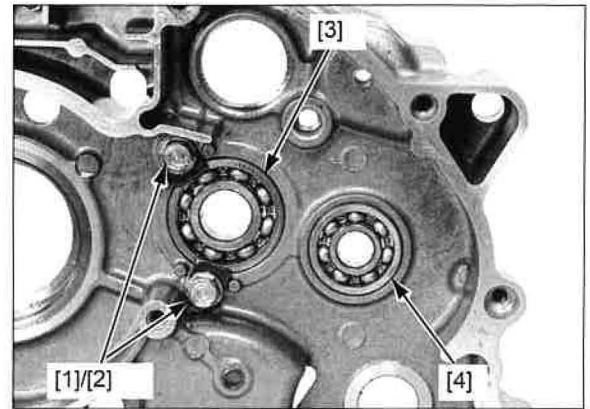


**BEARING REPLACEMENT**

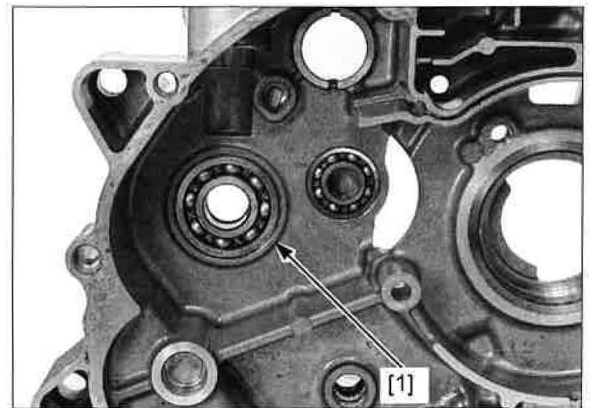
Remove the crankshaft (page 13-6).

Remove the bolts [1] and mainshaft bearing set plates [2].

Drive out the mainshaft bearing [3] and countershaft bearing [4] from the right crankcase.



Drive out the countershaft bearing [1] from the left crankcase.



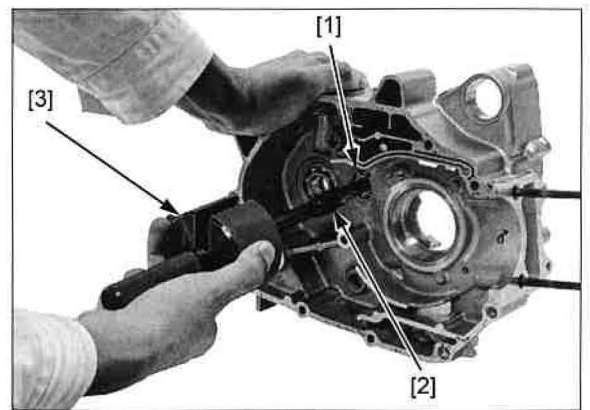
Remove the mainshaft bearing [1] from the left crankcase using the special tools.

**TOOLS:**

- Bearing remover set, 12 mm [2] 07936-1660101
- Bearing remover shaft, 12 mm 07936-1660120
- Bearing remover head, 12 mm 07936-1660110
- Remover weight [3] 07741-0010201

**U.S.A. TOOLS:**

- Bearing Remover, 12mm 07936-166010A
- Remover Handle 07936-3710100
- Remover Weight 07936-371020A



## CRANKCASE/TRANSMISSION/CRANKSHAFT

Apply engine oil to the new bearing cavities.  
Drive new bearings into the crankcase with their marked side facing up until they are fully seated using the special tools.

### TOOLS:

#### Left crankcase mainshaft bearing [1]:

Driver [2] 07749-0010000  
Attachment, 28 x 30 mm [3] 07946-1870100  
Pilot, 12 mm [4] 07746-0040200

#### Left crankcase countershaft bearing:

Driver 07749-0010000  
Attachment, 37 x 40 mm 07746-0010200  
Pilot, 17 mm 07746-0040400

#### Right crankcase mainshaft bearing:

Driver 07749-0010000  
Attachment, 37 x 40 mm 07746-0010200  
Pilot, 17 mm 07746-0040400

#### Right crankcase countershaft bearing:

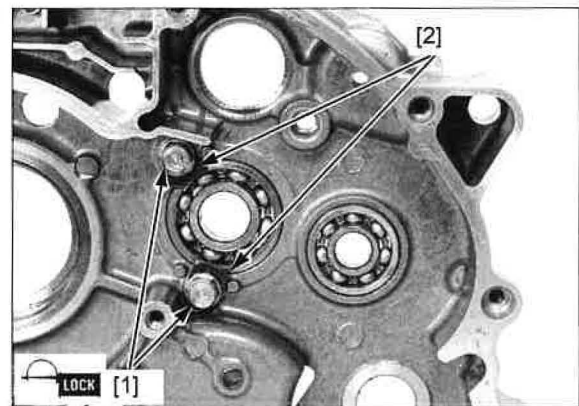
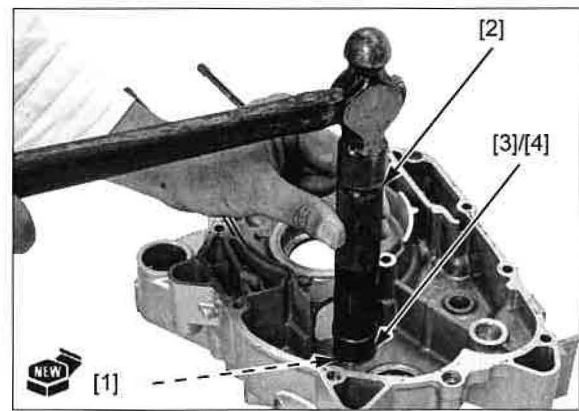
Driver 07749-0010000  
Attachment, 32 x 35 mm 07746-0010100  
Pilot, 12 mm 07746-0040200

Coating width  $6.5 \pm 1.0$  mm ( $0.26 \pm 0.04$  in) from the tip.

Apply locking agent to the threads of the mainshaft bearing set plate bolt [1].

Install the mainshaft bearing set plates [2] and bolts to the right crankcase and tighten the bolts securely.

Install the crankshaft (page 13-6).

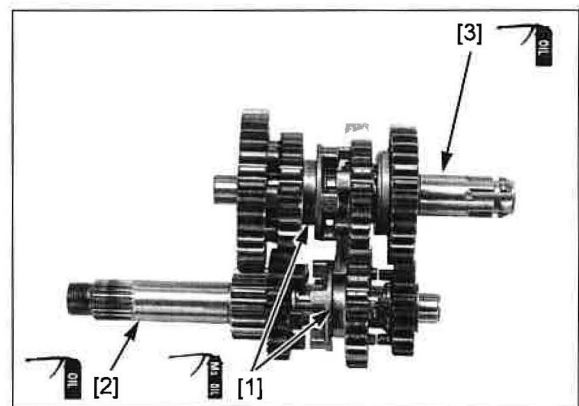


## INSTALLATION

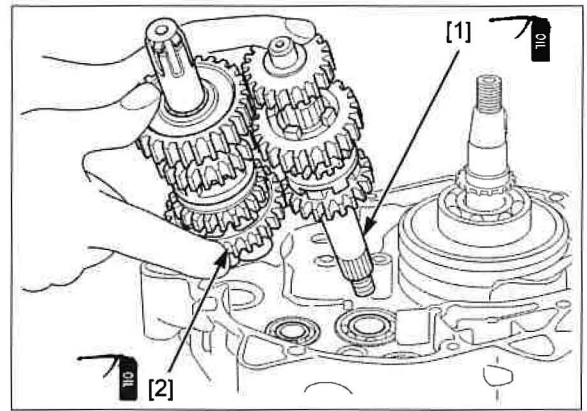
Apply molybdenum disulfide oil to the M4 and C3 gear shift fork grooves [1].

Engage the gears of the mainshaft [2] and countershaft [3].

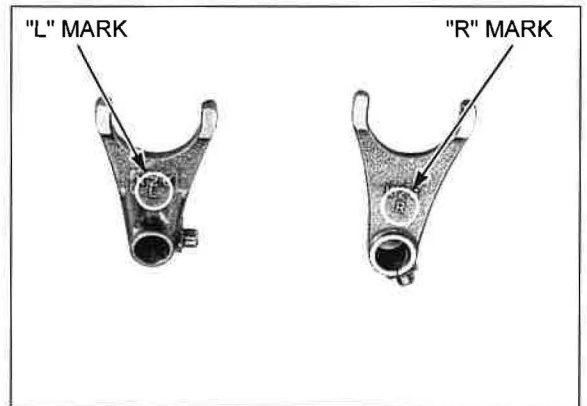
Apply engine oil to the transmission gear teeth.



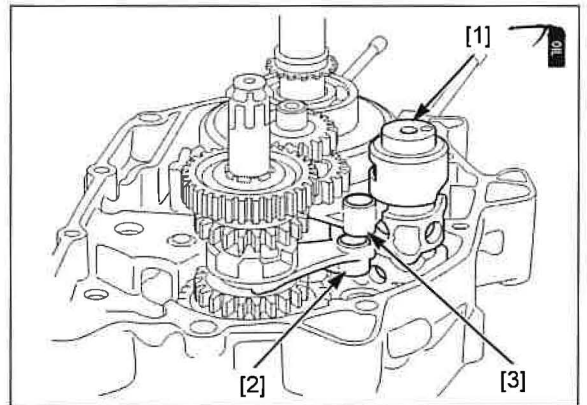
Apply engine oil to the transmission gear teeth.  
Engage the mainshaft [1] and countershaft [2] and install them into the right crankcase as an assembly.



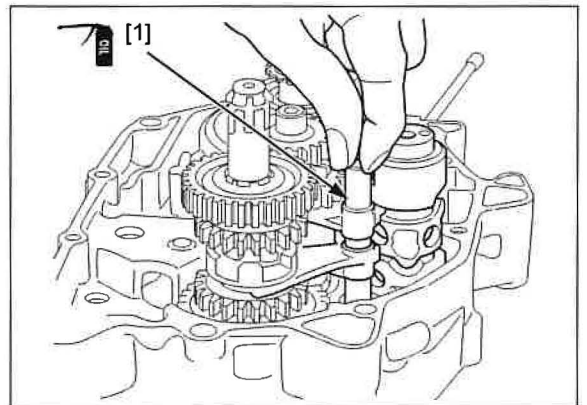
Face the shift fork identification marks to the left crankcase side. Each shift fork has an identification mark, "L" is for the left shift fork, "R" is for the right shift fork.



Apply engine oil to the shift drum [1] whole surface.  
Install the shift drum into the right crankcase.  
Install the right shift fork [2] into the C3 shifter groove with its mark facing up (left crankcase side).  
Install the left shift fork [3] into the M4 shifter groove with its mark facing up (left crankcase side).



Apply oil to the shift fork shaft [1] whole surface.  
Install the shift fork shaft.  
Rotate the shift drum to check the transmission operation.  
Assemble the crankcase (page 13-14).

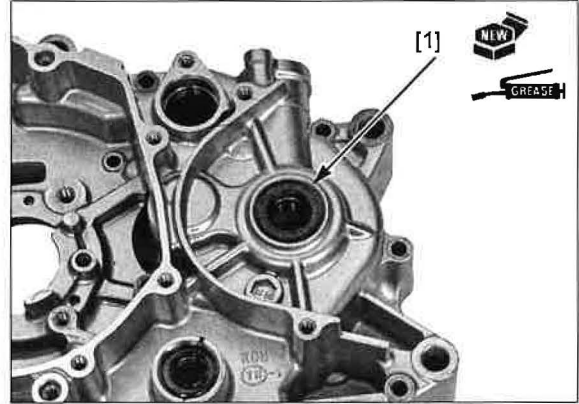


**CRANKCASE ASSEMBLY**

Apply grease to the lips of a new countershaft oil seal [1].

*Be careful not to damage the oil seal lips.*

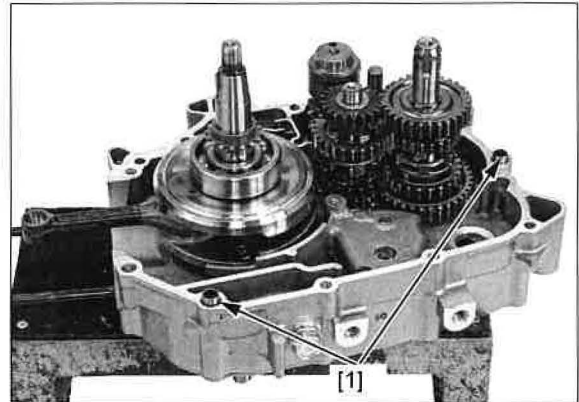
Install the oil seal to the left crankcase until it is flush with the left crankcase surface.



Clean off the sealant from the left and right crankcase mating surfaces.

If there is a scratch on the mating surfaces, repair it using an oil stone or equivalent.

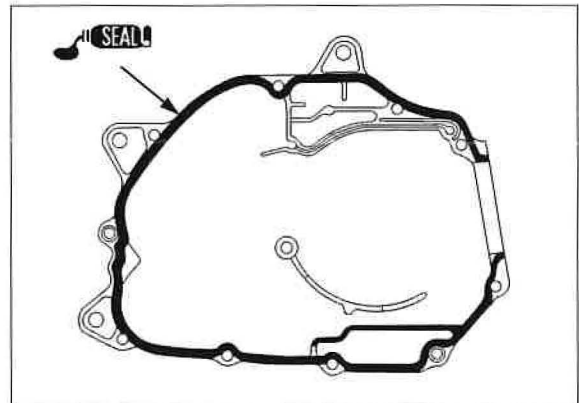
Install the dowel pins [1] to the right crankcase.



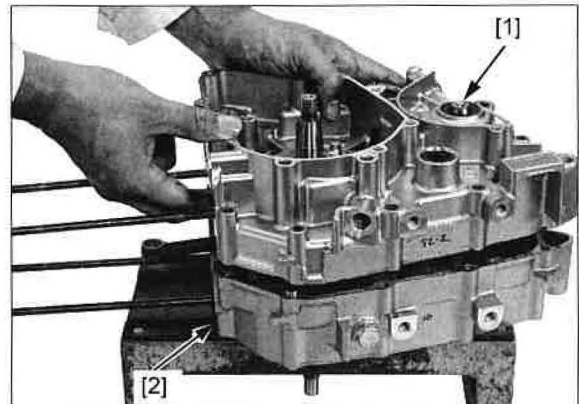
Apply light but thorough coating of sealant (THREE BOND 1215 or equivalent) to the left crankcase mating surface.

**NOTE:**

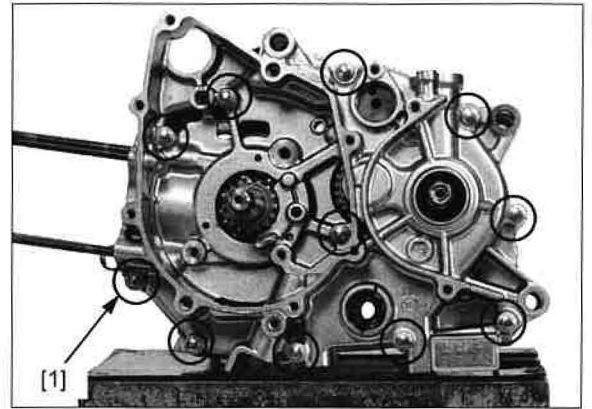
- Avoid applying the sealant around the oil passage area.



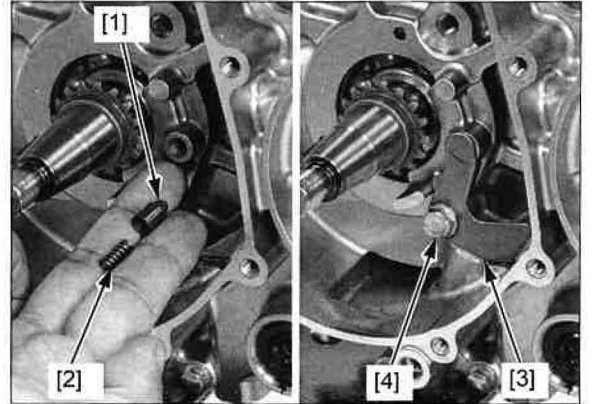
Install the left crankcase [1] to the right crankcase [2].



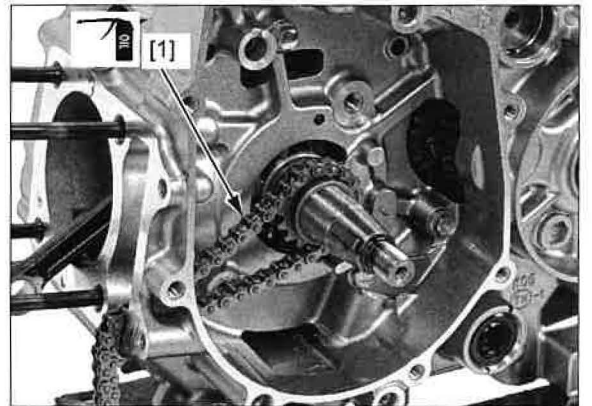
Install and tighten the crankcase bolts [1] in a crisscross pattern in several steps.



Install the bearing push plug [1], spring [2] and holder plate [3], then tighten the bolt [4].



Apply engine oil to the cam chain [1] whole surface.  
Install the cam chain over the timing sprocket teeth.  
Install the removed parts (page 13-2).



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**MEMO**

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# 14. ENGINE REMOVAL/INSTALLATION

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<b>SERVICE INFORMATION</b> .....	<b>14-2</b>	<b>ENGINE REMOVAL</b> .....	<b>14-4</b>
<b>COMPONENT LOCATION</b> .....	<b>14-3</b>	<b>ENGINE INSTALLATION</b> .....	<b>14-6</b>

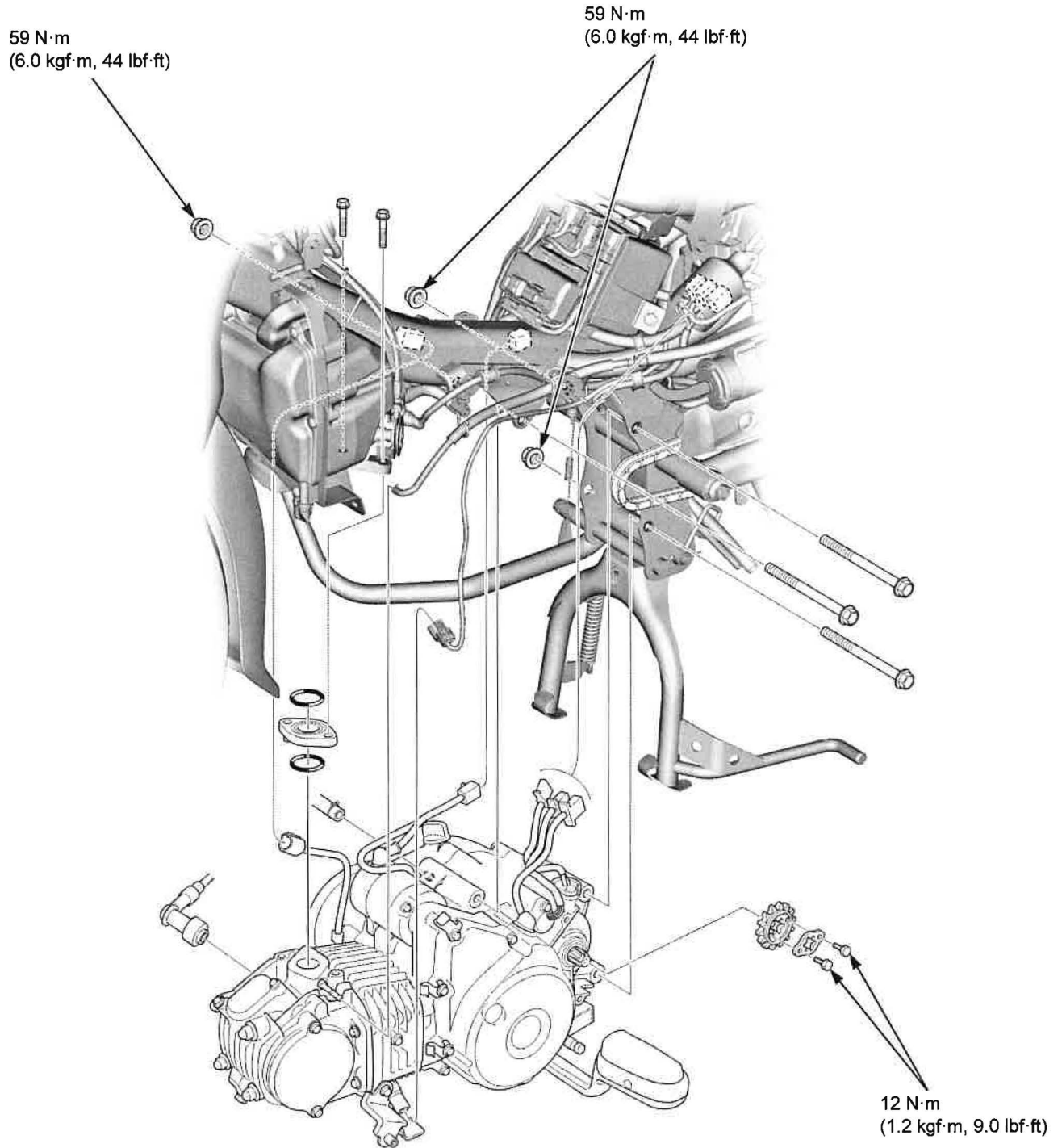


# SERVICE INFORMATION

## GENERAL

- During engine removal and installation, support the vehicle with its centerstand.
- Support the engine using a jack or other adjustable support to ease of engine hanger bolts removal.
- The following components can be serviced with the engine installed in the frame.
  - Alternator (page 12-4)
  - Manual clutch (page 11-9)
  - Centrifugal clutch (page 11-9)
  - Gearshift linkage (page 11-21)
  - Cylinder head (page 9-10)
  - Cylinder/piston (page 10-4)
  - Oil pump (page 8-4)
- The following components require engine removal for service.
  - Crankshaft/transmission (page 13-6)
  - Shift forks/shift drum (page 13-8)

COMPONENT LOCATION



## ENGINE REMOVAL/INSTALLATION

### ENGINE REMOVAL

Support the vehicle with its centerstand.

Drain the engine oil (page 3-9).

Remove the following:

- Leg shield (page 2-11)
- Body cover (page 2-13)
- Left crankcase rear cover (page 2-16)
- Exhaust pipe/muffler (page 2-19)
- Chain case (page 2-17)

Disconnect the following:

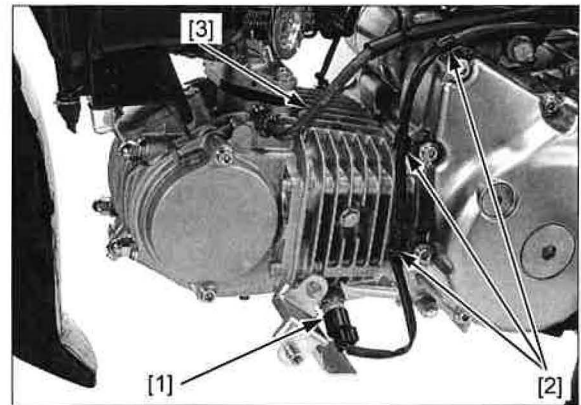
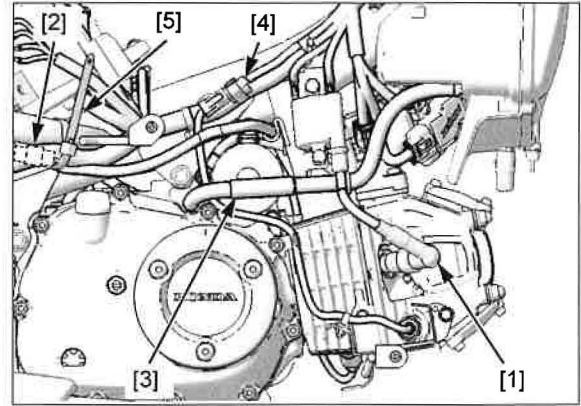
- Spark plug cap [1]
- Starter motor 2P connector [2]
- Crankcase breather hose [3]
- O<sub>2</sub> sensor 1P connector [4]

Remove the wire band [5].

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

Release the EOT sensor wire from the clamp [2].

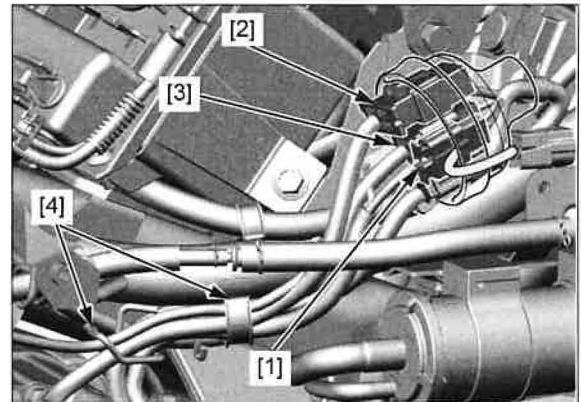
Disconnect the purge hose [3].



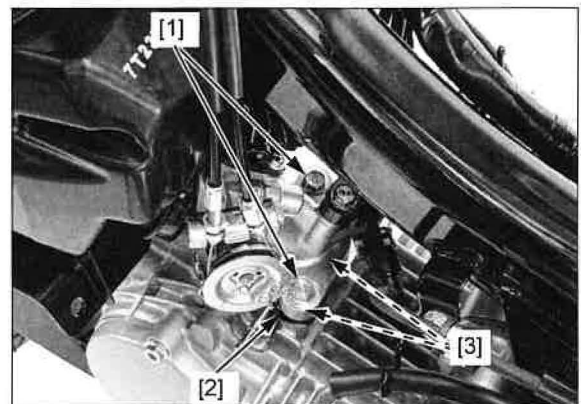
Disconnect the following:

- VS sensor 3P connector [1]
- Alternator/CKP sensor 4P connector [2]
- Gear position switch 6P (Black) connector [3]

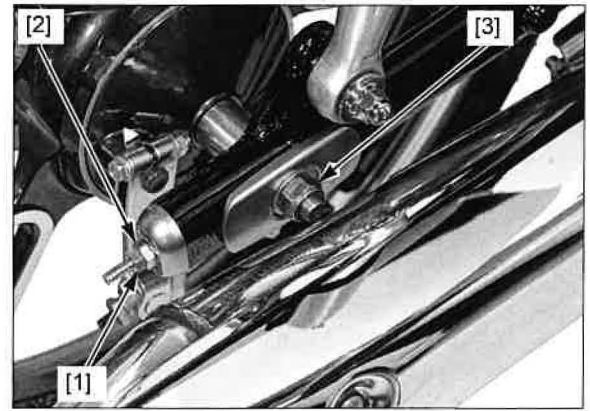
Release the wires from the guides [4].



Remove the intake pipe mounting bolts [1], Insulator [2] and O-ring [3].

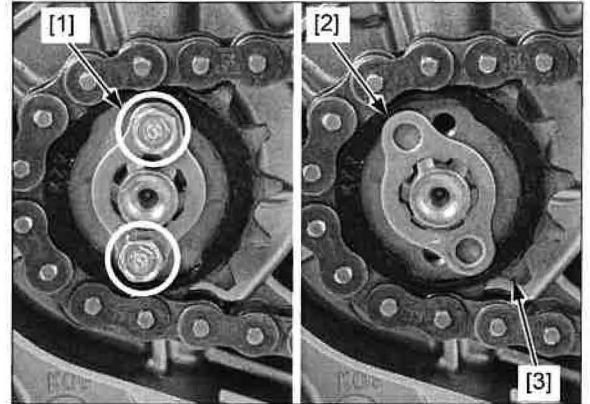


Loosen the lock nuts [1], drive chain adjuster nuts [2] and axle nut [3].  
Push the rear wheel forward.



Remove the drive sprocket fixing plate bolts [1].  
Turn and remove the fixing plate [2].

Remove the drive sprocket [3] from the countershaft and drive chain.



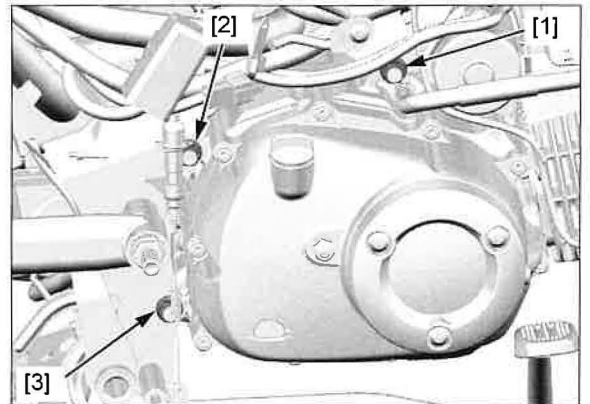
Support the engine using a jack or other adjustable support.

Remove the front engine hanger nut [1].

Remove the rear upper engine hanger nut [2] and rear lower engine hanger nut [3].

Remove the engine hanger bolts and engine from the frame.

- Wrap the intake manifold port with a shop towel or cover it with a piece of tape to prevent any foreign material from dropping into the engine.



## ENGINE REMOVAL/INSTALLATION

### ENGINE INSTALLATION

#### NOTE:

- Note the direction of the hanger bolts.
- Use a floor jack or other adjustable support, carefully place the engine into the frame and maneuver it into place.
- Route the wires and hoses properly (page 1-17).

*During engine installation, hold the engine securely and be careful not to damage the frame and engine.*

Place the engine into the frame and support the engine using a jack or other adjustable support.

Install the engine hanger bolts and nuts.

Tighten the rear upper engine hanger nut [1] to the specified torque.

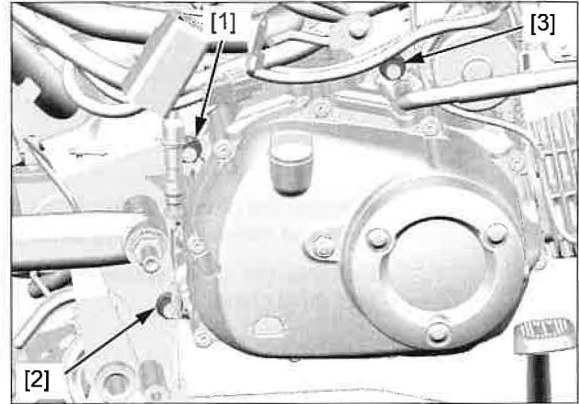
**TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)**

Tighten the rear lower engine hanger nut [2] to the specified torque.

**TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)**

Tighten the front engine hanger nut [3] to the specified torque.

**TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)**



*Using other than genuine drive sprocket causes ABS malfunction. Do not use it.*

Install the drive chain onto the drive sprocket [1].

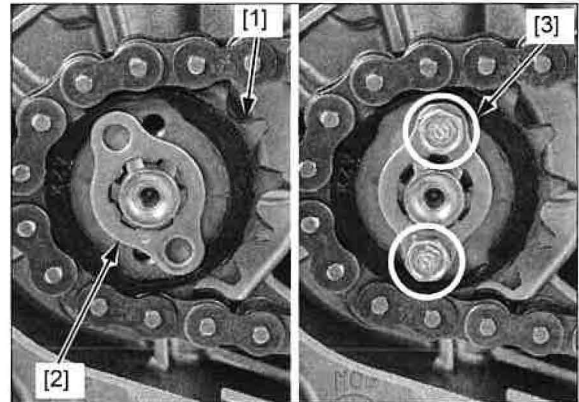
Install the drive sprocket onto the countershaft.

Install the fixing plate [2] to the countershaft while aligning their teeth.

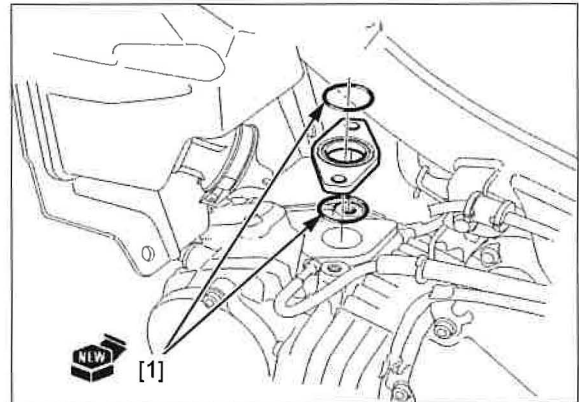
Rotate the fixing plate and align their bolt holes.

Install and tighten the drive sprocket fixing plate bolts [3] alternately to the specified torque.

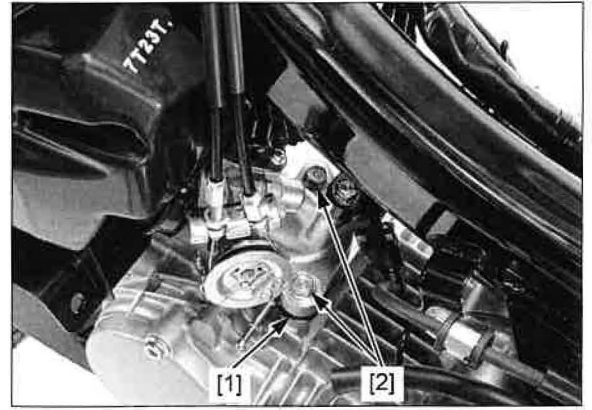
**TORQUE: 12 N·m (1.2 kgf·m, 9.0 lbf·ft)**



Install a new O-ring [1] into the Insulator groove.



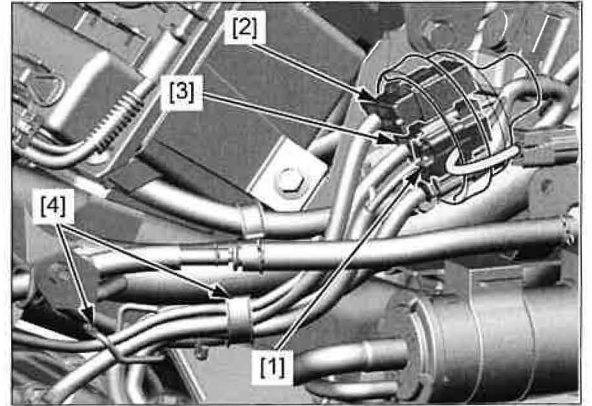
Install the Insulator [1] and intake pipe mounting bolts [2], then tighten them.



Connect the following:

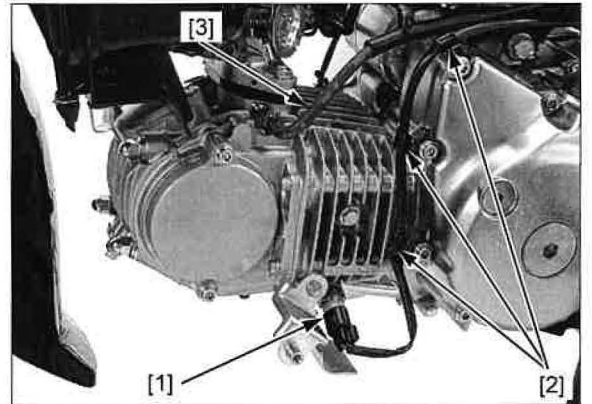
- VS sensor 3P connector [1]
- Alternator/CKP sensor 4P connector [2]
- Gear position switch 6P (Black) connector [3]

Secure the wires with the guides [4].



Connect the EOT sensor 2P connector [1] and secure the EOT sensor wire with the clamps [2].

Connect the purge hose [3].



Connect the following:

- Spark plug cap [1]
- Starter motor 2P connector [2]
- Crankcase breather hose [3]
- O<sub>2</sub> sensor 1P connector [4]

Install the wire band [5].

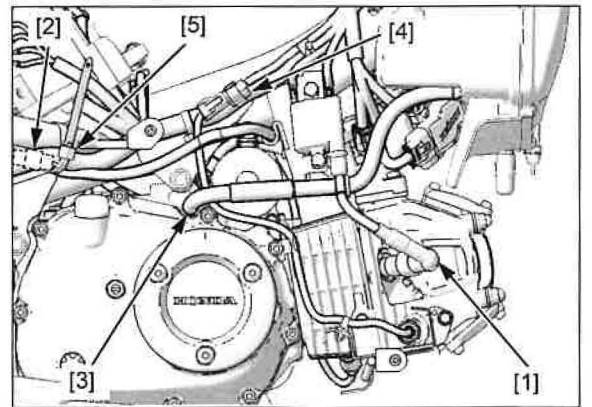
Install the following:

- Leg shield (page 2-11)
- Body cover (page 2-13)
- Left crankcase rear cover (page 2-16)
- Exhaust pipe/muffler (page 2-19)
- Chain case (page 2-17)

Fill the recommended engine oil up to the proper level (page 3-9).

Adjust the drive chain slack (page 3-12).

Check the brake pedal freeplay (page 3-16).



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**MEMO**

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# 15. FRONT WHEEL/SUSPENSION/STEERING

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<b>SERVICE INFORMATION</b> .....	<b>15-2</b>	<b>FRONT WHEEL</b> .....	<b>15-9</b>
<b>TROUBLESHOOTING</b> .....	<b>15-4</b>	<b>FORK</b> .....	<b>15-11</b>
<b>COMPONENT LOCATION</b> .....	<b>15-5</b>	<b>STEERING STEM</b> .....	<b>15-19</b>
<b>HANDLEBAR</b> .....	<b>15-6</b>		



# FRONT WHEEL/SUSPENSION/STEERING

## SERVICE INFORMATION

### GENERAL

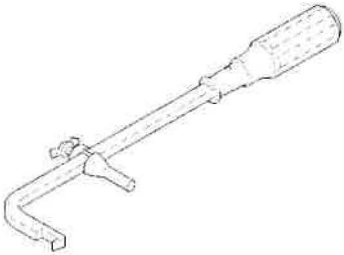
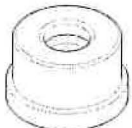


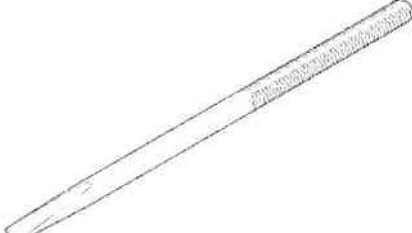

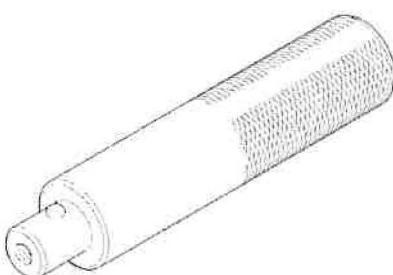
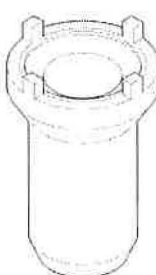
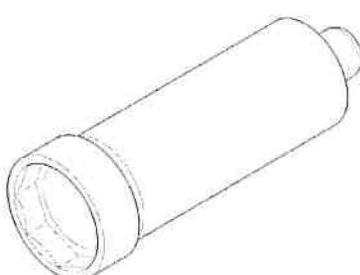
#### ⚠ WARNING

Frequent inhalation of brake shoe or pad dust, regardless of material composition could be hazardous to your health.

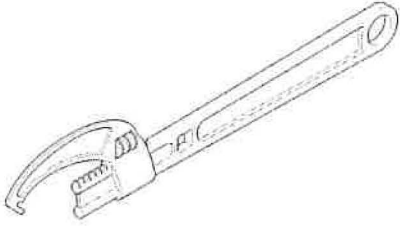
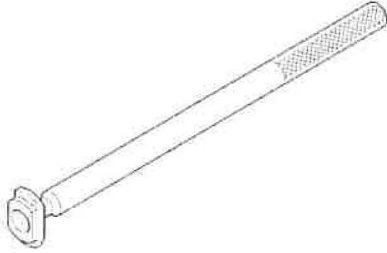
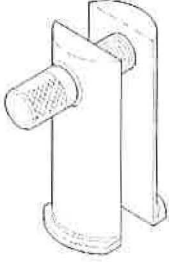


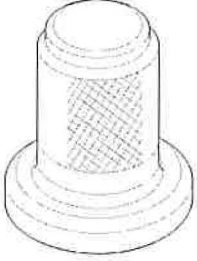
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

- This section covers the front wheel, fork, handlebar and steering stem.
- When servicing the front wheel, fork or steering stem, support the vehicle using a jack or other support.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- After the front wheel installation, check the brake operation by applying the brake lever.
- For hydraulic brake system service, refer to page 17-2.

### TOOLS

<p>Oil seal remover 07748-0010001</p>  <p>Equivalent commercially available in U.S.A.</p>	<p>Attachment, 32 x 35 mm 07746-0010100</p> 	<p>Attachment, 37 x 40 mm 07746-0010200</p> 
<p>Pilot, 12 mm 07746-0040200</p> 	<p>Bearing Remover Shaft 07746-0050100</p> 	<p>Remover Head, 12 mm 07746-0050300</p> 
<p>Driver 07749-0010000</p> 	<p>Steering stem socket 07916-3710101</p> 	<p>Socket wrench 07916-KM10000</p> 

**FRONT WHEEL/SUSPENSION/STEERING**

<p>Pin spanner 07702-0020001</p> 	<p>Ball race remover shaft 07GMD-KS40100</p> 	<p>Ball race remover, 34.5 mm 07948-4630100</p> 
<p>Inner driver, 35 mm 07746-0030400</p> 	<p>Attachment, 45 x 50 mm 07946-6920100</p>  <p>Not available in the U.S.A.</p>	<p>Oil seal driver, 54 mm 07947-6340000</p>  <p>Not available in the U.S.A.</p>

### TROUBLESHOOTING

#### Hard steering

- Insufficient tire pressure
- Faulty tire
- Steering stem lock nut too tight
- Faulty steering head bearing
- Faulty steering head bearing race
- Bent steering stem

#### Steers to one side or does not track straight

- Bent front axle
- Wheel installed incorrectly
- Worn or damaged front wheel bearings
- Bent fork
- Bent frame
- Faulty steering head bearing

#### Front wheel wobbles

- Loose front axle fasteners
- Bent rim
- Worn or damaged front wheel bearings

#### Front wheel turns hard

- Front brake drag
- Bent front axle
- Faulty front wheel bearings

#### Soft suspension

- Low tire pressure
- Deteriorated fork fluid
- Incorrect fork fluid weight
- Insufficient fluid in fork
- Weak fork spring

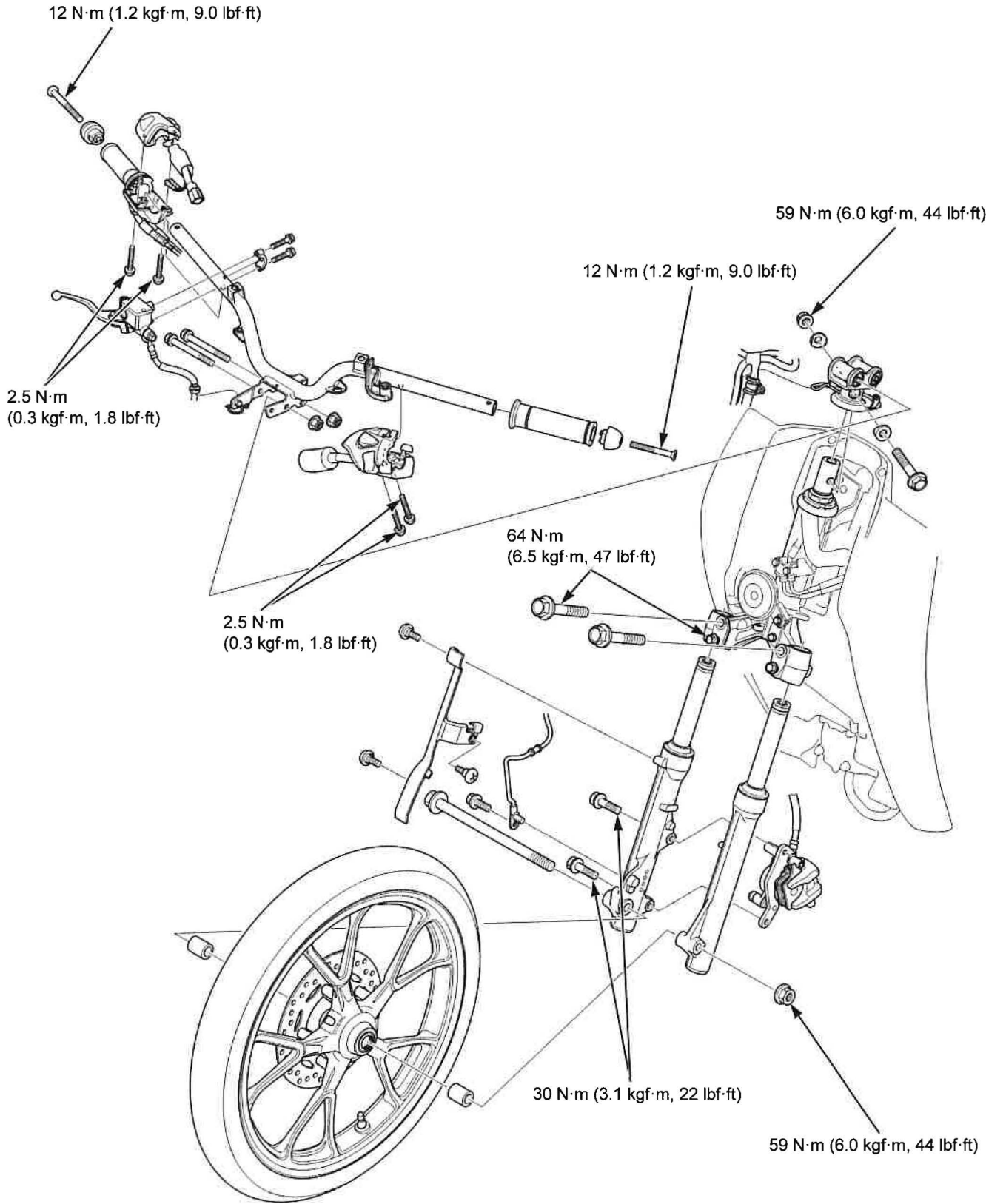
#### Hard suspension

- High tire pressure
- Too much fluid in fork
- Incorrect fork fluid weight
- Bent fork pipes
- Clogged fork fluid passage

#### Suspension noisy

- Bent fork slider
- Insufficient fluid in fork
- Loose fork fasteners

COMPONENT LOCATION



# HANDLEBAR

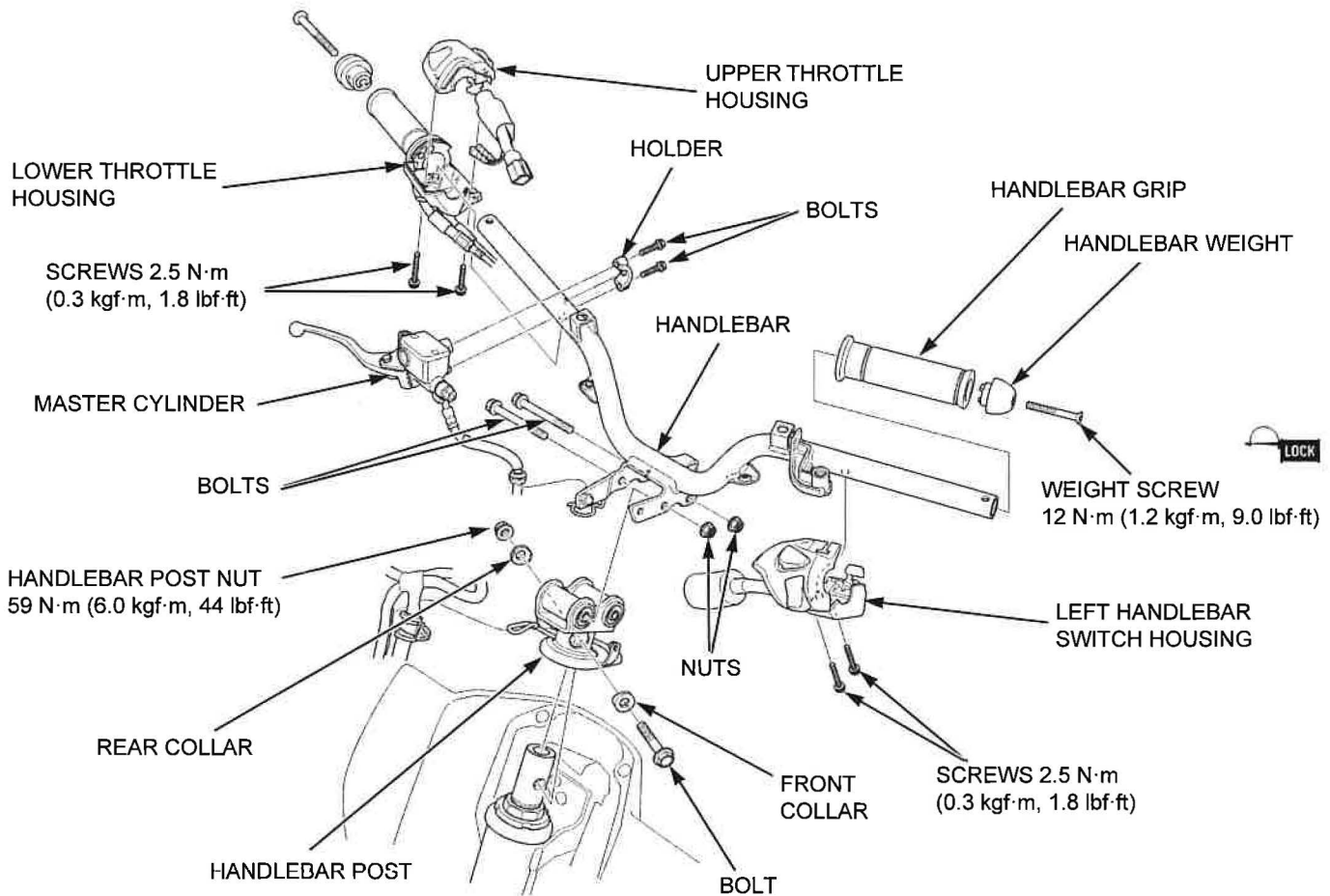
## REMOVAL/INSTALLATION

Remove the following:

- Handlebar lower cover (page 2-8)
- Fork cover (page 2-9)
- Right/Left handlebar switch connectors (page 20-11).

Remove and install the handlebar according to the illustration.

- Handlebar post installation (page 15-7)
- Right handlebar switch housing installation (page 15-7)
- Left handlebar switch housing installation (page 15-7)
- Handlebar grip installation (page 15-8)
- Handlebar inner weight replacement (page 15-8)



**HANDLEBAR POST INSTALLATION**

Install the handlebar post [1] onto the steering stem while aligning the bolt holes.

*Rear collar is taller than the front collar.*

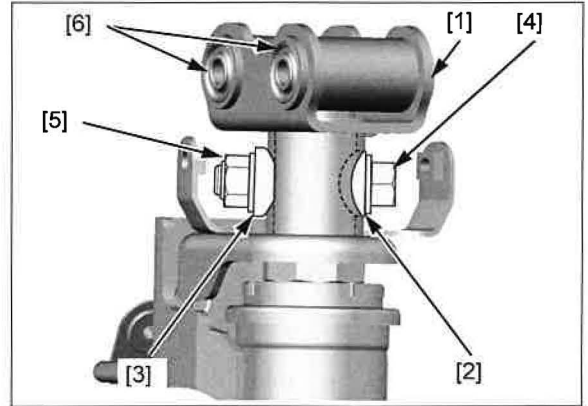
Install the following:

- Front collar [2]
- Rear collar [3]
- Bolt [4]
- Nut [5]

Tighten the nut to the specified torque.

**TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)**

- Check the bushing [6] for wear or damage.



**RIGHT HANDLEBAR SWITCH HOUSING INSTALLATION**

Apply 0.1 – 0.2 g (0.004 – 0.007 oz) of grease to the specified area and the cable ends [1] of the throttle cables [2].

Connect the throttle cable ends to the throttle pipe.

Set the throttle pipe into the right handlebar switch housing and install the throttle pipe onto the handlebar.

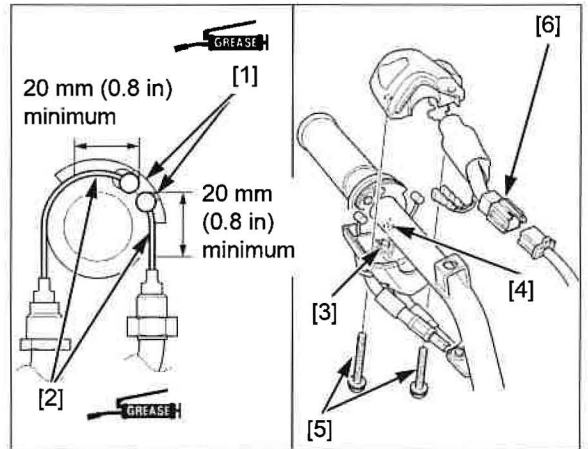
Install the right handlebar switch housing by aligning the locating pin [3] with the hole [4] in the handlebar.

Install the right handlebar switch screws [5].

Tighten the screw to the specified torque.

**TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)**

Connect the right handlebar switch 6P connector [6].



**LEFT HANDLEBAR SWITCH HOUSING INSTALLATION**

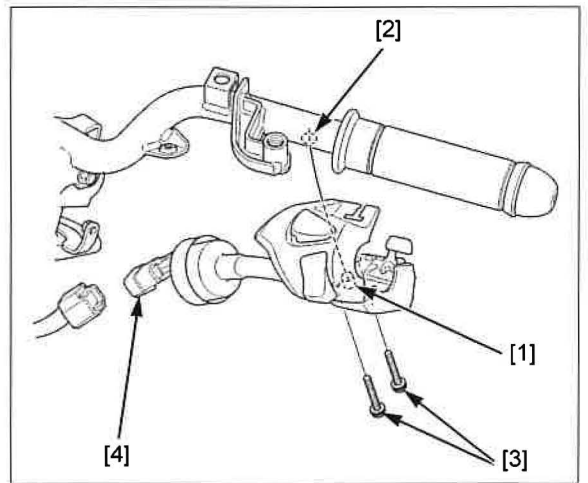
Install the left handlebar switch housing by aligning the locating pin [1] with the hole [2] in the handlebar.

Install the right handlebar switch screws [3].

Tighten the screw to the specified torque.

**TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)**

Connect the left handlebar switch 8P (Black) connector [4].



## FRONT WHEEL/SUSPENSION/STEERING

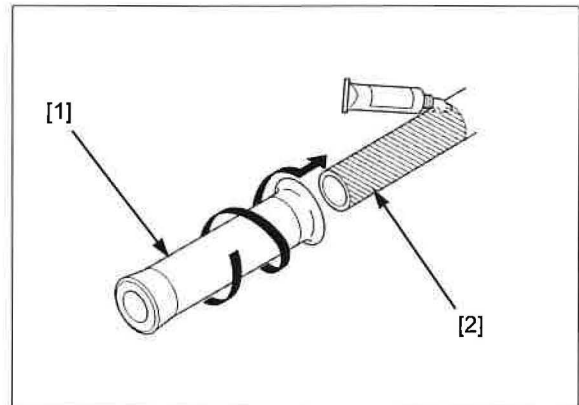
### HANDLEBAR GRIP INSTALLATION

If the handlebar grips [1] were removed, apply Honda Bond A or equivalent to the inside of the grip and to the clean surfaces of the left handlebar [2].

Wait 3 – 5 minutes and install the grip.

*Allow the adhesive to dry for 1 hour before using.*

Rotate the grip for even application of the adhesive.

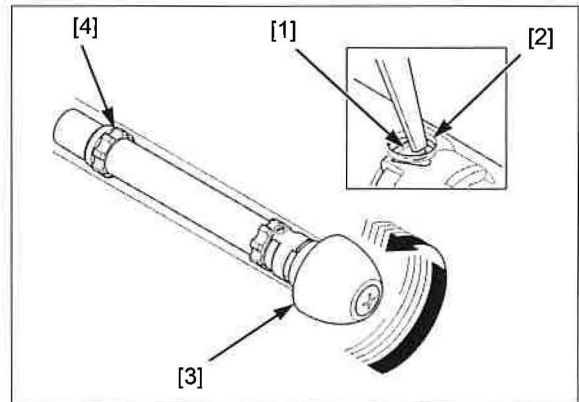


### HANDLEBAR INNER WEIGHT REPLACEMENT

Push the retainer tab [1] through the handlebar hole [2] with a screwdriver or punch.

*Apply lubricant spray through the handlebar hole to the rubber [4] for easy removal.*

Temporarily install the grip end and screw, then remove the inner weight [3] assembly by turning the grip end.



Remove the screw [1], grip end [2] and rubber cushions [3] from the inner weight [4].

Discard the retainer [5].

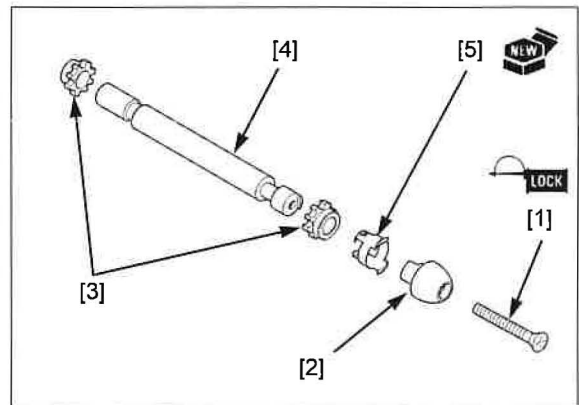
Check that the condition of the rubber cushions, replace them if necessary.

Install the rubber cushions and a new retainer onto the inner weight.

Install the grip end onto the inner weight aligning its boss with groove each other.

Clean the screw threads and apply locking agent to the bolt threads.

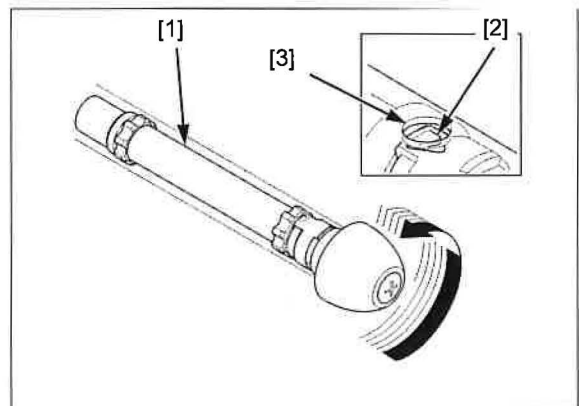
Install the new grip end screw.



**TORQUE: Handlebar weight screw**

**12 N·m (1.2 kgf·m, 9.0 lbf·ft)**

Insert the inner weight assembly [1] into the handlebar. Turn the inner weight and hook the retainer tab [2] with the hole [3] in the handlebar.



## FRONT WHEEL

### REMOVAL/INSTALLATION

#### NOTE:

- Do not operate the brake lever after removing the pads.

Loosen the front axle nut [1].

Support the vehicle securely using a jack or other support and raise the front wheel off the ground.

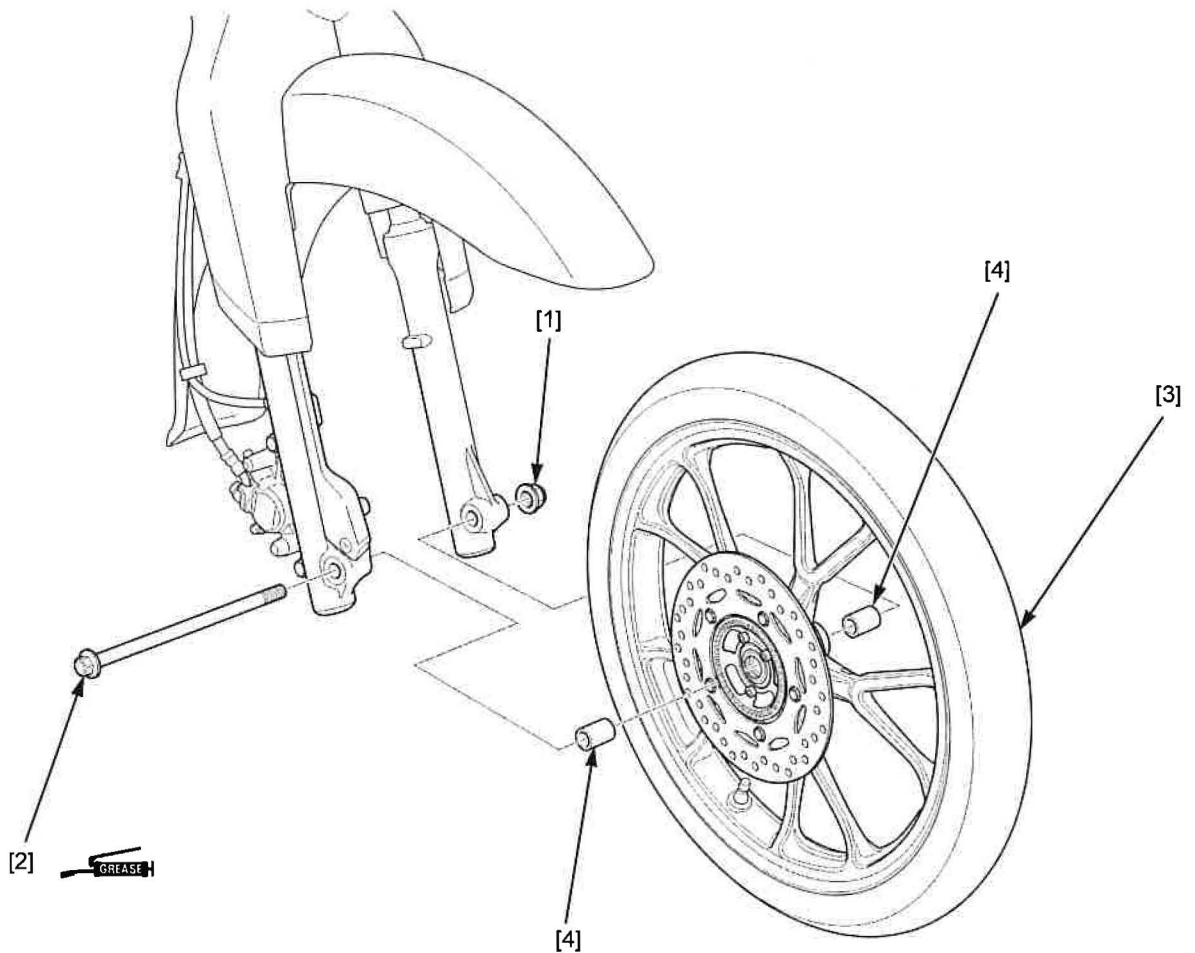
Remove the following:

- Front axle nut
  - Front axle [2]
  - Front wheel [3]
  - Side collar [4]
- Check the brake operation after installation.
  - Apply grease to the front axle surface.

