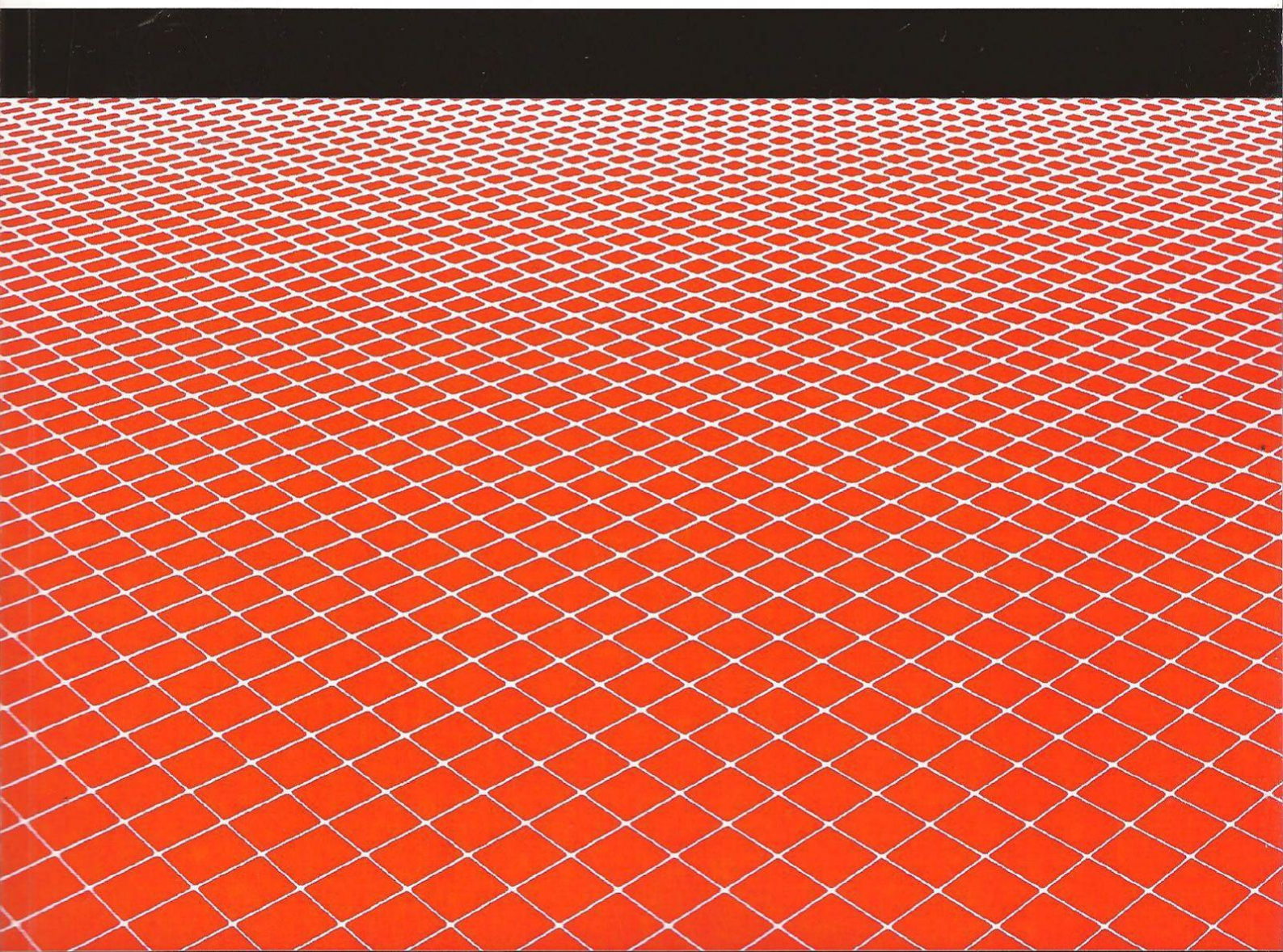




SHOP MANUAL

CBF125M



CBF125M₉

TYPE CODE

- Throughout this manual, the following abbreviations are used to identify individual type.

CODE	AREA TYPE
E	U.K.
F	France
ED	EUROPEAN DIRECT SALES

A Few Words About Safety

Service Information

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

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

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

For Your Customer's Safety

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

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.

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.

⚠ 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.

⚠ 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.

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the CBF125M.

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the vehicle is in peak operating condition and the emission levels are within the standard set.

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

Sections 1 and 3 apply to the whole motorcycle. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections. Section 4 through 18 describe parts of the motorcycle, grouped according to location.

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.

If you don't know the source of the trouble, go to section 20 Troubleshooting.

Your safety, and the safety of others, is very important. To help you make informed decisions we have provided safety messages and other information throughout this manual. Of course, it is not practical or possible to warn you about all the hazards associated with servicing this vehicle. You must use your own good judgement. You will find important safety information in a variety of forms including:

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

These signal words mean:

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

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

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

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

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

ALL INFORMATION, ILLUSTRATIONS, DIRECTIONS AND SPECIFICATIONS INCLUDED IN THIS PUBLICATION ARE BASED ON THE LATEST PRODUCT INFORMATION AVAILABLE AT THE TIME OF APPROVAL FOR PRINTING. Honda Motor Co., Ltd. RESERVES THE RIGHT TO MAKE CHANGES AT ANY TIME WITHOUT NOTICE AND WITHOUT INCURRING ANY OBLIGATION WHATSOEVER. NO PART OF THIS PUBLICATION MAY BE REPRODUCED WITHOUT WRITTEN PERMISSION. THIS MANUAL IS WRITTEN FOR PERSONS WHO HAVE ACQUIRED BASIC KNOWLEDGE OF MAINTENANCE ON Honda MOTORCYCLES, MOTOR SCOOTERS OR ATVS.

Honda Motor Co., Ltd.
SERVICE PUBLICATION OFFICE

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SYMBOLS

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

	Replace the part(s) with new one(s) before assembly.
	Use the recommended engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).
	Use multi-purpose grease (lithium based multi-purpose grease NLGI #2 or equivalent).
	Use molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® BR-2 plus manufactured by Dow Corning U.S.A. Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan
	Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® G-n Paste manufactured by Dow Corning U.S.A. Honda Moly 60 (U.S.A. only) Rocol ASP manufactured by Rocol Limited, U.K. Rocol Paste manufactured by Sumico Lubricant, Japan
	Use silicone grease.
	Apply a locking agent. Use a medium strength locking agent unless otherwise specified.
	Apply sealant.
	Use DOT 3 or DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified.
	Use fork or suspension fluid.

1. GENERAL INFORMATION

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GENERAL INFORMATION

SERVICE RULES

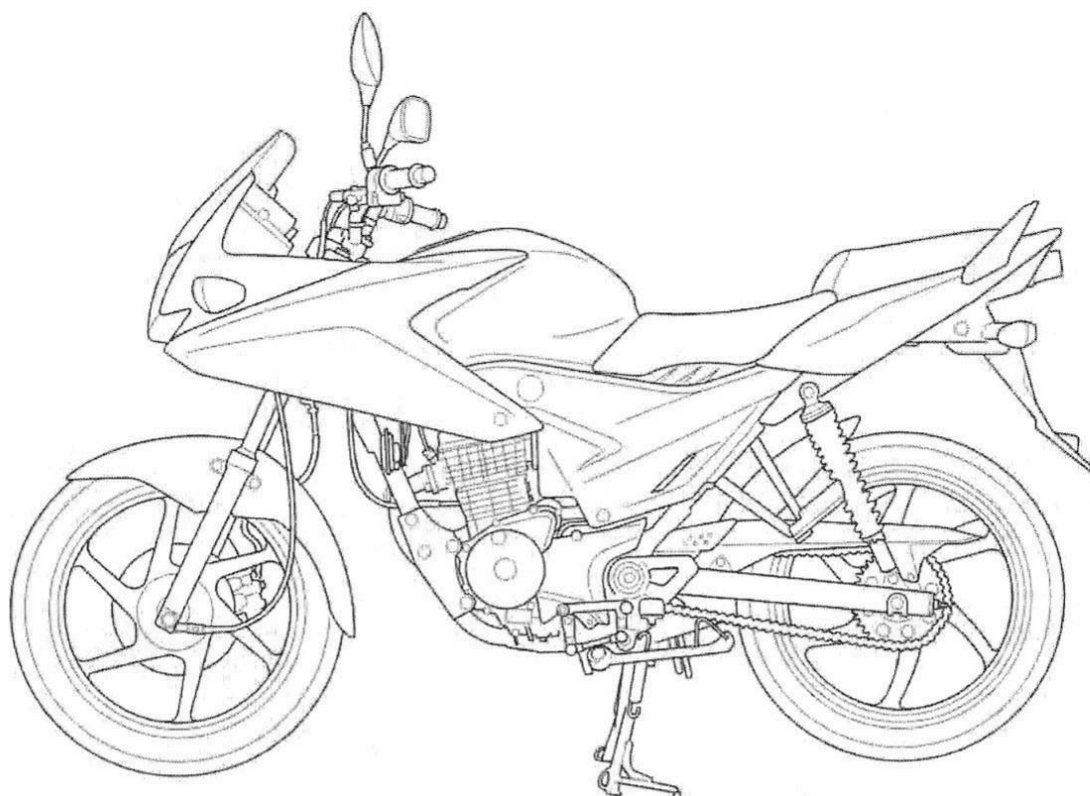
1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown in the CABLE & HARNESS ROUTING (page 1-16).
9. Do not bend or twist control cables. Damaged control cables will not operate smoothly and may stick or bend.

ABBREVIATION

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

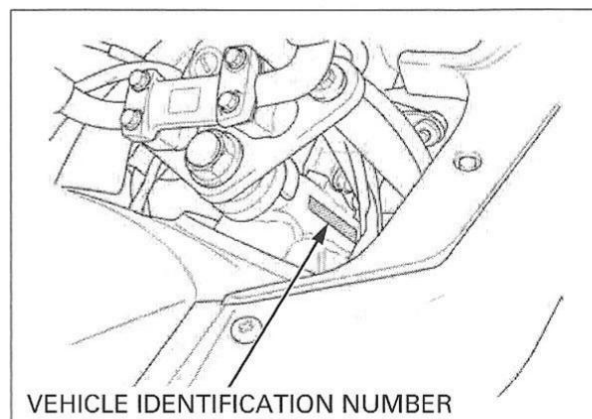
Abbrev. term	Full term
MAP sensor	Manifold Absolute Pressure sensor
MIL	Malfunction Indicator Lamp
PGM-FI	Programmed Fuel Injection
SCS connector	Service Check Short connector
IAT sensor	Intake Air Temperature sensor
TP sensor	Throttle Position sensor
ECM	Engine Control Module
DTC	Diagnostic Trouble Code
DLC	Data Link Connector
CKP sensor	Crankshaft Position sensor
EEPROM	Electrically Erasable Programmable Read Only Memory
HDS	Honda Diagnostic System
IACV	Idle Air Control Valve
EOT sensor	Engine Oil Temperature sensor
TDC	Top Dead Center

MODEL IDENTIFICATION

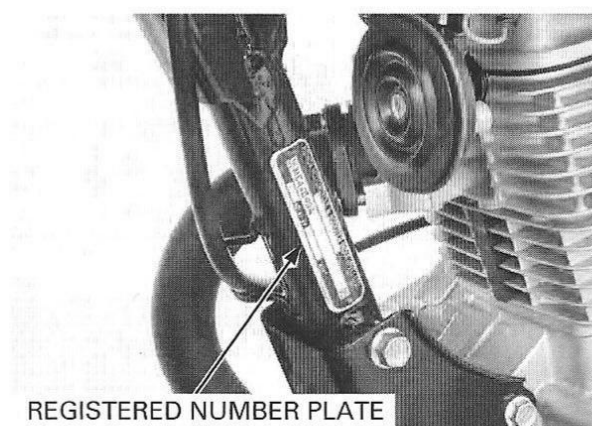


SERIAL NUMBERS

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

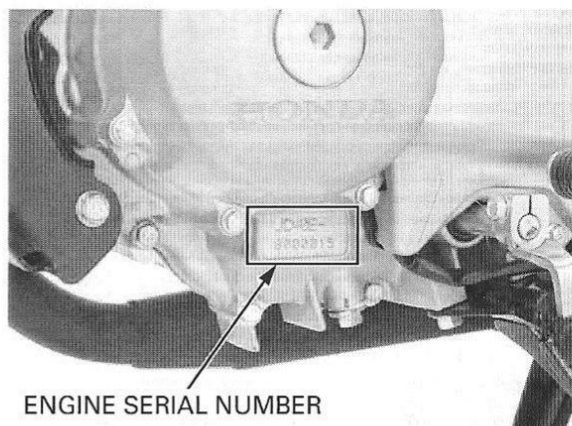


The registered number plate is located in left side of the frame.

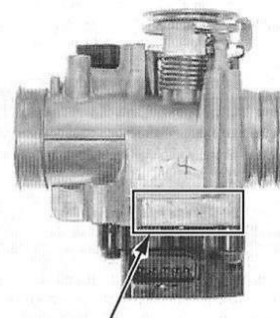


GENERAL INFORMATION

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

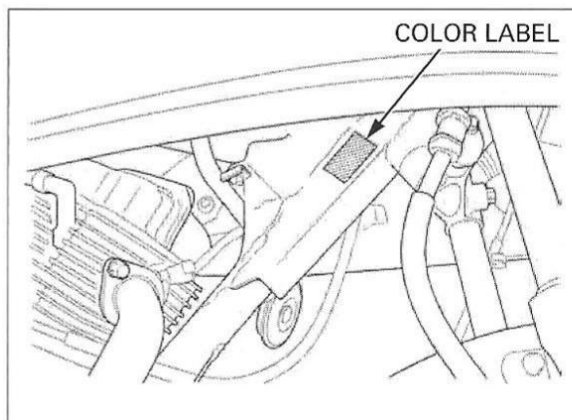


The throttle body identification number is stamped on the lower side of the throttle body.



LABEL

The color label is attached on the right front frame. When ordering color-coded parts, always specify the designated color code.



GENERAL SPECIFICATIONS

ITEM		SPECIFICATION
DIMENSIONS	Overall length	1,955 mm (77.0 in)
	Overall width	760 mm (29.9 in)
	Overall height	1,110 mm (43.7 in)
	Wheelbase	1,270 mm (50.0 in)
	Seat height	792 mm (31.2 in)
	Footpeg height	312 mm (12.3 in)
	Ground clearance	173 mm (6.8 in)
	Curb weight	128 kg (282 lbs)
	Maximum weight capacity	180 kg (397 lbs)
FRAME	Frame type	Diamond type
	Front suspension	Telescopic fork
	Front axle travel	103.4 mm (4.1 in)
	Rear suspension	Swingarm
	Rear axle travel	87.3 mm (3.4 in)
	Rear damper	Both side operation tube type
	Front tire size	80/100-17 M/C 46P
	Rear tire size	100/90-17 M/C 55P
	Tire brand	FRONT ContiGo! (CONTINENTAL)
		REAR ATT525 (TVS)
		ContiGo! (CONTINENTAL)
		ATT750 (TVS)
	Front brake	Hydraulic single disc
	Rear brake	Mechanical drum (leading-trailing)
	Caster angle	25°55'
ENGINE	Trail length	89 mm (3.5 in)
	Fuel tank capacity	13.0 liter (3.43 US gal, 2.86 Imp gal)
	Cylinder arrangement	Single cylinder inclined 15° forward-leaning from vertical
	Bore and stroke	52.4 x 57.8 mm (2.06 x 2.28 in)
	Displacement	125 cm ³ (7.6 cu-in)
	Compression ratio	9.2:1
	Valve train	Chain driven OHC with rocker arm
	Intake valve	opens 10° BTDC at 1.0 mm (0.04 in) lift closes 35° ABDC at 1.0 mm (0.04 in) lift
	Exhaust valve	opens 35° BBDC at 1.0 mm (0.04 in) lift closes 5° ATDC at 1.0 mm (0.04 in) lift
FUEL DELIV- ERY SYSTEM	Lubrication system	Forced pressure and wet sump
	Oil pump type	Trochoid
	Cooling system	Air cooled
	Air filtration	Viscous paper filter
	Engine dry weight	26.9 kg (59.3 lbs)
	Type	PGM-FI
	Throttle bore	26 mm (1.0 in)
DRIVE TRAIN	Clutch system	Multi-plate, wet
	Clutch operation system	Cable operating
	Transmission	Constant mesh, 5-speeds
	Primary reduction	3.350 (67/20)
	Final reduction	ED, E type 2.625 (42/16) F type 2.687 (43/16)
	Gear ratio	1st 3.076 (40/13) 2nd 1.944 (35/18) 3rd 1.473 (28/19) 4th 1.190 (25/21) 5th 1.038 (27/26)
	Gearshift pattern	Left foot operated return system 1 - N - 2 - 3 - 4 - 5
ELECTRICAL	Ignition system	Computer-controlled digital transistorized with electric advance
	Starting system	Electric starter motor
	Charging system	Single phase output alternator
	Regulator/rectifier	SCR shorted, single phase half-wave rectification

GENERAL INFORMATION

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	0.9 liter (1.0 US qt, 0.8 Imp qt)	—
	After disassembly	1.1 liter (1.2 US qt, 1.0 Imp qt)	—
Recommended engine oil		Honda "4-stroke motorcycle oil" or an equivalent Oil recommendation: API classification: SG or higher (except oils labeled as energy conserving on the circular API service label) Viscosity: SAE 10W-30 JASO T 903 Standard: MA	—
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.21 (0.006 – 0.008)	0.25 (0.010)
	Side clearance	0.05 – 0.10 (0.002 – 0.004)	0.15 (0.006)

FUEL SYSTEM (PGM-FI) SPECIFICATIONS

ITEM	SPECIFICATION
Throttle body identification number	GQM6A
Idle speed	1,500 ± 100 min ⁻¹ (rpm)
Throttle grip freeplay	2 – 6 mm (1/16 – 1/4 in)
Fuel pressure at idle	294 ± 6 kPa (3 ± 0.1 kgf/cm ² , 43 ± 0.9 psi)
Fuel pump flow (at 12 V)	27.7 cm ³ (0.94 US oz, 0.98 Imp oz) minimum/10 seconds

CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

Unit: mm (in.)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression at 800 min ⁻¹ (rpm)			1,275 kPa (13.0 kgf/cm ² , 185 psi)	—
Valve clearance		IN	0.08 ± 0.02 (0.003 ± 0.001)	—
		EX	0.12 ± 0.02 (0.005 ± 0.001)	—
Valve, valve guide	Valve stem O.D.	IN	4.975 – 4.990 (0.1959 – 0.1965)	4.92 (0.194)
		EX	4.955 – 4.970 (0.1951 – 0.1957)	4.90 (0.193)
	Valve guide I.D.	IN/EX	5.000 – 5.012 (0.1969 – 0.1973)	5.04 (0.198)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.07 (0.003)
		EX	0.030 – 0.057 (0.0012 – 0.0022)	0.09 (0.004)
	Valve seat width	IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length		IN/EX	37.78 (1.487)	—
Rocker arm	Arm I.D.	IN/EX	10.000 – 10.015 (0.3937 – 0.3943)	10.10 (0.398)
	Shaft O.D.	IN/EX	9.972 – 9.987 (0.3926 – 0.3932)	9.91 (0.390)
	Arm-to-shaft clearance	IN/EX	0.013 – 0.043 (0.0005 – 0.0017)	0.10 (0.004)
Camshaft	Cam lobe height	IN	33.268 – 33.508 (1.3098 – 1.3192)	—
		EX	33.018 – 33.258 (1.2999 – 1.3094)	—
Cylinder head warpage			—	0.05 (0.002)

CYLINDER/PISTON SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		52.400 – 52.410 (2.0630 – 2.0634)	52.50 (2.067)
	Out-of-round		–	0.10 (0.004)
	Taper		–	0.10 (0.004)
	Warpage		–	0.10 (0.004)
Piston, piston pin, piston ring	Piston O.D. at 5 (0.2) from bottom		52.370 – 52.390 (2.0618 – 2.0626)	52.30 (2.059)
	Piston pin hole I.D.		13.002 – 13.008 (0.5119 – 0.5121)	13.03 (0.513)
	Piston pin O.D.		12.994 – 13.000 (0.5116 – 0.5118)	12.98 (0.511)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)
	Piston ring end gap	Top	0.10 – 0.25 (0.004 – 0.010)	0.40 (0.016)
		Second	0.30 – 0.45 (0.012 – 0.018)	0.60 (0.024)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)	0.85 (0.033)
	Piston ring-to-ring groove clearance	Top	0.030 – 0.065 (0.0012 – 0.0026)	0.10 (0.004)
Second		0.015 – 0.050 (0.0006 – 0.0020)	0.09 (0.004)	
Cylinder-to-piston clearance			0.010 – 0.040 (0.0004 – 0.0016)	0.10 (0.004)
Connecting rod small end I.D.			13.016 – 13.034 (0.5124 – 0.5131)	13.05 (0.514)
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	0.07 (0.003)

CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch lever freeplay		10 – 20 (3/8 – 13/16)	–
Clutch	Spring free length	39.0 (1.54)	–
	Disc thickness	2.92 – 3.08 (0.115 – 0.121)	2.80 (0.110)
	Plate warpage	–	0.20 (0.008)
Primary driven gear I.D.		23.000 – 23.021 (0.9055 – 0.9063)	23.08 (0.909)
Clutch outer guide	O.D.	22.959 – 22.980 (0.9039 – 0.9047)	22.93 (0.903)
	I.D.	16.991 – 17.009 (0.6689 – 0.6696)	17.04 (0.671)
Mainshaft O.D. at clutch outer guide		16.966 – 16.984 (0.6680 – 0.6687)	16.95 (0.667)
Primary driven gear-to-guide clearance		0.020 – 0.062 (0.0008 – 0.0024)	–
Clutch outer guide-to-mainshaft clearance		0.007 – 0.043 (0.0003 – 0.0017)	–

ALTERNATOR/STARTER CLUTCH SPECIFICATION

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear boss O.D.	45.660 – 45.673 (1.7976 – 1.7981)	–

GENERAL INFORMATION

CRANKCASE/CRANKSHAFT/TRANSMISSION SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Runout		—	0.03 (0.001)
	Connecting rod big end radial clearance		0 – 0.008 (0 – 0.0003)	0.05 (0.002)
	Connecting rod big end side clearance		0.10 – 0.35 (0.004 – 0.014)	0.80 (0.031)
Transmission	Gear I.D.	M4	20.000 – 20.018 (0.7874 – 0.7881)	—
		M5	17.000 – 17.018 (0.6693 – 0.6700)	—
		C1	20.500 – 20.521 (0.8071 – 0.8079)	—
		C2	23.020 – 23.041 (0.9063 – 0.9071)	—
		C3	23.025 – 23.046 (0.9065 – 0.9073)	—
	Bushing O.D.	C1	20.459 – 20.480 (0.8055 – 0.8063)	—
		C2, C3	22.984 – 23.005 (0.9049 – 0.9057)	—
	Gear-to-bushing clearance	C1, C3	0.020 – 0.062 (0.0008 – 0.0024)	—
		C2	0.015 – 0.057 (0.0006 – 0.0022)	—
	Bushing I.D.	C1	17.000 – 17.018 (0.6693 – 0.6700)	—
		C2, C3	20.020 – 20.041 (0.7882 – 0.7890)	—
	Mainshaft O.D.	at M4	19.968 – 19.980 (0.7861 – 0.7866)	—
		at M5	16.968 – 16.980 (0.6680 – 0.6685)	—
	Gear-to-shaft clearance	at M4, M5	0.020 – 0.050 (0.0008 – 0.0020)	—
	Countershaft O.D.	at C1 bushing	16.966 – 16.984 (0.6680 – 0.6687)	—
		at C2 bushing	19.978 – 19.989 (0.7865 – 0.7870)	—
		at C3 bushing	19.979 – 20.000 (0.7866 – 0.7874)	—
Shift fork, shift fork shaft/shift drum	Shift fork shaft O.D.	C1	0.016 – 0.052 (0.0006 – 0.0020)	—
		C2	0.031 – 0.063 (0.0012 – 0.0025)	—
		C3	0.020 – 0.062 (0.0008 – 0.0024)	—
	Shift fork I.D.		9.986 – 9.995 (0.3931 – 0.3935)	—
	Shift fork claw thickness		10.000 – 10.018 (0.3937 – 0.3944)	—
	Shift fork O.D.		4.93 – 5.00 (0.194 – 0.197)	—
	Shift drum O.D.	Left	23.959 – 23.980 (0.9433 – 0.9441)	—
		Right	20.959 – 20.980 (0.8252 – 0.8260)	—
	Shift drum journal I.D.	Left	24.000 – 24.033 (0.9449 – 0.9462)	—
		Right	21.000 – 21.021 (0.8268 – 0.8276)	—
	Shift drum-to-shift drum journal clearance	Left	0.020 – 0.074 (0.0008 – 0.0029)	—
		Right	0.020 – 0.062 (0.0008 – 0.0024)	—

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire thread depth		—	1.5 (0.06)
Cold tire pressure	Driver only	175 kPa (1.75 kgf/cm ² , 25 psi)	—
	Driver and passenger	175 kPa (1.75 kgf/cm ² , 25 psi)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	1.0 (0.04)
	Axial	—	1.0 (0.04)
Fork	Spring free length	372.7 (14.67)	—
	Tube runout	—	0.20 (0.008)
	Recommended fluid	Honda Ultra Cushion Oil 10W or equivalent	—
	Fluid level	167 (6.6)	—
	Fluid capacity	146 ± 2.5 cm ³ (4.9 ± 0.08 US oz, 5.1 ± 0.09 Imp oz)	—
Steering head bearing pre-load		5.6 – 8.9 N (0.6 – 0.9 kgf)	—

REAR WHEEL/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Minimum tire thread depth			—	2.0 (0.08)
Cold tire pressure	Driver only		200 kPa (2.00 kgf/cm ² , 29 psi)	—
	Driver and passenger		225 kPa (2.25 kgf/cm ² , 33 psi)	—
Axle runout			—	0.2 (0.01)
Wheel rim runout	Radial		—	1.0 (0.04)
	Axial		—	1.0 (0.04)
Drive chain	Size/link	RK	RK428KRO-118LE	—
	Slack		15 – 25 (9/16 – 1)	—

BRAKE SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Front brake	Specified brake fluid		DOT 3 or DOT 4	—
	Brake disc thickness		3.8 – 4.2 (0.15 – 0.17)	3.5 (0.14)
	Brake disc runout		—	0.10 (0.004)
	Master cylinder I.D.		12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Master piston O.D.		12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
	Caliper cylinder I.D.		25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
	Caliper piston O.D.		25.318 – 25.368 (0.9968 – 0.9987)	25.310 (0.9965)
Rear brake	Brake pedal freeplay		20 – 30 (13/16 – 1-3/16)	—
	Brake drum I.D.		130.0 – 130.2 (5.12 – 5.13)	131.0 (5.16)
	Lining thickness		—	To the indicator

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM			SPECIFICATION
Battery	Capacity		12 V – 6 Ah
	Current leakage		0.1 mA max.
	Voltage (20°C/68°F)	Fully charged	12.7 – 12.9 V
		Needs charging	Below 12.4 V
	Charging current	Normal	0.6 A x 5 – 10 h
		Quick	3.0 A x 1 h
Alternator	Capacity		0.170 kW/5,000 min ⁻¹ (rpm)
	Charging coil resistance (20°C/68°F)		0.2 – 1.0 Ω

IGNITION SYSTEM SPECIFICATIONS

ITEM		SPECIFICATION
Spark plug	Standard	CPR7EA-9 (NGK) or UR6DC (BOSCH)
	For extended high speed riding	CPR8EA-9 (NGK) or UR5DC (BOSCH)
Spark plug gap		0.8 – 0.9 mm (0.03 – 0.04 in)
Ignition coil primary peak voltage		100 V minimum
CKP sensor peak voltage		0.7 V minimum
Ignition timing ("F" mark)		10° BTDC at 1,500 min ⁻¹ (rpm)

GENERAL INFORMATION

ELECTRIC STARTER SPECIFICATION

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	10.000 – 10.050 (0.3937 – 0.3957)	–

LIGHTS/METER/SWITCHES SPECIFICATIONS

ITEM		SPECIFICATION
Bulbs	Headlight (Hi/Low beam)	12 V – 35/35 W
	Brake/tail light	12 V – 21/5 W
	Turn signal light	12 V – 21 W x 4
	Position light	12 V – 5 W
	Instrument light	12 V – 1.7 W x 2
	Turn signal indicator	12 V – 1.7 W
	High-beam indicator	12 V – 1.7 W
	Neutral indicator	12 V – 1.7 W
MIL		12 V – 1.7 W
Fuse	Main	15 A
	Sub	10 A x 2
Fuel level sensor resistance (20°C/ 68°F)	Full	6 – 10 Ω
	Empty	90 – 96 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		6 mm screw	9.0 (0.9, 6.6)
(Includes SH flange bolt)	10 (1.0, 7)	6 mm flange bolt and nut	
8 mm bolt and nut	22 (2.2, 16)	(Includes 8 mm head, large flange)	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	55 (5.6, 41)	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 (page 1-11).

FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Exhaust pipe stud bolt	2	8	11 (1.1, 8)	See page 2-18 Left hand thread
Front cowl screw	4	6	5 (0.5, 3.7)	
Side cover screw	2	6	5 (0.5, 3.7)	
Muffler protector screw	3	6	9 (0.9, 6.6)	
Rearview mirror adaptor	2	10	34 (3.5, 25)	
Sidestand pivot bolt	1	10	10 (1.0, 7)	
Sidestand pivot nut	1	10	29 (3.0, 21)	

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Spark plug	1	10	16 (1.6, 12)	Apply engine oil to the threads and seating surface. Apply grease to the threads.
Valve adjusting screw lock nut	2	6	14 (1.4, 10)	
Crankshaft hole cap	1	32	15 (1.5, 11)	
Timing hole cap	1	14	10 (1.0, 7)	
Oil drain bolt	1	12	30 (3.1, 22)	
Oil filter rotor cover screw	3	5	4 (0.4, 3.0)	
Air cleaner cover screw	4	5	1.2 (0.1, 0.9)	
Throttle cable adjuster lock nut (throttle grip side)	1	10	3 (0.3, 2.2)	
Throttle cable adjuster lock nut (throttle body side)	1	6	8 (0.8, 5.9)	

LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil pump cover screw	1	4	3 (0.3, 2.2)	
Oil pump mounting bolt	2	6	12 (1.2, 9)	

FUEL SYSTEM (PGM-FI)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
IACV setting plate torx screw	2	4	2.1 (0.2, 1.5)	See page 5-58
Insulator band screw	1	5	1.0 (0.1, 0.7)	
O ₂ sensor	1	12	25 (2.5, 18)	
EOT sensor	1	10	14 (1.4, 10)	
Throttle cable guide screw	1	5	3.4 (0.3, 2.5)	
Sensor unit torx screw	3	5	3.4 (0.3, 2.5)	
Air cleaner housing cover screw	8	5	1.1 (0.11, 0.8)	
Injector joint mounting bolt	2	5	5.1 (0.5, 3.8)	

GENERAL INFORMATION

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front engine hanger nut	2	10	34 (3.5, 25)	
Rear engine hanger nut	2	10	54 (5.5, 40)	
Drive sprocket fixing plate bolt	2	6	12 (1.2, 9)	

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head cover bolt	2	6	10 (1.0, 7)	
Rocker arm shaft bolt	2	5	5 (0.5, 3.7)	
Insulator socket bolt	2	6	12 (1.2, 9)	
Cam sprocket bolt	2	5	9 (0.9, 6.6)	
Camshaft holder bolt	4	8	32 (3.3, 24)	
Cam chain tensioner lifter plug	1	6	4 (0.4, 3.0)	Apply engine oil to the threads and seating surface.

CYLINDER/PISTON

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder stud bolt	4	8	11 (1.1, 8)	See page 8-6

CLUTCH/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch center lock nut	1	14	74 (7.5, 55)	Apply engine oil to the threads and seating surface.
Clutch lifter plate bolt	4	6	12 (1.2, 9)	
Oil filter rotor lock nut	1	14	64 (6.5, 47)	Apply engine oil to the threads and seating surface.
Gearshift cam bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads.
Shift drum stopper arm bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads.

ALTERNATOR/STARTER CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Flywheel lock nut	1	14	74 (7.5, 55)	Apply engine oil to the threads and seating surface.
Starter clutch torx screw	6	6	16 (1.6, 12)	Apply locking agent to the threads.
CKP sensor socket bolt	2	6	12 (1.2, 9)	Apply locking agent to the threads.
Wire guide bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads.

CRANKSHAFT/TRANSMISSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Mainshaft bearing setting plate bolt	2	6	12 (1.2, 9)	Apply locking agent to the threads.
Push plug bolt	1	6	10 (1.0, 7)	Apply locking agent to the threads.

FRONT WHEEL/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch lever pivot bolt	1	6	1 (0.1, 0.7)	ALOC bolt; replace with a new one.
Clutch lever pivot nut	1	6	5.9 (0.6, 4.4)	
Front axle nut	1	12	54 (5.5, 40)	
Front brake disc mounting bolt	6	8	42 (4.3, 31)	
Handlebar end screw	2	6	9 (0.9, 6.6)	ALOC bolt; replace with a new one.
Handlebar lower holder nut	2	10	39 (4.0, 29)	Apply locking agent to the threads.
Handlebar upper holder bolt	4	6	12 (1.2, 9)	
Fork socket bolt	2	8	20 (2.0, 15)	
Fork cap	2	26	22 (2.2, 16)	
Bottom bridge pinch bolt	2	8	32 (3.3, 24)	See page 12-29
Top fork bolt	2	10	44 (4.5, 33)	
Steering bearing adjusting nut	1	26	—	
Steering stem nut	1	24	74 (7.5, 55)	

REAR WHEEL/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Driven sprocket nut	4	8	32 (3.3, 24)	
Rear axle nut	1	12	54 (5.5, 40)	
Shock absorber mounting nut	2	10	34 (3.5, 25)	
Shock absorber mounting bolt	2	10	34 (3.5, 25)	
Brake panel stopper arm joint nut	2	8	22 (2.2, 16)	
Swingarm pivot nut	1	12	54 (5.5, 40)	

BRAKE SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Caliper bleeder valve	1	8	5.4 (0.6, 4)	ALOC bolt; replace with a new one.
Master cylinder holder bolt	2	6	9 (0.9, 6.6)	
Master cylinder reservoir cap screw	2	4	1.2 (0.1, 0.9)	
Brake caliper mounting bolt	2	8	30 (3.1, 22)	
Front brake light switch screw	1	4	1.2 (0.1, 0.9)	Apply locking agent to the threads.
Brake lever pivot bolt	1	6	1.0 (0.1, 0.7)	
Brake lever pivot nut	1	6	6.0 (0.6, 4.4)	
Brake hose oil bolt	2	10	34 (3.5, 25)	
Brake caliper slide pin	1	8	22 (2.2, 16)	
Brake arm nut	1	6	10 (1.0, 7)	
Brake pad pin	1	10	17 (1.7, 13)	

ELECTRIC STARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Starter motor bolt	2	5	4.9 (0.5, 3.6)	

LIGHTS/METER/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel level sensor mounting nut	4	6	9 (0.9, 6.6)	

GENERAL INFORMATION

LUBRICATION & SEAL POINTS

ENGINE

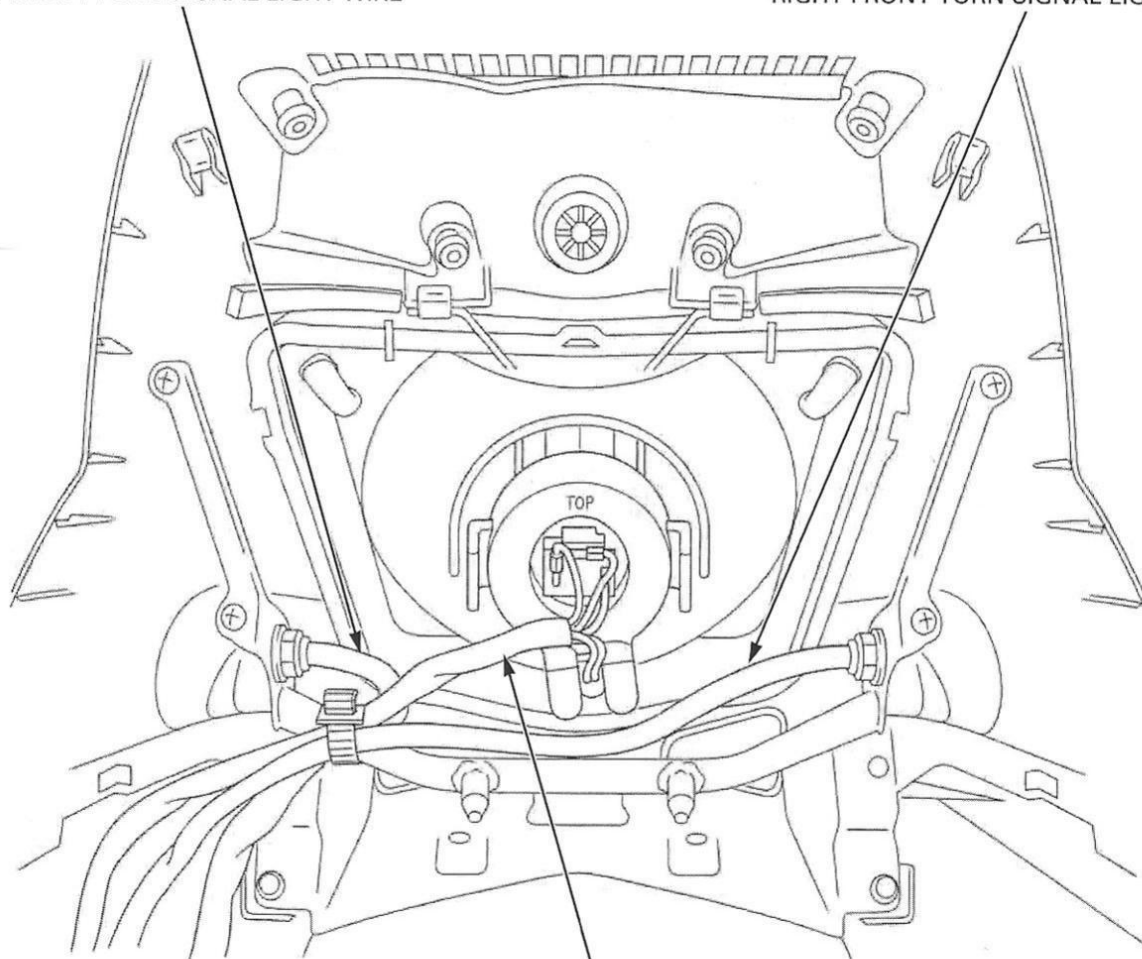
MATERIAL	LOCATION	REMARKS
Liquid sealant	Left crankcase mating surface Alternator wire grommet seating surface	See page 11-20
Engine oil	Oil pump inner, outer rotors and rotor shaft Oil through sliding surface Oil pump driven gear teeth Rocker arm shaft whole surface Rocker arm inner and roller surfaces Camshaft whole surface Cam chain entire surface Cylinder inner surface Piston pin hole and ring groove Piston sliding surface Piston ring whole surface Clutch disc whole surface Primary drive gear teeth Primary driven gear teeth Clutch lifter rod whole surface Gearshift spindle journal rotating area Transmission gear teeth Starter clutch rolling surface Starter reduction gear shaft whole surface Shift fork shaft whole surface Shift drum journal rotating surface Each bearing rotating surface Each O-ring	
Multi-purpose grease	Each dust seal lips Each oil seal lips	
Molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1)	Valve stem sliding surface and stem end Piston pin outer surface Clutch outer guide whole surface Clutch outer rotating surface Starter driven gear inner surface Crankshaft connecting rod small end inner surface Push plug whole surface C1, C2, C3 gear inner surface C1, C2, C3 gear bushing whole surface M4, M5 gear inner surface M3, C4, C5 gear shift fork grooves Crankshaft connecting rod big end needle bearing Each gear inner surface	1 – 2 cm ³
Locking agent	Shift drum stopper arm bolt threads Gearshift cam bolt threads Starter clutch torx screw threads CKP sensor mounting bolt threads Mainshaft bearing setting plate bolt threads Wire guide bolt threads Push plug bolt threads	Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) from tip Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) from tip Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) from tip Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) from tip Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) from tip Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) from tip Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) from tip Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in) from tip

1-15

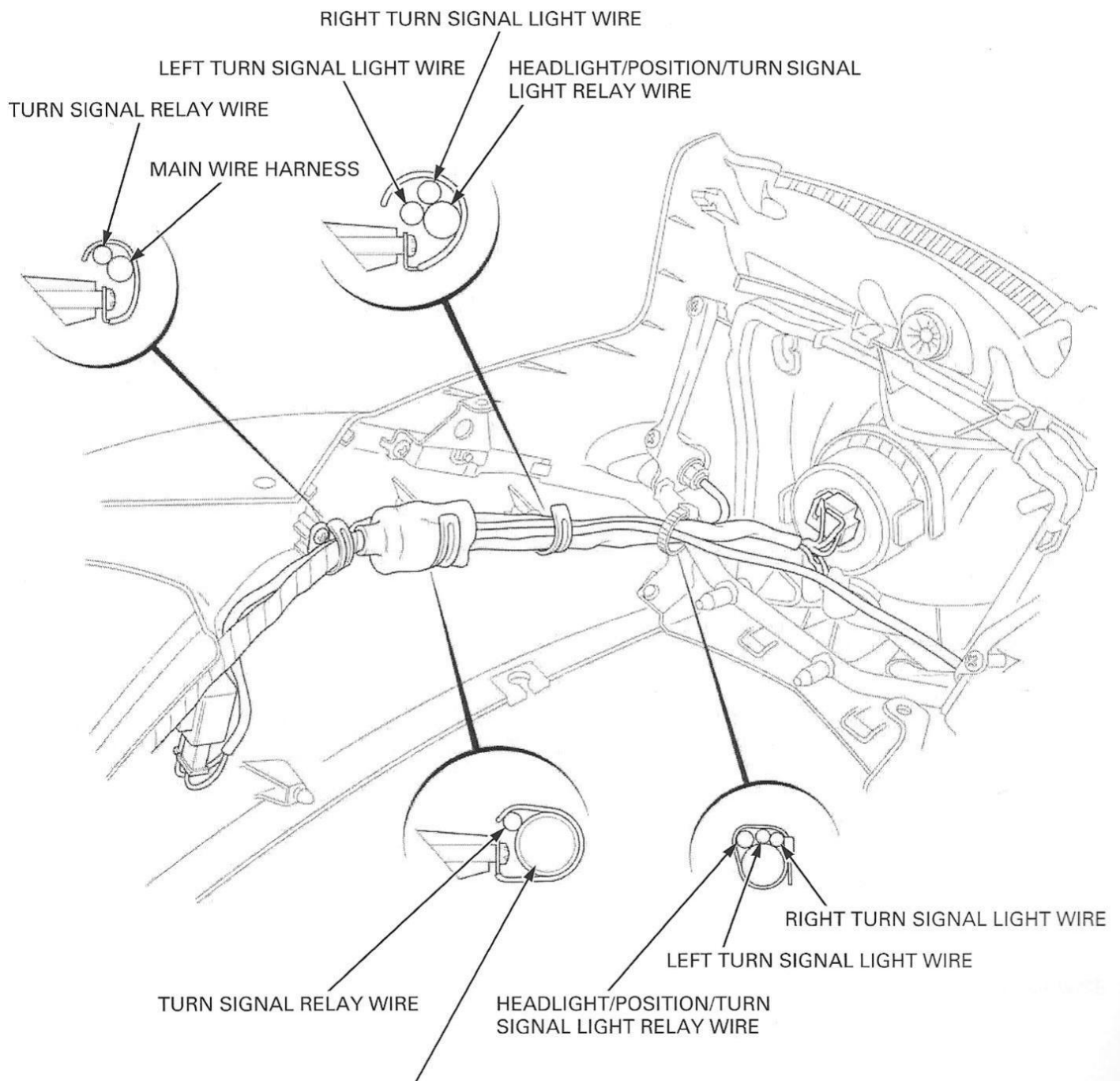
CABLE & HARNESS ROUTING

LEFT FRONT TURN SIGNAL LIGHT WIRE

RIGHT FRONT TURN SIGNAL LIGHT WIRE

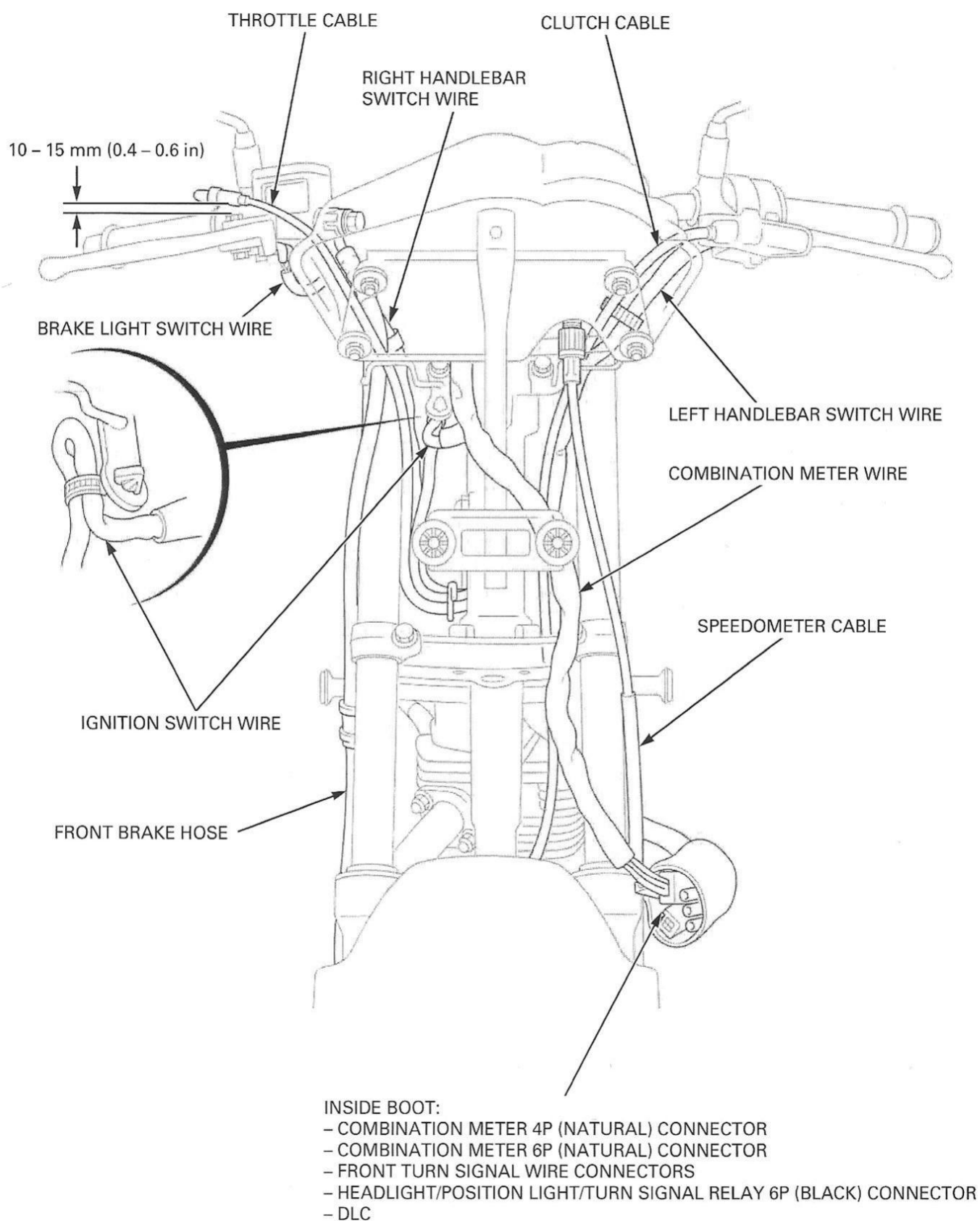


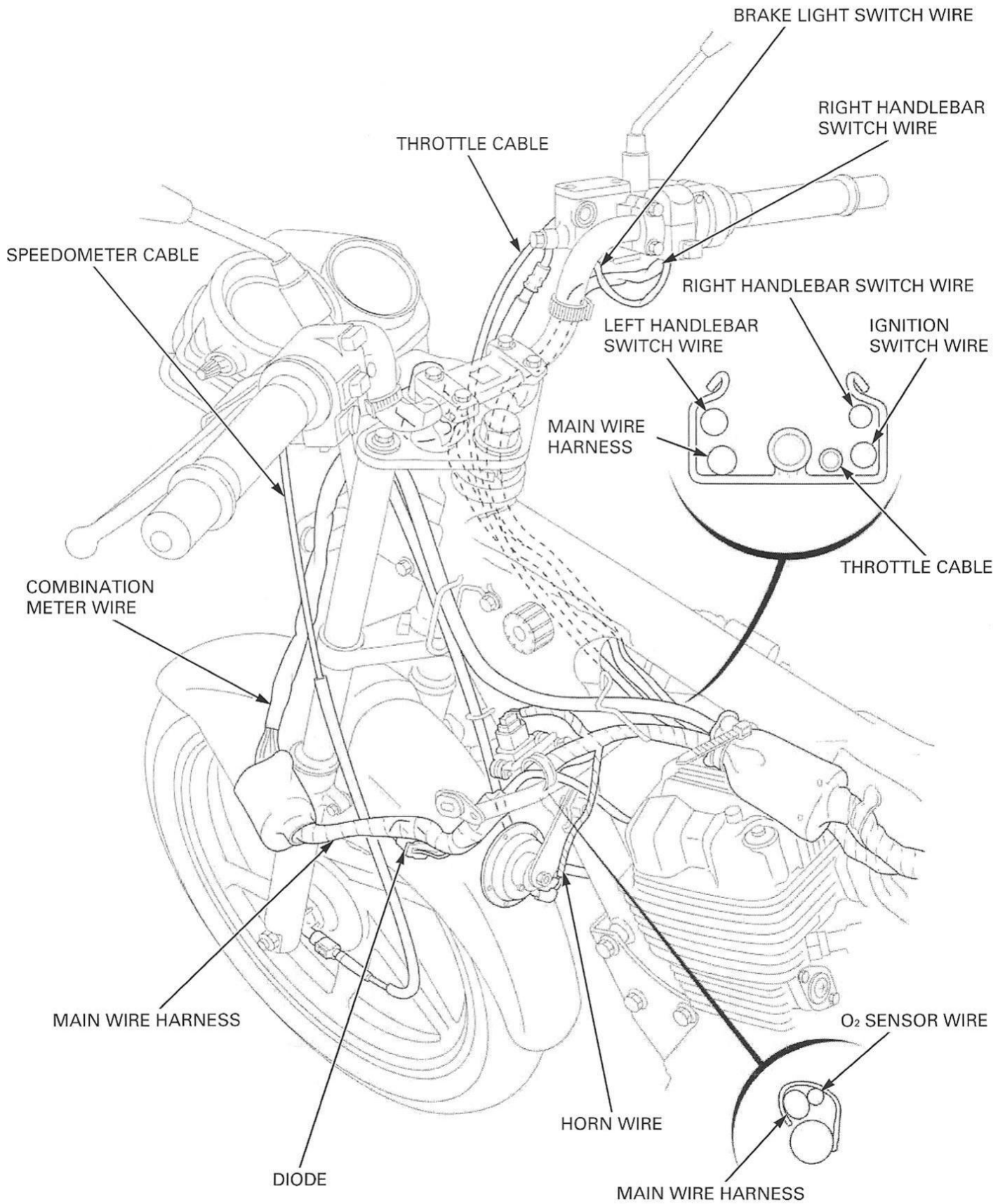
HEADLIGHT/POSITION LIGHT WIRE



INSIDE BOOT:

- FRONT TURN SIGNAL LIGHT WIRE CONNECTORS
- HEADLIGHT/POSITION LIGHT/TURN SIGNAL RELAY 6P (BLACK) CONNECTOR
- COMBINATION METER 4P (NATURAL) CONNECTOR
- COMBINATION METER 6P (NATURAL) CONNECTOR
- DLC

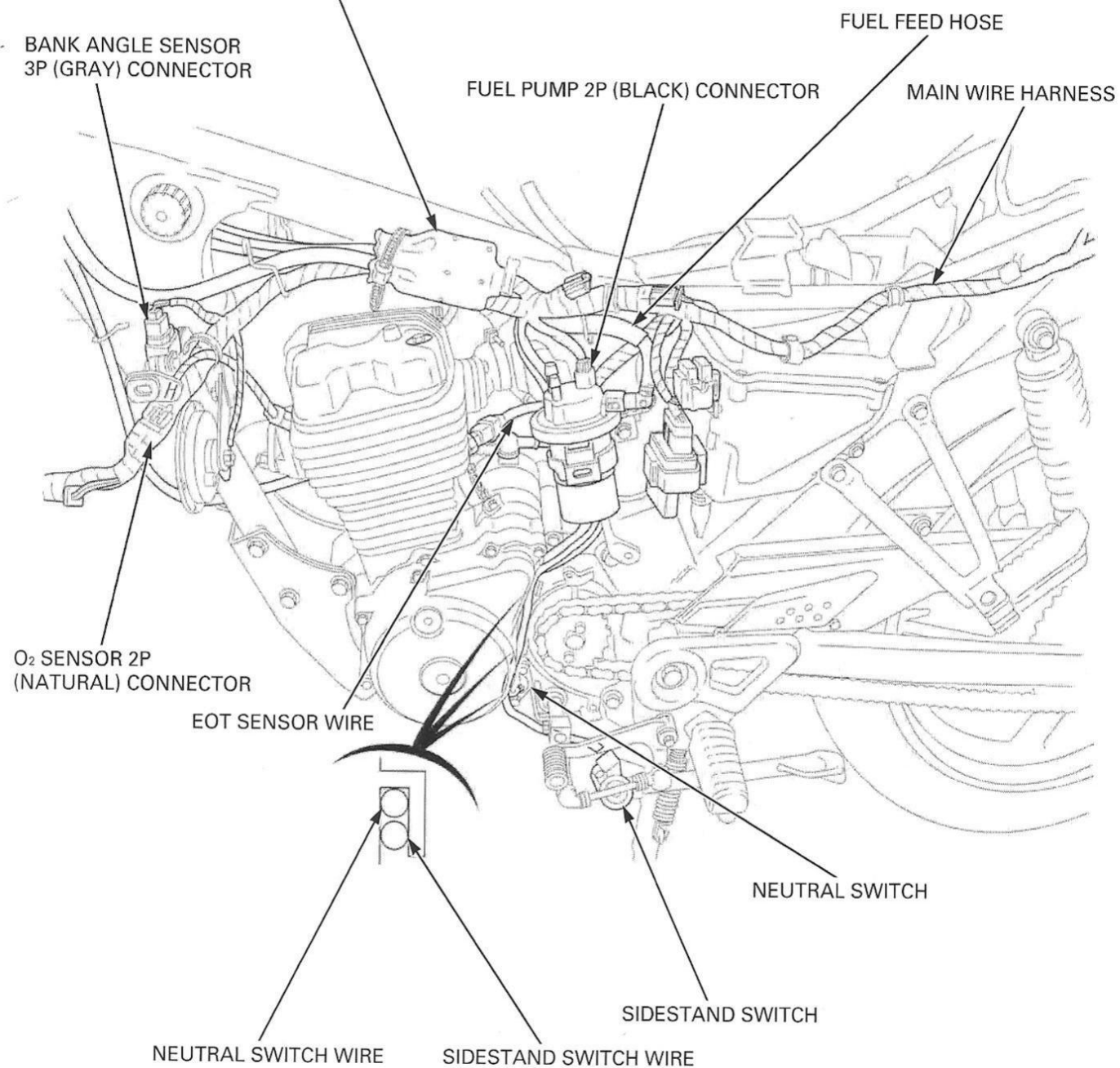




GENERAL INFORMATION

INSIDE BOOT:

- IGNITION SWITCH 3P (NATURAL) CONNECTOR
- HANDLEBAR SWITCH 6P (NATURAL) CONNECTOR
- HANDLEBAR SWITCH 4P (BLACK) CONNECTOR
- HANDLEBAR SWITCH 4P (NATURAL) CONNECTOR

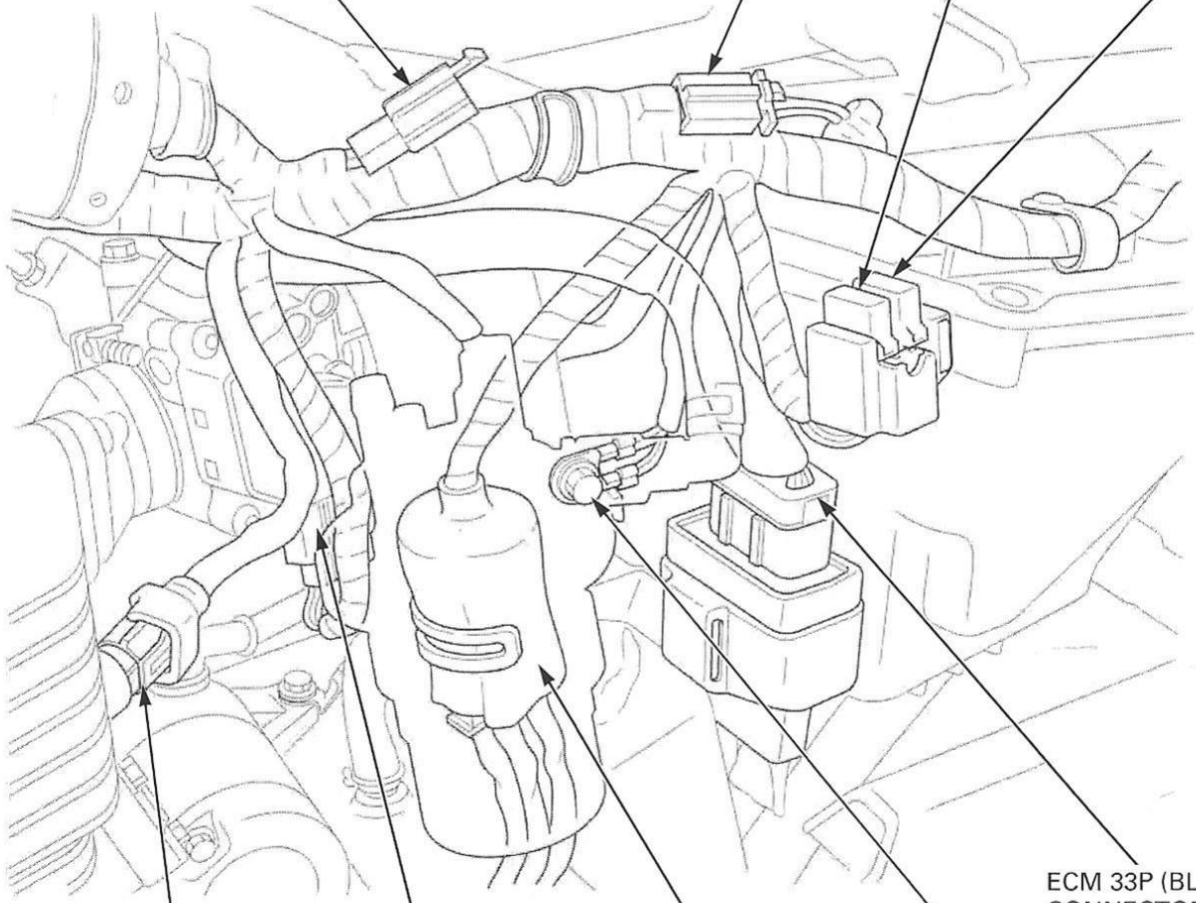


FUEL LEVEL SENSOR 2P (BLACK) CONNECTOR

REAR BRAKE LIGHT SWITCH 2P (NATURAL) CONNECTOR

SUB FUSE B

SUB FUSE A



EOT SENSOR 2P (BLACK) CONNECTOR

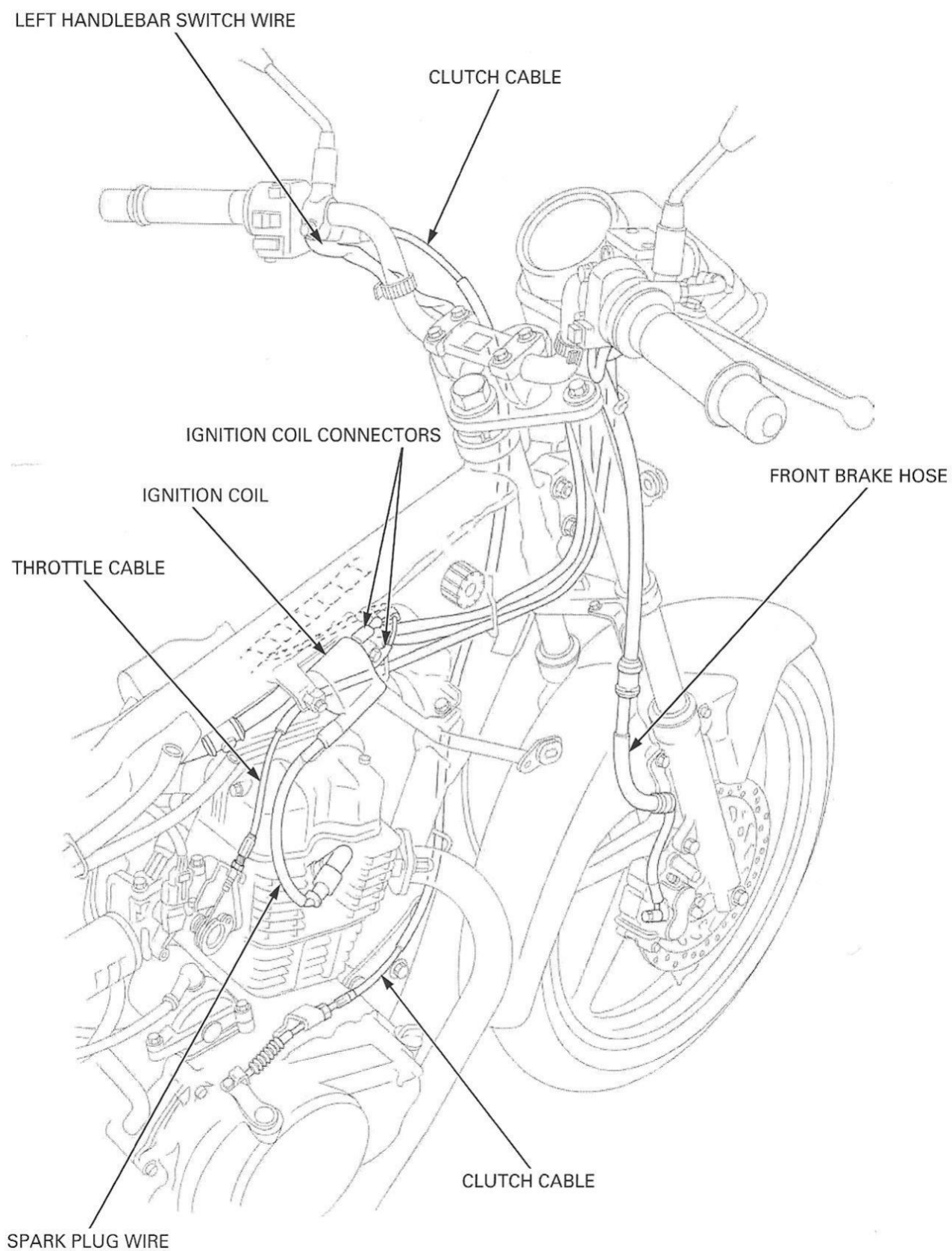
SENSOR UNIT 5P (BLACK) CONNECTOR

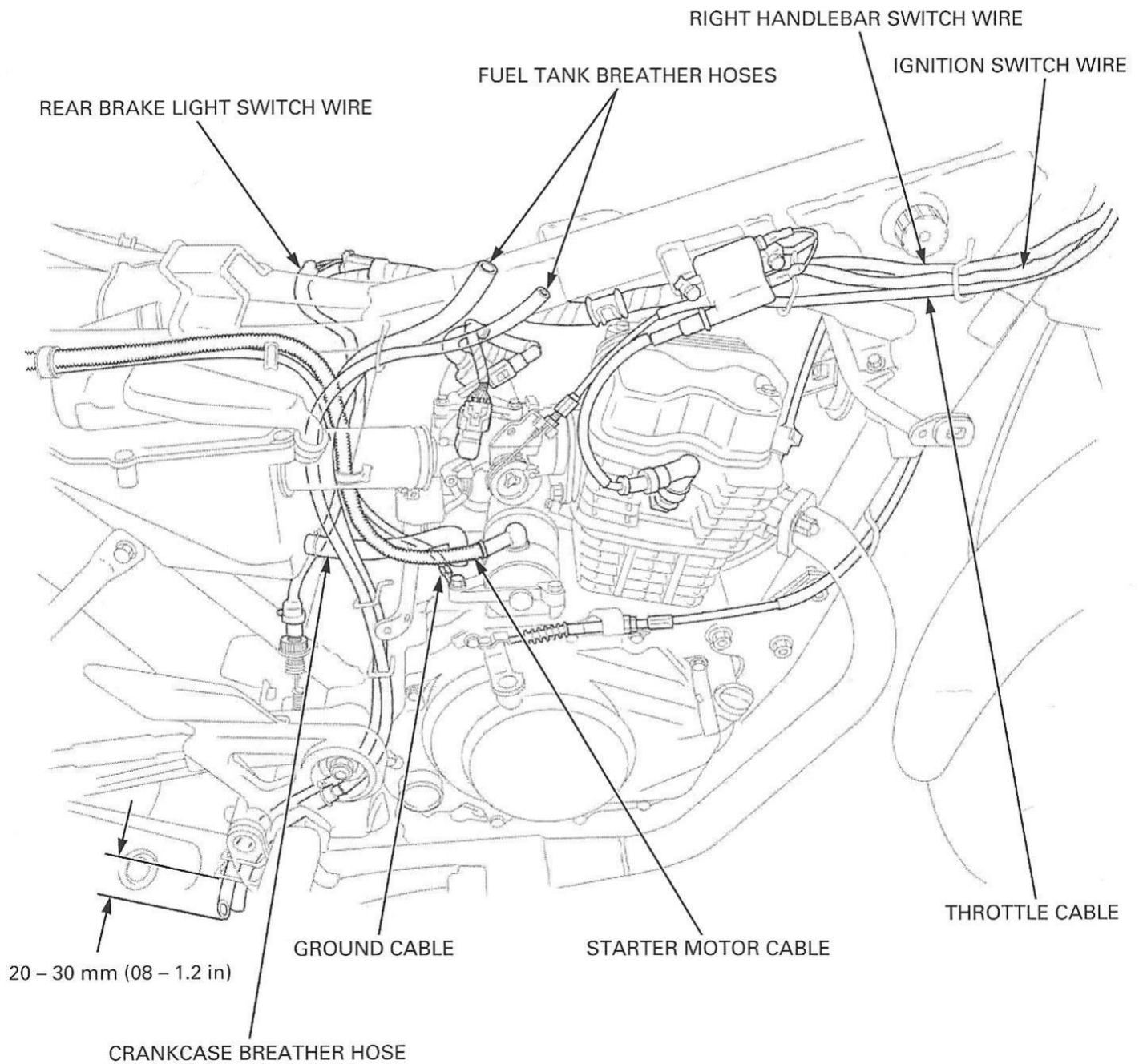
ECM 33P (BLACK) CONNECTOR

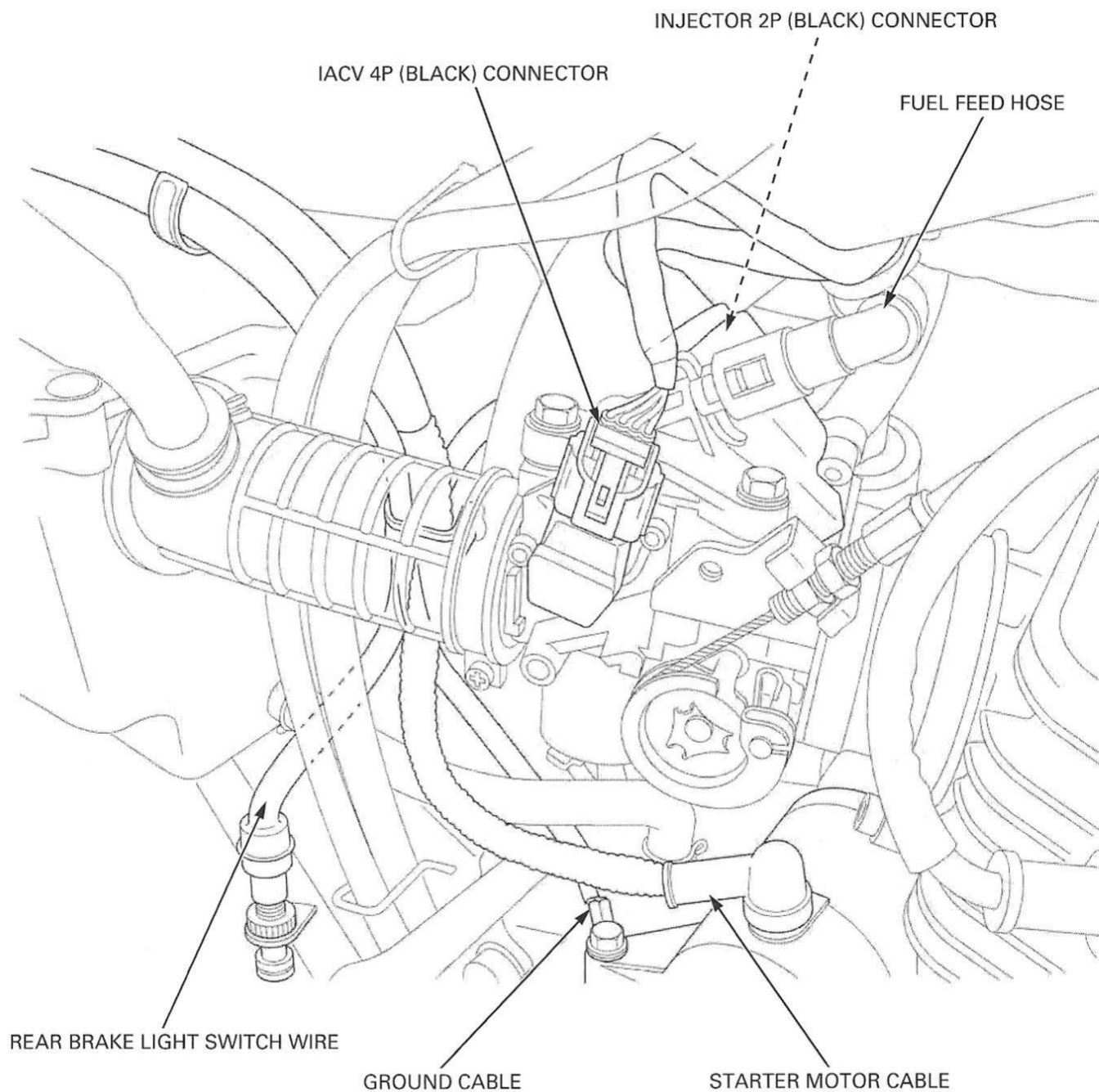
GROUND TERMINALS

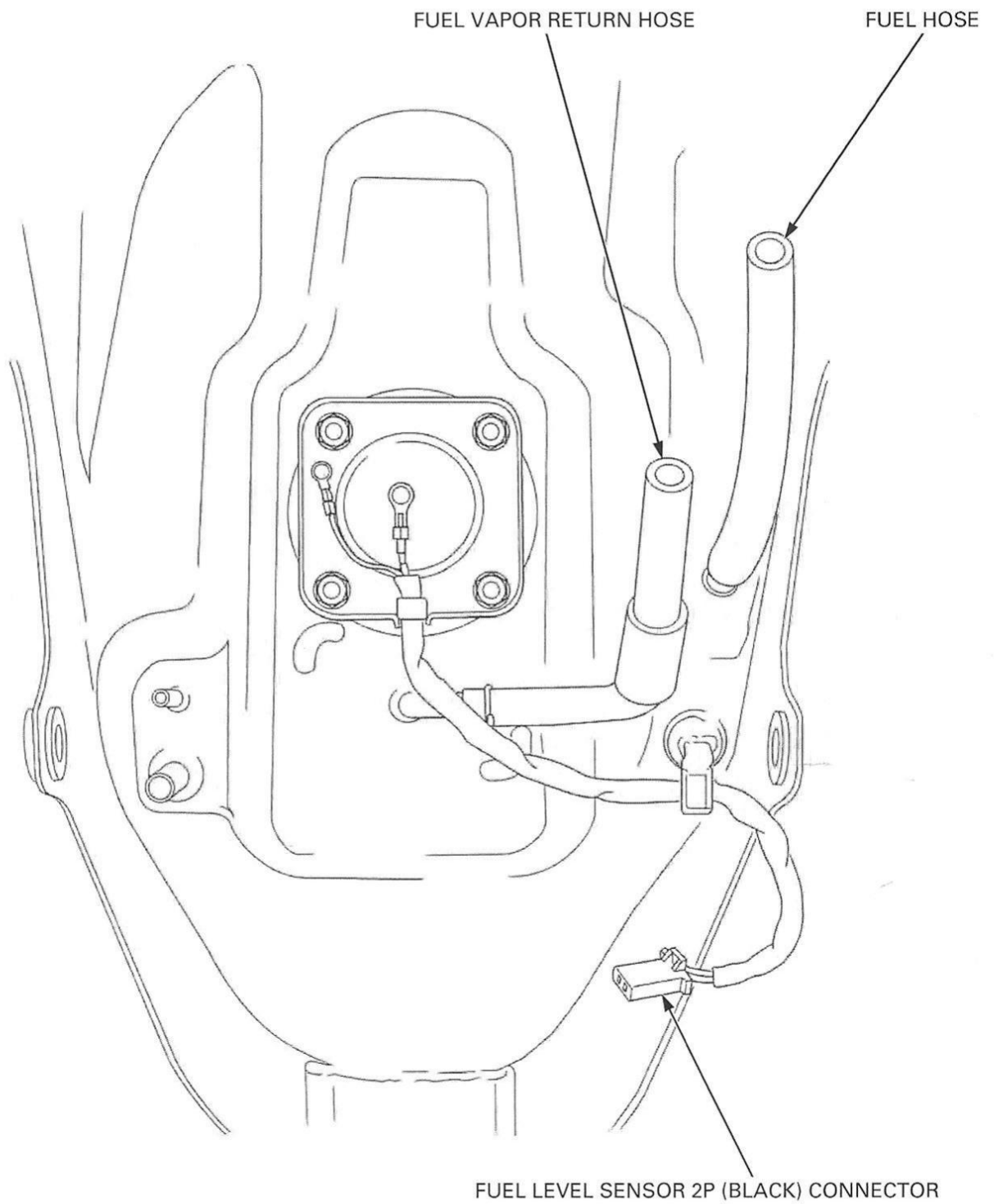
INSIDE BOOT:

- ALTERNATOR 2P (NATURAL) CONNECTOR
- NEUTRAL SWITCH CONNECTOR
- CKP SENSOR CONNECTORS
- SIDE STAND SWITCH 3P (NATURAL) CONNECTOR

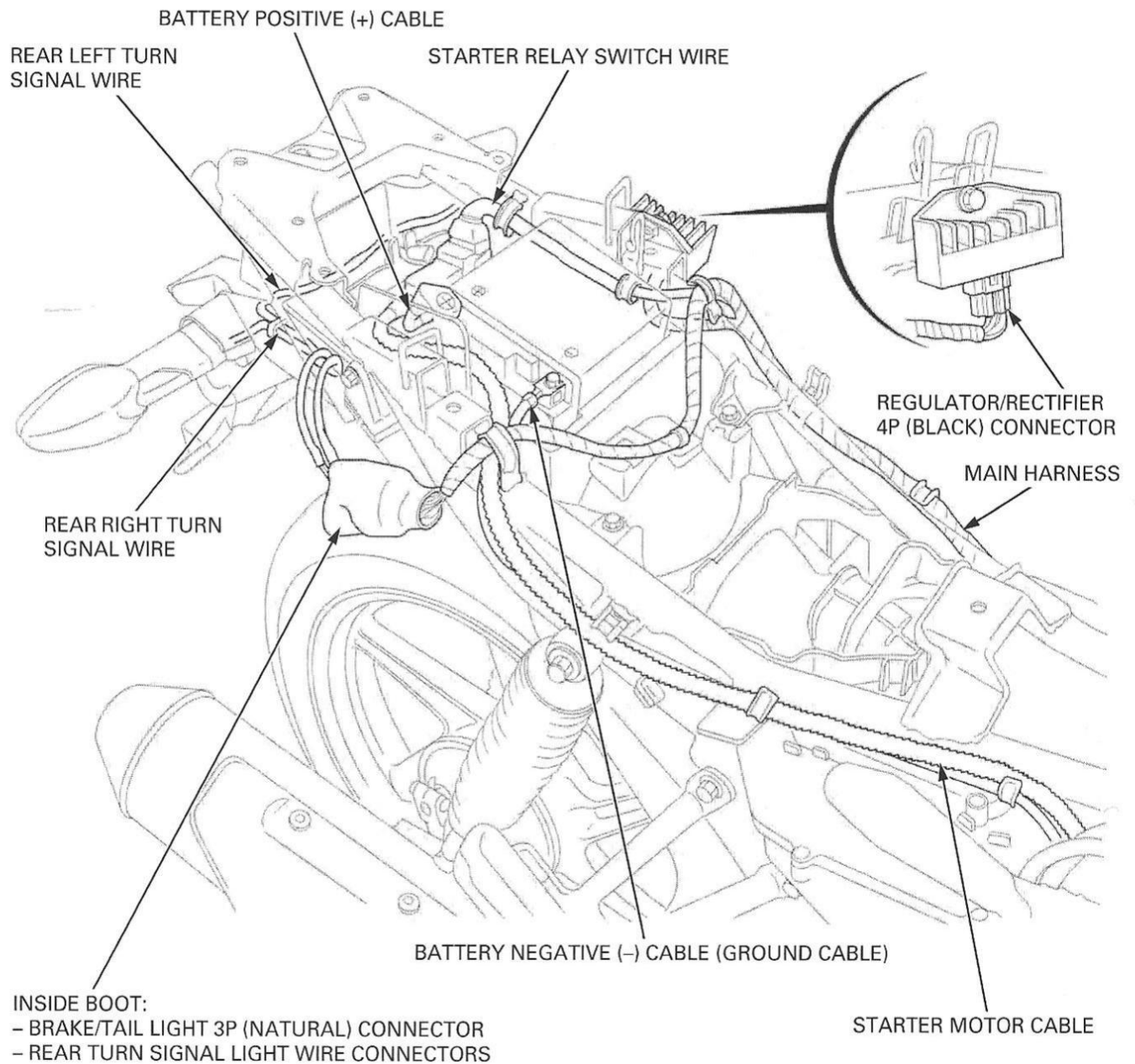


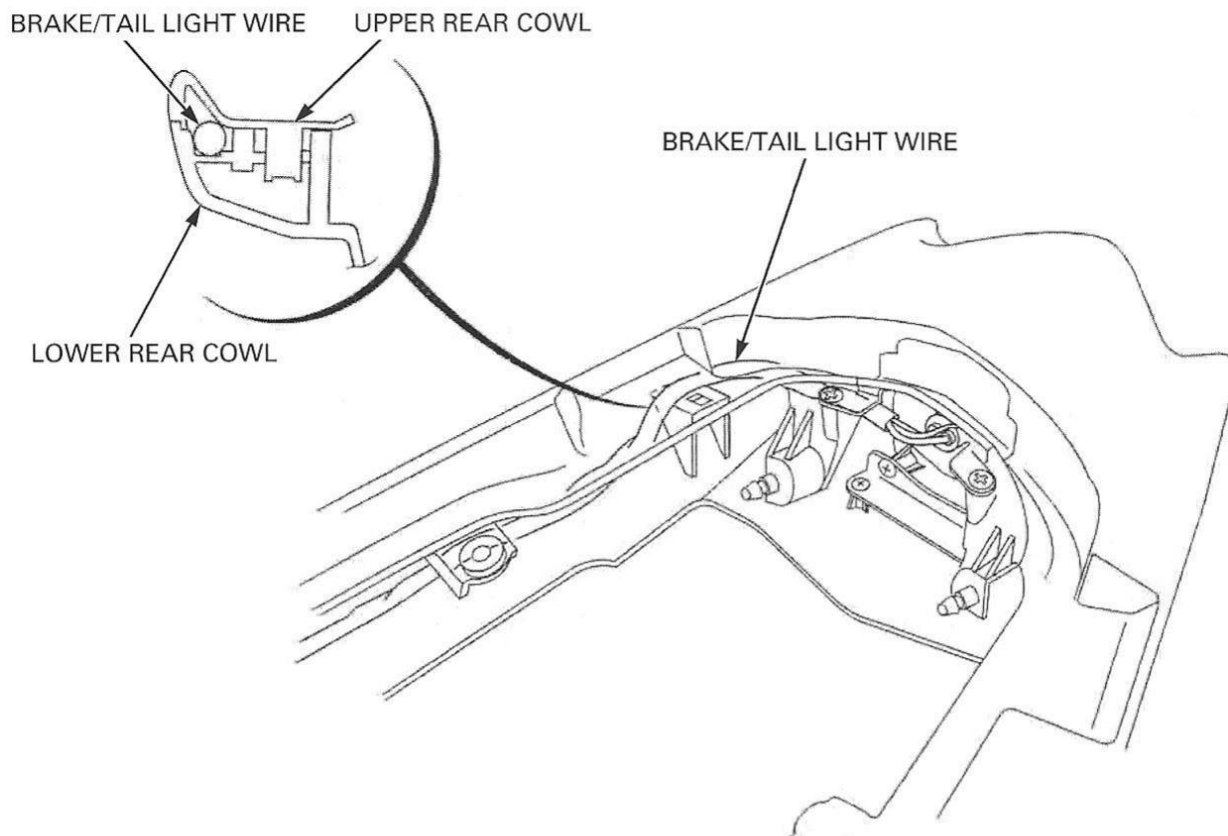






GENERAL INFORMATION





GENERAL INFORMATION

EMISSION CONTROL SYSTEMS

SOURCE OF EMISSIONS

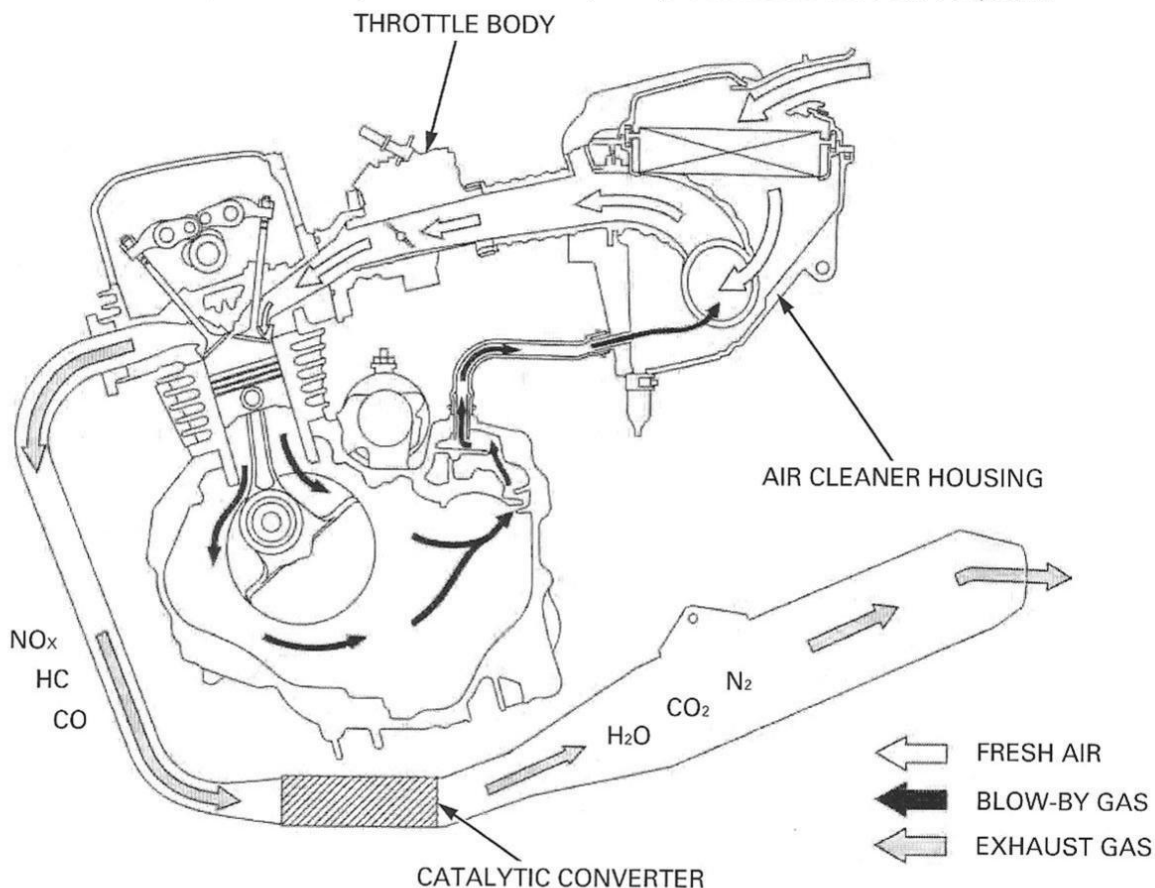
The combustion process produces carbon monoxide (CO), oxides of nitrogen (NO_x) and hydrocarbons (HC). Control of carbon monoxide, oxides of nitrogen and hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide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

Honda Motor Co., Ltd. utilizes various systems (page 1-28), to reduce carbon monoxide, oxides of nitrogen and hydrocarbons.

CRANKCASE EMISSION AND EXHAUST EMISSION CONTROL SYSTEMS

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

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



THREE-WAY CATALYTIC CONVERTER

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

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

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

NOISE EMISSION CONTROL SYSTEM

TAMPERING WITH THE NOISE EMISSION CONTROL SYSTEM IS PROHIBITED: Local law may prohibit the following acts or the causing thereof: (1) The removal or rendering inoperative by any person, other than for the purpose 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; or (2) the use of the vehicle after such device or element of design has been remove or rendered inoperative by any person.

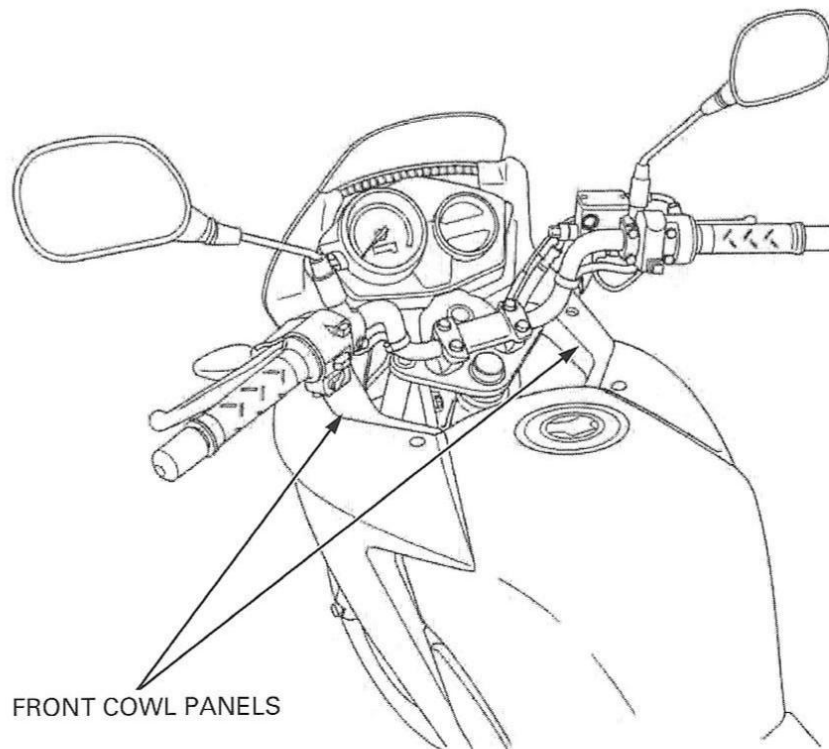
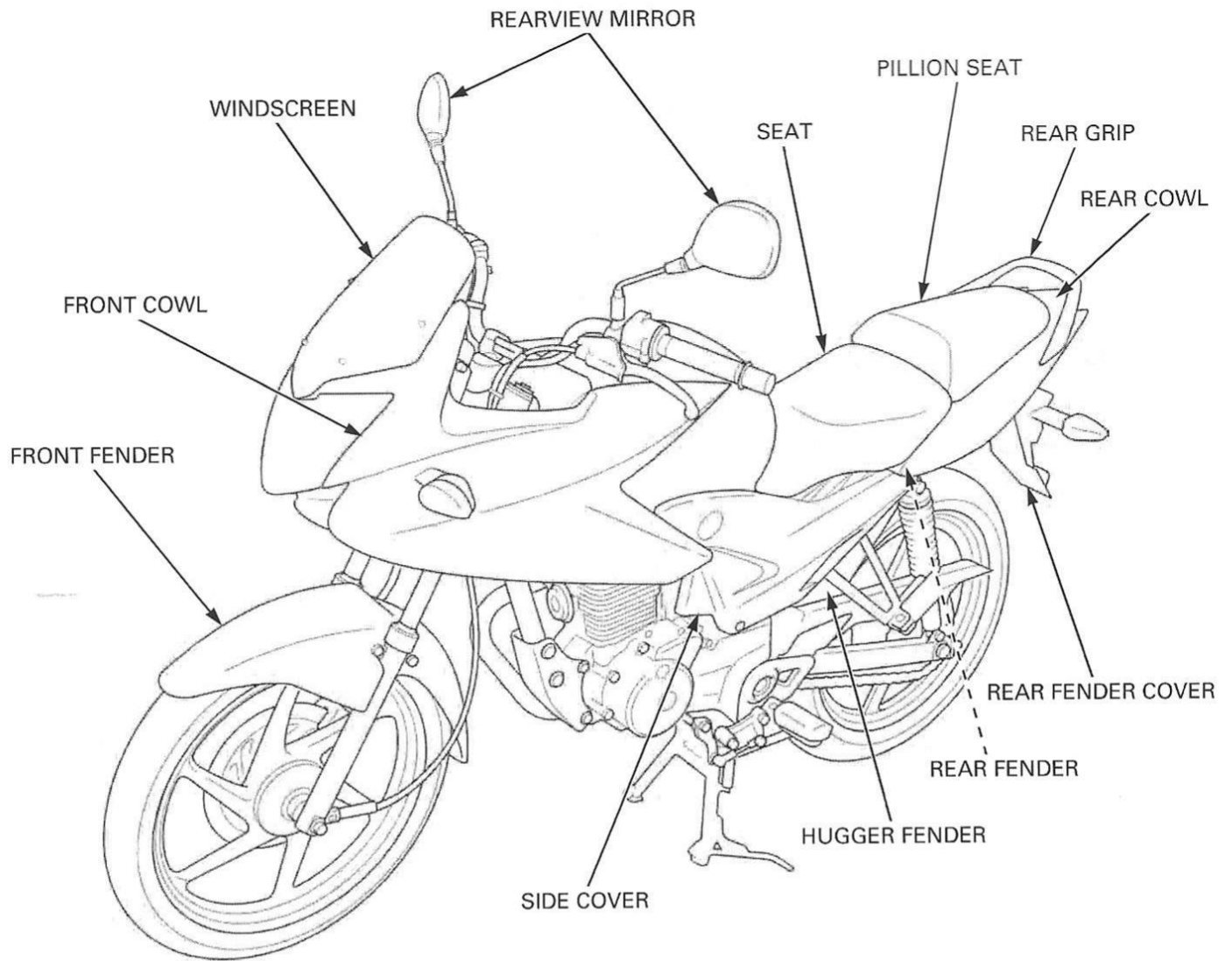
AMONG THOSE ACTS PRESUMED TO CONSTITUTE TAMPERING ARE THE ACTS LISTED BELOW:

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 parts of the intake system.
3. Lack of proper maintenance.
4. Replacing any moving parts of the vehicle, or parts of the exhaust or intake system, with parts other than those specified by the manufacturer.

2. FRAME/BODY PANELS/EXHAUST SYSTEM

BODY PANEL LOCATIONS	2-2	SEAT	2-11
SERVICE INFORMATION	2-3	REAR GRIP	2-12
TROUBLESHOOTING	2-3	REAR COWL	2-13
SNAP FIT CLIP	2-4	REAR FENDER	2-14
WINDSCREEN	2-4	HUGGER FENDER	2-16
FRONT COWL	2-5	EXHAUST PIPE/MUFFLER	2-16
FRONT FENDER	2-9	REARVIEW MIRROR	2-19
SIDE COVER	2-10	SIDESTAND	2-19
PILLION SEAT	2-11	CENTER STAND	2-20

BODY PANEL LOCATIONS



SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the body panels, exhaust system, sidestand and center stand.
- Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.
- Always replace the exhaust pipe gasket with a new one after loosening or removing the exhaust pipe joint nuts.
- When installing the exhaust system, loosely install all of the exhaust pipe/muffler fasteners, always tighten the exhaust pipe joint nuts first, then tighten the mounting bolt and nut, if you tighten the mounting bolt and nut first, the exhaust pipe may not seat properly.
- Always inspect the exhaust system for leaks after installation.

TORQUE VALUES

Exhaust pipe stud bolt	11 N·m (1.1 kgf·m, 8 lbf·ft)	See page 2-18
Front cowl screw	5 N·m (0.5 kgf·m, 3.7 lbf·ft)	
Side cover screw	5 N·m (0.5 kgf·m, 3.7 lbf·ft)	
Muffler protector screw	9 N·m (0.9 kgf·m, 6.6 lbf·ft)	
Rearview mirror adapter	34 N·m (3.5 kgf·m, 25 lbf·ft)	Left-hand threads
Sidestand pivot bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Sidestand pivot nut	29 N·m (3.0 kgf·m, 21 lbf·ft)	

TROUBLESHOOTING

Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

SNAP FIT CLIP

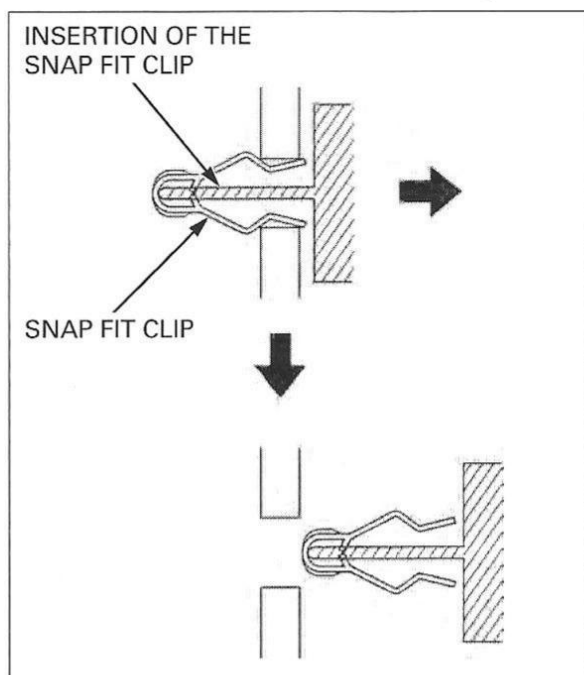
REMOVAL/INSTALLATION

Make sure that the insertion of the clip is not tilted when removing or installing the snap fit clip. If tilted upon removal or installation, damage to the insertion and/or the hole may occur.

Separate the parts by pulling the snap fit clip straight out of the hole, being careful not to tilt the insertion of the clip.

Check the snap fit clip for damage and replace if necessary.

Install the parts by inserting the snap fit clip straight into the hole, being careful not to tilt the insertion of the clip.



WINDSCREEN

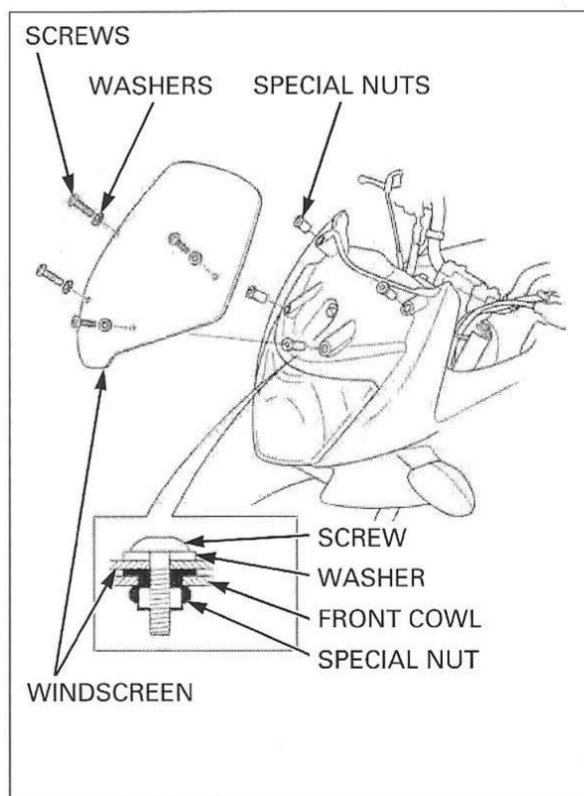
REMOVAL/INSTALLATION

Remove the following:

- Screws
- Washers
- Windscreen
- Special nuts

Installation is in the reverse order of removal.

- Tighten the windscreen screws properly as shown.



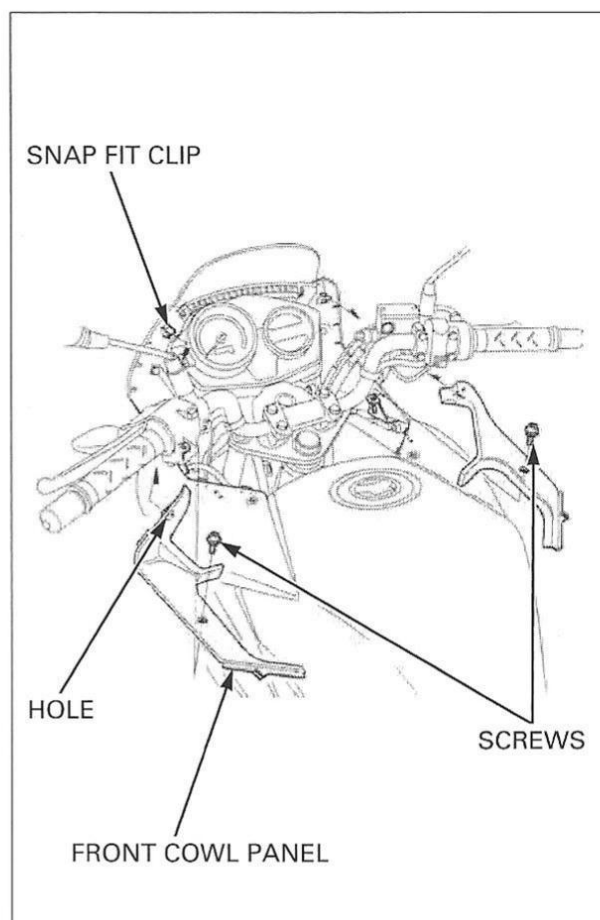
FRONT COWL

REMOVAL/INSTALLATION

Remove the windscreen (page 2-4).

Remove the screws and front cowl panels.

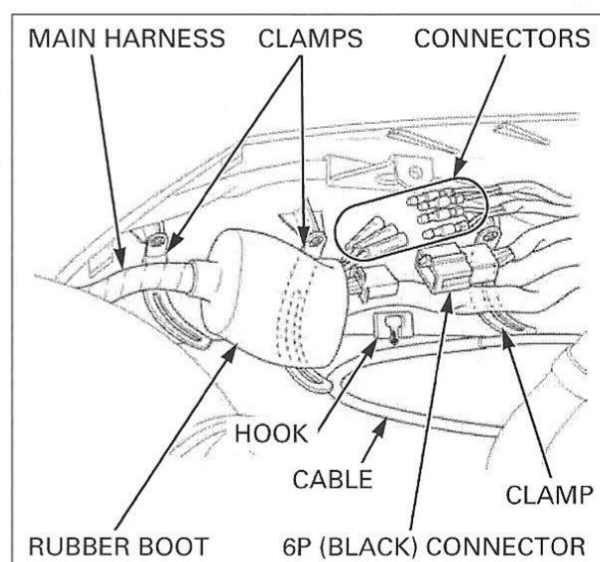
Be careful not to damage the snap fit clips and holes.



Unhook the harness from the clamps.

Slide the rubber boot and disconnect the turn signal light and headlight/position light/turn signal relay 6P (Black) connectors.

Release the speedometer cable from the hook of the front cowl.



FRAME/BODY PANELS/EXHAUST SYSTEM

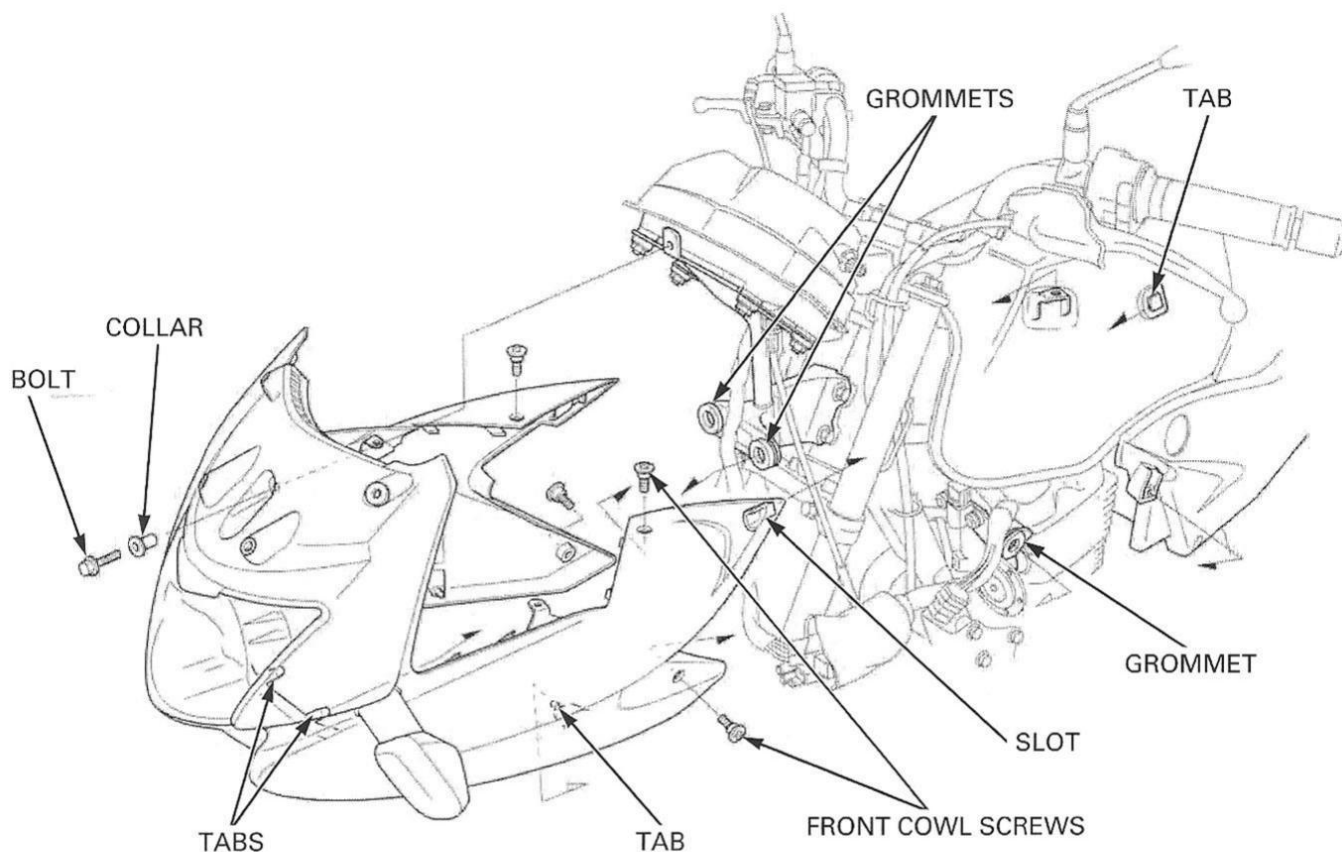
Remove the bolt and collar from the front side of the front cowl.

Remove the front cowl screws.

Remove the slots of the front cowl rear end from the tabs of the fuel tank.

Be careful not to damage the tabs.

Remove the front cowl by releasing its tabs from the grommets.



Installation is in the reverse order of removal.

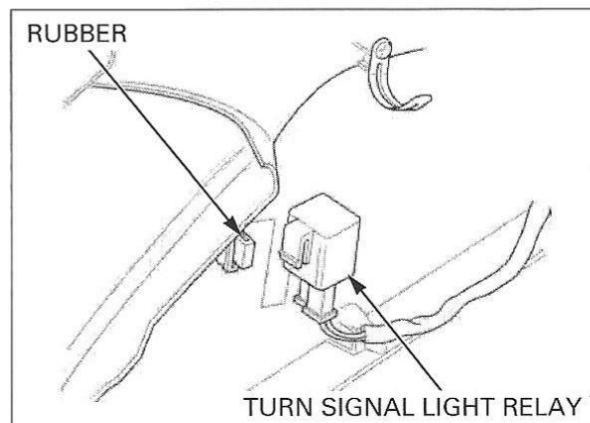
- Tighten the front cowl screws to the specified torque.

TORQUE: 5 N·m (0.5 kgf·m, 3.7 lbf·ft)

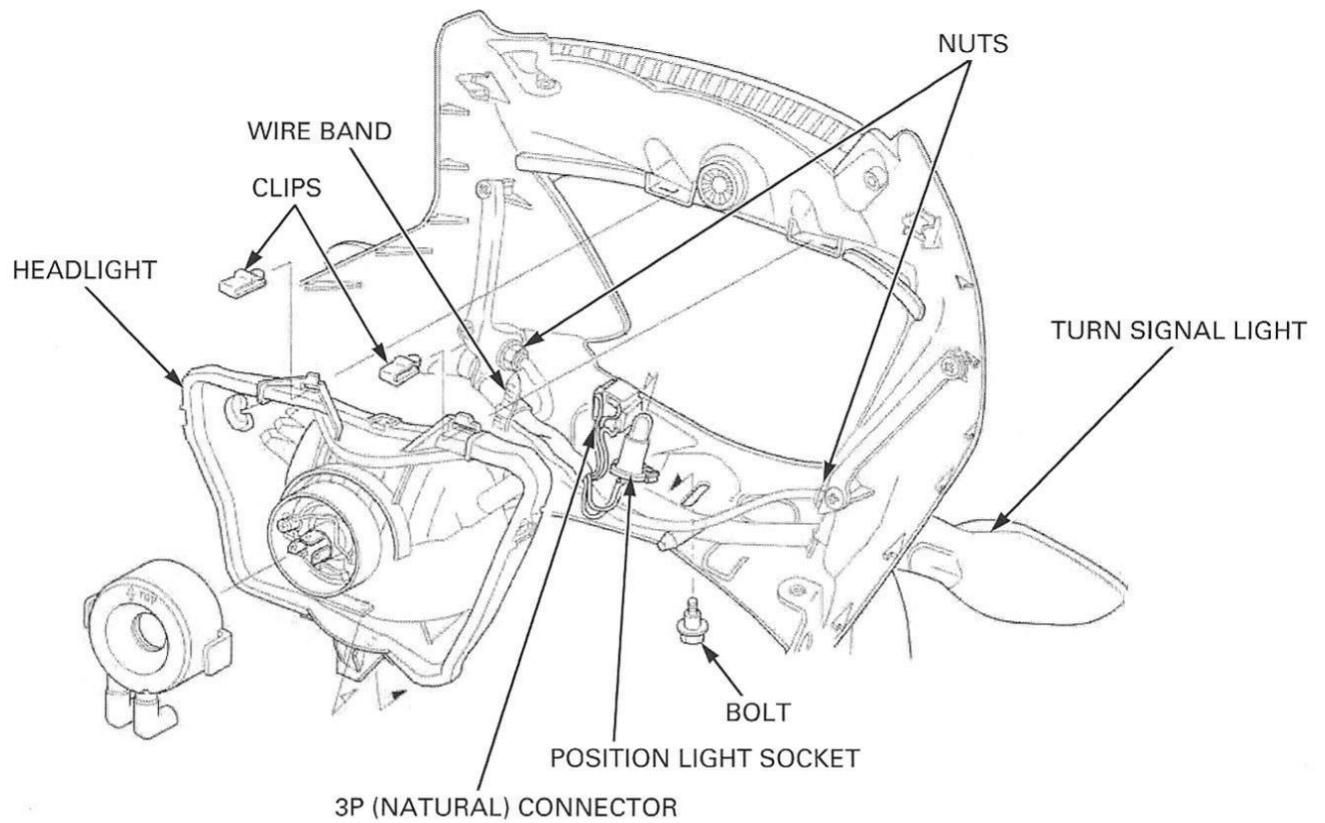
DISASSEMBLY/ASSEMBLY

Unhook the turn signal light relay from the rubber.

Remove the rubber from the front cowl.



Unhook the wires from the wire band.
Remove the nuts and turn signal lights (page 18-5).
Disconnect the headlight 3P (Natural) connector and
pull the position light socket out from the headlight.
Remove the bolt, clips and headlight.



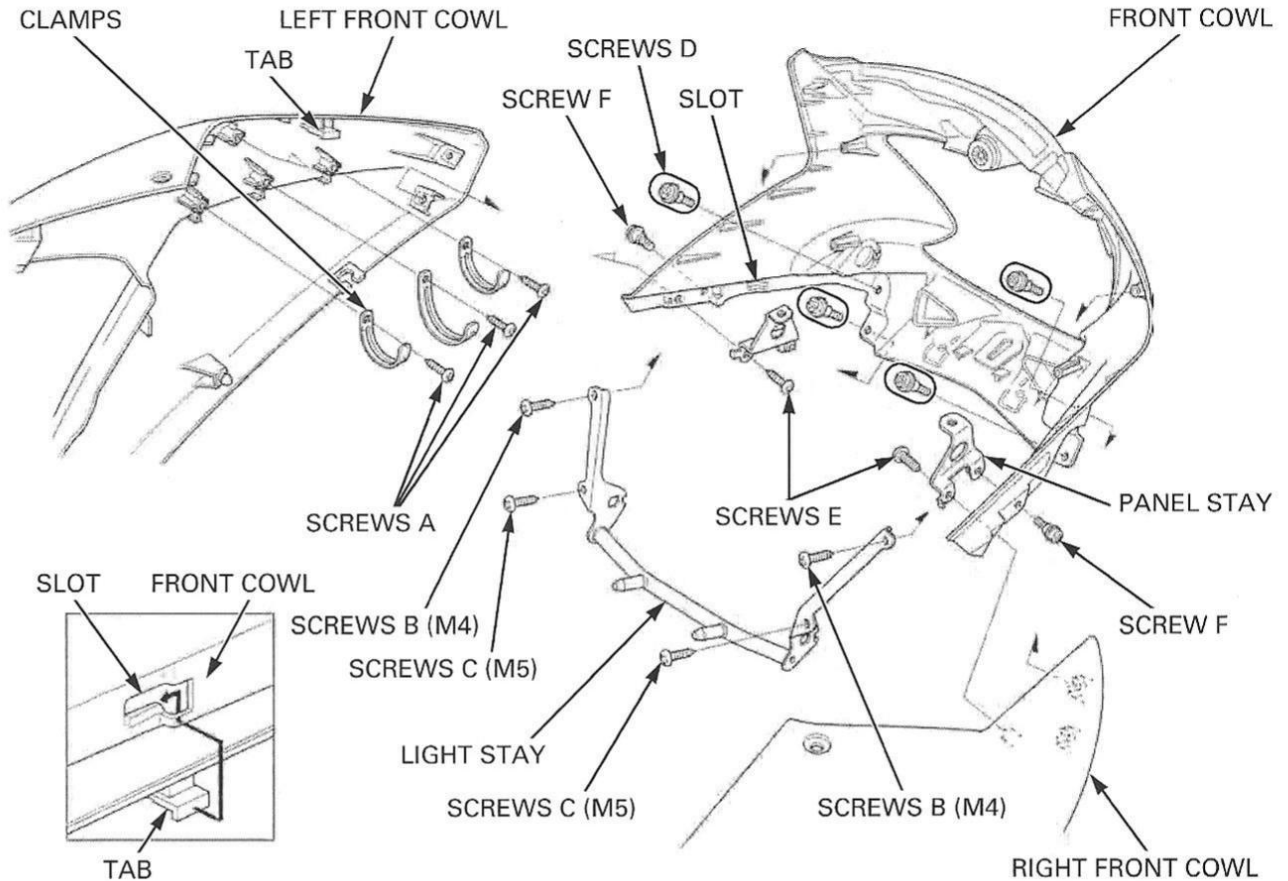
FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the screws A and clamps.

Remove the screws B, C and turn signal light stay.

Remove the screws D, screws E, front cowl, left and right front cowls.

Remove the screws F and front cowl inner panel stays.



Assembly is in the reverse order of disassembly.

- Install the left and right front cowls to the front cowl while aligning them tabs with the slots of the front cowl as show.

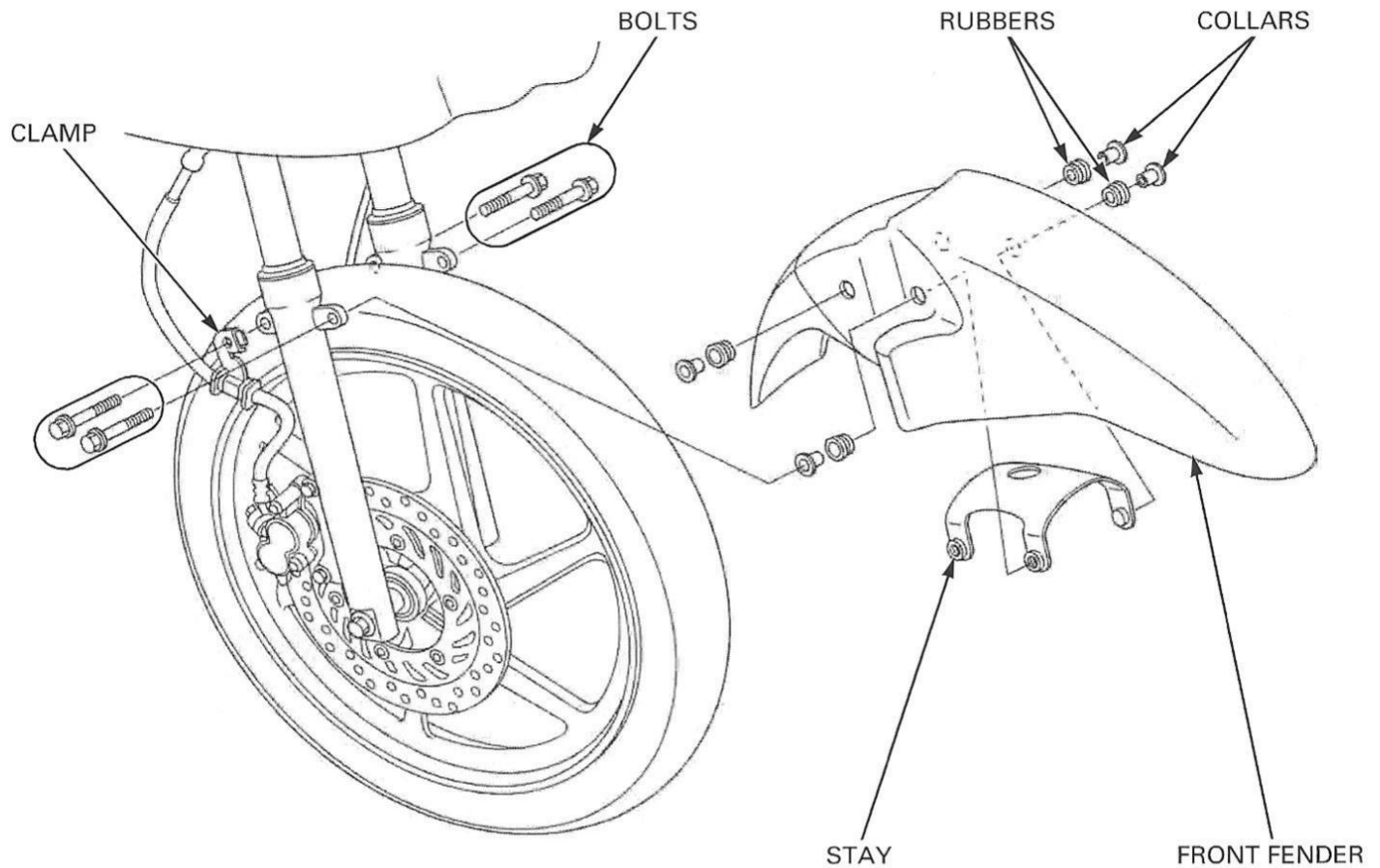
FRONT FENDER

REMOVAL/INSTALLATION

Remove the bolts, brake hose clamp, collars and front fender stay.

Remove the front fender by pulling it upward.

Remove the rubbers if necessary.



Installation is in the reverse order of removal.

SIDE COVER

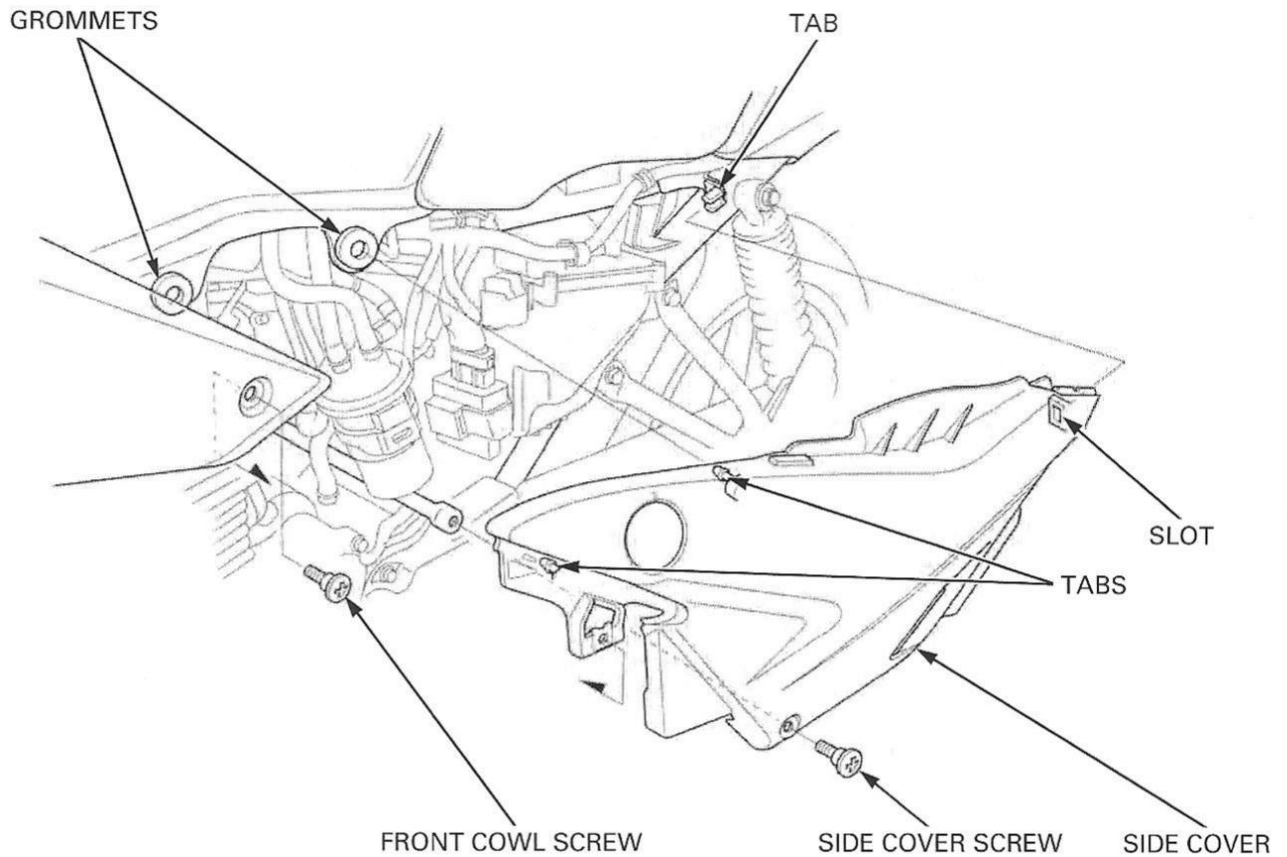
REMOVAL/INSTALLATION

Remove the front cowl and side cover screws.

Be careful not to damage the side cover boss.

Release the side cover tabs from the fuel tank grommets.

Remove the side cover by releasing its slot from the tab.



Installation is in the reverse order of removal.

- Tighten the front cowl and side cover screws to the specified torque.

TORQUE: 5 N·m (0.5 kgf·m, 3.7 lbf·ft)

PILLION SEAT

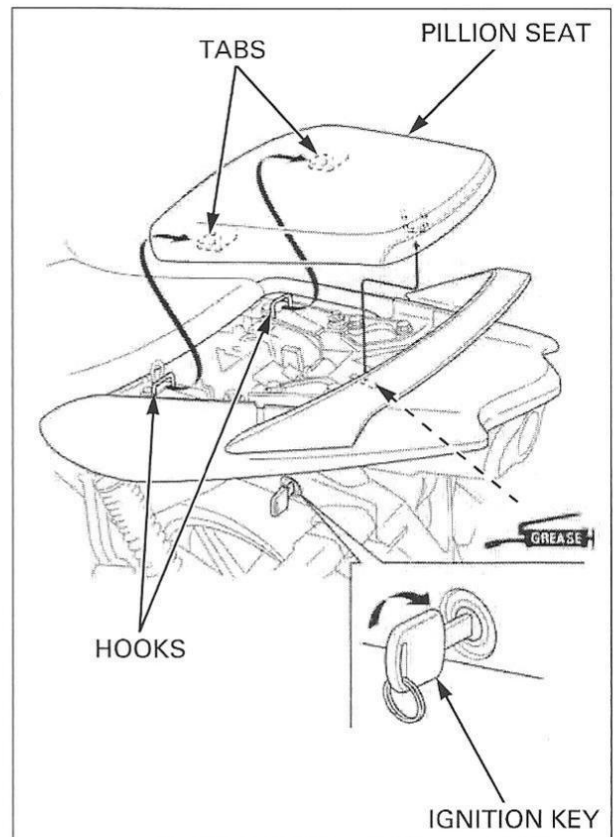
REMOVAL/INSTALLATION

Unhook the pillion seat lock using the ignition key.

Remove the pillion seat by pulling it rearward.

Apply 1.8 g (0.06 oz) of grease to the seat lock stay sliding surface.

Install the pillion seat by inserting its tabs to the hooks of the frame, then push down the rear of the pillion seat until it locks.



SEAT

REMOVAL/INSTALLATION

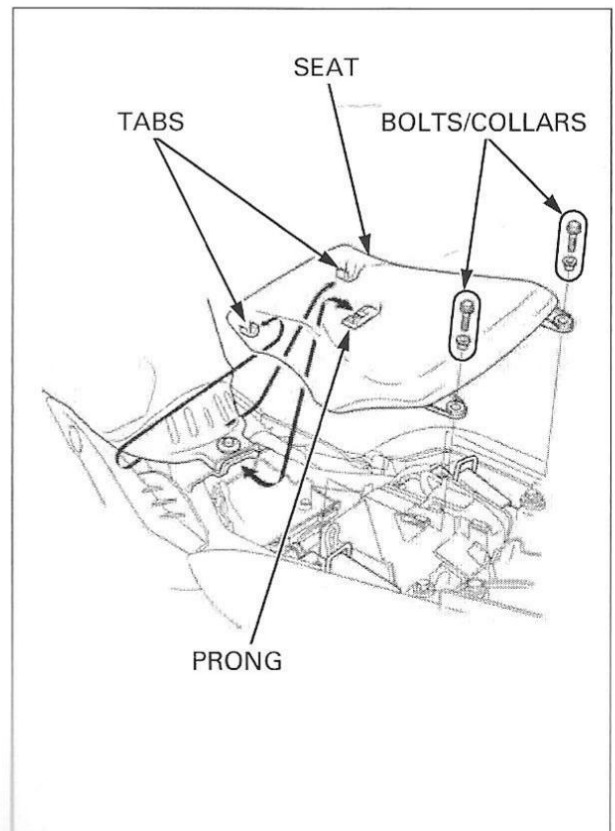
Remove the pillion seat (page 2-11).

Remove the bolts, collars and seat rearward.

Install the seat by aligning the following:

- Seat prong with the frame
- Seat tabs with the fuel tank
- Bolt holes of the seat and seat rail

Install and tighten the bolts securely.



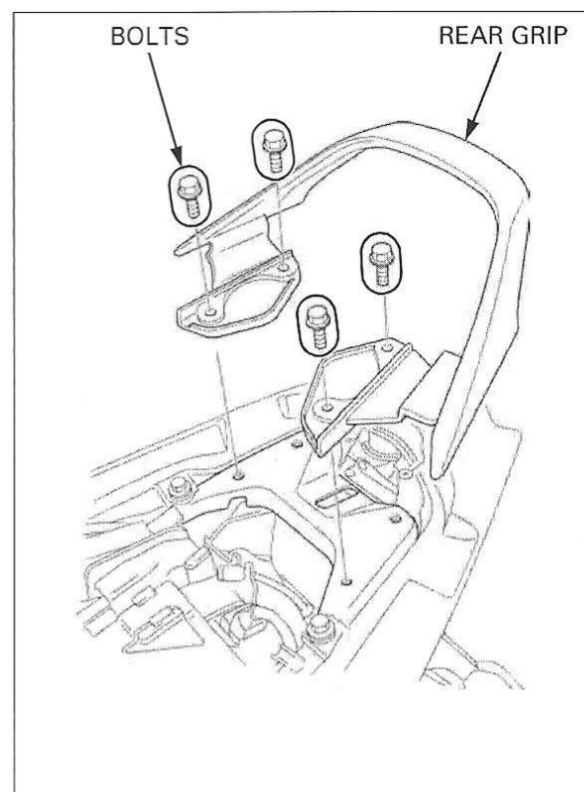
REAR GRIP

REMOVAL/INSTALLATION

Remove the pillion seat (page 2-11).

Remove the bolts and rear grip.

Installation is in the reverse order of removal.



REAR COWL

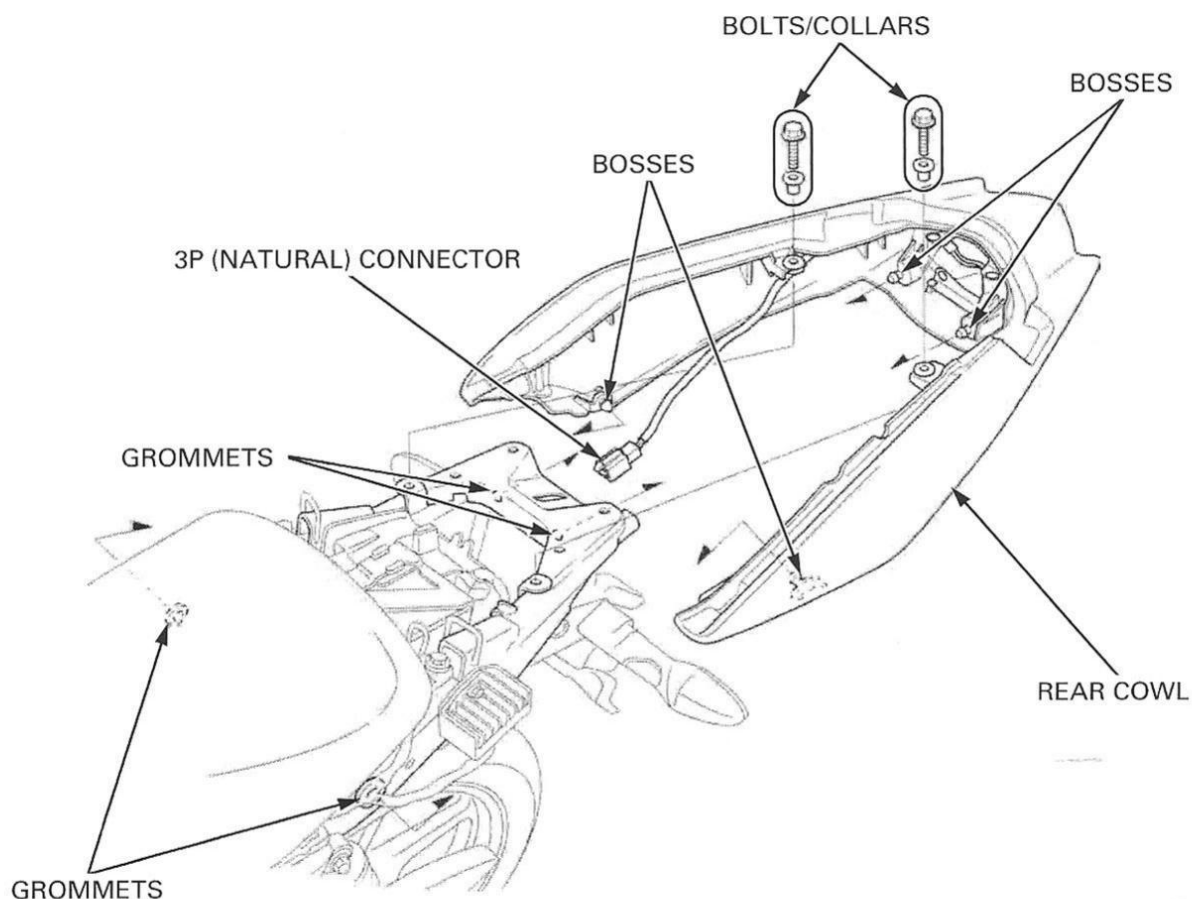
REMOVAL/INSTALLATION

Remove the rear grip (page 2-12).

Remove the bolts and collars.

Disconnect the brake/tail light 3P (Natural) connector.

Carefully release the bosses of the rear cowl from the grommets of the frame, then remove the rear cowl.



Installation is in the reverse order of removal.

FRAME/BODY PANELS/EXHAUST SYSTEM

DISASSEMBLY/ASSEMBLY

Be careful not to damage the snap fit clips and holes.

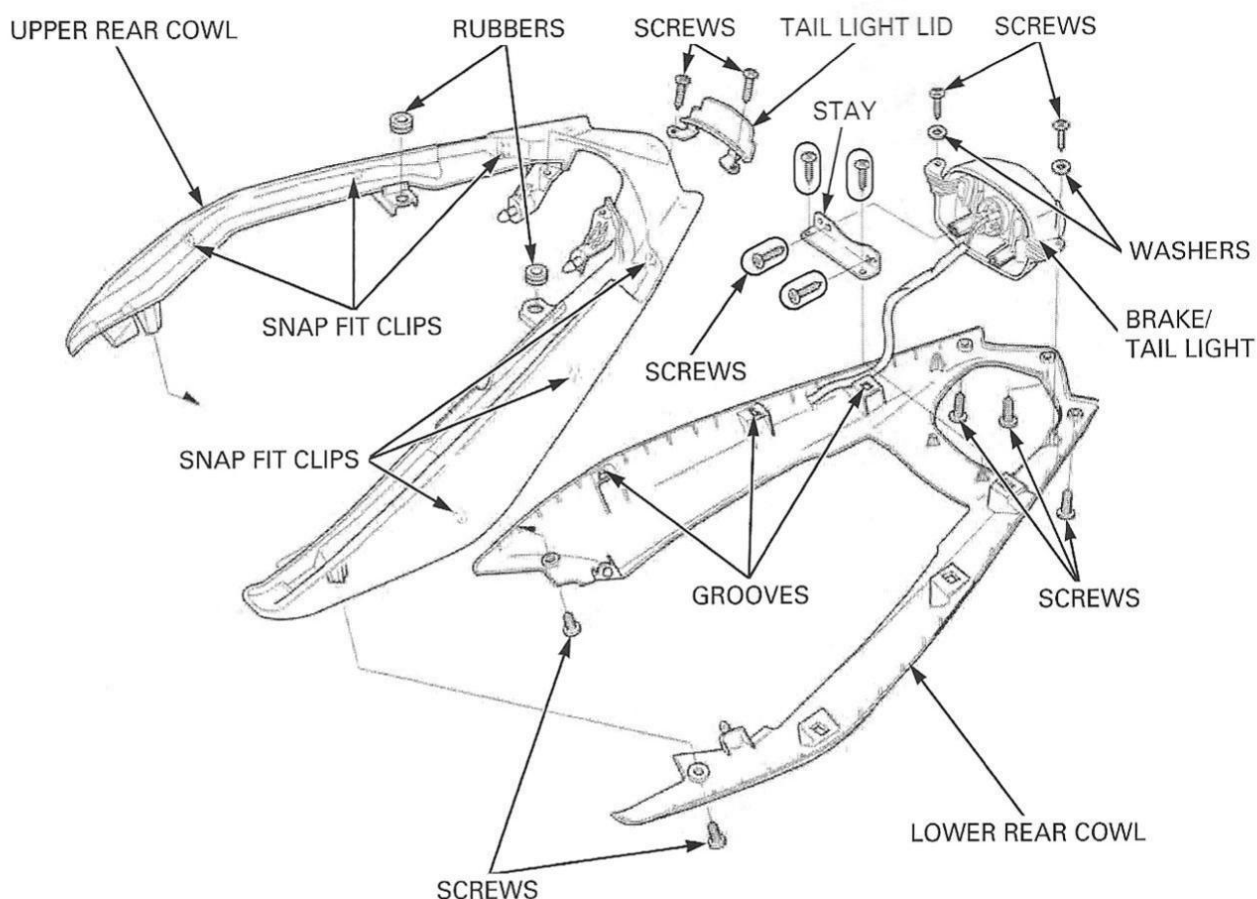
Remove the screws and separate the upper rear cowl from the lower rear cowl.

Remove the screws and tail light lid.

Remove the rubbers from the upper rear cowl.

Remove the screws and brake/tail light stay.

Remove the screws, washers and brake/tail light.



Assembly is in the reverse order of disassembly.

REAR FENDER

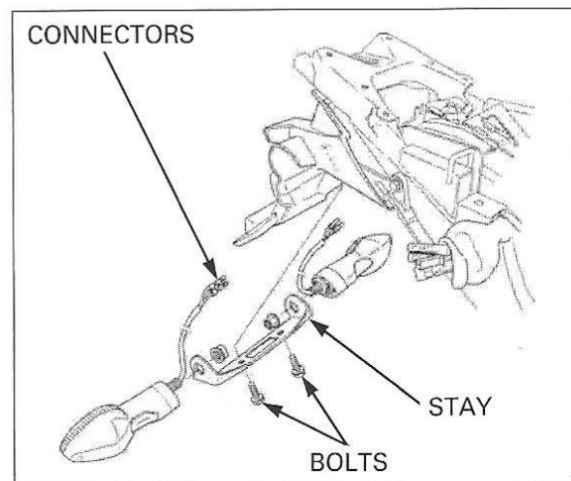
REMOVAL/INSTALLATION

Remove the following:

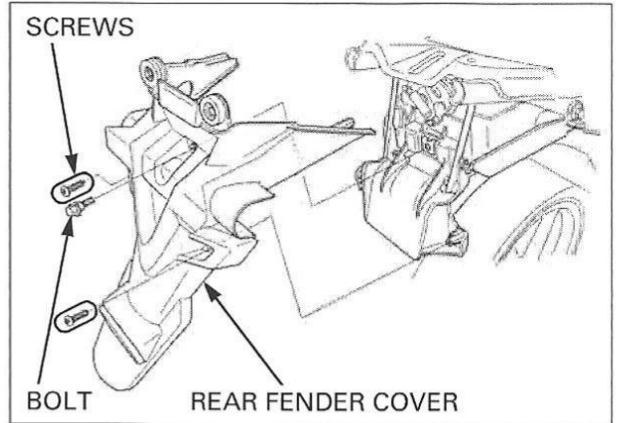
- Battery (page 15-7)
- Rear cowl (page 2-13)
- Seat (page 2-11)

Disconnect the rear turn signal light wire connectors.

Remove the bolts and rear turn signal light stay.



Remove the screws, bolt and rear fender cover.

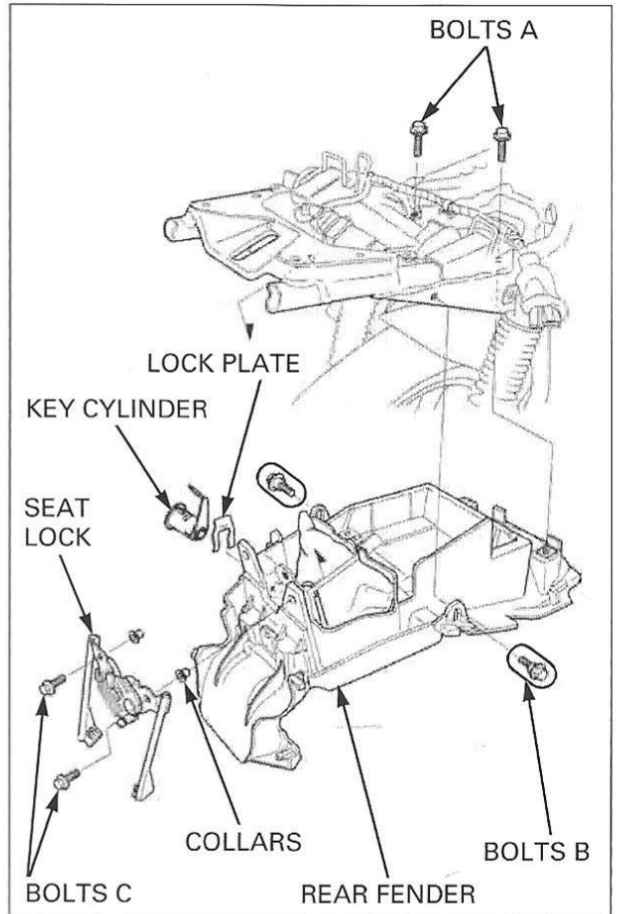


Remove the bolts A, bolts B, bolts C and rear fender.

Remove the seat lock and collars.

Remove the lock plate and key cylinder.

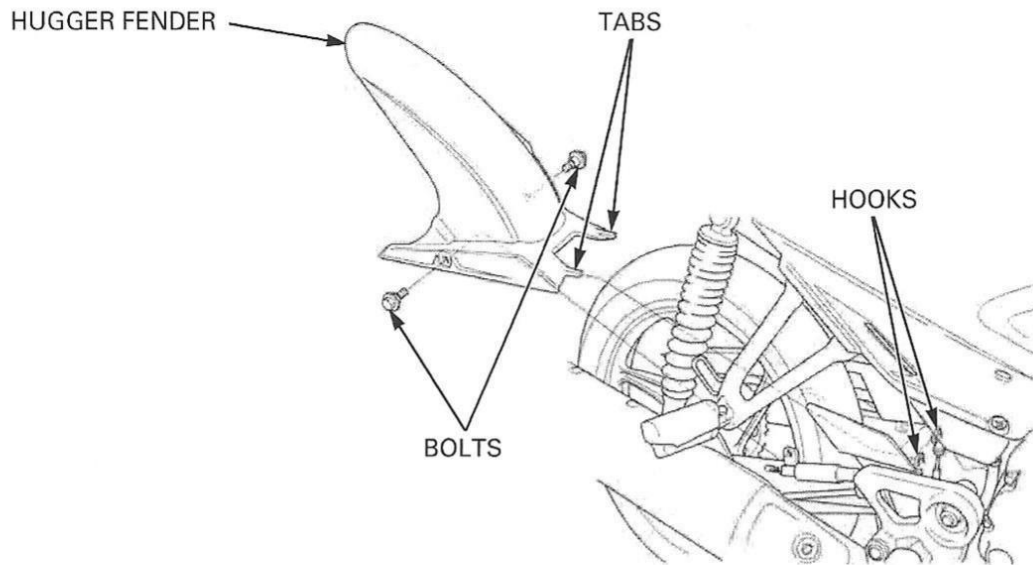
Installation is in the reverse order of removal.



HUGGER FENDER

REMOVAL/INSTALLATION

Remove the bolts and hugger fender.



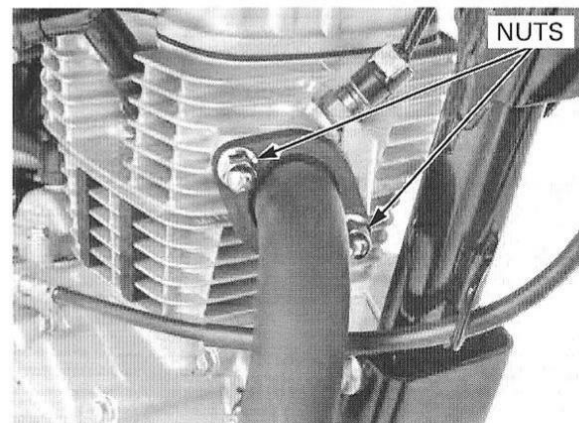
Install the hugger fender by aligning its tabs with the hooks of the swingarm.

Install the bolts securely.

EXHAUST PIPE/MUFFLER

REMOVAL

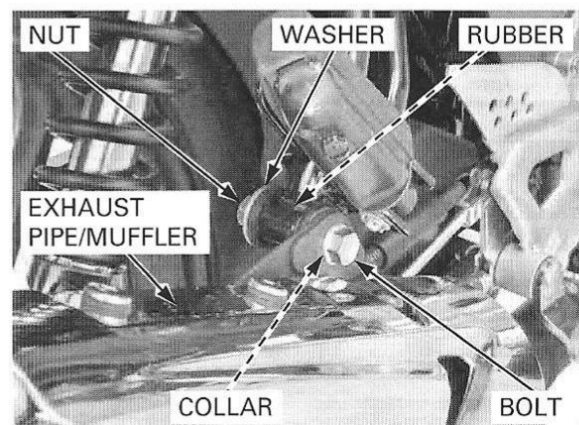
Remove the nuts.



Remove the following:

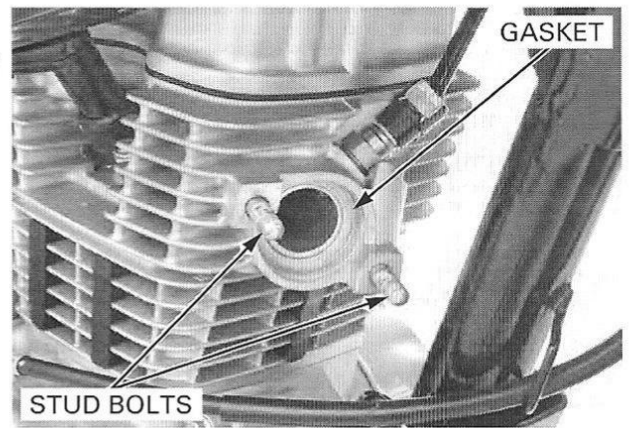
- Nut
- Washer
- Bolt
- Collar
- Exhaust pipe/muffler

Remove the rubber if necessary.



Remove the gasket from the cylinder head.

Check the installed length of the stud bolts (page 2-18).

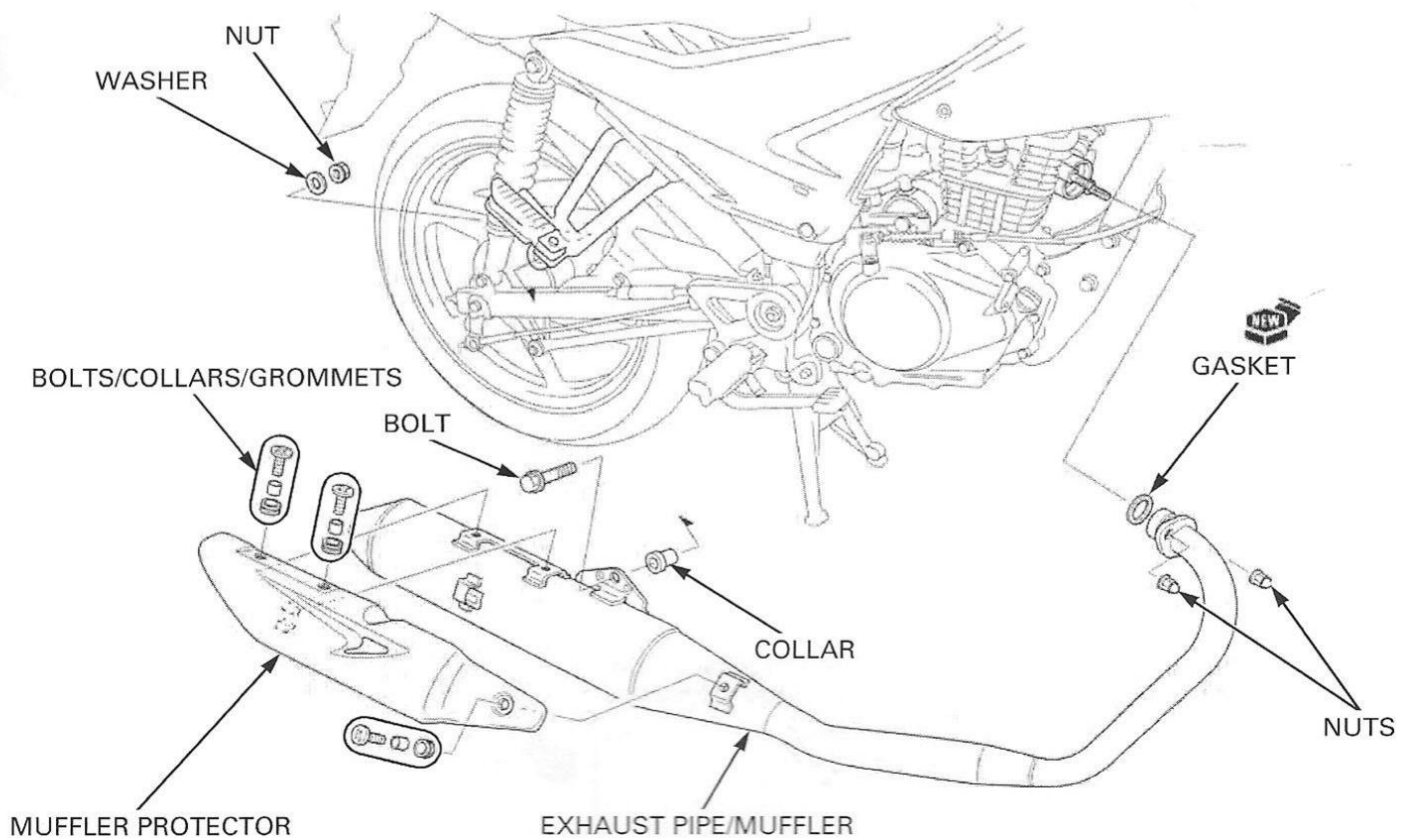
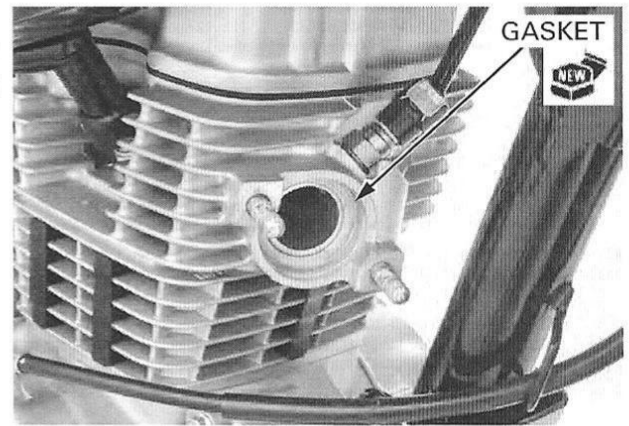


INSTALLATION

Always replace the exhaust pipe gasket with a new one when removing the exhaust pipe/muffler.