#### TORQUE:

Front axle nut:

59 N·m (6.0 kgf·m, 44 lbf·ft)





# FRONT WHEEL/SUSPENSION/STEERING

## 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
- Wheel rim

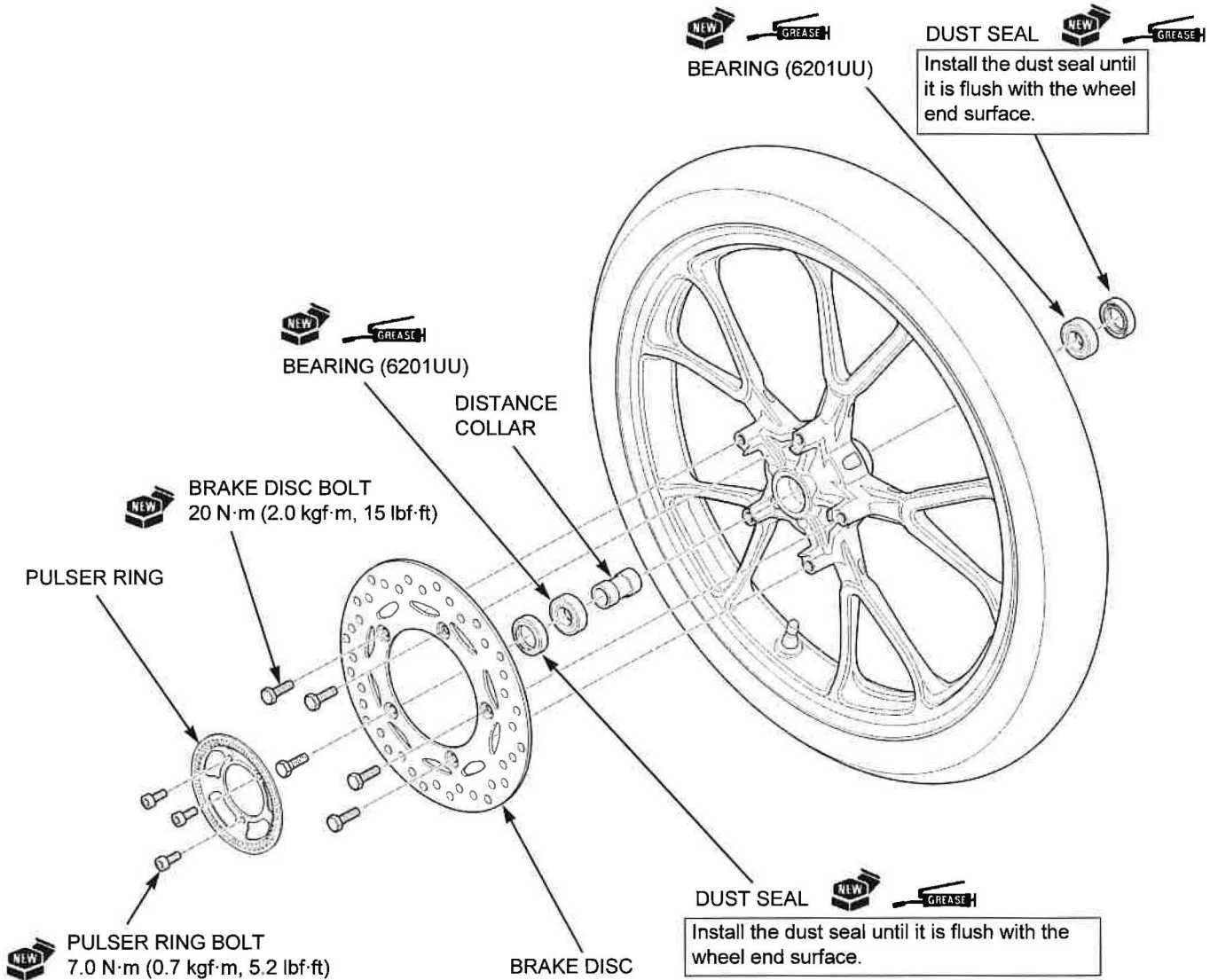
Measure each part according to FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS (page 1-7). Replace any part if it is out of service limit.

## DISASSEMBLY/ASSEMBLY

Disassemble and assemble the front wheel according to the illustration.

- Install each dust seal with the flat side facing out so that it is flush with the wheel hub.
- Use only the specified tire to avoid malfunctions of the ABS.

For wheel bearing replacement (page 15-11).



## BEARING REPLACEMENT

Remove the following:

- Front wheel (page 15-9)
- Dust seal (page 15-10)

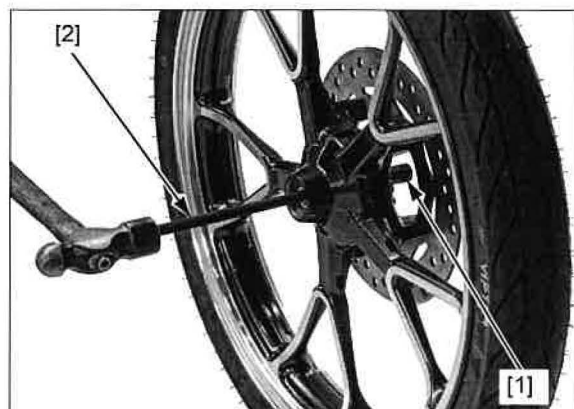
Install the bearing remover head into the bearing.

From the opposite side, install the bearing remover shaft and drive the bearing out of the wheel hub.

Remove the distance collar and drive out the other bearing.

### TOOLS:

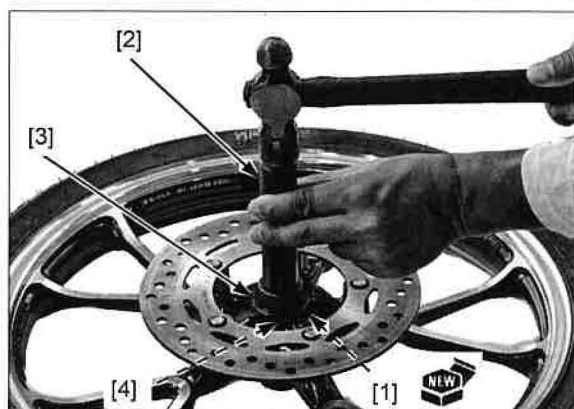
- [1] Bearing remover head, 12 mm 07746-0050300
- [2] Bearing remover shaft 07746-0050100



Drive in a new right (brake disc side) bearing [1] squarely with its marked side facing up until it is fully seated.

### TOOLS:

- [2] Driver 07749-0010000
- [3] Attachment, 32 x 35 mm 07746-0010100
- [4] Pilot, 12 mm 07746-0040200

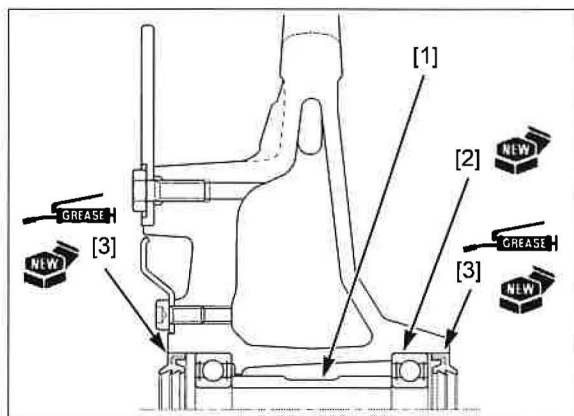


Install the distance collar [1].

Drive in a new left bearing [2] squarely with its marked side facing up.

### TOOLS:

- Driver 07749-0010000
- Attachment, 32 x 35 mm 07746-0010100
- Pilot, 12 mm 07746-0040200



Apply grease to the lip of the new dust seal [3] and install the dust seal until it is flush with the wheel end surface.

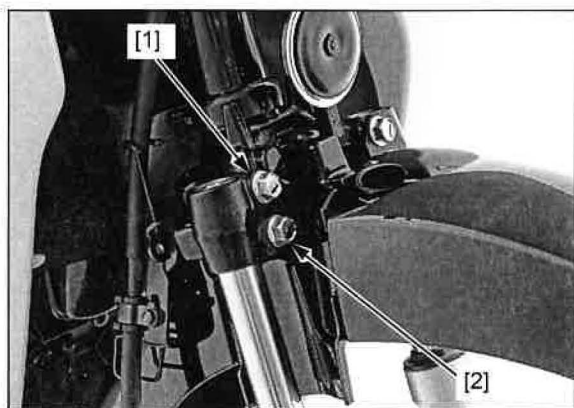
## FORK

### REMOVAL

Remove the following:

- Front wheel (page 15-9)
- Fork cover (page 2-9)
- Front brake caliper (page 17-9)
- Front wheel speed sensor (page 18-20)

Remove the bottom bridge upper pinch bolt [1]. Loosen the bottom bridge lower pinch bolt [2] and remove the fork leg.

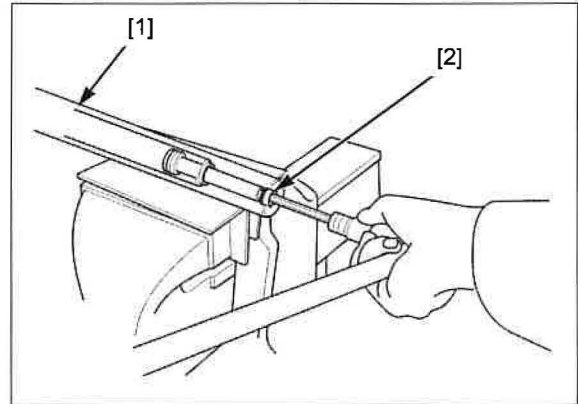


## FRONT WHEEL/SUSPENSION/STEERING

### DISASSEMBLY

Hold the fork slider [1] in a vice with soft jaws or a shop towel.

Loosen the fork socket bolt [2] but do not remove yet.



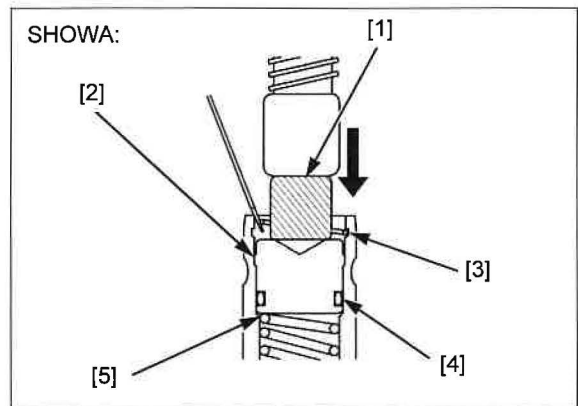
Put the suitable tool [1] on the spring seat [2].

*To prevent loss of tension, do not compress the fork spring more than necessary. The spring seat is under spring pressure.*

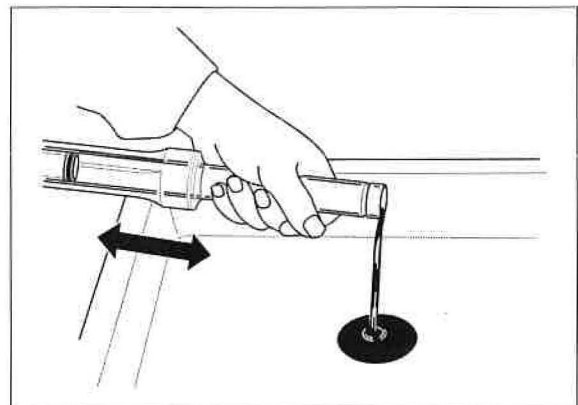
Press the spring seat into the fork pipe using a suitable tool and hydraulic press, then remove the stopper ring [3] using a small screwdriver.

Remove the spring seat, O-ring [4] and fork spring [5] from the fork pipe.

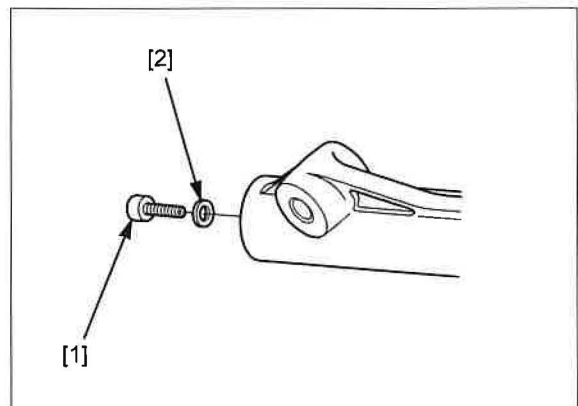
*Use care when removing the fork assembly from the hydraulic press.*



Pour out the fork fluid by pumping the fork pipe several times.

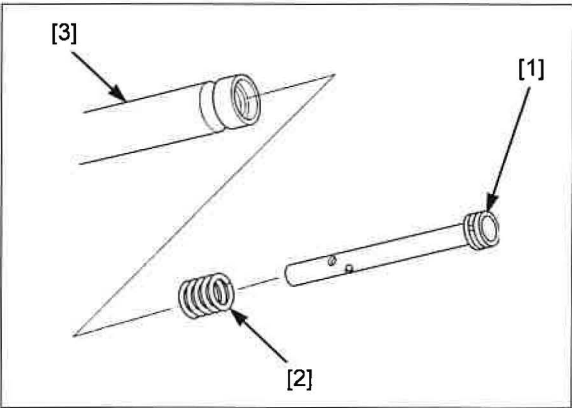


Remove the socket bolt [1] and sealing washer [2].

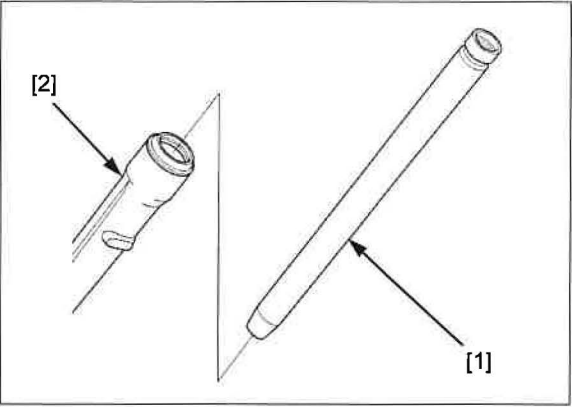


**FRONT WHEEL/SUSPENSION/STEERING**

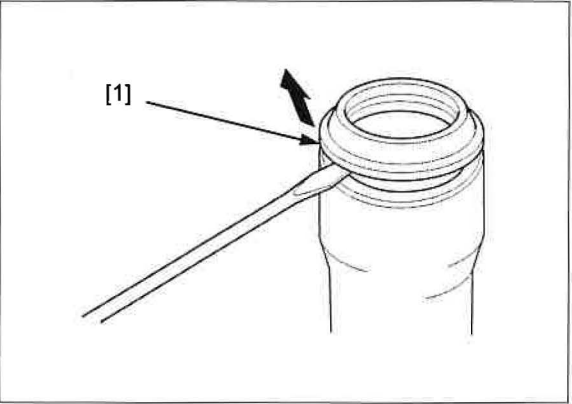
Remove the fork piston [1] and rebound spring [2] from the fork pipe [3].



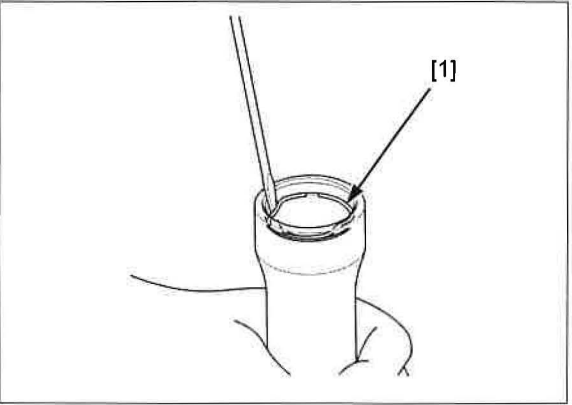
Pull the fork pipe [1] out from the fork slider [2].



Remove the dust seal [1].



Remove the oil seal stopper ring [1].



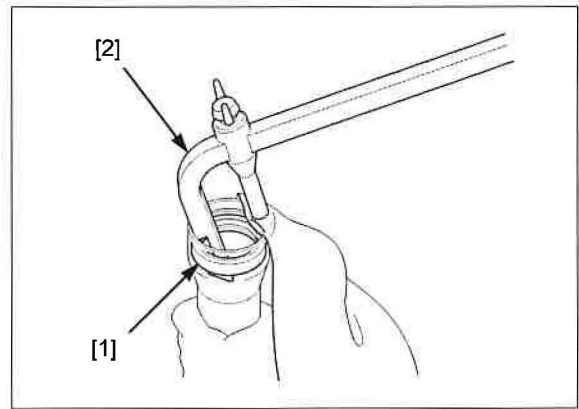
## FRONT WHEEL/SUSPENSION/STEERING

Remove the oil seal [1] using the special tool.

**TOOL:**

[2] Oil seal remover

07748-0010001 or  
equivalent commercially  
available.



Remove the back-up ring [1] from the fork slider [2].

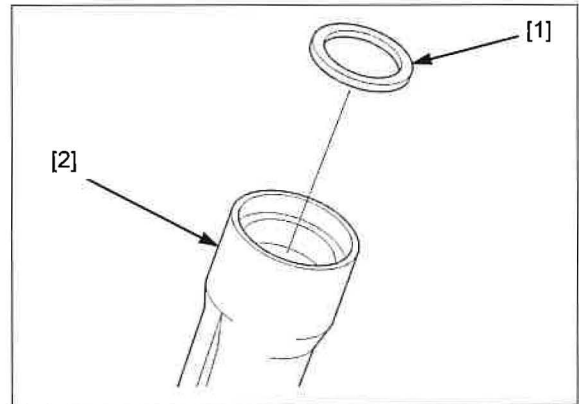
### INSPECTION

Inspect the following parts for damage, abnormal wear, bending, deformation, scoring and teflon coating wear

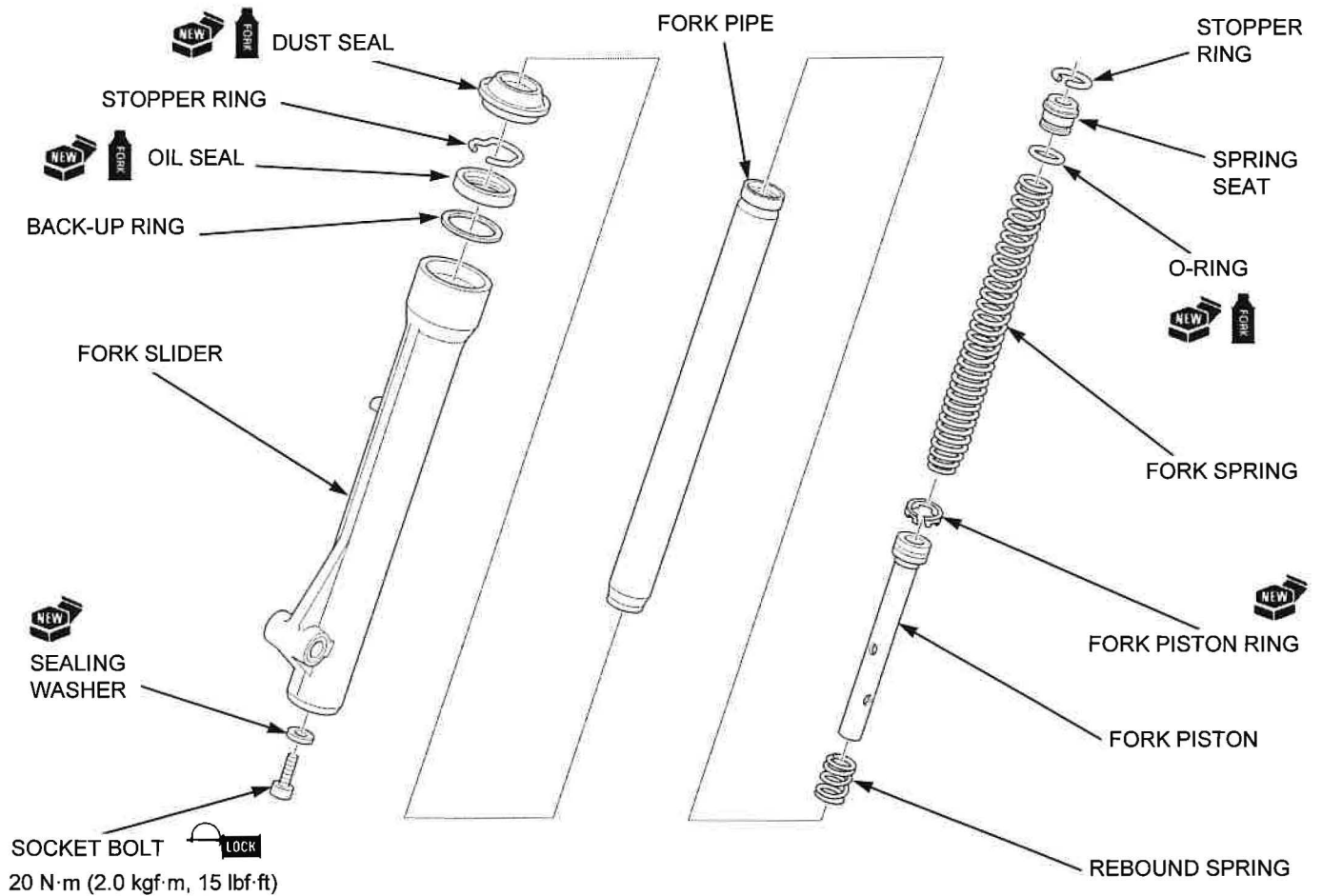
- Fork pipes
- Fork sliders
- Fork springs
- Fork pistons/rings
- Rebound spring
- Back-up rings

Measure each part according to FRONT WHEEL/  
SUSPENSION/STEERING SPECIFICATIONS  
(page 1-7).

Replace any part if it is out of service limit.

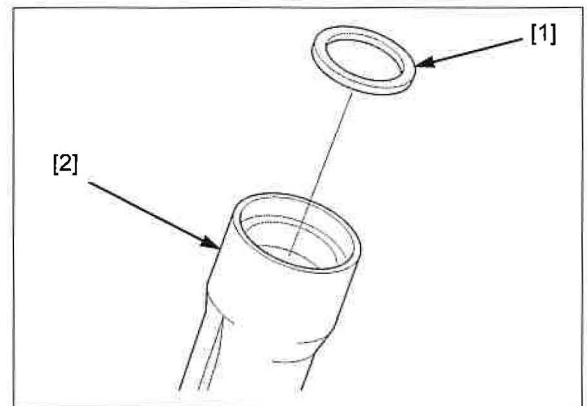


**ASSEMBLY**



Before assembly, wash all parts with high flash point or non-flammable solvent and wipe them dry.

Install the back-up ring [1] into the fork slider [2].



Apply fork fluid to the lip of a new oil seal [1].

*Install the oil seal with its marked side facing up.*

Drive the oil seal into the fork slider using the special tools until it is fully seated.

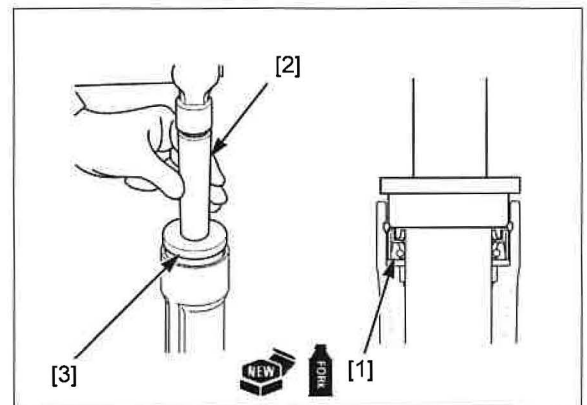
**TOOLS:**

[2] Driver

07749-0010000

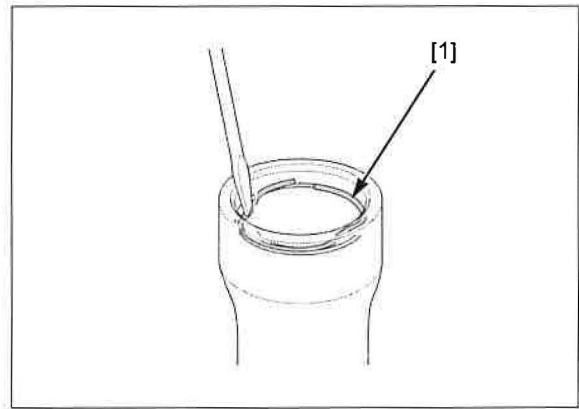
[3] Attachment, 37 x 40 mm

07746-0010200



## FRONT WHEEL/SUSPENSION/STEERING

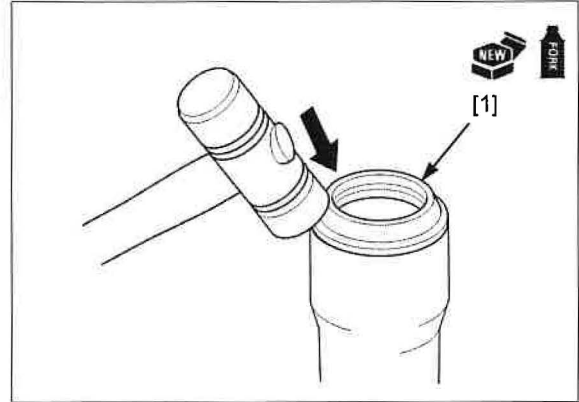
Install the oil seal stopper ring [1] into the stopper ring groove on the fork slider.



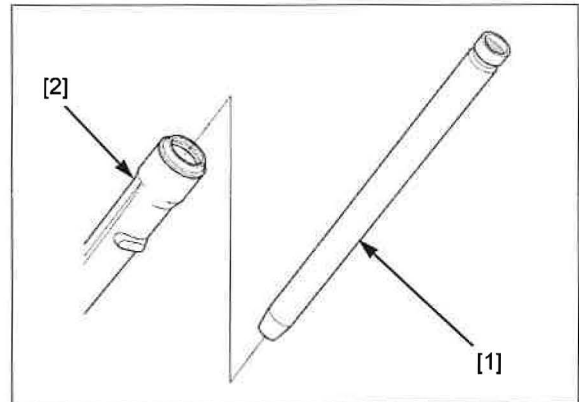
Apply fork fluid to the lip of a new dust seal [1] lips.

*Do not tap the dust seal lip too hard.*

Install the dust seal until it is fully seated.

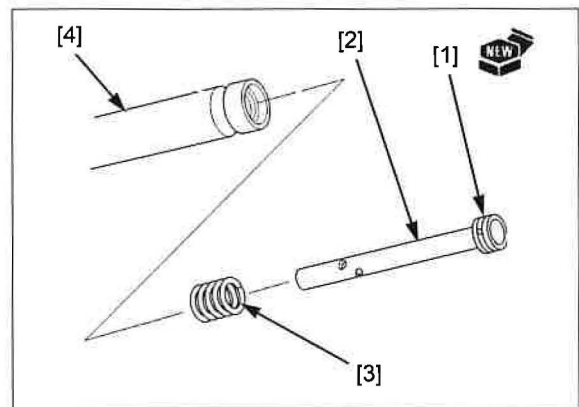


Install the fork pipe [1] into the fork slider [2].



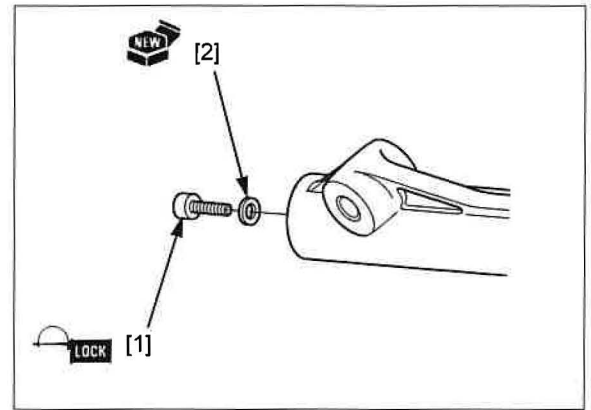
If removing the fork piston ring [1] from the fork piston [2], replace the piston ring with a new one, and install the uneven surface facing down.

Install the rebound spring [3] and fork piston into the fork pipe [4].



Clean the socket bolt [1] threads and apply locking agent to the bolt threads.

Install and tighten the socket bolt with a new sealing washer [2] to the fork piston.



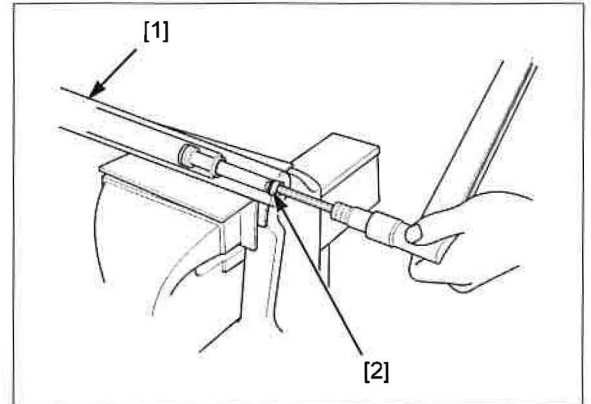
Hold the fork slider [1] in a vise with soft jaws or a shop towel.

Tighten the fork socket bolt [2] to the specified torque.

**TORQUE: 20 N·m (2.0 kgf-m, 15 lbf-ft)**

**NOTE:**

- If the socket bolt spins freely, temporarily install the fork spring and spring seat.



Pour the specified amount of recommended fork fluid into the fork pipe.

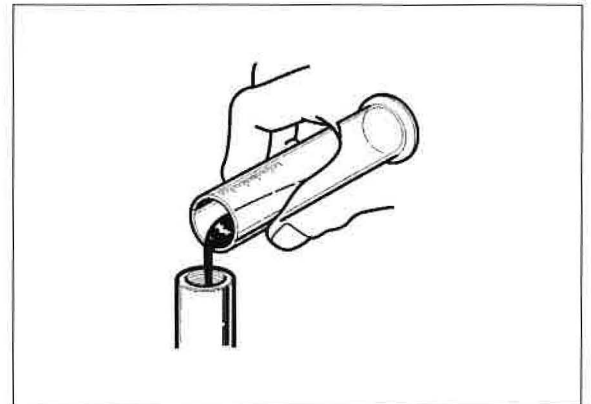
**RECOMMENDED FORK FLUID:**

**Honda Ultra Cushion Oil 10W or equivalent**

**FORK FLUID CAPACITY:**

**65 ± 1 cm<sup>3</sup> (2.20 ± 0.03 US oz, 2.29 ± 0.04 Imp oz)**

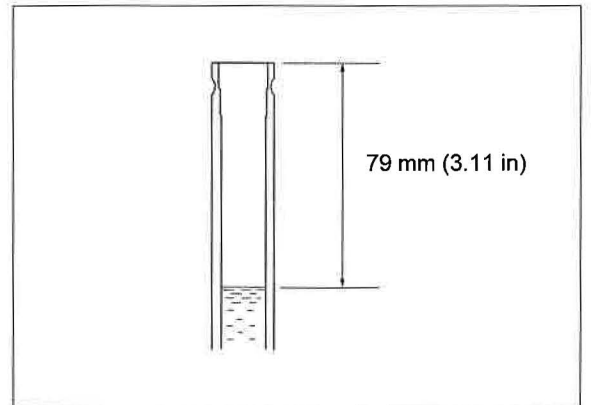
Pump the fork pipe several times to remove trapped air from the lower portion of the fork pipe.



*Be sure the oil level is same in the both forks.*

Compress the fork leg fully and measure the fluid level from the top of the fork pipe.

**FORK FLUID LEVEL: 79 mm (3.11 in)**





## FRONT WHEEL/SUSPENSION/STEERING

Pull the fork pipe up and install the fork spring [1] with its tapered side facing down.

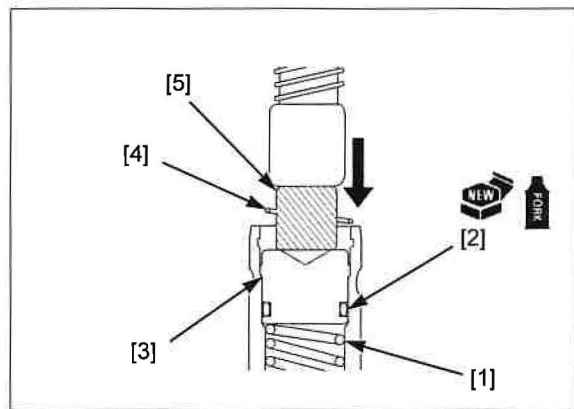
Coat a new O-ring [2] with fork fluid and install it into the groove in the spring seat [3].

Set the fork assembly, spring seat and stopper ring [4] onto the hydraulic press.

Put the suitable tool [5] on the spring seat.

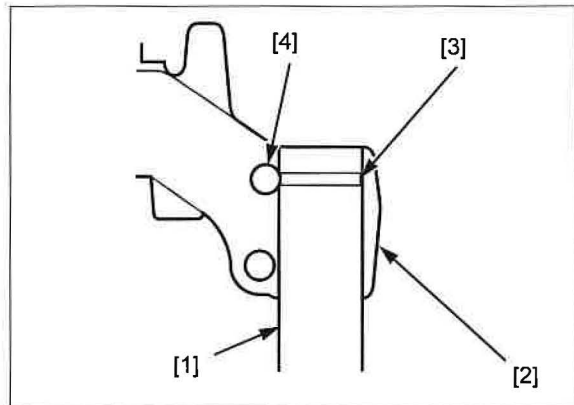
*To prevent loss of tension, do not compress the fork spring more than necessary.*

Press the spring seat into the fork pipe until the stopper ring groove is visible.



### INSTALLATION

Install the fork pipe [1] into the steering stem [2] while aligning its groove [3] with the upper pinch bolt hole [4].

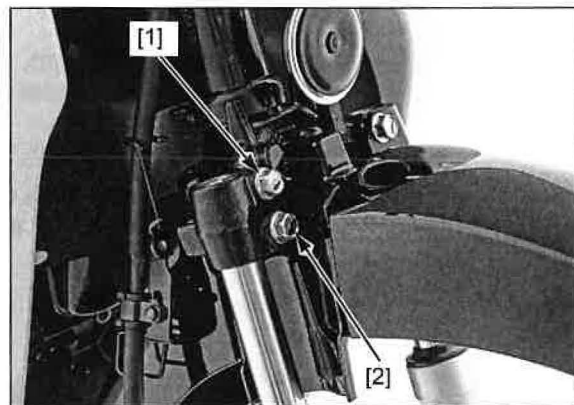


Install the bottom bridge upper pinch bolt [1]. Tighten the bottom bridge upper pinch bolt and lower pinch bolt [2] to the specified torque.

**TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)**

Install the following:

- Front wheel (page 15-9)
- Fork cover (page 2-9)
- Front brake caliper (page 17-9)
- Front wheel speed sensor (page 18-20)



## STEERING STEM

### REMOVAL

Remove the following:

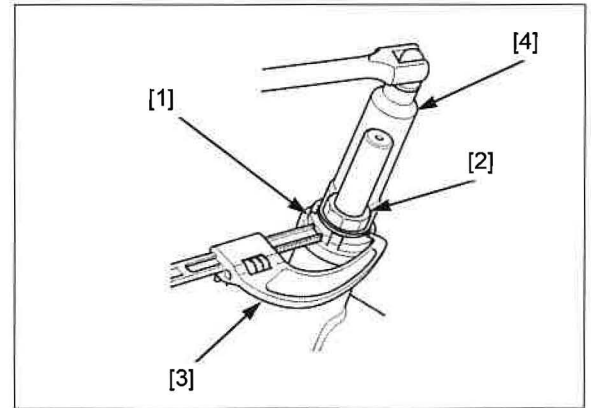
- Fork (page 15-11)
- Front fender (page 2-10)
- Handlebar post (page 15-6)

Hold the top thread [1] and loosen the steering stem lock nut [2] using the special tool.

**TOOL:**

- [3] Pin spanner 07702-0020001
- [4] Socket wrench 07916-KM10000

Remove the steering stem lock nut.

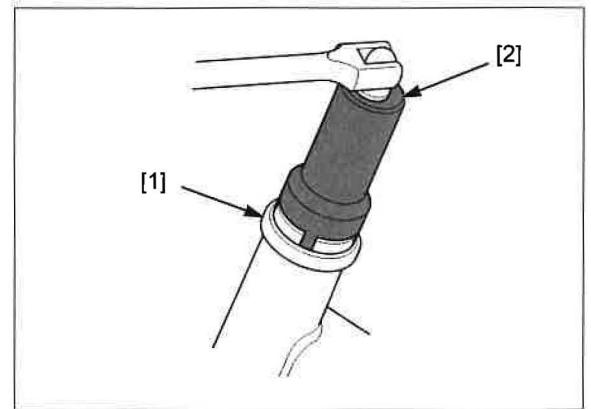


*Be careful not to drop the steering stem.*

Hold the steering stem and loosen the top thread [1] using the special tool.

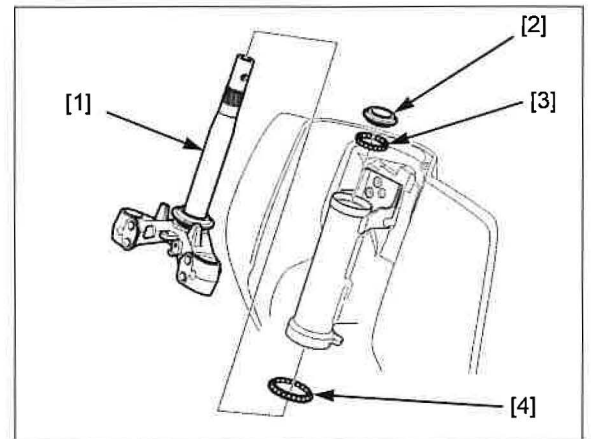
**TOOL:**

- [2] Steering stem socket 07916-3710101



Remove the following:

- Steering stem [1]
- Upper bearing inner race [2]
- Upper bearing [3]
- Lower bearing [4]



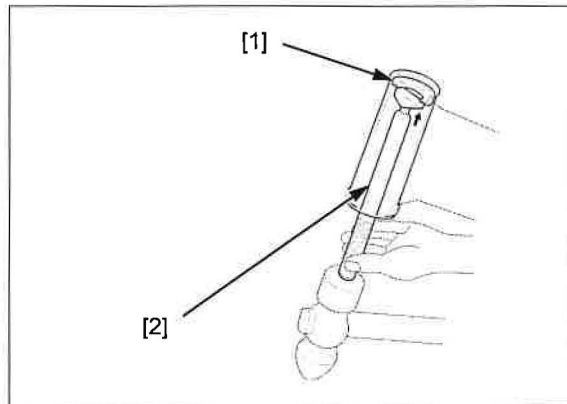
### STEERING STEM BEARINGS REPLACEMENT

- Always replace the bearings and races as a set.

Remove the steering stem (page 15-19).  
Remove the upper bearing outer race [1] using the following tool.

**TOOL:**

[2] Ball race remover shaft      07GMD-KS40100

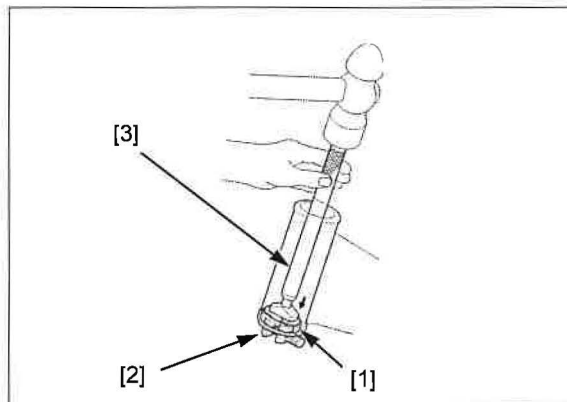


Remove the lower bearing outer race [1] using the following tools.

**TOOLS:**

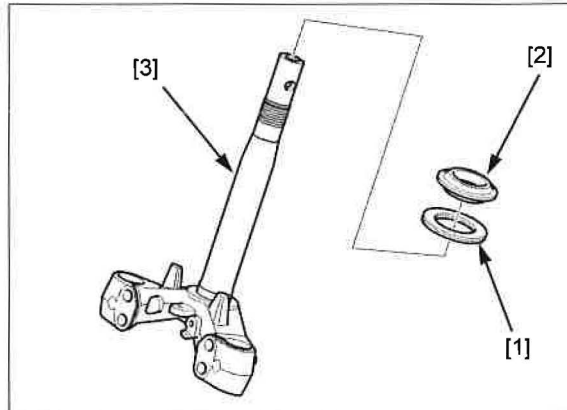
[2] Ball race remover, 34.5 mm      07948-4630100

[3] Ball race remover shaft      07GMD-KS40100



Remove the dust seal [1] from the steering stem lower bearing inner race [2].

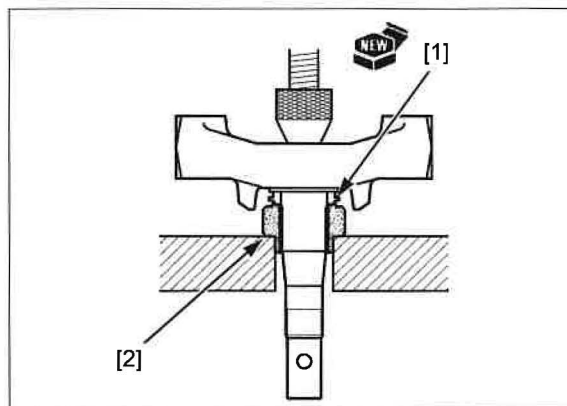
Remove the lower bearing inner race with a chisel or equivalent tool being careful not to damage the stem [3].



Install a new lower bearing inner race [1] using the following tool and hydraulic press.

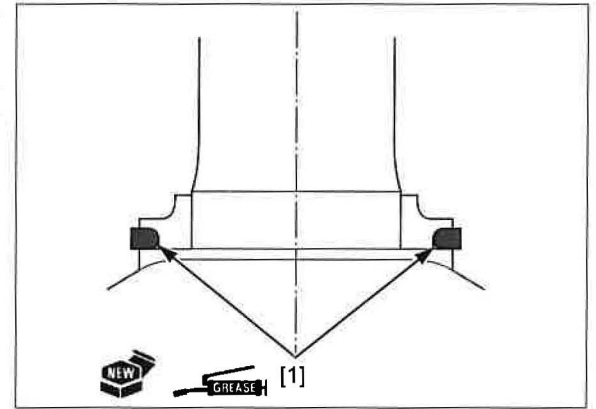
**TOOL:**

[2] Inner driver, 35 mm      07746-0030400



## FRONT WHEEL/SUSPENSION/STEERING

Apply 3 - 5 g minimum of grease with extreme pressure agent (recommended: EXCELIGHT EP2 manufactured by KYODO YUSHI, japan or ALVANIA EP2 manufactured by Shell or equivalent) to the lip of a new dust seal [1], then install it to the lower bearing inner race.



Drive a new upper bearing outer race [1] into the head pipe using the following tools.

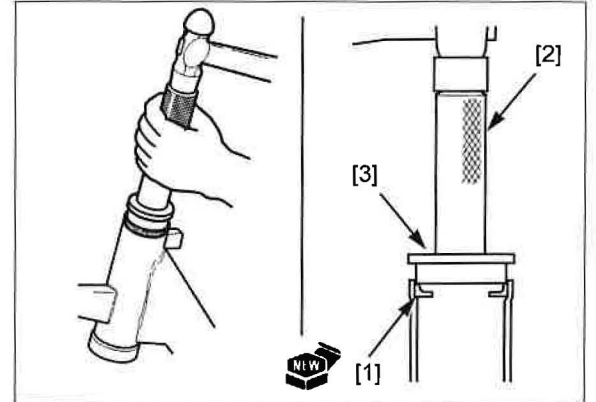
**TOOLS:**

[2] Driver

07749-0010000

[3] Attachment, 45 x 50 mm

07946-6920100  
(Not available in the U.S.A.)



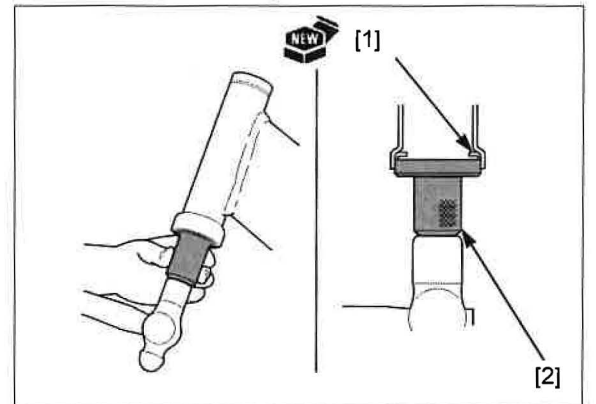
Drive a new lower bearing outer race [1] into the head pipe using the following tools.

**TOOL:**

[2] Oil seal driver 54 mm

07947-6340000  
(Not available in the U.S.A.)


Install the steering stem (page 15-22).

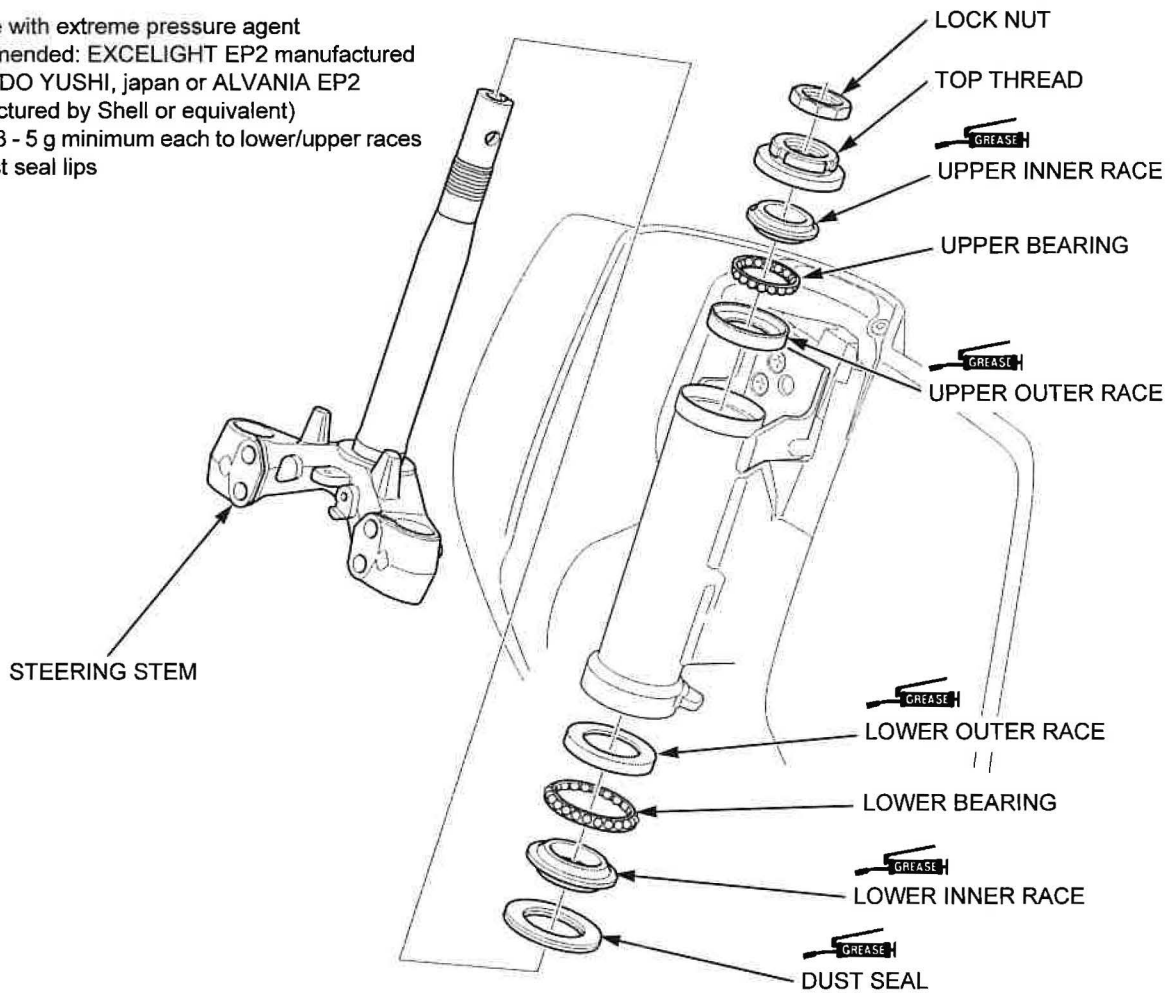


# FRONT WHEEL/SUSPENSION/STEERING

## INSTALLATION

For steering stem bearing replacement (page 15-20).

 : grease with extreme pressure agent  
(recommended: EXCELIGHT EP2 manufactured  
by KYODO YUSHI, japan or ALVANIA EP2  
manufactured by Shell or equivalent)  
: Apply 3 - 5 g minimum each to lower/upper races  
and dust seal lips



Apply 3-5 g minimum of grease with extreme pressure agent (recommended: EXCELIGHT EP2 manufactured by KYODO YUSHI, japan or ALVANIA EP2 manufactured by Shell or equivalent) to the bearing races.

*Replace the races and bearing as a set.*

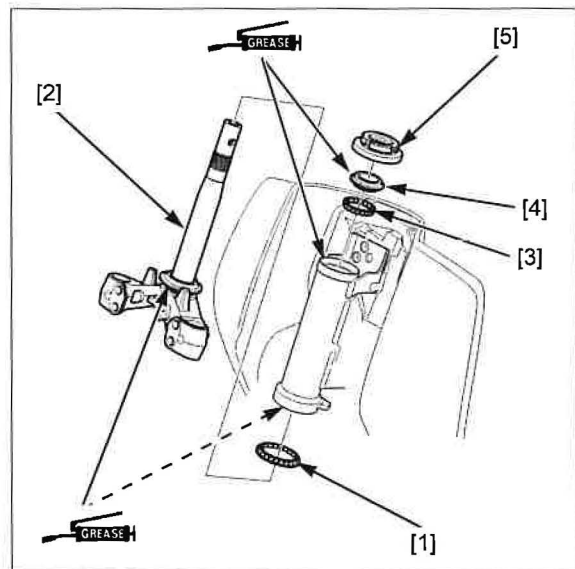
Install the lower bearing [1] to the steering stem [2].

Insert the steering stem into the steering head pipe.

*Replace the races and bearing as a set.*

Install the upper bearing [3] onto the upper bearing outer race.

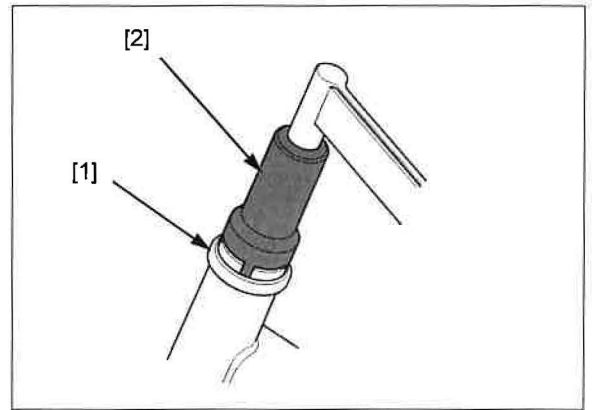
Install the upper bearing inner race [4] onto the stem and finger tighten the top thread nut [5].



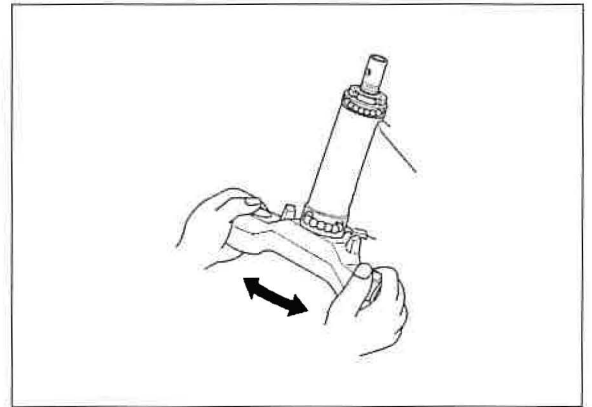
Hold the steering stem and tighten the stem top thread [1] to the initial torque using the special tool.

**TOOL:**  
**[2] Steering stem socket 07916-3710101**

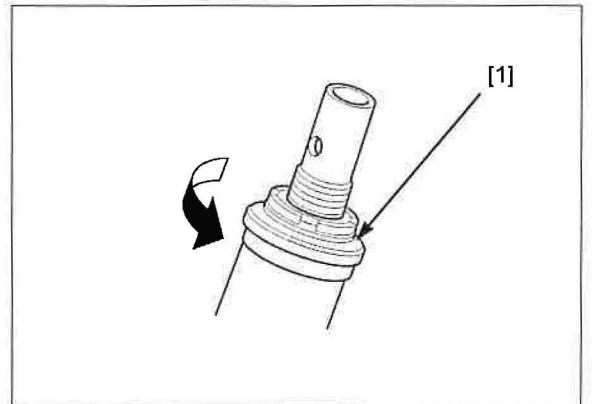
**TORQUE: 24.5 N·m (2.5 kgf·m, 18 lbf·ft)**



Turn the steering stem lock-to-lock several times to seat the bearing.



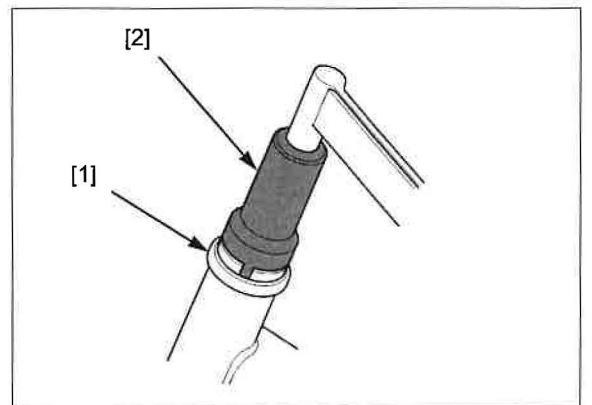
Completely loosen the top thread [1].



Hold the steering stem and tighten the stem top thread [1] to the specified torque using the special tool.

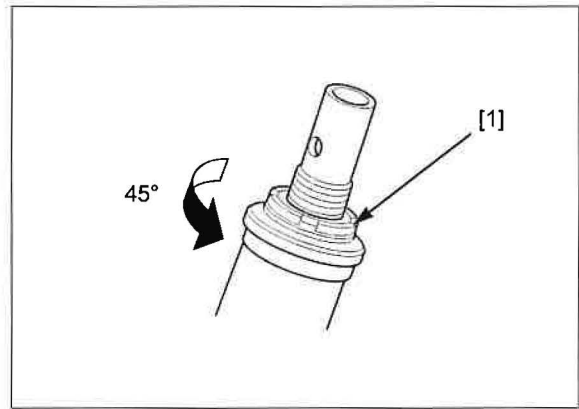
**TOOL:**  
**[2] Steering stem socket 07916-3710101**

**TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)**



## FRONT WHEEL/SUSPENSION/STEERING

Turn the top thread [1] counterclockwise about 45° degrees.



Hold the top thread [1] and tighten the steering stem lock nut [2] to the specified torque using the special tools.

**TOOL:**

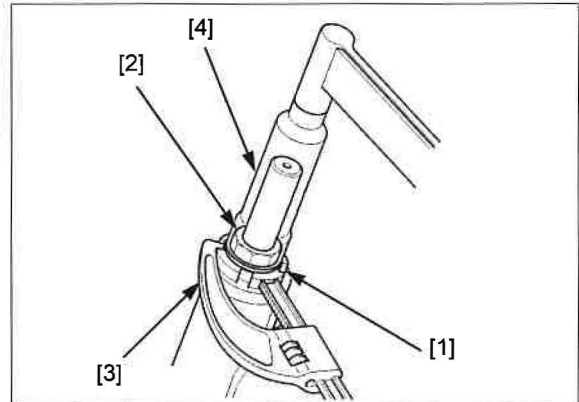
[3] Pin spanner **07702-0020001**  
[4] Socket wrench **07916-KM10000**

**TORQUE: 83 N·m (8.5 kgf·m, 61 lbf·ft)**

Turn the steering stem lock-to-lock several times.  
Make sure the steering stem moves smoothly without play or binding.

Install the following:

- Fork (page 15-11)
- Front fender (page 2-10)
- Handlebar post (page 15-7)



# 16. REAR WHEEL/BRAKE/SUSPENSION

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<b>SERVICE INFORMATION</b> .....	<b>16-2</b>	<b>REAR BRAKE PANEL</b> .....	<b>16-11</b>
<b>TROUBLESHOOTING</b> .....	<b>16-3</b>	<b>SWINGARM</b> .....	<b>16-12</b>
<b>COMPONENT LOCATION</b> .....	<b>16-4</b>	<b>SHOCK ABSORBER</b> .....	<b>16-15</b>
<b>REAR WHEEL</b> .....	<b>16-5</b>	<b>BRAKE PEDAL/CENTERSTAND</b> .....	<b>16-16</b>



## REAR WHEEL/BRAKE/SUSPENSION

### SERVICE INFORMATION

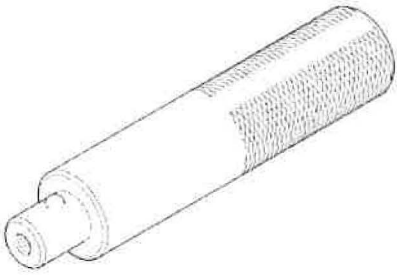

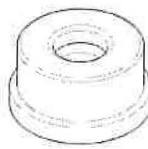



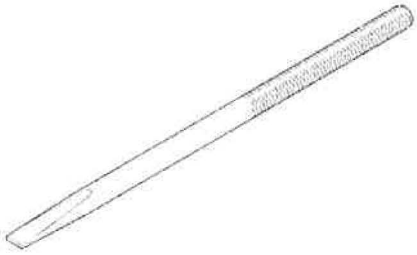
#### GENERAL

### ⚠ CAUTION

Frequent inhalation of brake shoe dust, regardless of material composition could be hazardous to your health.

- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.
- This section covers service of the rear wheel, rear brake, swingarm, shock absorber and brake pedal.
- A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes and clean a contaminated drum with a high quality brake degreasing agent.
- When servicing the rear wheel and suspension, support the vehicle with its centerstand.
- Use only genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.

#### TOOLS

<p>Driver 07749-0010000</p> 	<p>Attachment, 32 x 35 mm 07746-0010100</p> 	<p>Attachment, 37 x 40 mm 07746-0010200</p> 
<p>Pilot, 12 mm 07746-0040200</p> 	<p>Pilot, 17 mm 07746-0040400</p> 	<p>Remover Head, 12 mm 07746-0050300</p> 
<p>Bearing remover shaft 07746-0050100</p> 		

## TROUBLESHOOTING

### Rear wheel wobbles

- Bent rim
- Worn wheel bearings
- Faulty tire
- Improperly tightened axle fasteners
- Faulty swingarm pivot bushings
- Insufficient tire pressure

### Soft suspension

- Weak shock absorber springs
- Oil leakage from damper unit
- Low tire pressure

### Stiff suspension

- Bent shock absorber damper rod
- Damaged swingarm pivot bushings
- Bent swingarm pivot
- High tire pressure
- Damaged shock absorber bushings

### Steers to one side or does not track straight

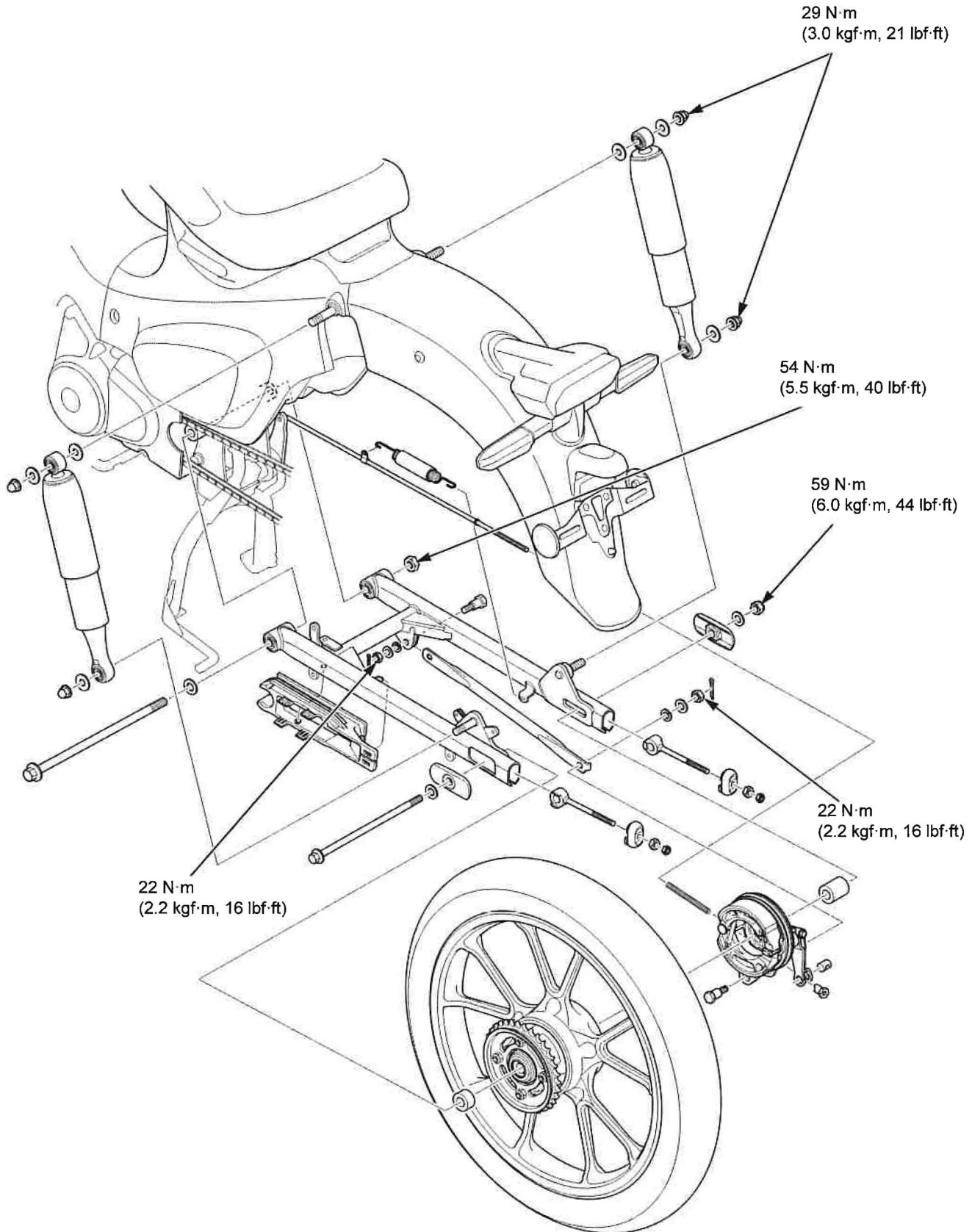
- Bent rear axle
- Bent frame
- Damaged swingarm pivot bushing
- Axle alignment/chain adjustment not equal on both sides

### Poor brake performance

- Improper brake adjustment
- Worn brake linings
- Contaminated brake linings
- Worn brake cam
- Worn brake drum
- Brake arm serrations improperly engaged
- Worn brake shoes at cam contact faces

# REAR WHEEL/BRAKE/SUSPENSION

## COMPONENT LOCATION



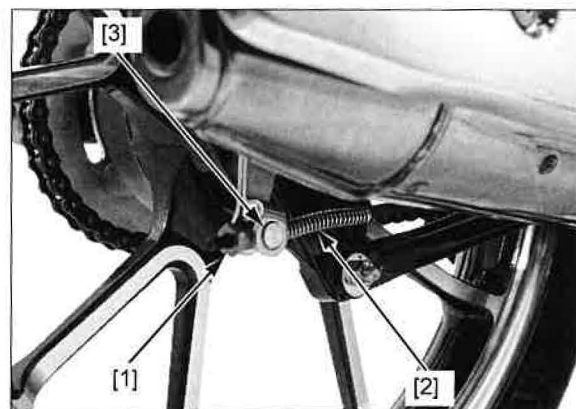
## REAR WHEEL

### REMOVAL

Support the vehicle with its centerstand.

Remove the chain case (page 2-17).

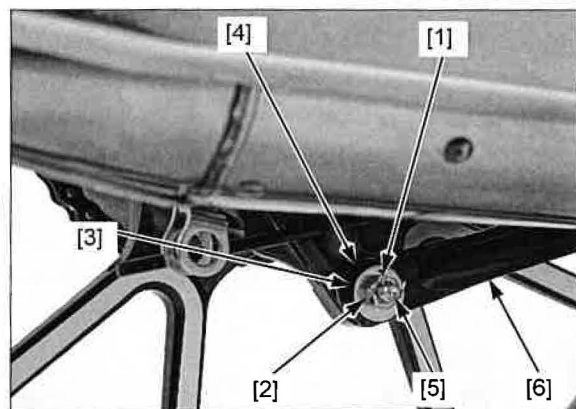
Remove the brake adjusting nut [1], spring [2] and joint pin [3].



Remove the following:

- Cotter pin [1]
- Nut [2]
- Washer [3]
- Rubber washer [4]

Remove the bolt [5] and release the stopper arm [6] from the brake panel.



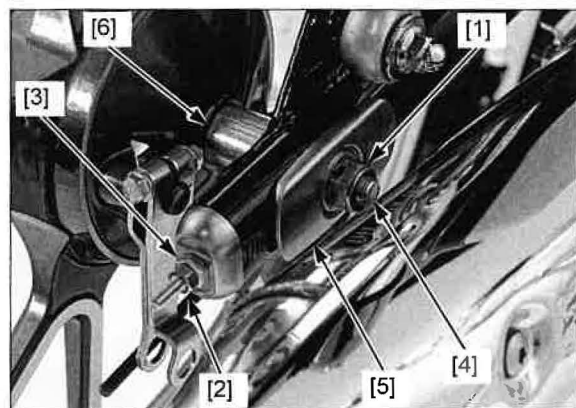
Loosen the axle nut [1].

Loosen both drive chain adjuster lock nuts [2] and adjusters [3].

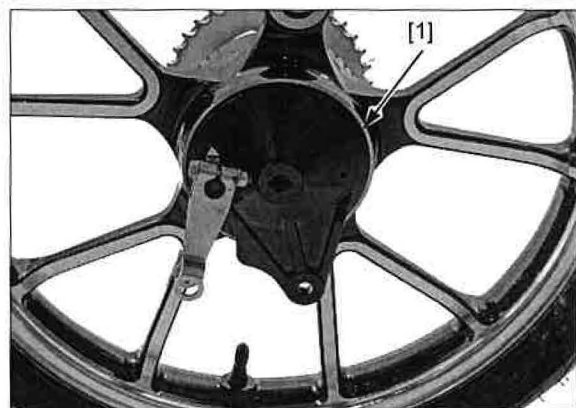
Push the rear wheel forward and release the drive chain.

Remove the following:

- Axle nut
- Rear axle [4]
- Adjuster plates [5]
- Rear wheel
- Right side collar [6]

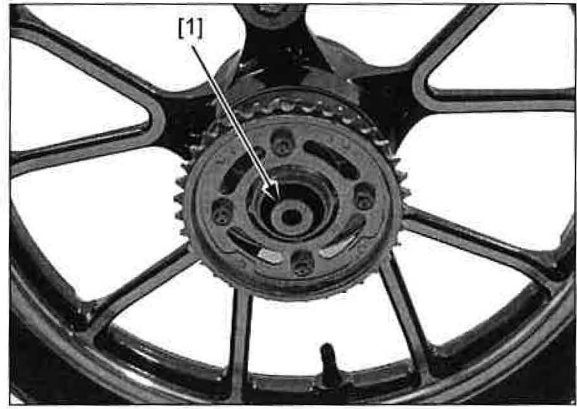


Remove the brake panel assembly [1] from the right wheel hub.



## REAR WHEEL/BRAKE/SUSPENSION

Remove the left side collar [1] from the driven flange.



### 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.

Inspect the following parts for damage, abnormal wear, deformation, looseness or bend.

- Rear axle
- Wheel rim
- Driven sprocket
- Damper rubbers

Measure each part according to REAR WHEEL/BRAKE/SUSPENSION SPECIFICATIONS (page 1-7). Replace any part if it is out of service limit.

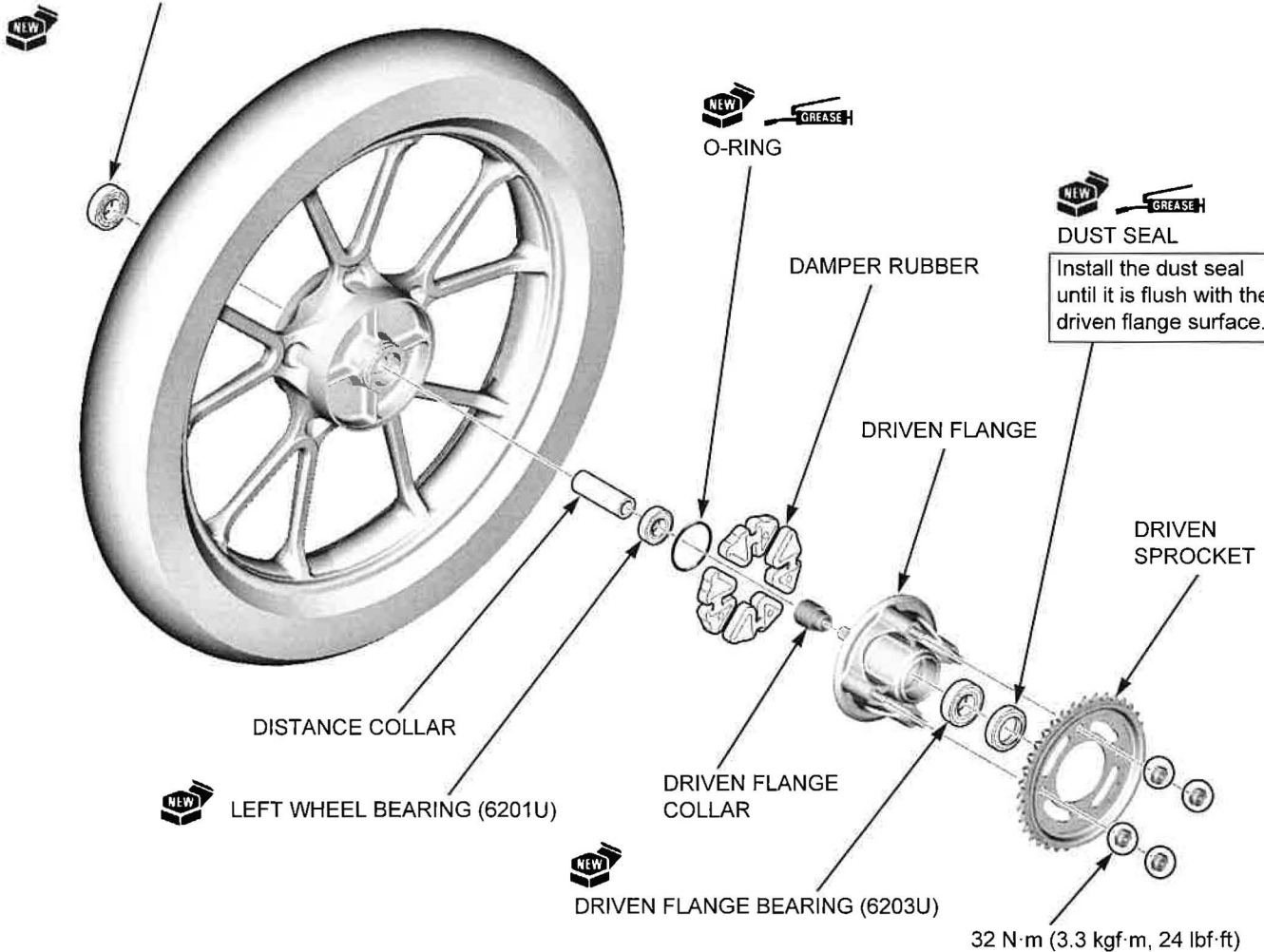
**DISASSEMBLY/ASSEMBLY**

Disassemble and assemble the rear wheel according to the illustration.

- Use only the specified tire and driven sprocket to avoid malfunctions of the ABS.

For bearing replacement (page 16-7).

RIGHT WHEEL BEARING (6301U)



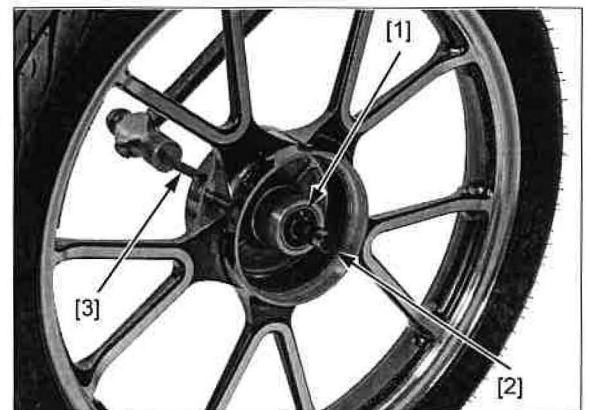
**BEARING REPLACEMENT**

*Replace the wheel bearings in pairs. Do not reuse the old bearings.*

Install the bearing remover head into the wheel bearing [1]. From opposite side install the bearing remover shaft and drive the bearing out of the wheel hub. Remove the distance collar and drive out the other bearing.

**TOOLS:**

- [2] Bearing remover head, 12 mm 07746-0050300
- [3] Bearing remover shaft 07746-0050100



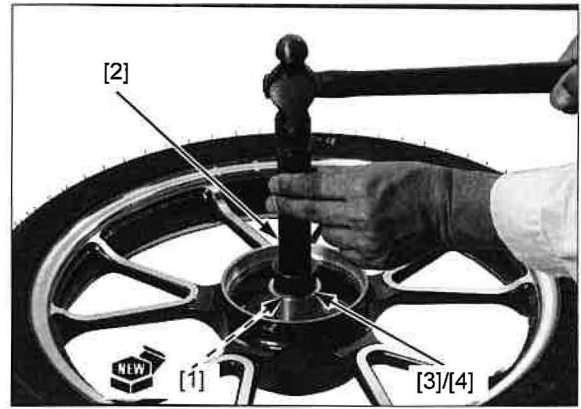
## REAR WHEEL/BRAKE/SUSPENSION

Pack all bearing cavities with grease.

Drive in a new right bearing [1] squarely with its sealed side facing up until it is fully seated.

### TOOLS:

[2] Driver	07749-0010000
[3] Attachment, 37 x 40 mm	07746-0010200
[4] Pilot, 12 mm	07746-0040200

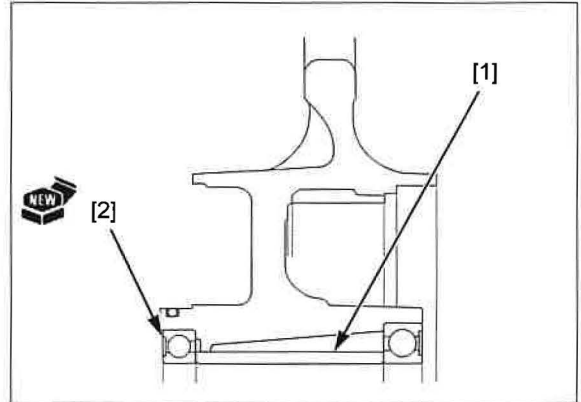


Install the distance collar [1].

Drive in a new left bearing [2] squarely with its sealed side facing up.

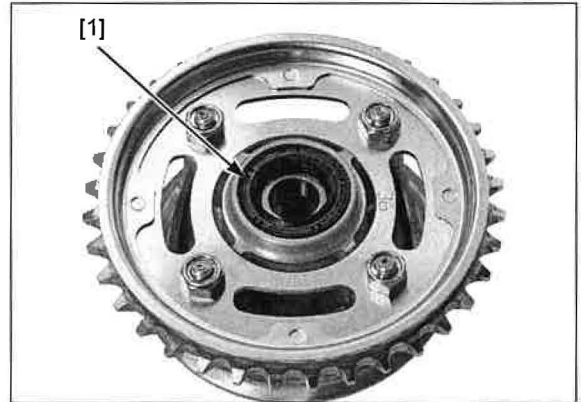
### TOOLS:

Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100
Pilot, 12 mm	07746-0040200



### DRIVEN FLANGE BEARING REPLACEMENT

Remove the dust seal [1].



Drive out the driven flange bearing [1].

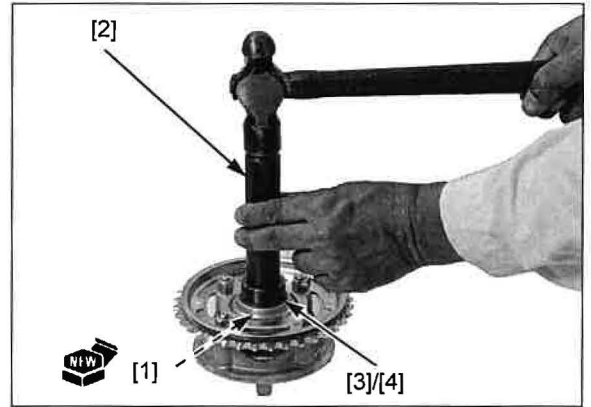


Pack all bearing cavities with grease.

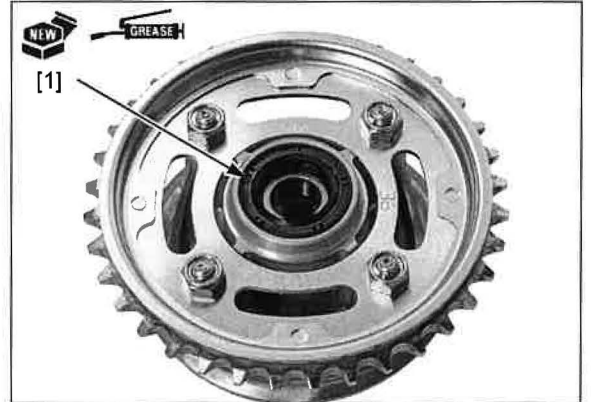
Install the new driven flange bearing [1] squarely with its sealed side facing up until it is fully seated.

**TOOLS:**

- |                            |               |
|----------------------------|---------------|
| [2] Driver                 | 07749-0010000 |
| [3] Attachment, 37 x 40 mm | 07746-0010200 |
| [4] Pilot, 17 mm           | 07746-0040400 |



Apply grease to the new dust seal lips [1] and install the dust seal until it is flush with the driven flange surface.



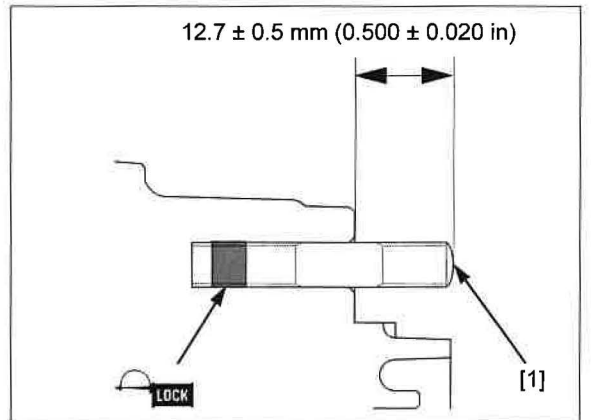
**DRIVEN FLANGE STUD BOLT**

Apply locking agent to the driven flange stud bolt [1] threads if the stud bolts are removed.

Install and tighten the driven flange stud bolt to the specified torque.

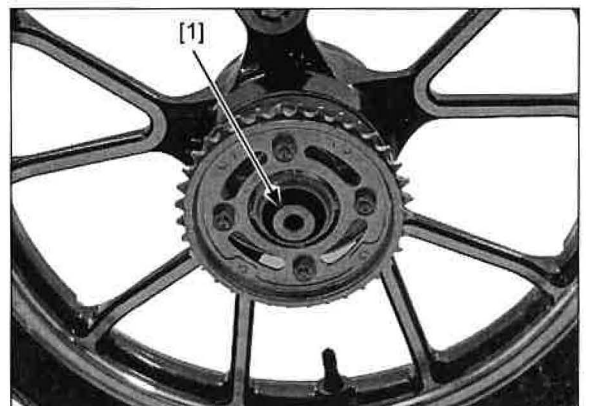
**TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)**

After installing the stud bolts, check that the height from the bolt head to the driven flange surface is within specification.



**INSTALLATION**

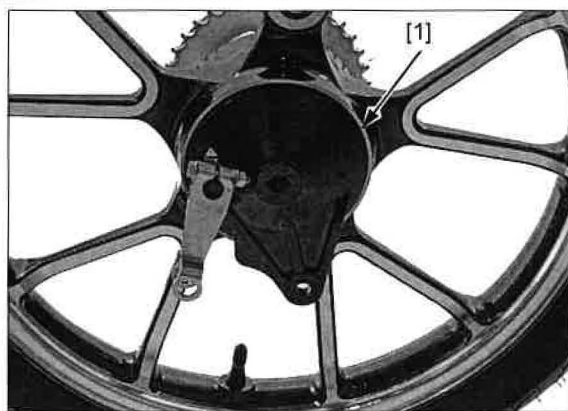
Install the left side collar [1] to the driven flange.



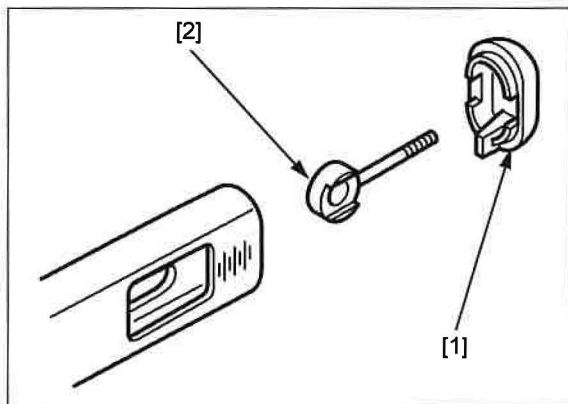


## REAR WHEEL/BRAKE/SUSPENSION

*Do not get grease on the brake drum or stopping power will be reduced.* Install the brake panel assembly [1] into the wheel hub.



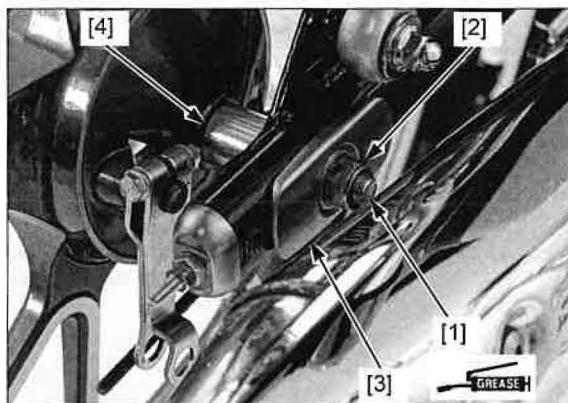
Install the swingarm end cap [1] and chain adjuster [2] as shown.



Place the rear wheel between the swingarm.  
Install the drive chain over the driven sprocket.  
Apply grease to the rear axle [1] surface.

Install the following:

- Rear axle
- Axle nut [2]
- Adjuster plates [3]
- Rear wheel
- Right side collar [4]

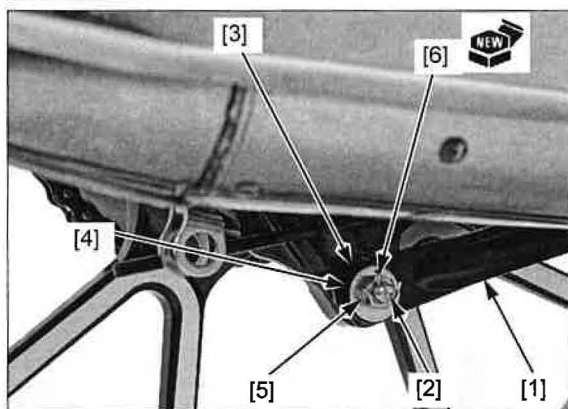


Install the stopper arm [1] to the brake panel with bolt [2], rubber washer [3], washer [4] and nut [5].

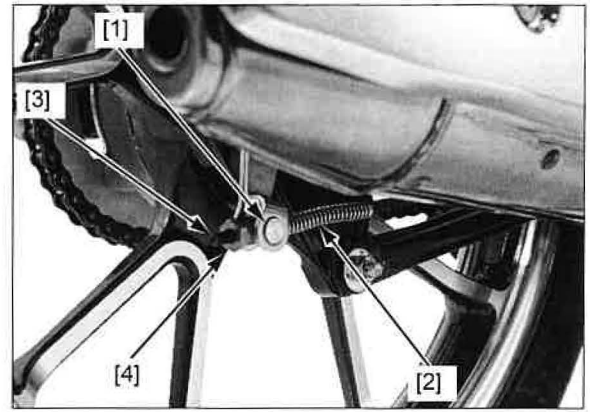
Tighten the nut to the specified torque.

**TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)**

Install a new cotter pin [6].



Install the joint pin [1] into the brake arm, then install the spring [2], brake rod [3] and adjusting nut [4].  
 Adjust the drive chain slack (page 3-12).  
 Install the chain case (page 2-17).  
 Adjust the brake pedal freeplay (page 3-16).



**REAR BRAKE PANEL**

**DISASSEMBLY/ASSEMBLY**

- Always replace the brake shoes as a set.
- When the brake shoes are reused, mark all parts before disassembly so they can be installed in their original locations.

Remove the rear drum brake panel assembly (page 16-11).

Expand the brake shoes [1] and remove them from the brake panel [2].  
 Remove the brake shoe springs [3] from the brake shoes.

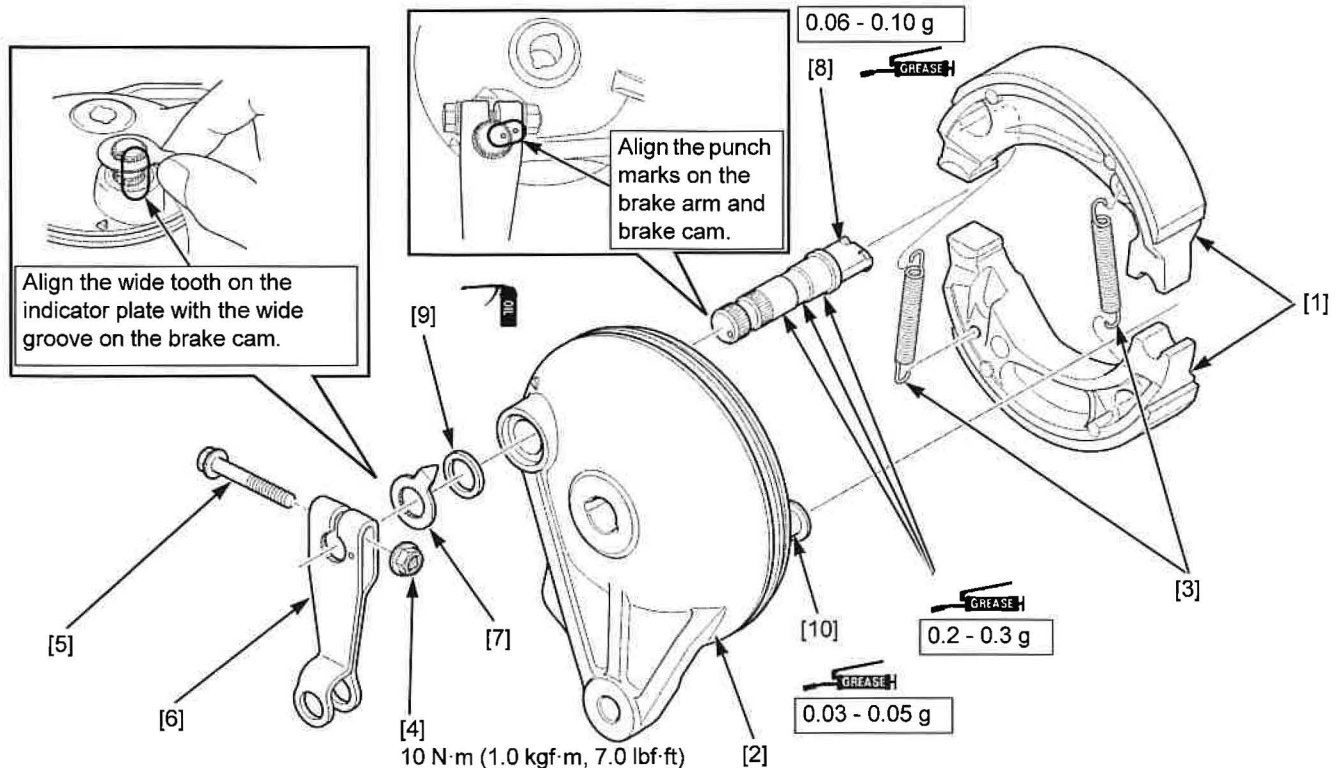
Remove the following:

- Nut [4]/bolt [5]/brake arm [6]/indicator plate [7]
- Brake cam [8]/felt seal [9]

Assembly is in the reverse order of disassembly.

- Apply grease to the brake cam and anchor pin [10].
- Apply gear oil to the felt seal.

Adjust the rear brake pedal freeplay (page 3-16).



**INSPECTION**

- For brake shoe inspection (page 3-15).

## REAR WHEEL/BRAKE/SUSPENSION

Inspect the following parts for abnormal wear, deformation or damage.

- Brake drum
- Brake cam
- Felt seal
- Shoe springs

Measure each part according to REAR WHEEL/BRAKE/SUSPENSION SPECIFICATIONS (page 1-7).  
Replace any part if it is out of service limit.

## SWINGARM

### REMOVAL/INSTALLATION

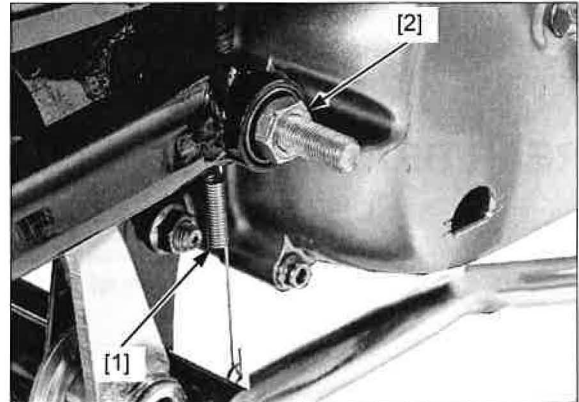
Support the vehicle with its centerstand.

Remove the following:

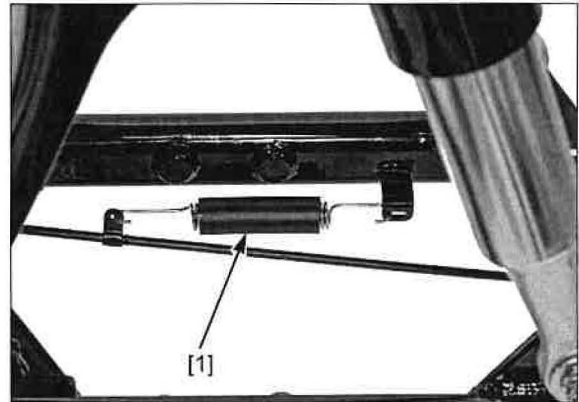
- Gearshift pedal (page 2-17)
- Exhaust pipe/muffler (page 2-19)
- Rear wheel (page 16-5)

Unhook the brake light switch spring [1] from the brake pedal.

Remove the swingarm pivot nut [2].

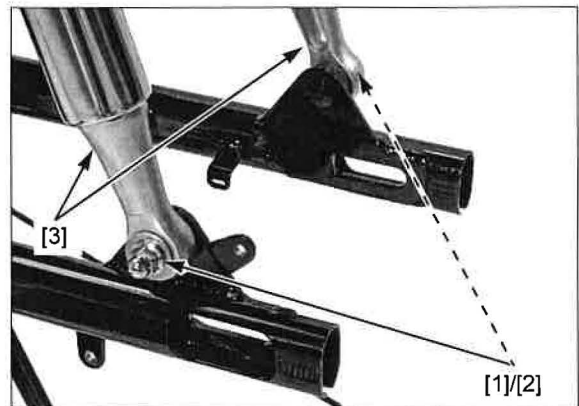


Unhook the brake pedal return spring [1] from the swingarm.

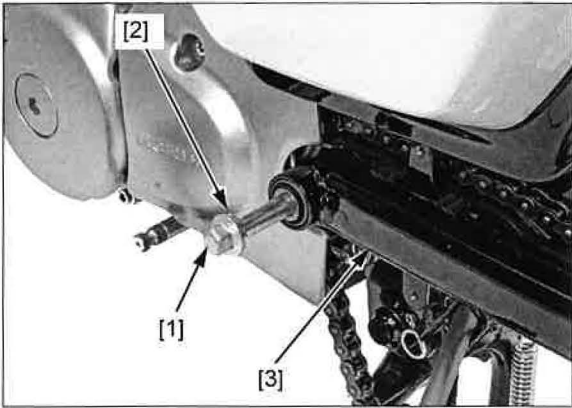


Remove the rear shock absorber lower mounting cap nuts [1] and washers [2].

Release both shock absorber lower mounts [3] from the swingarm studs.

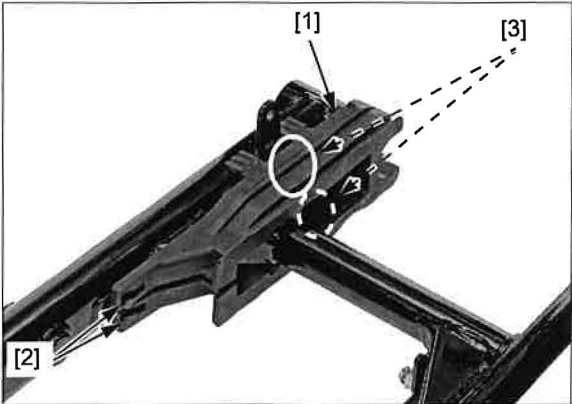


Remove the swingarm pivot bolt [1], washer [2] and swingarm [3].



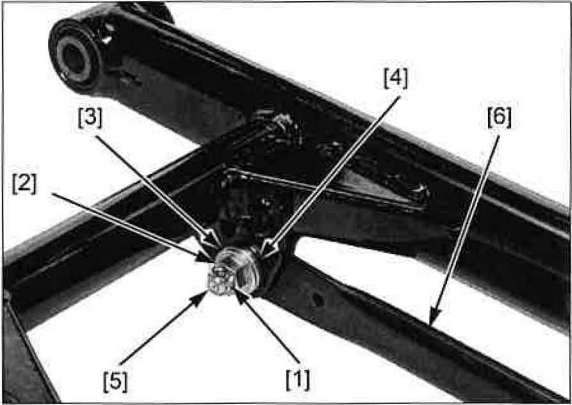
**DISASSEMBLY/INSPECTION**

Check the drive chain slider [1] for wear or damage.  
Remove the drive chain slider by releasing its slots from the hooks [2] on the swingarm.  
Release the drive chain slider bosses [3] from the holes on the swingarm.

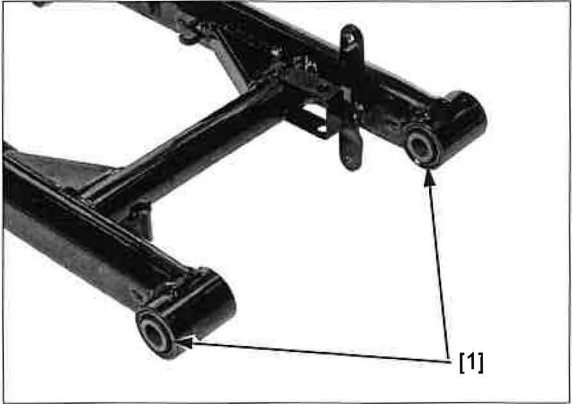


Remove the following:

- Cotter pin [1]
- Nut [2]
- Washer [3]
- Spring washer [4]
- Bolt [5]
- Stopper arm [6]



Check the pivot bushings [1] for wear or damage.  
Check the swingarm for cracks or damage.



## REAR WHEEL/BRAKE/SUSPENSION

### ASSEMBLY

Install the stopper arm [1].

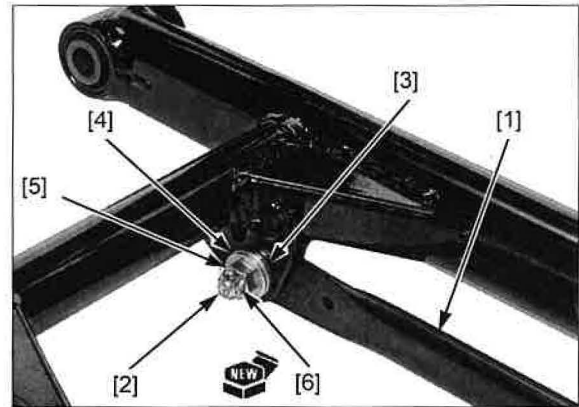
Install the following:

- Bolt [2]
- Spring washer [3]
- Washer [4]
- Nut [5]

Tighten the nut to the specified torque.

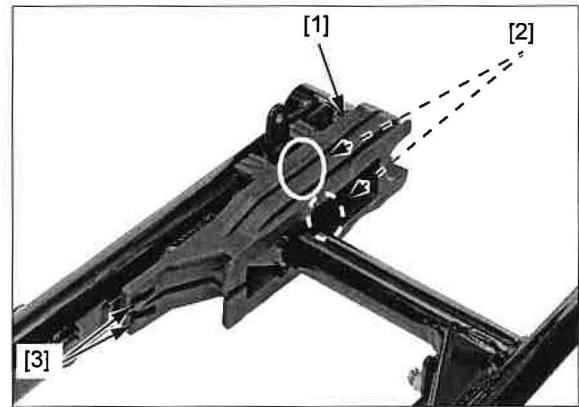
**TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)**

Install a new cotter pin [6].



Install the drive chain slider [1] by aligning its bosses [2] with the holes of the swingarm.

Install the drive chain slider by aligning its slots with the hooks [3] of the swingarm.

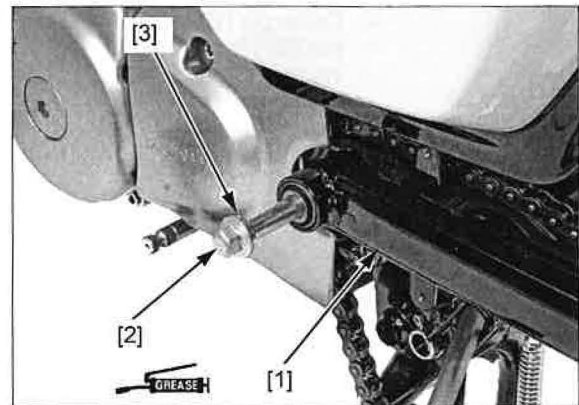


### INSTALLATION

Route the drive chain and install the swingarm [1] into the frame.

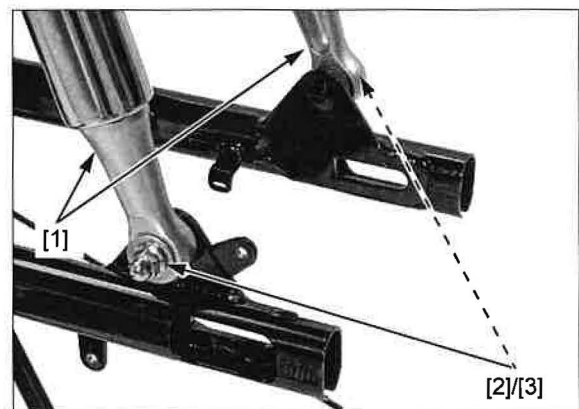
Insert the swingarm pivot bolt [2] and washer [3] from the left side.

- Apply thin coat of grease to the pivot bolt outer surface.



Set the rear shock absorber [1] in position, then install and tighten the rear shock absorber lower mounting cap nuts [2] and washer [3] to the specified torque.

**TORQUE: 29 N·m (3.0 kgf·m, 21 lbf·ft)**



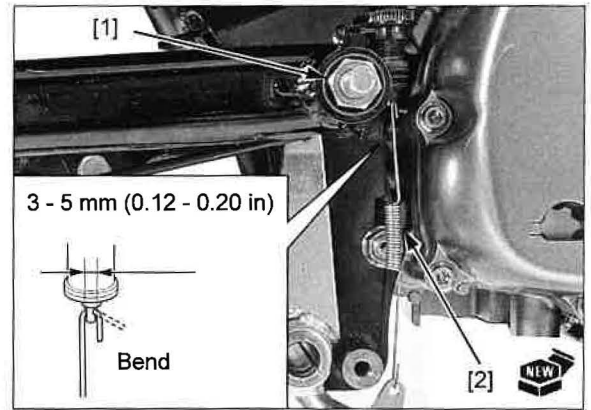
Retract the centerstand carefully and support the vehicle securely, then tighten the swingarm pivot nut [1] to the specified torque.

**TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)**

Hook the brake light spring [2] to the brake pedal as shown.

Support the vehicle with its centerstand.

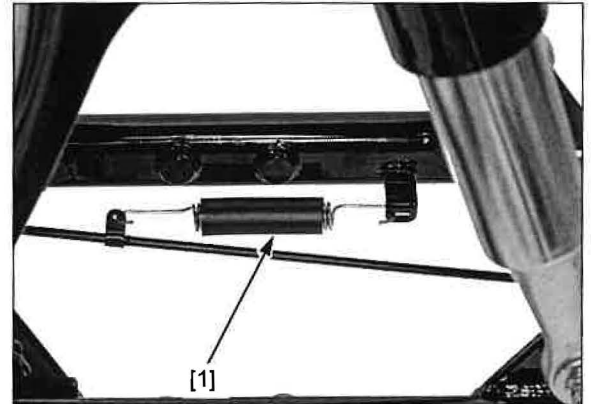
- Replace the brake light spring with new ones.



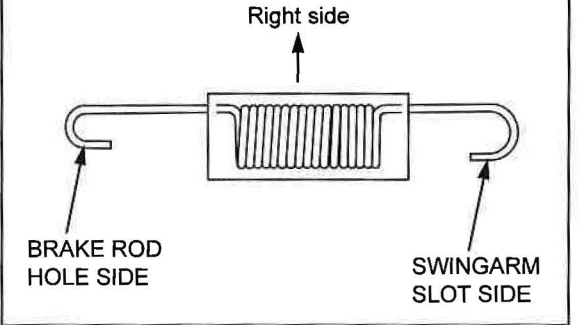
Hook the brake pedal return spring [1] to the swingarm as shown.

Install the following:

- Gearshift pedal (page 2-17)
- Exhaust pipe/muffler (page 2-19)
- Rear wheel (page 16-5)



**BRAKE PEDAL RETURN SPRING DIRECTION (Viewed from above):**



## SHOCK ABSORBER

### REMOVAL/INSTALLATION

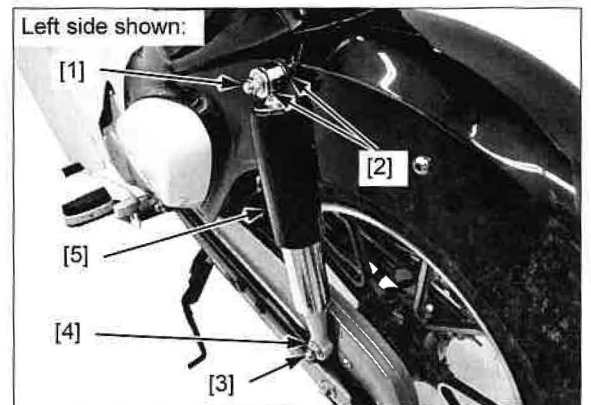
Support the vehicle with its centerstand.

Remove the shock absorber upper mounting cap nut [1] and two washers [2].

Remove the shock absorber lower mounting cap nut [3] and washer [4], then remove the shock absorber [5].

Installation is in the reverse order of removal.

**TORQUE: Shock absorber upper mounting cap nut:**  
**29 N·m (3.0 kgf·m, 21 lbf·ft)**  
**Shock absorber lower mounting cap nut:**  
**29 N·m (3.0 kgf·m, 21 lbf·ft)**



## REAR WHEEL/BRAKE/SUSPENSION

### INSPECTION

*Do not disassemble the shock absorber.*

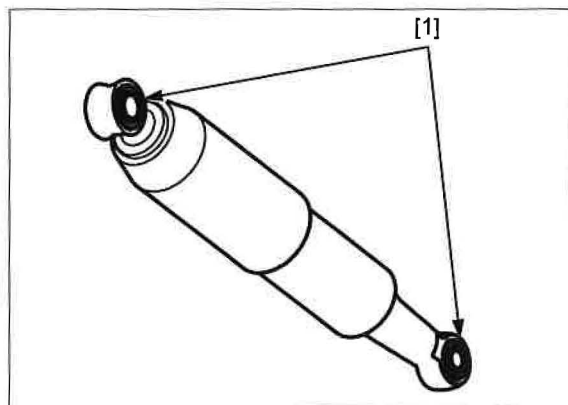
Visually inspect the shock absorber for wear or damage.

*Replace the shock absorbers as a set.*

Check the following:

- Deformation or oil leakage
- Bushings [1] for wear or damage

Check the smooth damper operation.



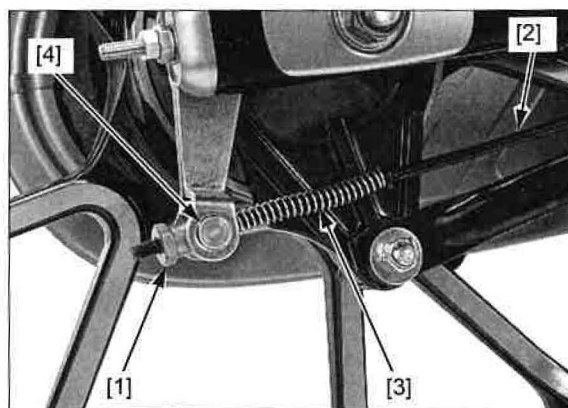
## BRAKE PEDAL/CENTERSTAND

### REMOVAL/INSTALLATION

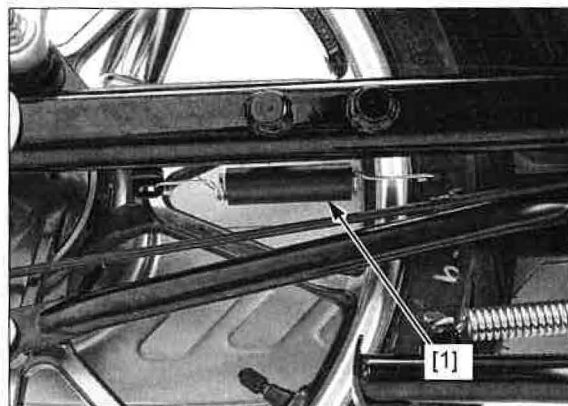
Remove the Exhaust pipe/muffler (page 2-19).

Support the vehicle using a safety stand or hoist.

Remove the brake pedal adjusting nut [1], brake rod [2], spring [3] and joint pin [4] from the brake arm.

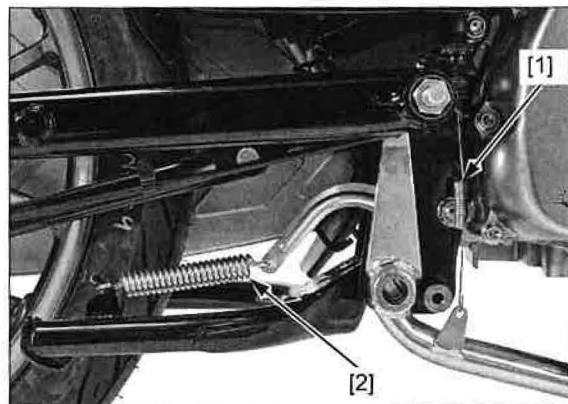


Unhook the brake pedal return spring [1].

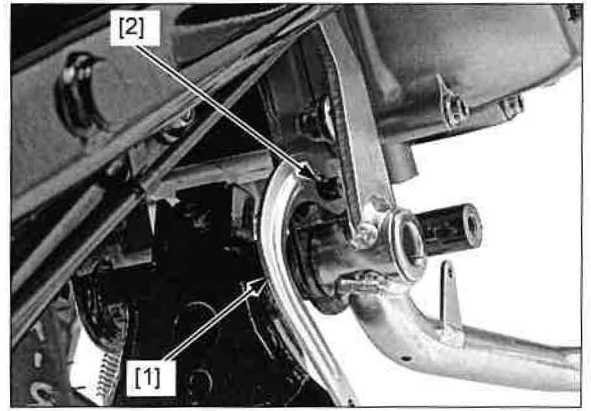


Unhook the brake light switch spring [1].

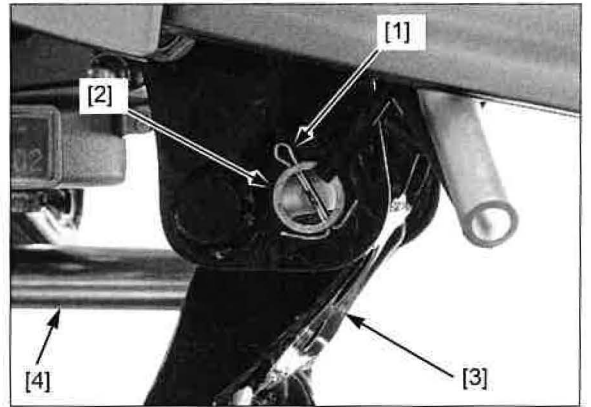
Remove the centerstand spring [2].



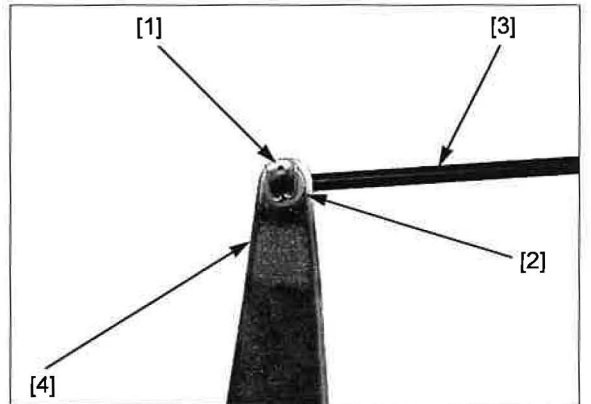
Remove the centerstand spring plate [1] from the boss [2] of the frame.



Remove the cotter pin [1], then remove the centerstand pivot [2].  
Remove the centerstand [3] and brake pedal [4].



Remove the cotter pin [1], washer [2], and separate the brake rod [3] from the brake pedal [4].

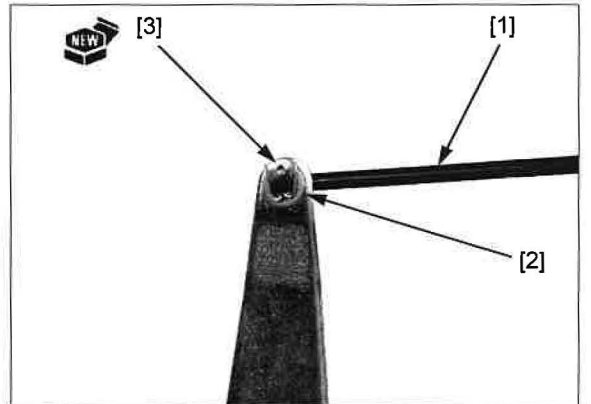


**INSTALLATION**

Install the following:

- Brake rod [1]
- Washer [2]

Install a new cotter pin [3].





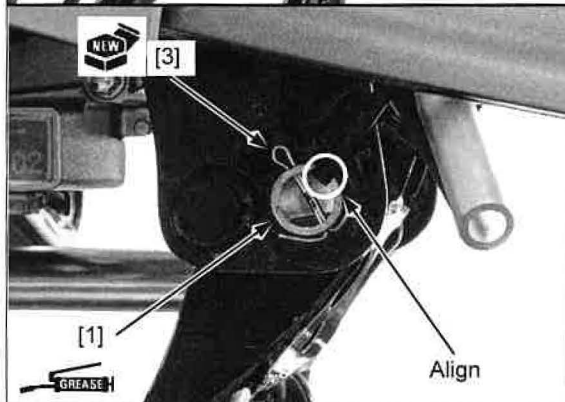
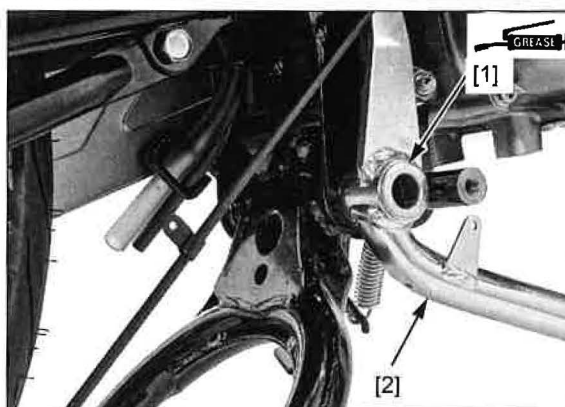
## REAR WHEEL/BRAKE/SUSPENSION

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

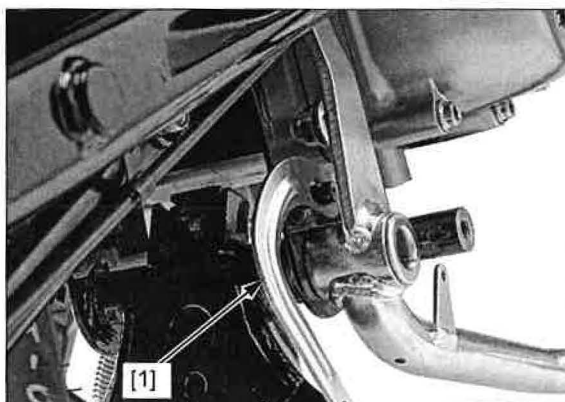
Install the brake pedal [2] and insert the centerstand pivot while aligning its groove with the stopper of the frame.

Insert the centerstand pivot while aligning its groove with the stopper of the frame.

Install a new cotter pin [3].

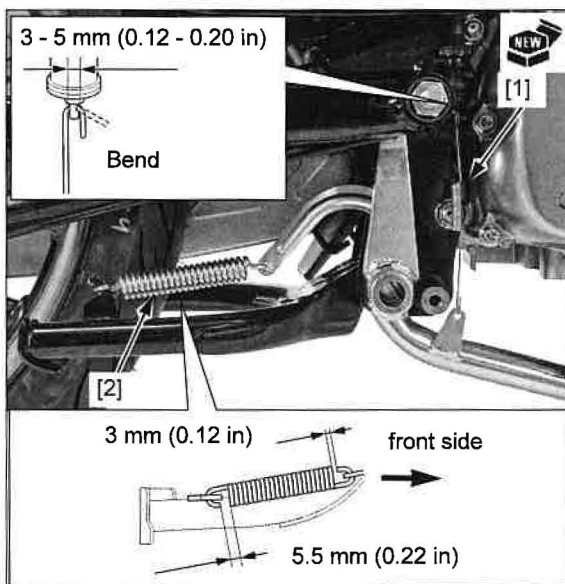


Install the centerstand spring plate [1] as shown.

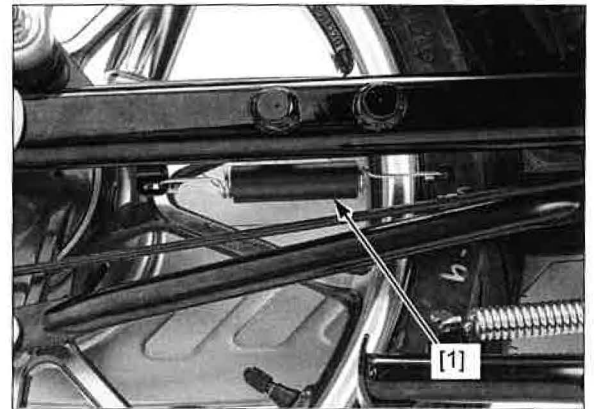


Hook the brake light spring [1] to the brake pedal as shown.

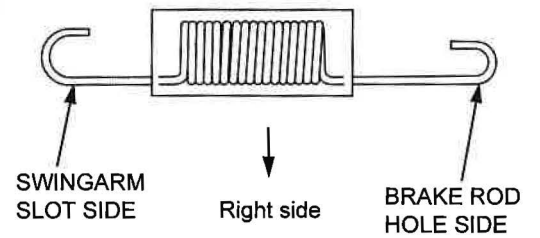
Hook the centerstand spring [2] to centerstand spring plate and centerstand the as shown.



Hook the brake pedal return spring [1] to the swingarm as shown.



**BRAKE PEDAL RETURN SPRING DIRECTION (Viewed from above):**

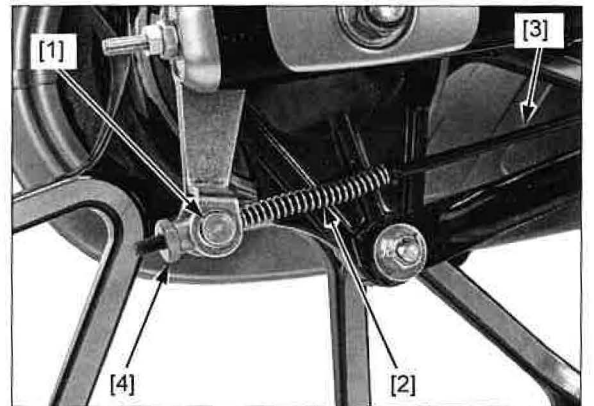


Install the joint pin [1] into the brake arm, then install the spring [2], brake rod [3] and adjusting nut [4].

Adjust the drive chain slack (page 3-12).

Install the Exhaust pipe/muffler (page 2-19).

Adjust the brake pedal freeplay (page 3-16).



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**MEMO**

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# 17. HYDRAULIC BRAKE

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<b>SERVICE INFORMATION</b> .....	17-2	<b>BRAKE PAD/DISC</b> .....	17-6
<b>TROUBLESHOOTING</b> .....	17-3	<b>MASTER CYLINDER</b> .....	17-7
<b>COMPONENT LOCATION</b> .....	17-4	<b>BRAKE CALIPER</b> .....	17-9
<b>BRAKE FLUID REPLACEMENT/AIR BLEEDING</b> .....	17-5		

## HYDRAULIC BRAKE

# SERVICE INFORMATION

## GENERAL

### ⚠ CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

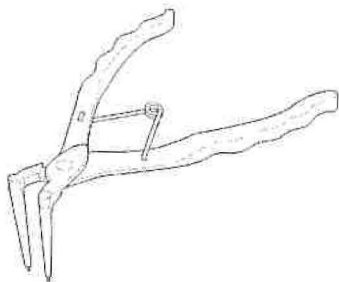
### NOTICE

*Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the front reservoir is horizontal first.*

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Check the brake system by applying the brake lever after the air bleeding.
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always use fresh DOT 3 or DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid, they may not be compatible.
- Always check the brake operation before riding the vehicle.

## TOOLS

Snap Ring Pliers  
07914-SA50001



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## TROUBLESHOOTING

### Brake lever soft or spongy

- Air in the hydraulic system
- Leaking hydraulic system
- Worn caliper piston seal
- Worn brake pad/disc
- Caliper not sliding properly
- Worn master cylinder piston cups
- Low brake fluid level
- Clogged brake fluid passage
- Contaminated brake pad/disc
- Contaminated caliper
- Contaminated master cylinder
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master piston
- Bent brake lever

### Brake lever hard

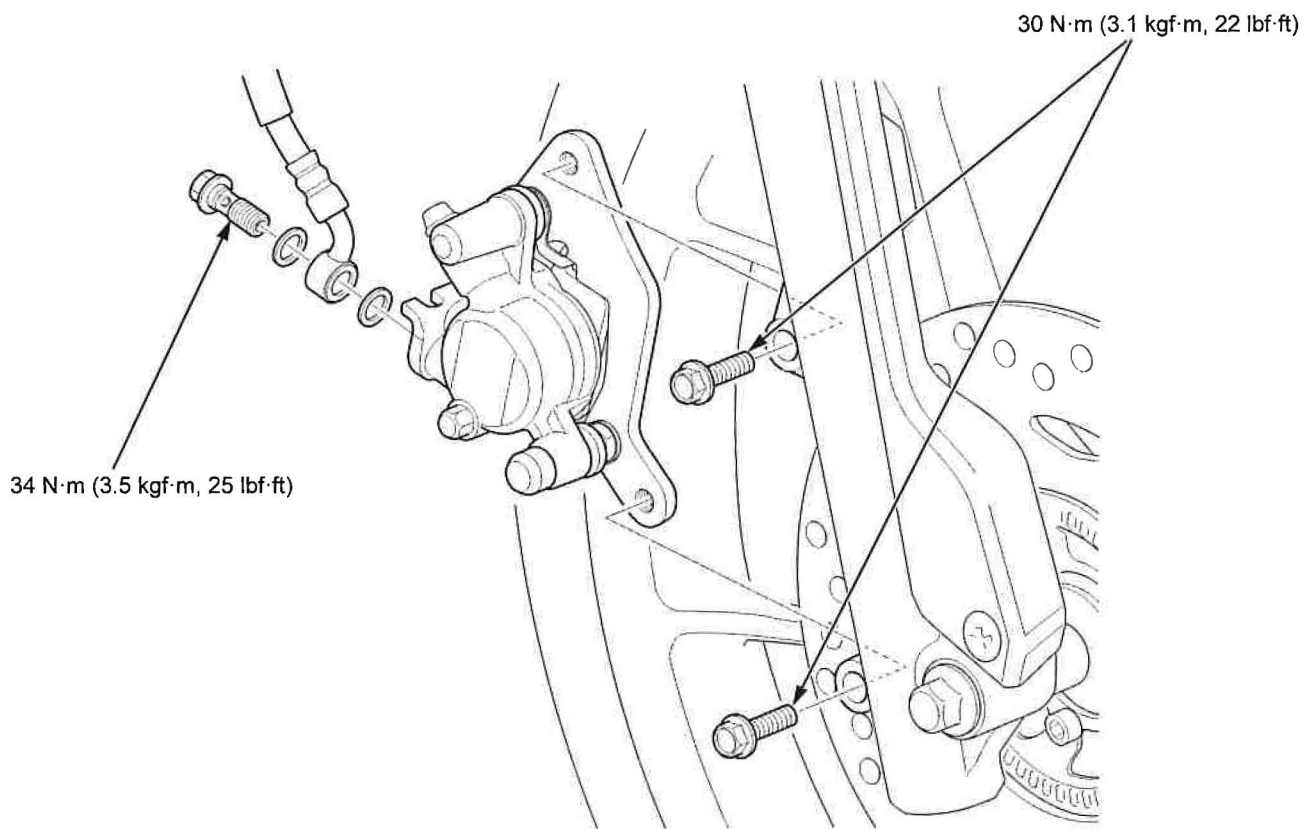
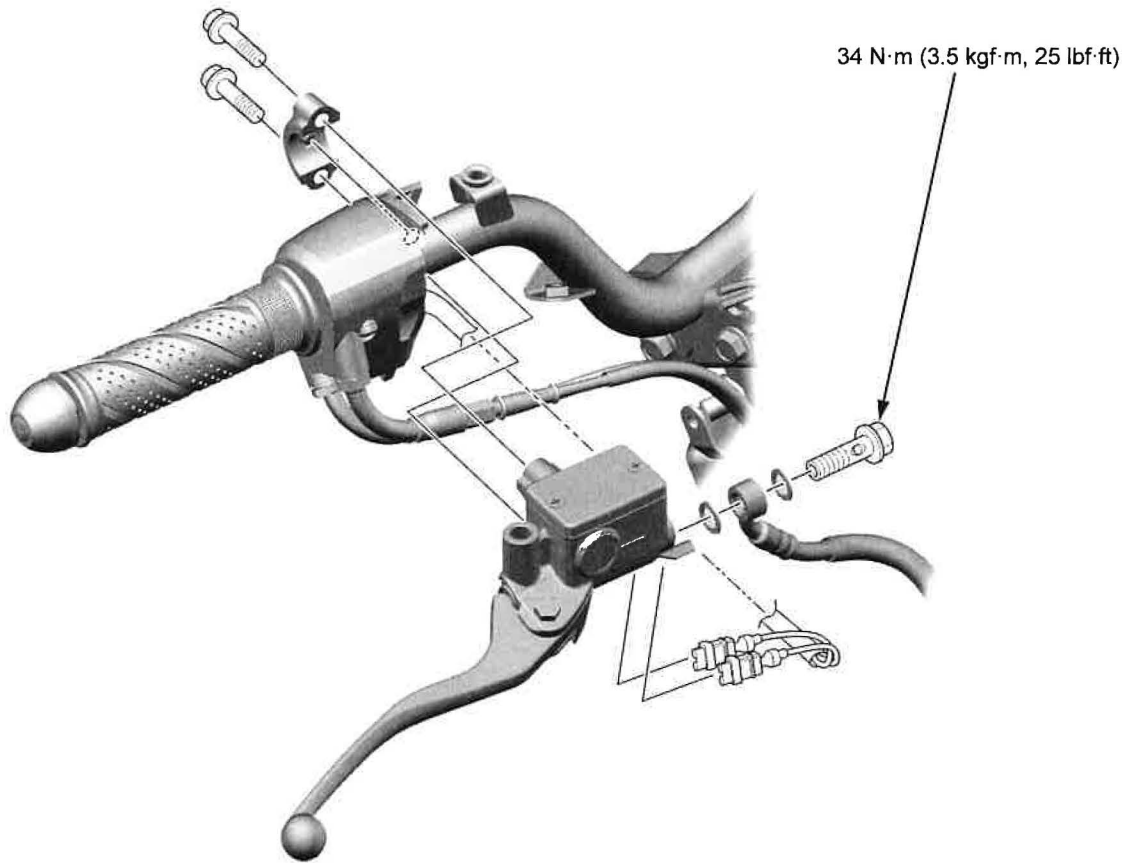
- Sticking/worn caliper piston
- Caliper not sliding properly
- Clogged/restricted brake fluid passage
- Sticking/worn master piston
- Bent brake lever

### Brake drag

- Contaminated brake disc/pad
- Warped/deformed brake disc
- Caliper not sliding properly
- Sticking caliper piston
- Sticking/worn master piston
- Clogged/restricted brake hose joint

# HYDRAULIC BRAKE

## COMPONENT LOCATION

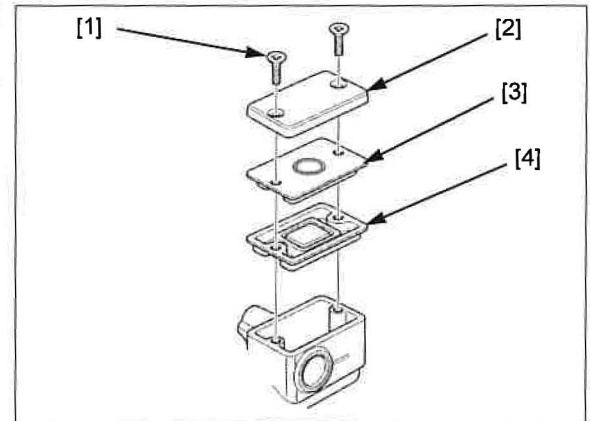


## BRAKE FLUID REPLACEMENT/AIR BLEEDING

### BRAKE FLUID DRAINING

Turn the handlebar to the left until the reservoir is level before removing the reservoir cap.