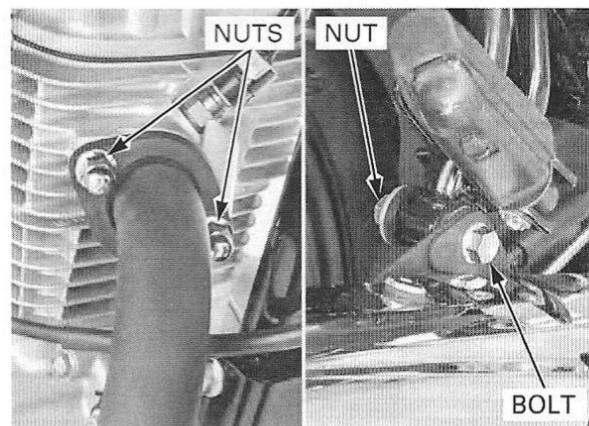
Install a new gasket into the exhaust port.

Install the exhaust pipe/muffler, then loosely install the exhaust pipe joint nuts, collar, bolt, washer and nut.



Tighten the exhaust pipe joint nuts securely, then tighten the nut while holding the bolt.

- Always inspect the exhaust system for leaks after installation.



MUFFLER PROTECTOR REMOVAL/INSTALLATION

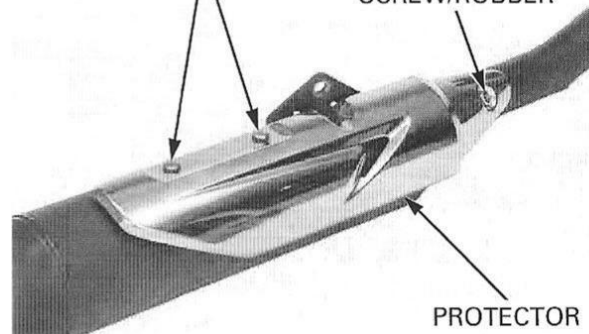
The muffler protector can be serviced with the muffler installed on the engine/frame.

Remove the screw and rubber.

Remove the screws, collars, rubbers and muffler protector forward.

SCREWS/COLLARS/RUBBERS

SCREW/RUBBER



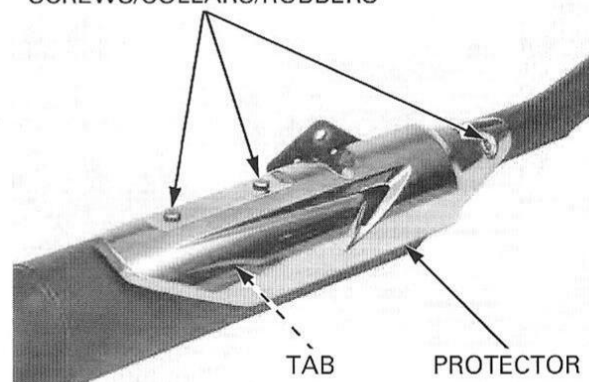
Install the following:

- Muffler protector by aligning its hole with the tab of the exhaust pipe/muffler
- Rubbers, collars and screws

Tighten the muffler protector screws to the specified torque.

TORQUE: 9 N·m (0.9 kgf·m, 6.6 lbf·ft)

SCREWS/COLLARS/RUBBERS



EXHAUST PIPE STUD BOLT

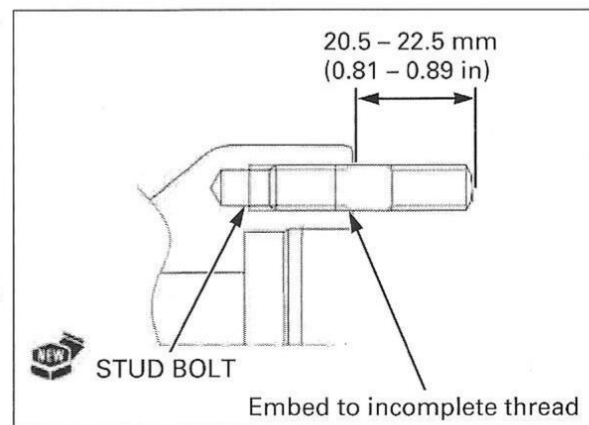
Check that the length from the bolt head to the cylinder head surface is within specifications.

STANDARD: 20.5 – 22.5 mm (0.81 – 0.89 in)

If the exhaust pipe stud bolts are loose, tighten them 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.



REARVIEW MIRROR

REMOVAL/INSTALLATION

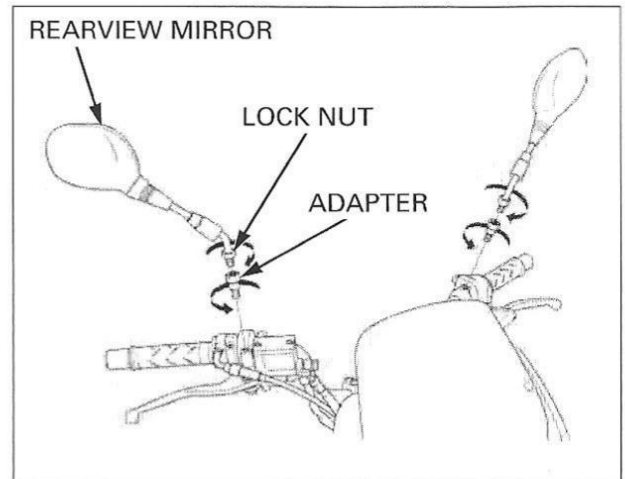
Remove the rearview mirrors.

- The rearview mirror has right-hand threads.
- The adapter has left-hand threads.

Install and tighten the rearview mirror adapter to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

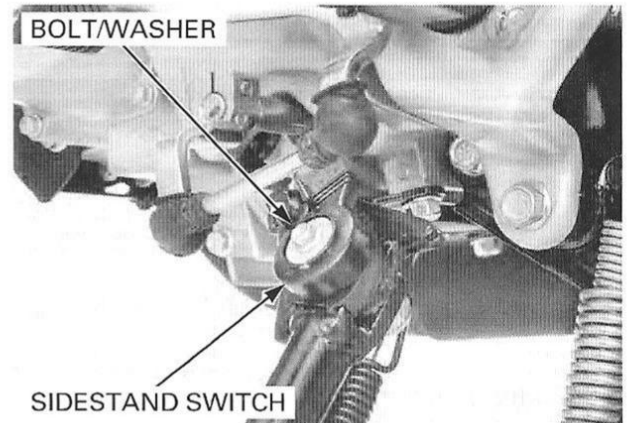
Install the rearview mirror and tighten the lock nut while holding the adapter.



SIDESTAND

REMOVAL/INSTALLATION

Remove the bolt/washer and sidestand switch.



Remove the springs, nut, bolt and sidestand.

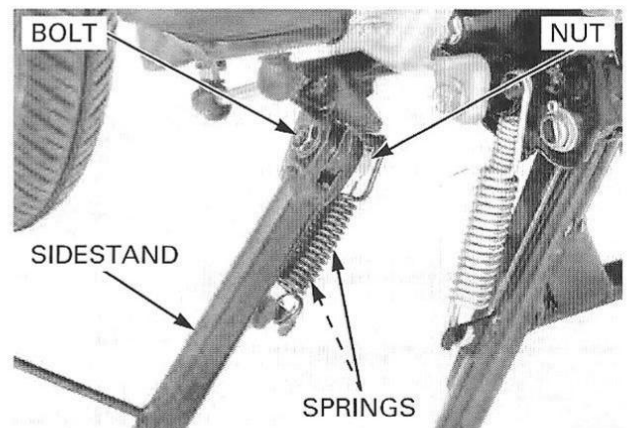
Install the sidestand and bolt, then tighten the bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

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

TORQUE: 29 N·m (3.0 kgf·m, 21 lbf·ft)

Hook the springs to the sidestand.

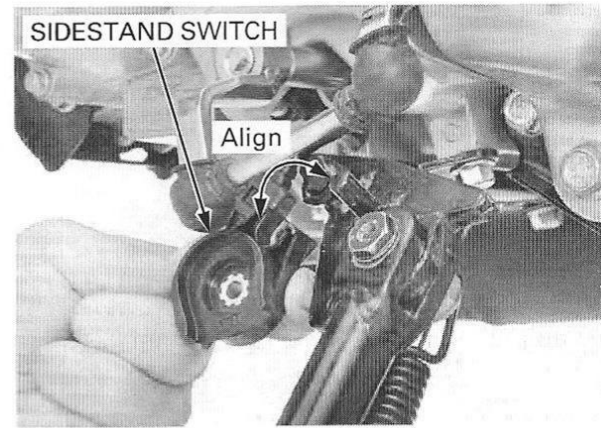


FRAME/BODY PANELS/EXHAUST SYSTEM

Install the sidestand switch by aligning its hole with the pin of the sidestand stay.

Apply locking agent to the threads of the sidestand switch bolt/washer.

Install the sidestand switch bolt/washer and tighten the bolt securely.



CENTER STAND

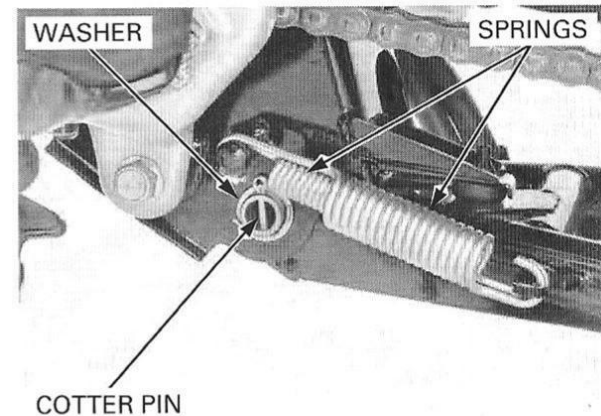
REMOVAL/INSTALLATION

Remove the exhaust pipe/muffler (page 2-16).

Support the motorcycle on its sidestand.

Unhook the center stand springs.

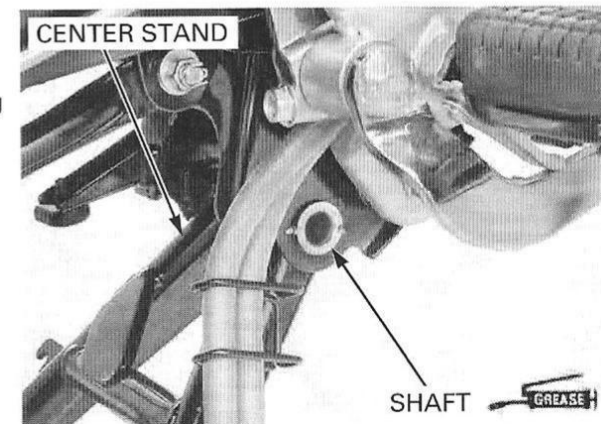
Remove the cotter pin and washer.



Remove the shaft and center stand.

Installation is in the reverse order of removal.

- Apply grease to the center stand shaft sliding surface.



SERVICE INFORMATION	3-2	DRIVE CHAIN.....	3-14
MAINTENANCE SCHEDULE	3-4	BRAKE FLUID	3-20
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THROTTLE OPERATION.....	3-5	BRAKE SYSTEM.....	3-21
AIR CLEANER.....	3-6	BRAKE LIGHT SWITCH	3-22
CRANKCASE BREATHER	3-7	HEADLIGHT AIM	3-22
SPARK PLUG	3-7	CLUTCH SYSTEM	3-23
VALVE CLEARANCE.....	3-9	SIDESTAND	3-23
ENGINE OIL.....	3-10	SUSPENSION	3-24
ENGINE OIL STRAINER SCREEN	3-12	NUTS, BOLTS, FASTENERS.....	3-25
ENGINE OIL CENTRIFUGAL FILTER.....	3-13	WHEELS/TIRES	3-25
ENGINE IDLE SPEED	3-14	STEERING HEAD BEARINGS	3-26

MAINTENANCE

SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

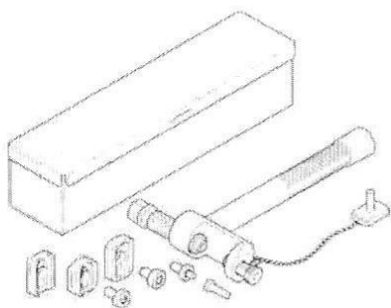
ITEM			SPECIFICATION
Throttle grip freeplay			2 – 6 mm (1/16 – 1/4 in)
Spark plug	Standard		CPR7EA-9 (NGK) or UR6DC (BOSCH)
	For extended high speed riding		CPR8EA-9 (NGK) or UR5DC (BOSCH)
Spark plug gap			0.8 – 0.9 mm (0.03 – 0.04 in)
Valve clearance	IN		0.08 ± 0.02 mm (0.003 ± 0.001 in)
	EX		0.12 ± 0.02 mm (0.005 ± 0.001 in)
Engine oil capacity	After draining		0.9 liter (1.0 US qt, 0.8 Imp qt)
	After disassembly		1.1 liter (1.2 US qt, 1.0 Imp qt)
Recommended engine oil			Honda "4-stroke motorcycle oil" or an equivalent Oil recommendation: API classification: SG or higher (except oils labeled as energy conserving on the circular API service label) Viscosity: SAE 10W-30 JASO T 903 standard: MA
Engine idle speed			1,500 ± 100 min ⁻¹ (rpm)
Drive chain size/link	RK		RK428KRO-118 LE
Drive chain slack			15 – 25 mm (9/16 – 1 in)
Recommended brake fluid			DOT 3 or DOT 4
Brake pedal freeplay			20 – 30 mm (13/16 – 1-3/16 in)
Clutch lever freeplay			10 – 20 mm (3/8 – 13/16 in)
Cold tire pressure	Front	Driver only	175 kPa (1.75 kgf/cm ² , 25 psi)
		Driver and passenger	175 kPa (1.75 kgf/cm ² , 25 psi)
	Rear	Driver only	200 kPa (2.00 kgf/cm ² , 29 psi)
		Driver and passenger	225 kPa (2.25 kgf/cm ² , 33 psi)
Tire size	Front		80/100 – 17 M/C 46P
	Rear		100/90 – 17 M/C 55P
Minimum tire tread depth	Front		1.5 mm (0.06 in)
	Rear		2.0 mm (0.08 in)

TORQUE VALUES

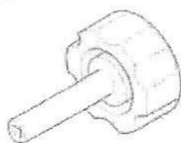
Spark plug	16 N·m (1.6 kgf·m, 12 lbf·ft)	Apply engine oil to the threads and seating surface. Apply grease to the threads.
Valve adjusting screw lock nut	14 N·m (1.4 kgf·m, 10 lbf·ft)	
Crankshaft hole cap	15 N·m (1.5 kgf·m, 11 lbf·ft)	
Timing hole cap	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Oil drain bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	
Oil filter rotor cover screw	4 N·m (0.4 kgf·m, 3.0 lbf·ft)	
Rear axle nut	54 N·m (5.5 kgf·m, 40 lbf·ft)	
Air cleaner cover screw	1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)	
Drive sprocket fixing plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Driven sprocket nut	32 N·m (3.3 kgf·m, 24 lbf·ft)	
Sidestand pivot bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Sidestand pivot nut	29 N·m (3.0 kgf·m, 21 lbf·ft)	
Throttle cable adjuster lock nut	8.5 N·m (0.9 kgf·m, 6.3 lbf·ft)	
Master cylinder reservoir cap screw	1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)	

TOOLS

Drive chain tool set
07HMH-MR10103



Valve adjusting wrench
07708-0030400



MAINTENANCE

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 an authorized Honda dealer.

ITEMS	FREQUENCY	WHICHEVER COMES FIRST  NOTE	ODOMETER READING (NOTE 1) 					REFER TO PAGE
			x 1,000 km	1	4	8	12	
			x 1,000 mi	0.6	2.5	5	7.5	
			MONTHS		6	12	18	
* FUEL LINE					I	I	I	3-5
* THROTTLE OPERATION					I	I	I	3-5
AIR CLEANER		NOTE 2					R	3-6
CRANKCASE BREATHER		NOTE 3			C	C	C	3-7
SPARK PLUG					I	R	I	3-7
* VALVE CLEARANCE				I	I	I	I	3-9
ENGINE OIL				R	R	R	R	3-10
** ENGINE OIL STRAINER SCREEN							C	3-12
** ENGINE OIL CENTRIFUGAL FILTER							C	3-13
* ENGINE IDLE SPEED				I	I	I	I	3-14
DRIVE CHAIN			EVERY 1,000 km (600 mi) I, L					3-14
BRAKE FLUID		NOTE 4			I	I	I	3-20
BRAKE SHOES/PADS WEAR					I	I	I	3-20
BRAKE SYSTEM				I	I	I	I	3-21
* BRAKE LIGHT SWITCH					I	I	I	3-22
* HEADLIGHT AIM					I	I	I	3-22
CLUTCH SYSTEM				I	I	I	I	3-23
SIDESTAND					I	I	I	3-23
* SUSPENSION					I	I	I	3-24
* NUTS, BOLTS, FASTENERS				I		I		3-25
** WHEELS/TIRES					I	I	I	3-25
** STEERING HEAD BEARINGS				I			I	3-26

* Should be serviced by an authorized Honda 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 an authorized Honda dealer.

Honda recommends that an authorized Honda dealer should road test the motorcycle after each periodic maintenance is carried out.

NOTES:

1. At higher odometer reading, 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. Replace every 2 years. Replacement requires mechanical skill.

FUEL LINE

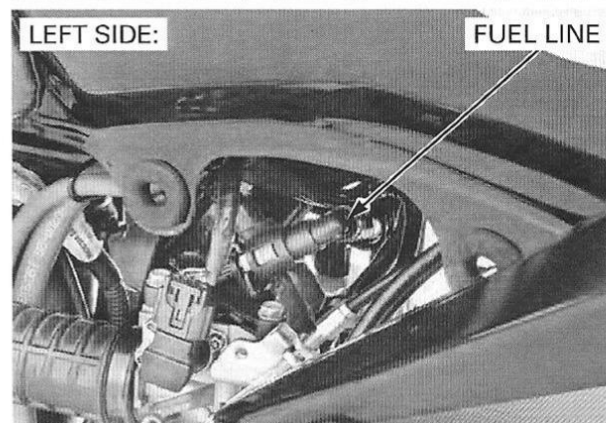
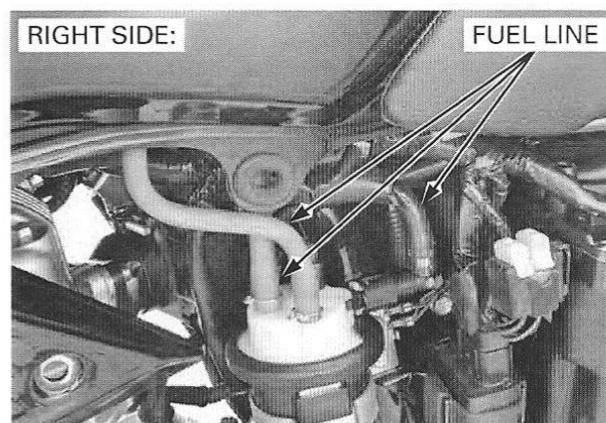
Remove the side covers (page 2-10).

Check the fuel line for deterioration, damaged or leakage.

Replace the fuel line if necessary.

Also, check the fuel feed hose fittings for leakage.

Install the right and left side covers (page 2-10).



THROTTLE OPERATION

Check for smooth operation of the throttle and that it returns automatically to the fully closed position from any open position and from any steering positions.

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

For cable lubrication: Disconnect the throttle cable at its upper end. Thoroughly lubricate the cable and its pivot point with a commercially available cable lubricant or a lightweight oil.

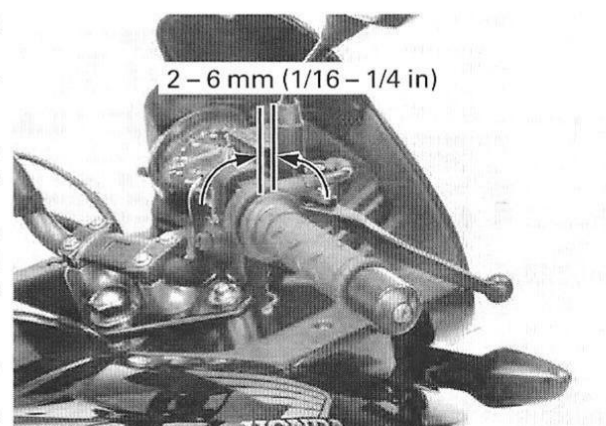
Reusing a damaged or abnormally bent or kinked throttle cable can prevent proper throttle operation and may lead to a loss of throttle control while riding.

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 left and right to ensure that the idle speed does not change. If idle speed increases, check the throttle grip freeplay and throttle cable connection.

Measure the throttle grip freeplay at the throttle grip flange.

FREEPLAY: 2 – 6 mm (1/16 – 1/4 in)



MAINTENANCE

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

Minor adjustment is made with the upper adjuster.

Slide the rubber boot off the adjuster.

Adjust the freeplay by loosening the adjuster lock nut and turning the adjuster.

After adjustment, tighten the adjuster lock nut to the specified torque while holding the adjuster.

TORQUE: 3 N·m (0.3 kgf·m, 2.2 lbf·ft)

Recheck the throttle operation.

If the adjuster cannot be reached the correct freeplay, turn the adjuster all the way in and turn it out one turn, then adjust the major adjustment.

Major adjustment is made with the lower adjuster on the throttle body.

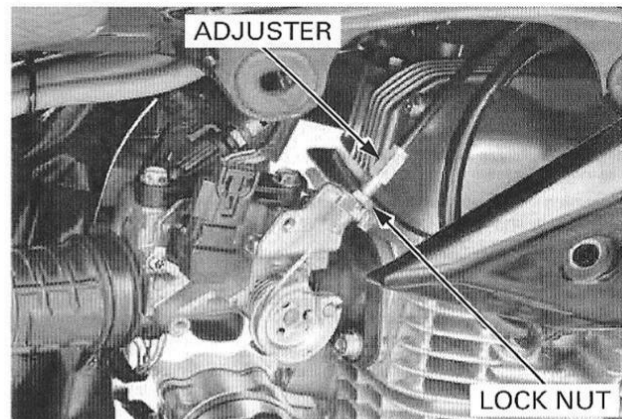
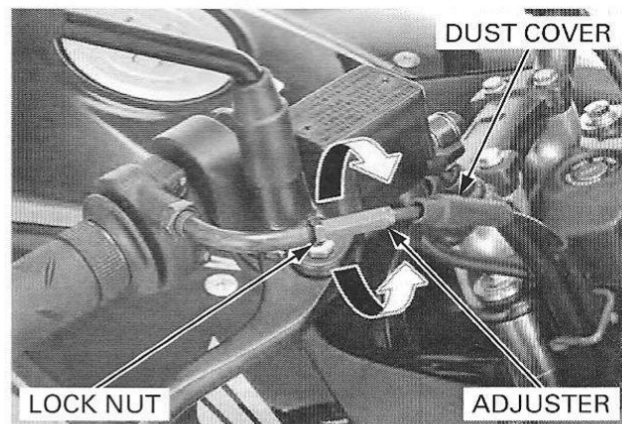
Remove the right side cover (page 2-10).

Loosen the lock nut, turn the adjuster as required and tighten the lock nut to the specified torque.

TORQUE: 8 N·m (0.8 kgf·m, 5.9 lbf·ft)

After adjustment, recheck the throttle operation.

Install the right side cover (page 2-10).



AIR CLEANER

REMOVAL/INSTALLATION

Remove the seat (page 2-11).

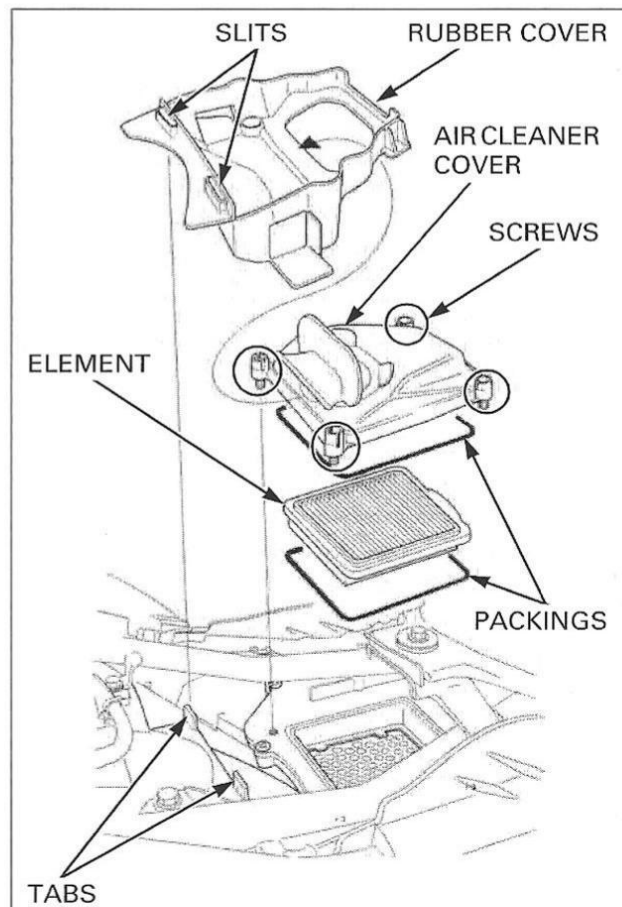
Remove the following:

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

Installation is in the reverse order of removal.

- Check that the packings are in good condition, replace them if necessary.
- Align the rubber cover slits to the tabs of the rear fender.
- Tighten the air cleaner cover screws to the specified torque.

TORQUE: 1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)



CRANKCASE BREATHER

CLEANING

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

Remove the right side cover (page 2-10).

Check the crankcase breather hose and replace it if the crankcase breather hose is deteriorated, damaged or leaked.

Also check the crankcase breather hose fittings for leakage.

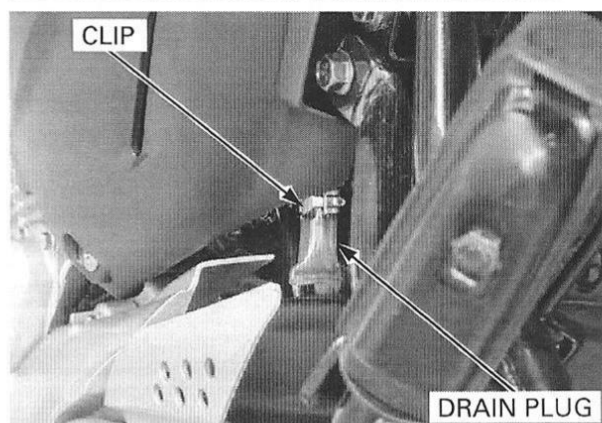
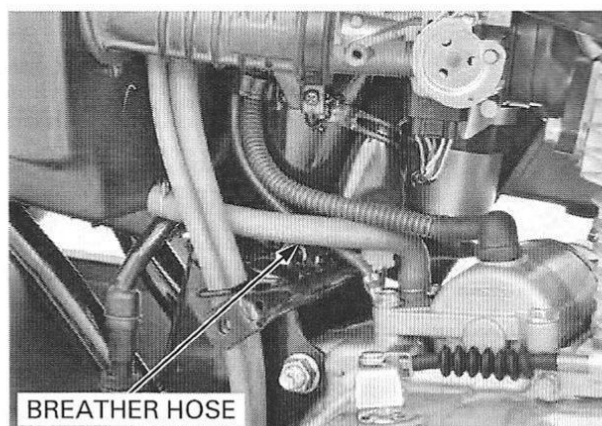
Install the right side cover (page 2-10).

Check the drain plug.

If deposit has corrected, remove the clip and drain plug.

Drain deposits into a suitable container.

Install the drain plug and clip securely.



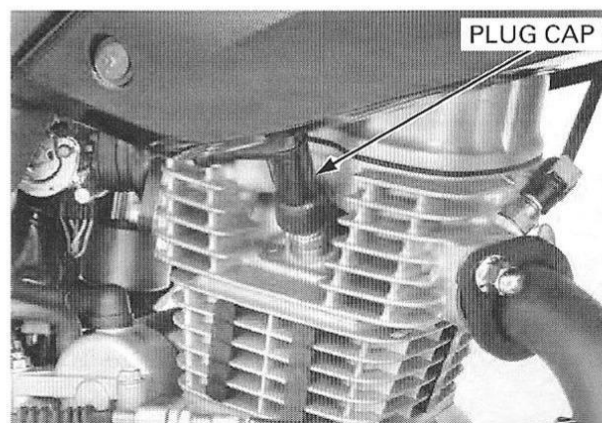
SPARK PLUG

REMOVAL

Disconnect the spark plug cap.

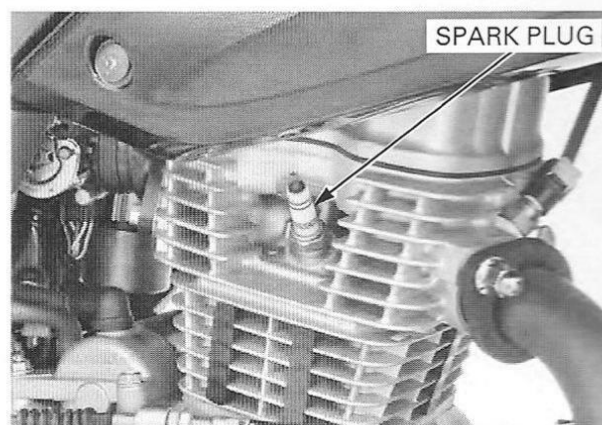
Make sure that no debris is allowed to enter the combustion chamber.

Clean around the spark plug base with compressed air before removing the plug.



Remove the spark plug using an equipped spark plug wrench or equivalent.

Inspect or replace the spark plug as described in the maintenance schedule (page 3-4).



MAINTENANCE

INSPECTION

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

Check the following:

- Insulator for damage or cracks
- Electrodes for wear
- Burning condition, discoloration

Replace the spark plug if necessary.

RECOMMENDED SPARK PLUG:

Standard:

CPR7EA-9 (NGK), UR6DC (BOSCH)

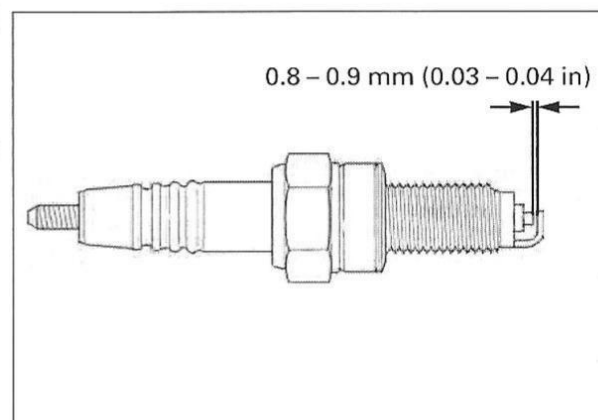
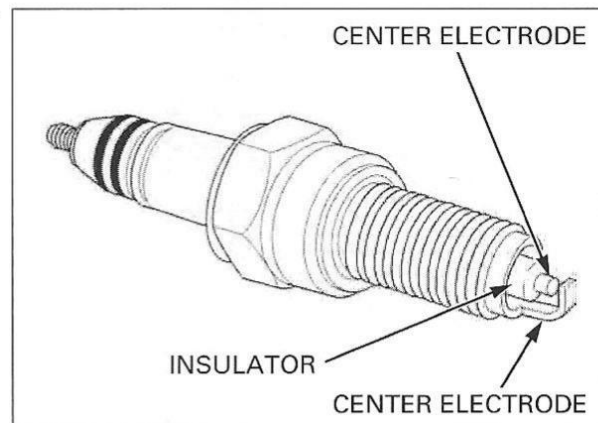
For extended high speed riding:

CPR8EA-9 (NGK), UR5DC (BOSCH)

Check the spark plug 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 spark plug gap by bending the side electrode carefully.



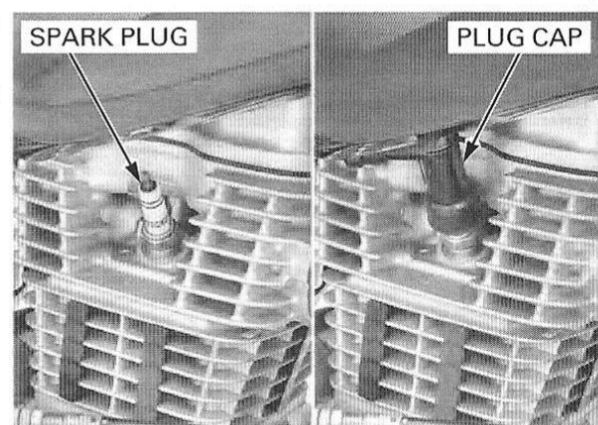
INSTALLATION

Install and hand tighten the spark plug to the cylinder head.

Tighten the spark plug to the specified torque using an equipped spark plug wrench or equivalent.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Install the spark plug cap securely.



Always use the specified spark plug on this motorcycle.

Do not over-tighten the spark plug.

VALVE CLEARANCE

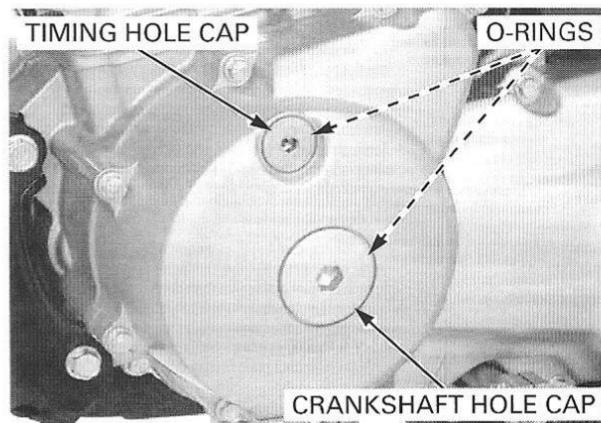
INSPECTION

NOTE:

- Inspect and adjust the valve clearance while the engine is cold (below 35°C/95°F).
- After the valve clearance inspection, check the engine idle speed (page 3-14).

Remove the cylinder head cover (page 7-6).

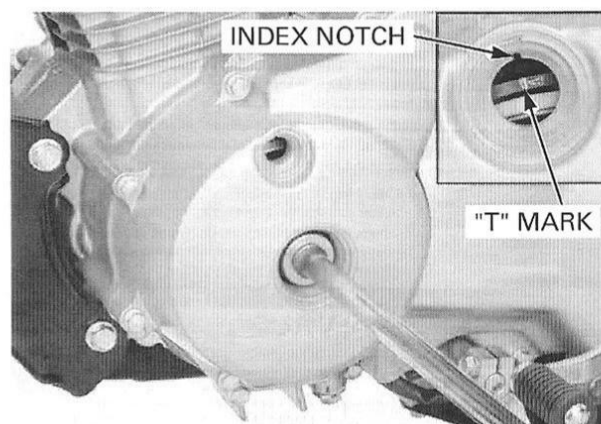
Remove the timing hole cap, crankshaft hole cap and O-rings.



Rotate the crankshaft counterclockwise, and align the "T" mark on the flywheel with the index notch on the left crankcase cover.

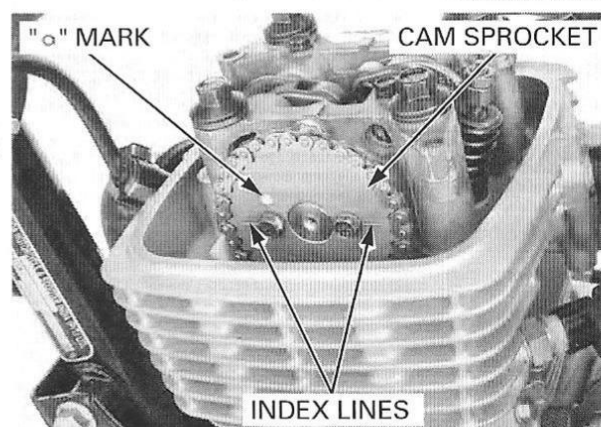
Make sure the piston is at TDC on the compression stroke.

This position can be obtained by confirming that there is slack in the rocker arms. If there is no slack, rotate the crankshaft counterclockwise one full turn and align the "T" mark with the index notch again.



The index lines on the cam sprocket must be flush with the cylinder head surface and timing mark "o" is facing front at TDC on the compression stroke.

If the timing mark is facing rear, rotate the crankshaft one full turn (360°), and match up the "T" mark again.



MAINTENANCE

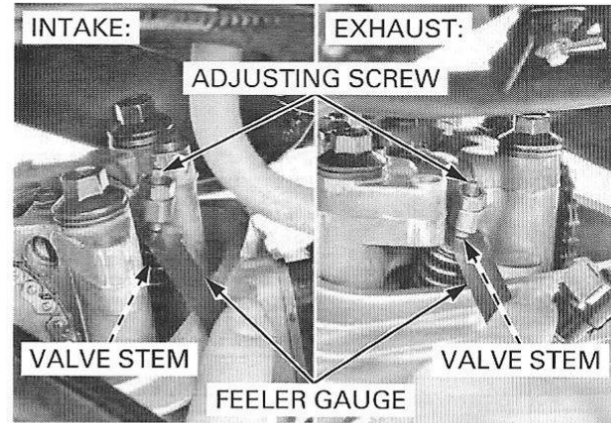
When checking the clearance, slide the feeler gauge from the outside to the center.

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

VALVE CLEARANCE:

IN: 0.08 ± 0.02 mm (0.003 ± 0.001 in)

EX: 0.12 ± 0.02 mm (0.005 ± 0.001 in)



ADJUSTMENT

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

TOOL:

Valve adjusting wrench 07708-0030400

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

Hold the adjusting screw and tighten the valve adjusting screw lock nut to the specified torque.

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)

Recheck the valve clearance.

Apply engine oil to new O-rings, and install them to each hole cap.

Apply grease to the crankshaft hole cap threads.

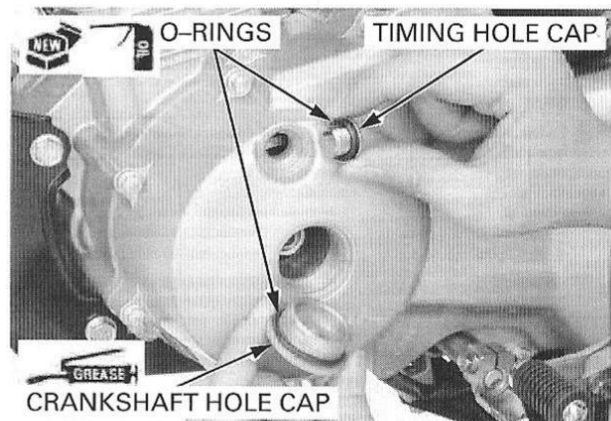
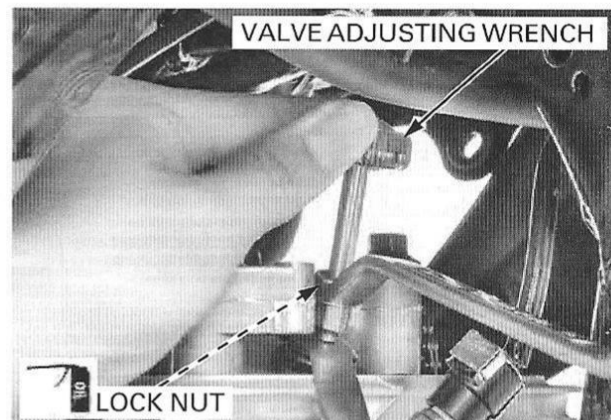
Install and tighten the crankshaft hole cap to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

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

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the cylinder head cover (page 7-25).



ENGINE OIL

OIL LEVEL INSPECTION

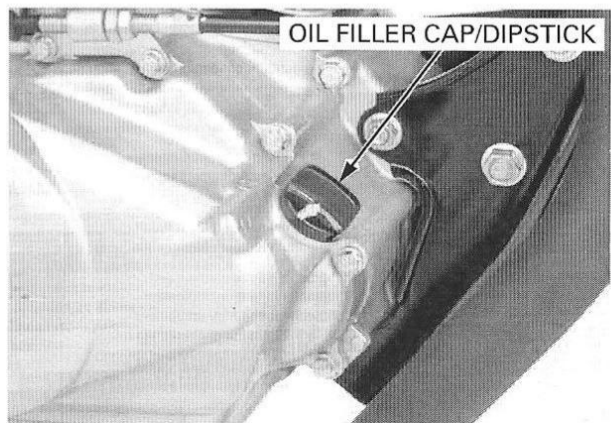
Start the engine and let it idle for 3 – 5 minutes.

Stop the engine and wait 2 – 3 minutes.

Hold the motorcycle in an upright position.

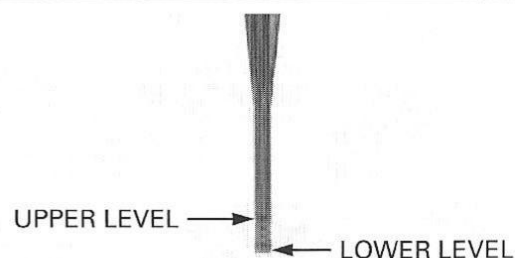
Remove the oil filler cap/dipstick, and wipe oil from the dipstick with a clean shop towel.

Insert the oil filler cap/dipstick without screwing it in, then remove it.



Check the oil level.

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



Other viscosities of oil may be used depending upon the average temperature in your riding area. Use the chart as a guide.

RECOMMENDED ENGINE OIL:

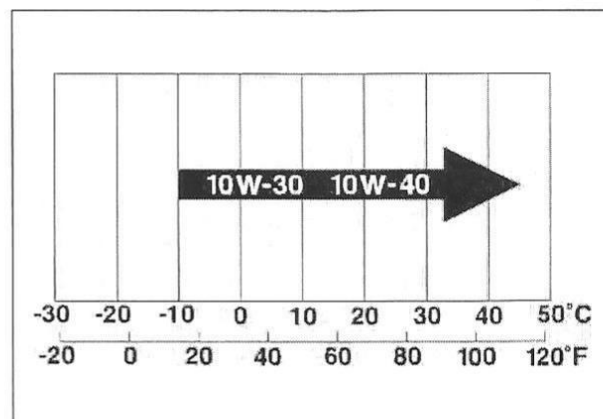
Honda "4-stroke motorcycle oil" or an equivalent

Oil recommendation:

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

Viscosity: SAE 10W-30

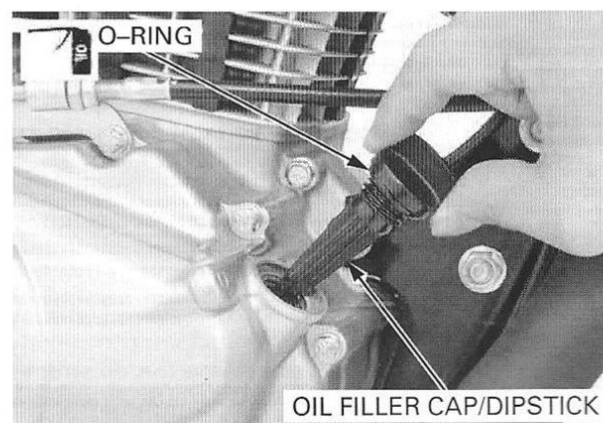
JASO T 903 standard: MA



Check the O-ring for wear or damage, and replace it if necessary.

Apply engine oil to the O-ring, and install it to the groove of oil filler cap/dipstick.

Install the oil filler cap/dipstick.

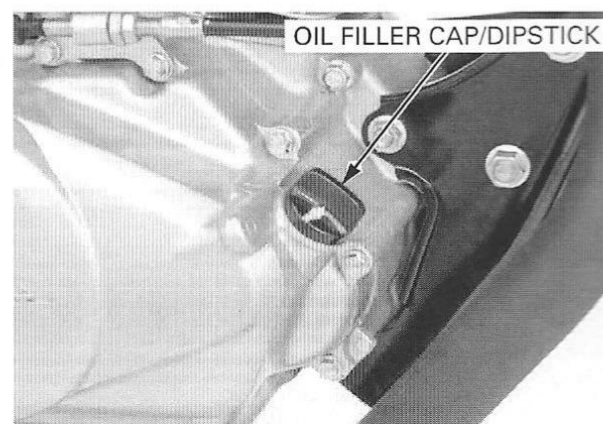


OIL CHANGE

Change the oil with the engine warm and the motorcycle placed on its center stand to assure complete and rapid draining.

Warm up the engine.

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



MAINTENANCE

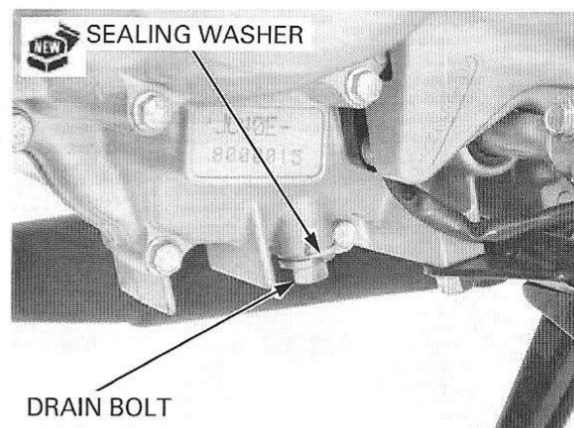
Place a clean container under the engine.

Remove the oil drain bolt and sealing washer.

Drain the engine oil completely.

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

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



Pour the recommended engine oil into the crankcase to the upper level line on the oil filler cap/dipstick.

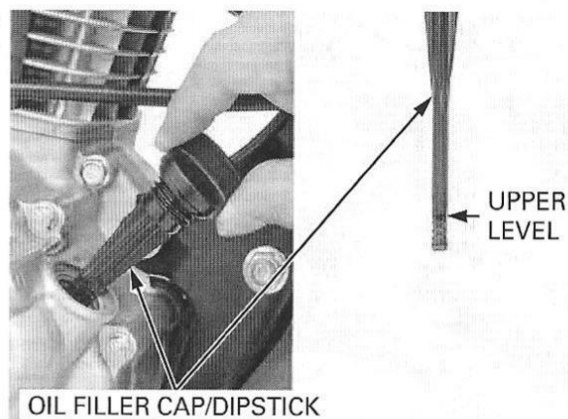
OIL CAPACITY:

0.9 liters (1.0 US qt, 0.8 Imp qt) at draining

1.1 liters (1.2 US qt, 1.0 Imp qt) at disassembly

Check the engine oil level (page 3-10).

Make sure there are no oil leaks.



ENGINE OIL STRAINER SCREEN

REMOVAL/INSTALLATION

Remove the right crankcase cover (page 9-6).

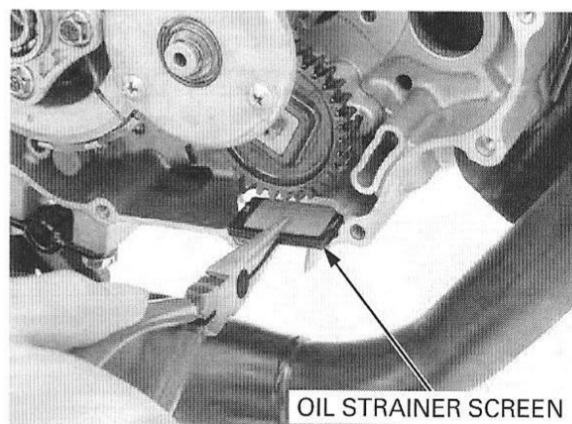
Be careful not to damage the oil strainer screen.

Pull the oil strainer screen out of the crankcase.

Wash the oil strainer screen thoroughly in nonflammable or high flash point solvent until all accumulated dirt has been removed.

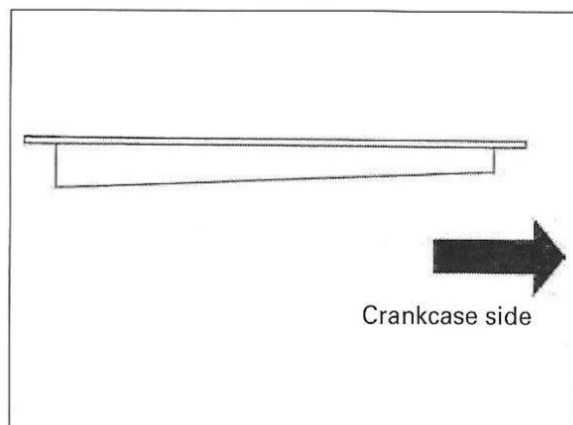
Blow and dry the oil strainer screen with compressed air to clean completely.

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



Install the oil strainer screen with the thin edge facing in and flange side facing up as shown.

Install the right crankcase cover (page 9-8).

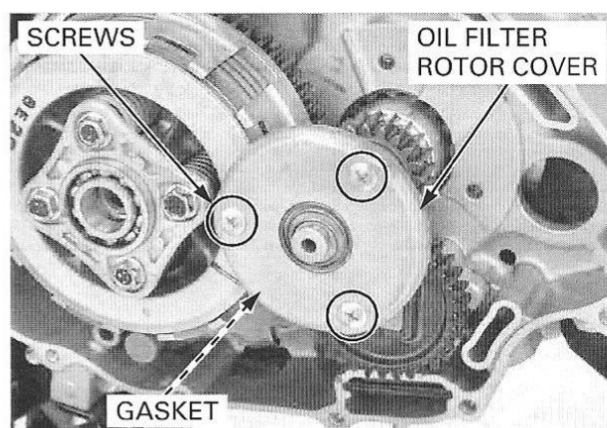


ENGINE OIL CENTRIFUGAL FILTER

CLEANING

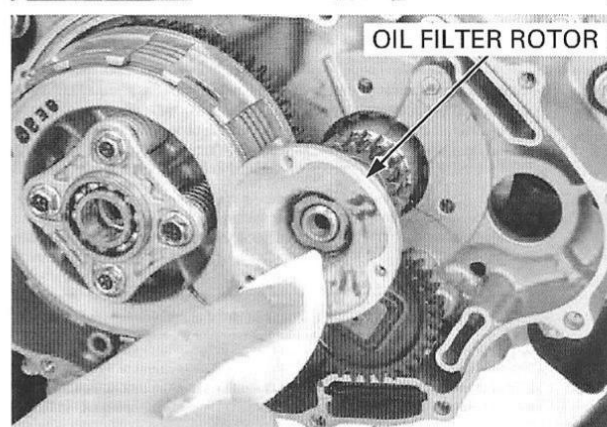
Remove the right crankcase cover (page 9-6).

Remove the screws, oil filter rotor cover and gasket.

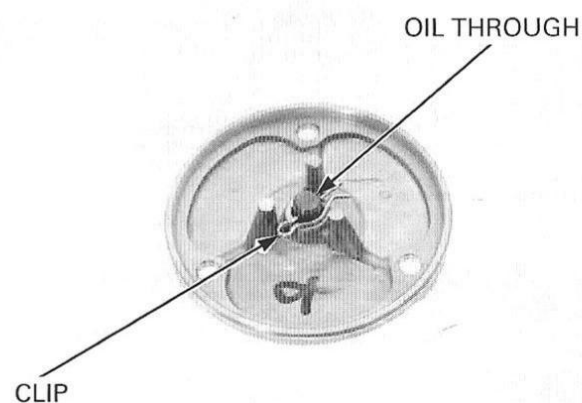


Do not allow dust and dirt to enter the oil passage in the crankshaft. Never use compressed air for cleaning.

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



While pressing the oil through from the reverse side, remove the clip.



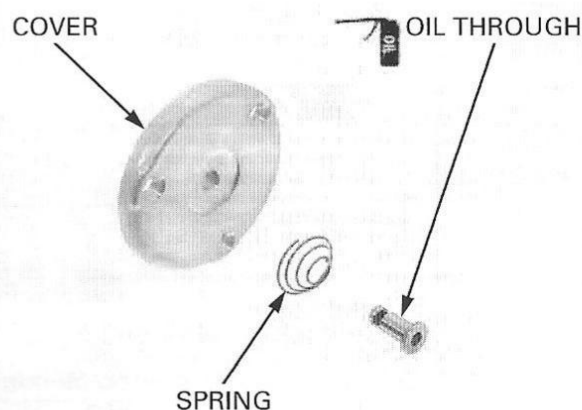
Remove the oil through and spring from the oil filter rotor cover.

Blow and clean the oil through using compressed air.

Apply engine oil to the oil through sliding surface. Install the spring and oil through to the oil filter rotor cover.

While pressing the oil through from the reverse side, install the clip.

Check the oil through operates freely without binding.

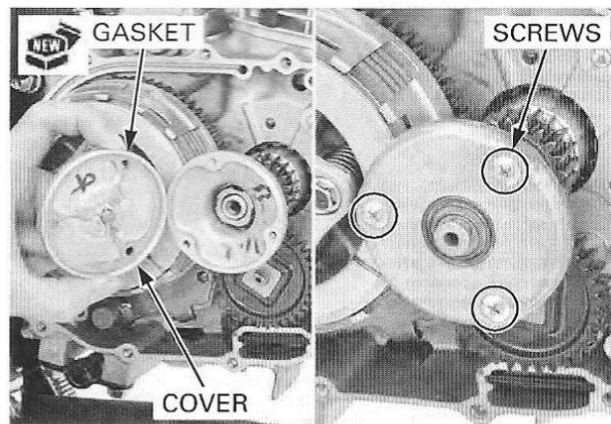


MAINTENANCE

Install a new gasket to the oil filter rotor cover, then install them to the oil filter rotor.
Install and tighten the screws to the specified torque.

TORQUE: 4 N·m (0.4 kgf·m, 3.0 lbf·ft)

Install the right crankcase cover (page 9-8).



ENGINE IDLE SPEED

NOTE:

- Inspect the idle speed after all other engine maintenance items have been performed and are within specifications.
- Before checking the idle speed, inspect the following items.
 - No DTC and MIL blinking
 - Spark plug condition (page 3-8)
 - Air cleaner element condition (page 3-6)
- The engine must be warm for accurate idle speed inspection.
- This system eliminates the need for manual idle speed adjustment compared to previous designs.
- Use a tachometer with graduations or 50 min⁻¹ (rpm) or smaller that will accurately indicate a 50 min⁻¹ (rpm) change.

Turn the ignition switch ON and start the engine, and let it idle.

Check the idle speed.

ENGINE IDLE SPEED: 1,500 ± 100 min⁻¹ (rpm)

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

- Intake air leak or engine top-end problem (page 7-5)
- Throttle operation and freeplay (page 3-5)
- IACV operation (page 5-63)

DRIVE CHAIN

DRIVE CHAIN SLACK INSPECTION

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

Turn the ignition switch OFF.

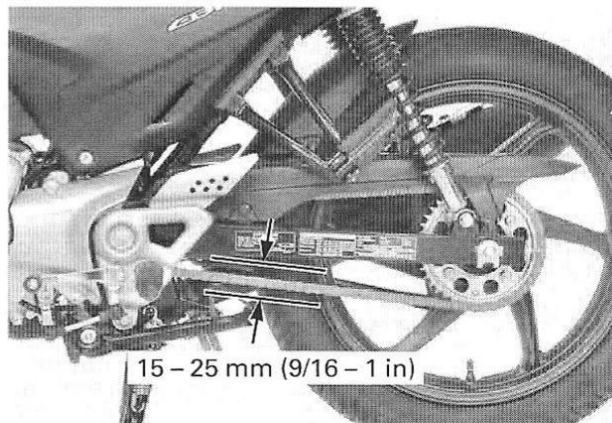
Place the motorcycle on its center stand and shift the transmission into neutral.

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

DRIVE CHAIN SLACK: 15 – 25 mm (9/16 – 1 in)

NOTICE

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



ADJUSTMENT

Loosen the rear axle nut.

Loosen the lock nuts and turn the adjusting nuts until the correct drive chain slack is obtained.

Make sure the arrow mark on both drive chain adjusters are aligned with the rear end of the axle slots in the swingarm.

Tighten the rear axle nut to the specified torque.

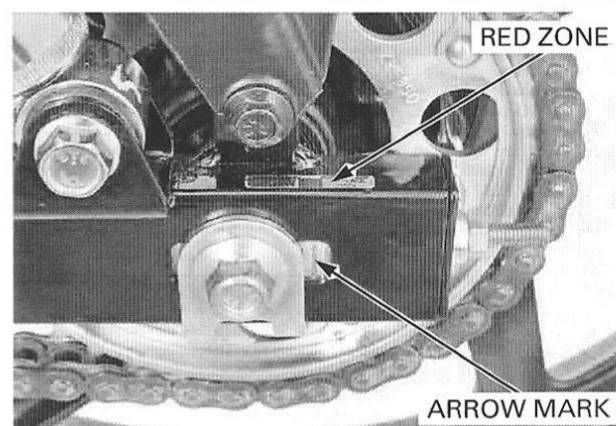
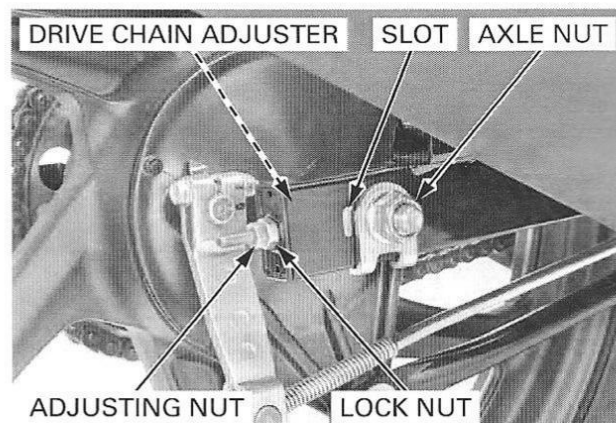
TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

Hold the adjusting nuts and tighten the lock nuts.

Recheck the drive chain slack and free wheel rotation.

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

If the arrow mark of the drive chain adjuster reaches red zone of the indicator label, replace the drive chain with a new one (page 3-17).



CLEANING AND LUBRICATION

Clean the chain with non-flammable or high flash point solvent 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 sprockets as necessary.

CLEANING:

SOFT BRUSH

SOLVENT

WIPE AND DRY:

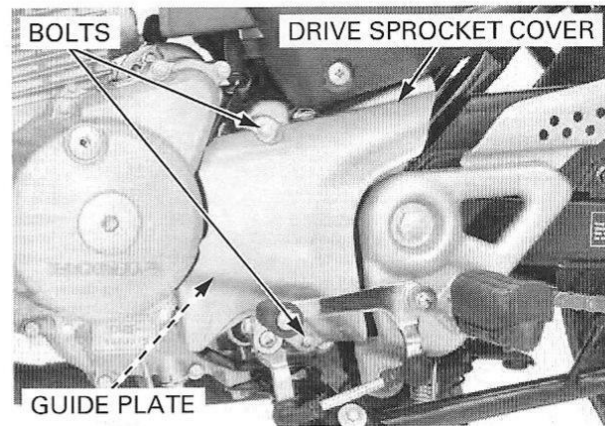
DRIVE CHAIN

DRIVE CHAIN LUBRICANT OR EQUIVALENT

Lubricate the drive chain with drive chain lubricant or equivalent designed specifically for use with O-ring chains. Wipe off the excess oil or drive chain lubricant.

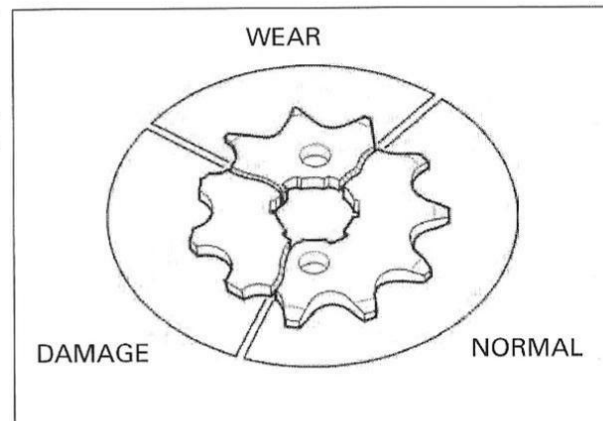
SPROCKET INSPECTION

Remove the bolts, drive sprocket cover and guide plate.



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.



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

If any are loose, torque them.

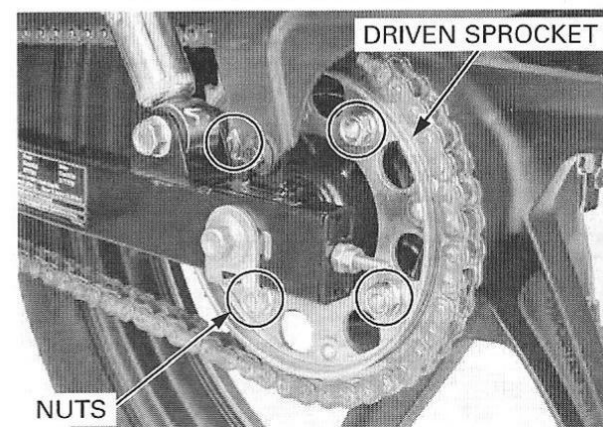
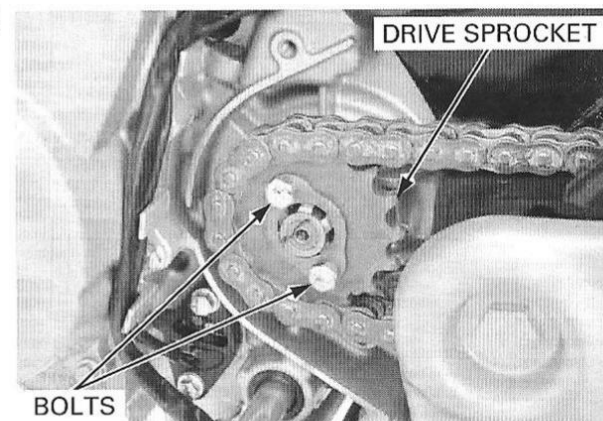
TORQUE:

Drive sprocket fixing plate bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)

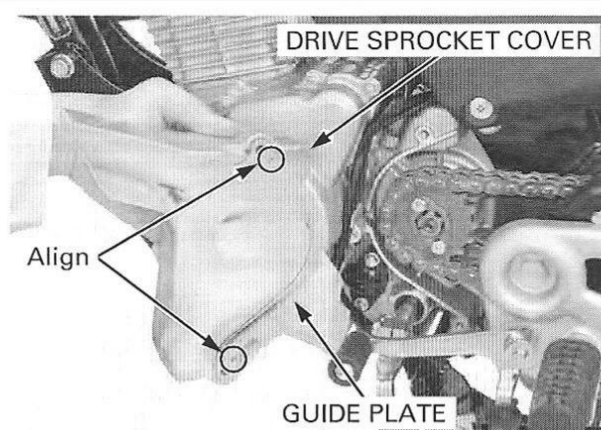
Driven sprocket nut:

32 N·m (3.3 kgf·m, 24 lbf·ft)

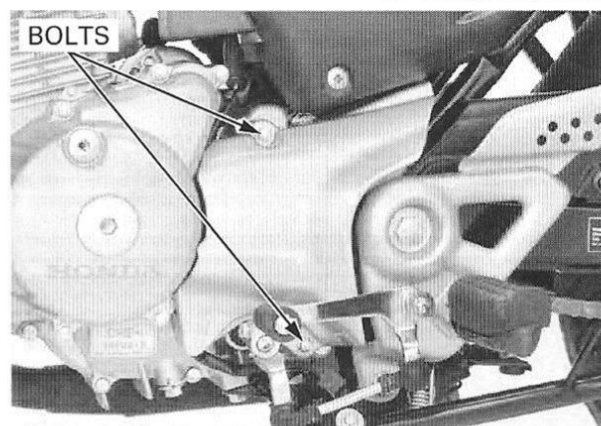


Install the guide plate by aligning its holes with the tabs of the drive sprocket cover.

Install the drive sprocket cover assembly.



Install and tighten the drive sprocket cover bolts.



REPLACEMENT

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

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

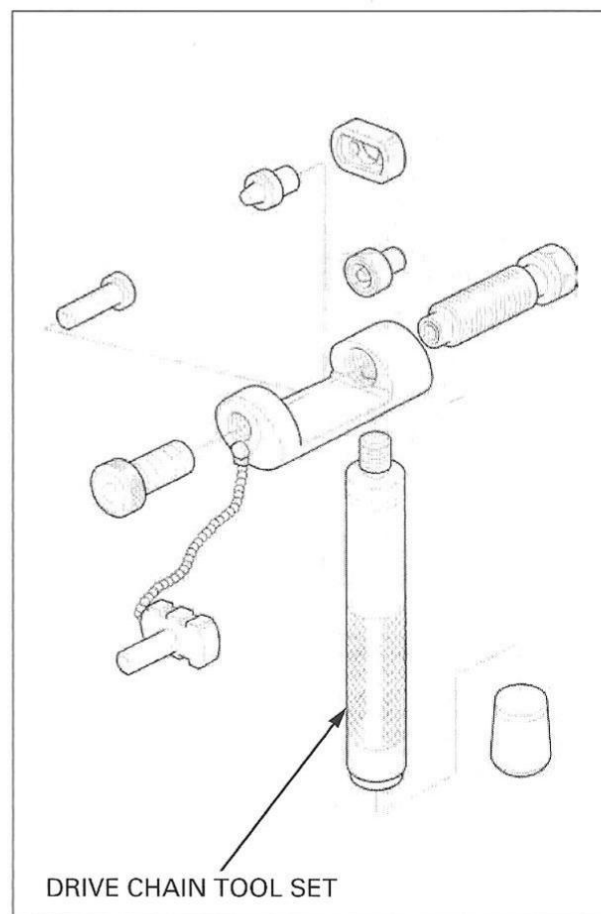
Assemble the special tool as shown.

TOOL:

Drive chain tool set

07HMH-MR10103

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



MAINTENANCE

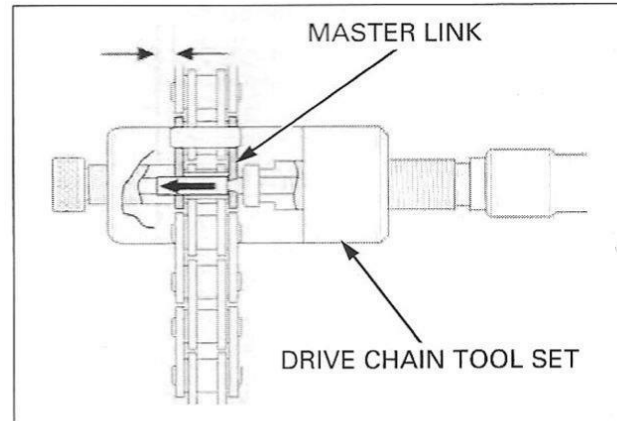
Locate the crimped pin ends of the master link from the outside of the drive chain, and remove the master link with the drive chain tool set.

TOOL:

Drive chain tool set

07HMH-MR10103

Remove the drive chain.



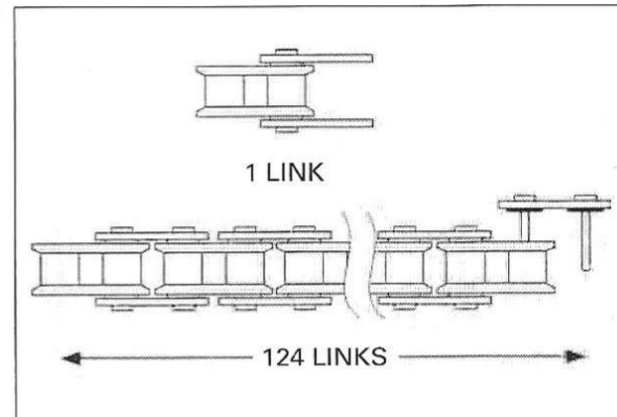
Include the master link when you count the drive chain links.

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

STANDARD LINKS: 118 LINKS

REPLACEMENT CHAIN:

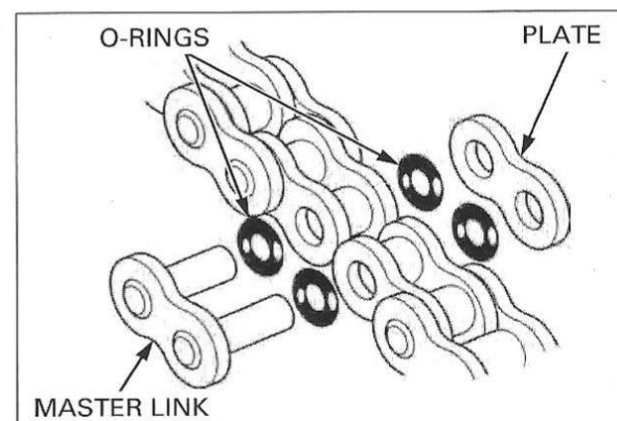
RK: RK428KRO-118LE



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

Insert the master link from the inside of the drive chain, and install the plate with the identification mark facing the outside.

Assemble the new master link, O-rings and plate.

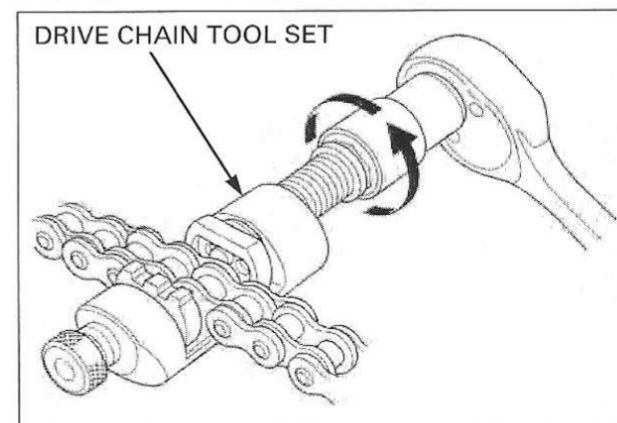


Assemble and set the drive chain tool set.

TOOL:

Drive chain tool set

07HMH-MR10103

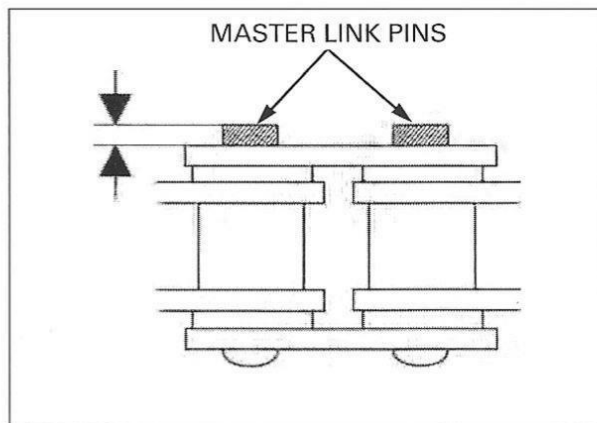


Make sure that the master link pins are installed properly.
Measure the master link pin length projected from the plate.

STANDARD LENGTH:

Approx. 1.1 mm (0.04 in)

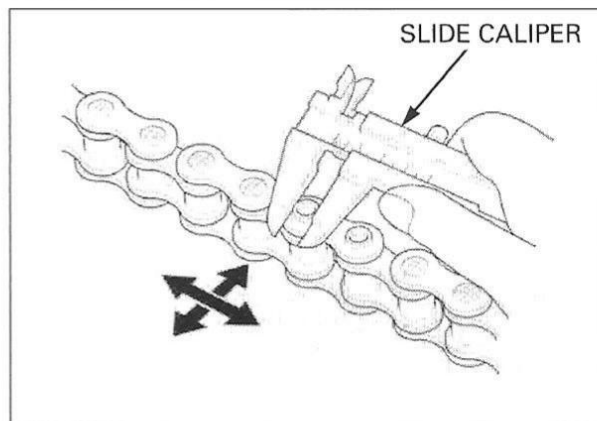
Stake the master link pins.



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

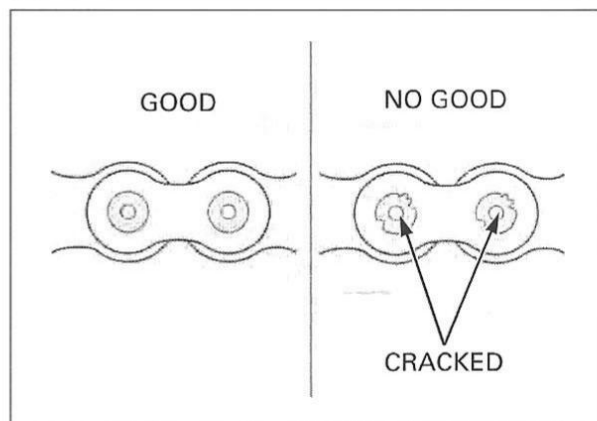
DIAMETER OF THE STAKED AREA:

4.75 – 4.95 mm (0.187 – 0.195 in)



A drive chain with a clip-type master link must not be used.

After staking, check the staked area of the master link for cracks.
If there is any cracking, replace the master link, O-rings and plate.



BRAKE FLUID

NOTICE

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

- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.

BRAKE FLUID LEVEL INSPECTION

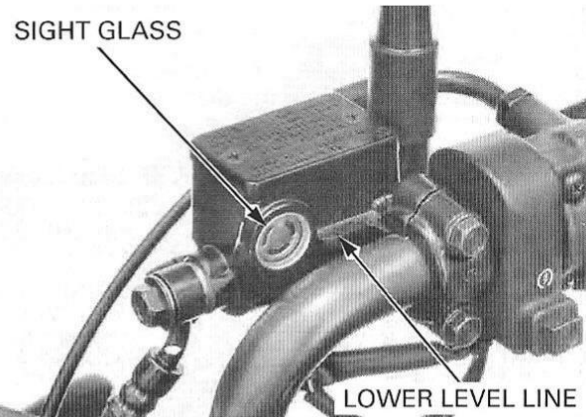
Support the motorcycle on its center stand.

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

When the fluid level is low, check the brake pads for wear (page 3-20).

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 entire system for leaks (page 3-21).

If the brake system not leaks and fluid level is low, fill the brake fluid as follows.



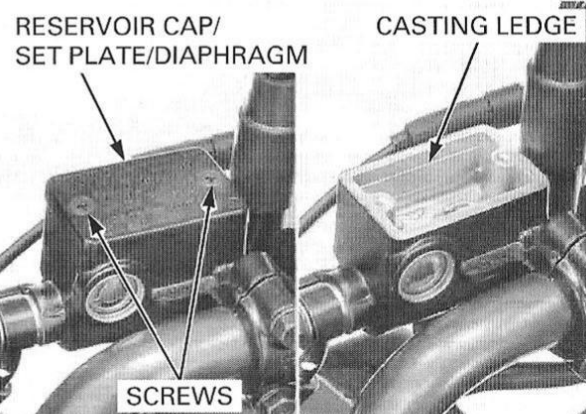
BRAKE FLUID FILLING

Remove the screws, reservoir cap, set plate and diaphragm.

Add the reservoir with DOT 3 or DOT 4 brake fluid from a sealed container to the casting ledge.

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

TORQUE: 1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)



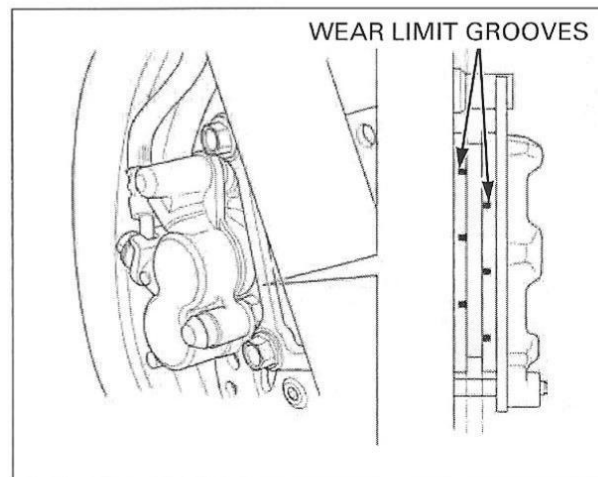
BRAKE SHOES/PADS WEAR

FRONT BRAKE PADS

Check the brake pads for wear.

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

For brake pad replacement (page 14-8).

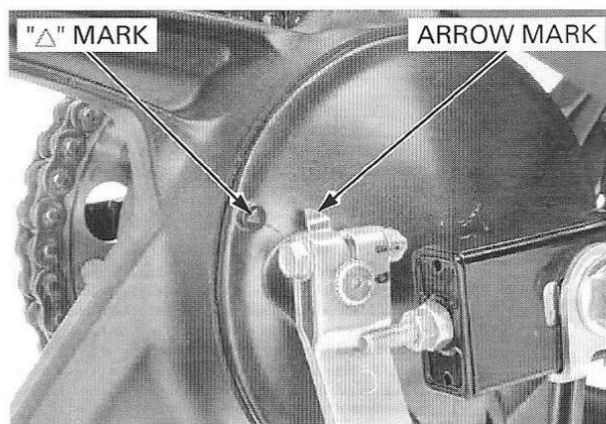


REAR BRAKE SHOES

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

If the arrow mark on the indicator plate aligns with the "△" mark on the brake panel, inspect the brake drum (page 14-22).

Replace the brake shoes (page 14-22) if the drum I.D. is within the service limit.



BRAKE SYSTEM

FRONT BRAKE

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

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

For air bleeding procedures (page 14-7).

Inspect the brake hose and fittings for deterioration, cracks, damage or signs of leakage.

Tighten any loose fittings.

Replace the hose and fittings as required.



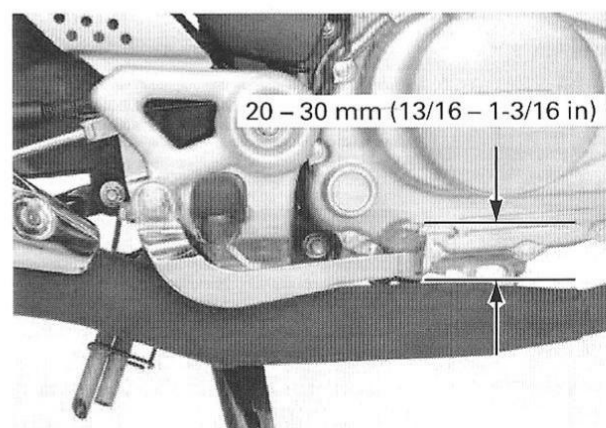
REAR BRAKE

Check the brake pedal and brake rod for loose connections, excessive play, or other damage.

Replace or repair them if necessary.

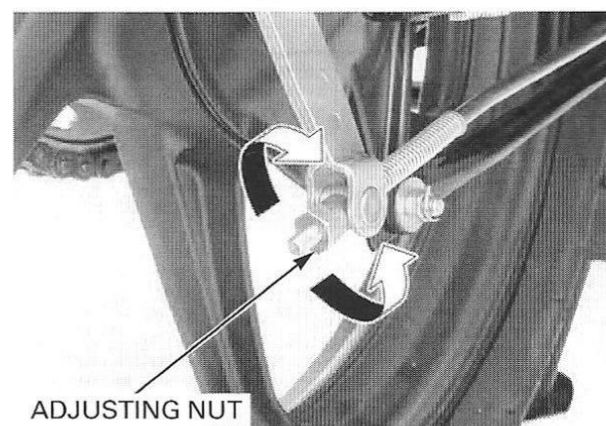
Measure the rear brake pedal freeplay.

FREEPLAY: 20 – 30 mm (13/16 – 1-3/16 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.

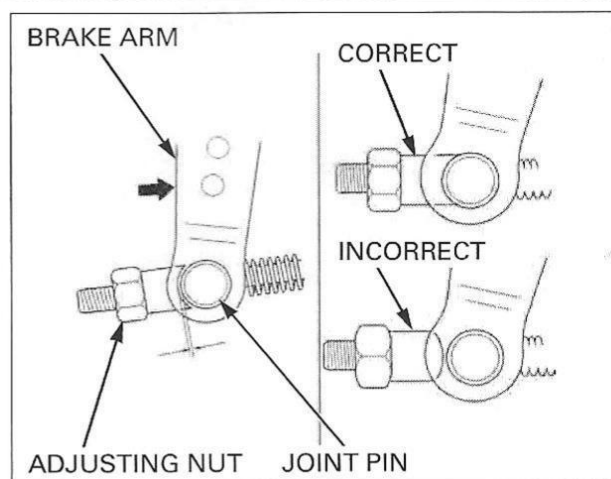


MAINTENANCE

Check the clearance of the joint pin and adjusting nut, by pushing the brake arm.
Make sure the cut-out of the adjusting nut is seated on the joint pin.

Make sure that the rear wheel rotates smoothly.

After adjusting the brake pedal freeplay, check the rear brake light switch operation (page 3-22).



BRAKE LIGHT SWITCH

NOTE:

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

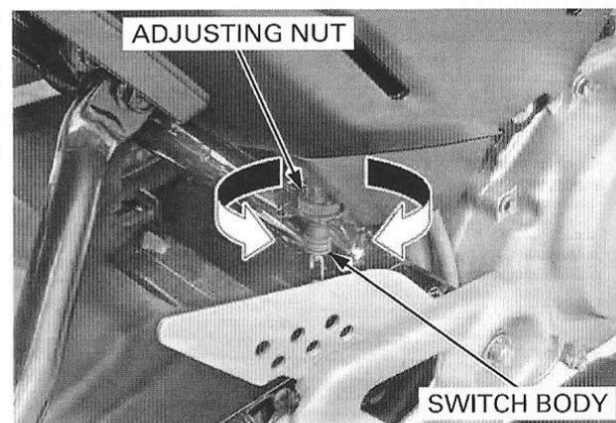
Check that the brake light comes on just prior to the brake actually being engaged.

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

Do not turn the switch body while turning the adjusting nut.

Hold the switch body and turn the adjusting nut as required.

Recheck the brake light switch operation.



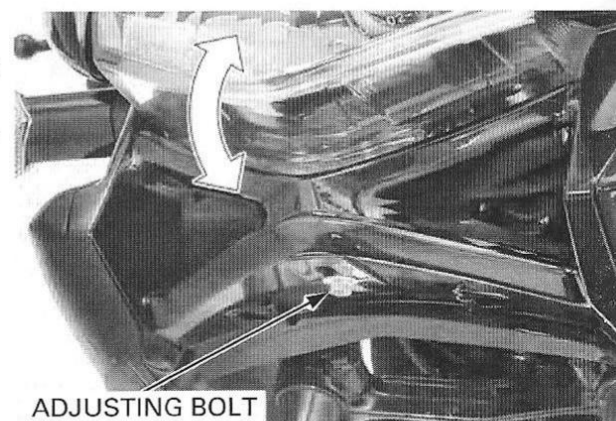
HEADLIGHT AIM

Support the motorcycle on its center stand.

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

Adjust the headlight beam vertically by loosening the headlight adjusting bolt.

After adjusting the headlight aim, tighten the headlight adjusting bolt securely.



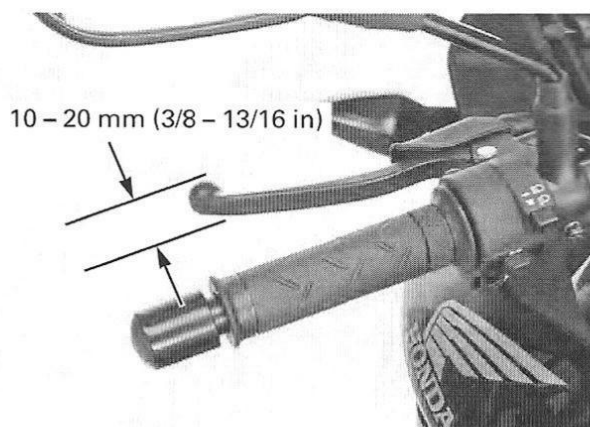
CLUTCH SYSTEM

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

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

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

FREEPLAY: 10 – 20 mm (3/8 – 13/16 in)

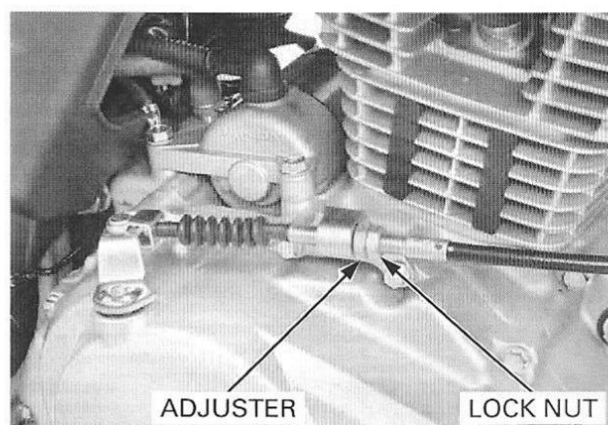


Adjustment is performed at the clutch lifter arm.

Loosen the adjuster lock nut and turn the adjuster. After adjustment is complete, tighten the adjuster lock nut while holding the adjuster.

Check the clutch operation.

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



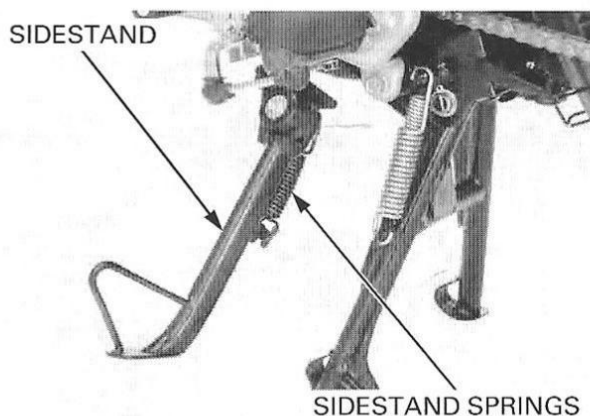
SIDESTAND

INSPECTION

Support the motorcycle on its center stand.

Check the sidestand springs for damage or loss of tension.

Check the sidestand operation for freedom of movement and lubricate the sidestand pivot if necessary. Make sure the sidestand is not bent.

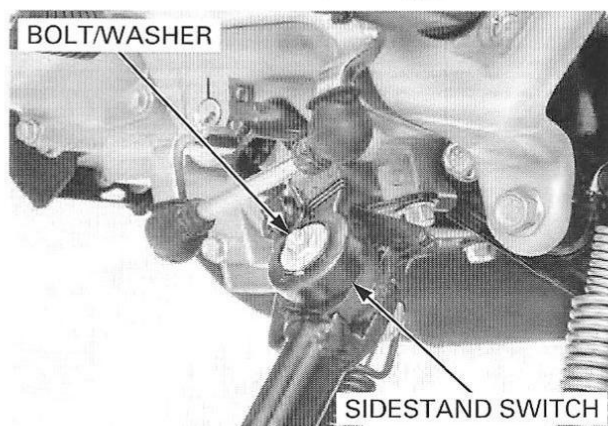


Check the sidestand ignition cut-off system:

- Sit astride the motorcycle and raise the sidestand.
- Start the engine with the transmission into neutral, then shift the transmission into gear, with the clutch lever squeezed.
- Move the sidestand full down.
- The engine should stop as the sidestand is lowered.

If there is a problem with the system, check the sidestand switch (page 18-13).

Remove the sidestand switch bolt/washer and sidestand switch.



MAINTENANCE

Check that the sidestand pivot bolt and pivot nut are tightened, and tighten them to the specified torque if loosened.

TORQUE:

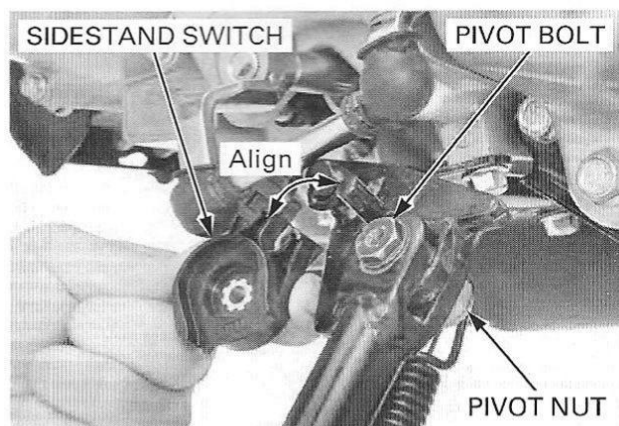
Sidestand pivot bolt: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Sidestand pivot nut: 29 N·m (3.0 kgf·m, 21 lbf·ft)

Install the sidestand switch by aligning its hole with the pin of the sidestand stay.

Apply locking agent to the threads of the sidestand switch bolt/washer.

Install the sidestand switch bolt/washer and tighten it securely.



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.

Replace the damaged components which cannot be repaired.

Tighten all nuts and bolts.

For fork service (page 12-18).



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

REAR SUSPENSION INSPECTION

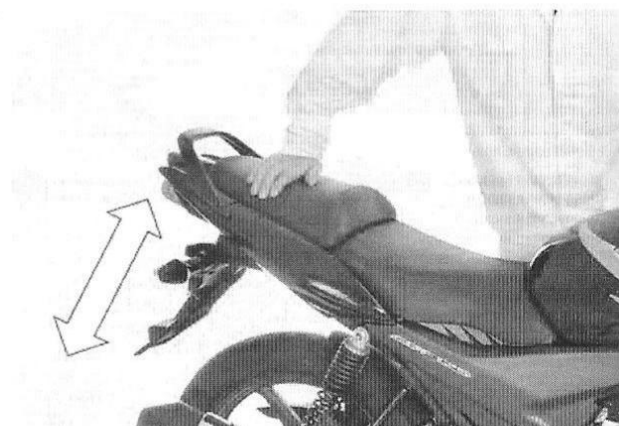
Check the action of the rear shock absorbers by compressing the rear end several times.

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

Replace the damaged components which cannot be repaired.

Tighten all nuts and bolts.

For shock absorber service (page 13-13).



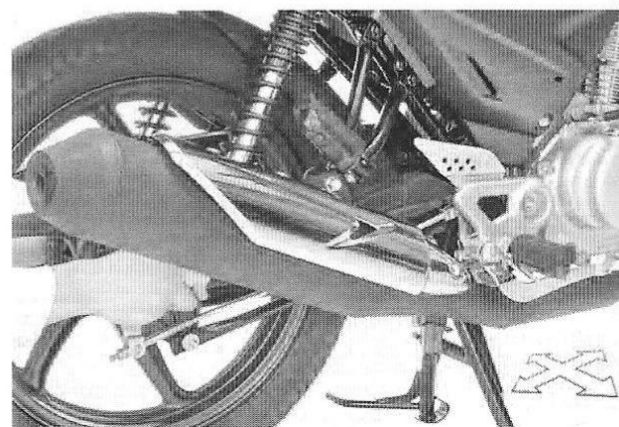
Loose, worn or damaged suspension parts impair motorcycle stability and control.

Support the motorcycle on its center stand.

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

Replace the bushing if any looseness is noted.

For swingarm service (page 13-15).



NUTS, BOLTS, FASTENERS

Check that all chassis nuts, bolts and screws are tightened to their correct torque values (page 1-11).
Check that all cotter pins, clips, hose clamps and cable stays are in place and properly secured.

WHEELS/TIRES

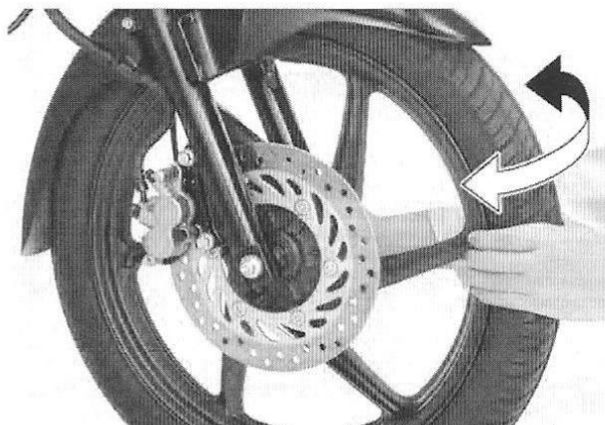
FRONT WHEEL

Support the motorcycle on its center stand and raise the front wheel off the ground.

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

Replace the bearings if any looseness is noted.

Replace the front wheel bearings if any looseness is noted (page 12-15).



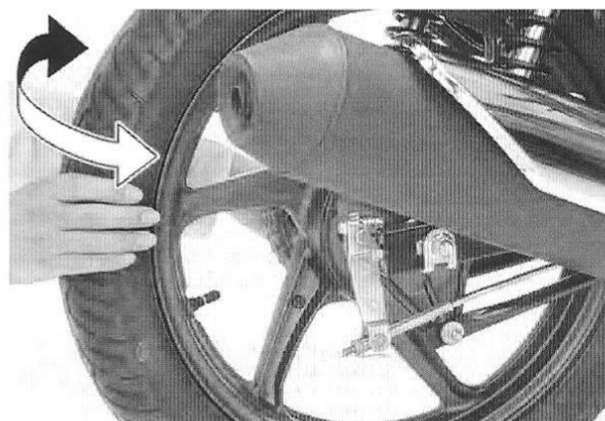
REAR WHEEL

Support the motorcycle on its center stand and raise the rear wheel off the ground.

Hold the swingarm and move the rear wheel sideways forcefully to see if the final bearing or swingarm bearing are worn.

Replace each bearing if any looseness is noted:

- Rear wheel bearings (page 13-8)
- Driven flange bearing (page 13-9)

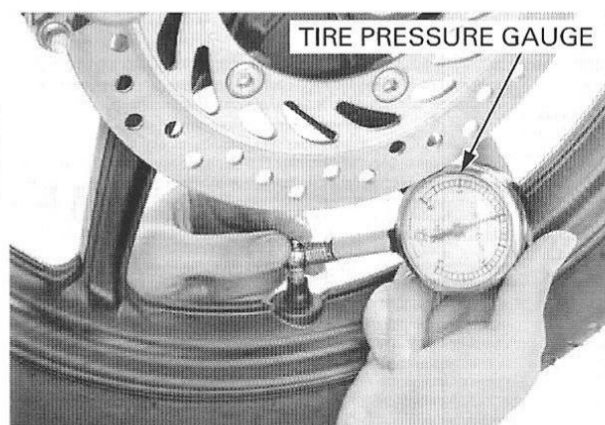


TIRES

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

RECOMMENDED TIRE PRESSURE: kPa (kgf/cm², psi)

	FRONT	REAR
Driver only	175 (1.75, 25)	200 (2.00, 29)
Driver and passenger	175 (1.75, 25)	225 (2.25, 33)



MAINTENANCE

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

Check the trueness of each wheel:

- Front wheel (page 12-14)
- Rear wheel (page 13-7)

RECOMMENDED TIRE SIZE:

Tire size	FRONT	80/100 – 17 M/C 46P
	REAR	100/90 – 17 M/C 55P

Measure the tread depth at the center of the tires. Replace the tires when the tread depth reaches the following limits.

MINIMUM TREAD DEPTH:

FRONT: 1.5 mm (0.06 in)

REAR: 2.0 mm (0.08 in)



STEERING HEAD BEARINGS

Support the motorcycle on its center stand and raise the front wheel off the ground.

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



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

If the handlebar or fork moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 12-26).



4. LUBRICATION SYSTEM

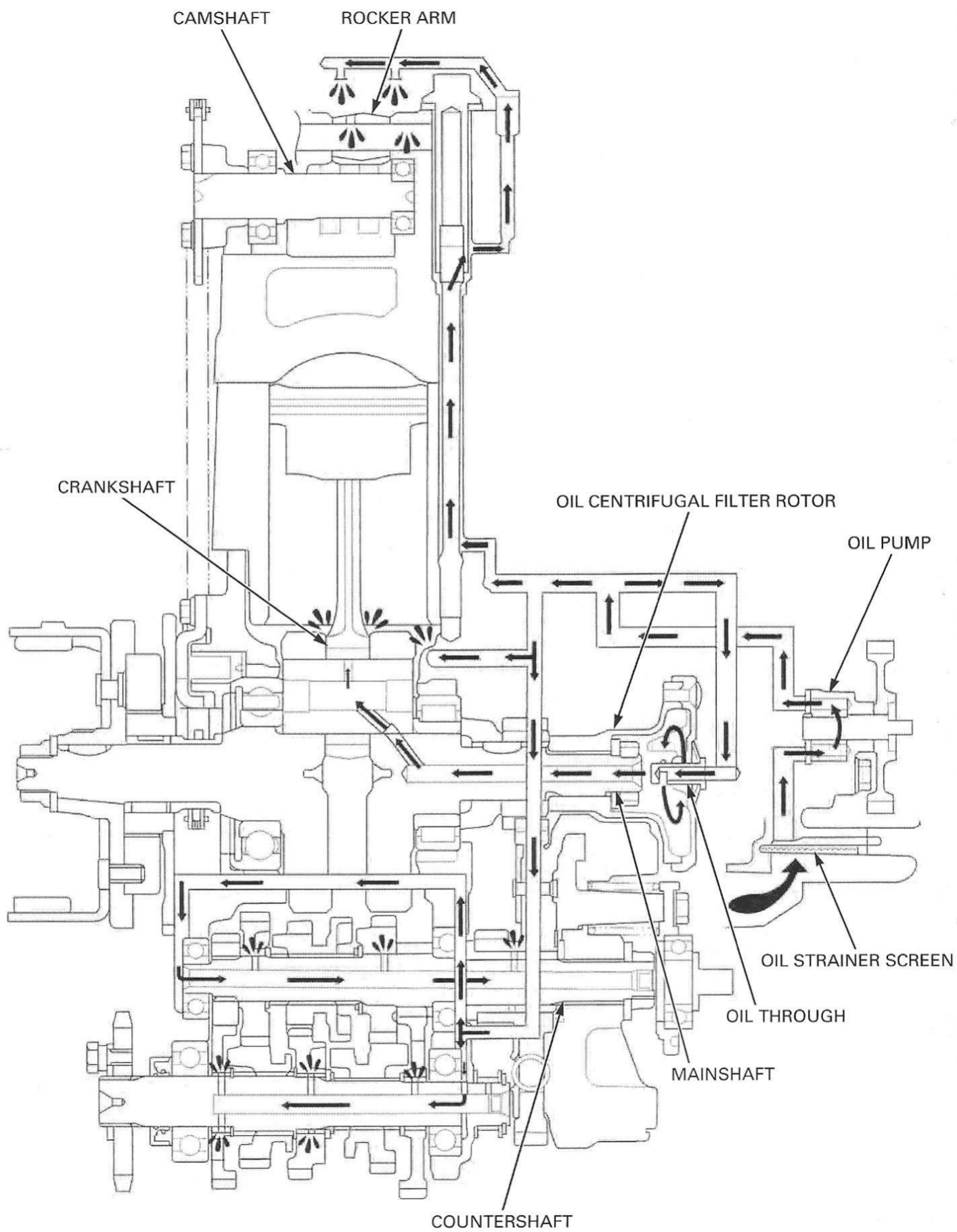
LUBRICATION SYSTEM DIAGRAM 4-2

SERVICE INFORMATION 4-3

TROUBLESHOOTING..... 4-3

OIL PUMP 4-4

LUBRICATION SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

⚠ CAUTION

Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.

- The oil pump can be serviced with the engine installed in the frame.
- The service procedures in this section must be performed with the engine oil drained.
- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the oil pump has been installed, check that there are no oil leaks.
- Refer to the following:
 - Engine oil level check (page 3-10)
 - Engine oil change (page 3-11)
 - Engine oil strainer screen cleaning (page 3-12)
 - Engine oil centrifugal filter cleaning (page 3-13)

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	0.9 liter (1.0 US qt, 0.8 Imp qt)	–
	After disassembly	1.1 liter (1.2 US qt, 1.0 Imp qt)	–
Recommended engine oil		Honda "4-stroke motorcycle oil" or an equivalent Oil recommendation: API classification: SG or higher (except oils labeled as energy conserving on the circular API service label) Viscosity: SAE 10W-30 JASO T 903 Standard: MA	–
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.21 (0.006 – 0.008)	0.25 (0.010)
	Side clearance	0.05 – 0.10 (0.002 – 0.004)	0.15 (0.006)

TORQUE VALUES

Oil pump cover screw	3.2 N·m (0.3 kgf·m, 2.4 lbf·ft)
Oil pump mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)

TROUBLESHOOTING

Engine oil level too low, high oil consumption

- Oil consumption
- External oil leaks
- Faulty valve stem seal
- Worn valve guide
- Worn piston rings or incorrect piston ring installation
- Worn cylinder
- Worn or damaged oil pump

Engine oil contamination

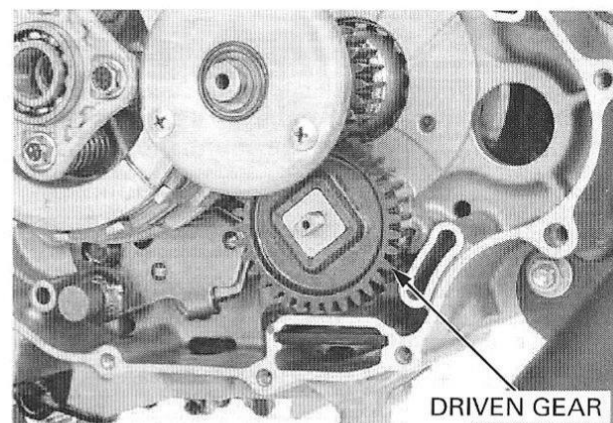
- Oil not changed often enough
- Clogged oil strainer
- Faulty cylinder head gasket
- Faulty valve stem seal
- Worn valve guide
- Worn piston rings or incorrect piston ring installation
- Worn cylinder

OIL PUMP

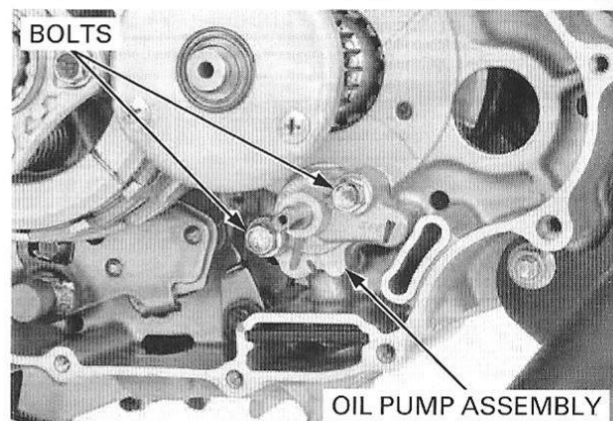
REMOVAL

Remove the right crankcase cover (page 9-6).

Remove the oil pump driven gear.

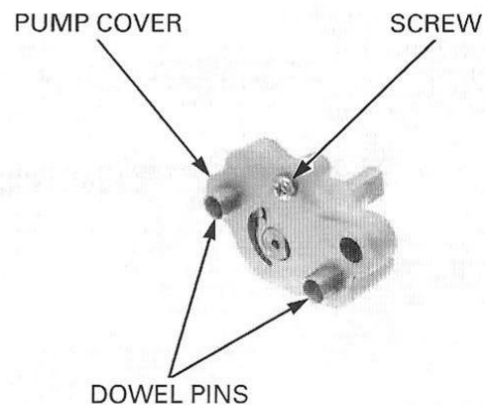


Remove the bolts and oil pump assembly.



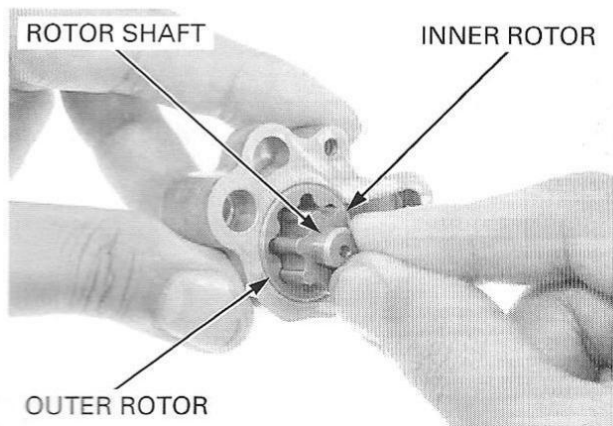
DISASSEMBLY

Remove the oil pump cover screw, dowel pins and oil pump cover.



Remove the rotor shaft, inner rotor and outer rotor from the oil pump body.

Clean all disassembled parts thoroughly.



INSPECTION

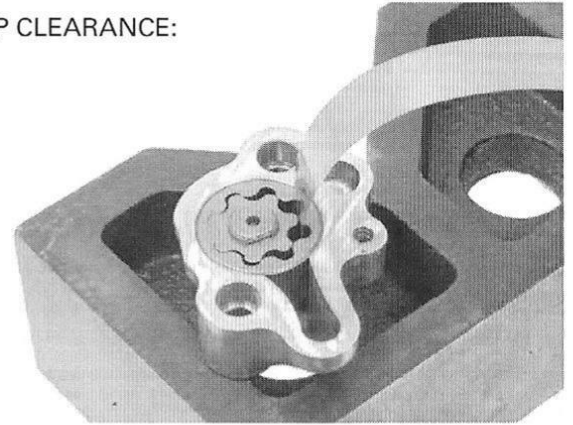
- Measure each clearance at several points and use the largest reading to compare to the service limit.
- If any portion of the oil pump is worn beyond the service limits, replace the oil pump and oil pump cover as an assembly.

Temporarily install the outer rotor, inner rotor and rotor shaft into the oil pump body.

Measure the rotor tip clearance between the inner and outer rotors.

SERVICE LIMIT: 0.20 mm (0.008 in)

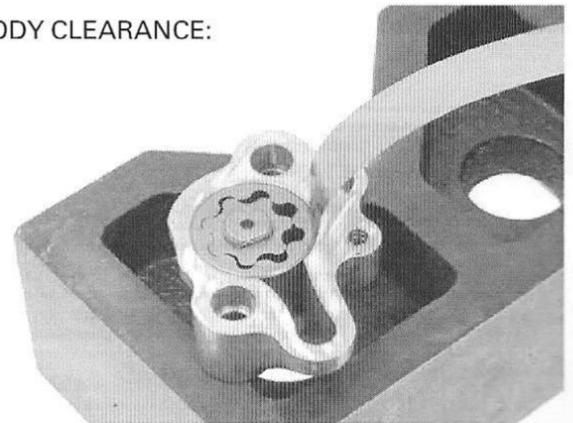
TIP CLEARANCE:



Measure the oil pump body clearance between the outer rotor and oil pump body.

SERVICE LIMIT: 0.25 mm (0.010 in)

BODY CLEARANCE:

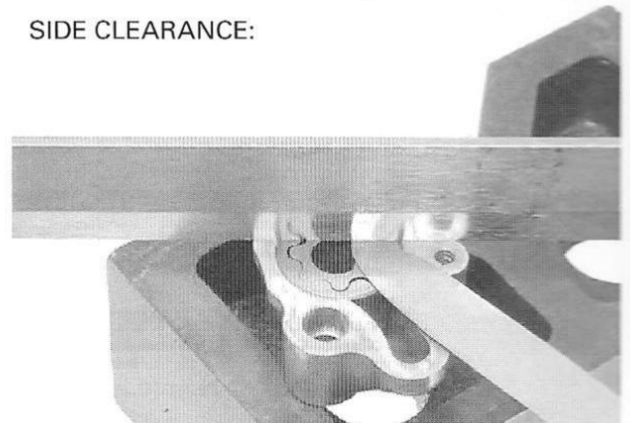


Remove the rotor shaft.

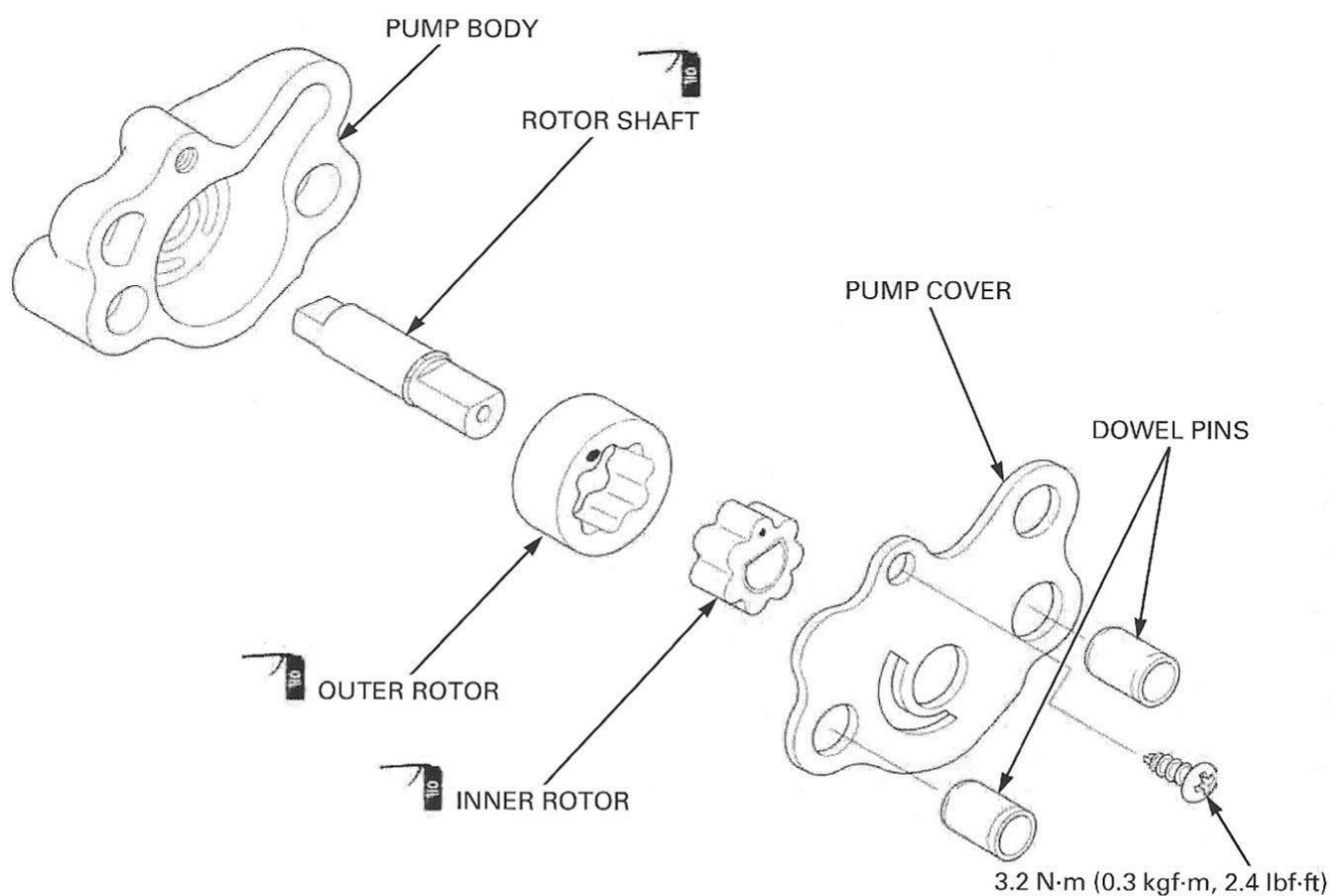
Measure the side clearance using a straight edge and feeler gauge.

SERVICE LIMIT: 0.15 mm (0.006 in)

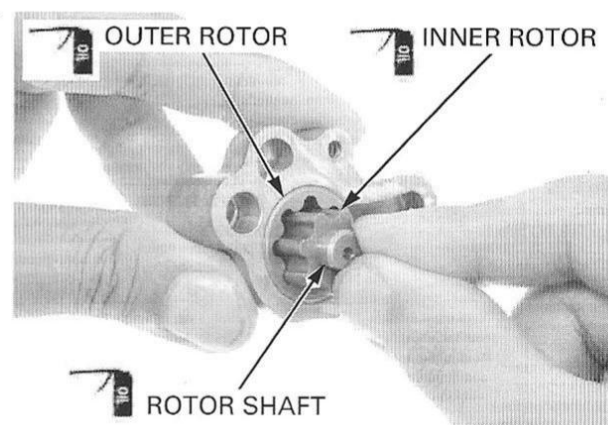
SIDE CLEARANCE:



ASSEMBLY



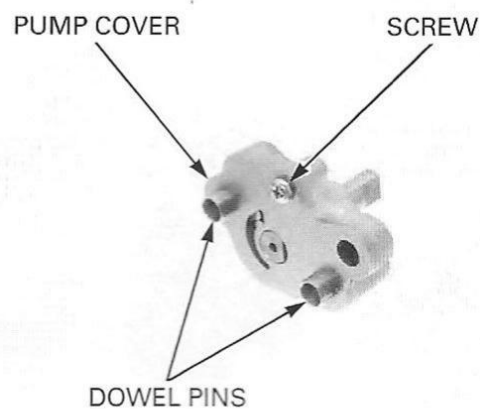
Apply engine oil to the inner, outer rotors and rotor shaft, then install them into the oil pump body.



Install the oil pump cover, dowel pins and oil pump cover screw.

Tighten the oil pump cover screw to the specified torque.

TORQUE: 3.2 N·m (0.3 kgf·m, 2.4 lbf·ft)



INSTALLATION

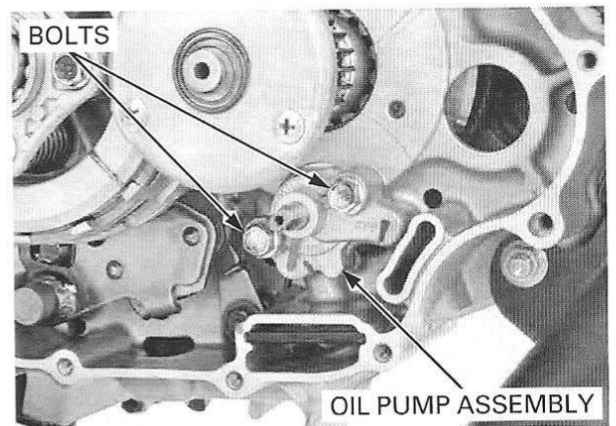
- When installing the oil pump assembly, do not allow dust or dirt to enter the engine.

Install the oil pump assembly onto the right crankcase by aligning the dowel pins with the bolt holes.

Install and tighten the bolts to the specified torque.

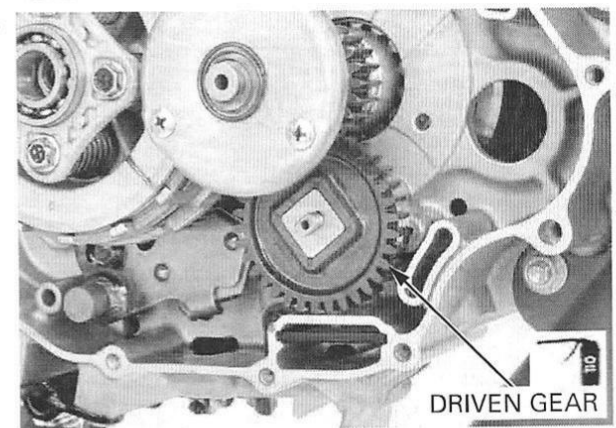
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Check that the oil pump shaft turns smoothly on the oil pump body.



Apply engine oil to the oil pump driven gear teeth, and install it.

Install the right crankcase cover (page 9-8).



5. FUEL SYSTEM (PGM-FI)

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PGM-FI SYMPTOM TROUBLESHOOTING	5-5	SUB FUEL TANK/FUEL PUMP	5-51
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PGM-FI CONNECTOR LOCATIONS	5-8	THROTTLE BODY	5-56
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DTC INDEX	5-14	IACV	5-63
SENSOR UNIT POWER LINE INSPECTION	5-15	EOT SENSOR	5-64
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MIL TROUBLESHOOTING	5-33	ECM	5-67
		O ₂ SENSOR	5-69



SERVICE INFORMATION

GENERAL

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- Before disconnecting the fuel feed hose, relieve fuel pressure from the system (page 5-46).
- Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.
- Do not snap the throttle valve from fully opened to fully closed after the throttle cable has been removed. It may cause incorrect idle operation.
- Seal the cylinder head intake port with tape or a clean cloth to keep dirt and debris from entering the engine after the throttle body has been removed.
- Do not damage the throttle body. It may cause incorrect throttle valve operation.
- Prevent dirt and debris from entering the throttle bore and air passages after the throttle body has been removed. Clean them using a compressed air if necessary.
- Do not loosen or tighten the white painted nut and screw of the throttle body. Loosening or tightening them can cause throttle valve and idle control failure.
- For fuel level sensor inspection (page 18-18).
- The following color codes are used throughout this section.

Bu = Blue
Bl = Black
P = Pink

Y = Yellow
G = Green

Lg = Light green
O = Orange

R = Red
W = White

Br = Brown
Gr = Gray

SPECIFICATIONS

ITEM	SPECIFICATION
Throttle body identification number	GQM6A
Idle speed	$1,500 \pm 100 \text{ min}^{-1}$ (rpm)
Throttle grip freeplay	2 – 6 mm (1/16 – 1/4 in)
Fuel pressure at idle	$294 \pm 6 \text{ kPa}$ ($3 \pm 0.1 \text{ kgf/cm}^2$, $43 \pm 0.9 \text{ psi}$)
Fuel pump flow (at 12 V)	27.7 cm^3 (0.94 US oz, 0.98 Imp oz) minimum/10 seconds

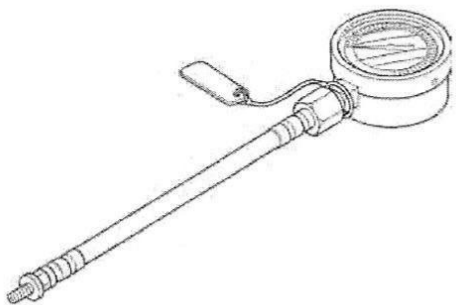
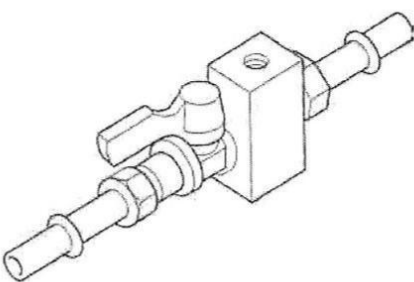
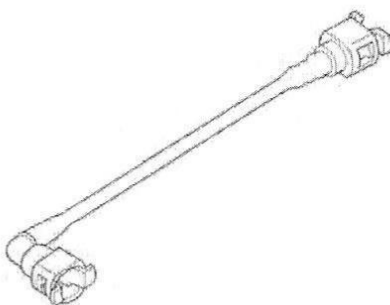
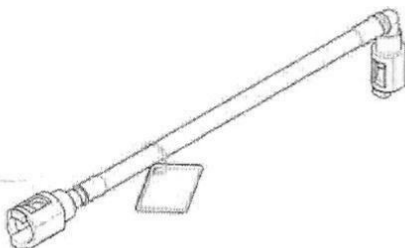
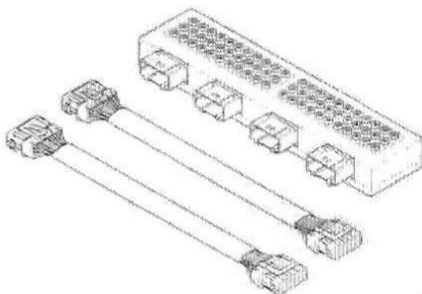
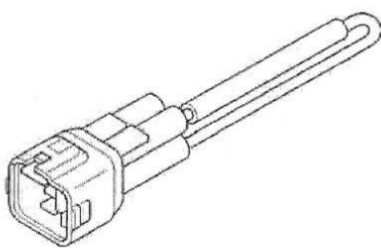
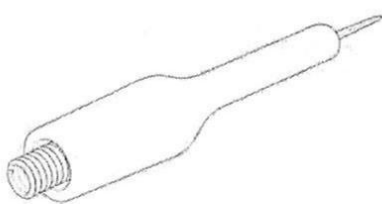
TORQUE VALUES

EOT sensor	14 N·m (1.4 kgf·m, 10 lbf·ft)
Injector joint mounting bolt	5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)
O ₂ sensor	25 N·m (2.5 kgf·m, 18 lbf·ft)
Sensor unit torx screw	3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)
IACV setting plate torx screw	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
Throttle cable stay screw	3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)
Insulator band screw	1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)
Air cleaner housing cover screw	1.1 N·m (0.11 kgf·m, 0.8 lbf·ft)

See page 5-58

FUEL SYSTEM (PGM-FI)

TOOLS

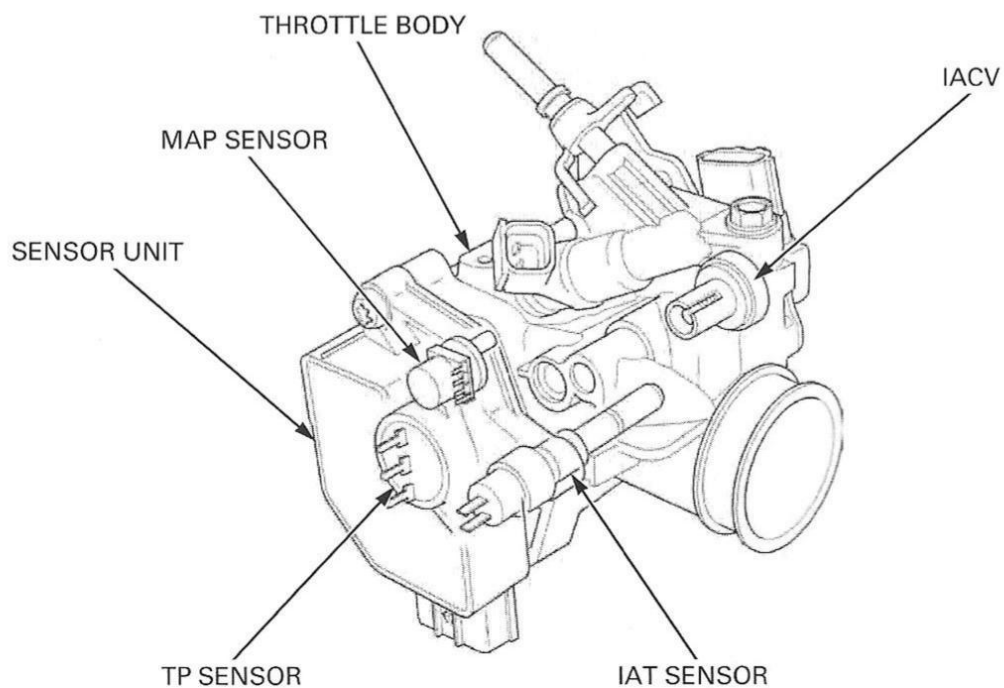
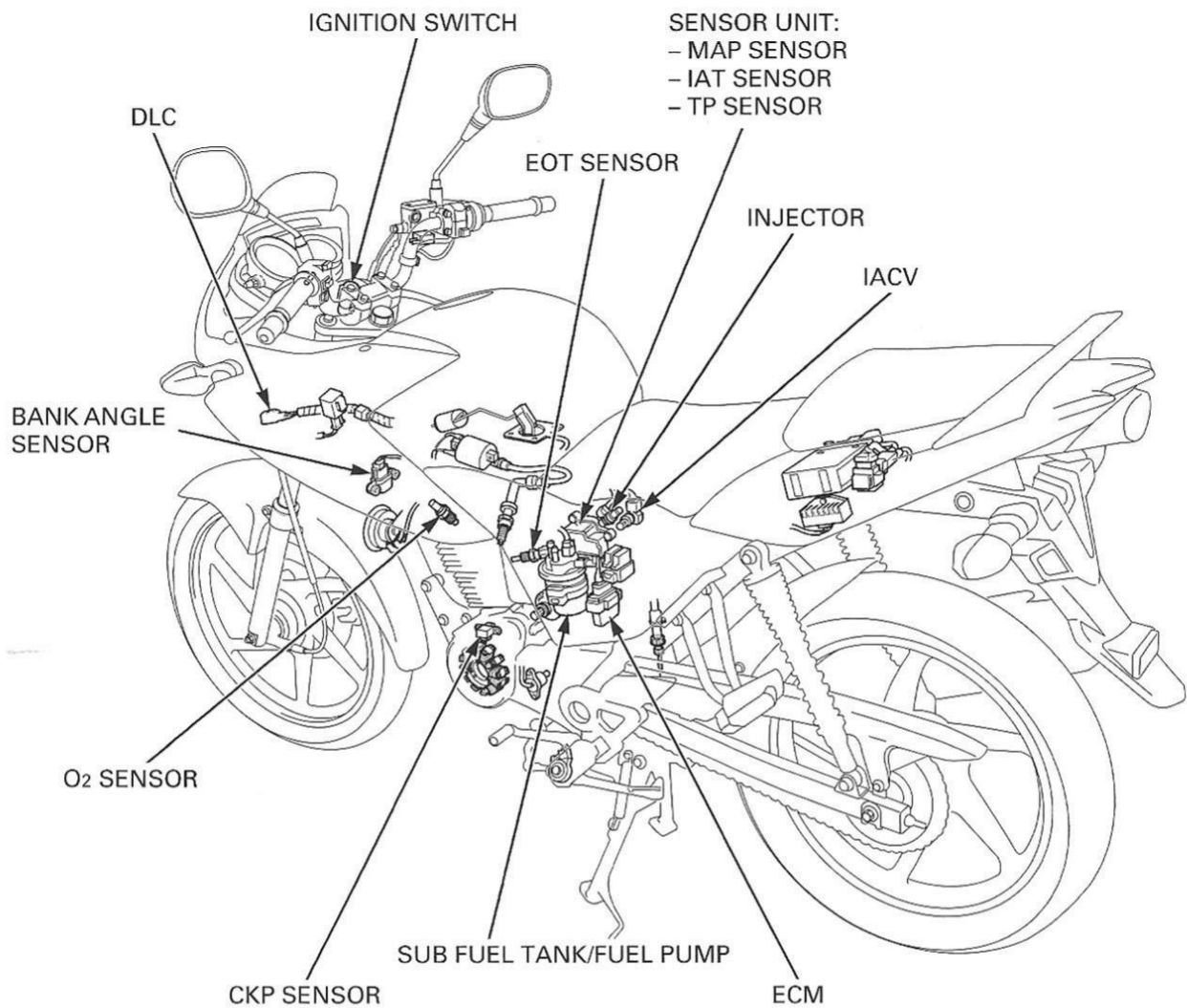
Fuel pressure gauge 07406-0040004 	Pressure gauge manifold 07ZAJ-S5A0111 	Hose attachment, 9 mm/9 mm 07ZAJ-S5A0120 
Hose attachment, 6 mm/9 mm 07ZAJ-S5A0130 	Attachment joint, 6 mm/9 mm 07ZAJ-S5A0150 	ECM test harness 33P 070MZ-MCA0100 
SCS connector 070PZ-ZY30100 	Test probe 07ZAJ-RDJA110 	

PGM-FI SYMPTOM TROUBLESHOOTING

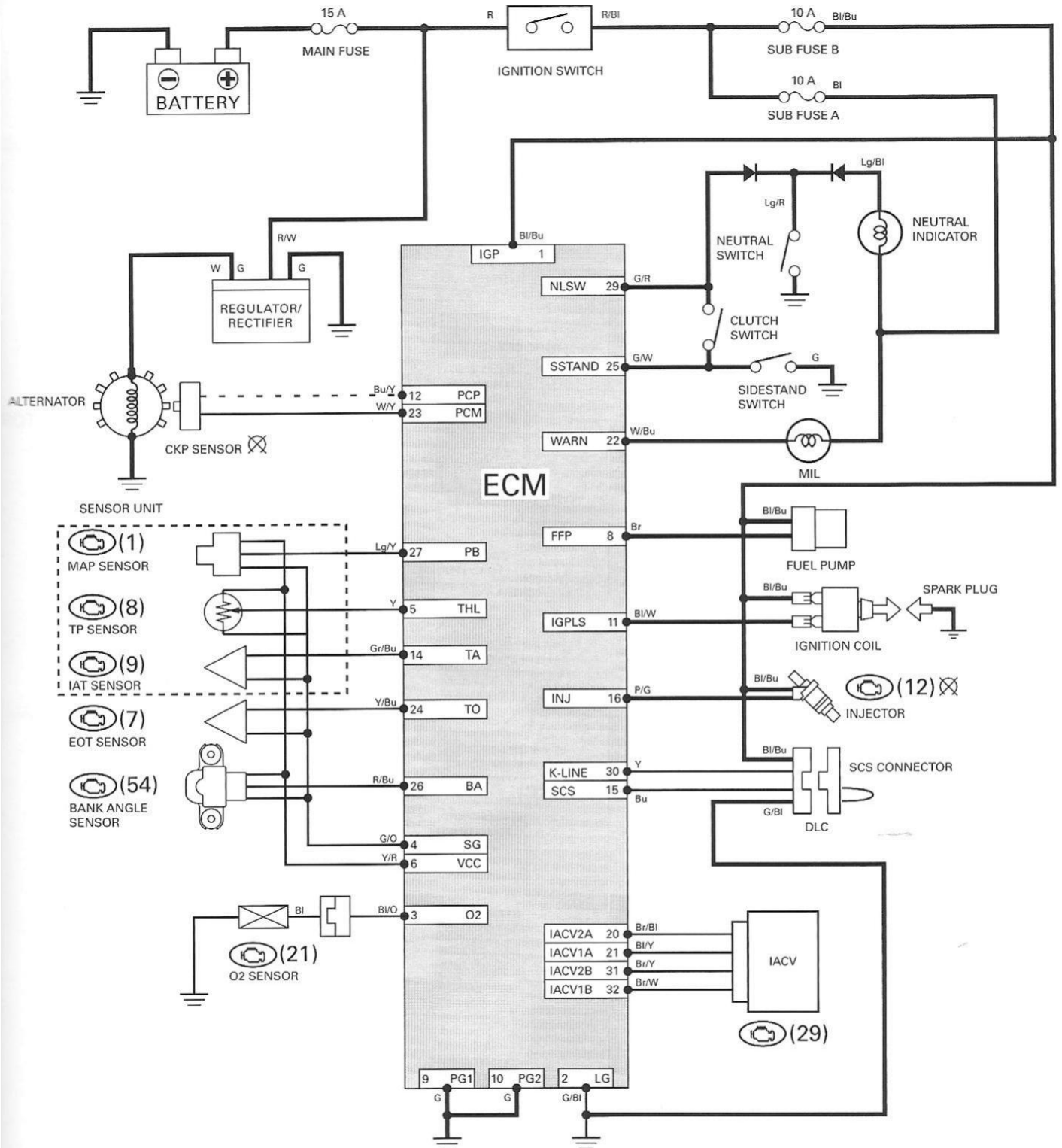
When the motorcycle has one of these symptoms, check the DTC or MIL blinking, refer to the DTC index (page 5-14) and begin the appropriate troubleshooting procedure. If there are no DTC/MIL blinking stored in the ECM memory, do the diagnostic procedure for the symptom, in sequence listed below, until you find a cause.

Symptom	Diagnosis procedure	Also check for
Engine cranks but won't start (No DTC and MIL blinking)	1. Inspect the fuel supply system (page 5-46). 2. Inspect the IACV (page 5-63). 3. Inspect the ignition system (page 18-9).	• No fuel to injector – Clogged fuel filter – Pinched or clogged fuel feed hose – Faulty fuel pump – Faulty fuel pump circuits • Intake air leak • Contaminated/deteriorated fuel • Faulty fuel injector
Engine cranks but won't start (No fuel pump operation sound when the turning the ignition ON)	1. ECM power/ground circuits malfunction (page 5-67). 2. Inspect the fuel supply system (page 5-46).	• Open circuit in the power input and/or ground wire of the ECM • Blown main fuse (15 A) • Blown sub fuse B (10 A)
Engine stalls, hard to start, rough idling	1. Check the idle speed. 2. Check the IACV. 3. Inspect the fuel supply system (page 5-46). 4. Inspect the battery charging system (page 15-8). 5. Inspect the ignition system (page 18-9).	• Restricted fuel feed hose • Contaminated/deteriorated fuel • Intake air leak • Restricted fuel tank breather hose • Faulty ignition system
Afterburn when engine braking is used	1. Inspect the ignition system (page 18-9). 2. Inspect the IACV (page 5-63).	
Backfiring or misfiring during acceleration	Inspect the ignition system (page 18-9).	
Poor performance (driveability) and poor fuel economy	1. Inspect the fuel supply system. 2. Inspect the air cleaner element (page 3-6). 3. Inspect the ignition system (page 18-9).	• Pinched or clogged fuel feed hose • Faulty pressure regulator (fuel pump) • Faulty injector • Clogged air cleaner element
Idle speed is below specifications or fast idle too low (No DTC and MIL blinking)	1. Inspect the idle speed (page 3-14). 2. Inspect the IACV (page 5-63). 3. Inspect the fuel supply system (page 5-46). 4. Inspect the ignition system (page 18-9).	
Idle speed is above specifications or fast idle too high (No DTC and MIL blinking)	1. Inspect the idle speed (page 3-14). 2. Inspect the throttle operation and freeplay. 3. Inspect the IACV (page 5-63).	• Intake air leak • Engine top-end problem • Air cleaner element condition
MIL never comes ON at all	1. Check the MIL bulb (page 18-7). 2. Inspect the MIL circuit (page 5-44).	
MIL stays ON at all (No DTC set)	Inspect the MIL/DLC circuits (page 5-45).	

PGM-FI SYSTEM LOCATION



PGM-FI SYSTEM DIAGRAM

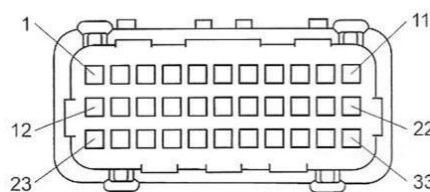


ECM 33P (BLACK) CONNECTOR

() = DTC/MIL number

⊗ = Engine does not start when detecting DTC/MIL

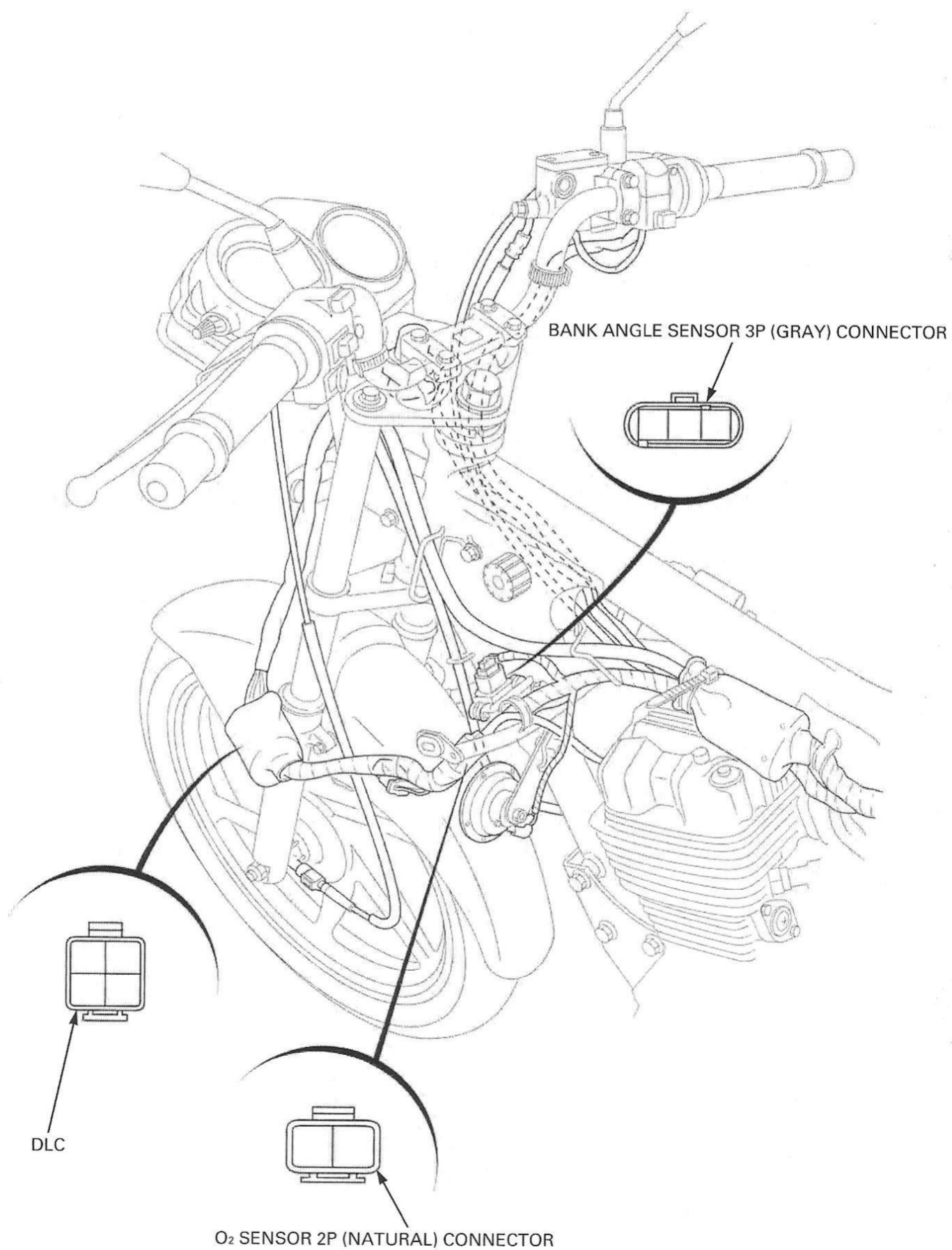
⏏ = Short terminals for reading DTC/MIL



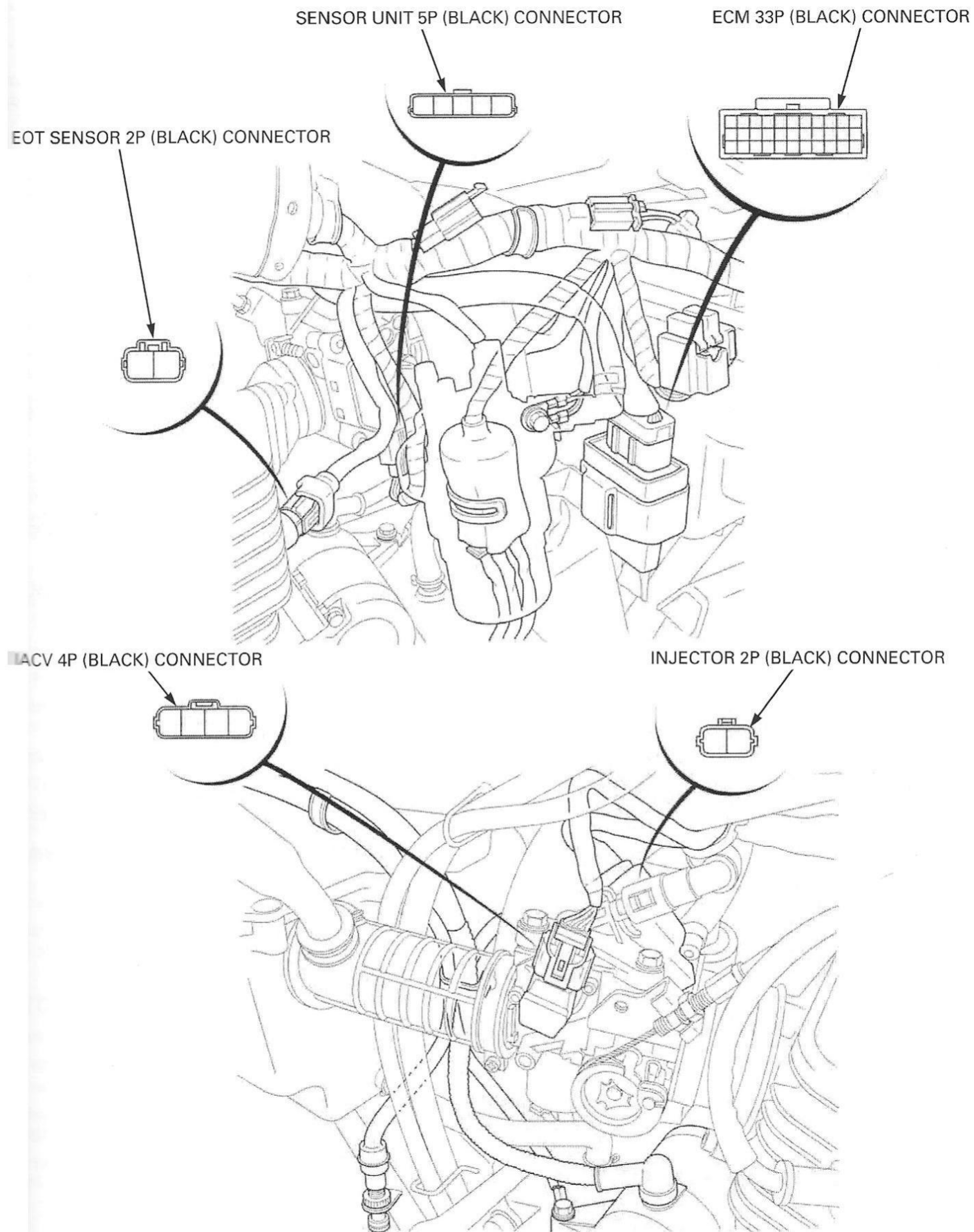
(ECM side/male terminals)

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

PGM-FI CONNECTOR LOCATIONS



NOTE 1: Remove the left side cover (page 2-10).



PGM-FI TROUBLESHOOTING INFORMATION

GENERAL TROUBLESHOOTING

Intermittent Failure

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

Opens and Shorts

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

If the MIL has come on

Refer to DTC READOUT (page 5-11).

If the MIL did not stay on

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

SYSTEM DESCRIPTION

SELF-DIAGNOSIS SYSTEM

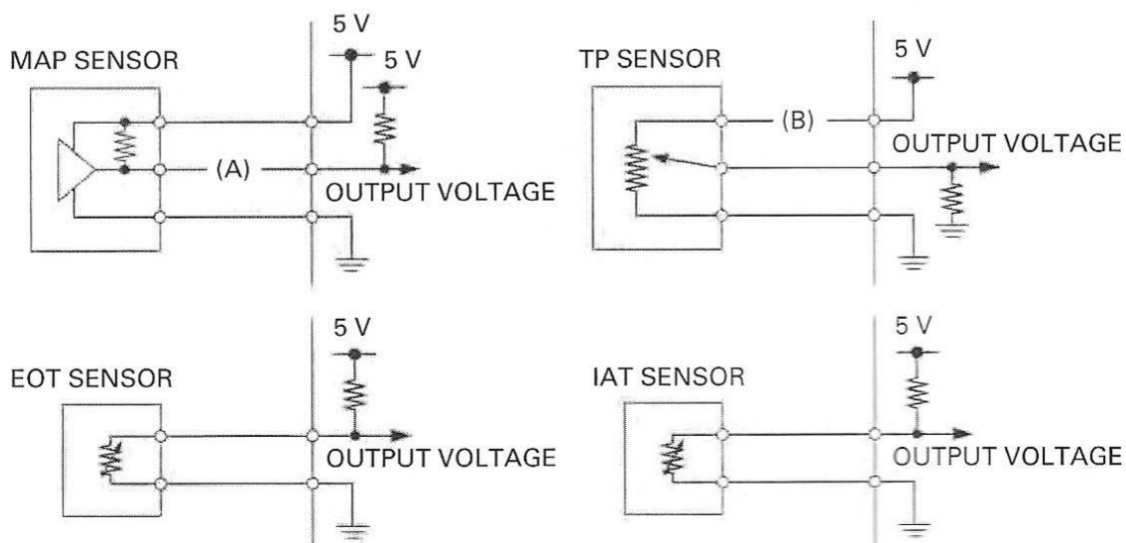
The PGM-FI system is equipped with the self-diagnostic system. When any abnormality occurs in the system, the ECM turns on the MIL and stores a DTC in its erasable memory.

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 values in the simulated program map. When any abnormality is detected in the injector, the fail-safe function stops the engine to protect it from damage.

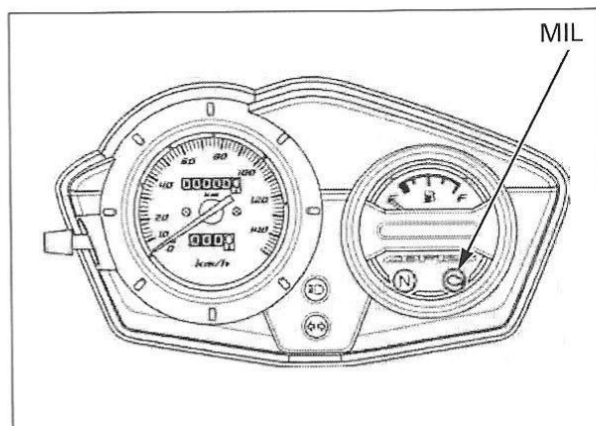
DTC

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



MIL Blink Pattern

- If the HDS pocket tester is not available, DTC can be read from the ECM memory by the MIL blink pattern.
- The number of MIL blinks is equivalent to the main code of the DTC (the sub code cannot be displayed by the MIL).
- The MIL will blink the current DTC, in case the ECM detects the problem at present, when the ignition switch ON or idling with the sidestand down. The MIL will stay ON when the engine speed is over 5,000 min⁻¹ (rpm) or with the sidestand up.
- 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 nine short blinks, the MIL is 29 (two long blinks = 20 blinks, plus nine short blinks).
- When the ECM stores more than one DTC, the MIL will indicate them by blinking in the order from the lowest number to highest number.



MIL Check

When the ignition switch is turned ON, the MIL will stay on for a few seconds, then go off. If the MIL does not come on, troubleshoot the MIL circuit (page 5-44).

CURRENT DTC/STORED DTC

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

- In the case that the ECM detects an active problem, the MIL will come on and will start to blink the DTC when the side-stand is lowered.
- In the case that the ECM does not detect an active problem but has recorded a previous problem in its memory, the MIL will not come on. If it is necessary to retrieve any past problems stored in the memory, readout the stored DTC by following the DTC readout procedure (page 5-11).

HDS POCKET TESTER INFORMATION

- The HDS pocket tester can readout the DTC, stored data, current data and other ECM condition.

How to connect the HDS pocket tester

Turn the ignition switch OFF.

Remove the dummy connector from the DLC.

Connect the HDS pocket tester to the DLC.

Turn the ignition switch ON and check the DTC and stored data.

NOTE:

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

ECM reset

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

After the ECM reset, perform the TP sensor reset procedure from ECM initialization (page 5-60).



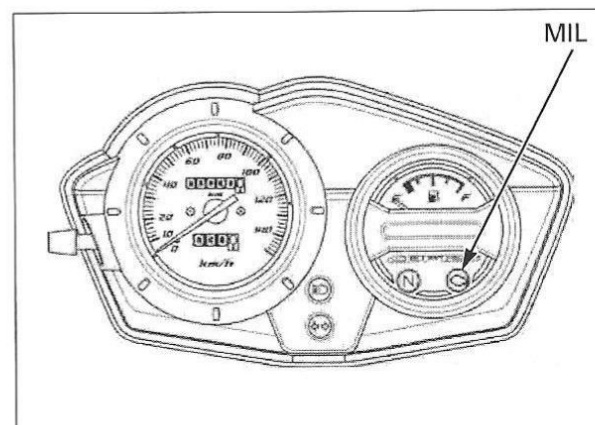
DTC READOUT

Start the engine and check the MIL.

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

If the MIL stays on or blinks, connect the HDS pocket tester to the DLC (page 5-11).

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



FUEL SYSTEM (PGM-FI)

Reading DTC with the MIL

Turn the ignition switch OFF.