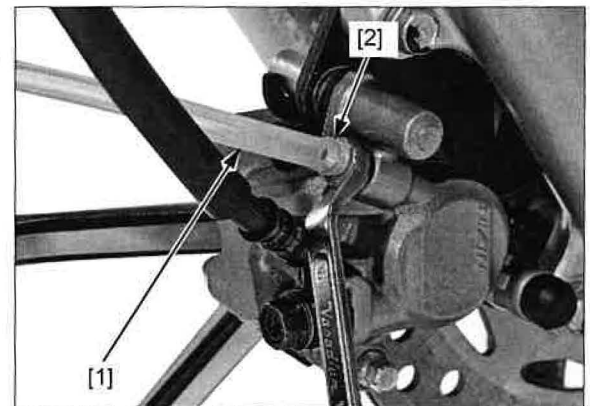
Remove the screws [1], reservoir cap [2], setting plate [3] and diaphragm [4].



Connect a bleed hose [1] to the bleed valve [2].

Loosen the bleed valve and pump the brake lever until no more fluid flows out of the bleed valve.

Tighten the bleed valve.



### BRAKE FLUID FILLING/AIR BLEEDING

*Do not mix different types of fluid. They are not compatible.*

Fill the reservoir to the casting ledge [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 when bleeding to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instruction.
- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

After bleeding the air completely, tighten the bleed valve to the specified torque.

**TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)**

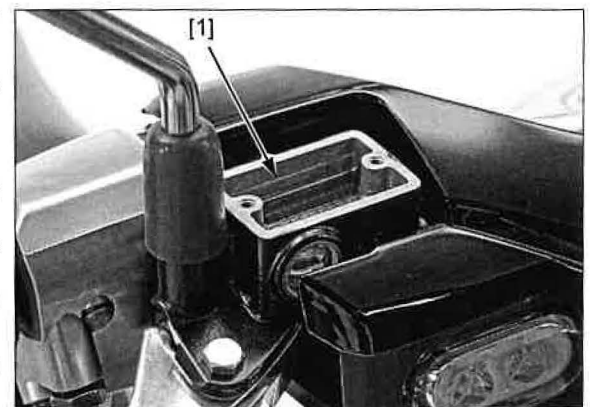
If a brake bleeder is not available, use the following procedure:

*Do not mix different types of fluid. They are not compatible.*

Fill the reservoir to the casting ledge with DOT 3 or DOT 4 brake fluid from the sealed container.

Pump up the system pressure with the brake lever until lever resistance is felt.

Connect a bleed hose to the bleed valve and bleed the system as follows:





## HYDRAULIC BRAKE

*Do not release the brake lever until the bleed valve has been closed.*

1. Squeeze the brake lever. Open the bleed valve 1/2 turn and close it.
2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.

Repeat steps 1 and 2 until air bubbles do not appear in the bleed hose.

After bleeding the air 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 casting ledge with DOT 3 or DOT 4 brake fluid from a sealed container.

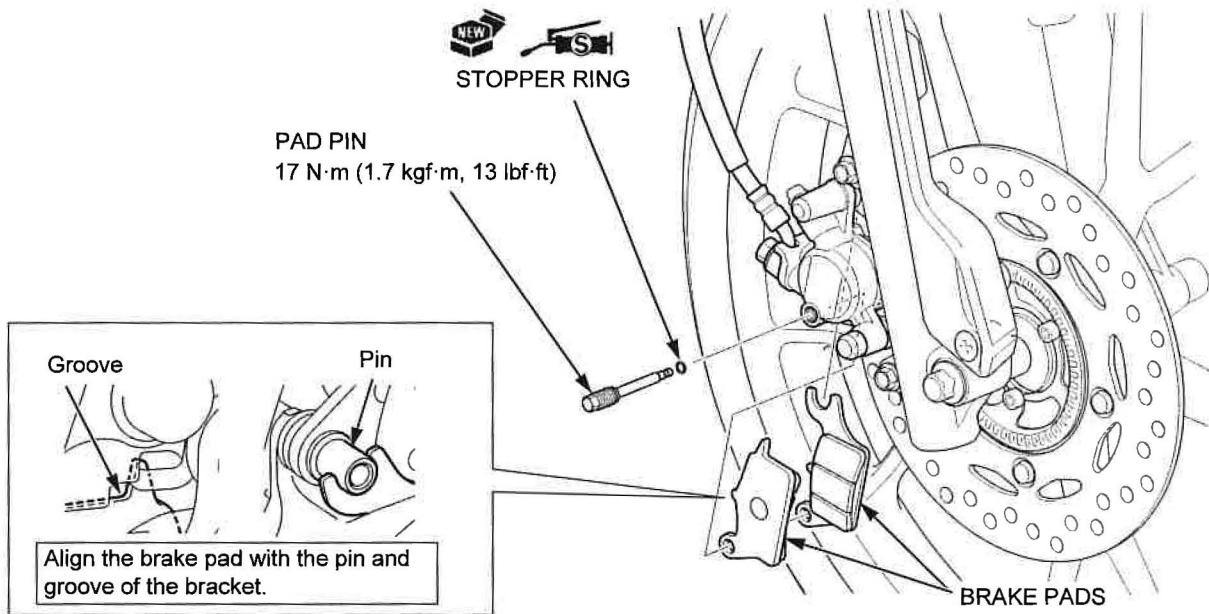
Install the diaphragm, setting plate and reservoir cap. Tighten the screws to the specified torque.

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

## BRAKE PAD/DISC

### BRAKE PAD REMOVAL/ INSTALLATION

Remove and install the brake pad according to the illustration.



### BRAKE DISC INSPECTION

Visually inspect the brake disc for damage or cracks.

Measure the brake disc according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-7) and replace if necessary.

# MASTER CYLINDER

## REMOVAL/INSTALLATION

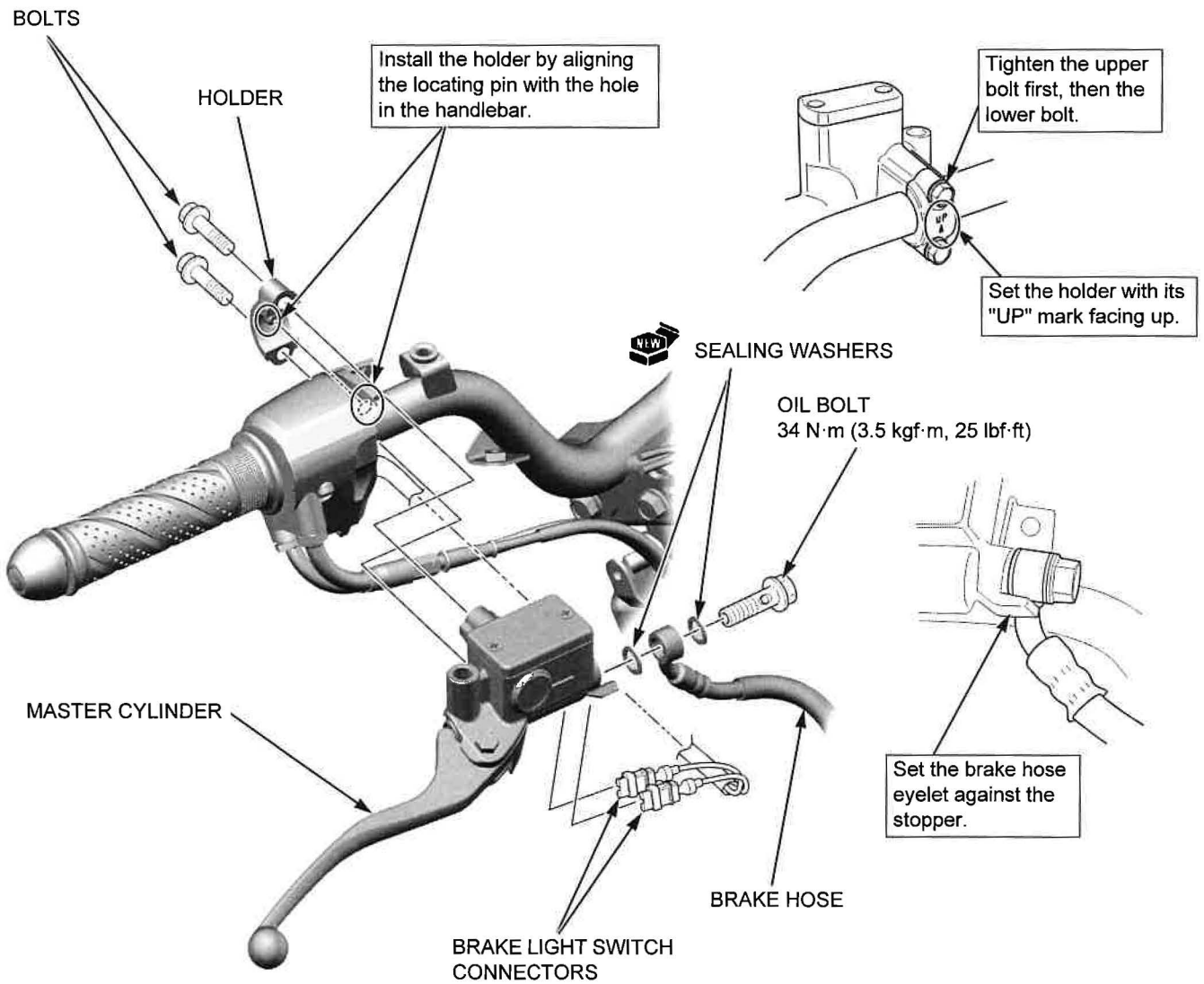
Drain the brake fluid (page 17-5).

Remove the handlebar lower cover (page 2-8).

Remove and install the master cylinder according to the illustration.

- When removing the oil bolt, cover the end of the hose to prevent contamination.

Fill and air bleed the hydraulic system (page 17-5).



# HYDRAULIC BRAKE

## DISASSEMBLY/ASSEMBLY

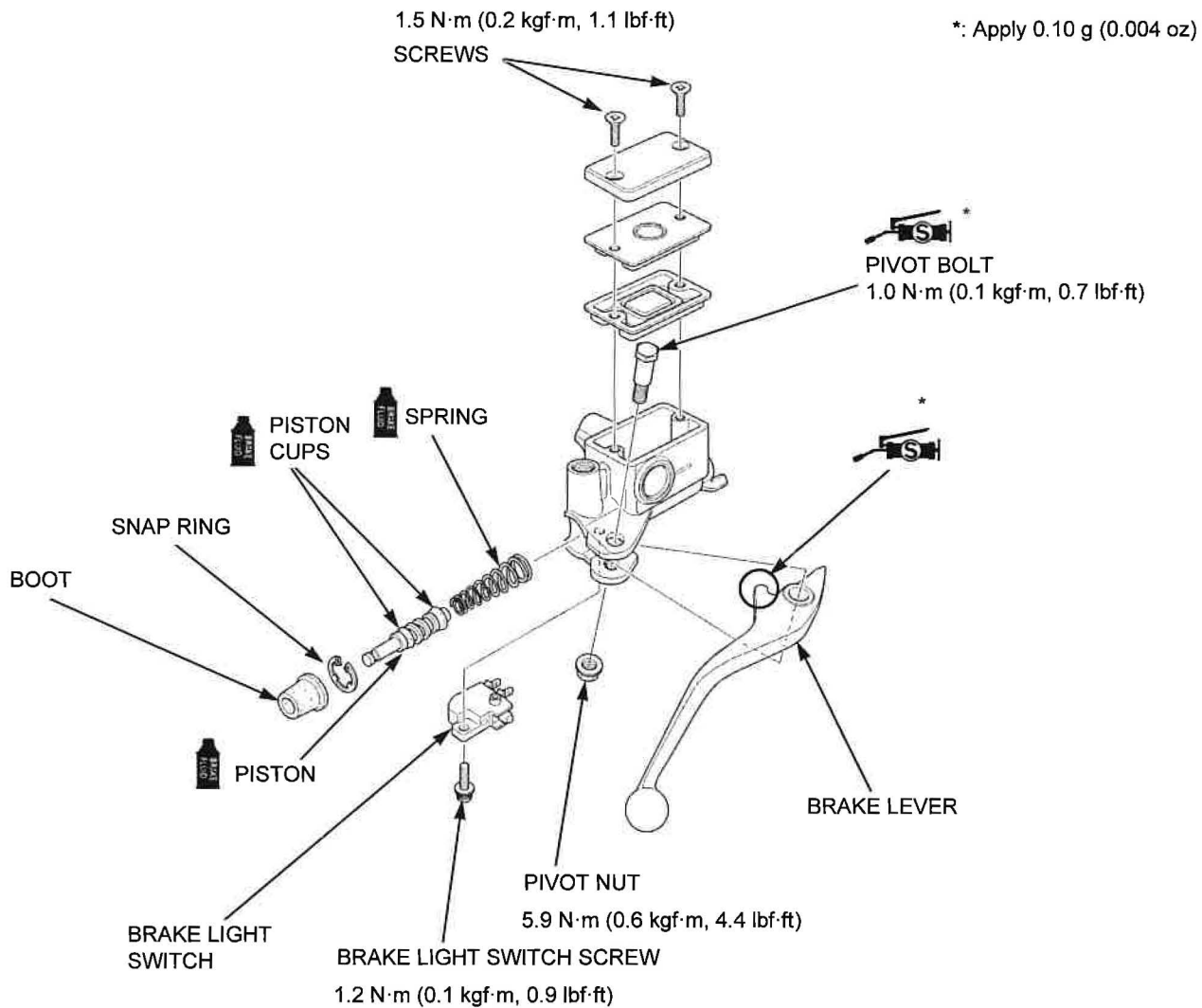
Disassemble and assemble the master cylinder according to the illustration.

### TOOL:

Snap ring pliers

07914-SA50001

- Do not allow the piston cup lips to turn inside out.
- Install the snap ring with the chamfered edge facing the thrust load side and be certain it is firmly seated in the groove. Do not reuse the snap ring which could easily spin in the groove.
- Align the switch boss with the master cylinder hole properly.
- When tightening the pivot nut, hold the pivot bolt securely.



## INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

- Master cylinder
- Master piston
- Piston cups
- Spring
- Boot

Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-7) and replace if necessary.

# BRAKE CALIPER

## REMOVAL/INSTALLATION

Avoid spilling fluid on painted, plastic, or rubber parts. Place a shop towel over these parts whenever the system is serviced.

Drain the brake fluid (page 17-5).

Remove the following:

- Oil bolt [1]/brake hose [2]/sealing washers [3]
- Mounting bolts [4]
- Brake caliper [5]

Installation is in the reverse order of removal.

### TORQUE:

**Front brake caliper mounting bolt:**

**30 N·m (3.1 kgf·m, 22 lbf·ft)**

**Oil bolt:**

**34 N·m (3.5 kgf·m, 25 lbf·ft)**

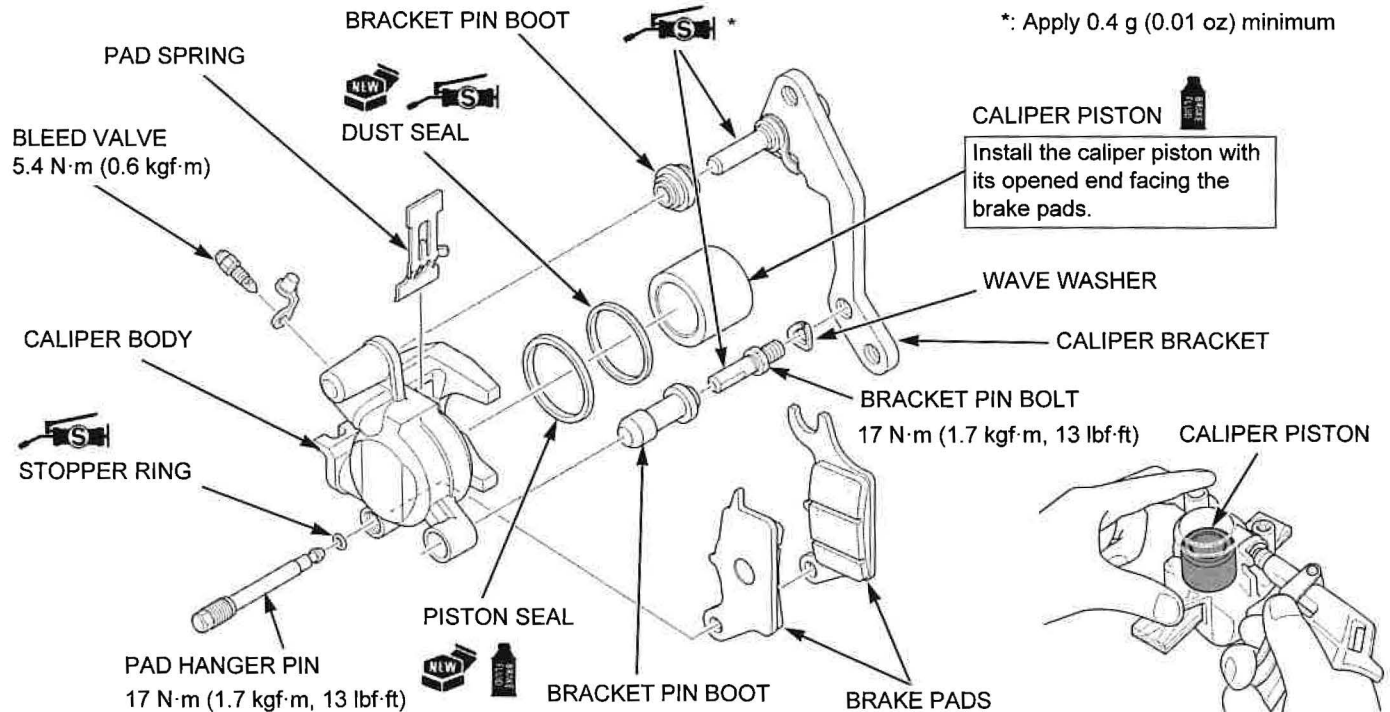
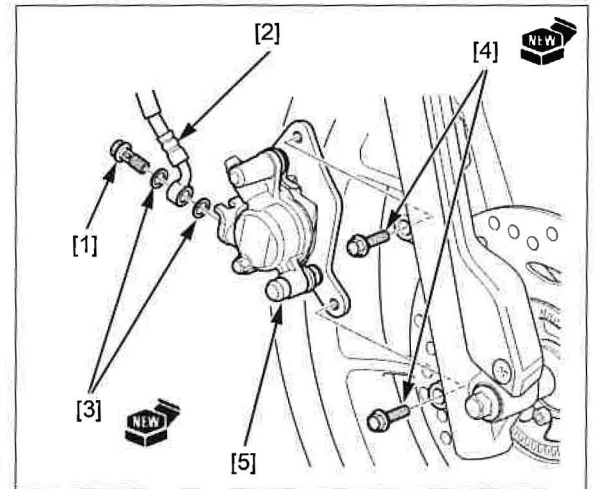
- Replace the caliper mounting bolts and sealing washers with new ones.

Fill the brake fluid and bleed the hydraulic system (page 17-5).

## DISASSEMBLY/ASSEMBLY

Disassemble and assemble the brake caliper according to the illustration.

- When removing the piston, place a shop towel over the piston. Position the caliper with the piston facing down and apply small squirts of air pressure.
- Replace the piston seal and dust seal with new ones as a set.



## INSPECTION

Check the following parts for scoring, scratches, deterioration or damage.

- Caliper cylinders
- Caliper pistons

Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-7) and replace if necessary.

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**MEMO**

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# 18. ANTI-LOCK BRAKE SYSTEM (ABS)

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<b>SERVICE INFORMATION</b> .....	18-2	<b>ABS INDICATOR CIRCUIT TROUBLESHOOTING</b> .....	18-11
<b>ABS SYSTEM LOCATION</b> .....	18-3	<b>ABS TROUBLESHOOTING</b> .....	18-14
<b>SYSTEM DIAGRAM</b> .....	18-4	<b>FRONT WHEEL SPEED SENSOR</b> .....	18-20
<b>ABS TROUBLESHOOTING INFORMATION</b> .....	18-5	<b>ABS MODULATOR</b> .....	18-21
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## ANTI-LOCK BRAKE SYSTEM (ABS)

### SERVICE INFORMATION

#### GENERAL

##### NOTICE

- The ABS modulator may be damaged if dropped. Also if a connector is disconnected when current is flowing, the excessive voltage may damage the control unit. Always turn off the ignition switch before servicing.
- Spilling brake fluid will severely damage plastic parts and painted surfaces. It is also harmful to some rubber parts.
- This section covers service of the Anti-lock Brake System (ABS). For conventional brake service (page 17-2).
- The ABS control unit is integrated in the ABS modulator. Do not disassemble the ABS modulator. Replace the ABS modulator as an assembly when it is faulty.
- The ABS control unit performs pre-start self-diagnosis to check whether the ABS functions normally until the vehicle speed reaches 10 km/h (6 mph). After pre-start self-diagnosis, the ABS control unit monitors the ABS functions and vehicle running condition constantly until the ignition switch is turned OFF (ordinary self-diagnosis).
- When the ABS control unit detects a problem, it stops the ABS function, switches back to the conventional brake operation, and turns on or blinks the ABS indicator. Take care during the test-ride.
- Read "ABS TROUBLESHOOTING INFORMATION" carefully, inspect and troubleshoot the ABS according to the diagnostic troubleshooting flow chart. Observe each step of the procedures one by one. Write down the DTC and probable faulty part before starting diagnosis and troubleshooting.
- Use a fully charged battery. Do not diagnose with a charger connected to the battery.
- After troubleshooting, erase the DTC and test-ride the vehicle to check that the ABS indicator operates normally during pre-start self-diagnosis (page 18-9).
- Problems not caused by the faulty ABS (e.g. brake disc squeak, unevenly worn brake pad) cannot be detected by the ABS diagnosis system.
- When the wheel speed sensor and/or pulser ring is removed, be sure to check the air gap after installing them (page 18-20).
- Be careful not to damage the wheel speed sensor and pulser ring when removing and installing the wheel.
- For front wheel pulser ring service (page 15-9).
- The following color codes are used throughout this section.

Bl: Black  
Bu: Blue

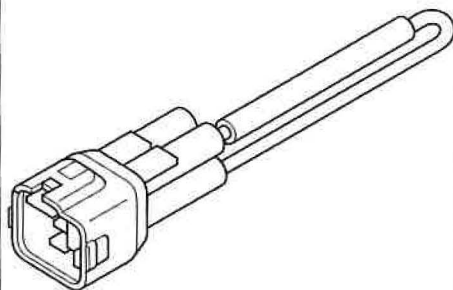
W: White  
G: Green

R: Red  
P: Pink

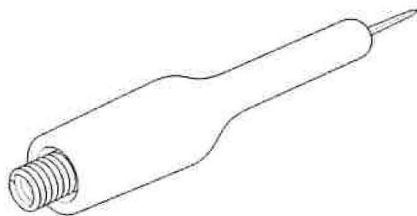
Y: Yellow

#### TOOLS

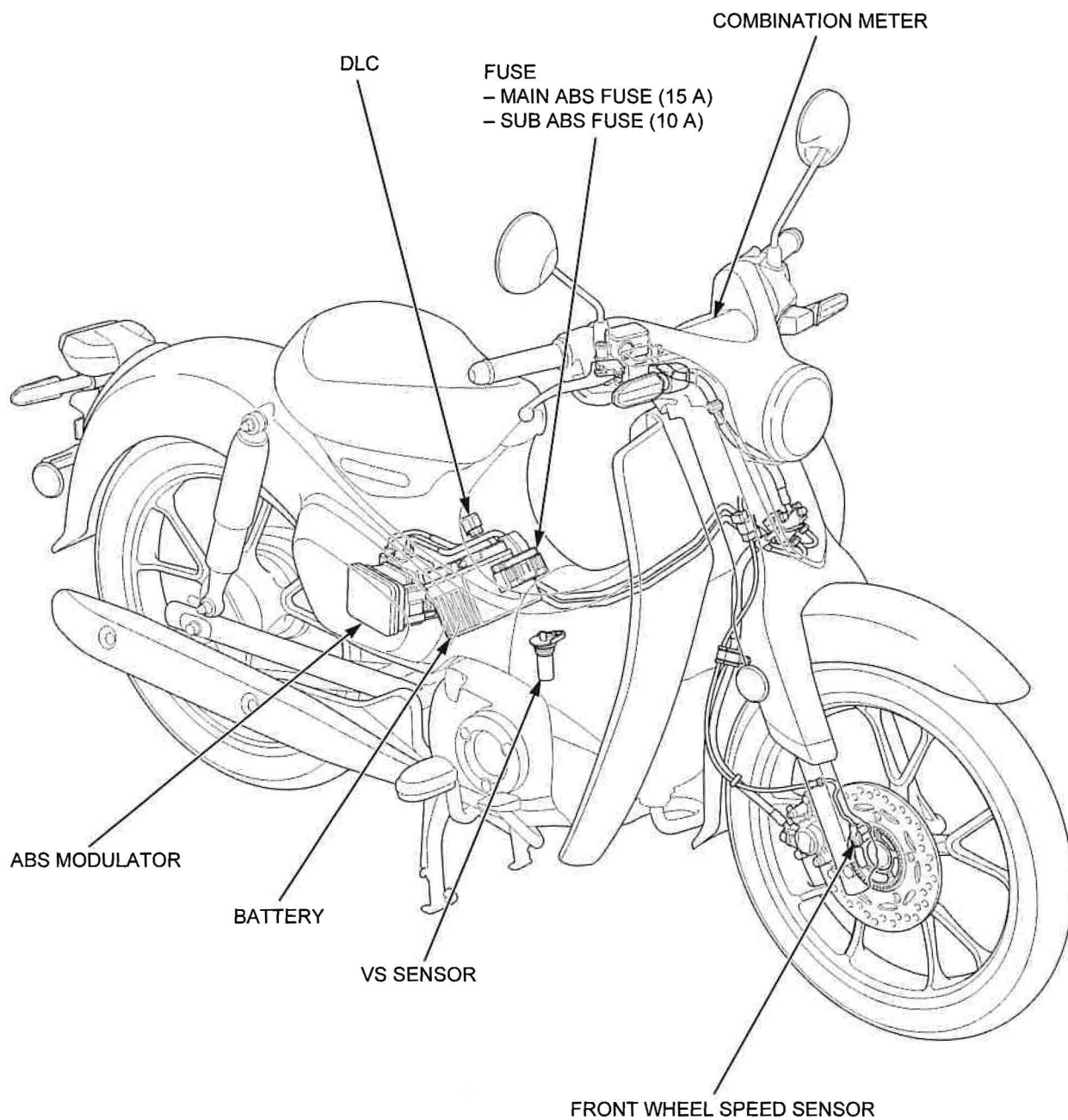
SCS Service Connector  
070PZ-ZY30100



Test Probe (2 pack)  
07ZAJ-RDJA110

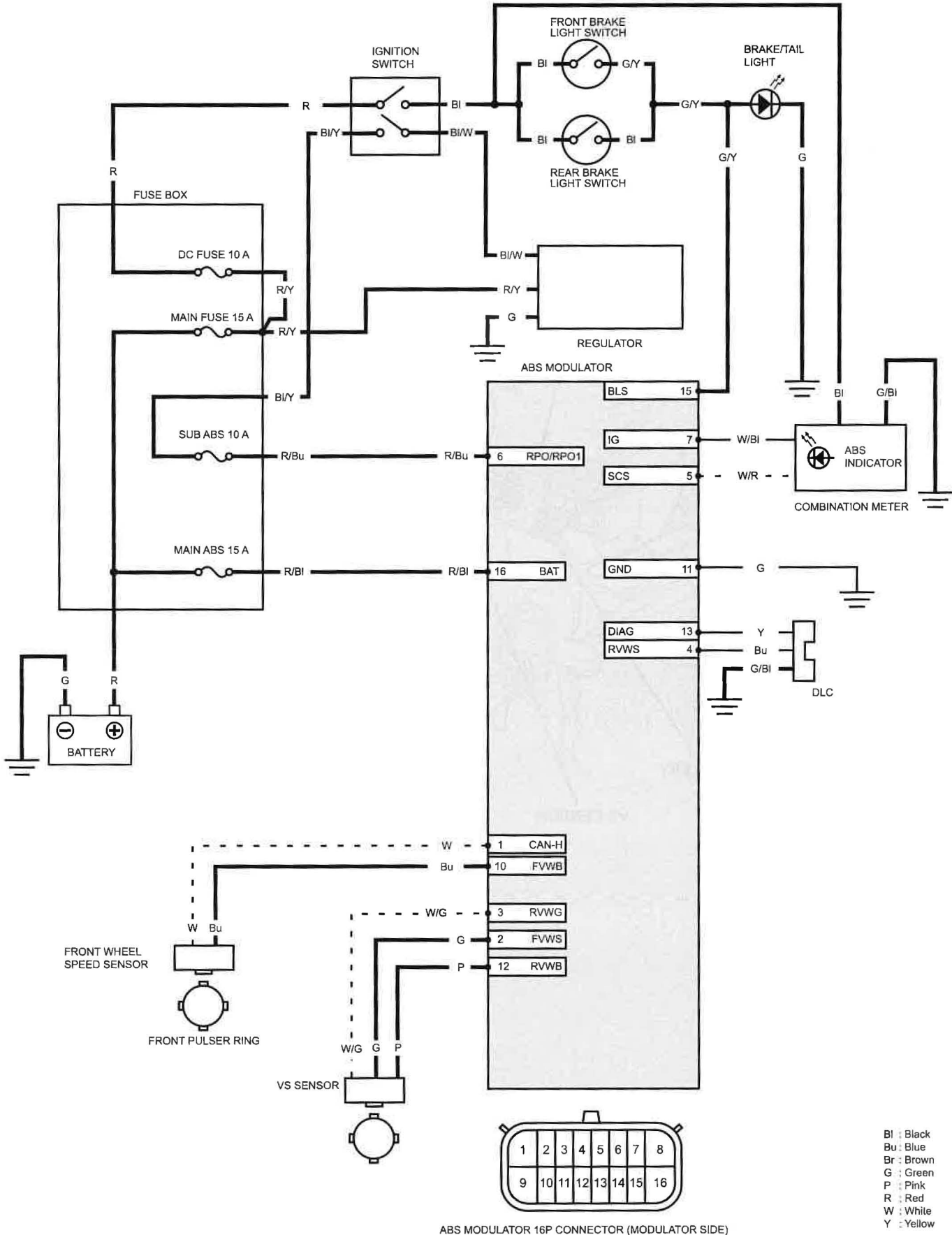


ABS SYSTEM LOCATION





# ANTI-LOCK BRAKE SYSTEM (ABS) SYSTEM DIAGRAM



# ABS TROUBLESHOOTING INFORMATION

## SYSTEM DESCRIPTION

### SUMMARY OF ABS PRE-START SELF-DIAGNOSIS SYSTEM

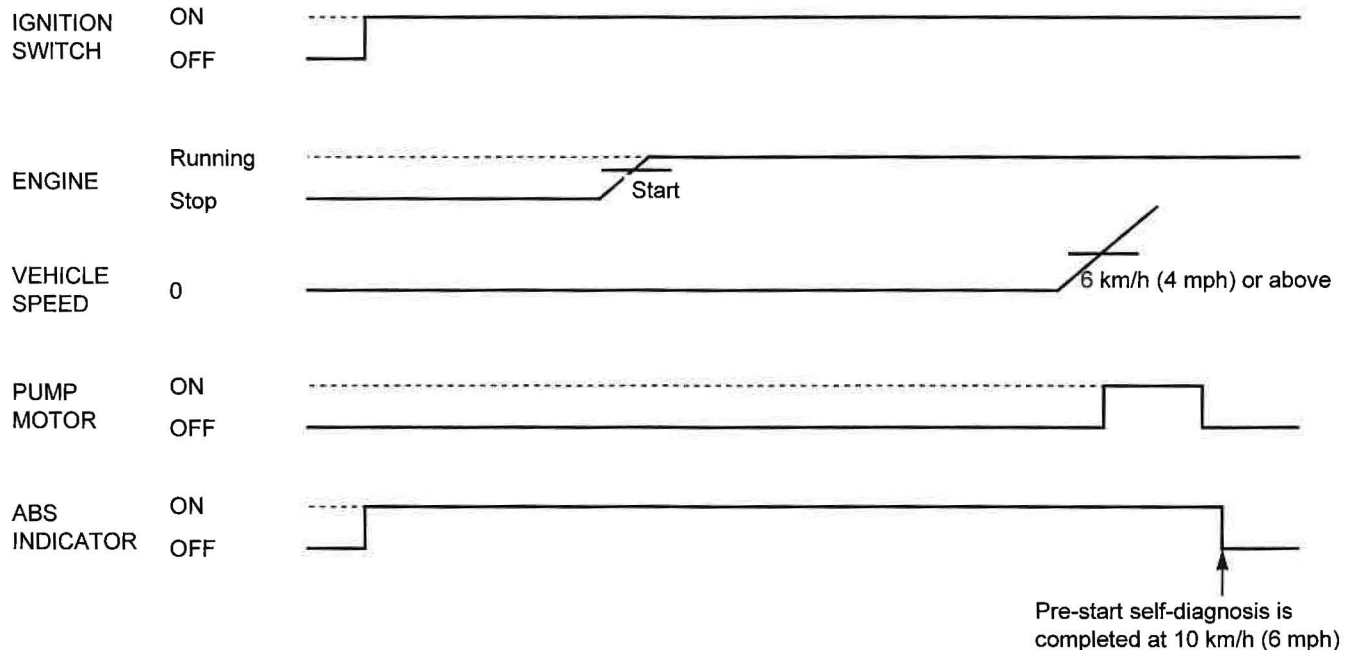
The ABS pre-start self-diagnosis system diagnoses the electrical system as well as the operating status of the modulator. When there is any abnormality, the problem and the associated part can be detected by reading the Diagnostic Trouble Code (DTC).

When the vehicle is running, pulse signal generated at the front wheel speed sensor is sent to the ABS control unit. When the vehicle speed reaches approximately 6 km/h (4 mph), the ABS control unit operates the pump motor to check it. When the vehicle speed reaches 10 km/h (6 mph), the ABS control unit turns off the ABS indicator if the system is normal and the pre-start self-diagnosis is completed.

If any problem is detected, the ABS indicator blinks or comes on and stays on to notify the rider of the problem. The ordinary self-diagnosis is also made while the vehicle is running after the pre-start diagnosis is completed. When the ABS indicator blinks or stays on, the cause of the problem can be identified by retrieving the DTC (page 18-9).

If the ABS indicator does not come on when the ignition switch is turned ON, or the ABS indicator stays on after the pre-start self-diagnosis is completed although the ABS is normal, the ABS indicator circuit may be faulty. Follow the troubleshooting (page 18-5).

Pre-start self-diagnosis when the system is normal:



### PRE-START SELF-DIAGNOSIS PROCEDURE (Daily check)

1. Turn the ignition switch ON with the engine stop switch "O".
2. Make sure the ABS indicator comes on.
3. Start the engine.
4. Ride the vehicle and increase the vehicle speed to approximately 10 km/h (6 mph).
5. The ABS is normal if the ABS indicator goes off.

## ANTI-LOCK BRAKE SYSTEM (ABS)

### MCS INFORMATION

- The MCS can readout and erase the DTC.

#### How to connect the MCS

Turn the ignition switch OFF.

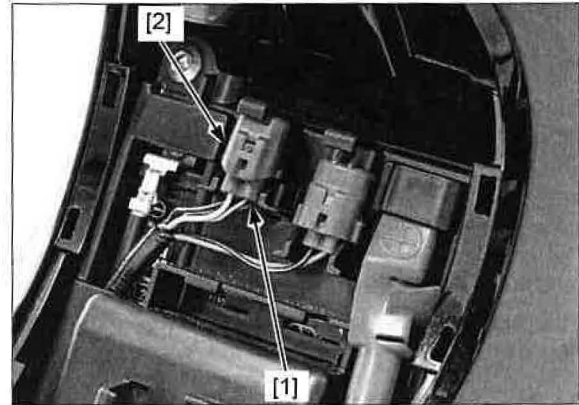
Remove the center cover (page 2-10).

Remove the DLC [1] from the battery case cover.

Remove the dummy connector [2] from the DLC and connect the MCS to the DLC.

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

Check the DTC and freeze data.



### DTC READOUT

#### NOTE:

- The DTC is not erased by turning the ignition switch OFF while the DTC is being output. Note that turning the ignition switch ON again does not indicate the DTC. To show the DTC again, repeat the DTC readout procedures from the beginning.
- Be sure to record the indicated DTC.
- After diagnostic troubleshooting, erase the DTC and perform the pre-start self-diagnosis procedure to be sure that there is no problem in the ABS (page 18-5).
- Do not apply the brake during DTC readout.

Connect the MCS to the DLC (page 18-6).

Read the DTC, stored data and follow the DTC index (page 18-9).

- If the MCS is not available, perform the following.

#### Reading DTC with the ABS indicator

1. Turn the ignition switch OFF.

Remove the center cover (page 2-10).

Remove the DLC [1] from the battery case cover.

Remove the dummy connector [2] from the DLC and connect the special tool to the DLC.

#### TOOL:

**SCS service connector [3] 070PZ-ZY30100**

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

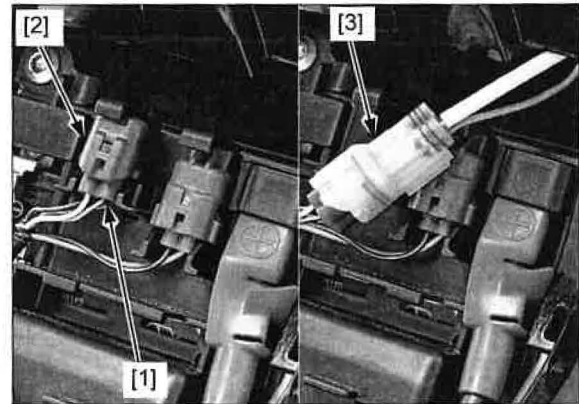
The ABS indicator should come on for 2 seconds (start signal), then goes off for 3.6 seconds and starts DTC indication.

The DTC is indicated by the number of the times of the ABS indicator blinking.

If the DTC is not stored, the ABS indicator stays on.

3. Turn the ignition switch OFF and remove the SCS connector from the DLC.

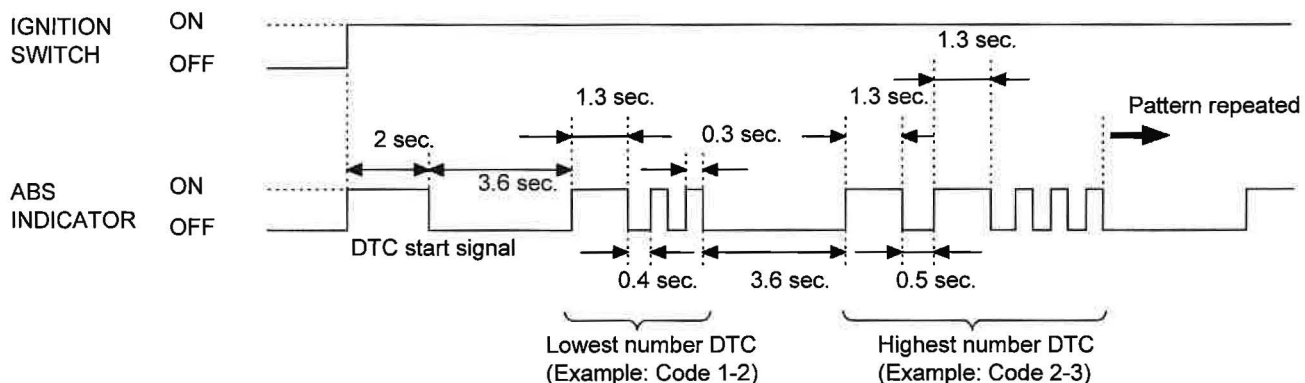
Install the removed parts in the reverse order of removal.



## DTC INDICATION PATTERN

### NOTE:

- The ABS indicator indicates the DTC by blinking a specified number of times. The indicator has two types of blinking, a long blink and short blink. The long blink lasts for 1.3 seconds, the short blink lasts for 0.3 seconds. For example, when one long blink is followed by two short blinks, the DTC is 1-2 (one long blink = 1 blink, plus two short blinks = 2 blinks).
- When the ABS control unit stores some DTCs, the ABS indicator shows the DTCs in the order from the lowest number to highest number. For example, when the ABS indicator indicates code 1-2, then indicates code 2-3, two failures have occurred.



When the DTC is not stored:



## ERASING STORED DTC

### NOTE:

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

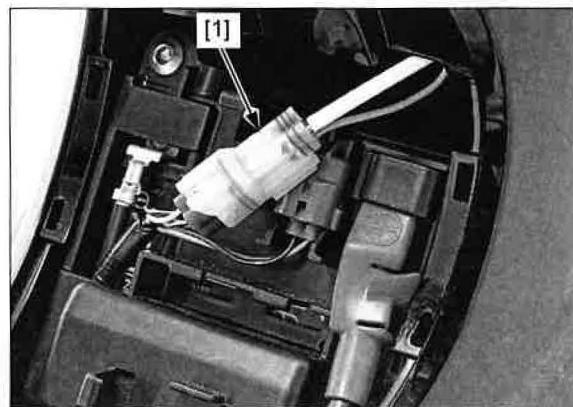
Connect the MCS to the DLC (page 18-6).

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

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

### How to erase the DTC without MCS

- Short the DLC terminals using the SCS service connector [1] (page 18-6).
- Turn the ignition switch ON with the engine stop switch "O" while squeezing the brake lever. The ABS indicator should come on for 2 seconds and go off.
- Release the brake lever immediately after the ABS indicator goes off. The ABS indicator should come on.
- Squeeze the brake lever immediately after the ABS indicator comes on. The ABS indicator should go off.
- Release the brake lever immediately after the ABS indicator goes off. When the DTC is erased, the ABS indicator blinks 2 times and stays on. If the ABS indicator does not blink 2 times, the self-diagnostic memory has not been erased, so try again.
- Turn the ignition switch OFF and disconnect the SCS service connector. Install the removed parts in the reverse order of removal.



# ANTI-LOCK BRAKE SYSTEM (ABS)

## CIRCUIT INSPECTION

### INSPECTION AT ABS MODULATOR CONNECTOR

Turn the ignition switch OFF.

Disconnecting procedure:

Move the slide retainer [1] forward, press and hold the lock tab [2] and disconnect the ABS modulator 16P (Black) connector [3]. Pull out the connector to the right side of the vehicle.

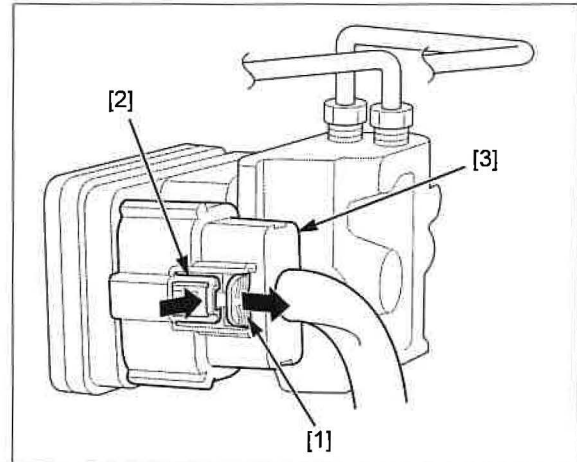
#### NOTE:

- Always clean around and keep any foreign material away from the connector before disconnecting it.

Connecting procedure:

Connect the ABS modulator 16P (Black) connector fully, and then move the slide retainer rearward.

Make sure the connector is locked securely.

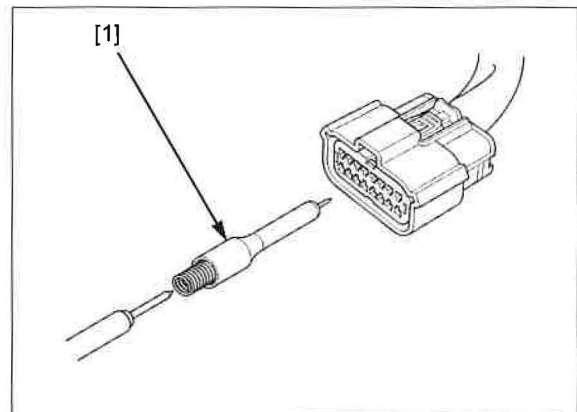


- A faulty ABS is often related to poorly connected or corroded connections. Check those connections before proceeding.
- In testing at ABS modulator 16P (Black) connector terminals, always use the test probe [1]. Insert the test probe into the connector terminal, then connect the digital multimeter probe to the test probe.

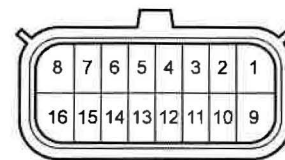
#### TOOL:

Test probe (2 pack) [1]

07ZAJ-RDJA110



#### TERMINAL LAYOUT:



(Terminal side of the wire harness)

**DTC INDEX**

**NOTE:**

- The ABS indicator might blink in the following cases. Correct the faulty part.
  - Incorrect tire pressure.
  - Tires not recommended for the vehicle were installed (incorrect tire size).
  - Deformation of the wheel or tire.
  - Sprockets not recommended for the vehicle are installed (Incorrect sprocket gear ratio).
- The ABS indicator might blink while riding under the following conditions. This is temporary failure. Be sure to erase the DTC (page 18-7).
  - Test-ride the vehicle above 30 km/h (19 mph) and check the DTC (page 18-6). Ask the rider for the riding conditions in detail when the vehicle is brought in for inspection.
  - The vehicle has continuously run bumpy roads.
  - The front wheel leaves the ground for a long time when riding (wheelie).
  - Only either the front or rear wheel rotates.
  - The ABS operates continuously.
  - The ABS control unit has been disrupted by an extremely powerful radio wave (electromagnetic interference).

DTC	Function failure	Detection		Symptom/Fail-safe function	Refer to
		A	B		
-	ABS indicator malfunction <ul style="list-style-type: none"> <li>• ABS modulator voltage input line</li> <li>• Indicator related wires</li> <li>• Combination meter</li> <li>• ABS modulator</li> <li>• SUB ABS fuse (10 A)</li> </ul>			• ABS indicator never comes ON at all	18-11
				• ABS indicator stays ON	18-11
1-1	Front wheel speed sensor circuit malfunction <ul style="list-style-type: none"> <li>• Wheel speed sensor or related wires</li> </ul>	○	○	• Stops ABS operation	18-14
1-2	Front wheel speed sensor malfunction <ul style="list-style-type: none"> <li>• Wheel speed sensor, pulser ring or related wires</li> <li>• Electromagnetic interference</li> </ul>		○	• Stops ABS operation	18-14
1-3	VS sensor circuit malfunction <ul style="list-style-type: none"> <li>• VS sensor or related wires</li> </ul>	○	○	• Stops ABS operation	18-16
1-4	VS sensor malfunction <ul style="list-style-type: none"> <li>• VS sensor or related wires</li> <li>• Electromagnetic interference</li> </ul>		○	• Stops ABS operation	18-16
2-1	Front wheel pulser ring <ul style="list-style-type: none"> <li>• Pulser ring or related wires</li> </ul>		○	• Stops ABS operation	18-14
3-3	Solenoid valve malfunction (ABS modulator)	○	○	• Stops ABS operation	18-17
3-4					18-17
4-1	Front wheel lock <ul style="list-style-type: none"> <li>• Riding condition</li> </ul>		○	• Stops ABS operation	18-14
4-2	Front wheel lock (Wheelie) <ul style="list-style-type: none"> <li>• Riding condition</li> </ul>		○		18-14
5-1	Pump motor lock <ul style="list-style-type: none"> <li>• Pump motor (ABS modulator) or related wires</li> <li>• MAIN ABS fuse (15 A)</li> </ul>	○	○	• Stops ABS operation	18-17
5-2	Pump motor stuck off <ul style="list-style-type: none"> <li>• Pump motor (ABS modulator) or related wires</li> <li>• MAIN ABS fuse (15 A)</li> </ul>	○	○	• Stops ABS operation	18-17
5-3	Pump motor stuck on <ul style="list-style-type: none"> <li>• Pump motor (ABS modulator) or related wires</li> <li>• MAIN ABS fuse (15 A)</li> </ul>	○	○	• Stops ABS operation	18-17
5-4	Power supply relay malfunction <ul style="list-style-type: none"> <li>• Power supply relay (ABS modulator) or related wires</li> <li>• MAIN ABS fuse (15 A)</li> </ul>	○	○	• Stops ABS operation	18-17
6-1	Power circuit under voltage <ul style="list-style-type: none"> <li>• Input voltage (too low)</li> <li>• MAIN ABS fuse (15 A)</li> <li>• SUB ABS fuse (10 A)</li> </ul>	○	○	• Stops ABS operation	18-18

## ANTI-LOCK BRAKE SYSTEM (ABS)

DTC	Function failure	Detection		Symptom/Fail-safe function	Refer to
		A	B		
6-2	Power circuit over voltage • Input voltage (too high)	○	○	• Stops ABS operation	18-18
7-1	Tire malfunction • Tire size • Incorrect sprocket gear ratio (Sprockets not recommended for the vehicle are installed.)		○	• Stops ABS operation	18-19
8-1	ABS control unit • ABS control unit malfunction (ABS modulator)	○	○	• Stops ABS operation	18-19

(A) Pre-start self-diagnosis (page 18-5)

(B) Ordinary self-diagnosis: diagnoses while the vehicle is running (after pre-start self-diagnosis)

# ABS INDICATOR CIRCUIT TROUBLESHOOTING

## ABS INDICATOR DOES NOT COME ON (when the ignition switch turned ON)

NOTE:

- Before starting this inspection, check the initial function of the combination meter (page 20-8).

### 1. Indicator Operation Inspection

Turn the ignition switch OFF.

Disconnect the ABS modulator 16P (Black) connector (page 18-8).

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

Check the ABS indicator.

**Does the ABS indicator come on?**

**YES** – Faulty ABS modulator

**NO** – GO TO STEP 2.

### 2. Indicator Signal Line Short Circuit Inspection

Turn the ignition switch OFF.

Check for continuity between the wire harness side ABS modulator 16P (Black) connector [1] terminal and ground.

**TOOL:**

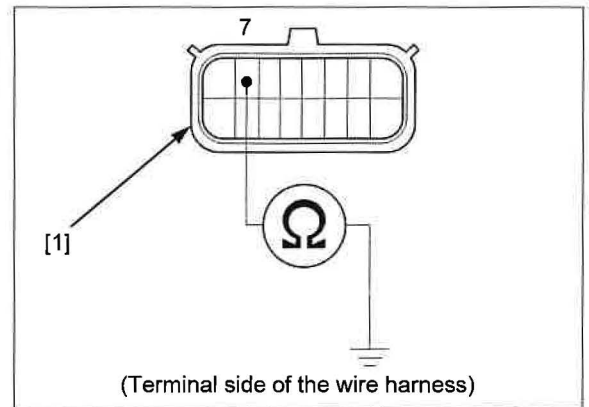
**Test probe (2 pack) 07ZAJ-RDJA110**

**CONNECTION: 7 – Ground**

**Is there continuity?**

**YES** – Short circuit in the White/black wire

**NO** – Faulty combination meter



## ABS INDICATOR STAYS ON (Indicator does not go off when the vehicle is running, but DTC is not stored)

### 1. Service Check Line Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ABS modulator 16P (Black) connector (page 18-8).

Check for continuity between the wire harness side ABS modulator 16P (Black) connector [1] terminal and ground.

**TOOL:**

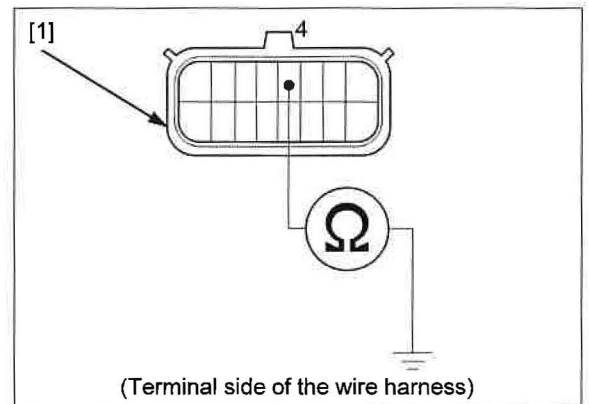
**Test probe (2 pack) 07ZAJ-RDJA110**

**CONNECTION: 4 – Ground**

**Is there continuity?**

**YES** – Short circuit in the Blue wire

**NO** – GO TO STEP 2.





## ANTI-LOCK BRAKE SYSTEM (ABS)

### 2. Indicator Signal Line Open Circuit Inspection

Short the wire harness side ABS modulator 16P (Black) connector [1] terminal to the ground with a jumper wire [2].

**CONNECTION: 7 – Ground**

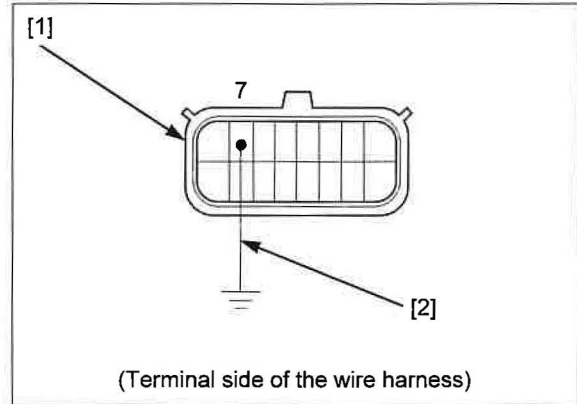
Turn the ignition switch ON with the engine stop switch "○".

Check the ABS indicator.

**Does it go off?**

**YES** – GO TO STEP 3.

**NO** – • Open circuit in the White/black wire  
• Faulty combination meter (if the White/black wire is OK)



### 3. Modulator Ground Line Open Circuit Inspection

Turn the ignition switch OFF.

Check for continuity between the wire harness side ABS modulator 16P (Black) connector [1] terminal and ground.

**TOOL:**

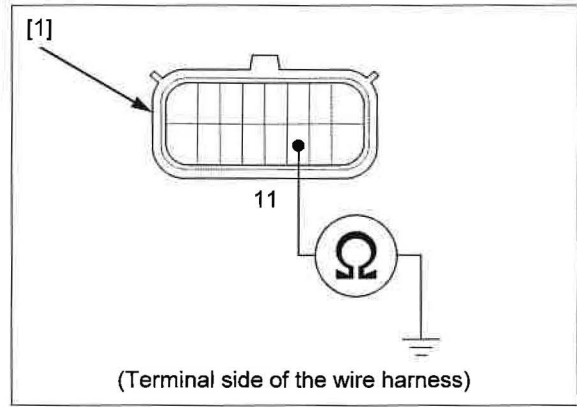
**Test probe (2 pack) 07ZAJ-RDJA110**

**CONNECTION: 11 – Ground**

**Is there continuity?**

**YES** – GO TO STEP 4.

**NO** – Open circuit in the Green wire



### 4. Fuse Inspection

Remove the battery cover (page 19-5).

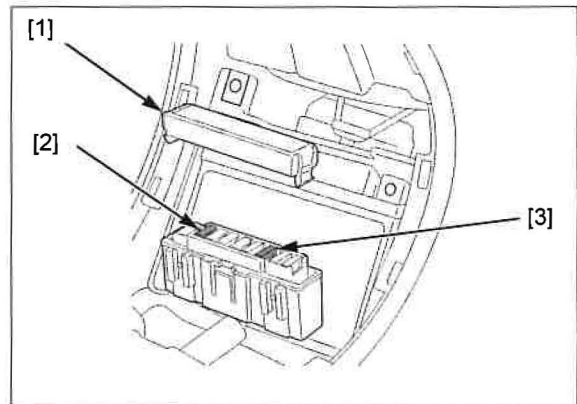
Open the fuse box cover [1].

Check the MAIN ABS fuse (15 A) [2] and SUB ABS fuse (10 A) [3] in the fuse box.

**Is the fuse(s) blown?**

**YES** – GO TO STEP 5.

**NO** – GO TO STEP 6.



## 5. Power Input Line Short Circuit Inspection

With the MAIN ABS fuse (15 A) and SUB ABS fuse (10 A) removed, check for continuity between the wire harness side ABS modulator 16P (Black) connector [1] and ground.

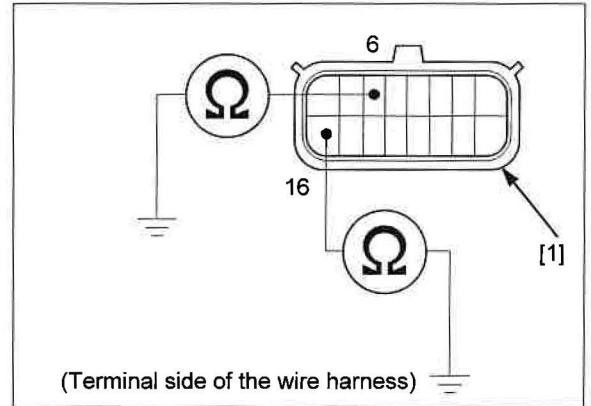
**TOOL:**

Test probe (2 pack)                      07ZAJ-RDJA110

**CONNECTION:** 6 – Ground  
16 – Ground

**Is there continuity?**

- YES** – Short circuit in Red/blue or Red/black wire
- NO** – Intermittent failure. Replace the MAIN ABS fuse (15 A) and/or SUB ABS fuse (10 A) with a new one, and recheck.



## 6. Power Input Line Open Circuit Inspection

Install the MAIN ABS fuse (15 A) and SUB ABS fuse (10 A). Turn the ignition switch ON with the engine stop switch "O".

Measure the voltage between the wire harness side ABS modulator 16P (Black) connector [1] terminal and ground.

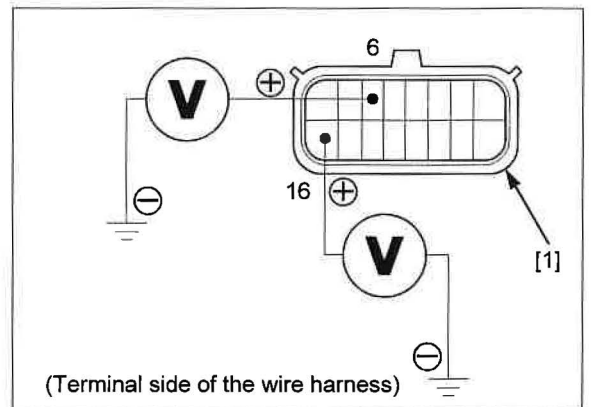
**TOOL:**

Test probe (2 pack)                      07ZAJ-RDJA110

**CONNECTION:** 6 (+) – Ground (-)  
16 (+) – Ground (-)

**Is there battery voltage?**

- YES** – Faulty ABS modulator
- NO** – Open circuit in Red/blue or Red/black wire



### ABS TROUBLESHOOTING

**NOTE:**

- Perform inspection with the ignition switch OFF, unless otherwise specified.
- All connector diagrams in the troubleshooting are viewed from the terminal side.
- Use a fully charged battery. Do not diagnose with a charger connected to the battery.
- When the ABS modulator assembly is detected to be faulty, recheck the wire harness and connector connections closely before replacing it.
- After diagnostic troubleshooting, erase the DTC (page 18-7).  
Test-ride the vehicle to check that the ABS indicator operates normally during pre-start self-diagnosis (page 18-5).

#### **DTC 1-1, 1-2, 2-1, 4-1 or 4-2 (Front Wheel Speed Sensor Circuit/Front Wheel Speed Sensor/Front Pulser Ring/Front Wheel Lock)**

**NOTE:**

- The ABS indicator might blink under unusual riding conditions (page 18-9). This is temporary failure. Erase the DTC (page 18-7).  
Test-ride the vehicle above 30 km/h (19 mph).  
Recheck the DTC (page 18-6).
- If DTC 4-1 is indicated, check the front brake for drag.

##### **1. Speed Sensor Air Gap Inspection**

Measure the air gap between the front wheel speed sensor and pulser ring (page 18-20).

***Is the air gap correct?***

**YES** – GO TO STEP 2.

**NO** – Check each part for deformation and looseness and correct accordingly.  
Recheck the air gap.

##### **2. Speed Sensor Condition Inspection**

Inspect the area around the front wheel speed sensor.

Check that there is iron or other magnetic deposits between the pulser ring [1] and wheel speed sensor [2], and the pulser ring slots for obstructions.

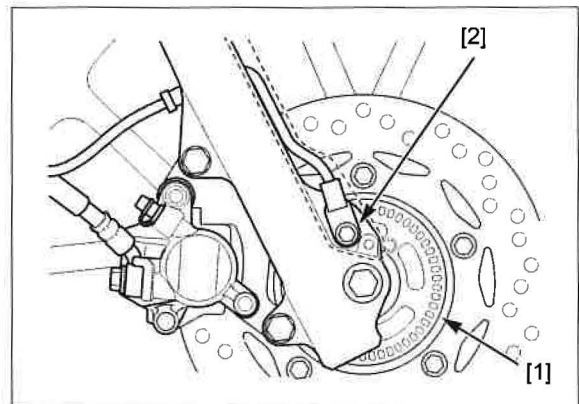
Check the installation condition of the pulser ring or wheel speed sensor for looseness.

Check the pulser ring and sensor tip for deformation or damage.

***Are the sensor and pulser ring in good condition?***

**YES** – GO TO STEP 3.

**NO** – Remove any deposits. Install properly or replace faulty part.



**3. Front Wheel Speed Sensor Line Short Circuit Inspection (at sensor side)**

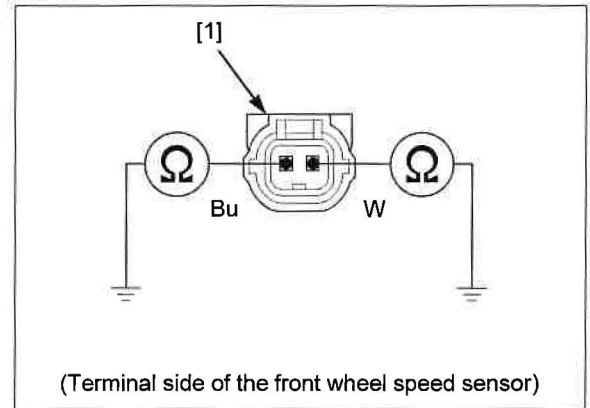
Turn the ignition switch OFF.

Disconnect the front wheel speed sensor 2P (Black) connector (page 2-18).  
Check for continuity between each terminal of the sensor side front wheel speed sensor 2P (Black) connector [1] and ground.

**CONNECTION: Blue – Ground**  
**White – Ground**

*Is there continuity?*

- YES** – Faulty front wheel speed sensor  
**NO** – GO TO STEP 4.



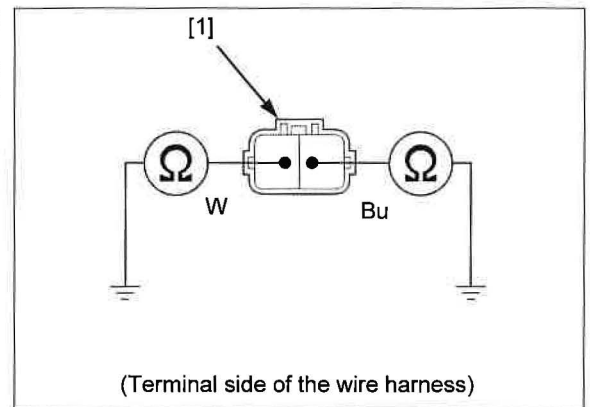
**4. Front Wheel Speed Sensor Line Short Circuit Inspection**

Disconnect the ABS modulator 16P (Black) connector (page 18-8).  
Check for continuity between each terminal of the wire harness side front wheel speed sensor 2P (Black) connector [1] and ground.

**CONNECTION: White – Ground**  
**Blue – Ground**

*Is there continuity?*

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



**5. Speed Sensor Line Open Circuit Inspection**

Short the wire harness side ABS modulator 16P (Black) connector [1] terminals with a jumper wire [2].

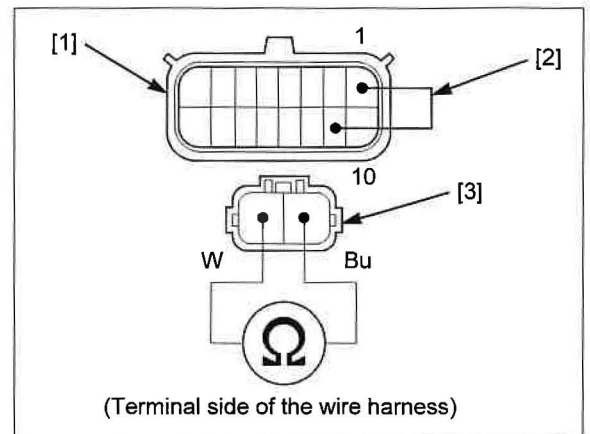
**CONNECTION: 1 – 10**

Check for continuity between the wire harness side front wheel speed sensor 2P (Black) connector [3] terminals.

**CONNECTION: White – Blue**

*Is there continuity?*

- YES** – GO TO STEP 6.  
**NO** – Open circuit in the White or Blue wire



**6. Failure Reproduction with a New Speed Sensor**

Replace the front wheel speed sensor with a new one (page 18-20)  
Connect the ABS modulator 16P (Black) and front wheel speed sensor 2P (Black) connectors.  
Erase the DTC (page 18-7).  
Test-ride the vehicle above 30 km/h (19 mph).  
Recheck the DTC (page 18-6).

*Is the DTC 1-1, 1-2, 2-1, 4-1 or 4-2 indicated?*

- YES** – Faulty ABS modulator  
**NO** – Faulty original wheel speed sensor

## ANTI-LOCK BRAKE SYSTEM (ABS)

### DTC 1-3 or 1-4 (VS Sensor Circuit/VS Sensor)

#### NOTE:

- The ABS indicator might blink under unusual riding conditions (page 18-9). This is temporary failure. Erase the DTC (page 18-7) and test-ride the vehicle above 30 km/h (19 mph). Recheck the DTC (page 18-6).

#### 1. VS Sensor Line Inspection 1

Turn the ignition switch OFF.  
Disconnect the following:

- ABS modulator 16P (Black) connector (page 18-8)
- VS sensor 3P (Black) connector (page 20-13)

Short the wire harness side ABS modulator 16P (Black) connector [1] terminals with a jumper wire [2].

**CONNECTION: 3 – 12**

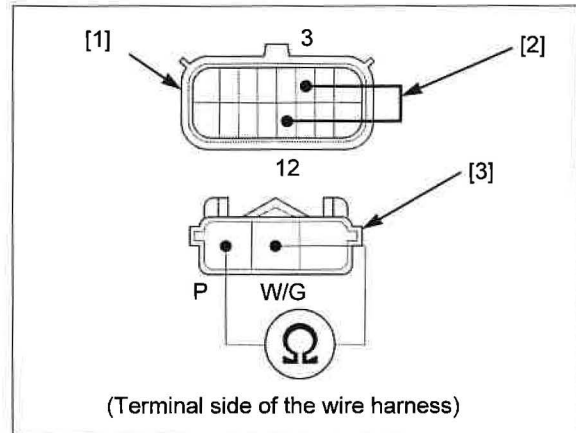
Check for continuity between the wire harness side VS sensor 3P (Black) connector [3] terminal.

**CONNECTION: Pink – White/green**

*Is there continuity?*

**YES** – GO TO STEP 2.

**NO** – Open circuit in the Pink or White/green wire



#### 2. VS Sensor Line Inspection 2

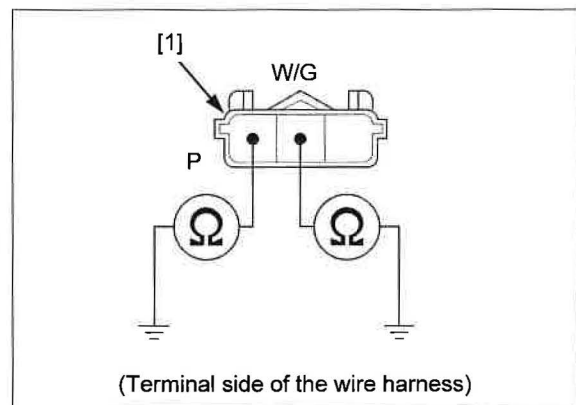
Disconnect the jumper wire.  
Check for continuity between the wire harness side VS sensor 3P (Black) connector [1] terminals and ground.

**CONNECTION: Pink – Ground  
White/green – Ground**

*Is there continuity?*

**YES** – Short circuit in the Pink or White/green wire

**NO** – GO TO STEP 3.



#### 3. VS Sensor Ground Line Inspection

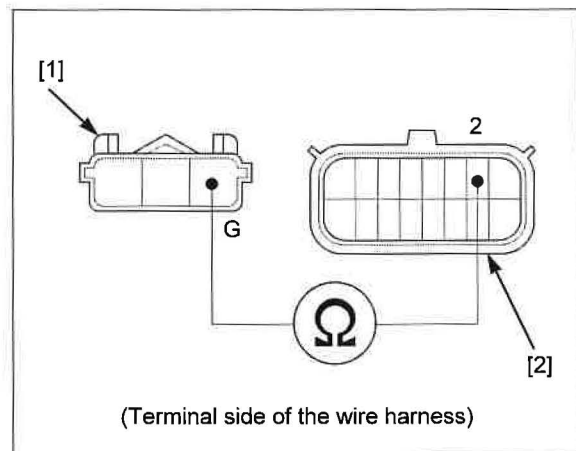
Check for continuity between the wire harness side VS sensor 3P (Black) connector [1] and ABS modulator 16P (Black) connector [2] terminals.

**CONNECTION: Green – 2**

*Is there continuity?*

**YES** – GO TO STEP 4.

**NO** – Open circuit in the Green wire



**4. Failure Reproduction with a New VS Sensor**

Replace the VS sensor with a new one (page 20-13).  
 Connect the ABS modulator 16P (Black) and VS sensor 3P (Black) connectors.  
 Erase the DTC (page 18-7).  
 Test-ride the vehicle above 30 km/h (19 mph).  
 Recheck the DTC (page 18-6).

**Is the DTC 1-3 or 1-4 indicated?**

- YES** – Faulty ABS modulator
- NO** – Faulty original VS sensor

**DTC 3-3 or 3-4 (Solenoid Valve Malfunction)**

**1. Failure Reproduction**

Erase the DTC (page 18-7).  
 Test-ride the vehicle above 30 km/h (19 mph).  
 Recheck the DTC (page 18-6).

**Is the DTC 3-3 or 3-4 indicated?**

- YES** – Faulty ABS modulator
- NO** – Solenoid valve is normal (intermittent failure).

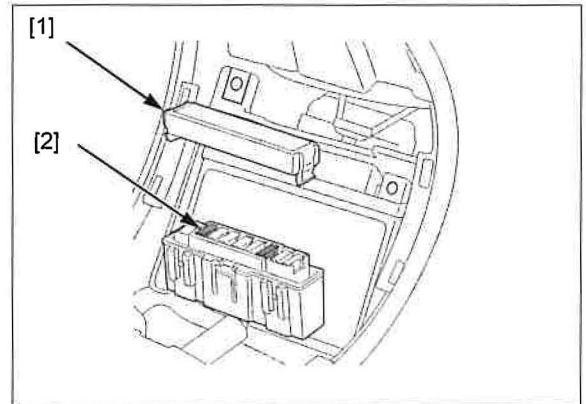
**DTC 5-1, 5-2, 5-3 or 5-4 (Pump Motor Lock/Power Supply Relay)**

**1. Fuse Inspection**

Turn the ignition switch OFF.  
 Remove the battery cover (page 19-5).  
 Open the fuse box cover [1].  
 Check the MAIN ABS fuse (15 A) [2] in the fuse box.

**Is the fuse blown?**

- YES** – GO TO STEP 2.
- NO** – GO TO STEP 3.



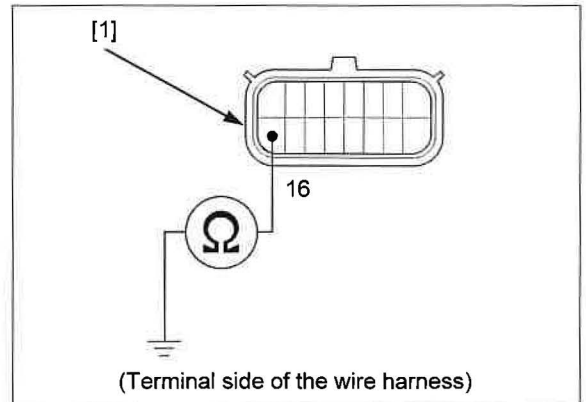
**2. Motor Power Input Line Short Circuit Inspection**

Disconnect the ABS modulator 16P (Black) connector (page 18-8).  
 With the MAIN ABS fuse (15 A) removed, check for continuity between the wire harness side ABS modulator 16P (Black) connector [1] terminal and ground.

**CONNECTION: 16 – Ground**

**Is there continuity?**

- YES** – Short circuit in the Red/black wire between the fuse box and ABS modulator 16P (Black) connector
- NO** – Intermittent failure. Replace the MAIN ABS fuse (15 A) with a new one, and recheck.



# ANTI-LOCK BRAKE SYSTEM (ABS)

## 3. Motor Power Input Line Open Circuit Inspection

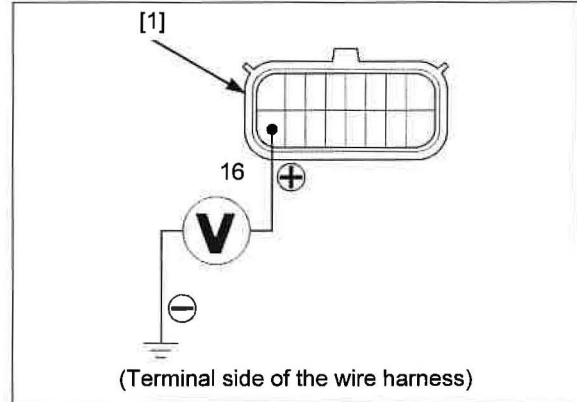
Install the ABS MAIN fuse (15 A).  
Disconnect the ABS modulator 16P (Black) connector.  
Measure the voltage between the wire harness side ABS modulator 16P (Black) connector [1] terminal and ground.

**CONNECTION: 16 (+) – Ground (-)**

*Is there battery voltage?*

**YES** – GO TO STEP 4.

**NO** – Open circuit in the Red/black or Red wire between the battery and ABS modulator 16P (Black) connector



## 4. Failure Reproduction

Turn the ignition switch OFF.  
Connect the ABS modulator 16P (Black) connector.  
Erase the DTC (page 18-7).  
Test-ride the vehicle above 30 km/h (19 mph).  
Recheck the DTC (page 18-6).

*Is the DTC 5-1, 5-2, 5-3 or 5-4 indicated?*

**YES** – Faulty ABS modulator

**NO** – Pump motor is normal (intermittent failure).

## DTC 6-1 or 6-2 (Power Circuit Under Voltage/Over Voltage)

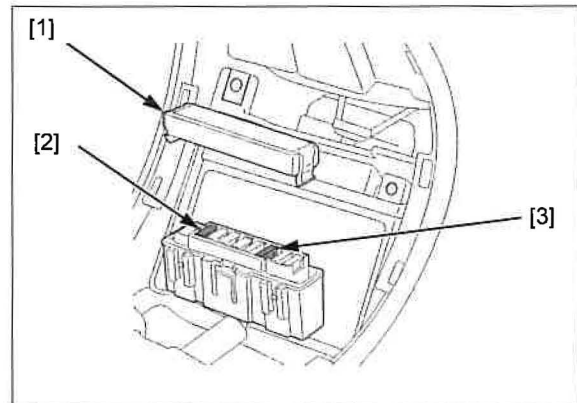
### 1. Fuse Inspection

Turn the ignition switch OFF.  
Remove the battery cover (page 19-5).  
Open the fuse box cover [1].  
Check the MAIN ABS fuse (15 A) [2] and SUB ABS fuse (10 A) [3] in the fuse box.

*Is the fuse(s) blown?*

**YES** – GO TO STEP 2.

**NO** – GO TO STEP 3.



### 2. Power Input Line Short Circuit Inspection

Disconnect the ABS modulator 16P (Black) connector (page 18-8).  
With the MAIN ABS fuse (15 A) and SUB ABS fuse (10 A) removed, check for continuity between the wire harness side ABS modulator 16P (Black) connector [1] and ground.

**TOOL:**

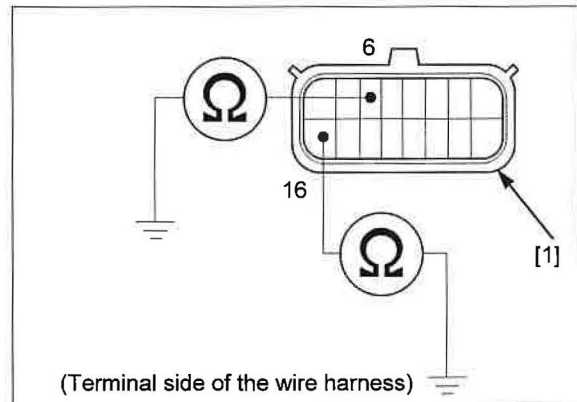
Test probe (2 pack)                      07ZAJ-RDJA110

**CONNECTION: 6 – Ground**  
**16 – Ground**

*Is there continuity?*

**YES** – Short circuit in Red/blue or Red/black wire

**NO** – Intermittent failure. Replace the MAIN ABS fuse (15 A) and/or SUB ABS fuse (10 A) with a new one, and recheck.



**3. Power Input Line Open Circuit Inspection**

Install the MAIN ABS fuse (15 A) and SUB ABS fuse (10 A).

Disconnect the ABS modulator 16P (Black) connector (page 18-8).

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

Measure the voltage between the wire harness side ABS modulator 16P (Black) connector [1] terminal and ground.

**TOOL:**

**Test probe (2 pack) 07ZAJ-RDJA110**

**CONNECTION: 6 (+) – Ground (-)  
16 (+) – Ground (-)**

**Is there battery voltage?**

**YES** – GO TO STEP 4.

**NO** – Open circuit in Red/blue or Red/black wire

**4. Failure Reproduction**

Turn the ignition switch OFF.

Connect the ABS modulator 16P (Black) connector.

Erase the DTC (page 18-7).

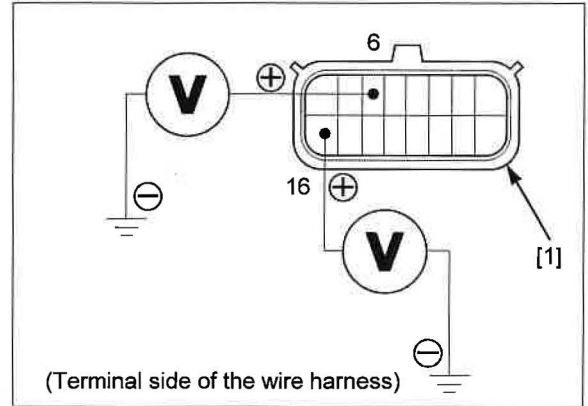
Test-ride the vehicle above 30 km/h (19 mph).

Recheck the DTC (page 18-6).

**Is the DTC 6-1 or 6-2 indicated?**

**YES** – Faulty ABS modulator

**NO** – Power circuit is normal (intermittent failure)



**DTC 7-1 (Tire Size)**

**NOTE:**

- Check the following and correct the faulty part.
  - Incorrect tire pressure.
  - Tires not recommended for the vehicle were installed (incorrect tire size).
  - Deformation of the wheel or tire.
  - Sprockets not recommended for the vehicle were installed. (incorrect sprocket gear ratio)

**1. Failure Reproduction**

If the above items are normal, recheck the DTC:

Erase the DTC (page 18-7).

Test-ride the vehicle above 30 km/h (19 mph).

Recheck the DTC (page 18-6).

**Is the DTC 7-1 indicated?**

**YES** – Faulty ABS modulator

**NO** – Tire size is normal (intermittent failure)

**DTC 8-1 (ABS Control Unit)**

**1. Failure Reproduction**

Erase the DTC (page 18-7).

Test-ride the vehicle above 30 km/h (19 mph).

Recheck the DTC (page 18-6).

**Is the DTC 8-1 indicated?**

**YES** – Faulty ABS modulator

**NO** – ABS control unit is normal (intermittent failure)



## ANTI-LOCK BRAKE SYSTEM (ABS)

### FRONT WHEEL SPEED SENSOR

#### AIR GAP INSPECTION

Support the vehicle securely using a hoist or equivalent and raise the wheel off the ground.

Measure the clearance (air gap) between the fork bracket and pulser ring at several points by turning the wheel slowly.

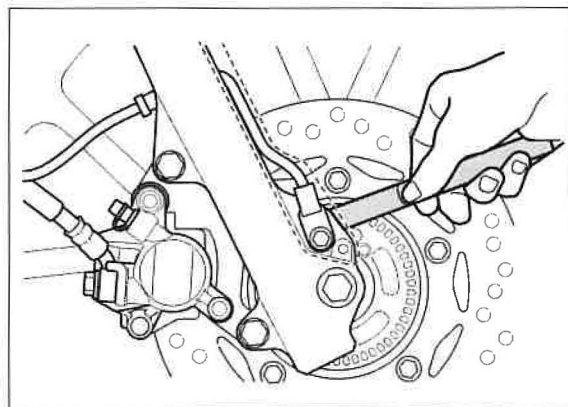
It must be within specification.

**STANDARD: 0.1 – 1.4 mm (0.004 – 0.055 in)**

The clearance (air gap) cannot be adjusted. If it is not within specification, check each part for deformation, looseness or damage.

Check the wheel speed sensor for damage, and replace if necessary.

Check the pulser ring for deformation or damage, and replace if necessary.



#### REMOVAL/INSTALLATION

Remove the wheel speed sensor cover (page 2-18).

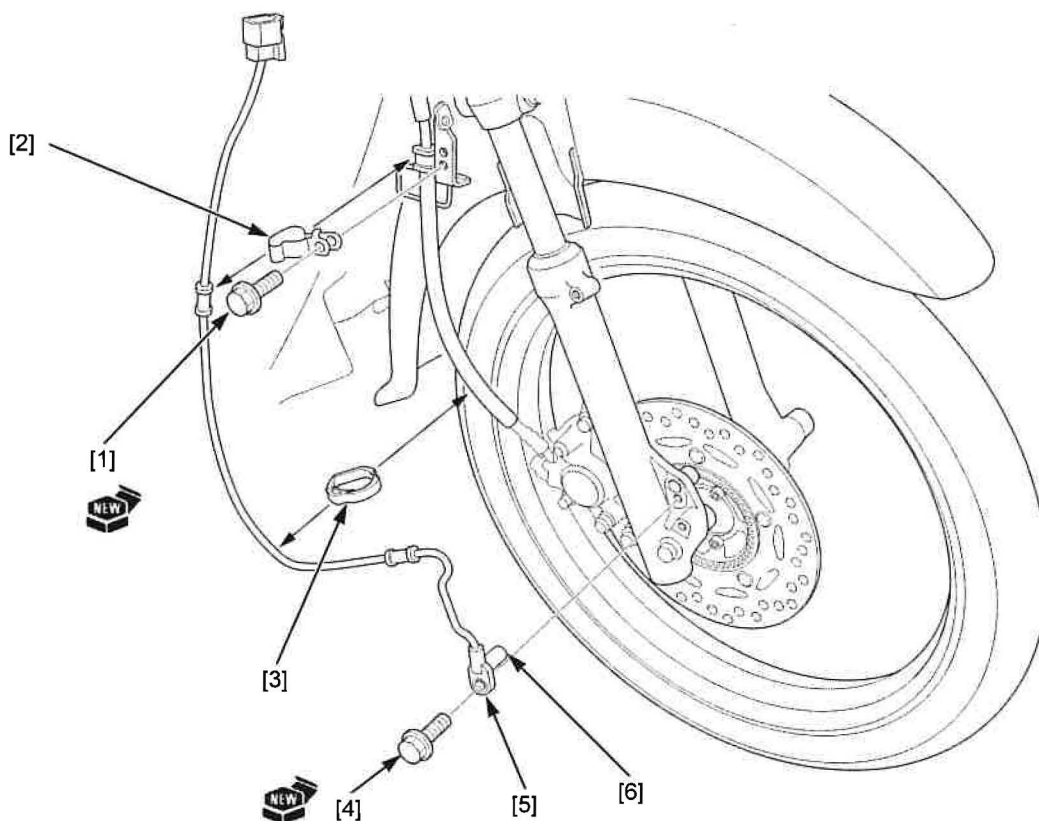
Remove the wire clamp bolt [1], wire clamp [2], wire clip [3], front wheel speed sensor mounting bolt [4] and front wheel speed sensor [5] from the right fork leg.

Wipe the sensor tip [6] and mounting area to remove any foreign material.

Installation is in the reverse order of removal.

#### NOTE:

- Replace the front wheel speed sensor mounting bolt and the wire clamp bolt with a new ones.
- After installation, check the air gap (page 18-20).



## ABS MODULATOR

### REMOVAL/INSTALLATION

Drain the front brake line hydraulic system (page 17-5).

Remove the Fuel tank (page 7-11)

Release the brake pipe clamps [1].

Remove the two bolts [2] and slide the battery box [3].

*When loosening the joint nuts, cover the ends of the brake pipes to prevent contamination. Be careful not to bend or damage the brake pipes.*

Loosen the brake pipe joint nuts [4] and disconnect the pipes [5] from the ABS modulator [6].

Remove the bolts [7] and collars [8].

Disconnect the ABS modulator 16P (Black) connector [9] and release the wire clip [10].

Remove the bolts [11] and bracket [12] from the modulator.

Installation is in the reverse order of removal.

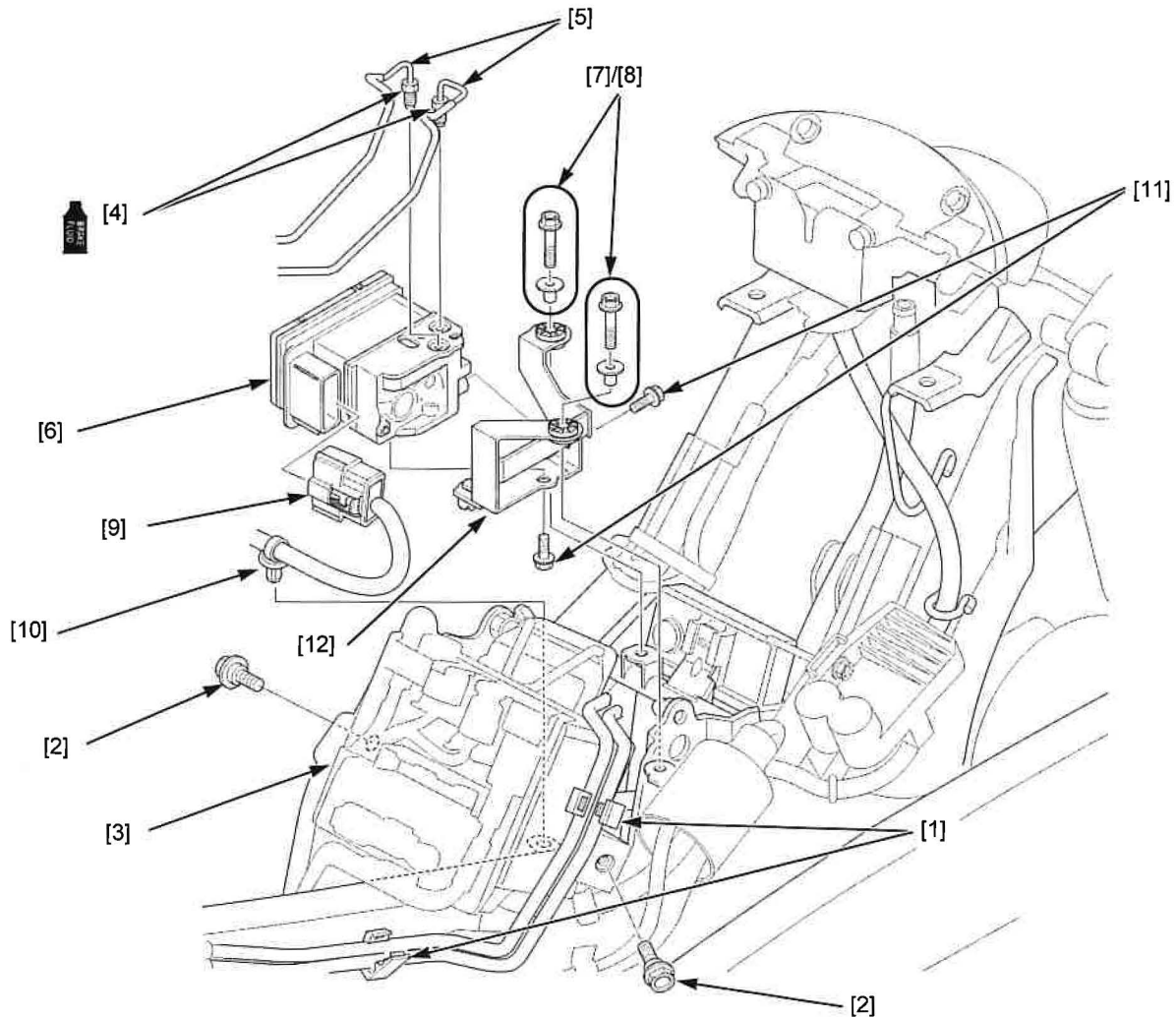
### TORQUE:

**Brake pipe joint nut:**

**14 N·m (1.4 kgf·m, 10 lbf·ft)**

- Apply brake fluid to the brake pipe joint nut threads.

Fill and bleed the front brake line hydraulic system (page 17-5).



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**MEMO**

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# 19. BATTERY/CHARGING SYSTEM

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<b>SERVICE INFORMATION</b> .....	<b>19-2</b>	<b>BATTERY</b> .....	<b>19-5</b>
<b>TROUBLESHOOTING</b> .....	<b>19-3</b>	<b>CHARGING SYSTEM INSPECTION</b> .....	<b>19-6</b>
<b>SYSTEM LOCATION</b> .....	<b>19-4</b>	<b>ALTERNATOR CHARGING COIL</b> .....	<b>19-7</b>
<b>SYSTEM DIAGRAM</b> .....	<b>19-4</b>	<b>REGULATOR/RECTIFIER</b> .....	<b>19-7</b>

## 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 call a physician immediately.

### NOTICE

- Always turn OFF the ignition switch before disconnecting any electrical component.
- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON position and current is present.
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For a battery remaining in a stored vehicle, disconnect the negative battery cable from the battery terminal.
- The maintenance free (MF) battery must be replaced when it reaches the end of its service life.
- The battery can be damaged if overcharged or undercharged, or if left to discharge for long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2 – 3 years.
- Battery voltage may recover after battery charging, but under heavy load, the 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 turn signal and brake lights on for long periods of time without riding the vehicle.
- The battery will self-discharge when the vehicle is not in use. For this reason, charge the battery every two weeks to prevent sulfation from occurring.
- When checking the charging system, always follow the steps in the troubleshooting (page 19-3).
- For alternator service (page 12-4).

## 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 that the actual battery condition during load can be measured.

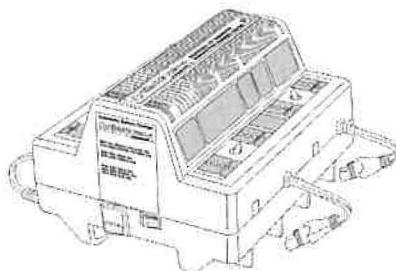
**Recommended battery tester:** Honda MDX-604P Battery Tester

## TOOLS

Motorcycle Battery Tester  
Honda MDX-604P (U.S.A. only)



Optimate PRO-4 Battery Charger  
TMNTS53 (U.S.A. only)



## TROUBLESHOOTING

### BATTERY IS DAMAGED OR WEAK

#### 1. BATTERY TEST

Remove the battery (page 19-5).

Check the battery condition using a recommended battery tester.

**RECOMMENDED BATTERY TESTER:** Honda MDX-604P Battery Tester (U.S.A. only).

*Is the battery in good condition?*

**YES** – GO TO STEP 2.

**NO** – Faulty battery

#### 2. CURRENT LEAKAGE TEST

Install the battery (page 19-5).

Check the battery current leakage test (Leak test; (page 19-6)).

*Is the current leakage below 0.9 mA?*

**YES** – GO TO STEP 4.

**NO** – GO TO STEP 3.

#### 3. CURRENT LEAKAGE TEST WITHOUT REGULATOR/RECTIFIER CONNECTED

Disconnect the regulator/rectifier 6P connector and recheck the battery current leakage.

*Is the current leakage below 0.9 mA?*

**YES** – Faulty regulator/rectifier

**NO** – • Shorted wire harness  
• Faulty ignition switch

#### 4. CHARGING VOLTAGE INSPECTION

Measure and record the battery voltage using a digital multimeter (page 19-5).

Start the engine.

Measure the charging voltage (page 19-6).

Compare the measurements to the results of the following calculation.

**STANDARD:**

**Measured BV < Measured CV < 15.5 V**

- **BV = Battery Voltage**
- **CV = Charging Voltage**

*Is the measured charging voltage within the standard voltage?*

**YES** – Faulty battery

**NO** – GO TO STEP 5.

#### 5. ALTERNATOR CHARGING COIL INSPECTION

Check the alternator charging coil (page 19-7).

*Is the alternator charging coil resistance within 0.2 – 1.0  $\Omega$  (20°C/68°F)?*

**YES** – GO TO STEP 6.

**NO** – Faulty charging coil

#### 6. REGULATOR/RECTIFIER SYSTEM INSPECTION

Check the voltage and resistance at the regulator/rectifier 6P connector (page 19-7).

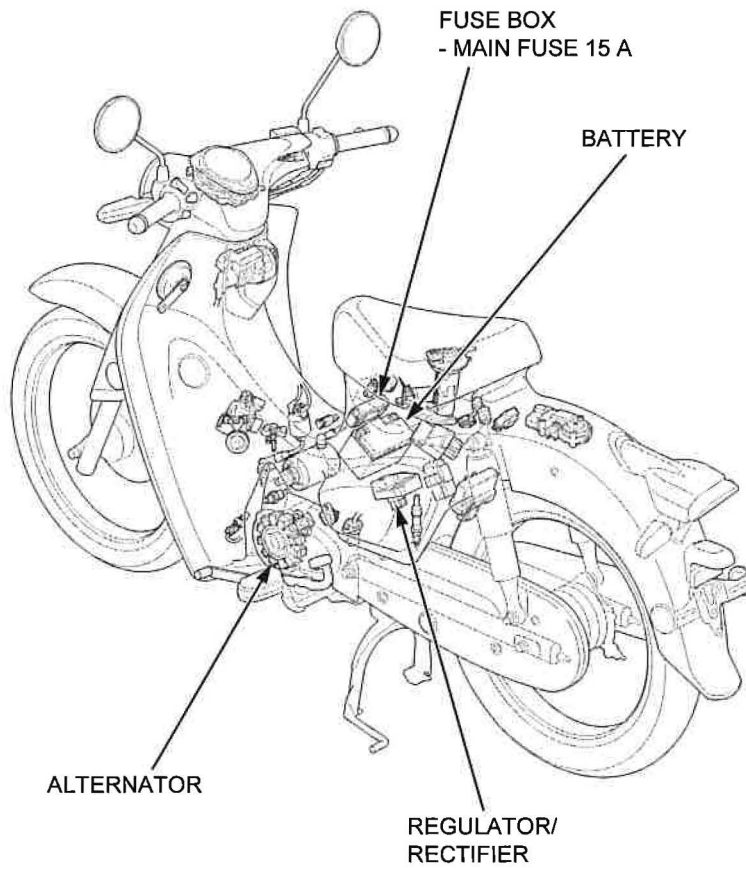
*Are the measurements correct?*

**YES** – Faulty regulator/rectifier

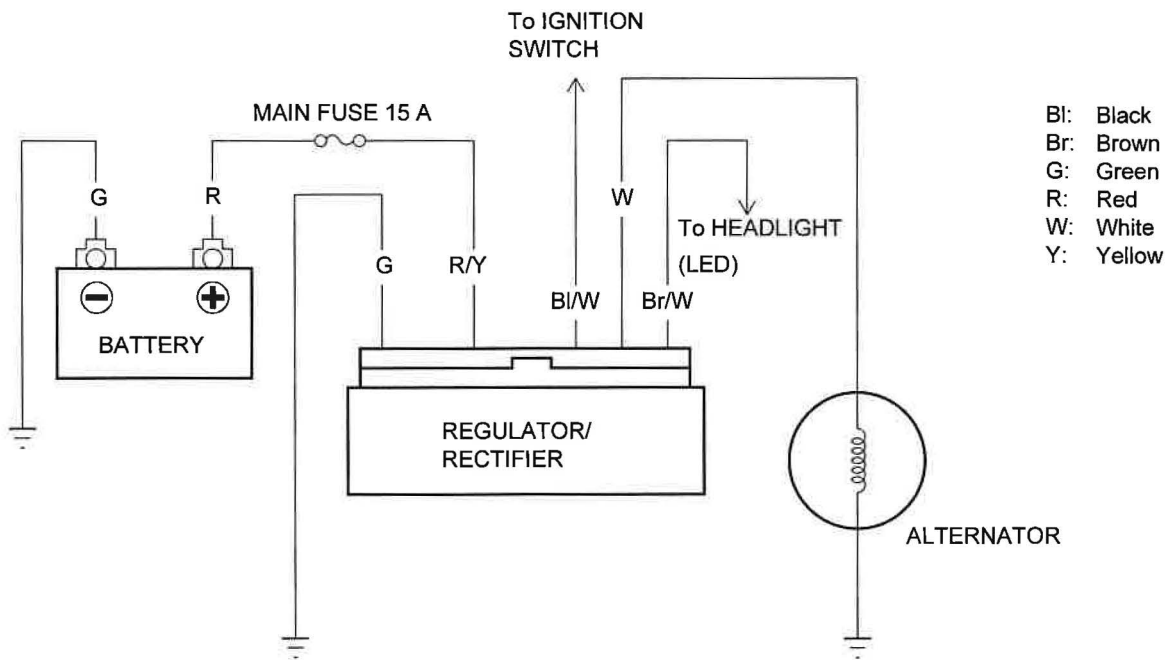
**NO** – • Open circuit in related wire  
• Loose or poor contacts of related terminal  
• Shorted wire harness

# BATTERY/CHARGING SYSTEM

## SYSTEM LOCATION



## SYSTEM DIAGRAM



# BATTERY

## REMOVAL/INSTALLATION

- Always turn the ignition switch OFF before removing the battery.

Remove the center cover (page 2-10).

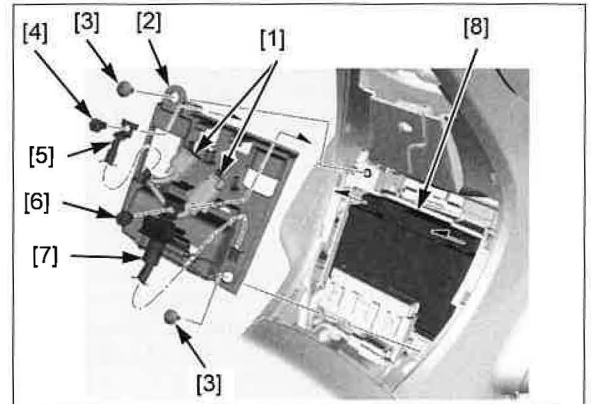
Remove the couplers [1] from the battery cover [2]. Move the battery cover upward by removing the bolts [3].

Remove the terminal bolt [4] and disconnect the battery negative (-) terminal [5].

Remove the terminal bolt [6] and disconnect the battery positive (+) terminal [7].

Remove the battery cover.

Remove the battery [8] taking care not to drop the terminal nuts.



Installation is in the reverse order of removal.

- Always disconnect the negative (-) terminal first.
- Connect the positive (+) cable to the battery first, then connect the negative (-) cable.

## VOLTAGE INSPECTION

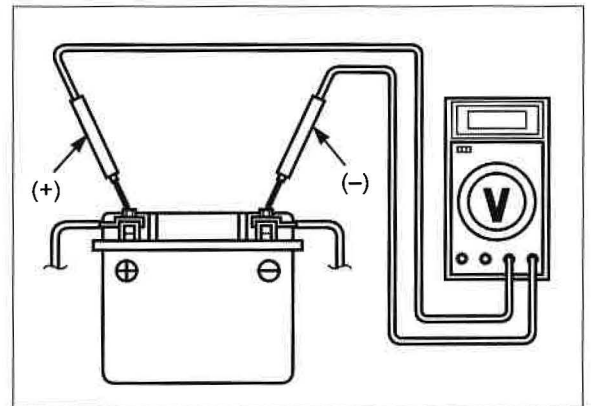
Measure the battery voltage using a commercially available digital multimeter.

**VOLTAGE (20°C/68°F):**

**Fully charged: 13.0 – 13.2 V**  
**Needs charging: Below 12.3 V**

**NOTE:**

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



## BATTERY TESTING

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

**TOOL:**

**Battery tester: Honda MDX-604P Battery Tester**

## BATTERY CHARGING (U.S.A. only)

Remove the battery (page 18-5).

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

**TOOL:**

**Battery charger Optimate PRO-4 Battery Charger TMNTS53 (U.S.A. only)**



## CHARGING SYSTEM INSPECTION

### CURRENT LEAKAGE TEST

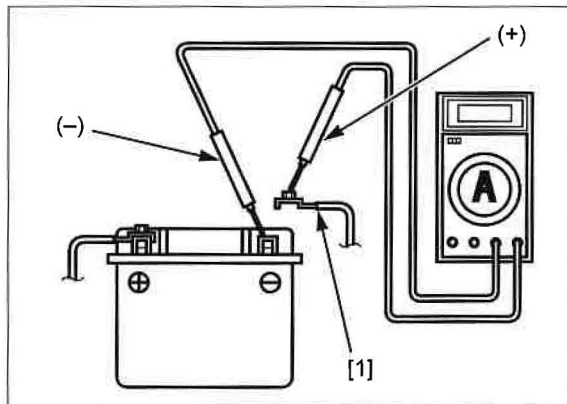
Remove the battery cover (page 19-5).

Turn the ignition switch OFF and disconnect the negative (-) cable [1] from the battery.

Connect the ammeter (+) probe to the negative cable and the ammeter (-) probe to the battery (-) terminal. With the ignition switch OFF, check for current leakage.

#### NOTE:

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow the fuse in the tester.
- While measuring current, do not turn the ignition switch ON. A sudden surge of current may blow the fuse in the tester.



**SPECIFIED CURRENT LEAKAGE: 0.9 mA max.**

If current leakage exceeds the specified value, a shorted circuit is the probable cause.

Locate the short by disconnecting connections one by one and measuring the current.

### CHARGING VOLTAGE INSPECTION

Remove the battery cover (page 19-5).

#### NOTE:

Make sure the battery is in good condition before performing this inspection.

Warm up the engine to normal operating temperature. Stop the engine and connect the multimeter as shown.

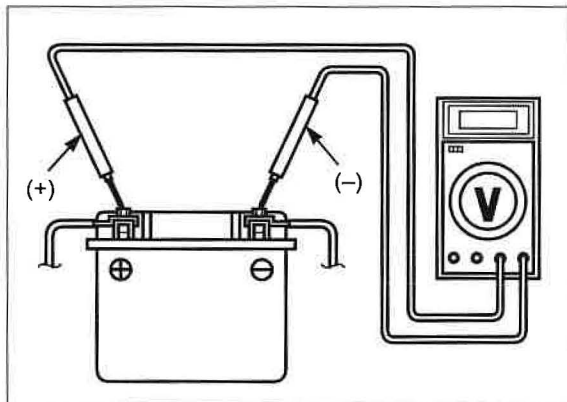
#### NOTE:

To prevent a short, make absolutely certain which are the positive and negative terminals or cables.

Connect a tachometer according to its manufacturer's instructions.

Restart the engine.

Measure the voltage on the multimeter when the engine runs at 5,000 min<sup>-1</sup>.



*Do not disconnect the battery or any cable in the charging system without first switching OFF the ignition switch. Failure to follow this precaution can damage the tester or electrical components.*

#### STANDARD:

**Measured BV < Measured CV < 15.5 V**

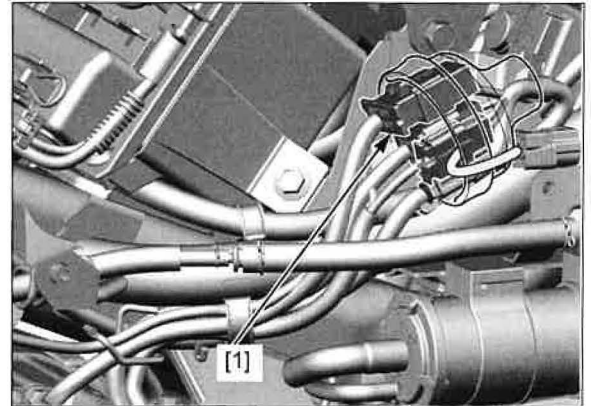
- **BV = Battery Voltage (page 19-5)**
- **CV = Charging Voltage**

## ALTERNATOR CHARGING COIL

### INSPECTION

Remove the left body cover (page 2-13).

Disconnect the alternator/CKP sensor 4P connector [1].



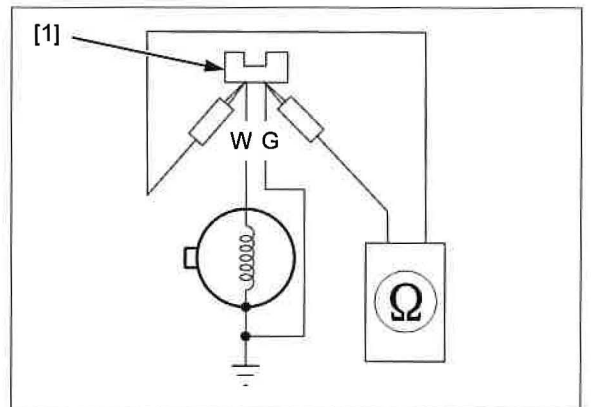
Check the resistance between the alternator/CKP sensor 4P connector [1] White and Green wire terminals of the alternator side.

**STANDARD: 0.2 – 1.0 Ω (at 20°C/68°F)**

Replace the stator if the resistance is out of specification.

For stator removal (page 12-4).

Install the removed parts in the reverse order of removal.



## REGULATOR/RECTIFIER

### SYSTEM INSPECTION

Remove the left body cover (page 2-13).

Turn the ignition switch OFF.

Disconnect the regulator/rectifier 6P connector [1].

Check it for loose contact or corroded terminals.

If the charging voltage reading (page 19-6) is out of the specification, inspect the regulator/rectifier connector terminals (wire harness side) as follows:

Item	Terminal	Specification
Battery charging line	Red/yellow (+) and Ground (-)	Battery voltage should appear
Charging coil line	White and Green	0.2 – 1.0 Ω (at 20°C/68°F)
Ground line	Green and Ground	Continuity should exist



If all components of the charging system is normal and there are no loose connections at the regulator/rectifier connector, replace the regulator/rectifier unit.

Install the left body cover (page 2-13).

## BATTERY/CHARGING SYSTEM

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### REMOVAL/INSTALLATION

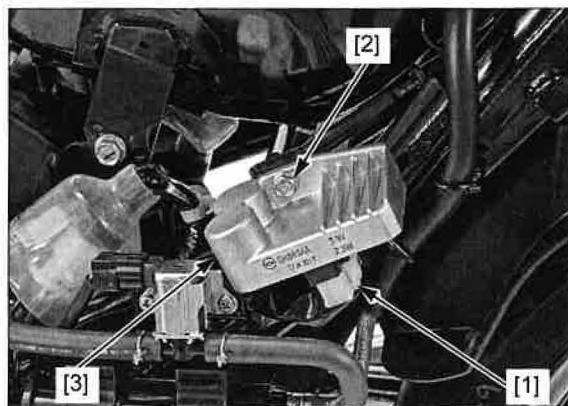
Remove the left body cover (page 2-13).

Turn the ignition switch OFF.

Disconnect the regulator/rectifier 6P connector [1].

Remove the bolt [2] and regulator/rectifier [3] from the frame.

Installation is in the reverse order of removal.



# 20. LIGHTS/METERS/SWITCHES

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SERVICE INFORMATION .....	20-2	HANDLEBAR SWITCHES .....	20-10
SYSTEM LOCATION .....	20-2	BRAKE LIGHT SWITCH .....	20-10
HEADLIGHT .....	20-3	GEAR POSITION SWITCH .....	20-11
BRAKE/TAILLIGHT .....	20-5	VS SENSOR .....	20-12
TURN SIGNAL LIGHT .....	20-5	HORN .....	20-13
LICENSE LIGHT .....	20-7	FUEL GAUGE/FUEL LEVEL SENSOR ..	20-14
COMBINATION METER .....	20-7	TURN SIGNAL RELAY .....	20-16

## LIGHTS/METERS/SWITCHES

---

### SERVICE INFORMATION

#### GENERAL

- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the vehicle.
- The following color codes are used throughout this section.

Bu = Blue

G = Green

Lg = Light green

R = Red

Bl = Black

Gr = Gray

O = Orange

W = White

Br = Brown

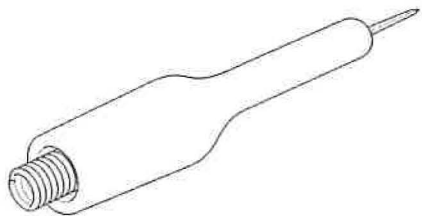
Lb = Light blue

P = Pink

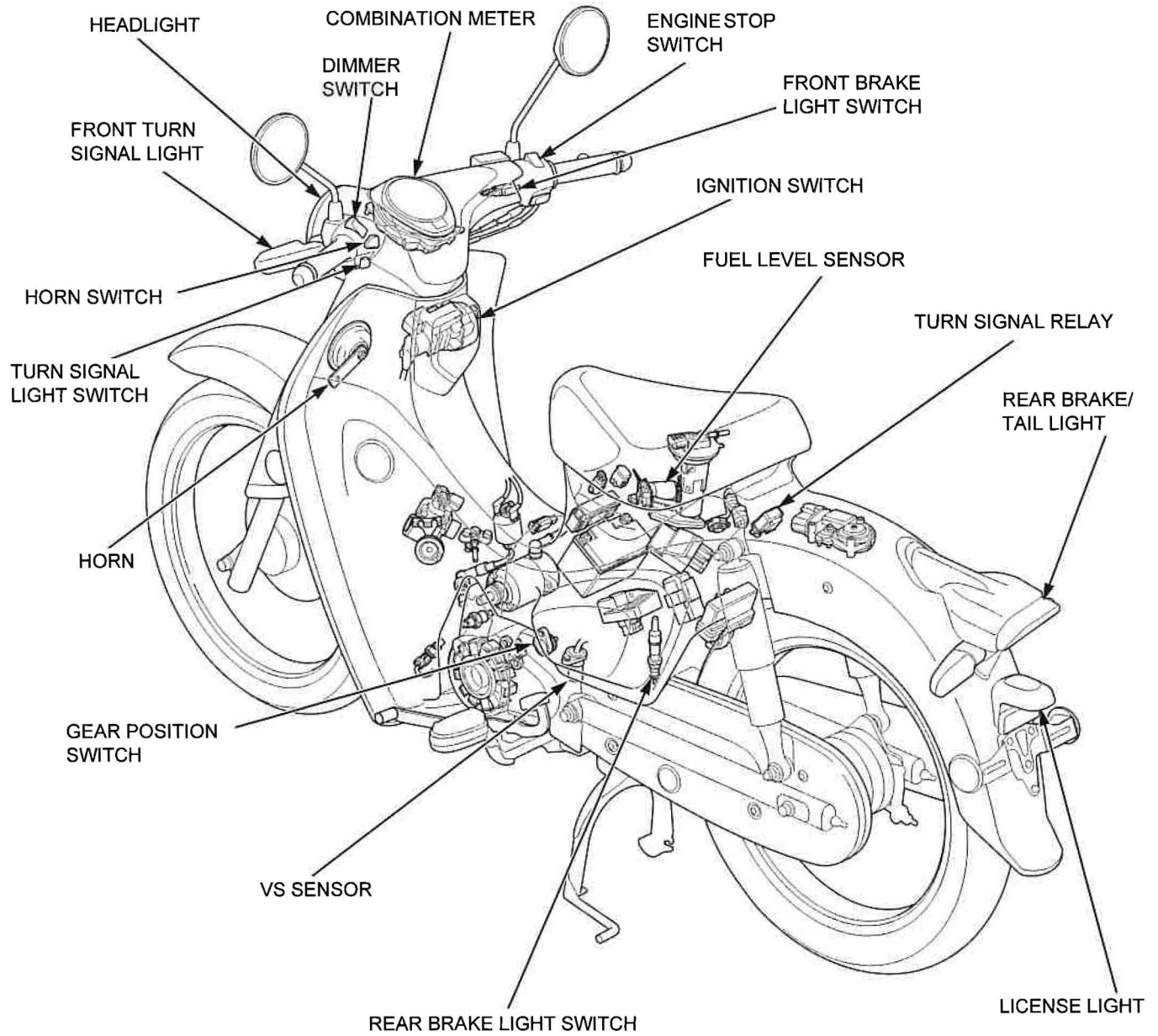
Y = Yellow

#### TOOLS

Test Probe (2 pack)  
07ZAJ-RDJA110



SYSTEM LOCATION



## HEADLIGHT

### REMOVAL/INSTALLATION

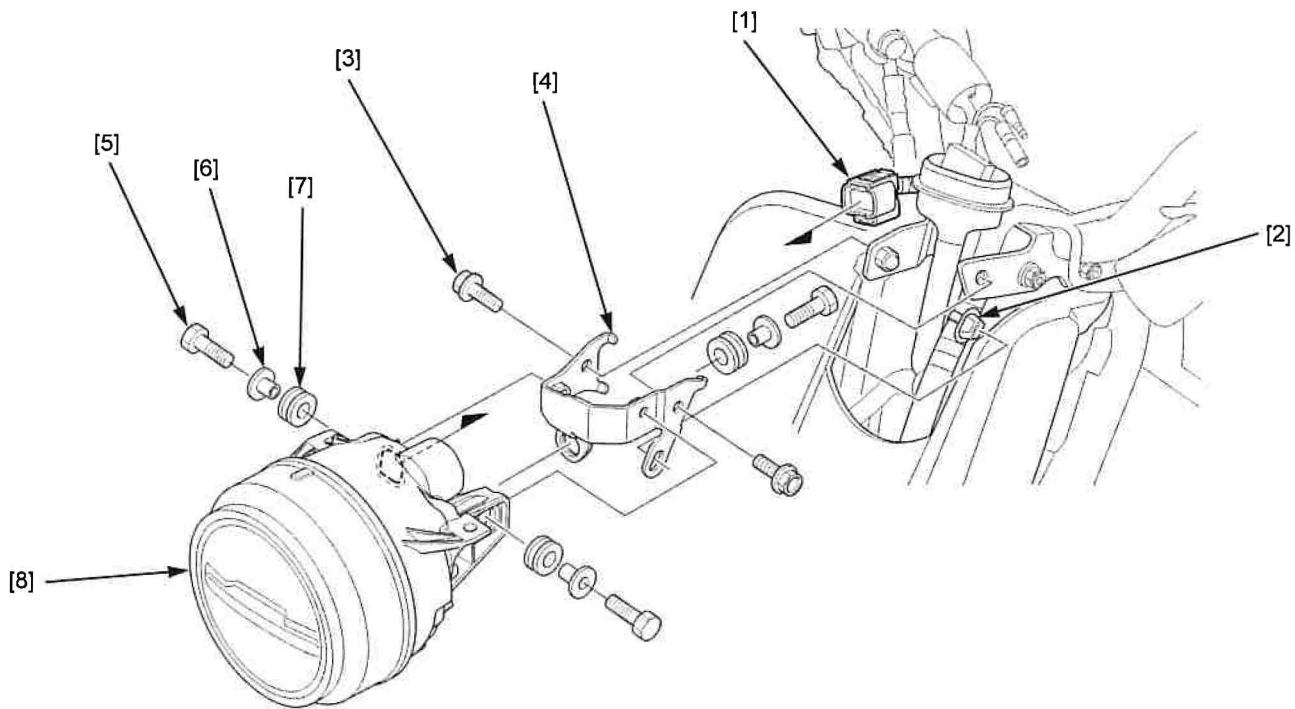
Remove the handlebar lower cover (page 2-8).

Disconnect the headlight 8P (Gray) connector [1]

Remove the following:

- Wire clip [2]
- Two flange bolt [3]
- Headlight bracket [4]
- Three bolts [5]
- Three collars [6]
- Three grommets [7]
- Headlight unit [8]

Installation is in the reverse order of removal.



## HEADLIGHT TROUBLESHOOTING

### HEADLIGHT DOES NOT TURN ON WHEN THE ENGINE IS STARTED

#### 1. Headlight Input Voltage Inspection

Disconnect the headlight 8P (Gray) connector (page 20-4).

Turn the ignition switch ON and start the engine. Measure the voltage between the wire harness side headlight 8P (Gray) connector [1] terminals.

**TOOL:**

Test Probe (2 pack)                      07ZAJ-RDJA110

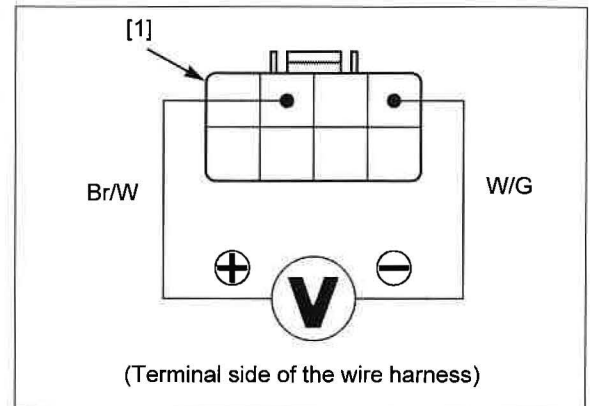
**CONNECTION:**

Brown/white (+) – White/green (–)

*Is the voltage above 18 V?*

**YES** – Faulty headlight

**NO** – GO TO STEP 2.



#### 2. Headlight Power Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the regulator/rectifier 6P connector (page 19-7).

Check the continuity between the wire harness side headlight 8P (Gray) connector [1] and regulator/rectifier 6P connector [2].

**TOOL:**

Test Probe (2 pack)                      07ZAJ-RDJA110

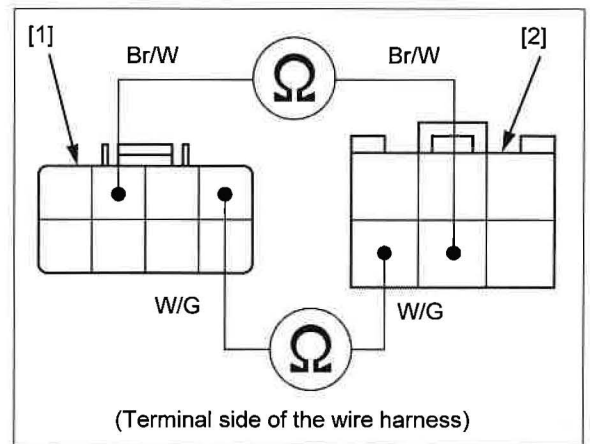
**CONNECTION:**

Brown/white – Brown/white  
White/green – White/green

*Is there continuity?*

**YES** – GO TO STEP 3.

**NO** – Open circuit in Brown/white or White/green wire



#### 3. Regulator/Rectifier Line Open Circuit Inspection

Disconnect the alternator/CKP sensor 4P connector (page 12-4).

Check the continuity between the regulator/rectifier 6P connector [1] and alternator/CKP sensor 4P connector [2].

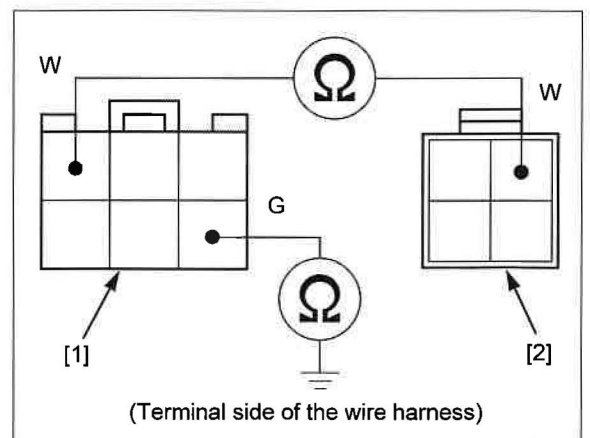
**CONNECTION:**

White – White  
Green – Ground

*Is there continuity?*

**YES** – GO TO STEP 4.

**NO** – Open circuit in White or Green wire



#### 4. Alternator Inspection

Inspect the alternator charging coil (page 19-7).

*Is the resistance 0.2 - 1.0 Ω (20°C/68°F)?*

**YES** – Faulty regulator/rectifier

**NO** – Faulty alternator charging coil.



## LIGHTS/METERS/SWITCHES

### Headlight Flickers

- Faulty regulator/rectifier
- Faulty headlight

### Headlight High Beam or Low Beam Does Not Turn On When the Engine Is Running And Dimmer Switch Is Operated

- Open circuit in White/green wire between the regulator rectifier and headlight
- Faulty regulator/rectifier
- Faulty headlight
- Faulty dimmer switch

### High Beam Does Not Turn On When the Dimmer Switch Is Operated

- Open circuit in White or White/black wire between the dimmer switch and headlight
- Faulty regulator/rectifier
- Faulty headlight
- Faulty dimmer switch

## BRAKE/TAILLIGHT

### REMOVAL/INSTALLATION

Remove the rear fender (page 2-15).

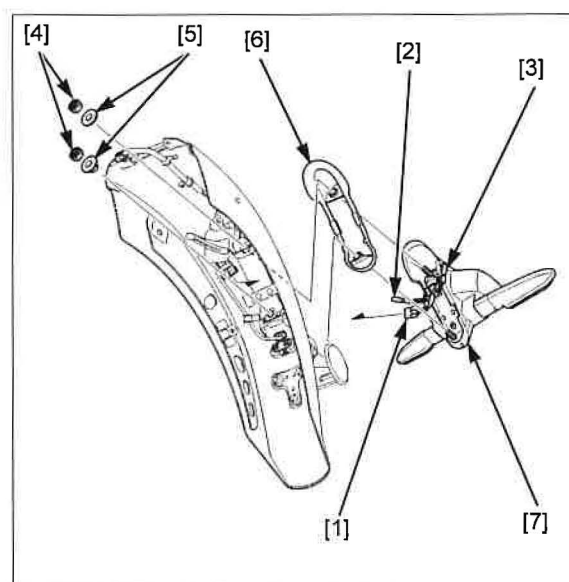
Disconnect the following:

- Brake/taillight 3P connector [1]
- Right rear turn signal light connectors [2]
- Left rear turn signal light connectors [3]

Remove the following:

- Two nuts [4]
- Two collars [5]
- Taillight light mounting rubber [6]
- Brake/taillight unit [7]

Installation is in the reverse order of removal.