Remove the dummy connector from the DLC.
Short the DLC terminals using the special tool.

TOOL:

SCS connector 070PZ-ZY30100

CONNECTION: Blue – Green/black

Turn the ignition switch ON, and note the MIL blinks and refer to the troubleshooting index (page 5-14).

NOTE:

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



ERASING DTC

NOTE:

Start the erasing procedure with the engine stopped.

Connect the HDS pocket tester to the DLC (page 5-11).

Erase the DTC with the HDS pocket tester.

To erase the DTC without HDS pocket tester, refer to the following procedure.

How to erase the DTC without HDS Pocket Tester

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

TOOL:

SCS connector 070PZ-ZY30100

CONNECTION: Blue – Green/black

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



NOTE:

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

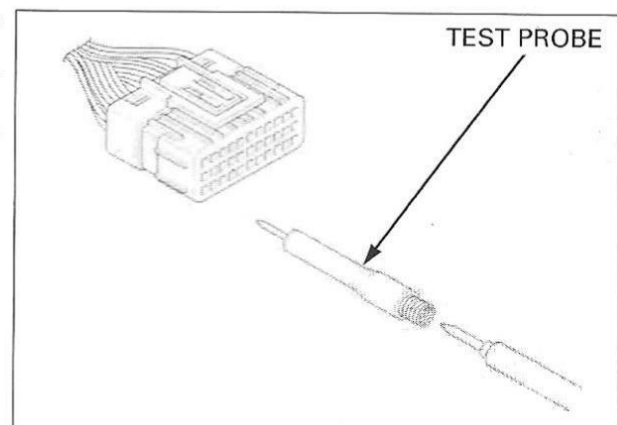
CIRCUIT INSPECTION

INSPECTION AT ECM CONNECTOR

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

TOOL:

Test probe 07ZAJ-RDJA110

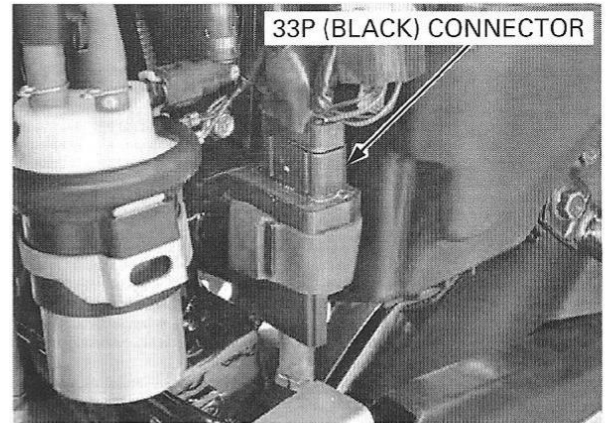


TEST HARNESS CONNECTION

Remove the left side cover (page 2-10).

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector.

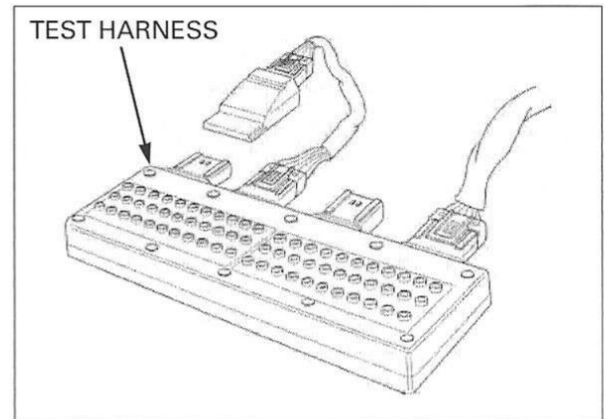


Connect the test harness between the main wire harness and ECM.

TOOL:

ECM test harness 33P

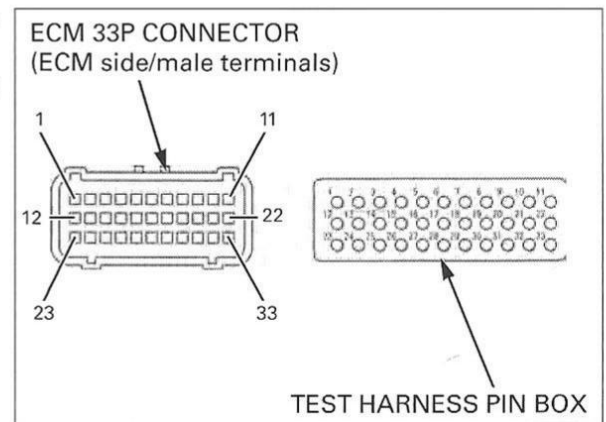
070MZ-MCA0100



TEST HARNESS TERMINAL LAYOUT

The ECM 33P (Black) connector terminals are numbered as shown in this illustration.

The test harness terminals are same layout as for the ECM 33P (Black) connector terminals as shown.



DTC INDEX

DTC (MIL blinks)	Function Failure	Symptom/Fail-safe function	Refer to (DTC)	Refer to (MIL)
1-1 (1)	MAP sensor circuit low voltage (less than 0.215 V) • MAP sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 760 mmHg/ 1,013 hPa	5-17	5-33
1-2 (1)	MAP sensor circuit high voltage (more than 3.848 V) • Loose or poor contact of the MAP sensor connector • MAP sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 760 mmHg/ 1,013 hPa	5-18	
7-1 (7)	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: 75°C/167°F • Cooling fan turns on	5-19	5-34
7-2 (7)	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: 75°C/167°F • Cooling fan turns on	5-20	
8-1 (8)	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°	5-21	5-36
8-2 (8)	TP sensor circuit high voltage (more than 4.922 V) • TP sensor or its circuit malfunction	• Poor engine acceleration • Pre-program value: 0°	5-22	
9-1 (9)	IAT sensor circuit low voltage (less than 0.078 V) • IAT sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 35°C/95°F	5-23	5-37
9-2 (9)	IAT sensor circuit high voltage (more 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°C/95°F	5-24	
12-1 (12)	Injector circuit malfunction • Loose or poor contact of the injector connector • Injector or its circuit malfunction	• Engine does not start • Injector, fuel pump and ignition coil shut down	5-25	5-38
21-1 (21)	O ₂ sensor malfunction • Loose or poor contact of the O ₂ sensor connector • O ₂ sensor or its circuit malfunction	• Engine operates normally	5-27	5-40
29-1 (29)	IACV circuit malfunction • Loose or poor contact of the IACV connector • IACV or its circuit malfunction	• Engine stalls, hard to start, rough idling	5-28	5-41
33-2 (-)	ECM EEPROM malfunction	• Engine operates normally	5-29	-
54-1 (54)	Bank angle sensor circuit low voltage (less than 0.351 V) • Bank angle sensor or its circuit malfunction	• Engine operates normally • Engine stop function does not operate	5-30	5-42
54-2 (54)	Bank angle sensor circuit high voltage (more than 4.531 V) • Loose or poor contact of the bank angle sensor con- nector • Bank angle sensor or its circuit malfunction	• Engine operates normally • Engine stop function does not operate	5-31	

SENSOR UNIT POWER LINE INSPECTION

BEFORE DTC TROUBLESHOOTING

When the DTC displays 1-2, 8-1 and 9-2, check the following before DTC troubleshooting.

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

1. Sensor Unit Power Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the sensor unit 5P (Black) connector.

Turn the ignition switch ON.
Measure the voltage at the wire side.

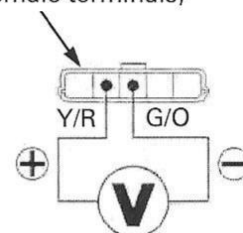
CONNECTION: Yellow/red (+) – Green/orange (–)
STANDARD: 4.75 – 5.25 V

If the voltage within 4.75 – 5.25 V?

YES – Turn the ignition switch OFF. Connect the sensor unit 5P (Black) connector and start the DTC troubleshooting (page 5-17).

NO – GO TO STEP 2.

SENSOR UNIT 5P CONNECTOR
(Wire side/female terminals)



2. Sensor Unit Input Voltage Line Short Circuit Inspection

Turn the ignition switch OFF.
Check the continuity between the sensor unit 5P connector of the wire side and ground.

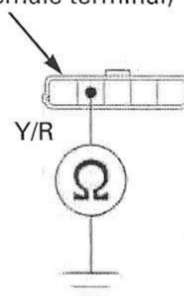
CONNECTION: Yellow/red – Ground

Is there continuity?

YES – Short circuit in Yellow/red wire

NO – GO TO STEP 3.

SENSOR UNIT 5P CONNECTOR
(Wire side/female terminal)



3. Sensor Unit Power Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector.
Check the continuity between the sensor unit 5P and ECM 33P connectors.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION:

6 (Yellow/red) – Yellow/red

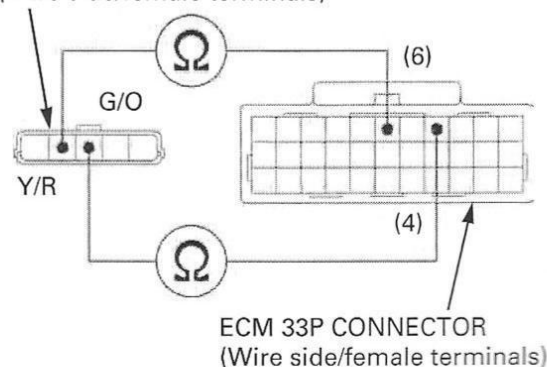
4 (Green/orange) – Green/orange

Is there continuity?

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

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

SENSOR UNIT 5P CONNECTOR
(Wire side/female terminals)



BEFORE MIL TROUBLESHOOTING

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

1. Sensor Unit Power Input Voltage Inspection 1

Turn the ignition switch OFF.

Connect the test harness to the ECM 33P (Black) connector (page 5-13).

Turn the ignition switch ON.

Measure the voltage at the test harness terminals.

CONNECTION: 6 (+) – 4 (–)

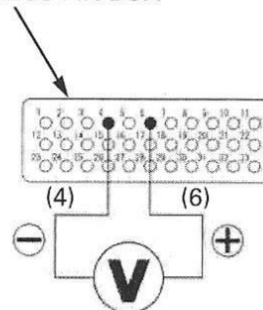
STANDARD: 4.75 – 5.25 V

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 2.

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

TEST HARNESS PIN BOX



2. Sensor Unit Power Input Voltage Inspection 2

Turn the ignition switch OFF.

Disconnect the sensor unit 5P (Black) connector.

Turn the ignition switch ON.

Measure the voltage at the wire side.

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

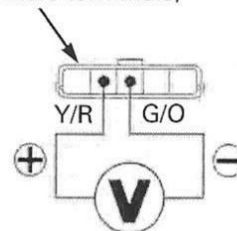
STANDARD: 4.75 – 5.25 V

Is the voltage within 4.75 – 5.25 V?

YES – Turn the ignition switch OFF. Connect the sensor unit 5P (Black) connector and start the MIL troubleshooting (page 5-33).

NO – GO TO STEP 3.

SENSOR UNIT 5P CONNECTOR
(Wire side/female terminals)



3. Sensor Unit Input Voltage Line Short Circuit Inspection

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

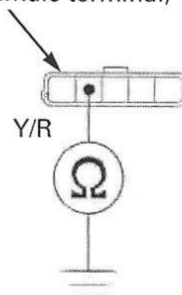
CONNECTION: Yellow/red – Ground

Is there continuity?

YES – Short circuit in Yellow/red wire

NO – GO TO STEP 4.

SENSOR UNIT 5P CONNECTOR
(Wire side/female terminal)



4. Sensor Unit Input Voltage Line Open Circuit Inspection

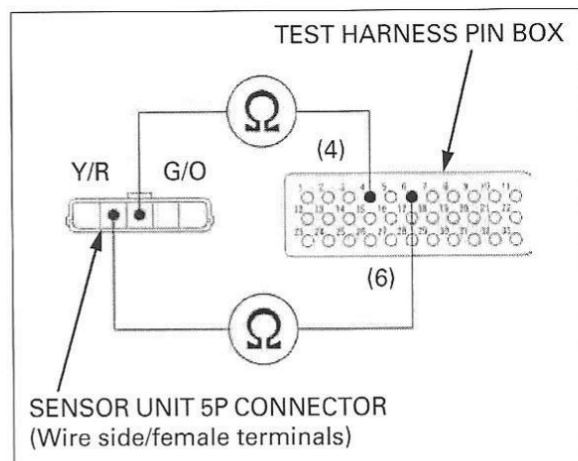
Check the continuity between the test harness and sensor unit 5P connector of the wire side.

CONNECTION: 6 – Yellow/red
4 – Green/orange

Is there continuity?

YES – Intermittent failure

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



DTC TROUBLESHOOTING

DTC 1-1 (MAP SENSOR LOW VOLTAGE)

1. MAP Sensor System Inspection

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

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Sensor Unit Power Line Inspection

Check the sensor unit power line inspection (page 5-15).

Is the sensor unit power line normal?

YES – GO TO STEP 3.

NO – Replace or repair the abnormal circuit.

3. MAP Sensor Output Line Short Circuit Inspection

Disconnect the sensor unit 5P (Black) connector.

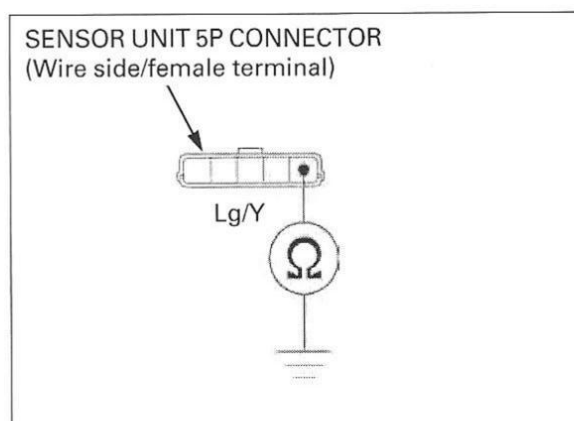
Check the continuity between the sensor unit 5P connector of the wire side and ground.

CONNECTION: Light green/yellow – Ground

Is there continuity?

YES – Short circuit in Light green/yellow wire

NO – GO TO STEP 4.



4. MAP Sensor Inspection

Replace the sensor unit with a known good one (page 5-56).

Erase the DTC's (page 5-12).

Turn the ignition switch OFF.

Connect the sensor unit 5P connector.

Turn the ignition switch ON.

Check the MAP sensor with the HDS pocket tester.

Is DTC 1-1 indicated?

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

NO – Faulty original sensor unit (MAP sensor)

DTC 1-2 (MAP SENSOR HIGH VOLTAGE)

1. MAP Sensor System Inspection 1

Turn the ignition switch ON.

Check the MAP sensor with the HDS pocket tester.

Is about 5 V indicated?

YES – GO TO STEP 2.

NO –

- Intermittent failure
- Loose or poor contact on the sensor unit 5P (Black) and/or ECM 33P (Black) connectors

2. Sensor Unit Power Line Inspection

Check the sensor unit power line inspection (page 5-15).

Is the sensor unit power line normal?

YES – GO TO STEP 3.

NO – Replace or repair the abnormal circuit.

3. MAP Sensor System Inspection 2

Turn the ignition switch OFF.

Disconnect the sensor unit 5P (Black) connector.

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

CONNECTION:

Light green/yellow – Green/orange

Turn the ignition switch ON.

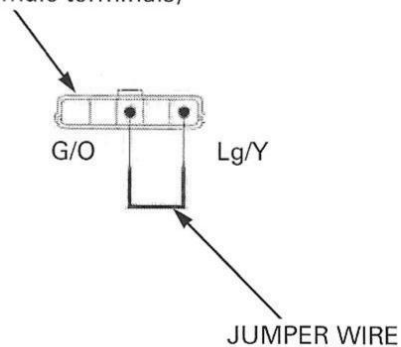
Check the MAP sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – Faulty sensor unit (MAP sensor)

NO – GO TO STEP 4.

SENSOR UNIT 5P CONNECTOR
(Wire side/female terminals)



4. MAP Sensor Output Line Open Circuit Inspection

Turn the ignition switch OFF.
Remove the jumper wire.
Disconnect the ECM 33P (Black) connector.

Check the continuity at the Light green/yellow wire between the sensor unit 5P and ECM 33P connectors.

TOOL:

Test probe 07ZAJ-RDJA110

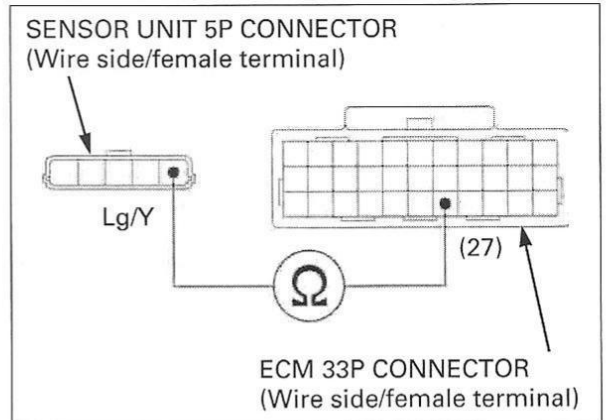
CONNECTION:

27 (Light green/yellow) – Light green/yellow

Is there continuity?

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

NO – Open circuit in Light green/yellow wire



DTC 7-1 (EOT SENSOR LOW VOLTAGE)

1. EOT Sensor System Inspection

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

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. EOT Sensor Inspection

Turn the ignition switch OFF.
Disconnect the EOT sensor 2P (Black) connector.

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

Is about 0 V indicated?

YES – GO TO STEP 4.

NO – GO TO STEP 3.

3. EOT Sensor Resistance Inspection

Turn the ignition switch OFF.
Measure the resistance between the EOT sensor terminals.

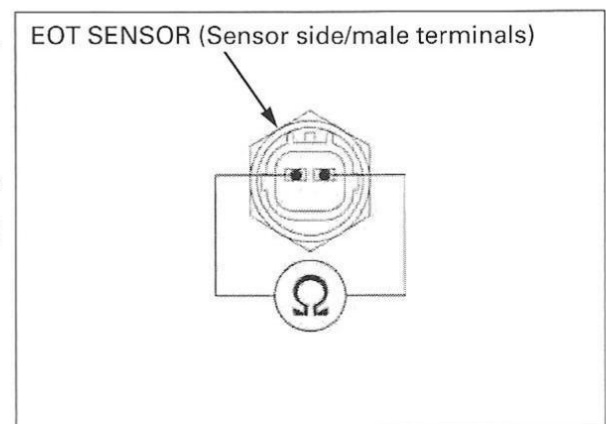
CONNECTION: Yellow/blue – Green/orange

STANDARD: 2.4 – 2.9 kΩ (20°C/68°F)

Is the resistance within 2.4 – 2.9 kΩ (20°C/68°F)?

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

NO – Faulty EOT sensor



4. EOT Sensor Line Short Circuit Inspection

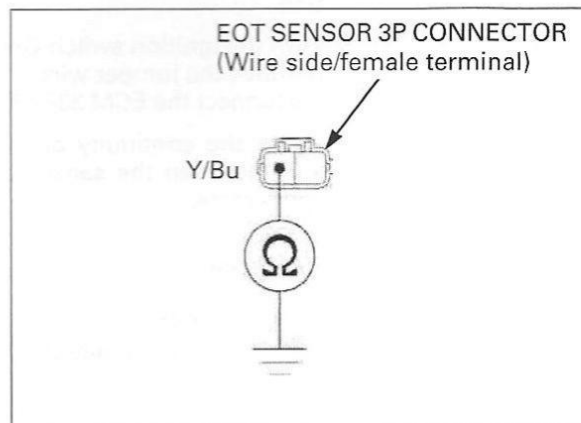
Turn the ignition switch OFF.
Check the continuity between the EOT sensor 2P connector of the wire side and ground.

CONNECTION: Yellow/blue – Ground

Is there continuity?

YES – Short circuit in Yellow/blue wire

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



DTC 7-2 (EOT SENSOR HIGH VOLTAGE)

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

1. EOT Sensor System Inspection

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

Is about 5 V indicated?

YES – GO TO STEP 2.

NO –

- Intermittent failure
- Loose or poor contact on the EOT sensor 2P (Black) and/or ECM 33P (Black) connectors

2. EOT Sensor Inspection

Turn the ignition switch OFF.
Disconnect the EOT sensor 2P (Black) connector.
Connect the EOT sensor 2P connector terminals at the wire side with a jumper wire.

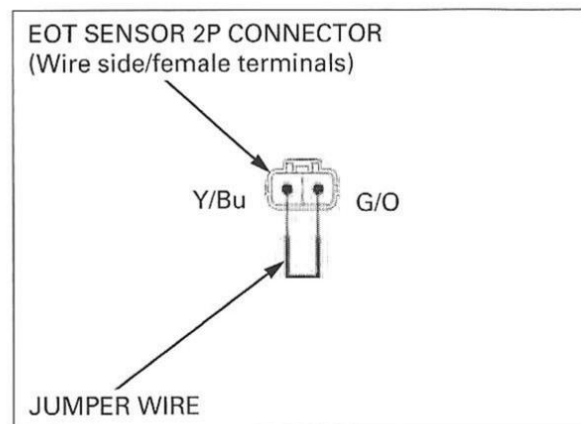
CONNECTION: Yellow/blue – Green/orange

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

Is about 0 V indicated?

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

NO – GO TO STEP 3.



3. EOT Sensor Open Circuit Inspection

Turn the ignition switch OFF.
Remove the jumper wire.
Disconnect the ECM 33P (Black) connector.

Check the continuity between the ECM 33P and EOT sensor 2P connectors.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION:

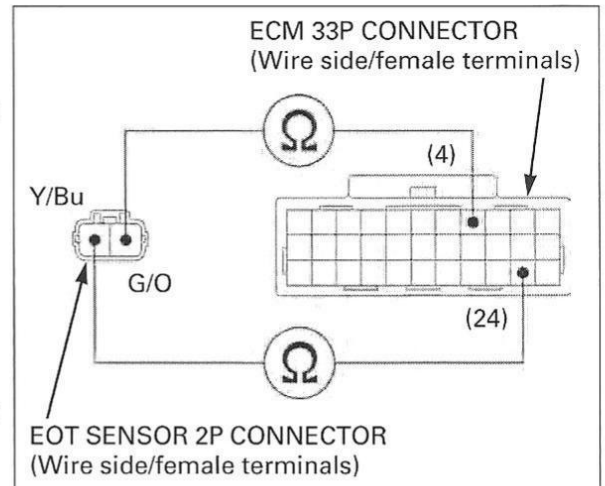
24 (Yellow/blue) – Yellow/blue

4 (Green/orange) – Green/orange

Is there continuity?

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

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



DTC 8-1 (TP SENSOR LOW VOLTAGE)

1. TP Sensor System Inspection

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

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – • Intermittent failure
• Loose or poor contact on the sensor unit 5P (Black) and/or ECM 33P (Black) connectors

2. Sensor Unit Power Line Inspection

Check the sensor unit power line inspection (page 5-15).

Is the sensor unit power line normal?

YES – GO TO STEP 3.

NO – Replace or repair the abnormal circuit.

3. TP Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the sensor unit 5P (Black) and ECM 33P (Black) connectors.

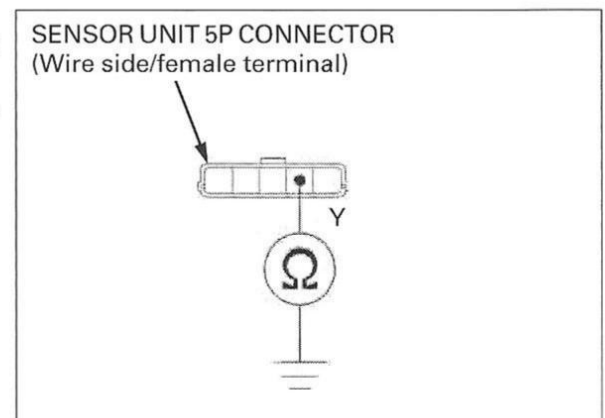
Check the continuity between the sensor unit 5P connector of the wire side and ground.

CONNECTION: Yellow – Ground

Is there continuity?

YES – Short circuit in Yellow wire

NO – GO TO STEP 4.



4. TP Sensor Output Line Open Circuit Inspection

Check the continuity between the sensor unit 5P and ECM 33P connectors.

TOOL:

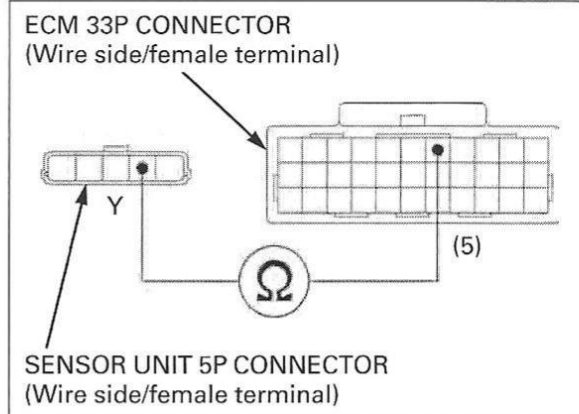
Test probe 07ZAJ-RDJA110

CONNECTION: 5 (Yellow) – Yellow

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in Yellow wire



5. TP Sensor Inspection

Replace the sensor unit with a known good one (page 5-56).

Erase the DTC's (page 5-12).

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

Turn the ignition switch ON.

Check the TP sensor with the HDS pocket tester.

Is DTC 8-1 indicated?

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

NO – Faulty original sensor unit (TP sensor)

DTC 8-2 (TP SENSOR HIGH VOLTAGE)

1. TP Sensor System Inspection

Turn the ignition switch ON.

Check the TP sensor with the HDS pocket tester.

Is about 5 V indicated?

YES – GO TO STEP 3.

NO – GO TO STEP 2.

2. TP Sensor Inspection

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

Is the voltage increase continuously?

YES – Intermittent failure

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

3. TP Sensor Resistance Inspection

Turn the ignition switch OFF.
Disconnect the sensor unit 5P (Black) connector.
Check the resistance in the throttle position while operating the throttle grip.

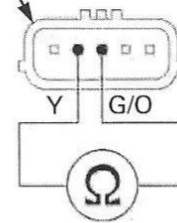
CONNECTION: Yellow – Green/orange
STANDARD: 4 – 6 k Ω

Is the resistance within 4 – 6 k Ω (Is the resistance changed by operating the throttle grip)?

YES – GO TO STEP 4.

NO – Faulty sensor unit (TP sensor)

SENSOR UNIT 5P CONNECTOR
(Sensor side/male terminals)



4. TP Sensor Power Line Inspection

Turn the ignition switch ON.
Measure the voltage at the wire side.

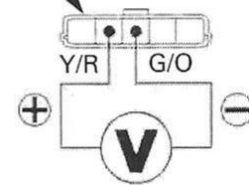
CONNECTION: Yellow/red (+) – Green/orange (–)
STANDARD: 4.75 – 5.25 V

Is the voltage within 4.75 – 5.25 V?

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

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

SENSOR UNIT 5P CONNECTOR
(Wire side/female terminals)



DTC 9-1 (IAT SENSOR LOW VOLTAGE)

1. IAT Sensor System Inspection

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

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. IAT Sensor Inspection

Turn the ignition switch OFF.
Disconnect the sensor unit 5P (Black) connector.
Turn the ignition switch ON.
Check the IAT sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – GO TO STEP 3.

NO – Faulty sensor unit (IAT sensor)

3. IAT Sensor Line Short Circuit Inspection

Turn the ignition switch OFF.

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

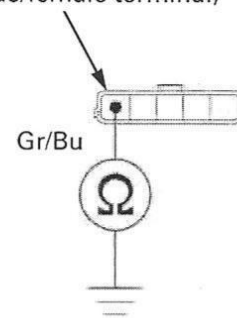
CONNECTION: Gray/blue – Ground

Is there continuity?

YES – Short circuit in Gray/blue wire

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

SENSOR UNIT 5P CONNECTOR
(Wire side/female terminal)



DTC 9-2 (IAT SENSOR HIGH VOLTAGE)

1. IAT Sensor System Inspection

Turn the ignition switch ON.

Check the IAT sensor with the HDS pocket tester.

Is about 5 V indicated?

YES – GO TO STEP 2.

NO –

- Intermittent failure
- Loose or poor contact on the sensor unit 5P (Black) and/or ECM 33P (Black) connectors

2. Sensor Unit Power Line Inspection

Check the sensor unit power line inspection (page 5-15).

Is the sensor unit power line normal?

YES – GO TO STEP 3.

NO – Replace or repair the abnormal circuit.

3. IAT Sensor Inspection

Turn the ignition switch OFF.

Disconnect the sensor unit 5P (Black) connector.

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

CONNECTION: Gray/blue – Green/orange

Turn the ignition switch ON.

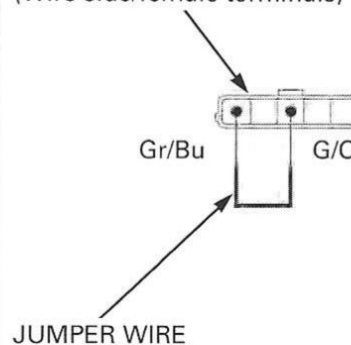
Check the IAT sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – Faulty sensor unit (IAT sensor)

NO – GO TO STEP 4.

SENSOR UNIT 5P CONNECTOR
(Wire side/female terminals)



4. IAT Sensor Line Open Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) connector.

Check the continuity at the between the sensor unit 5P and ECM 33P connectors.

TOOL:

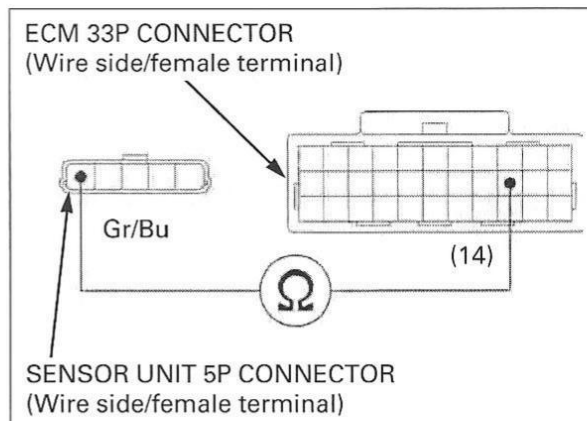
Test probe 07ZAJ-RDJA110

CONNECTION: 14 (Gray/blue) – Gray/blue

Is there continuity?

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

NO – Open circuit in Gray/blue wire



DTC 12-1 (INJECTOR)

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

1. Injector System Inspection

Erase the DTC's (page 5-12).

Turn the ignition switch ON.
Start the engine and check the injector with the HDS pocket tester.

Is the DTC 12-1 indicated?

YES – GO TO STEP 2.

NO –

- Intermittent failure
- Loose or poor contact on the injector 2P (Black) and/or ECM 33P (Black) connectors

2. Injector Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the injector 2P (Black) connector.

Turn the ignition switch ON.
Measure the voltage between the injector 2P connector of the wire side and ground.

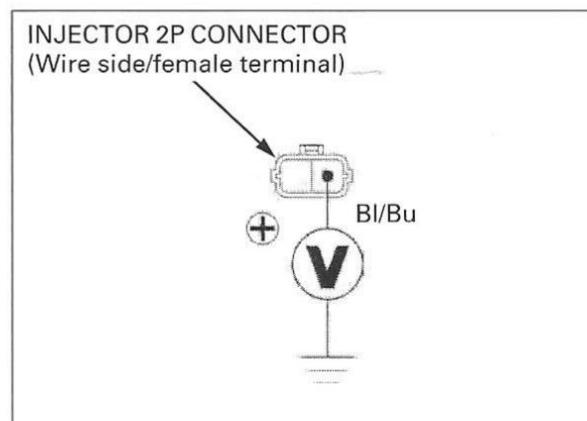
CONNECTION: Black/blue (+) – Ground

STANDARD: Battery voltage

Is there battery voltage?

YES – GO TO STEP 3.

NO – Open or short circuit in Black/blue wire



3. Injector Signal Line Short Circuit Inspection

Turn the ignition switch OFF.
Check the continuity between the injector 2P connector of wire side and ground.

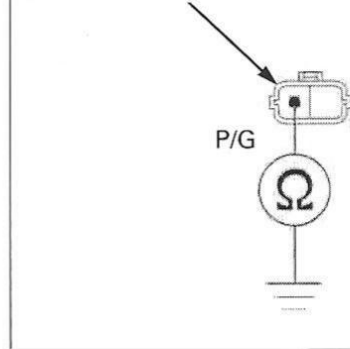
CONNECTION: Pink/green – Ground

Is there continuity?

YES – Short circuit in Pink/green wire

NO – GO TO STEP 4.

INJECTOR 2P CONNECTOR
(Wire side/female terminal)



4. Injector Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Black) connector.

Check the continuity between the ECM 33P and injector 2P connectors of the wire side.

TOOL:

Test probe 07ZAJ-RDJA110

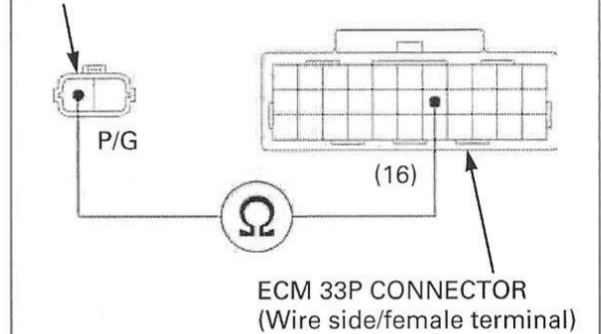
CONNECTION: 16 (Pink/green) – Pink/green

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in Pink/green wire

INJECTOR 2P CONNECTOR
(Wire side/female terminal)



5. Injector Resistance Inspection

Measure the resistance between the injector 2P connector terminals.

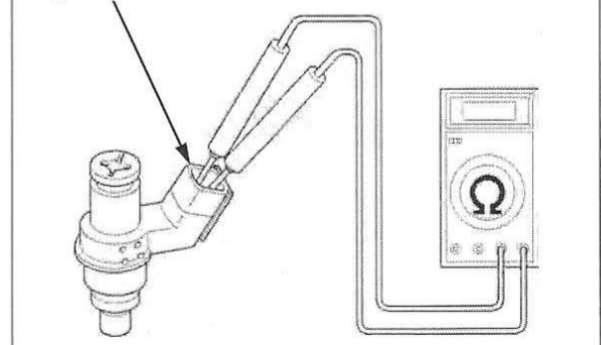
STANDARD: 9 – 12 Ω (20°C/68°F)

Is the resistance within 9 – 12 Ω (20°C/68°F)?

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

NO – Faulty injector

INJECTOR 2P CONNECTOR
(Injector side/male terminals)



DTC 21-1 (O₂ SENSOR)**NOTICE**

- Do not get grease, oil or other materials in the O₂ sensor air hole.
- Before starting the inspection, check for loose or poor contact on the O₂ sensor 2P (Natural) connector or O₂ sensor cap and ECM 33P (Black) connector, and recheck the DTC.

1. O₂ Sensor System Inspection

Turn the ignition switch ON.
Start the engine and warm it up until the engine oil temperature is 75°C (167°F).

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

Is the DTC 21-1 indicated?

YES – GO TO STEP 2.

NO – • Intermittent failure
• Loose or poor contact on the O₂ sensor 2P (Natural) connector or O₂ sensor cap and ECM 33P (Black) connector.

2. O₂ Sensor Short Circuit Inspection

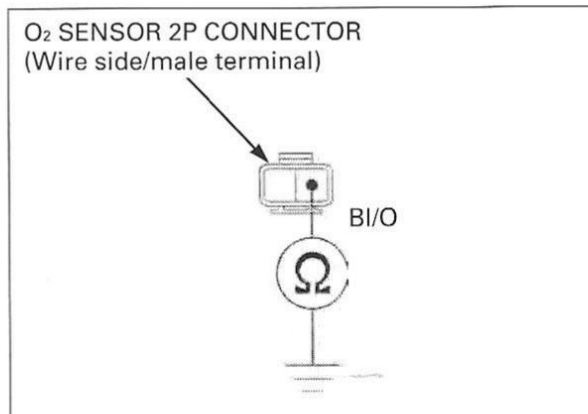
Turn the ignition switch OFF.
Disconnect the O₂ sensor 2P (Natural) connector.
Check the continuity between the O₂ sensor 2P connector of the wire side and ground.

CONNECTION: Black/orange – Ground

Is there continuity?

YES – Short circuit in Black/orange wire

NO – GO TO STEP 3.

**3. O₂ Sensor Open Circuit Inspection**

Disconnect the ECM 33P (Black) connector.
Check the continuity between the ECM 33P and O₂ sensor 2P connectors of the wire side.

TOOL:

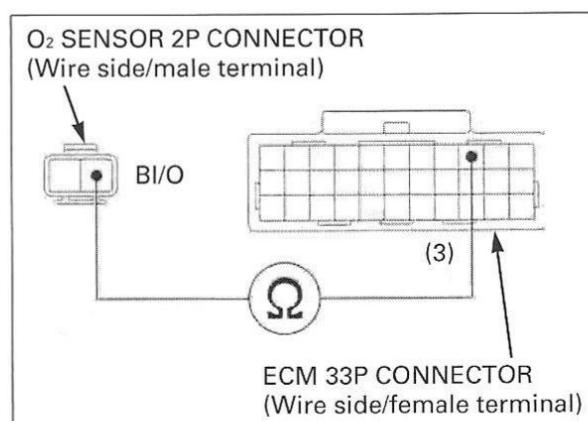
Test probe 07ZAJ-RDJA110

CONNECTION: 3 (Black/orange) – Black/orange

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in Black/orange wire



4. O₂ Sensor Inspection

Replace the O₂ sensor and O₂ sensor cord with a known good one (page 5-69).
Erase the DTC's (page 5-12).

Connect the O₂ sensor 2P (Black) and ECM 33P (Black) connectors.

Turn the ignition switch ON.
Start the engine and warm it up until the engine oil is 75°C (167°F).

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

Is the DTC 21-1 indicated?

- YES** – Replace the ECM with a known good one, and recheck.
- NO** – Faulty original O₂ sensor and/or O₂ sensor cord

DTC 29-1 (IACV)

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

1. Recheck DTC

Erase the DTC's (page 5-12).
Turn the ignition switch ON.
Check the IACV with the HDS pocket tester.

Is the DTC 29-1 indicated?

- YES** – GO TO STEP 2.
- NO** –
- Intermittent failure
 - Loose or poor contact on the IACV 4P (Black) and/or ECM 33P (Black) connectors

2. IACV Short Circuit Inspection

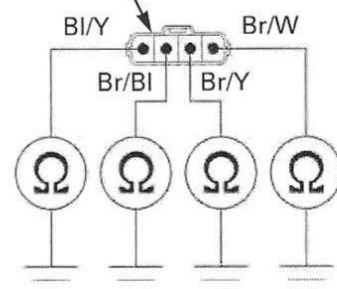
Turn the ignition switch OFF.
Disconnect the IACV 4P (Black) connector.
Check the continuity between the IACV 4P connector of the wire side and ground.

CONNECTION: Brown/white – Ground
Brown/yellow – Ground
Brown/black – Ground
Black/yellow – Ground

Is there continuity?

- YES** –
- Short circuit in Brown/white or Brown/yellow wire
 - Short circuit in Brown/black or Black/yellow wire
- NO** – GO TO STEP 3.

IACV 4P CONNECTOR
(Wire side/female terminals)



3. IACV Open Circuit Inspection

Disconnect the ECM 33P (Black) connector.

Check the continuity between the ECM 33P and IACV 4P connectors of the wire side.

TOOL:

Test probe 07ZAJ-RDJA110

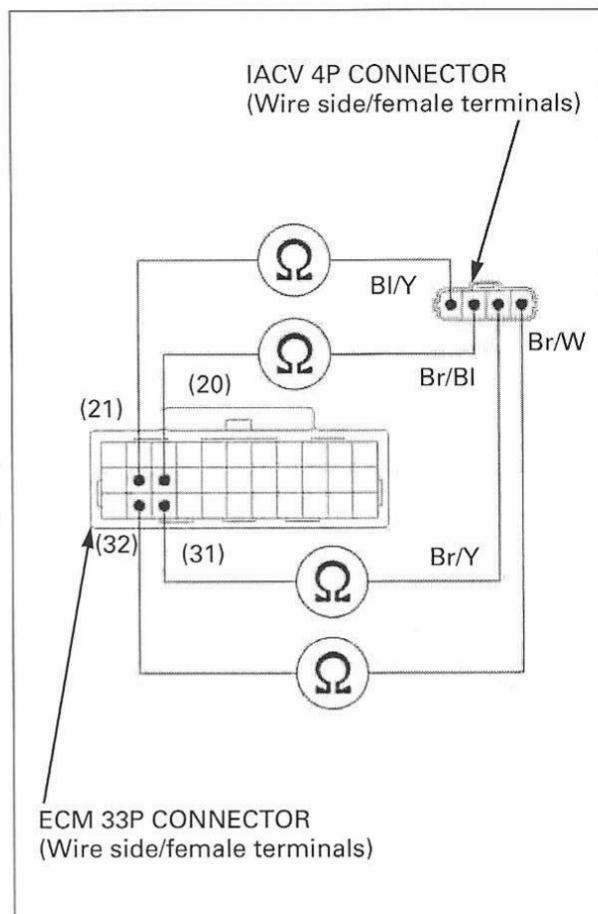
CONNECTION:

- 20 (Brown/black) – Brown/black
- 21 (Black/yellow) – Black/yellow
- 31 (Brown/yellow) – Brown/yellow
- 32 (Brown/white) – Brown/white

Is there continuity?

YES – GO TO STEP 4.

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



4. IACV Resistance Inspection

Measure the resistance at the IACV 4P connector of the wire side.

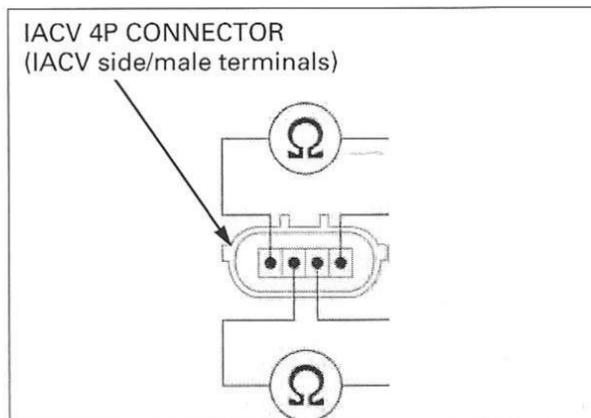
CONNECTION: Brown/white – Black/yellow
Brown/black – Brown/yellow

STANDARD: 117 – 143 Ω (25°C/77°F)

Is the resistance within 117 – 143 Ω (25°C/77°F)?

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

NO – Faulty IACV



DTC 33-2 (EEPROM)

1. Recheck DTC

Erase the DTC's (page 5-12).

Turn the ignition switch ON and recheck the ECM EEPROM.

Is the DTC 33-2 indicated?

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

NO – Intermittent failure

DTC 54-1 (BANK ANGLE SENSOR LOW VOLTAGE)

1. Recheck DTC

Erase the DTC's (page 5-12).

Turn the ignition switch ON and check the bank angle sensor with the HDS pocket tester.

Is the DTC 54-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Bank Angle Sensor Power Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the bank angle sensor 3P (Gray) connector.

Turn the ignition switch ON.

Measure the voltage at the bank angle sensor connector of the wire side.

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

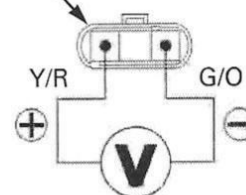
STANDARD: 4.75 – 5.25 V

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 4.

NO – GO TO STEP 3.

BANK ANGLE SENSOR 3P CONNECTOR
(Wire side/female terminals)



3. Bank Angle Sensor Input Voltage Line Short Circuit Inspection

Turn the ignition switch OFF.

Check the continuity between the bank angle sensor 3P connector of the wire side and ground.

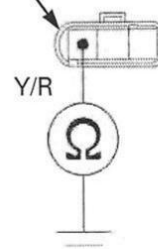
CONNECTION: Yellow/red – Ground

Is there continuity?

YES – Short circuit in Yellow/red wire

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

BANK ANGLE SENSOR 3P CONNECTOR
(Wire side/female terminal)



4. Bank Angle Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector.

Check the continuity between the bank angle sensor 3P connector of the wire side and ground.

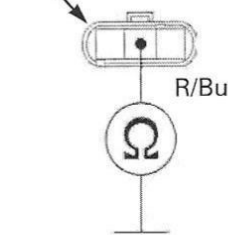
CONNECTION: Red/blue – Ground

Is there continuity?

YES – Short circuit in Red/blue wire

NO – GO TO STEP 5.

BANK ANGLE SENSOR 3P CONNECTOR
(Wire side/female terminal)



5. Bank Angle Sensor Inspection

Replace the bank angle sensor with a known good one (page 5-65).
Erase the DTC's (page 5-12).

Connect the bank angle sensor 3P (Gray) connector.

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

Is DTC 54-1 indicated?

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

NO – Faulty original bank angle sensor

DTC 54-2 (BANK ANGLE SENSOR HIGH VOLTAGE)

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

1. Recheck DTC

Erase the DTC's (page 5-12).

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

Is the DTC 54-2 indicated?

YES – GO TO STEP 2.

NO – • Intermittent failure
• Loose or poor contact on the bank angle sensor 3P (Gray) and/or ECM 33P (Black) connectors

2. Bank Angle Sensor Power Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the bank angle sensor 3P (Gray) connector.

Turn the ignition switch ON.
Measure the voltage at the bank angle sensor connector of the wire side.

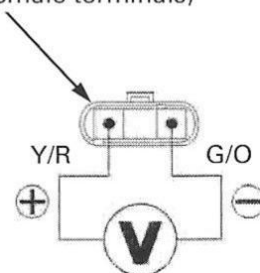
CONNECTION: White/red (+) – Green/orange (–)
STANDARD: 4.75 – 5.25 V

Is there within 4.75 – 5.25 V?

YES – GO TO STEP 4.

NO – GO TO STEP 3.

BANK ANGLE SENSOR 3P CONNECTOR
(Wire side/female terminals)



3. Bank Angle Sensor Input Voltage Line Open Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) connector.

Check the continuity between the ECM 33P and bank angle sensor 3P connectors of the wire side.

TOOL:

Test probe 07ZAJ-RDJA110

CONNECTION:

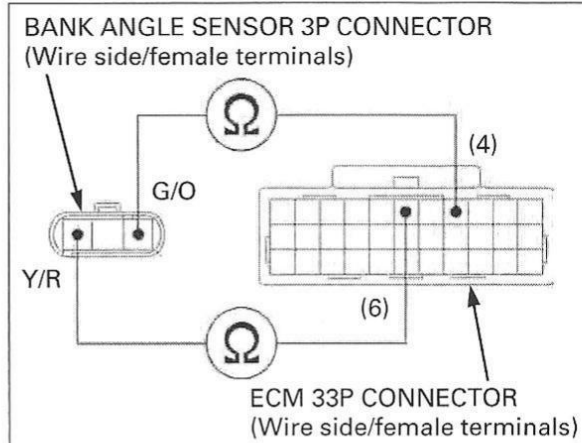
6 (Yellow/red) – Yellow/red

4 (Green/orange) – Green/orange

Is there continuity?

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

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



4. Bank Angle Sensor Output Line Open Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) connector.

Check the continuity between the ECM 33P and bank angle sensor 3P connectors.

TOOL:

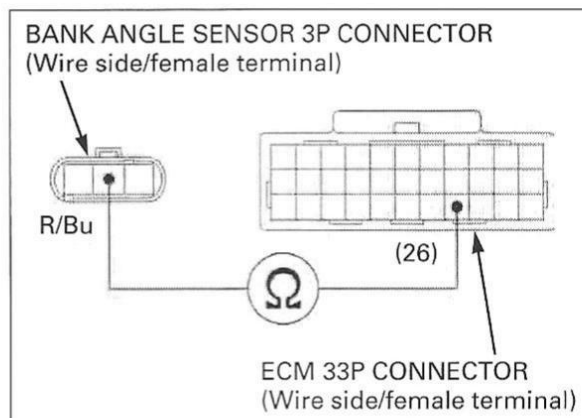
Test probe 07ZAJ-RDJA110

CONNECTION: 26 (Red/blue) – Red/blue

Is there continuity?

YES – Inspect the bank angle sensor (page 5-65).

NO – Open circuit in Red/blue wire



MIL TROUBLESHOOTING

MIL 1 BLINK (MAP SENSOR)

1. Sensor Unit Power Line Inspection

Check the sensor unit power line inspection (page 5-16).

Is the sensor unit power line normal?

YES – GO TO STEP 2.

NO – Replace or repair of the abnormal circuit.

2. MAP Sensor Output Voltage Inspection 1

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

CONNECTION: 27 (+) – 4 (–)

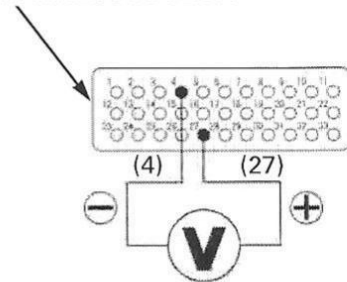
STANDARD: 2.6 – 3.2 V (20°C/68°F)

Is the voltage within 2.6 – 3.2 V (20°C/68°F)?

YES – • Intermittent failure
• Loose or poor contact on the sensor unit 5P (Black) and/or ECM 33P (Black) connectors

NO – GO TO STEP 3.

TEST HARNESS PIN BOX



3. MAP Sensor Output Voltage Inspection 2

Turn the ignition switch OFF.
Disconnect the sensor unit 5P (Black) connector.

Turn the ignition switch ON.
Measure the voltage at the sensor unit 5P connector of the wire side.

CONNECTION:

Light green/yellow (+) – Green/orange (–)

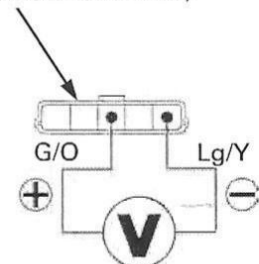
STANDARD: 3.80 – 5.25 V

Is the voltage within 3.80 – 5.25 V?

YES – Faulty sensor unit (MAP sensor)

NO – GO TO STEP 4.

SENSOR UNIT 5P CONNECTOR
(Wire side/female terminals)



4. MAP Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the sensor unit 5P (Black) connector.

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

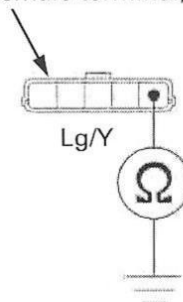
CONNECTION: Light green/yellow – Ground

Is there continuity?

YES – Short circuit in Light green/yellow wire

NO – GO TO STEP 5.

SENSOR UNIT 5P CONNECTOR
(Wire side/female terminal)



5. MAP Sensor Output Line Open Circuit Inspection

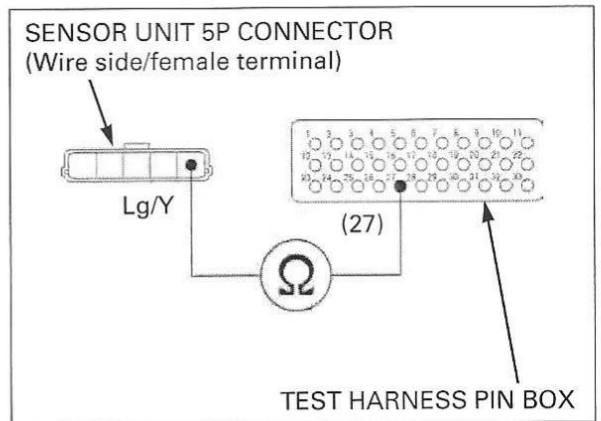
Check the continuity between the test harness and sensor unit 5P connector of the wire side.

CONNECTION: 27 – Light green/yellow

Is there continuity?

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

NO – Open circuit in Light green/yellow wire



MIL 7 BLINKS (EOT SENSOR)

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

1. EOT Sensor Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the EOT sensor 2P (Black) connector.
Turn the ignition switch ON.
Measure the voltage at the EOT sensor connector of the wire side and ground.

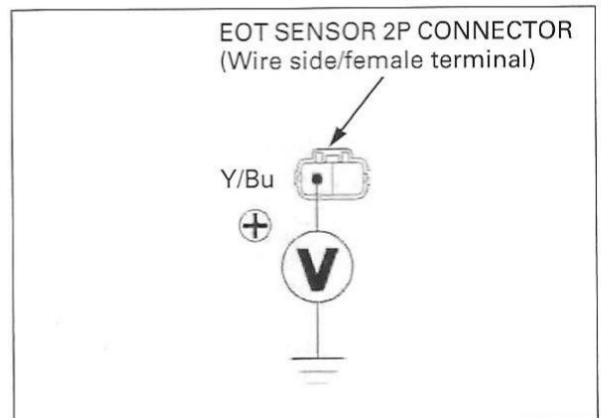
CONNECTION: Yellow/blue (+) – Ground

STANDARD: 4.75 – 5.25 V

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 3.

NO – GO TO STEP 2.



2. EOT Sensor Short Circuit Inspection

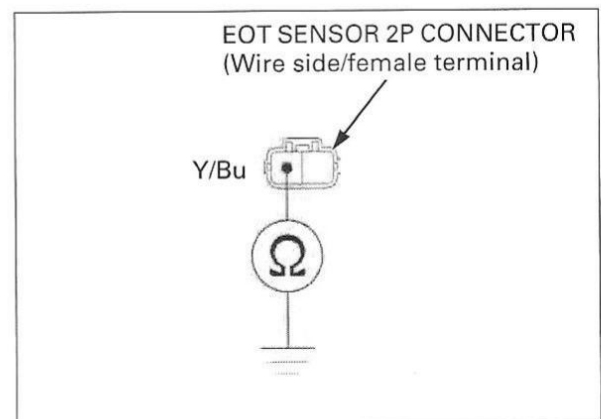
Turn the ignition switch OFF.
Check the continuity between the EOT sensor connector of the wire side and ground.

CONNECTION: Yellow/blue – Ground

Is there continuity?

YES – Short circuit in Yellow/blue wire

NO – GO TO STEP 3.



3. EOT Sensor Resistance Inspection

Turn the ignition switch OFF.
Measure the resistance at the EOT sensor terminals.

CONNECTION: Yellow/blue – Green/orange

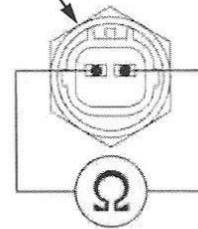
STANDARD: 2.4 – 2.9 k Ω (20°C/68°F)

Is the resistance within 2.4 – 2.9 k Ω (20°C/68°F)?

YES – GO TO STEP 4.

NO – Faulty EOT sensor

EOT SENSOR (Sensor side/male terminals)



4. EOT Sensor Open Circuit Inspection

Connect the test harness to ECM 33P (Black) connector (page 5-13).

Check the continuity between the test harness and EOT 2P sensor connector of the wire side.

CONNECTION: 24 – Yellow/blue

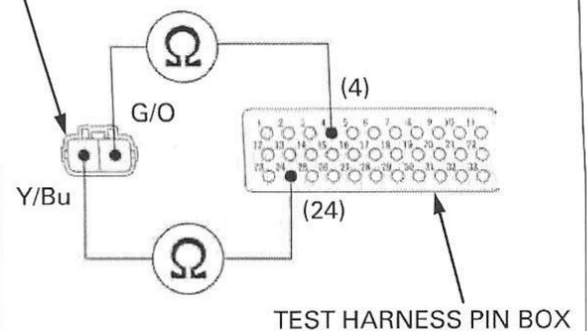
4 – Green/orange

Is there continuity?

YES – GO TO STEP 5.

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

EOT SENSOR 2P CONNECTOR
(Wire side/female terminals)



5. EOT Sensor Output Voltage Inspection

Connect the EOT sensor 2P (Black) connector.

Turn the ignition switch ON.

Measure the voltage at the test harness terminals.

CONNECTION: 24 (+) – 4 (–)

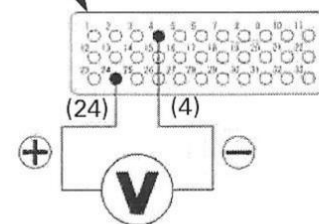
STANDARD: 2.7 – 3.1 V (20°C/68°F)

Is the voltage within 2.7 – 3.1 V (20°C/68°F)?

YES – • Intermittent failure
• Loose or poor contact on the EOT sensor 2P (Black) and/or ECM 33P (Black) connectors

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

TEST HARNESS PIN BOX



MIL 8 BLINKS (TP SENSOR)

1. Sensor Unit Power Line Inspection

Check the sensor unit power line inspection (page 5-16).

Is the sensor unit power line normal?

YES – GO TO STEP 2.

NO – Replace or repair the abnormal circuit.

2. TP Sensor Output Voltage Inspection

Turn the ignition switch ON.

Measure the TP sensor output voltage at the test harness terminals.

CONNECTION: 5 (+) – 4 (–)

STANDARD:

0.29 – 0.71 V (throttle fully closed)

4.13 – 4.76 V (throttle fully opened)

Is there standard voltage?

YES – • Intermittent failure
• Loose or poor contact on the sensor unit 5P (Black) and/or ECM 33P (Black) connectors

NO – GO TO STEP 3.

3. TP Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.

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

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

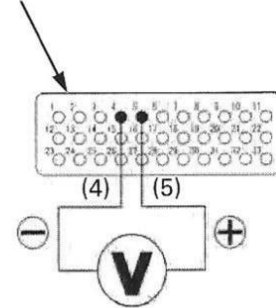
CONNECTION: Yellow – Ground

Is there continuity?

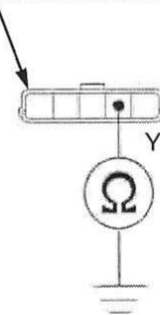
YES – Short circuit in Yellow wire

NO – GO TO STEP 4.

TEST HARNESS PIN BOX



SENSOR UNIT 5P CONNECTOR (Wire side/female terminal)



4. TP Sensor Voltage Input Line Open Circuit Inspection

Connect the test harness to the ECM 33P (Black) connector (page 5-13).

Check the continuity between the sensor unit 5P connector of the wire side and test harness.

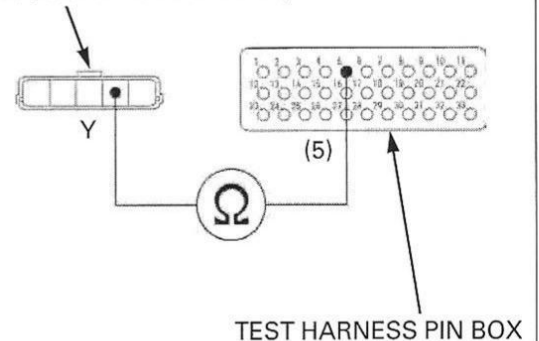
CONNECTION: 5 – Yellow

Is there continuity?

YES – • Faulty sensor unit (TP sensor)
• Replace the ECM with a known good one, and recheck.

NO – Open circuit in Yellow wire

SENSOR UNIT 5P CONNECTOR (Wire side/female terminal)



MIL 9 BLINKS (IAT SENSOR)

1. Sensor Unit Power Line Inspection

Check the sensor unit power line inspection (page 5-16).

Is the sensor unit power line normal?

YES – GO TO STEP 2.

NO – Replace or repair the abnormal circuit.

2. IAT Sensor Output Voltage Inspection

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

CONNECTION: 14 (+) – 4 (–)

STANDARD: 2.7 – 3.1 V (20°C/68°F)

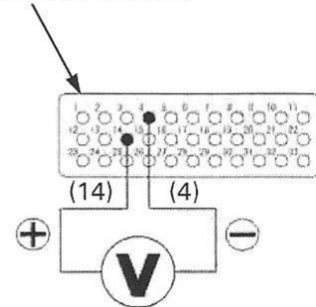
Is the voltage within 2.7 – 3.1 V (20°C/68°F)?

YES –

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

NO – GO TO STEP 3.

TEST HARNESS PIN BOX



3. IAT Sensor Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the sensor unit 5P (Black) connector.

Turn the ignition switch ON.
Measure the voltage at the sensor unit 5P connector of the wire side.

CONNECTION: Gray/blue (+) – Green/orange (–)

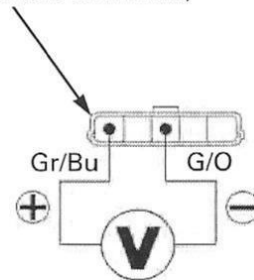
STANDARD: 4.75 – 5.25 V

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 6.

NO – GO TO STEP 4.

SENSOR UNIT 5P CONNECTOR
(Wire side/female terminals)



4. IAT Sensor Voltage Input Line Short Circuit Inspection

Turn the ignition switch OFF.

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

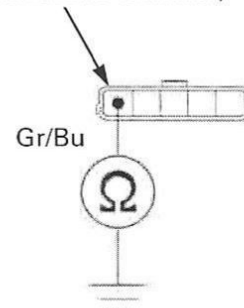
CONNECTION: Gray/blue – Ground

Is there continuity?

YES – Short circuit in Gray/blue wire

NO – GO TO STEP 5.

SENSOR UNIT 5P CONNECTOR
(Wire side/female terminal)



5. IAT Sensor Voltage Input Line Open Circuit Inspection

Check the continuity between the sensor unit 5P connector of the wire side and test harness.

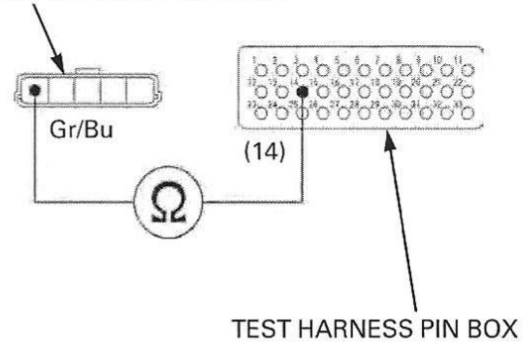
CONNECTION: 14 – Gray/blue

Is there continuity?

YES – GO TO STEP 6.

NO – Open circuit in Gray/blue wire

SENSOR UNIT 5P CONNECTOR
(Wire side/female terminal)



6. IAT Sensor Resistance Inspection

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

Measure the resistance at the test harness terminals.

CONNECTION: 14 – 4

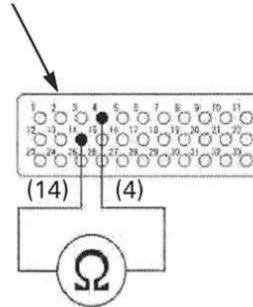
STANDARD: 1 – 4 kΩ (20°C/68°F)

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

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

NO – Faulty sensor unit (IAT sensor)

TEST HARNESS PIN BOX



MIL 12 BLINKS (INJECTOR)

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

1. Injector Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the injector 2P (Black) connector.

Turn the ignition switch ON.
Measure the voltage between the injector 2P connector of the wire side and ground.

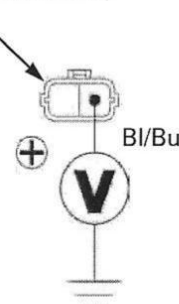
CONNECTION: Black/blue (+) – Ground (–)

Is there battery voltage?

YES – GO TO STEP 2.

NO – Open or short circuit in Black/blue wire

INJECTOR 2P CONNECTOR
(Wire side/female terminal)



2. Injector Signal Line Short Circuit Inspection

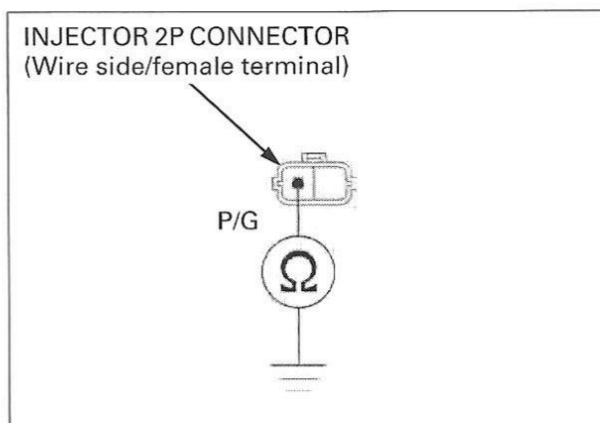
Turn the ignition switch OFF.
Check the continuity between the injector 2P connector of the wire side and ground.

CONNECTION: Pink/green – Ground

Is there continuity?

YES – Short circuit in Pink/green wire

NO – GO TO STEP 3.



3. Injector Signal Line Open Circuit Inspection

Connect the test harness to the ECM 33P (Black) connector (page 5-13).

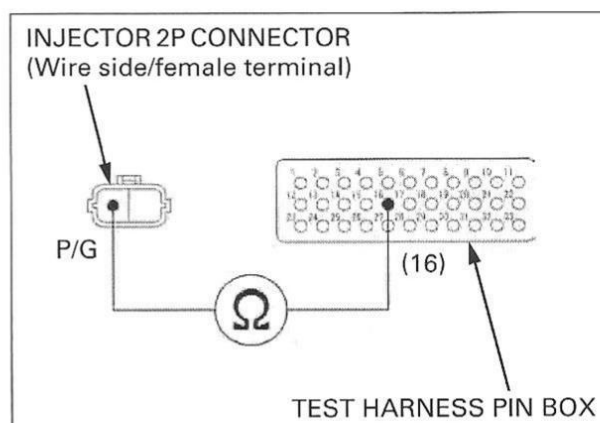
Check the continuity between the test harness and injector 2P connector of the wire side.

CONNECTION: 16 – Pink/green

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in Pink/green wire



4. Injector Resistance Inspection

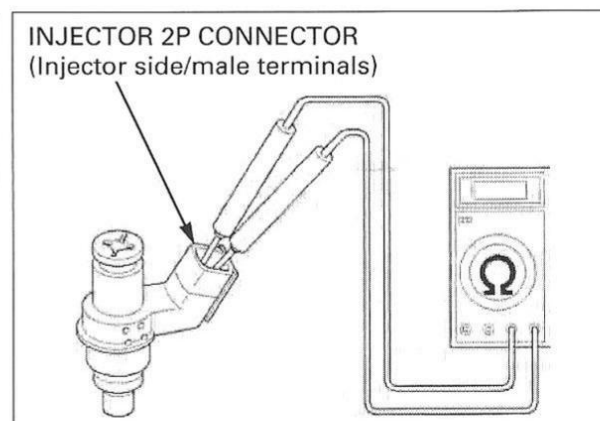
Measure the resistance between the injector 2P connector terminals.

STANDARD: 9 – 12 Ω (20°C/68°F)

Is the resistance within 9 – 12 Ω (20°C/68°F)?

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

NO – Faulty injector



MIL 21 BLINKS (O₂ SENSOR)

NOTICE

- Do not get grease, oil or other materials in the O₂ sensor air hole.
- Before starting the inspection, check for loose or poor contact on the O₂ sensor 2P (Natural) connector or O₂ sensor cap and ECM 33P (Black) connector, and recheck the MIL blinking.

1. O₂ Sensor System Inspection

Turn the ignition switch ON.
Start the engine and warm it up until the engine oil temperature is 75°C (167°F).

Test-ride the motorcycle and recheck the MIL blinking.

Does the MIL blink 21 times?

YES – GO TO STEP 2.

- NO** –
- Intermittent failure
 - Loose or poor contact on the O₂ sensor 2P (Natural) connector, O₂ sensor cap and/or ECM 33P (Black) connector.

2. O₂ Sensor Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the O₂ sensor 2P (Natural) connector.
Check the continuity between the O₂ sensor 2P connector of the wire side and ground.

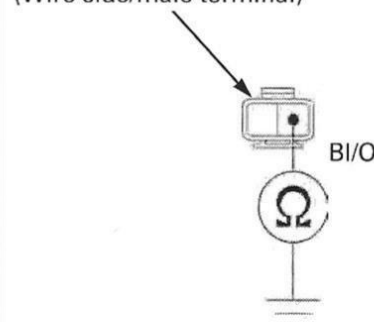
CONNECTION: Black/orange – Ground

Is there continuity?

YES – Short circuit in Black/orange wire

NO – GO TO STEP 3.

O₂ SENSOR 2P CONNECTOR
(Wire side/male terminal)



3. O₂ Sensor Open Circuit Inspection

Connect the test harness to the ECM 33P (Black) connector (page 5-13).

Check the continuity between the test harness and O₂ sensor 2P connector of the wire side.

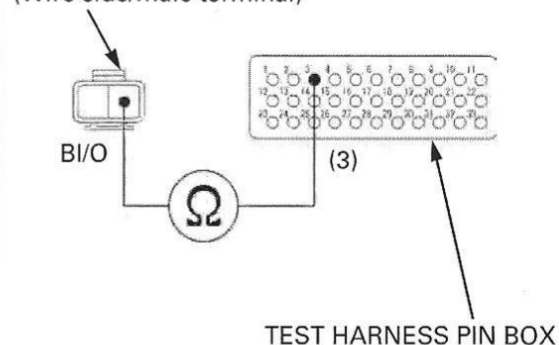
CONNECTION: 3 – Black/orange

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in Black/orange wire

O₂ SENSOR 2P CONNECTOR
(Wire side/male terminal)



4. O₂ Sensor Inspection

Replace the O₂ sensor and O₂ sensor cord with a known good one (page 5-69).

Disconnect the test harness and connect the ECM 33P (Black) connector.

Turn the ignition switch ON.

Start the engine and warm it up until the engine oil temperature is 75°C (167°F).

Test-ride the motorcycle and recheck the MIL blinking.

Does the MIL blink 21 times?

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

NO – Faulty original O₂ sensor and/or O₂ sensor cord

MIL 29 BLINKS (IACV)

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

1. IACV Resistance Inspection

Turn the ignition switch OFF.

Connect the test harness to the ECM 33P (Black) connector (page 5-13).

Measure the resistance at the test harness terminals.

CONNECTION: 20 – 21

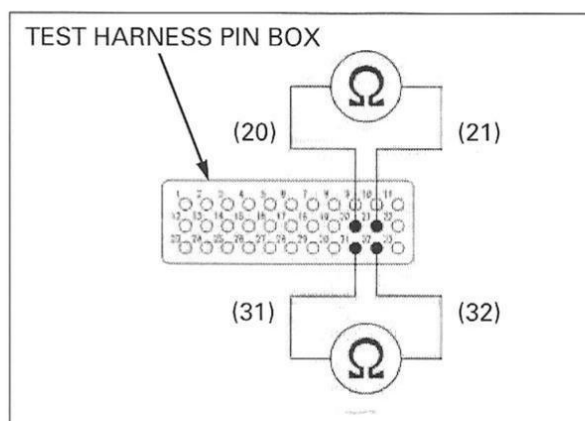
31 – 32

STANDARD: 117 – 143 Ω (25°C/77°F)

Is the resistance within 117 – 143 Ω (25°C/77°F)?

YES – GO TO STEP 2.

NO – Faulty IACV



2. IACV Short Circuit Inspection

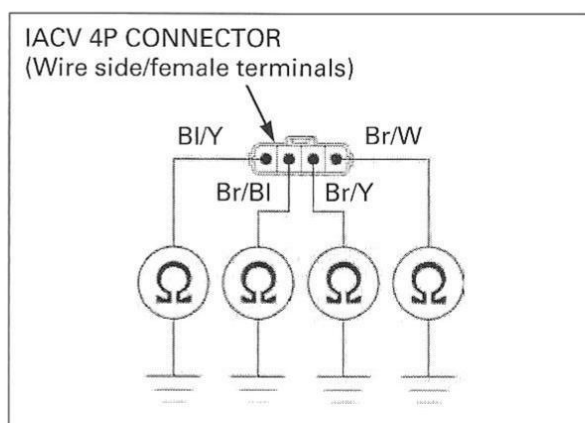
Check for continuity between the IACV 4P connector of the wire side and ground.

CONNECTION: Brown/white – Ground
Brown/yellow – Ground
Brown/black – Ground
Black/yellow – Ground

Is there continuity?

YES – • Short circuit in Brown/white or Brown/yellow wire
• Short circuit in Brown/black or Black/yellow wire

NO – GO TO STEP 3.



3. IACV Open Circuit Inspection

Connect the test harness to ECM 33P (Black) connector.

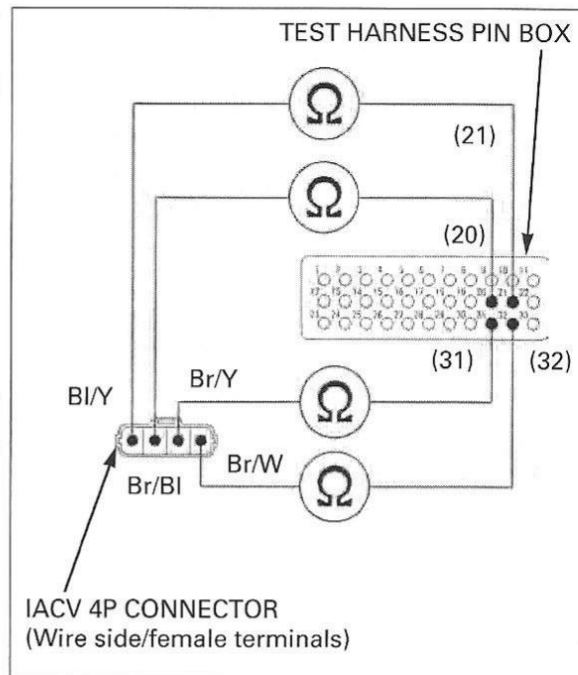
Check the continuity between the test harness and IACV 4P connector of the wire side.

CONNECTION: 20 – Brown/black
21 – Black/yellow
31 – Brown/yellow
32 – Brown/white

Is there continuity?

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

NO – • Open circuit in Brown/white or Brown/yellow wire
• Open circuit in Brown/black or Black/yellow wire



MIL 54 BLINKS (BANK ANGLE SENSOR)

- Before starting the inspection, check for loose or poor contact on the bank angle sensor 3P (Gray) and ECM 33P (Black) connectors, and recheck the MIL blinking.

1. Bank Angle Sensor Power Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the bank angle sensor 3P (Gray) connector.

Turn the ignition switch ON.

Measure the voltage at the bank angle sensor connector of the wire side.

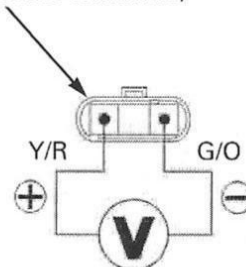
CONNECTION: Yellow/red (+) – Green/orange (–)
STANDARD: 4.75 – 5.25 V

Is there within 4.75 – 5.25 V?

YES – GO TO STEP 4.

NO – GO TO STEP 2.

BANK ANGLE SENSOR 3P CONNECTOR
(Wire side/female terminals)



2. Bank Angle Sensor Input Voltage Line Short Circuit Inspection

Turn the ignition switch OFF.

Check the continuity between the bank angle sensor 3P connector of the wire side and ground.

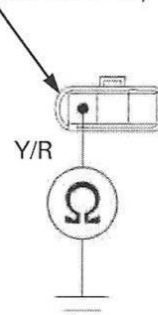
CONNECTION: Yellow/red – Ground

Is there continuity?

YES – GO TO STEP 3.

NO – Short circuit in Yellow/red wire

BANK ANGLE SENSOR 3P CONNECTOR
(Wire side/female terminal)



3. Bank Angle Sensor Input Voltage Line Open Circuit Inspection

Connect the test harness to the ECM 33P (Black) connector (page 5-13).

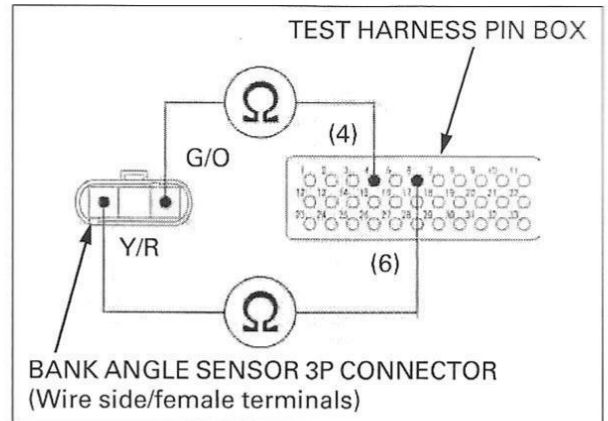
Check the continuity between the test harness and bank angle sensor 3P connector of the wire side.

CONNECTION: 6 – Yellow/red
4 – Green/orange

Is there continuity?

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

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



4. Bank Angle Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.

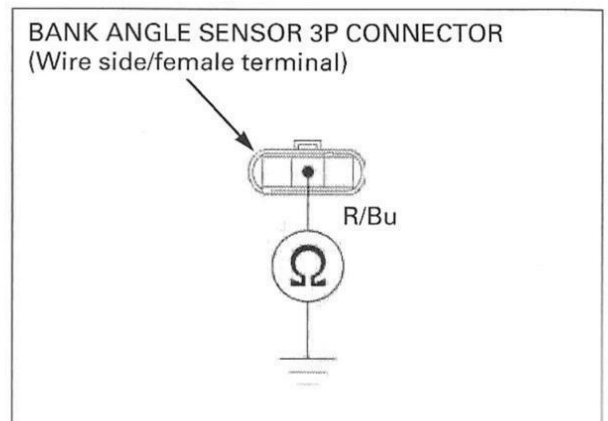
Check the continuity between the bank angle sensor 3P connector of the wire side and ground.

CONNECTION: Red/blue – Ground

Is there continuity?

YES – Short circuit in Red/blue wire

NO – GO TO STEP 5.



5. Bank Angle Sensor Output Line Open Circuit Inspection

Connect the test harness to the ECM 33P (Black) connector (page 5-13).

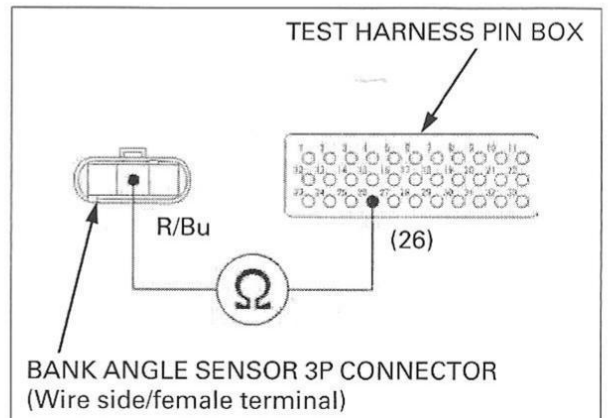
Check the continuity between the test harness and bank angle sensor 3P connector of the wire side.

CONNECTION: 26 – Red/blue

Is there continuity?

YES – Open circuit in Red/blue wire

NO – Inspect the bank angle sensor (page 5-65).



MIL CIRCUIT INSPECTION

When The Engine Starts But The MIL Does Not Come On

Check for the combination meter function.

- Check the MIL bulb (page 18-7).
- If it is properly, check as follows:

MIL circuit inspection with test probe

Turn the ignition switch OFF.

Remove the left side cover (page 2-10).

Disconnect the ECM 33P (Black) connector.



Ground the ECM 33P connector terminal of the wire side with a jumper wire.

TOOL:

Test probe

07ZAJ-RDJA110

CONNECTION: 22 (White/blue) – Ground

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

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

If the wire is good condition, replace the combination meter with a known good one, and recheck.

MIL circuit inspection with test harness

Connect the test harness to the ECM 33P (Black) connector (page 5-13).

Ground the test harness terminal with a jumper wire.

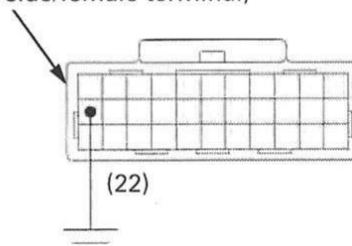
CONNECTION: 22 – Ground

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

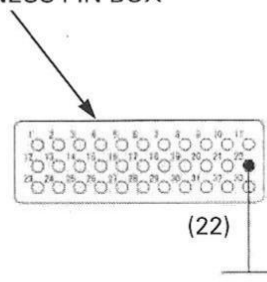
- If the MIL come on, replace the ECM with a known good one.
- If the MIL does not come on, check for open circuit in the White/blue wire between the combination meter and ECM.

If the wire is good condition, replace the combination meter with a known good one, and recheck.

ECM 33P CONNECTOR
(Wire side/female terminal)



TEST HARNESS PIN BOX



When The Engine Starts But The MIL Does Not Go Off Within A Few Seconds

Check for the combination meter function.

- Check the MIL bulb (page 18-7).
- If it is properly, check as follows:

MIL and DLC circuit inspections with test probe

Turn the ignition switch OFF.

Remove the left side cover (page 2-10).

Disconnect the ECM 33P (Black) connector.

Turn the ignition switch ON, then the MIL should turn off.

- If the MIL turns off, check for short circuit in the blue wire between the DLC and ECM as follows:
- If the MIL stays on, check for short circuit in the White/blue wire between the combination meter and ECM as follows:



Check the continuity between the ECM 33P connector of the wire side and ground.

TOOL:

Test probe

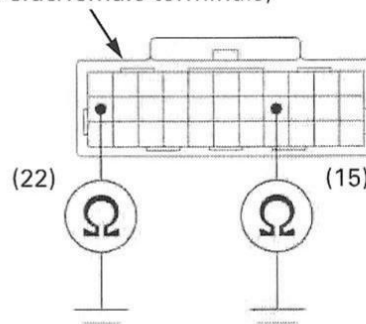
07ZAJ-RDJA110

CONNECTION: 15 (Blue) – Ground
22 (White/blue) – Ground

If there is continuity, check the White/blue and/or Blue wires for short circuit.

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

ECM 33P CONNECTOR
(Wire side/female terminals)



MIL and DLC circuit inspection with test harness

Connect the test harness to the ECM 33P (Black) connector (page 5-13).

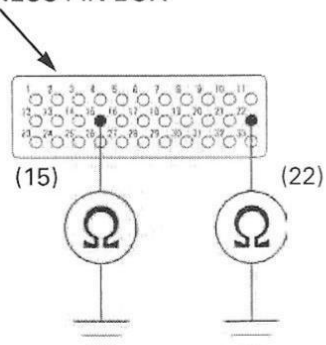
Check the continuity between the test harness and ground.

CONNECTION: 15 – Ground
22 – Ground

If there is continuity, check the White/blue and/or Blue wires for short circuit.

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

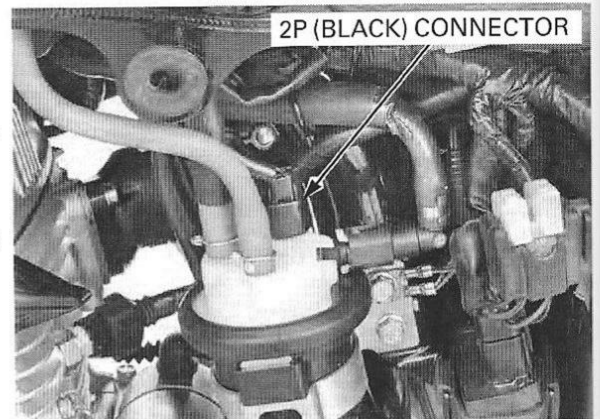
TEST HARNESS PIN BOX



FUEL LINE INSPECTION

FUEL PRESSURE RELIEVING

- Before disconnecting fuel feed hose, relieve pressure from the system as follows.
1. Turn the ignition switch OFF.
 2. Remove the side covers (page 2-10).
 3. Disconnect the fuel pump 2P (Black) connector. Turn the ignition switch ON and start the engine, and let it idle until the engine stalls.
 4. Turn the ignition switch OFF.
 5. Disconnect the battery negative (-) cable (page 15-7).

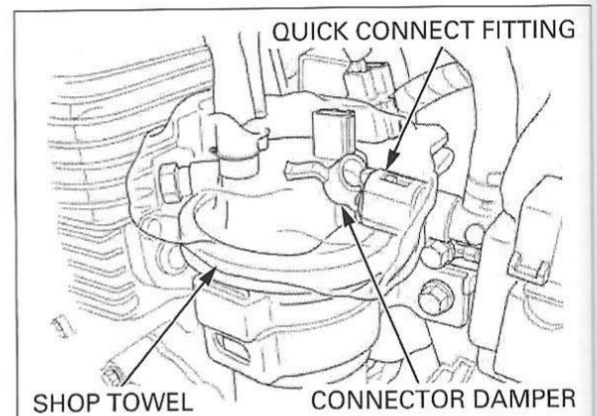


QUICK CONNECT FITTING REMOVAL

FUEL PUMP SIDE

1. Relieve the fuel pressure (page 5-46).
2. Check the fuel quick connect fitting for dirt, and clean if necessary.
3. Pull and release the connector damper from the retainer.

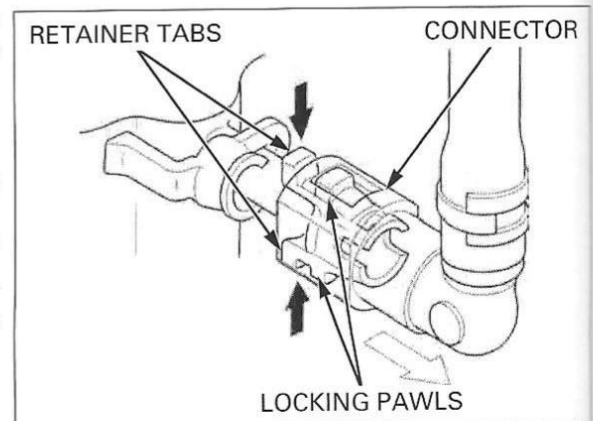
Place a shop towel over the quick connect fitting.



4. Hold the connector with one hand and squeeze the retainer tabs with the other hand to release them from the locking pawls. Pull the connector off and remove the retainer.

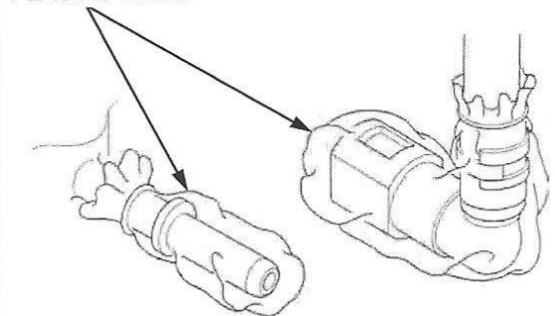
NOTE:

- Absorb the remaining fuel in the fuel feed hose with a shop towel.
- Be careful not to damage the hose or other parts.
- Do not use tools.
- If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.
- Do not bent or twist the fuel feed hose.



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

PLASTIC BAGS

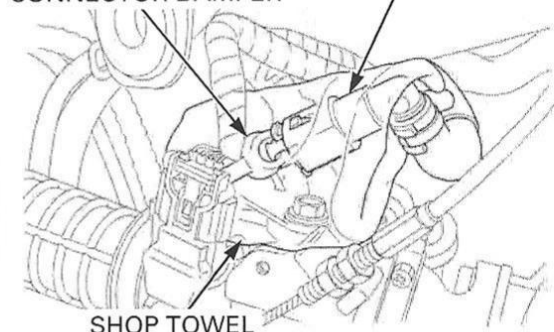


INJECTOR SIDE

1. Relieve the fuel pressure (page 5-46).
2. Check the fuel quick connect fitting for dirt, and clean if necessary
3. Pull and release the connector damper tabs from the retainer when disconnecting the injector joint quick connect fitting.

Place a shop towel over the quick connect fitting.

QUICK CONNECT FITTING
CONNECTOR DAMPER

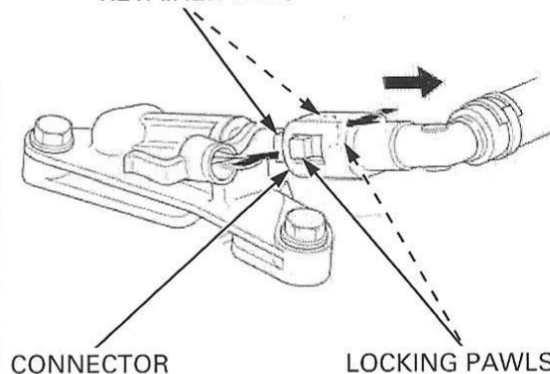


4. Hold the connector with one hand and squeeze the retainer tabs with the other hand to release them from the locking pawls. Pull the connector off and remove the retainer.

NOTE:

- Absorb the remaining fuel in the fuel feed hose with a shop towel.
- Be careful not to damage the hose or other parts.
- Do not use tools.
- If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.

RETAINER TABS

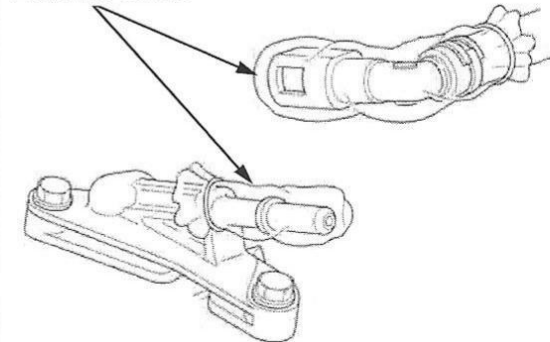


CONNECTOR

LOCKING PAWLS

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

PLASTIC BAGS



QUICK CONNECT FITTING INSTALLATION

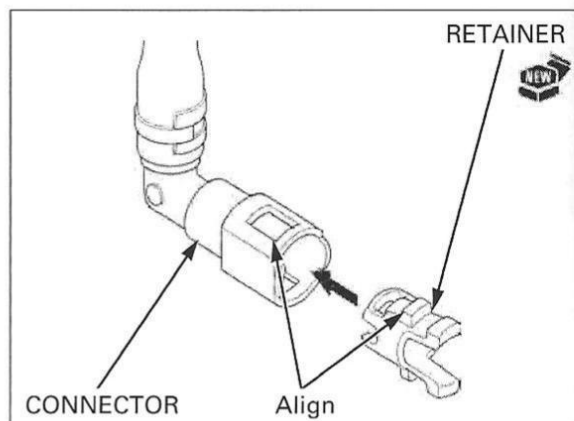
- Always replace the retainer of the quick connect fitting when the fuel feed hose is disconnected.
- If any retainer needs replacing, use the same manufacturer's retainer as the ones being removed (The various manufactures feature different retainer specifications).
- Do not bent or twist fuel feed hose.
- If the connector dampers is damaged or cut, replace it with a new one.

FUEL PUMP SIDE

1. Insert a new retainer into the connector.

NOTE:

- Align new retainer locking pawls with the connector grooves.

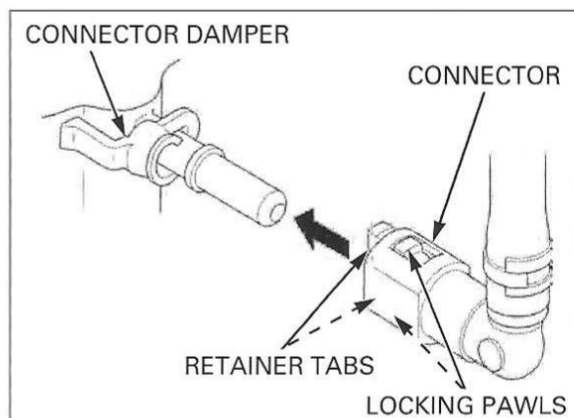


2. Set the connector damper on the fuel joint as shown.

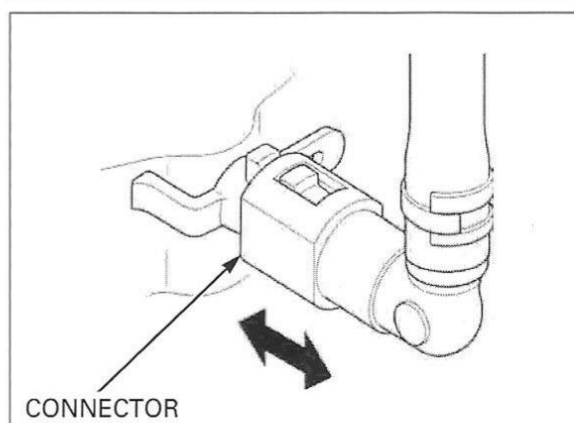
Install the connector to the fuel joint, then press the quick connect fitting onto the pipe until both retainer pawls lock with a "CLICK".

NOTE:

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



3. Make sure the connection is secure and that the locking pawls are firmly locked into place; check visually and by pulling the connector.
4. Make sure the connector damper is in place (between the retainer tabs).
5. Increase the fuel pressure and check that there is no leakage in fuel supply system (page 5-50).

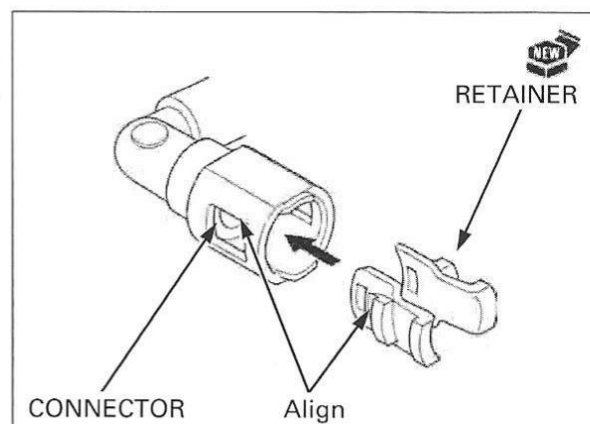


INJECTOR SIDE

1. Insert a new retainer into the connector.

NOTE:

- Align new retainer locking pawls with the connector grooves.



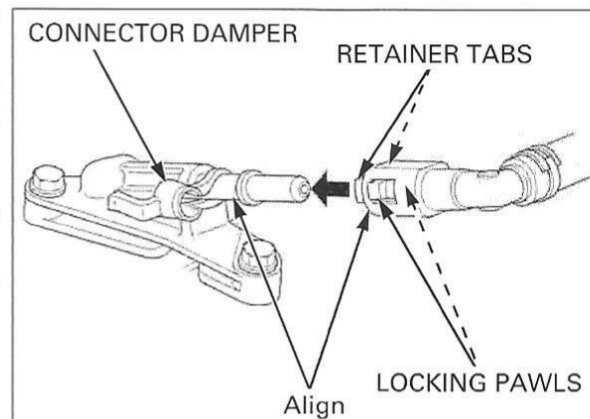
2. Set the connector damper on the injector joint as shown.

Install the connector to the injector joint, then press the quick connect fitting onto the pipe until both retainer pawls lock with a "CLICK".

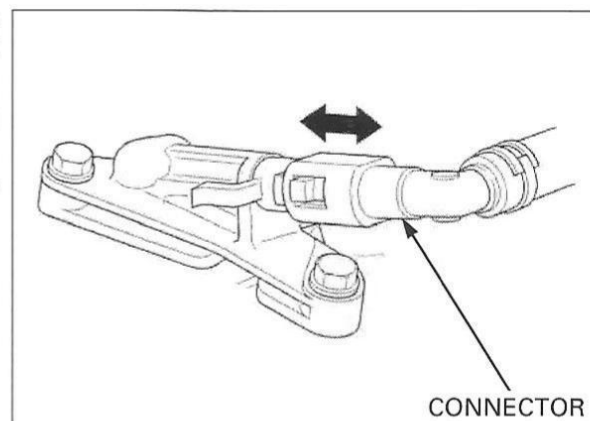
NOTE:

- Align the quick connect fitting with the injector joint.

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



3. Make sure the connection is secure and that the locking pawls are firmly locked into place; check visually and by pulling the connector.
4. Make sure the connector damper tabs are in place (between the retainer tabs).
5. Increase the fuel pressure and check that there is no leakage in fuel supply system (page 5-50).

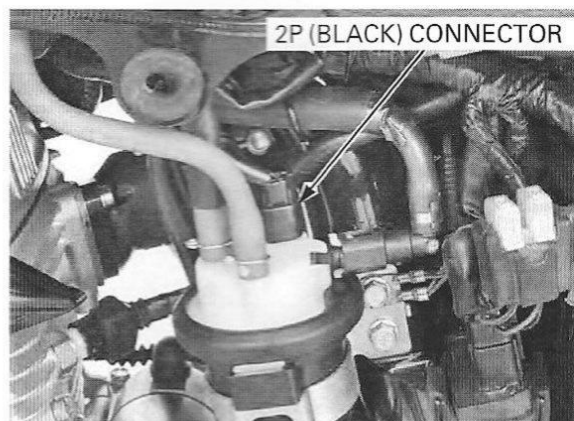


FUEL PRESSURE INCREASING

1. Connect the battery negative (–) cable.
2. Connect the fuel pump 2P (Black) connector.
3. Turn the ignition switch ON.

NOTE:

- Do not start the engine.
The fuel pump will operate for about 2 seconds, and fuel pressure will rise.
4. Turn the ignition switch OFF.
 5. Repeat step 3 and 4, 2 – 3 times, and check that there is no leakage in the fuel supply system.
 6. Install the side covers (page 2-10).



FUEL PRESSURE TEST

Relieve the fuel pressure and disconnect the quick connect fitting from the fuel pump side (page 5-46).

Attach the fuel pressure gauge, attachments and manifold between the fuel pump joint and fuel feed hose.

TOOLS:

Fuel pressure gauge	07406-0040004
Pressure gauge manifold	07ZAJ-S5A0111
Hose attachment, 9 mm/9 mm	07ZAJ-S5A0120
Hose attachment, 6 mm/9 mm	07ZAJ-S5A0130
Attachment joint, 6 mm/9 mm	07ZAJ-S5A0150

Temporarily connect the battery negative (–) cable and fuel pump 2P (Black) connector.

Turn the ignition switch ON and start the engine, and let it idle.

Read the fuel pressure.

STANDARD:

$294 \pm 6 \text{ kPa}$ ($3 \pm 0.1 \text{ kgf/cm}^2$, $43 \pm 0.9 \text{ psi}$)

If the fuel pressure is higher than specified, replace the fuel pump.

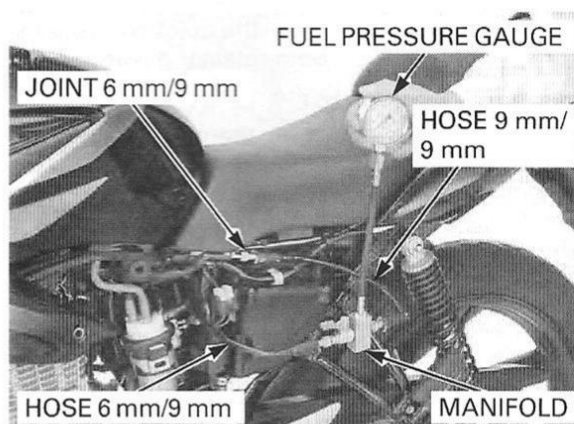
If the fuel pressure is lower than specified, inspect the following:

- Fuel line leaking
- Pinched or clogged fuel feed hose or fuel tank breather hose
- Fuel flow (page 5-51)
- Clogged fuel filter (Faulty fuel pump)

After inspection, relieve the fuel pressure (page 5-46).

Remove the fuel pressure gauge, attachments and manifold to the fuel pump joint.

Connect the quick connect fitting (page 5-48).



FUEL FLOW INSPECTION

Relieve the fuel pressure and disconnect the quick connect fitting (page 5-46).

Wipe off spilled out gasoline.

Connect the special tool to the fuel pump joint.

TOOL:

Hose attachment, 6 mm/9 mm 07ZAJ-S5A0130

Place the end of the hose into an approved gasoline container.

Temporarily connect the battery negative (-) cable and fuel pump 2P (Black) connector.

Turn the ignition switch ON.
Measure the amount of fuel flow.

NOTE:

- The fuel pump operates for 2 seconds. Repeat 5 times so that the total measuring time.
- Return fuel to the fuel tank when the first fuel is flowed.

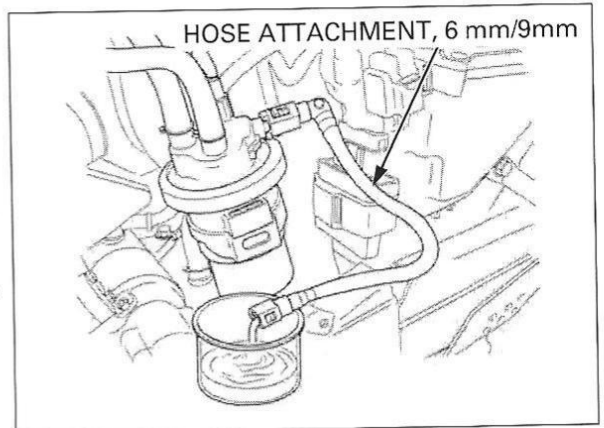
Amount of fuel flow:

27.7 cm³ (0.94 US oz, 0.98 Imp oz) minimum/10 seconds at 12 V

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

- Fuel pump (page 5-51)
- Clogged fuel filter (Faulty fuel pump unit)
- Clogged fuel cap breather hole

Connect the quick connect fitting (page 5-48).



SUB FUEL TANK/FUEL PUMP INSPECTION

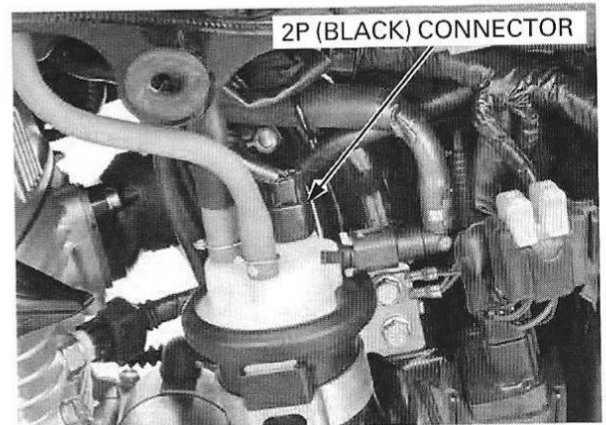
Turn the ignition switch ON and confirm that the fuel pump operates a few seconds.

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

Turn the ignition switch OFF.

Remove the left side cover (page 2-10).

Disconnect the fuel pump 2P (Black) connector.



FUEL SYSTEM (PGM-FI)

Turn the ignition switch ON.
Measure the voltage at the fuel pump 2P (Black) connector of the wire side.

CONNECTION: Black/blue (+) – Brown (-)

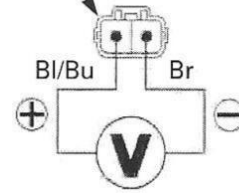
There should be standard voltage for a few seconds.

If there is standard voltage, replace the sub fuel tank/fuel pump.

If there is no standard voltage, inspect the following:

- Main fuse (15 A)
- Sub fuse B (10 A)
- Ignition switch
- Open circuit in Red, Red/black or Black/blue wire
- ECM (page 5-67)

FUEL PUMP 2P (BLACK) CONNECTOR
(Wire side/female terminals)



REMOVAL

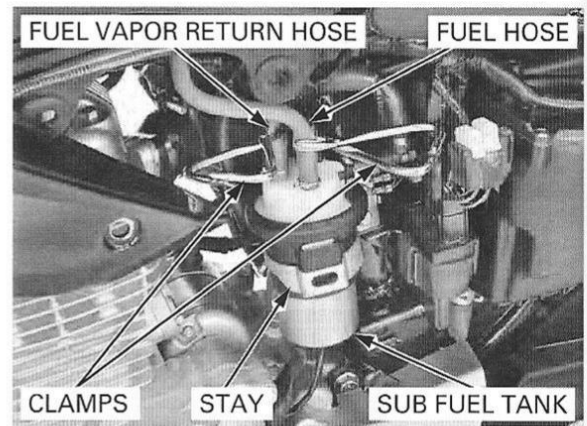
- Do not disassemble the sub fuel tank/fuel pump.

Relieve the fuel pressure and disconnect the quick connect fitting (page 5-46).

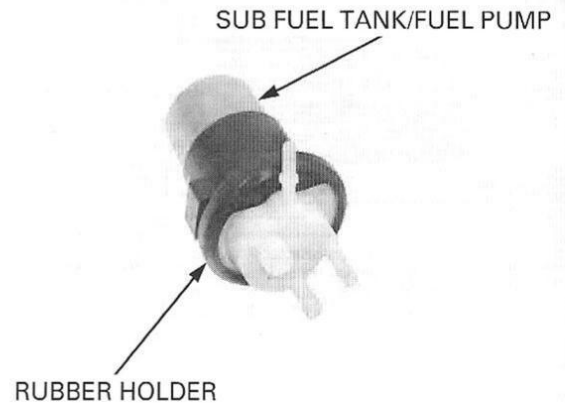
Install clamps to the fuel hose and fuel vapor return hose, and shut them as shown.

Disconnect the fuel hose and fuel vapor return hose from the sub fuel tank/fuel pump.

Remove the sub fuel tank/fuel pump assembly from the stay.



Remove the rubber holder from the sub fuel tank/fuel pump.



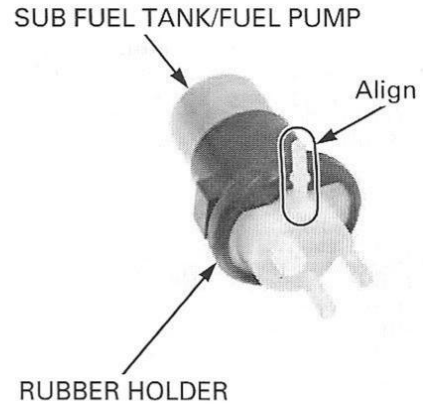
INSPECTION

Check the sub fuel tank/fuel pump for damage, replace it if necessary.



INSTALLATION

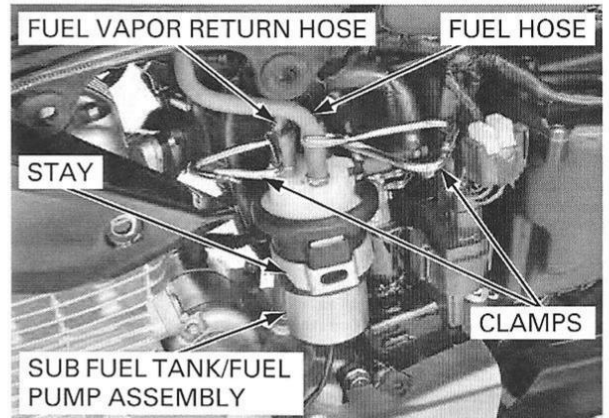
Install the rubber holder to the sub fuel tank/fuel pump by aligning its semicircular groove with fuel joint.



Connect the fuel hose and fuel vapor return hose to the sub fuel tank/fuel pump.

Remove the clamps.

Connect the quick connect fitting (page 5-48).



FUEL TANK

REMOVAL

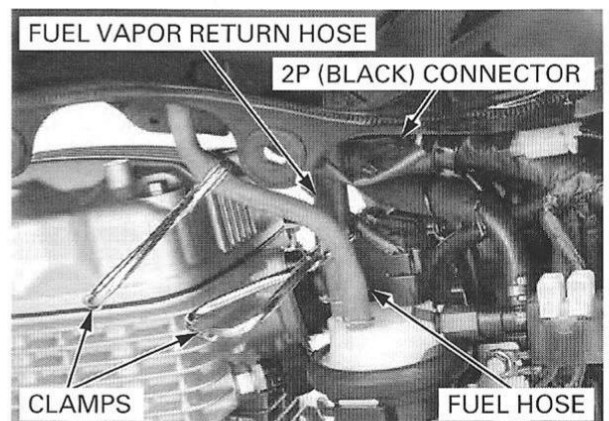
Remove the front cowl (page 2-5).

Relieve the fuel pressure and disconnect the quick connect fitting from the sub fuel tank/fuel pump (page 5-46).

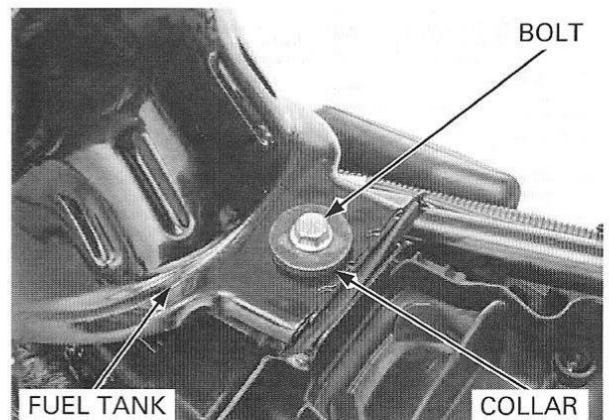
Disconnect the fuel level sensor 2P (Black) connector.

Install clamps to the fuel hose and fuel vapor return hose, and shut them as shown.

Disconnect the fuel hoses from the sub fuel tank/fuel pump.

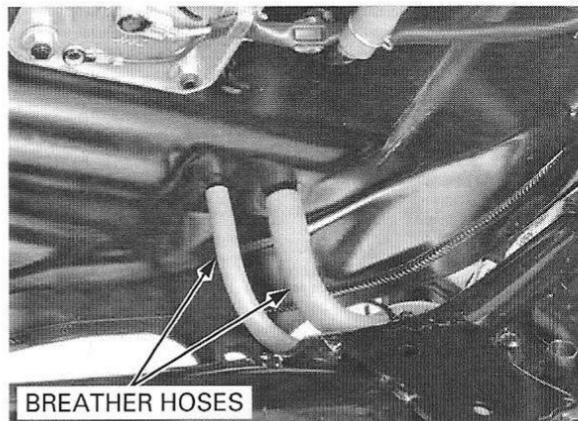


Remove the bolt and collar from the rear side of fuel tank.



FUEL SYSTEM (PGM-FI)

Disconnect the fuel tank breather hoses from the fuel tank and remove the fuel tank.



INSTALLATION

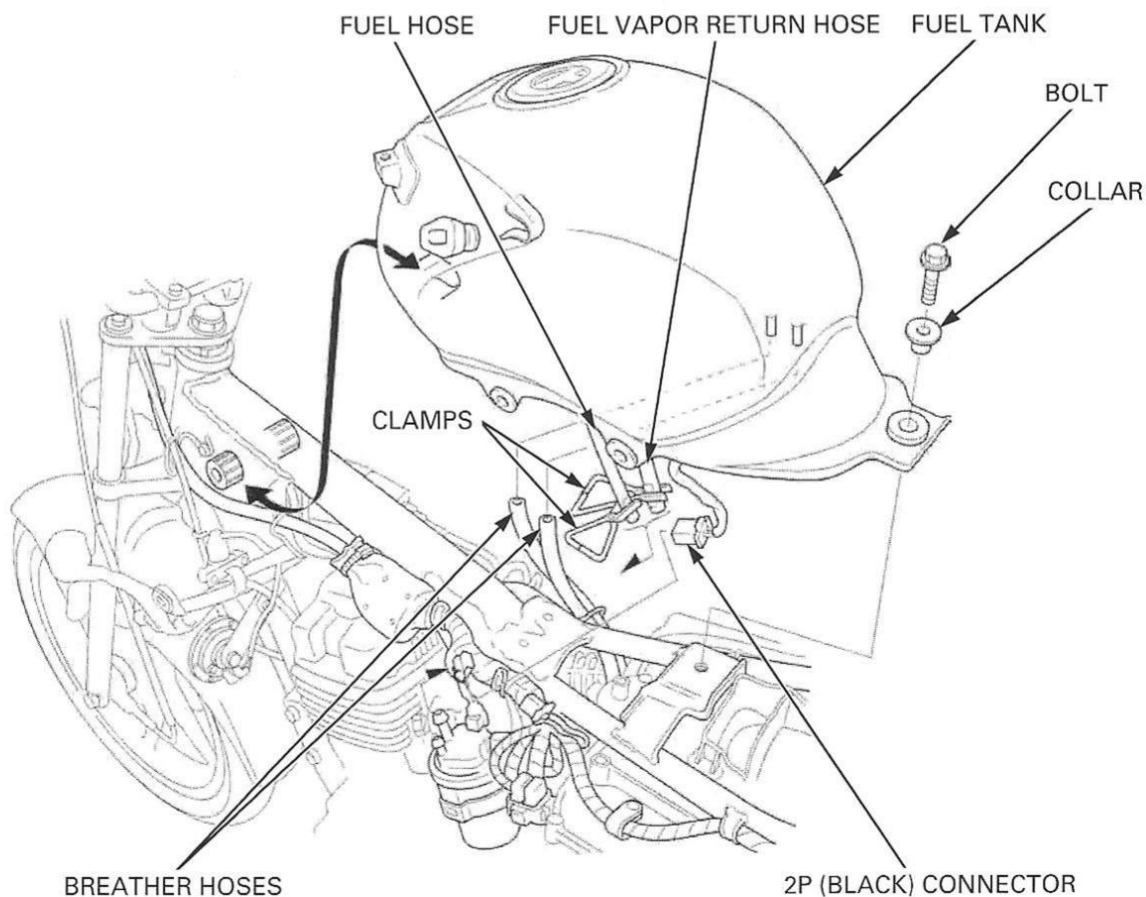
- Route the hose and wire properly (page 1-16).

Connect the fuel tank breather hoses to the fuel tank.

Install the fuel tank, collar and bolt.

Connect the fuel hoses to the fuel tank, then remove the clamps from them.

Connect the fuel level sensor 2P (Black) connector.



Connect the quick connect fitting (page 5-48).

Install the removed parts in the reverse order of removal.

AIR CLEANER HOUSING

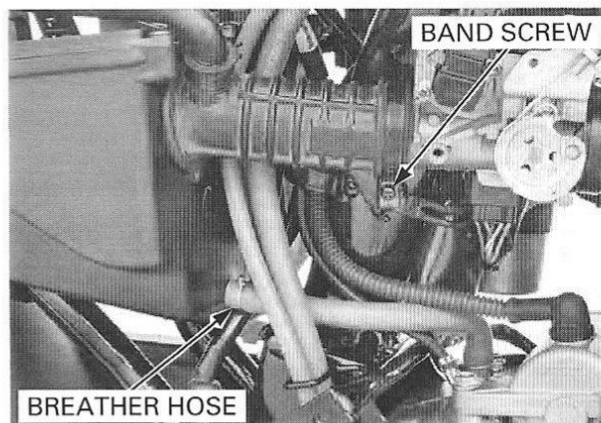
REMOVAL/INSTALLATION

Remove the following:

- Air cleaner element (page 3-6).
- Side covers (page 2-10)

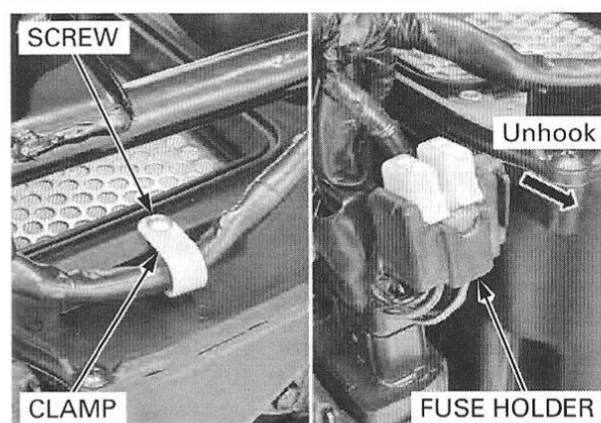
Disconnect the crankcase breather hose.

Loosen the connecting hose band screw.

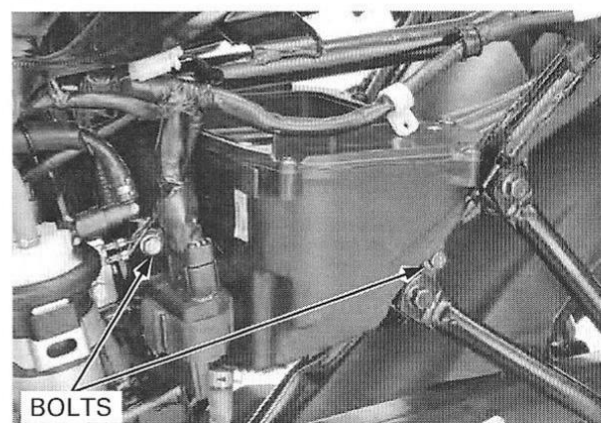


Remove the screw and main wire harness clamp.

Unhook the sub fuse holder from the air cleaner housing.

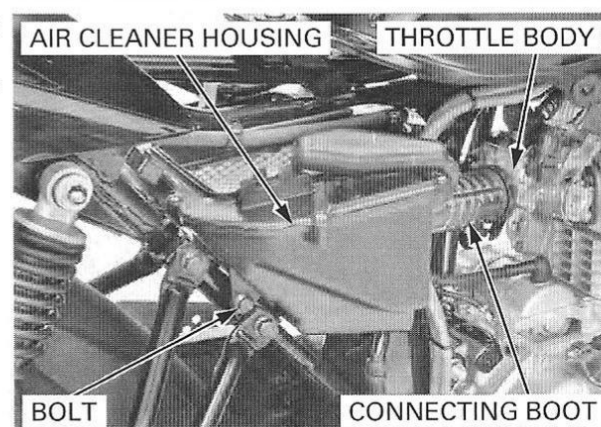


Remove the bolts from left side air cleaner housing.



Remove the bolt, and release the connecting boot from the throttle body.

Remove the air cleaner housing to the right side of the frame.



Installation is in the reverse order of removal.

Route the hose and wire properly (page 1-16).

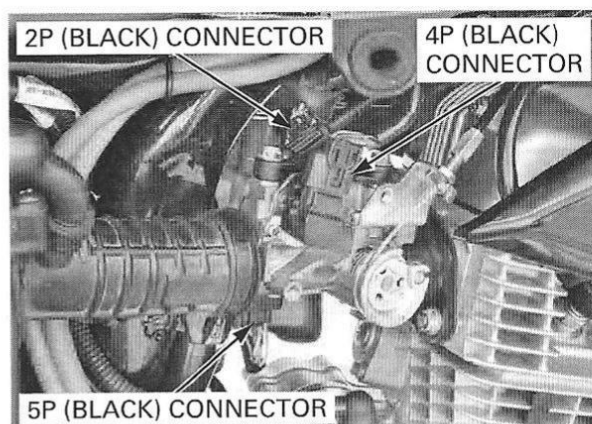
THROTTLE BODY

REMOVAL

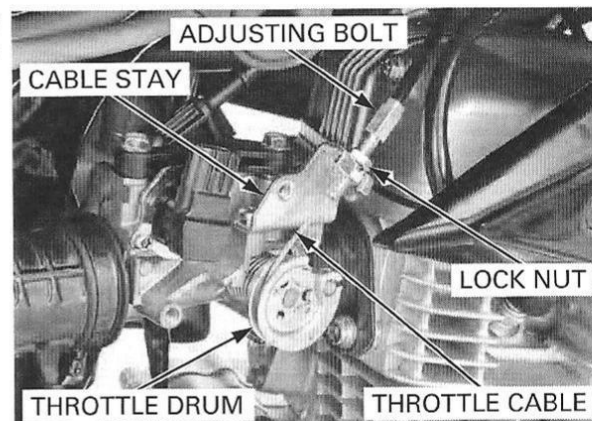
Relieve the fuel pressure and disconnect the quick connect fitting from the injector (page 5-46).

Disconnect the following:

- Injector 2P (Black) connector
- IACV 4P (Black) connector
- Sensor unit 5P (Black) connector

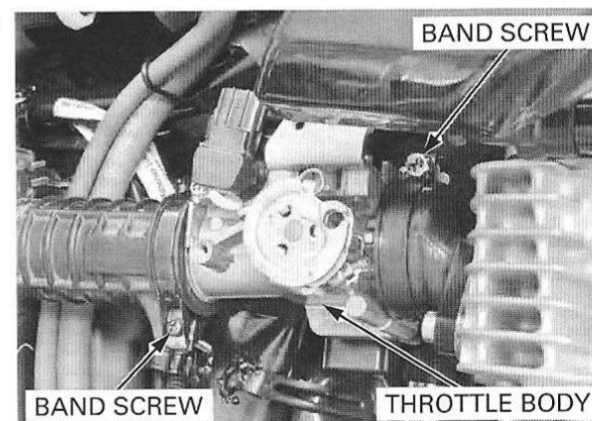


Loosen the throttle cable lock nut and adjusting bolt then disconnect the throttle cable from the throttle drum and cable stay.



Loosen the band screws and remove the throttle body assembly.

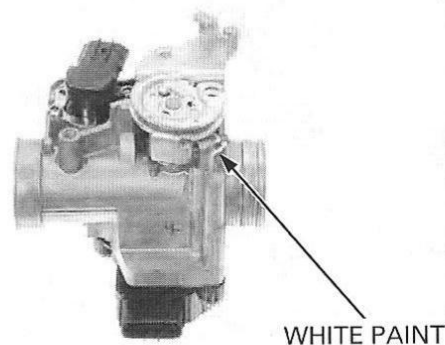
Place a shop towel over the insulator.



DISASSEMBLY

NOTICE

- 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 fully opened to fully closed after the throttle cable has been removed. It may cause incorrect idle operation.
- Do not damage the throttle body. It may cause incorrect throttle valve operation.
- Do not loosen or tighten the white painted nut and screw of the throttle body. Loosening or tightening them can cause throttle valve and idle control failure.
- Always clean around the throttle body before each sensor removal to prevent dirt and debris from entering the air passage.



Remove the following:

- Injector (page 5-61)
- IACV (page 5-63)

Remove the sensor unit torx screws and sensor unit.

Remove the O-ring from the throttle body groove.

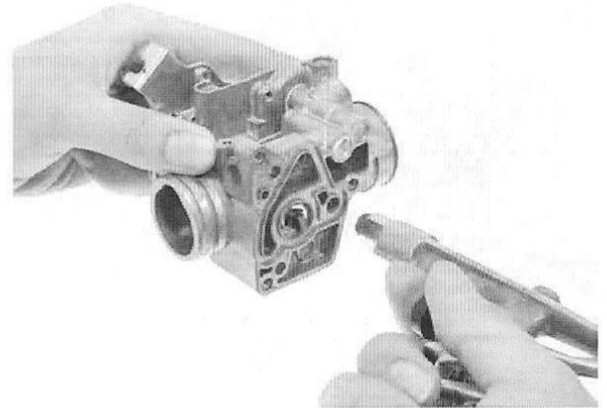
TORX SCREWS

O-RING

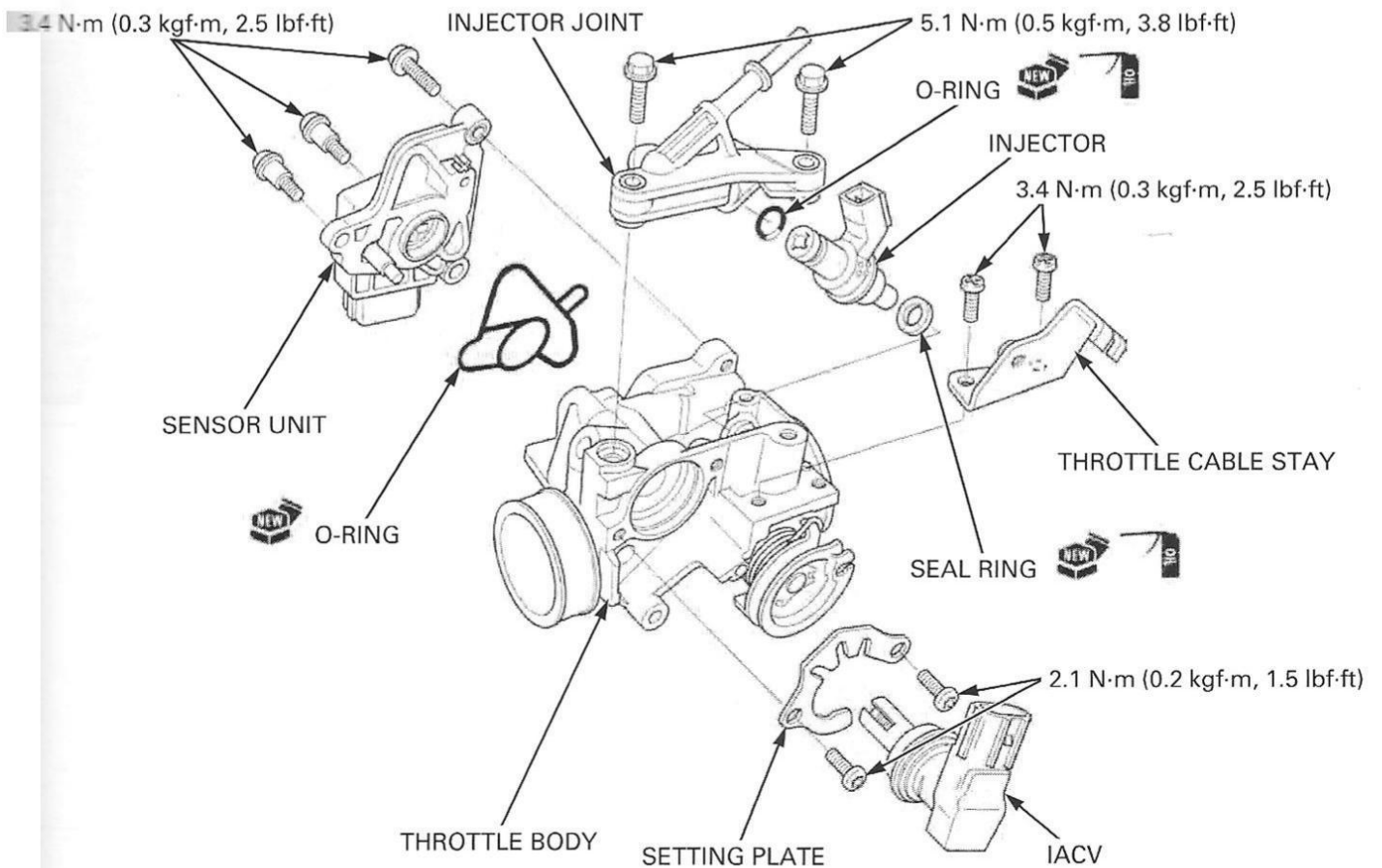
SENSOR UNIT

Cleaning the air passages and sensor hole with a piece of wire will damage the throttle body.

Blow open all air passages and sensor holes in the throttle body with compressed air.



ASSEMBLY



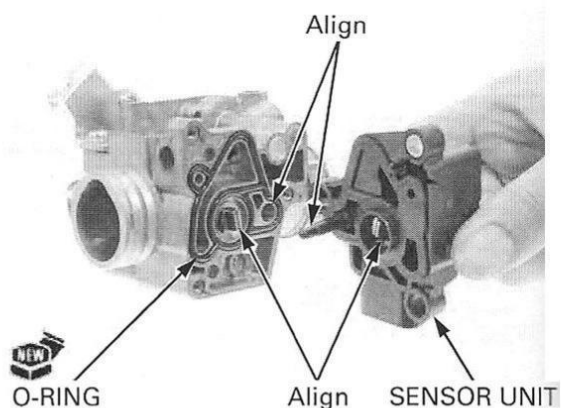
FUEL SYSTEM (PGM-FI)

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

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

When installing the sensor unit to the throttle body, align the following:

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



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

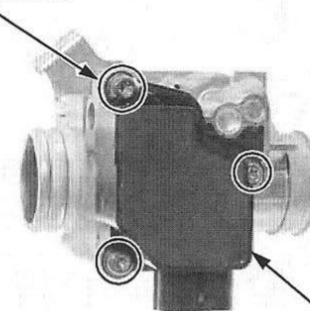
TORQUE: 3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)

- Reset the TP sensor (page 5-60).

Install the following:

- Injector (page 5-62)
- IACV (page 5-64)

TORX SCREWS



SENSOR UNIT

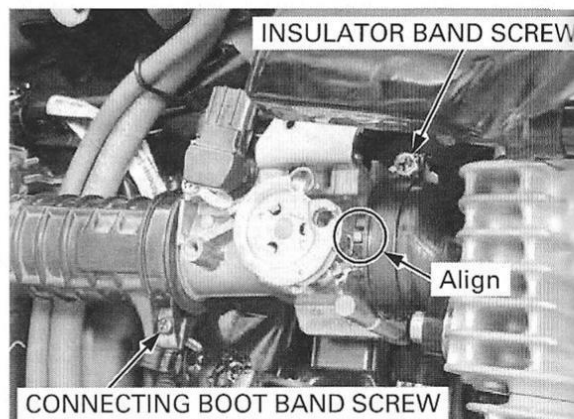
INSTALLATION

Install the throttle body assembly to the insulator by aligning its tab with the groove of the insulator.

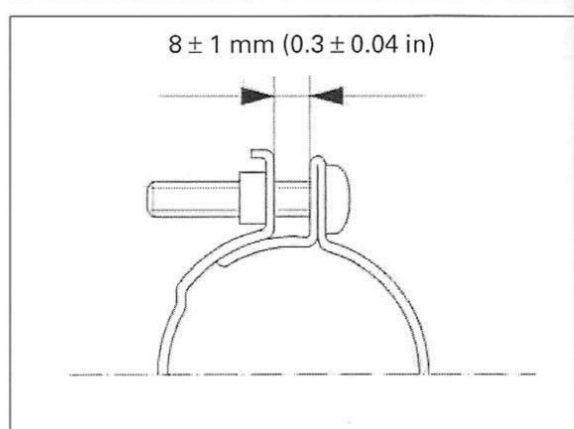
Tighten the connecting boot band screw securely.

Tighten the insulator band screw to the specified torque.

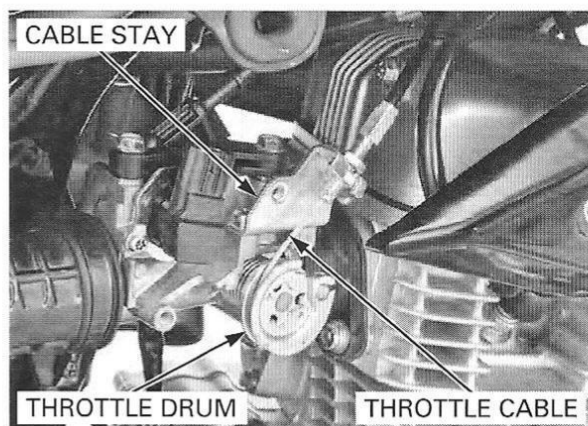
TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)



Check that the width between the insulator band ends clearance is 8 ± 1 mm (0.3 ± 0.04 in).



Connect the throttle cable to the throttle drum and cable stay.

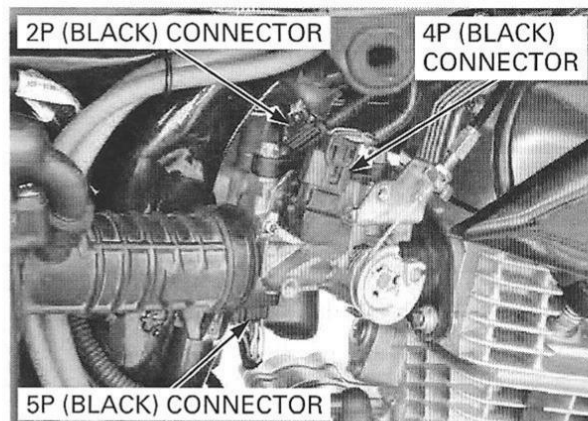


Connect the following:

- Injector 2P (Black) connector
- IACV 4P (Black) connector
- Sensor unit 5P (Black) connector

NOTE:

If the sensor unit is removed, reset the TP sensor (page 5-60).



Route the hose and wire properly (page 1-16).

Connect the quick connect fitting (page 5-48).
Adjust the throttle grip freeplay (page 3-5).

TP SENSOR RESET PROCEDURE

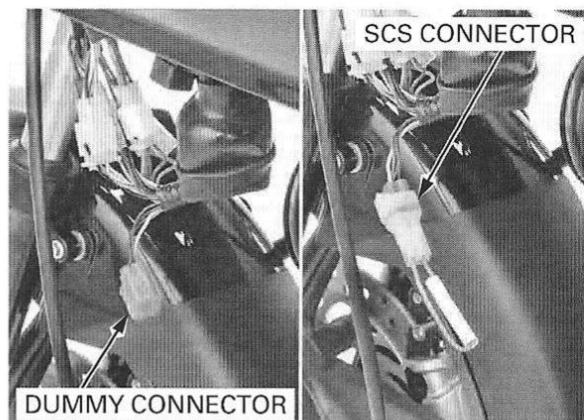
- Make sure that the DTCs are not stored in ECM.
If the DTCs are stored in ECM, the TP sensor reset mode won't start.
- If the sensor unit is removed, reset the throttle valve fully closed position as following.

1. Erase the DTC's (page 5-12).
2. Turn the ignition switch OFF.
3. Remove the dummy connector.
4. Short the DLC using the special tool.

TOOL:

SCS connector

070PZ-ZY30100



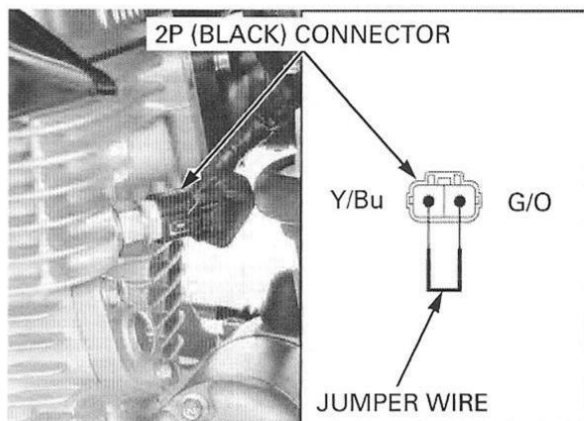
5. Remove the left side cover (page 2-10) and disconnect the EOT sensor 2P (Black) connector.

Short the EOT sensor 2P (Black) connector of the wire side using a jumper wire.

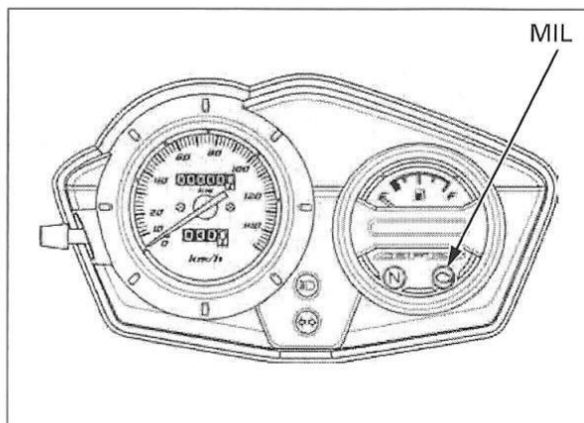
CONNECTION: Yellow/blue – Green/orange

6. Turn the ignition switch ON.

Within 10 seconds after turning the ignition switch ON, disconnect the jumper wire from the EOT sensor 2P (Black) connector.



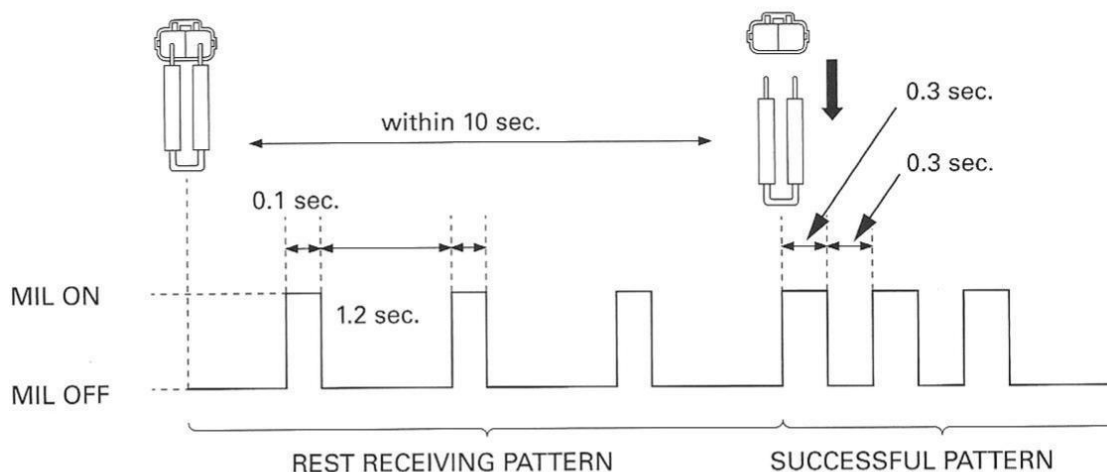
7. After disconnecting the jumper wire, the MIL start to blinking.



8. Check if the MIL is blinking.

If the MIL begins short blink (0.3 seconds), the throttle valve fully closed position is reset.

- If the MIL stays lit, the throttle valve fully closed position is not reset, perform the reset procedure from step 4 again.



9. Turn the ignition switch OFF.

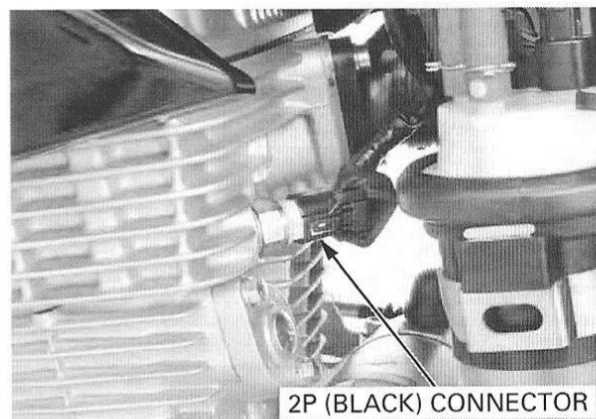
10. Connect the EOT sensor 2P (Black) connector.

Install the left side cover (page 2-10).

11. Disconnect the SCS connector from the DLC and install the dummy connector.

12. Check the engine idle speed (page 3-14).

- If the engine revolution is out of specification, check the following:
 - Throttle operation (page 3-5)
 - IACV (page 5-63)
 - Intake air leaks
 - Sensor unit installed condition



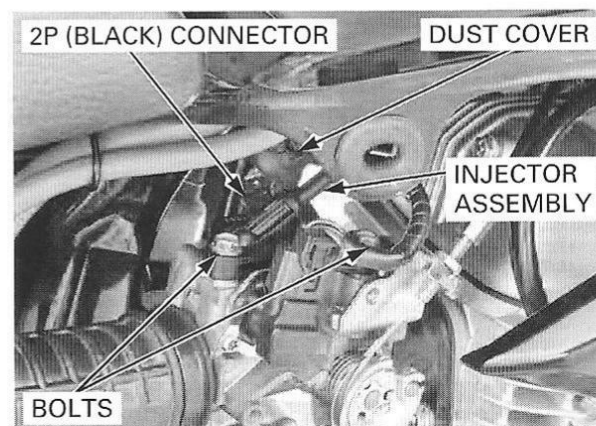
INJECTOR

REMOVAL

Relieve the fuel pressure and disconnect the quick connect fitting (page 5-46).

Slide the dust cover and disconnect the injector 2P (Black) connector.

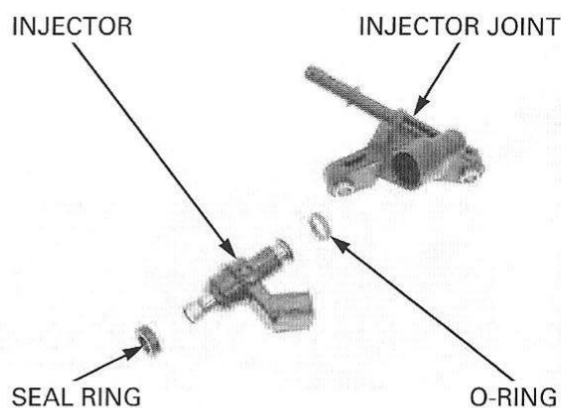
Remove the bolts and injector assembly from the throttle body.



FUEL SYSTEM (PGM-FI)

Remove the injector joint, O-ring and seal ring from the injector.

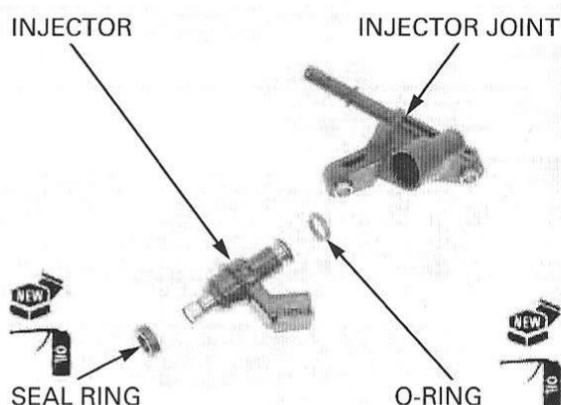
Check the removed parts for wear or damage and replace them if necessary.



INSTALLATION

Apply engine oil to new O-ring and seal ring.

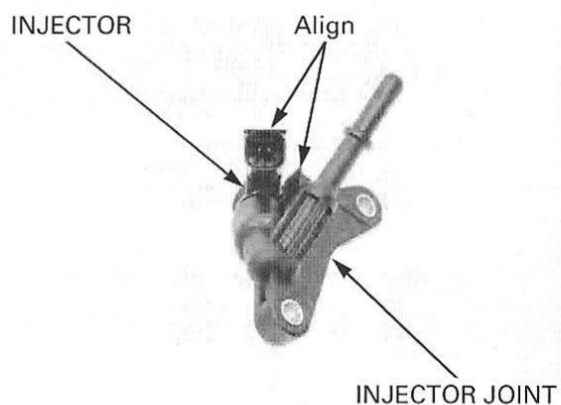
Install the O-ring and seal ring to the injector, being careful not to damage them.



Install the injector into the injector joint, being careful not to damage the O-ring.

NOTE:

Align the injector with the injector joint as shown.

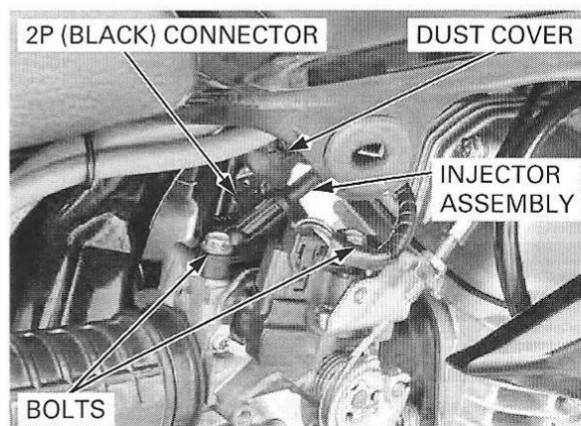


Be careful not to damage the seal ring.

Install the injector assembly to the throttle body. Install and tighten the injector joint mounting bolts alternately to the specified torque.

TORQUE: 5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)

Connect the injector 2P (Black) connector and install the dust cover.



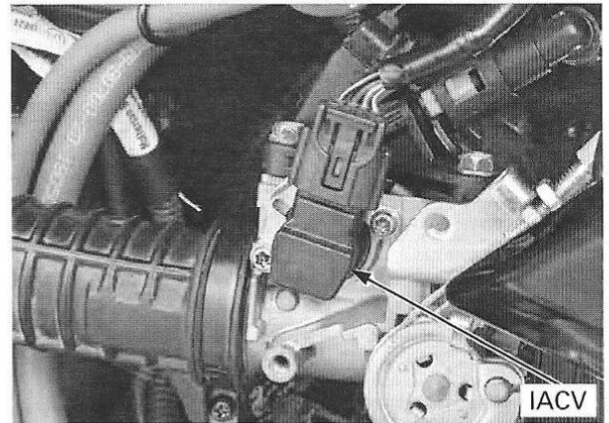
IACV

INSPECTION

The IACV is installed on the throttle body and is operated by the step motor. When the ignition switch is turned ON, the IACV operates for a few seconds.

Check the step motor operating (beep) sound with the ignition switch turned ON.

Check the IACV for wear or damage.
Replace if necessary.

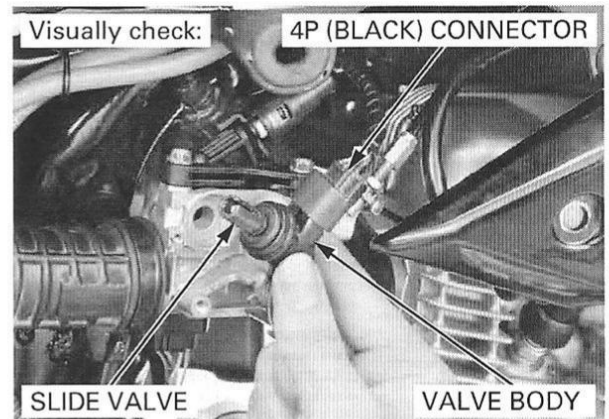


The IACV operation can be checked visually as follows:

Remove the IACV (page 5-63).

Connect the IACV 4P (Black) connector and turn the ignition switch ON.

- The IACV slide valve will move to valve body, and then move out the valve body while guiding the groove of the slide valve.



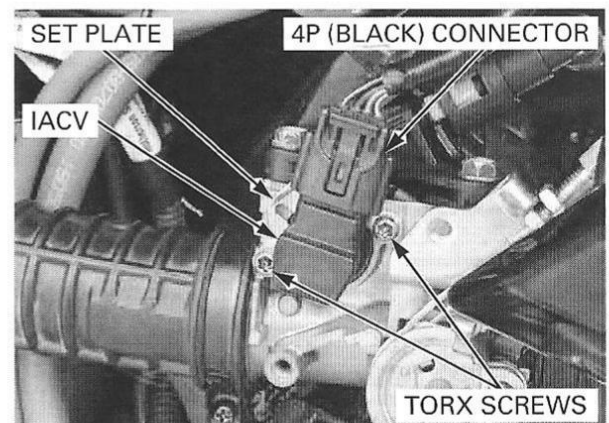
REMOVAL

- Always clean the throttle body before the IACV removal to prevent dirt and debris from entering the IACV passage.

Remove the left side cover (page 2-10).

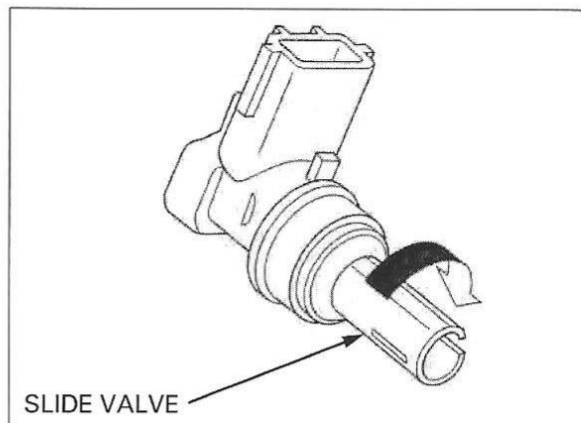
Disconnect the IACV 4P (Black) connector.

Remove the torx screw, set plate and IACV from the throttle body.

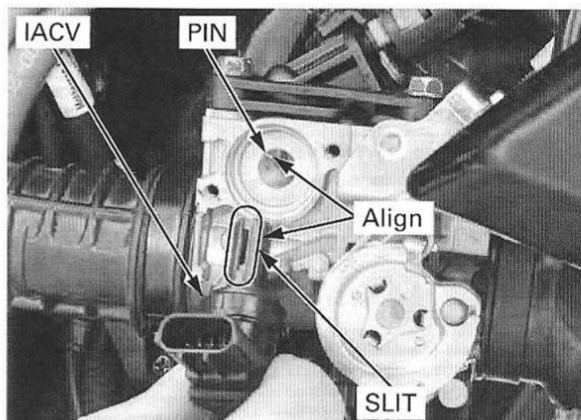


INSTALLATION

Turn the slide valve clockwise until lightly seated on valve body.



Install the IACV into the throttle body while aligning its valve slit with the slide valve housing pin in the throttle body.