## TURN SIGNAL LIGHT

### REMOVAL/INSTALLATION

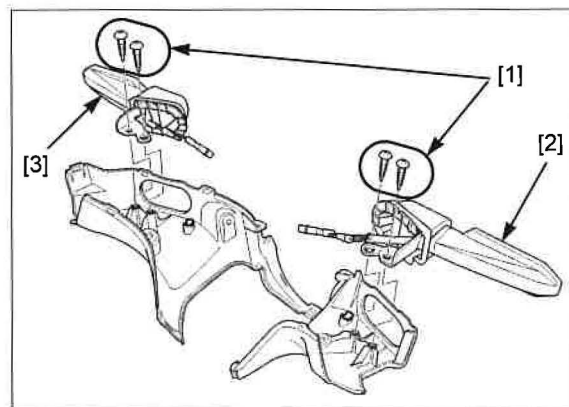
#### FRONT:

Remove the handlebar lower cover (page 2-8).

Remove the following:

- Four screws [1]
- Right front turn signal light [2]
- Left front turn signal light [3]

Installation is in the reverse order of removal.



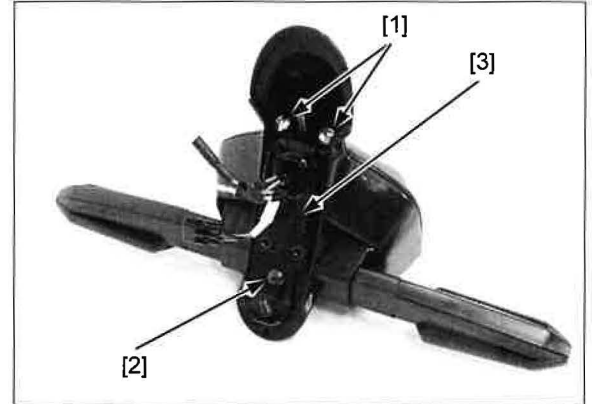
**REAR:**

Remove the following:

- Rear fender (page 2-15)
- Brake/taillight (page 20-6)

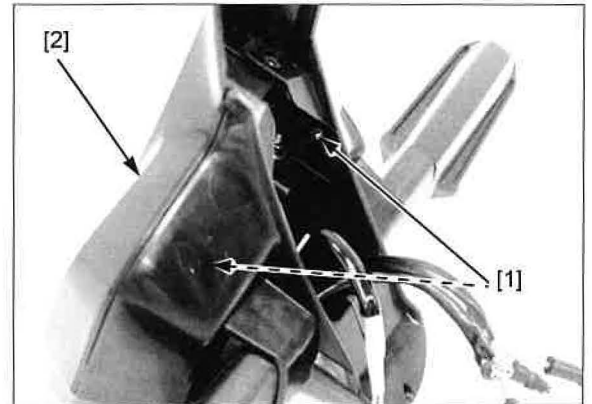
Remove the following:

- Two socket bolts [1]
- Screw [2]
- Taillight stay [3]



Remove the following:

- Two screws [1]
- Taillight upper cover [2]



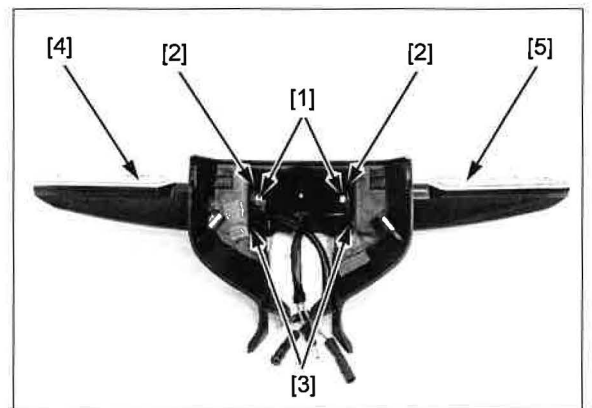
Remove the following:

- Two nuts [1]
- Turn signal light brackets [2]
- Turn signal light mounting rubbers [3]
- Right rear turn signal light [4]
- Left rear turn signal light [5]

Installation is in the reverse order of removal.

**TORQUE:**

**Rear turn signal mounting nut:** 9.0 N·m  
(0.9 kgf·m, 6.6 lbf·ft)



### LICENSE LIGHT

#### REMOVAL/INSTALLATION

Remove the rear fender (page 2-15).

Disconnect the license light 2P connector [1]

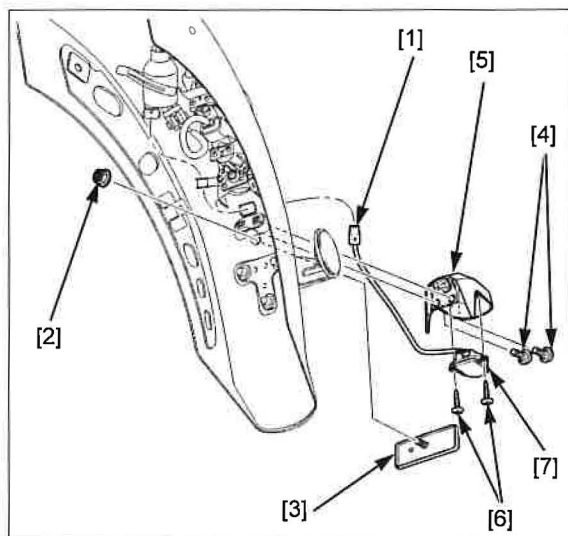
Remove the following:

- Nut [2]
- Reflector [3]
- Two special screws [4]
- License light cover [5]
- Two screws [6]
- License light unit [7]

Installation is in the reverse order of removal.

#### TORQUE:

License light mounting screw:  
0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)



### COMBINATION METER

#### SYSTEM INSPECTION

##### NOTE:

Check for loose or poor contact terminals at the combination meter 20P (Gray) connector.

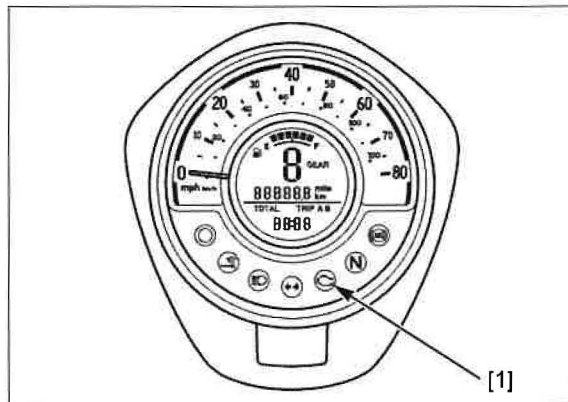
When the ignition switch is turned ON, the combination meter will show the entire digital display.

##### NOTE:

- If the MIL [1] stays on but no DTCs set and it does not go off, refer to MIL circuit troubleshooting (page 4-30).

If the digital display does not function at all, inspect the combination meter power/ground line (page 20-8).

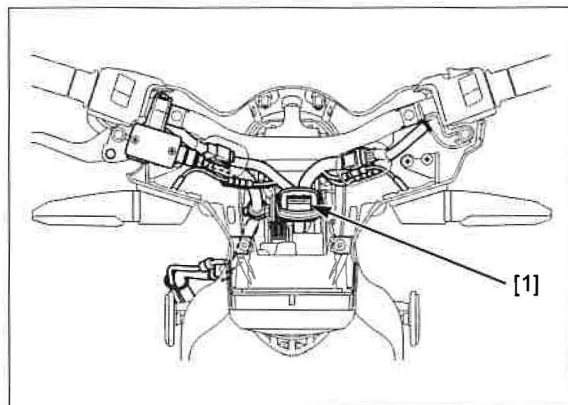
If the power and ground lines are OK, replace the combination meter (page 2-6).



#### POWER/GROUND LINES INSPECTION

Remove the handlebar upper cover (page 2-6).

Check the following at the wire harness side connector [1] of the combination meter.



**POWER INPUT LINE**

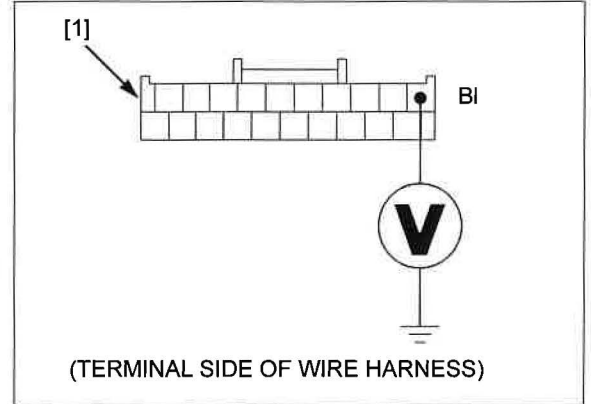
Measure the voltage between the combination meter 20P (Gray) connector [1] and ground.

**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 Red wire between the fuse box and ignition switch
- Blown MAIN fuse (15 A)
- Blown DC fuse (10 A)



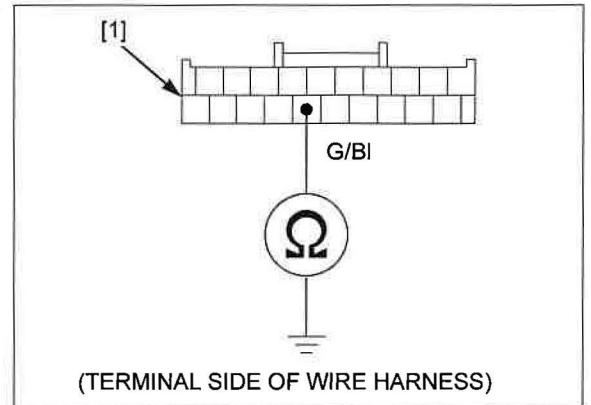
**GROUND LINE**

Check for continuity between the combination meter 20P (Gray) connector [1] and ground.

**CONNECTION: Green/black – Ground**

There should be continuity at all times.

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



**BACK-UP VOLTAGE LINE**

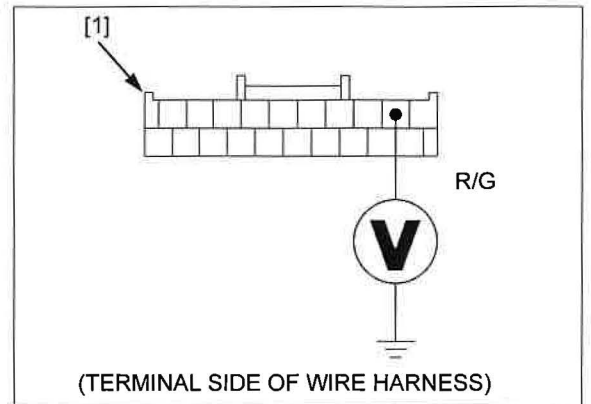
Measure the voltage between the combination meter 20P (Gray) connector [1] and ground.

**CONNECTION: Red/green (+) – Ground (-)**

There should be battery voltage at all times.

If there is no battery voltage, check the following:

- Open circuit in the Red/green wire
- Blown BACKUP fuse (10 A)
- Open circuit in Red wire between the fuse box and battery



## LIGHTS/METERS/SWITCHES

### REMOVAL/INSTALLATION

#### NOTE:

- For combination meter removal/installation, refer to FRAME/BODY PANELS/EXHAUST System section (page 2-6)

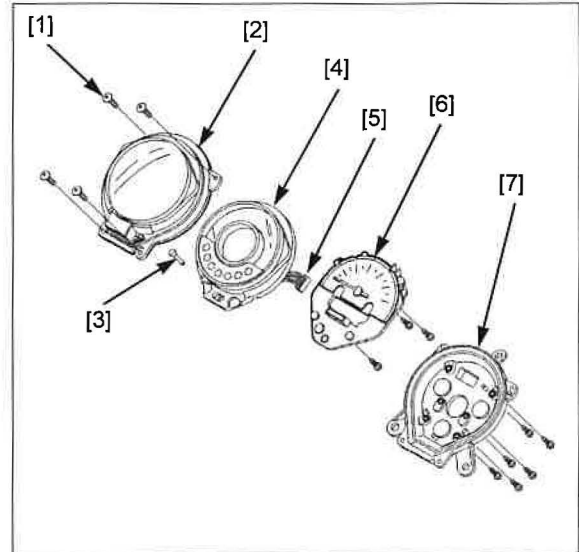
### DISASSEMBLY/ASSEMBLY

Remove the combination meter (page 2-6)

Remove the following:

- Thirteen screws [1]
- Meter cover [2]
- Key top shaft [3]
- Reflecting plate [4] (disconnect connector [5])
- Combination meter [6]
- Meter case [7]

Installation is in the reverse order of removal.



### DIGITAL CLOCK SETTING PROCEDURE

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

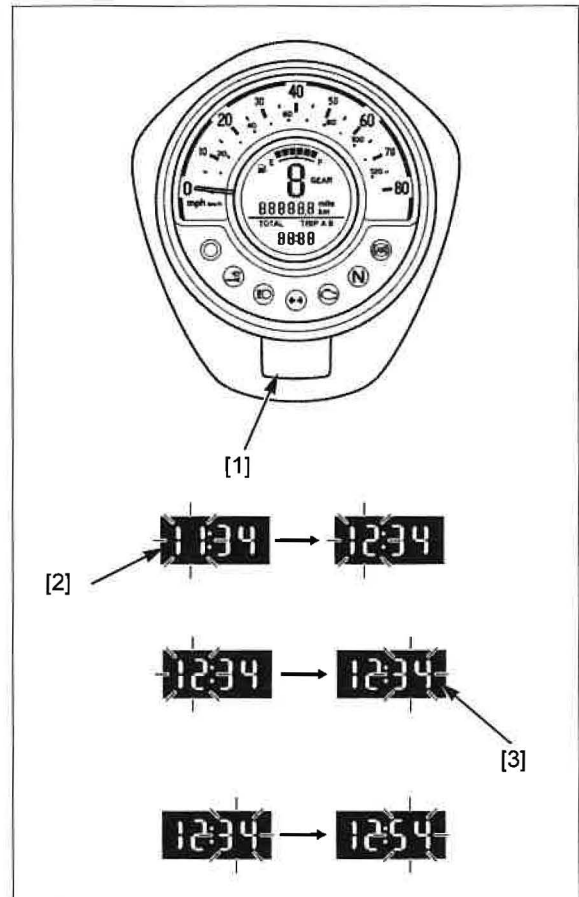
With odometer displayed, press and hold the mode button [1], the hour digits start flashing [2].

Press the mode button until the desired hour is displayed.

Press and hold the mode button, the minute digits start flashing [3].

Press the mode button until the desired minute is displayed.

Press and hold the mode button. The clock is set, and then the display moves to the changing of mileage unit.



## HANDLEBAR SWITCHES

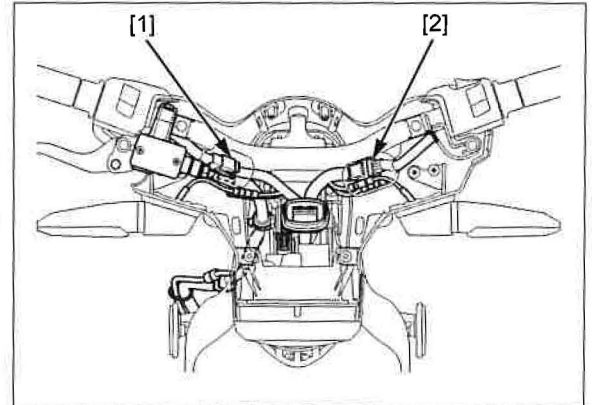
Remove the handlebar upper cover (page 2-6).

Disconnect the following connectors:

- Right handlebar switch 9P connector [1]
- Left handlebar 8P (Black) connector [2]

Check for continuity between the connector terminals in each switch position according to the chart (page 22-2).

Install the removed parts in the reverse order of removal.



## BRAKE LIGHT SWITCH

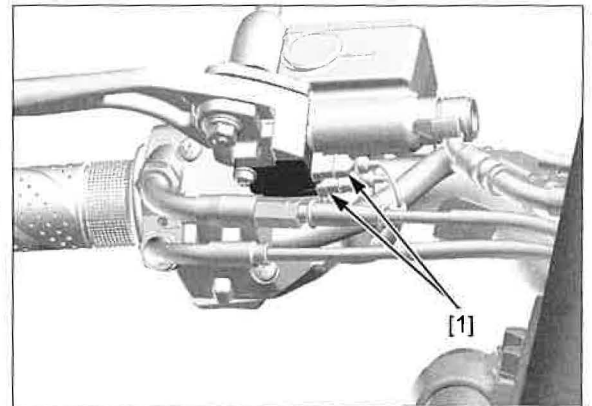
### FRONT

Remove the handlebar lower cover (page 2-8).

Disconnect the front brake light switch wire connectors [1] and check for continuity between the switch terminals.

There should be continuity with the brake lever squeezed and no continuity with the lever released.

Install the removed parts in the reverse order of removal.



### REAR

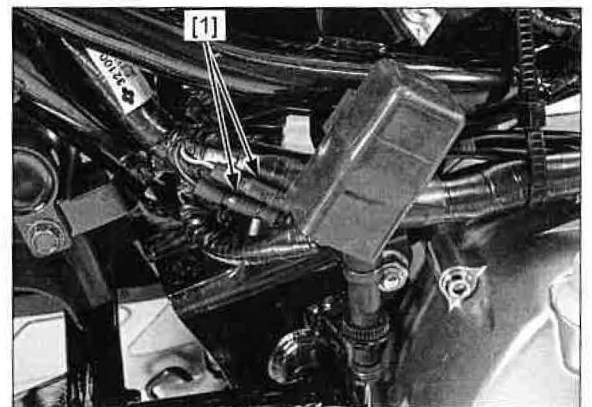
Remove the right body cover (page 2-13).

Disconnect the rear brake light switch wire connectors [1].

Check for continuity between the switch side connector terminals.

There should be continuity with the brake pedal applied and no continuity with the pedal released.

Install the removed parts in the reverse order of removal.



## GEAR POSITION SWITCH

### REMOVAL/INSTALLATION

Remove the following:

- Left body cover (page 2-13).
- Left crankcase rear cover (page 2-16).

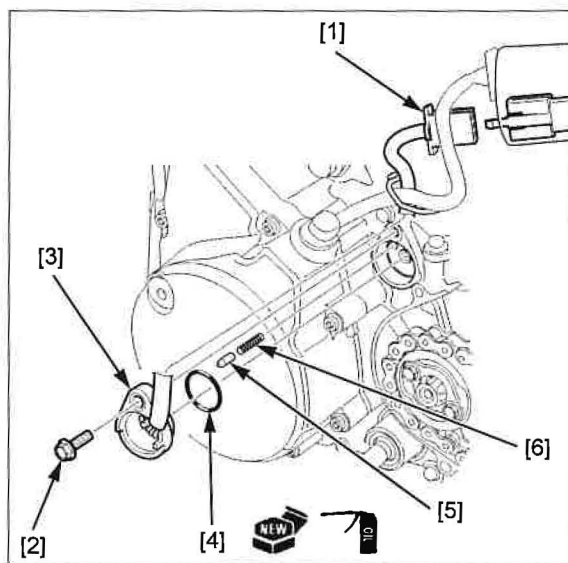
Disconnect the gear position switch 6P (Black) connector [1].

Remove the bolt [2] and gear position switch [3].

Remove the O-ring [4], contact switch cap [5] and spring [6] from the shift drum.

Install the removed parts in the reverse order of removal.

- Apply engine oil to a new O-ring.



### INSPECTION

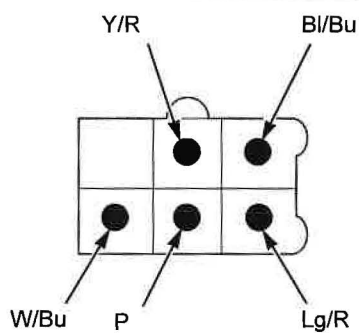
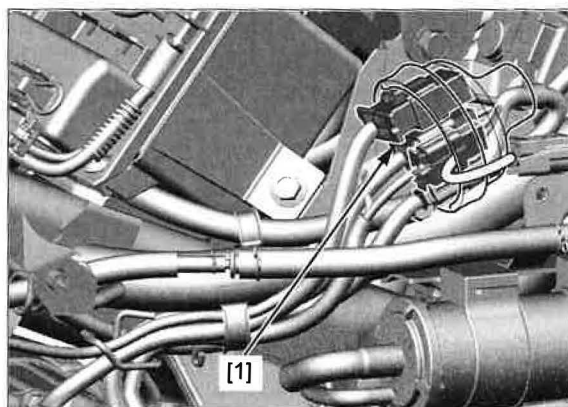
Remove the left body cover (page 2-13).

Disconnect the gear position switch 6P (Black) connector [1].

Turn the ignition switch ON, and check for continuity between the terminals at each gear position.

The gear position switch is normal if the continuity exist between the color coded wires as shown in the chart.

Install the removed parts in the reverse order of removal.



GEAR	GROUND	Lg/R	Y/R	BI/Bu	W/Bu	P
N	○	○				
1	○	○	○			
2	○			○		
3	○				○	
4	○					○

# VS SENSOR

## INSPECTION

### 1. VS Sensor Power Voltage Inspection

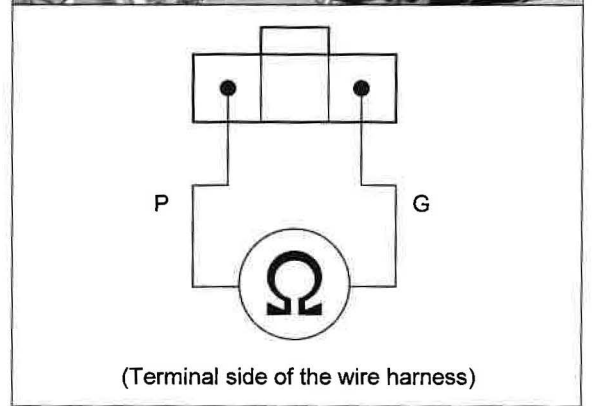
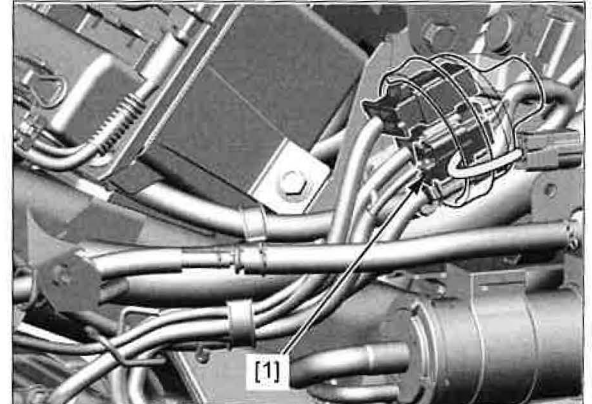
Remove the left body cover (page 2-13).  
 Disconnect the VS sensor 3P connector [1].  
 Turn the ignition switch ON with the engine stop switch "O".  
 Measure the voltage at the VS sensor 3P connector of the wire harness side.

**CONNECTION:** Pink (+) – Green (–)  
**STANDARD:** Battery voltage

*Does the standard voltage exist?*

**YES** – GO TO STEP 2.

**NO** – Open circuit in Pink or Green wire



### 2. VS Sensor Signal Line Open Circuit Inspection

Turn the ignition switch OFF.  
 Disconnect the VS sensor 3P connector [1].  
 Disconnect the ABS modulator 16P (Black) connector [2] (page 18-8).  
 Check for continuity between the VS sensor 3P connector and ABS modulator 16P (Black) connector at the wire harness side.

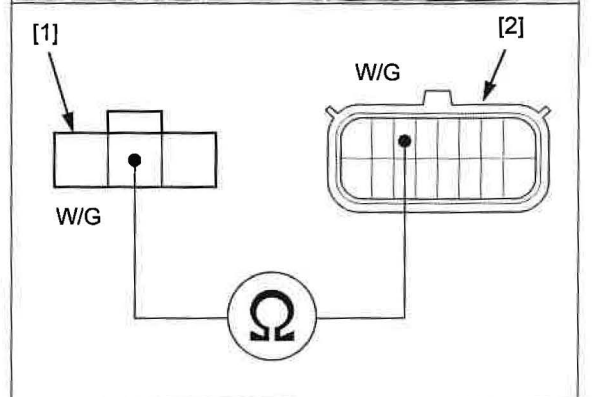
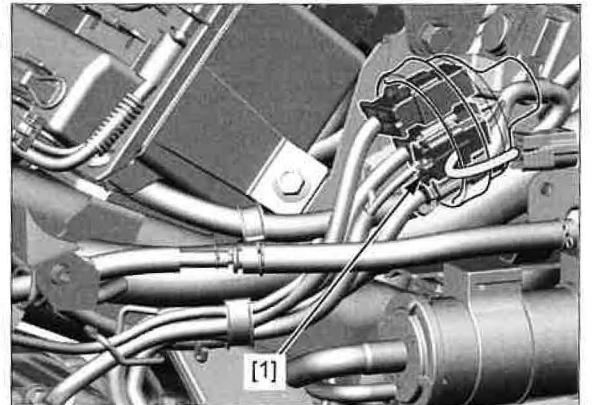
**TOOL:**  
 Test probe (2 pack)                      07ZAJ-RDJA110

**CONNECTION:**  
 White/green – White/green

*Is there continuity?*

**YES** – Faulty VS sensor

**NO** – Open circuit in White/green wire





### REMOVAL/INSTALLATION

Remove the left body cover (page 2-13).

Disconnect the VS sensor 3P connector [1].

Release the wire from the wire guides [2].

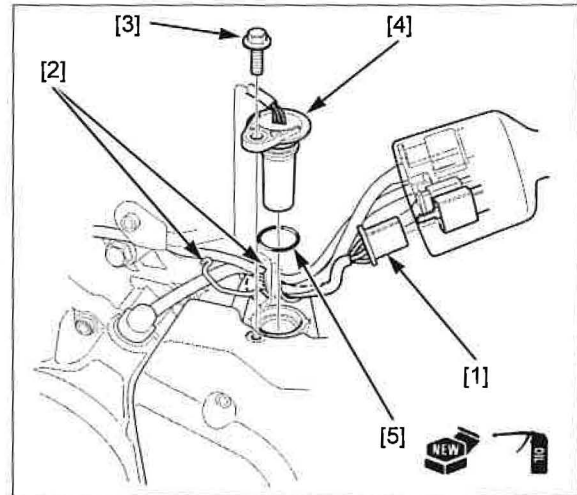
Remove the VS sensor mounting bolt [3] and the VS sensor [4].

Remove the O-ring [5].

Installation is in the reverse order of removal.

#### NOTE:

- Apply engine oil to a new O-ring and install it to the VS sensor.



## HORN

### REMOVAL/INSTALLATION

Remove the fork cover (page 2-9).

Remove the following:

- Bolt [1]
- Collar [2]
- Damper rubbers [3]
- Horn [4]

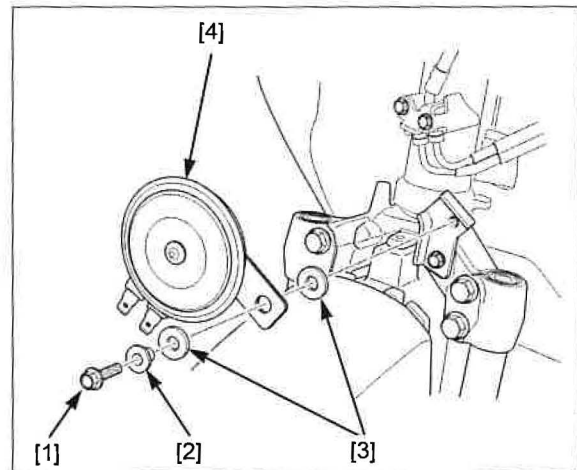
Installation is in the reverse order of removal.

### INSPECTION

Disconnect the horn wire connectors.

Connect the 12 V battery to the horn terminals.

The horn is normal if it sounds when the 12 V battery is connected to the horn terminals.



## FUEL GAUGE/FUEL LEVEL SENSOR

### FUEL LEVEL SENSOR REPLACEMENT

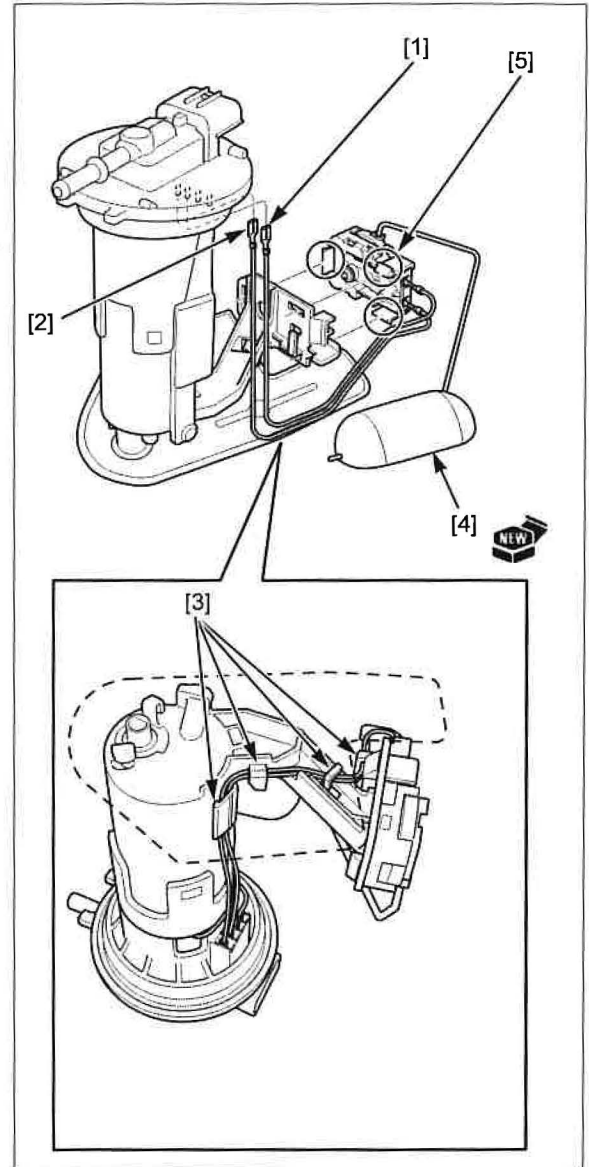
Remove the fuel pump unit (page 7-8).

Disconnect the fuel level sensor Black [1] and Red [2] wire connectors.

Release the wires from the guides [3] of the fuel pump unit.

Remove the fuel level sensor [4] from the fuel pump unit by releasing the three hooks [5].

Install a new fuel level sensor in the reverse order of removal.



## LIGHTS/METERS/SWITCHES

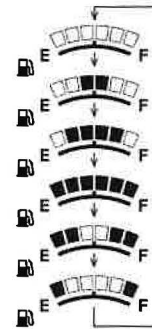
### FUEL GAUGE INSPECTION

When the circuit malfunction occurs, the combination meter displays the flow pattern in the fuel gauge. If it is indicated, check for open or short circuit in the Yellow/white wire between the combination meter and fuel pump unit.

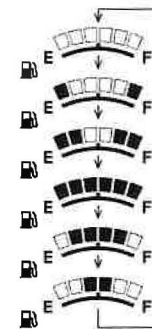
If the Yellow/white wire is OK, check the fuel level sensor (page 20-16).

If the fuel level sensor is OK, replace the combination meter (page 2-6).

Open circuit (flowing to outside):



Short circuit (flowing to inside):



### FUEL LEVEL SENSOR INSPECTION

Remove the fuel pump unit (page 7-8).

Connect the ohmmeter to the fuel pump unit 5P connector terminals [1].

Inspect the resistance of the float at the full and empty positions.

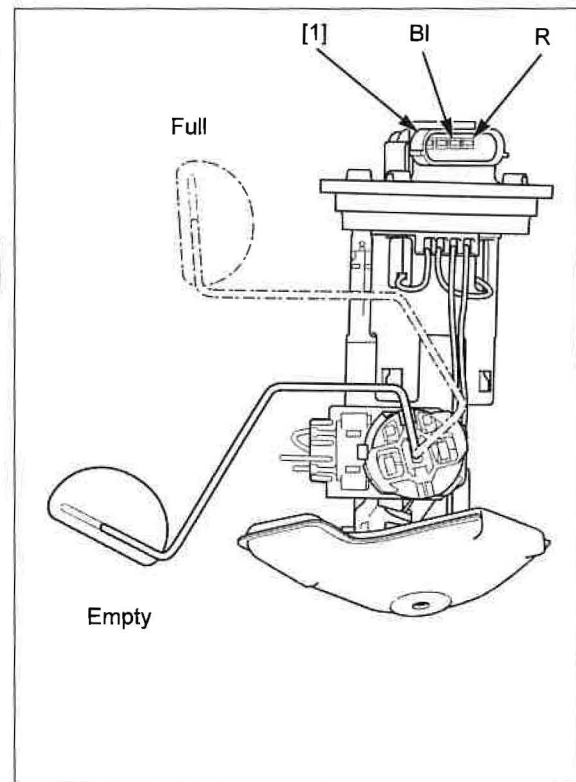
**CONNECTION: Red – Black**

FLOAT POSITION	Full	Empty
RESISTANCE	7 – 11 $\Omega$	384 – 396 $\Omega$

Replace the fuel level sensor if it is out of specification.

Install the fuel pump unit (page 7-8).

*Do not disconnect the fuel level sensor wires. If disconnected, replace the fuel level sensor with a new one.*



## TURN SIGNAL RELAY

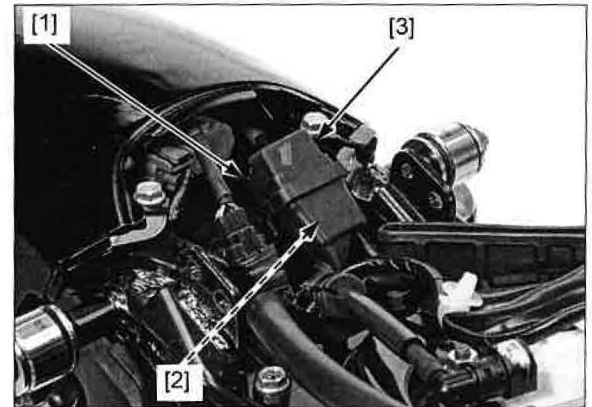
### REMOVAL/INSTALLATION

Remove the mainstand grip (page 2-12).

Release the turn signal relay mounting rubber [1] from the frame.

Disconnect the turn signal relay 3P (Black) connector [2] and remove the turn signal relay [3]

Installation is in the reverse order of removal.



### INSPECTION

Check the following:

- Battery condition
- MAIN fuse (15 A)
- DC fuse (10 A)
- Ignition switch (page 21-37)
- Turn signal switch (page 20-11)
- Loose connectors

If above items are all normal, check the following:

Turn the ignition switch ON and turn signal light switch ON.

Measure the voltage between the following terminals of the wire harness side connector.

NOTE:

- Measure with the connector connected.

**CONNECTION: A (Gray) (+) – B (Green) (-)**

**STANDARD:**

**Battery voltage – peak voltage = 1.5 V maximum**

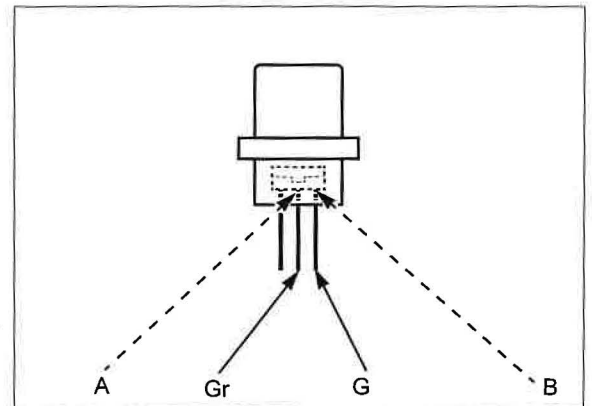
**TOOLS:**

**Peak voltage adaptor** 07HGJ-0020100 or  
**IgnitionMate peak voltage tester** MTP07-0286  
 (U.S.A. only)

**with commercially available digital multimeter  
 (impedance 10 M $\Omega$ /DCV minimum)**

If there is no standard voltage, inspect the open or short circuit in Gray and Green wires.

If there is standard voltage, replace the turn signal relay with a known good one (page 20-17), and recheck.



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**MEMO**

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# 21. Honda SMART Key SYSTEM

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<b>SERVICE INFORMATION</b> .....	<b>21-2</b>	<b>Honda SMART Key</b> .....	<b>21-29</b>
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<b>SYSTEM DIAGRAM</b> .....	<b>21-4</b>	<b>ALARM SYSTEM</b> .....	<b>21-34</b>
<b>TROUBLESHOOTING</b> .....	<b>21-5</b>	<b>IGNITION SWITCH (SMART STEERING LOCK)</b> .....	<b>21-37</b>
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<b>IMMOBILIZER AUTHENTICATION ID REGISTRATION PROCEDURE</b> .....	<b>21-25</b>	<b>SEAT SWITCH</b> .....	<b>21-39</b>
		<b>REPLACEMENT PARTS FOR Honda SMART Key SYSTEM PROBLEM</b> .....	<b>21-40</b>

## Honda SMART Key SYSTEM

# SERVICE INFORMATION

## GENERAL

- When checking the Honda SMART Key system, follow the steps in the troubleshooting flow chart (page 21-5).
- Keep the Honda SMART Key away from the other Honda SMART Key when using it. The jamming of the key code signal may occur and the proper operation of the system will be obstructed.
- The Honda SMART Key has electrical parts inside. Do not drop or strike the Honda SMART Key against a hard object, and do not leave the Honda SMART Key in a vehicle, where the temperature will rise. Do not leave the Honda SMART Key in water for a prolonged time such as washing clothes and leaving it in a pocket.
- Keep the emergency key and ID tag separately from the Honda SMART Key. If you lose the Honda SMART Key and emergency key at the same time, it is impossible to unlock the seat.
- Once the new Honda SMART Key is registered, it is not usable for other vehicle.
- To replace the smart control unit, replace the smart control unit and the smart-authentication-completed Honda SMART Key as a set.
- The smart control unit can store up to four Honda SMART Key codes. (The four Honda SMART Keys can be registered.)
- Do not modify the Honda SMART Key system as it can cause the system failure. (The engine cannot be started.)
- For ignition system inspection (page 5-2).
- The following color codes are used throughout this section.

Bl = Black  
Br = Brown

Bu = Blue  
G = Green

Gr = Gray  
Lg = Light green

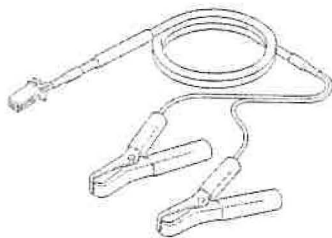
O = Orange  
Lb = Light blue

R = Red  
V = Violet

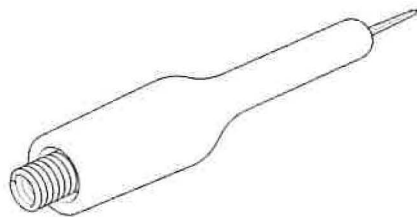
W = White  
Y = Yellow

## TOOLS

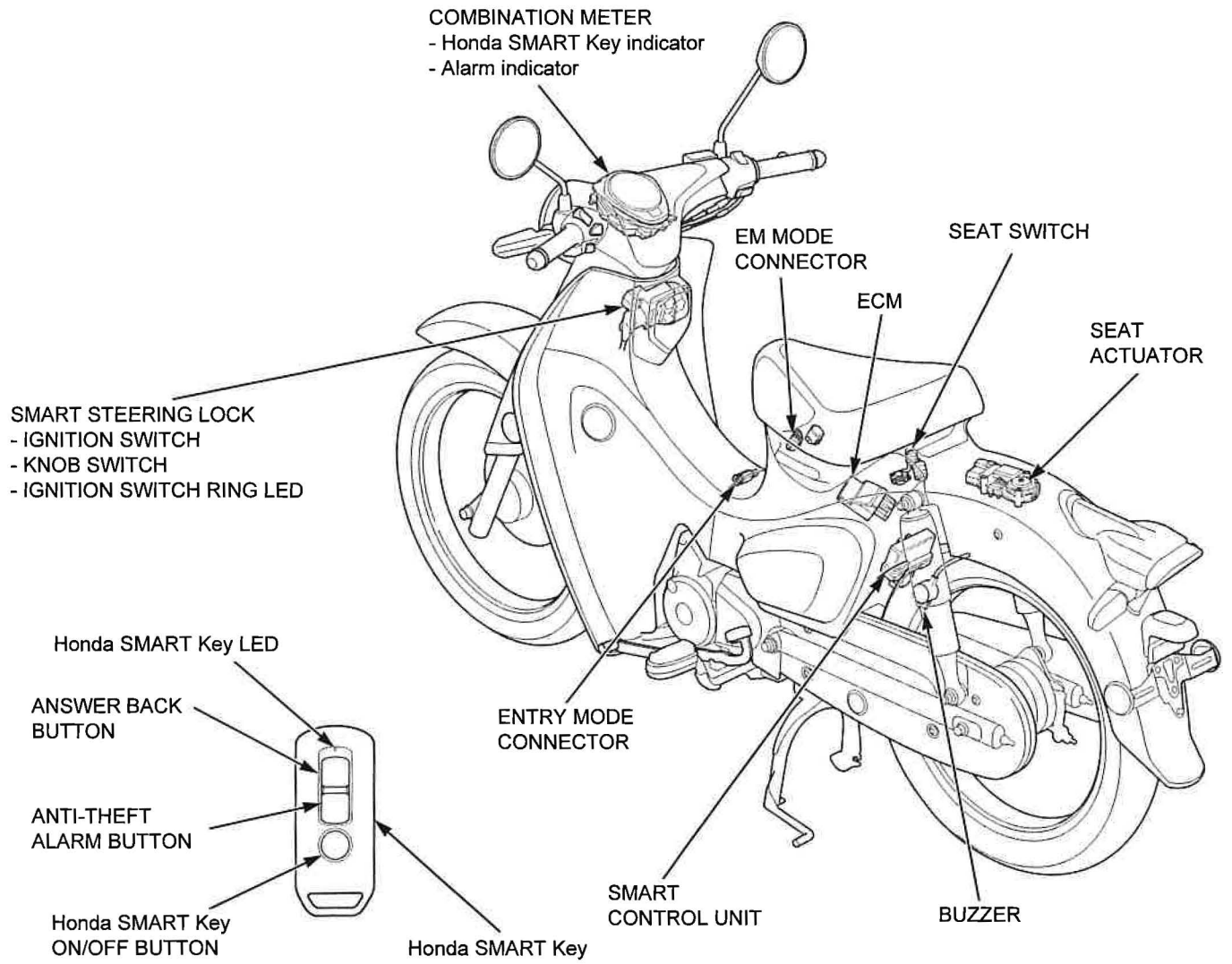
Inspection Adaptor  
07XMZ-MBW0101



Test Probe (2 pack)  
07ZAJ-RDJA110



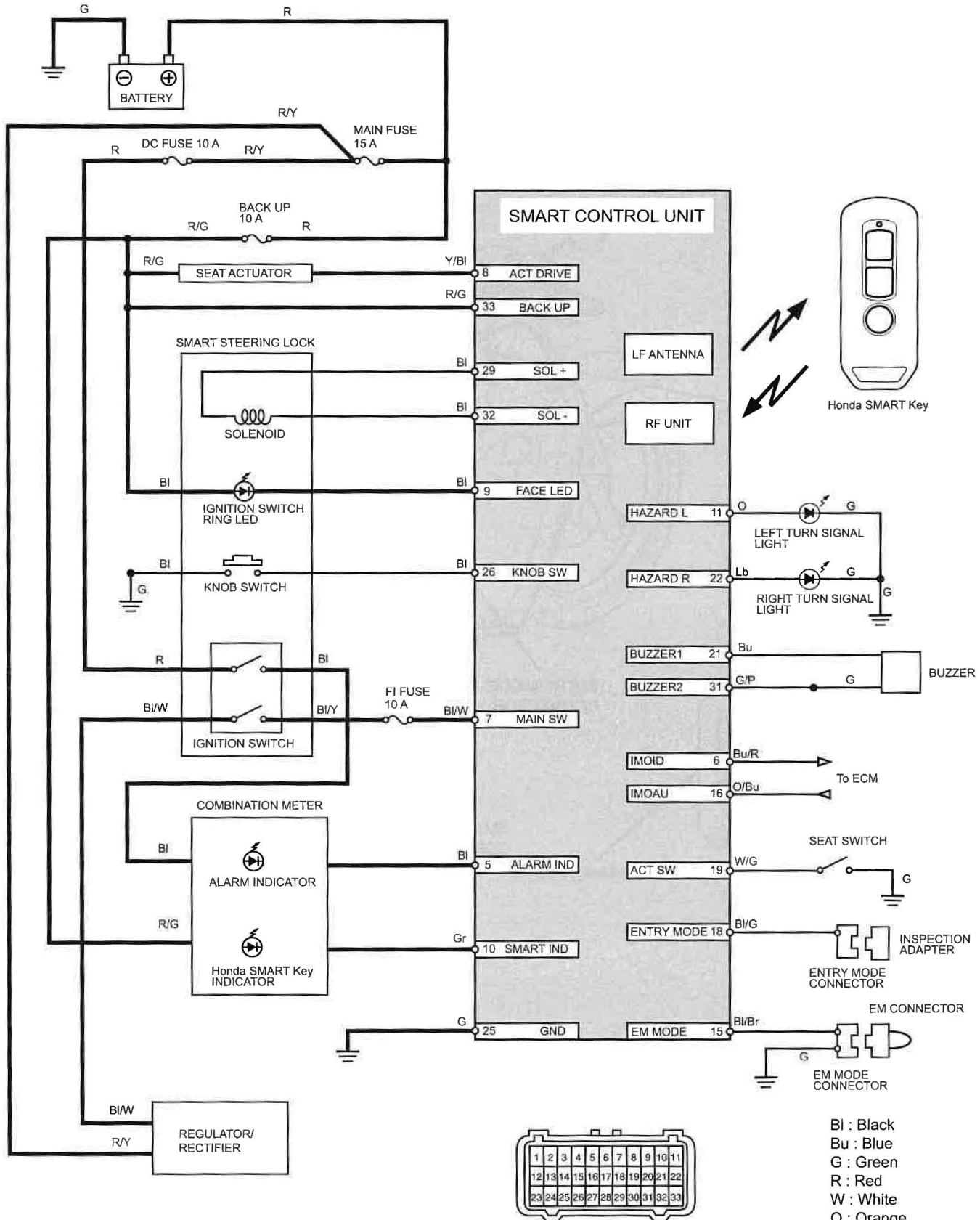
# SYSTEM LOCATION





# Honda SMART Key SYSTEM

## SYSTEM DIAGRAM



SMART CONTROL UNIT 33P (Gray) CONNECTOR  
SMART CONTROL UNIT side of male terminals

- BI : Black
- Bu : Blue
- G : Green
- R : Red
- W : White
- O : Orange
- Lg : Light green
- Br : Brown
- Lb : Light blue

## TROUBLESHOOTING

### NOTE:

- Before starting the troubleshooting, check the following:
  - Battery voltage
  - Honda SMART Key battery
  - Each fuse condition
  - Loose or poor contact of the relation connectors
  - Communication errors (page 21-21)
  - Answer back system (page 21-6)

The Honda SMART Key indicator comes on for approx. two seconds then it goes off, when the ignition switch is turned ON with the properly registered Honda SMART Key and the Honda SMART Key system functions normally.

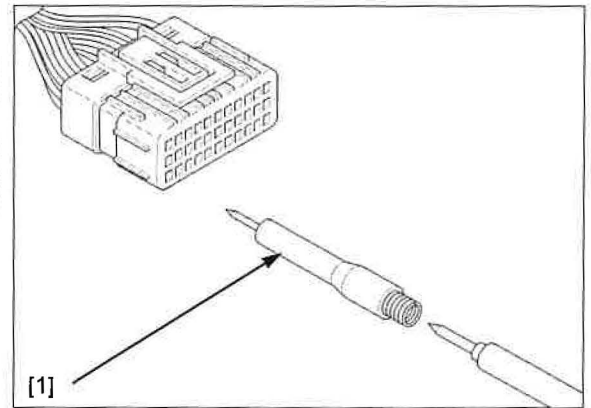
## CIRCUIT INSPECTION

### INSPECTION AT ECM AND SENSOR UNIT CONNECTOR

- Always clean around and keep any foreign material away from the connector before disconnecting it.
- A faulty Honda SMART Key system is often related to poorly connected or corroded connections. Check those connections before proceeding.
- When testing at connector (wire harness side) terminal, always use the test probe [1]. Insert the test probe into the connector terminal, then connect the digital multimeter probe to the test probe.

#### TOOL:

Test probe (2 pack) [1]      07ZAJ-RDJA110

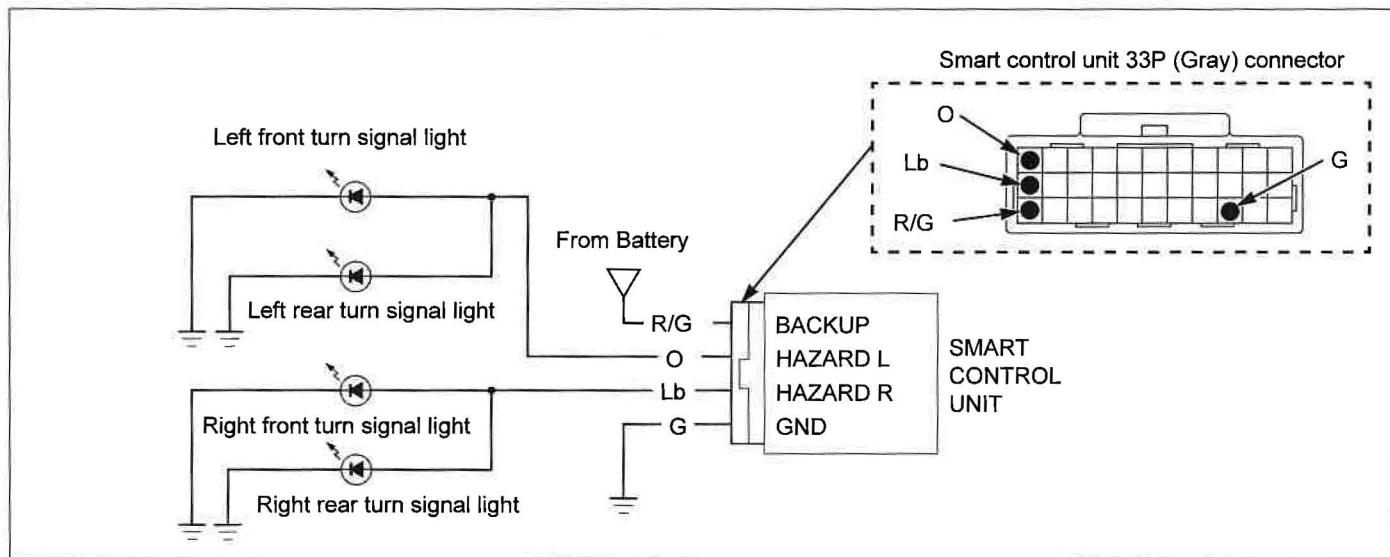


## Answer Back Malfunction

Turn Signal Light Does Not Come On (When the Answer Back Button is Pushed)

NOTE:

- If one side of the turn signal light does not turn on, check the Orange or Light blue wire.



### 1. Turn Signal and Hazard Light Line Inspection

Check an open or short circuit in turn signal and hazard line.

**Is the inspection normal?**

**YES** – GO TO STEP 2.

**NO** – Faulty turn signal and hazard related circuit

### 2. Smart Control Unit Backup Line Inspection

Disconnect the smart control unit 33P (Gray) connector (page 21-38).

Measure the voltage between the smart control unit 33P (Gray) connector terminal of the wire side and ground.

**CONNECTION: Red/green (+) – ground (-)**

**Does the battery voltage exist?**

**YES** – GO TO STEP 3.

**NO** – Open circuit in Red/green wire

### 3. Smart Control Unit Ground Line Inspection

Check for continuity between the smart control unit 33P (Gray) connector terminal of the wire side and ground.

**CONNECTION: Green – ground**

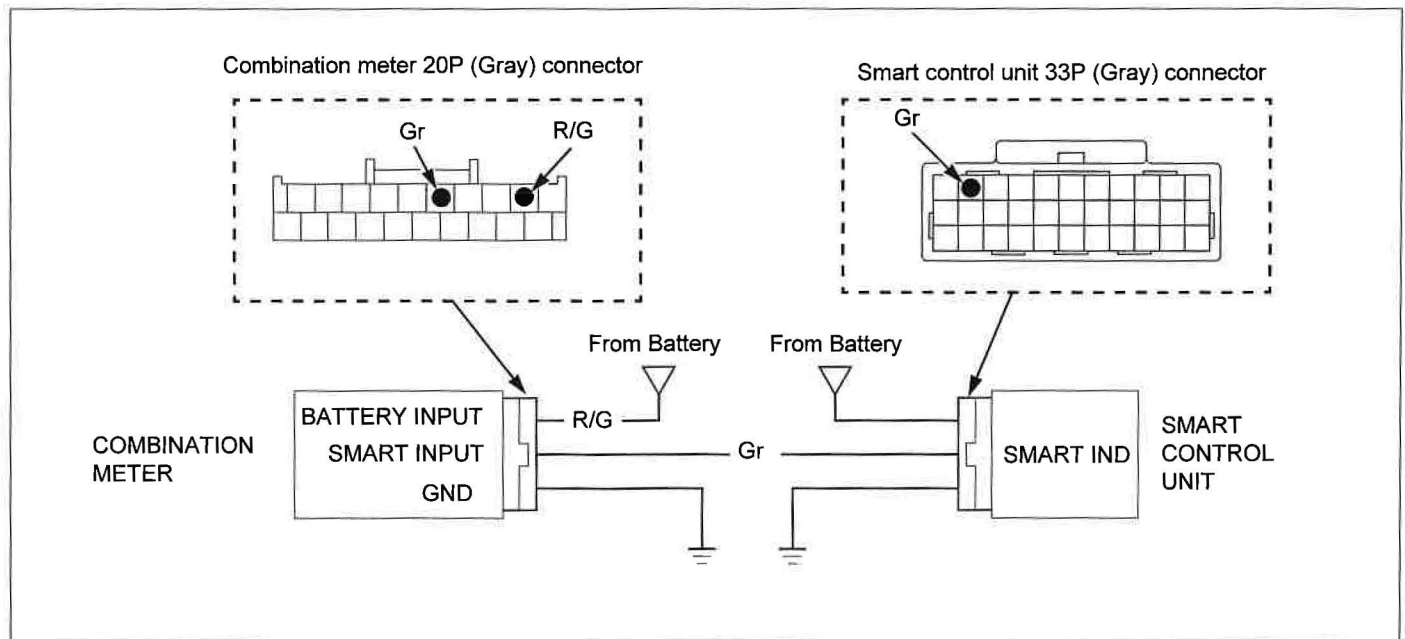
**Is there continuity?**

**YES** – Replace the smart control unit with a new one and recheck

**NO** – Open circuit in green wire

## Honda SMART Key Indicator Malfunction

Honda SMART Key Indicator Does Not Come On (When the Knob Switch is Pushed)



### 1. Ignition switch ring check

Check the ignition switch ring come on when ignition switch pushed.

**Does the ignition switch ring come on?**

**YES** – GO TO STEP 2.

**NO** – Check for Smart control unit ground line and power line.

### 2. Meter Backup Line Inspection

Disconnect the combination meter 20P (Gray) connector (page 2-6).

Measure the voltage between the combination meter 20P (Gray) connector terminal of the wire side and ground.

**CONNECTION: Red/green (+) – ground (-)**

**Does the battery voltage exist?**

**YES** – GO TO STEP 3.

**NO** – Open circuit in Red/green wire

### 3. Honda SMART Key Indicator Line Inspection

Disconnect the smart control unit 33P (Gray) connector (page 21-38).

Check for continuity between the combination meter 20P (Gray) connector terminal of the wire side and smart control unit 33P (Gray) connector of the wire side.

**CONNECTION: Gray – Gray**

**Is there continuity?**

**YES** – GO TO STEP 4.

**NO** – Open circuit in Gray wire

### 4. Meter Inspection

Replace the combination meter with a new one (page 2-6).

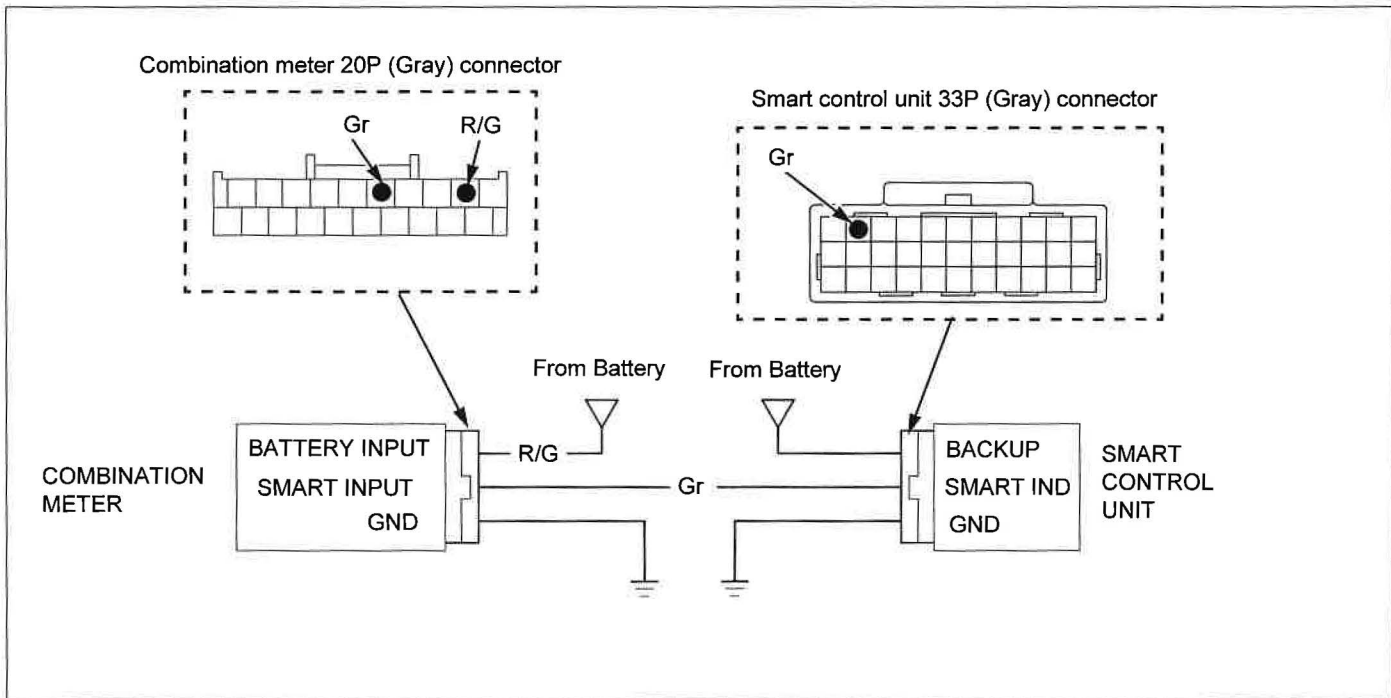
**Does the Honda SMART Key indicator come on?**

**YES** – Faulty original combination meter

**NO** – Replace the smart control unit with a new one and recheck

# Honda SMART Key SYSTEM

Honda SMART Key Indicator Does Not Turn Off Within a Few Seconds (When the Ignition Switch is ON)



## 1. Honda SMART Key Indicator Line Inspection

Disconnect the combination meter 20P (Gray) connector (page 2-6).

Check for continuity between the combination meter 20P (Gray) connector terminal of the wire side and ground.

**CONNECTION: Gray – Ground**

*Is there continuity?*

**YES** – Open circuit in Gray wire

**NO** – GO TO STEP 2.

## 2. Meter Inspection

Replace the combination meter with a new one (page 2-6).

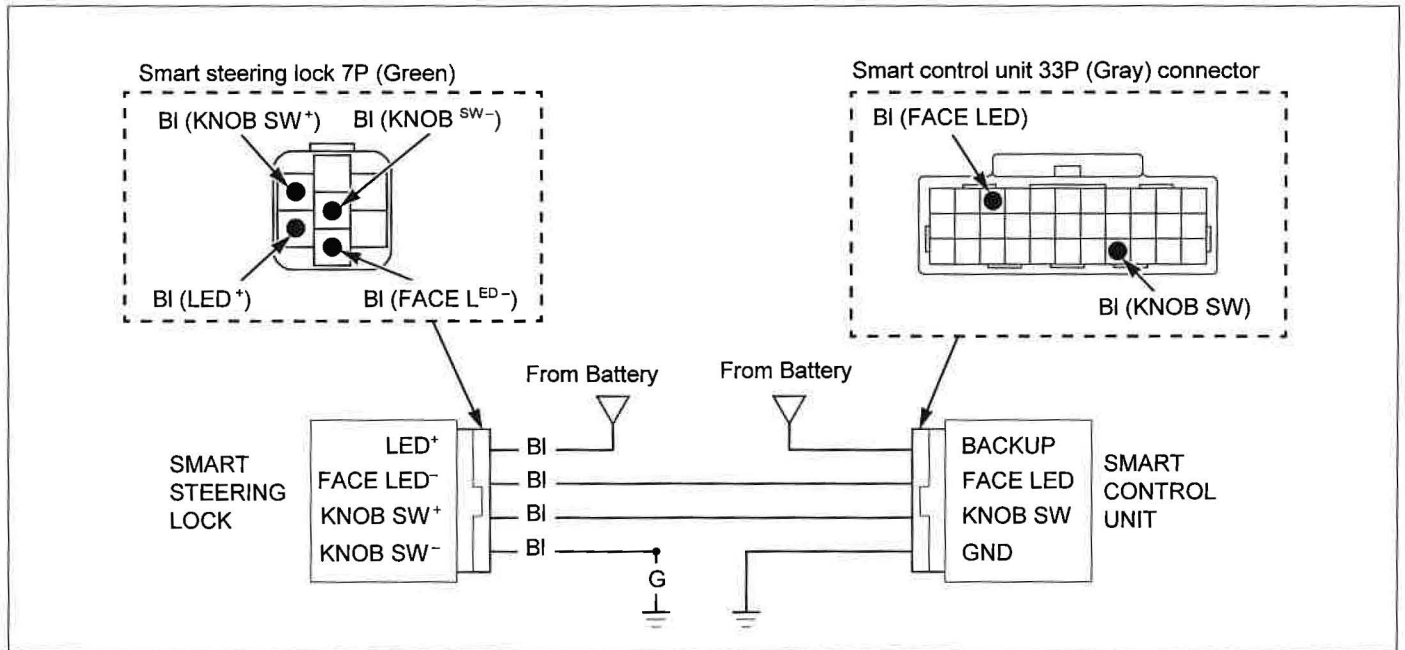
*Does the Honda SMART Key indicator go off?*

**YES** – Faulty original combination meter

**NO** – Replace the smart control unit with a new one and recheck

## Ignition Switch Ring LED Malfunction

Ignition Switch Ring LED Does Not Come On (When the Knob Switch is Pushed)



### 1. Honda SMART Key indicator check

Check the Honda SMART Key indicator come on when ignition switch pushed.

**Does the Honda SMART Key indicator stays on?**

**YES** – GO TO STEP 4.

**NO** – • Check for Smart control unit ground line and power line.(page 21-4)  
• If the above system circuit is normally,GO TO STEP 2.

### 2. Knob Switch Line (knob SW +) Inspection

Disconnect the smart steering lock 7P (Green) connector (page 21-37).

Disconnect the smart control unit 33P (Gray) connector (page 21-5).

Check for continuity between the wire harness side smart control unit 33P (Gray) connector terminal and wire harness side smart steering lock 7P (Green) connector terminal.

**CONNECTION: Black (KNOB SW+) – Black (KNOB SW)**

**Is there continuity?**

**YES** – GO TO STEP 3.

**NO** – Open circuit in Black wire between the smart control unit and smart steering lock

### 3. Knob Switch Line (knob SW –) Inspection

Check for continuity between the wire harness side smart steering lock 7P (Green) connector terminal and ground.

**CONNECTION: Black (KNOB SW-) – Ground**

**Is there continuity?**

**YES** – GO TO STEP 4.

**NO** – Open circuit in Green wire between the smart steering lock and ground

### 4. Ignition Switch Ring LED Power Line (LED +) Inspection

Measure the voltage between the smart steering lock 7P (Green) connector terminal of the wire side and ground.

**CONNECTION: Black (LED +) (+) – ground (-)**

**Does the battery voltage exist?**

**YES** – GO TO STEP 5.

**NO** – Open circuit in Black wire between the smart steering lock and ground

## Honda SMART Key SYSTEM

### 5. Ignition Switch Ring LED Line (FACE LED -) Inspection

Check for continuity between the wire harness side smart control unit 33P (Gray) connector terminal and smart steering lock 7P (Green) connector terminal.

**CONNECTION: Black (FACE LED-) – Black (FACE LED)**

*Is there continuity?*

**YES** – GO TO STEP 6.

**NO** – Open circuit in Black wire between the smart control unit and smart steering lock

### 6. Smart Steering Lock Inspection

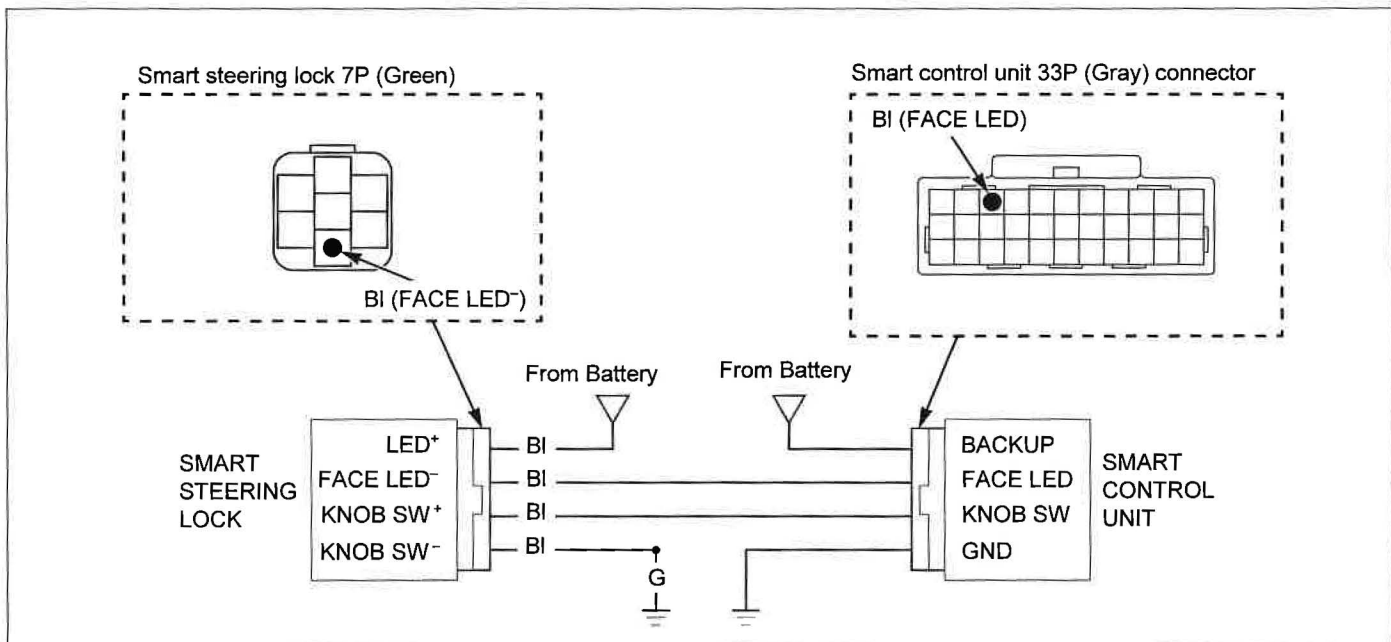
Replace the smart steering lock with a new one and recheck (page 21-37).

*Does the ignition switch ring LED come on?*

**YES** – Faulty original smart steering lock

**NO** – Replace the smart control unit with a new one and recheck

### Ignition Switch Ring LED Stays On (When the Ignition Switch is ON)



### 1. Ignition Switch Ring LED Line (FACE LED -) Inspection

Disconnect the smart steering lock 7P (Green) connector (page 21-37).

Disconnect the smart control unit 33P (Gray) connector (page 21-38).

Check for continuity between the wire harness side smart control unit 33P (Gray) connector terminal and ground.

**CONNECTION: Black (FACE LED-) - Ground**

*Is there continuity?*

**YES** – GO TO STEP 2.

**NO** – Short circuit in Black wire between the smart steering lock and smart steering lock

### 2. Smart Steering Lock Inspection

Replace the smart steering lock with a new one and recheck (page 21-37).

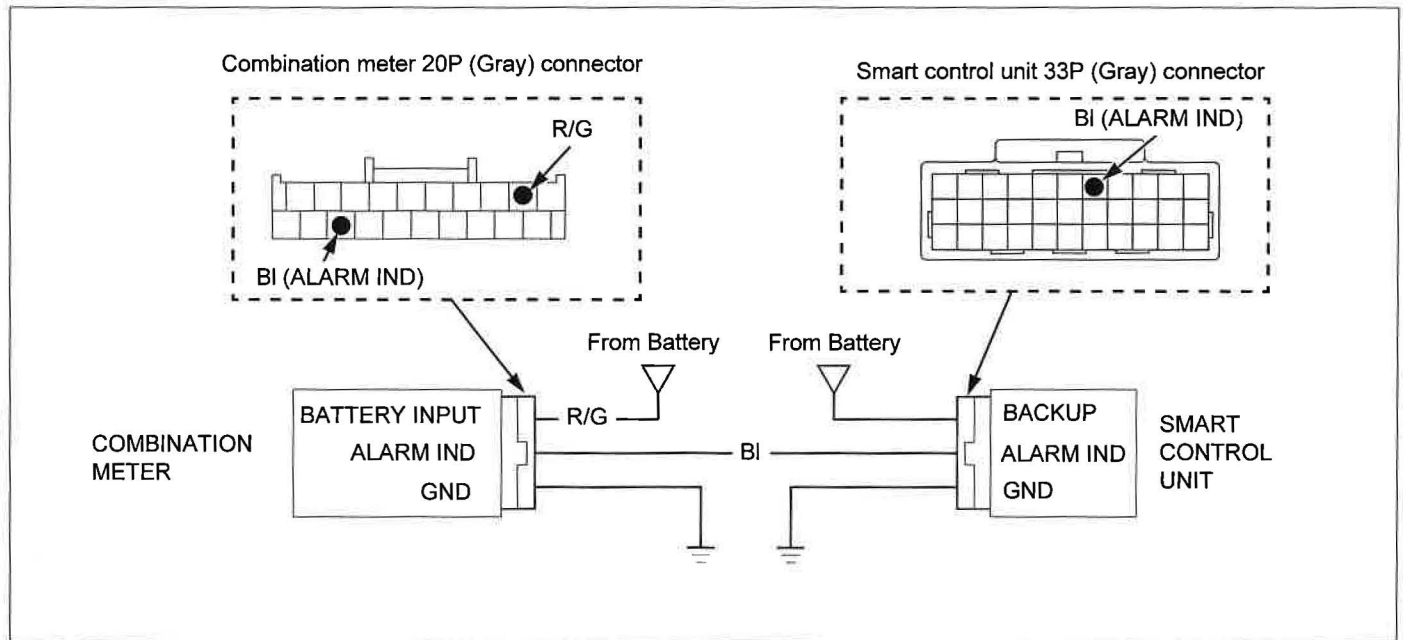
*Does the ignition switch ring LED go off?*

**YES** – Faulty original smart steering lock

**NO** – Replace the smart control unit with a new one and recheck

## Alarm Indicator Malfunction

Alarm Indicator Does Not Come On (When the alarm button is Pushed)



### 1. Meter Backup Line Inspection

Disconnect the combination meter 20P (Gray) connector (page 2-6).

Measure the voltage between the combination meter 20P (Gray) connector terminal of the wire side and ground.

**CONNECTION: Red/green (+) – ground (-)**

*Does the battery voltage exist?*

**YES** – GO TO STEP 2.

**NO** – Open circuit in Red/green wire

### 2. Alarm Indicator Line Inspection

Disconnect the smart control unit 33P (Gray) connector (page 21-38).

Check for continuity between the combination meter 20P (Gray) connector terminal of the wire side and smart control unit 33P (Gray) connector of the wire side.

**CONNECTION: Black – Black**

*Is there continuity?*

**YES** – GO TO STEP 3.

**NO** – Open circuit in Black wire

### 3. Meter Inspection

Replace the combination meter with a new one (page 2-6).

*Does the alarm indicator come on?*

**YES** – Faulty original combination meter

**NO** – Replace the smart control unit with a new one and recheck

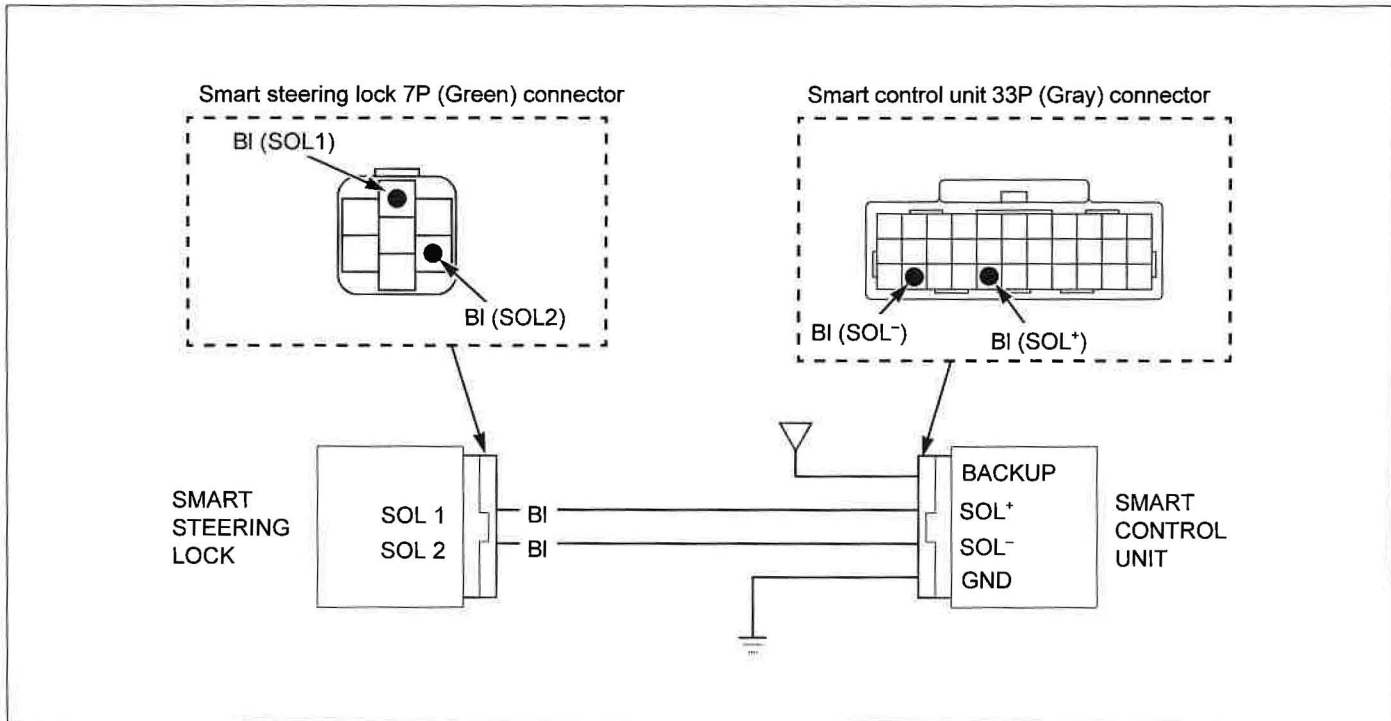


## Knob Lock Solenoid Malfunction

Ignition Switch Cannot be Turned ON  
(The Honda SMART Key Indicator and Ignition Switch Ring Come On)

NOTE:

- Before starting the troubleshooting, check that the EM or entry mode connectors are not connected.



### 1. Knob Lock Solenoid Line (SOL1 and SOL2) Inspection

Disconnect the smart steering lock 7P (Green) connector (page 21-37).  
Disconnect the smart control unit 33P (Gray) connector (page 21-38).

Check for continuity between the wire harness side smart control unit 33P (Gray) connector terminals and smart steering lock 7P (Green) connector terminals.

**CONNECTION: Black (SOL1) – Black (SOL+)**  
**Black (SOL2) – Black (SOL-)**

*Is there continuity?*

**YES** – GO TO STEP 2.

**NO** – Open circuit in Black wire between the smart steering lock and smart control unit

### 2. Smart Steering Lock Inspection

Replace the smart steering lock with a new one and recheck (page 21-37)

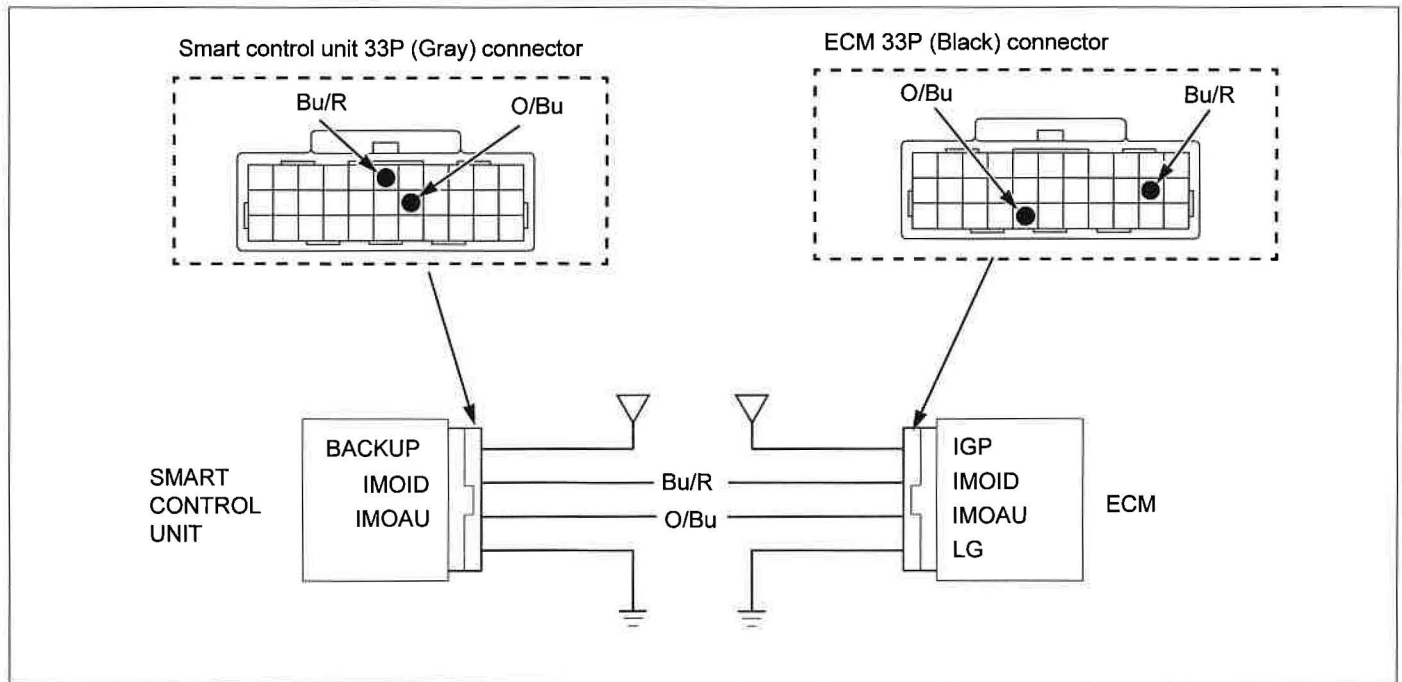
**Does the ignition switch can be turned ON?**

**YES** – Faulty original smart steering lock

**NO** – Replace the smart control unit with a new one and recheck

## Immobilizer Malfunction

Engine Does Not Start (The Ignition Switch Can be Turned ON)



### 1. Immobilizer Communication Line Inspection

Disconnect the smart control unit 33P (Gray) connector (page 21-38).

Disconnect the ECM 33P (Black) connector (page 4-8).

Check for continuity between the wire harness side smart control unit 33P (Gray) connector terminals and wire harness side ECM 33P (Black) connector terminals.

**CONNECTION:** Blue/red – Blue/red  
Orange/blue – Orange/blue

**STANDARD:** Continuity

Check for continuity between the wire harness side smart control unit 33P (Gray) connector terminal and ground.

**CONNECTION:** Blue/red – ground  
Orange/blue – ground

**STANDARD:** No continuity

*Are the inspection normal?*

**YES** – GO TO STEP 2.

**NO** – • Open circuit in Blue/red wire and/or Orange/blue wire  
• Short circuit in Blue/red wire and/or Orange/blue wire

### 2. Smart control unit Inspection

Replace the smart control unit with a new one and recheck (page 21-38).

*Does the engine start?*

**YES** – Faulty original smart control unit

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

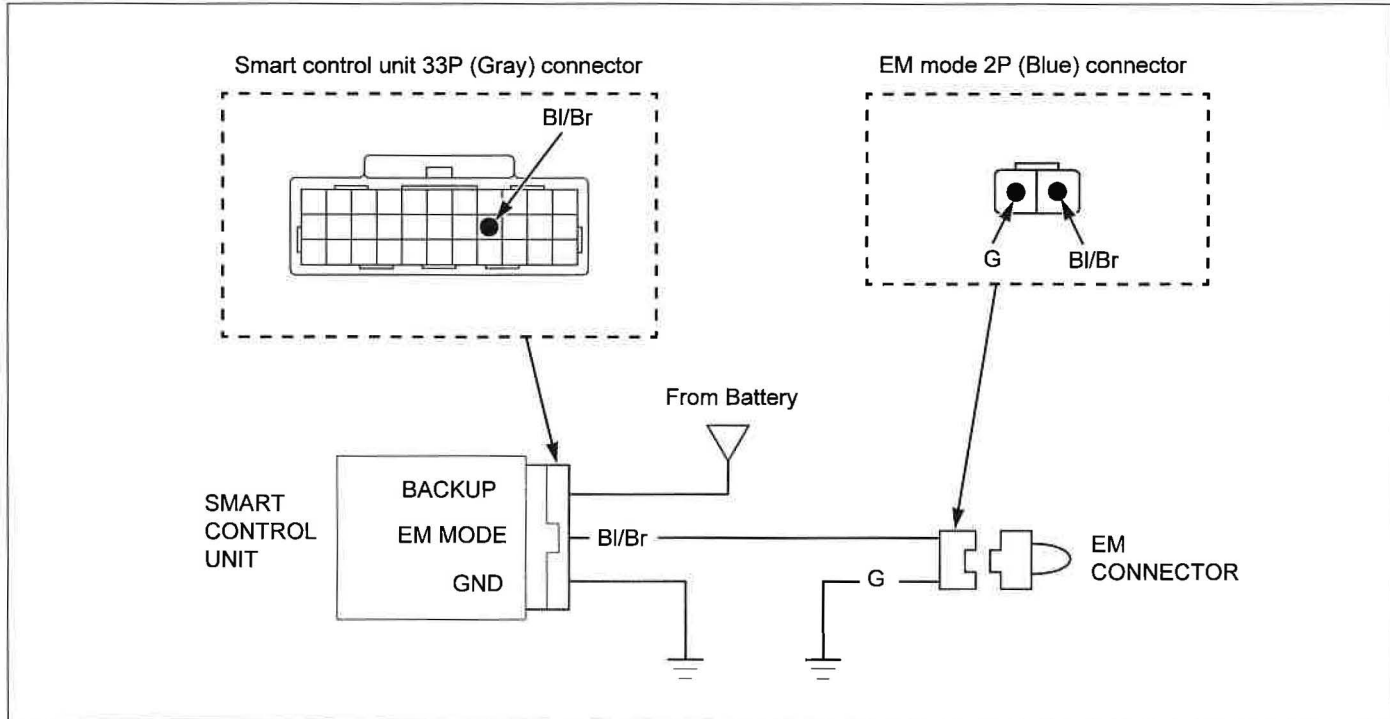
## Honda SMART Key SYSTEM

### EM Mode Malfunction (Engine Starting Procedure in Emergency Mode)

The EM Connector Connected but Honda SMART Key Indicator and Ignition Switch Ring Does Not Come On

NOTE:

- Before starting the troubleshooting, check the ignition switch ring LED malfunction (page 21-9).



#### 1. EM Mode Connector Ground Line Inspection

Remove the dummy connector from the EM mode 2P (Blue) connector (page 21-19).

Check for continuity between the EM mode 2P (Blue) connector terminal and ground.

**CONNECTION: Green – ground**

*Is there continuity?*

**YES** – GO TO STEP 2.

**NO** – Open circuit in Green wire

#### 2. EM Mode Connector Signal Line Inspection

Disconnect the smart control unit 33P (Gray) connector (page 21-38).

Check for continuity between the wire harness side EM mode 2P (Blue) connector terminal and wire harness side smart control unit 33P (Gray) connector terminal.

**CONNECTION: Black/brown – Black/brown**

*Is there continuity?*

**YES** – Replace the smart control unit with a new one and recheck

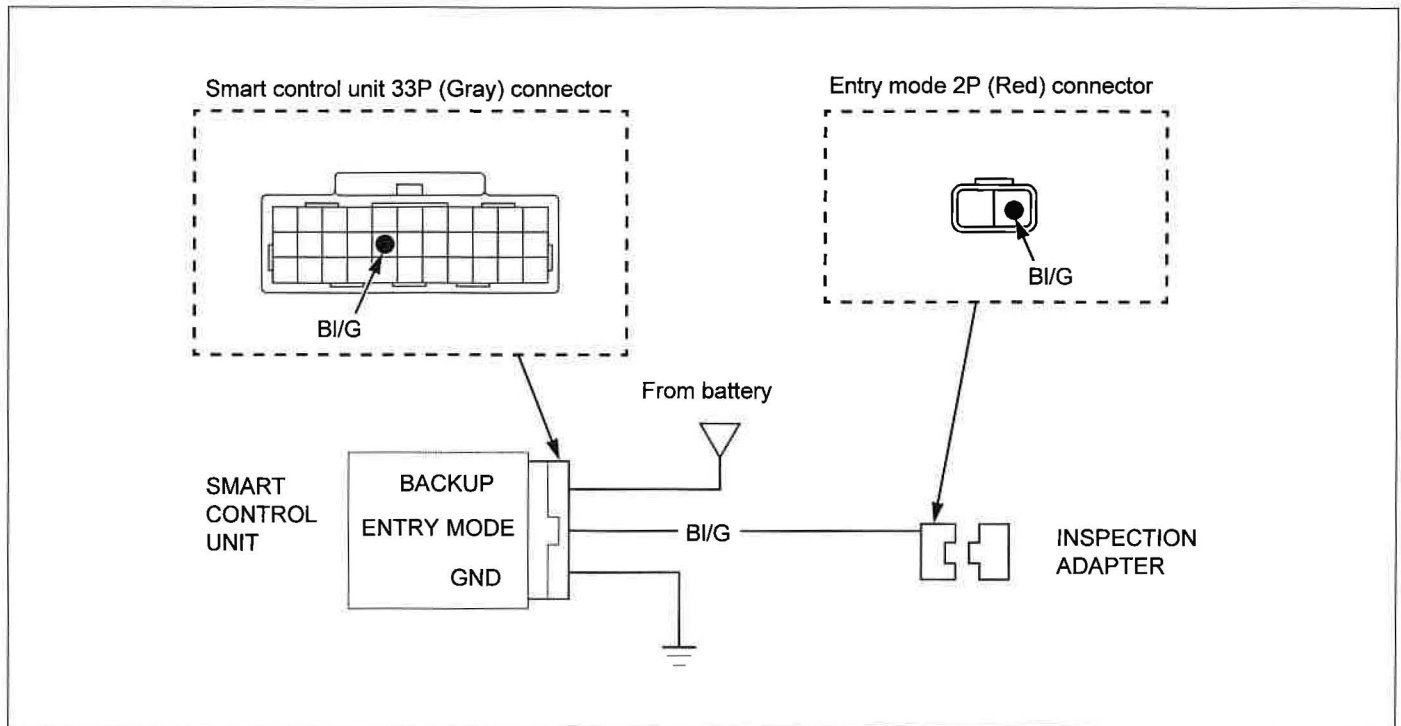
**NO** – Open circuit in Black/brown wire

## Honda SMART Key Registration Mode Malfunction

Cannot be Started the Honda SMART Key Registration Mode

NOTE:

- Before starting the troubleshooting, check the immobilizer malfunction (page 21-13).



### 1. Entry Mode Connector Line Inspection

Disconnect the smart control unit 33P (Gray) connector (page 21-38).

Remove the dummy connector from the entry mode 2P (Red) connector (page 21-21).

Check for continuity between the entry mode 2P (Red) connector terminal and wire harness side smart control unit 33P (Gray) connector terminal.

**CONNECTION: Black/green – Black/green**

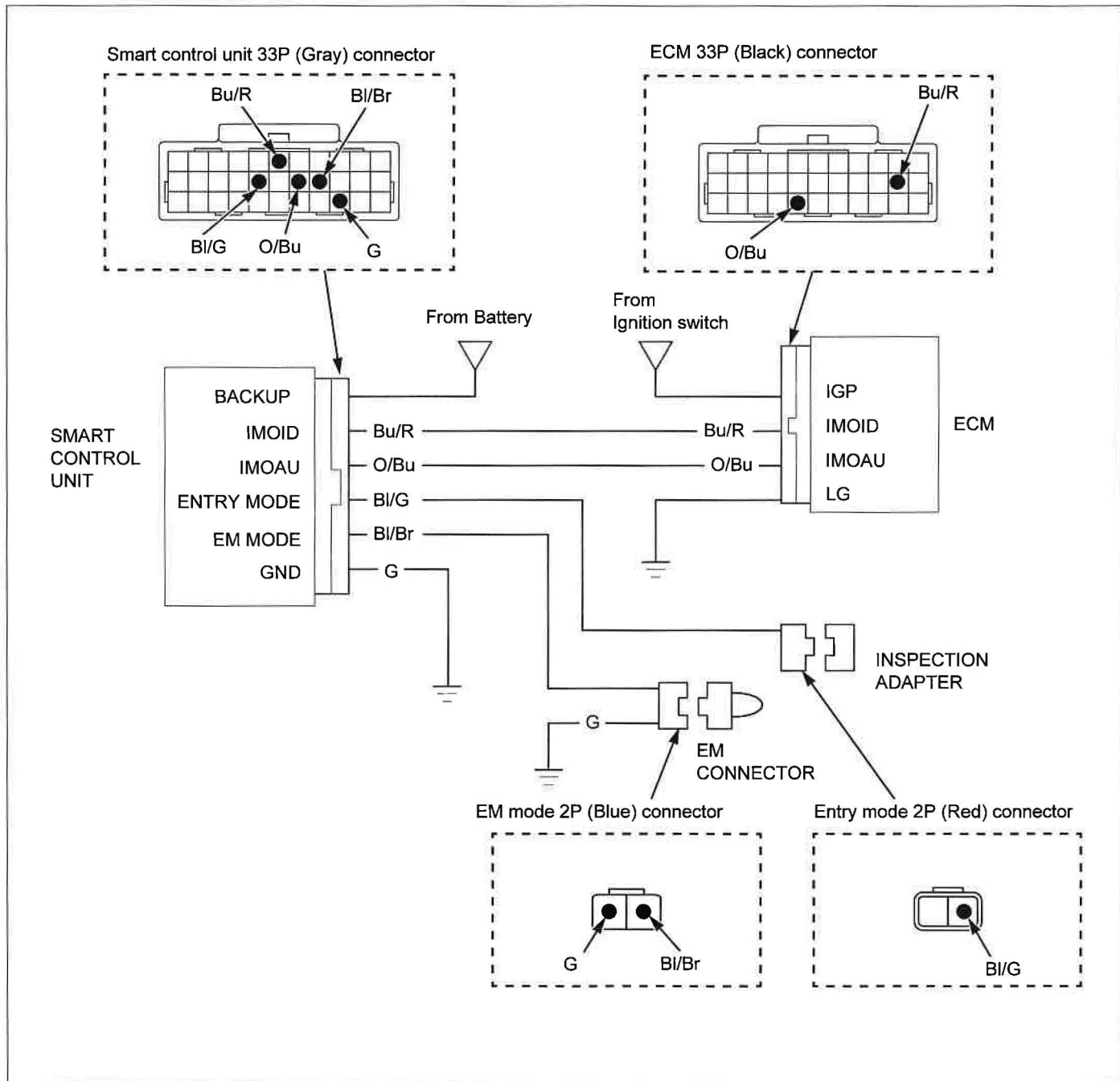
*Is there continuity?*

**YES** – Replace the smart control unit with a new one and recheck

**NO** – Open circuit in Black/green wire

## Smart Control Unit Registration Mode Malfunction

Cannot be Started Smart Control Unit Registered Mode



Check the following:

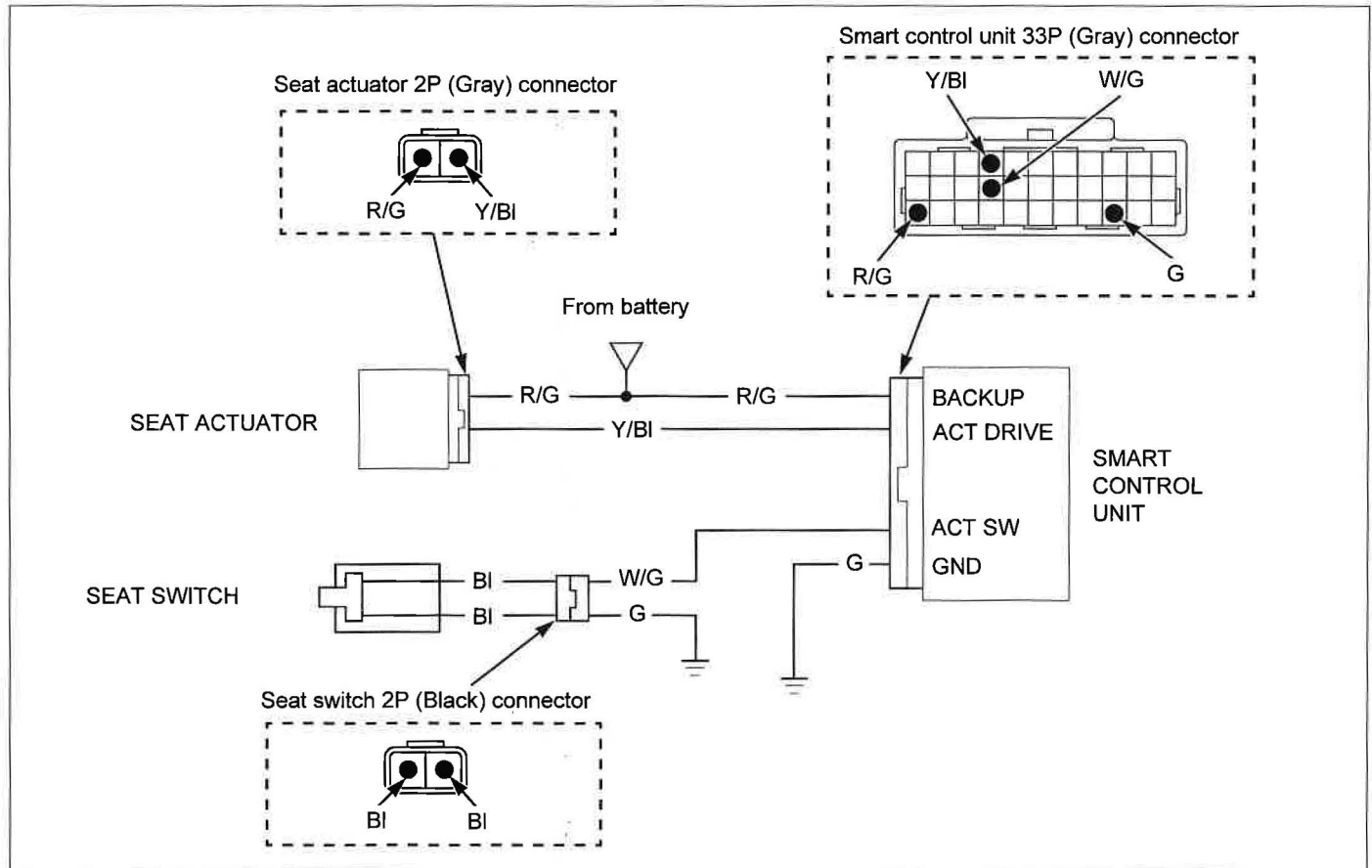
- Immobilizer malfunction (page 21-13)
- EM mode malfunction (page 21-14)
- Honda SMART Key registration mode malfunction (page 21-15)

## Electric Seat Opener Malfunction

Cannot be opened the seat (When the Seat Switch is Pushed)

**NOTE:**

- Before starting the troubleshooting, check the battery condition.
- The seat open button can be operated when the Honda SMART Key is in the operating range and the ignition switch is in the (Off) or (LOCK) position.



### 1. Seat Switch Inspection

Disconnect the seat switch 2P (Black) connector (page 2-13).

Check for continuity between the seat switch 2P (Black) connector terminals on the wire harness side.

**CONNECTION: Black – Black**

*Is there continuity? (When the seat switch is Pushed)*

**YES** – GO TO STEP 2.

**NO** – Faulty seat switch

### 2. Seat Switch Signal Line Inspection

Disconnect the smart control unit 33P (Gray) connector (page 21-38).

Check for continuity between the smart control unit 33P (Gray) connector terminal of the wire side and the seat switch 2P (Black) connector terminal.

**CONNECTION: White/green – White/green**

*Is there continuity?*

**YES** – GO TO STEP 3.

**NO** – Open circuit in White/green wire

## Honda SMART Key SYSTEM

---

### 3. Seat Switch Ground Line Inspection

Check for continuity between the seat switch 2P (Black) connector terminals on the wire harness side.

**CONNECTION:** Green – ground

*Is there continuity?*

**YES** – GO TO STEP 4.

**NO** – Open circuit in green wire

### 4. Seat Actuator Backup Line Inspection

Disconnect the seat actuator 2P (Gray) connector (page 21-39).

Measure the voltage between the seat actuator 2P (Gray) connector terminals on the wire harness side.

**CONNECTION:** Red/green (+) – ground (-)

*Is there battery voltage?*

**YES** – GO TO STEP 5.

**NO** – Open circuit in Red/green wire

### 5. Seat Actuator Ground Line Inspection

Disconnect the smart control unit 33P (Gray) connector (page 21-38).

Check for continuity between the smart control unit 33P (Gray) connector terminal of the wire side and the seat actuator 2P (Gray) connector terminal.

**CONNECTION:** Yellow/black – Yellow/black

*Is there continuity?*

**YES** – GO TO STEP 6.

**NO** – Open circuit in Yellow/black wire

### 6. Seat Actuator Inspection

Replace the seat actuator with a new one and recheck

*Does the seat can be opened?*

**YES** – Faulty original seat actuator

**NO** – Faulty smart control unit

## PROCEDURE FOR OPENING THE SEAT IN EMERGENCY

### How to Unlock the Seat Without the Honda SMART Key

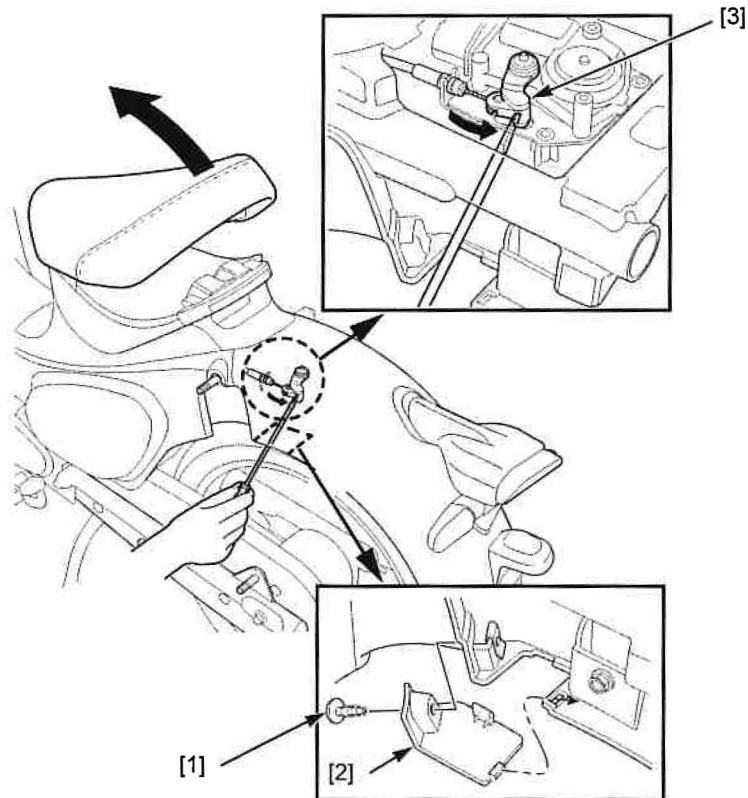
**NOTE:**

- Before starting the troubleshooting, check the battery condition.
- The seat open button can be operated when the Honda SMART Key is in the operating range and the ignition switch is in the (Off) or (LOCK) position.

Remove the left shock absorber (page 16-15).

Remove the screw [1] and the inner fender lid [2].

Move the lock arm of the seat actuator [3] using the proper tool to unlock the seat.



## EMERGENCY MODE

### How to connect the EM connector

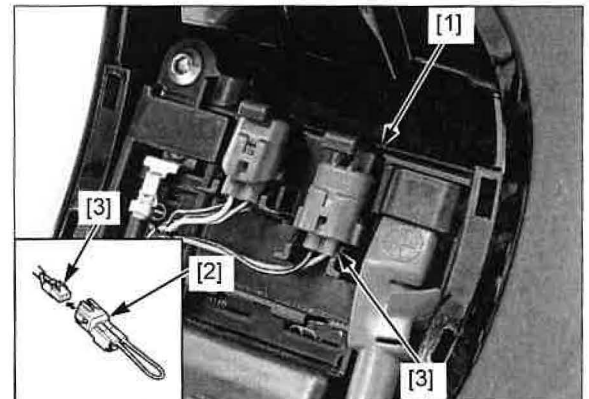
**NOTE:**

- Smart control unit provides an emergency mode to start the engine in an emergency such as when the vehicle's battery runs out or the Honda SMART key is lost or Honda SMART Key battery runs out.
- Before starting the engine in emergency mode, check the vehicle's battery voltage.

Remove the center cover (page 2-10).

Disconnect the dummy connector [1].

Connect the EM connector [2] to the EM mode 2P (Blue) connector [3].





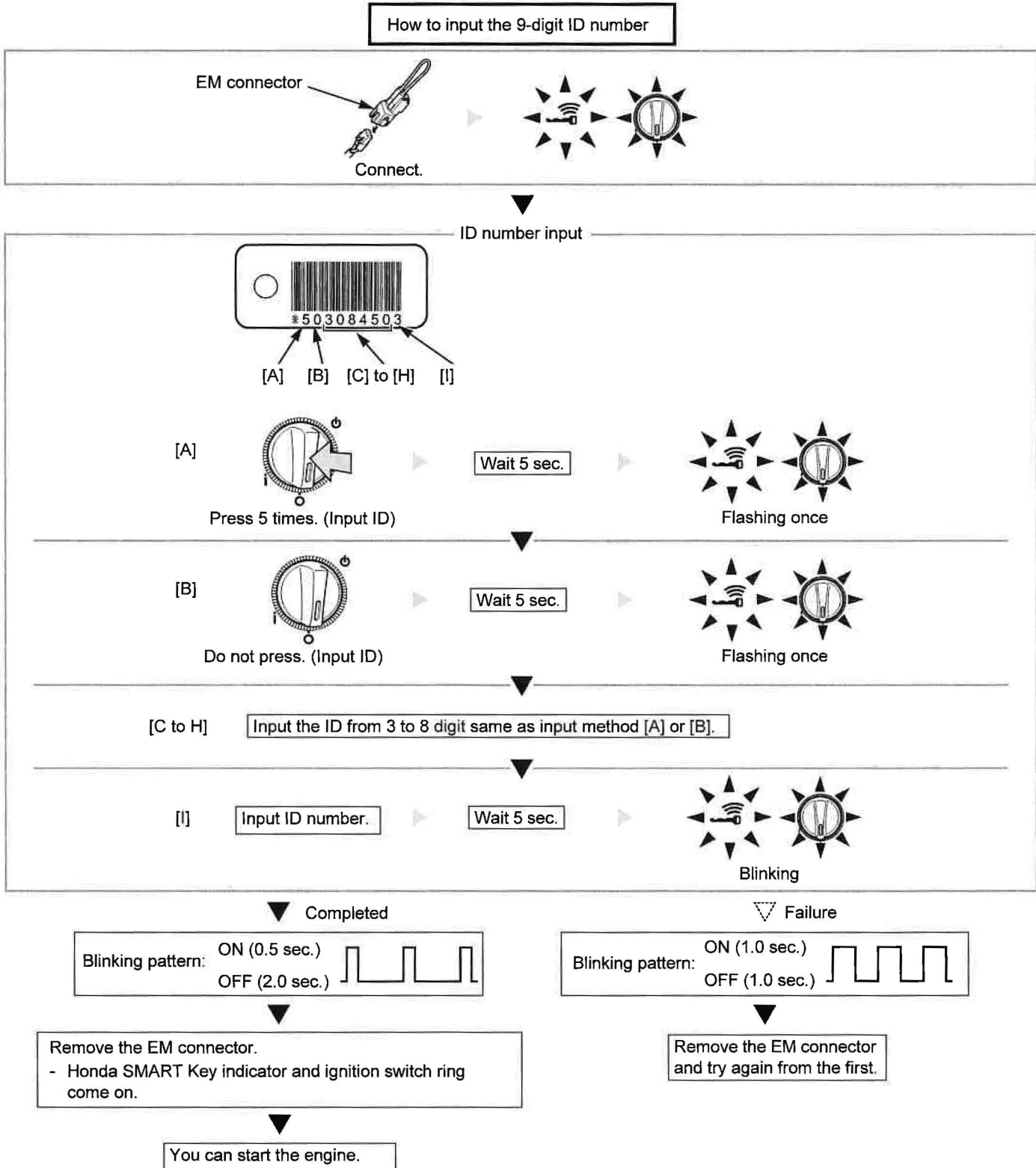
# Honda SMART Key SYSTEM

## Engine Starting Procedure in Emergency Mode

### NOTE:

- Smart control unit provides an emergency mode to start the engine in an emergency such as when the vehicle's battery runs out or the Honda SMART key is lost or Honda SMART Key battery runs out.

Check the ID number indicated on the ID tag of the Honda SMART Key registered in the vehicle.  
Connect the EM connector (page 21-19).



## SMART AUTHENTICATION ID REGISTRATION PROCEDURE

- Each Honda SMART Key has its particular ID number that cannot be changed or deleted.
- The Honda SMART Key that was registered once in the smart control unit cannot be registered in another smart control unit.

### COMMUNICATION ERRORS INSPECTION

To register the smart authentication ID, use a radio communication. Before registration, check the below items that may cause communication error.

- A TV tower, power generation plant, broadcast station, airport or other facility that generates strong radio wave or noise is not situated nearby.
- The Honda SMART Key is not brought together with a wireless communications device such as wireless applications and mobile phone or laptop.
- The Honda SMART Key does not make contact with or is not covered by a metallic product.
- The vehicle battery voltage is not low
- The Honda SMART Key battery power is not low
- The Honda SMART Key does not have any trouble
- The smart control unit does not have any trouble
- The associated circuits of the smart control unit do not have any trouble

### HOW TO CONNECT THE INSPECTION ADAPTOR

Remove the center cover (page 2-10).

Remove the dummy connector from the entry mode 2P (Red) connector [1].

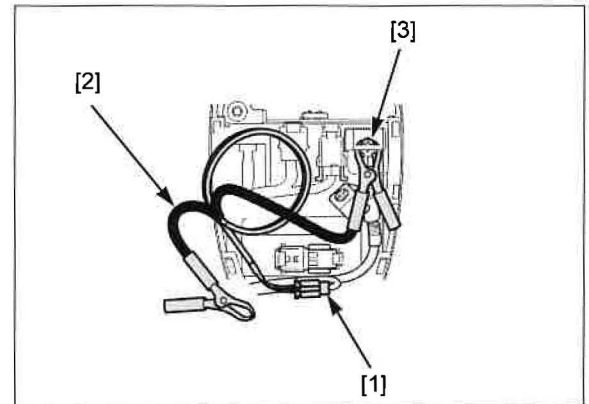
Connect the inspection adaptor [2] to the entry mode 2P (Red) connector.

Connect the adaptor clip to the battery (+) terminal [3]

**TOOL:**

Inspection adapter

07XMZ-MBW0101



### SMART AUTHENTICATION DIAGNOSTIC CODE

If the smart authentication ID is registered and not completed normally, the following error codes appear.

Honda SMART Key indicator blinking pattern	Symptom	Remedy
ON OFF	Communication error between the Honda SMART Key and smart control unit	Check for any communication error.
ON OFF	Failure to register the Honda SMART Key	Perform the registration procedure again.
ON OFF	The Honda SMART Key has already registered.	Check the behavior with the previously registered Honda SMART Key.
ON OFF	The Honda SMART Key has already registered in other vehicle.	Use a new Honda SMART Key to perform the registration procedure again.

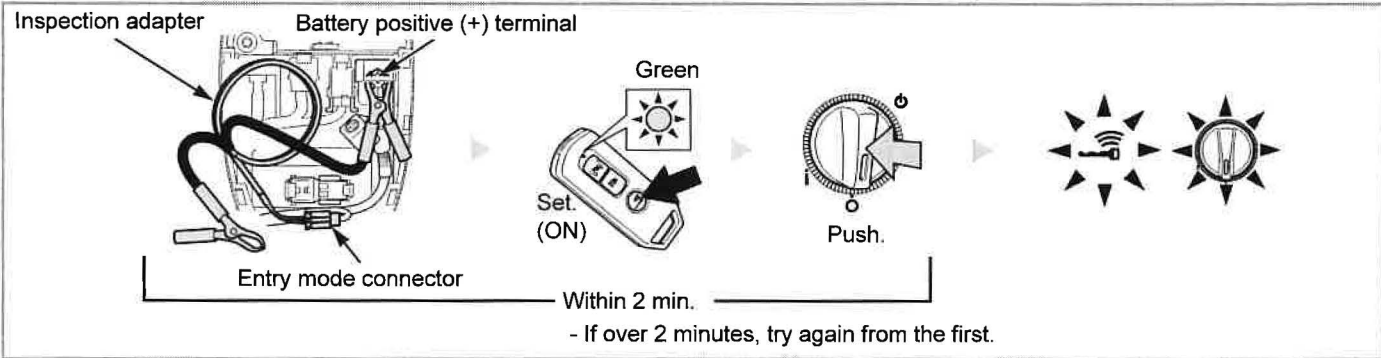
# Honda SMART Key SYSTEM

## Procedure for additional registration of a spare Honda SMART Key

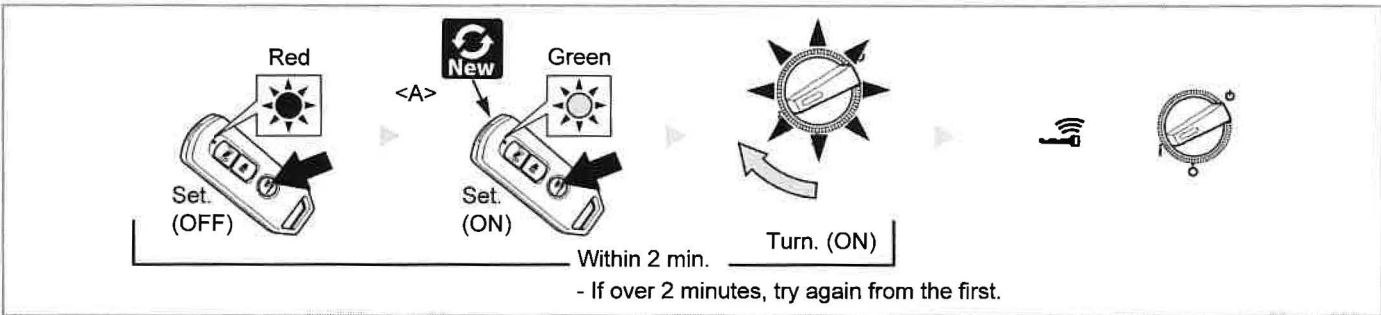
- Register all registered spare Honda SMART Key again.
- Use a Honda SMART Key registered in the vehicle and an inspection adapter to shift the Honda SMART Key system from normal mode to Honda SMART Key registration mode for additional registration.
- 4 ID codes can be registered in one smart control unit, so that it is possible to register up to 4 Honda SMART Keys.

Prepare a new Honda SMART Key and confirm that the ON/OFF buttons of all Honda SMART Keys are set to OFF.  
 Confirm that the seat is locked with the ignition switch set to OFF (the ignition switch is not turned).  
 Connect the inspection adaptor (page 21-21).

### How to register the additional Honda SMART Key



▼ Within 2 min.



▼ Completed

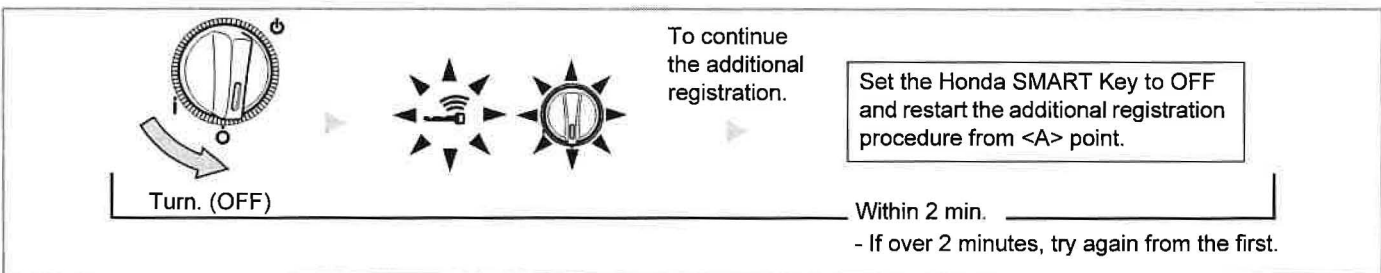
▽ Failure

#### Registration completed:

- After the Honda SMART Key indicator lights for about 2 seconds, it repeats blinking.
- The Honda SMART Key LED blinks Green 5 times.

#### Registration failure:

- The Honda SMART Key indicator displays the smart diagnosis code.



#### To complete the additional registration:

Remove the inspection adapter or wait 2 minutes or more.

- The Honda SMART Key indicator and ignition switch ring go off and the registration mode returns to the normal mode.
- Confirm that the ignition switch can be set to ON using the all registered Honda SMART Keys.

**Honda SMART Key registration procedure when all Honda SMART Keys were lost**

- When all Honda SMART Keys registered in the vehicle are lost and the smart authentication is disabled, input the ID number manually to perform the smart authentication, shift the Honda SMART Key system from the normal mode to the Honda SMART Key registration mode and register a new Honda SMART Key.
- It is possible to register up to 3 Honda SMART Keys when all Honda SMART Keys were lost.

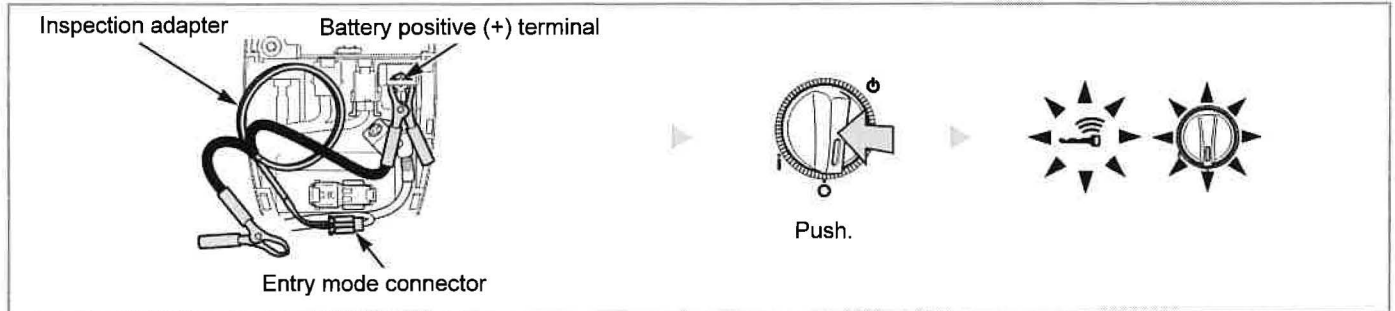
Confirm the ID number indicated on the ID tag of the lost Honda SMART Key.

Prepare a new Honda SMART Key.

Confirm that ON/OFF buttons of all Honda SMART Keys are set to OFF.

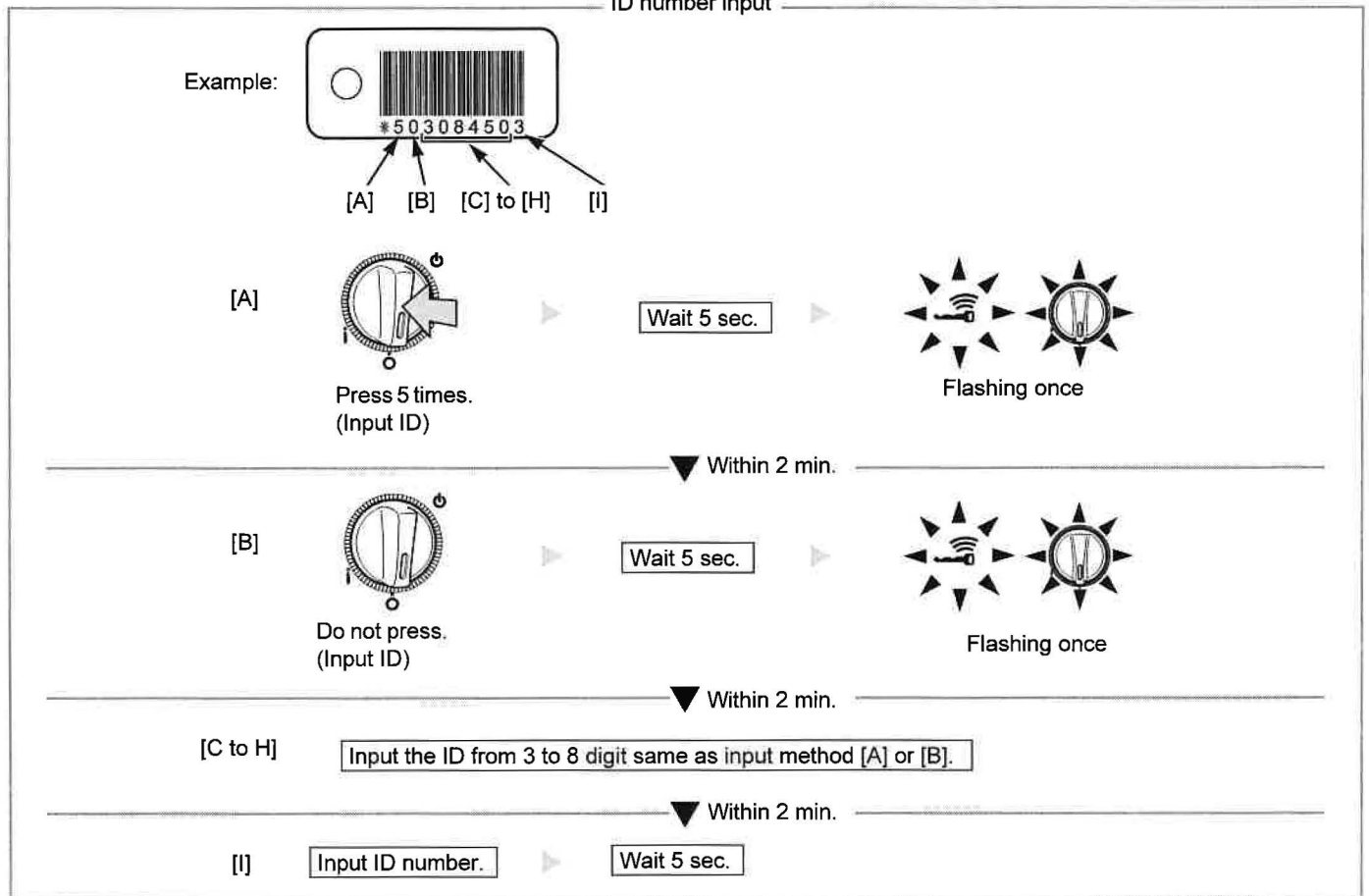
Connect the inspection adaptor (page 21-21).

How to input the 9-digit ID number and register the Honda SMART Key.



▼ Within 2 min.

ID number input



▼ Completed (Go to next page.)

▽ Failure (Go to next page.)

# Honda SMART Key SYSTEM

▼ Completed  
(From previous page)

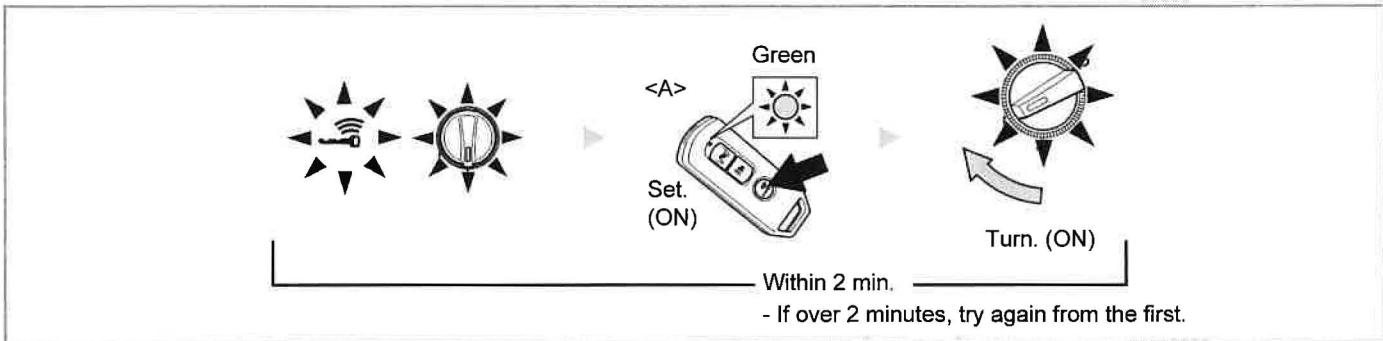
▽ Failure  
(From previous page)

Input completed:

- Honda SMART Key indicator and ignition switch ring go off in 5 seconds, and then come on.

Input failure:

- Honda SMART Key indicator and ignition switch ring start blinking.



▼ Completed

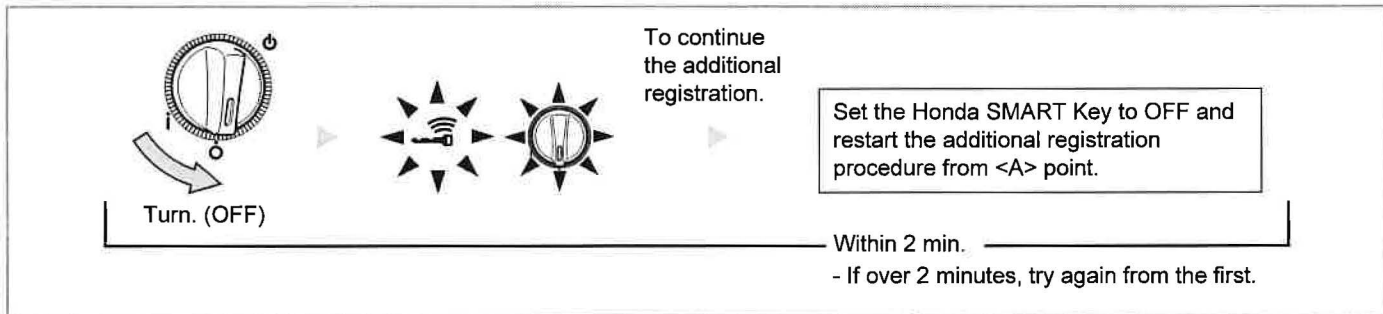
▽ Failure

Registration completed:

- After the Honda SMART Key indicator lights for about 2 seconds, it repeats blinking.
- The Honda SMART Key LED blinks Green 5 times.

Registration failure:

- The Honda SMART Key indicator displays the smart diagnosis code.



To complete the additional registration:

Remove the inspection adapter or wait 2 minutes or more.

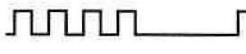
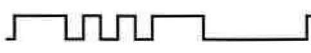
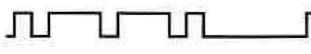
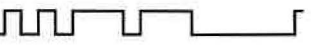
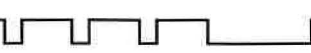
- The Honda SMART Key indicator and ignition switch ring go off and the registration mode returns to the normal mode.
- Confirm that the ignition switch can be set to ON using the all registered Honda SMART Keys.