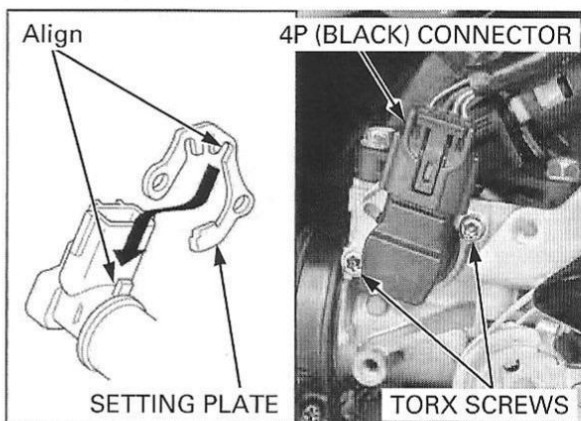
Install the setting plate while aligning its cut-out with the lug on the IACV as shown.

Install and tighten the IACV setting plate torx screws to the specified torque.

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

Connect the IACV 4P (Black) connector.

Install the left side cover (page 2-10).



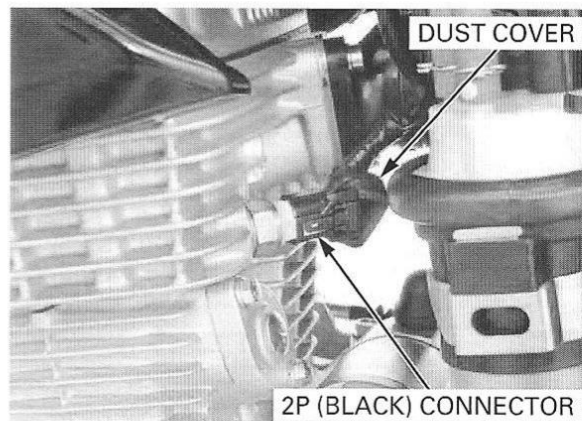
EOT SENSOR

REMOVAL/INSTALLATION

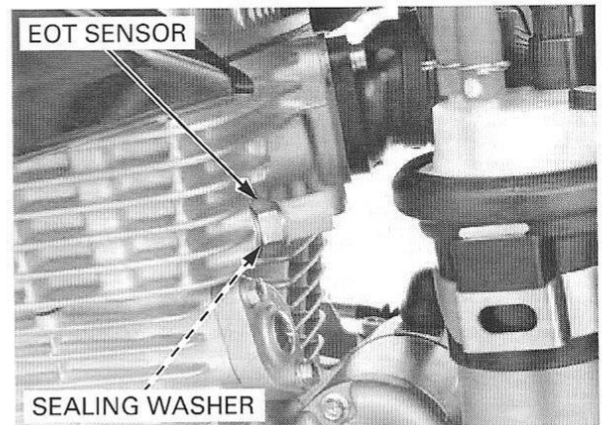
- Replace the EOT sensor while the engine is cold.

Remove the left side cover (page 2-10).

Slide the dust cover and disconnect the EOT sensor 2P (Black) connector.



Remove the EOT sensor and sealing washer.



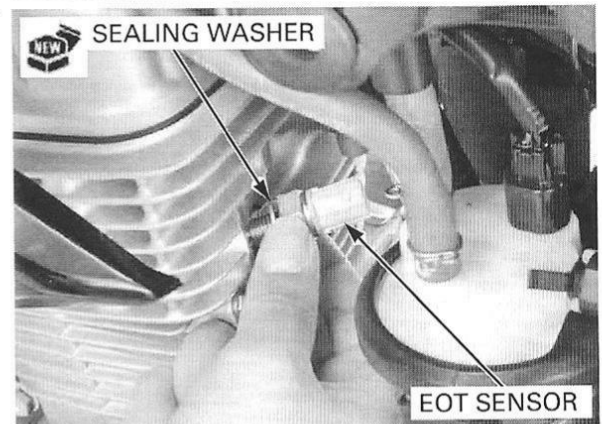
Always replace a sealing washer with a new one.

Install a new sealing washer onto the EOT sensor and install them. Tighten the EOT sensor to the specified torque.

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)

Connect the EOT sensor 2P (Black) connector.

Check the engine oil level (page 3-10).

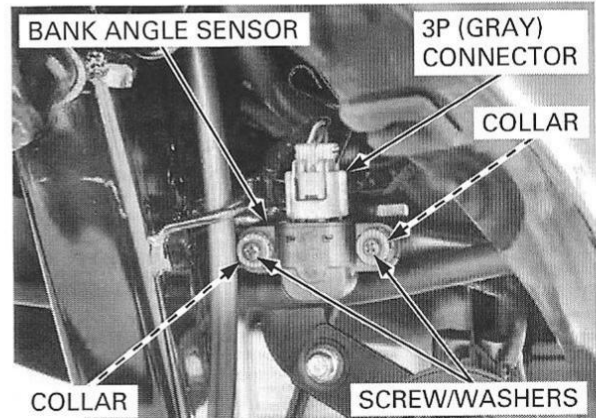


BANK ANGLE SENSOR

REMOVAL/INSTALLATION

Disconnect the bank angle sensor 3P (Gray) connector.

Remove the mounting screw/washers, collars and bank angle sensor.

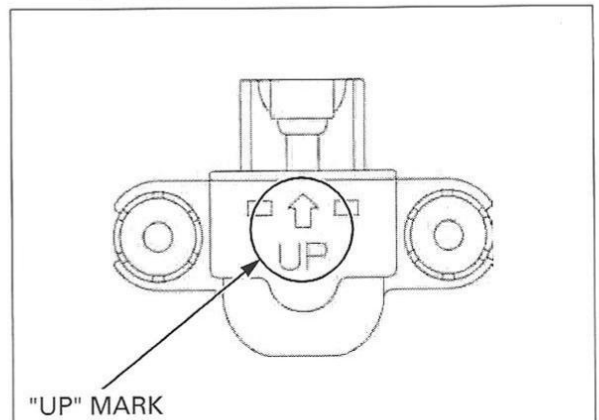


Install the bank angle sensor with its "UP" mark facing up.

Install the bank angle sensor, collars and mounting screw/washers.

Tighten the mounting screw/washers securely.

Connect the bank angle sensor 3P (Gray) connector.



INSPECTION WITH HDS POCKET TESTER

Connect the HDS pocket tester (page 5-11).
Remove the bank angle sensor (page 5-65).

Connect the bank angle sensor 3P (Gray) connector.

Place the bank angle sensor is horizontal as shown.

Turn the ignition switch ON.

Read the voltage with the HDS pocket tester.

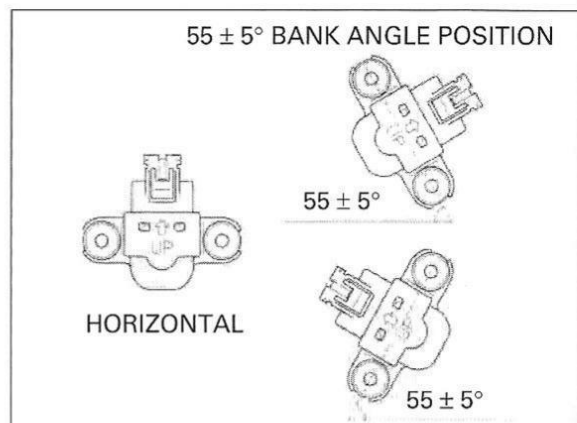
STANDARD: 3.6 – 4.4 V

Incline the bank angle sensor $55 \pm 5^\circ$ to the left or right with keeping the ignition switch ON.

Read the voltage with HDS pocket tester.

STANDARD: 0.7 – 1.3 V

- If you repeat this test, first turn the ignition switch OFF, then turn the ignition switch ON.



INSPECTION WITH ECM TEST HARNESS

Connect the test harness (page 5-13).

Remove the bank angle sensor (page 5-65).

Connect the bank angle sensor 3P (Gray) connector.

Place the bank angle sensor is horizontal as shown.

Turn the ignition switch ON.

Measure the output voltage with the test harness terminals.

CONNECTION: 26 (+) – 4 (–)

STANDARD: 3.6 – 4.4 V

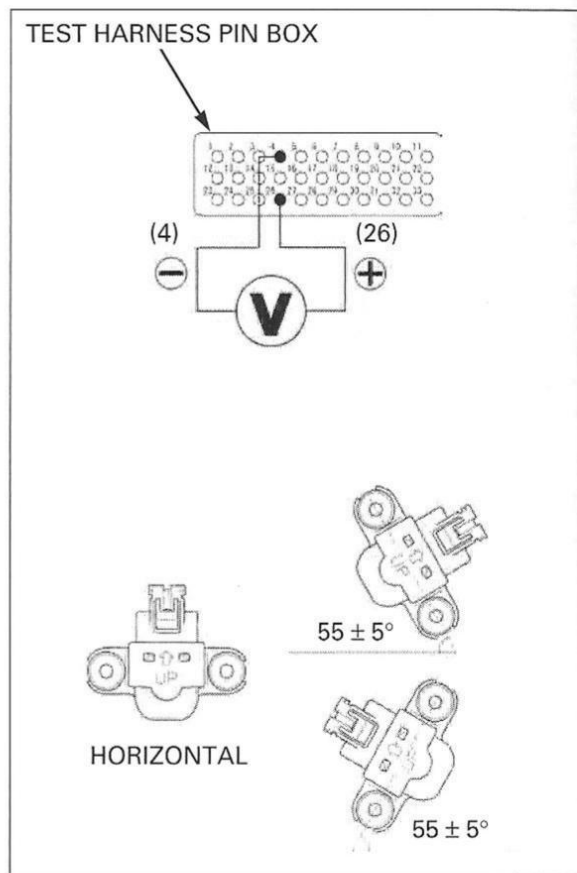
Incline the bank angle sensor $55 \pm 5^\circ$ to the left or right with keeping the ignition switch ON.

Measure the output voltage with test harness terminals.

CONNECTION: 26 (+) – 4 (–)

STANDARD: 0.7 – 1.3 V

- If you repeat this test, first turn the ignition switch OFF, then turn the ignition switch ON.



ECM

REMOVAL/ INSTALLATION

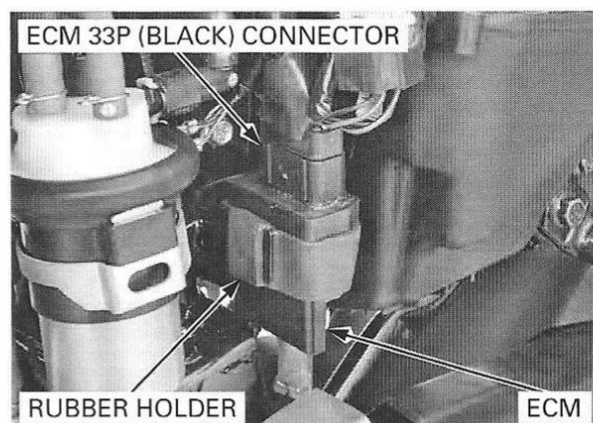
Remove the left side cover (page 2-10).

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector.
Remove the ECM from the rubber holder.

Install the ECM to the rubber holder.
Connect the ECM 33P (Black) connector.

Install the left side cover (page 2-10)



ECM POWER/GROUND LINE INSPECTION WITH TEST PROBE

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

ENGINE DOES NOT START (No DTC)

1. ECM Power Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) connector.

Turn the ignition switch ON.
Measure the voltage at the ECM 33P connector of the wire side and ground.

TOOL:

Test probe 07ZAJ-RDJA110

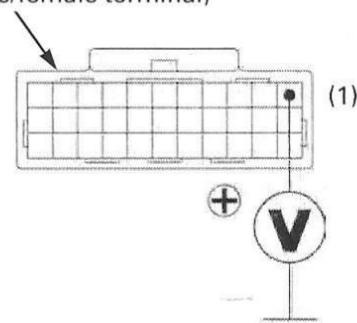
CONNECTION: 1 (Black/blue) (+) – Ground

Is there battery voltage?

YES – GO TO STEP 2.

- NO** –
- Open or short circuit in Black/blue wire
 - Faulty ignition switch
 - Blown main or sub fuse B (10 A)

ECM 33P CONNECTOR
(Wire side/female terminal)



2. ECM Ground Line Inspection

Turn the ignition switch OFF.
Check the continuity between the ECM 33P connector of the wire side and ground.

TOOL:

Test probe 07ZAJ-RDJA110

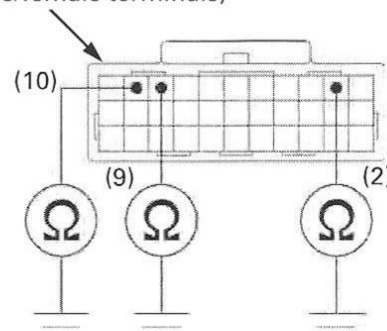
CONNECTION: 9 (Green) – Ground (PG1)
10 (Green) – Ground (PG2)
2 (Green/black) – Ground (LG)

Is there continuity?

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

- NO** –
- Open circuit in Green wires
 - Open circuit in Green/black wire

ECM 33P CONNECTOR
(Wire side/female terminals)



ECM POWER/GROUND LINE INSPECTION WITH TEST HARNESS

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

ENGINE DOES NOT START (MIL no blinks)

1. ECM Power Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) connector.

Turn the ignition switch ON.
Measure the voltage at the test harness terminal and ground.

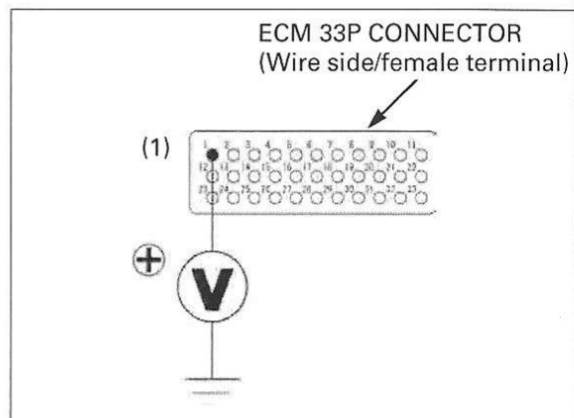
CONNECTION: 1 (+) – Ground

Is there battery voltage?

YES – GO TO STEP 2.

NO –

- Open or short circuit in Black/blue wire
- Faulty ignition switch
- Blown main or sub fuse B (10 A)



2. ECM Ground Line Inspection

Turn the ignition switch OFF.
Check the continuity between the test harness terminals and ground.

CONNECTION: 9 – Ground (PG1)

10 – Ground (PG2)

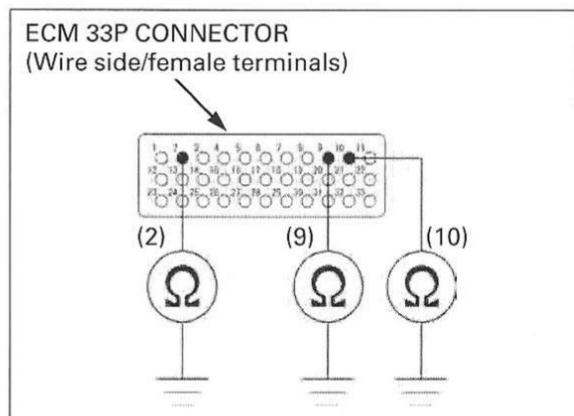
2 – Ground (LG)

Is there continuity?

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

NO –

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



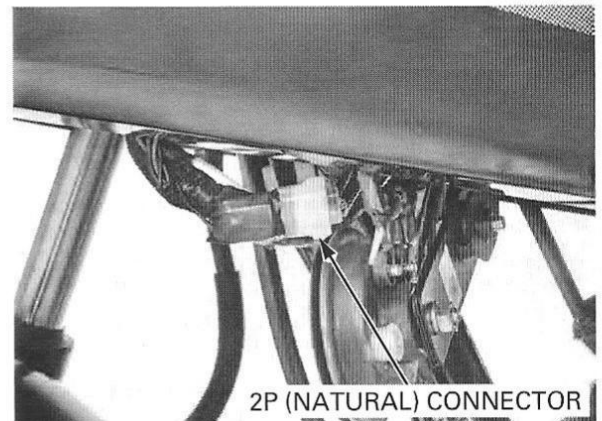
O₂ SENSOR

NOTICE

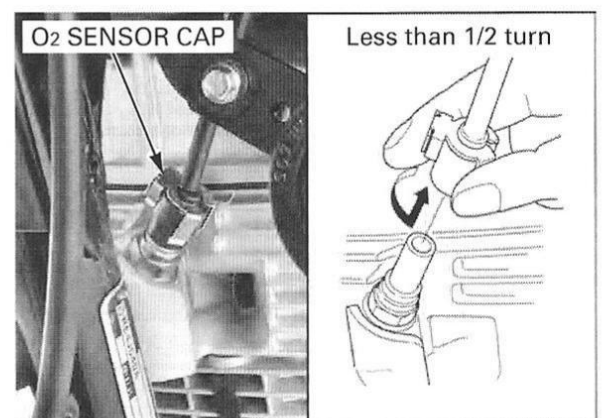
- Do not get grease, oil or other materials in the O₂ sensor air hole.
- The O₂ sensor may be damaged if dropped. Replace it with a new one, if dropped.
- Handle the O₂ sensor with care.
- Do not service the O₂ sensor while it is hot.

REMOVAL

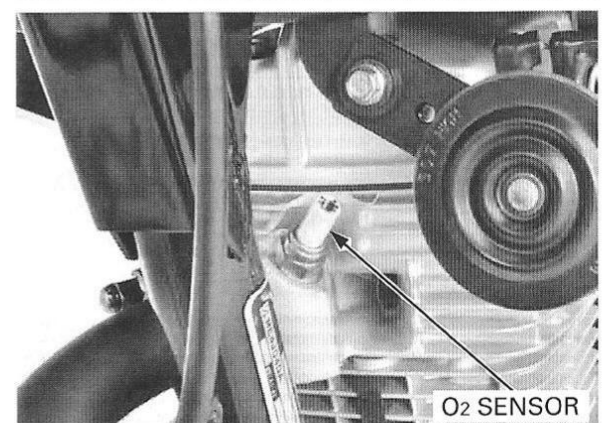
Disconnect the O₂ sensor 2P (Natural) connector.



Hold the center of the O₂ sensor cap by hand and disconnect the cap while turning it less than 1/2 of a turn.



Remove the O₂ sensor.



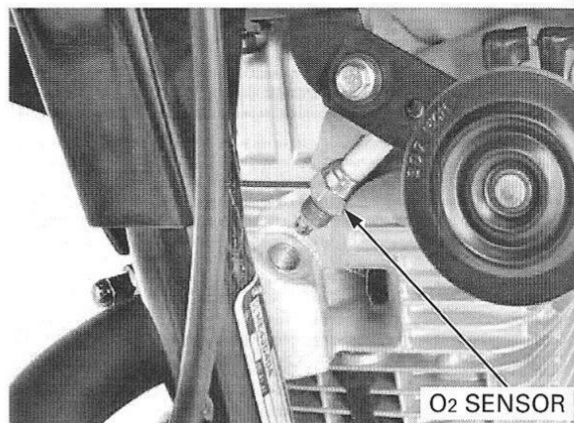
INSTALLATION

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

Install and hand tighten the O₂ sensor onto the cylinder head.

Tighten the O₂ sensor to the specified torque.

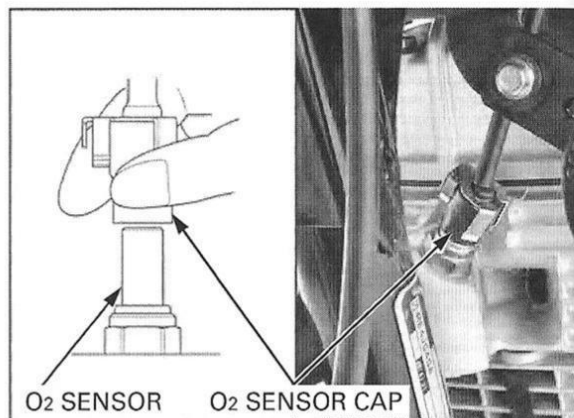
TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)



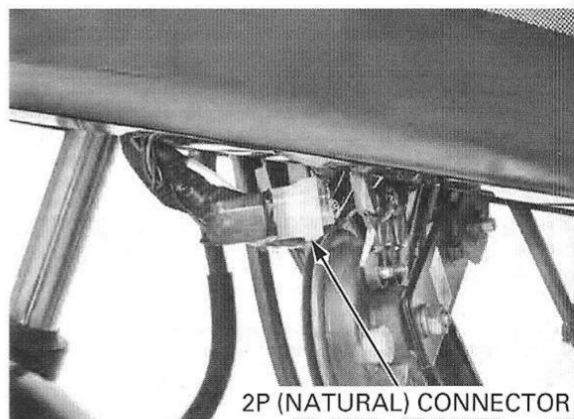
Connect the O₂ sensor cap by pushing it straight.

NOTICE

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



Connect the O₂ sensor 2P (Natural) connector.



6. ENGINE REMOVAL/INSTALLATION

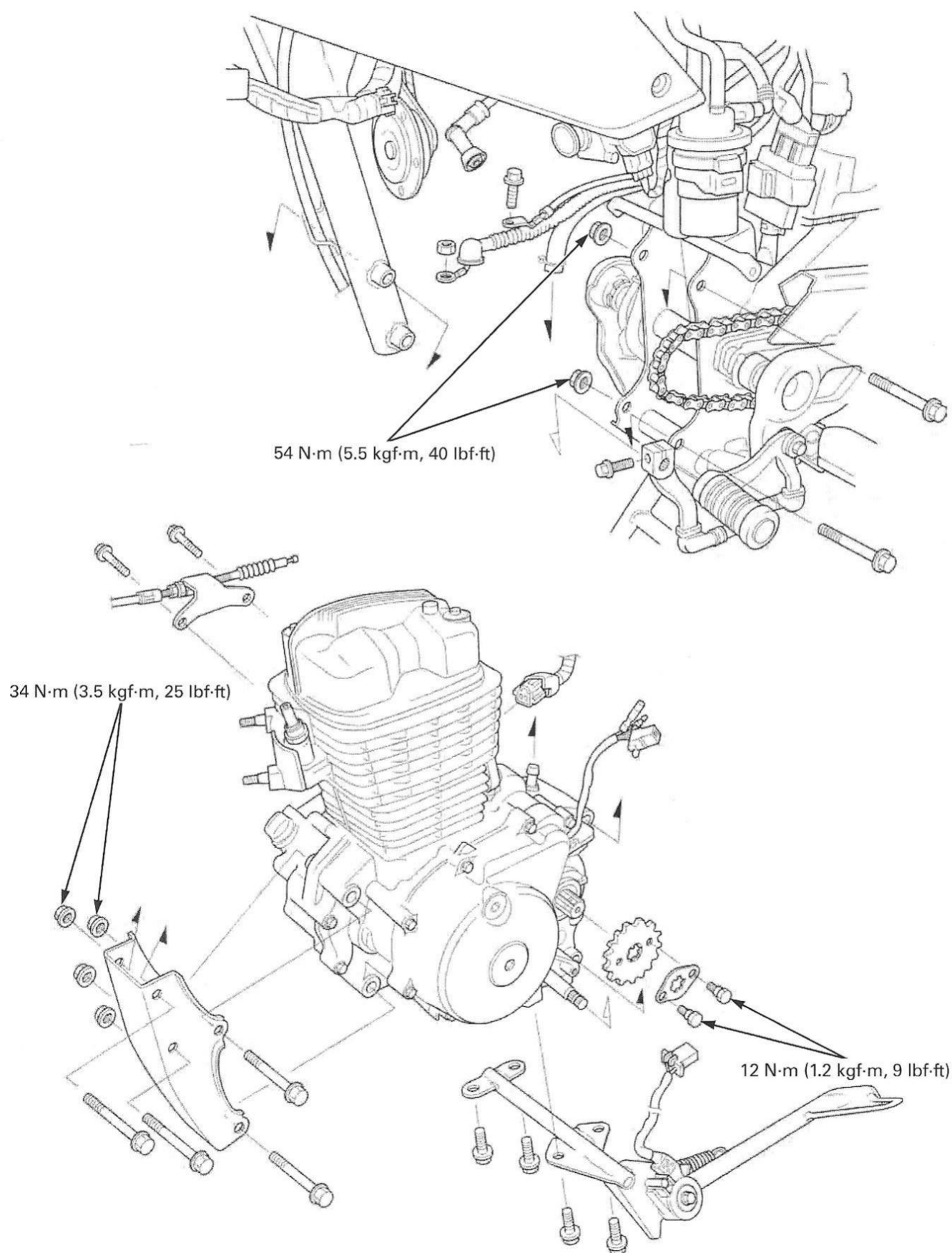
COMPONENT LOCATION 6-2

SERVICE INFORMATION 6-3

ENGINE REMOVAL 6-4

ENGINE INSTALLATION..... 6-6

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- During engine removal/installation, support the motorcycle on its center stand.
- Support the engine using a jack or other adjustable support to ease of engine hanger bolts removal.
- When removing/installing the engine, tape the frame around the engine beforehand for frame protection.
- The following components can be serviced with the engine installed in the frame.
 - Stator/CKP sensor (page 10-11)
 - Camshaft (page 7-7)
 - Clutch (page 9-9)
 - Cylinder head (page 7-11)
 - Cylinder/piston (page 8-5)
 - Gearshift linkage (page 9-17)
 - Oil pump (page 4-4)
 - Fly wheel/starter clutch (page 10-6)
- The following components require engine removal for service.
 - Crankcase (page 11-6)
 - Crankshaft (page 11-8)
 - Shift fork/shift drum/transmission (page 11-11)

SPECIFICATIONS

ITEM		SPECIFICATION
Engine oil capacity	After draining	0.9 liter (1.0 US qt, 0.8 Imp qt)
	After disassembly	1.1 liter (1.2 US qt, 1.0 Imp qt)
Engine dry weight		26.9 kg (59.3 lbs)

TORQUE VALUES

Front engine hanger nut	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Rear engine hanger nut	54 N·m (5.5 kgf·m, 40 lbf·ft)	
Drive sprocket fixing plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Insulator band screw	1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)	See page 6-8

ENGINE REMOVAL

Support the motorcycle on its center stand.

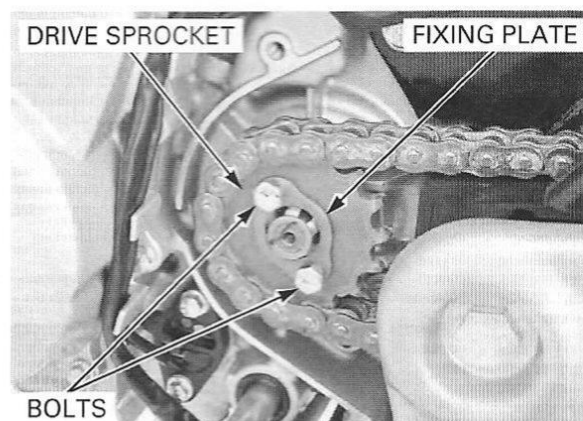
Drain the engine oil (page 3-11).

Remove the following:

- Exhaust pipe/muffler (page 2-16)
- Drive sprocket cover (page 3-16)
- Side covers (page 2-10)
- Spark plug cap (page 3-7)

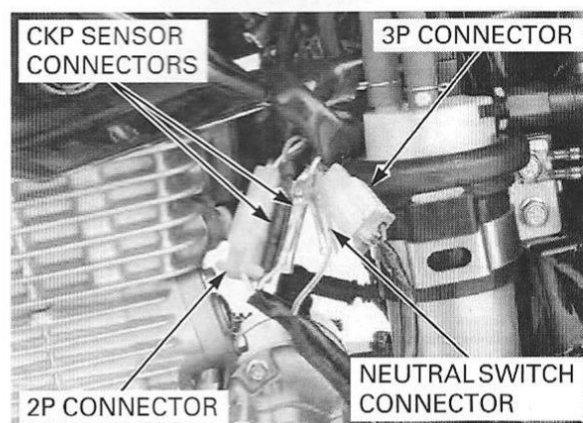
Loosen the rear axle nut, drive chain adjuster lock nuts and adjusters all the way (page 3-15).

Remove the bolts, fixing plate and drive sprocket.

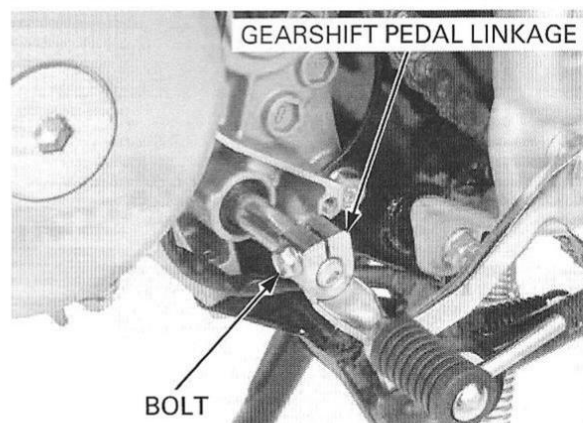


Disconnect the following:

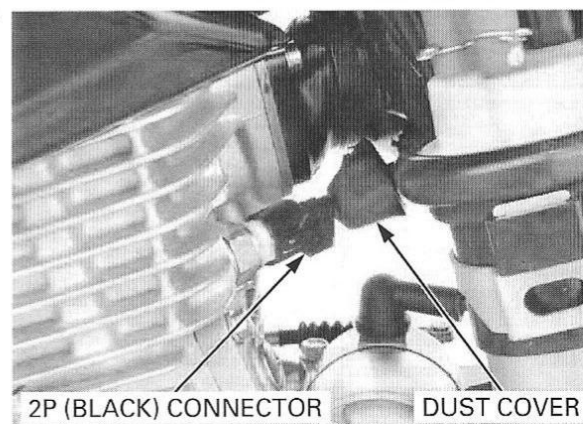
- Alternator 2P (Natural) connector
- CKP sensor wire connectors
- Neutral switch wire connector
- Sidestand switch 3P (Natural) connector



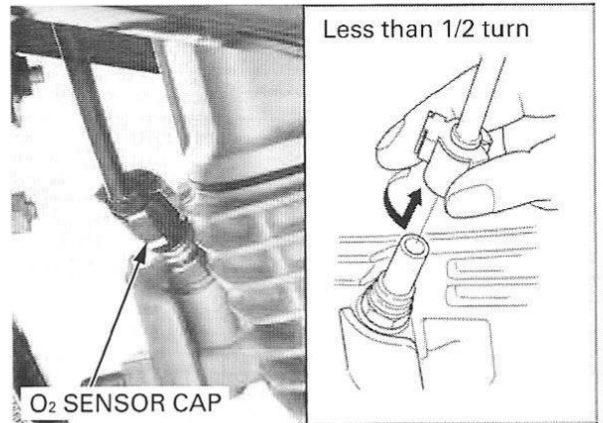
Remove the bolt and gearshift pedal linkage from the gearshift spindle.



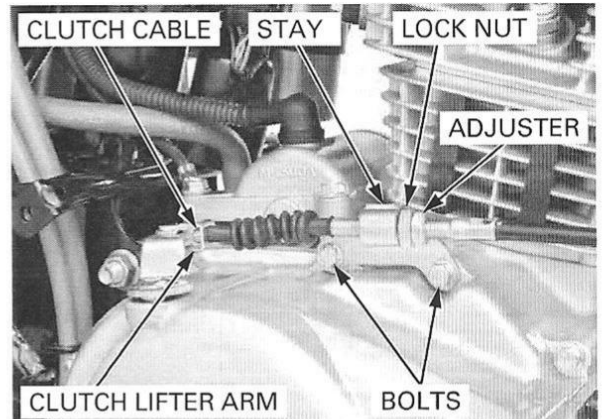
Slide the dust cover and disconnect the EOT sensor 2P (Black) connector.



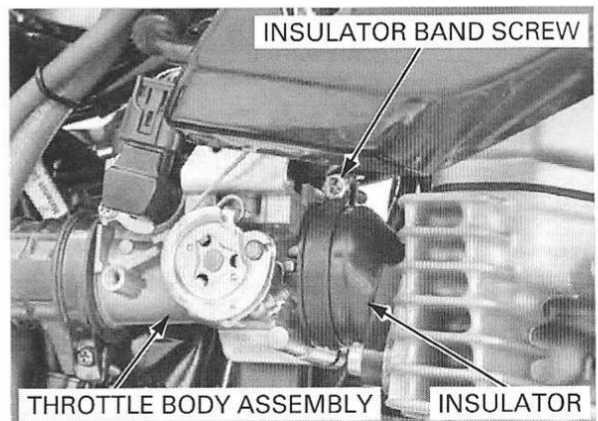
Hold the center of the O₂ sensor cap by hand and disconnect the cap while turning it less than 1/2 of a turn.



Loosen the adjuster lock nut and turn the adjuster. Remove the bolts and clutch cable stay, then disconnect the clutch cable from the clutch lifter arm.



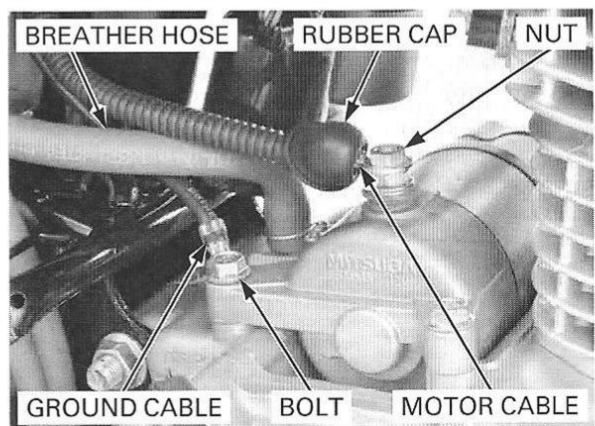
Loosen the insulator band screw and remove the throttle body assembly from the insulator.



Slide the rubber cap and remove the terminal nut and starter motor cable.

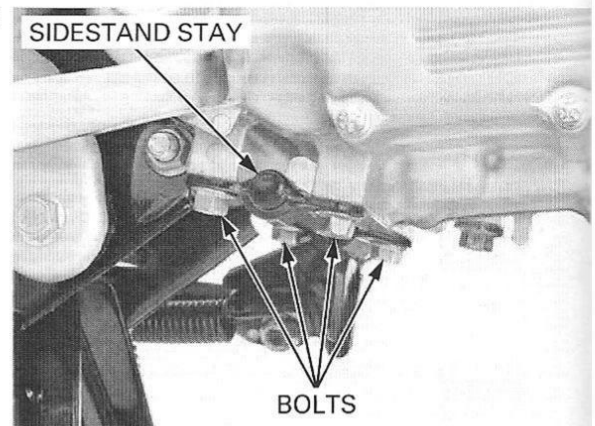
Remove the starter mounting bolt and ground cable.

Disconnect the crankcase breather hose from the crankcase.



ENGINE REMOVAL/INSTALLATION

Remove the bolts and sidestand stay from the crankcase.

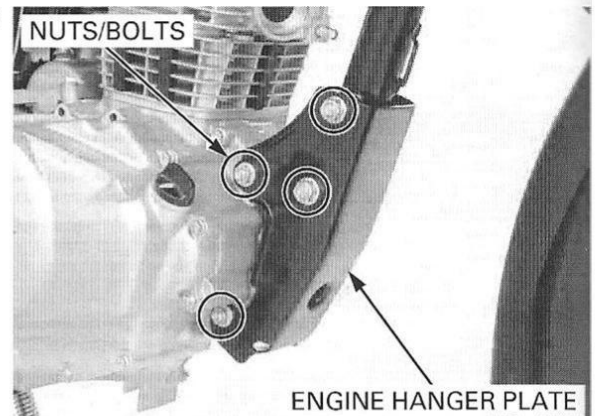


The jack height must be continually adjusted to relieve stress for ease of bolt removal.

Support the engine using a jack or other adjustable support.

Remove the following:

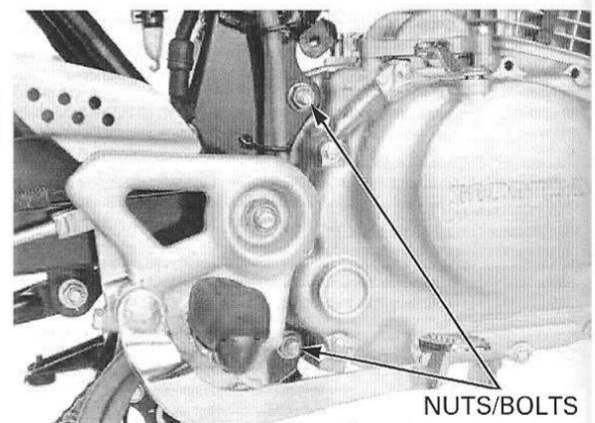
- Front engine hanger nuts and bolts
- Front engine hanger plate



Remove the rear engine hanger nuts and bolts.

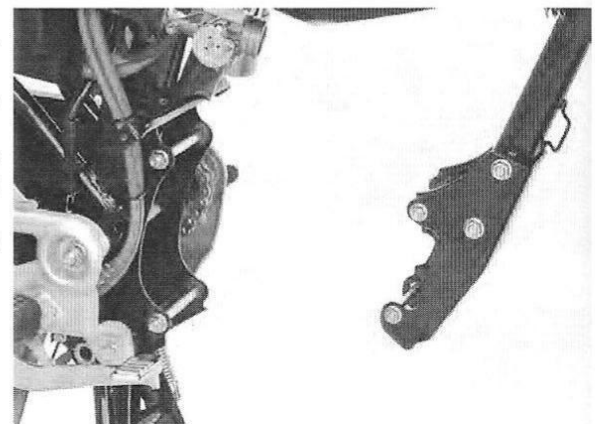
Remove the engine from the frame.

- During engine removal, hold the engine securely and be careful not to damage the frame and engine.



ENGINE INSTALLATION

- Note the direction of the engine hanger bolts.
- Place a jack or other adjustable support under the engine.
- The jack height must be continually adjusted to relieve stress for ease bolt installation.
- Carefully align the mounting points with the jack to prevent damage the engine, frame, wires and cables.
- Route the wires, hoses and cables properly (page 1-16).



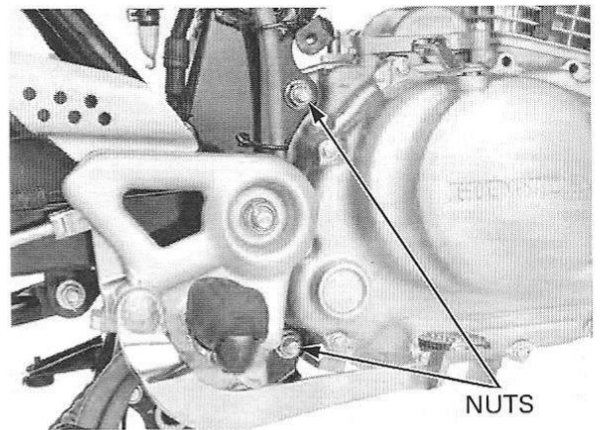
ENGINE REMOVAL/INSTALLATION

During engine installation, hold the engine securely and be careful not to damage the frame and engine.

Place the engine in the frame, then loosely install all the bolts, nuts and front engine hanger plate.

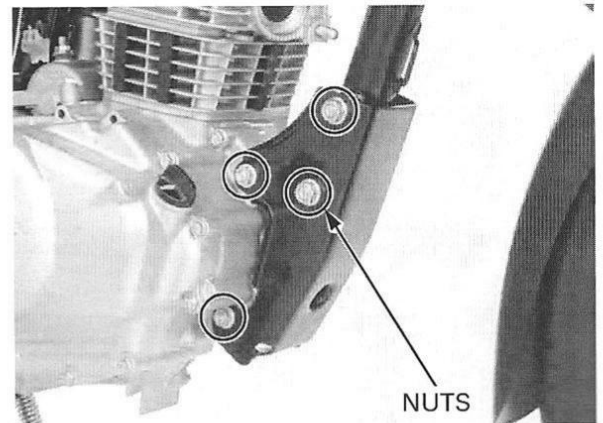
Tighten the rear engine hanger nuts to the specified torque.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

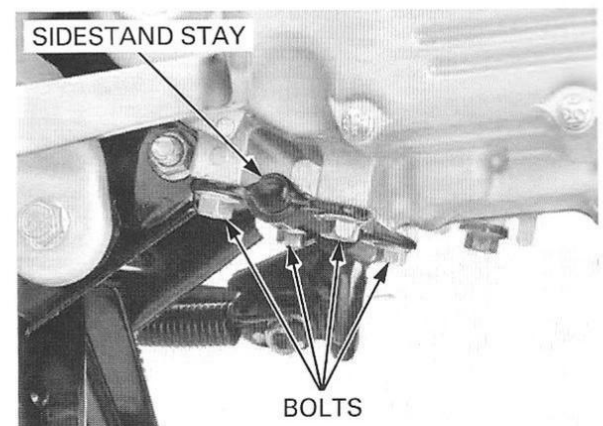


Tighten the front engine hanger nuts to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



Install the sidestand stay and bolts.
Tighten the sidestand stay bolts securely.

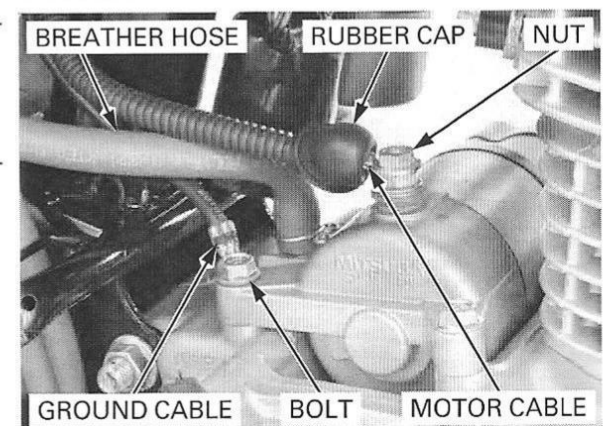


Connect the crankcase breather hose to the crankcase.

Install the ground cable and starter mounting bolt.
Tighten the starter mounting bolt securely.

Install the starter motor cable, terminal nut and rubber cap.

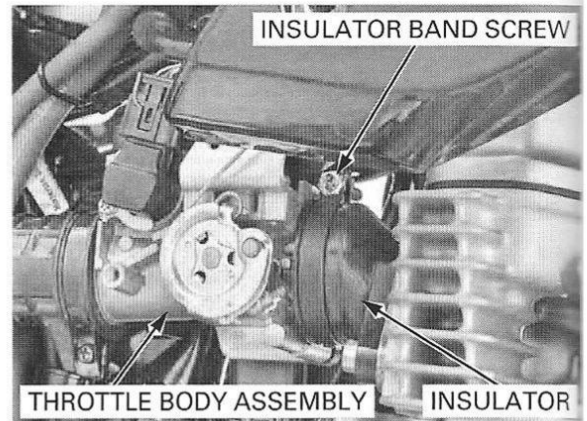
Tighten the terminal nut securely.



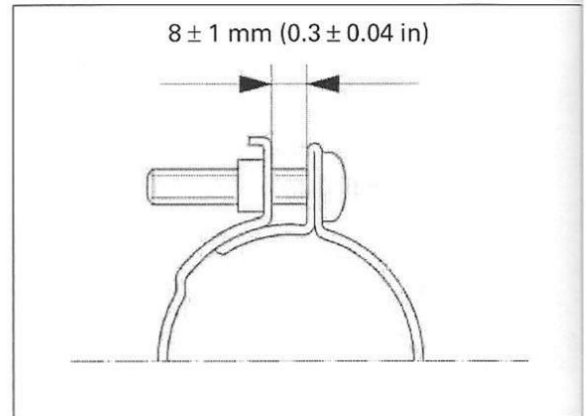
ENGINE REMOVAL/INSTALLATION

Install the throttle body assembly to the insulator. Tighten the insulator band screw to the specified torque.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

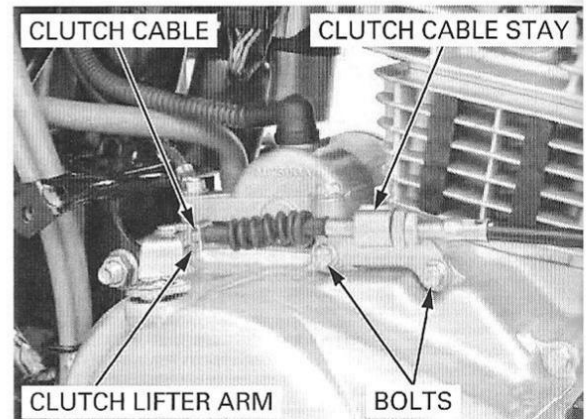


Check that the width between the insulator band ends clearance is 8 ± 1 mm (0.3 ± 0.04 in).



Connect the clutch cable to the clutch lifter arm and install the clutch cable stay and bolts.

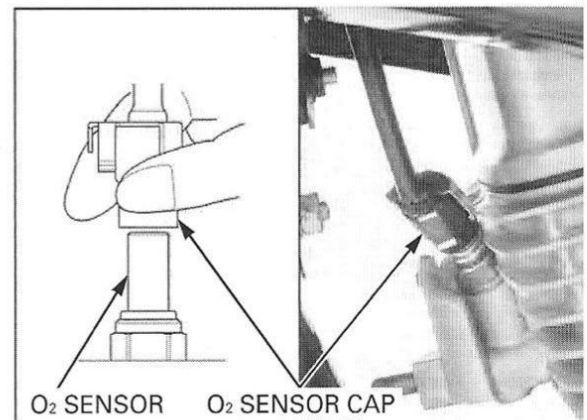
Tighten the clutch cable stay bolts securely.



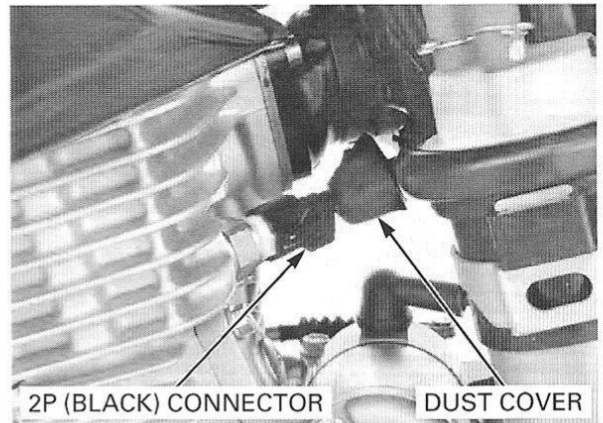
Connect the O₂ sensor cap to the O₂ sensor by pushing it straight.

NOTICE

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

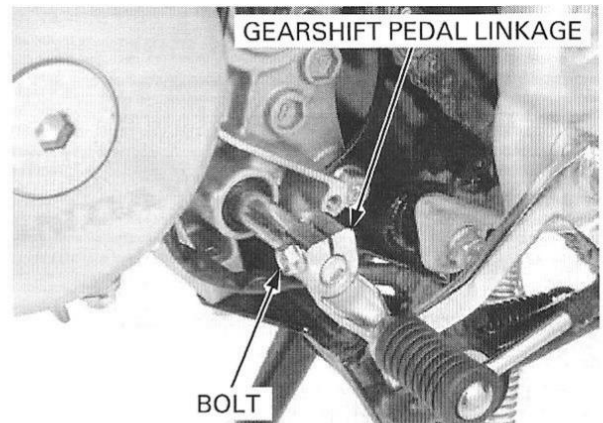


Connect the EOT sensor 2P (Black) connector and install the dust cover.



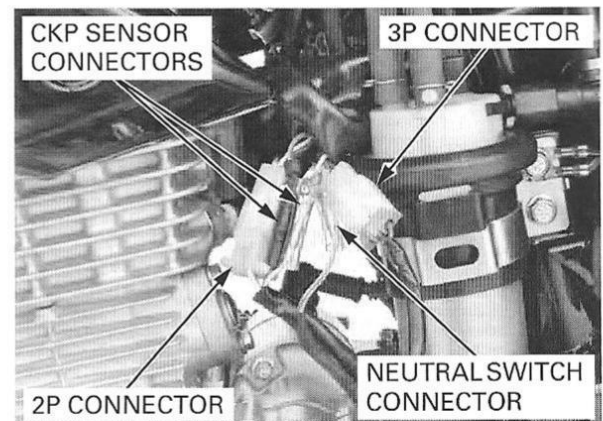
Install the gearshift pedal linkage to the gearshift spindle.

Tighten the gearshift pedal linkage bolt securely.



Connect the following:

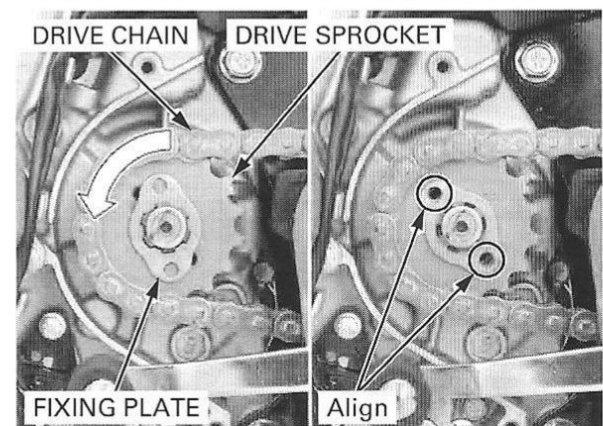
- Alternator 2P (Natural) connector
- CKP sensor wire connectors
- Neutral switch wire connector
- Sidestand switch 3P (Natural) connector



Install the drive chain onto the drive sprocket.
Install the drive sprocket to the countershaft.

Install the fixing plate.

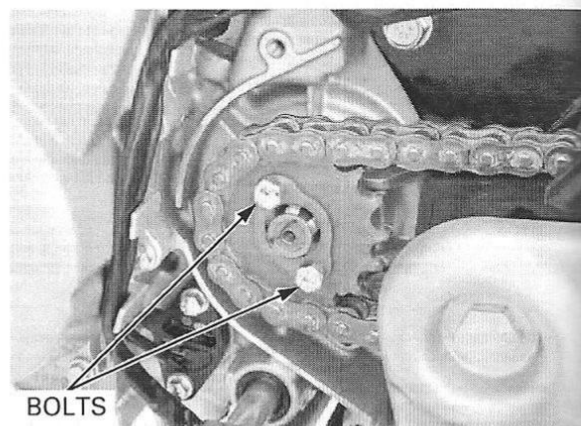
Rotate the fixing plate and align the bolt holes of the fixing plate and drive sprocket.



ENGINE REMOVAL/INSTALLATION

Install and tighten the drive sprocket fixing plate bolts alternately to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Hook the neutral and sidestand switch wires to the tabs of the left crankcase cover.

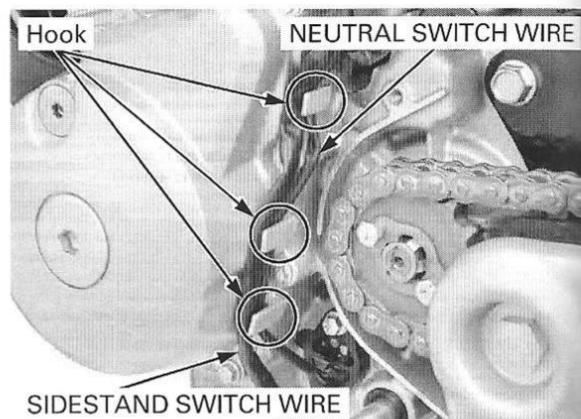
Install the following:

- Exhaust pipe/muffler (page 2-16)
- Drive sprocket cover (page 3-16)
- Side covers (page 2-10)
- Spark plug cap (page 3-7)

Fill the crankcase with recommended engine oil to the proper level (page 3-11).

After installing the engine, perform the following inspections and adjustments:

- Drive chain slack (page 3-15)
- Clutch lever freeplay (page 3-23)

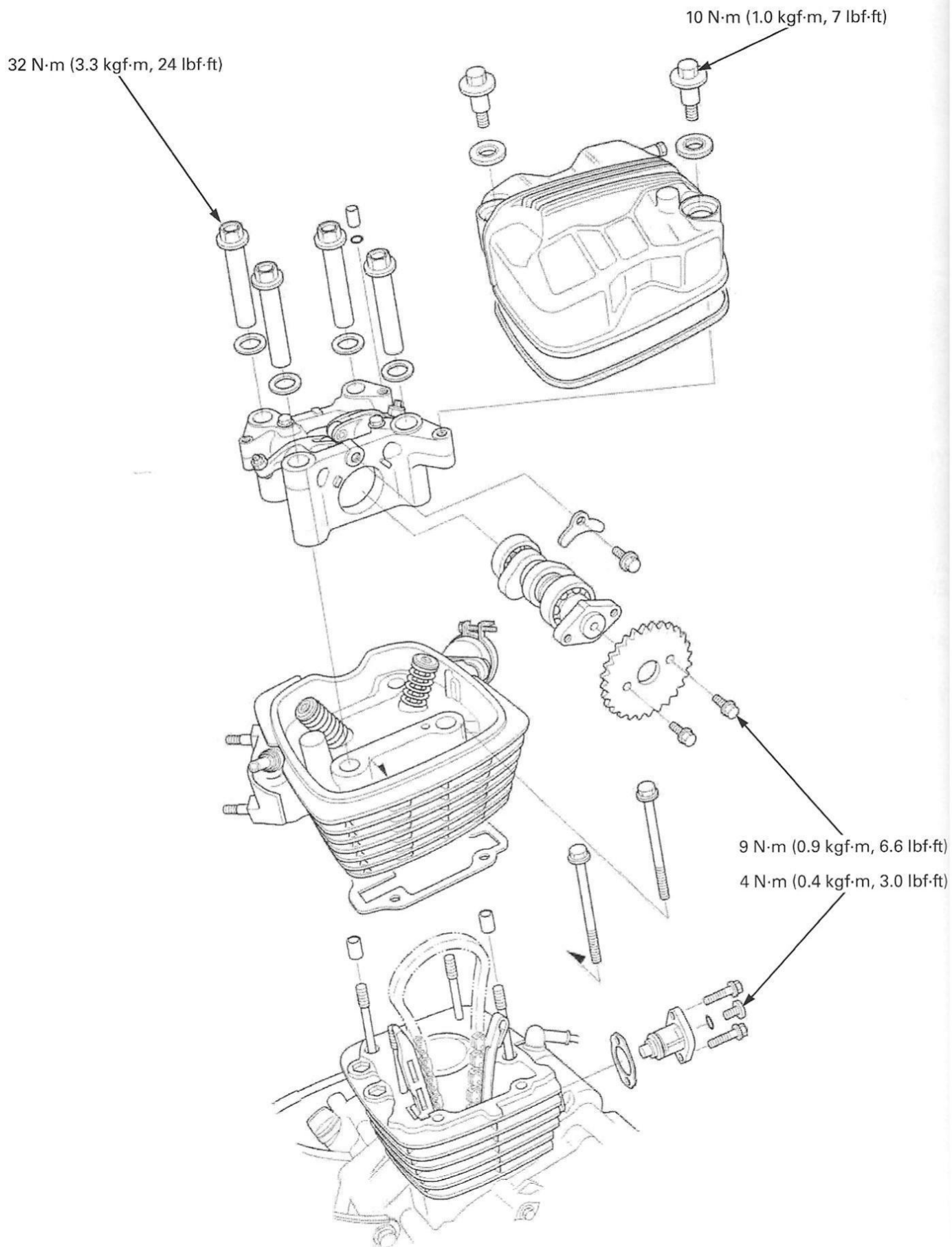


7. CYLINDER HEAD/VALVES

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CAMSHAFT HOLDER REMOVAL	7-9
CYLINDER HEAD REMOVAL	7-11

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CAM SPROCKET/CAMSHAFT INSTALLATION	7-22
CYLINDER HEAD COVER INSTALLATION	7-25

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves, rocker arms and camshaft. These services can be done with the engine installed in the frame.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head. Do not strike the cylinder head cover and cylinder head too hard during removal.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft and rocker arm lubricating oil is fed through oil passages in the cylinder head (stud bolt hole), camshaft holder and cylinder head cover. Clean the oil passages before assembling them.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression at 800 min ⁻¹ (rpm)			1,275 kPa (13.0 kgf/cm ² , 185 psi)	—
Valve clearance		IN	0.08 ± 0.02 (0.003 ± 0.001)	—
		EX	0.12 ± 0.02 (0.005 ± 0.001)	—
Valve, valve guide	Valve stem O.D.	IN	4.975 – 4.990 (0.1959 – 0.1965)	4.92 (0.194)
		EX	4.955 – 4.970 (0.1951 – 0.1957)	4.90 (0.193)
	Valve guide I.D.	IN/EX	5.000 – 5.012 (0.1969 – 0.1973)	5.04 (0.198)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.07 (0.003)
		EX	0.030 – 0.057 (0.0012 – 0.0022)	0.09 (0.004)
	Valve seat width	IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length		IN/EX	37.78 (1.487)	—
Rocker arm	Arm I.D.	IN/EX	10.000 – 10.015 (0.3937 – 0.3943)	10.10 (0.398)
	Shaft O.D.	IN/EX	9.972 – 9.987 (0.3926 – 0.3932)	9.91 (0.390)
	Arm-to-shaft clearance	IN/EX	0.013 – 0.043 (0.0005 – 0.0017)	0.10 (0.004)
Camshaft	Cam lobe height	IN	33.268 – 33.508 (1.3098 – 1.3192)	—
		EX	33.018 – 33.258 (1.2999 – 1.3094)	—
Cylinder head warpage			—	0.05 (0.002)

TORQUE VALUES

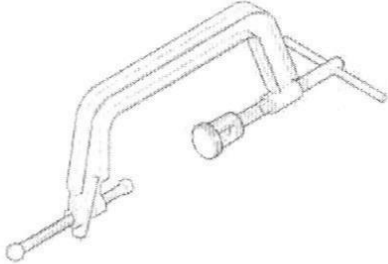
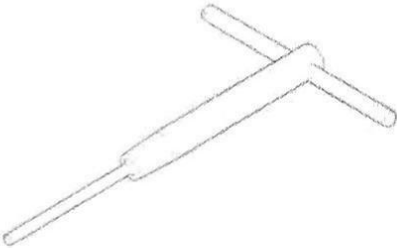
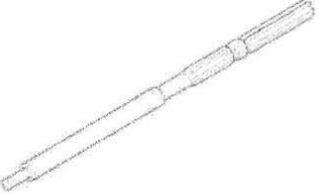
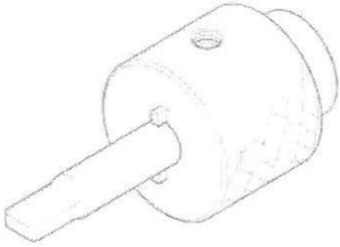
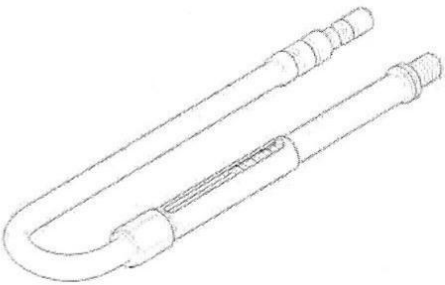
Cylinder head cover bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
Rocker arm shaft bolt	5 N·m (0.5 kgf·m, 3.7 lbf·ft)
Insulator socket bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Cam sprocket bolt	9 N·m (0.9 kgf·m, 6.6 lbf·ft)
Camshaft holder bolt	32 N·m (3.3 kgf·m, 24 lbf·ft)
Cam chain tensioner lifter plug	4 N·m (0.4 kgf·m, 3.0 lbf·ft)
Crankshaft hole cap	15 N·m (1.5 kgf·m, 11 lbf·ft)
Timing hole cap	10 N·m (1.0 kgf·m, 7 lbf·ft)

Apply engine oil to the threads and seating surface.

Apply grease to the threads.

CYLINDER HEAD/VALVES

TOOLS

Valve guide driver 07942-8920000 	Valve spring compressor 07757-0010000 	Seat cutter, 27.5 mm (45° IN) 07780-0010200 
Seat cutter, 24 mm (45° EX) 07780-0010600 	Flat cutter, 27 mm (32° IN) 07780-0013300 	Flat cutter, 24 mm (32° EX) 07780-0012500 
Interior cutter, 26 mm (60° IN) 07780-0014500 	Interior cutter, 22 mm (60° EX) 07780-0014202 	Cutter holder, 5.0 mm 07781-0010400 
Valve guide reamer 07984-MA60001 	Cam chain tensioner holder 070MG-0010100 	Compression gauge attachment 07RMJ-MY50100  or equivalent commercially available

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problems can be diagnosed by a compression test, or by tracing top-end noise with a sounding rod or stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather hose. If the hose is smoky, check for seized piston ring (page 8-8).

Compression too low, hard starting or poor performance at low speed

- Valves:
 - Incorrect valve clearance adjustment
 - Burned or bent valve
 - Incorrect valve timing
 - Broken valve spring
 - Weak valve spring
 - Uneven valve seating
 - Valve stuck open
- Cylinder head:
 - Leaking or damaged cylinder head gasket
 - Warped or cracked cylinder head
 - Loose spark plug
- Cylinder/piston problem (page 8-5)

Compression too high

- Excessive carbon build-up on piston head or combustion chamber

Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Cylinder/piston problem (page 8-5)

Excessive noise

- Incorrect valve clearance adjustment
- Sticking valve or broken valve spring
- Excessive worn valve seat
- Worn or damaged camshaft
- Worn rocker arm and/or shaft
- Worn rocker arm roller and valve stem end
- Worn cam sprocket teeth
- Loose or worn cam chain
- Worn or damaged cam chain tensioner
- Cylinder/piston problem (page 8-5)

Rough idle

- Low cylinder compression
- Faulty fuel system

CYLINDER COMPRESSION

Reference engine
oil temperature: 60
– 65°C (140 –
149°F)

Warm up the engine to normal operating temperature.

Stop the engine and disconnect the spark plug cap and remove the spark plug (page 3-7).

Install a compression gauge attachment into the spark plug hole.

Connect a compression gauge to the attachment.

TOOL:

**Compression gauge attachment 07RMJ-MY50100
or equivalent commercially available**

Turn the ignition switch ON.

Shift the transmission into neutral.

Crank the engine with the starter motor.

*To avoid discharging
the battery, do not
operate the starter
motor for more
than 7 seconds.*

Open the throttle all the way and crank the engine with the starter motor until the gauge reading stops rising.

COMPRESSION PRESSURE:

1,275 kPa (13.0 kgf/cm², 185 psi) at 800 min⁻¹ (rpm)

— Low compression can be caused by:

- Blown cylinder head gasket
- Improper valve clearance adjustment
- Valve leakage
- Worn piston ring or cylinder

High compression can be caused by:

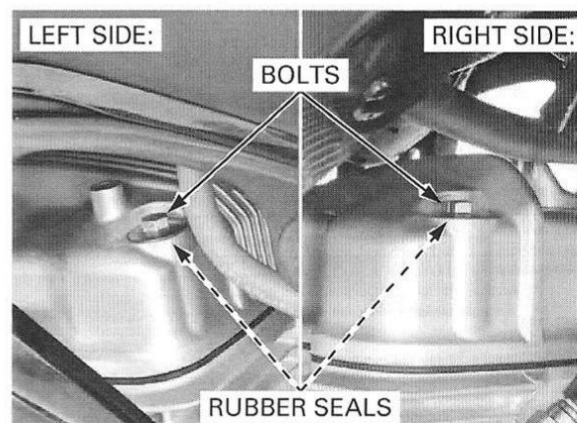
- Carbon deposits in the combustion chamber or on piston head



CYLINDER HEAD COVER REMOVAL

Remove the left side cover (page 2-10).

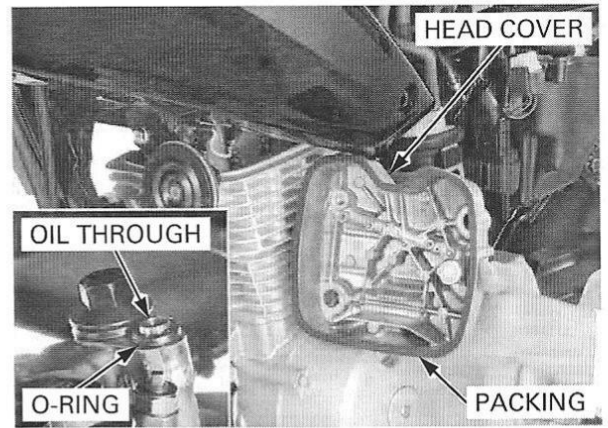
Remove the cylinder head cover bolts and rubber seals.



Remove the cylinder head cover from the cylinder head.

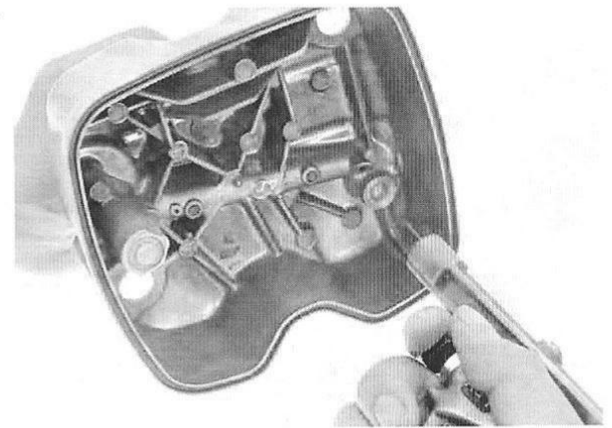
Remove the O-ring and oil through from the camshaft holder.

Check that the packing is in good condition, replace it if necessary.



CLEANING

Clean the oil passages of the cylinder head cover using compressed air.

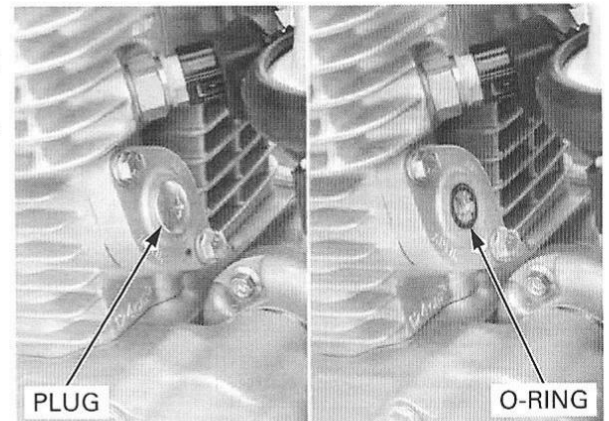


CAM SPROCKET/CAMSHAFT REMOVAL

Remove the cylinder head cover (page 7-6).

Make sure the piston is at TDC on the compression stroke (page 3-9).

Remove the cam chain tensioner lifter plug and O-ring.

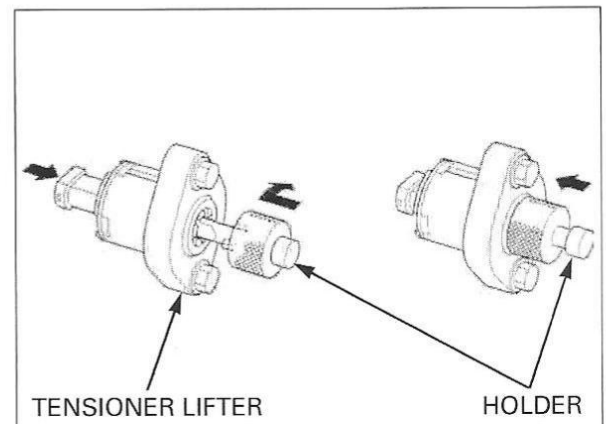


Install the stopper tool to the cam chain tensioner lifter.

Turn the cam chain tensioner lifter shaft clockwise with the cam chain tensioner holder to retract the cam chain tensioner lifter, then insert the cam chain tensioner holder fully to hold the cam chain tensioner lifter.

TOOL:

Cam chain tensioner holder 070MG-0010100



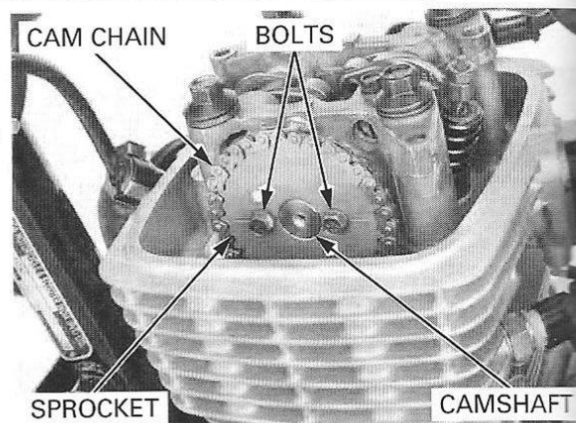
CYLINDER HEAD/VALVES

Be careful not to let the cam sprocket bolts fall into the crankcase.

Remove the cam sprocket bolts.

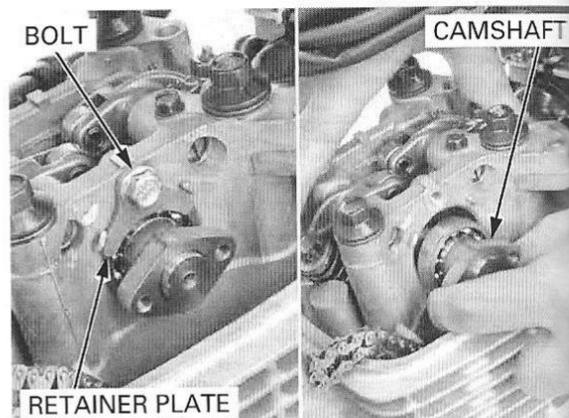
Remove the cam sprocket off the camshaft, then remove it from the cam chain.

Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.



Remove the bolt and camshaft retainer plate.

Remove the camshaft from the camshaft holder while pushing the rocker arms.



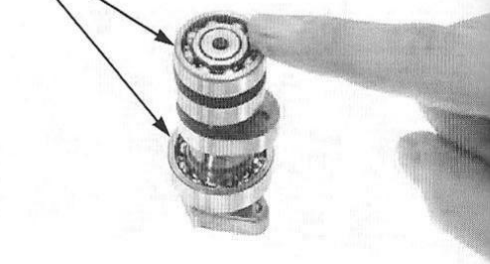
INSPECTION

CAMSHAFT BEARING

Turn the outer race of each bearing with your finger. The outer race should turn smoothly and quietly. Also check that the bearing inner race fits tightly on the camshaft.

Replace the camshaft if the outer race does not turn smoothly, quietly, or if the inner race fits loosely on the camshaft.

BEARINGS



CAMSHAFT

Check the cam lobe surfaces for scratches or evidence of insufficient lubrication.

Measure the height of each cam lobe.

STANDARD:

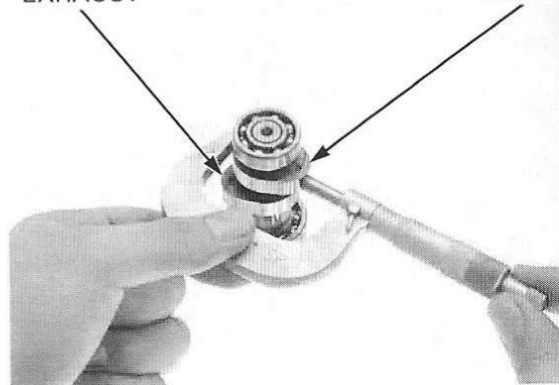
IN: 33.268 – 33.508 mm (1.3098 – 1.3192 in)

EX: 33.018 – 33.258 mm (1.2999 – 1.3094 in)

If the cam lobe is damaged or excessively worn, inspect the rocker arms and oil passage.

EXHAUST

INTAKE



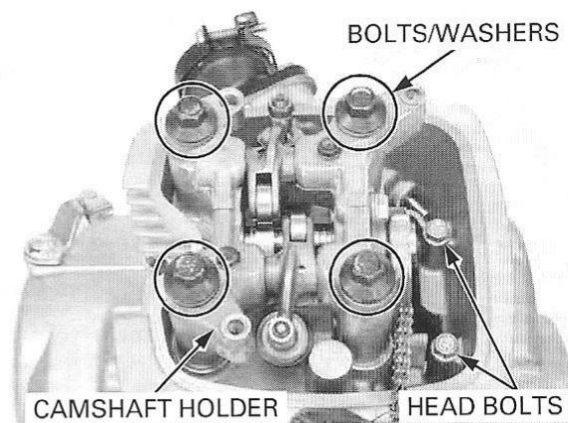
CAMSHAFT HOLDER REMOVAL

Remove the cam sprocket (page 7-7).

The camshaft holder can be serviced with the engine installed in the frame.

Loosen the cylinder head bolts in a crisscross pattern in several steps.

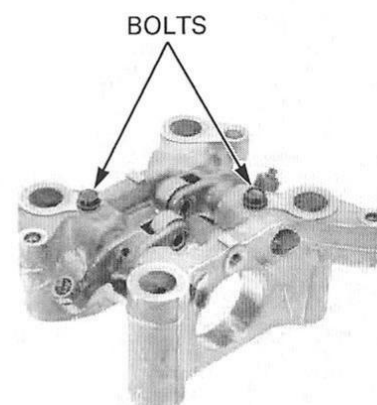
Remove the camshaft holder bolts, washers and camshaft holder.



DISASSEMBLY

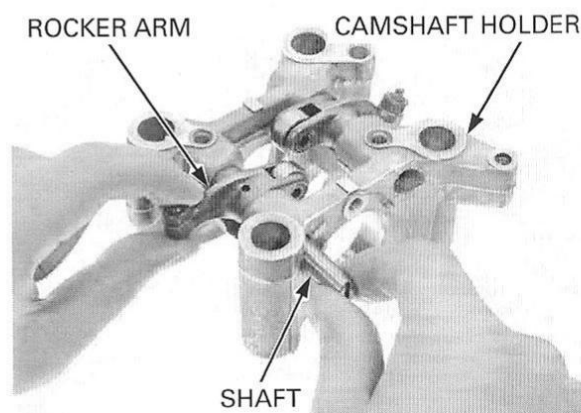
Remove the camshaft holder (page 7-9).

Remove the rocker arm shaft bolts.



Mark all the parts so they can be placed back in their original locations.

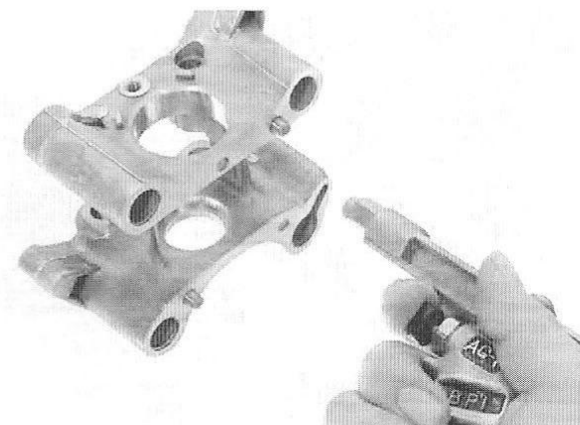
Remove the rocker arm shafts and rocker arms from the camshaft holder.



INSPECTION

CAMSHAFT HOLDER

Clean the oil passage of the camshaft holder using compressed air.



CYLINDER HEAD/VALVES

ROCKER ARM/SHAFT

If either rocker arm require service or replacement, inspect the cam lobes and oil passages.

Inspect the sliding surface of each rocker arm and shaft for wear or damage. Check each rocker arm roller for scoring, scratches or evidence of insufficient lubrication. Check the oil hole of each rocker arm for clog.

Measure each rocker arm I.D.

SERVICE LIMIT: 10.10 mm (0.398 in)

Measure each rocker arm shaft O.D.

SERVICE LIMIT: 9.91 mm (0.390 in)

Turn the rocker arm roller with your finger, the roller should turn smoothly and quietly.

Calculate the rocker arm-to-shaft clearance.

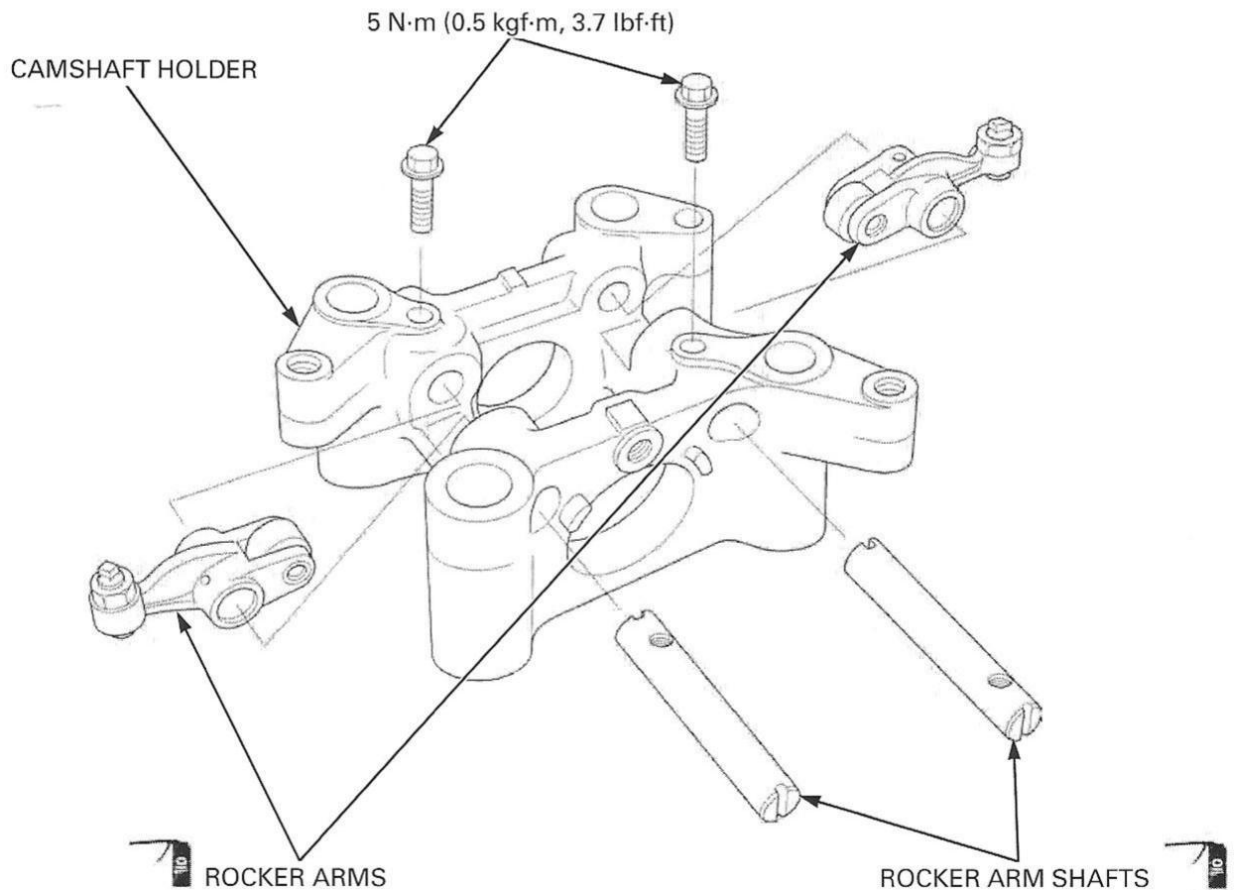
SERVICE LIMIT: 0.10 mm (0.004 in)

ROCKER ARM

SHAFT

ROLLER

ASSEMBLY

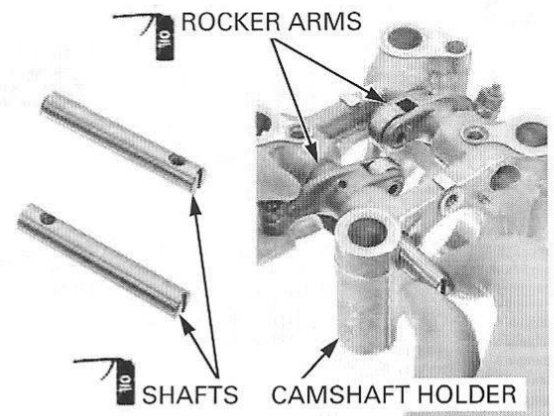


Install the removed parts in their original locations.

Clean the threads of each rocker arm shaft thoroughly.

Apply engine oil to each rocker arm inner and shaft rotating surfaces.

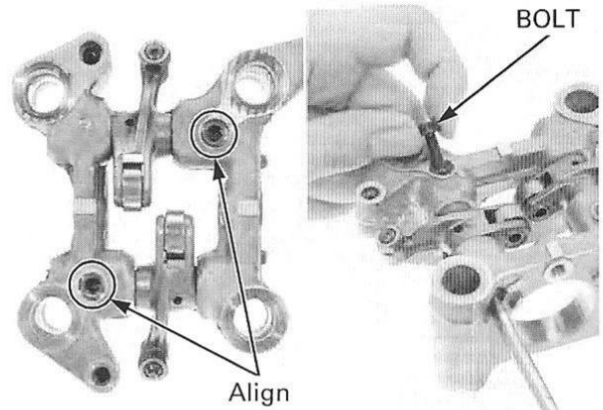
Set the rocker arm into the camshaft holder in the direction as shown, then install the rocker arm shaft with its bolt hole facing the camshaft holder bolt hole into the camshaft holder through the rocker arm.



Turn each rocker arm shaft so its bolt hole is upright position to align the rocker arm shaft bolt holes in the rocker arm shaft and camshaft holder.

Install and tighten the rocker arm shaft bolts to the specified torque while aligning the bolt holes using a flat blade screwdriver.

TORQUE: 5 N·m (0.5 kgf·m, 3.7 lbf·ft)



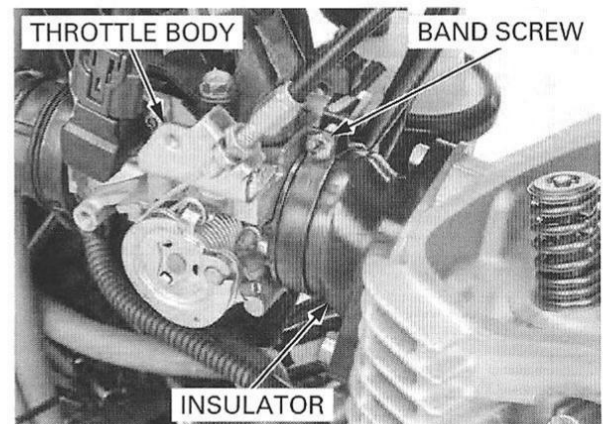
CYLINDER HEAD REMOVAL

Remove the following:

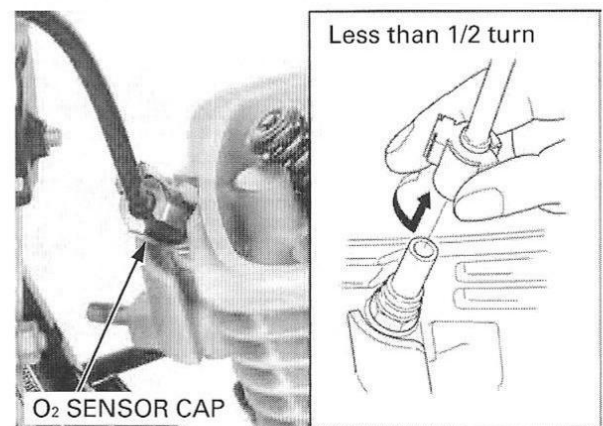
- Cylinder head cover (page 7-6)
- Camshaft holder (page 7-9)
- Spark plug cap (page 3-7)
- Exhaust pipe/muffler (page 2-16)

Loosen the insulator band screw.

Pull the throttle body out from the insulator.

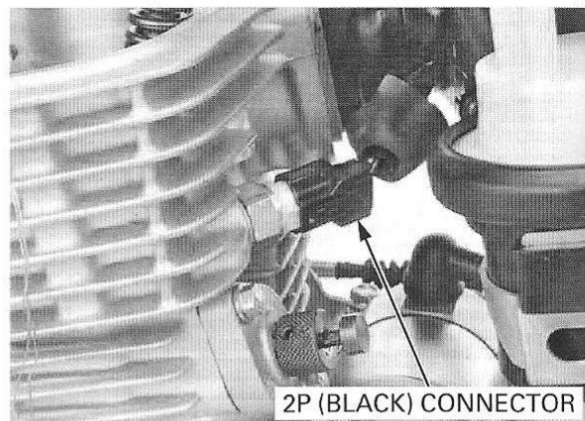


Hold the center of the O₂ sensor cap by hand and disconnect the sensor cap while turning it less than 1/2 of a turn.



CYLINDER HEAD/VALVES

Disconnect the EOT sensor 2P (Black) connector.

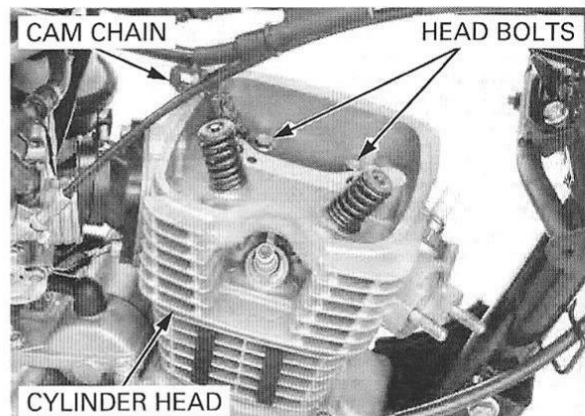


Remove the cylinder head bolts.

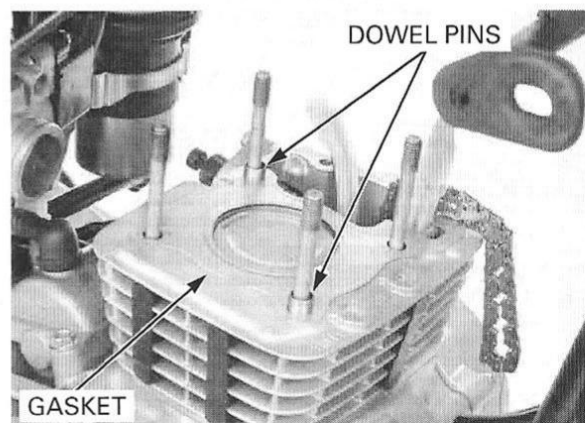
Remove the cylinder head.

- Be careful not to let the cam chain fall into the crankcase.

Do not strike the cylinder head too hard and do not damage the mating surface with a screwdriver.



Remove the gasket and dowel pins.



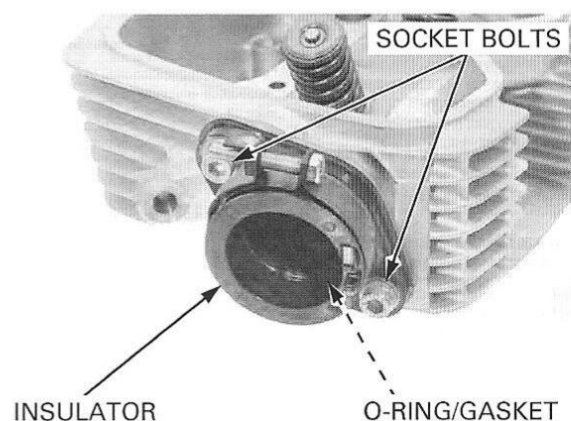
CYLINDER HEAD DISASSEMBLY/ASSEMBLY

DISASSEMBLY

Remove the following:

- Spark plug (page 3-7)
- EOT sensor (page 5-64)
- O₂ sensor (page 5-69)

Remove the socket bolts, insulator, O-ring and gasket.



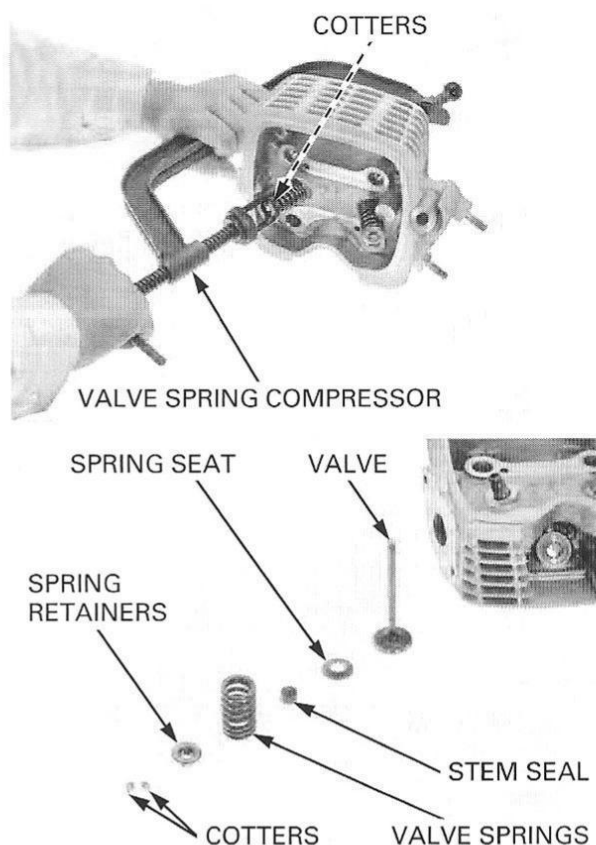
To prevent loss of tension, do not compress the valve spring more than necessary to remove the cotters.

Remove the valve spring cotters using the special tool.

TOOL:

Valve spring compressor

07757-0010000



Mark all the parts during disassembly so they can be installed in their original locations.

Loosen the valve spring compressor and remove the following:

- Spring retainers
- Valve springs
- Intake and exhaust valves
- Stem seals
- Spring seats

INSPECTION

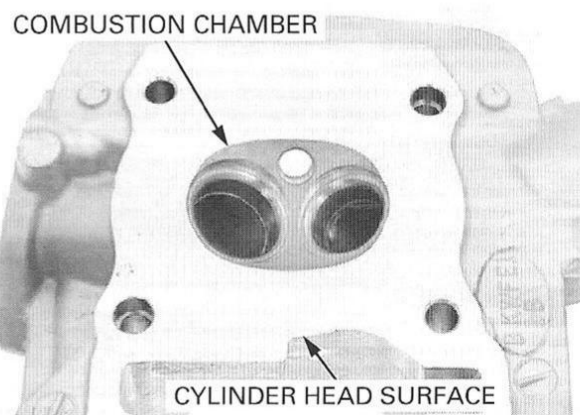
CYLINDER HEAD

Avoid damaging the mating and valve seat surfaces.

Remove the carbon deposits from the combustion chamber.

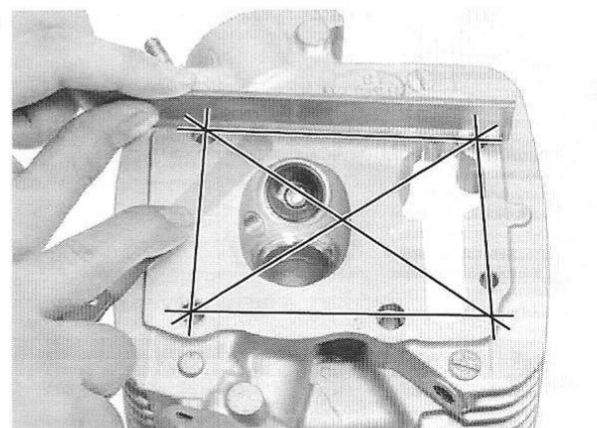
Clean off any gasket materials from the cylinder head surface.

Check the spark plug hole and valve area for cracks.



Check the cylinder head for warpage with a straight edge and feeler gauge as shown.

SERVICE LIMIT: 0.05 mm (0.002 in)



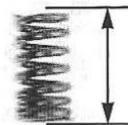
CYLINDER HEAD/VALVES

VALVE SPRING

Check the valve springs for fatigue or damage.

Measure the valve spring free length.

STANDARD: IN/EX: 37.78 mm (1.487 in)



VALVE/VALVE GUIDE

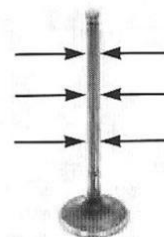
Check that the valve moves smoothly in the guide.
Check each valve for bending, burning, scratches or abnormal stem wear.

Measure and record each valve stem O.D.

SERVICE LIMITS:

IN: 4.92 mm (0.194 in)

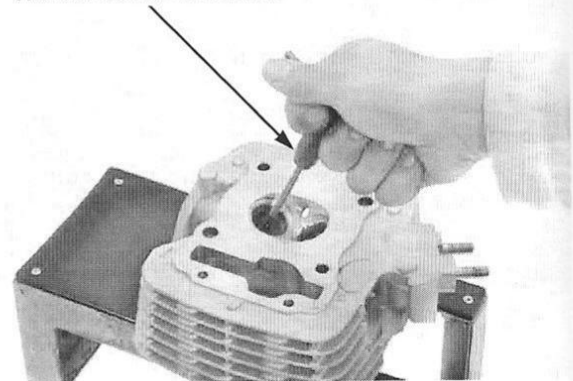
EX: 4.90 mm (0.193 in)



Use cutting oil on the reamer during this operation. Take care not to tilt or lean the reamer in the guide while reaming.

Ream the valve guide to remove any carbon build up before measuring the guide.
Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

VALVE GUIDE REAMER



Measure and record each valve guide I.D. at several points.

SERVICE LIMIT: IN/EX: 5.04 mm (0.198 in)

Calculate each valve stem O.D. from the corresponding guide I.D. to obtain the stem-to-guide clearance.

SERVICE LIMITS:

IN: 0.07 mm (0.003 in)

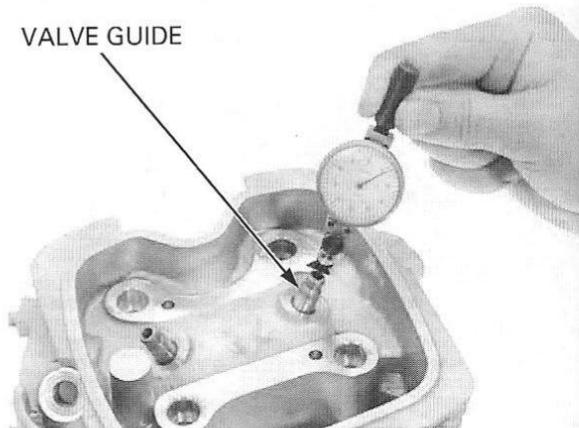
EX: 0.09 mm (0.004 in)

Reface the valve seats whenever the valve guides are replaced (page 7-15).

If the stem-to-guide clearance exceeds the service limit, determine if a new guide with standard dimensions would bring the clearance within tolerance. If so replace the guides as necessary and ream to fit.

If the stem-to-guide clearance exceeds the service limit with new guides, also replace the valve.

VALVE GUIDE



VALVE GUIDE REPLACEMENT

Chill the new valve guides in the freezer section of a refrigerator for about an hour.

Wear insulated gloves to avoid burns when handling the heated cylinder head.

Heat the cylinder head to 130 – 140°C (266 – 284°F) with a hot plate or oven. Do not heat the cylinder head beyond 150°C (302°F). Use temperature indicator sticks, available from welding supply stores, to be sure the cylinder head is heated to the proper temperature.

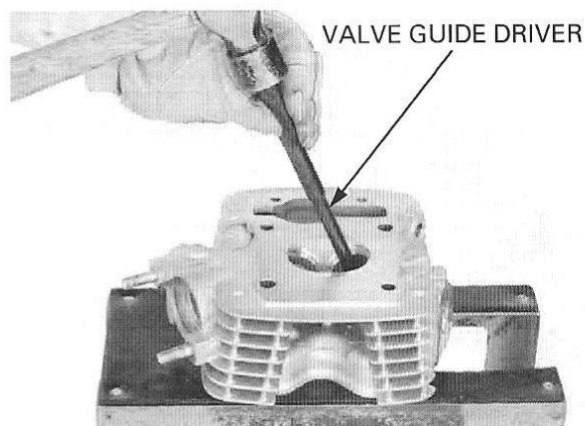
- Using a torch to heat the cylinder head may cause warping.

Support the cylinder head, then drive the valve guides and clips out of the cylinder head from the combustion chamber side using the special tool.

TOOL:

Valve guide driver

07942-8920000



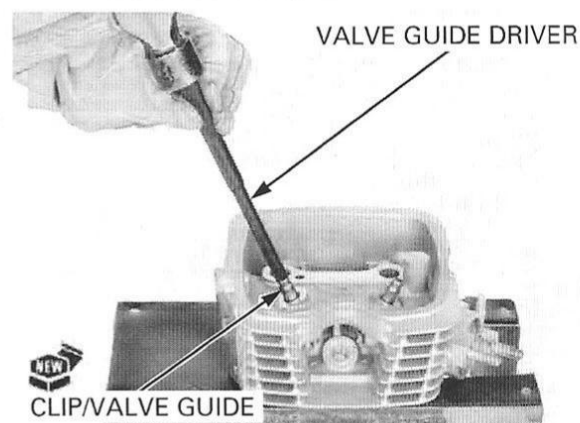
Remove new valve guides from the freezer and install a new valve guide clip to each valve guide.

While the cylinder head is still heated, drive each valve guide into the cylinder head from the camshaft side until it is fully seated.

TOOL:

Valve guide driver

07942-8920000



Let the cylinder head cool to room temperature.

Ream the new valve guides.

Insert the reamer from the combustion chamber side of the cylinder head and also always rotate the reamer clockwise.

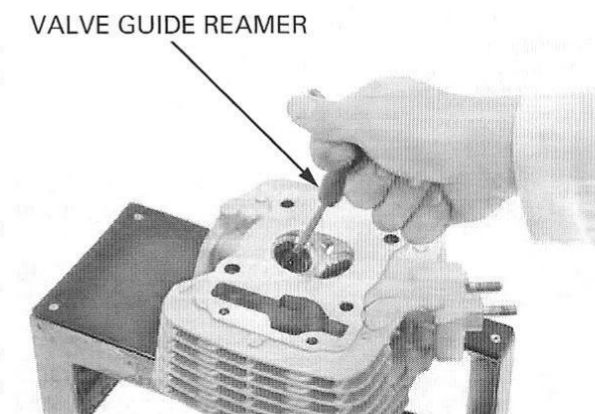
TOOL:

Valve guide reamer

07984-MA60001

- Take care not to tilt or lean the reamer in the valve guide while reaming.
- Use cutting oil on the reamer during this operation.

Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat (page 7-17).



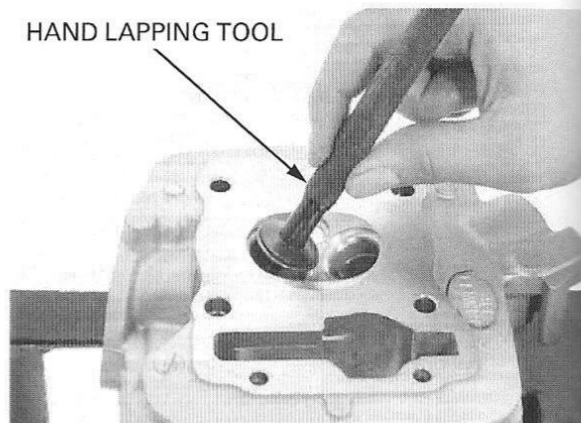
VALVE SEAT INSPECTION

Clean the intake and exhaust valves thoroughly to remove the carbon deposits.

Apply a light coat of Prussian Blue to each valve seat.

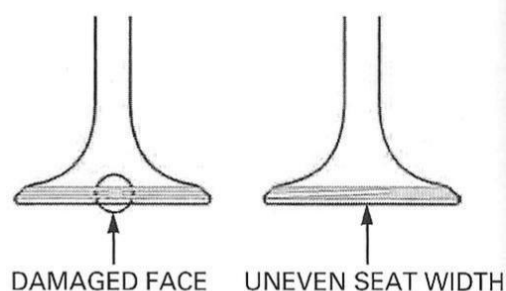
Tap the valve against the valve seat several times without rotating the valve to check for proper valve seat contact.

HAND LAPPING TOOL



Remove the valve and inspect the valve seat face for:

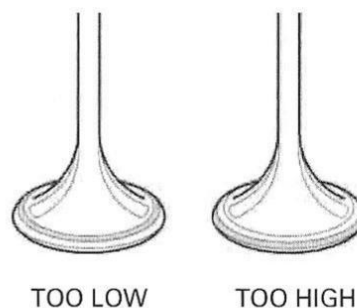
- Damaged face:
 - Replace the valve and reface the valve seat.
- Uneven seat width:
 - Bent or collapsed valve stem; Replace the valve and reface the valve seat.



- Contact area (too high or too low area):
 - Reface the valve seat.

NOTE:

The valve cannot be ground. If the valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.



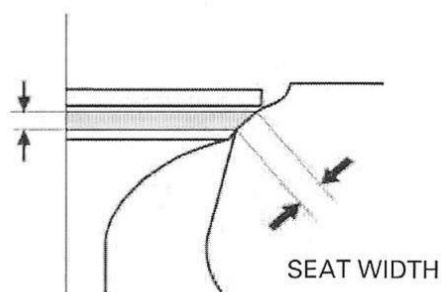
Inspect the width of each valve seat.

The valve seat contact should be within the specified width and even all around the circumference.

STANDARD: 0.90 – 1.10 mm (0.035 – 0.043 in)

SERVICE LIMIT: 1.5 mm (0.06 in)

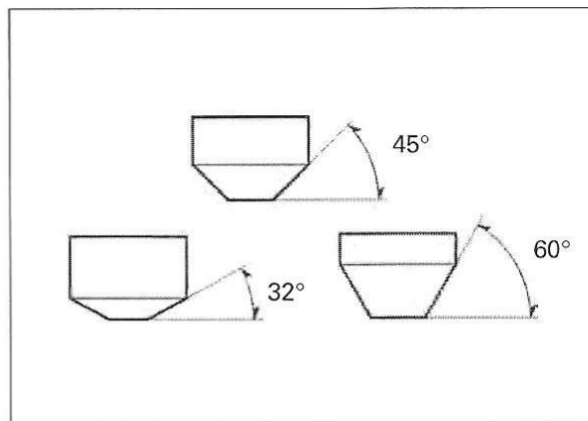
If the valve seat width is not within specification, reface the valve seat (page 7-17).



VALVE SEAT REFACING

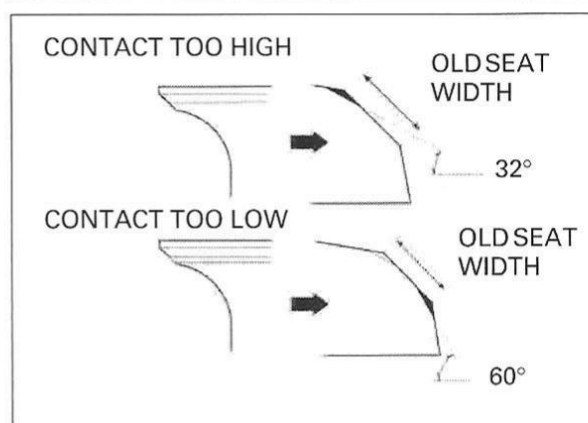
Follow the refacing
manufacture's
operating
instructions.

Valve seat cutters/grinders or equivalent valve seat refacing equipment are recommended to correct worn valve seats.



If the contact area is too high on the valve, the seat must be lowered using a 32° flat cutter.

If the contact area is too low on the valve, the seat must be raised using a 60° inner cutter.



Reface the valve
seat with a 45°
cutter whenever a
valve guide is
replaced.

Use a 45° cutter to remove any roughness or irregularities from the seat.

TOOLS:

Seat cutter, 27.5 mm (IN)

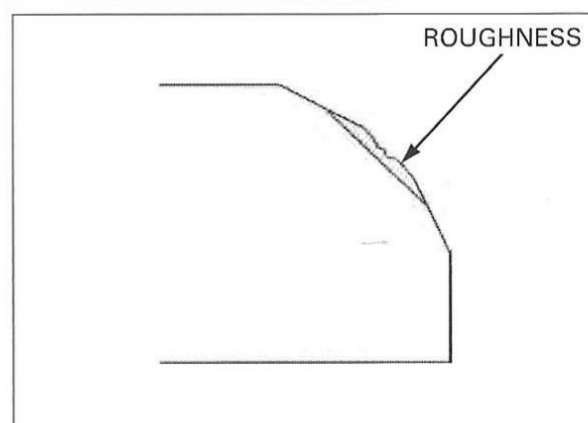
07780-0010200

Seat cutter, 24 mm (EX)

07780-0010600

Cutter holder, 5.0 mm

07781-0010400



Use a 32° cutter, remove top 1/4 of the existing valve seat material.

TOOLS:

Flat cutter, 27 mm (IN)

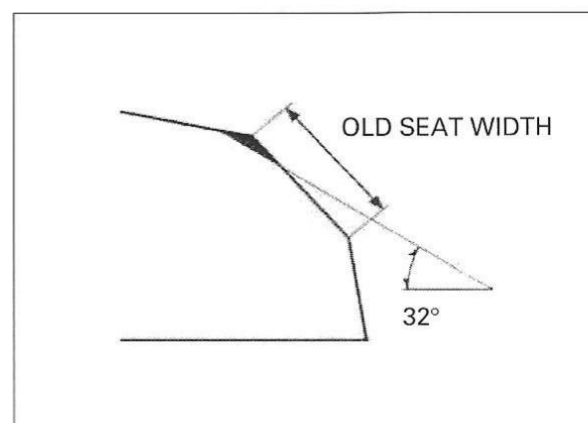
07780-0013300

Flat cutter, 24 mm (EX)

07780-0012500

Cutter holder, 5.0 mm

07781-0010400



CYLINDER HEAD/VALVES

Use a 60° cutter, remove the bottom 1/4 of the old seat.

TOOLS:

Interior cutter, 26 mm (IN)

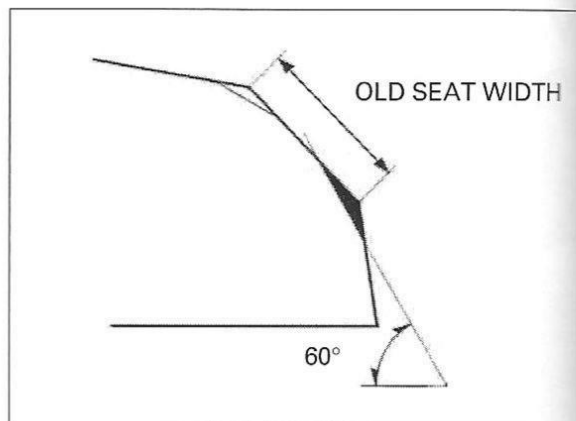
07780-0014500

Interior cutter, 22 mm (EX)

07780-0014202

Cutter holder, 5.0 mm

07781-0010400

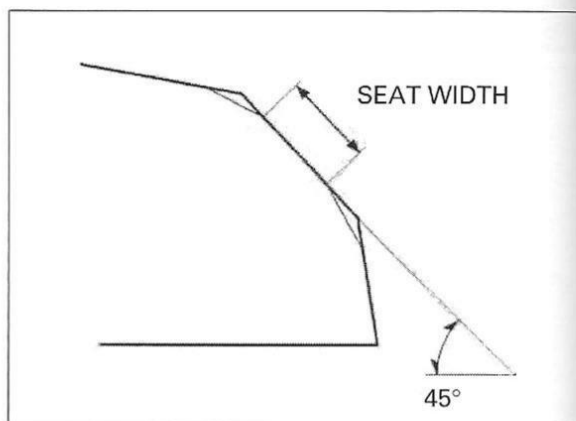


Using a 45° finish cutter and cut the seat to the proper width.

STANDARD SEAT WIDTH:

0.90 – 1.10 mm (0.035 – 0.043 in)

Make sure that all pitting and irregularities are removed.



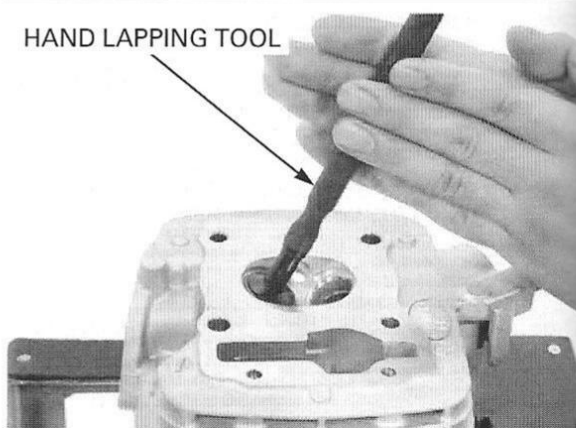
After cutting the seat, apply lapping compound to the valve face and lap the valve using light pressure.

NOTE:

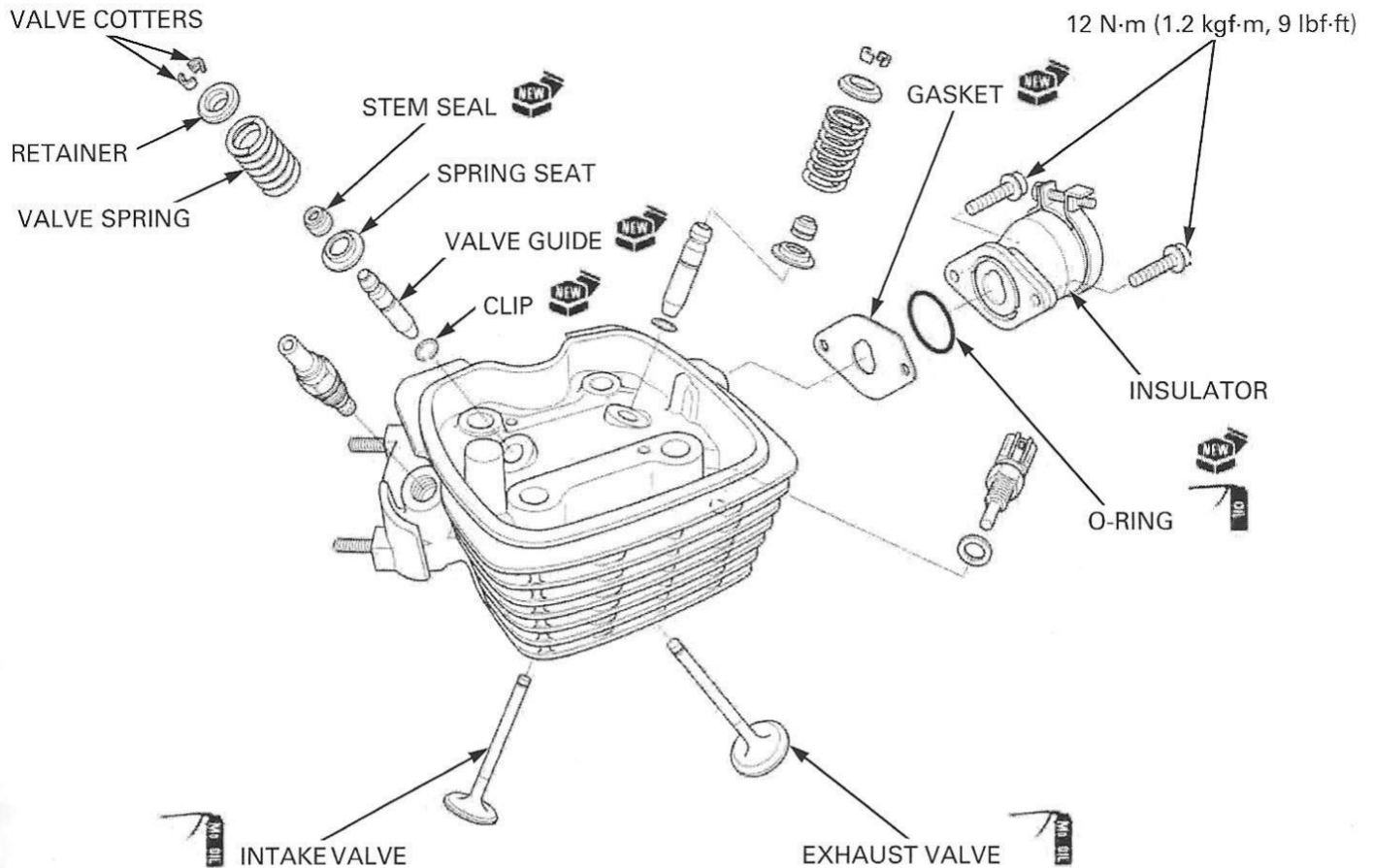
- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool frequently to prevent uneven seat wear.
- Lapping compound can cause damage if it enters between the valve stem and guide.

After lapping, wash any residual compound off the cylinder head and valve.

Recheck the seat contact after lapping.



ASSEMBLY

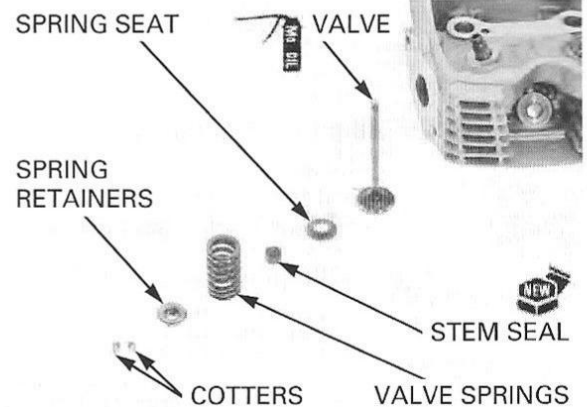


Blow through all oil passage with compressed air.

Install the spring seats and new valve stem seals.

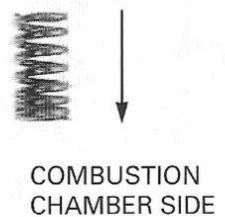
Lubricate each valve stem sliding surface and stem end with molybdenum oil solution.

Insert the intake and exhaust valves into the valve guides while turning it slowly to avoid damage to the stem seal.



Install the valve springs with the tightly wound coils should face toward the combustion chamber.

Install the spring retainers.



CYLINDER HEAD/VALVES

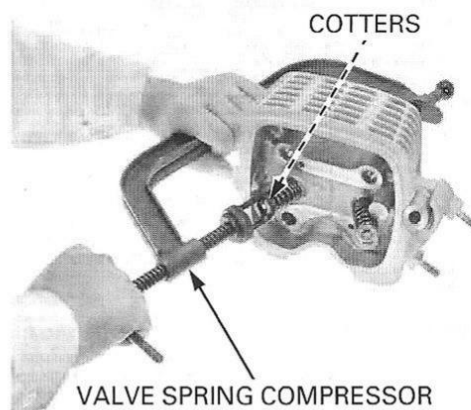
Grease the cotters to ease installation. To prevent loss of tension, do not compress the valve spring more than necessary.

While compressing the valve spring using the special tool, install the valve cotters.

TOOL:

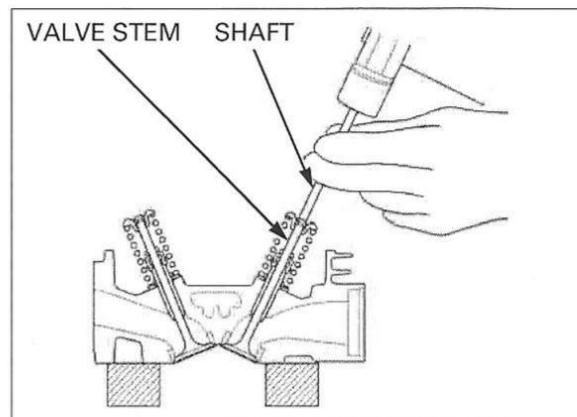
Valve spring compressor

07757-0010000



- Support the cylinder head above the work bench surface to prevent possible valve damage.

Tap the valve stems gently with a plastic hammer and shaft as shown to seat the cotters firmly.



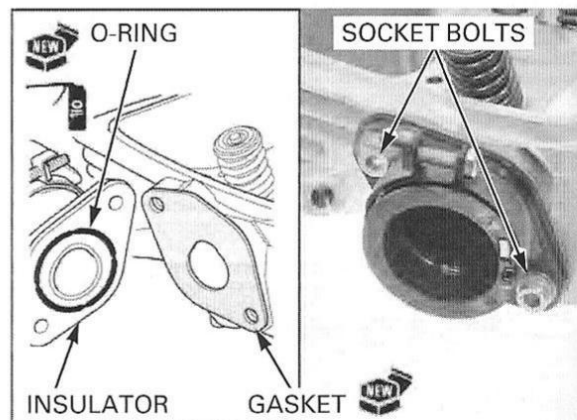
Apply engine oil to a new O-ring and install it to the insulator groove.

Install a new gasket, insulator and socket bolts to the cylinder head, and tighten them to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the following:

- Spark plug (page 3-7)
- EOT sensor (page 5-64)
- O₂ sensor (page 5-69)

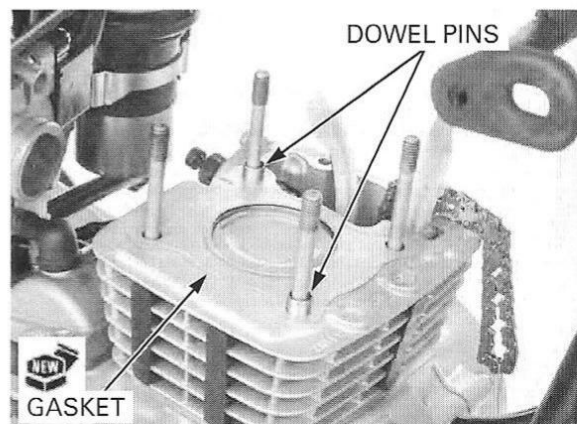


CYLINDER HEAD INSTALLATION

Do not allow dust and dirt to enter the engine.

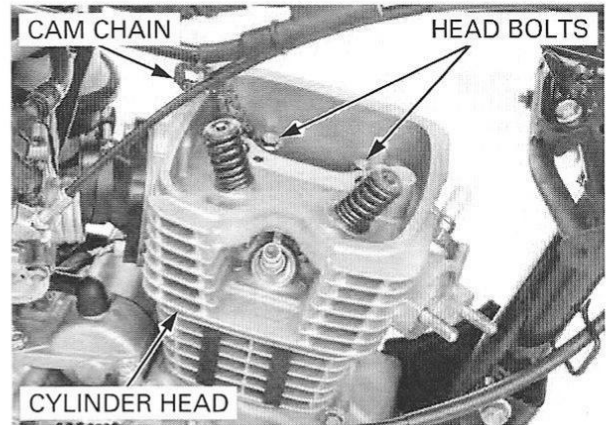
Clean off any gasket material from the cylinder head mating surfaces of the cylinder and cylinder head.

Install the dowel pins and new gasket.

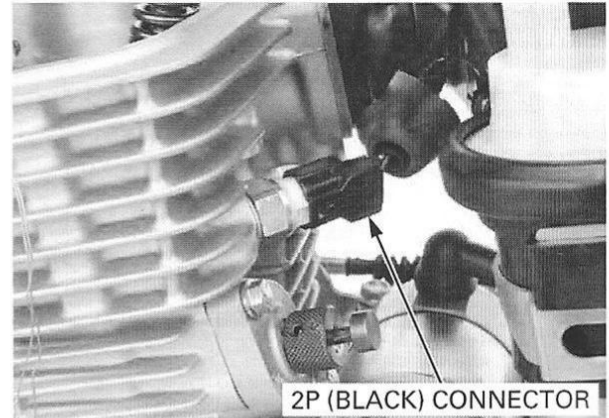


Route the cam chain through the cylinder head and install the cylinder head onto the cylinder.

Loosely install the cylinder head bolts.



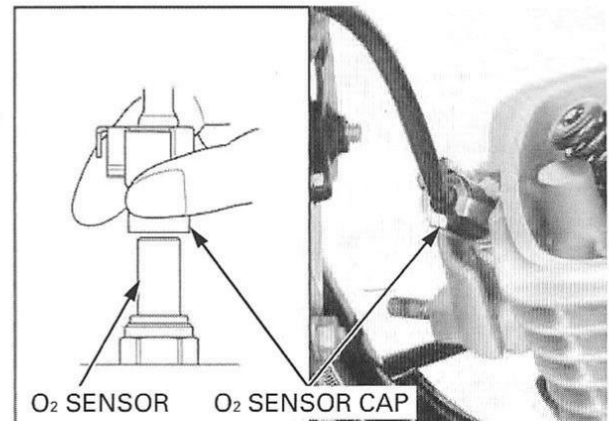
Connect the EOT sensor 2P (Black) connector.



Connect the O₂ sensor cap by pushing it straight.

NOTICE

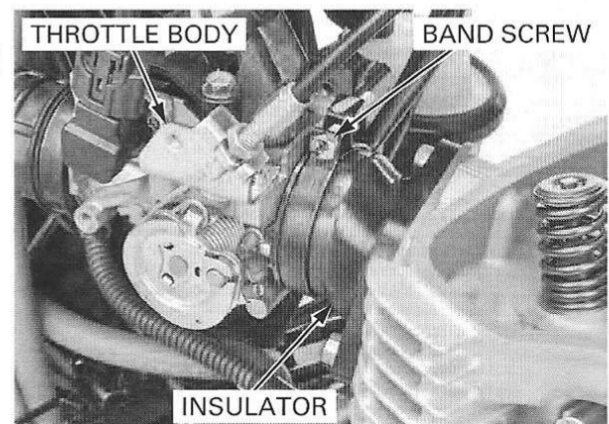
Be careful not to tilt the O₂ sensor cap when connecting the cap to the O₂ sensor.



Install the throttle body to the insulator.

Tighten the insulator band screw to the specified torque.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

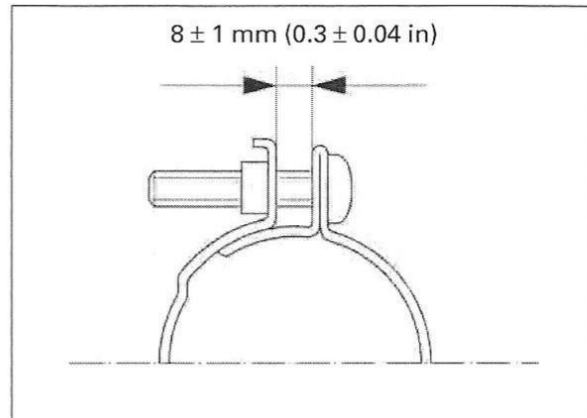


CYLINDER HEAD/VALVES

Check that the width between the insulator band ends clearance is 8 ± 1 mm (0.3 ± 0.04 in).

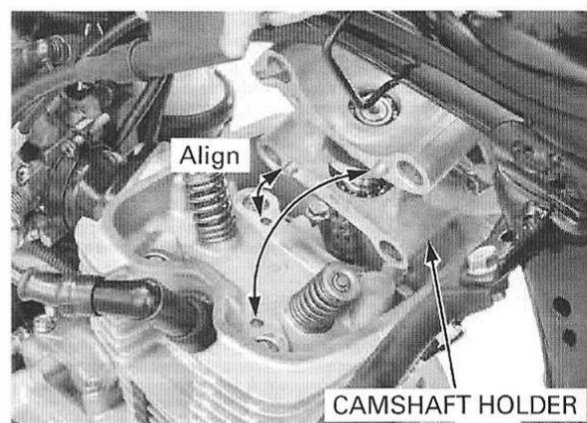
Install the following:

- Exhaust pipe/muffler (page 2-17)
- Spark plug (page 3-7)
- Camshaft holder (page 7-22)
- Cylinder head cover (page 7-25)



CAMSHAFT HOLDER INSTALLATION

Install the camshaft holder onto the cylinder head by aligning the holes of the cylinder head with the pins of the camshaft holder.



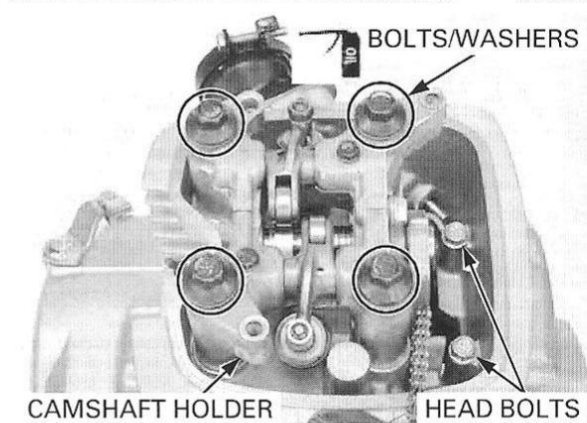
Apply engine oil to the camshaft holder bolt threads and seating surface.

Install the washers onto the camshaft holder bolts.

Install and tighten the camshaft holder bolts to the specified torque in a crisscross pattern in several steps.

TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

Tighten the cylinder head bolts alternately.

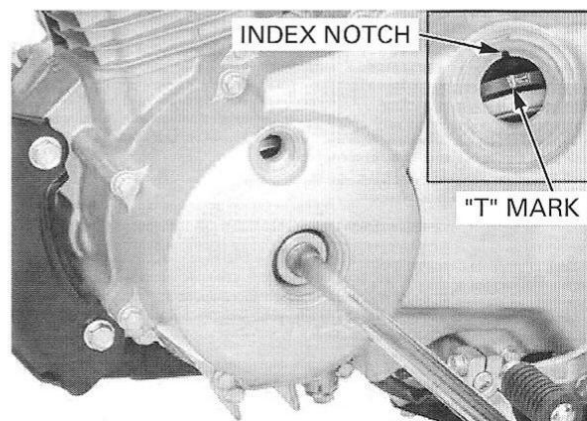


CAM SPROCKET/CAMSHAFT INSTALLATION

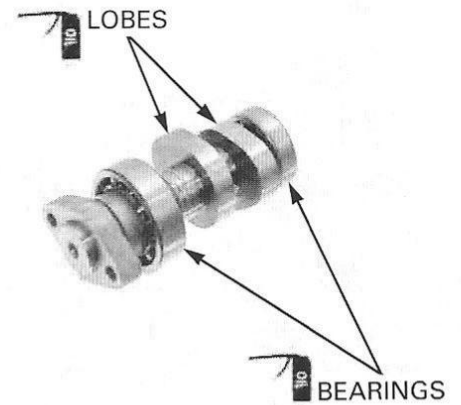
Remove the timing hole cap and crankshaft hole cap (page 3-9).

Be careful not to jam the cam chain and timing sprocket on the crankshaft when rotating the crankshaft.

Rotate the crankshaft counterclockwise, and align the "T" mark on the flywheel with the index notch on the left crankcase cover.

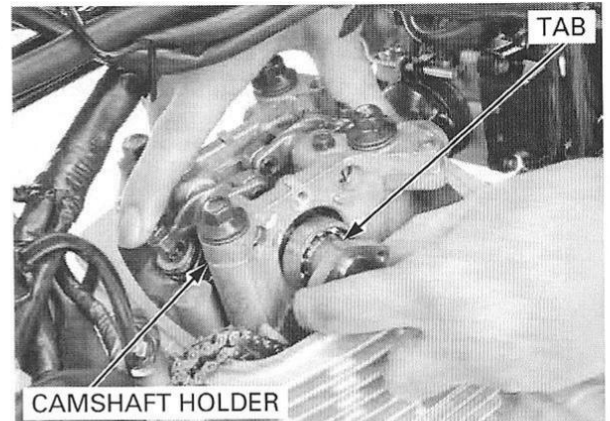


Apply engine oil to the camshaft whole surface.

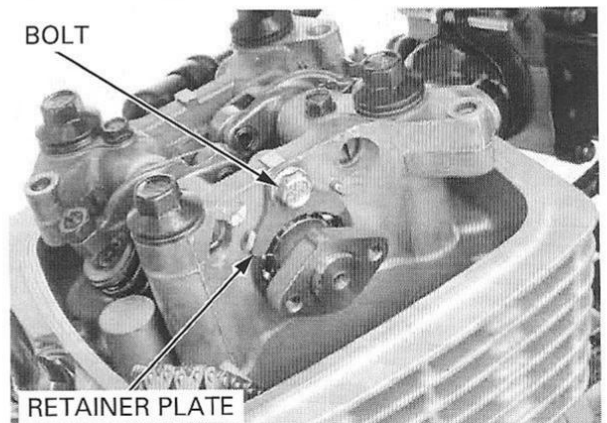


Make sure the tab of the camshaft facing up.

If the camshaft is removed, install the camshaft into the camshaft holder while holding the rocker arms to make a good access for camshaft installation.



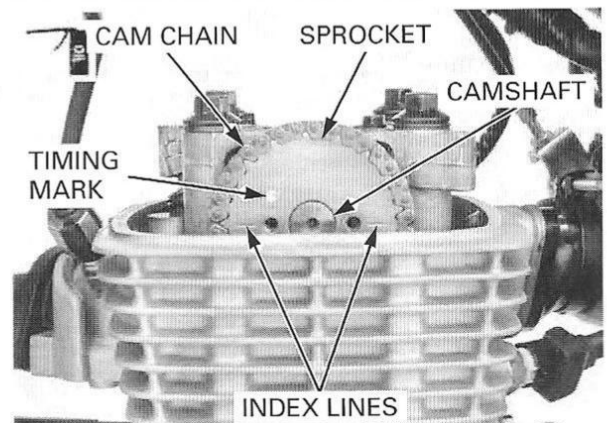
Install the camshaft retainer plate and tighten the bolt securely.



Apply engine oil to the cam chain entire surface.

Install the cam sprocket to the cam chain so that the index lines of the cam sprocket are flush with the cylinder head surface and timing mark "O" is facing front.

Install the cam sprocket to the camshaft.



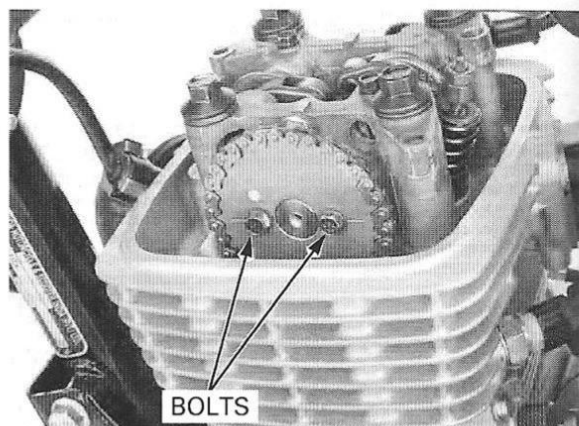
CYLINDER HEAD/VALVES

Cover the cam chain opening with a shop towel to prevent the cam sprocket bolts from falling into the crankcase.

Align the bolt holes in the cam sprocket and camshaft.

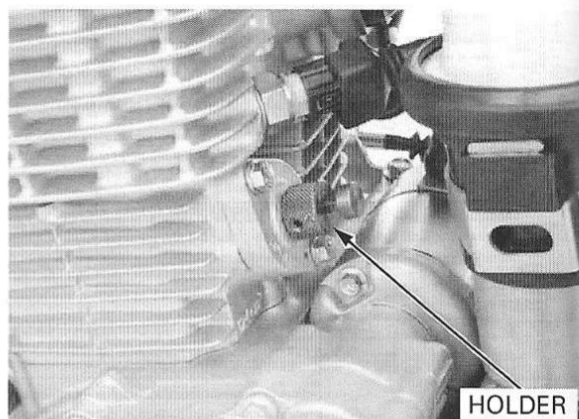
Install and tighten the cam sprocket bolts to the specified torque by holding the crankshaft.

TORQUE: 9 N·m (0.9 kgf·m, 6.6 lbf·ft)



Remove the cam chain tensioner holder from the cam chain tensioner lifter.

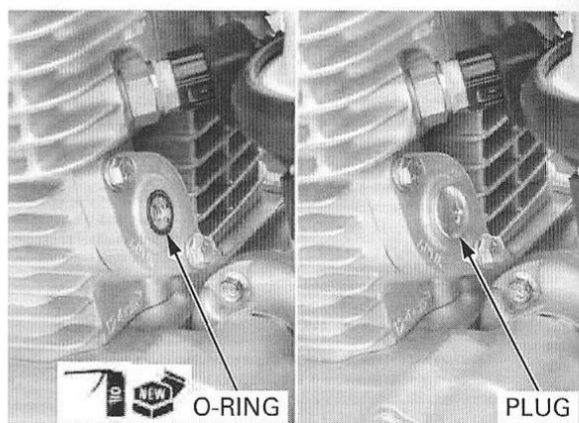
Make sure the index lines on the cam sprocket are flush with the cylinder head surface when aligning the "T" mark on the flywheel with the index notch on the left crankcase cover.



Apply engine oil to a new O-ring, and install it to the cam chain tensioner lifter groove.

Install and tighten the cam chain tensioner lifter plug to the specified torque.

TORQUE: 4 N·m (0.4 kgf·m, 3.0 lbf·ft)



Apply engine oil to new O-rings, and install them to each hole cap.

Apply grease to the crankshaft hole cap threads.

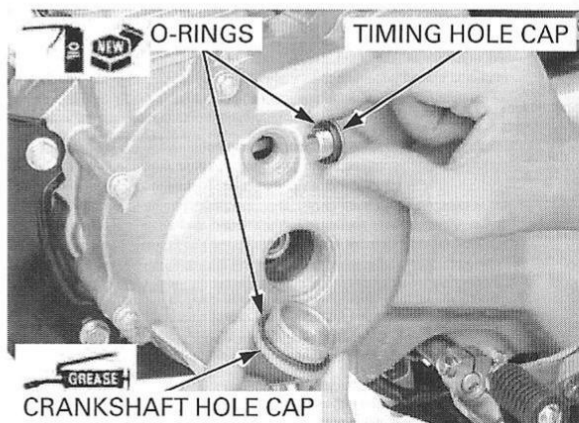
Install and tighten the crankshaft hole cap to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

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

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the cylinder head cover (page 7-25).

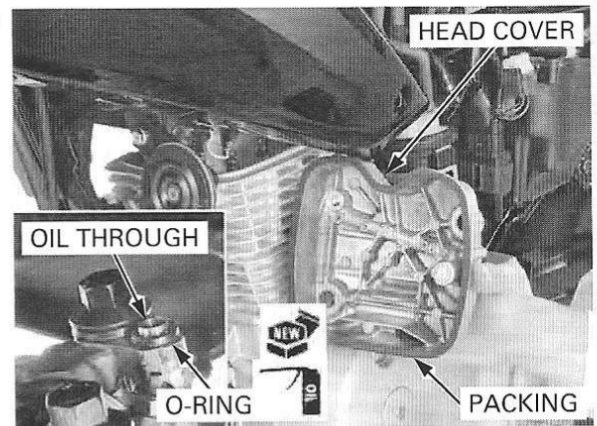


CYLINDER HEAD COVER INSTALLATION

Apply engine oil to a new O-ring and install it onto the oil through.

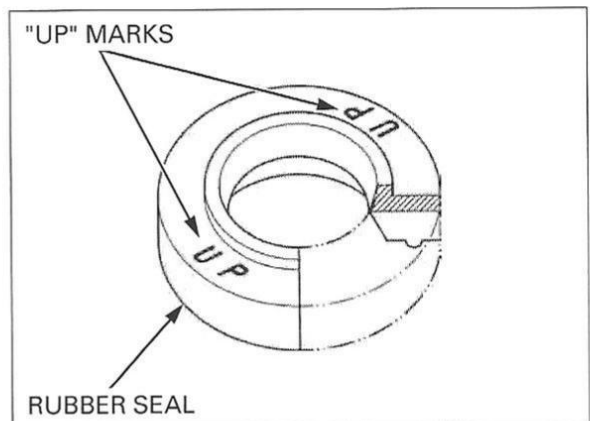
Install the oil through to the camshaft holder.

Install the cylinder head cover to the cylinder head.



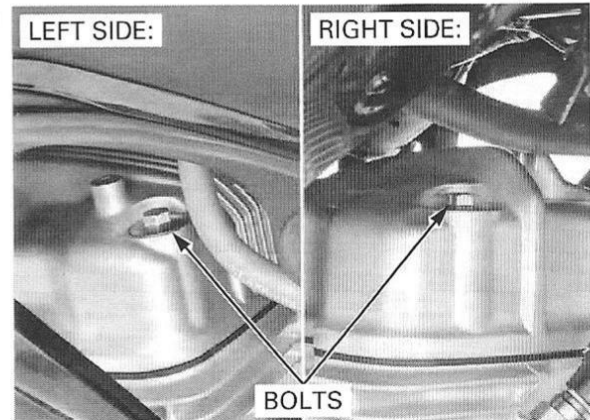
Check the rubber seals is in good condition, replace them if necessary.

Install the rubber seals onto the cylinder head cover with their "UP" marks facing up.



Install the cylinder head cover bolts and tighten them to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



8. CYLINDER/PISTON

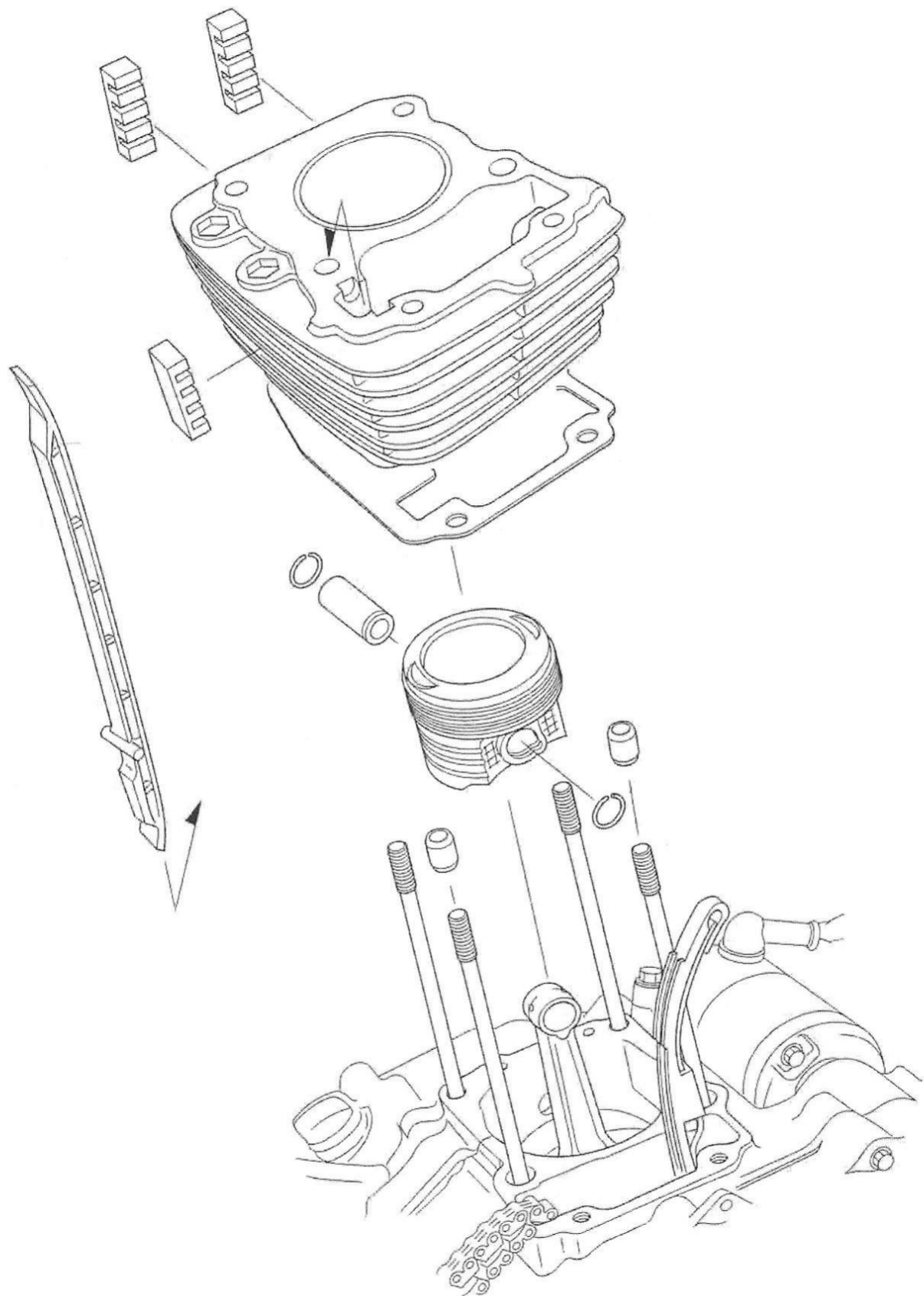
COMPONENT LOCATION 8-2

SERVICE INFORMATION 8-3

TROUBLESHOOTING..... 8-4

CYLINDER/PISTON 8-5

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- The cylinder and piston services can be done 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 strike the cylinder too hard during removal.
- Camshaft and rocker arm lubricating oil is fed through an oil passage in the cylinder. Clean the oil passage before installing cylinder.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		52.400 – 52.410 (2.0630 – 2.0634)	52.50 (2.067)
	Out-of-round		–	0.10 (0.004)
	Taper		–	0.10 (0.004)
	Warpage		–	0.10 (0.004)
Piston, piston pin, piston ring	Piston O.D. at 5 (0.2) from bottom		52.370 – 52.390 (2.0618 – 2.0626)	52.30 (2.059)
	Piston pin hole I.D.		13.002 – 13.008 (0.5119 – 0.5121)	13.03 (0.513)
	Piston pin O.D.		12.994 – 13.000 (0.5116 – 0.5118)	12.98 (0.511)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)
	Piston ring end gap	Top	0.10 – 0.25 (0.004 – 0.010)	0.40 (0.016)
		Second	0.30 – 0.45 (0.012 – 0.018)	0.60 (0.024)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)	0.85 (0.033)
	Piston ring-to-ring groove clearance	Top	0.030 – 0.065 (0.0012 – 0.0026)	0.10 (0.004)
Second		0.015 – 0.050 (0.0006 – 0.0020)	0.09 (0.004)	
Cylinder-to-piston clearance			0.010 – 0.040 (0.0004 – 0.0016)	0.10 (0.004)
Connecting rod small end I.D.			13.016 – 13.034 (0.5124 – 0.5131)	13.05 (0.514)
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	0.07 (0.003)

TORQUE VALUE

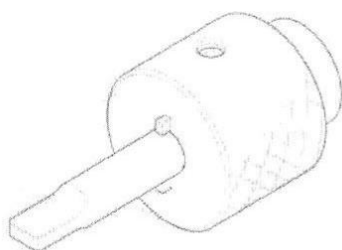
Cylinder stud bolt

11 N·m (1.1 kgf·m, 8 lbf·ft)

See page 8-6

TOOL

Cam chain tensioner holder
070MG-0010100



TROUBLESHOOTING

Compression too low, hard starting or poor performance at low speed

- Leaking cylinder head gasket
- Worn, stuck or broken piston rings
- Worn or damaged cylinder and piston

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

Abnormal noise

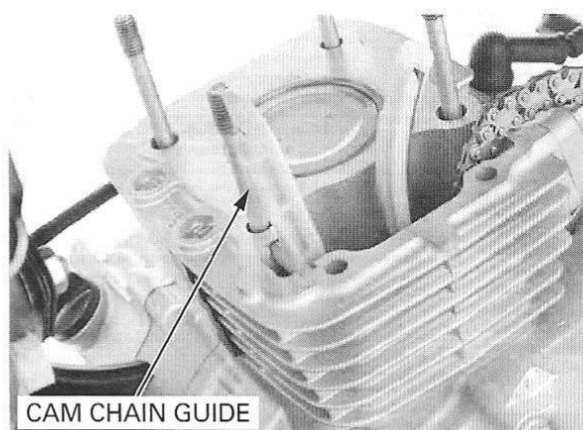
- Worn piston pin or piston pin hole
- Worn cylinder, piston or piston rings
- Worn connecting rod small end

CYLINDER/PISTON

CYLINDER REMOVAL

Remove the cylinder head (page 7-11).

Remove the cam chain guide.

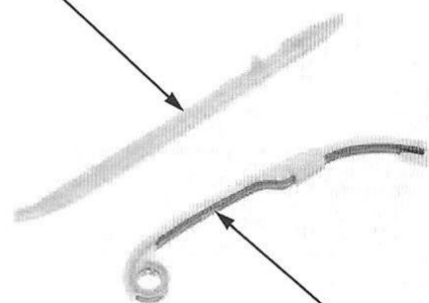


CAM CHAIN GUIDE

Check the cam chain guide and cam chain tensioner for excessive wear or damage, replace them if necessary.

- For cam chain tensioner removal (page 11-6)

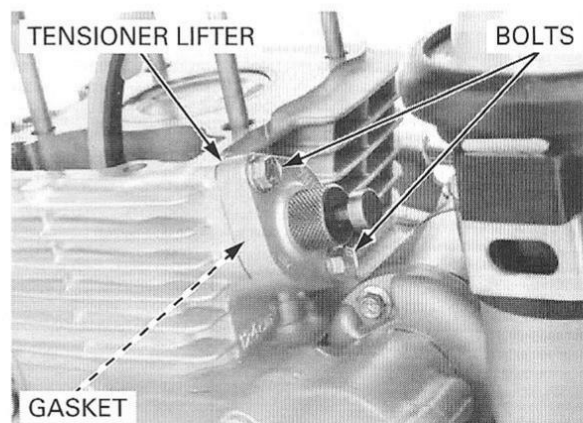
CAM CHAIN GUIDE



CAM CHAIN TENSIONER

Remove the bolts and cam chain tensioner lifter.

Remove the gasket.



TENSIONER LIFTER

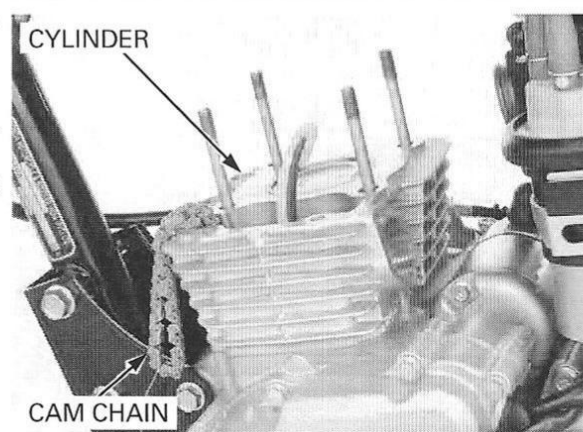
BOLTS

GASKET

Remove the cylinder being careful not to damage the piston with the stud bolts.

NOTE:

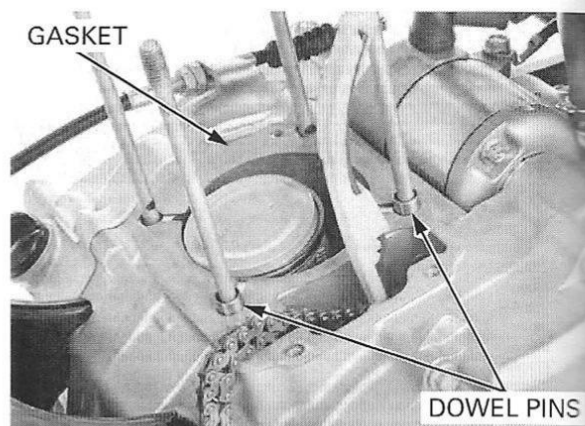
- Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.
- Do not strike the cylinder too hard and do not damage the mating surface with a screwdriver.



CYLINDER

CAM CHAIN

Remove the dowel pins and gasket.



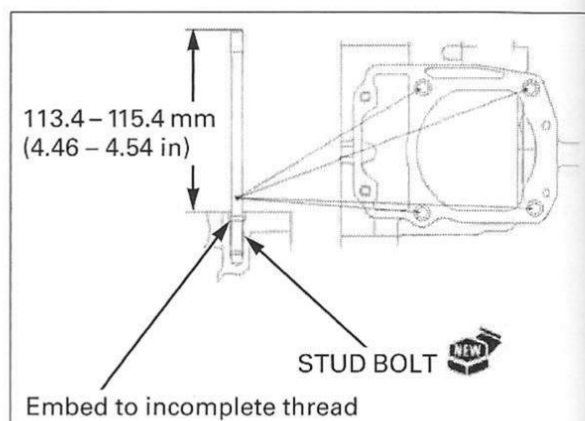
STUD BOLT REPLACEMENT

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

Install new stud bolts into the crankcase as shown.

TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)

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



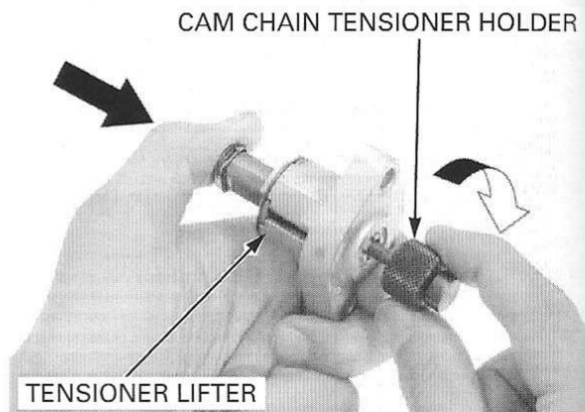
CAM CHAIN TENSIONER LIFTER INSPECTION

Check the lifter operation:

- The cam chain tensioner lifter shaft should not go into the cam chain tensioner lifter body when it is pushed.
- When it is turned clockwise with a cam chain tensioner holder, the cam chain tensioner lifter shaft should be pulled into the cam chain tensioner lifter body. The cam chain tensioner lifter shaft should spring out of the cam chain tensioner lifter body as soon as the cam chain tensioner holder is released.

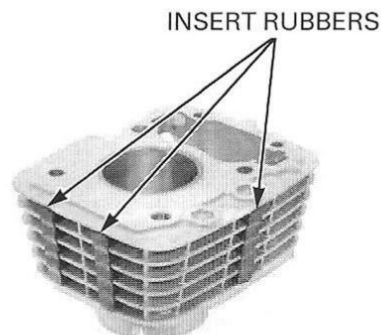
TOOL:

Cam chain tensioner holder 070MG-0010100



CYLINDER INSPECTION

Remove and check the insert rubbers are in good condition, replace them if necessary.



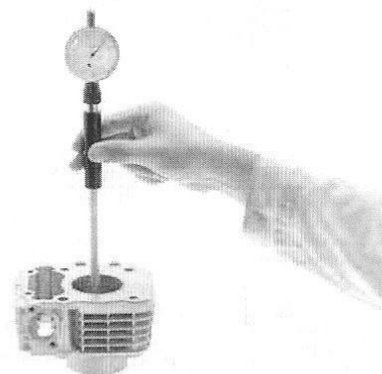
Inspect the cylinder wall for scratches and wear.

Measure and record the cylinder I.D. at three levels in both the X and Y axes.

Take the maximum reading to determine the cylinder wear.

SERVICE LIMIT: 52.50 mm (2.067 in)

Calculate the cylinder-to-piston clearance (page 8-8).



Calculate the cylinder for taper and out-of-round at three levels in the X and Y axes.

Take the maximum reading to determine the taper and out-of-round.

SERVICE LIMITS:

Taper: 0.10 mm (0.004 in)

Out-of-round: 0.10 mm (0.004 in)

The cylinder must be rebored and an oversize piston fitted if the service limit is exceeded.

The following oversize pistons are available:

0.25 mm (0.010 in)

0.50 mm (0.020 in)

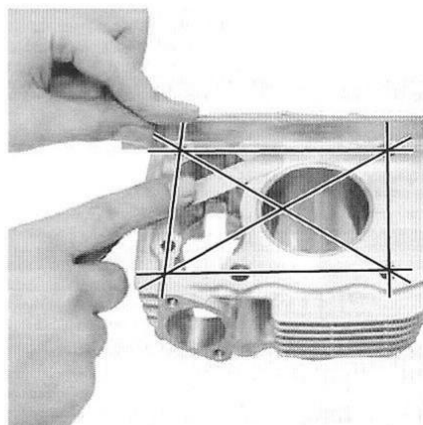
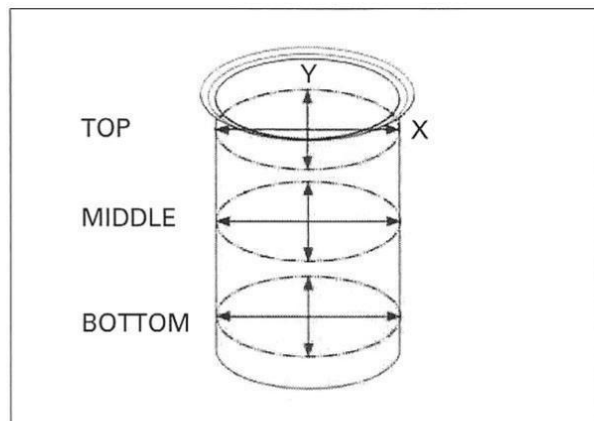
0.75 mm (0.030 in)

1.00 mm (0.040 in)

The cylinder must be rebored so that the clearance for an oversize piston is 0.010 – 0.040 mm (0.0004 – 0.0016 in).

Check the cylinder for warpage with a straight edge and feeler gauge as shown.

SERVICE LIMIT: 0.10 mm (0.004 in)

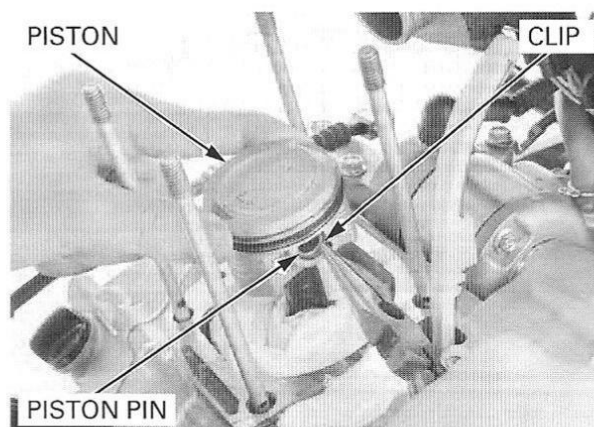


PISTON REMOVAL

Place a clean shop towel at the crankcase opening to prevent the piston pin clips from falling into the crankcase.

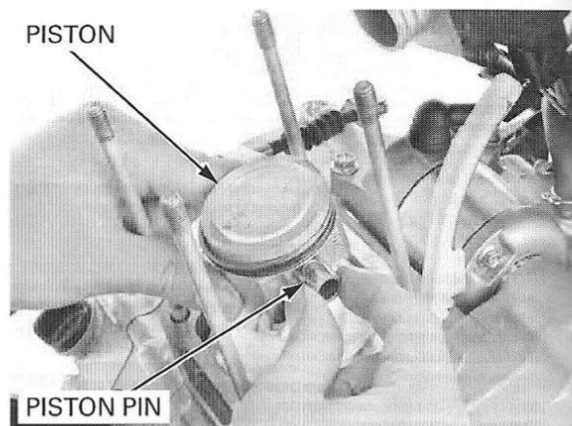
Remove the cylinder (page 8-5).

Remove the piston pin clips using pliers.



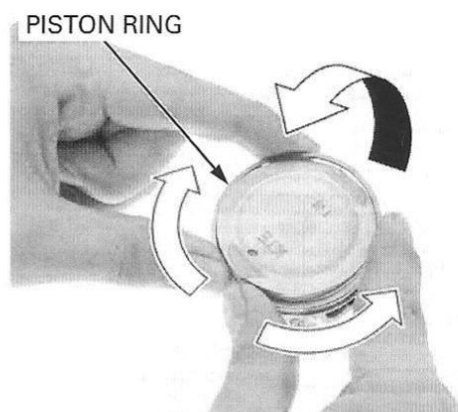
CYLINDER/PISTON

Push the piston pin out of the piston and connecting rod, then remove the piston.



Spread each piston ring and remove them by lifting up at a point just opposite the gap.

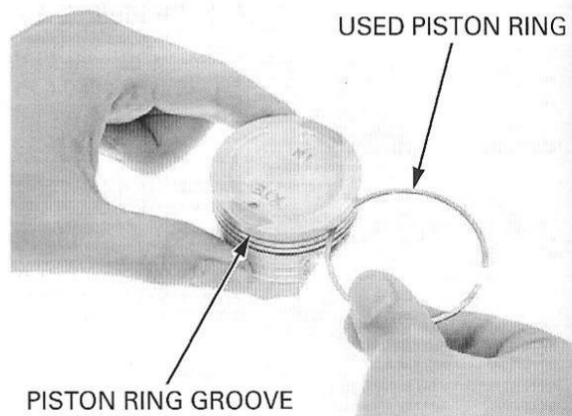
- Do not damage the piston rings by spreading the ends too far.
- Be careful not to damage the piston.



Never use a wire brush; it will scratch the piston ring grooves.

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.



PISTON/PISTON RING INSPECTION

Always replace the piston rings as a set.

Inspect the piston rings and replace them if they are damaged.

Temporarily install the piston rings (page 8-10) into their proper position with the mark facing up.

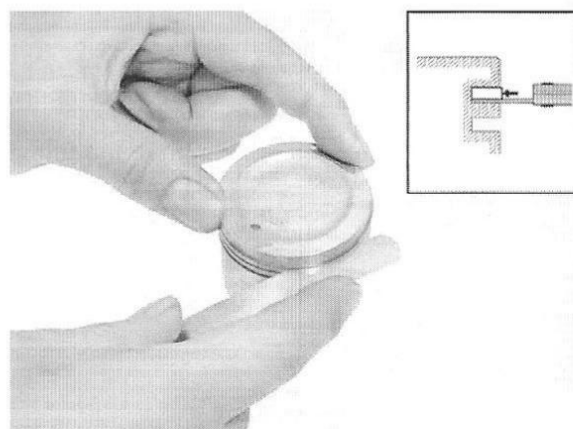
Inspect the piston rings for smooth movement by rotating them. The rings should be able to move in their grooves without catching.

Push the ring until the outer surface of the piston ring is nearly flush with the piston and measure the ring-to-ring groove clearance using a feeler gauge.

SERVICE LIMITS:

Top: 0.10 mm (0.004 in)

Second: 0.09 mm (0.004 in)



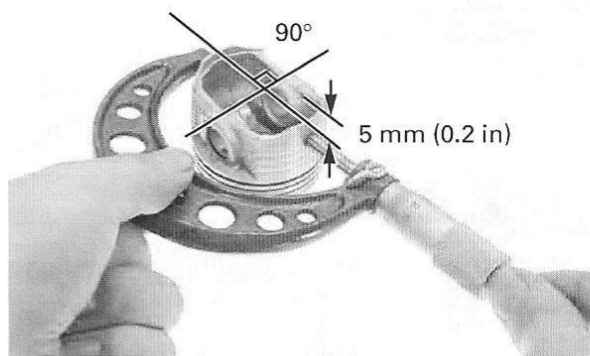
Inspect the piston for cracks or other damage.
Inspect the ring grooves for excessive wear and carbon build-up.

Measure the piston O.D. at a point 5 mm (0.2 in) from the bottom and 90° to the piston pin hole.

SERVICE LIMIT: 52.30 mm (2.059 in)

Calculate the cylinder-to-piston clearance.
Take the maximum reading to determine the clearance (Cylinder I.D.: page 8-6).

SERVICE LIMIT: 0.10 mm (0.004 in)



Measure the piston pin hole I.D. in the X and Y axes.
Take the maximum reading to determine I.D.

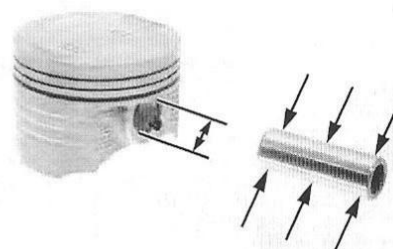
SERVICE LIMIT: 13.03 mm (0.513 in)

Measure the piston pin O.D. at three points.

SERVICE LIMIT: 12.98 mm (0.511 in)

Calculate the piston-to-piston pin clearance.

SERVICE LIMIT: 0.04 mm (0.002 in)

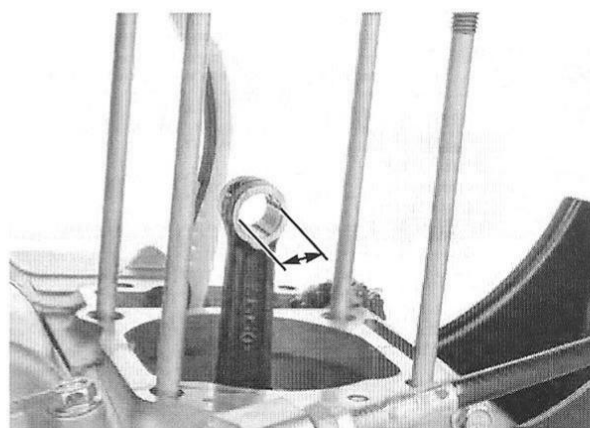


Measure the connecting rod small end I.D.

SERVICE LIMIT: 13.05 mm (0.514 in)

Calculate the connecting rod small end-to-piston pin clearance.

SERVICE LIMIT: 0.07 mm (0.003 in)



Insert the piston ring into the bottom of the cylinder squarely using the piston crown.

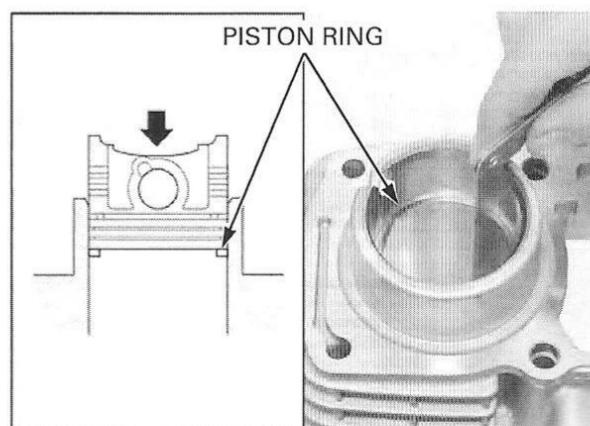
Measure the ring end gap.

SERVICE LIMITS:

Top: 0.40 mm (0.016 in)

Second: 0.60 mm (0.024 in)

Oil: 0.85 mm (0.033 in)

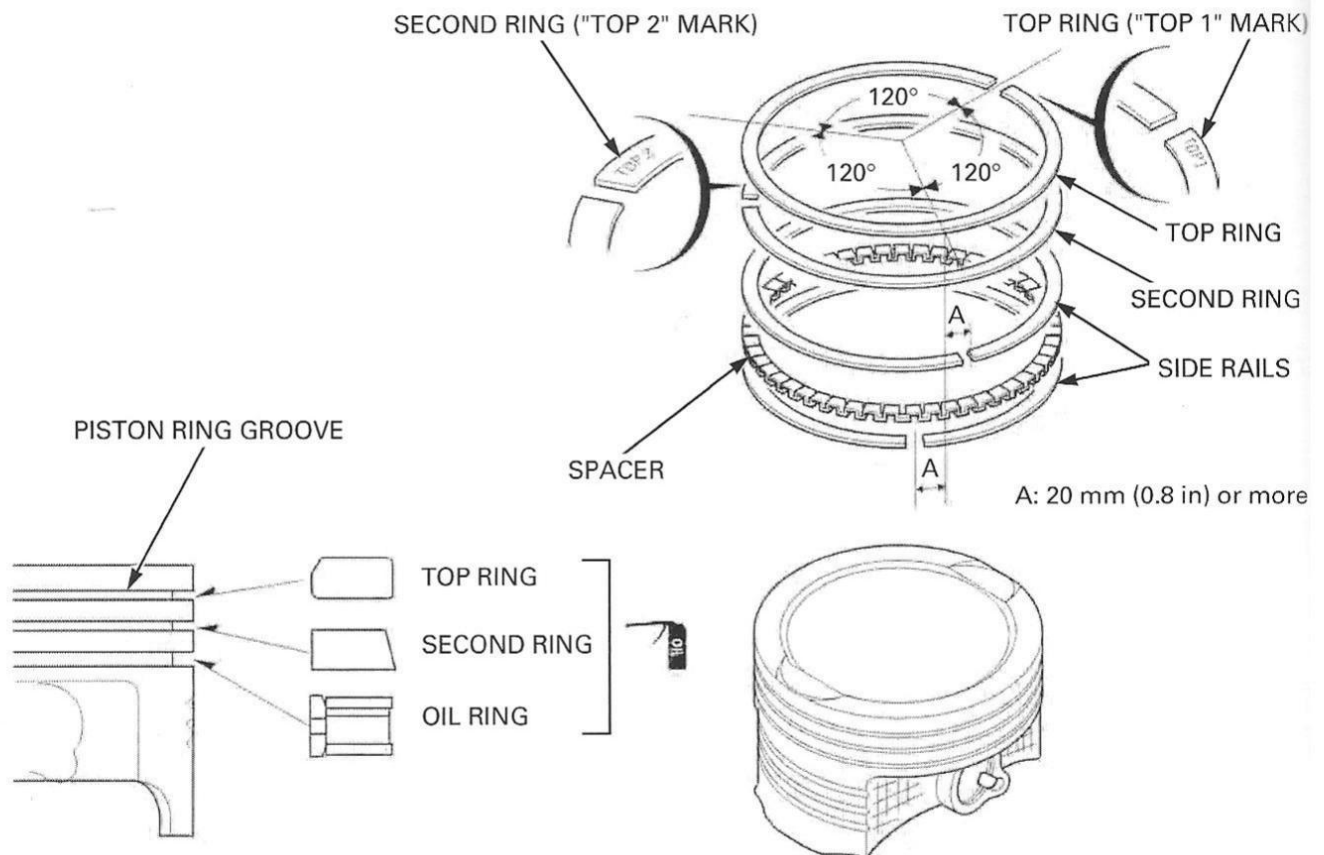


PISTON INSTALLATION

Apply engine oil to the piston ring whole surface, piston pin hole and ring groove.

Carefully install the piston rings into the piston ring grooves with the marks facing up.

- Do not damage the piston ring by spreading the ends too far.
- Be careful not to damage the piston.
- Do not confuse the top and second rings.
- To install the oil ring, install the spacer first, then install the side rails.
- After installing the rings they should rotate freely, without sticking.
- Stagger the ring end gaps 120° apart from each other.

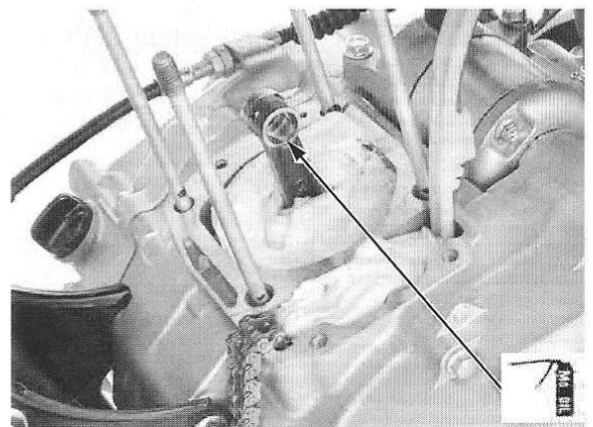


Place a clean shop towel in the crankcase opening to prevent the gasket material or piston pin clip from falling into the crankcase.

Be careful not to damage the gasket surface.

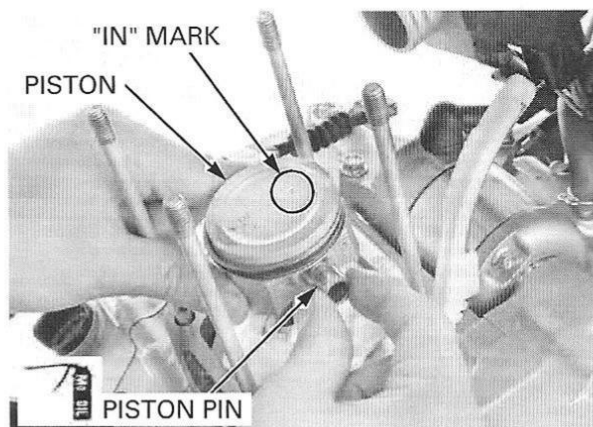
Clean off any gasket material from the cylinder mating surface of the crankcase.

Apply molybdenum oil solution to the connecting rod small end inner surface.



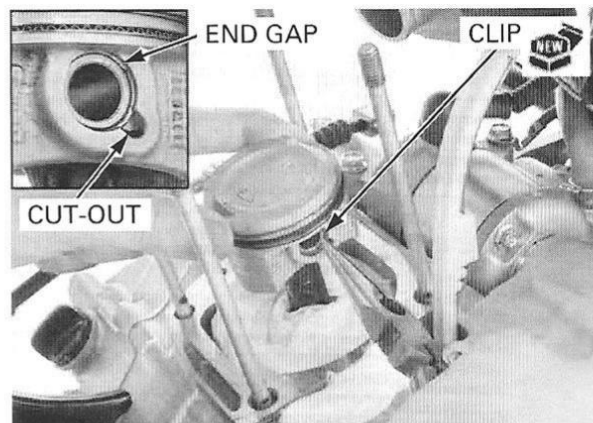
Apply molybdenum oil solution to the piston pin outer surface.

Install the piston with its "IN" mark toward the intake side and insert the piston pin through the piston and connecting rod.



Install new piston pin clips.

- Always use new piston pin clips. Reinstalling used piston pin clips may lead to serious engine damage.
- Make sure the piston pin clips are seated securely.
- Do not align the piston pin clip end gap with the piston cut-out.

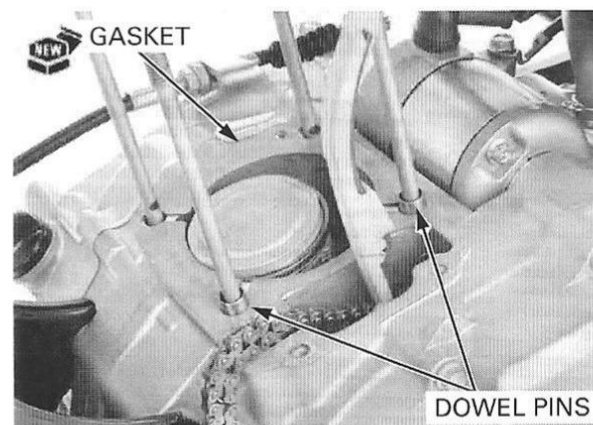


CYLINDER INSTALLATION

Do not reuse the gasket, replace with a new one.

Install the dowel pins and a new gasket.

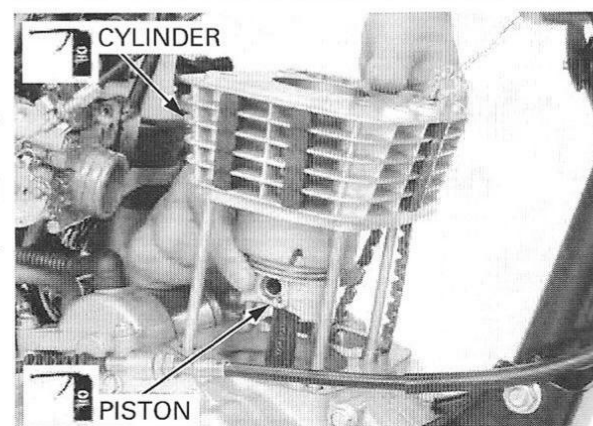
Make sure that the cam chain is installed on the timing sprocket.



Apply engine oil to the cylinder inner and, piston sliding surfaces.

Route the cam chain through the cylinder and install the cylinder over the piston while compressing the piston rings with your fingers.

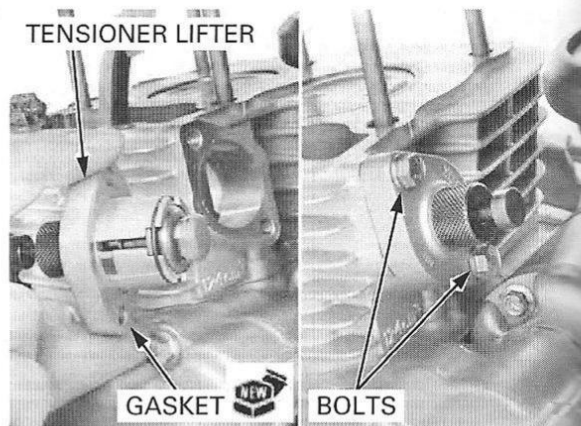
- Be careful not to damage the piston rings and cylinder wall.
- Be careful not to stick the piston rings to the cut-out of the cylinder sleeve.



CYLINDER/PISTON

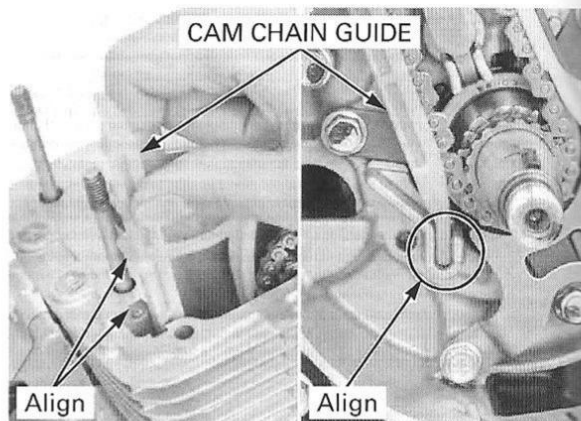
Install a new gasket on the cam chain tensioner lifter and install them to the cylinder.

Install and tighten the bolt securely.



Install the cam chain guide by aligning its tabs with the cylinder grooves and its end with the left crank-case groove as shown.

Install the cylinder head (page 7-20).

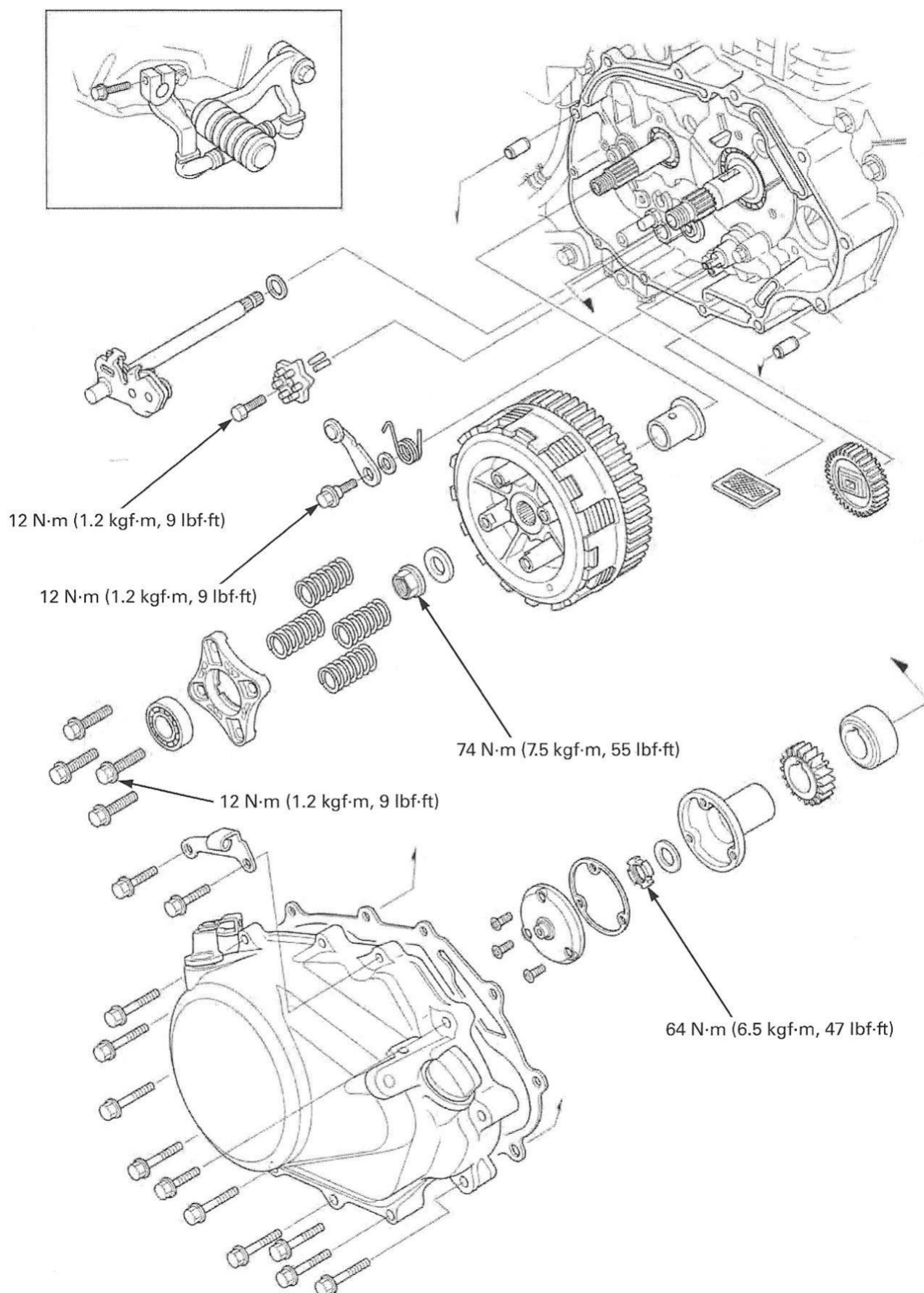


9. CLUTCH/GEARSHIFT LINKAGE

COMPONENT LOCATION	9-2	CLUTCH	9-9
SERVICE INFORMATION	9-3	GEARSHIFT LINKAGE	9-17
TROUBLESHOOTING	9-5	PRIMARY DRIVE GEAR/ CRANKSHAFT COLLAR	9-20
RIGHT CRANKCASE COVER.....	9-6		

CLUTCH/GEARSHIFT LINKAGE

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers service of the clutch and gearshift linkage. All services can be done with the engine installed in the frame.
- Engine oil viscosity and level have an effect on clutch disengagement. When the clutch does not disengage or the motorcycle creeps with clutch disengaged, inspect the engine oil level before servicing the clutch system.
- Clean off any gasket material from the right crankcase cover surface.
- Use care not to allow dust or dirt to enter the engine.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch lever freeplay		10 – 20 (3/8 – 13/16)	–
Clutch	Spring free length	39.0 (1.54)	–
	Disc thickness	2.92 – 3.08 (0.115 – 0.121)	2.80 (0.110)
	Plate warpage	–	0.20 (0.008)
Primary driven gear I.D.		23.000 – 23.021 (0.9055 – 0.9063)	23.08 (0.909)
Clutch outer guide	O.D.	22.959 – 22.980 (0.9039 – 0.9047)	22.93 (0.903)
	I.D.	16.991 – 17.009 (0.6689 – 0.6696)	17.04 (0.671)
Mainshaft O.D. at clutch outer guide		16.966 – 16.984 (0.6680 – 0.6687)	16.95 (0.667)
Primary driven gear-to-guide clearance		0.020 – 0.062 (0.0008 – 0.0024)	–
Clutch outer guide-to-mainshaft clearance		0.007 – 0.043 (0.0003 – 0.0017)	–

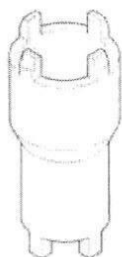
TORQUE VALUES

Clutch center lock nut	74 N·m (7.5 kgf·m, 55 lbf·ft)	Apply engine oil to the threads and seating surface.
Clutch lifter plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Oil filter rotor lock nut	64 N·m (6.5 kgf·m, 47 lbf·ft)	Apply engine oil to the threads and seating surface.
Gearshift cam bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads.
Shift drum stopper arm bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads.

CLUTCH/GEARSHIFT LINKAGE

TOOLS

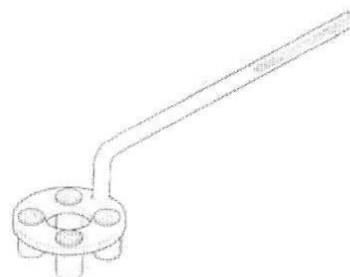
Lock nut wrench
07716-0020100



Pin driver
07744-0010200



Clutch center holder
07GMB-KT70101



Gear holder
07724-0010200



TROUBLESHOOTING

Faulty clutch operation can usually be corrected by adjusting the freeplay.

Clutch lever is too hard to pull in

- Damaged, kinked or dirty clutch cable
- Improperly routed clutch cable
- Damaged clutch lifter mechanism
- Faulty clutch lifter plate bearing

Clutch will not disengage or motorcycle creeps with clutch disengaged

- Excessive clutch lever freeplay
- Clutch plate warped
- Oil level too high, improper oil viscosity, or additive used
- Damaged clutch lifter mechanism
- Loose clutch center lock nut

Clutch slips when accelerating

- Clutch lifter sticking
- Worn clutch discs
- Weak clutch springs
- No clutch lever freeplay
- Engine oil mixed with molybdenum or graphite additive

Hard to shift

- Improper clutch operation
- Incorrect oil viscosity
- Loose gearshift spindle pin
- Loose shift drum stopper arm bolt
- Loose gearshift cam bolt
- Damaged gearshift cam
- Damaged gearshift spindle pin
- Damaged shift drum stopper arm
- Damaged gearshift spindle

Transmission jumps out of gear

- Worn shift drum stopper arm
- Weak or broken gearshift spindle return spring

Gearshift pedal will not return

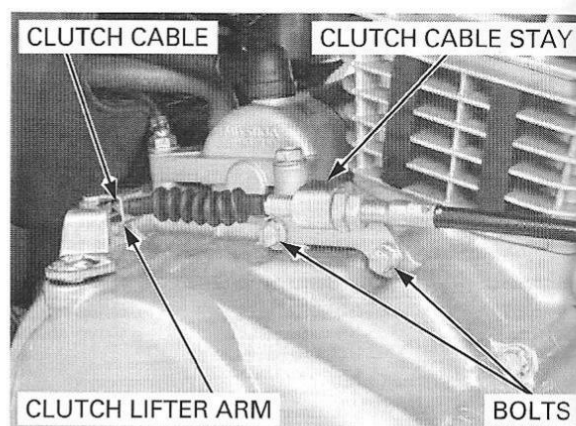
- Weak or broken gearshift spindle return spring
- Bent gearshift spindle
- Loose gearshift cam bolt
- Damaged gearshift cam

RIGHT CRANKCASE COVER

REMOVAL

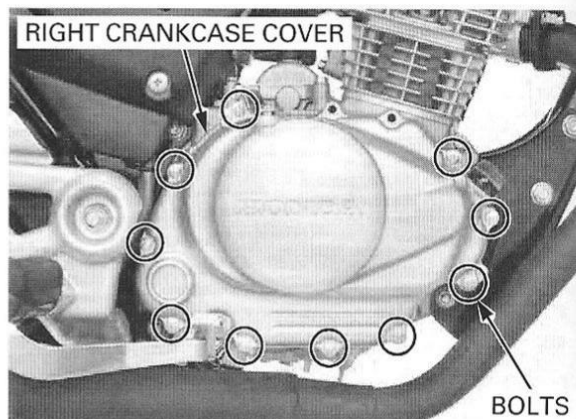
Drain the engine oil (page 3-11).

Remove the bolts and clutch cable stay, then disconnect the clutch cable from the clutch lifter arm.

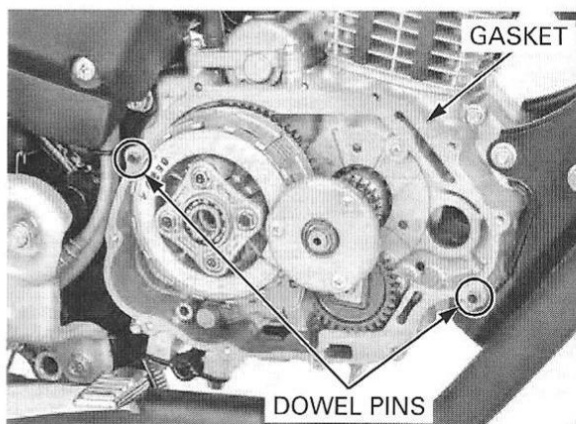


Loosen the right crankcase cover bolts in a criss-cross pattern in several steps.

Remove the right crankcase cover, being careful not to damage the mating surface.



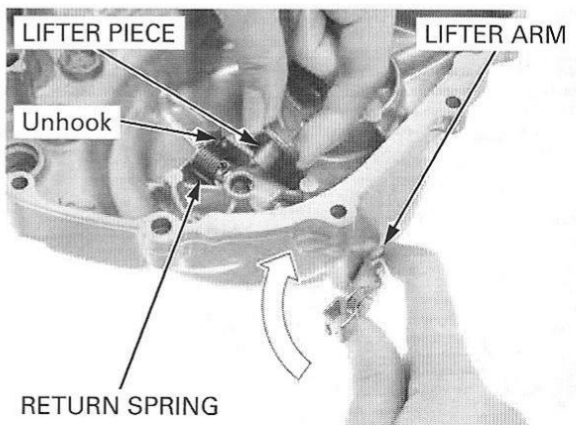
Remove the dowel pins and gasket.



DISASSEMBLY

Turn the clutch lifter arm clockwise and remove the clutch lifter piece.

Unhook the return spring end from the right crankcase cover.



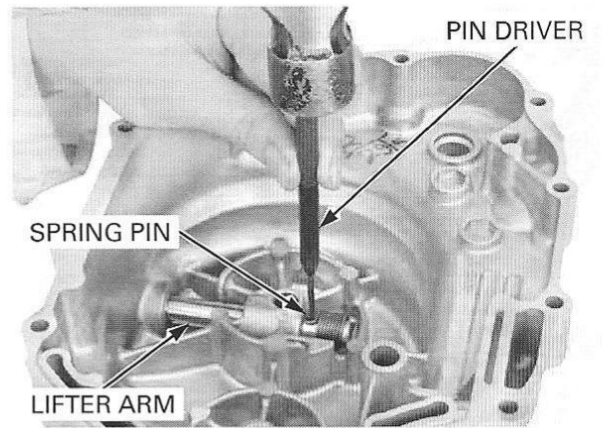
Measure and record the length of drive pin protrusion.

Drive the spring pin into the clutch lifter arm until the pin end is flush with the lifter arm surface using the special tool.

TOOL:

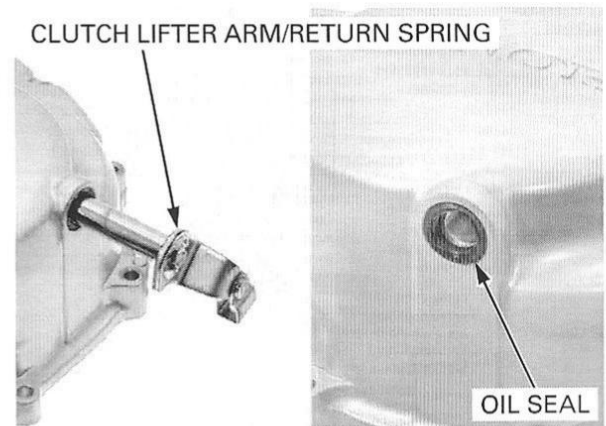
Pin driver

07744-0010200



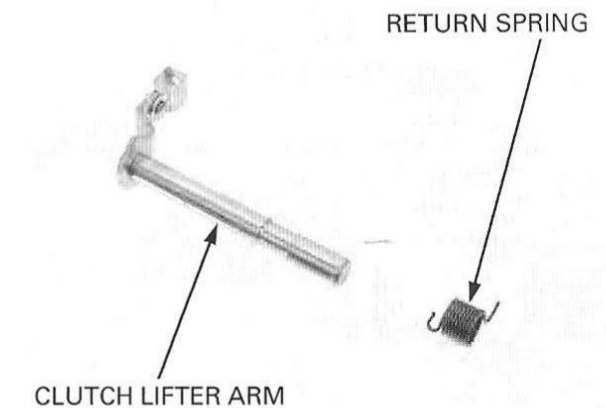
Pull out the clutch lifter arm from the right crankcase cover and remove the return spring.

Check that the clutch lifter arm oil seal is in good condition, replace it if necessary.



INSPECTION

Check the clutch lifter arm for wear or damage.
Check the return spring for fatigue or damage.
Replace them if necessary.

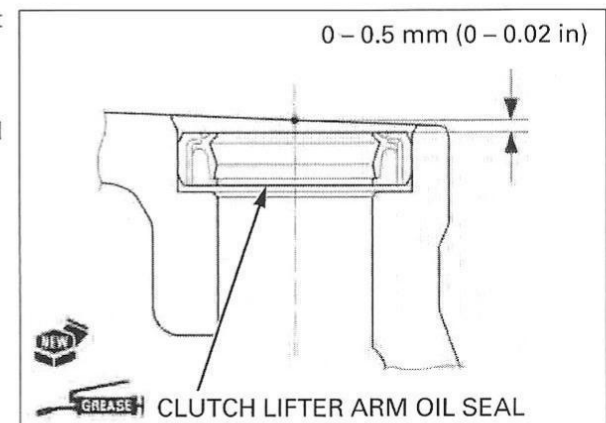


OIL SEAL REPLACEMENT

Remove the clutch lifter arm oil seal from the right crankcase cover.

Apply grease to a new oil seal lips.

Install a new clutch lifter arm oil seal to the specified depth below the right crankcase cover as shown.

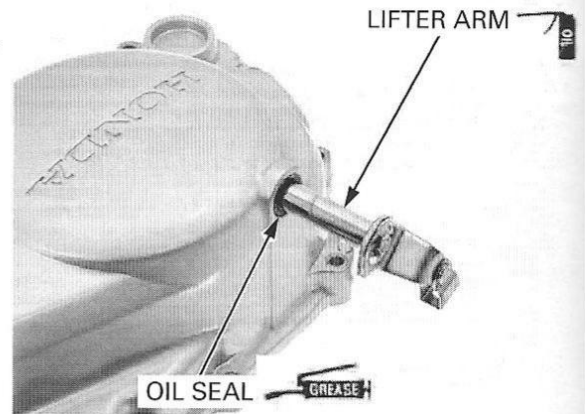


CLUTCH/GEARSHIFT LINKAGE

ASSEMBLY

Apply grease to the oil seal lips.

Apply engine oil to the clutch lifter arm whole surface and install it into the right crankcase cover.



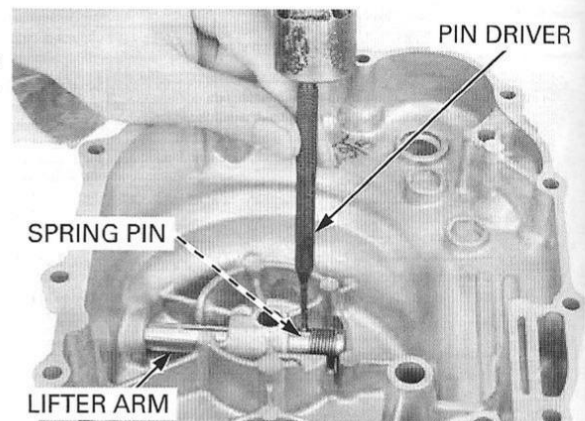
Install the return spring onto the lifter arm end.

From the opposite side, drive the spring pin until it projects the same amount as recorded at disassembly using the special tool.

TOOL:

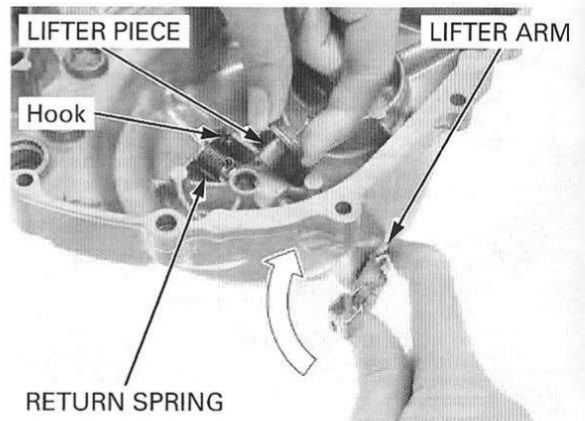
Pin driver

07744-0010200



Hook the return spring ends to the right crankcase cover.

Install the clutch lifter piece into the clutch lifter arm groove.

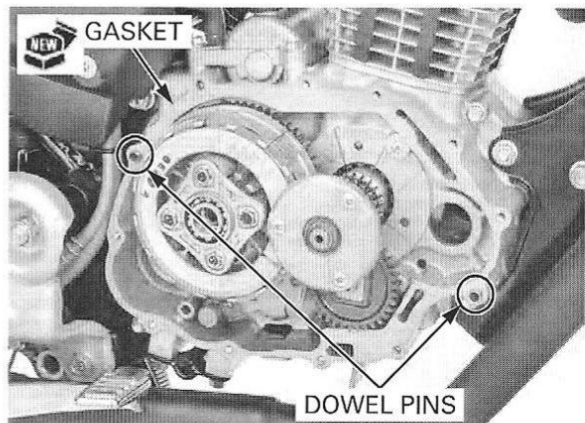


INSTALLATION

Be careful not drop any foreign materials into the engine.

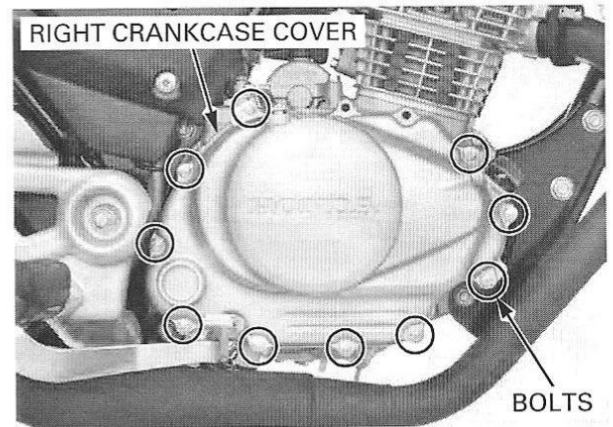
Clean off any gasket material from the mating surfaces of the right crankcase and cover, being careful not to damage them.

Install the dowel pins and new gasket.



Install the right crankcase cover.

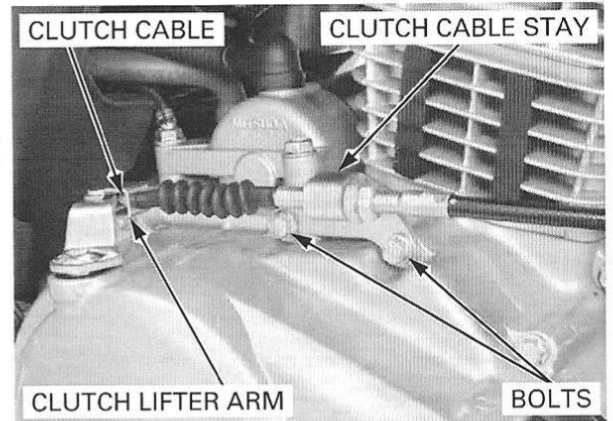
Install and tighten the right crankcase cover bolts in a crisscross pattern in several steps.



Connect the clutch cable to the clutch lifter arm, then install the clutch cable stay and bolts. Tighten the bolts securely.

Adjust the clutch lever freeplay (page 3-23).

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



CLUTCH

REMOVAL

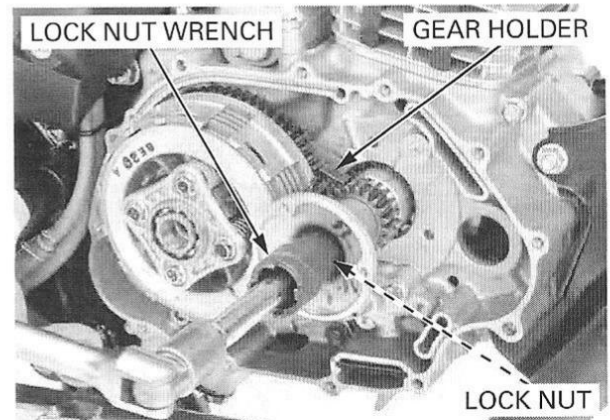
Remove the following:

- Oil filter rotor cover (page 3-13)
- Oil pump driven gear (page 4-4)

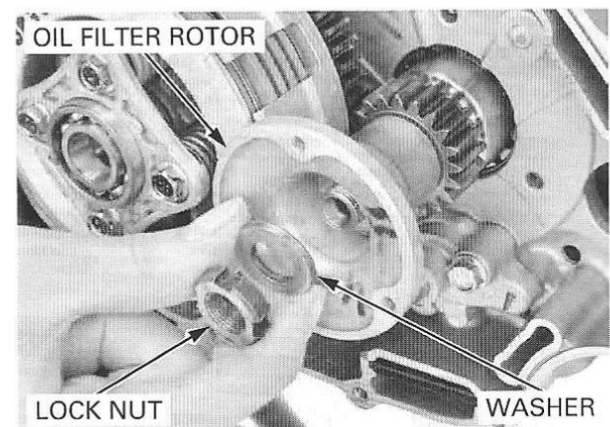
Install the gear holder between the primary drive and driven gears as shown, and loosen the oil filter rotor lock nut using the special tool.

TOOLS:

Gear holder	07724-0010200
Lock nut wrench	07716-0020100



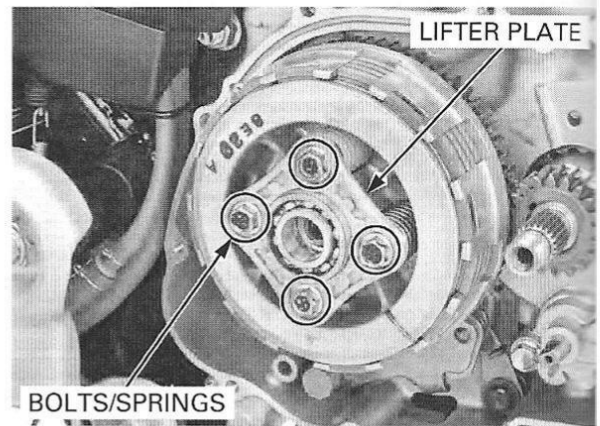
Remove the lock nut, washer and oil filter rotor.



CLUTCH/GEARSHIFT LINKAGE

Loosen the clutch lifter plate bolts in a crisscross pattern in several steps.

Remove the bolts, lifter plate and clutch springs.

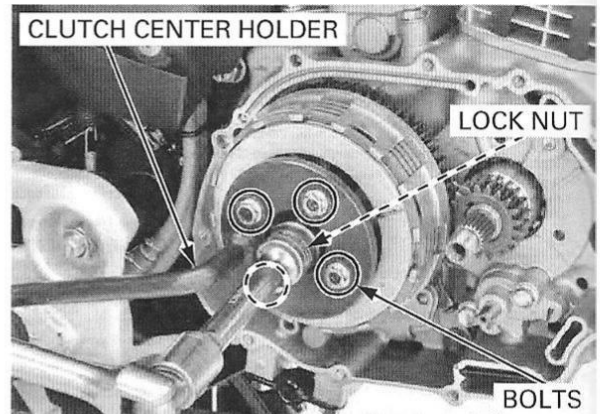


Attach the clutch center holder to the pressure plate using the clutch lifter plate bolts to hold the clutch center, then loosen the clutch center lock nut.

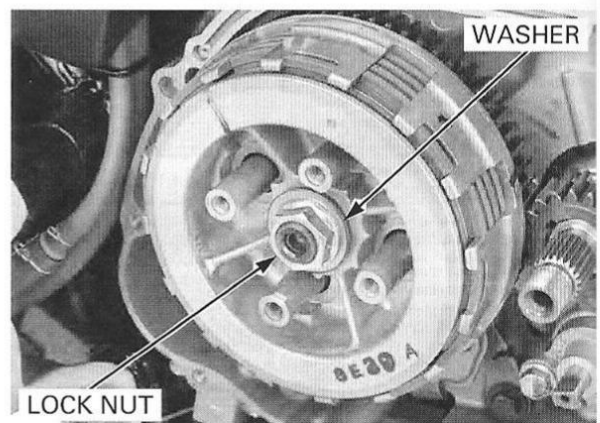
TOOL:

Clutch center holder 07GMB-KT70101

Remove the bolts and special tool.

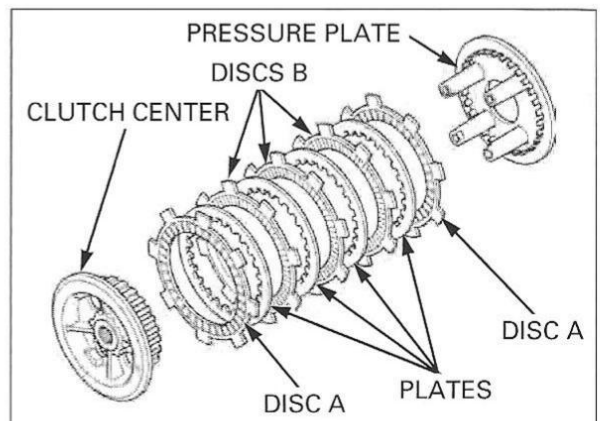


Remove the clutch center lock nut and washer.

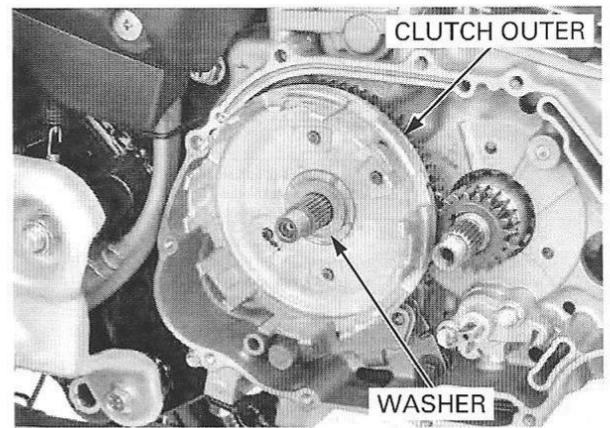


Remove the following:

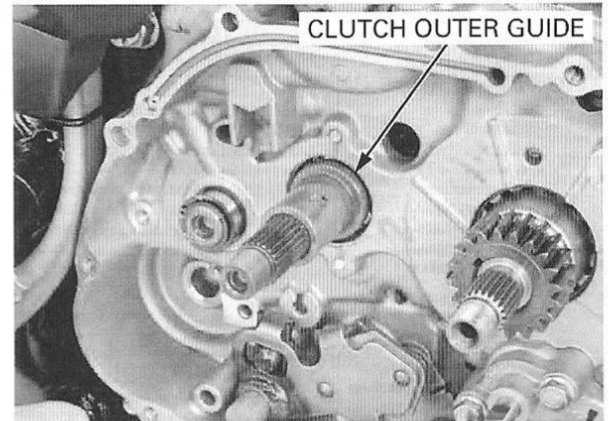
- Clutch center
- Clutch disc A
- Clutch plates and discs B
- Clutch disc A
- Pressure plate
- Record the clutch disc A, plates and discs B to ensure that they are reinstalled in their original locations.



Remove the washer and clutch outer.



Remove the clutch outer guide.

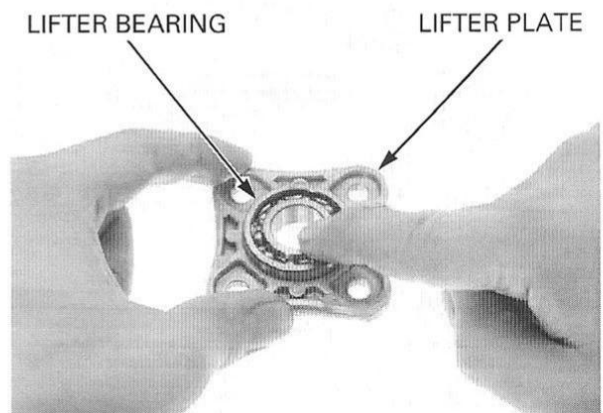


INSPECTION

CLUTCH LIFTER BEARING

Turn the inner race of the clutch lifter bearing with your finger. The bearing should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the clutch lifter plate.

Replace the bearing if the inner race does not turn smoothly, quietly, or if the outer race fits loosely in the clutch lifter plate.



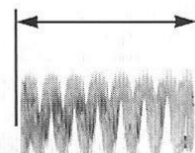
CLUTCH SPRING

Replace the clutch springs as a set.

Check the clutch spring for fatigue or damage.

Measure the clutch spring free length.

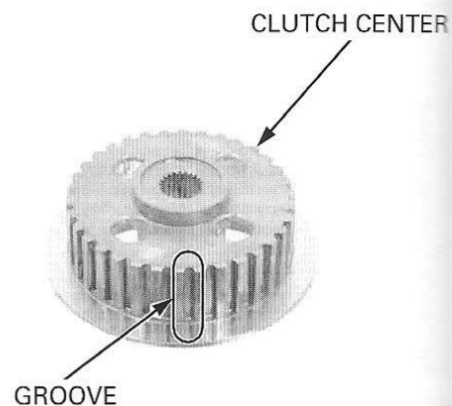
STANDARD: 39.0 mm (1.54 in)



CLUTCH/GEARSHIFT LINKAGE

CLUTCH CENTER

Check the grooves of the clutch center for damage or wear caused by the clutch plates.



CLUTCH DISC

Replace the clutch discs and plates as a set.

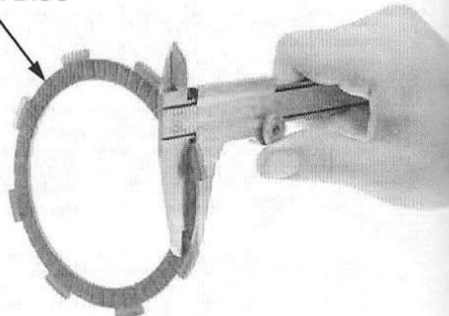
Check clutch discs for signs of scoring or discoloration.

Measure the thickness of each clutch disc.

SERVICE LIMIT:

Disc A, B: 2.80 mm (0.110 in)

CLUTCH DISC



CLUTCH PLATE

Replace the clutch discs and plates as a set.

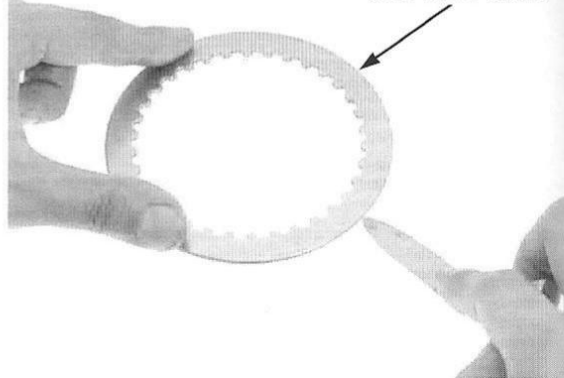
Check the plate for discoloration.

Check the clutch plate for warpage on a surface plate using a feeler gauge.

SERVICE LIMIT: 0.20 mm (0.008 in)

Warped clutch plates prevent the clutch from disengaging properly.

CLUTCH PLATE



CLUTCH OUTER/OUTER GUIDE

Check the slots in the clutch outer for nicks, indentations or abnormal wear made by the clutch discs. Check the primary driven gear teeth for wear or damage.

Measure the primary driven gear I.D.

SERVICE LIMIT: 23.08 mm (0.909 in)

Check the clutch outer guide for damage or abnormal wear.

Measure the clutch outer guide I.D. and O.D.

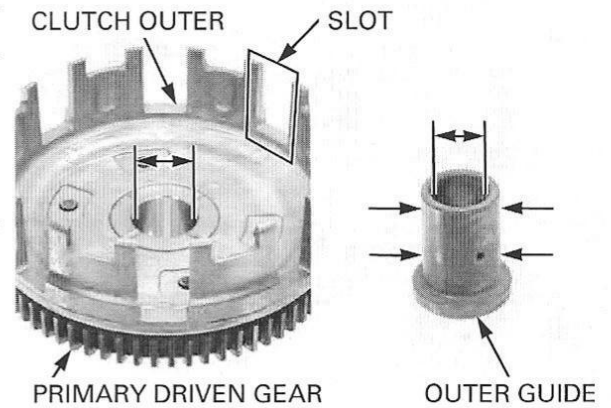
SERVICE LIMITS:

I.D.: 17.04 mm (0.671 in)

O.D.: 22.93 mm (0.903 in)

Calculate the primary driven gear-to-guide clearance.

STANDARD: 0.020 – 0.062 mm (0.0008 – 0.0024 in)

**MAINSHAFT**

Measure the mainshaft O.D. at the clutch outer guide.

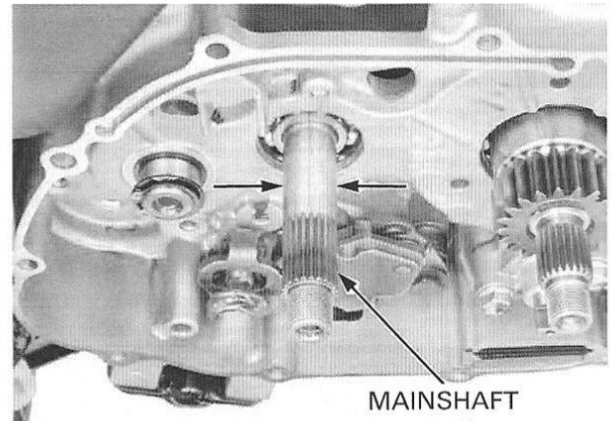
SERVICE LIMIT: 16.95 mm (0.667 in)

Calculate the clutch outer guide-to-mainshaft clearance.

STANDARD: 0.007 – 0.0043 mm (0.0003 – 0.0017 in)

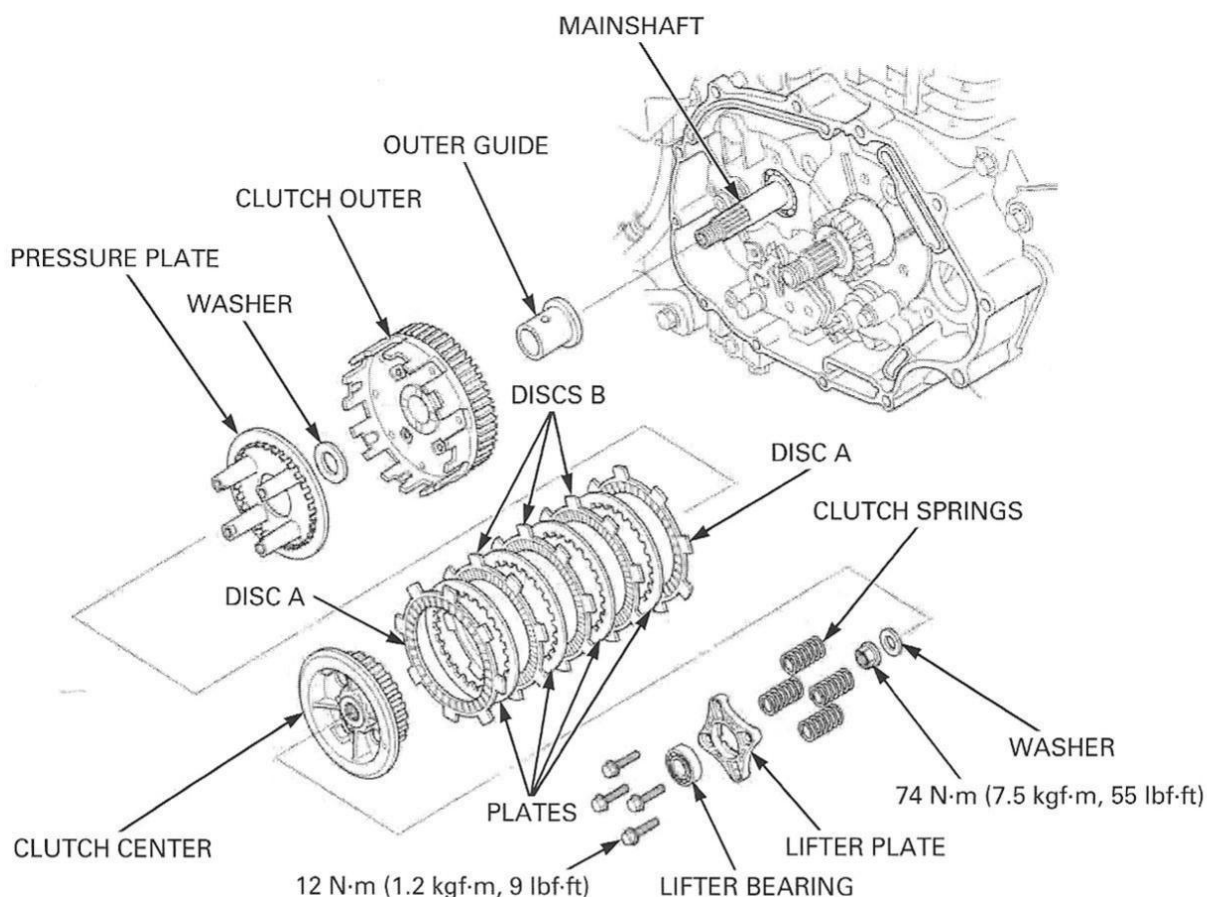
For measurement of the clutch outer guide O.D. (page 9-13).

For mainshaft removal (page 11-11).

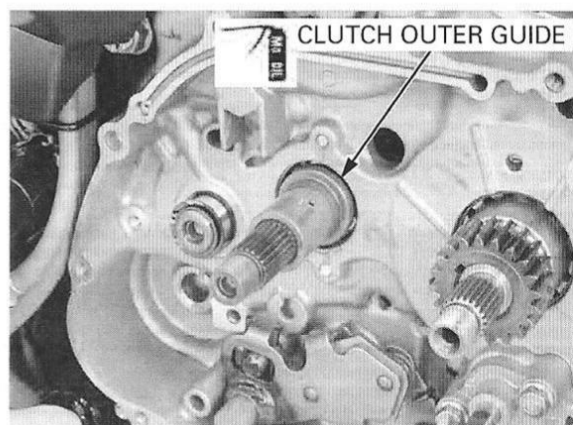


CLUTCH/GEARSHIFT LINKAGE

INSTALLATION

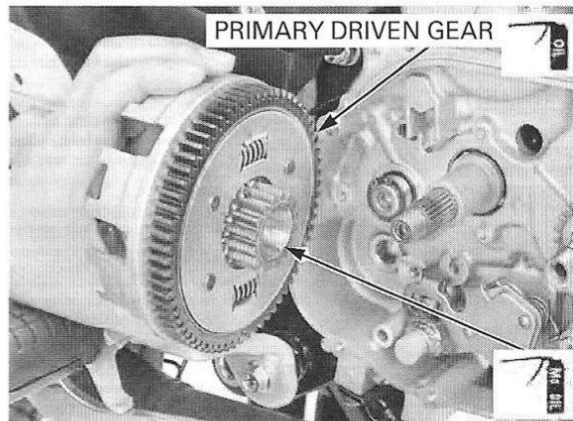


Apply molybdenum oil solution to the whole surface of the clutch outer guide and install it to the mainshaft with the flange side facing the crankcase.

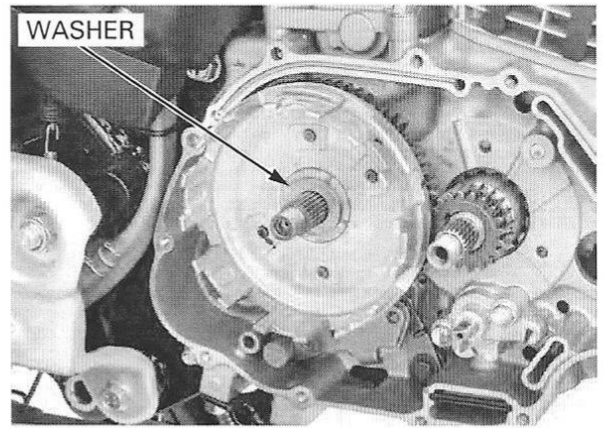


Apply engine oil to the primary driven gear teeth.

Apply molybdenum oil solution to the rotating area of the clutch outer and install it to the clutch outer guide.

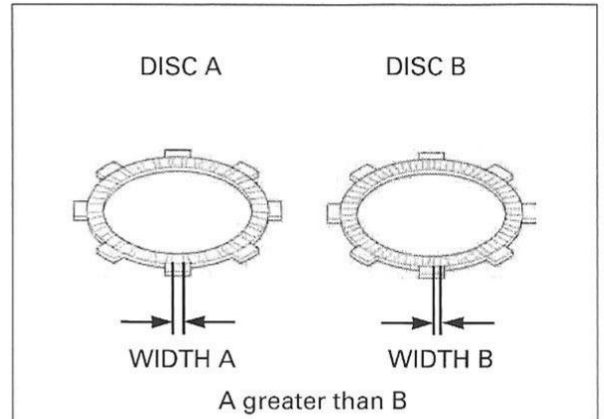


Install the washer.



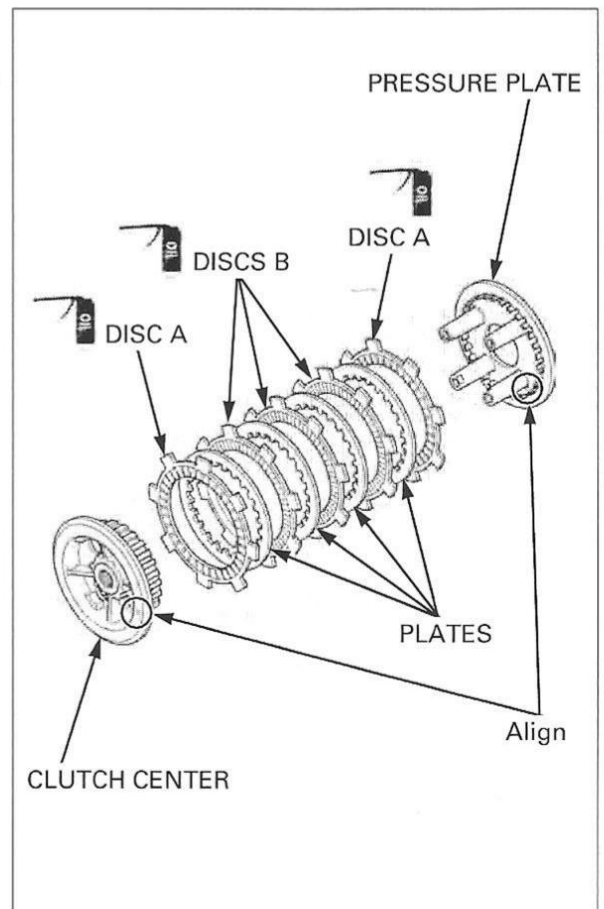
Set the clutch disc A and B as noted during removal.

Clutch disc A has a larger lining width than clutch disc B.



Apply engine oil to the clutch disc whole surface.

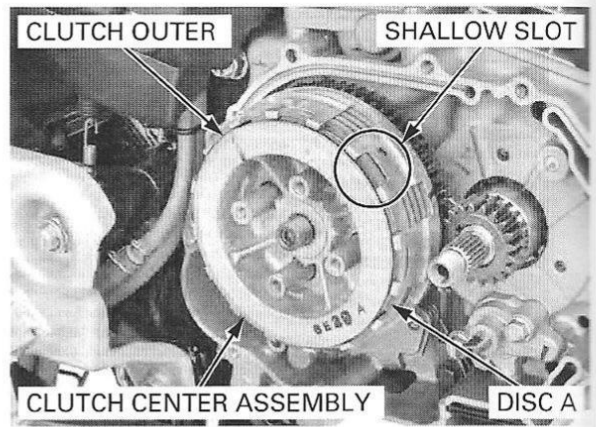
Assemble the clutch discs A, B, clutch plates and pressure plate onto the clutch center by aligning "o" marks of the clutch center and pressure plate.



CLUTCH/GEARSHIFT LINKAGE

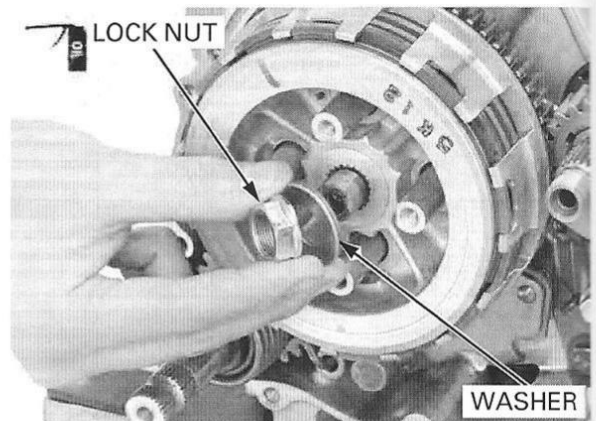
Install the clutch center assembly to the clutch outer.

- Install the tabs of the clutch disc A (out side) to the shallow slots of the clutch outer.



Install the washer.

Apply engine oil to the threads and seating surface of the clutch center lock nut, and install it.



Attach the clutch center holder to the pressure plate using the clutch lifter plate bolts to hold the clutch center, then tighten the clutch center lock nut to the specified torque.

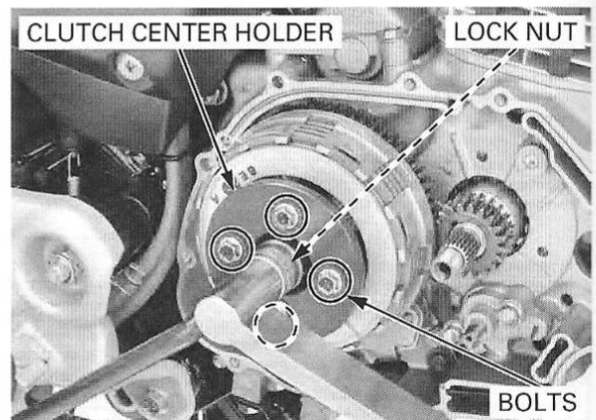
TOOL:

Clutch center holder

07GMB-KT70101

TORQUE: 74 N·m (7.5 kgf·m, 55 lbf·ft)

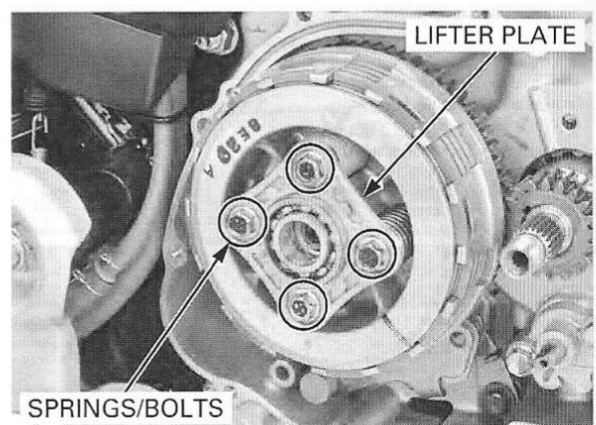
Remove the bolts and special tool.



Install the clutch springs, clutch lifter plate and clutch lifter plate bolts.

Tighten the clutch lifter plate bolts to the specified torque in a crisscross pattern in several steps.

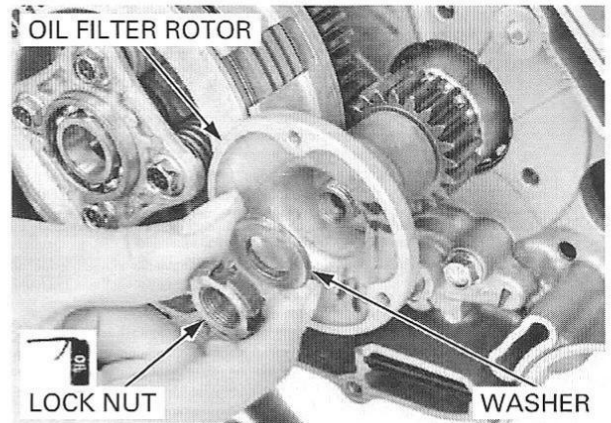
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Clean the inside of the oil filter rotor.

Install the oil filter rotor and washer to the crankshaft.

Apply engine oil to the threads and seating surface of the oil filter rotor lock nut, and install it.



Install the gear holder between the primary drive and driven gears as shown, and tighten the oil filter rotor lock nut to the specified torque using the special tools.

TOOLS:

Gear holder

07724-0010200

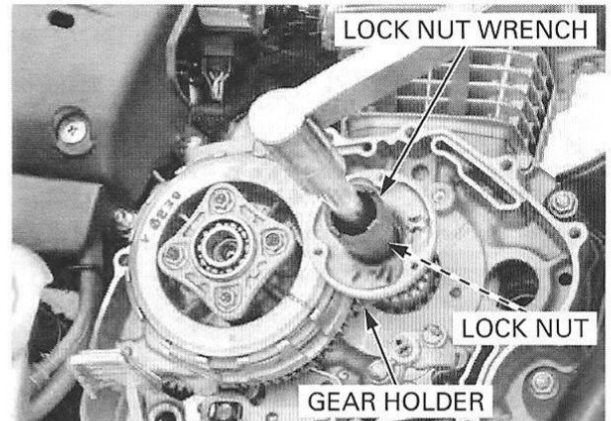
Lock nut wrench

07716-0020100

TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)

Install the following:

- Oil pump driven gear (page 4-7)
- Oil filter rotor cover (page 3-13)



GEARSHIFT LINKAGE

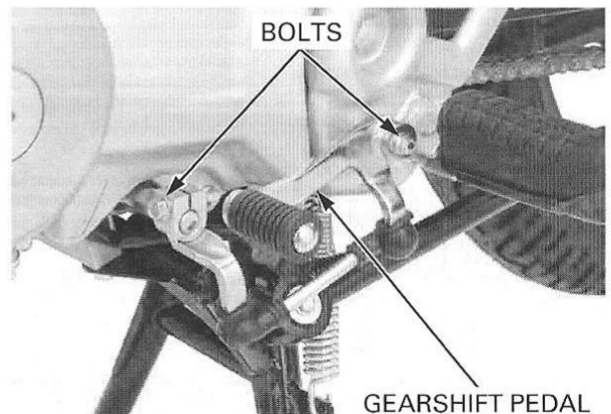
REMOVAL

Remove the clutch assembly (page 9-9).

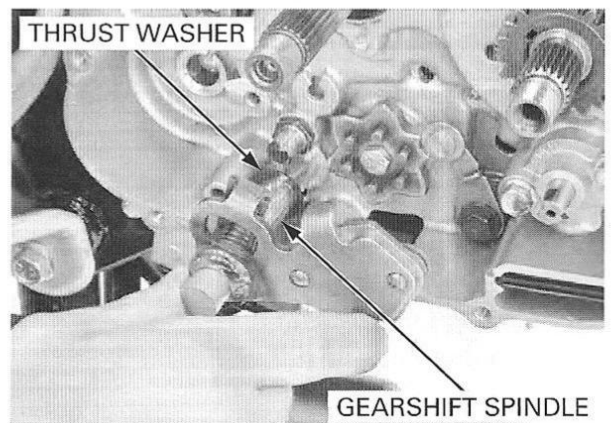
Remove the bolts and gearshift pedal.

- When removing the gearshift pedal, mark the pedal position to ensure correct reassembly in its original position.

Clean the gearshift spindle end.

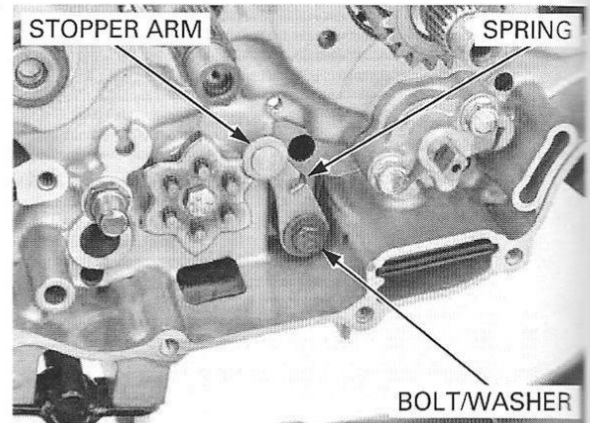


Pull the gearshift spindle out of the crankcase. Remove the thrust washer from the gearshift spindle.

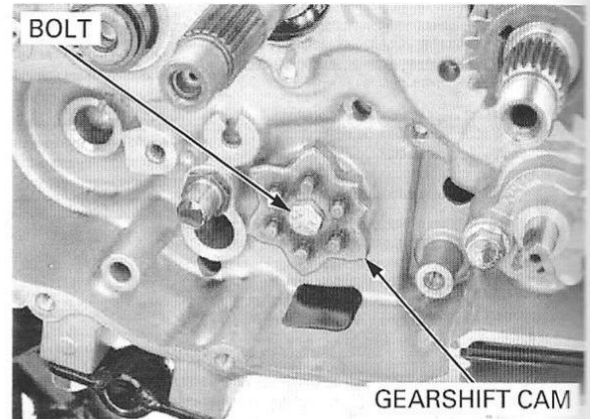


CLUTCH/GEARSHIFT LINKAGE

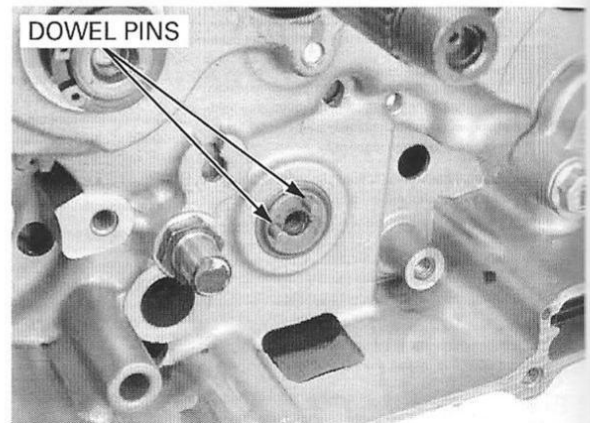
Remove the stopper arm bolt, stopper arm, washer and return spring.



Remove the bolt and gearshift cam.



Remove the dowel pins from the shift drum.

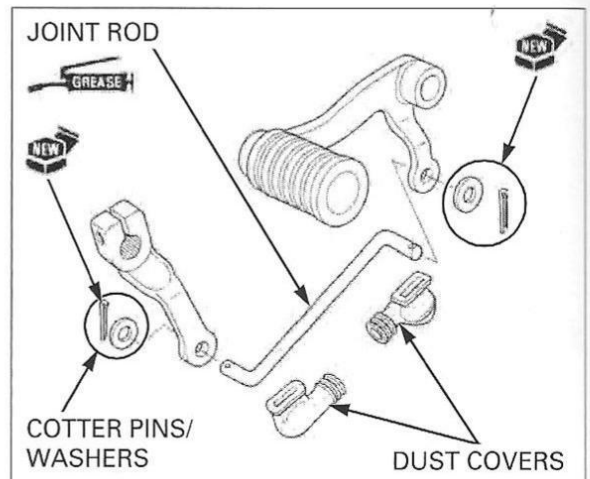


GEARSHIFT PEDAL DISASSEMBLY/ASSEMBLY

Slide the dust covers and remove the cotter pins, washers and joint rod.

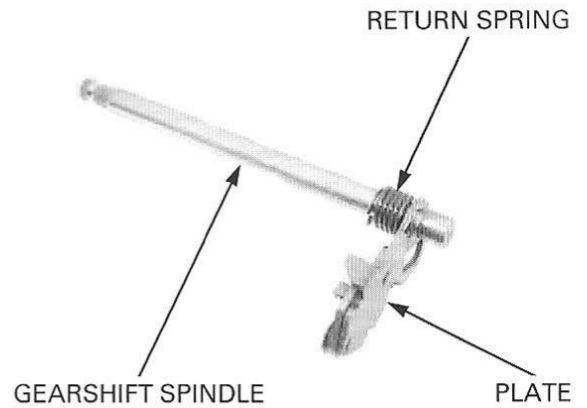
Assembly is in the reverse order of disassembly.

- Replace the cotter pin with a new one.
- Apply 1 g (0.04 oz) of grease to the gearshift pedal pivot sliding surface.
- Apply grease to the joint rod sliding surface.



INSPECTION

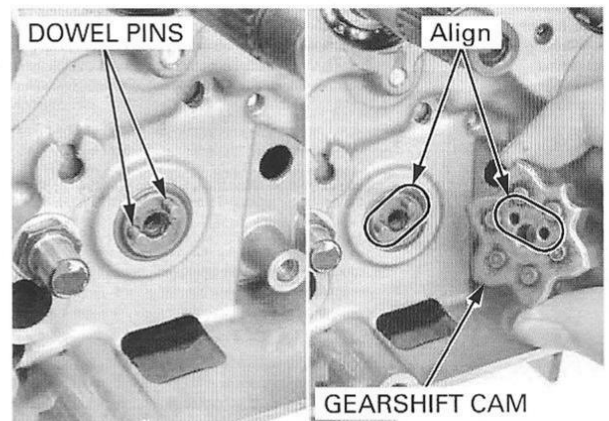
Check the gearshift spindle for bend, wear or damage.
 Check the spindle plate for wear, damage or deformation.
 Check the return spring for fatigue or damage.



INSTALLATION

Install the dowel pins to the shift drum.

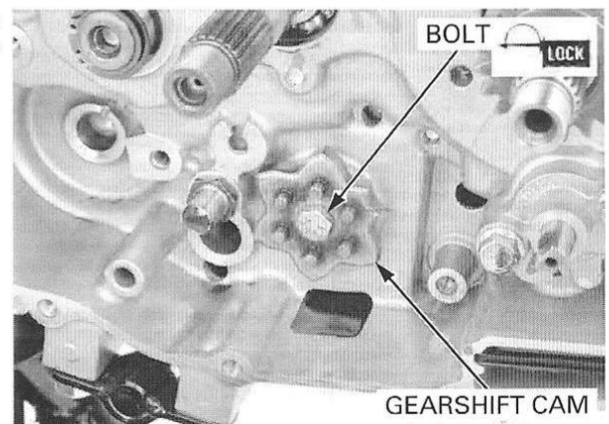
Install the gearshift cam to the shift drum by aligning its holes with the dowel pins.



Apply locking agent to the gearshift cam threads (coating width 6.5 ± 1.0 mm (0.26 ± 0.04 in) from the tip) and install it to the gearshift cam.

Tighten the bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



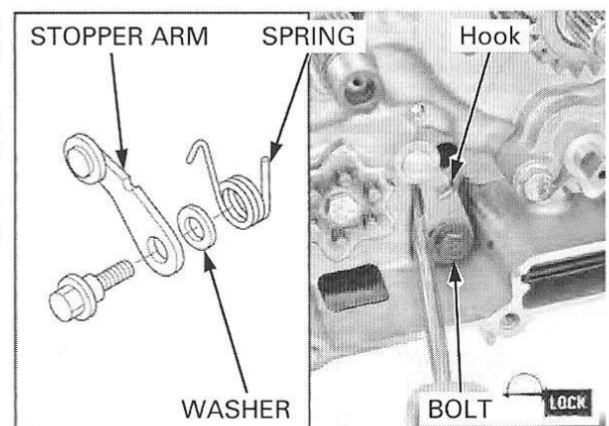
Apply locking agent to the stopper arm bolt threads (coating width 6.5 ± 1.0 mm (0.26 ± 0.04 in) from the tip).

Install the return spring, washer, stopper arm with hooking the return spring at the stopper arm groove.

Install and tighten the stopper arm bolt to the specified torque while holding the stopper arm using a screwdriver.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Check the stopper arm for proper operation.



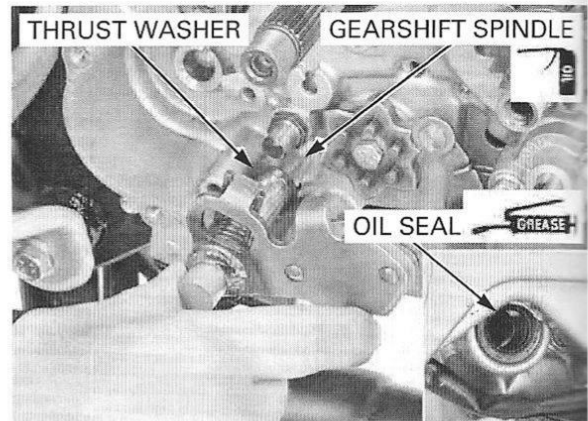
CLUTCH/GEARSHIFT LINKAGE

Check the gearshift spindle oil seal is in good condition, replace it if necessary (page 11-20).

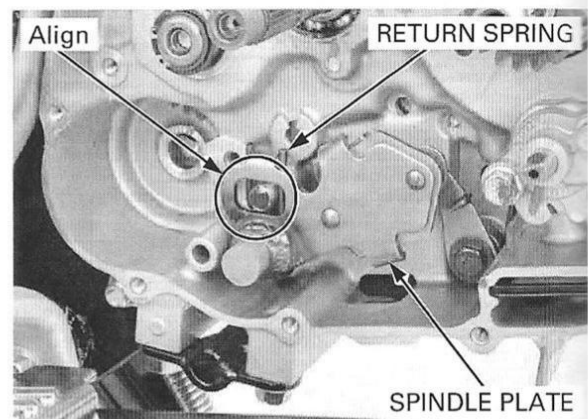
Apply grease to the gearshift spindle oil seal lips.

Apply engine oil to the gearshift spindle journal rotating area.

Install the thrust washer to the gearshift spindle, and insert them into the crankcase.



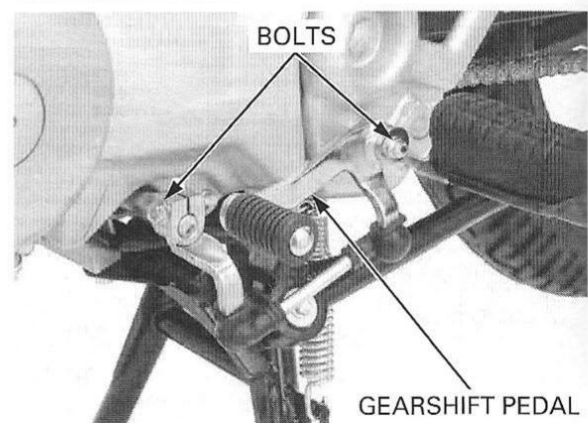
Install the spindle plate by aligning the return spring ends with the stopper pin.



Install the gearshift pedal on its original position as marked during removal.

Install and tighten the pinch bolts securely.

Install the clutch assembly (page 9-14).

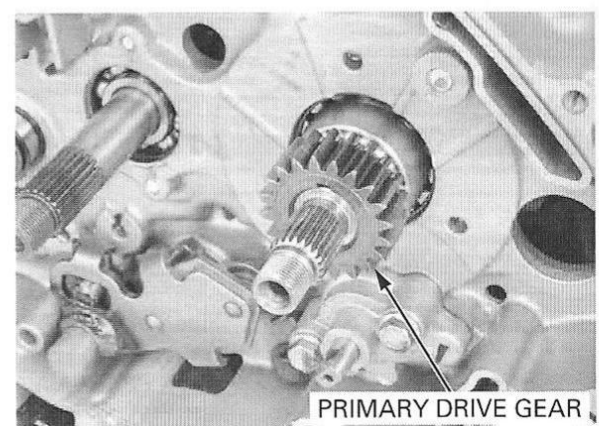


PRIMARY DRIVE GEAR/CRANKSHAFT COLLAR

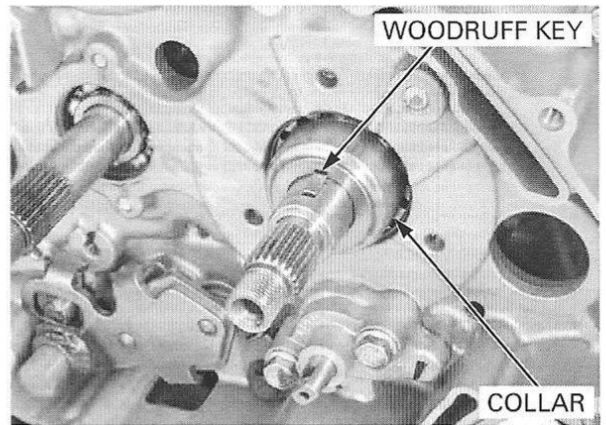
REMOVAL

Remove the clutch assembly (page 9-9).

Remove the primary drive gear.



Remove the crankshaft collar and woodruff key, being careful not to damage the key groove and crankshaft.

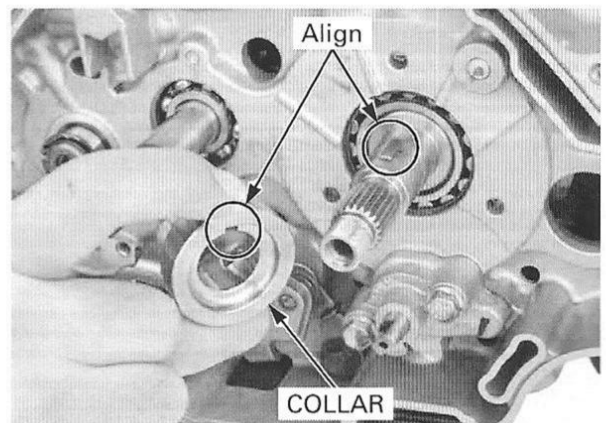


INSTALLATION

Clean any oil from the crankshaft surface.

Install the woodruff key, being careful not to damage the key groove and crankshaft.

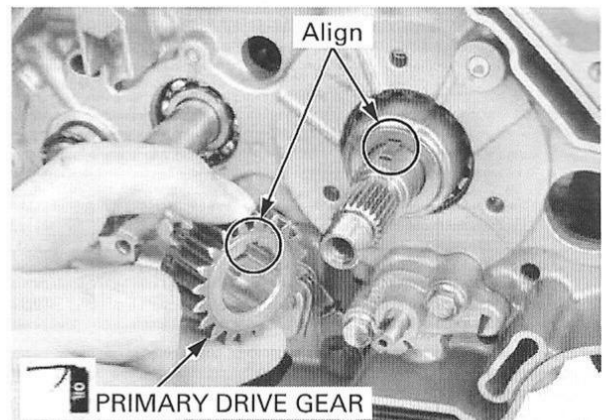
Install the crankshaft collar by aligning its groove with the woodruff key.



Apply engine oil to the primary drive gear teeth.

Install the primary drive gear by aligning its groove with the woodruff key.

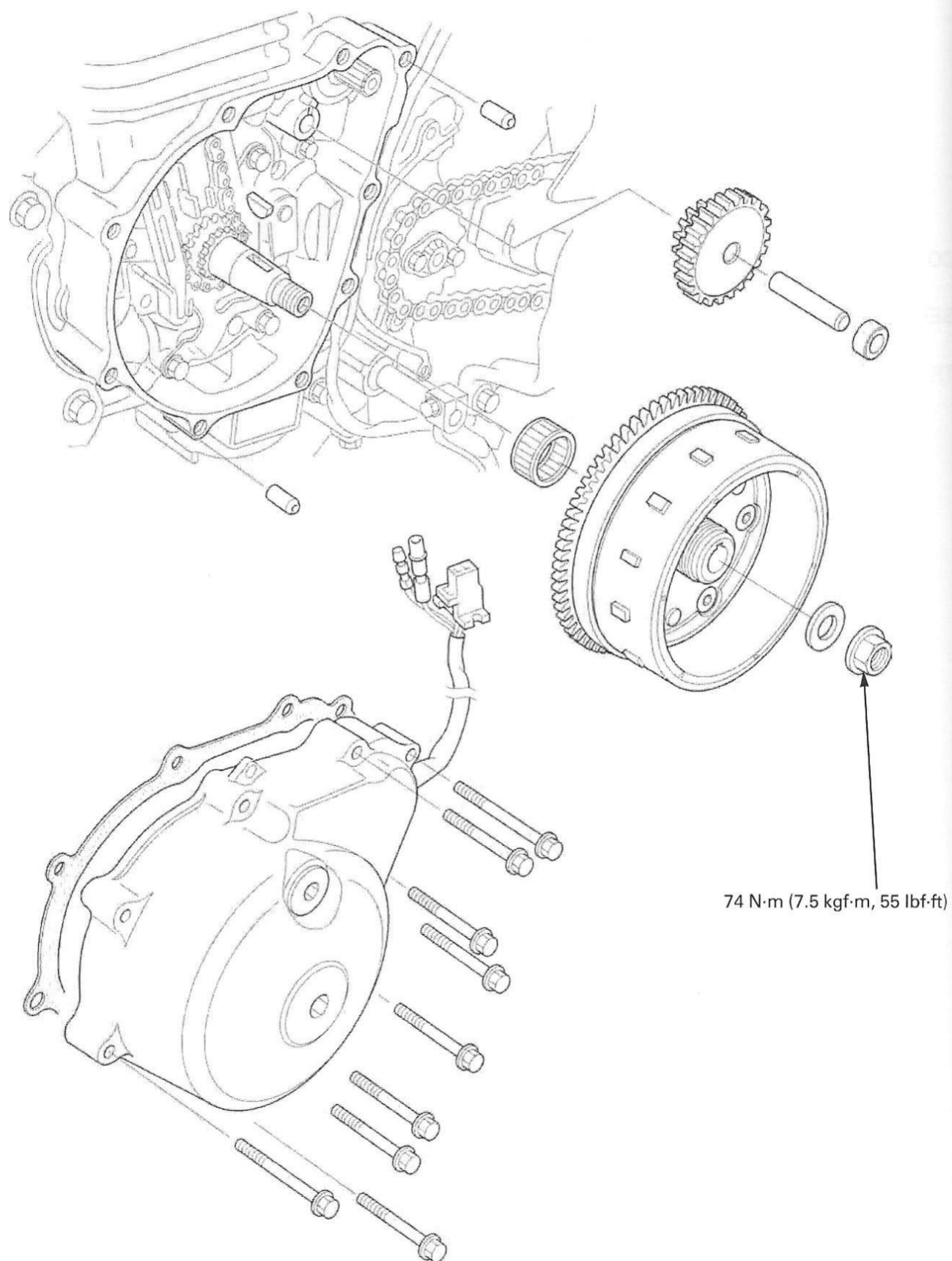
Install the clutch assembly (page 9-14).



10. ALTERNATOR/STARTER CLUTCH

COMPONENT LOCATION	10-2	LEFT CRANKCASE COVER	10-4
SERVICE INFORMATION	10-3	FLYWHEEL/STARTER CLUTCH	10-6
TROUBLESHOOTING	10-3	STATOR/CKP SENSOR	10-11

ALTERNATOR/STARTER CLUTCH COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers the removal and installation of the flywheel/starter clutch, stator and CKP sensor. These services can be done with the engine installed in the frame.
- For alternator inspection (page 15-9).

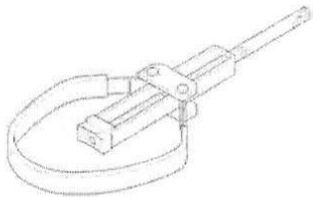
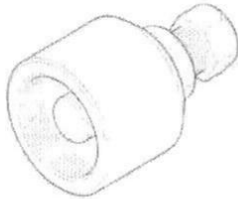
SPECIFICATION

ITEM	STANDARD	Unit: mm (in)
		SERVICE LIMIT
Starter driven gear boss O.D.	45.660 – 45.673 (1.7976 – 1.7981)	–

TORQUE VALUES

Flywheel lock nut	74 N·m (7.5 kgf·m, 55 lbf·ft)	Apply engine oil to the threads and seating surface.
Starter clutch torx screw	16 N·m (1.6 kgf·m, 12 lbf·ft)	Apply locking agent to the threads.
CKP sensor mounting socket bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads.
Wire guide bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads.

TOOLS

Flywheel holder 07725-0040001 	Flywheel puller 07933-KM10001 
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TROUBLESHOOTING

Starter motor turns, but engine does not turn

- Faulty starter clutch
- Damaged starter reduction gear/shaft

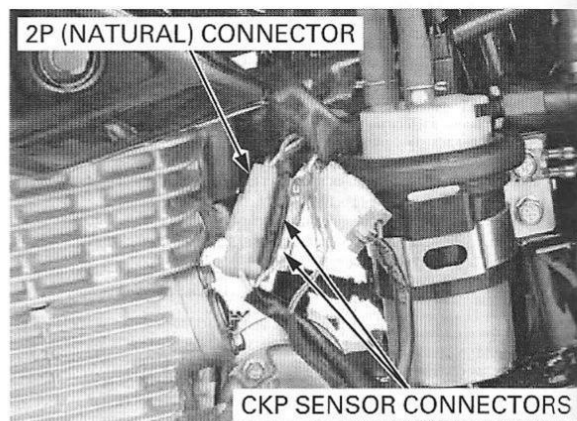
LEFT CRANKCASE COVER

REMOVAL

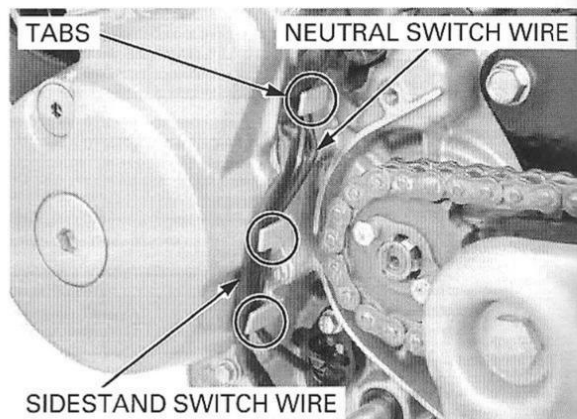
Remove the following:

- Left side cover (page 2-10)
- Drive sprocket cover (page 3-16)

Disconnect the alternator 2P (Natural) connector and CKP sensor wire connectors.

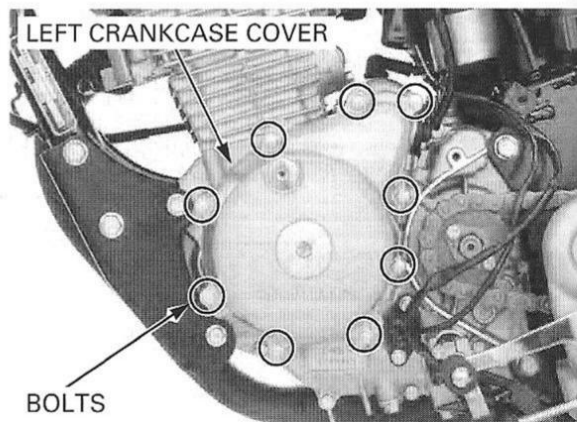


Release the neutral switch and sidestand switch wires from the left crankcase tabs.

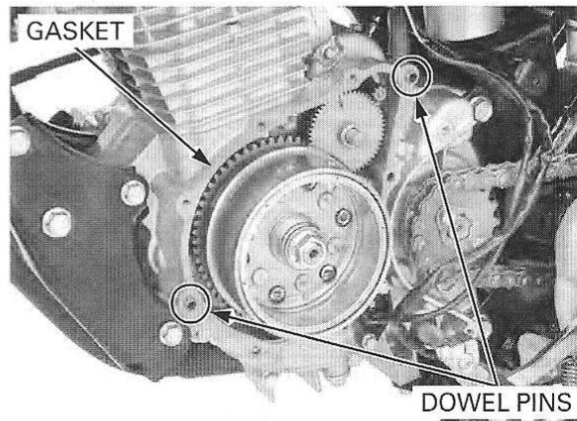


The left crankcase cover (stator) is magnetically attracted to the flywheel, be careful during remove.

Loosen the left crankcase cover bolts in a crisscross pattern in several steps and remove the left crankcase cover bolts and left crankcase cover.

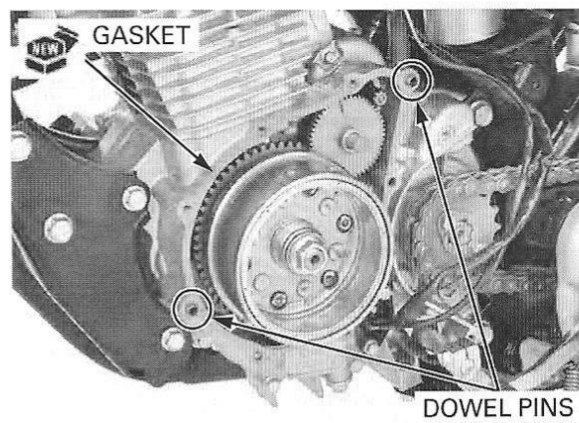


Remove the dowel pins and gasket.



INSTALLATION

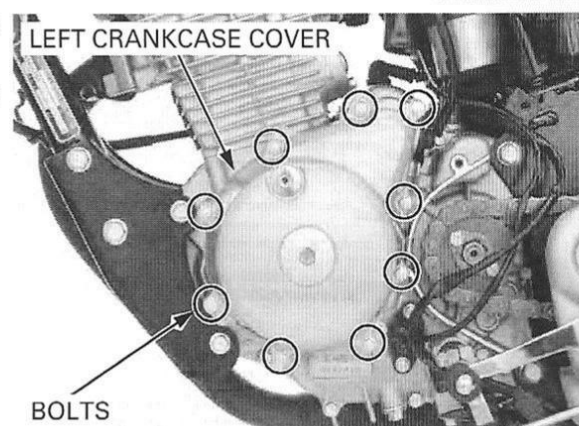
Install the dowel pins and new gasket.



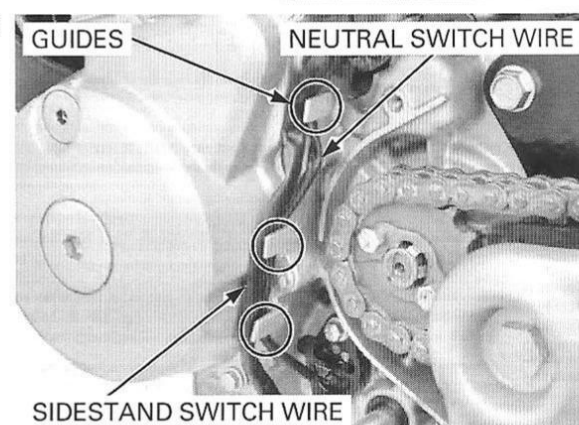
Be careful not to pinch your fingers because the stator is magnetically attracted.

Install the left crankcase cover and left crankcase cover bolts.

Tighten the left crankcase cover bolts in a crisscross pattern in several steps securely.



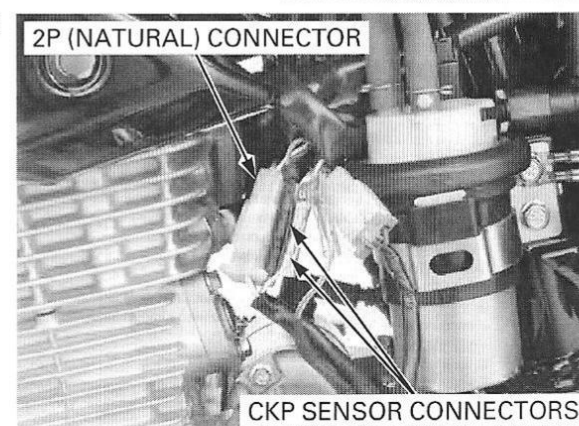
Route the neutral switch and sidestand switch wires to the left crankcase guides.



Connect the alternator 2P (Natural) connector and CKP sensor connectors.

Install the following:

- Drive sprocket cover (page 3-17)
- Left side cover (page 2-10)



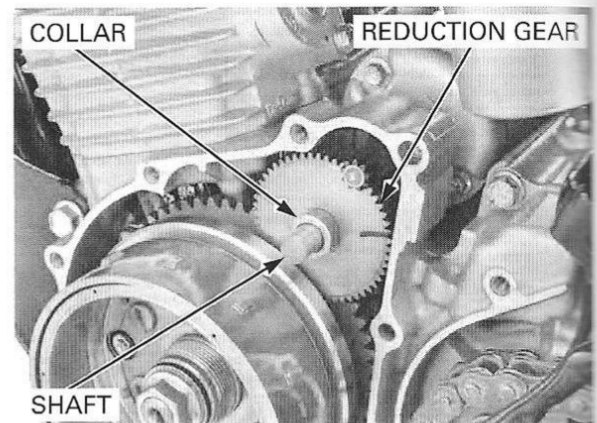
FLYWHEEL/STARTER CLUTCH

REMOVAL

Remove the left crankcase cover (page 10-4).

Remove the shaft, collar and starter reduction gear.

Check the shaft, collar and starter reduction gear for wear or damage.

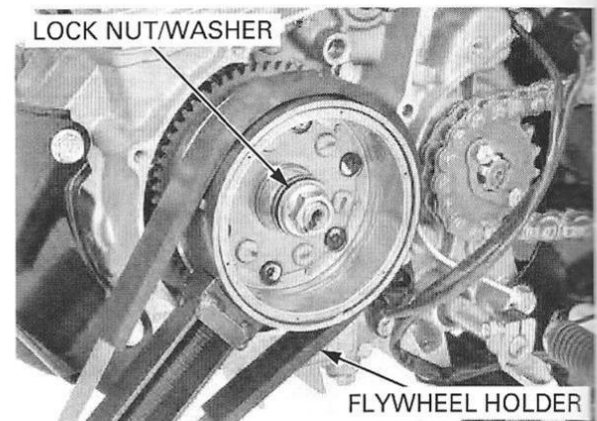


Hold the flywheel with the special tool and remove the flywheel lock nut and washer.

TOOL:

Flywheel holder

07725-0040001



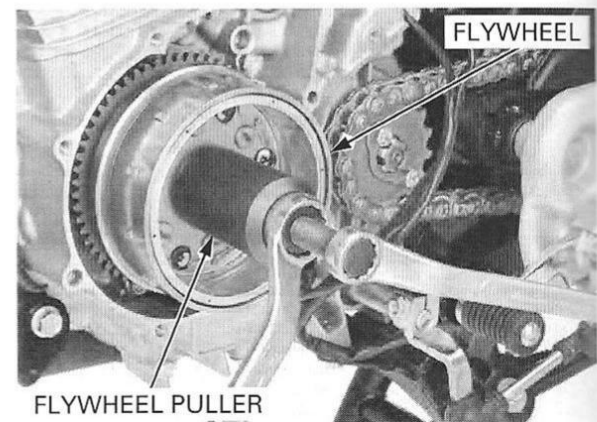
Remove the flywheel using the special tool.

TOOL:

Flywheel puller

07933-KM10001

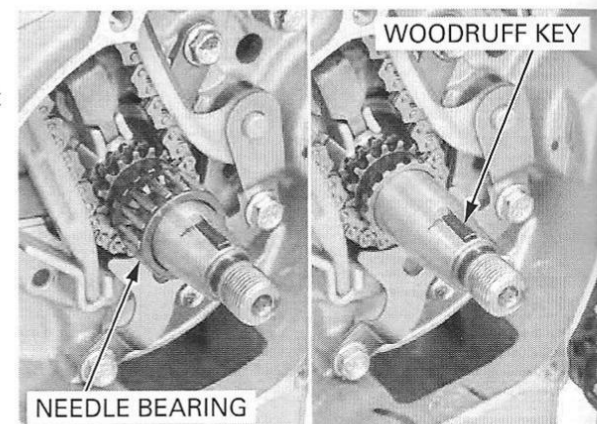
Remove the special tool from the flywheel.



Remove the needle bearing and woodruff key.

NOTE:

- When removing the woodruff key, be careful not to damage the key groove and crankshaft.
- Do not lose the woodruff key.

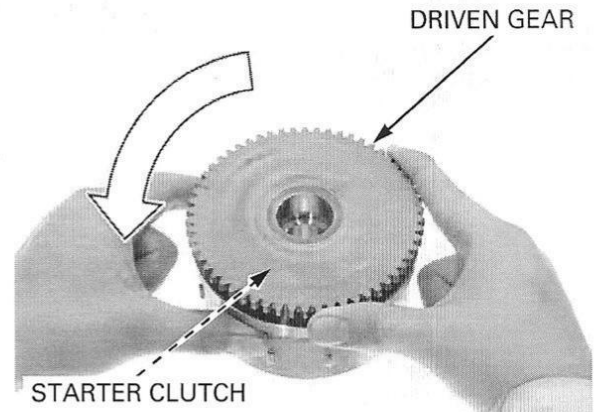


DISASSEMBLY

Check the operation of the starter clutch by turning the driven gear.

You should be able to turn the driven gear clockwise smoothly, but the gear should not turn counterclockwise.

Remove the starter driven gear from the starter clutch while turning it counterclockwise.

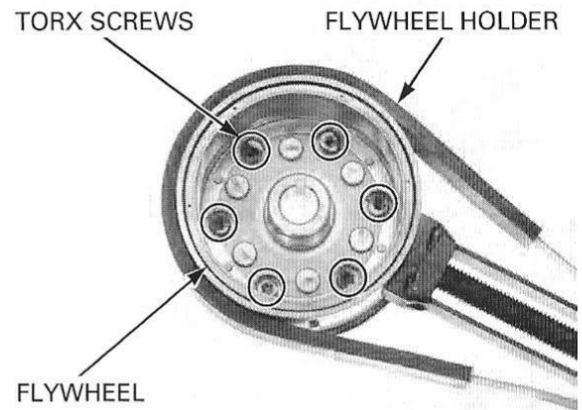


Hold the flywheel with the special tool and remove the starter clutch torx screws.

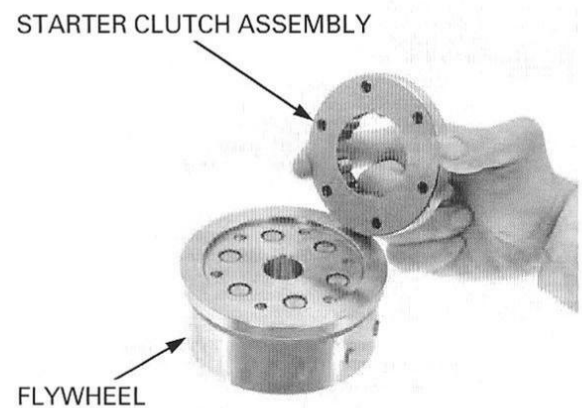
TOOL:

Flywheel holder

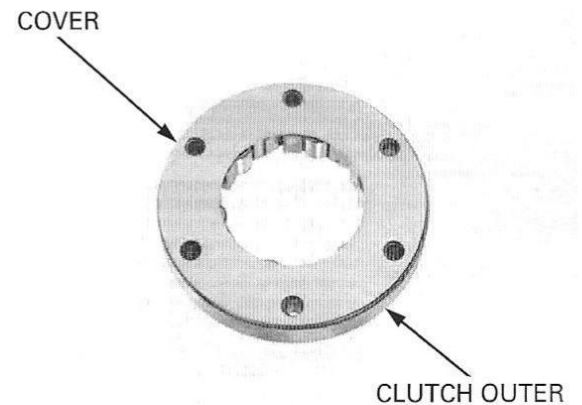
07725-0040001



Remove the starter clutch assembly from the flywheel.

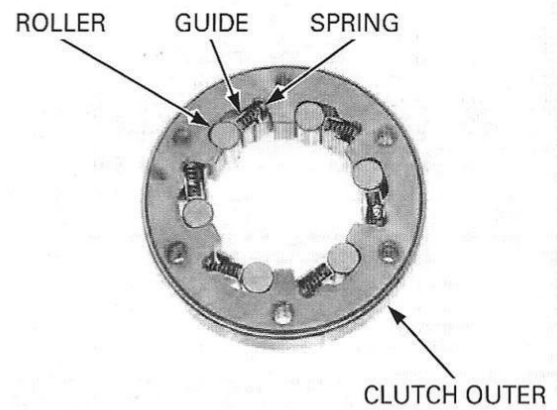


Remove the cover from the clutch outer.



ALTERNATOR/STARTER CLUTCH

Remove the rollers, spring guides and springs from the starter clutch outer.



INSPECTION

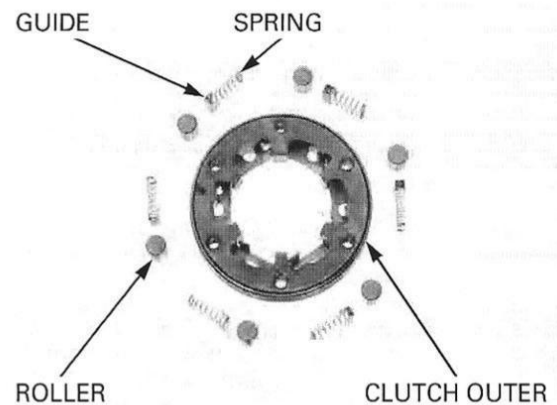
Check the rollers, spring guides, springs and starter clutch outer for wear or damage.

Replace the rollers as a set.

Replace the rollers if necessary.

NOTE:

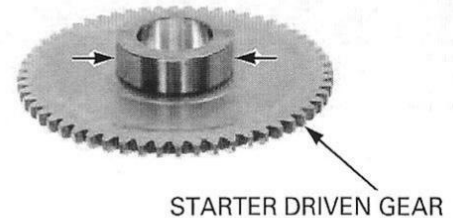
Starter clutch should be replaced as an assembly if the starter clutch, spring guides and springs are damaged or worn.



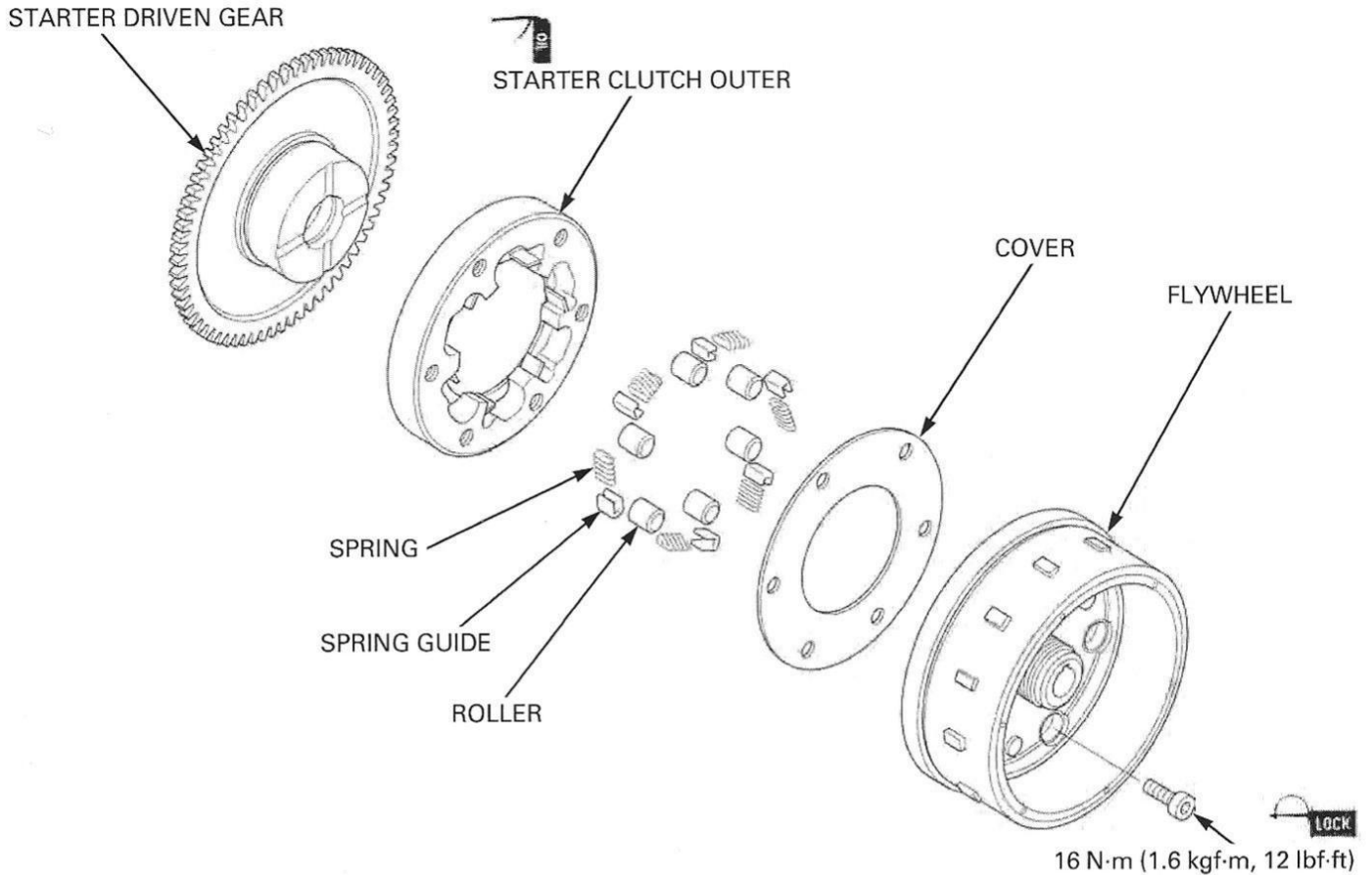
Check the starter driven gear teeth and roller contact surface for wear or damage.

Measure the starter driven gear boss O.D.

STANDARD: 45.660 – 45.673 mm (1.7976 – 1.7981 in)

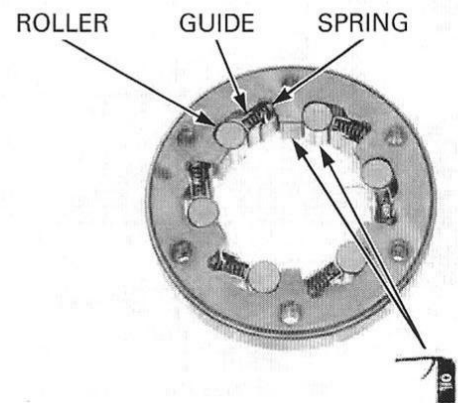


ASSEMBLY

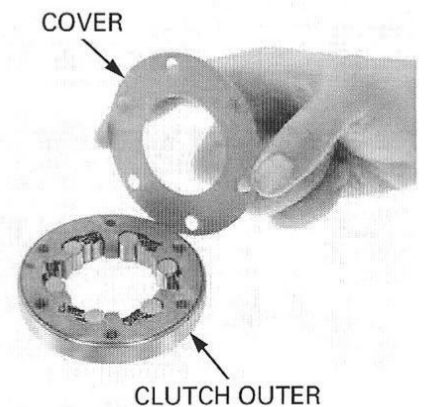


Install the springs, spring guides and rollers into the starter clutch outer.

Apply engine oil to the starter clutch rolling surface.



Install the cover to the clutch outer.



ALTERNATOR/STARTER CLUTCH

Install the starter clutch assembly to the flywheel as shown.

STARTER CLUTCH ASSEMBLY

FLYWHEEL

Apply locking agent to the starter clutch torx screw threads (coating width 6.5 ± 0.1 mm (0.26 ± 0.04 in) from tip).

Install the starter clutch assembly onto the flywheel. Install the torx screws by aligning the bolt holes with the starter clutch assembly and flywheel. Hold the flywheel with the special tool and tighten the torx screws to the specified torque.

TOOL:

Flywheel holder

07725-0040001

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

TORX SCREWS

FLYWHEEL HOLDER

STARTER CLUTCH ASSEMBLY

Install the starter driven gear into the starter gear assembly while turning it counterclockwise.

Make sure that the starter driven gear turns counterclockwise smoothly and does not turn clockwise.

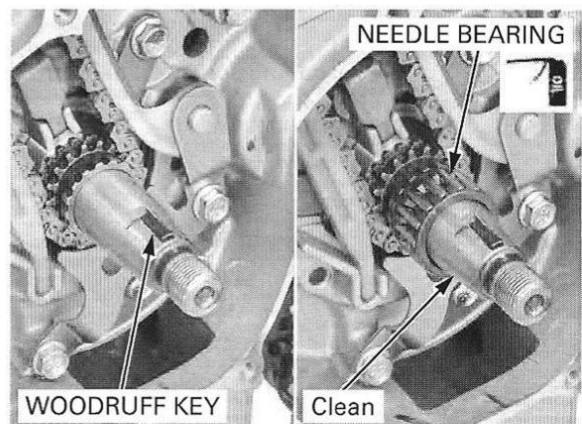
DRIVEN GEAR

INSTALLATION

Install the woodruff key, being careful not to damage the key groove and crankshaft.

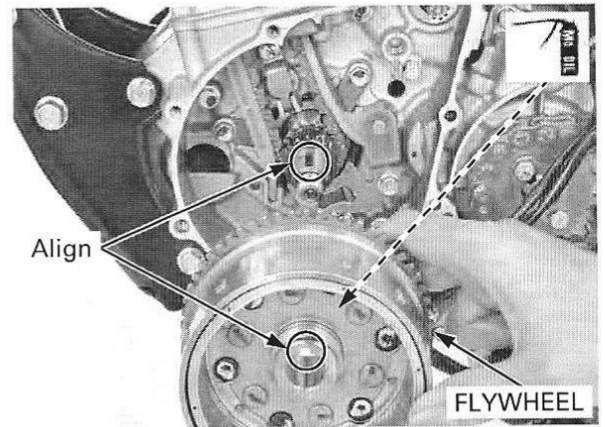
Apply engine oil to the needle bearing rolling surface and install the needle bearing on the crankshaft.

Clean any oil from the crankshaft taper.



Apply molybdenum oil solution to the starter driven gear inner surface.

Install the flywheel by aligning its groove with the woodruff key.



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

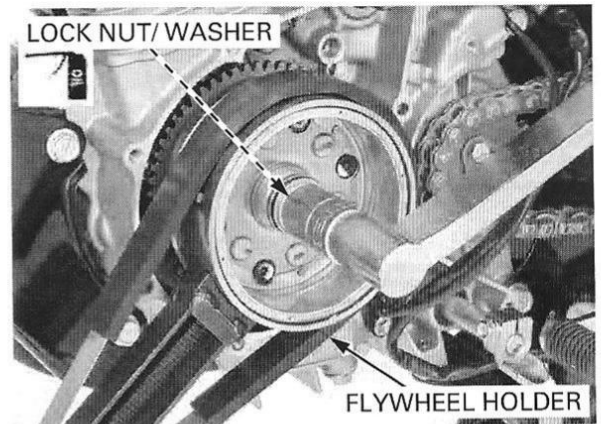
Install the washer and lock nut.

Hold the flywheel with the special tool and tighten the flywheel lock nut to the specified torque.

TOOL:

Flywheel holder 07725-0040001

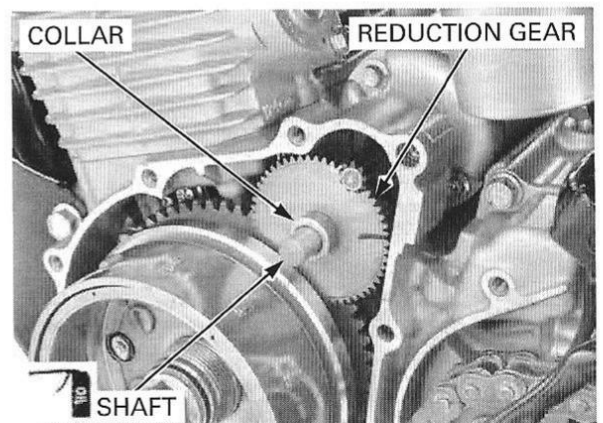
TORQUE: 74 N·m (7.5 kgf·m, 55 lbf·ft)



Apply engine oil to the starter reduction gear shaft whole surface.

Install the starter reduction gear, collar and shaft.

Install the left crankcase cover (page 10-5).

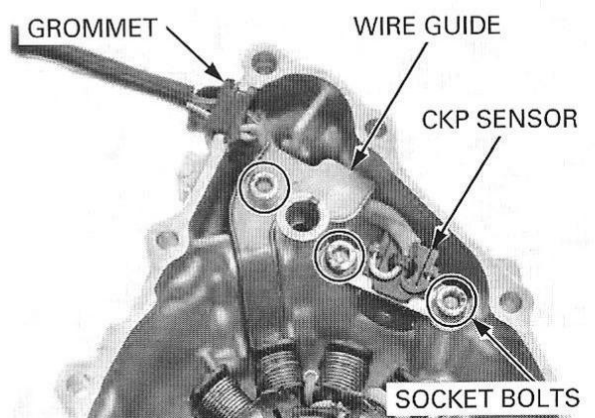


STATOR/CKP SENSOR

REMOVAL

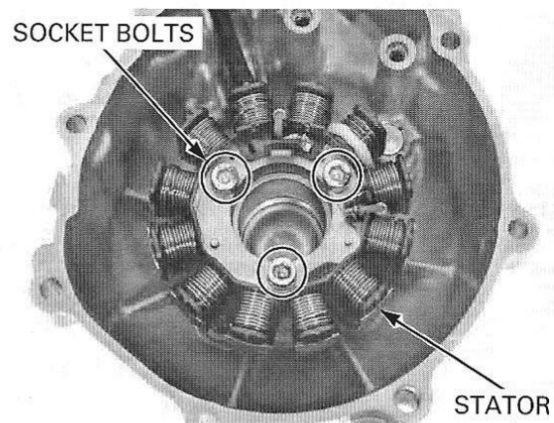
Remove the left crankcase cover (page 10-4).

Remove the socket bolts, wire guide, CKP sensor and alternator wire grommet.

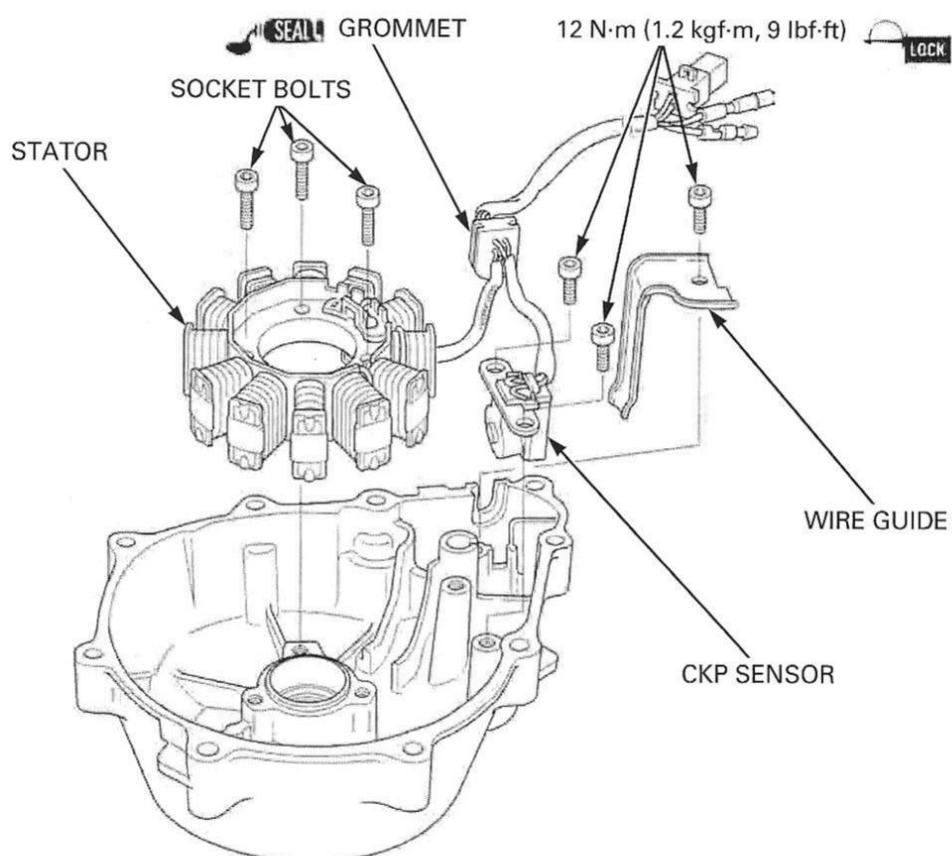


ALTERNATOR/STARTER CLUTCH

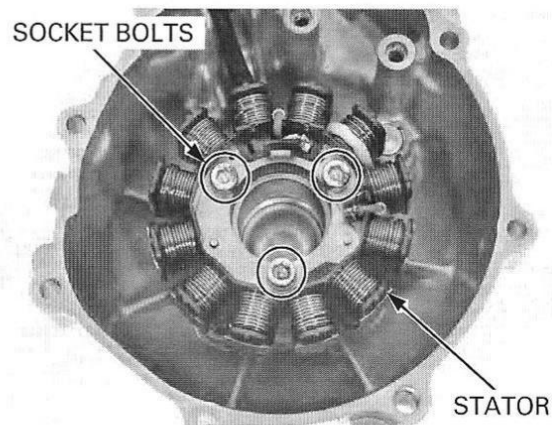
Remove the socket bolts and stator from the left crankcase cover.



INSTALLATION



Install the stator.
Install and tighten the socket bolts securely.



Apply liquid sealant to the alternator wire grommet seating surface and install the wire grommet to the groove.

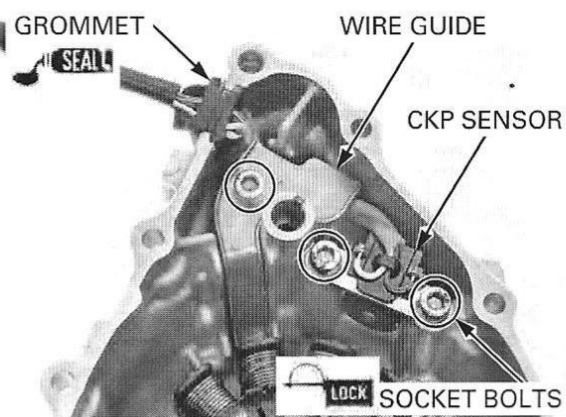
Install the wire guide and CKP sensor.

Apply locking agent to the wire guide and CKP sensor mounting socket bolt threads (coating width 6.5 ± 1.0 mm (0.26 ± 0.04 in) from the tip).

Install and tighten the wire guide and CKP sensor mounting socket bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

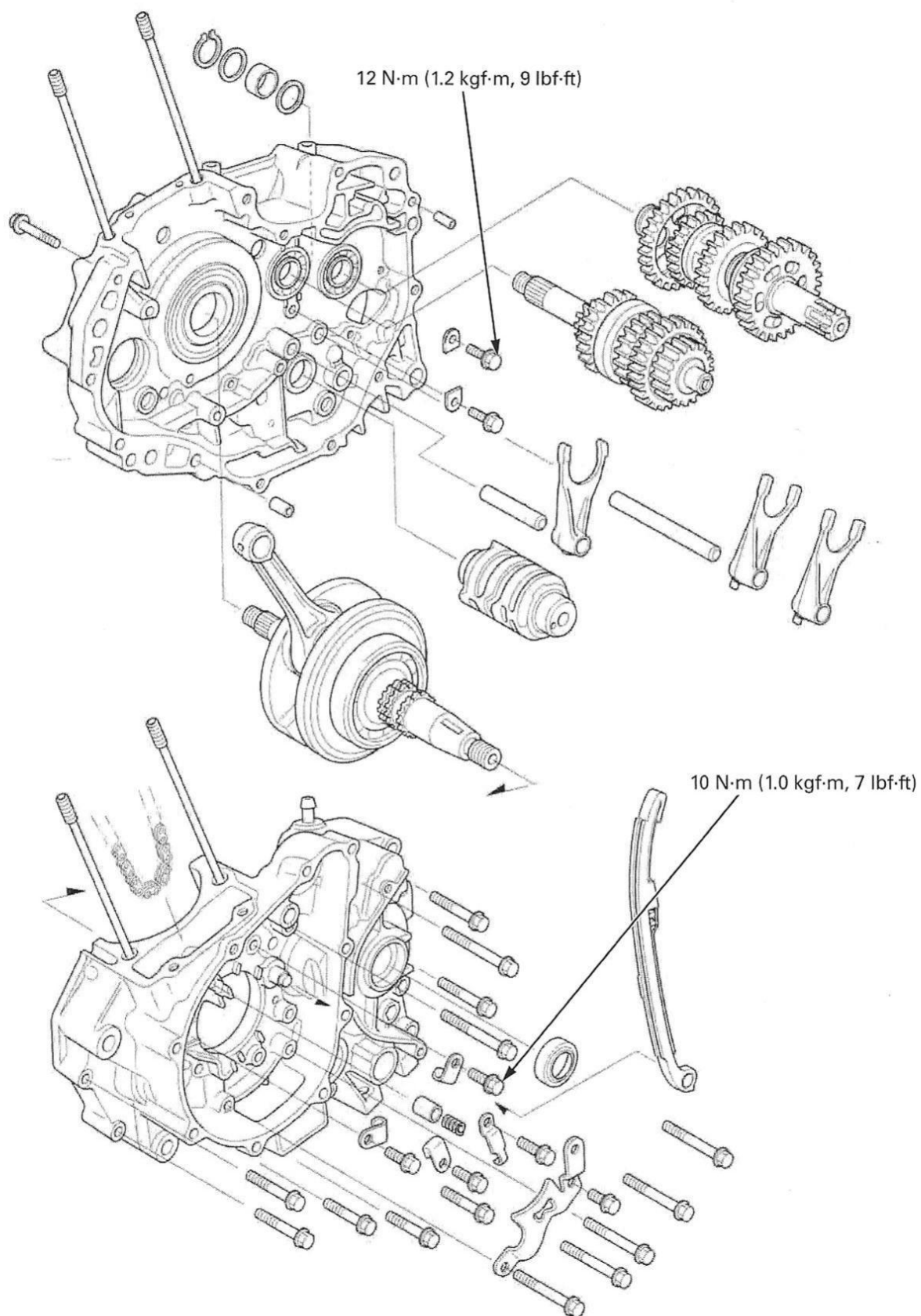
Install the left crankcase cover (page 10-5).



11. CRANKCASE/CRANKSHAFT/TRANSMISSION

COMPONENT LOCATION	11-2	CRANKSHAFT	11-8
SERVICE INFORMATION	11-3	TRANSMISSION.....	11-11
TROUBLESHOOTING	11-5	CRANKCASE ASSEMBLY	11-20
CRANKCASE SEPARATION	11-6		

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the crankshaft and transmission.
- The following parts must be removed before separating the crankcase:
 - Cylinder head (page 7-11)
 - Cylinder/piston (page 8-5)
 - Oil pump (page 4-4)
 - Clutch (page 9-9)
 - Gearshift linkage (page 9-17)
 - Primary drive gear/crankshaft collar (page 9-20)
 - Flywheel/starter clutch (page 10-6)
 - Neutral switch (page 18-13)
 - Sidestand (page 2-19)
 - Starter motor (page 17-6)
 - Engine (page 6-4)
- Be careful not to damage the crankcase mating surfaces when servicing.
- Clean the oil passages before assembling the crankcase halves.
- Prior to assembling the crankcase halves, apply sealant to their mating surfaces. Wipe off excess sealant thoroughly.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Runout		–	0.03 (0.001)
	Connecting rod big end radial clearance		0 – 0.008 (0 – 0.0003)	0.05 (0.002)
	Connecting rod big end side clearance		0.10 – 0.35 (0.004 – 0.014)	0.80 (0.031)
Transmission	Gear I.D.	M4	20.000 – 20.018 (0.7874 – 0.7881)	–
		M5	17.000 – 17.018 (0.6693 – 0.6700)	–
		C1	20.500 – 20.521 (0.8071 – 0.8079)	–
		C2	23.020 – 23.041 (0.9063 – 0.9071)	–
		C3	23.025 – 23.046 (0.9065 – 0.9073)	–
	Bushing O.D.	C1	20.459 – 20.480 (0.8055 – 0.8063)	–
		C2, C3	22.984 – 23.005 (0.9049 – 0.9057)	–
	Gear-to-bushing clearance	C1, C3	0.020 – 0.062 (0.0008 – 0.0024)	–
		C2	0.015 – 0.057 (0.0006 – 0.0022)	–
	Bushing I.D.	C1	17.000 – 17.018 (0.6693 – 0.6700)	–
		C2, C3	20.020 – 20.041 (0.7882 – 0.7890)	–
	Mainshaft O.D.	at M4	19.968 – 19.980 (0.7861 – 0.7866)	–
		at M5	16.968 – 16.980 (0.6680 – 0.6685)	–
	Gear-to-shaft clearance	at M4, M5	0.020 – 0.050 (0.0008 – 0.0020)	–
	Countershaft O.D.	at C1 bushing	16.966 – 16.984 (0.6680 – 0.6687)	–
		at C2 bushing	19.978 – 19.989 (0.7865 – 0.7870)	–
		at C3 bushing	19.979 – 20.000 (0.7866 – 0.7874)	–
Shift fork, shift fork shaft/shift drum	Bushing-to-shaft clearance	C1	0.016 – 0.052 (0.0006 – 0.0020)	–
		C2	0.031 – 0.063 (0.0012 – 0.0025)	–
		C3	0.020 – 0.062 (0.0008 – 0.0024)	–
	Shift fork shaft O.D.		9.986 – 9.995 (0.3931 – 0.3935)	–
	Shift fork I.D.		10.000 – 10.018 (0.3937 – 0.3944)	–
	Shift fork claw thickness		4.93 – 5.00 (0.194 – 0.197)	–
	Shift drum O.D.	Left	23.959 – 23.980 (0.9433 – 0.9441)	–
		Right	20.959 – 20.980 (0.8252 – 0.8260)	–
	Shift drum journal I.D.	Left	24.000 – 24.033 (0.9449 – 0.9462)	–
		Right	21.000 – 21.021 (0.8268 – 0.8276)	–
	Shift drum-to-shift drum journal clearance	Left	0.020 – 0.074 (0.0008 – 0.0029)	–
		Right	0.020 – 0.062 (0.0008 – 0.0024)	–

CRANKCASE/CRANKSHAFT/TRANSMISSION

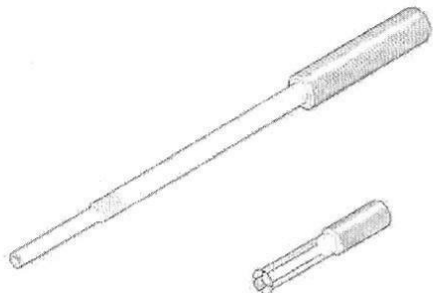
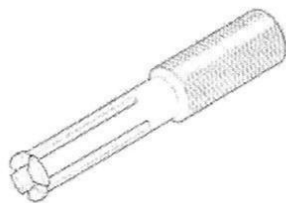
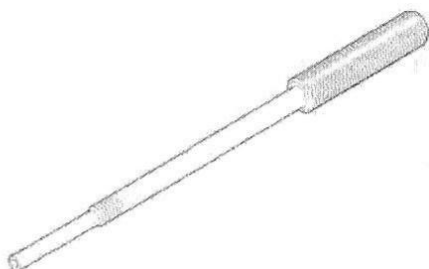
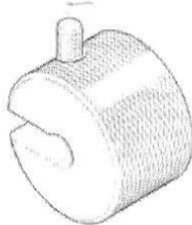
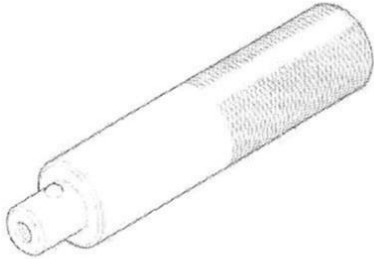
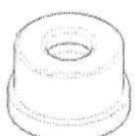
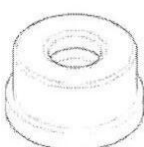
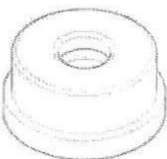
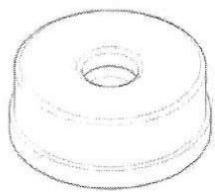
TORQUE VALUES

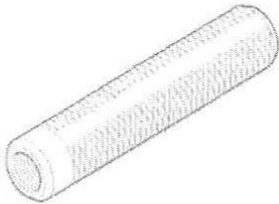
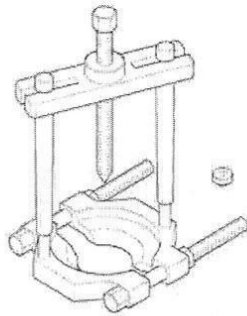
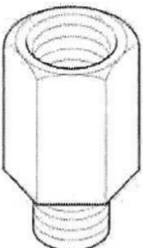
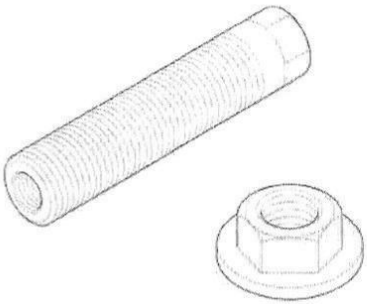
Mainshaft bearing setting plate bolt
Push plug bolt

12 N·m (1.2 kgf·m, 9 lbf·ft)
10 N·m (1.0 kgf·m, 7 lbf·ft)

Apply locking agent to the threads.
Apply locking agent to the threads.

TOOLS

Remover shaft set, 12 mm 07936-1660101 	Remover head, 12 mm 07936-1660110 	Remover shaft, 12 mm 07936-1660120 
Remover weight 07741-0010201 	Driver 07749-0010000 	Pilot, 12 mm 07746-0040200 
Pilot, 17 mm 07746-0040400 	Pilot, 20 mm 07746-0040500 	Attachment, 32 x 35 mm 07746-0010100 
Attachment, 37 x 40 mm 07746-0010200 	Attachment, 42 x 47 mm 07746-0010300 	Attachment, 52 x 55 mm 07746-0010400 

Remover shaft, 17 mm 07936-3710300 	Remover handle 07936-3710100 	Universal bearing puller 07631-0010000 
Threaded adaptor 07WMF-KFF0300 	Assembly collar 07965-VM00100 	Assembly shaft 07965-VM00200 
Seal driver 07947-1180001 		

TROUBLESHOOTING

Excessive engine noise

- Worn, seized or chipped transmission gears
- Worn or damaged transmission bearings
- Worn or damaged connecting rod big end bearing
- Worn crankshaft bearing

Hard to shift

- Improper clutch operation
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum guide grooves
- Damaged shift fork guide pin

Transmission jumps out of gear

- Worn gear dogs or slots
- Worn shift drum guide groove
- Worn shift fork guide pin
- Worn shift fork groove in gear
- Worn shift fork shaft
- Bent shift fork shaft
- Bent shift fork claw

Engine vibration

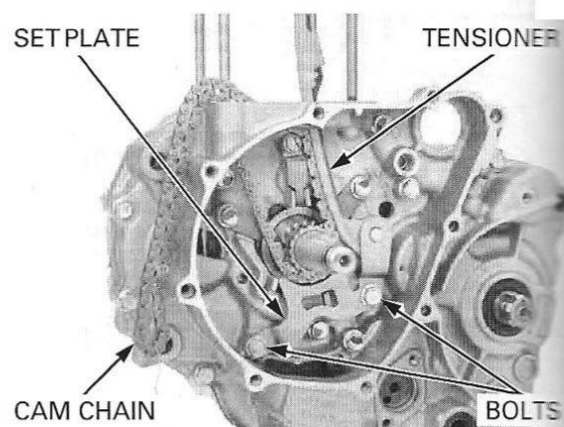
- Excessive crankshaft runout

CRANKCASE SEPARATION

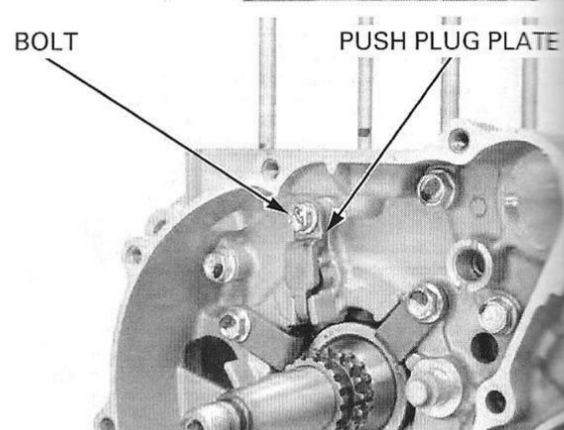
Refer to Service Information (page 11-3) for removal of necessary parts before separating the crankcase.

Remove the bolts, tensioner set plate and cam chain tensioner.

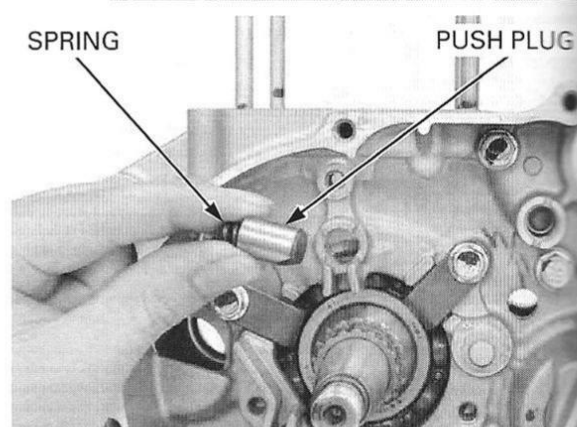
Remove the cam chain.