## IMMOBILIZER AUTHENTICATION ID REGISTRATION PROCEDURE

- To change the immobilizer authentication ID in the smart control unit, use the ignition switch to register the ID number manually.
- The ECM where the immobilizer authentication ID was registered once cannot delete or change the immobilizer ID.

### IMMOBILIZER AUTHENTICATION DIAGNOSTIC CODE

If the immobilizer authentication ID is registered and not completed normally, the following error codes appear.

Honda SMART Key indicator blinking pattern	Symptom	Cause		Remedy
ON OFF 	Registration failure	When the smart control unit is replaced	Failure to register the immobilizer authentication ID in the smart control unit	Perform the smart control unit registration procedure again.
		When the ECM is replaced	Failure to register the immobilizer authentication ID in the ECM	Perform the ECM registration procedure again.
ON OFF 	Disapproved registration	Other immobilizer authentication ID has already been registered in the ECM.		Check the immobilizer authentication ID registered in the ECM and perform the smart control unit registration procedure. <ul style="list-style-type: none"> <li>• If the immobilizer authentication ID registered in the ECM cannot be confirmed, replace the ECM with a new one and perform the ECM registration procedure.</li> </ul>
ON OFF 	Disapproved registration	The ECM has any error.		Use a new ECM to perform the ECM registration procedure again.
ON OFF 	Registration failure	Communication error between the smart control unit and the ECM		Perform the registration procedure again.
ON OFF 	Registration failure	Communication from the ECM to smart control unit is abnormal		Perform the ECM registration procedure again. If same failure appears again, replace the ECM with a new one and perform the ECM registration procedure.

# Honda SMART Key SYSTEM

## Registration procedure when the smart control unit is replaced

- To replace the smart control unit, replace the smart control unit and the smart-authentication-completed Honda SMART Key as a set because the Honda SMART Key that has been used cannot be reregistered
- To replace the smart control unit, manually input the immobilizer authentication ID number for registration.

### NOTE:

- The factory preset immobilizer authentication ID number (\* + 9 digit ID) is the same as the smart authentication ID number.
- When the smart control unit is replaced, use the factory preset ID number that has been registered in the ECM for the immobilizer authentication ID number.
- It is necessary to store the factory preset ID tag of the Honda SMART Key or note down the ID number after the smart control unit was replaced.
- If you don't remember the immobilizer authentication ID number, you need to replace the engine control unit, too.

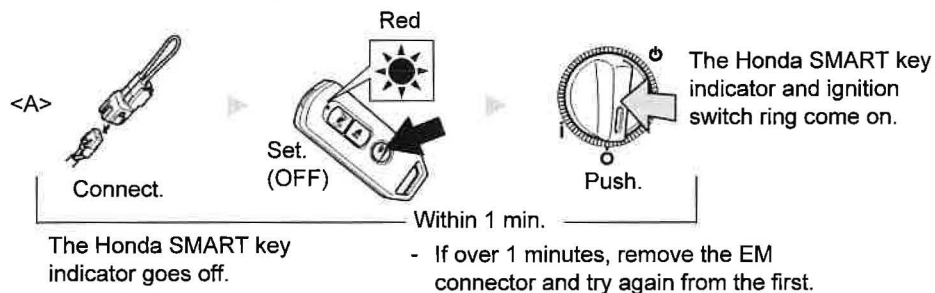
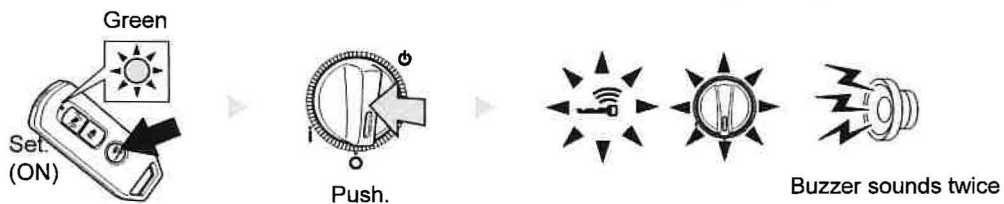
Confirm the ID number indicated on the factory preset ID tag of the Honda SMART Key.

Replace the smart control unit (page 21-38).

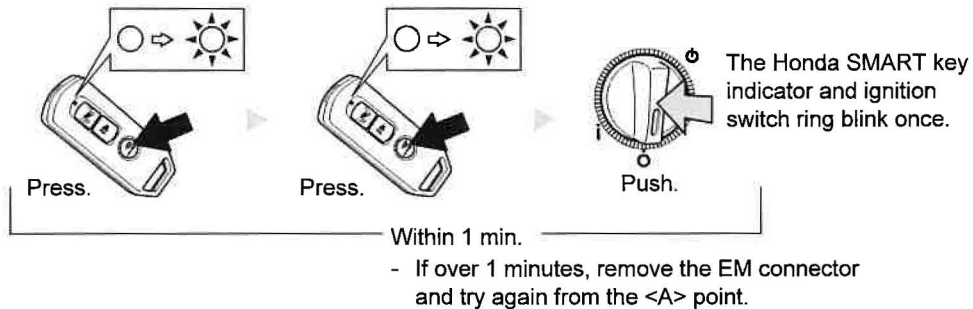
Connect the EM connector (page 21-19)

Connect the inspection adaptor (page 21-21)

How to register the immobilizer authentication ID number in the smart control unit. (When the smart control unit is replaced.)

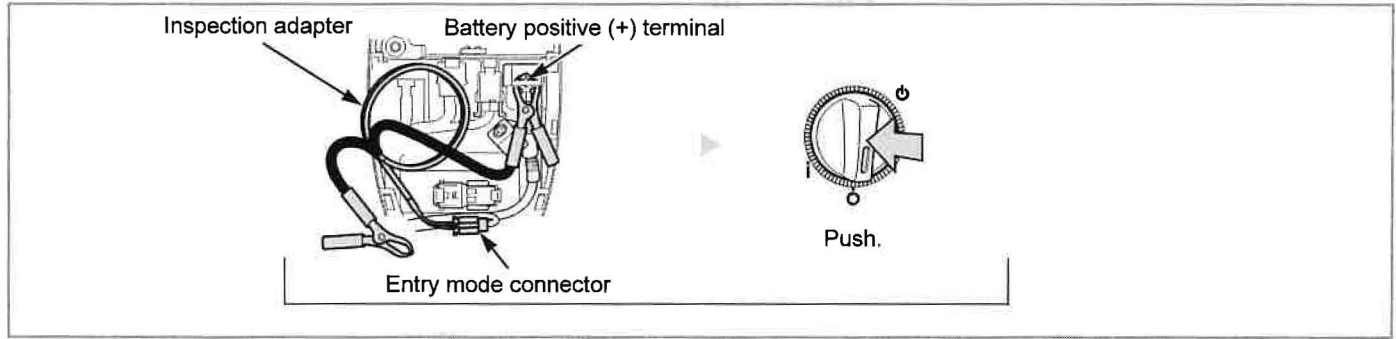


▼ Within 1 min.

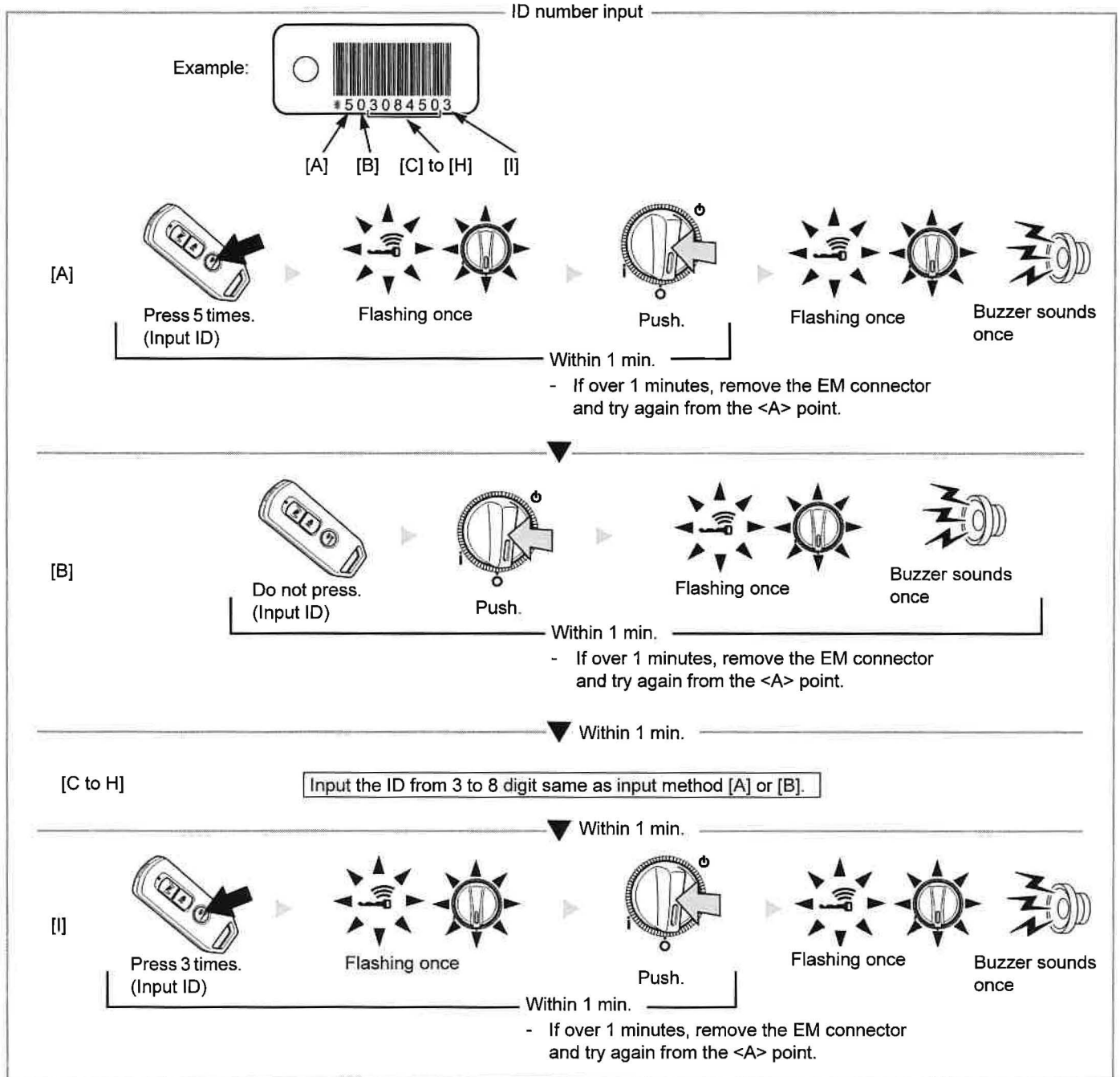


▼ (Go to next page.)

▼ (From previous page.)



▼ Within 1 min.



▼ Completed (Go to next page.)

▽ Failure (Go to next page.)



# Honda SMART Key SYSTEM

▼ Completed  
(From previous page.)

▽ Failure  
(From previous page.)



Buzzer  
sounds twice

Registration completed:  
- Honda SMART Key indicator and  
ignition switch ring blink twice.

▼ Within 1 min.

Registration failure:  
- Honda SMART Key indicator  
starts blinking. Remove the  
inspection adapter and try  
again from the beginning.

To complete the registration:

- Remove the EM connector and inspection adapter.
- Confirm that the engine can be started using the replaced smart control unit.

## Registration procedure when the ECM is replaced

- To replace the ECM with a new one, you need to register the immobilizer authentication ID number registered in the smart control unit to the ECM. The ID number is automatically registered.
- The immobilizer authentication ID number can be registered only once in the ECM. It cannot be deleted or changed.

### NOTE:

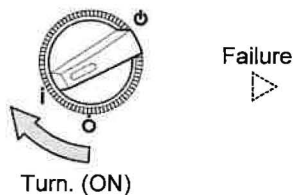
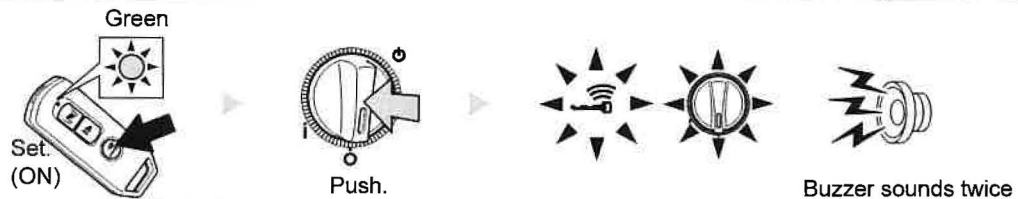
- To replace the ECM with a known-good one (Immobilizer authentication ID number is already registered), confirm the registered immobilizer authentication ID number, follow the "Registration procedure when the smart control unit is replaced" and register the immobilizer authentication ID number that is registered in the ECM to the smart control unit.

Replace the ECM with a new one (page 4-31).

Confirm that the Honda SMART Key ON/OFF buttons of the all Honda SMART Keys are set to OFF.

Confirm that the seat is locked with the ignition switch set to OFF (the ignition switch is not turned).

How to register the immobilizer authentication ID number in the ECM.



Registration failure:  
- Honda SMART Key indicator  
displays the immobilizer  
authentication diagnostic code.

Registration completed:  
- Honda SMART Key indicator start blinking.  
- Repeat sounds the buzzer.

Turn the ignition switch OFF.  
- Confirm that the engine can be  
started using the replaced ECM.

## Registration procedure when the ECM and smart control unit are replaced at the same time

- Replace the smart control unit and Honda SMART Key as a set.
- Replace the ECM with a new one.

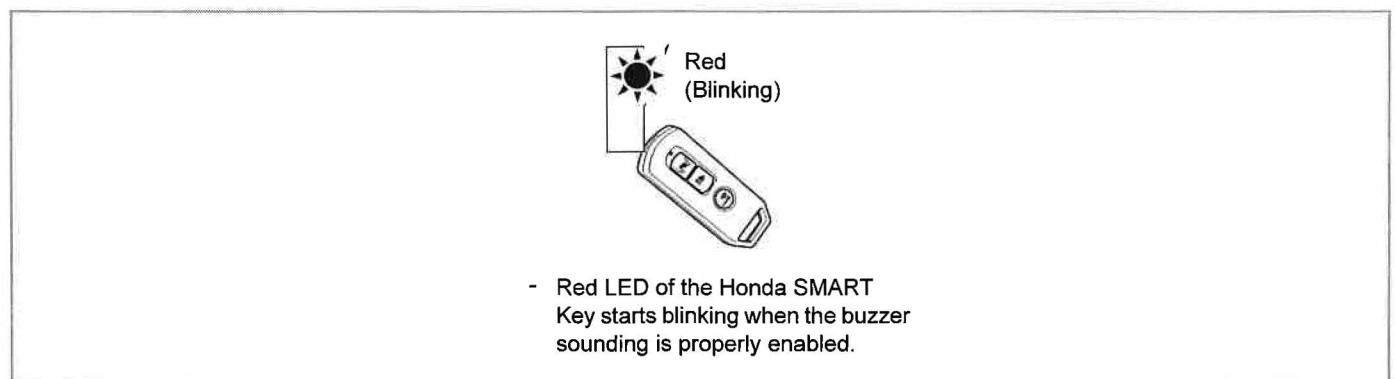
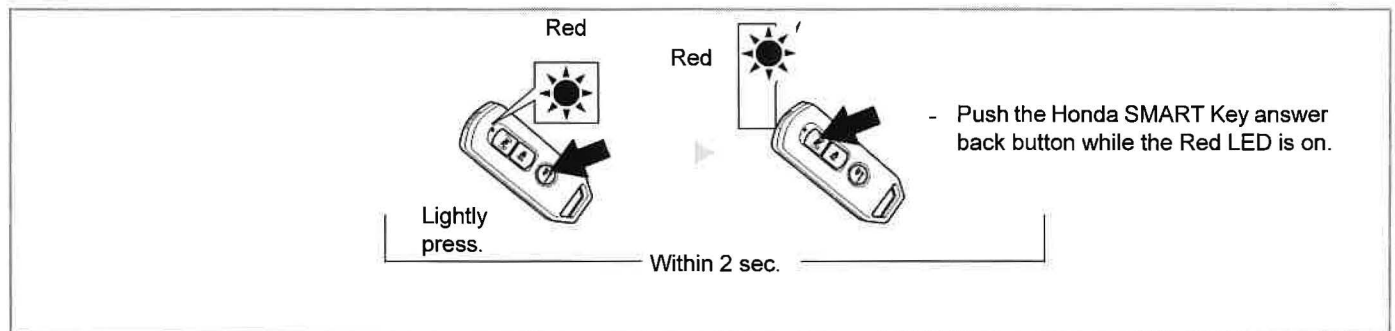
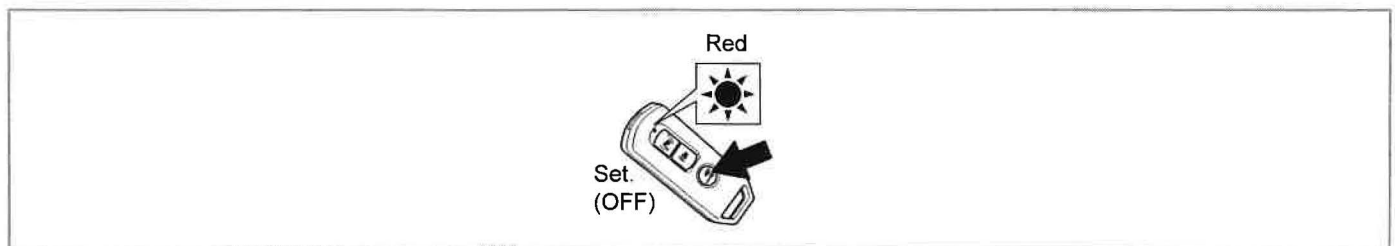
To register the immobilizer authentication ID number that was registered in the replaced smart control unit, in the ECM, follow the "Registration procedure when the ECM is replaced".

- To use the ECM where the immobilizer authentication ID number was registered, confirm the registered immobilizer ID number, follow the "Registration procedure when the smart control unit is replaced" and register the immobilizer authentication ID number that was registered in the ECM, in the smart control unit.
- Confirm that the engine can be started with the replaced smart control unit and ECM.

## Honda SMART Key

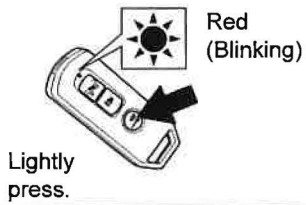
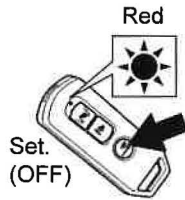
### Switch the buzzer sounding when the ignition switch locked/unlocked

Enable

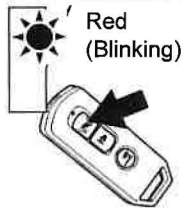


# Honda SMART Key SYSTEM

## Disable



Within 2 sec.



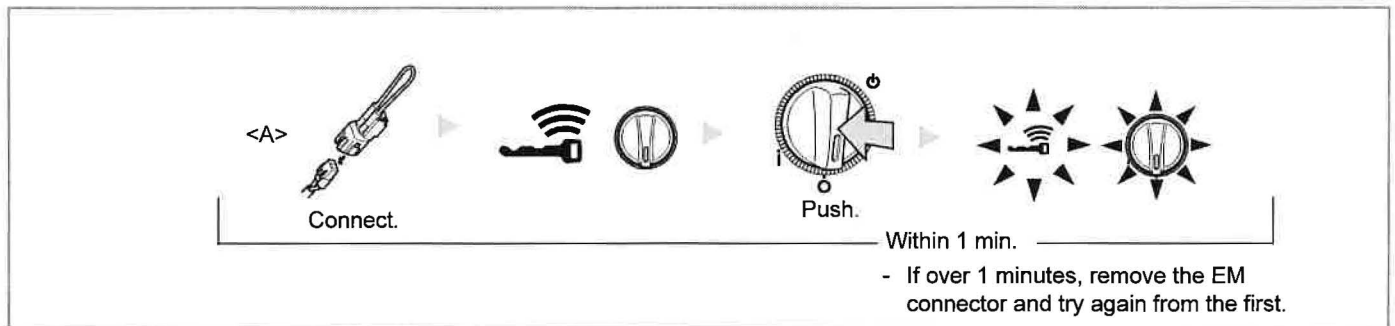
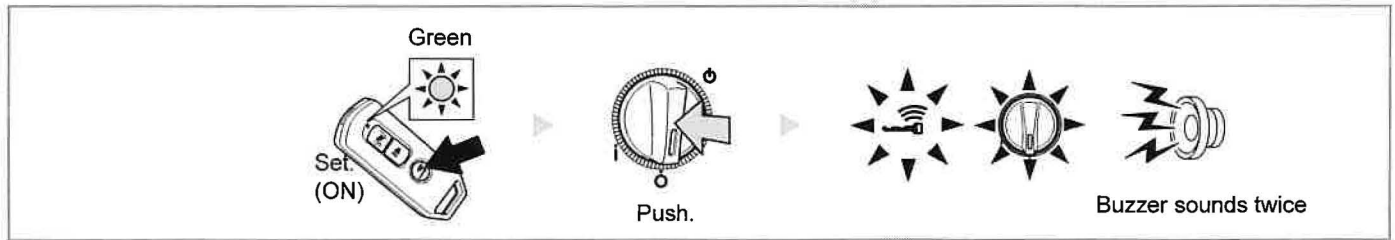
- Push the Honda SMART Key answer back button while the Red LED is blinking.



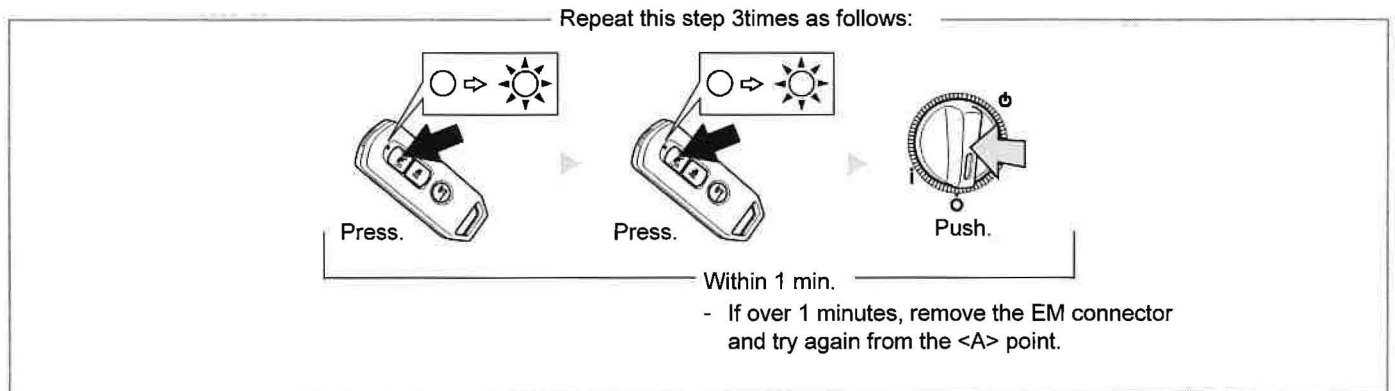
- The Honda SMART Key LED stops blinking and stays on when the buzzer sounding is properly disabled.

## ANSWER BACK SYSTEM

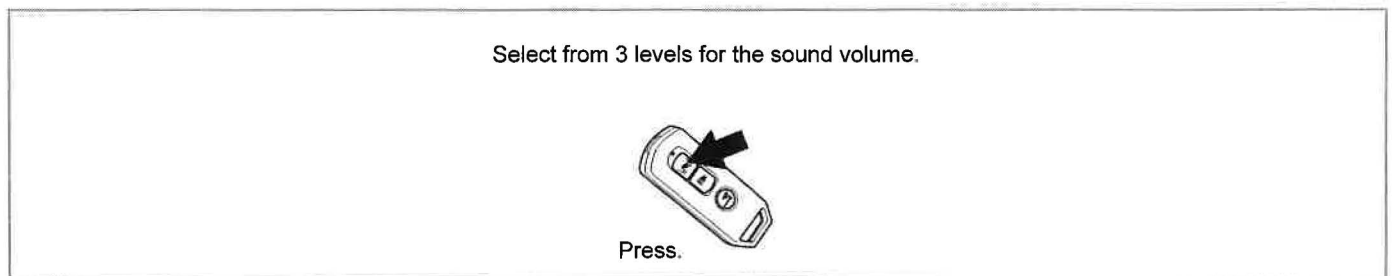
### Adjusting the answer back buzzer sound volume level



▼ Within 1 min.



Select from 3 levels for the sound volume.

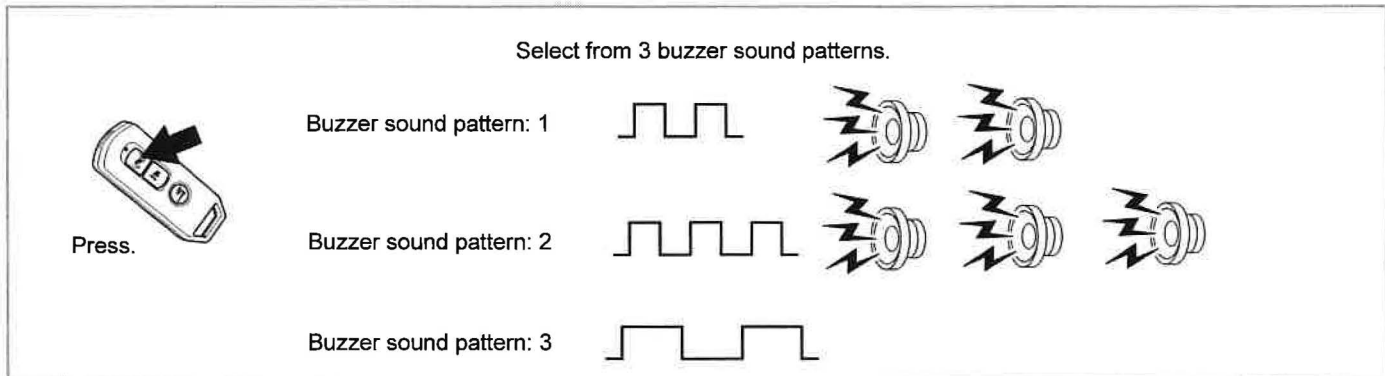
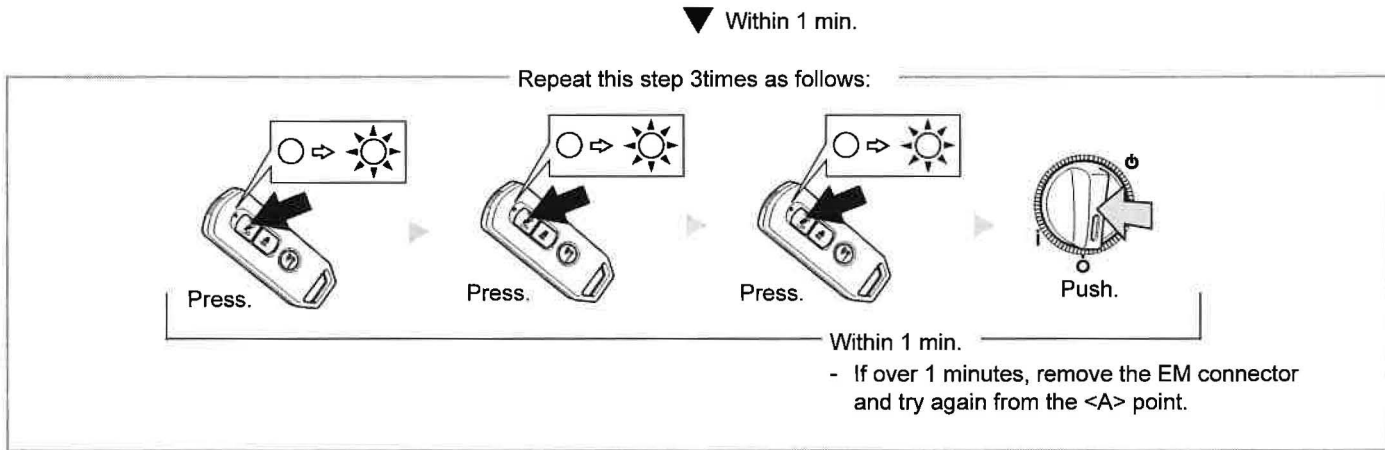
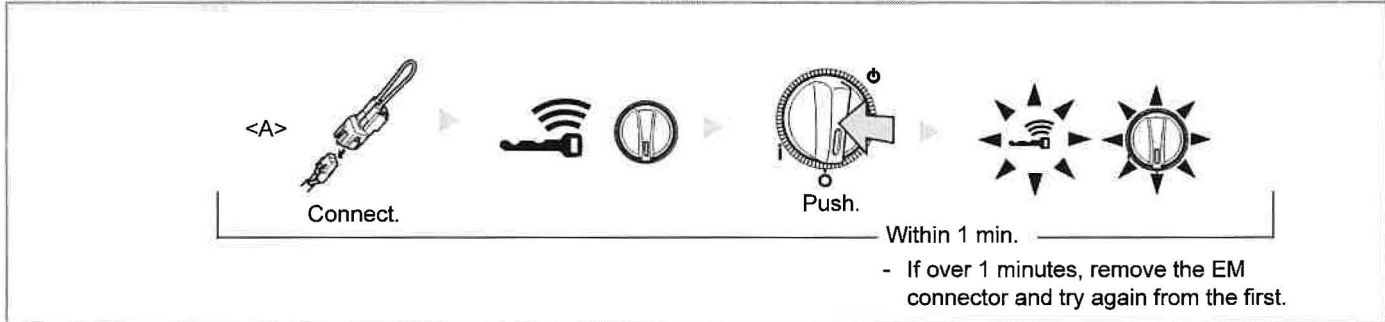
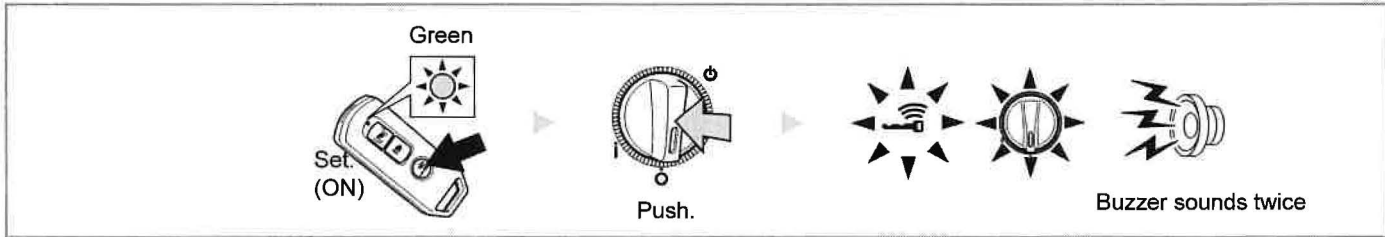


To complete the sound volume:

- Remove the EM connector
- Wait for about 10 seconds until the ignition switch ring starts blinking.

# Honda SMART Key SYSTEM

## Changing the answer back buzzer sound pattern



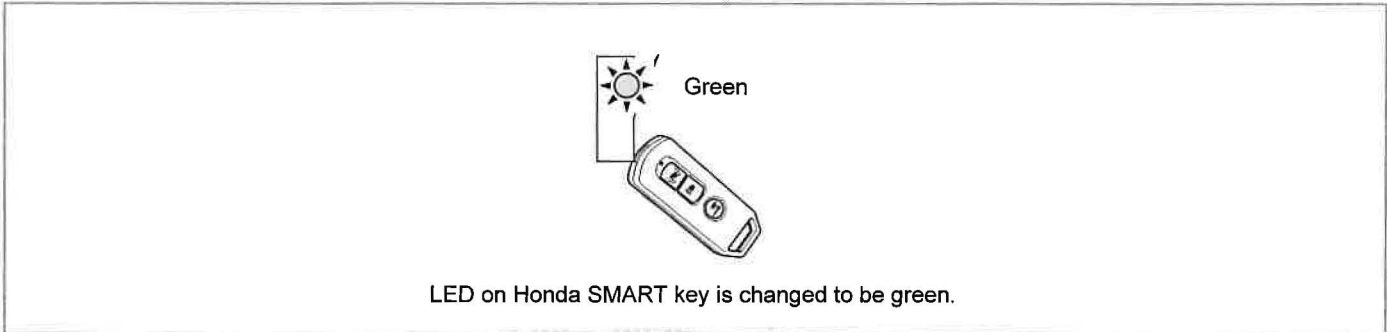
To complete the buzzer sound patterns:

- Remove the EM connector
- Wait for about 10 seconds until the ignition switch ring starts blinking.

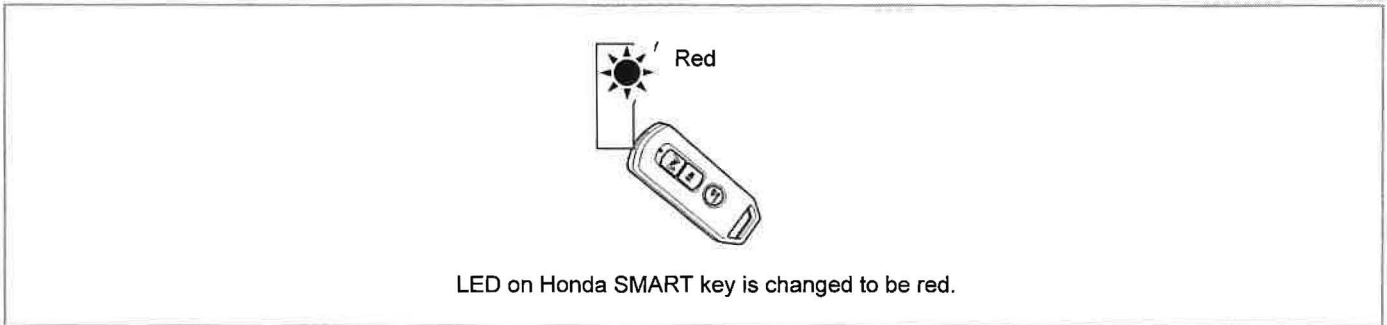
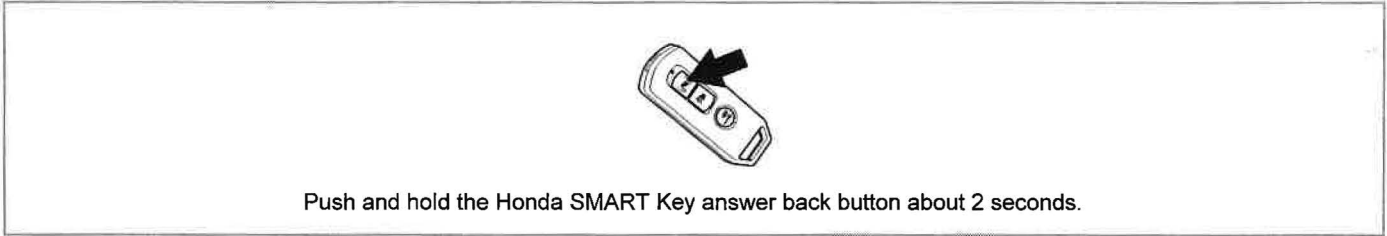
**Temporary silence mode**

- If you enable the silent mode, alert sounds at various registration procedure will no longer.

Enable



Disable

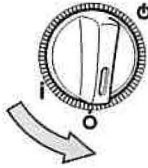


## ALARM SYSTEM

### Setting the ANTI-THEFT ALARM SYSTEM

- If you enable the silent mode, alert sounds at various registration procedure will no longer.

Enable



Turn. (OFF)



Press.

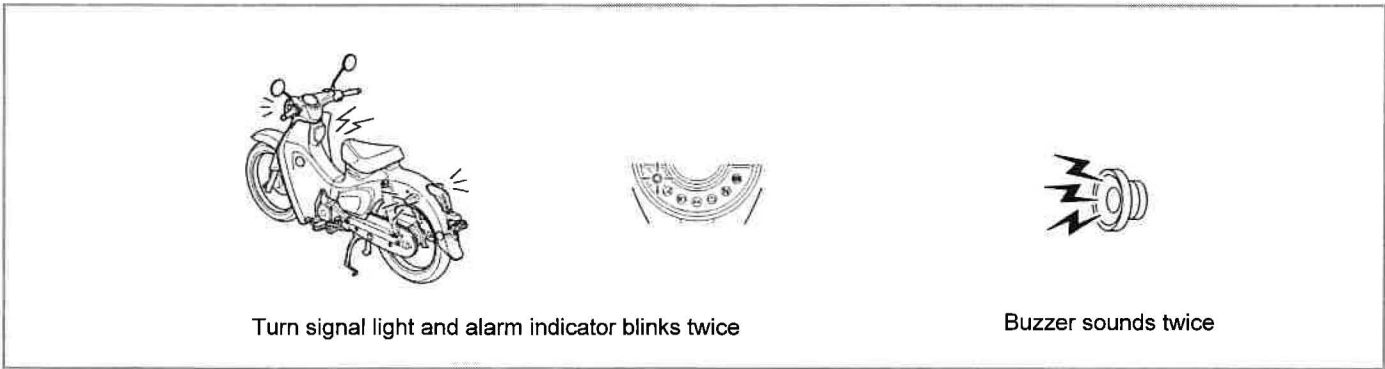
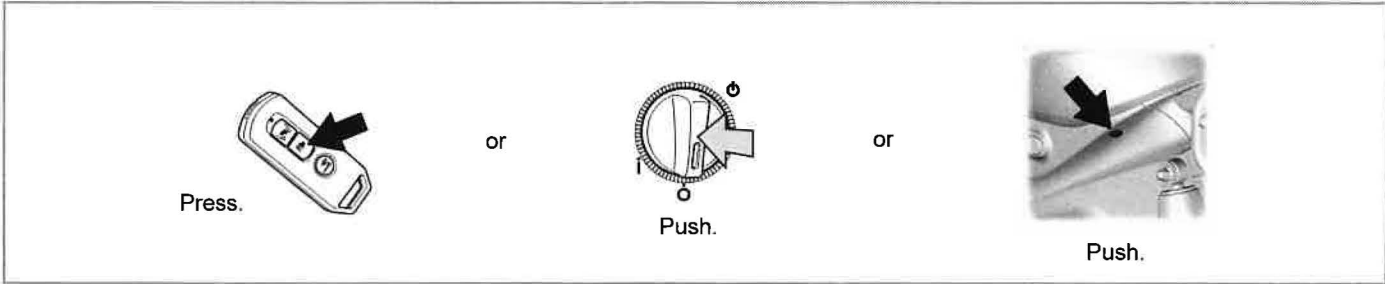


Turn signal light blinks once



Buzzer sounds once

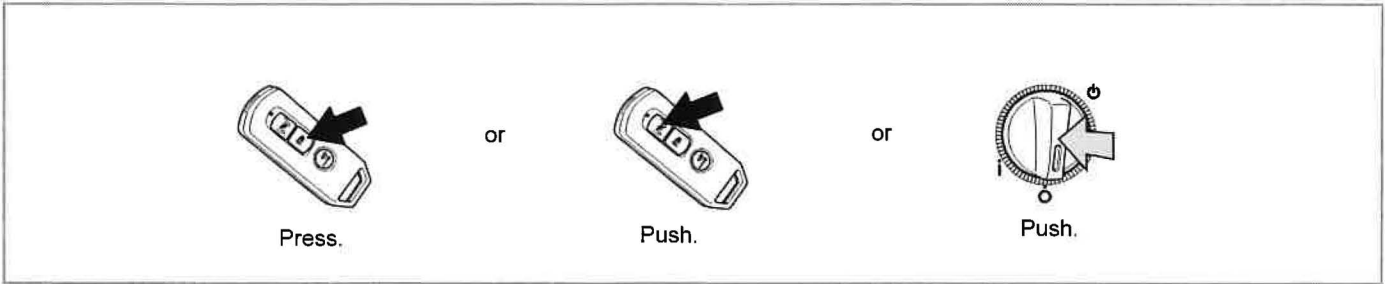
Disable



Stopping the ANTI-THEFT ALARM SYSTEM

- After stopping the ALARM activation, ALARM system will be cancelled.

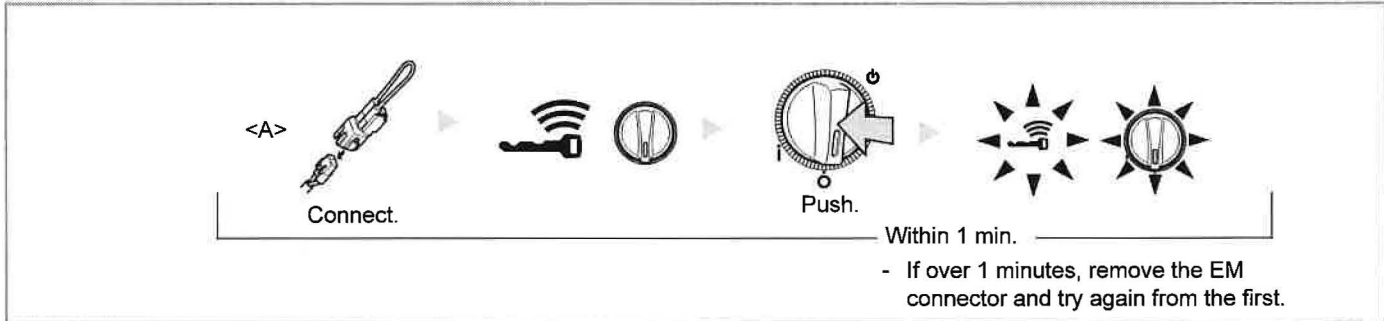
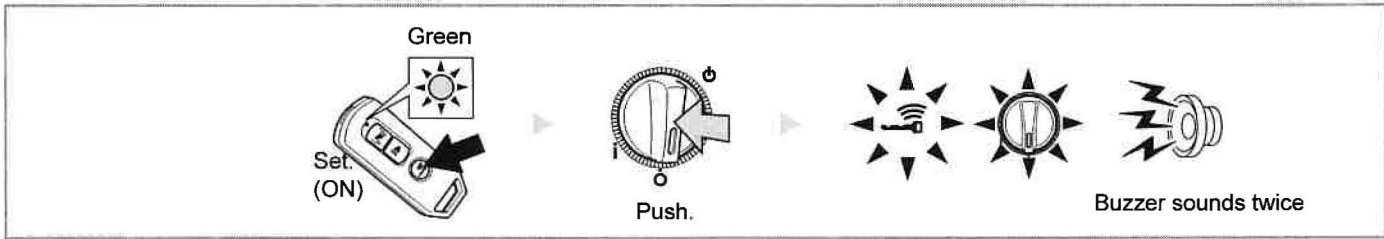
Disable





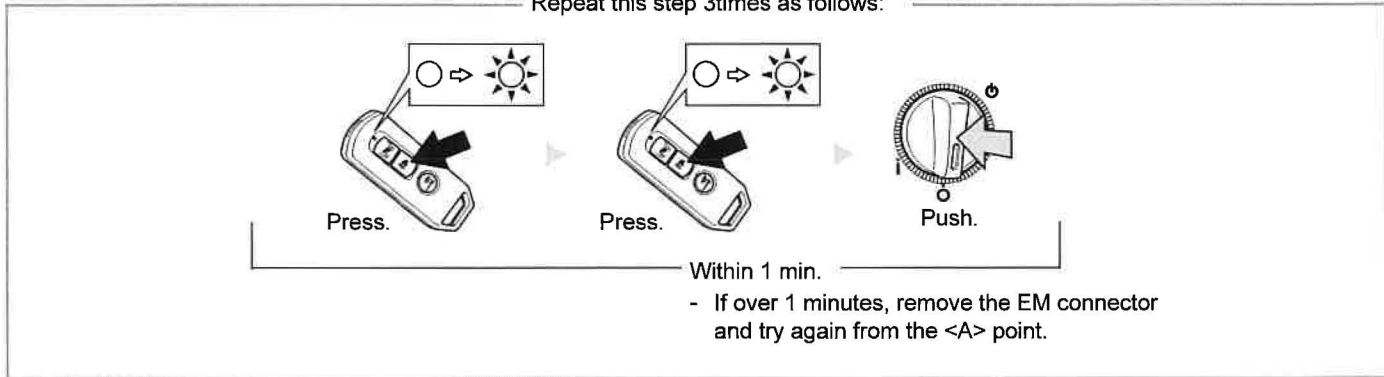
# Honda SMART Key SYSTEM

## Adjusting the sensitivity of Anti-Theft Alarm system



▼ Within 1 min.

Repeat this step 3times as follows:



▼

Press the Honda SMART Key alarm button to select from 3 sensitivity level of ANTI-THEFT ALARM SYSTEM.



- 3 times of buzzer sound: sensitivity level: 3 (high)
- 2 times of buzzer sound: sensitivity level: 2 (middle)
- 1 time of buzzer sound: sensitivity level: 1 (low)

▼

To complete the sensitivity level of ANTI-THEFT ALARM SYSTEM:

- Remove the EM connector
- Wait for about 10 seconds until the ignition switch ring starts blinking.

## IGNITION SWITCH (SMART STEERING LOCK)

### INSPECTION

Remove the following:

- Leg shield (page 2-11)
- Steering stem (page 15-19)

Removal and installation the ignition switch (smart steering lock) according to the illustration.

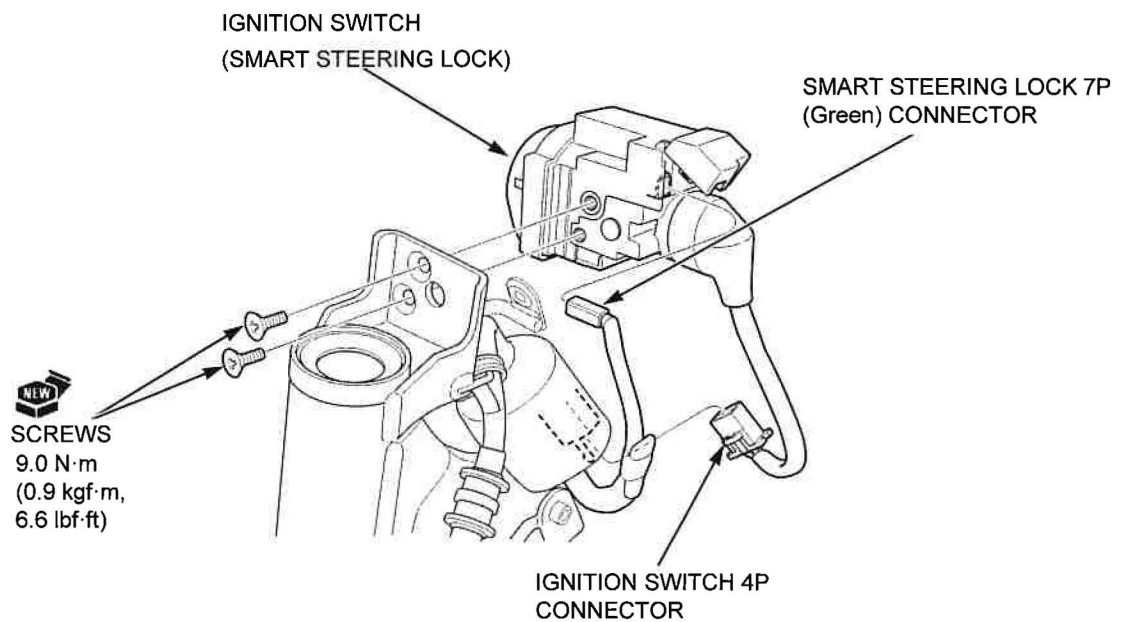
Installation is in the reverse order of removal.

- Replace the smart steering lock screws with new ones.

### TORQUE:

Smart steering lock screw:

**9.0 N·m (0.9 kgf·m, 6.6 lbf·ft)**

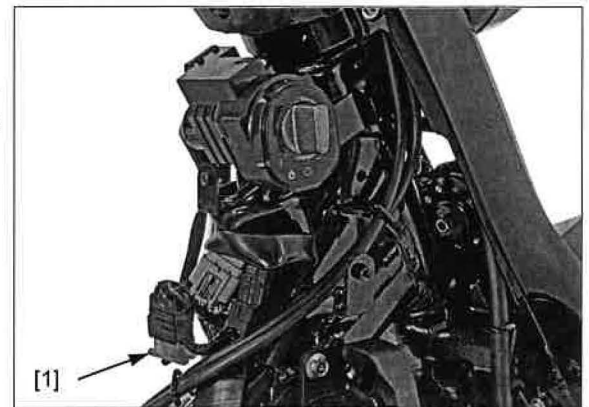


### INSPECTION

Remove the leg shield (page 2-11).

Disconnect the ignition switch 4P connector [1].

Check for continuity between the switch side connector terminals in each switch position according to the chart (page 22-2).



## SMART CONTROL UNIT

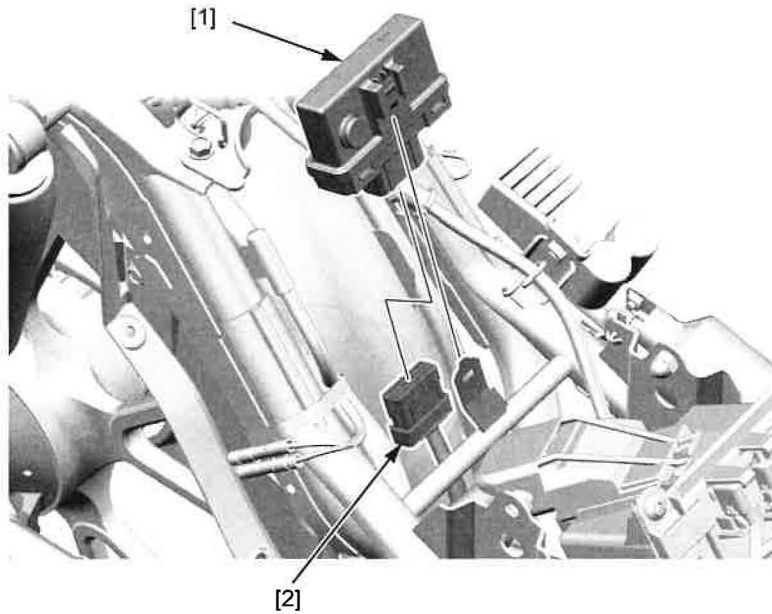
### REMOVAL/INSTALLATION

Remove the fuel tank (page 7-11)

Remove the smart control unit [1].

Disconnect the smart control unit 33P (Gray) connector [2].

Installation is in the reverse order of removal.



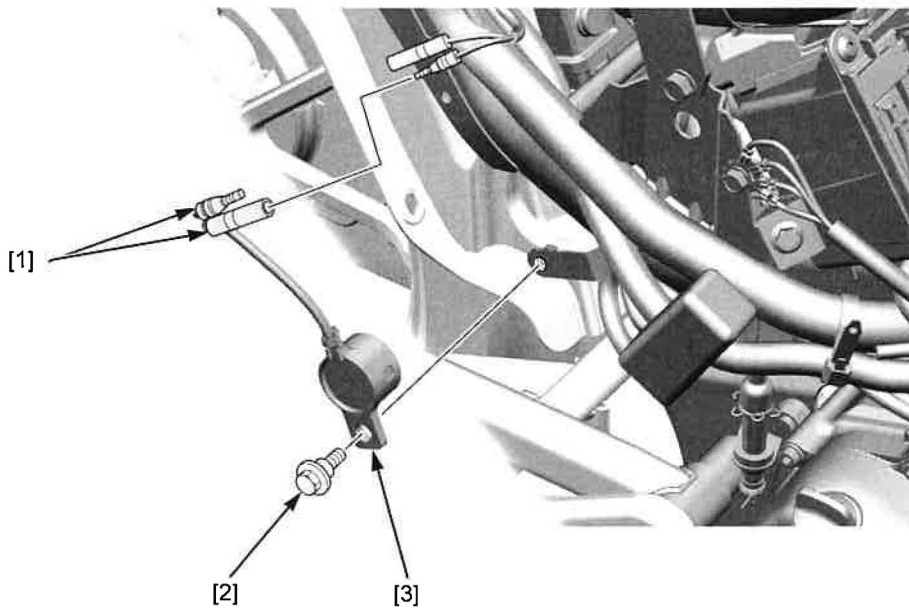
## BUZZER

### REMOVAL/INSTALLATION

Remove the body cover (page 2-13)

Disconnect the buzzer connectors [1].  
Remove the bolt [1] and the buzzer [3].

Installation is in the reverse order of removal.



## SEAT ACTUATOR

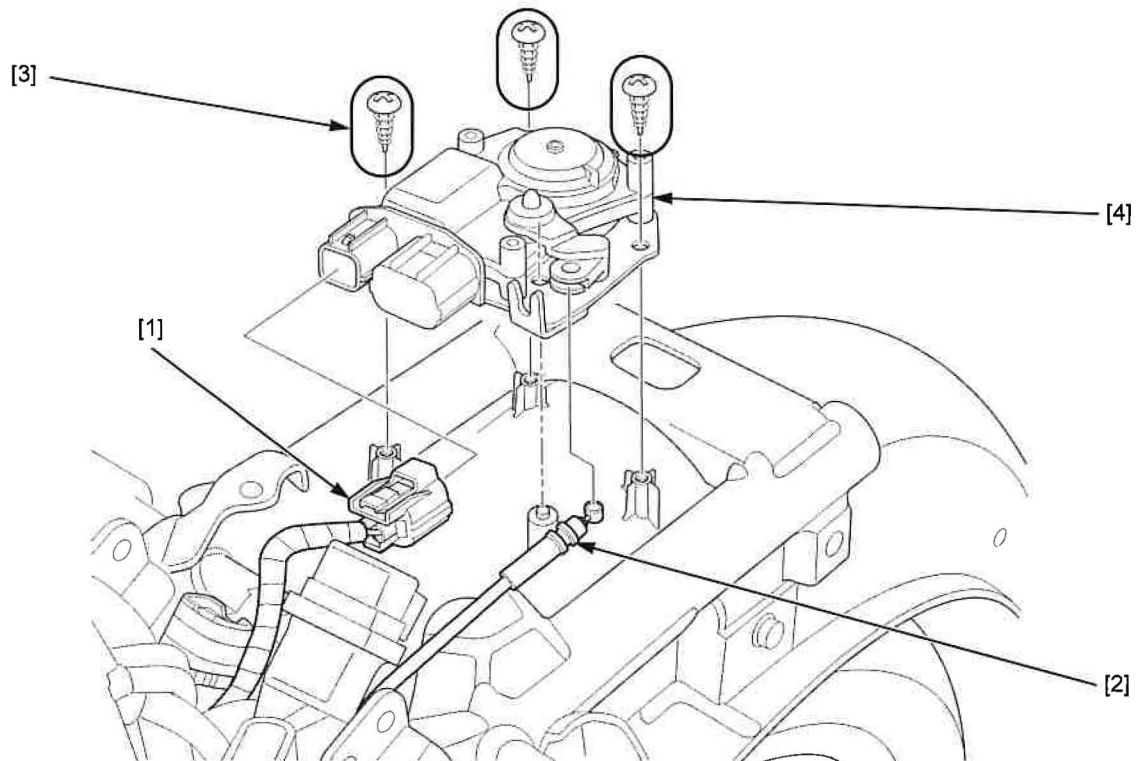
### REMOVAL/INSTALLATION

Remove the rear fender (page 2-15)

Disconnect the seat actuator 2P (Gray) connector [1] and seat lock cable [2].

Remove the three screws [3] and the seat actuator [4].

Installation is in the reverse order of removal.



## SEAT SWITCH

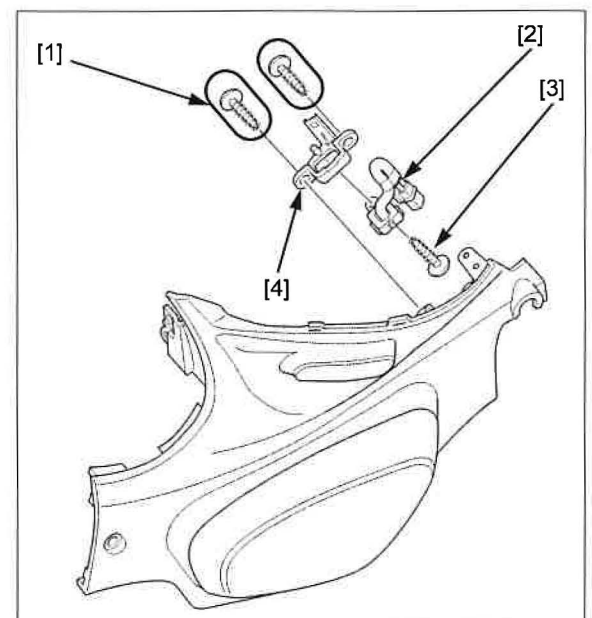
### REMOVAL/INSTALLATION

Remove the body cover (page 2-13).

Remove the two screws [1] and seat switch [2].

Remove the screw [3] and seat stay [4] from seat switch.

Installation is in the reverse order of removal.



## Honda SMART Key SYSTEM

# REPLACEMENT PARTS FOR Honda SMART Key SYSTEM PROBLEM

Problem	Replacement parts			
	Smart Honda SMART Key	Smart control unit	ECM	Smart steering lock
Additional registration of a spare Honda SMART Key	○			
All Honda SMART Key have been lost. (Registered smart authentication ID number can be confirmed)	○			
All Honda SMART Key have been lost. (Registered smart authentication ID number and immobilizer authentication ID number cannot be confirmed)	○	○	○	
Smart control unit is faulty. (Registered immobilizer authentication ID number can be confirmed)	○	○		
Smart control unit is faulty. (Registered immobilizer authentication ID number cannot be confirmed)	○	○	○	
ECM is faulty.			○	
Smart steering lock is faulty.				○

# 22. WIRING DIAGRAMS

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WIRING DIAGRAMS ..... 22-2

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**MEMO**

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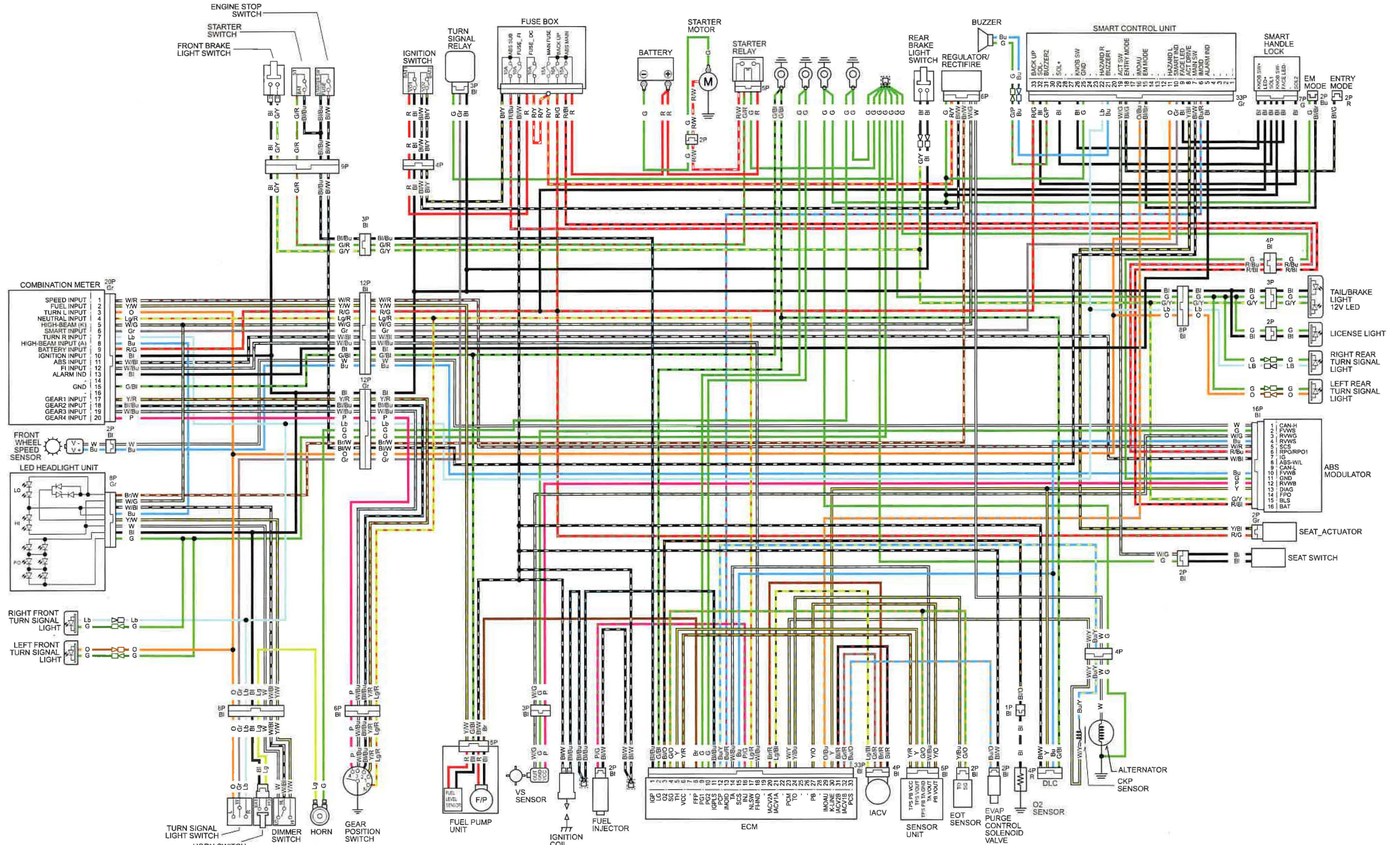


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SWITCH CONTINUITY

DIMMER SWITCH			TURN SIGNAL SWITCH			HORN SWITCH		IGNITION SWITCH				STARTER SWITCH		ENGINE STOP SWITCH					
	HL	LO	HI	W	R	L	FREE	BAT	HO	BAT1	VO1	BAT2	VO2	FREE	BAT	ST	OFF	BAT	IG
LO	○	○		R	○	○	PUSH	○	○	ON	○	○		PUSH	○	○	OFF	○	○
(N)	○	○		N			COLOR	BI	Lg	OFF				COLOR	BW/Bu	G/R			
HI	○	○		L	○	○				COLOR	B/Y	BI	BI/Y						
COLOR	W/BI	W	Y/W	COLOR	Gr	Lb				COLOR	B/Bu	BI	BI/W						

BI Black	— Br Brown	— O Orange
Y Yellow	— Lb Light Blue	— Lg Light Green
Bu Blue	— P Pink	— Gr Gray
G Green	— W White	
R Red		
W White		

TWO COLORED WIRE (EXAMPLE:YELLOW/RED)



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