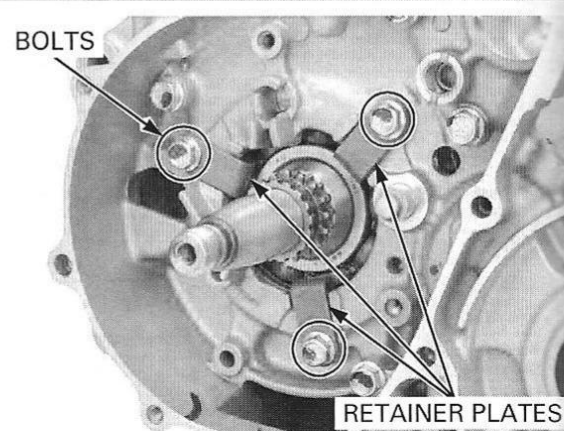
Remove the bolt and push plug plate.



Remove the spring and push plug.

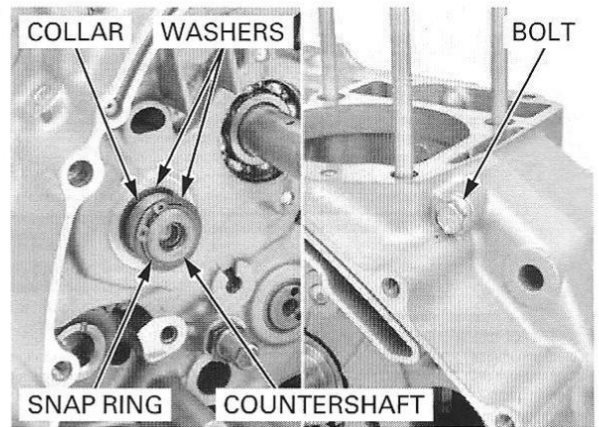


Remove the bolts and bearing retainer plates.

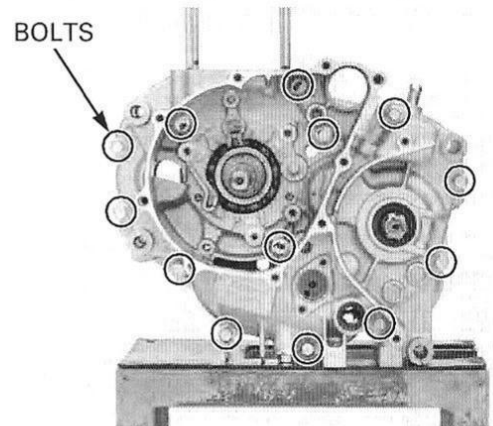


Remove the snap ring, washer, collar and washer from the countershaft.

Remove the right crankcase bolt.



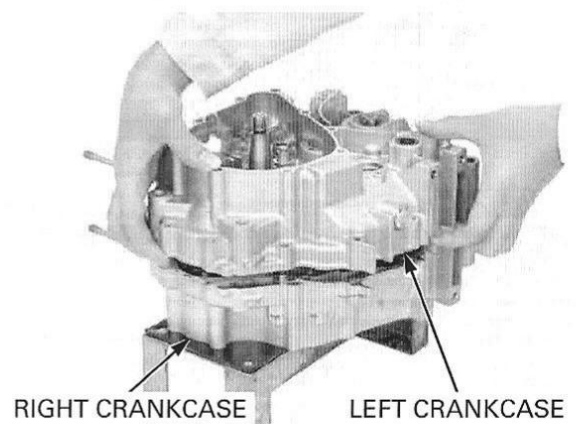
Loosen the left crankcase bolts in a crisscross pattern in several steps and remove them.



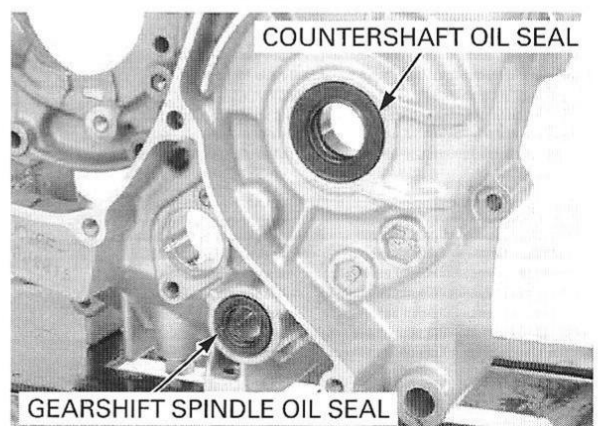
Place the crankcase assembly with the right side down.

Do not pry the crankcase halves with a screwdriver.

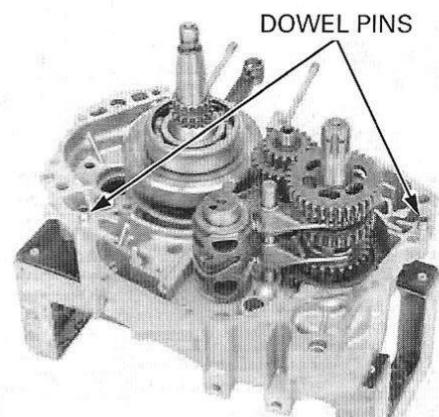
Carefully separate the left crankcase from the right crankcase by tapping them at several locations with a plastic hammer.



Remove the countershaft and gearshift spindle oil seals from the left crankcase.



Remove the dowel pins.

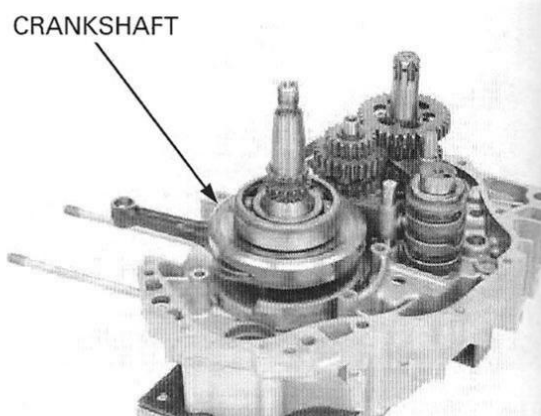


CRANKSHAFT

REMOVAL

Separate the crankcase halves (page 11-6).

Remove the crankshaft from the right crankcase.



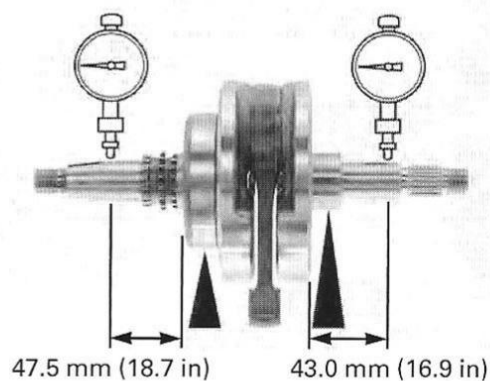
INSPECTION

CRANKSHAFT RUNOUT

Place the crankshaft on a stand or V-blocks.
Set the dial indicator on the shafts as shown.
Rotate the crankshaft two revolutions and measure the runout.

Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.03 mm (0.001 in)

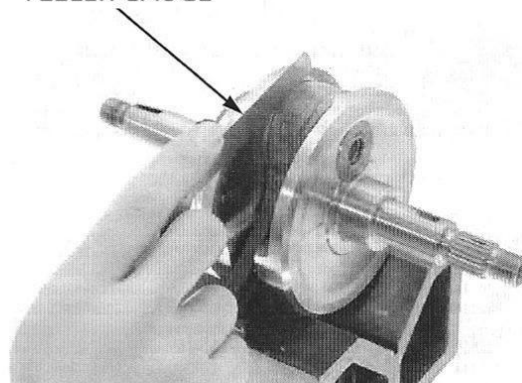


BIG END SIDE CLEARANCE

Measure the side clearance between the connecting rod big end and crank weight.

SERVICE LIMIT: 0.80 mm (0.031 in)

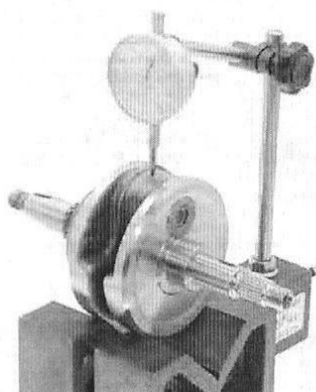
FEELER GAUGE



BIG END RADIAL CLEARANCE

Measure the radial clearance of the connecting rod big end.

SERVICE LIMIT: 0.05 mm (0.002 in)

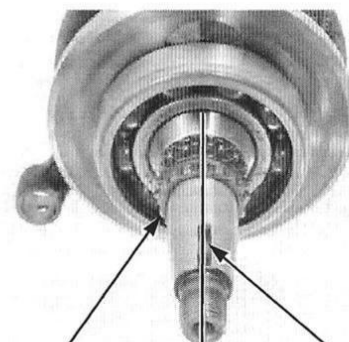


TIMING SPROCKET

If the timing sprocket teeth are worn or damaged, check the cam chain, tensioner guide and cam sprocket.

Check the timing sprocket teeth for wear or damage.

If you replace the timing sprocket, align the center of the timing sprocket tooth with the center of the key groove as shown.



Align

TIMING SPROCKET

GROOVE

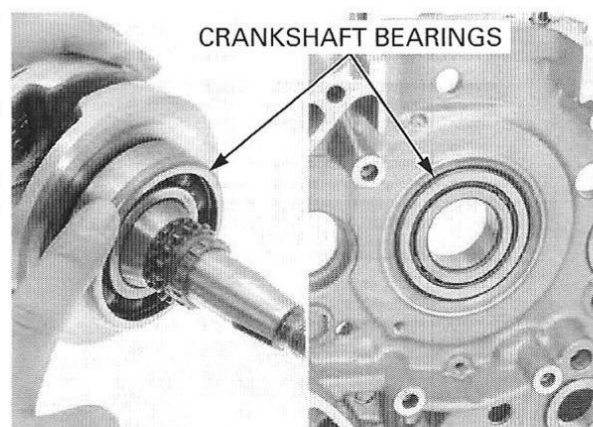
CRANKSHAFT BEARING

Turn the race of each crankshaft bearing with your finger.

The bearing should turn smoothly and quietly. Also check that the bearing race fits tightly in the crankcase or crankshaft.

Replace the bearing in pairs.

Replace any bearings if the race does not turn smoothly, quietly, or if they fit loosely in the crankcase or crankshaft (page 11-10).



CRANKSHAFT BEARING REPLACEMENT

RIGHT BEARING

Remove the transmission (page 11-11).

Remove the inner race.

Remove the right crankshaft bearing from the right crankcase using a hydraulic press.

Press a new right crankshaft bearing into the right crankcase until it is fully seated using the special tools and a hydraulic press as shown.

TOOLS:

Driver 07749-0010000

Attachment, 52 x 55 mm 07746-0010400

Seal driver (ϕ 60 side facing up) 07947-1180001

Apply engine oil to the bearing rotating surface.

Install the crankshaft bearing inner race to the right crankshaft bearing from the inside.

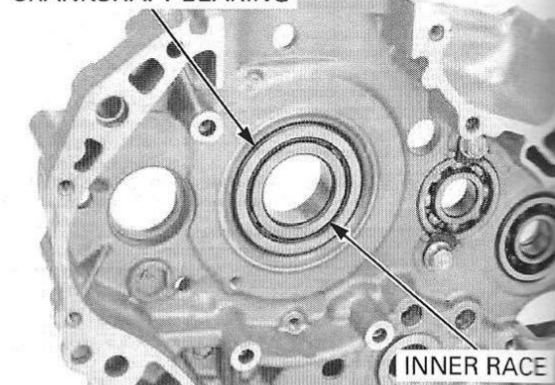
LEFT BEARING

Remove the left crankshaft bearing from the crankshaft using the special tool as shown.

TOOL:

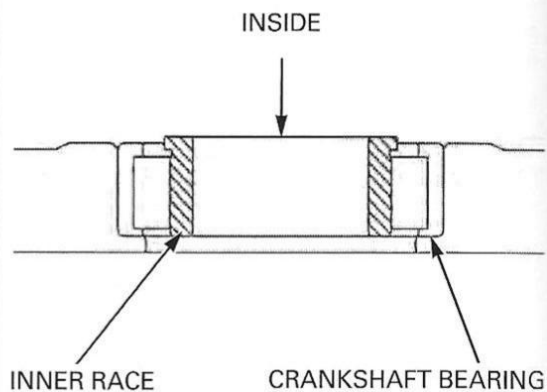
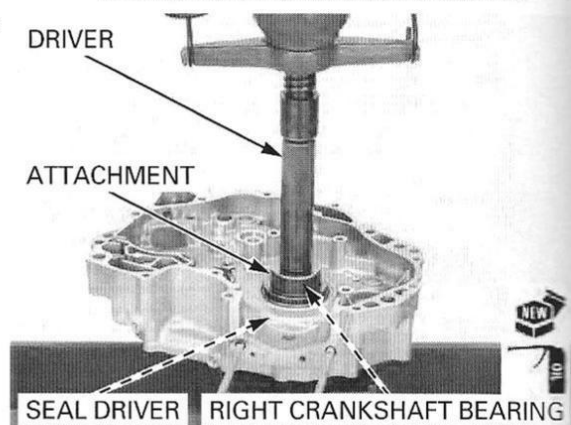
Universal bearing puller 07631-0010000

CRANKSHAFT BEARING

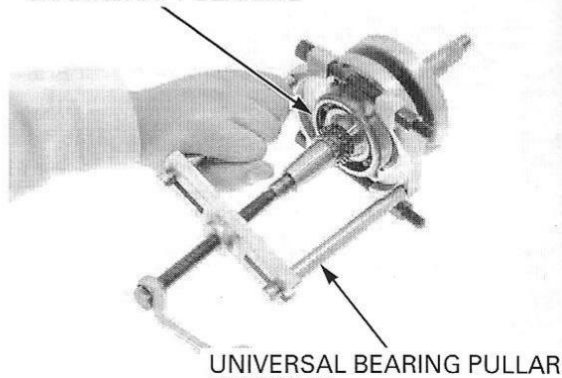


DRIVER

ATTACHMENT



CRANKSHAFT BEARING



Install the special tool onto the left crankshaft end.

TOOL:

Threaded adaptor 07WMF-KFF0300

Install new left crankshaft bearing with the retainer groove facing out and special tools onto the crankshaft.

TOOLS:

Assembly collar 07965-VM00100

Assembly shaft 07965-VM00200

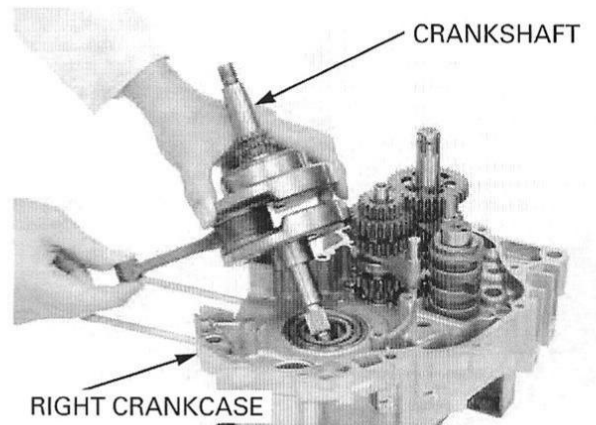
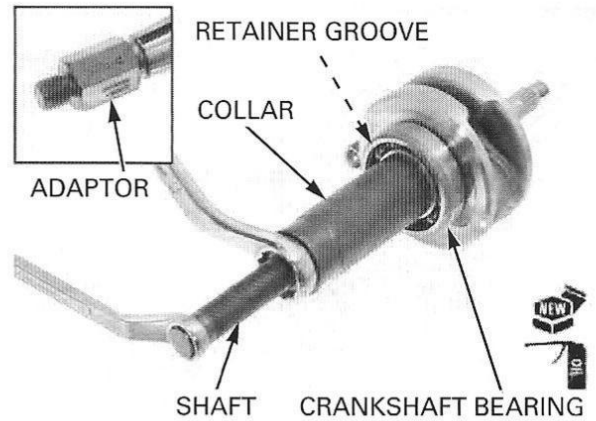
Draw the crankshaft into the bearing inner race.

Apply engine oil to the bearing rotating surface.

INSTALLATION

Install the crankshaft into the right crankcase with the flywheel side facing up.

Assemble the crankcase (page 11-20).

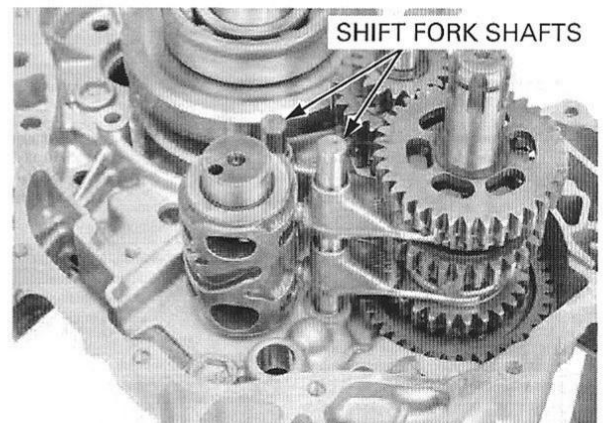


TRANSMISSION

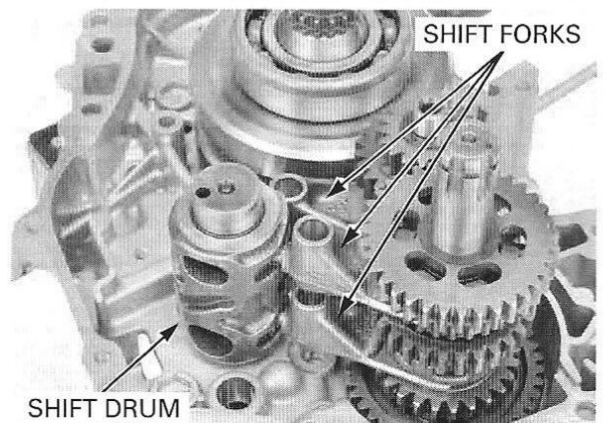
REMOVAL/DISASSEMBLY

Separate the crankcase halves (page 11-6).

Pull out the shift fork shafts.

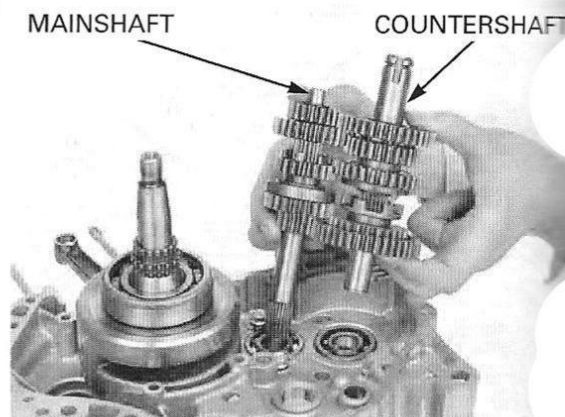


Remove the shift forks and shift drum.



CRANKCASE/CRANKSHAFT/TRANSMISSION

Remove the mainshaft and countershaft as an assembly.

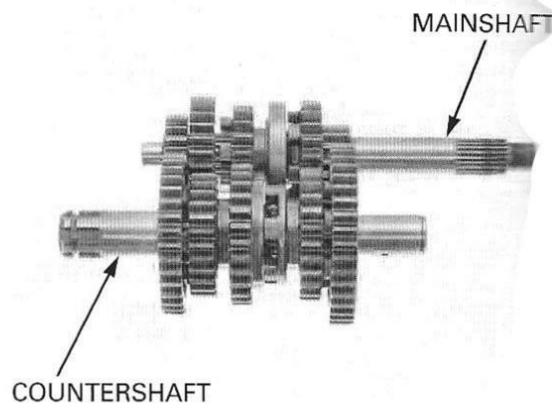


Disassemble the mainshaft and countershaft.

Clean all disassembled parts in solvent thoroughly.

NOTE:

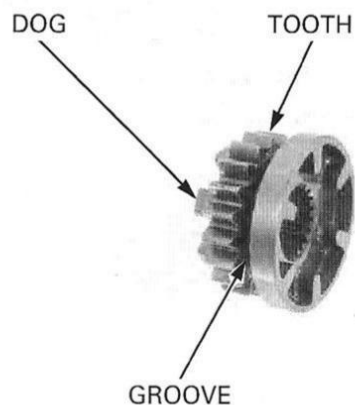
- Do not expand the snap ring more than necessary for removal.
- Keep track of the disassembled parts (gears, bushings, washers and snap rings) by sliding them onto a tool or piece of wire.



INSPECTION

GEAR/BUSHING

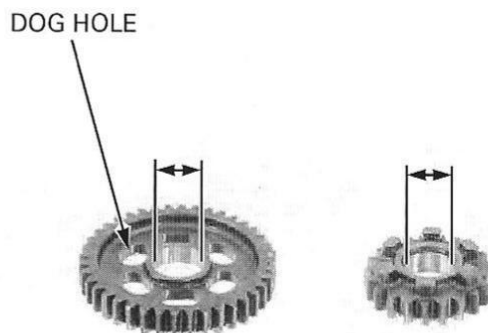
Check the gear shifter groove, dogs, dog holes and teeth for abnormal wear or damage.



Measure the I.D. of each gear.

STANDARD:

- M4: 20.000 – 20.018 mm (0.7874 – 0.7881 in)
- M5: 17.000 – 17.018 mm (0.6693 – 0.6700 in)
- C1: 20.500 – 20.521 mm (0.8071 – 0.8079 in)
- C2: 23.020 – 23.041 mm (0.9063 – 0.9071 in)
- C3: 23.025 – 23.046 mm (0.9065 – 0.9073 in)



Check the bushings for abnormal wear or damage.

Measure the O.D. of each bushing.

STANDARD:

C1: 20.459 – 20.480 mm (0.8055 – 0.8063 in)

C2, C3: 22.984 – 23.005 mm (0.9049 – 0.9057 in)

Calculate the gear-to-bushing clearance.

STANDARD:

C1, C3: 0.020 – 0.062 mm (0.0008 – 0.0024 in)

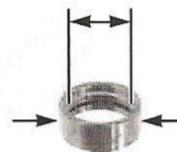
C2: 0.015 – 0.057 mm (0.0006 – 0.0022 in)

Measure the I.D. of each bushing.

STANDARD:

C1: 17.000 – 17.018 mm (0.6693 – 0.6700 in)

C2, C3: 20.020 – 20.041 mm (0.7882 – 0.7890 in)



MAINSHAFT/COUNTERSHAFT

Check the spline grooves and sliding surfaces for abnormal wear or damage.

Measure the mainshaft and countershaft O.D. at the gear or bushing sliding areas.

STANDARD:

at M4 gear:

19.968 – 19.980 mm (0.7861 – 0.7866 in)

at M5 gear:

16.968 – 16.980 mm (0.6680 – 0.6685 in)

at C1 bushing:

16.966 – 16.984 mm (0.6680 – 0.6687 in)

at C2 bushing:

19.978 – 19.989 mm (0.7865 – 0.7870 in)

at C3 bushing:

19.979 – 20.000 mm (0.7866 – 0.7874 in)

Calculate the gear-to-shaft clearance.

STANDARD:

M4, M5: 0.020 – 0.050 mm (0.0008 – 0.0020 in)

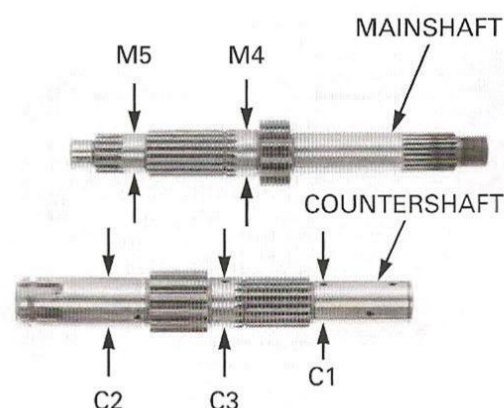
Calculate the bushing-to-shaft clearance.

STANDARD:

C1: 0.016 – 0.052 mm (0.0006 – 0.0020 in)

C2: 0.031 – 0.063 mm (0.0012 – 0.0025 in)

C3: 0.020 – 0.062 mm (0.0008 – 0.0024 in)



SHIFT DRUM

Inspect the shift drum end for scoring, scratches, or evidence of sufficient lubrication.

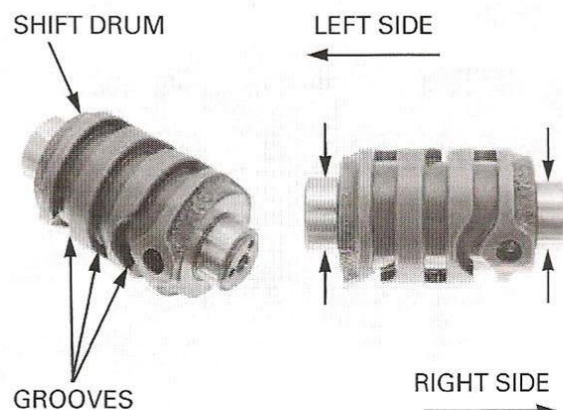
Check the shift drum grooves for abnormal wear or damage.

Measure the O.D. at each shift drum end.

STANDARD:

Left side: 23.959 – 23.980 mm (0.9433 – 0.9441 in)

Right side: 20.959 – 20.980 mm (0.8252 – 0.8260 in)



CRANKCASE/CRANKSHAFT/TRANSMISSION

Measure the I.D. of each shift drum journal.

STANDARD:

Left side: 24.000 – 24.033 mm (0.9449 – 0.9462 in)

Right side: 21.000 – 21.021 mm (0.8268 – 0.8276 in)

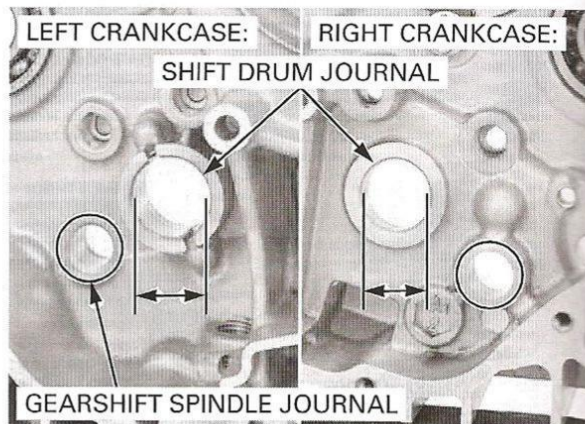
Calculate the shift drum-to-shift drum journal clearance.

STANDARD:

Left side: 0.020 – 0.074 mm (0.0008 – 0.0029 in)

Right side: 0.020 – 0.062 mm (0.0008 – 0.0024 in)

Check the gearshift spindle journals of the left and right crankcases for excessive wear or damage.



SHIFT FORK/SHAFT

Check the shift forks for deformation or abnormal wear.

Check the shift fork guide pin for abnormal wear or damage.

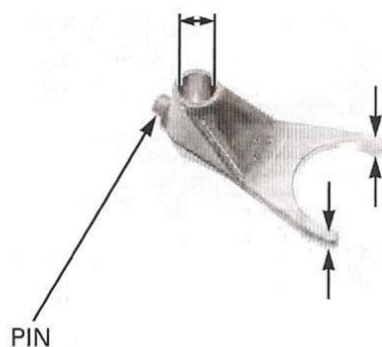
Measure the shift fork claw thickness of each shift fork.

STANDARD: 4.93 – 5.00 mm (0.194 – 0.197 in)

Measure each shift fork I.D.

STANDARD:

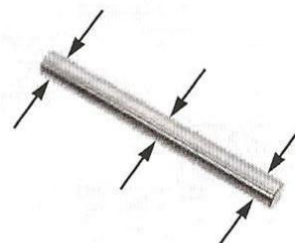
10.000 – 10.018 mm (0.3937 – 0.3944 in)



Check the shift fork shafts for damage and straightness.

Measure each shift fork shaft O.D.

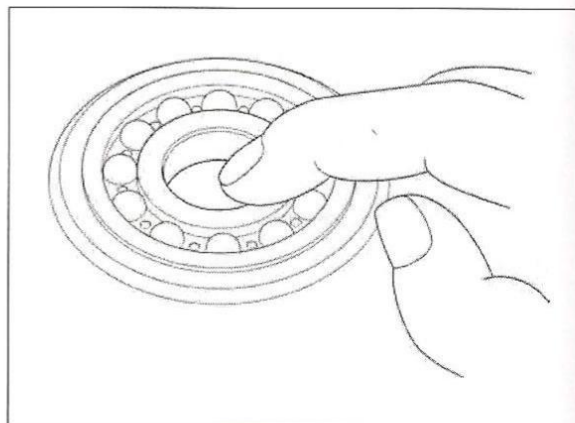
STANDARD: 9.986 – 9.995 mm (0.3931 – 0.3935 in)



TRANSMISSION BEARING

Turn the inner race of each bearing with your finger. The inner race should turn smoothly and quietly. Also check that each bearing outer race fits tightly in the crankcases.

Replace any bearings if the inner race does not turn smoothly, quietly, or if the outer race fits loosely in the crankcase (page 11-15).

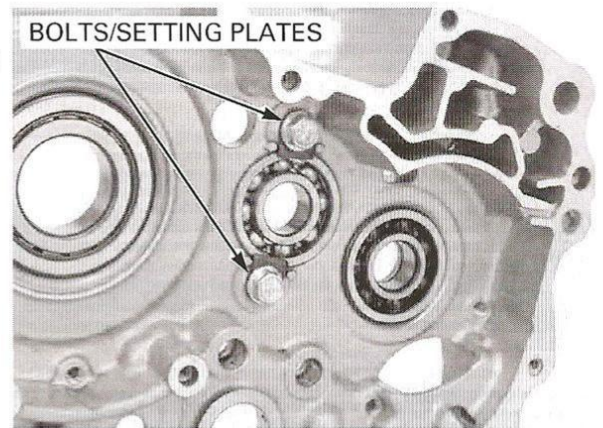


TRANSMISSION BEARING REPLACEMENT

RIGHT CRANKCASE

Remove the crankshaft (page 11-8).

Remove the bolts and mainshaft bearing setting plates from the right crankcase.

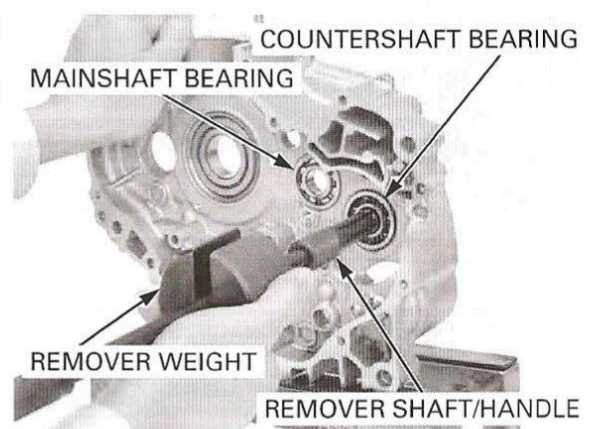


Drive out the mainshaft bearing from the right crankcase.

Remove the countershaft bearing from the right crankcase using the special tools.

TOOLS:

Remover shaft, 17 mm	07936-3710300
Remover handle	07936-3710100
Remover weight	07741-0010201



Drive a new right mainshaft bearing into right crankcase with its marked side facing up until it is fully seated using the special tools.

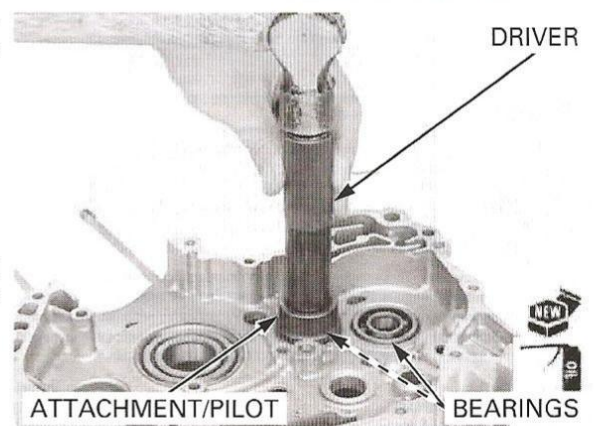
TOOLS:

Driver	07749-0010000
Attachment, 37 x 40 mm	07746-0010200
Pilot, 17 mm	07746-0040400

Drive a new right countershaft bearing into right crankcase with its sealed side facing down until it is fully seated using the special tools.

TOOLS:

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 17 mm	07746-0040400

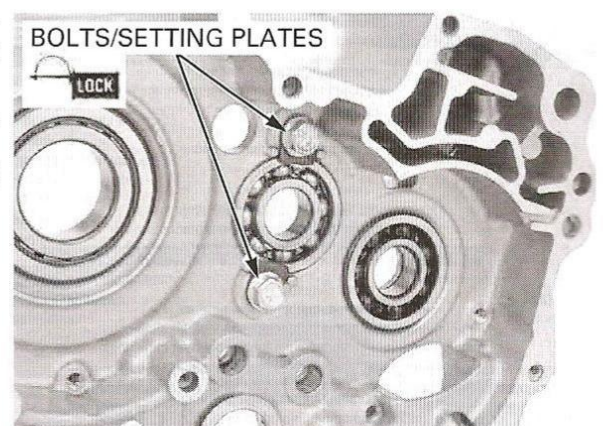


Apply locking agent to the mainshaft bearing setting plate bolt threads (coating width 6.5 ± 1.0 mm (0.26 ± 0.04 in) from the tip).

Install the mainshaft bearing setting plates and setting plate bolts.

Tighten the setting plate bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



CRANKCASE/CRANKSHAFT/TRANSMISSION

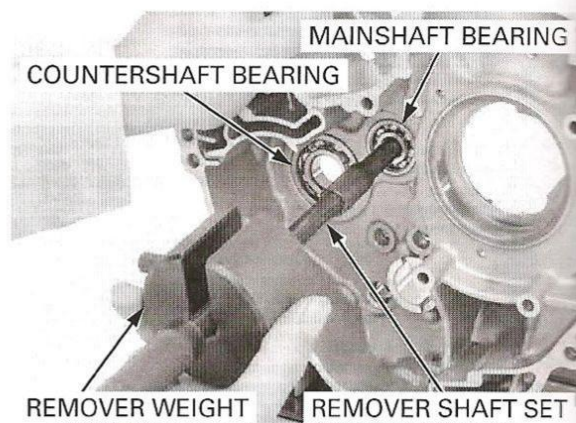
LEFT CRANKCASE

Drive out the countershaft bearing from the left crankcase.

Remove the mainshaft bearing from the left crankcase using the special tools.

TOOLS:

Remover shaft set, 12 mm	07936-1660101
- Remover head, 12 mm	07936-1660110
- Remover shaft, 12 mm	07936-1660120
Remover weight	07741-0010201



Apply engine oil to each bearing rotating area.

Drive a new left mainshaft bearing into the left crankcase with its sealed side facing down until it is fully seated using the special tools.

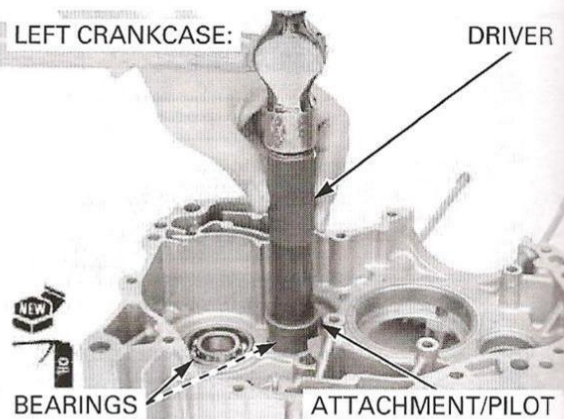
TOOLS:

Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100
Pilot, 12 mm	07746-0040200

Drive a new left countershaft bearing into the left crankcase with its marked side facing up until it is fully seated using the special tools.

TOOLS:

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 20 mm	07746-0040500



ASSEMBLY/INSTALLATION

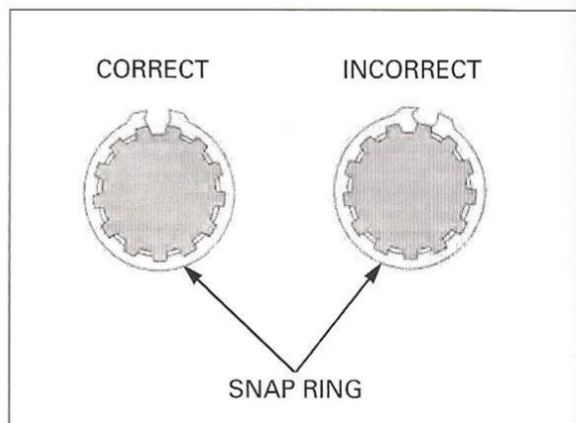
Clean all parts in solvent, and dry them thoroughly.

Apply molybdenum oil solution to each gear inner surface, C1, C2, C3 gear bushing whole surface and M3, C4, C5 gear shift fork grooves to ensure initial lubrication.

Assemble all parts into their original positions.

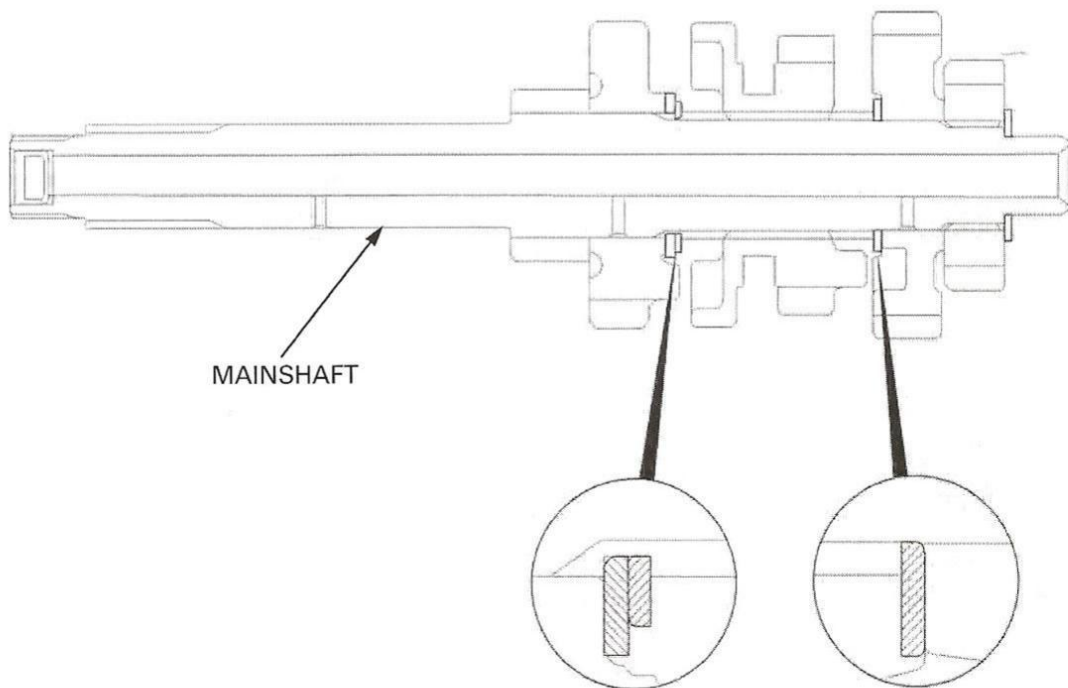
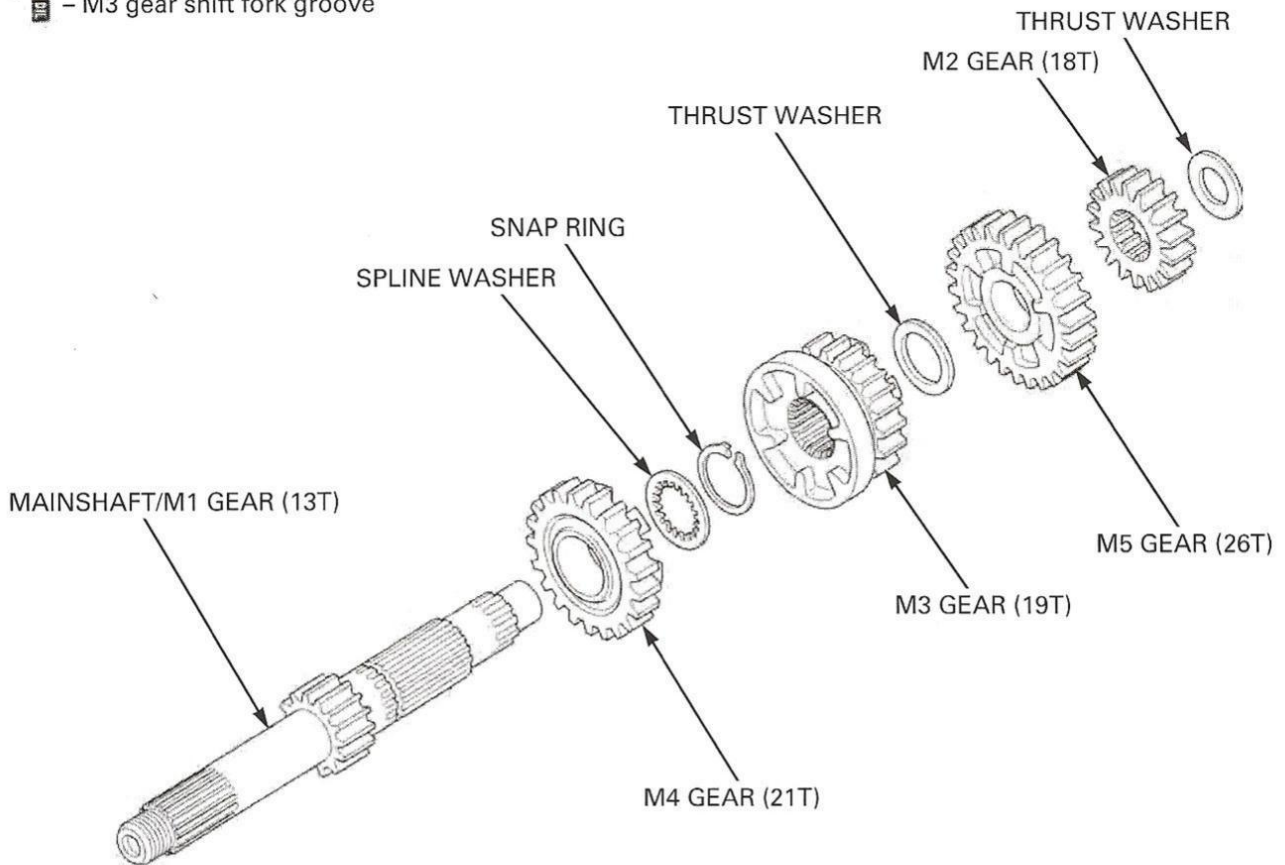
NOTE:

- Check the gears for freedom of movement or rotation on the shaft.
- Install the washers and snap rings with the chamfered edge facing the thrust load side.
- Do not reuse worn snap ring which could easily spin in the groove.
- Check that the snap rings are seated in the shaft grooves and align their end gaps with the grooves of the spline.



MAINSHAFT

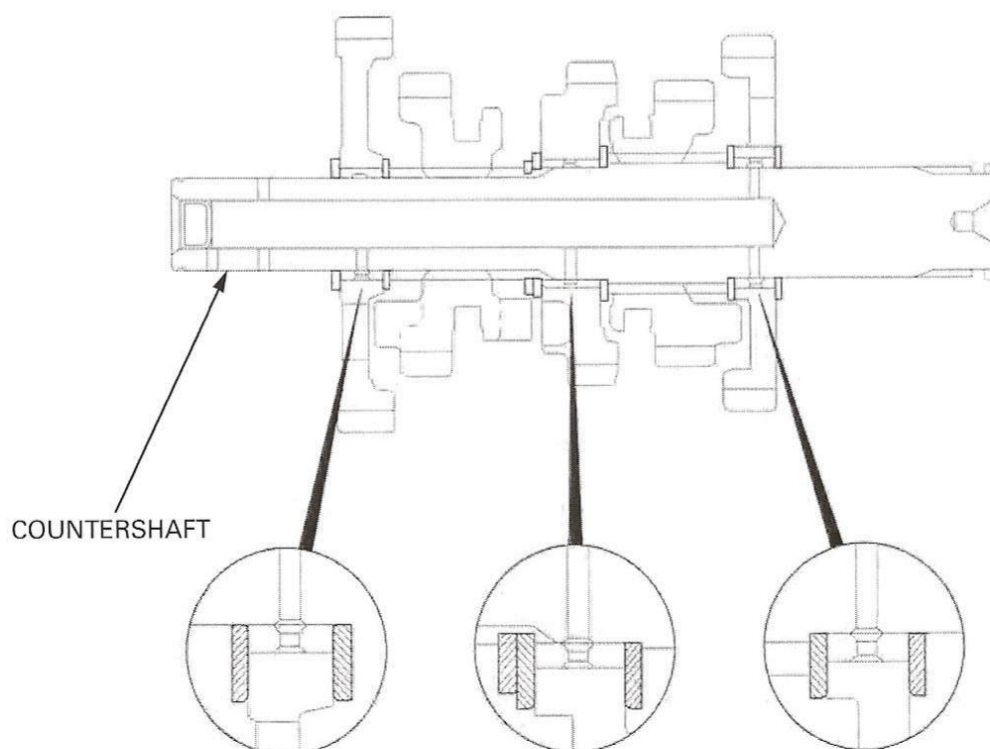
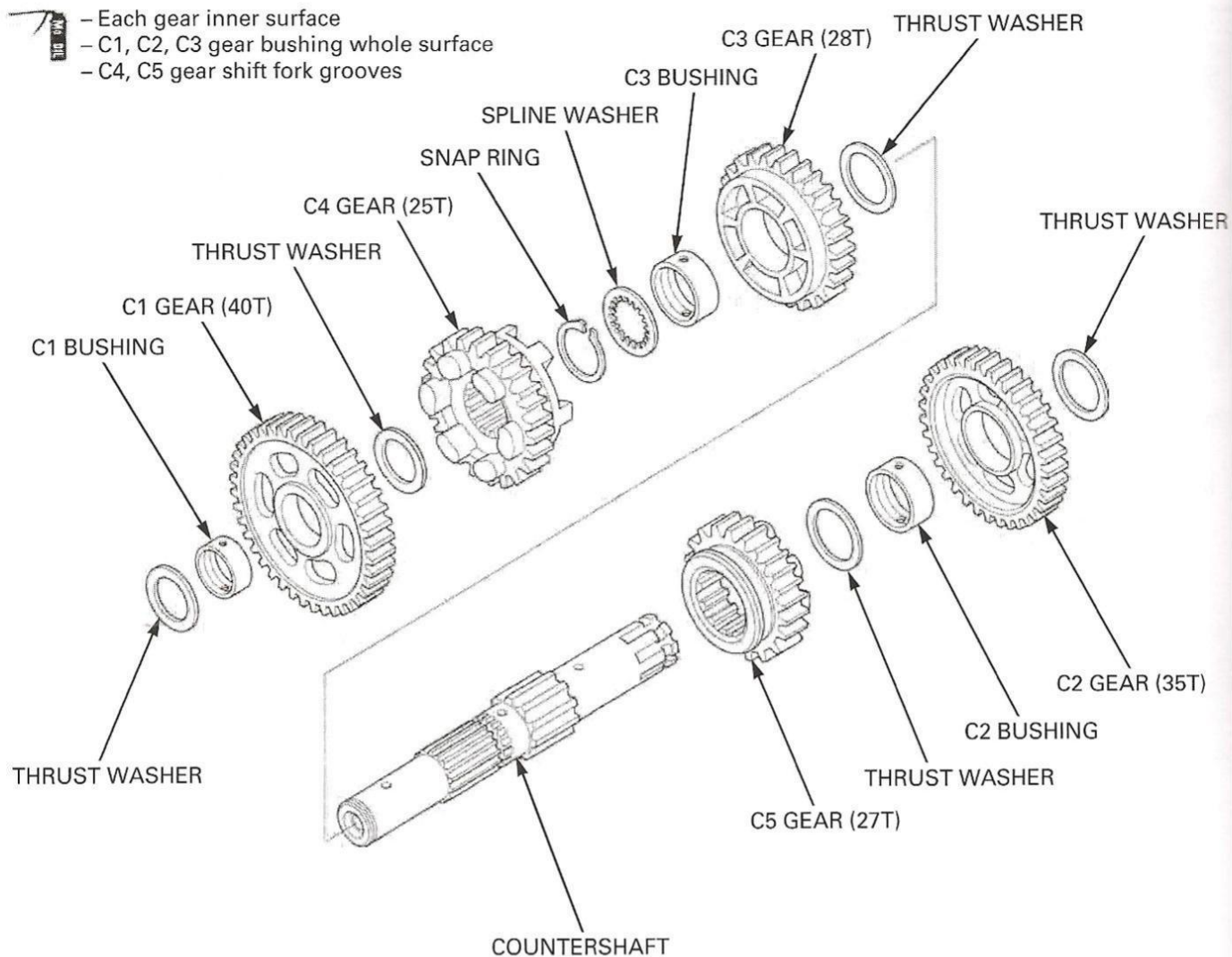
- Each gear inner surface
- M3 gear shift fork groove



CRANKCASE/CRANKSHAFT/TRANSMISSION

COUNTERSHAFT

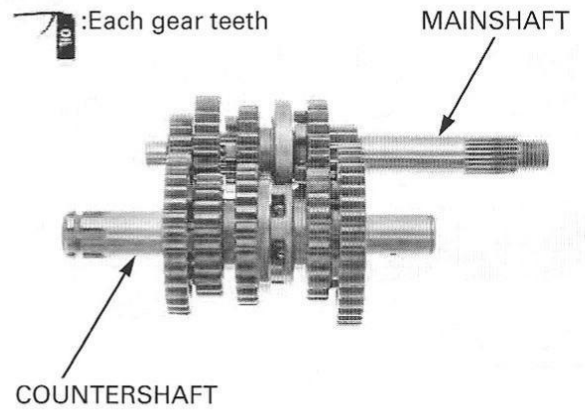
- Each gear inner surface
- C1, C2, C3 gear bushing whole surface
- C4, C5 gear shift fork grooves



Check the transmission gears for freedom of movement and rotation on the shaft.

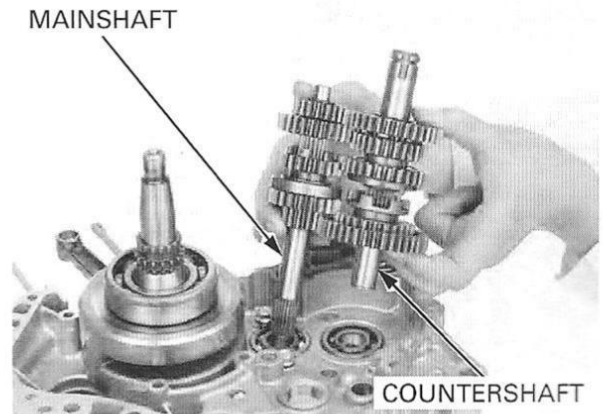
Apply engine oil to the transmission gear teeth.

Engage the mainshaft and countershaft gears.



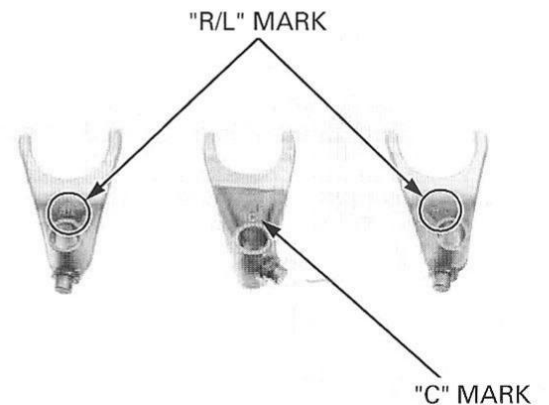
Install the mainshaft and countershaft as an assembly into the right crankcase.

Be sure to install the three ends washers (mainshaft; left only/countershaft; both ends).



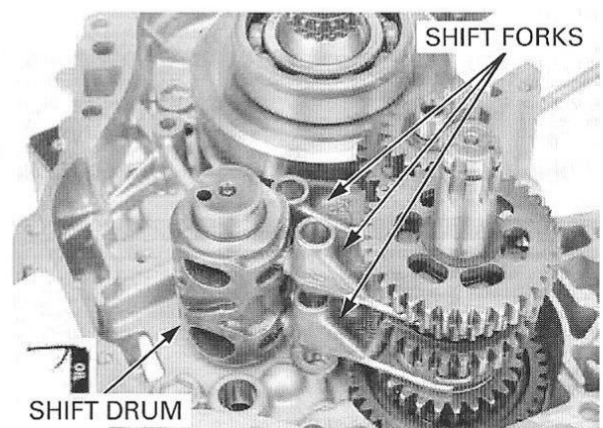
Each shift fork has an identification mark:

- "C" for mainshaft
- "R/L" for countershaft



Install the shift forks into the shifter gear grooves with their identification marks facing up (left crankcase side).

Apply engine oil to the shift drum journal rotating area and install the shift drum by aligning the shift fork guide pins with the shift drum guide grooves.

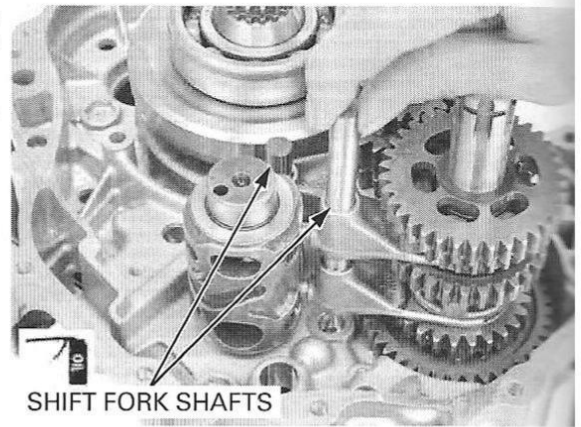


CRANKCASE/CRANKSHAFT/TRANSMISSION

Apply engine oil to the shift fork shaft whole surface and insert the shafts through the shift forks into the right crankcase.

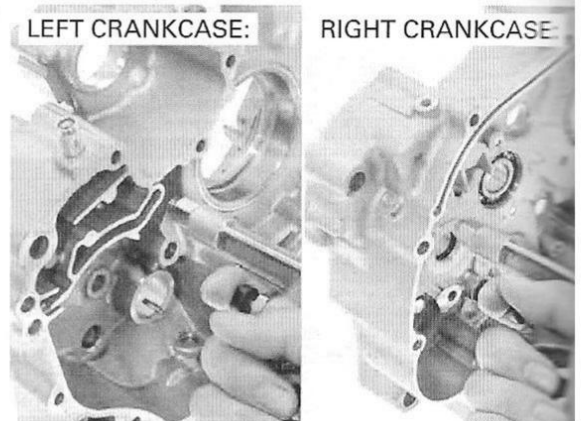
Rotate the mainshaft by hand to see the gears rotate freely.

Assemble the crankcase (page 11-20).



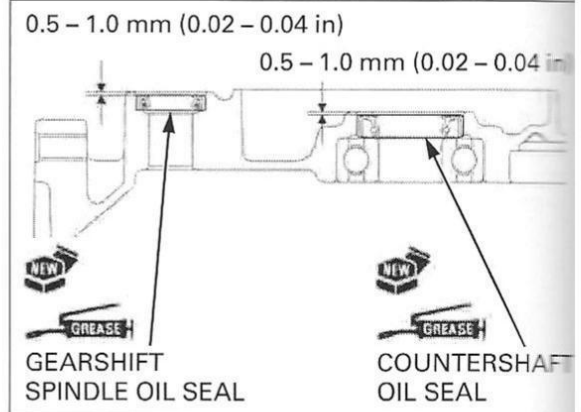
CRANKCASE ASSEMBLY

Clean the oil passages of each crankcase using the compressed air.



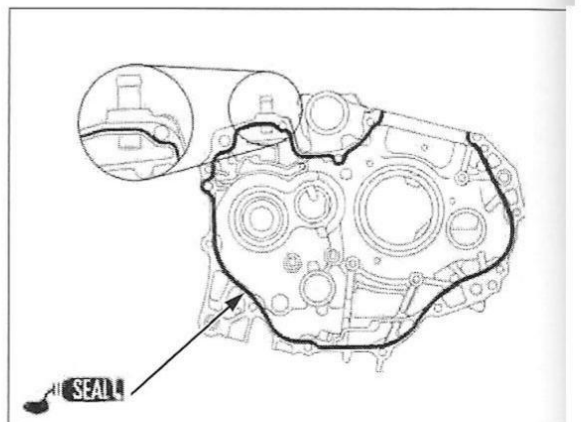
Apply grease to each new oil seal lips.

Install the countershaft and gearshift spindle oil seals to the specified depth below the crankcase surface as shown.

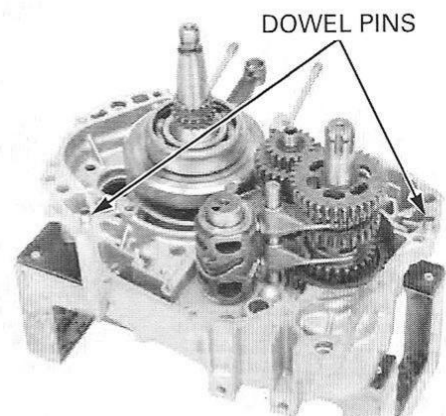


Clean the left and right crankcase mating surfaces thoroughly, being careful not to damage them and check for damage.

Apply a light but thorough coating of the liquid sealant to the left crankcase mating surface except the oil passage area as shown.

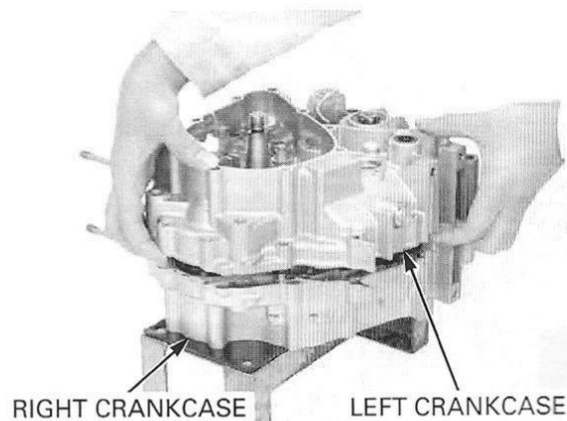


Install the dowel pins.

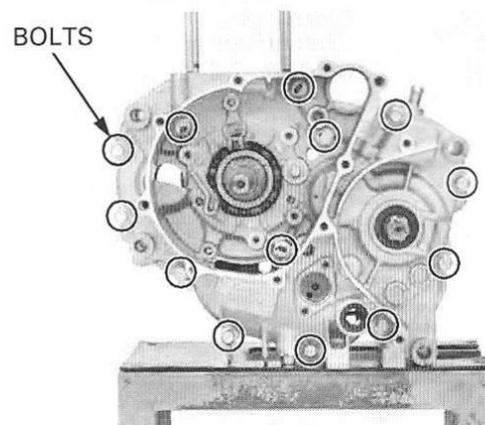


Install the left crankcase over the right crankcase, being careful not to damage the oil seal lips.

- Do not force the crankcase halves together, if there is excessive force required, something is wrong. Remove the left crankcase and check for misaligned parts.



Install and tighten the left crankcase bolts in a criss-cross pattern in several steps.



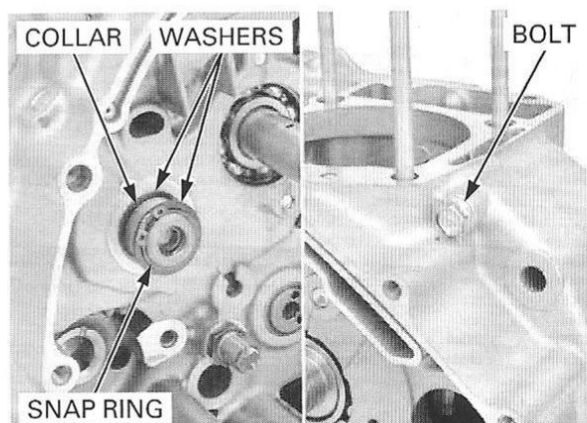
Install the washer, collar and washer onto the countershaft.

Install the snap ring with its chamfered edge facing the thrust load side.

Install the snap ring into the groove of the countershaft.

- Check that the snap ring is seated in the groove.
- Do not reuse the snap ring which could easily spin in the groove.

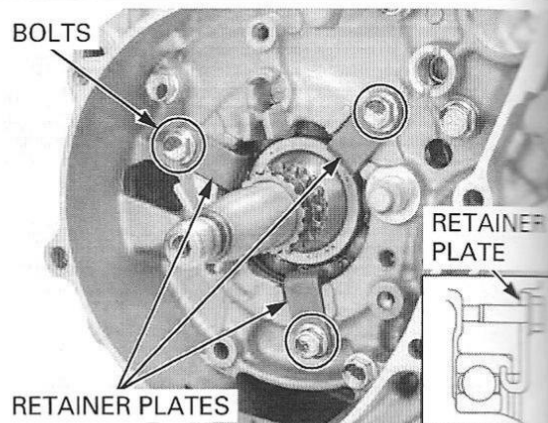
Install and tighten the right crankcase bolt.



CRANKCASE/CRANKSHAFT/TRANSMISSION

When installing the retainer plate, lightly pull the crankshaft out and hook the plate tabs on the crankshaft bearing groove.

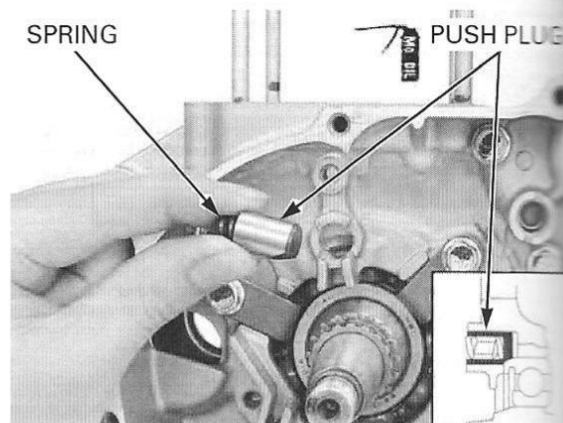
Install the bearing retainer plates, and tighten the plate bolts.



Apply molybdenum oil solution to the push plug whole surface.

Install the push plug and spring.

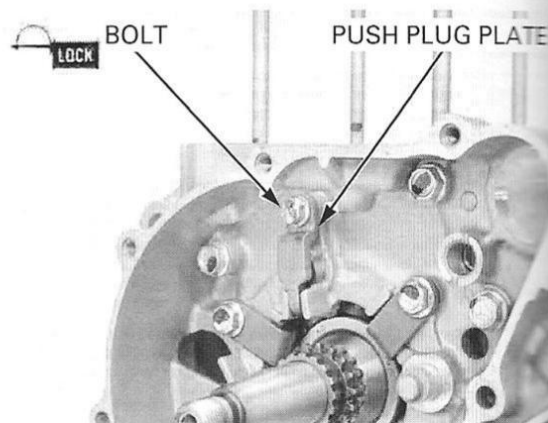
- Make sure the crankshaft bearing outer touches the taper part of the push plug.



Apply locking agent to the push plug bolt threads (coating width 6.5 ± 1.0 mm (0.26 ± 0.04 in) from the tip).

Install the push plug plate and push plug bolt. Tighten the push plug bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



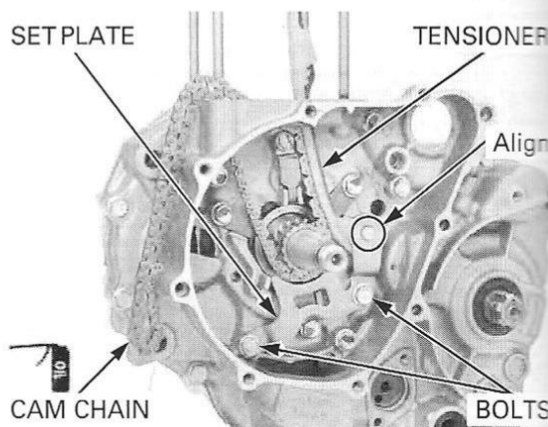
Apply engine oil to the cam chain entire surface.

Install the cam chain onto the timing sprocket.

Install the cam chain tensioner and tensioner set plate while aligning its hole with the pin of the left crankcase.

Install and tighten the tensioner set plate bolts securely.

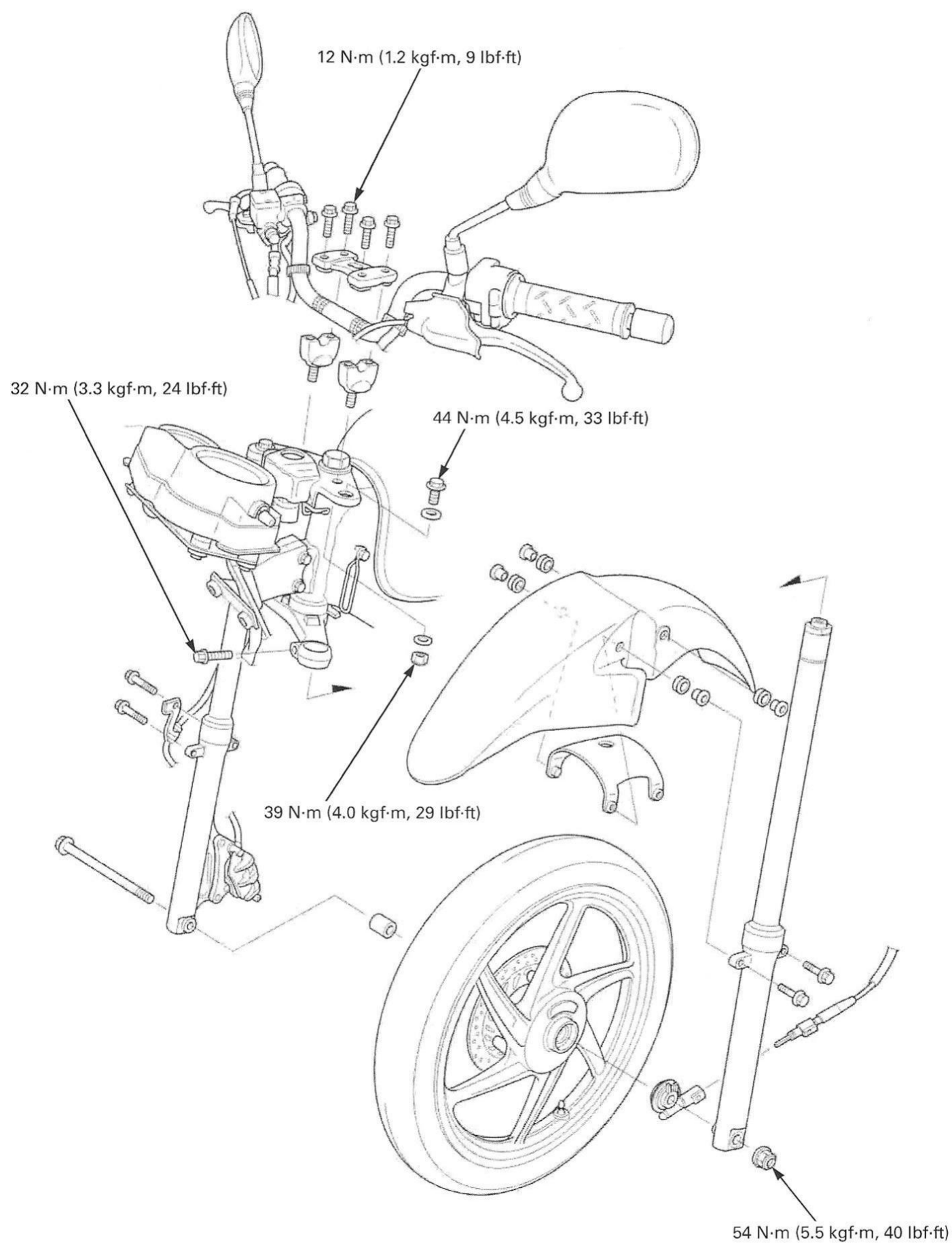
- Refer to service information (page 11-3) for installation of the removed parts for crankcase/crankshaft/transmission service.



12. FRONT WHEEL/SUSPENSION/STEERING

COMPONENT LOCATION	12-2	FRONT WHEEL	12-13
SERVICE INFORMATION	12-3	FORK	12-18
TROUBLESHOOTING	12-5	STEERING STEM.....	12-26
HANDLEBAR	12-6		

COMPONENT LOCATION



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.

- Riding on damaged rims impairs safe operation of the motorcycle.
- When servicing the front wheel, fork or steering stem, support the motorcycle using a center stand or hoist.
- Raise the front wheel off the ground by supporting the frame securely when servicing the front wheel, suspension and steering stem. A hoist or equivalent is required to support the motorcycle.
- When using the pin spanner, use a deflecting beam type torque wrench 25 cm (10 in) long. The pin spanner increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the steering stem adjusting nut. The specification given is the actual torque applied to the adjusting nut, not the reading on the torque wrench. Do not overtighten the adjusting nut. The specification later in the text gives both actual and indicated torque.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Do not operate the brake lever after removing the caliper and front wheel. To do so will cause difficulty in fitting the brake disc between the pads.
- After the front wheel installation, check the brake operation by applying the brake lever.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "TUBELESS TIRE APPLICABLE".
- Keep grease off the brake pads and disc.
- For brake system information (page 14-3).

SPECIFICATIONS

Unit: mm (in)

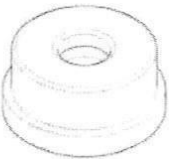
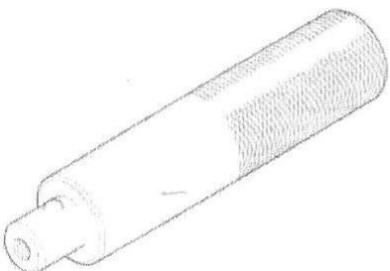
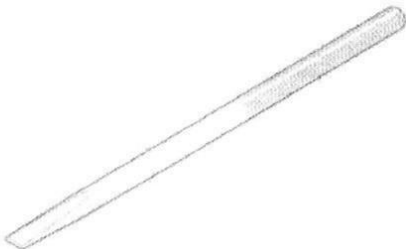
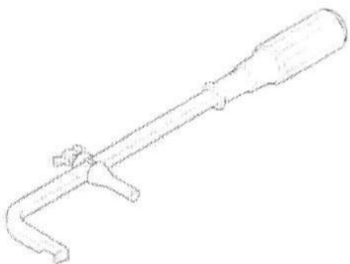
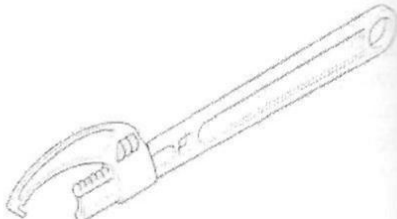
ITEM		STANDARD	SERVICE LIMIT
Minimum tire thread depth		—	1.5 (0.06)
Cold tire pressure	Driver only	175 kPa (1.75 kgf/cm ² , 25 psi)	—
	Driver and passenger	175 kPa (1.75 kgf/cm ² , 25 psi)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	1.0 (0.04)
	Axial	—	1.0 (0.04)
Fork	Spring free length	372.7 (14.67)	—
	Tube runout	—	0.20 (0.008)
	Recommended fluid	Honda Ultra Cushion Oil 10W or equivalent	—
	Fluid level	167 (6.6)	—
	Fluid capacity	146 ± 2.5 cm ³ (4.9 ± 0.08 US oz, 5.1 ± 0.09 Imp oz)	—
Steering head bearing pre-load		5.6 – 8.9 N (0.6 – 0.9 kgf)	—

TORQUE VALUES

Clutch lever bolt	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Clutch lever nut	5.9 N·m (0.6 kgf·m, 4.4 lbf·ft)	
Front axle nut	54 N·m (5.5 kgf·m, 40 lbf·ft)	
Front brake disc mounting bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)	ALOC bolt; replace with a new one.
Handlebar end screw	9 N·m (0.9 kgf·m, 6.6 lbf·ft)	ALOC bolt; replace with a new one.
Handlebar lower holder nut	39 N·m (4.0 kgf·m, 29 lbf·ft)	
Handlebar upper holder bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Fork socket bolt	20 N·m (2.0 kgf·m, 15 lbf·ft)	Apply locking agent to the threads.
Fork cap	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Bottom bridge pinch bolt	32 N·m (3.3 kgf·m, 24 lbf·ft)	
Top fork bolt	44 N·m (4.5 kgf·m, 33 lbf·ft)	
Steering bearing adjusting nut	—	See page 12-29
Steering stem nut	74 N·m (7.5 kgf·m, 55 lbf·ft)	
Master cylinder holder bolt	9 N·m (0.9 kgf·m, 6.6 lbf·ft)	

FRONT WHEEL/SUSPENSION/STEERING

TOOLS

Attachment, 37 x 40 mm 07746-0010200 	Attachment, 42 x 47 mm 07746-0010300 	Pilot, 12 mm 07746-0040200 
Driver 07749-0010000 	Bearing remover shaft 07746-0050100 	Bearing remover head, 12 mm 07746-0050300 
Oil seal remover 07748-0010001 	Steering stem driver 07947-1180001 	Pin spanner 07702-0020001 
Ball race remover 07GMD-KS40100 		

TROUBLESHOOTING

Hard steering

- Steering stem adjusting nut too tight
- Worn or damaged steering head bearings
- Worn or damaged steering head bearing races
- Bent steering stem
- Insufficient tire pressure
- Faulty tire

Steers to one side or does not track straight

- Bent fork tubes
- Bent axle
- Wheel installed incorrectly
- Damaged or loose steering head bearings
- Bent frame
- Worn or damaged wheel bearing
- Unevenly assembled left and right fork tubes
- Unequal oil quantity in each fork tube

Front wheel wobbling

- Bent rim
- Worn or damaged wheel bearings
- Faulty tire
- Axle fastener not tightened properly
- Unbalanced front wheel and tire

Front wheel turns hard

- Faulty wheel bearings
- Faulty speedometer gear
- Bent axle
- Brake drag

Soft suspension

- Weak fork springs
- Insufficient fluid in fork
- Insufficient tire pressure
- Incorrect fork fluid weight (low viscosity)

Stiff suspension

- Incorrect fork fluid weight (high viscosity)
- Bent or damaged fork tubes
- Clogged fork fluid passage
- Tire pressure too high
- Fork slider binds
- Incorrect axle alignment

Front suspension noisy

- Insufficient fluid in fork
- Loose fork fasteners
- Lack of grease in speedometer gearbox

HANDLEBAR

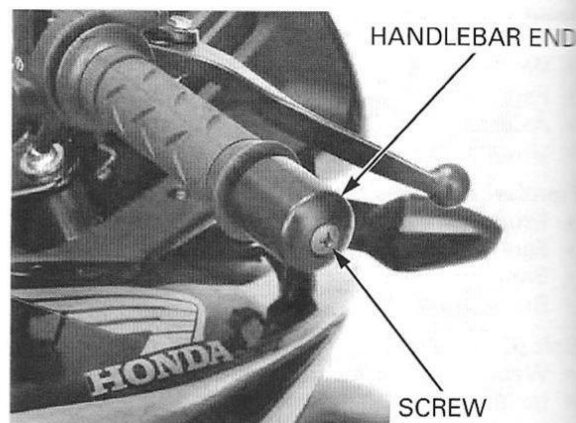
REMOVAL

Remove the rearview mirrors (page 2-19).

Remove the wire bands.



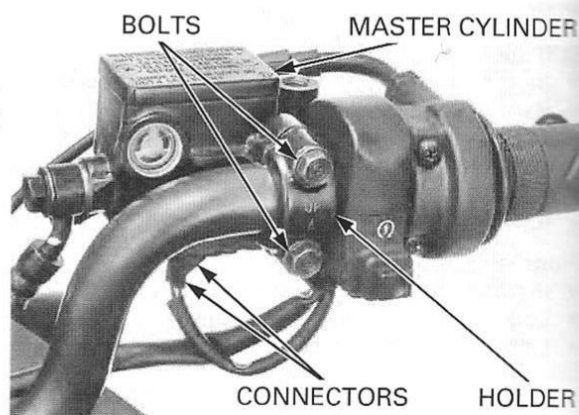
Remove the screws and handlebar ends.



Disconnect the brake light switch wire connectors.

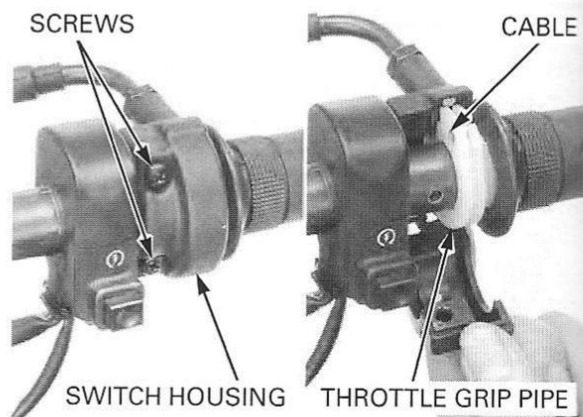
Remove the bolts, holder and master cylinder.

- Keep the master cylinder upright to prevent air from entering the hydraulic system. Do not twist the brake hose.



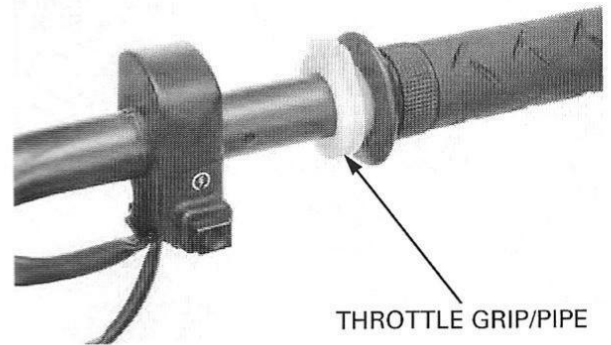
Remove the screws and separate the throttle housing.

Disconnect the throttle cable from the throttle grip pipe.

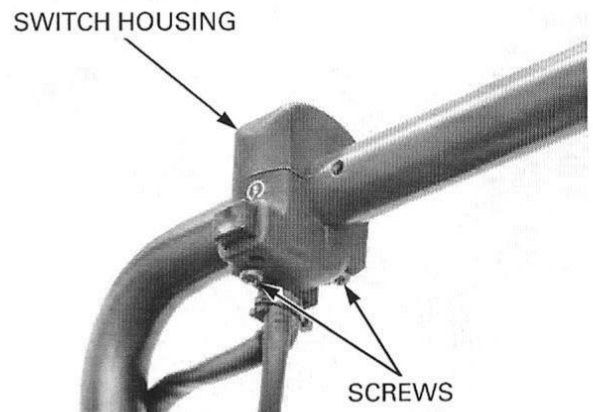


Remove the throttle grip/pipe from the handlebar.

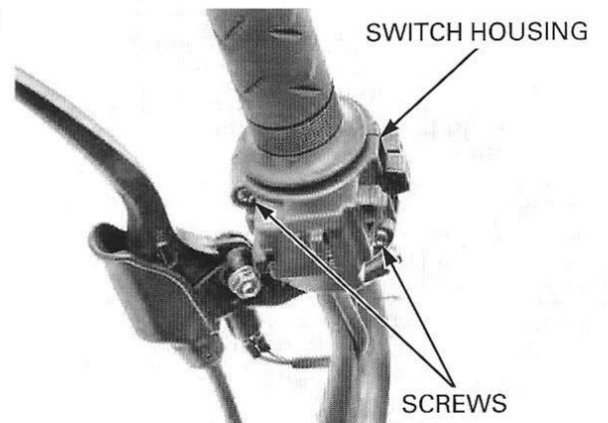
Remove the throttle grip from the throttle pipe if necessary.



Remove the screws and separate the right handlebar switch housing.

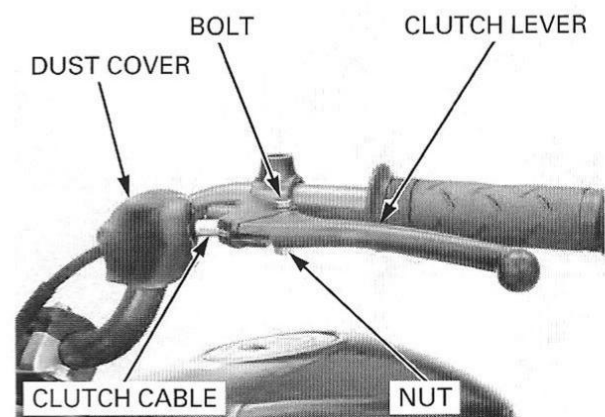


Remove the screws and separate the left handlebar switch housing.



Slide the dust cover out from the clutch lever.
Remove the nut, bolt and clutch lever.

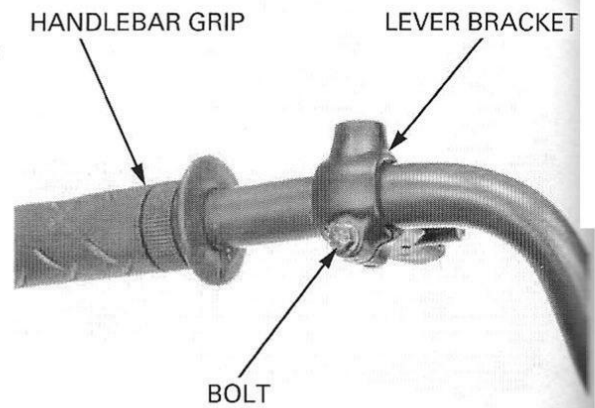
Disconnect the clutch cable from the clutch lever.



FRONT WHEEL/SUSPENSION/STEERING

Remove the handlebar grip.

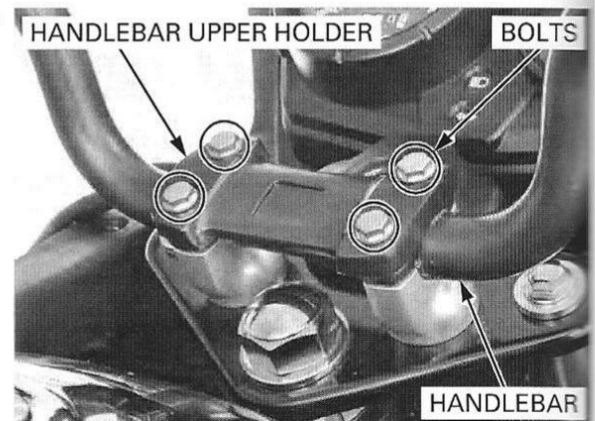
Loosen the clutch lever bracket bolt and slide the clutch lever bracket out from the handlebar.



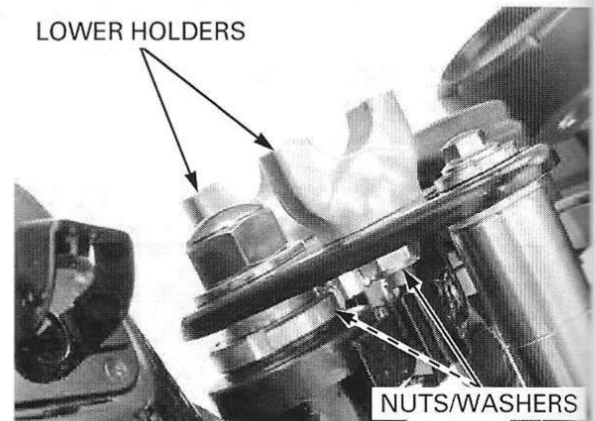
If removing the handlebar lower holders, loosen the handlebar lower holder nuts.



Remove the handlebar upper holder bolts, handlebar upper holder and handlebar.



Remove the nuts, washers and handlebar lower holders.

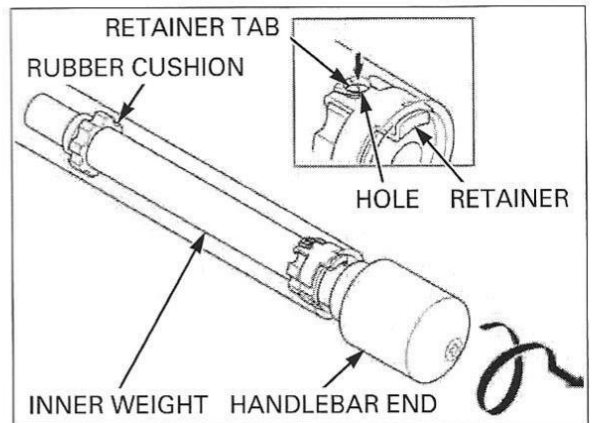


HANDLEBAR INNER WEIGHT REPLACEMENT

Push the retainer tab through the handlebar hole with a screwdriver or punch.

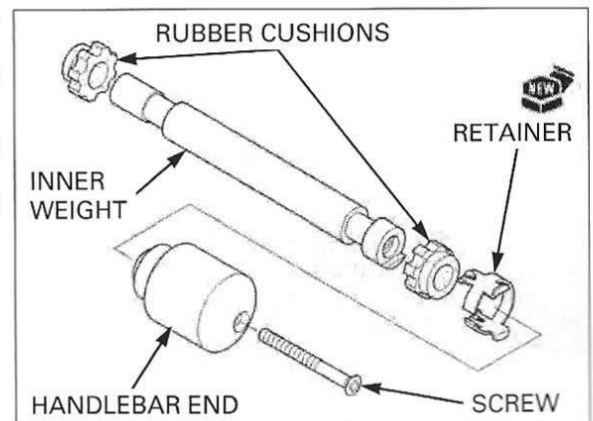
Apply lubricant spray through the handlebar hole to the rubber for easy removal.

Temporarily install the handlebar end and screw, then remove the inner weight assembly by turning the handlebar end.



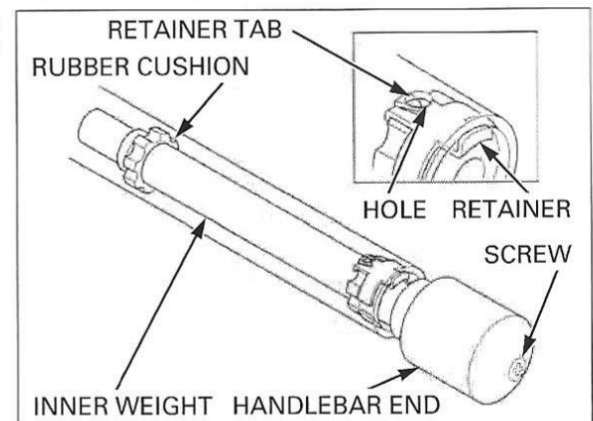
Remove the screw, handlebar end and rubber cushions from the inner weight. Check the condition of the rubber cushions, replace them if necessary.

Install the rubber cushions and a new retainer onto the inner weight. Install the handlebar end onto the inner weight aligning its boss with the groove each other. Install the handlebar end screw.



Insert the inner weight assembly into the handlebar. Turn the inner weight and hook the retainer tab with the hole in the handlebar.

Remove the screw and handlebar end.



INSTALLATION

GRIP REPLACEMENT

Install the clutch lever bracket to the left side handlebar.

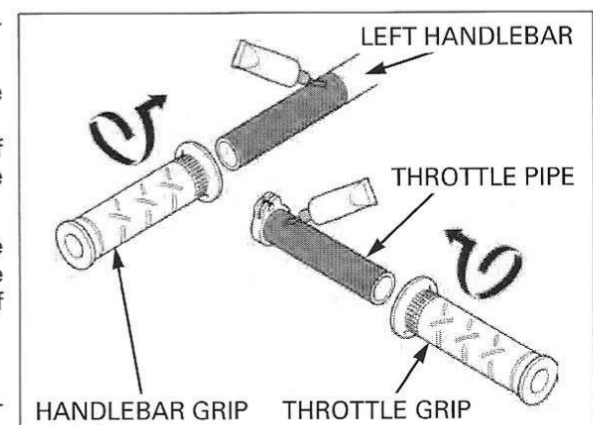
Clean the inside of the handlebar grip, outer surface of the left handlebar.

Apply Honda Bond A or equivalent to the inside of new handlebar grip and to the clean surface of the left handlebar.

When removing the throttle grip from the throttle pipe, apply Honda Bond A or equivalent to the inside of the throttle grip and to the clean surface of the throttle pipe.

Allow the adhesive to dry for an hour before using.

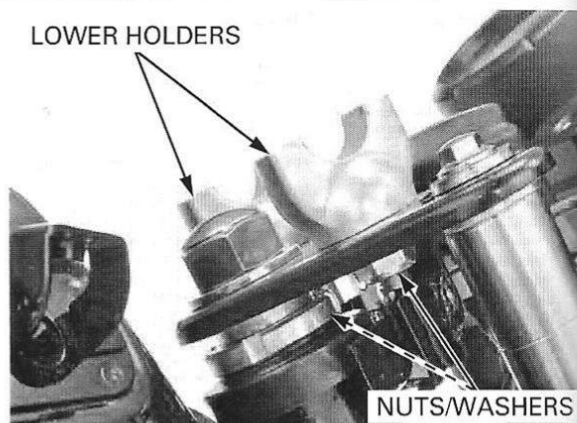
Wait 3 – 5 minutes and install the grips. Rotate the grips for even application of the adhesive.



FRONT WHEEL/SUSPENSION/STEERING

Install the handlebar lower holders, washer and nuts.

Temporarily tighten the nuts securely.



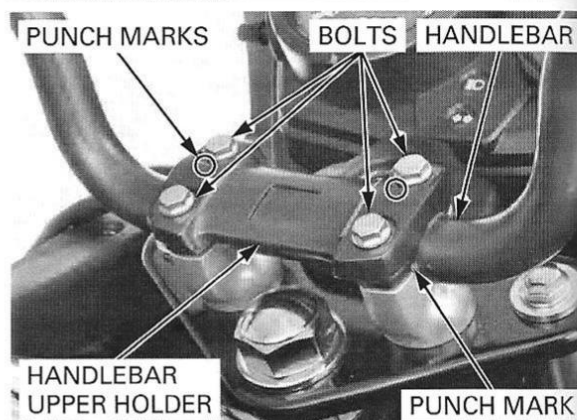
Place the handlebar onto the handlebar lower holders.

Place the handlebar upper holder with the punch marks facing forward and install the handlebar upper holder bolts.

Align the end of the handlebar lower holder with the punch mark on the handlebar.

Tighten the front bolts first, then tighten the rear bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



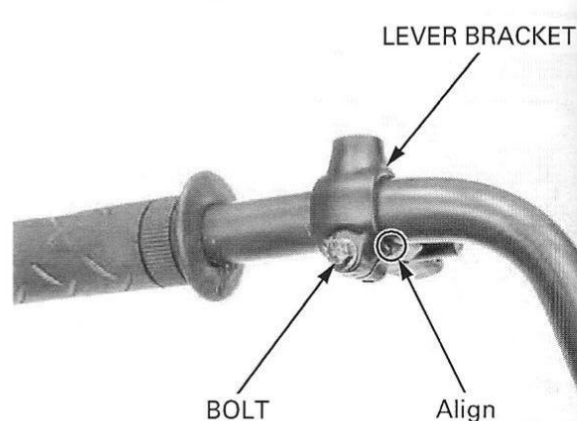
Tighten the handlebar lower holder nuts to the specified torque.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)



Align the end of the clutch lever bracket with the punch mark on the handlebar.

Tighten the clutch lever bracket bolt securely.



Connect the clutch cable to the clutch lever.

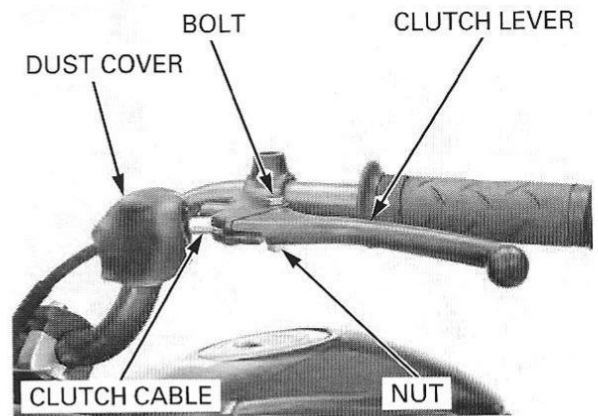
Install the clutch lever and bolt.
Tighten the bolt to the specified torque.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

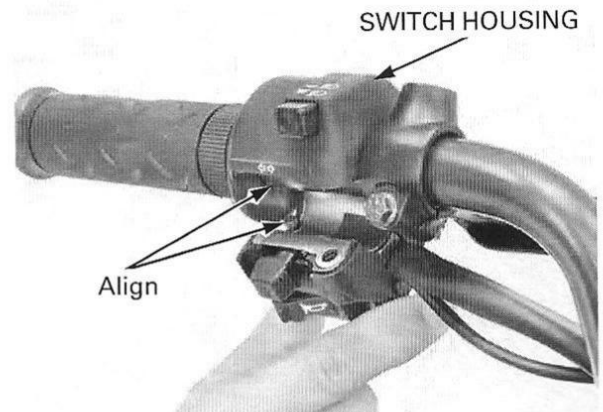
Install and tighten the nut to the specified torque while holding the bolt.

TORQUE: 5.9 N·m (0.6 kgf·m, 4.4 lbf·ft)

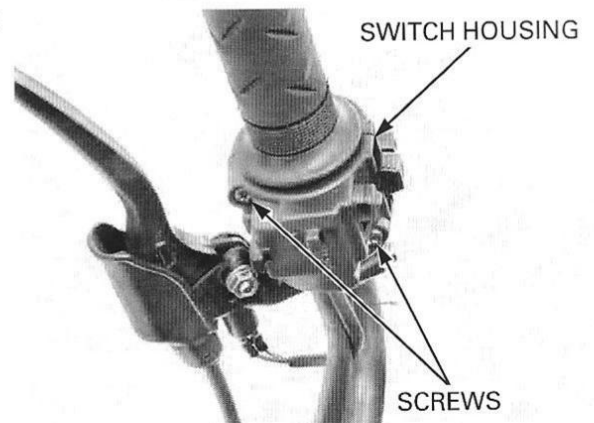
Set the dust cover to the clutch lever.



Install the left handlebar switch housing by aligning its locating pin with the hole on the handlebar.

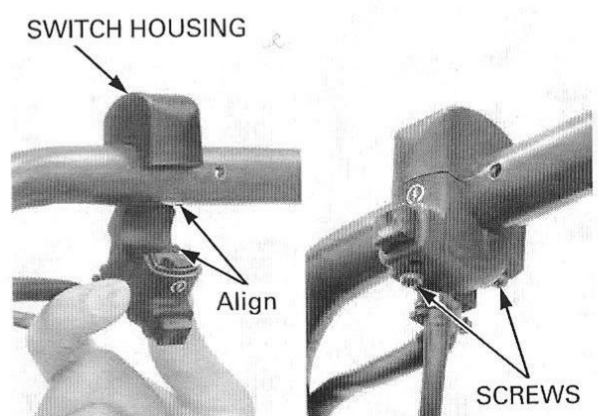


Install and tighten the front screw first, then tighten the rear screw.



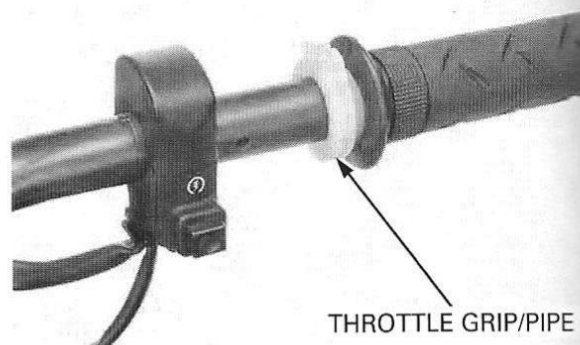
Install the right handlebar switch housing by aligning its locating pin with the hole on the handlebar.

Install and tighten the front screw first, then tighten the rear screw.



FRONT WHEEL/SUSPENSION/STEERING

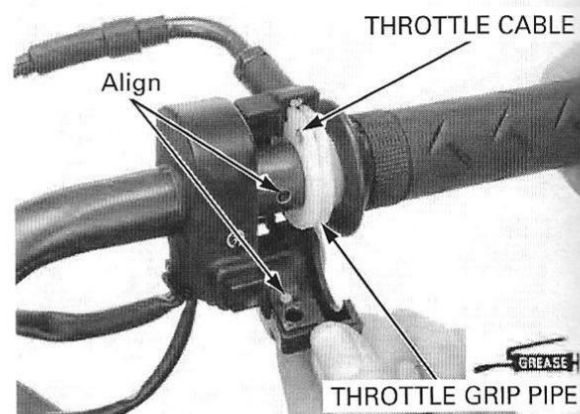
Install the throttle grip/pipe on the handlebar.



Apply grease to the throttle grip/pipe flange.

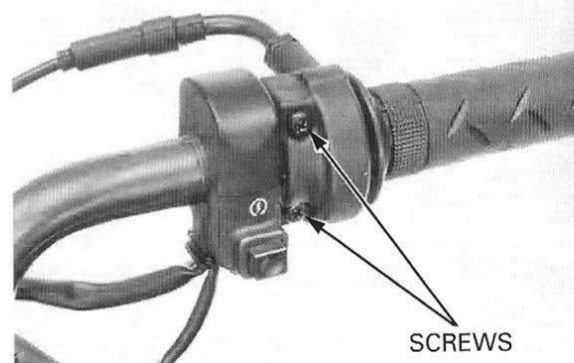
Connect the throttle cable end to the throttle grip pipe.

Install the throttle housing by aligning its locating pin with the hole on the handlebar.



Install the screws.

Tighten the upper screw first, then tighten the lower screw securely.



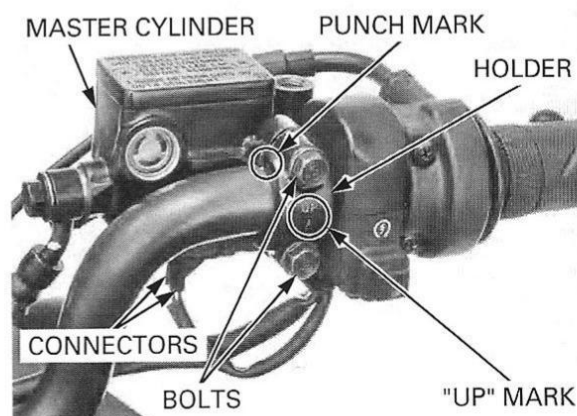
Place the master cylinder on the handlebar and set the master cylinder holder with its "UP" mark facing up, and loosely install the bolts.

Align the end of the master cylinder with the punch mark on the handlebar.

Tighten the upper bolt first, then tighten the lower bolt to the specified torque.

TORQUE: 9 N·m (0.9 kgf·m, 6.6 lbf·ft)

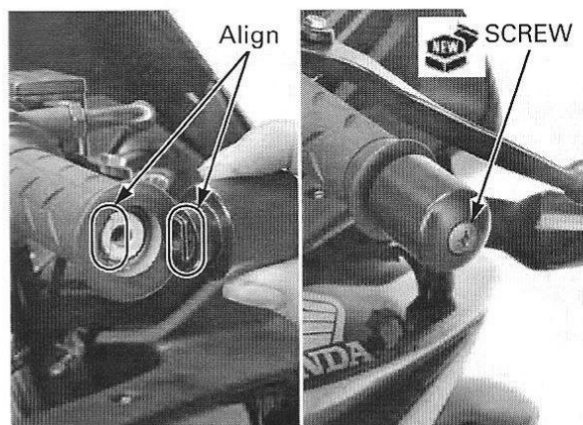
Connect the brake light switch connectors.



Install the handlebar end by aligning the cut-outs of the handlebar end and inner weight.

Install and tighten a new screw to the specified torque.

TORQUE: 9 N·m (0.9 kgf·m, 6.6 lbf·ft)



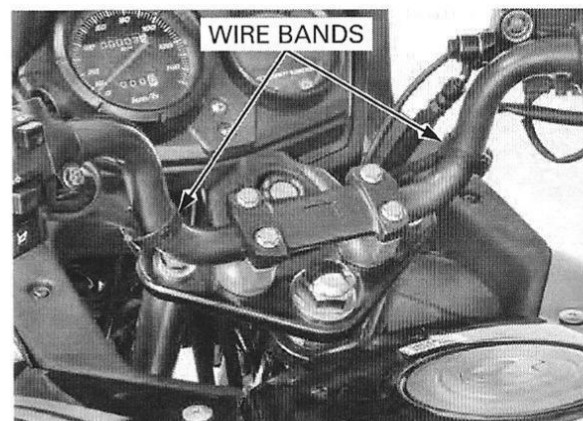
Install the wire bands.

- Route the wires and cables properly (page 1-16).

Install the rearview mirror (page 2-19).

Check the following:

- Throttle grip freeplay (page 3-5)
- Clutch lever freeplay (page 3-23)



FRONT WHEEL

REMOVAL

Loosen the axle nut.

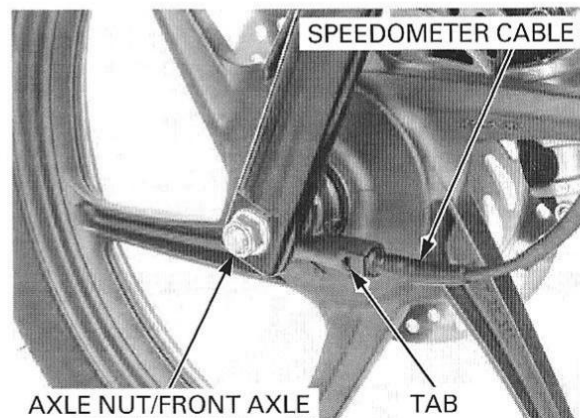
Support the motorcycle on its center stand and raise the front wheel off the ground.

Push the caliper pistons all the way in by pushing the caliper body inward to allow installation of the front wheel.

Disconnect the speedometer cable by pushing the cable tab.

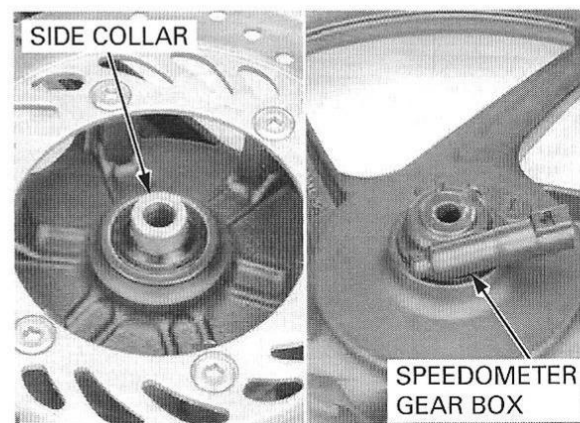
Remove the axle nut, front axle and front wheel.

Do not operate the front brake lever after removing the front wheel.



Remove the right side collar.

Remove the speedometer gear box.



INSPECTION

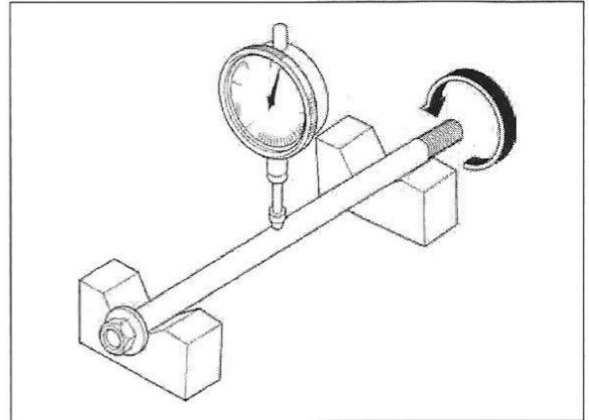
AXLE

Place the axle on V-blocks.

Turn the axle and measure the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

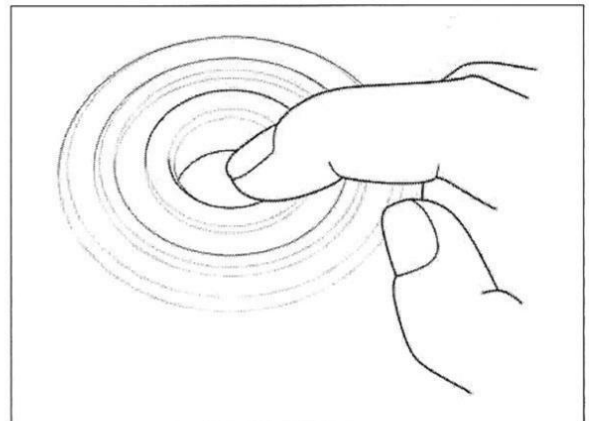
SERVICE LIMIT: 0.2 mm (0.01 in)



WHEEL BEARING

Turn the inner race of each bearing with your finger. The bearing should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

Remove the bearings if the inner race does not turn smoothly, quietly, or if the outer race fits loosely in the hub.



WHEEL RIM

Check the wheel rim runout by placing the wheel in a truing stand.

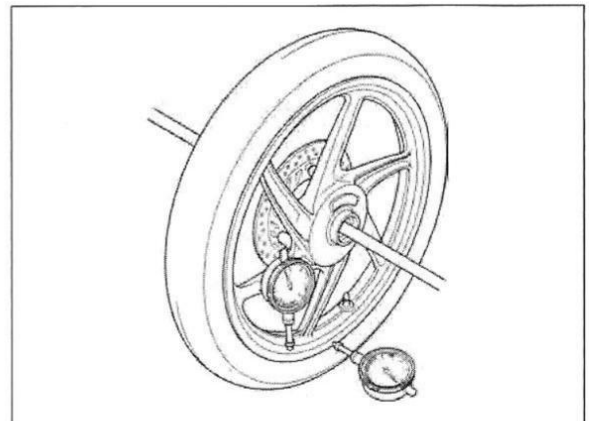
Turn the wheel slowly and read the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

SERVICE LIMITS:

Axial: 1.0 mm (0.04 in)

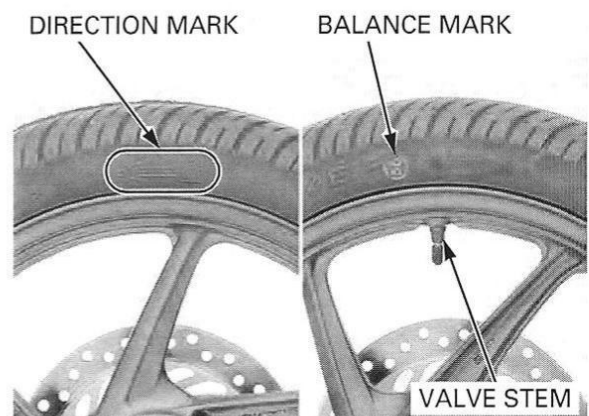
Radial: 1.0 mm (0.04 in)



TIRE

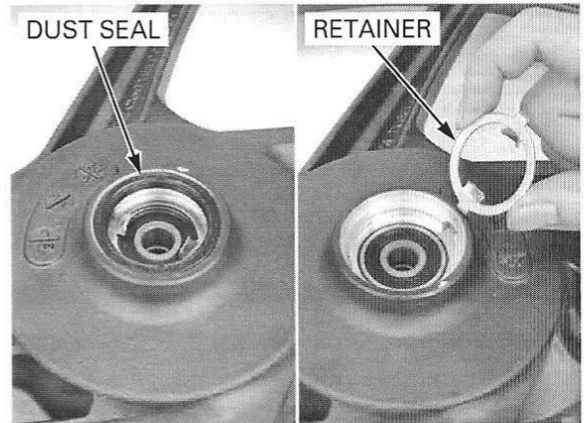
Note the rotating direction mark on the wheel and tire.

When installing the tire align the balance mark on the tire with the valve stem of the wheel rim within 50 mm (2.0 in).



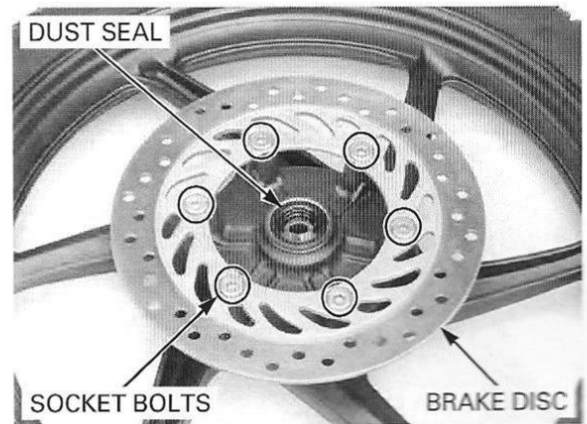
DISASSEMBLY

Remove the dust seal, then remove the speedometer gear retainer from the left wheel hub.



Remove the dust seal from the right wheel hub.

Loosen the brake disc socket bolts in a crisscross pattern in several steps, and remove them and brake disc.



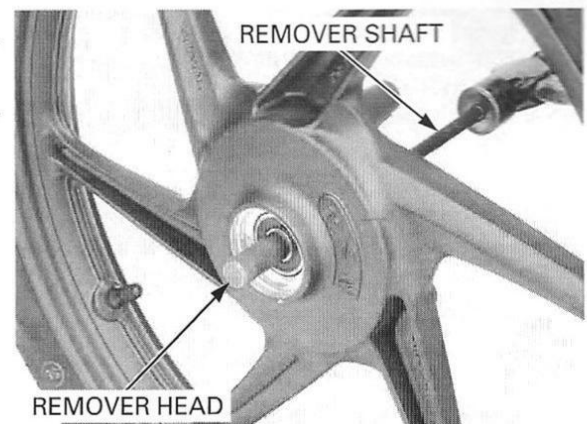
WHEEL BEARING REPLACEMENT

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:

Bearing remover head, 12 mm 07746-0050300
Bearing remover shaft 07746-0050100



Never install the old bearing, once the bearing has been removed, the bearing must be replaced with new ones.

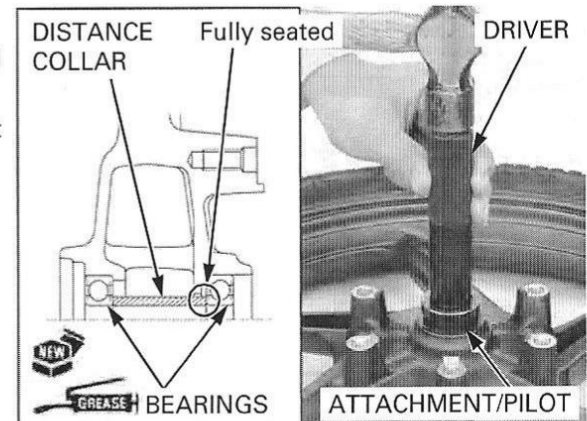
Pack all bearing cavities with grease.

Drive in a new right bearing squarely with its sealed side facing up until it is fully seated.

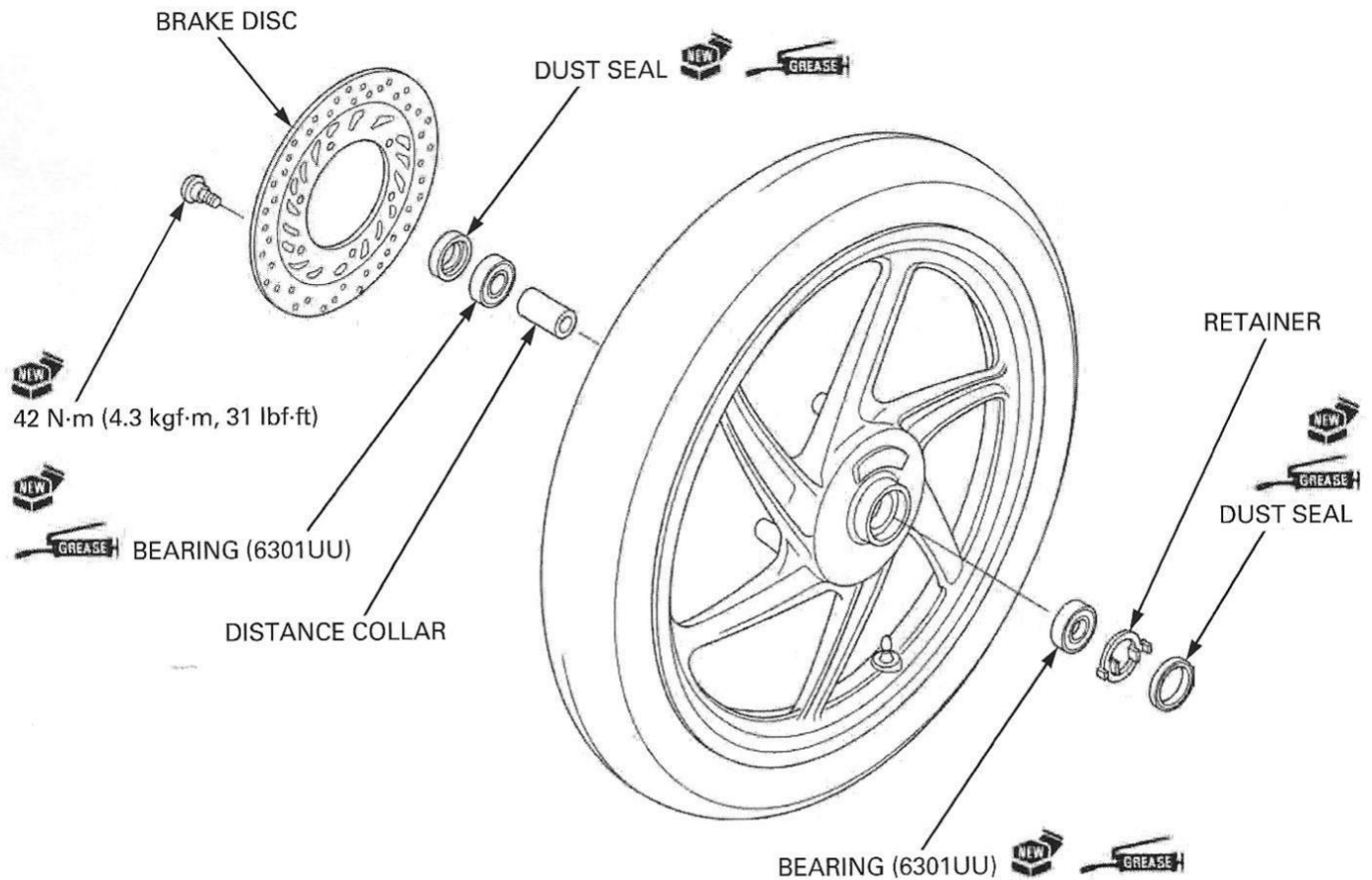
Install the distance collar, then drive in a new left bearing squarely with its sealed side facing up.

TOOLS:

Driver 07749-0010000
Attachment, 37 x 40 mm 07746-0010200
Pilot, 12 mm 07746-0040200



ASSEMBLY



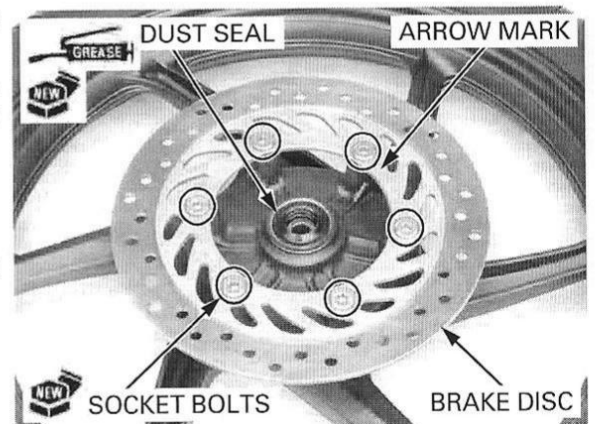
Do not get grease on the brake disc or stopping power will be reduced.

Install the brake disc onto the brake hub with the arrow mark facing out.

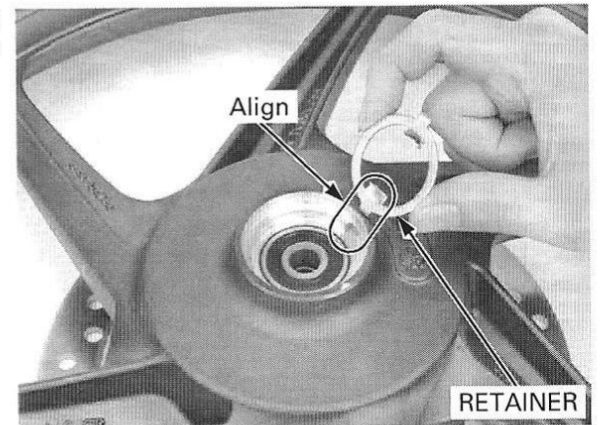
Install and tighten new brake disc socket bolts to the specified torque in a crisscross pattern in several steps.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

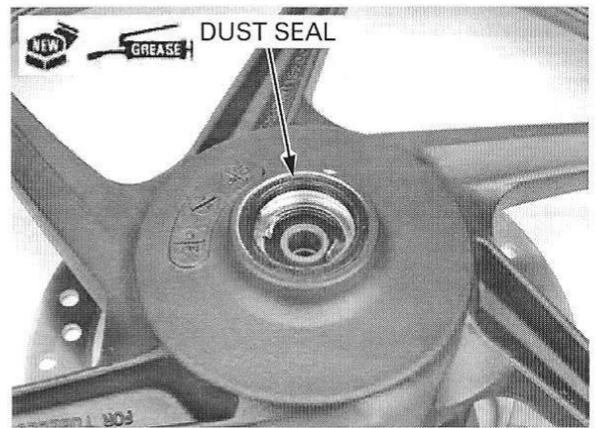
Apply grease to a new right dust seal lips. Install the dust seal until it is flush with the right wheel hub surface.



Install the speedometer gear retainer to the left wheel hub by aligning its tabs with the slots on the hub.



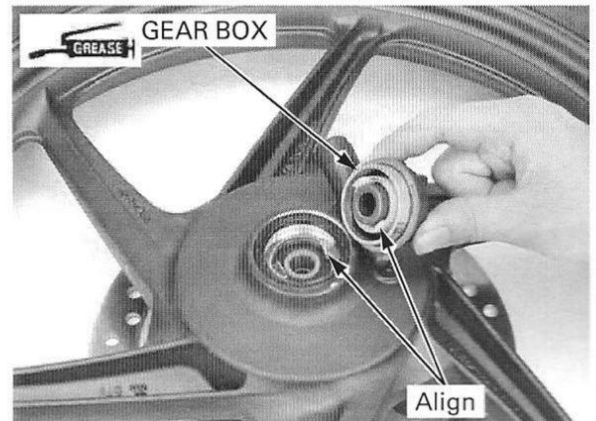
Apply grease to a new left dust seal lips.
Install the dust seal until it is fully seated with the left wheel hub.



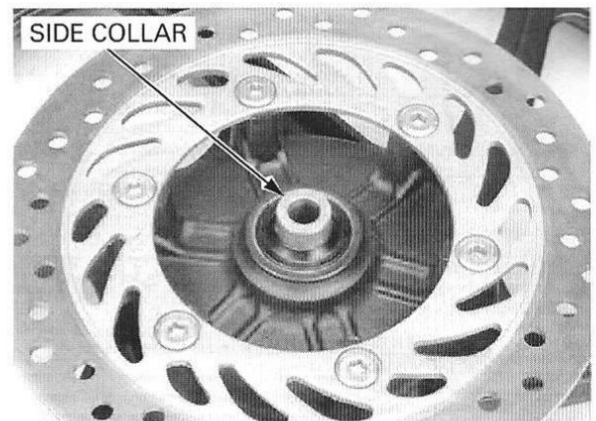
INSTALLATION

Apply grease to the speedometer gear box inside area and retainer tabs.

Install the speedometer gear box onto the left wheel hub by aligning its retainer tabs with the slots on the hub.



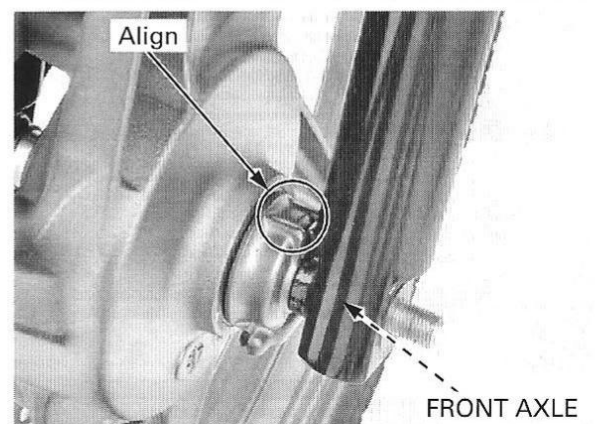
Install the side collar onto the right wheel hub.



Be careful not to damage the pads.

Install the front wheel between the fork legs by aligning the speedometer gear box groove with the boss of the left fork leg so that the brake disc is positioned between the pads.

Install the front axle from right side.



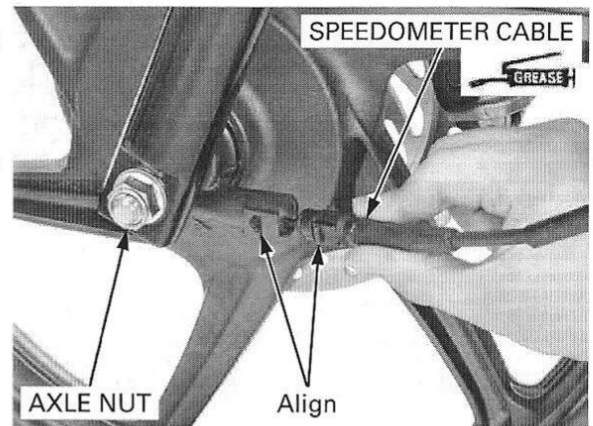
FRONT WHEEL/SUSPENSION/STEERING

Apply grease to the speedometer pinion gear teeth. Install and tighten the axle nut to the specified torque.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

Connect the speedometer cable by aligning its tab with the groove of the speedometer gear box.

Check the brake operation.



FORK

REMOVAL

Do not twist the brake hose.

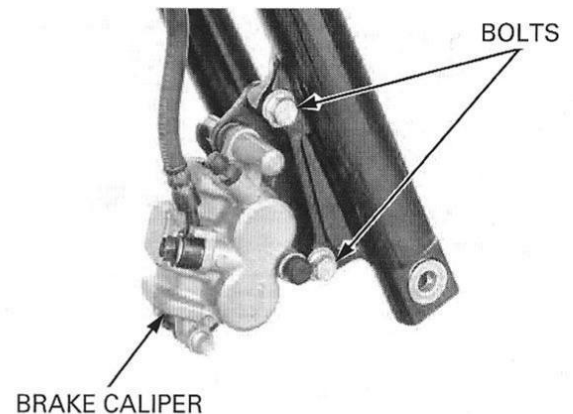
Remove the following:

- Front fender (page 2-9)
- Front wheel (page 12-13)

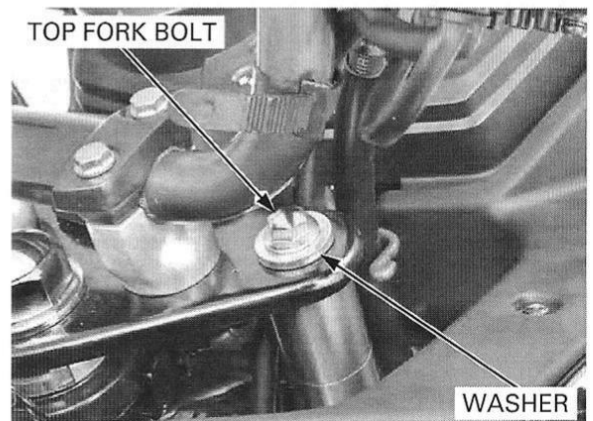
Remove the bolts and brake caliper with the hose connected.

Support the brake caliper with a piece of wire so that it does not hang from the brake hose.

- Do not operate the brake lever after removing the brake caliper.



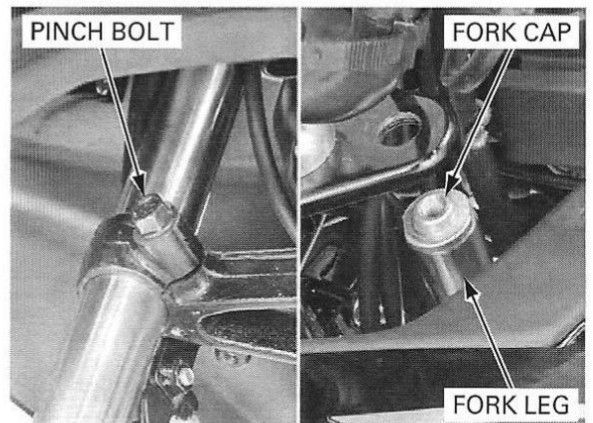
Remove the top fork bolt and washer.



Loosen the bottom bridge pinch bolts and lower the fork leg.

If the fork will be disassembled, temporarily tighten the bottom bridge pinch bolts and loosen the fork cap.

Loosen the bottom bridge pinch bolts and remove the fork legs.

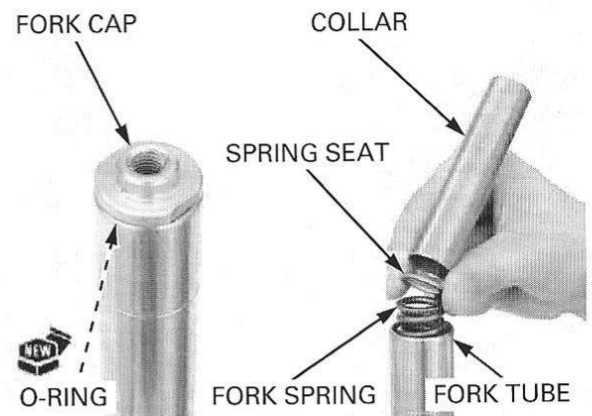


DISASSEMBLY

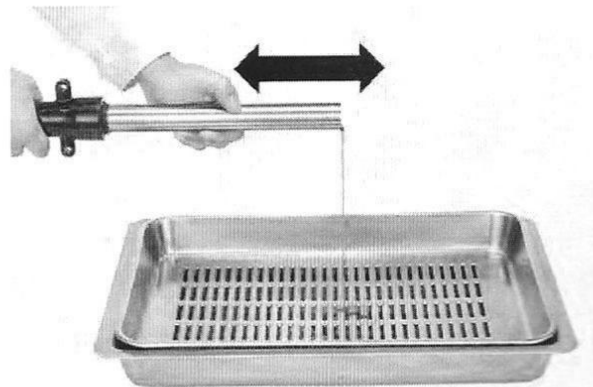
The fork cap is under spring pressure; use care when loosening it.

Remove the fork cap and O-ring.

Remove the collar, spring seat and fork spring from the fork tube.



Pour out the fork fluid by pumping the fork tube several times.



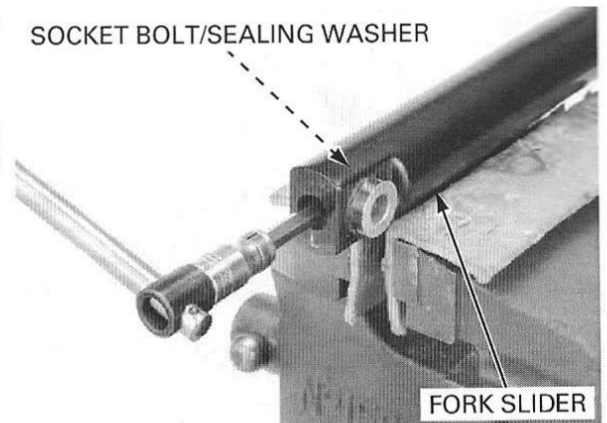
Do not over-tighten the vise on the fork slider.

Hold the fork slider in a vise with soft jaws or a shop towel.

Remove the fork socket bolt and sealing washer.

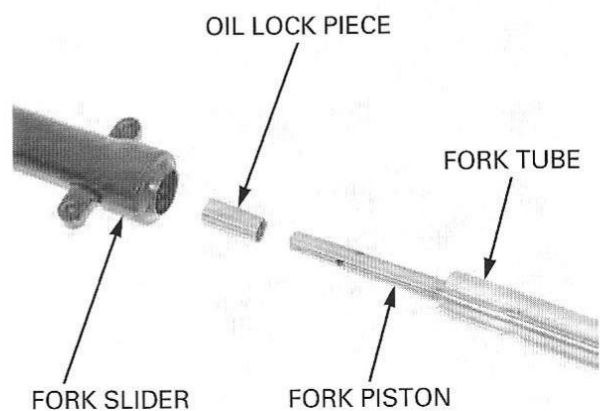
- If the fork piston turns together with the socket bolt, temporarily install the fork spring, spring seat, collar and fork cap.

SOCKET BOLT/SEALING WASHER



Remove the fork tube/fork piston from the fork slider.

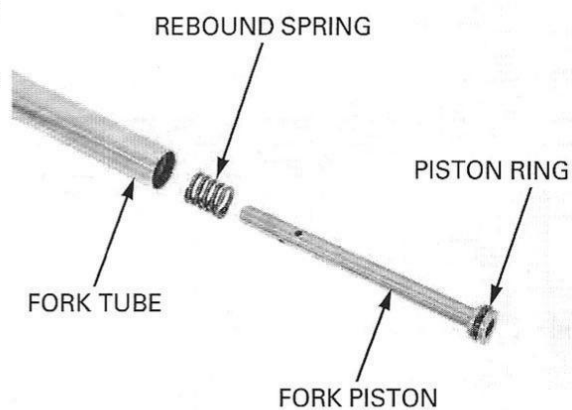
Remove the oil lock piece from the fork slider.



FRONT WHEEL/SUSPENSION/STEERING

Remove the fork piston and rebound spring from the fork tube.

- Do not remove the fork piston ring, unless it is necessary to replace with a new one.



Remove the dust seal.



Remove the oil seal stopper ring.



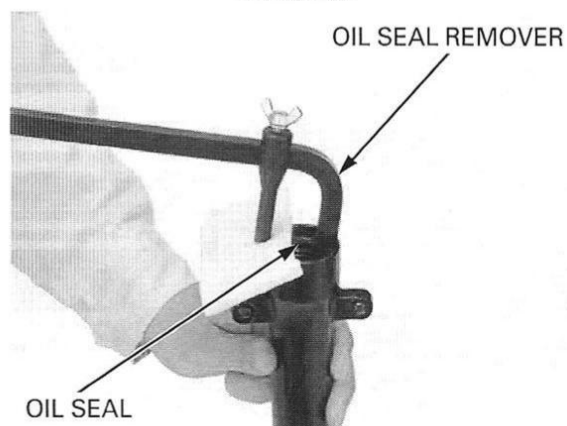
Be careful not to damage the fork slider.

Remove the oil seal using the special tool.

TOOL:

Oil seal remover

07748-0010001



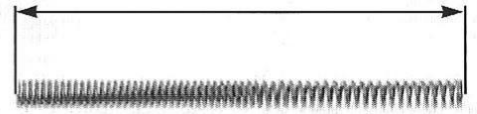
INSPECTION

FORK SPRING

Check the fork spring for fatigue or damage.

Measure the fork spring free length.

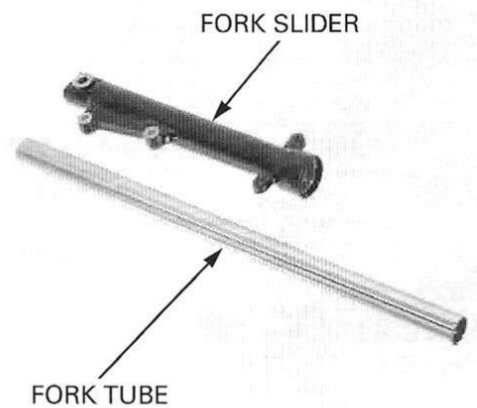
STANDARD: 372.7 mm (14.67 in)



FORK TUBE/SLIDER/PISTON/REBOUND SPRING

Check the fork tube and slider for score marks, excessive or abnormal wear.

Replace any damaged component if necessary.

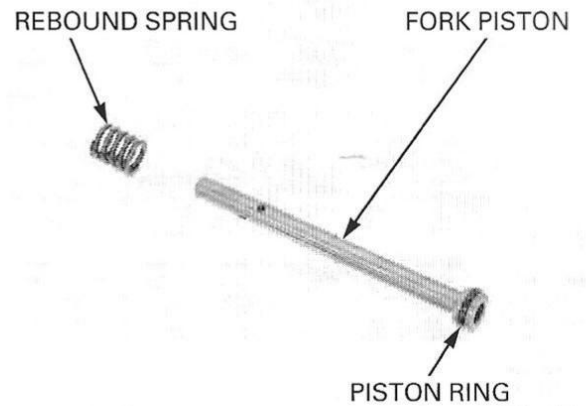


Check the fork piston for score marks, excessive or abnormal wear.

Check the fork piston ring for wear or damage.

Check the rebound spring for fatigue or damage.

Replace any damaged component if necessary.

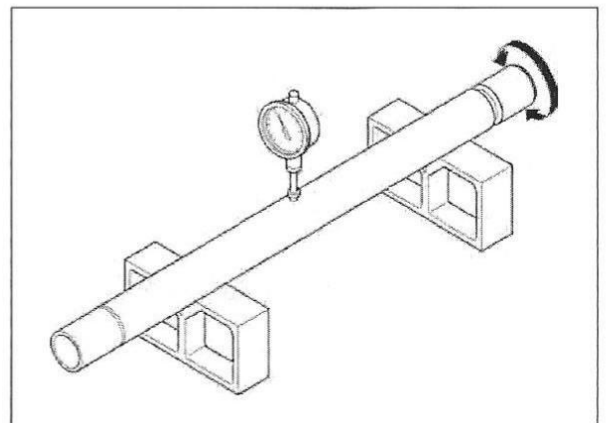


Place the fork tube on V-blocks.

Turn the fork tube and measure the runout using a dial indicator.

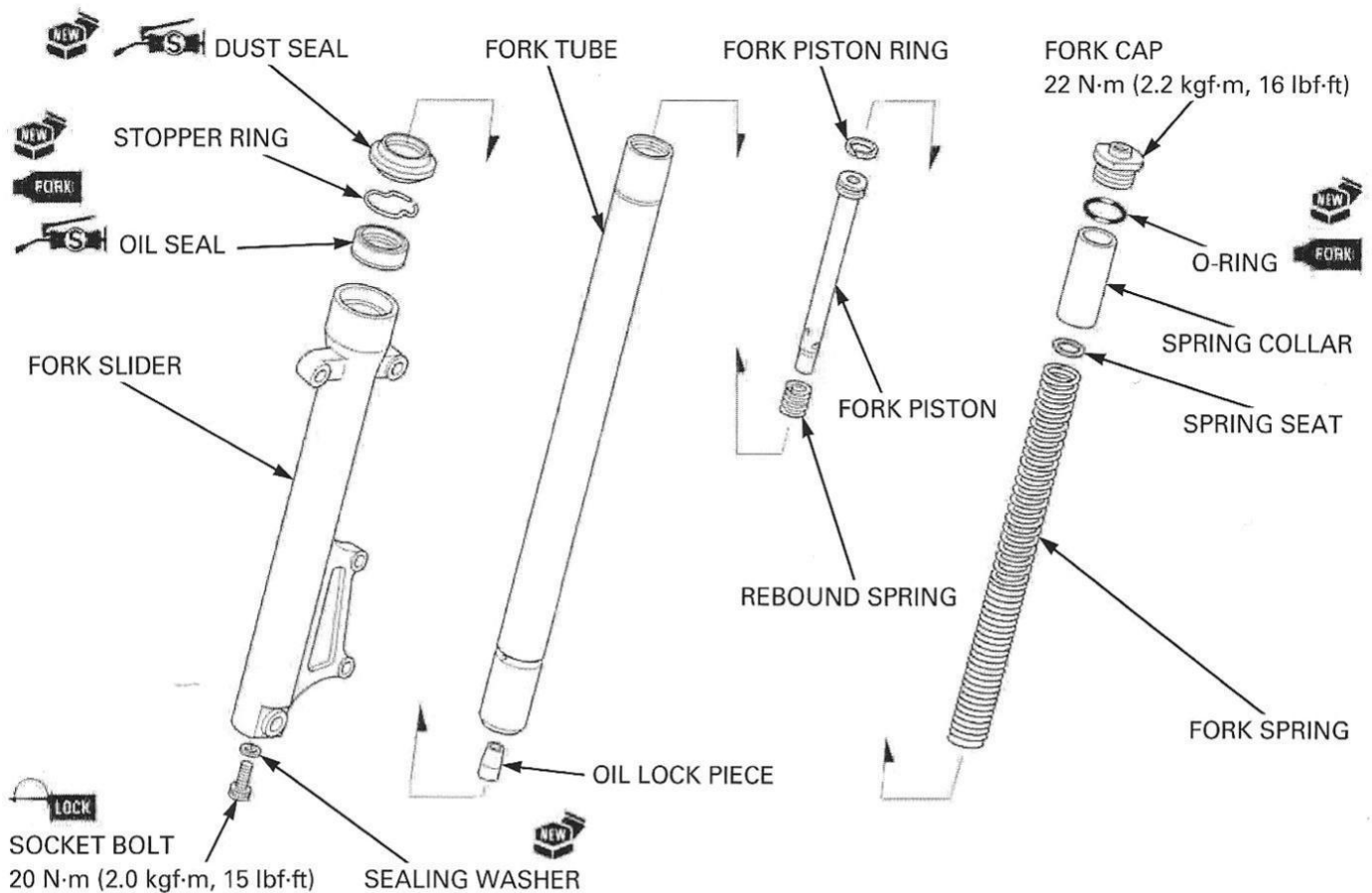
Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)



FRONT WHEEL/SUSPENSION/STEERING

ASSEMBLY



Apply silicone grease to a new oil seal lips and apply fork fluid to the oil seal outer surface.

Install the oil seal with its marked side facing up.

Drive the oil seal into the fork slider until the stopper ring groove is visible, using the special tools.

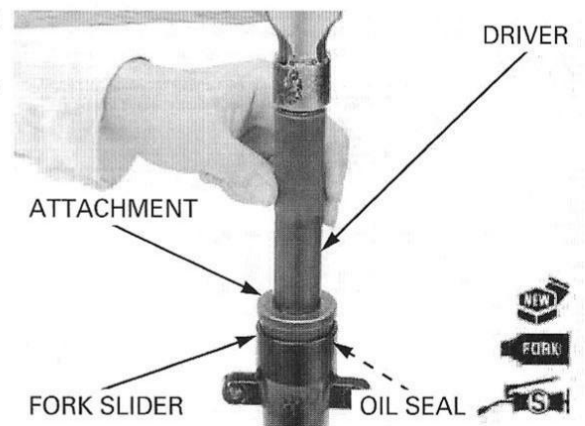
TOOLS:

Driver

07749-0010000

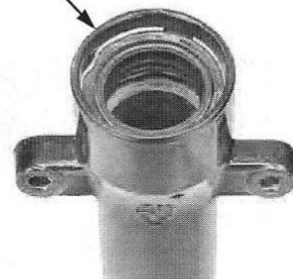
Attachment, 42 x 47 mm

07746-0010300

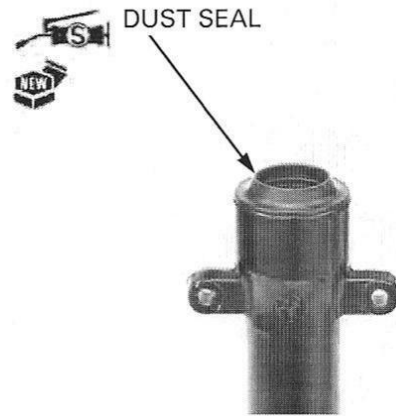


Install the oil seal stopper ring into the groove of the fork slider securely.

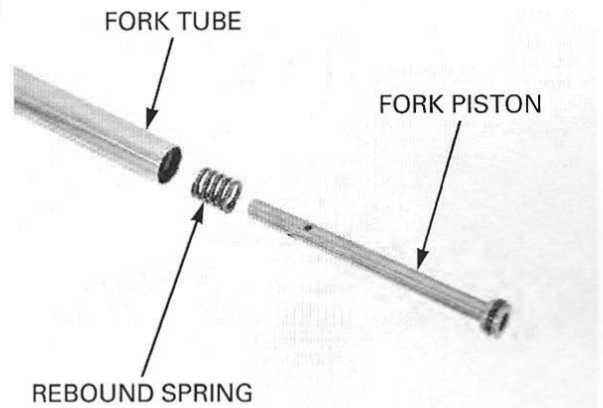
STOPPER RING



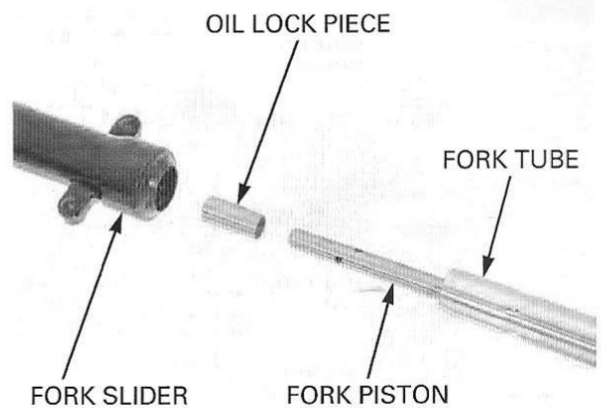
Apply silicone grease to a new dust seal lips and install it to the fork slider.



Install the rebound spring onto the fork piston, then install them into the fork tube.



Install the oil lock piece to the fork piston end, then install the fork tube into the fork slider.

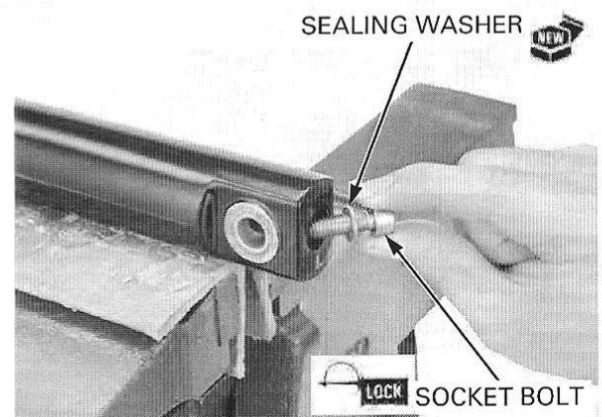


Do not over-tighten the vise on the fork slider.

Hold the fork slider in a vise with piece of woods or a shop towel.

Install a new sealing washer onto the socket bolt.

Apply locking agent to the fork socket bolt threads, and install it.



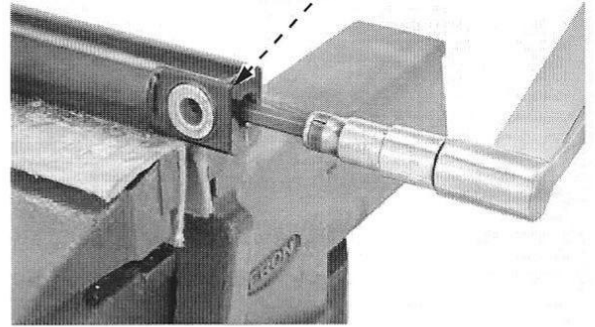
FRONT WHEEL/SUSPENSION/STEERING

If the fork piston turns together with the socket bolt, temporarily install the fork spring, spring seat, collar and fork cap.

Tighten the socket bolt to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

SOCKET BOLT



Pour the specified amount of recommended fork fluid into the fork tube.

RECOMMENDED FLUID:

Honda Ultra Cushion Oil 10 W or equivalent

FORK FLUID CAPACITY:

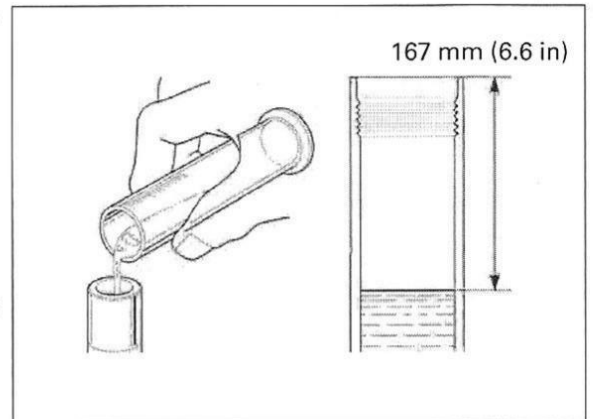
$146 \pm 2.5 \text{ cm}^3$ ($4.9 \pm 0.08 \text{ US oz}$, $5.1 \pm 0.09 \text{ Imp oz}$)

Pump the fork tube several times to remove trapped air from the lower portion of the fork tube.

Be sure the oil level is the same in the both forks.

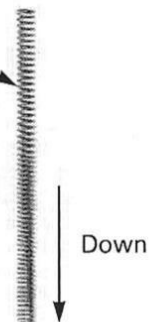
Compress the fork leg fully, and measure the fork fluid level from the top of the fork tube.

FORK FLUID LEVEL: 167 mm (6.6 in)



Pull the fork tube up and install the fork spring with its taper (tightly wound coil) side facing down.

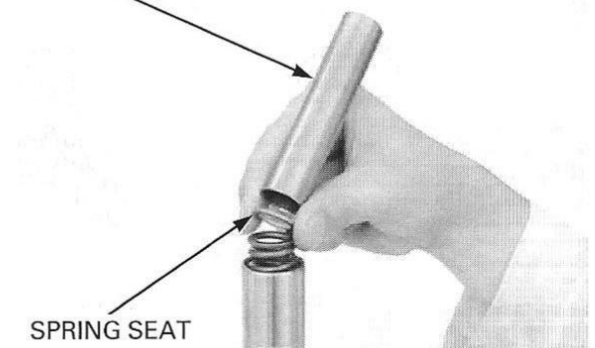
FORK SPRING



Install the spring seat and collar.

COLLAR

SPRING SEAT

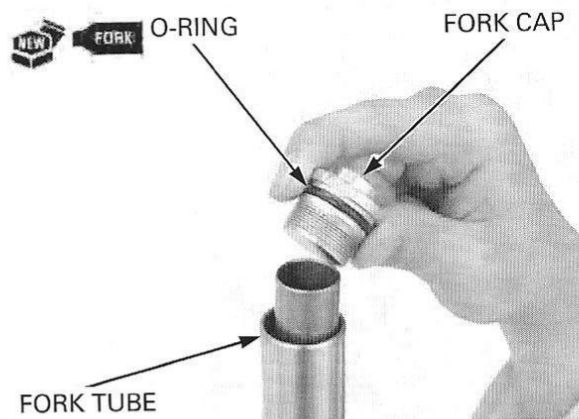


Apply fork fluid to a new O-ring and install it to the fork cap groove.

Be careful not to cross-thread the fork cap.

Install and tighten the fork cap while pushing it to the fork tube.

- Tighten the fork cap after installing the fork tube into the bottom bridge.

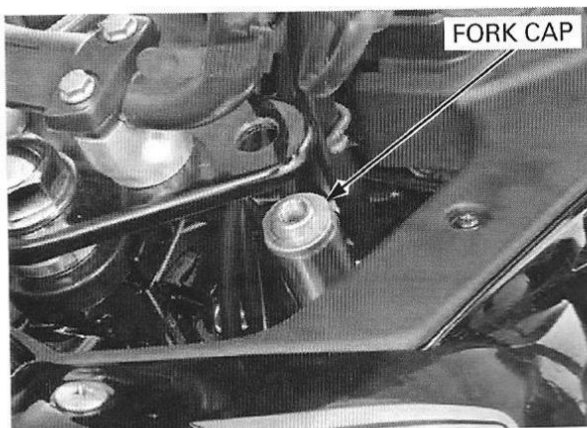


INSTALLATION

Install the fork leg through the bottom bridge, and temporarily tighten the bottom bridge pinch bolt.

Tighten the fork cap to the specified torque.

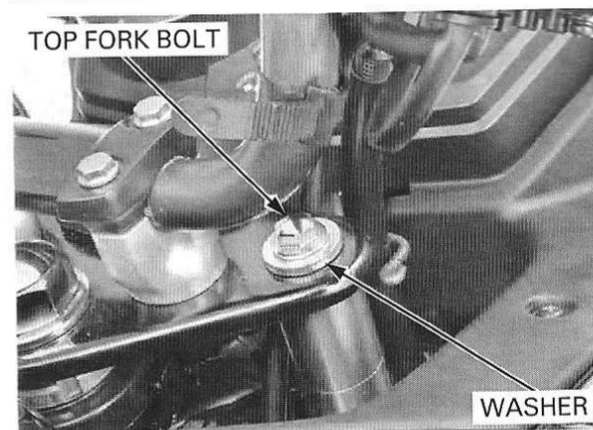
TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



Loosen the bottom pinch bolt and install the fork leg through the top bridge.

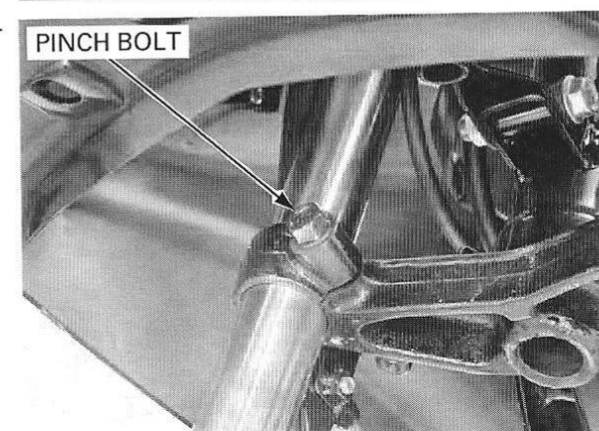
Install the washer and top fork bolt. Tighten the top fork bolt to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)



Tighten the bottom bridge pinch bolt to the specified torque.

TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)



FRONT WHEEL/SUSPENSION/STEERING

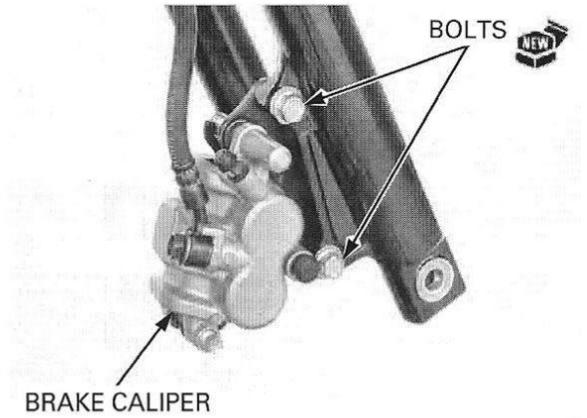
Install the brake caliper to the fork.

Install and tighten new brake caliper bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Install the following:

- Front fender (page 2-9)
- Front wheel (page 12-17)



STEERING STEM

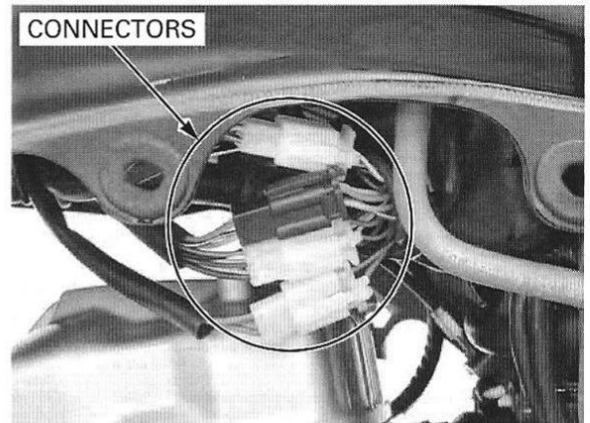
REMOVAL

Remove the following:

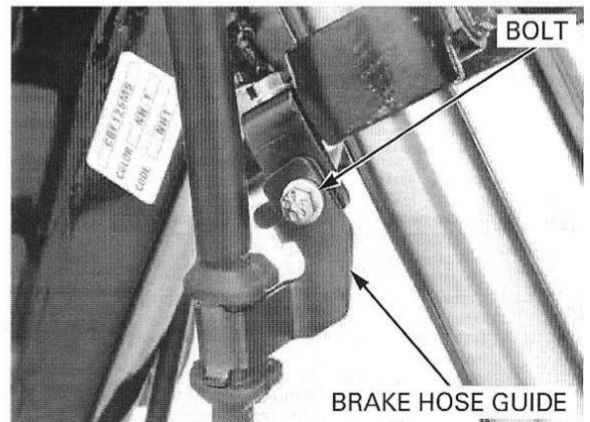
- Front cowl (page 2-5)
- Front fender (page 2-9)
- Front wheel (page 12-13)
- Handlebar (page 12-6)

Disconnect the following:

- Handlebar switch 4P (Black) connector
- Handlebar switch 4P (Natural) connector
- Handlebar switch 6P (Natural) connector
- Ignition switch 3P (Natural) connector



Remove the bolt and brake hose guide from the bottom bridge.

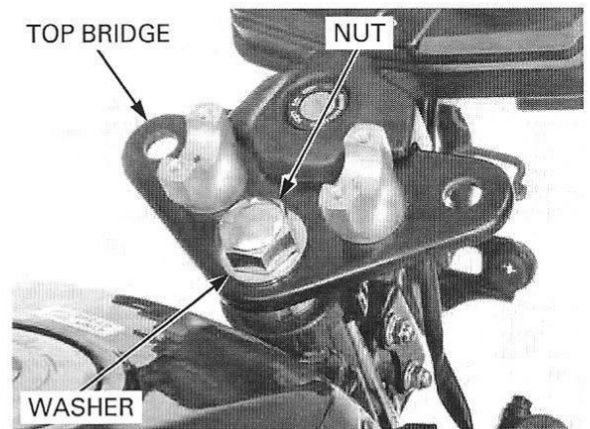


Loosen the steering stem nut.

Remove the fork legs (page 12-18).



Remove the steering stem nut, washer and top bridge.



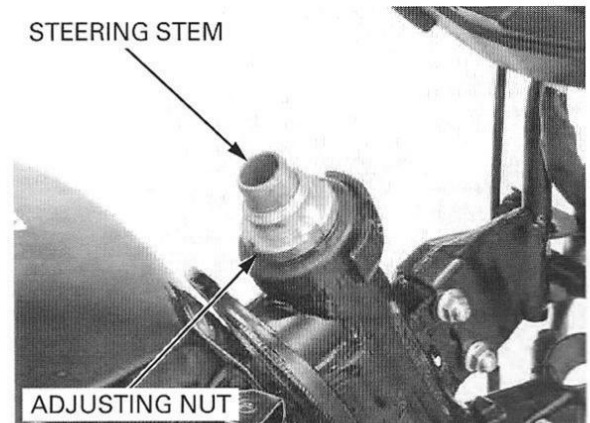
Loosen the steering bearing adjusting nut using the special tool.

TOOL:

Pin spanner

07702-0020001

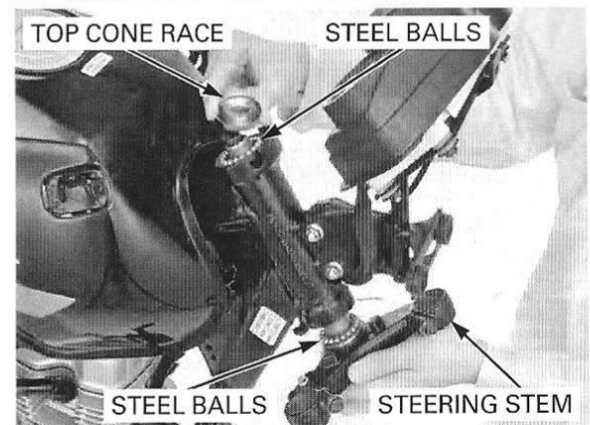
Hold the steering stem, and remove the steering bearing adjusting nut.



Be careful not to lose the steel balls.

Remove the top cone race and upper steel balls (18 pieces).

Remove the steering stem and lower steel balls (18 pieces).



BALL RACE REPLACEMENT

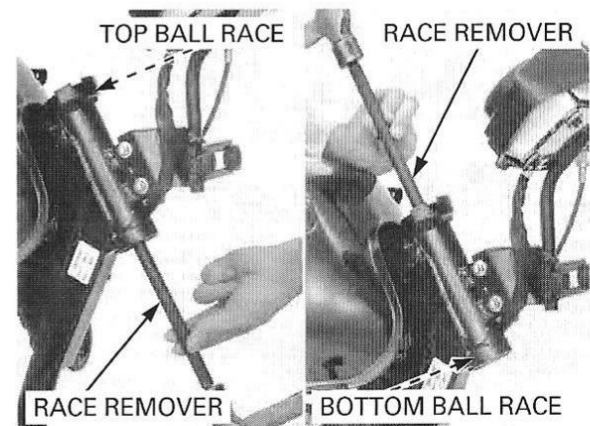
Replace the steel balls, outer race and inner race as a set.

Remove the ball races using the special tool.

TOOL:

Ball race remover

07GMD-KS40100

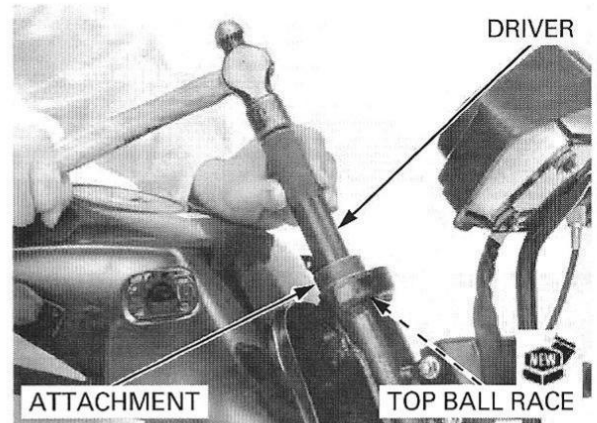


FRONT WHEEL/SUSPENSION/STEERING

Install a new top ball race using the special tools.

TOOLS:

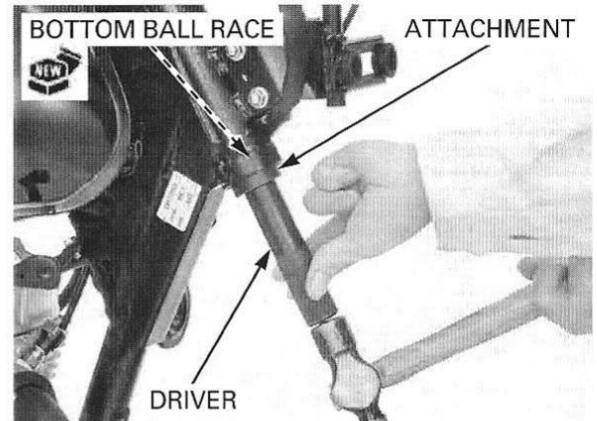
Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300



Install a new bottom ball race using the special tools.

TOOLS:

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300



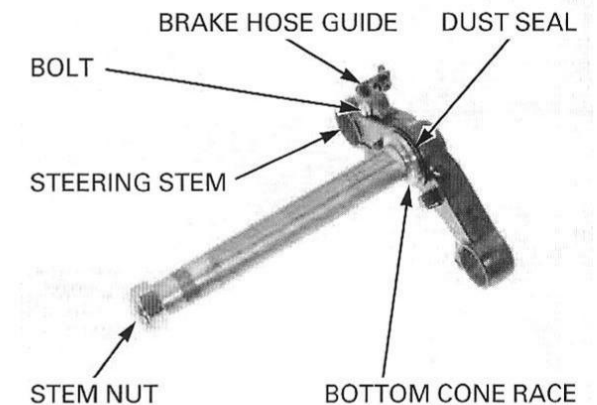
BOTTOM CONE RACE REPLACEMENT

Avoid damaging the steering stem thread, temporarily install the steering stem nut.

Remove the bolt and brake hose guide.

Remove the bottom cone race with a chisel or equivalent tool, being careful not to damage the stem.

Remove the dust seal.

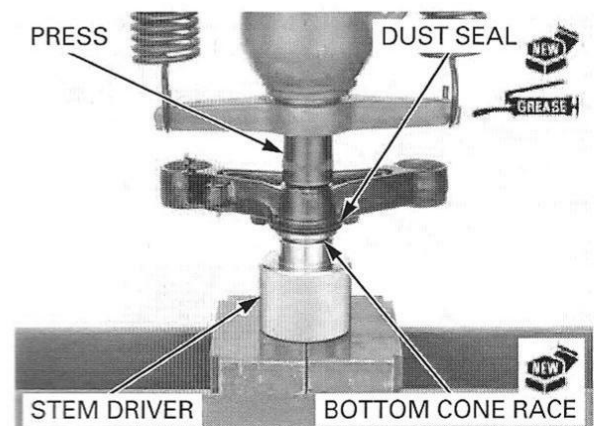


Apply specified grease (page 1-15) to a new dust seal lips and install it over the steering stem. Install a new steering bottom cone race to the steering stem using the special tool and a hydraulic press as shown.

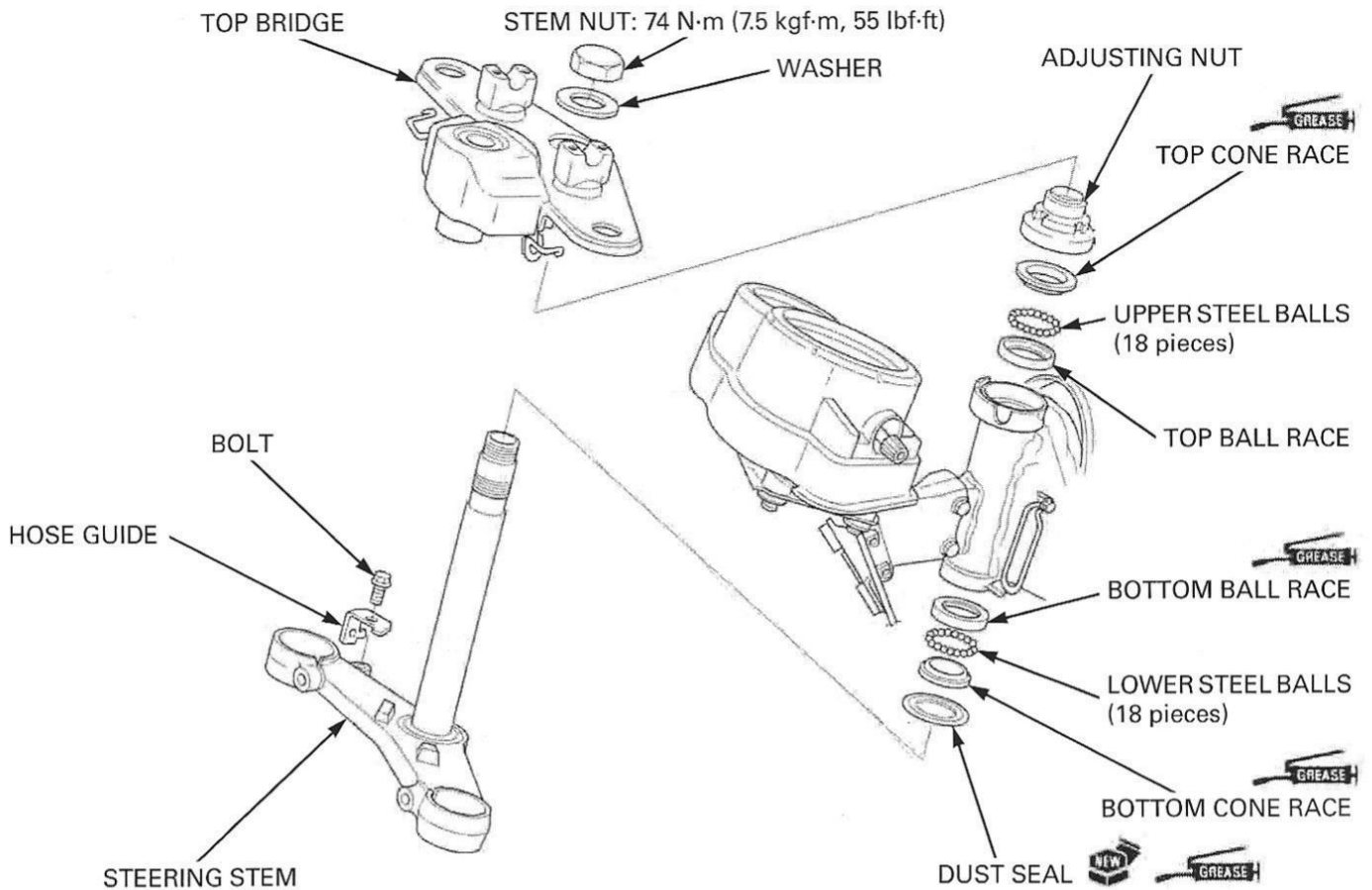
TOOL:

Steering stem driver	07947-1180001
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Install the brake hose guide and bolt, tighten the bolt securely.



INSTALLATION



Apply specified grease (page 1-15) to the steering cone races and steering ball races.

Install the steel balls (18 pieces) onto the bottom cone race.

Insert the steering stem into the steering head pipe, being careful not to drop the steel balls.

Install the steel balls (18 pieces) onto the top ball race.

Install the top cone race.

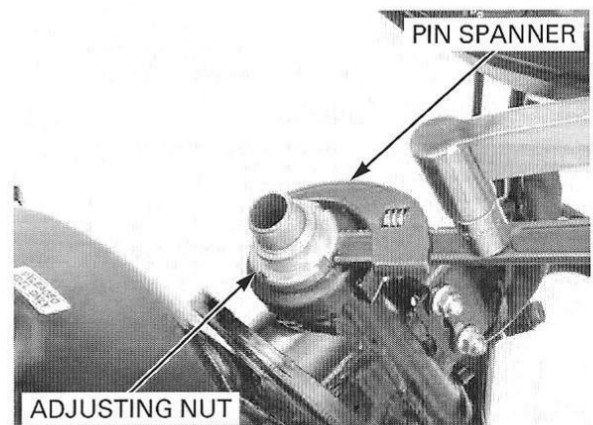
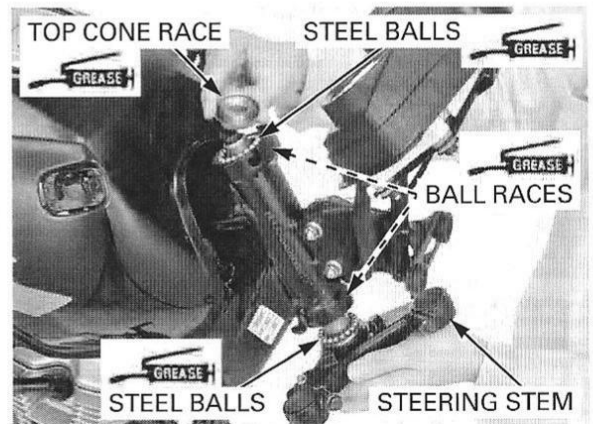
Install the steering bearing adjusting nut, and tighten it to the specified torque using the special tool.

TOOL:

Pin spanner

07702-0020001

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)

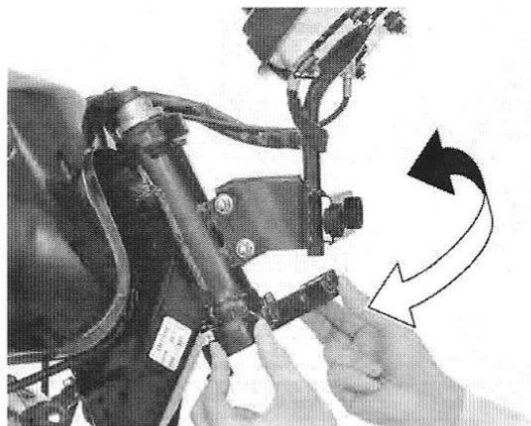


FRONT WHEEL/SUSPENSION/STEERING

Move the steering stem left and right, lock-to-lock, several times to seat the bearings.

Check that the steering stem moves smoothly, without play or binding.

Loosen the steering bearing adjusting nut to torque of 0 N·m (0 kgf·m, 0 lbf·ft).



Retighten the steering bearing adjusting nut to the specified torque using the special tool.

TOOL:

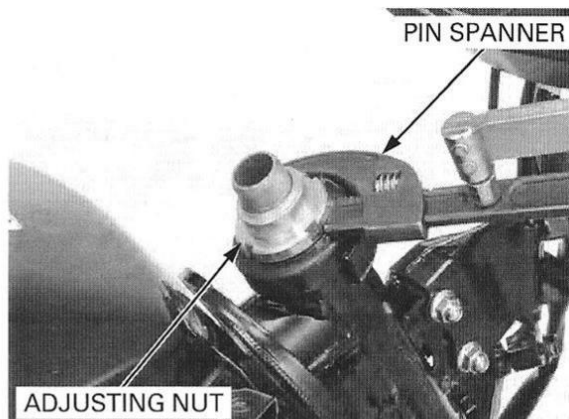
Pin spanner

07702-0020001

TORQUE:

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

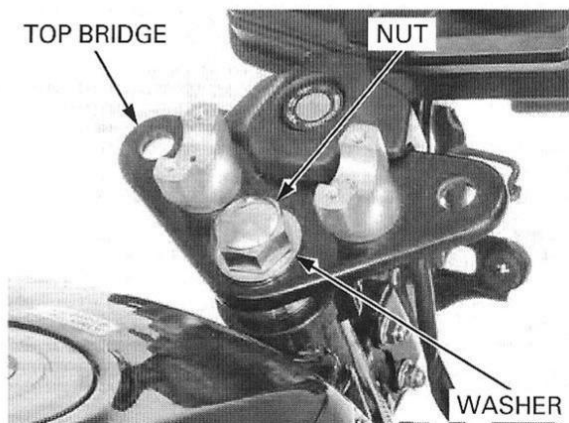
Indicated: 1.1 N·m (0.1 kgf·m, 0.8 lbf·ft)



Install the top bridge to the steering head.

Install the washer and steering stem nut.

Temporarily install the fork legs (page 12-25) but do not tighten the bottom bridge pinch bolts.

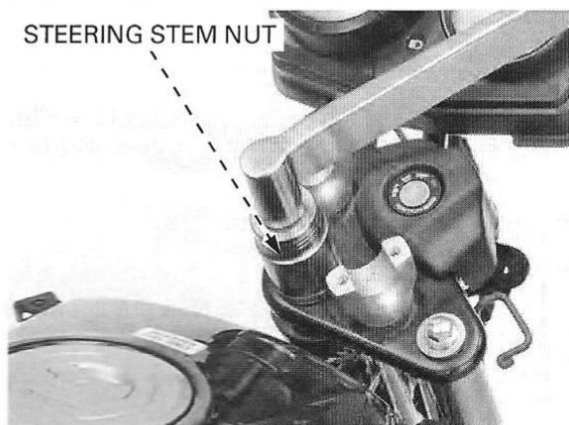


Tighten the steering stem nut to the specified torque.

TORQUE: 74 N·m (7.5 kgf·m, 55 lbf·ft)

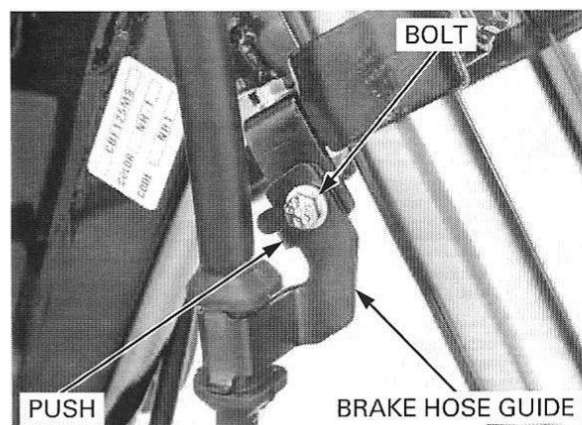
Move the steering stem right and left, lock-to-lock several times again.

Make sure that the steering stem moves smoothly, without play or binding.



Install the brake hose guide and push it against the guide stay of the bottom bridge.

Install and tighten the bolt securely.

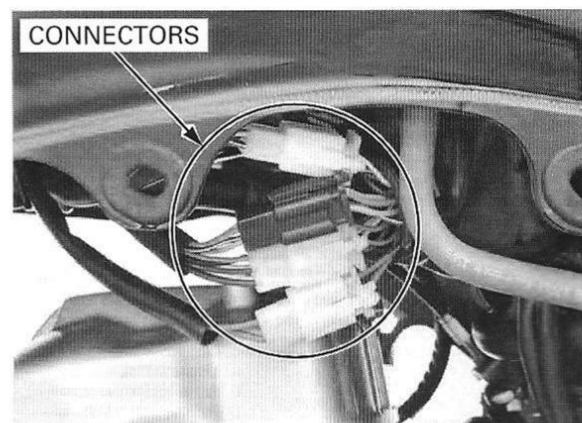


Connect the following:

- Handlebar switch 4P (Black) connector
- Handlebar switch 4P (Natural) connector
- Handlebar switch 6P (Natural) connector
- Ignition switch 3P (Natural) connector

Install the following:

- Fork legs (page 12-25)
- Front cowl (page 2-5)
- Front fender (page 2-9)
- Front wheel (page 12-17)
- Handlebar (page 12-9)



STEERING BEARING PRELOAD

Support the motorcycle on its center stand.
Raise the front wheel off the ground using a hoist or equivalent.
Position the steering stem to the straight ahead position.

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

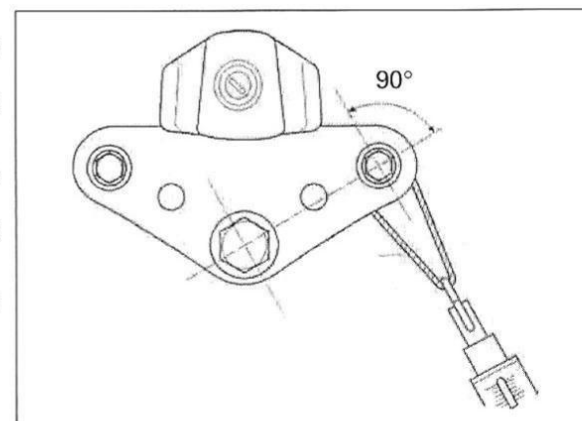
Hook a spring scale to the fork tube between the fork top and bottom bridges.
Pull the spring scale keeping the scale at a right angle to the steering stem.

Read the scale at the point where the steering stem just starts to move.

STEERING BEARING PRELOAD:

5.6 – 8.9 N (0.6 – 0.9 kgf)

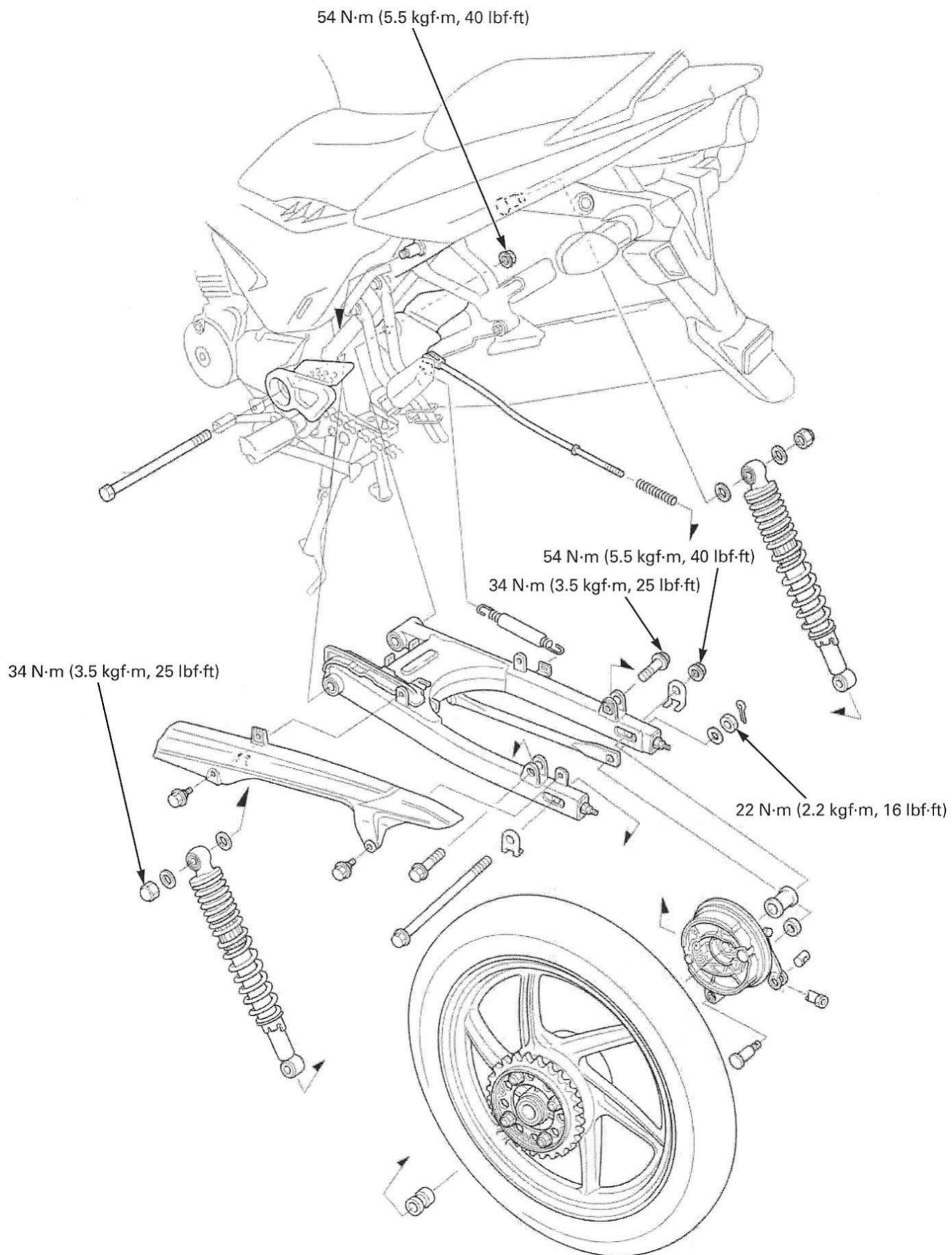
If the readings do not fall within the limits, lower the front wheel to the ground, and readjust the steering bearing adjusting nut.



13. REAR WHEEL/SUSPENSION

COMPONENT LOCATION	13-2	REAR WHEEL.....	13-6
SERVICE INFORMATION	13-3	SHOCK ABSORBER.....	13-13
TROUBLESHOOTING	13-5	SWINGARM.....	13-15

COMPONENT LOCATION



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.

- Riding on damaged rims impairs safe operation of the motorcycle.
- When servicing the rear wheel and suspension, support the motorcycle on its center stand.
- A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes, and clean a contaminated drum with a high quality brake degreasing agent.
- Keep grease off of the brake shoes and drum.
- Use only tires marked "TUBELESS" and tubeless valve stems on rims marked "FOR TUBELESS".
- Use genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.
- For brake system service (page 14-3).
- For brake light switch inspection (page 3-22).

SPECIFICATIONS

Unit: mm (in)

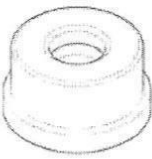
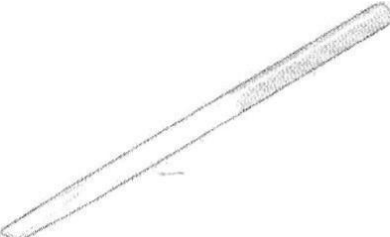
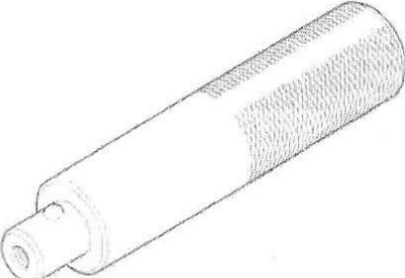
ITEM			STANDARD	SERVICE LIMIT
Minimum tire thread depth			—	2.0 (0.08)
Cold tire pressure	Driver only		200 kPa (2.00 kgf/cm ² , 29 psi)	—
	Driver and passenger		225 kPa (2.25 kgf/cm ² , 33 psi)	—
Axle runout			—	0.2 (0.01)
Wheel rim runout	Radial		—	1.0 (0.04)
	Axial		—	1.0 (0.04)
Drive chain	Size/link	RK	RK428KPO-118LE	—
	Slack		15 – 25 (9/16 – 1)	50 (1-15/16)

TORQUE VALUES

Driven sprocket nut	32 N·m (3.3 kgf·m, 24 lbf·ft)
Rear axle nut	54 N·m (5.5 kgf·m, 40 lbf·ft)
Shock absorber mounting nut	34 N·m (3.5 kgf·m, 25 lbf·ft)
Shock absorber mounting bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)
Brake panel stopper arm joint nut	22 N·m (2.2 kgf·m, 16 lbf·ft)
Swingarm pivot nut	54 N·m (5.5 kgf·m, 40 lbf·ft)

REAR WHEEL/SUSPENSION

TOOLS

Pilot, 12 mm 07746-0040200 	Pilot, 17 mm 07746-0040400 	Attachment, 37 x 40 mm 07746-0010200 
Bearing remover shaft 07746-0050100 	Bearing remover head, 12 mm 07746-0050300 	Driver 07749-0010000 

TROUBLESHOOTING

Rear wheel wobbling

- Bent rim
- Worn or damaged rear wheel bearings
- Worn or damaged driven flange bearing
- Faulty tire
- Worn or damaged swingarm pivot bushings
- Bent frame or swingarm
- Axle fastener not tightened properly
- Insufficient tire pressure

Wheel turns hard

- Brake drag
- Faulty rear wheel bearings
- Faulty driven flange bearing
- Bent axle
- Drive chain too tight (page 3-14)

Soft suspension

- Incorrect shock absorber spring preload
- Weak shock absorber springs
- Oil leakage from damper unit
- Insufficient tire pressure
- Faulty tire

Stiff suspension

- Incorrect shock absorber spring preload
- Bent shock absorber damper rod
- Worn or damaged shock absorber or swingarm pivot bushings
- Bent swingarm pivot or frame
- Insufficient tire pressure
- Improperly tightened swingarm pivot

Steers to one side or does not track straight

- Axle alignment/chain adjustment not equal on both sides
- Bent axle
- Bent frame and/or swingarm
- Worn swingarm pivot component

Rear suspension noise

- Loose shock absorber fasteners
- Worn or damaged shock absorber pivot bushings
- Faulty shock absorber

REAR WHEEL

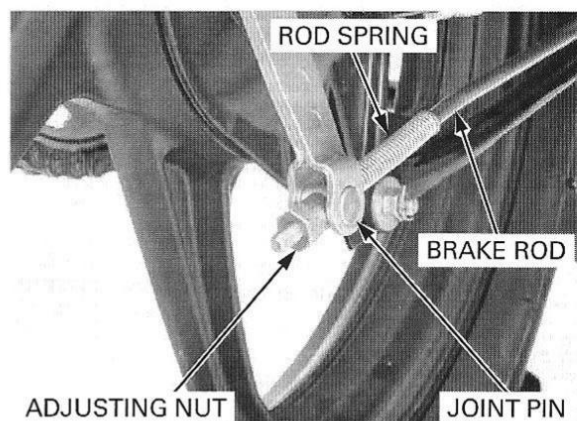
REMOVAL

Support the motorcycle on its center stand.

Remove the rear brake adjusting nut.

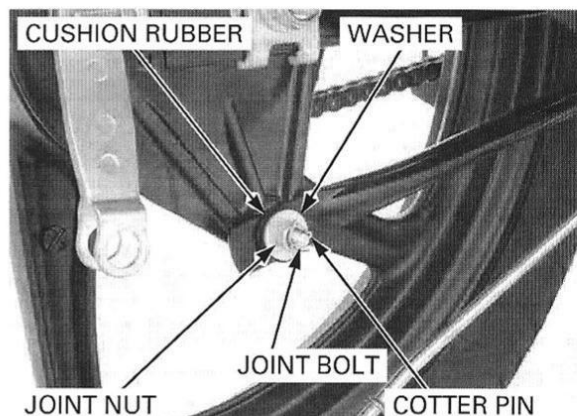
Push the brake pedal down, and remove the brake rod from the joint pin.

Remove the rod spring and joint pin.



Remove the following:

- Cotter pin
- Joint nut
- Washer
- Cushion rubber
- Joint bolt



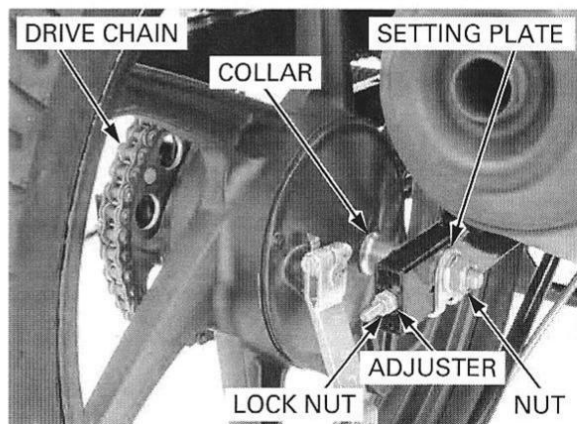
Loosen the axle nut.

Loosen both the drive chain adjuster lock nuts and slacken the drive chain fully.

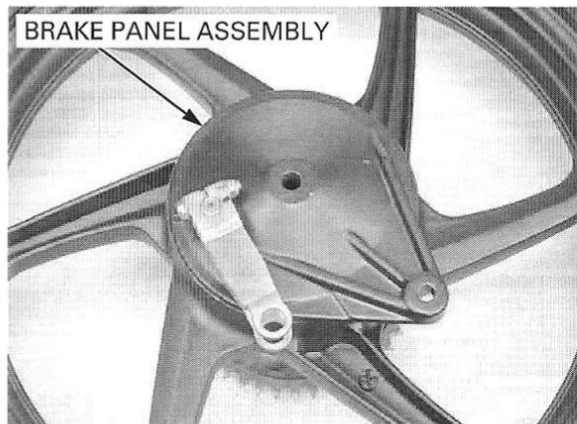
Remove the drive chain from the driven sprocket.

Remove the following:

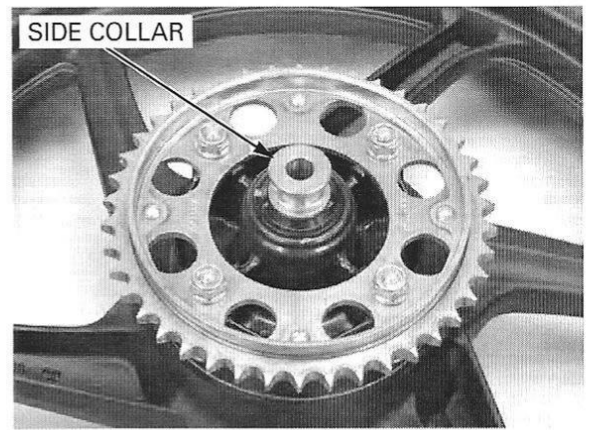
- Axle nut
- Rear axle
- Setting plates
- Rear wheel
- Right side collar



Remove the brake panel assembly from the right wheel hub.



Remove the left side collar from the wheel hub.



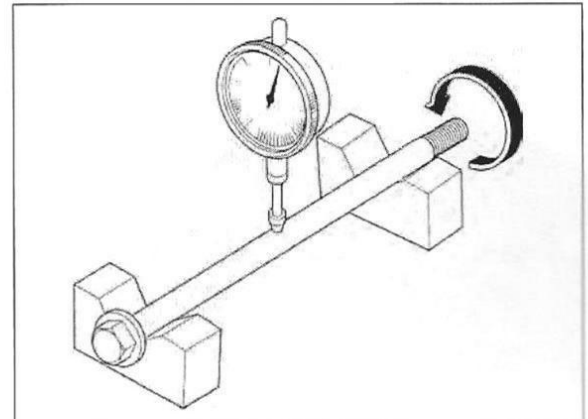
INSPECTION

AXLE

Place the axle on V-blocks.
Turn the axle and measure the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.2 mm (0.01 in)

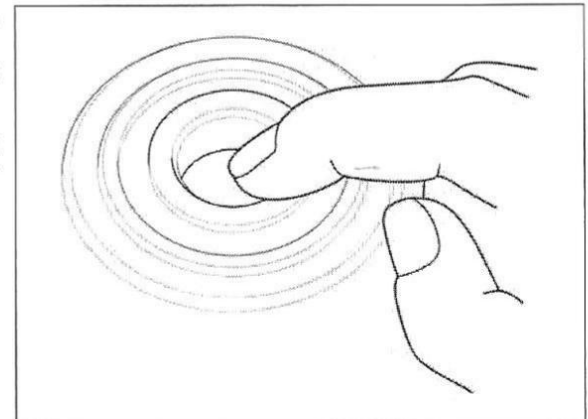


WHEEL AND DRIVEN FLANGE BEARINGS

Turn the inner race of each bearing with your finger.
The inner race should turn smoothly and quietly.
Also check that the bearing outer race fits tightly in the wheel hub or driven flange.

Replace the bearings in pairs.

Replace the bearings if the inner race does not turn smoothly and quietly, or if the outer race fits loosely in the wheel hub or driven flange.



WHEEL RIM

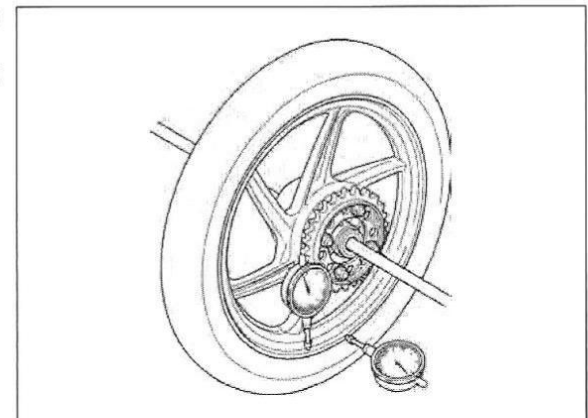
Check the wheel rim runout by placing the wheel in a truing stand.
Turn the wheel by hand, and read the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

SERVICE LIMITS:

Radial: 1.0 mm (0.04 in)

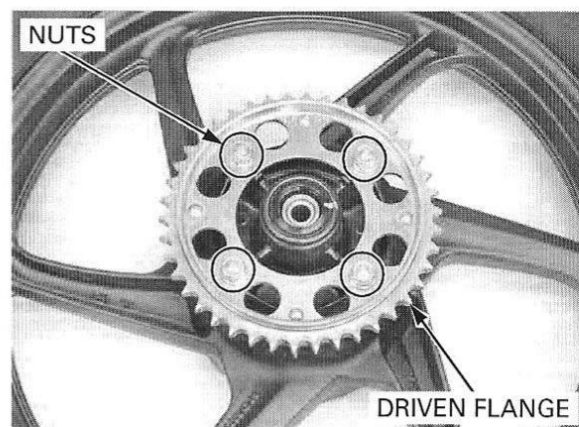
Axial: 1.0 mm (0.04 in)



REAR WHEEL/SUSPENSION

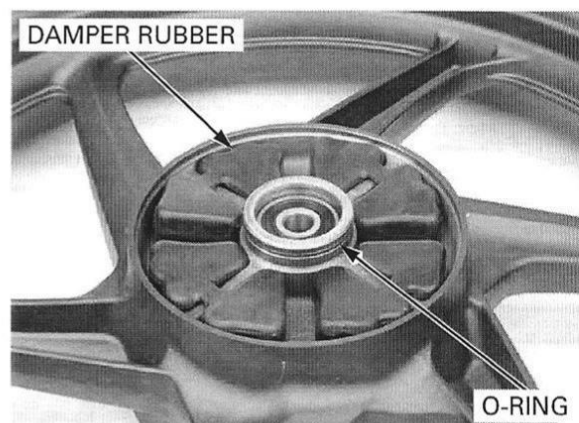
DISASSEMBLY

If removing the drive sprocket, loosen the nuts.
Remove the driven flange from the left wheel hub.

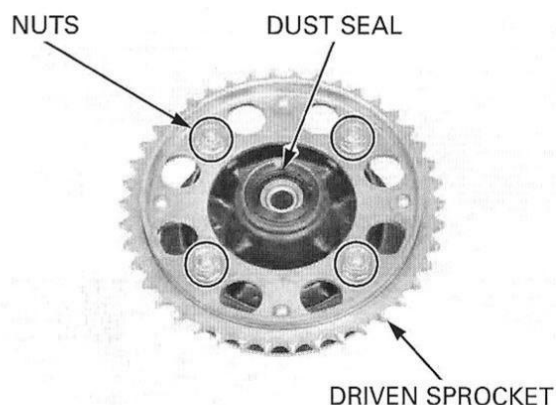


*Replace the
damper rubbers as
a set.*

Remove the damper rubbers and O-ring.



Remove the nuts and driven sprocket.
Remove the dust seal.



WHEEL BEARING REMOVAL

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.

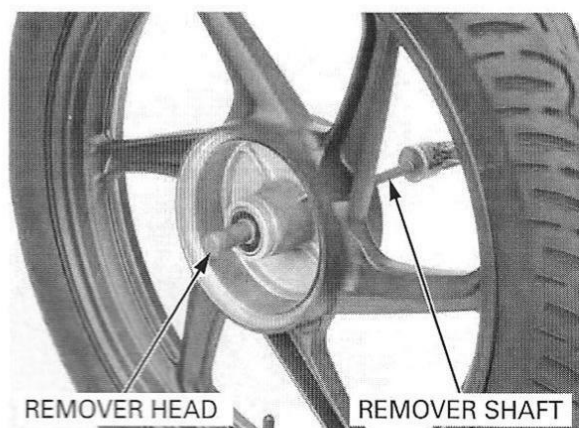
Remove the distance collar, and drive out the other bearing.

TOOLS:

Bearing remover head, 12 mm 07746-0050300

Bearing remover shaft 07746-0050100

For wheel bearing installation (page 13-10).



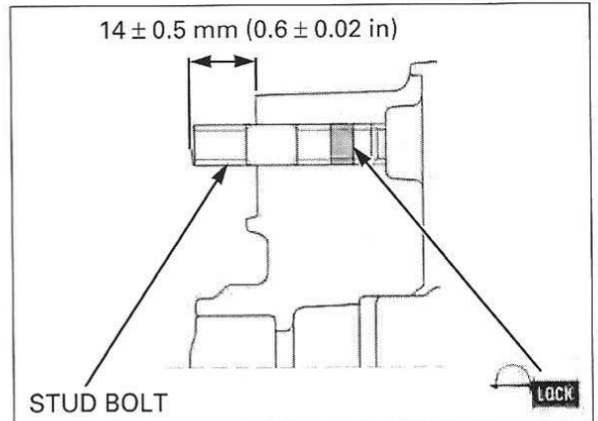
DRIVEN FLANGE

STUD BOLT REPLACEMENT

Check that the length from the bolt head to the driven flange surface is within specifications.

STANDARD: 14 ± 0.5 mm (0.6 ± 0.02 in)

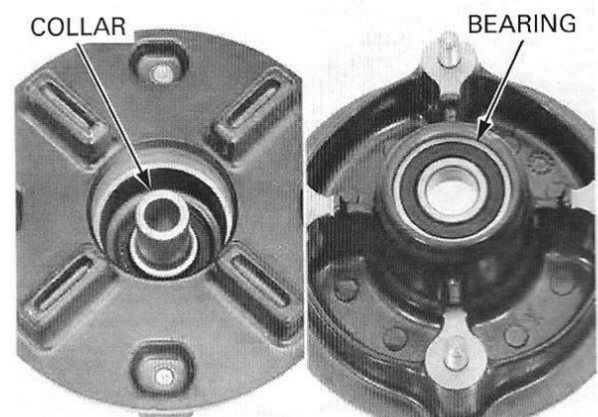
When removing the driven flange stud bolts, install and tighten new stud bolts into the driven flange so that the length from the bolt head to the driven flange surface is within specifications.



BEARING REPLACEMENT

Remove the driven flange collar.

Drive out the driven flange bearing.



Never install the old bearing, once the bearing has been removed, the bearing must be replaced with new ones.

Drive in a new driven flange bearing squarely until it is fully seated using the special tools.

TOOLS:

Driver

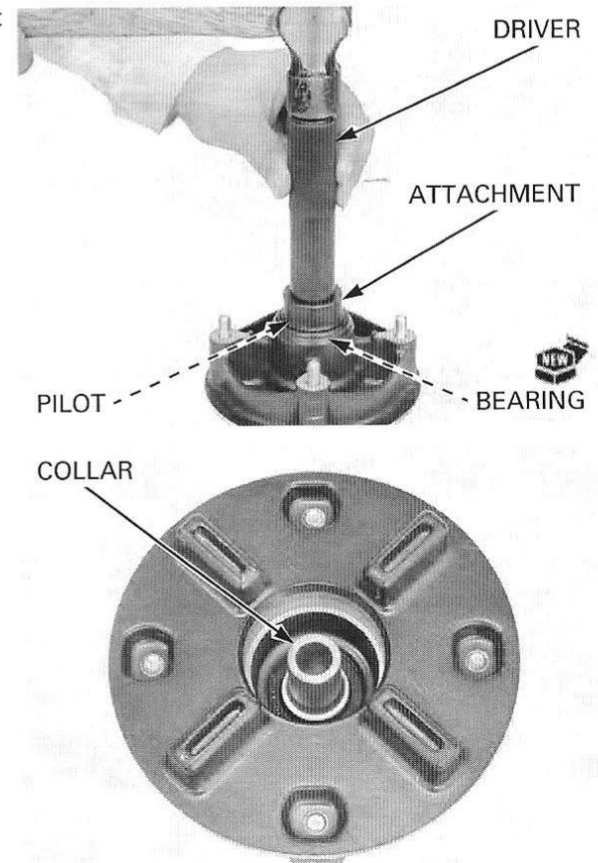
07749-0010000

Attachment, 37 x 40 mm

07746-0010200

Pilot, 17 mm

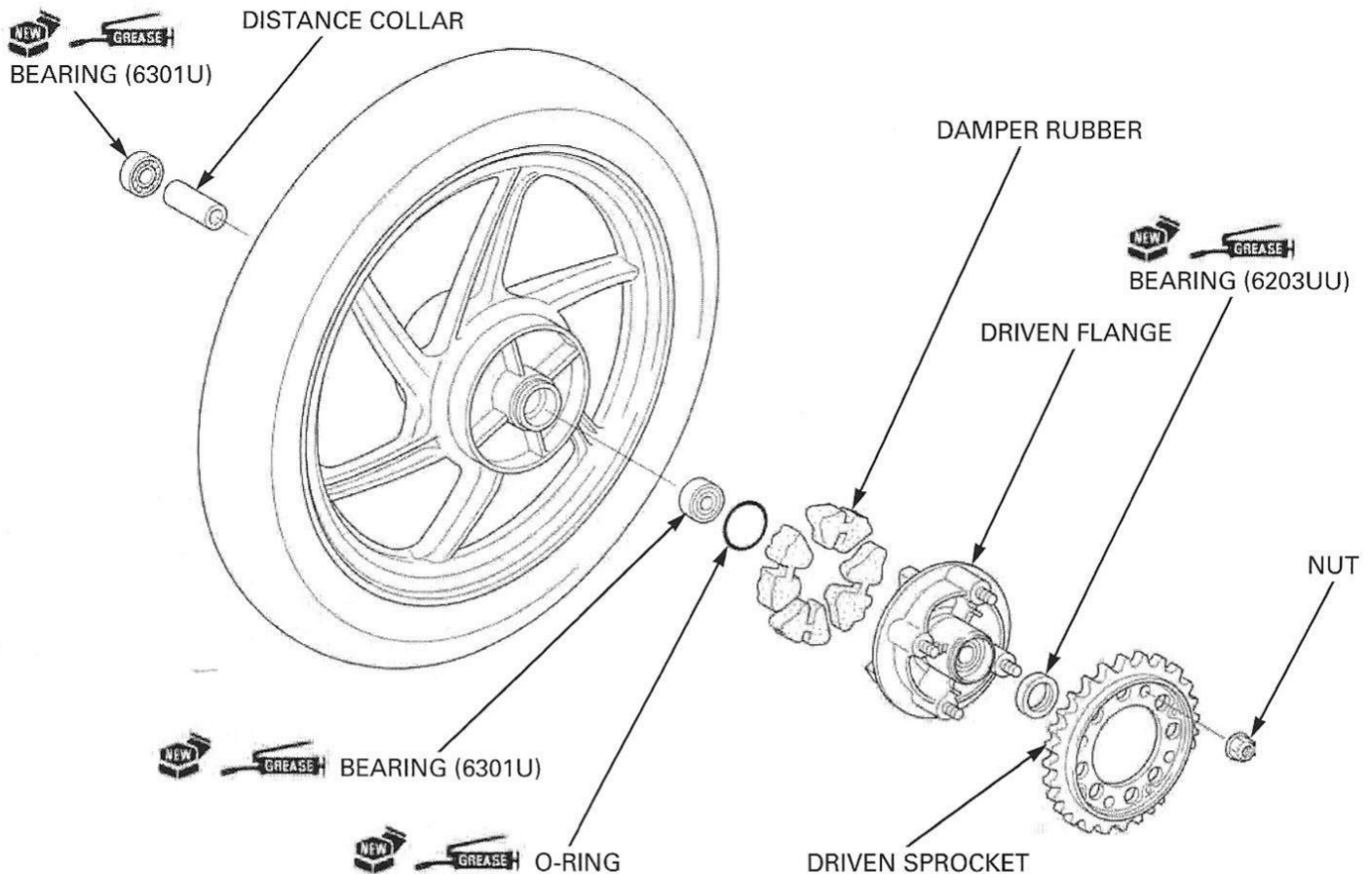
07746-0040400



Install the driven flange collar securely.

REAR WHEEL/SUSPENSION

ASSEMBLY



WHEEL BEARING INSTALLATION

Never install the old bearing, once the bearing has been removed, the bearing must be replaced with new ones.

Pack all bearing cavities with grease.

Drive in a new left bearing squarely with its sealed side facing up until it is fully seated using the special tools.

TOOLS:

Driver

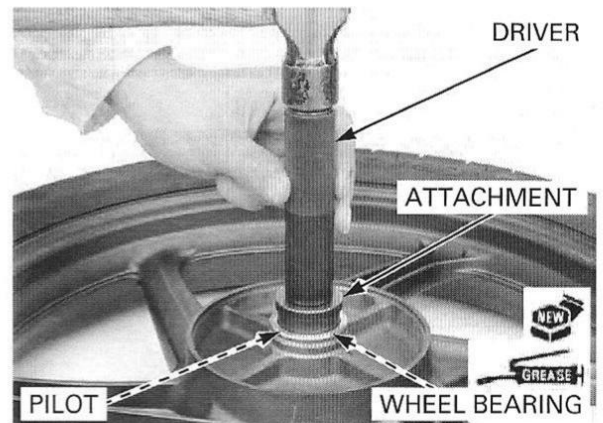
Attachment, 37 x 40 mm

Pilot, 12 mm

07749-0010000

07746-0010200

07746-0040200



Install the distance collar, then drive in a new left bearing squarely with its sealed side facing up using the special tools.

TOOLS:

Driver

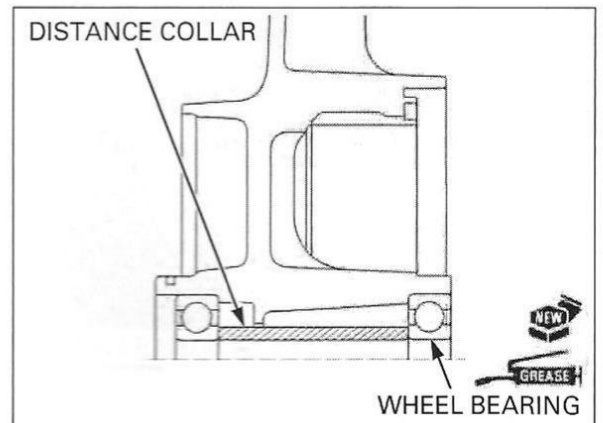
Attachment, 37 x 40 mm

Pilot, 12 mm

07749-0010000

07746-0010200

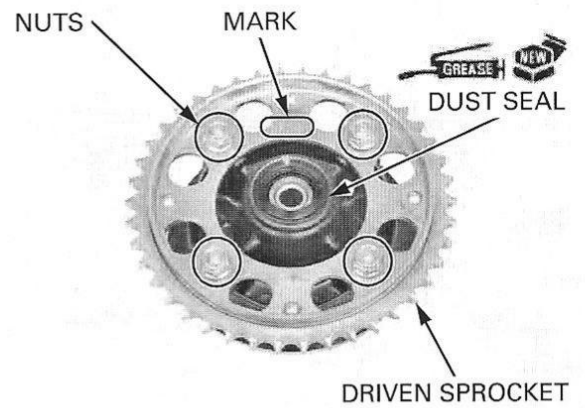
07746-0040200



Apply grease to a new dust seal lips.

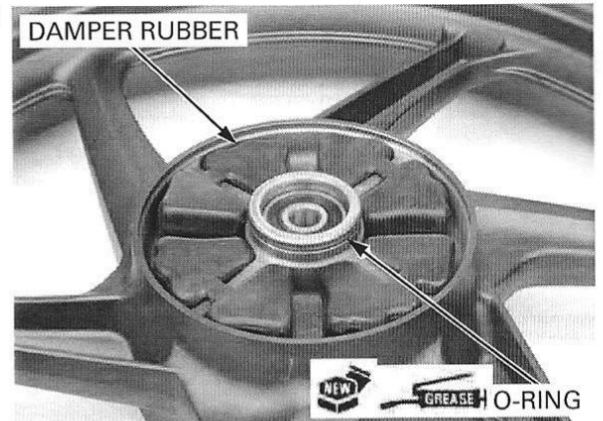
Install the dust seal until it is flush with the driven flange.

Install the driven sprocket to the driven flange with its stamp mark facing out. Loosely install the nuts.



Apply grease to a new O-ring and install it to the left wheel hub groove.

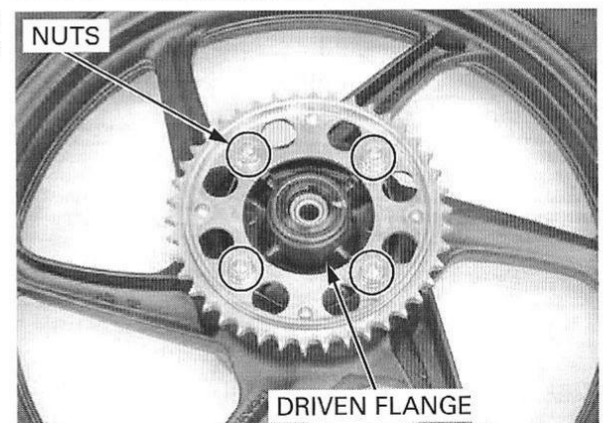
Install the damper rubbers.



Install the driven flange onto the left wheel hub by aligning the damper rubber grooves with the driven flange bosses.

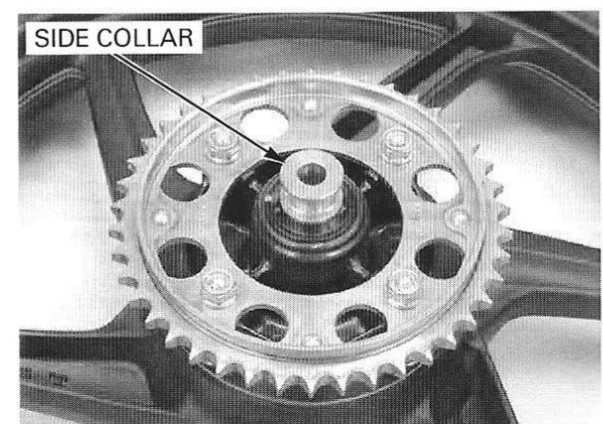
Tighten the nuts to the specified torque.

TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)



INSTALLATION

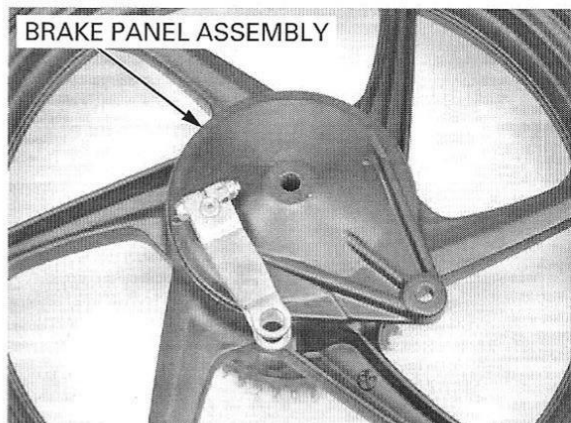
Install the left side collar to the wheel hub.



REAR WHEEL/SUSPENSION

Do not get grease on the brake drum and shoe linings.

Install the brake panel assembly to the right wheel hub.



Place the rear wheel into the swingarm.
Install the drive chain over the driven sprocket.

Install the left setting plate on the rear axle.

Install the rear axle from the left side through the swingarm, left collar, rear wheel, right collar and swingarm.

Install the right adjusting plate.

Install and tighten the axle nut to the specified torque.

TORQUE: 54 N·m (5.5 kgf-m, 40 lbf-ft)

Make sure the right adjusting plate position is aligned with the left adjusting plate position.

Adjust the drive chain slack (page 3-15).

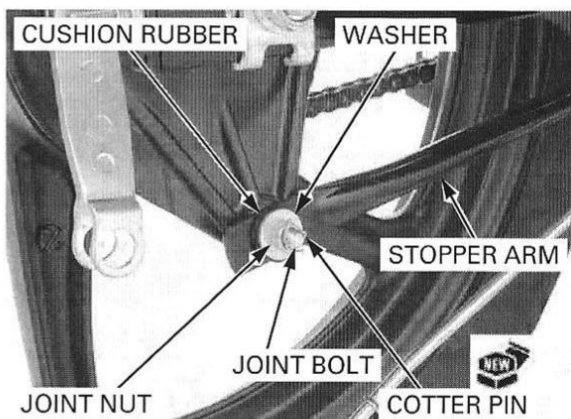
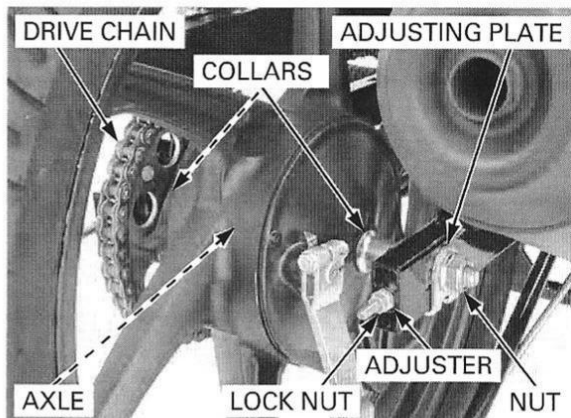
Install the following:

- Joint bolt
- Brake panel stopper arm
- Cushion rubber
- Washer

Install and tighten the joint nut.

TORQUE: 22 N·m (2.2 kgf-m, 16 lbf-ft)

Install a new cotter pin.

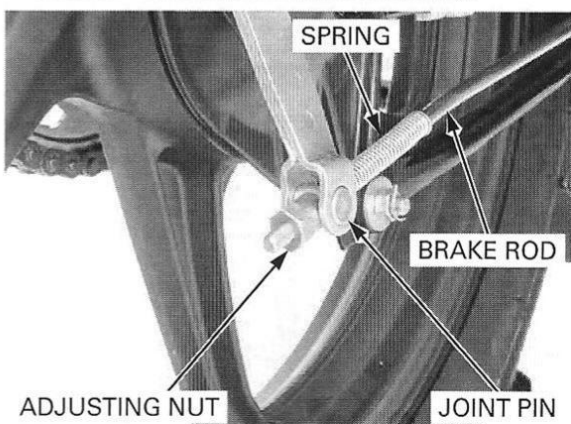


Install the joint pin to the brake arm.
Install the rod spring to the brake rod.

Push down the brake pedal and insert the brake rod into the joint pin.

Install the adjusting nut.

Adjust the brake pedal freeplay (page 3-21).



SHOCK ABSORBER

REMOVAL

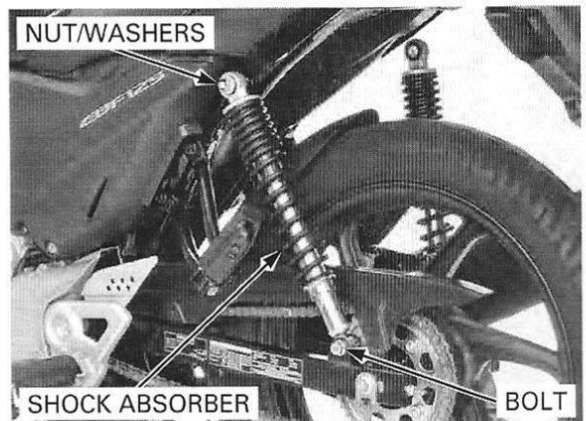
Support the motorcycle on its center stand.

Remove the right shock absorber upper mounting nut, washer, upper mount of the shock absorber and washer.

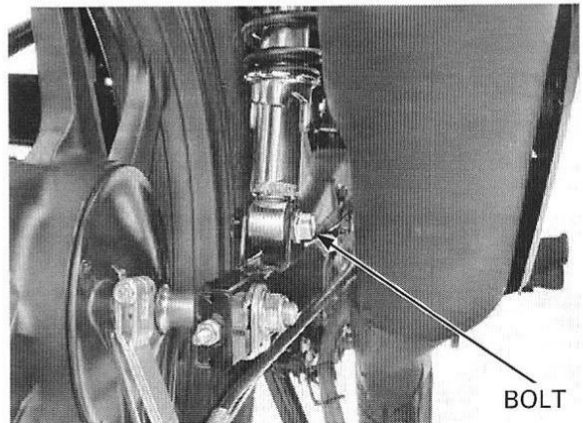


Remove the left shock absorber upper mounting nut, washer, upper mount of the shock absorber and washer.

Remove the left shock absorber lower mounting bolt and shock absorber.



Remove the right shock absorber lower mounting bolt and shock absorber.



INSPECTION

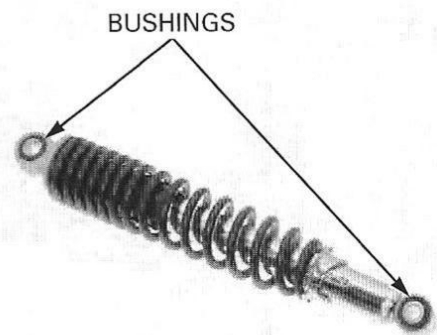
*Do not disassemble the shock absorber.
Replace the shock absorbers as a set.*

Visually inspect the shock absorber for wear or damage.

Check the following:

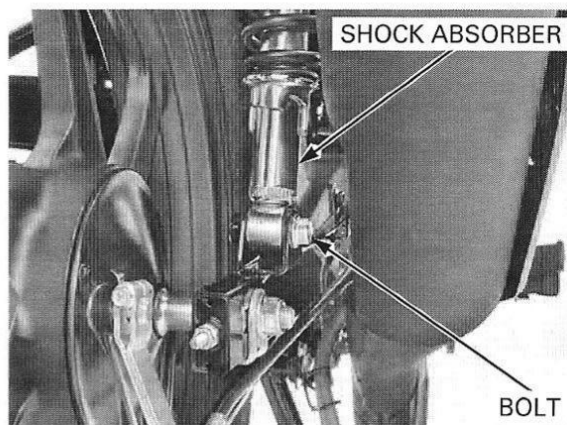
- Damper rod for bending or damage
- Deformation or oil leakage
- Bushings for wear or damage

Check the smooth damper operation.



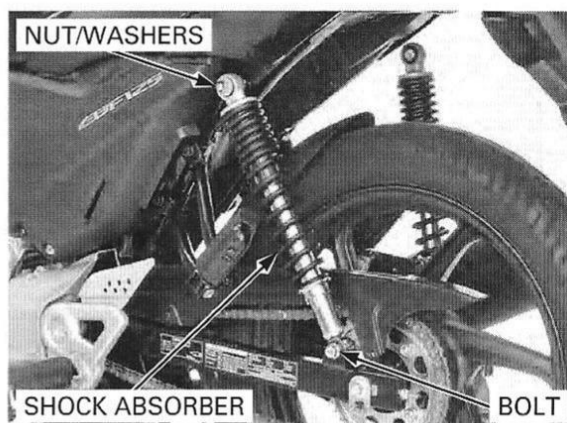
INSTALLATION

Install the right shock absorber and lower mounting bolt loosely.



Install the left shock absorber and lower mounting bolt loosely.

Install the washer, upper mount of the left shock absorber, washer and upper mounting nut loosely.



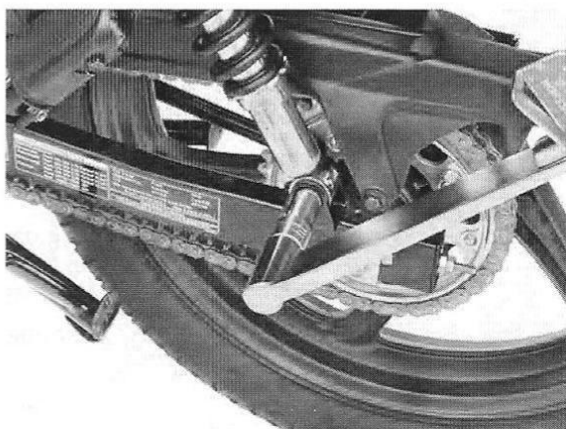
Install the washer, upper mount of the right shock absorber, washer and upper mounting nut loosely.



Retract the center stand and support the motorcycle as be preloaded to the shock absorber and swingarm pivot bushings.

Tighten the shock absorber mounting nuts and bolts to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



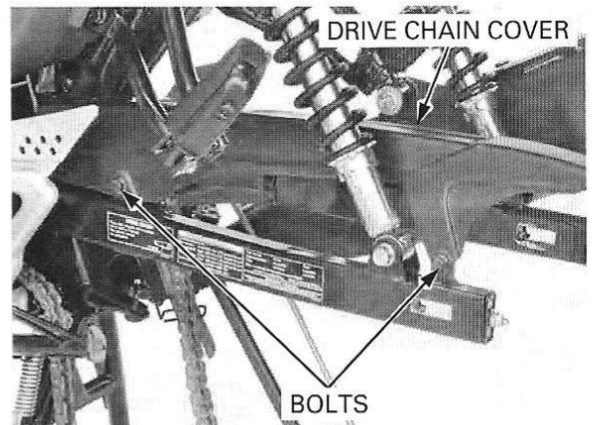
SWINGARM

REMOVAL

Remove the following:

- Rear wheel (page 13-6)
- Hugger fender (page 2-16)

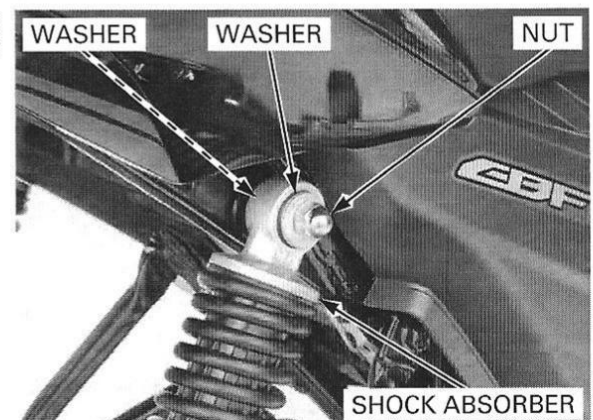
Remove the bolts and drive chain cover.



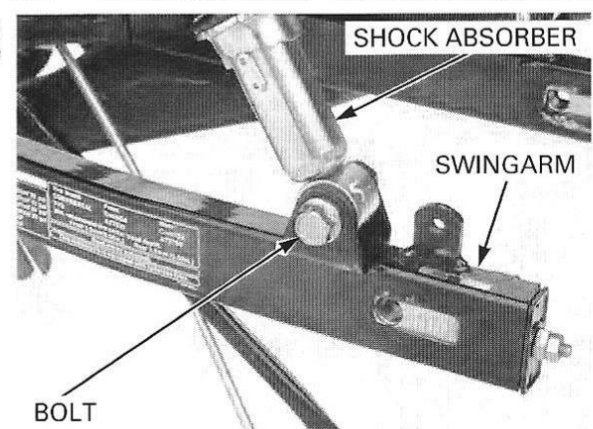
Unhook the brake pedal return spring.



Remove the right shock absorber upper mounting nut, washer, upper mount of the shock absorber and washer.

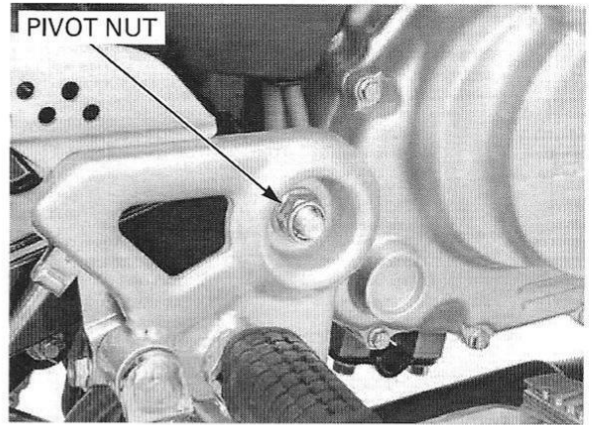


Remove the left shock absorber lower mounting bolt and release the left shock absorber from the swingarm.

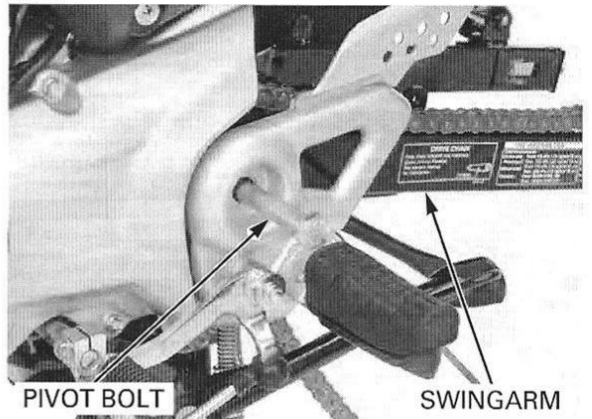


REAR WHEEL/SUSPENSION

Remove the swingarm pivot nut.

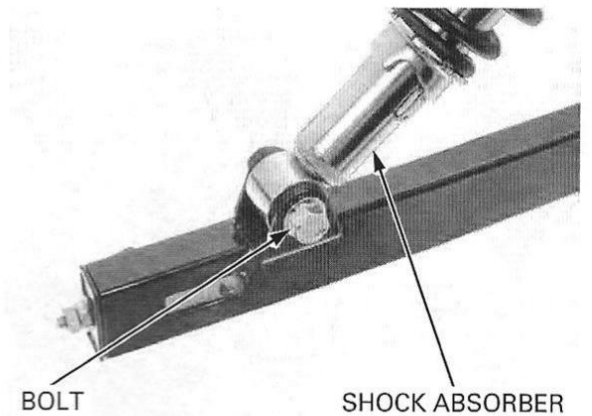


Remove the swingarm pivot bolt and swingarm.

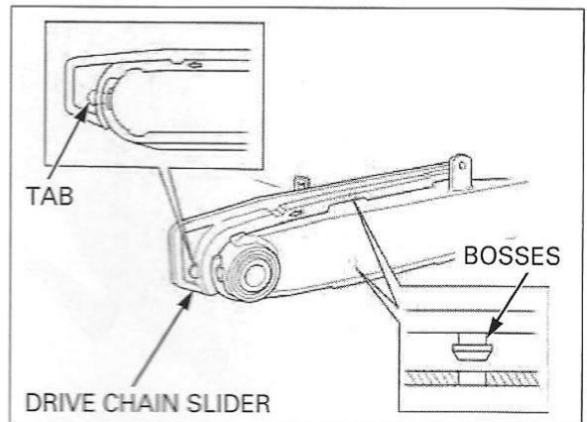


DISASSEMBLY/INSPECTION

Remove the bolt and right shock absorber.

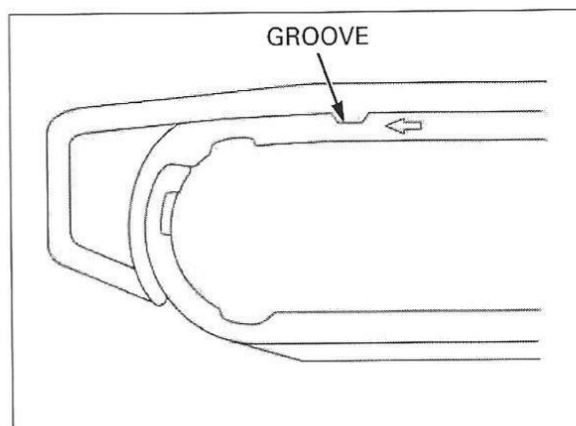


Remove the drive chain slider by releasing the slits from the tab of the swingarm, then release the bosses from the swingarm.

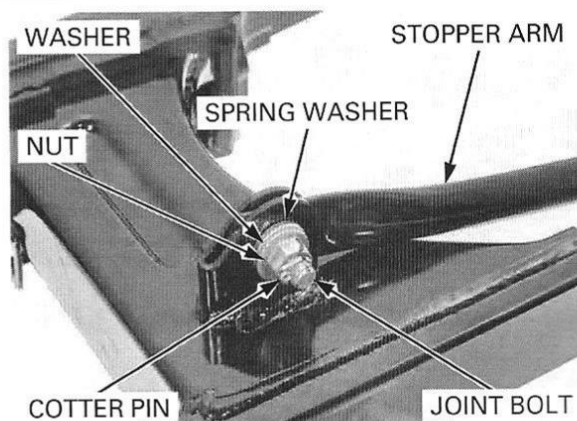


Check the drive chain slider for wear or damage.

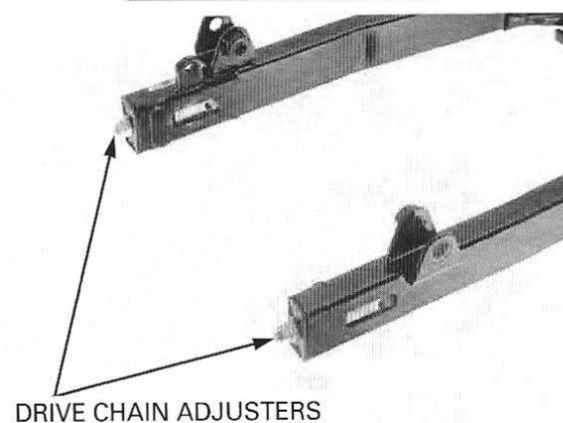
The drive chain slider must be replaced if it is worn to the wear limit groove.



Remove the cotter pin, joint nut, washer, spring washer, joint bolt and brake panel stopper arm.



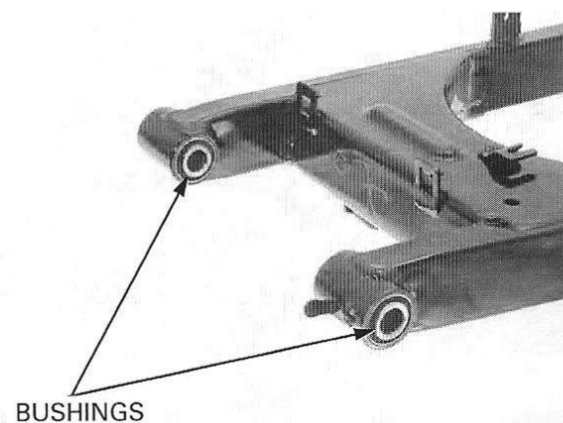
Remove the drive chain adjusters.



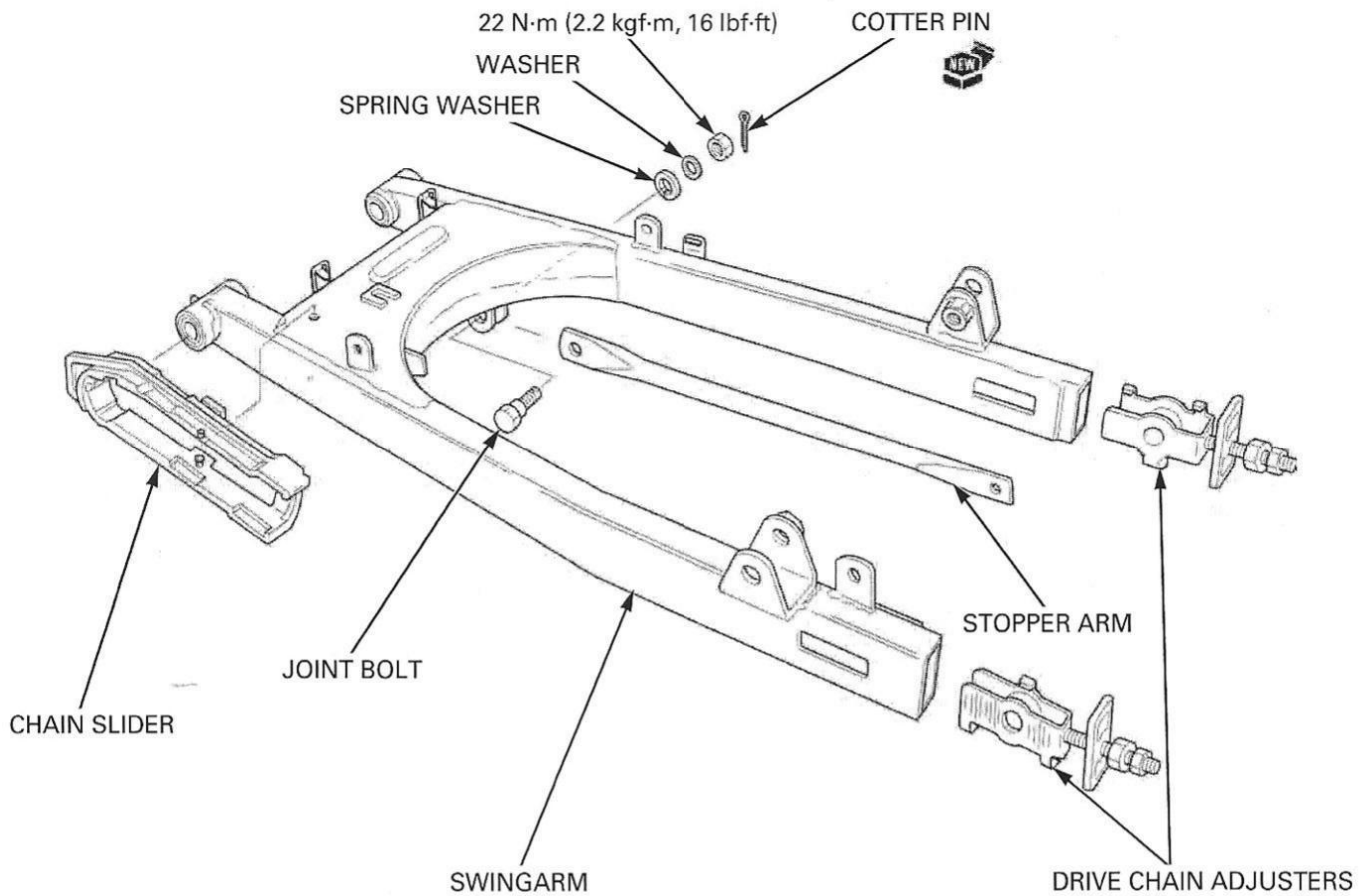
Check the swingarm pivot bushings for wear or damage.

Check the swingarm for cracks or damage.

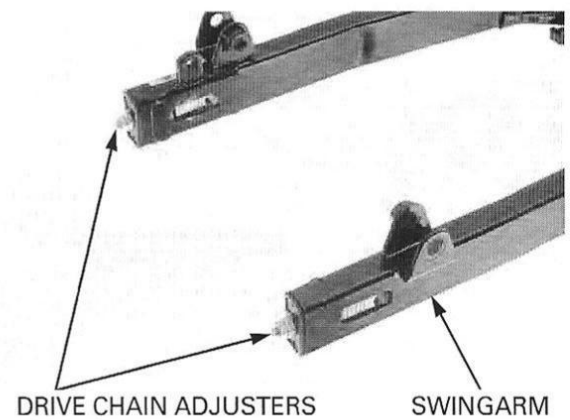
Replace them if necessary.



REAR WHEEL/SUSPENSION ASSEMBLY



Install the drive chain adjusters to the swingarm.

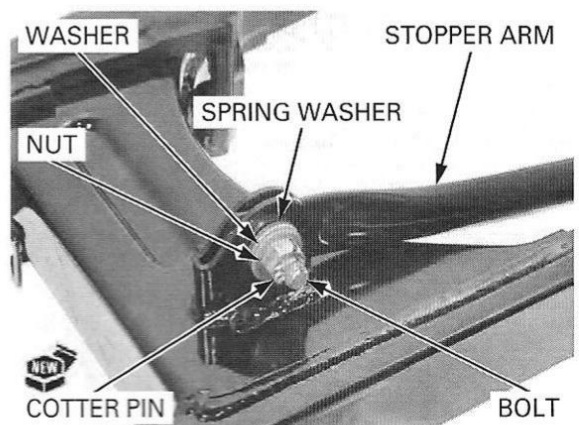


Install the brake panel stopper arm, joint bolt, spring washer and washer.

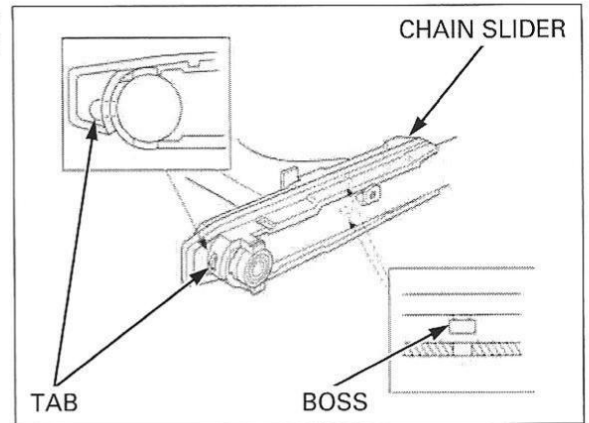
Install and tighten the joint nut to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

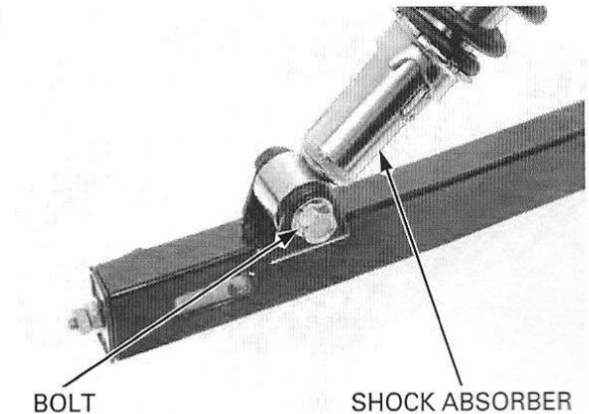
Install a new cotter pin.



Install the drive chain slider by aligning the bosses with the holes of the swingarm, then install the slits of the drive chain slider to the swingarm on the tab.



Install the right shock absorber and lower mounting bolt loosely.

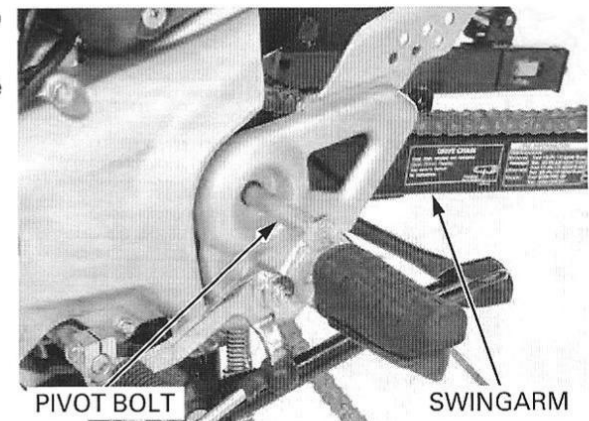


INSTALLATION

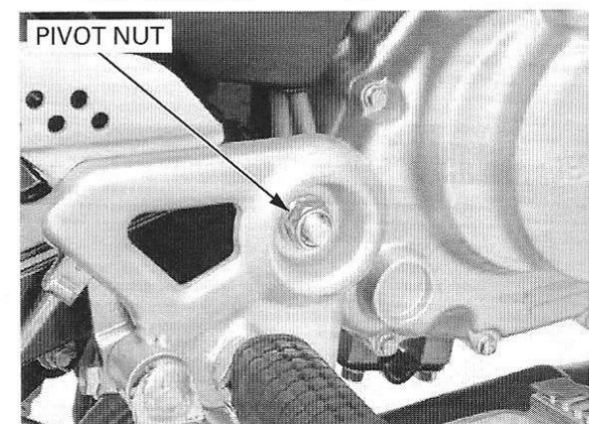
Be careful not to damage the rear brake light switch spring.

Route the drive chain and install the swingarm to the frame.

Install the swingarm pivot bolt from the left side through the swingarm pivot and frame.

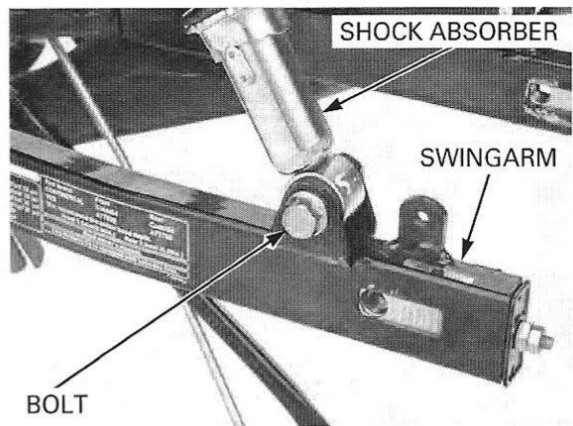


Loosely install the swingarm pivot nut.

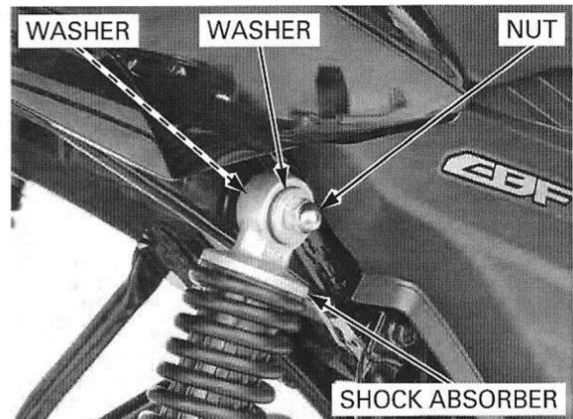


REAR WHEEL/SUSPENSION

Install the left shock absorber to the swingarm and bolt loosely.



Install the washer, right upper mount of the shock absorber, washer and nut loosely.



Hook the brake pedal return spring to the swingarm.



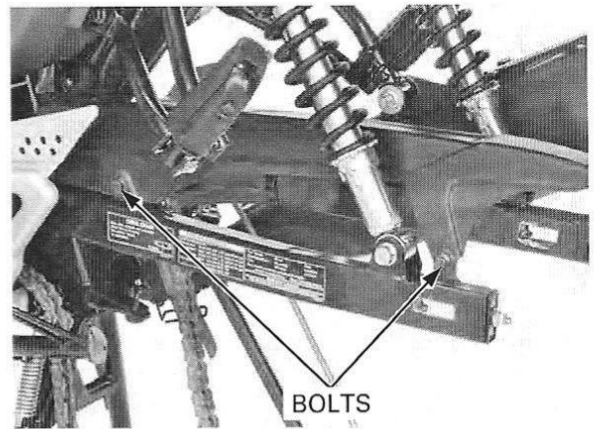
Install the drive chain cover to the swingarm by aligning its tab with the slit of the swingarm.



Install and tighten the drive chain cover bolts securely.

Install the following:

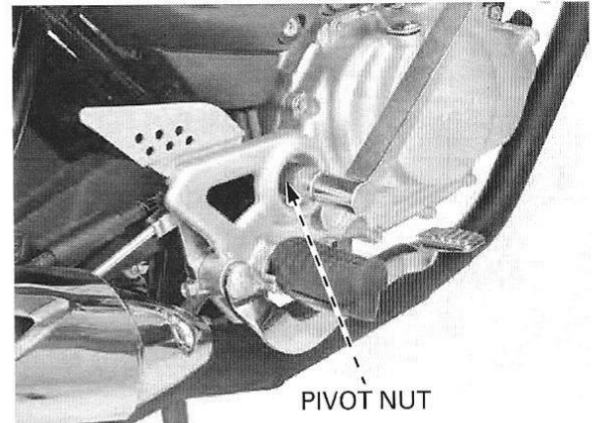
- Rear wheel (page 13-11)
- Hugger fender (page 2-16)



Retract the center stand and support the motorcycle as be preload to the shock absorber and swingarm pivot bushings.

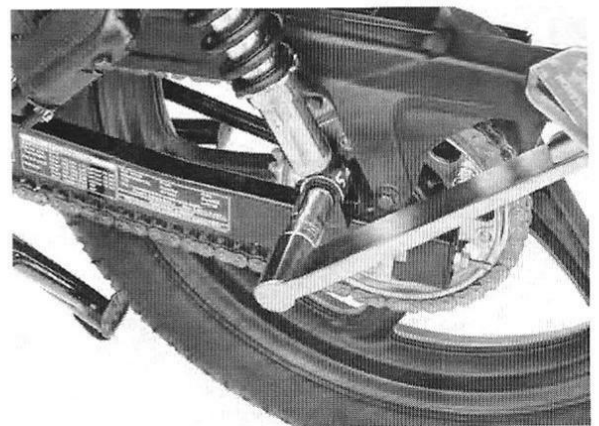
Tighten the pivot nut to the specified torque.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)



Tighten the shock absorber mounting nut and bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



14. BRAKE SYSTEM

COMPONENT LOCATION	14-2	BRAKE PAD/DISC	14-8
SERVICE INFORMATION	14-3	FRONT MASTER CYLINDER.....	14-10
TROUBLESHOOTING	14-5	FRONT BRAKE CALIPER.....	14-15
BRAKE FLUID REPLACEMENT/ AIR BLEEDING	14-6	BRAKE PEDAL	14-19
		REAR DRUM BRAKE	14-22

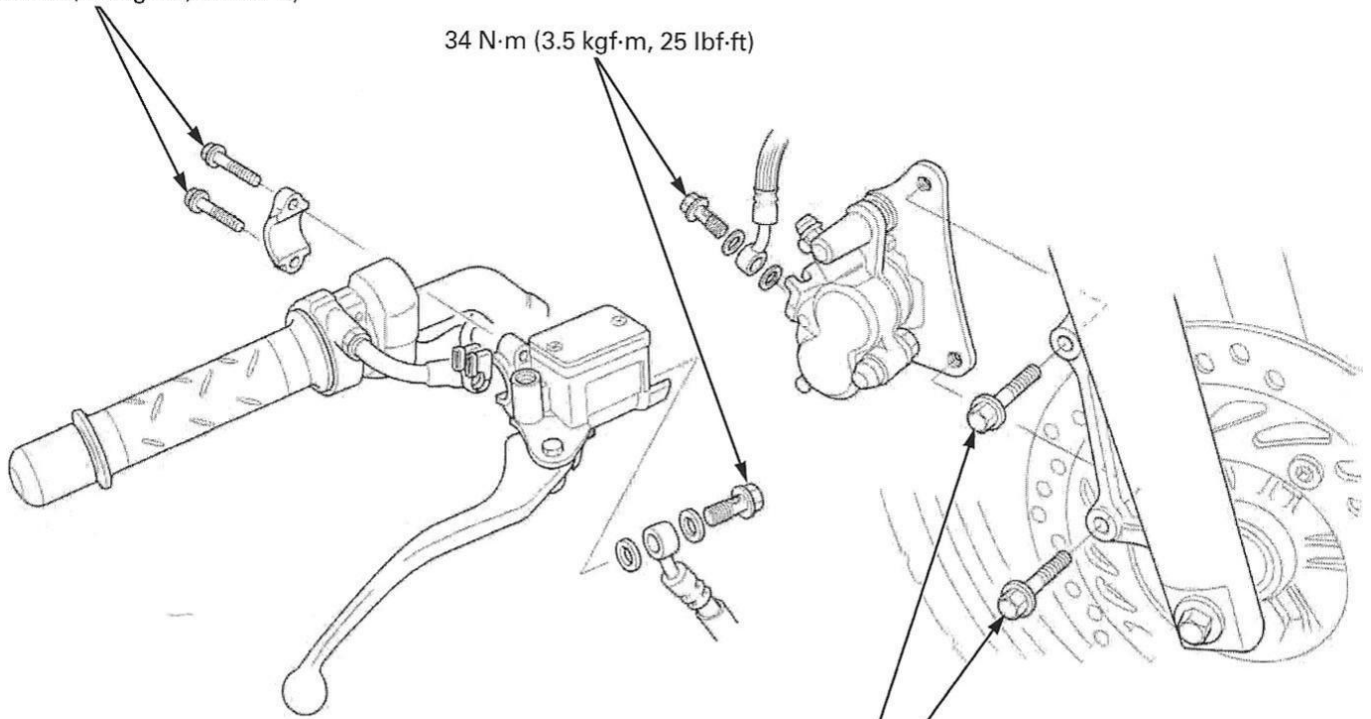
BRAKE SYSTEM

COMPONENT LOCATION

FRONT

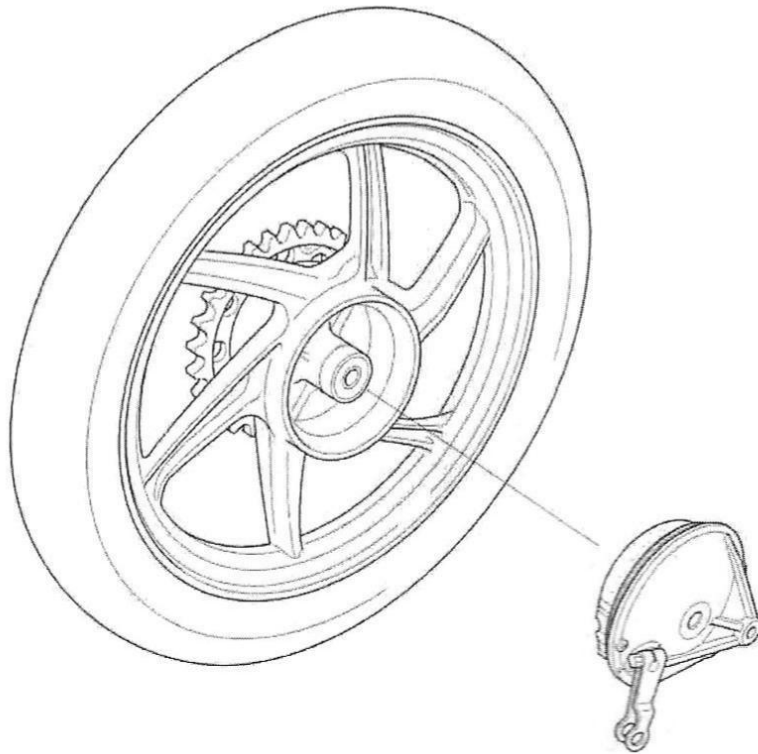
9 N·m (0.9 kgf·m, 6.6 lbf·ft)

34 N·m (3.5 kgf·m, 25 lbf·ft)



30 N·m (3.1 kgf·m, 22 lbf·ft)

REAR



SERVICE INFORMATION

GENERAL

⚠ CAUTION

Frequent inhalation of brake pad (shoe) dust, regardless of material composition, could be hazardous to your health.

- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

NOTICE

Spilling brake fluid will severely damage instrument lenses and painted surface. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the reservoir is horizontal first.

- A contaminated brake disc or pad (drum or shoe) reduces stopping power. Discard contaminated pads (shoes), and clean a contaminated disc (drum) with a high quality brake degreasing agent.
- Check the hydraulic brake system by applying the brake lever after the air bleeding.
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always use fresh DOT 3 or DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid, they may not be compatible.
- Always check brake operation before riding the motorcycle.
- Do not reuse the sealing washers. Replace with new ones.

SPECIFICATIONS

Unit: mm (in)

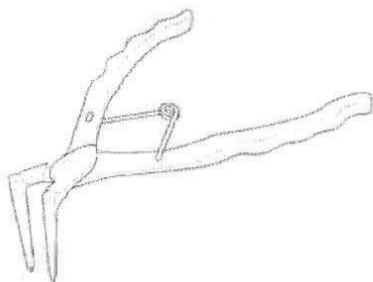
	ITEM	STANDARD	SERVICE LIMIT
Front brake	Specified brake fluid	DOT 3 or DOT 4	—
	Brake disc thickness	3.8 – 4.2 (0.15 – 0.17)	3.5 (0.14)
	Brake disc runout	—	0.10 (0.004)
	Master cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Master piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
	Caliper cylinder I.D.	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
	Caliper piston O.D.	25.318 – 25.368 (0.9968 – 0.9987)	25.310 (0.9965)
Rear brake	Brake pedal freeplay	20 – 30 (13/16 – 1-3/16)	—
	Brake drum I.D.	130.0 – 130.2 (5.12 – 5.13)	131.0 (5.16)
	Lining thickness	—	To the indicator

TORQUE VALUES

Caliper bleed valve	5.4 N·m (0.6 kgf·m, 4 lbf·ft)	
Master cylinder holder bolt	9 N·m (0.9 kgf·m, 6.6 lbf·ft)	
Master cylinder reservoir cap screw	1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)	
Brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	ALOC bolt; replace with a new one.
Front brake light switch screw	1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)	
Brake lever pivot bolt	1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Brake lever pivot nut	6.0 N·m (0.6 kgf·m, 4.4 lbf·ft)	
Brake hose oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Brake caliper slide pin	22 N·m (2.2 kgf·m, 16 lbf·ft)	Apply locking agent to the threads.
Brake arm nut	10 N·m (1.0 kgf·m, 7 lbf·ft)	

TOOL

Snap ring pliers
07914-SA50001



TROUBLESHOOTING

FRONT BRAKE

Brake lever soft or spongy

- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master cylinder piston cups
- Worn brake pad/disc
- Contaminated caliper
- Contaminated master cylinder
- Caliper not sliding properly
- Low brake fluid level
- Clogged/restricted fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Bent brake lever

Brake lever hard

- Clogged/restricted fluid passage
- Sticking/worn caliper piston
- Caliper not sliding properly
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever

Brake drags

- Contaminated brake pad/disc
- Axle alignment/chain adjustment not equal on both sides
- Badly worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Sticking/worn master cylinder piston

REAR BRAKE

Poor brake performance

- Improperly brake adjustment
- Worn brake linings
- Worn brake drum
- Worn brake cam
- Improperly installed brake linings
- Contaminated brake linings
- Contaminated brake drum
- Worn brake shoes at cam contact area
- Improper engagement between brake arm and serrations

Brake lever hard or slow return

- Worn/broken return spring
- Improperly adjusted rear brake freeplay
- Sticking brake drum due to contamination
- Worn brake shoes at cam contact area
- Brake cable sticking/needs lubrication
- Improperly installed brake linings

Brake squeaks

- Worn brake linings
- Worn brake drum
- Contaminated brake linings
- Contaminated brake drum

BRAKE FLUID REPLACEMENT/AIR BLEEDING

NOTICE

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

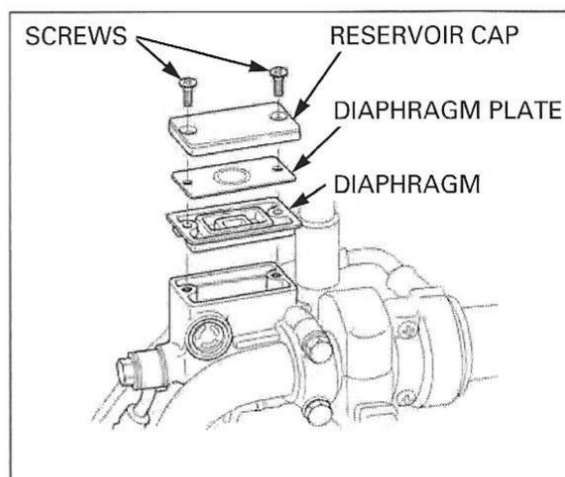
NOTE:

Never allow contaminants (dirt, water, etc.) to get into an open reservoir.

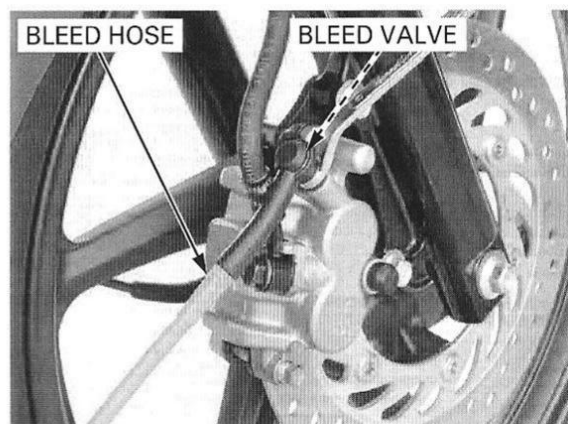
BRAKE FLUID DRAINING

Support the motorcycle on its center stand and turn the handlebar until the reservoir is parallel to the ground.

Remove the screws, reservoir cap, diaphragm plate and diaphragm.

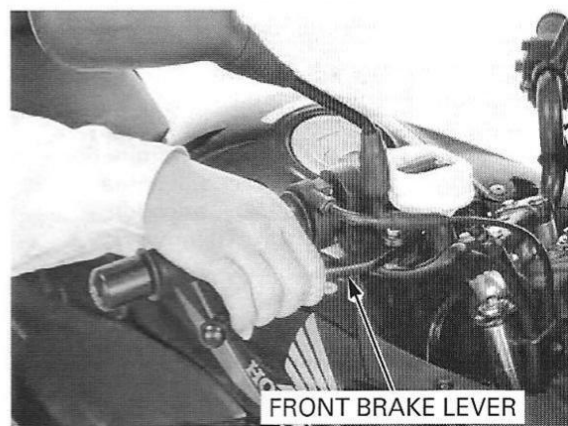


Connect a bleed hose to the caliper bleed valve.



Loosen the bleed valve and pump the front 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 brake fluid.

There are not compatible.

Fill the master cylinder reservoir with DOT 3 or DOT 4 brake fluid from a sealed container.

Connect a commercially available brake bleeder to the front brake caliper bleed valve.

If an automatic refill system is not used, add brake fluid when the fluid level in the reservoir is low.

- Check the fluid level often by bleeding the brake to prevent air from being pumped into the system.



If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Operate the brake bleeder and loosen the bleed valve.

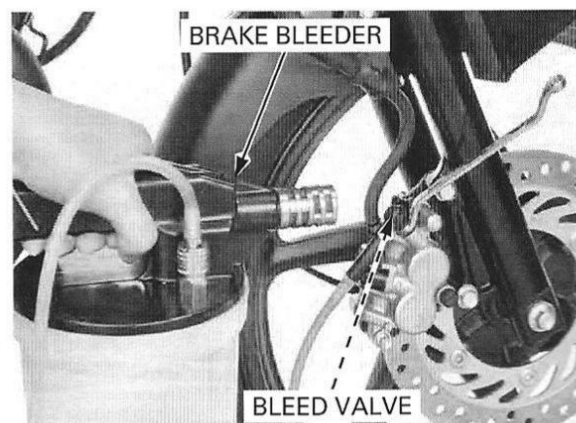
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

Perform the bleeding procedure until the system is completely flushed/bled.

Close the bleed valve and operate the brake lever. If it still feels spongy, bleed the system again.

After bleeding the system completely, tighten the bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4 lbf·ft)



If the brake bleeder is not available, perform 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 the lever resistance is felt.



Connect a bleed hose to the bleed valve, and bleed the system as follows:

1. Squeeze the brake lever all the way and loosen the bleed valve 1/2 turn. Wait several seconds, and then close the bleed valve.

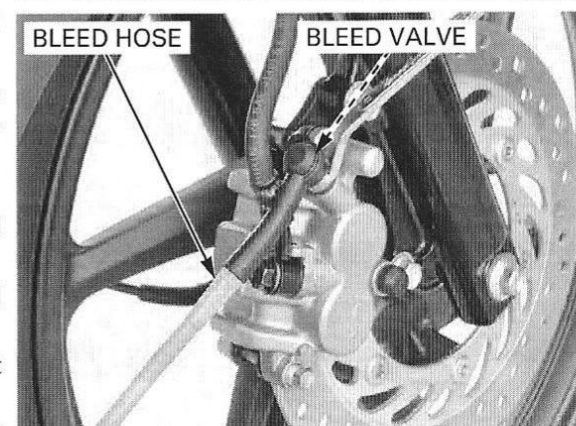
NOTE:

- Do not release the brake lever until the bleed valve has been closed.
- 2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.

Repeat the steps 1 and 2 until air bubbles do not appear in the bleed hose.

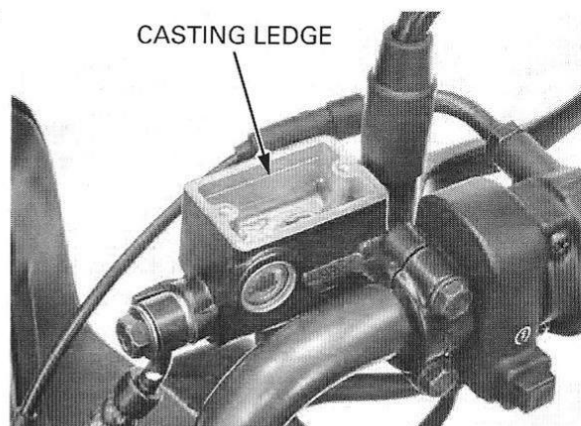
After bleeding the air completely, tighten the bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4 lbf·ft)



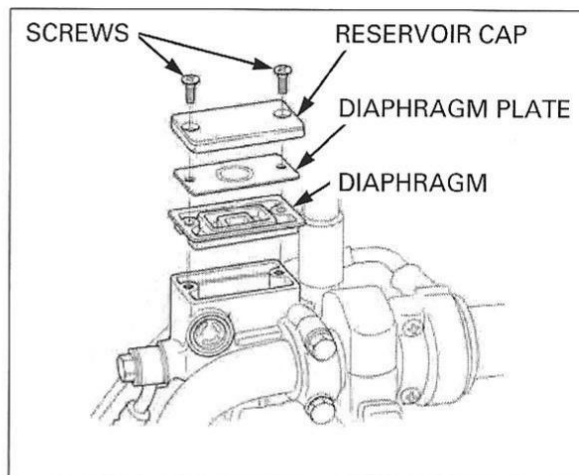
BRAKE SYSTEM

Fill the reservoir to the casting ledge with DOT 3 or DOT 4 brake fluid from a sealed container.



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

TORQUE: 1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)



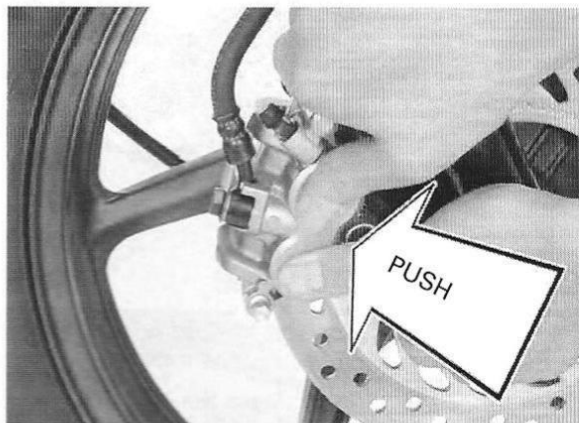
BRAKE PAD/DISC

BRAKE PAD REPLACEMENT

Check the brake fluid level in the master cylinder reservoir as this operation causes the fluid level to rise.

Push the caliper pistons all the way in by pushing the caliper body inward to allow installation of new brake pads.

- Always replace the brake pads in pairs to assure even disc pressure.

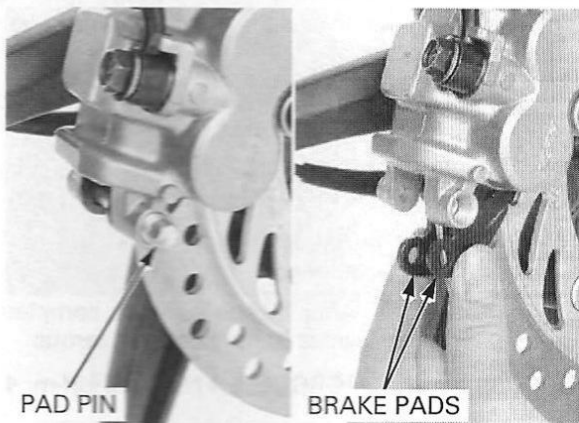


Do not operate the front brake lever after the brake pads are removed.

Remove the pad pin and brake pads.

Check the pad pin for abnormal wear or distortion, replace them if necessary.

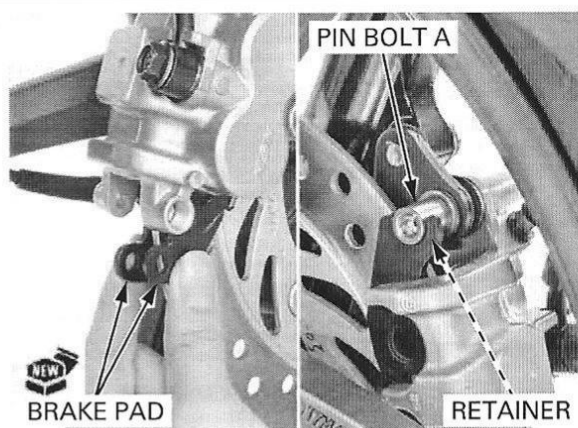
Clean the brake caliper inside especially around the pistons.



Install new brake pads to the brake caliper so their ends seat against the retainer and brake caliper pin bolt A.

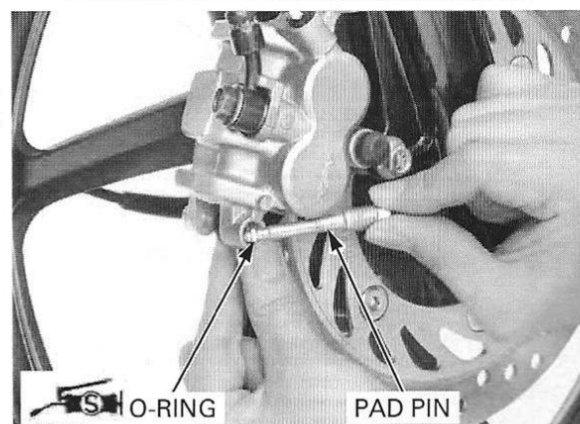
NOTE:

Make sure that the retainer is installed on the caliper bracket.



Apply silicone grease to the pad pin O-ring and install it to the pad pin groove.

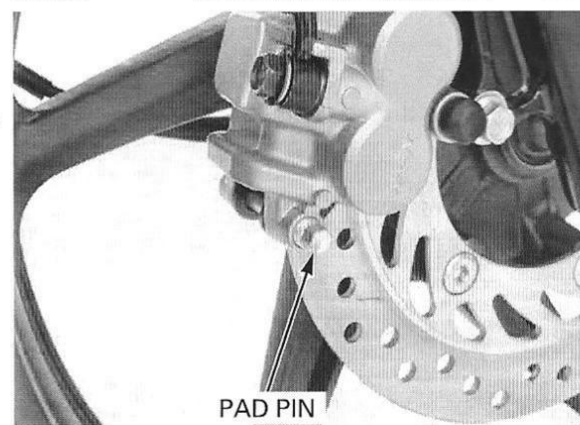
Install the pad pin by pushing the pads against the pad spring to align the pad pin holes in the pads and brake caliper.



Tighten the pad pin to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

Operate the brake lever to seat the caliper pistons against the pads.



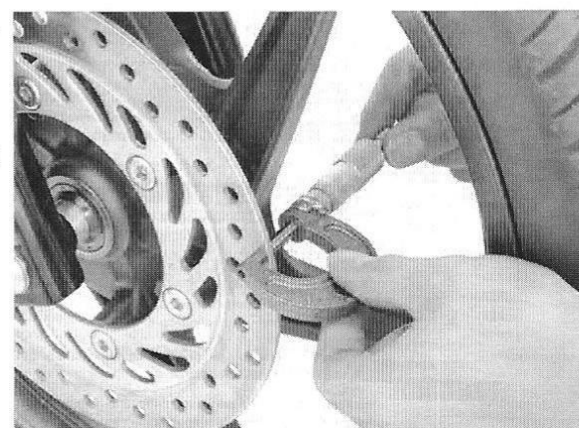
BRAKE DISC INSPECTION

Visually inspect the brake disc for damage or cracks.

Measure the brake disc thickness at several points.

SERVICE LIMIT: 3.5 mm (0.14 in)

Replace the brake disc if the smallest measurement is less than service limit.



BRAKE SYSTEM

Measure the brake disc warpage using a dial indicator.

SERVICE LIMIT: 0.10 mm (0.004 in)

Check the wheel bearings for excessive play, if the warpage exceeds the service limit.
Replace the brake disc if the wheel bearings are normal.



FRONT MASTER CYLINDER

REMOVAL

Drain the brake fluid from the hydraulic system (page 14-6).

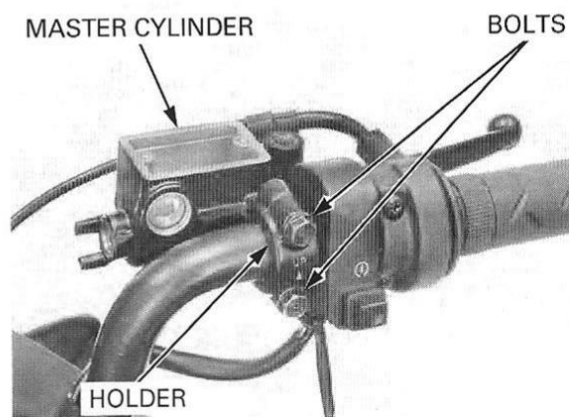
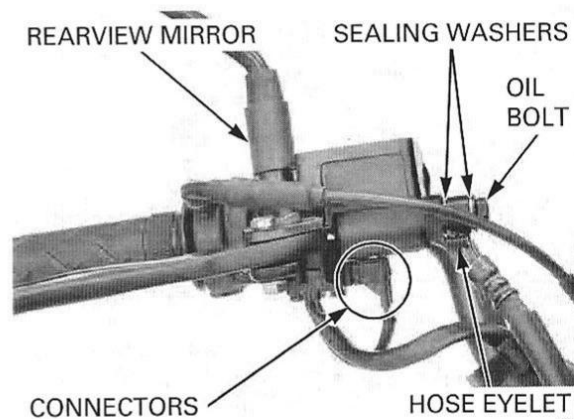
Remove the right rearview mirror with the rearview mirror adapter.

Disconnect the brake light switch connectors.

When removing the oil bolt, cover the end of the brake hose to prevent contamination.

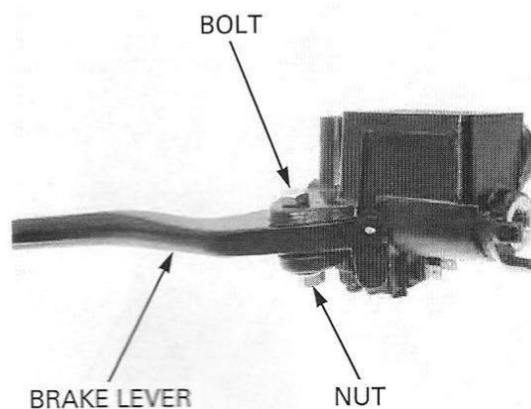
Remove the oil bolt, sealing washers and brake hose eyelet.

Remove the bolts, holder and master cylinder.

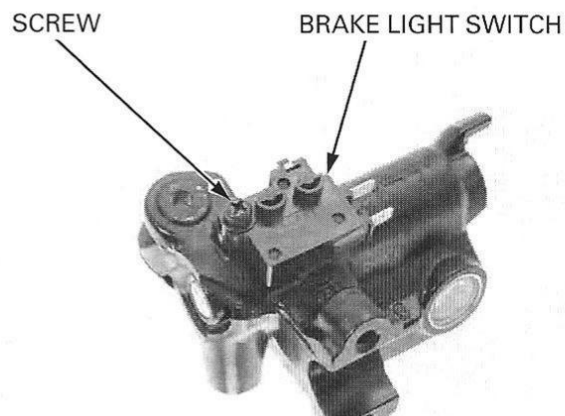


DISASSEMBLY

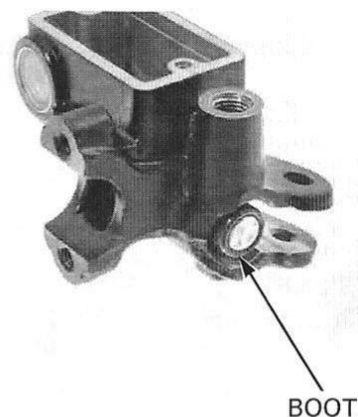
Remove the brake lever pivot nut, bolt and brake lever.



Remove the screw and brake light switch.



Remove the boot from the master cylinder.

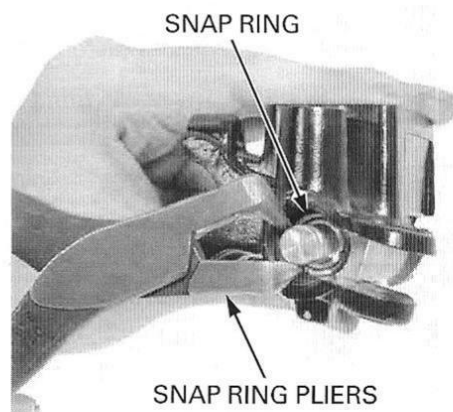


Remove the snap ring using the special tool.

TOOL:

Snap ring pliers

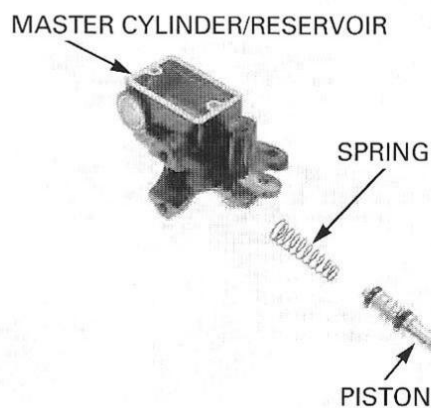
07914-SA50001



Remove the master piston and spring from the master cylinder.

Be sure that each parts is free from dust or dirt before reassembly.

Clean the master cylinder, reservoir and master piston in clean brake fluid.



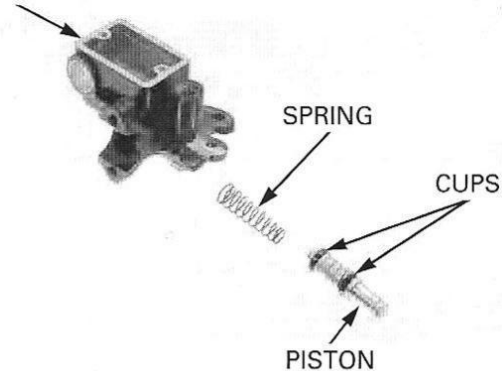
INSPECTION

Check the piston cups for wear, deterioration or damage.

Check the spring for fatigue or damage.

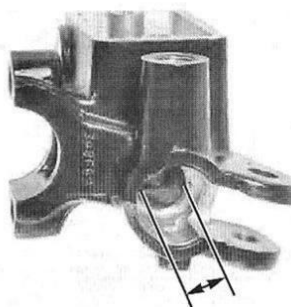
Check the master cylinder inner surface and master piston outer surface for scratches or damage.

MASTER CYLINDER



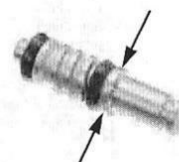
Measure the master cylinder I.D.

SERVICE LIMIT: 12.755 mm (0.5022 in)

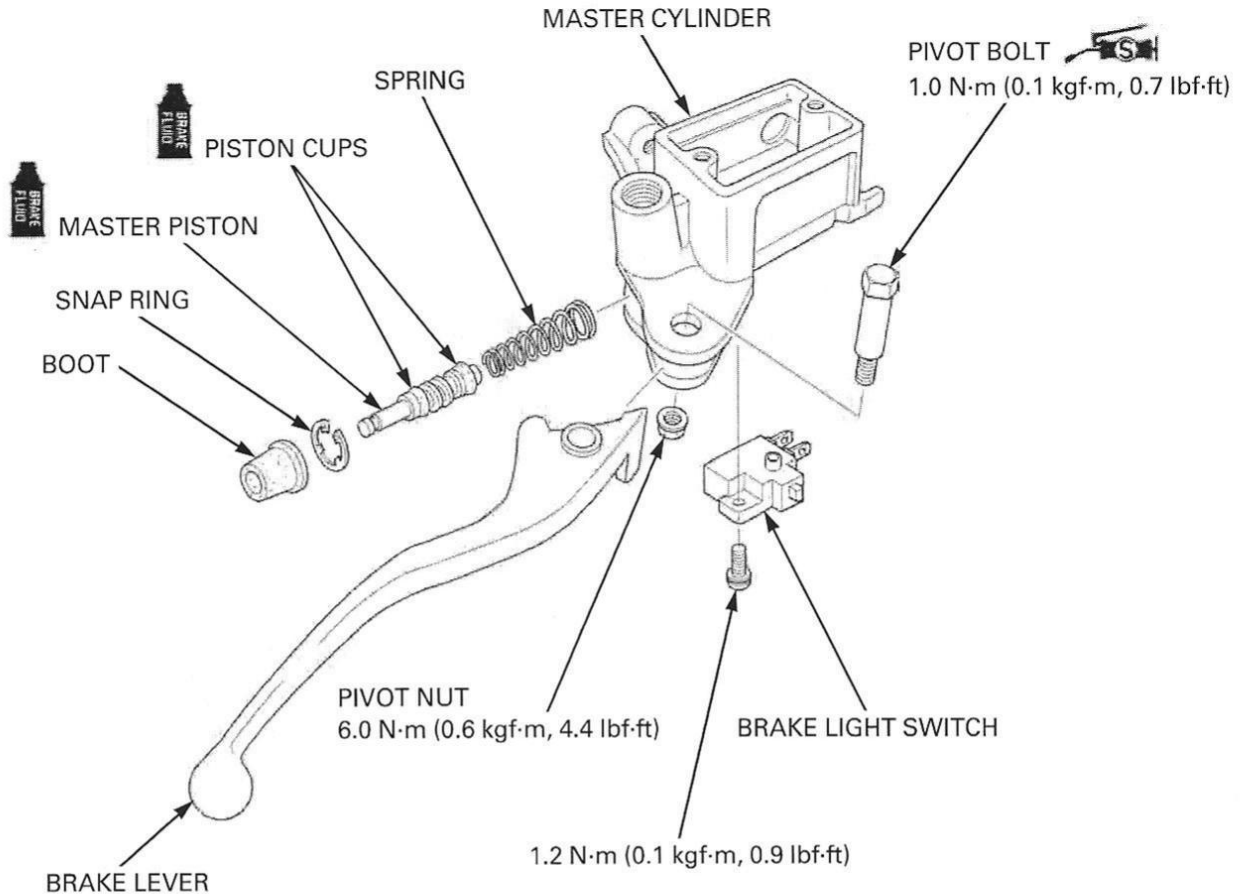


Measure the master piston O.D.

SERVICE LIMIT: 12.645 mm (0.4978 in)



ASSEMBLY



Keep the piston, cups, spring, snap ring and boot as a set; do not substitute individual part.

Coat the master piston, spring, and piston cups with clean brake fluid.

Install the spring with its tapered side facing the master piston.

Install the master piston/spring into the master cylinder.

- Do not allow the piston cup lips to turn inside out.

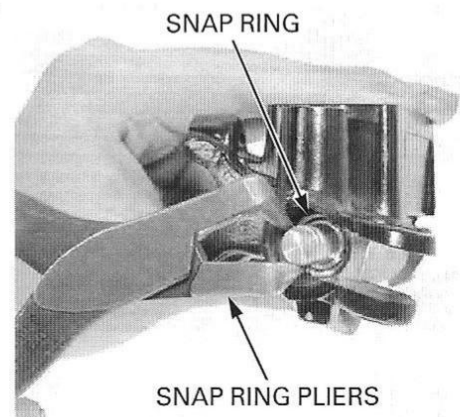
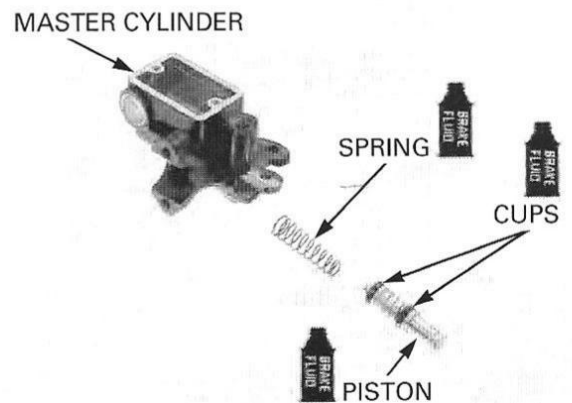
Be certain the snap ring is firmly seated in the groove.

Install the snap ring into the groove in the master cylinder using the special tool.

TOOL:

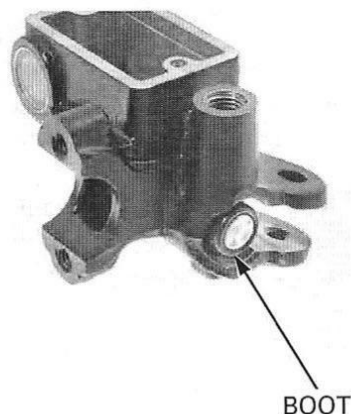
Snap ring pliers

07914-SA50001



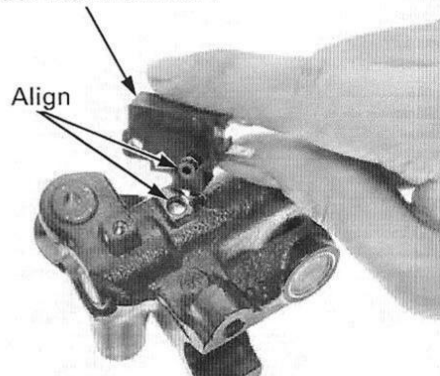
BRAKE SYSTEM

Install the boot securely.



Install the brake light switch by aligning its boss with the hole of the master cylinder.

BRAKE LIGHT SWITCH

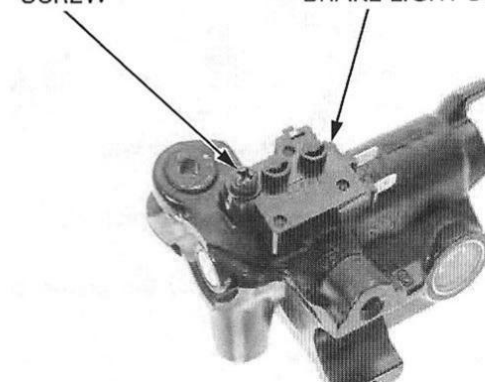


Install and tighten the brake light switch screw to the specified torque.

TORQUE: 1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)

SCREW

BRAKE LIGHT SWITCH



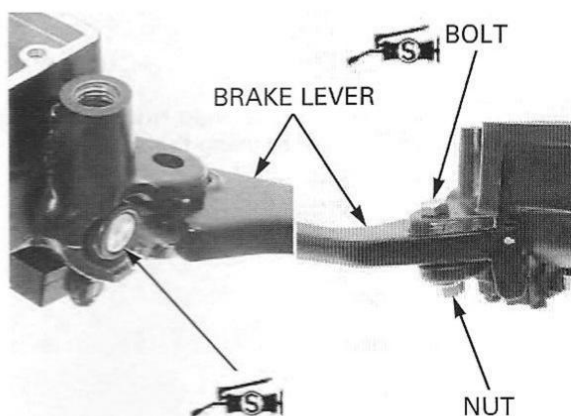
Apply silicone grease to the brake lever contacting area of the master piston and brake lever pivot bolt sliding surface.

Install the brake lever to the master cylinder.
Install and tighten the pivot bolt to the specified torque.

TORQUE: 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)

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

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



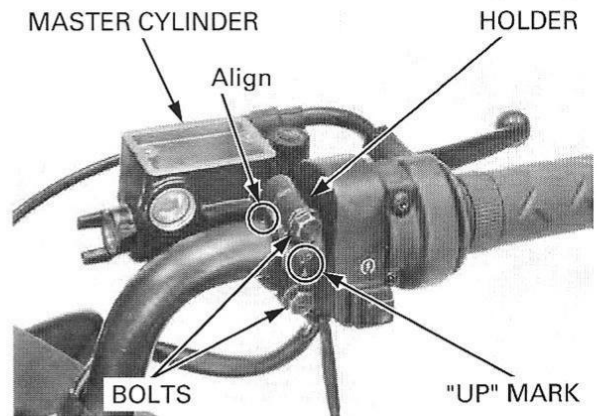
INSTALLATION

Install the master cylinder and holder with the "UP" mark facing up.

Loosely install the bolts while aligning the end of the master cylinder with the punch mark on the handlebar.

Tighten the upper bolt first, then tighten the lower bolt to the specified torque.

TORQUE: 9 N·m (0.9 kgf·m, 6.6 lbf·ft)



Push the brake hose joint against the stopper of the lower side.

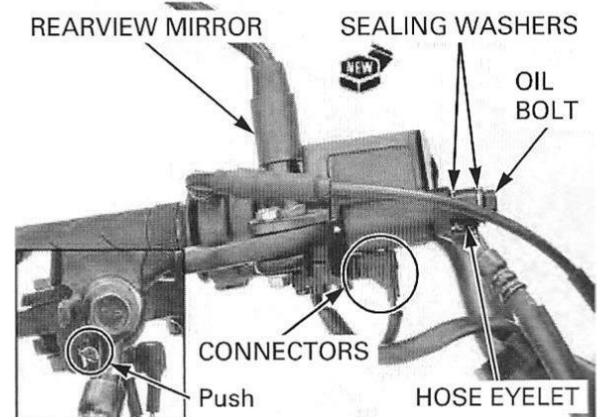
Install the brake hose to the master cylinder with the oil bolt and new sealing washers. Tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Connect the brake light switch connectors.

Fill and bleed the hydraulic brake system with brake fluid (page 14-7).

Install the right rearview mirror (page 2-19).



FRONT BRAKE CALIPER

NOTICE

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

NOTE:

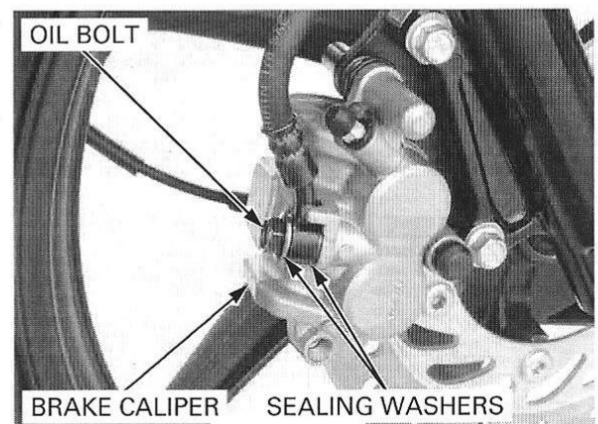
When removing the brake hose oil bolt, cover the end of the hose to prevent contamination. Secure the hose to prevent fluid from leaking out.

REMOVAL

Drain the brake fluid from the hydraulic brake system (page 14-6).

Remove the brake pads (page 14-8).

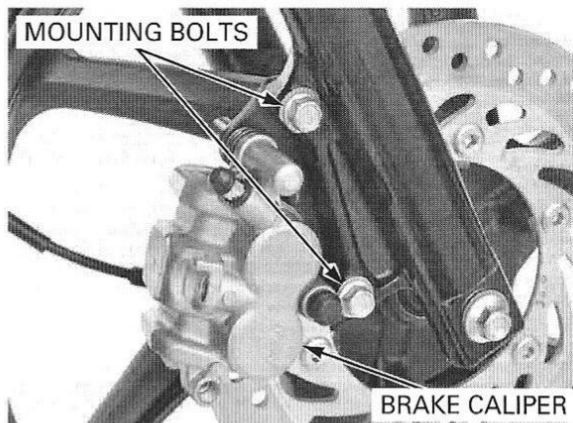
Remove the oil bolt, sealing washers and disconnect the brake hose from the brake caliper.



BRAKE SYSTEM

Do not reuse the brake caliper mounting bolts.

Remove the brake caliper mounting bolts and brake caliper.

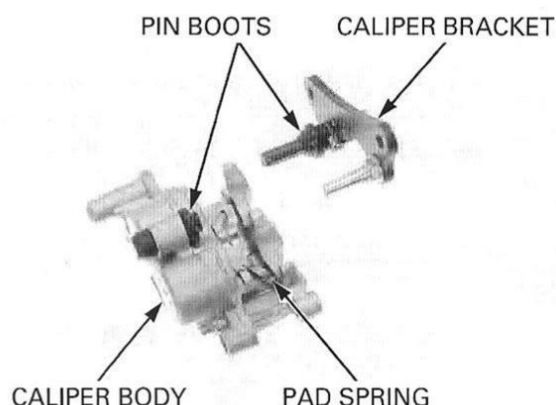


DISASSEMBLY

Remove the caliper bracket from the caliper body.

Remove the caliper pin boot from the caliper bracket.

Remove the pad spring and pin boot from the caliper body.



Place a shop towel over the caliper pistons.

Do not use high pressure air or bring the nozzle too close to the inlet.

Position the caliper body with the piston down, and apply short bursts of air pressure to the fluid inlet to remove the caliper pistons.

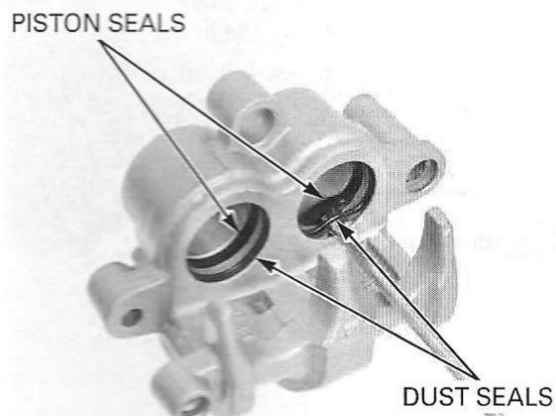


Be careful not to damage the piston sliding surface.

Remove the dust and piston seals from the brake caliper.

Clean the seal grooves, caliper piston sliding surfaces and caliper pistons with clean brake fluid.

- Mark the pistons to ensure that they are reinstall in their original locations.

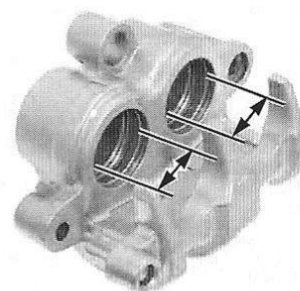


INSPECTION

Check the caliper cylinder for scoring, scratches or damage.

Measure the caliper cylinder I.D.

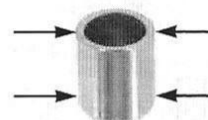
SERVICE LIMIT: 25.460 mm (1.0024 in)



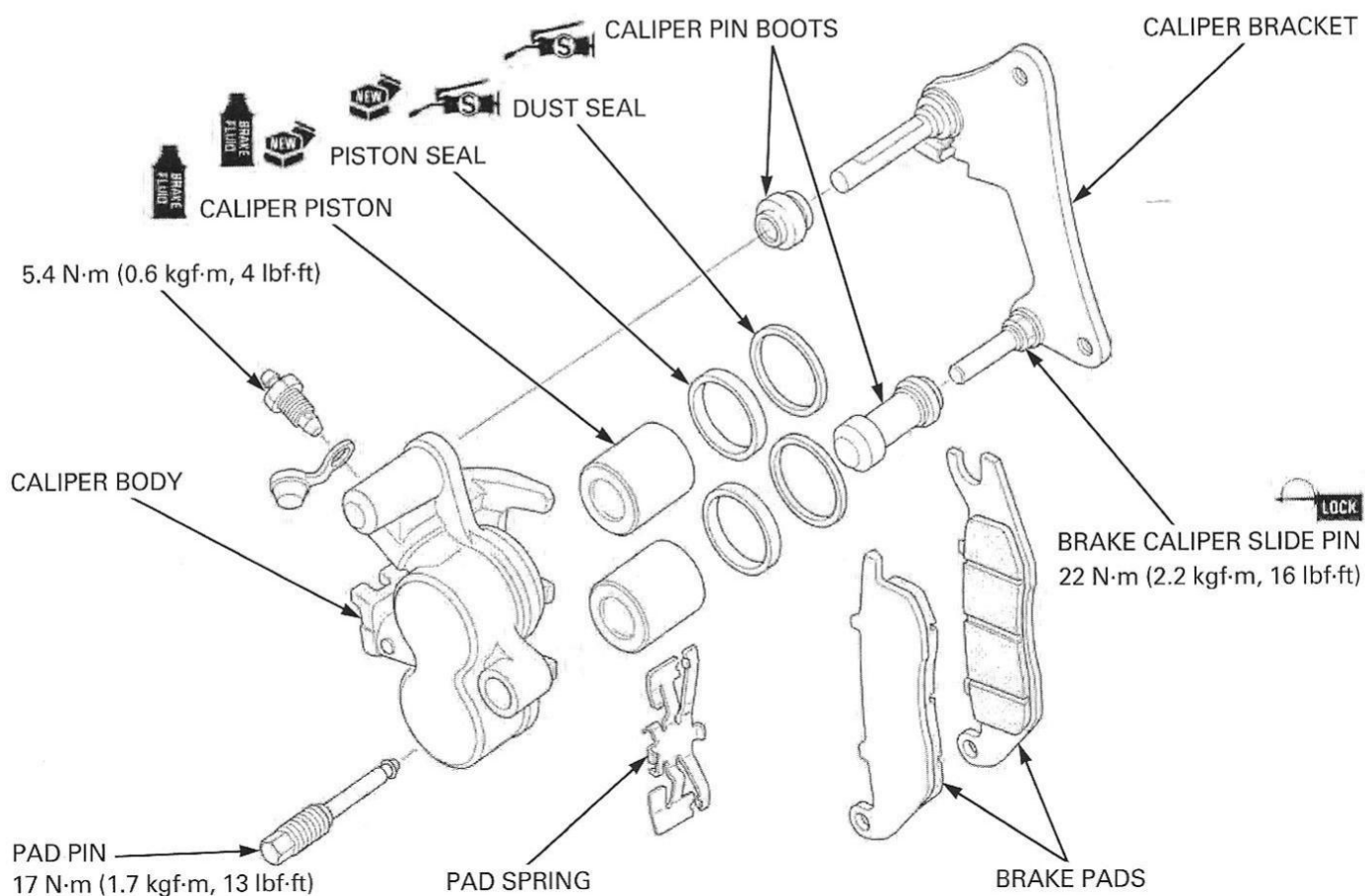
Check the caliper piston for scoring, scratches or damage.

Measure the caliper piston O.D.

SERVICE LIMIT: 25.310 mm (0.9965 in)



ASSEMBLY



BRAKE SYSTEM

NOTE:

- Be sure that each part is free from the dust or dirt before disassembly.

Coat new piston seal whole surface with clean brake fluid.

Coat new dust seal whole surface with silicone grease.

Install the piston seals and dust seals into the seal grooves in the caliper cylinder.

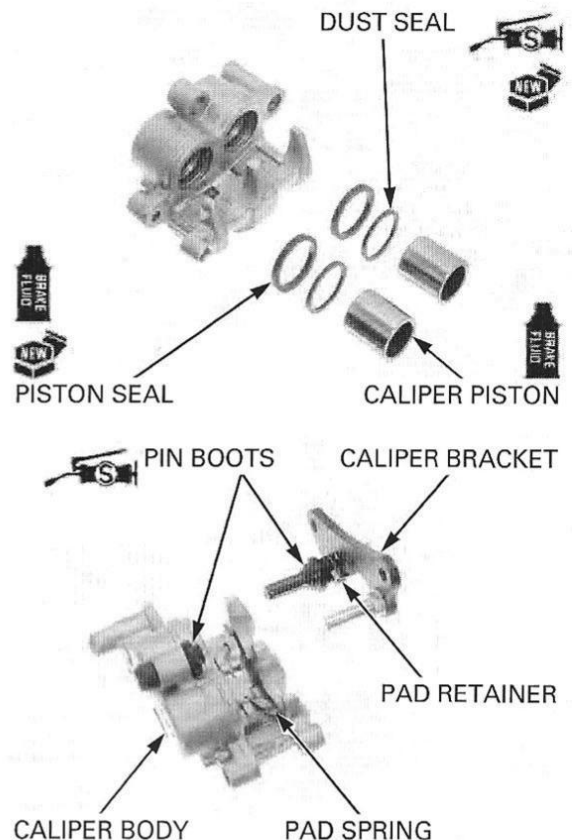
Coat the caliper piston outer surface with clean brake fluid and install them into their original locations with the opening sides toward the pads.

Install the pad spring onto the caliper body.

Replace the bracket pin boots with new ones if they are wear, deterioration or damage.

Apply silicone grease to the inside of the brake caliper pin boots, and install them into the caliper body.

Install the caliper bracket into the caliper body.



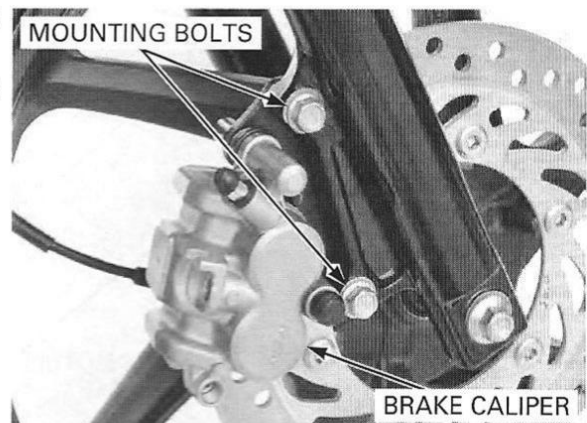
INSTALLATION

Be careful not to damage the pads.

Install the brake caliper to the right fork leg so that the disc is positioned between the pads.

Install and tighten new brake caliper mounting bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



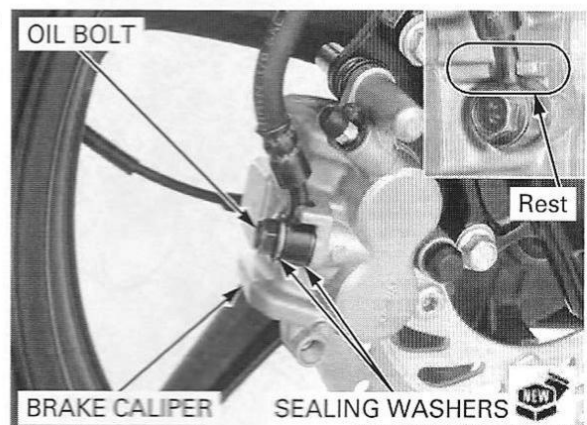
Install the brake hose to the brake caliper with the oil bolt and new sealing washers.

Rest the hose joint onto the stoppers, and tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the brake pads (page 14-8).

Fill and bleed the hydraulic system with brake fluid (page 14-7).



BRAKE PEDAL

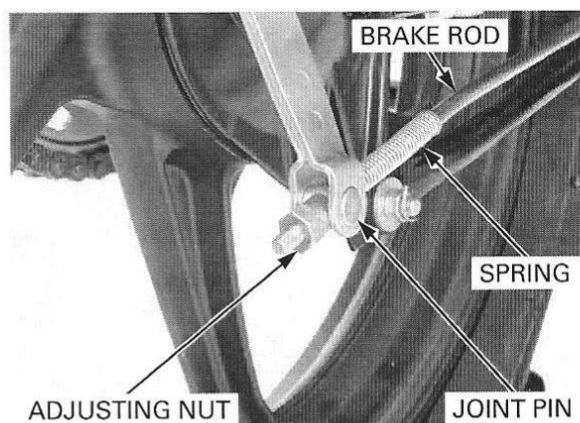
REMOVAL

Support the motorcycle on its center stand.

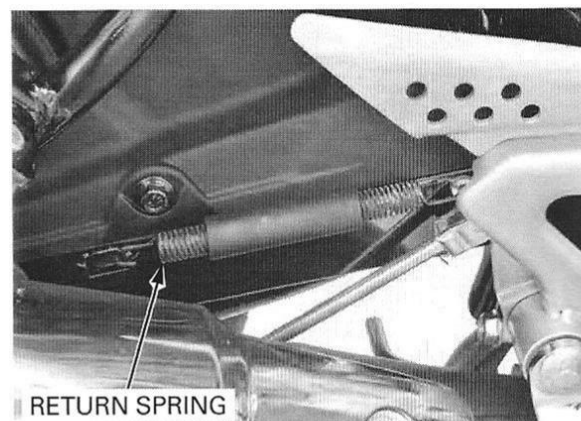
Remove the rear brake adjusting nut.

Push the brake pedal down, and remove the brake rod from the joint pin.

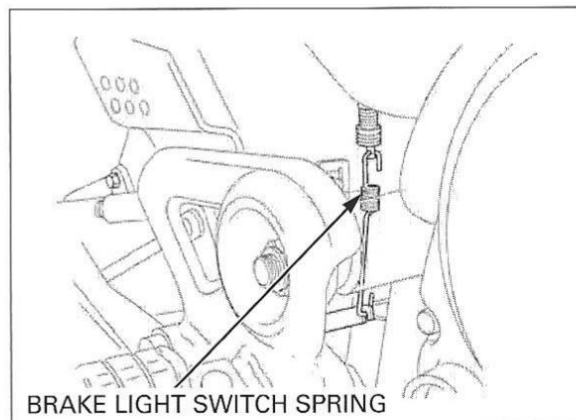
Remove the rod spring and joint pin.



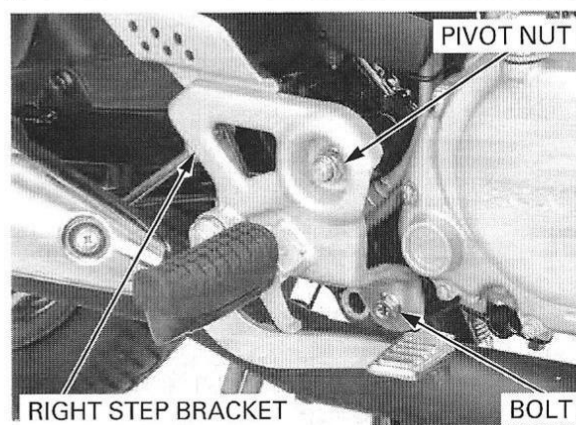
Unhook the brake pedal return spring.



Unhook the brake light switch spring from the brake pedal.



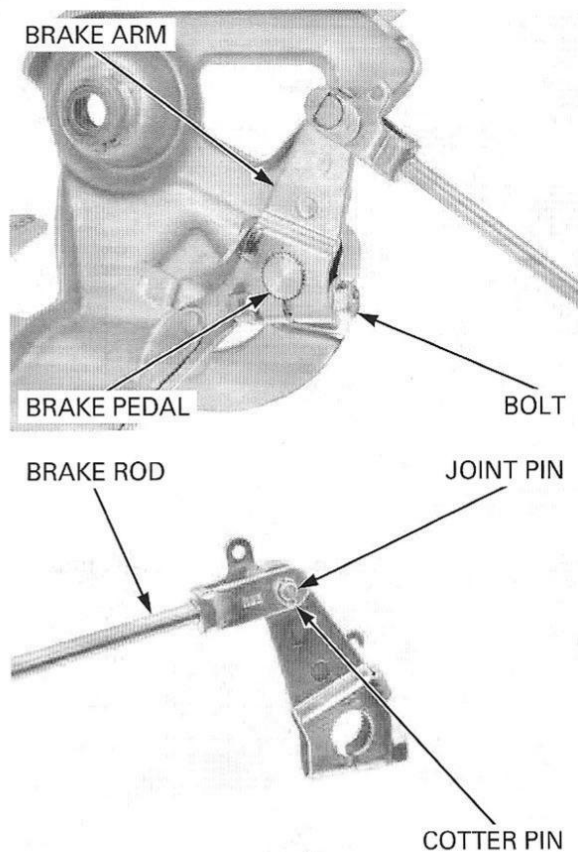
Remove the pivot nut, bolt and right step bracket.



BRAKE SYSTEM

Remove the bolt and brake arm from the brake pedal.

Remove the brake pedal from the right step bracket.

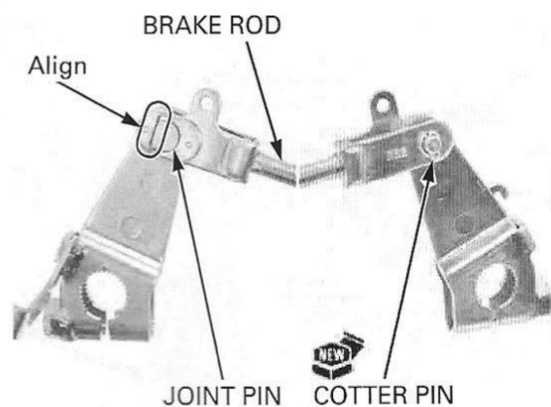


Remove the cotter pin, joint pin and brake rod.

INSTALLATION

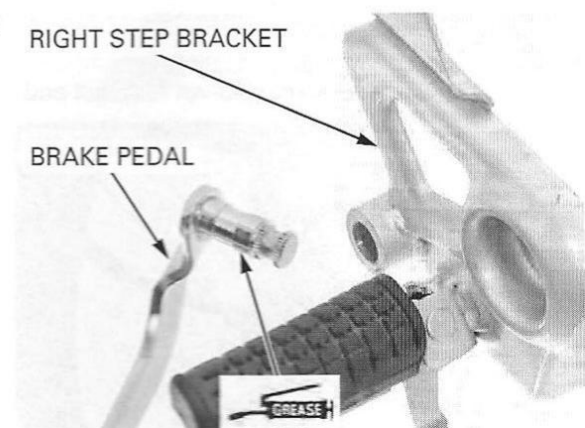
Install the brake rod to the brake arm, then install the joint pin by aligning the cut-outs of the joint pin and brake rod.

Install a new cotter pin to the joint pin hole securely.



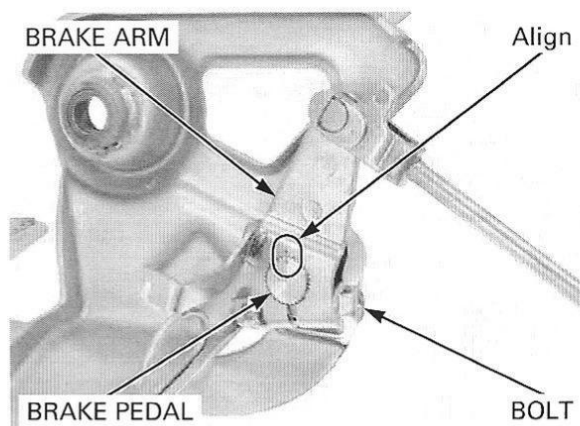
Apply 3 g (0.1 oz) of grease to the brake pedal pivot sliding surface.

Install the brake pedal to the right step bracket.



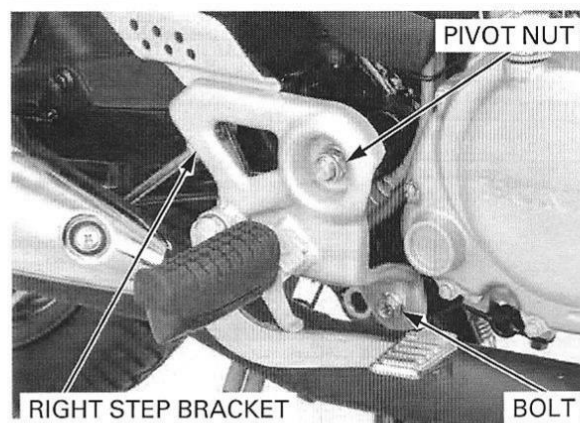
Install the brake arm to the brake pedal while aligning the punch marks of the brake arm and brake pedal.

Install and tighten the bolt securely.

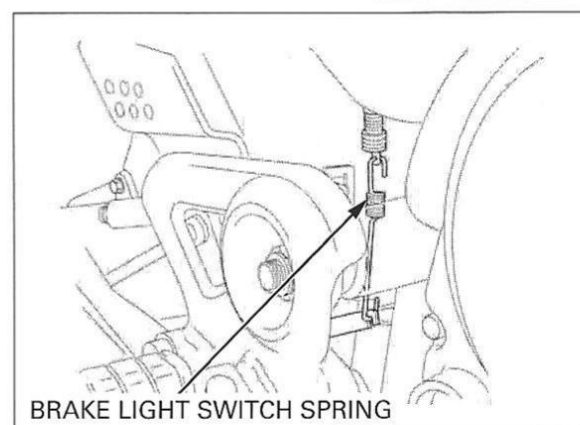


Install the right step bracket and bolt.

Loosely install the pivot nut.



Hook the brake light switch spring to the brake pedal.



Hook the return spring.



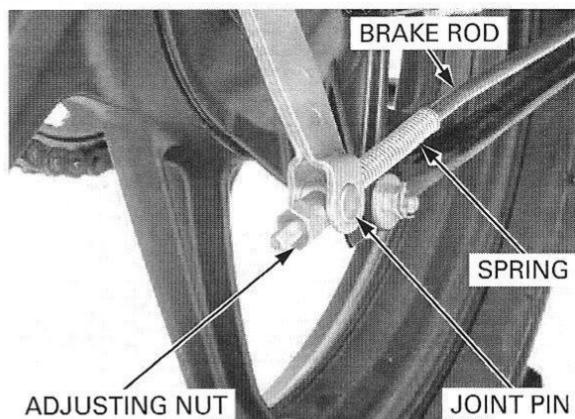
BRAKE SYSTEM

Install the joint pin to the brake arm.
Install the rod spring to the brake rod.

Push down the brake pedal, and insert the brake rod into the joint pin.

Install the adjusting nut.

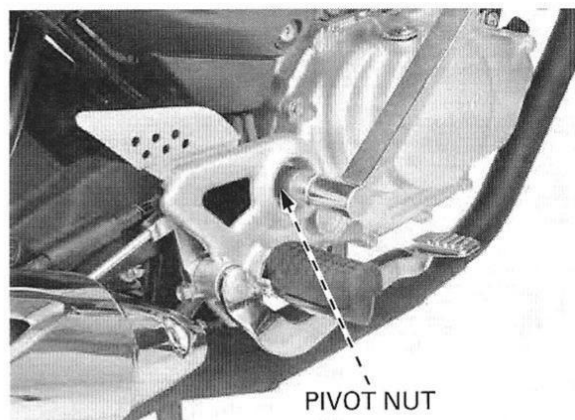
Adjust the brake pedal freeplay (page 3-21).



Retract the center stand and support the motorcycle as be preload to the shock absorber and swingarm pivot bushings.

Tighten the pivot nut to the specified torque.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)



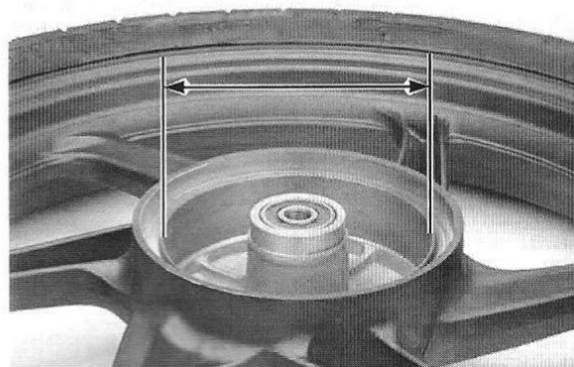
REAR DRUM BRAKE

INSPECTION

Remove the rear wheel and then remove the brake panel (page 13-6).

Measure the rear brake drum I.D.

SERVICE LIMIT: 131.0 mm (5.16 in)



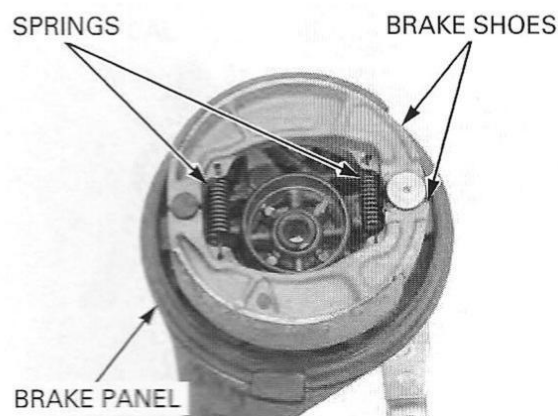
DISASSEMBLY

Expand the brake shoes and remove them from the brake panel.

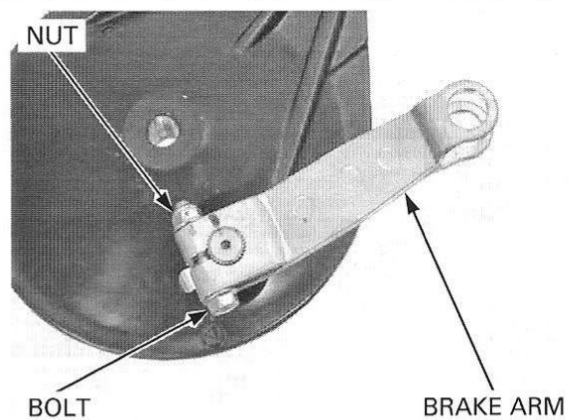
Remove the shoe springs from the brake shoes.

NOTE:

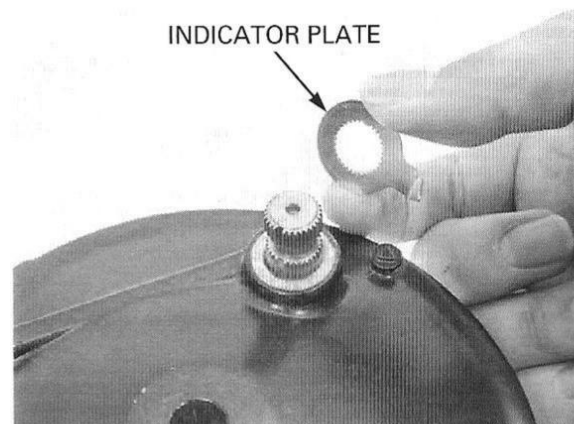
- Always replace the brake shoes as a set.
- When the brake shoes are reused, mark all parts before disassembly so they can be installed in their original locations.



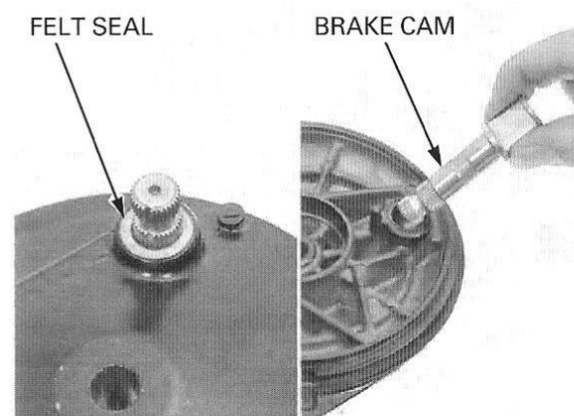
Remove the brake arm nut, bolt and brake arm.



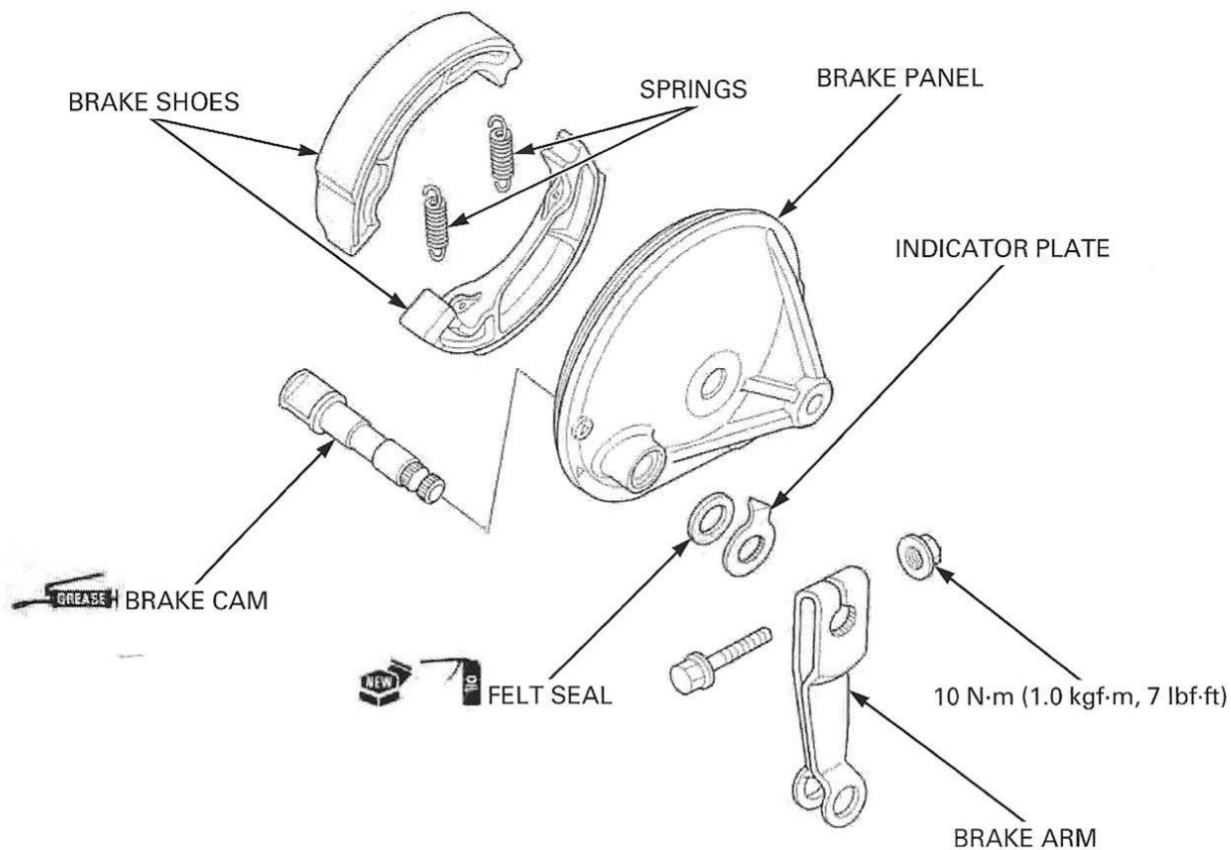
Remove the indicator plate.



Remove the felt seal and brake cam.



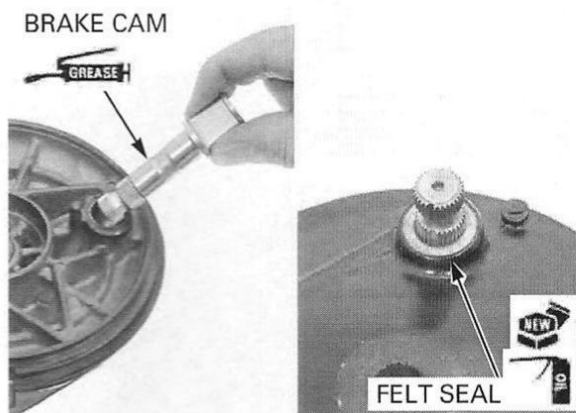
ASSEMBLY



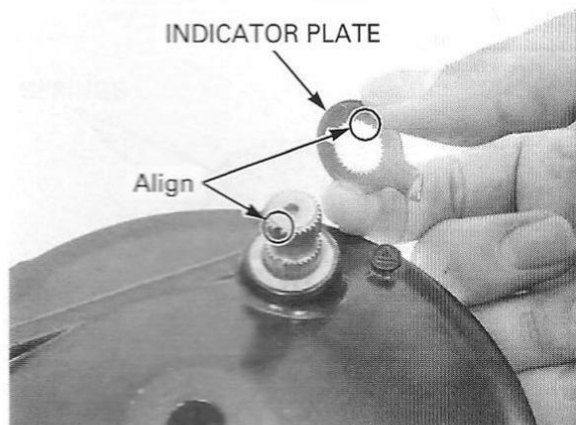
Apply grease to the brake cam sliding surface.

Install the brake cam to the brake panel.

Apply engine oil to a new felt seal and install it onto the brake panel.



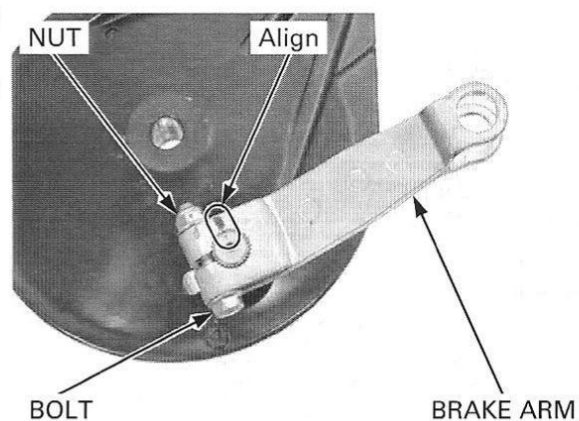
Install the indicator plate onto the brake cam by aligning its wide tooth with the wide groove on the brake cam.



Install the brake arm by aligning the punch marks of the brake arm and brake cam.

Install the brake arm bolt and nut as shown, and tighten the nut to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



Apply 0.20 – 0.30 g (0.007 – 0.010 oz) of grease to the following:

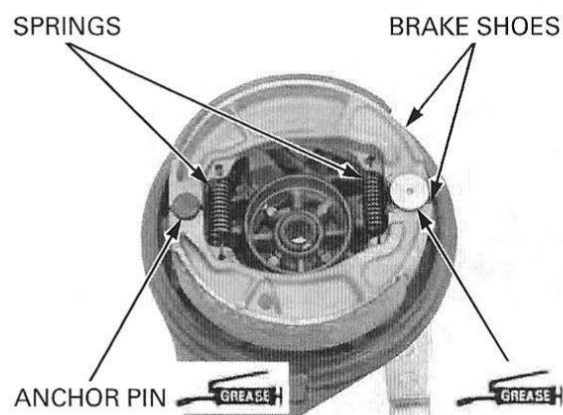
- Brake cam sliding surface and shoe contacting area
- Brake panel anchor pin sliding surface

If the brake shoes are reused, the shoes and springs must be placed back in their original locations.

Assemble the brake shoes and springs. Install the shoe assembly onto the brake panel.

Wipe any excess grease off the brake cam and anchor pin.

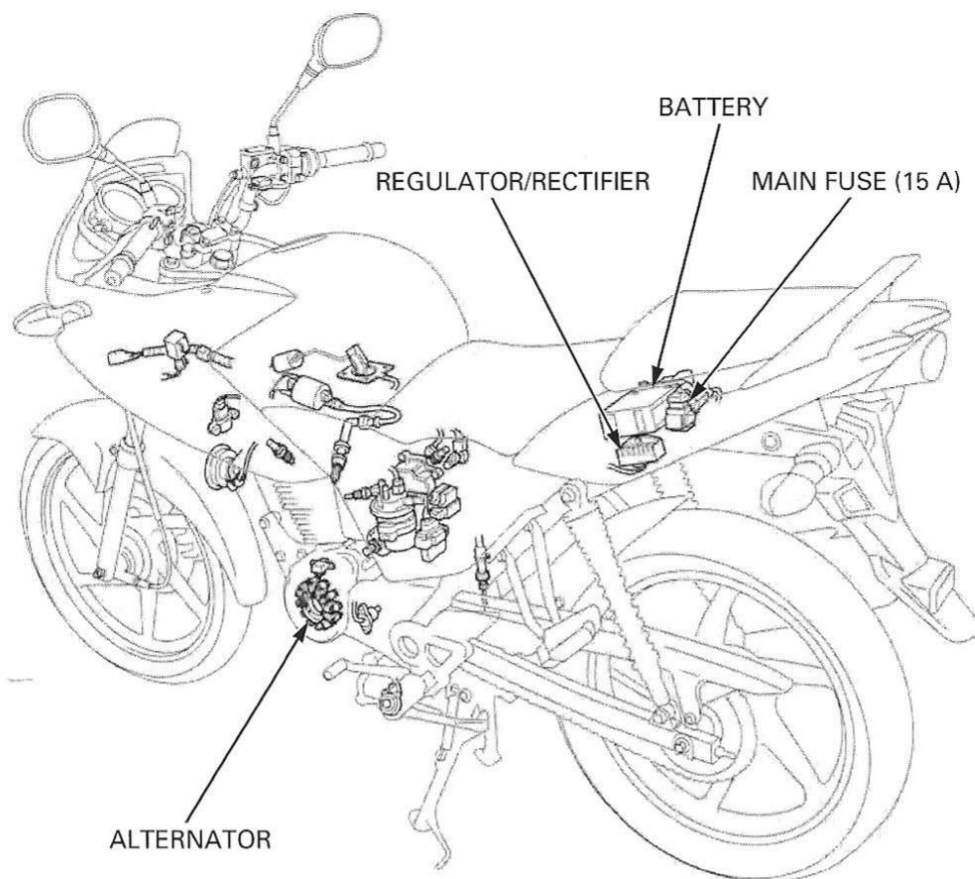
Install the brake panel and then install the rear wheel (page 13-11).



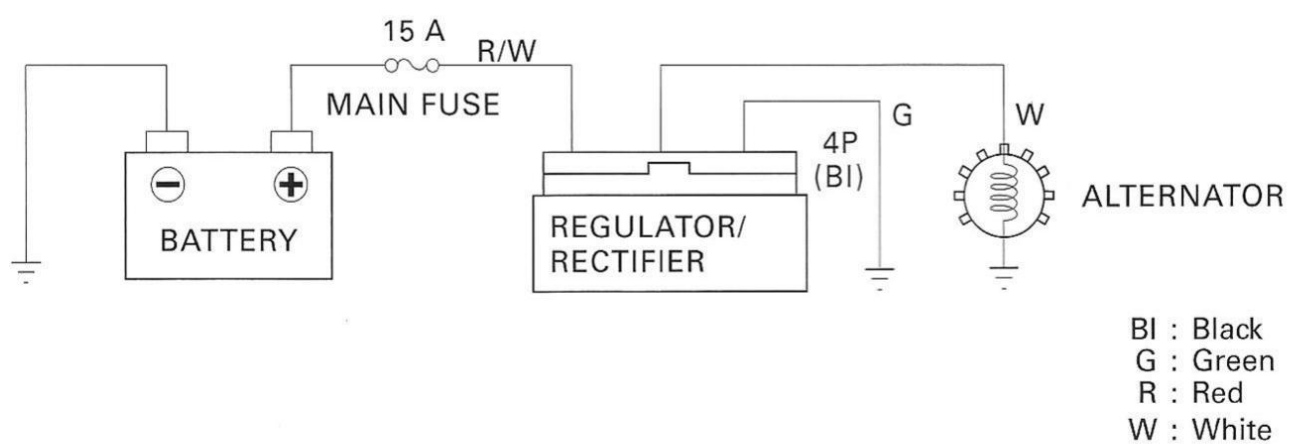
15. BATTERY/CHARGING SYSTEM

SYSTEM LOCATION.....	15-2	BATTERY	15-7
SYSTEM DIAGRAM.....	15-2	CHARGING SYSTEM INSPECTION.....	15-8
SERVICE INFORMATION	15-3	ALTERNATOR CHARGING COIL	15-9
TROUBLESHOOTING	15-5	REGULATOR/RECTIFIER	15-9

SYSTEM LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

⚠ WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
 - If electrolyte gets on your skin, flush with water.
 - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
 - If swallowed, drink large quantities of water or milk and call your local Poison Control Center or a 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 by the ignition switch is ON, and current is present.*
- This model comes with a maintenance free (MF) battery. Remember the following about MF batteries:
 - Use only the electrolyte that comes with the battery.
 - Use all of the electrolyte.
 - Seal the battery properly.
 - Never open the seals after installation.
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For a battery remaining in a stored motorcycle, 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 a long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2 – 3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and tail light ON for long periods of time without riding the motorcycle.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every 2 weeks to prevent sulfation from occurring.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 15-5).
- For stator removal (page 10-11).

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 in 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 can be measured.

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

BATTERY/CHARGING SYSTEM

SPECIFICATIONS

ITEM			SPECIFICATION
Battery	Capacity		12 V – 6 Ah
	Current leakage		0.1 mA max.
	Voltage (20°C/68°F)	Fully charged	12.7 – 12.9 V
		Needs charging	Below 12.4 V
	Charging current	Normal	0.6 A x 5 – 10 h
		Quick	3.0 A x 1 h
Alternator	Capacity		0.170 kW/5,000 min ⁻¹ (rpm)
	Charging coil resistance (20°C/68°F)		0.2 – 1.0 Ω

TROUBLESHOOTING

BATTERY IS DAMAGED OR WEAK

1. BATTERY TEST

Remove the battery (page 15-7).

Check the battery condition using the recommended battery tester.

RECOMMENDED BATTERY TESTER:

BM-210 or BATTERY MATE or equivalent

Is the battery in good condition?

YES – GO TO STEP 2.

NO – Faulty battery

2. FUSE INSPECTION

Check the main fuse (15 A) for blown.

Is the main fuse good condition?

YES – GO TO STEP 3.

NO – Replace a main fuse.

3. CURRENT LEAKAGE TEST

Install the battery (page 15-7).

Check the battery current leakage (Leak test; page 15-8).

Is the current leakage below 0.1 mA?

YES – GO TO STEP 5.

NO – GO TO STEP 4.

4. CURRENT LEAKAGE TEST WITHOUT REGULATOR/RECTIFIER CONNECTOR

Disconnect the regulator/rectifier connector, and recheck the battery current leakage.

Is the current leakage below 0.1 mA?

YES – Faulty regulator/rectifier

NO – • Shorted wire harness
• Faulty ignition switch

5. ALTERNATOR CHARGING COIL INSPECTION

Check the alternator charging coil (page 15-9).

Is the alternator charging coil resistance within 0.2 – 1.0 Ω (20°C/68°F)?

YES – GO TO STEP 6.

NO – Faulty charging coil

6. CHARGING VOLTAGE INSPECTION

Measure and record the battery voltage using a digital multimeter (page 15-7).

Start the engine and measure the charging voltage (page 15-8).

Compare the measurements to the results of the following calculation.

STANDARD:

Measured BV < Measured CV < 15.5 V

- BV = Battery Voltage (page 15-7)
- CV = Charging Voltage (page 15-8)

Is the measured charging voltage within the standard voltage?

YES – Faulty battery

NO – GO TO STEP 7.

7. REGULATOR/RECTIFIER SYSTEM INSPECTION

Check the voltage and resistance at the regulator/rectifier connector (page 15-9).

Are the results of the checked voltage and resistance correct?

YES – Faulty regulator/rectifier

NO –

- Open circuit in related wire
- Loose or poor contacts of related terminal
- Shorted wire harness

BATTERY

REMOVAL/INSTALLATION

Always turn the ignition switch OFF before removing the battery.

Remove the seat (page 2-11).

Remove the bolts and battery holder.

Remove the bolt and disconnect the battery negative (-) cable from the battery.

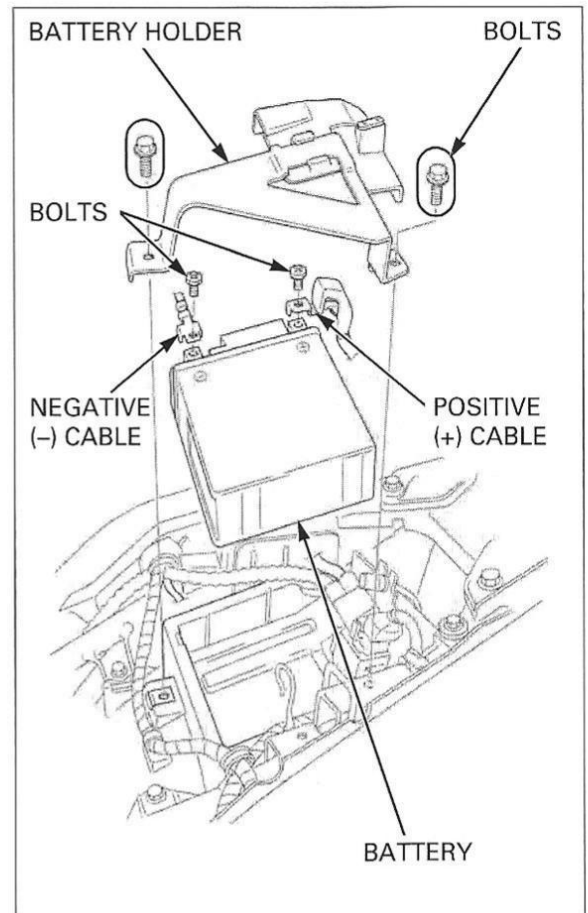
Remove the bolt and disconnect the battery positive (+) cable from the battery.

Remove the battery from the rear fender.

Route the battery cable properly (page 1-16).

Install the battery in the reverse order of removal.

- Connect the positive (+) cable first and then the negative (-) cable.



VOLTAGE INSPECTION

Remove the seat (page 2-11).

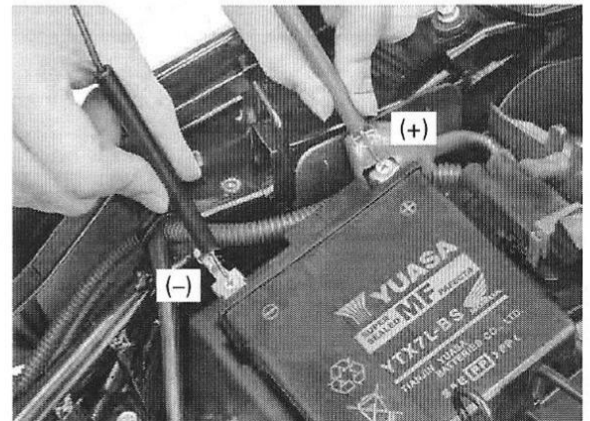
Measure the battery voltage using a commercially available digital multimeter.

VOLTAGE (20°C/68°F):

Fully charged: 12.7 – 12.9 V

Under charged: Below 12.4 V

If the battery voltage is below 12.4 V, charge the battery.



BATTERY TESTING

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

TOOL:

Battery tester

BM-210 or BATTERY MATE or equivalent

CHARGING SYSTEM INSPECTION**CURRENT LEAKAGE INSPECTION**

Remove the seat (page 2-11).

Turn the ignition switch OFF and disconnect the negative (-) cable from the battery.

Connect the ammeter (+) probe to the battery negative (-) cable and ammeter (-) probe to the battery negative (-) terminal.

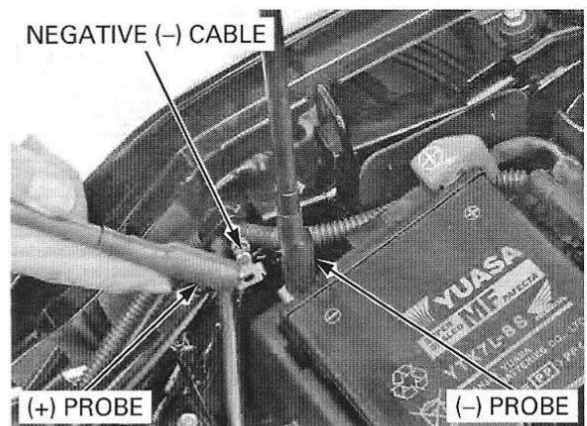
With the ignition switch OFF and check for current leakage.

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition switch ON. A sudden surge of current may blow out the fuse in the tester.

SPECIFIED CURRENT LEAKAGE: 0.1 mA max.

If current leakage exceeds the specified value, a shorted circuit is likely.

Locate the shorted circuit by disconnecting connections one by one and measuring the current.

**CHARGING VOLTAGE INSPECTION**

Remove the seat (page 2-11).

Be sure the battery is in good condition before performing this test.

Warm up the engine to normal operating temperature.

Stop the engine, and connect the multimeter between the battery positive (+) and negative (-) terminals of the battery.

- To prevent a short, make absolutely certain which are the positive (+) and negative (-) terminals or cables.
- Do not disconnect the battery or any cable in the charging system without first turning the ignition switch OFF. Failure to follow this precaution can damage the tester or electrical components.

Connect a tachometer according to the tachometer manufacturer's instructions.

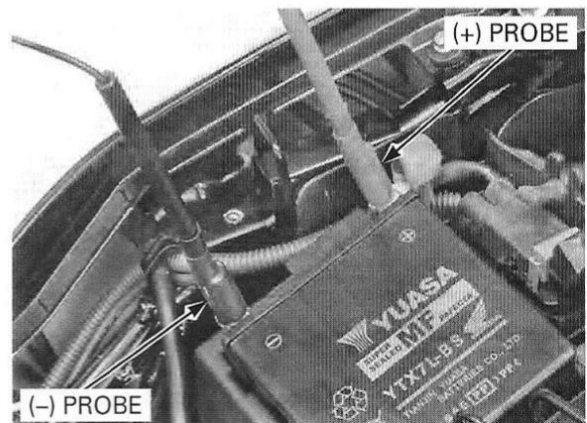
Restart the engine.

With the headlight on high beam, measure the voltage on the multimeter when the engine runs at 5,000 min⁻¹ (rpm).

STANDARD:

Measured BV < Measured CV < 15.5 V

- BV = Battery Voltage (page 15-7)
- CV = Charging voltage



ALTERNATOR CHARGING COIL

INSPECTION

Remove the left side cover (page 2-10).

Disconnect the alternator 2P (Natural) connector.



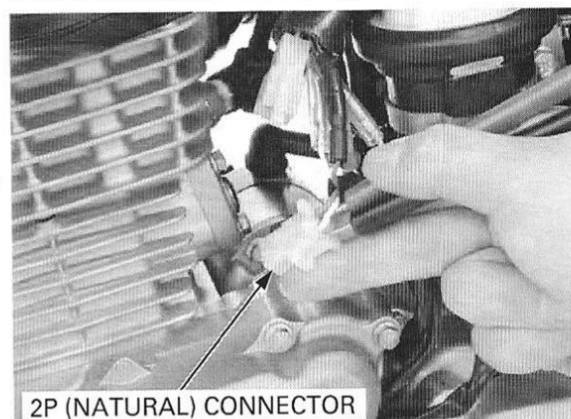
Measure the resistance between each wire terminal of the alternator side connector.

CONNECTION: White – Green

STANDARD: 0.2 – 1.0 Ω (20°C/68°F)

If reading is for beyond the standard, replace the stator.

For stator removal (page 10-11).



REGULATOR/RECTIFIER

SYSTEM INSPECTION

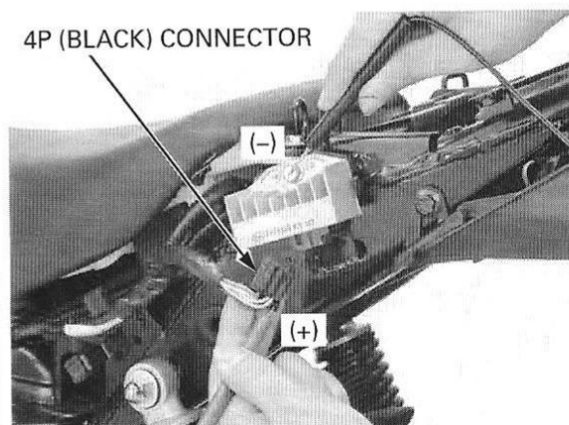
Remove the rear cowl (page 2-13).

Disconnect the regulator/rectifier 4P (Black) connector, and check it for loose contact or corroded terminals.

If the charging voltage reading (page 15-8) is out of the specification, measure and check the following between the wire harness side connector terminal and ground:

Item	Terminal	Specification
Battery charging line	Red (+) and ground (-)	Battery voltage should appear
Charging coil line	White and ground	0.2 – 1.0 Ω (20°C/68°F)
Ground line	Green and ground	Continuity should exist

If all components of the charging system are normal and there are no loose connection at the regulator/rectifier connector, replace the regulator/rectifier.



REMOVAL/INSTALLATION

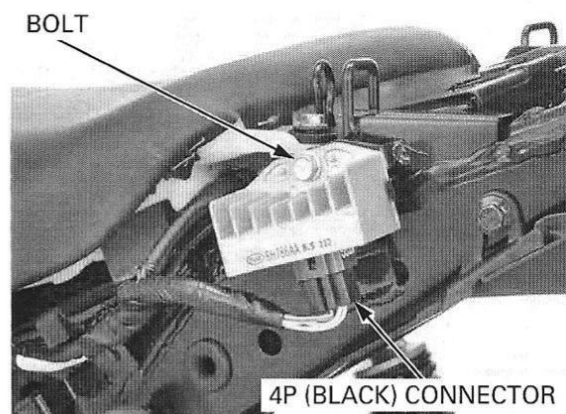
Remove the rear cowl (page 2-13).

Disconnect the regulator/rectifier 4P (Black) connector.

Remove the bolt and regulator/rectifier from the frame.

Install the regulator/rectifier in the reverse order of removal.

- Route the wire and cable properly (page 1-16).

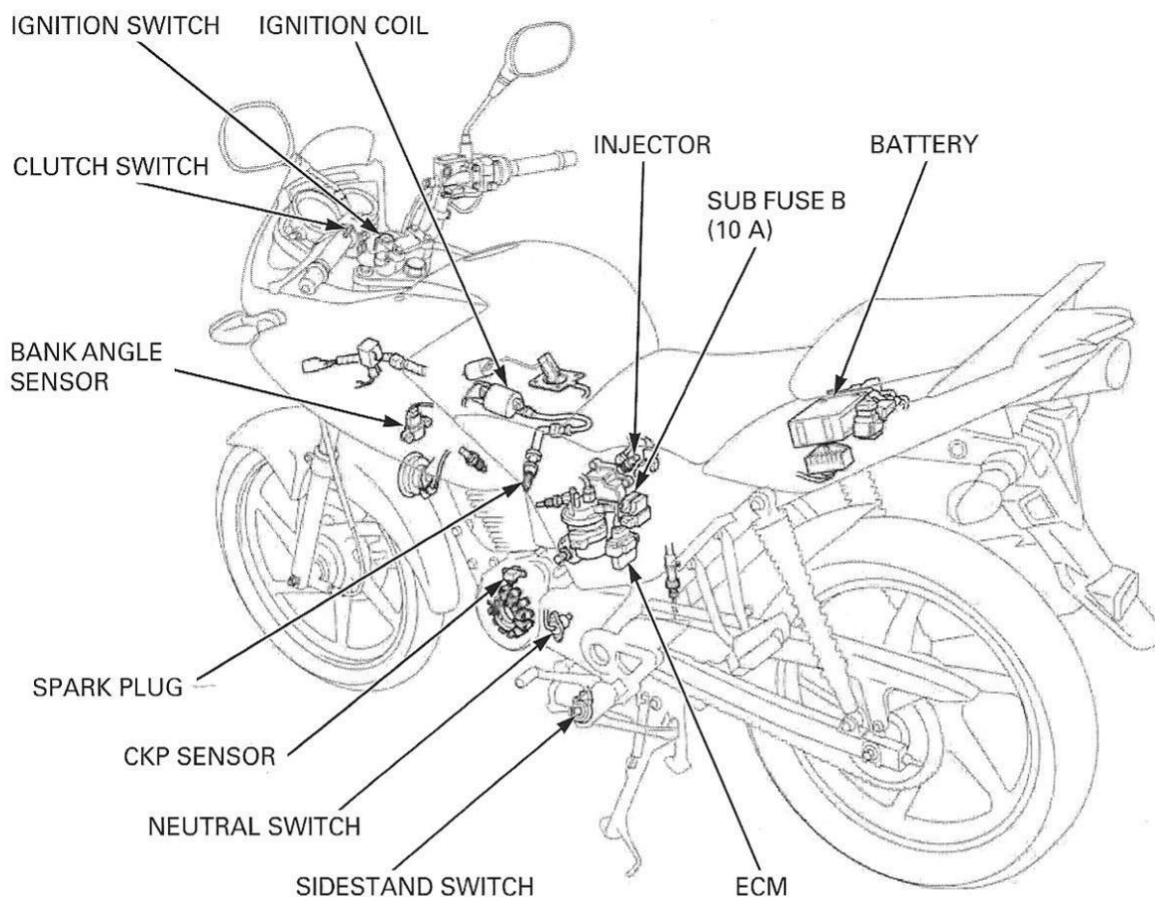


16. IGNITION SYSTEM

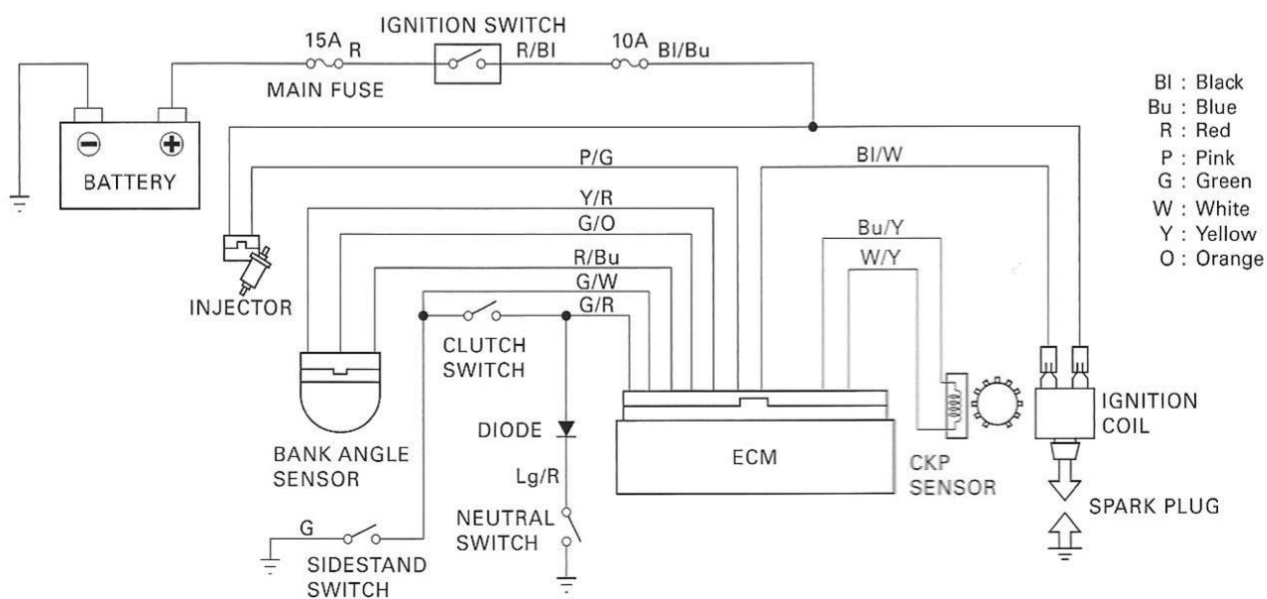
SYSTEM LOCATION.....	16-2	IGNITION SYSTEM INSPECTION.....	16-5
SYSTEM DIAGRAM.....	16-2	IGNITION TIMING	16-8
SERVICE INFORMATION	16-3	IGNITION COIL	16-9
TROUBLESHOOTING	16-4		

IGNITION SYSTEM

SYSTEM LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

NOTICE

- The ECM may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the ECM. Always turn OFF the ignition switch before servicing.
- Use spark plug of the correct heat range. Using spark plug with an incorrect heat range can damage the engine.
- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned ON and current is present.
- When servicing the ignition system, always follow the steps in the troubleshooting sequence (page 16-4).
- This motorcycle's ICM is built into the ECM.
- The ignition timing cannot be adjusted since the ECM is factory preset.
- A faulty ignition system is often related to poor connected or corroded connectors. Check those connections before proceeding. Make sure the battery is adequately charged. Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plug.
- Although the ECM is controlling ignition timing according to engine speed fundamentally, ignition timing is assisted also with the signal from the TP sensor and ECT sensor.
- The following components information.
 - Ignition switch (page 18-9)
 - Sidestand switch (page 18-13)
 - Bank angle sensor (page 5-65)
 - Clutch switch (page 18-12)
 - Neutral switch (page 18-13)
 - Diode (page 17-16)

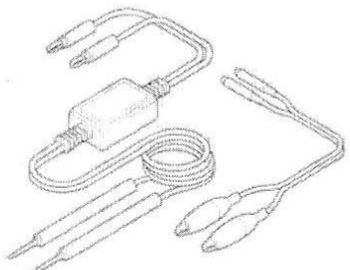
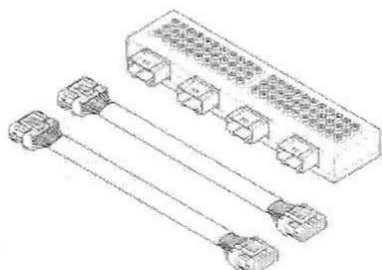
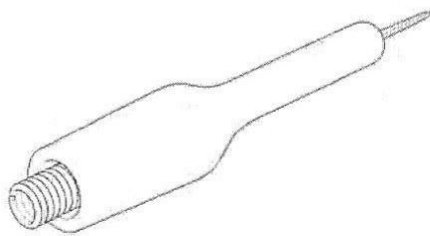
SPECIFICATIONS

ITEM		SPECIFICATION
Spark plug	Standard	CPR7EA-9 (NGK) or UR6DC (BOSCH)
	For extended high speed riding	CPR8EA-9 (NGK) or UR5DC (BOSCH)
Spark plug gap		0.8 – 0.9 mm (0.03 – 0.04 in)
Ignition coil primary peak voltage		100 V minimum
CKP sensor peak voltage		0.7 V minimum
Ignition timing ("F" mark)		10° BTDC at 1,500 min ⁻¹ (rpm)

TORQUE VALUE

Timing hole cap 10 N·m (1.0 kgf·m, 7 lbf·ft)

TOOLS

Imrie diagnostic tester (model 625) or Peak voltage adaptor 07HGG-0020100  with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)	ECM test harness 33P 070MZ-MCA0100 	Test probe 07ZAJ-RDJA110 
--	--	---

TROUBLESHOOTING

- Inspect the following before diagnosing the system.
 - Faulty spark plug
 - Loose spark plug cap or spark plug wire connection
 - Water got into the spark plug cap (Leaking the ignition coil secondary 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 (The engine is not cranked by the starter motor).

No spark at spark plug

	Unusual condition	Probable cause (Check in numerical order)
Ignition coil primary voltage	No initial voltage with the ignition switch turned ON (Other electrical components are normal).	1. Faulty ignition switch 2. An open circuit in Black/blue and/or Red/black wires between the ignition coil and ignition switch 3. Loose or poor connection of the ignition coil primary wire terminal, or an open circuit in the primary coil 4. Faulty ECM (in case when the initial voltage is normal while disconnecting ECM connector).
	Initial voltage is normal, but it drops down to 2 – 4 V while cranking the engine.	1. Incorrect peak voltage adaptor connections (System is normal if measured voltage is over the specifications with reverse connections). 2. Battery is undercharged (Voltage drops largely when the engine is started). 3. No voltage between the Black/blue (+) wire and body ground (–) at the ECM connector or loosen ECM connection 4. An open circuit or loose connection in Green wire at the ECM 5. An open circuit or loose connection in Black/white wire between the ignition coils and ECM 6. Faulty sidestand switch or neutral switch 7. Loose or poor connection or an open circuit in No. 6 related wires – Sidestand switch line: Green/white wire – Neutral switch line: Light green/red wire 8. Faulty CKP sensor (measure peak voltage) 9. Faulty ECM (in case when above No. 1 – 8 are normal)
	Initial voltage is normal but there is no peak voltage while cranking the engine.	1. Incorrect peak voltage adaptor connections (System is normal if measured voltage is over the specifications with reverse connections) 2. Faulty peak voltage adaptor 3. Faulty CKP sensor 4. Faulty ECM (in case when above No. 1 – 3 are normal)
	Initial voltage is normal but peak voltage is lower than the standard value.	1. The multimeter impedance is too low; below 10 M Ω /DCV. 2. Cranking speed is too slow (Battery is undercharged) 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once) 4. Faulty ignition coil 5. Faulty ECM (in case when above No. 1 – 4 are normal)
	Initial and peak voltages are normal but does not spark.	1. Faulty spark plug or leaking ignition coil secondary current ampere 2. Faulty ignition coil
CKP sensor	Peak voltage is lower than the standard value.	1. The multimeter impedance is too low; below 10 M Ω /DCV. 2. Cranking speed is too low (Battery is undercharged). 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). 4. Faulty CKP sensor (in case when above No.1 – 3 are normal)
	No peak voltage	1. Faulty peak voltage adapter 2. Faulty CKP sensor

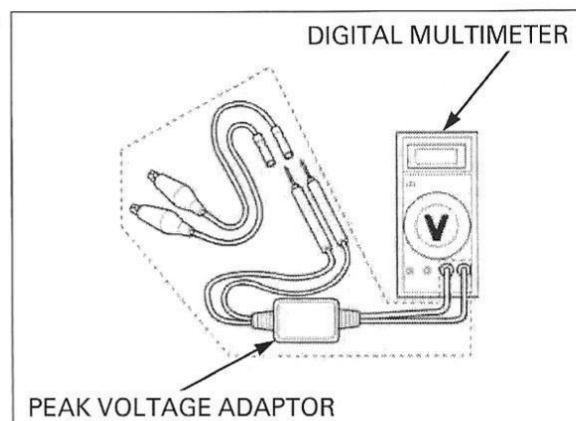
IGNITION SYSTEM INSPECTION

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

Connect the peak voltage adaptor to the digital multimeter, or use the imrie diagnostic tester.

TOOLS:

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



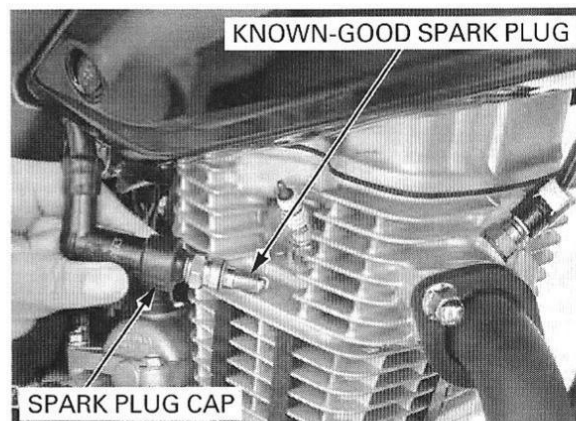
IGNITION COIL PRIMARY PEAK VOLTAGE

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

Disconnect the spark plug cap from the spark plug.

*Avoid touching the
spark plug to
prevent electrical
shock.*

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



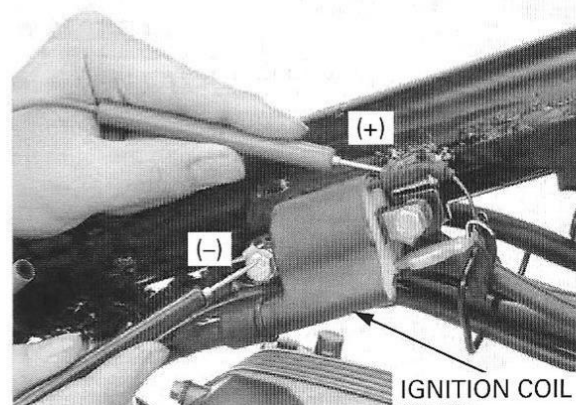
Remove the fuel tank (page 5-53).

Retract the sidestand and shift the transmission into neutral.

Turn the ignition switch ON.

Measure the voltage between the Black/blue (+) wire terminal at the ignition coil and ground (-).

If the battery voltage appears only when the ignition switch is ON, the ignition coil input voltage is normal.



IGNITION SYSTEM

With the ignition coil primary wire connected, connect the peak voltage adaptor or tester probes to the ignition coil primary terminal and ground.

TOOLS:

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

CONNECTION: Black/white (+) – Ground

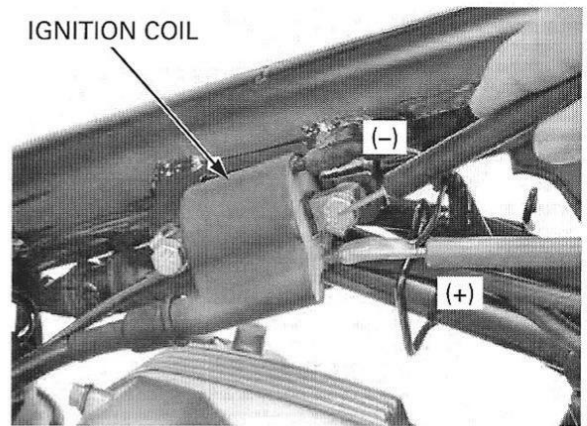
Avoid touching the tester probes to prevent electric shock.

Crank the engine with the starter switch, and measure the ignition coil primary peak voltage.

PEAK VOLTAGE: 100 V minimum

If the peak voltage is abnormal, follow the checks described in the troubleshooting chart (page 16-4).

Install the removed parts in the reverse order of removal.



CKP SENSOR PEAK VOLTAGE

USING THE TEST PROBE

- Check all system connections before performing this inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check the cylinder compression, and make sure that the spark plug is installed correctly in the cylinder head.

Remove the left side cover (page 2-10).

Support the motorcycle on its center stand.

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

TOOLS:

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

CONNECTION: Blue/yellow – White/yellow

Retract the sidestand and shift the transmission into neutral.

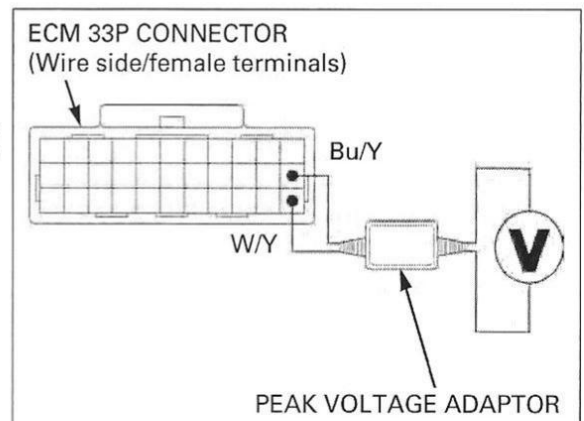
Turn the ignition switch ON.

Avoid touching the tester probes to prevent electric shock.

Crank the engine with the kickstarter, and measure the CKP sensor peak voltage.

PEAK VOLTAGE: 0.7 V minimum

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



Remove the left side cover (page 2-10).

Disconnect the CKP sensor connectors and connect the tester or adaptor probes to the CKP sensor side connector terminals.

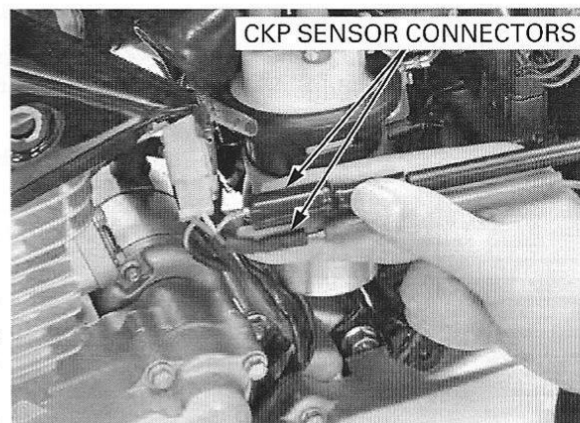
CONNECTION: Blue/yellow – White/yellow

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

- If the peak voltage measured at the ECM 33P connector is abnormal and the one measured at the CKP sensor is normal, the wire harness has an open or short circuit, or loose connection.
- If both peak voltages are abnormal, follow the checks described in the troubleshooting chart (page 16-4).
- If all items are normal, the CKP sensor is faulty.

For CKP sensor replacement (page 10-11).

Install the removed parts in the reverse order of removal.



USING THE TEST HARNESS

- Check all system connections before performing this inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check the cylinder compression, and make sure that the spark plug is installed correctly in the cylinder head.

Support the motorcycle on its center stand.

Connect the test harness to the ECM 33P (Black) connector (page 5-13).

Connect the peak voltage adaptor or tester probes to the terminals of the test harness.

TOOLS:

ECM test harness 070MZ-MCA0100

Imrie diagnostic tester (model 625) or

Peak voltage adaptor 07HGJ-0020100

with commercially available digital multimeter (impedance 10 M Ω /DCV minimum)

CONNECTION: 12 – 23

Retract the sidestand and shift the transmission into neutral.

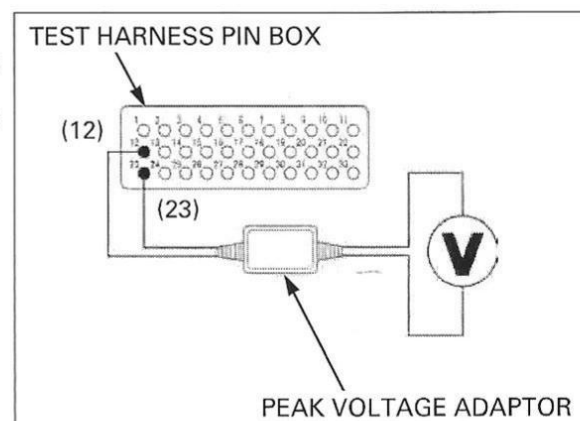
Turn the ignition switch ON.

Avoid touching the tester probes to prevent electric shock.

Crank the engine with the kickstarter, and measure the CKP sensor peak voltage.

PEAK VOLTAGE: 0.7 V minimum

If the peak voltage measured at the test harness is abnormal, measure the peak voltage at the CKP sensor connector.



IGNITION SYSTEM

Remove the left side cover (page 2-10).

Disconnect the CKP sensor connectors and connect the tester or adaptor probes to the CKP sensor side connector terminals.

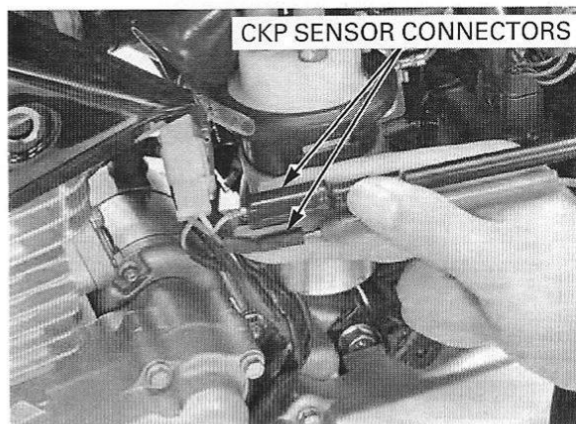
CONNECTION: Blue/yellow – White/yellow

In the same manner as at the test harness, measure the peak voltage and compare it to the voltage measured at the CKP sensor connectors.

- If the peak voltage measured at the test harness is abnormal and the one measured at the CKP sensor is normal, the wire harness has an open or short circuit, or loose connection.
- If both peak voltages are abnormal, follow the checks described in the troubleshooting chart (page 16-4).
- If all items are normal, the CKP sensor is faulty.

For CKP sensor replacement (page 10-11).

Install the removed parts in the reverse order of removal.



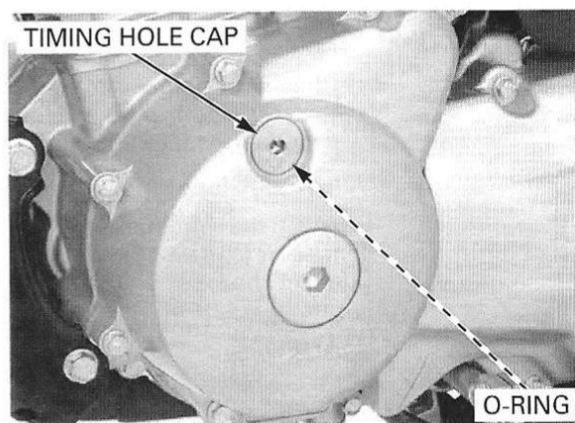
IGNITION TIMING

Warm up the engine.

Stop the engine, and remove the timing hole cap.

Read the instructions for timing light operation.

Connect a timing light to the spark plug wire.

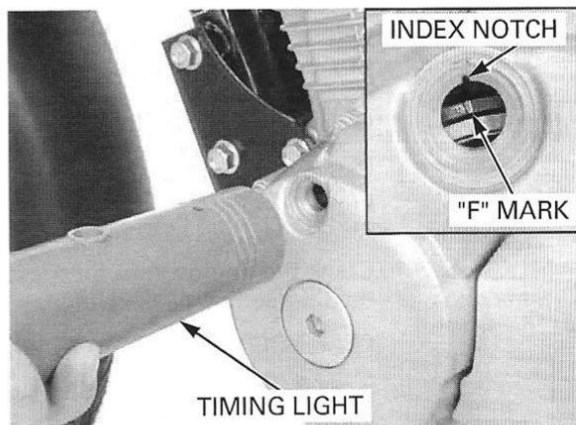


Connect a tachometer according to the tachometer manufacturer's instructions.

Start the engine, and hold it at idle speed while pointing the timing light towards the flywheel.

IDLE SPEED: $1,500 \pm 100 \text{ min}^{-1}$ (rpm)

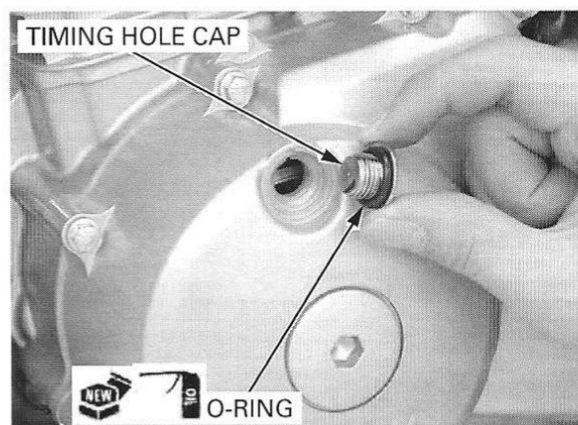
The ignition timing is correct if the "F" mark on the flywheel aligns with the index notch in the left crankcase cover.



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

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

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



IGNITION COIL

REMOVAL/INSTALLATION

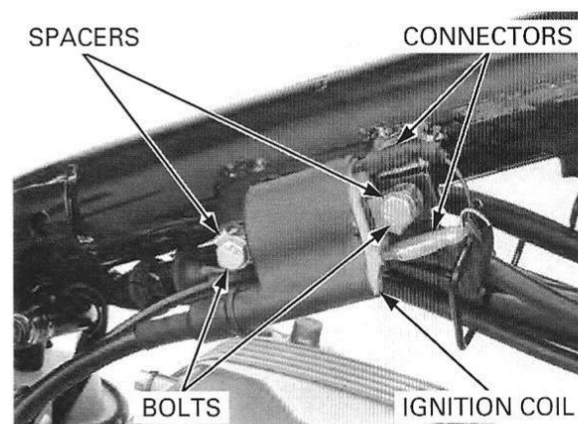
Remove the fuel tank (page 5-53).

Disconnect the spark plug cap (page 3-7).

Disconnect the connectors from the ignition coil.
Remove the bolts, spacers and ignition coil.

Installation is in the reverse order of removal.

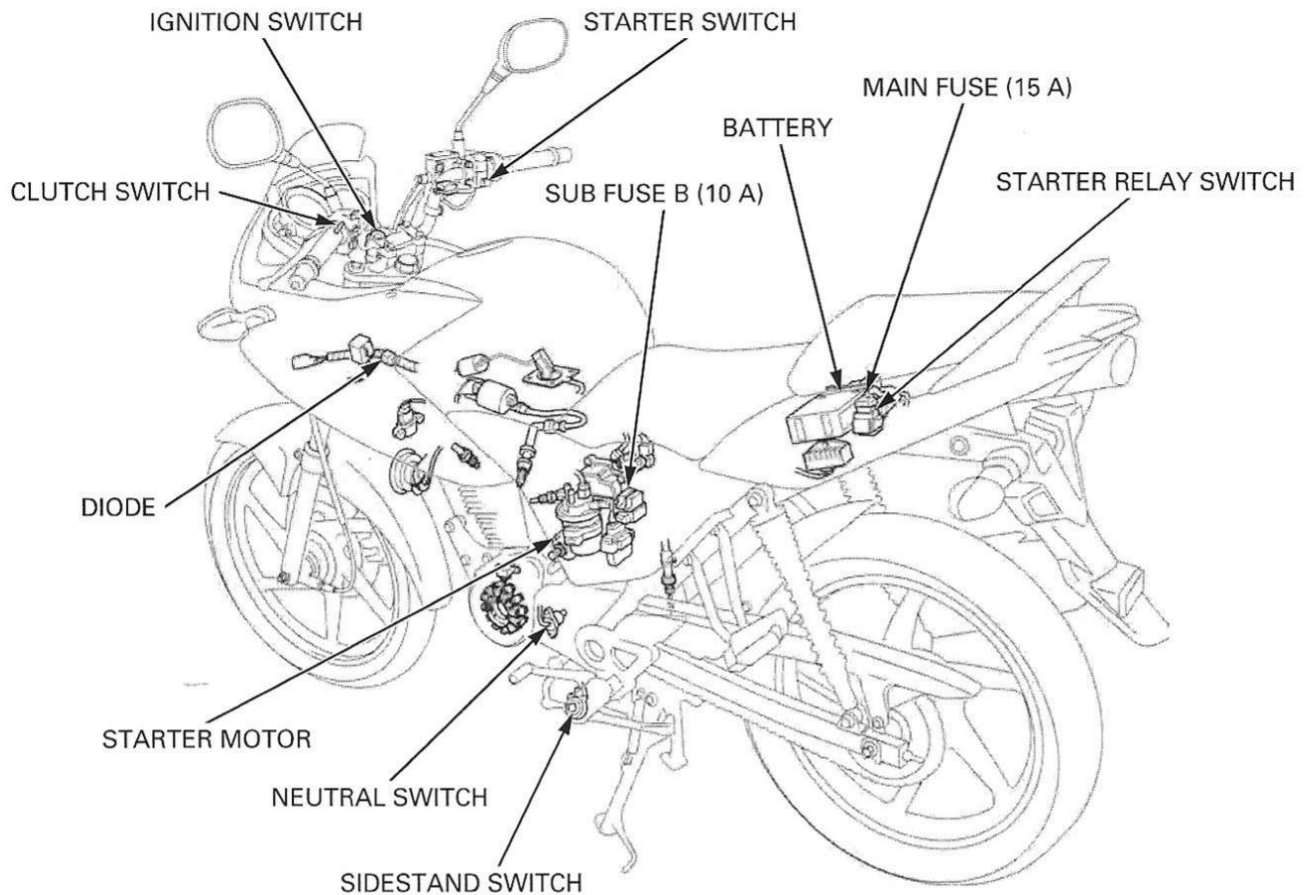
- Route the wires properly (page 1-16).



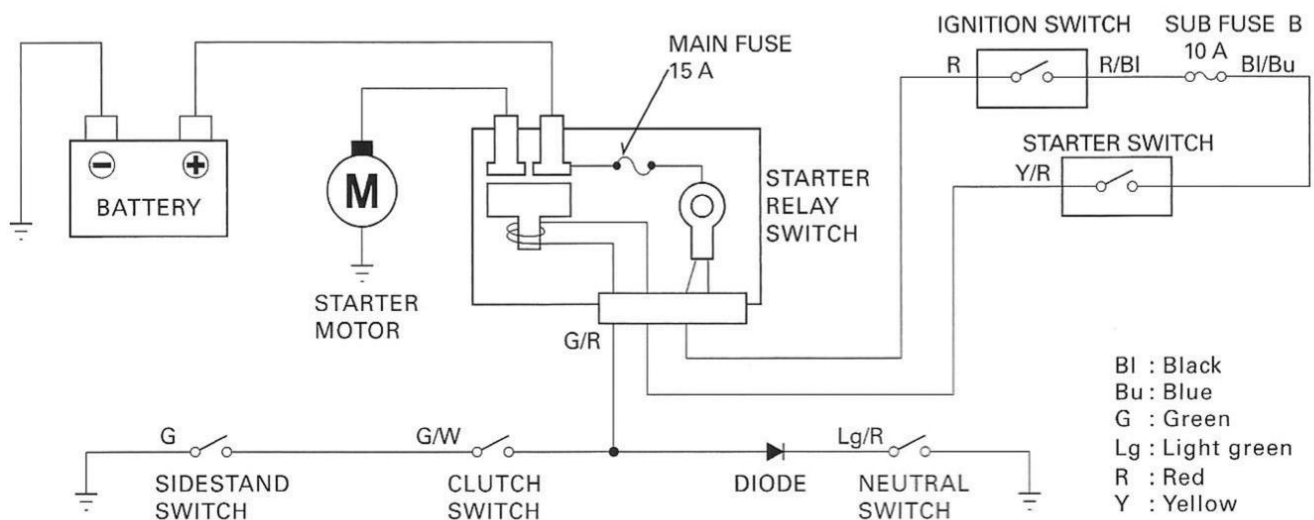
17. ELECTRIC STARTER

SYSTEM LOCATION.....	17-2	STARTER MOTOR.....	17-6
SYSTEM DIAGRAM.....	17-2	STARTER RELAY SWITCH.....	17-14
SERVICE INFORMATION	17-3	DIODE.....	17-16
TROUBLESHOOTING.....	17-4		

SYSTEM LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

NOTICE

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.

- The starter motor can be serviced with the engine installed in the frame.
- Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- When servicing the starter system, always follow the steps in the troubleshooting flow chart (page 17-4).
- Refer to the following components information:
 - Ignition switch (page 18-9)
 - Starter switch (page 18-10)
 - Neutral switch (page 18-13)
 - Sidestand switch (page 18-13)
 - Clutch switch (page 18-12)

SPECIFICATION

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	10.000 – 10.050 (0.3937 – 0.3957)	–

TORQUE VALUE

Starter motor case bolt 4.9 N·m (0.5 kgf·m, 3.6 lbf·ft)

TROUBLESHOOTING

Starter motor does not turn

1. Fuse Inspection

Check for blown main fuse (15 A) or sub fuse B (10 A).

Is the fuse blown?

YES – Replace the fuse.

NO – GO TO STEP 2.

2. Battery Inspection

Make sure the battery is fully charged and in good condition (page 15-7).

Is the battery in good condition?

YES – GO TO STEP 3.

NO – Charge or replace the battery.

3. Starter Relay Switch Operation

Check the starter relay switch operation.

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

Is there a "CLICK"?

YES – GO TO STEP 4.

NO – GO TO STEP 5.

4. Starter Motor Inspection

Apply battery voltage directly to the starter motor and check the operation.

Is the starter motor turn?

YES – • Loose or poorly contacted starter motor cable.
• Inspect starter relay switch (page 17-14).

NO – Faulty starter motor (page 17-6)

5. Starter Relay Coil Ground Lines Inspection

Disconnect the starter relay switch connector, and check the relay coil ground line as below for continuity:

1. Green/red terminal – diode – neutral switch line (with the transmission in neutral and clutch lever released).
2. Green/red terminal – clutch switch – sidestand switch line (in any gear except neutral, and with the clutch lever pulled in and sidestand up).

Is there continuity?

YES – GO TO STEP 6.

NO – • Loose or poor contact connector
• Open circuit in wire harness
• Faulty starter switch (page 18-10)
• Faulty sidestand switch (page 18-13)
• Faulty diode (page 17-16)
• Faulty clutch switch (page 18-12)
• Faulty neutral switch (page 18-13)

6. Starter Relay Input Voltage Inspection

Connect the starter relay switch connector.

With the ignition switch ON, measure the voltage at the starter relay switch connector (between Yellow/red (+) and ground (-)).

Is there battery voltage?

YES – GO TO STEP 7.

NO – • Faulty ignition switch (page 18-9)
• Faulty starter switch (page 18-10)
• Loose or poor contact connector
• Open circuit in wire harness

7. Starter Relay Switch Continuity Inspection

Remove and check the starter relay switch for continuity (page 17-15).

Is there continuity?

YES – Loose or poor contact starter relay switch connector

NO – Faulty starter relay switch

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

1. Clutch Switch Inspection

Check the clutch switch operation (page 18-12).

Is the clutch switch operation normal?

YES – GO TO STEP 2.

NO – Faulty clutch switch

2. Sidestand Switch Inspection

Check the sidestand switch operation (page 3-23).

Is the sidestand switch operation normal?

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

NO – Faulty sidestand switch

Starter motor turns slowly

- Low battery voltage
- Poorly connected battery cables
- Poorly connected starter motor cable
- Faulty starter motor

Starter motor turns, but engine does not turn

- Starter motor is running backwards
 - Case assembled improperly
 - Terminals connected improperly
- Faulty starter clutch
- Damaged or faulty starter idle gear or shaft
- Damaged or faulty starter reduction gear

Starter relay switch "CLICK", but engine does not turn over

- Crankshaft does not turn due to engine problems

STARTER MOTOR

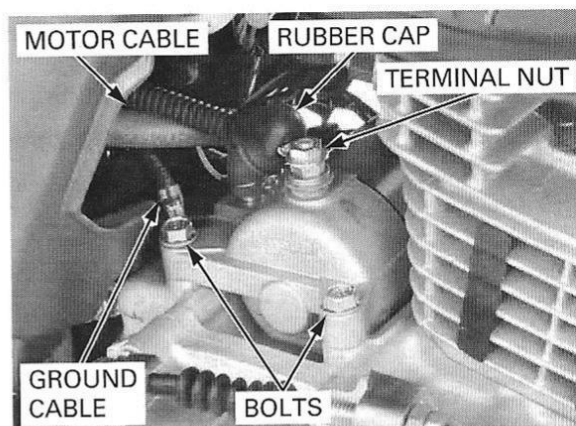
REMOVAL

- With the ignition switch OFF, disconnect the negative (-) cable at the battery before servicing the starter motor.

Release the rubber cap.

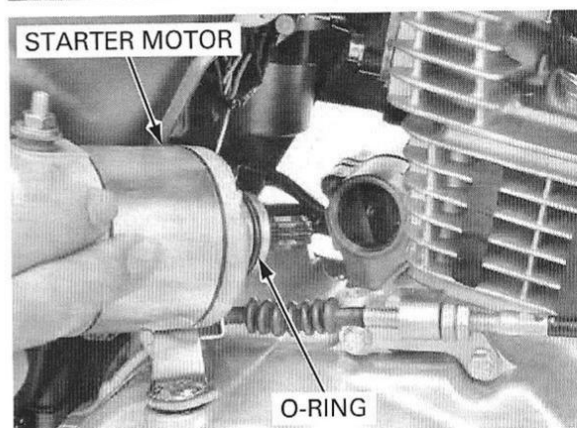
Remove the starter motor terminal nut and starter motor cable.

Remove the bolts and ground cable.



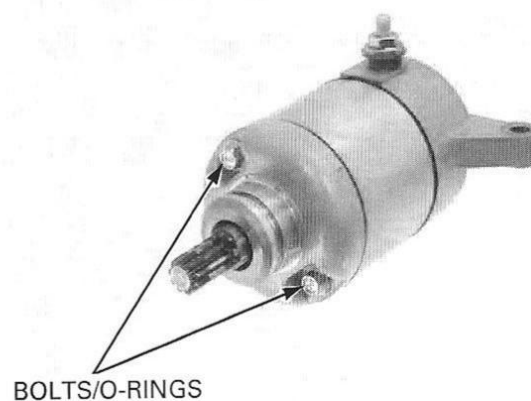
Pull the starter motor out from the left crankcase.

Remove the O-ring.



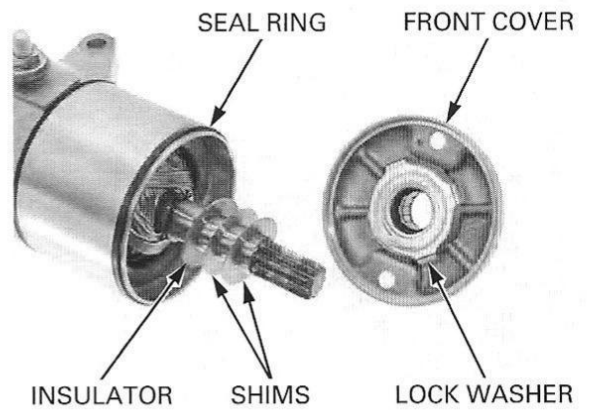
DISASSEMBLY/INSPECTION

Remove the starter motor case bolts and O-rings.



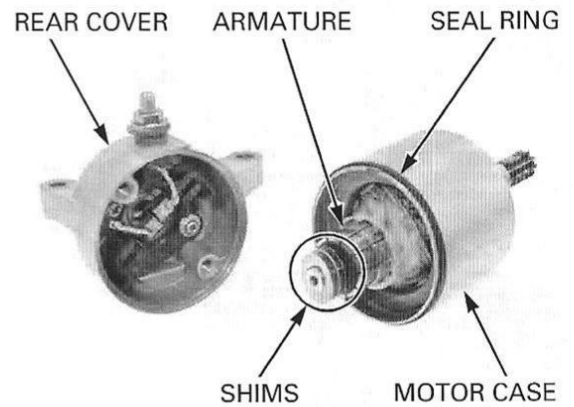
Record the location
and number of
shims.

Remove the front cover, shims, insulator and seal
ring.
Remove the lock washer from the front cover.

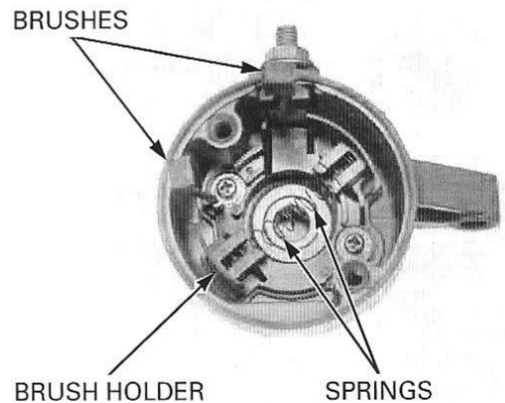


Record the location
and number of
shims.

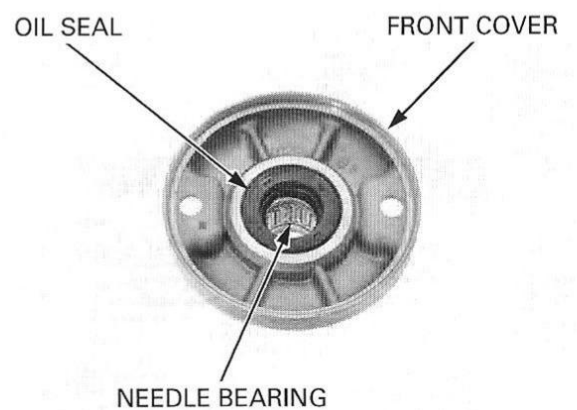
Remove the rear cover, shims and seal ring.
Remove the armature from the motor case.



Remove the brushes and springs from the brush
holder.



Check the oil seal of the front cover for deterioration
or damage.
Check the needle bearing for wear or damage.
Replace the starter motor as an assembly if neces-
sary.



ELECTRIC STARTER

Do not use emery or sand paper on the commutator.

Clean the metallic debris off between commutator bars.

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

Replace the starter motor as an assembly if necessary.

ARMATURE COIL

COMMUTATOR BARS

Check for continuity between pair of commutator bars.

There should be continuity.

CONTINUITY:

COMMUTATOR BARS

Check for continuity between each individual commutator bar and the armature shaft.

There should be no continuity.

NO CONTINUITY:

COMMUTATOR BAR

ARMATURE SHAFT

Check for continuity between the positive brush and starter motor cable terminal.

There should be continuity.

CONTINUITY:

CABLE TERMINAL

POSITIVE BRUSH

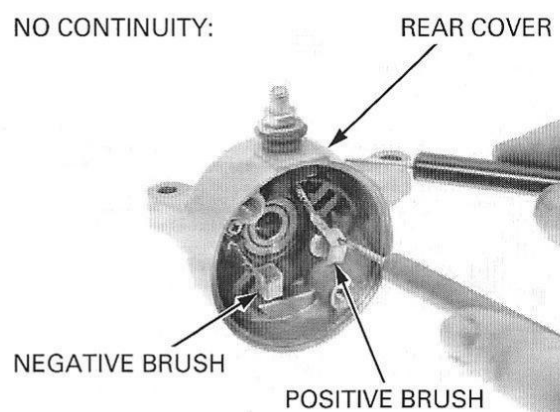
Check for continuity between the positive brush and rear cover.

There should be no continuity.

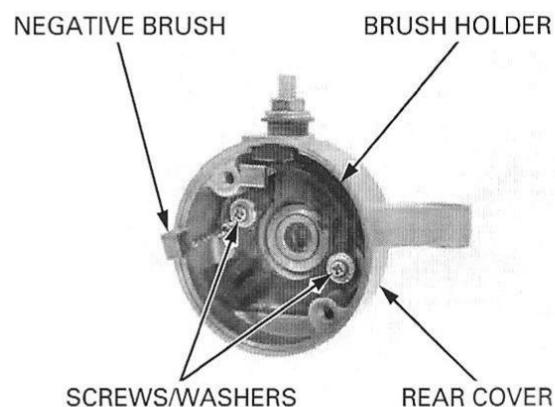
Check for continuity between positive and negative brushes.

There should be no continuity.

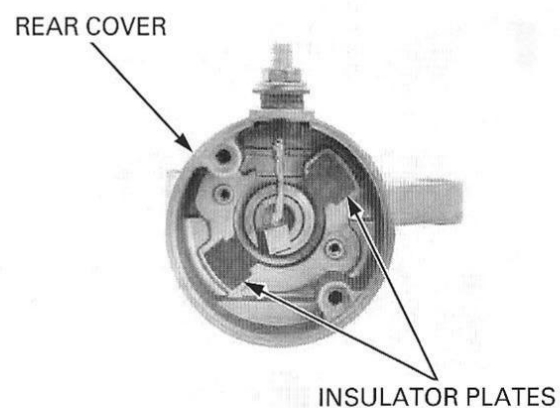
NO CONTINUITY:



Remove the screws, washers, negative brush and brush holder from the rear cover.

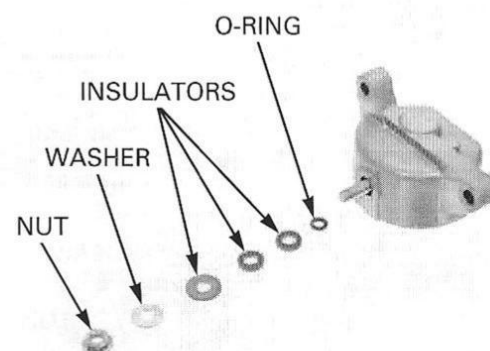


Remove the insulator plates from the rear cover.



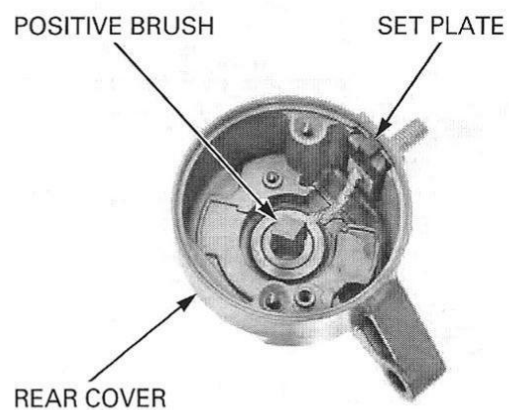
Remove the following:

- Nut
- Washer
- Insulators
- O-ring



ELECTRIC STARTER

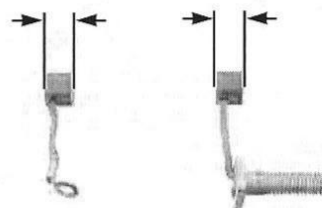
Remove the positive brush and set plate from the rear cover.



Check the brushes for wear or damage.

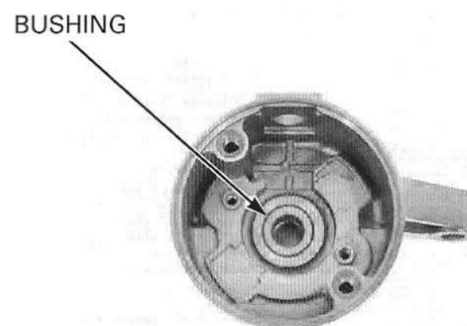
Measure the brush length.

STANDARD: 10.000 – 10.050 mm (0.3937 – 0.3957 in)

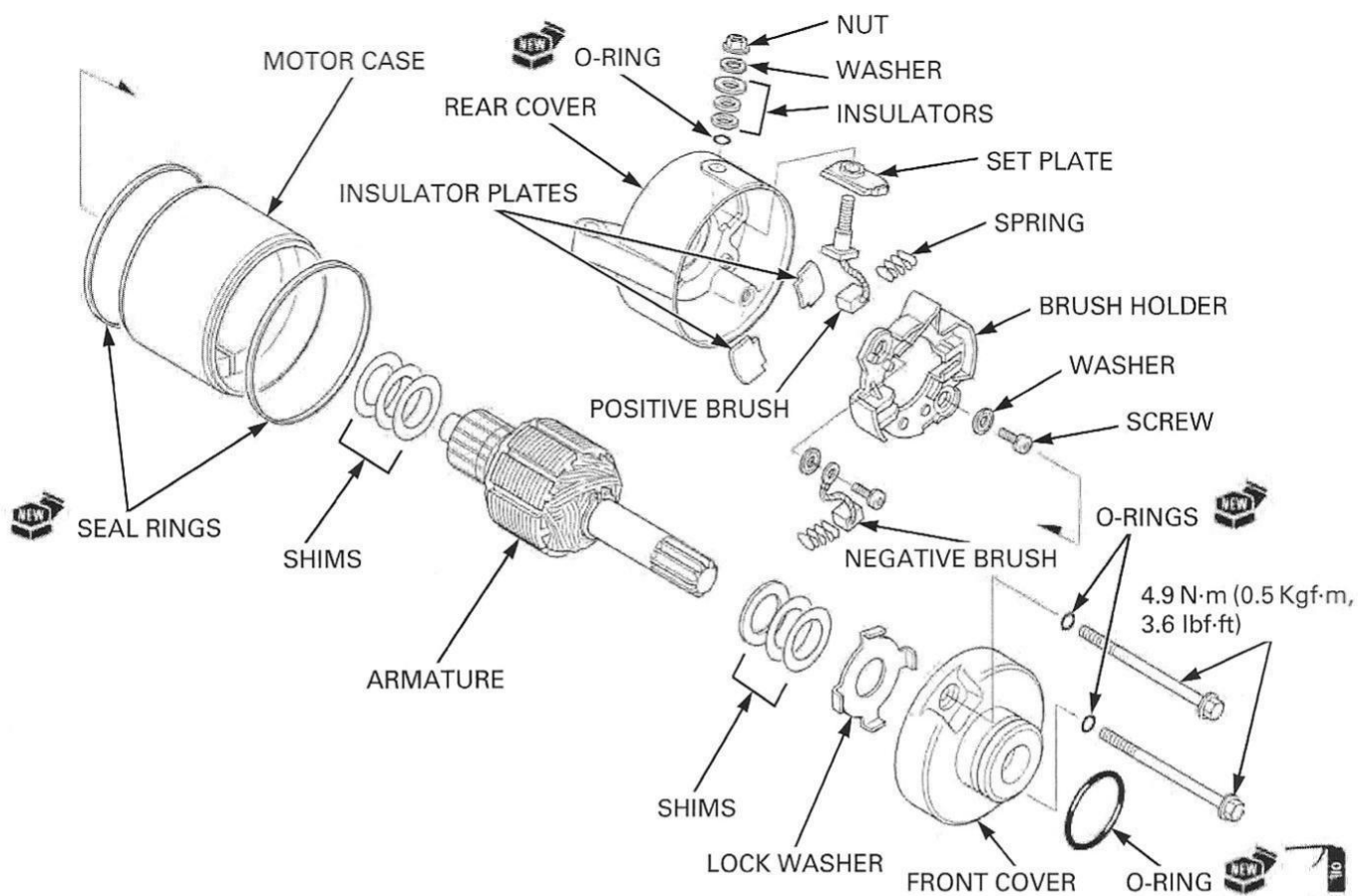


Check the bushing of the rear cover for wear or damage.

Replace the starter motor as an assembly if necessary.

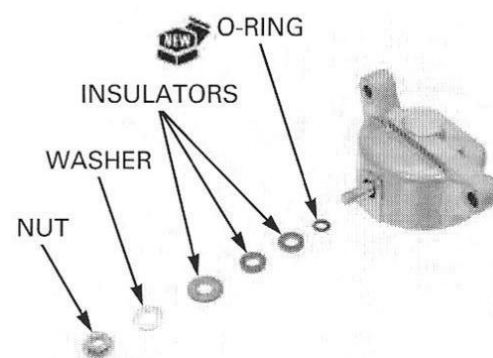
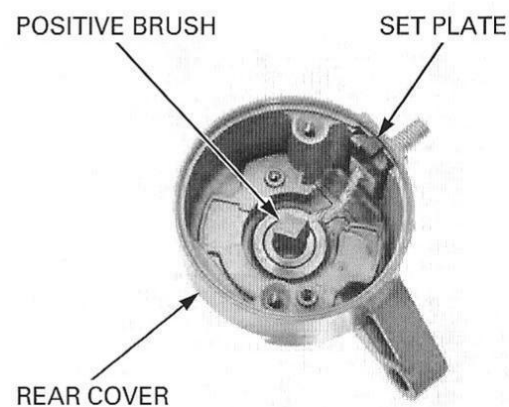


ASSEMBLY



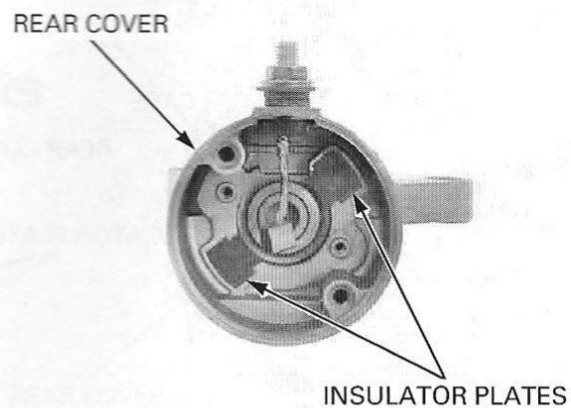
Install the set plate and positive brush into the rear cover.

Install a new O-ring, insulators, washer and nut.
Tighten the nut securely.



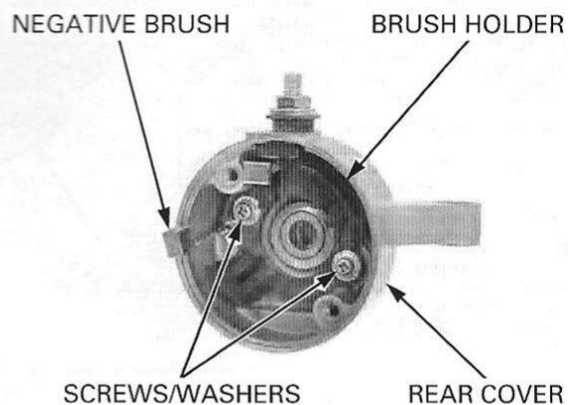
ELECTRIC STARTER

Install the insulator plates onto the rear cover.



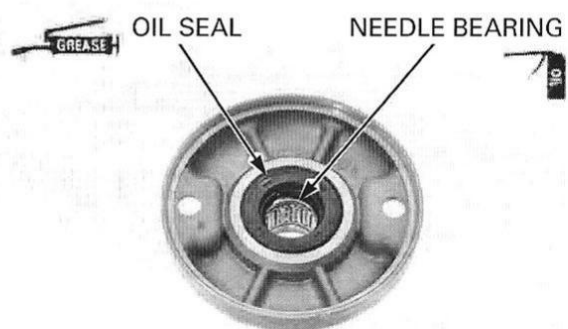
Install the brush holder, negative brush, washers and screws into the rear cover as shown.

Tighten the screws securely.



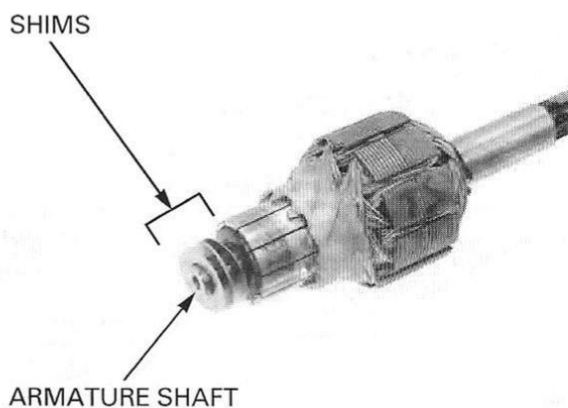
Apply engine oil to the needle bearing rotating surface.

Apply grease to the oil seal lips.



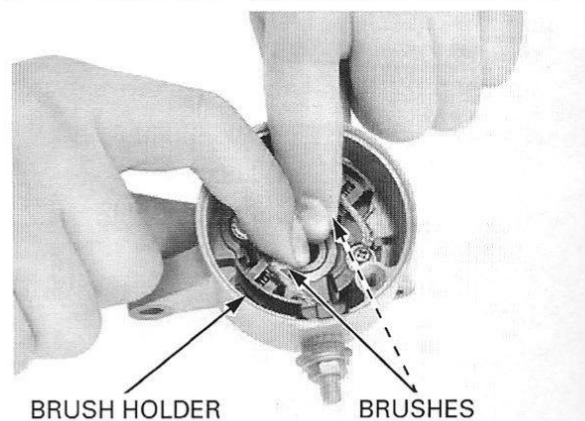
Install the same number of shims in the same locations as noted during disassembly.

Install the shims onto the armature shaft.



Install the springs and brushes into the brush holder.

Install the armature into the rear cover by holding the brushes into the brush holder.



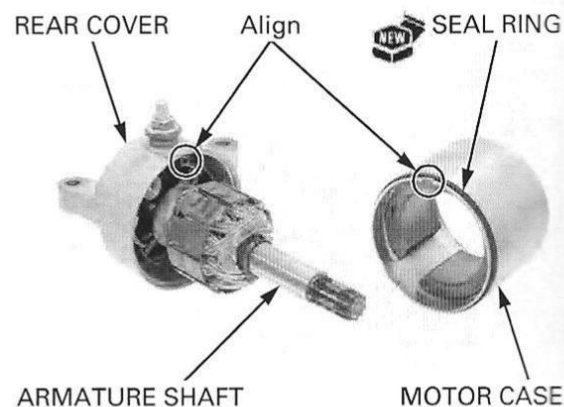
Install a new seal ring to the motor case.

Install the motor case to the rear cover while align the brush set plate tab with the motor case groove.

- Install the motor case to the rear cover 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 same number of shims in the same locations as noted during disassembly.

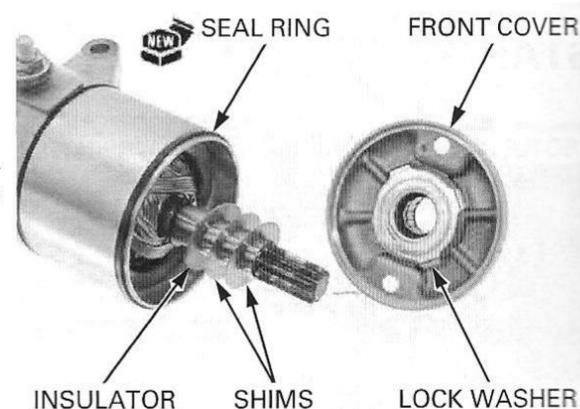
Install the shims and insulator.

Install a new seal ring to the motor case.

Install the lock washer to the front cover.

Install the front cover.

- When installing the front cover, take care to prevent damaging the oil seal lip with the armature shaft.

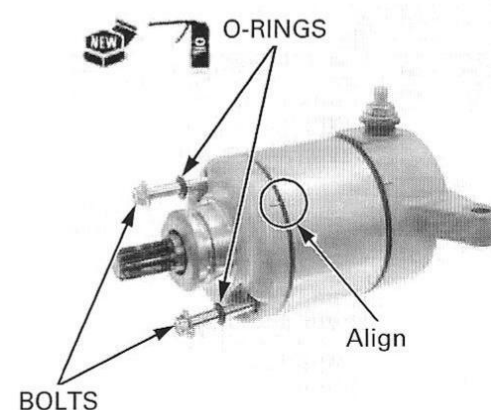


Align the index lines on the front cover and motor case.

Apply engine oil to new O-rings and install them onto the motor case bolts.

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)

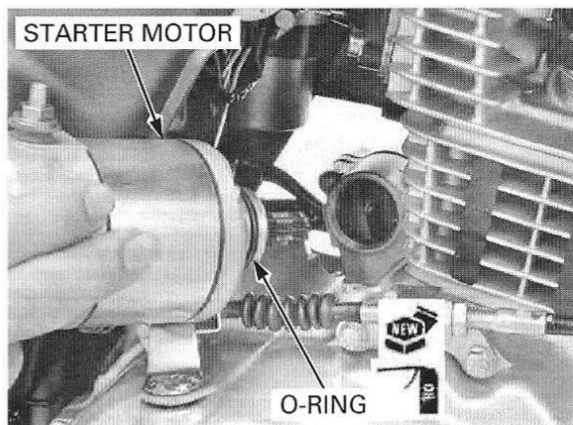


ELECTRIC STARTER

INSTALLATION

Apply engine oil to a new O-ring and install it into the starter motor groove.

Install the starter motor into the crankcase from the right side.



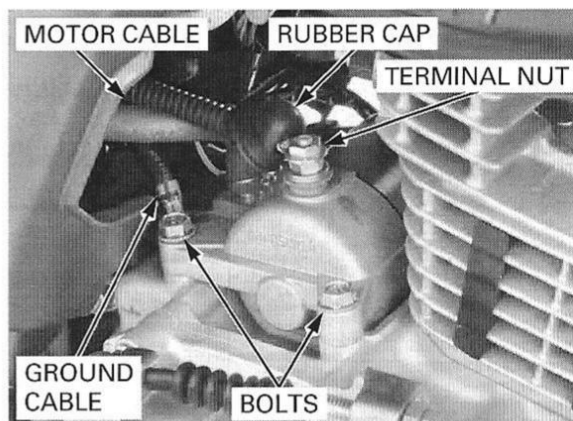
Route the cable properly (page 1-16).

Install the ground cable and starter motor mounting bolts.

Tighten the mounting bolts securely.

Install the starter motor cable and starter motor terminal nut.

Tighten the terminal nut securely and reposition rubber cap properly on the starter motor terminal.



STARTER RELAY SWITCH

INSPECTION

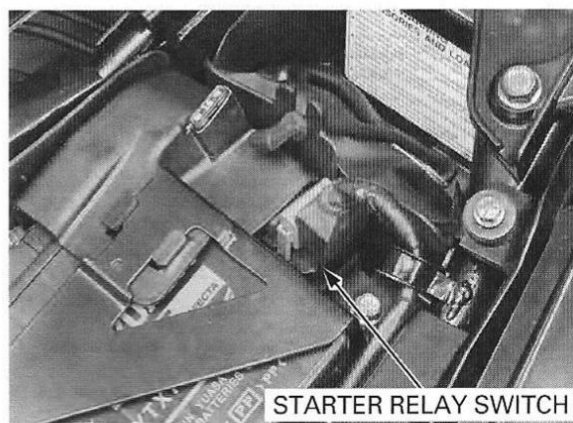
Remove the seat (page 2-11).

Shift the transmission into neutral.

Turn the ignition switch ON and push the starter switch.

The coil is normal if the starter relay switch clicks.

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

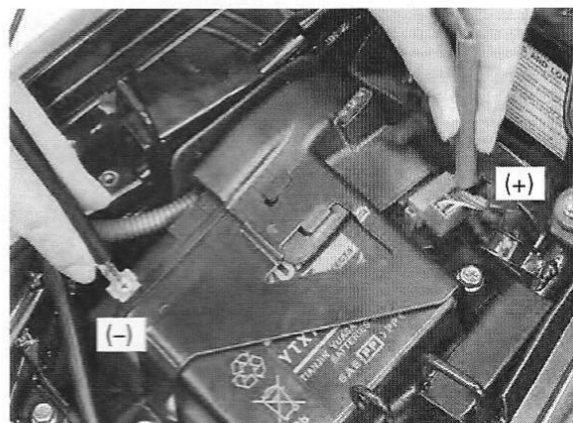


INPUT VOLTAGE

Connect the starter relay switch 4P (Red) connector. Turn the ignition switch ON.

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

If the battery voltage appears only when the starter switch is pushed with the ignition switch ON, the starter relay input voltage is normal.



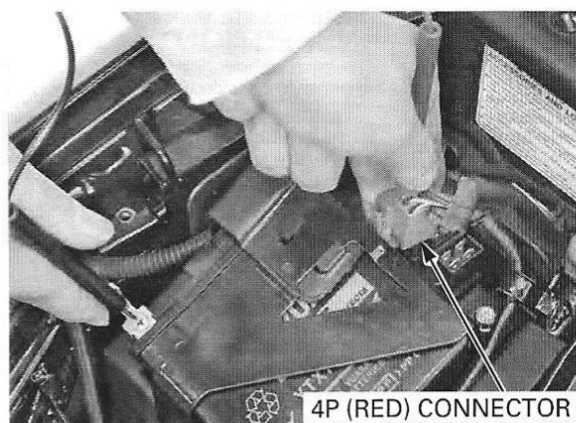
GROUND LINE

Turn the ignition switch OFF.

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

Check for continuity between the Green/red wire of the wire harness side (ground line) and ground when the starter switch button is pushed.

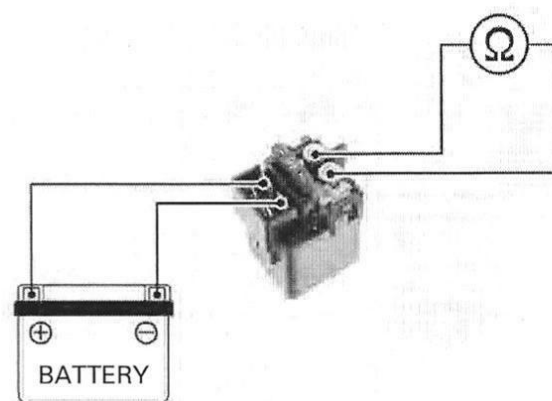
If there is continuity when the transmission is in neutral or when the clutch is disengaged and the sidestand is retracted, the ground circuit of the relay coil is normal. (In neutral, there is a slight resistance due to the diode.)

**OPERATION CHECK**

Remove the starter relay switch (page 17-15).

Connect a fully charged 12 V battery wires to the relay switch Yellow/red wire terminal and Green/red wire terminal.

There should be continuity between the cable terminals when the battery is connected, and not continuity when the battery is disconnected.

**REMOVAL/INSTALLATION**

Remove the battery holder (page 15-7).

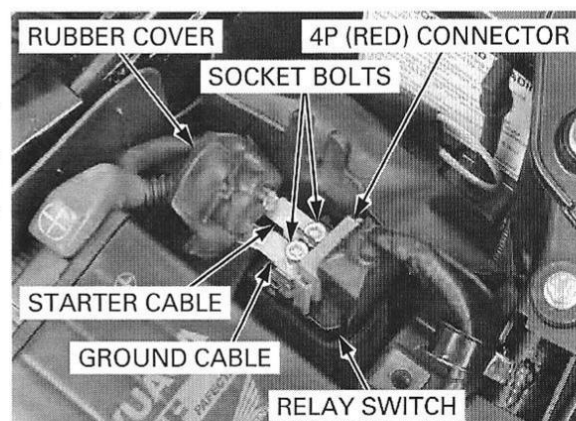
Release the rubber cover.

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

Remove the socket bolts and disconnect the starter and ground cables.

Remove the starter relay switch from the rear fender.

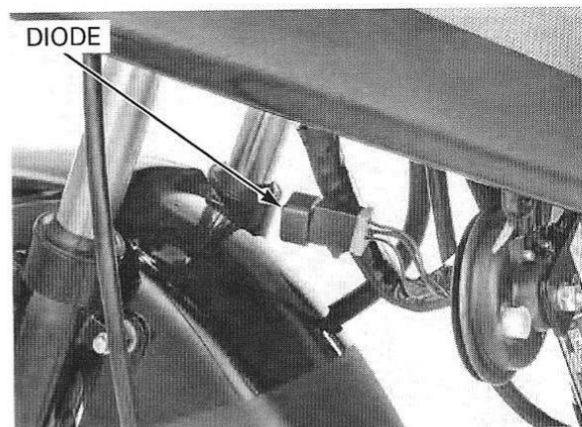
Installation is in the reverse order of removal.



DIODE

INSPECTION

Remove the diode.

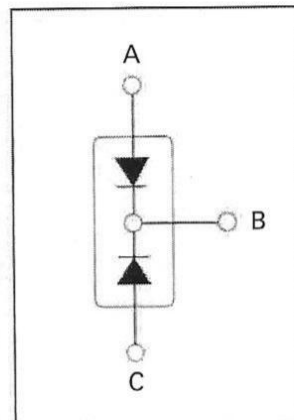
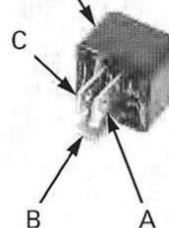


Check for continuity between the diode terminals.

When there is continuity, a small resistance value will register.

If there is continuity in one direction, the diode is normal.

DIODE

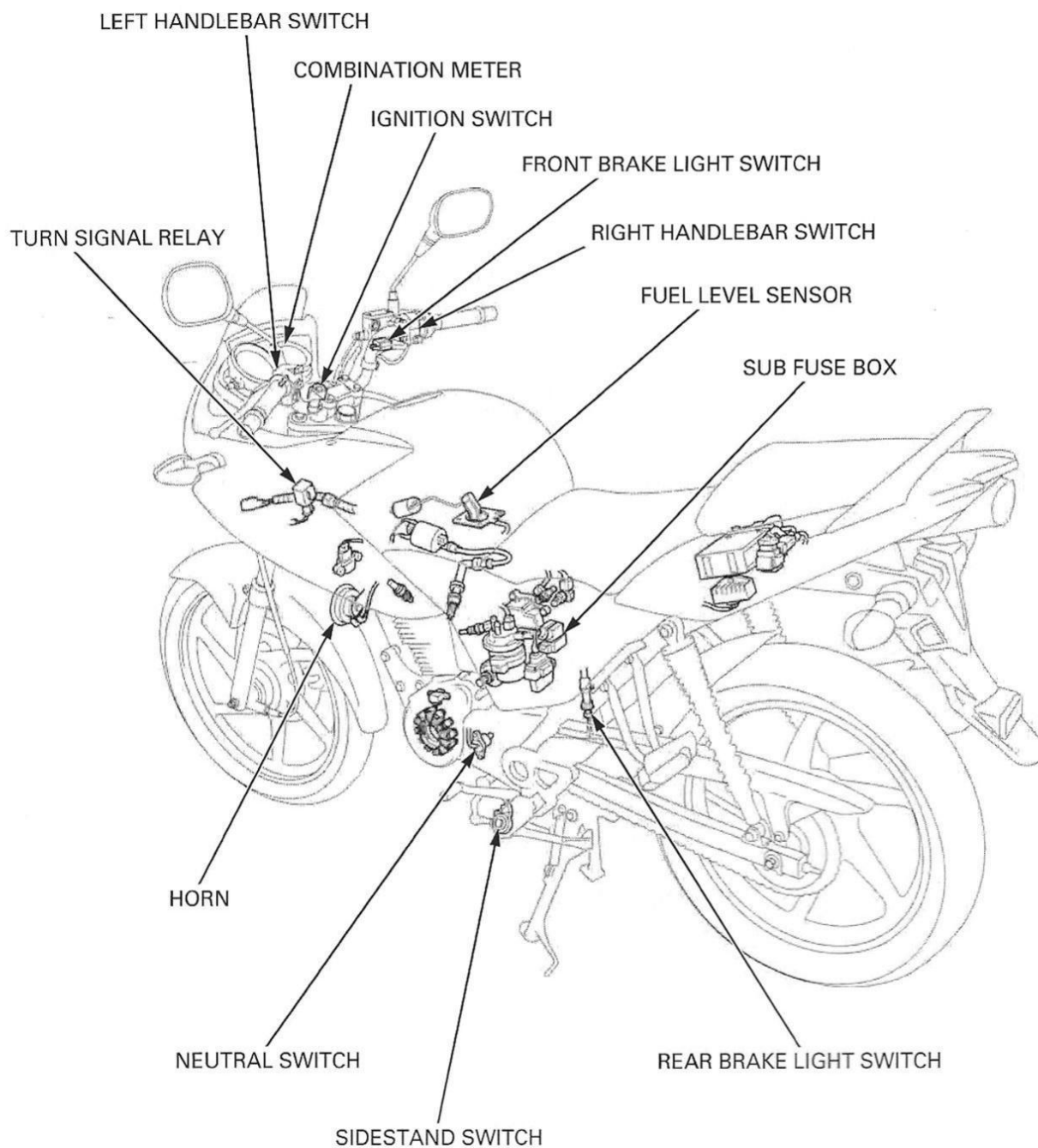


18. LIGHTS/METER/SWITCHES

SYSTEM LOCATION.....	18-2	BRAKE LIGHT SWITCH	18-11
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HEADLIGHT.....	18-4	SIDESTAND SWITCH.....	18-13
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IGNITION SWITCH.....	18-9	TURN SIGNAL RELAY	18-19
HANDLEBAR SWITCHES	18-10	FUSE BOX.....	18-20

LIGHTS/METER/SWITCHES

SYSTEM LOCATION



SERVICE INFORMATION

GENERAL

NOTICE

- Note the following when replacing the halogen headlight bulb.
 - Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause it to break.
 - If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
 - Be sure to install the dust cover after replacing the bulb.
- A halogen headlight bulb becomes very hot while the headlight is on, and remains hot for a while after it is turned off. Be sure to let it cool down before servicing.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.
- The following color codes are used throughout this section.

Bu = Blue
Bl = Black

Y = Yellow
Gr = Gray

Lg = Light green
O = Orange

R = Red
W = White

Lb = Light blue

SPECIFICATIONS

ITEM		SPECIFICATION
Bulbs	Headlight (Hi/Low beam)	12 V – 35/35 W
	Brake/tail light	12 V – 21/5 W
	Turn signal light	12 V – 21 W x 4
	Position light	12 V – 5 W
	Instrument light	12 V – 1.7 W x 2
	Turn signal indicator	12 V – 1.7 W
	High-beam indicator	12 V – 1.7 W
	Neutral indicator	12 V – 1.7 W
	MIL	12 V – 1.7 W
Fuse	Main	15 A
	Sub	10 A x 2
Fuel level sensor resistance (20°C/ 68°F)	Full	6 – 10 Ω
	Empty	90 – 96 Ω

TORQUE VALUE

Fuel level sensor mounting nut

9 N·m (0.9 kgf·m, 6.6 lbf·ft)

HEADLIGHT

- For headlight removal/installation (page 2-6)

HEADLIGHT BULB REPLACEMENT

Remove the front cowl panels (page 2-5).

Disconnect the headlight connector.

Remove the dust cover.

Unhook the bulb retainer and remove the headlight bulb.

NOTICE

Avoid touching the halogen headlight bulb. Finger points can create hot spots that cause a bulb to break.

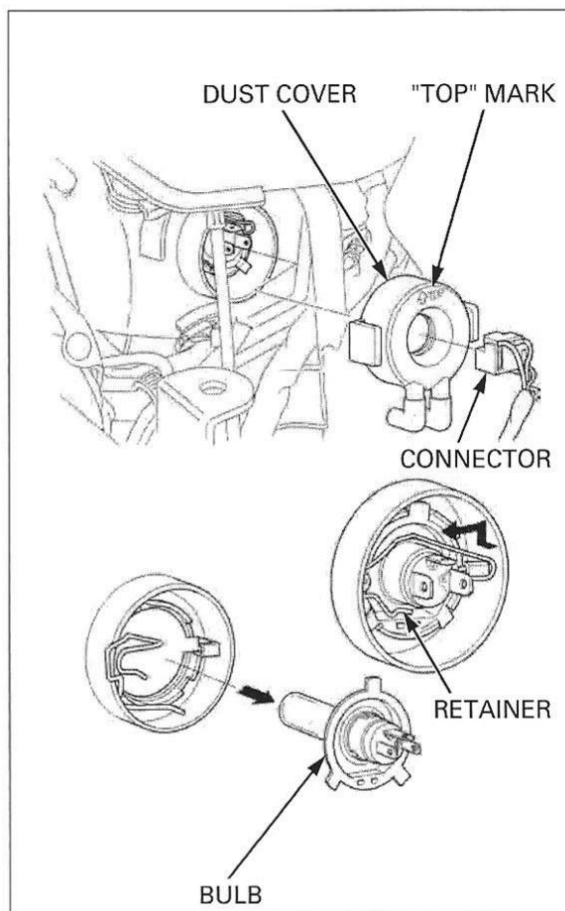
If you touch the bulb with your bare hands, clean it with cloth moistened with denatured alcohol to prevent early bulb failure.

Install a new headlight bulb by aligning the tabs of the bulb with the slots of the headlight unit.

Hook the bulb retainer into the headlight unit groove.

Install the dust cover with its "TOP" mark facing up.

Install the front cowl panels (page 2-5).

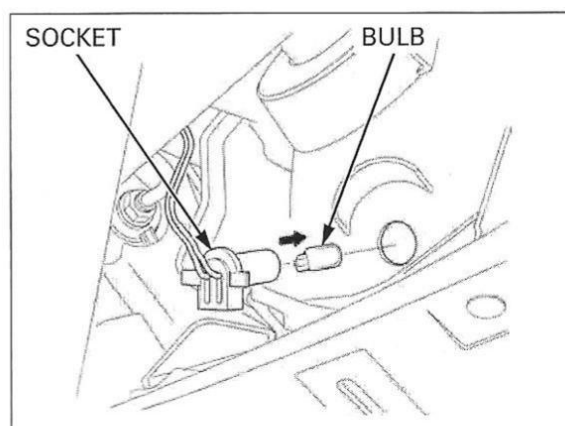


POSITION LIGHT BULB REPLACEMENT

Pull the position light bulb socket out from the headlight unit.

Remove the position light bulb from the bulb socket.

Install the position light bulb to the bulb socket and install them to the headlight unit.



BRAKE/TAIL LIGHT

- For brake/tail light unit removal/installation (page 2-14)

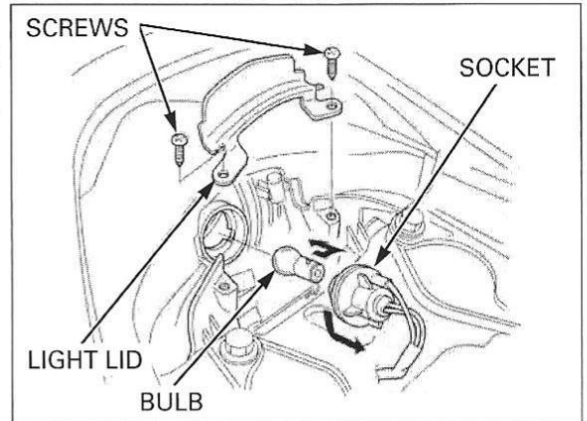
BULB REPLACEMENT

Remove the screws and tail light lid.

Remove the brake/tail light bulb socket by turning it counterclockwise.

While pushing the bulb in, turn it counterclockwise to remove it and replace the bulb with a new one.

Installation is in the reverse order of removal.



TURN SIGNAL LIGHTS

BULB REPLACEMENT

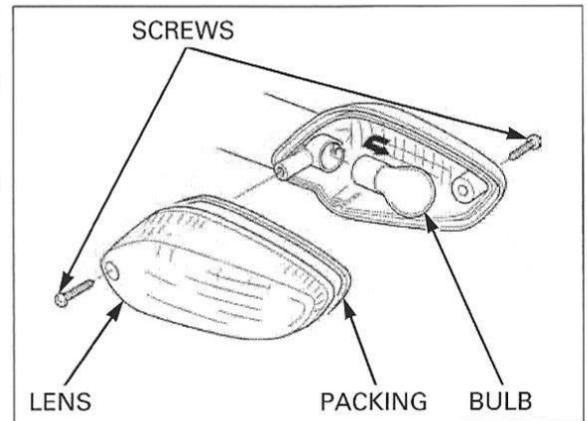
Remove the screws, turn signal light lens and packing.

While pushing the bulb in, turn it counterclockwise to remove it.

Replace the bulb with a new one.

Check the condition of the rubber seal, replace it if necessary.

Installation is in the reverse order of removal.



REMOVAL/INSTALLATION

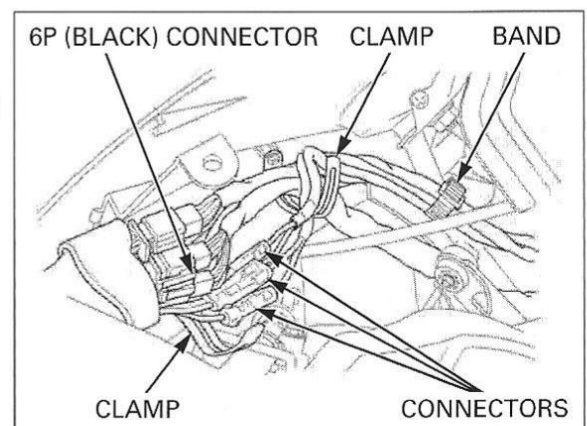
FRONT

Remove the front cowl panels (page 2-5).

Disconnect the turn signal light connectors.

Disconnect the headlight/position light/turn signal relay 6P (Black) connector.

Unhook the wire clamps and band.



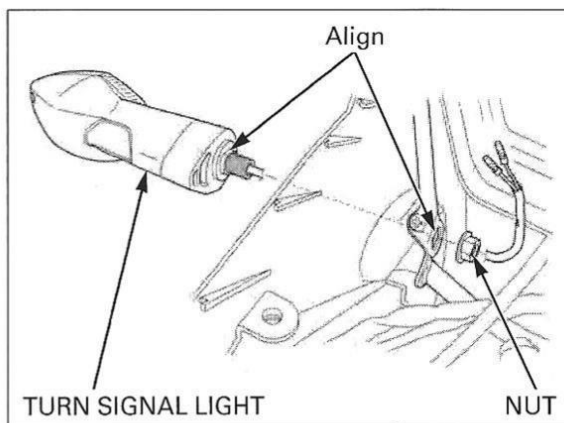
LIGHTS/METER/SWITCHES

Remove the nut and turn signal light.

Install the turn signal light by aligning the cut-outs of the turn signal light and stay.

Install the removed parts in the reverse order of removal.

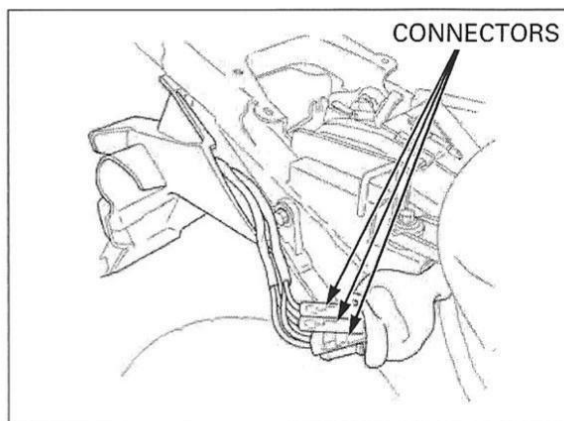
- Route the wires properly (page 1-16).



REAR

Remove the rear cowl (page 2-13).

Disconnect the turn signal light connectors.

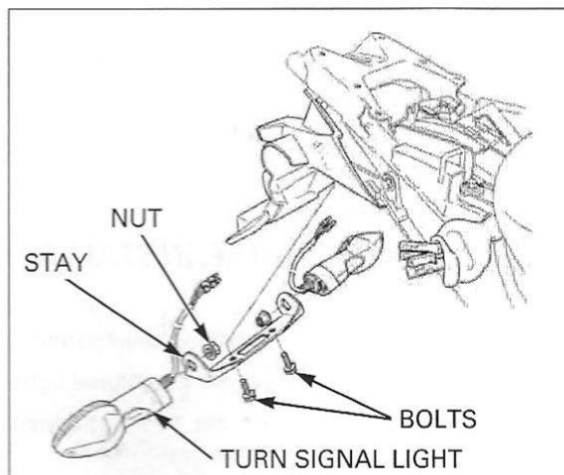


Remove the bolts and turn signal light stay.
Remove the nuts and turn signal lights.

Install the turn signal light by aligning the cut-out of turn signal light and stay.

Install the removed parts in the reverse order of removal.

- Route the wires properly (page 1-16).



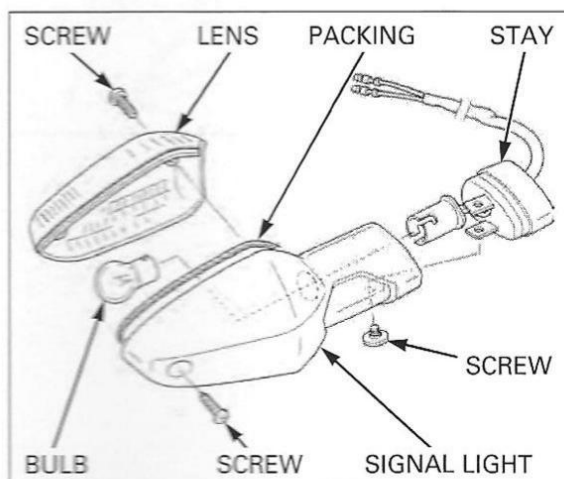
DISASSEMBLY/ASSEMBLY

Remove the screws, turn signal light lens and packing.

While pushing the bulb in, turn it counterclockwise to remove it.

Remove the screw and separate the turn signal light and stay.

Assembly is in the reverse order of disassembly.

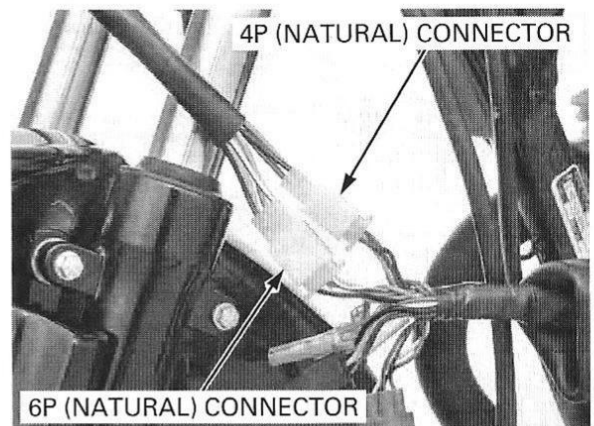


COMBINATION METER

BULB REPLACEMENT

Remove the front cowl (page 2-5).

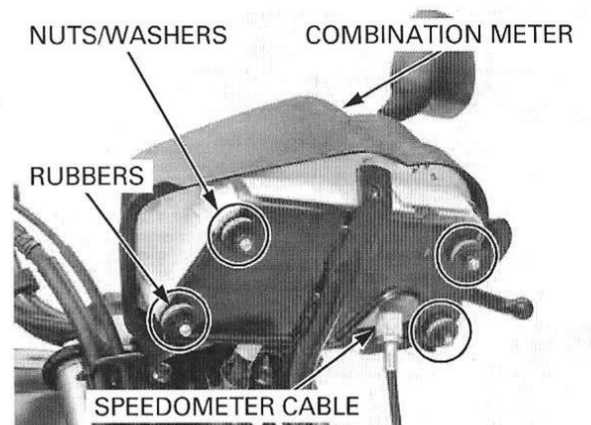
Disconnect the combination meter 4P (Natural) and 6P (Natural) connectors.



Disconnect the speedometer cable.

Remove the nuts, washers and combination meter.

Check the condition of the rubbers, replace it if necessary.

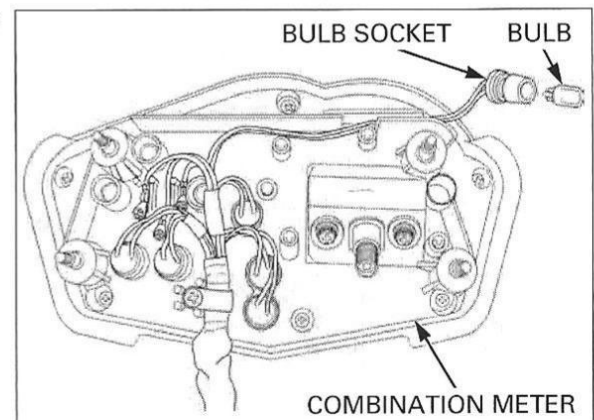


Pull the bulb sockets out from the combination meter.

Remove the bulb from the bulb socket.

Installation is in the reverse order of removal.

- Route the wires properly (page 1-16).

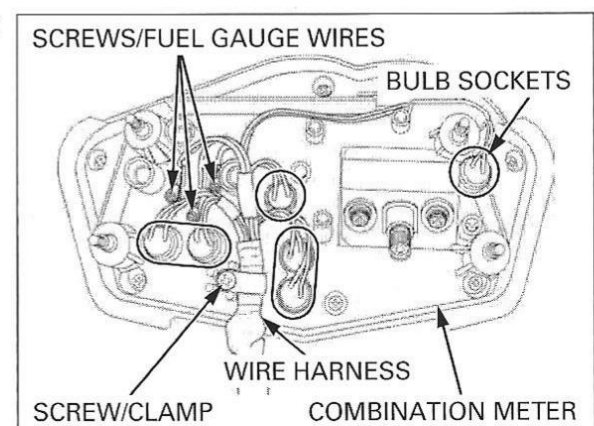


DISASSEMBLY

Pull the bulb sockets out from the combination meter.

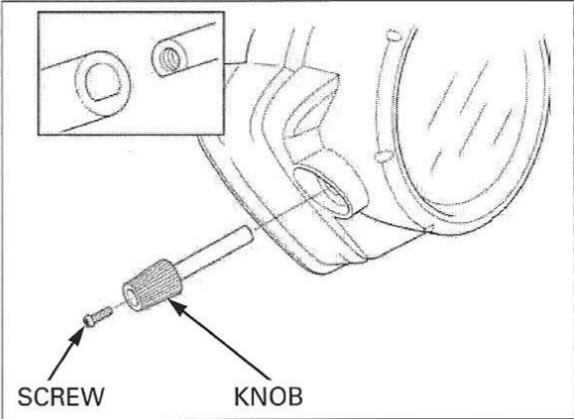
Remove the screws and fuel gauge wires.

Remove the screw, clamp and wire harness.



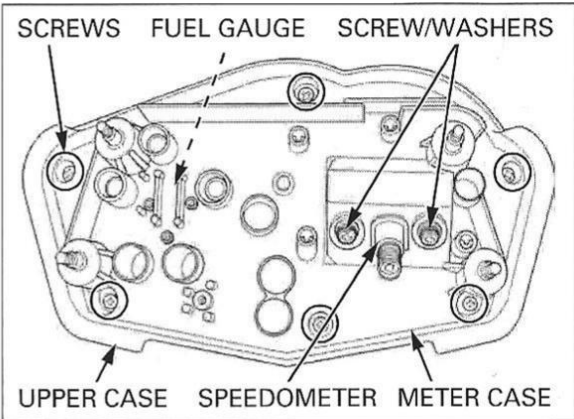
LIGHTS/METER/SWITCHES

Remove the screw and knob from the speedometer.

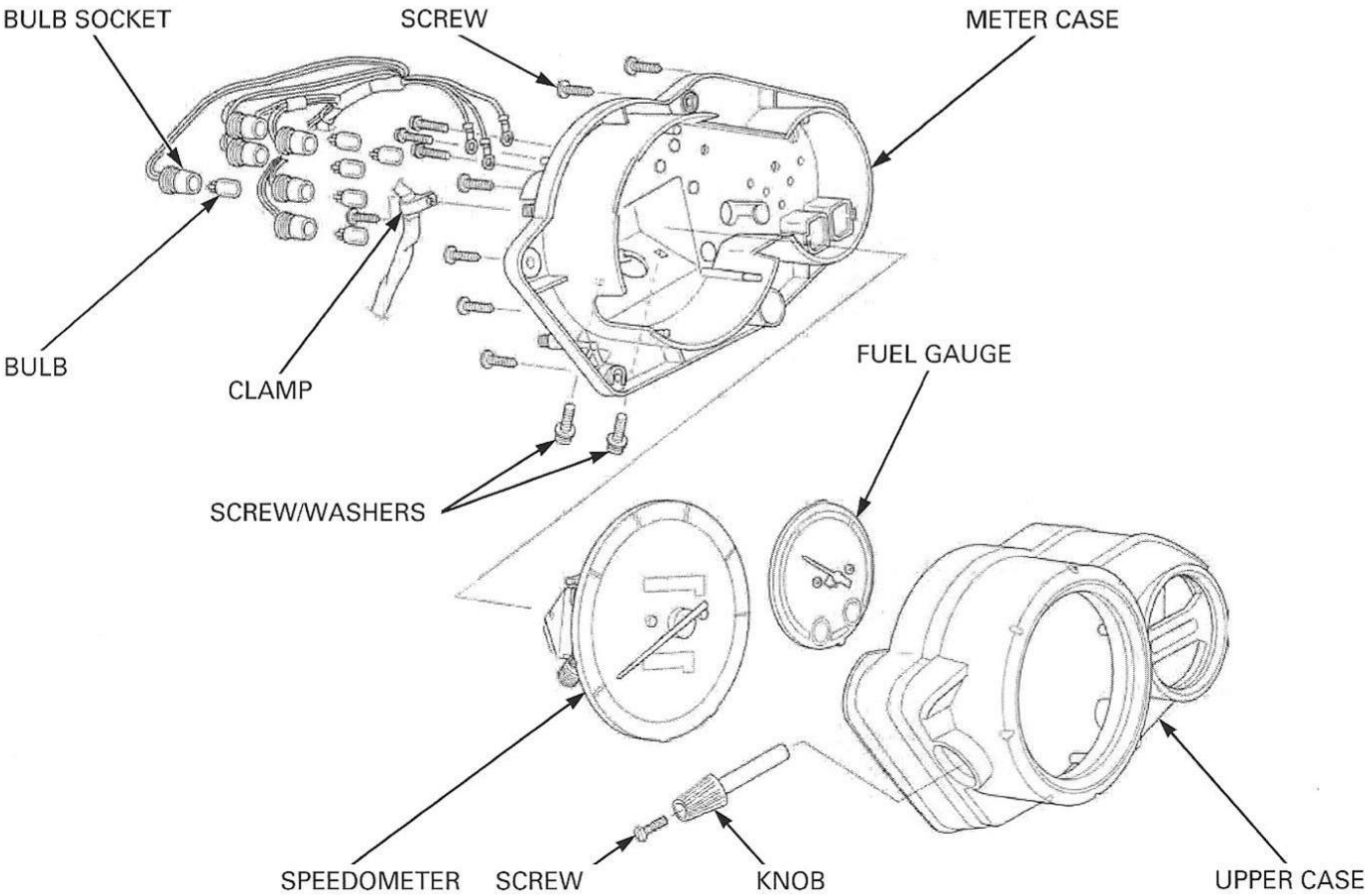


Remove the screw/washers from the speedometer.
Remove the screws and disassemble the following:

- Upper case
- Meter case
- Speedometer
- Fuel gauge



ASSEMBLY



Assemble the meter in the reverse order of disassembly.

IGNITION SWITCH

INSPECTION

Remove the left side cover (page 2-10).

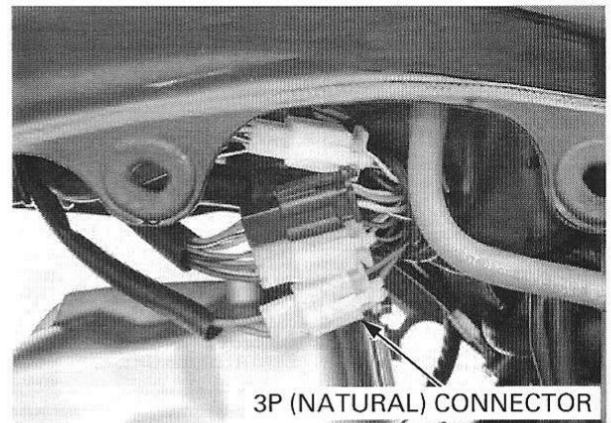
Disconnect the ignition switch 3P (Natural) connector.

Check for continuity between the ignition switch connector terminal in each switch position.

Continuity should exist between the color coded wires as follows:

Ignition Switch:

	BAT1	VO1
LOCK		
OFF		
ON	○	○
COLOR	R	R/BI



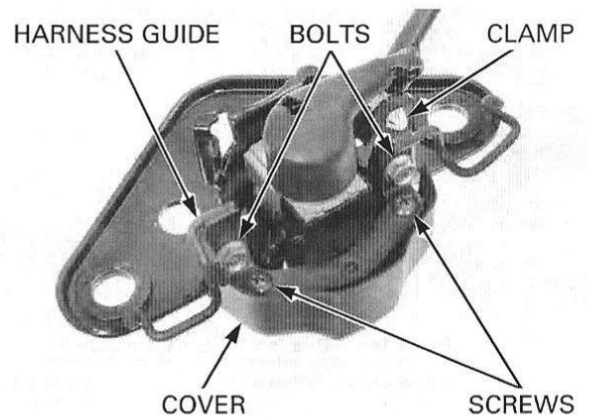
REMOVAL/INSTALLATION

Remove the top bridge (page 12-26).

Remove the screws and cover.

Remove the clamp from the harness guide.

Remove the bolts and harness guide.



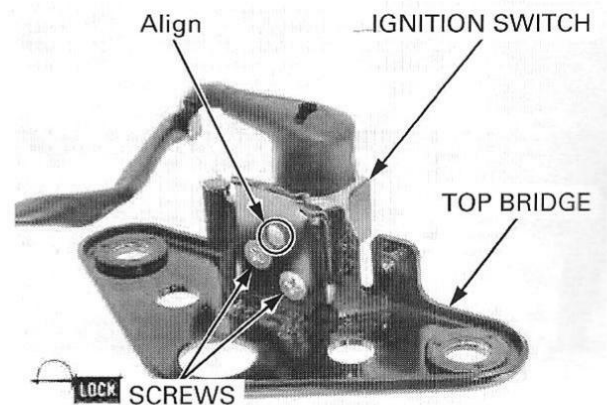
Remove the ignition switch mounting screws and ignition switch.

Clean the ignition switch mounting screw threads, then apply locking agent to them.

Install the ignition switch by aligning its tab with the hole of the top bridge.

Install and tighten the ignition switch mounting screws securely.

Install the top bridge (page 12-29).



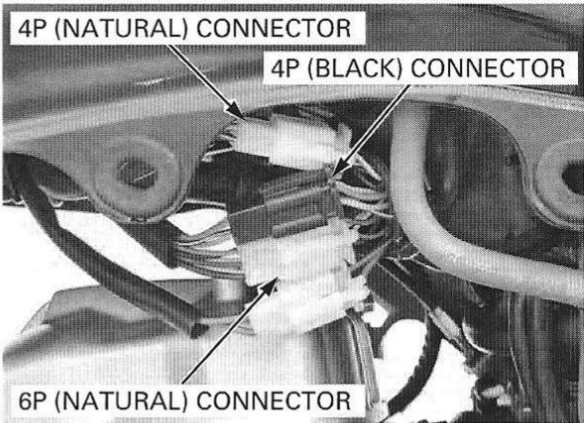
HANDLEBAR SWITCHES

INSPECTION

Remove the left side cover (page 2-10).

Disconnect the following:

- Handlebar switch 6P (Natural) connector
- Handlebar switch 4P (Black) connector
- Handlebar switch 4P (Natural) connector



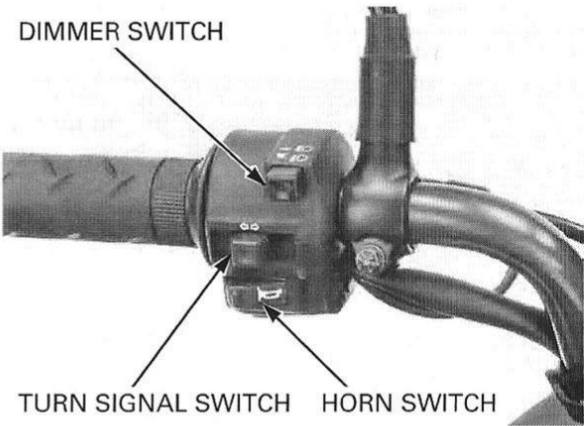
LEFT HANDLEBAR SWITCHES

Check for continuity between the connector terminals in each switch position.

Continuity should exist between the color coded wires as shown in the charts:

Turn Signal Switch:

	R	WR	L
	☐	☐	
(N)			
		☐	☐
COLOR	Lb	Gr	O



Dimmer Switch:

	HL	HI	LO
	☐	☐	☐
(N)	☐	☐	☐
	☐	☐	
COLOR	Y	Bu	W

Horn Switch:

	BAT	HO
FREE		
PUSH	☐	☐
COLOR	Bl	Lg

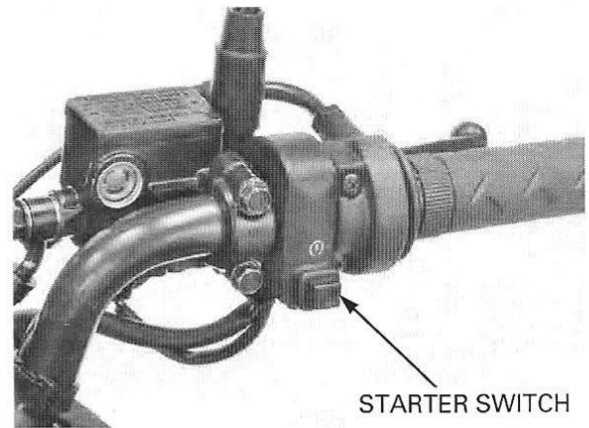
RIGHT HANDLEBAR SWITCH

Check for continuity between the connector terminals in each switch position.

Continuity should exist between the color coded wires as shown in the charts:

Starter Switch:

	BAT	ST
FREE		
PUSH	○	○
COLOR	Bl/Bu	Y/R

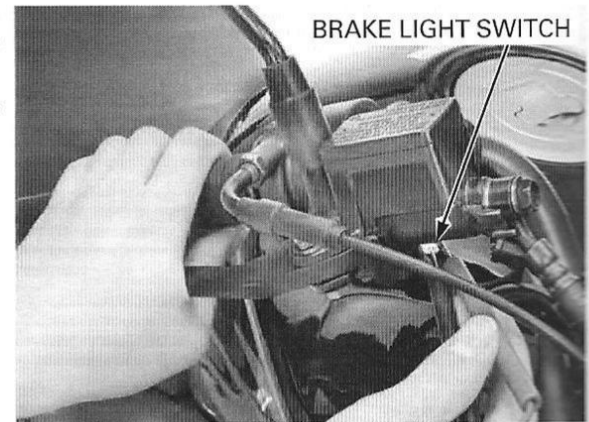


BRAKE LIGHT SWITCH

FRONT

Disconnect the front brake light switch connectors and check for continuity between the switch terminals.

There should be continuity with the brake lever squeezed and no continuity with the lever released.

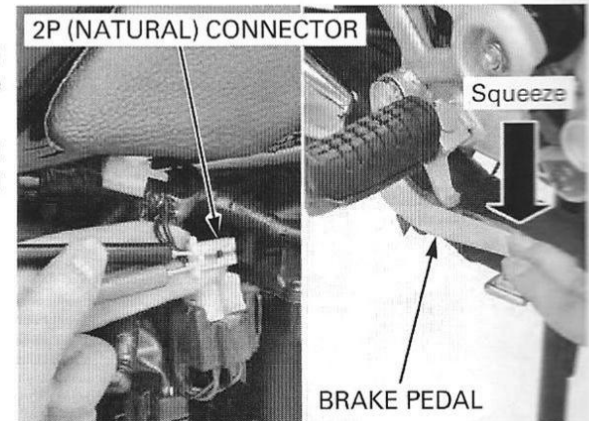


REAR

Remove the left side cover (page 2-10).

Disconnect the rear brake light switch 2P (Natural) connector, and check for continuity between the switch side connector terminals.

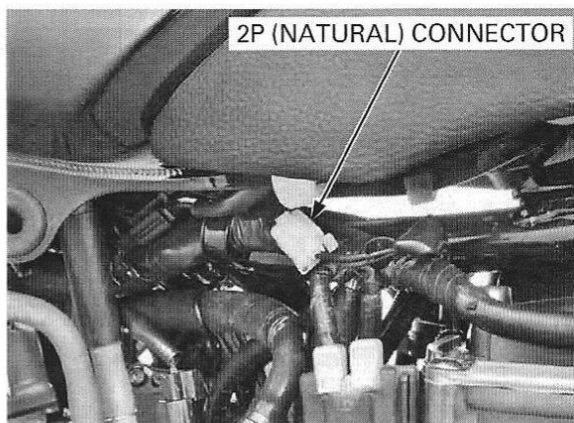
There should be continuity with the brake pedal squeezed, and no continuity with the pedal released.



REAR BRAKE LIGHT SWITCH REMOVAL/INSTALLATION

Remove the side covers (page 2-10).

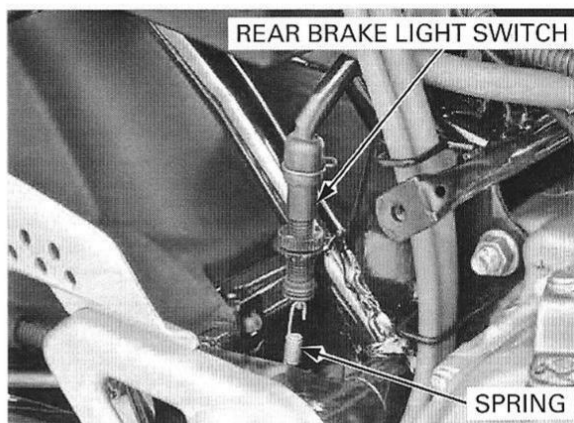
Disconnect the rear brake light switch 2P (Natural) connector.



Unhook the brake light switch spring and remove the rear brake light switch.

Installation is in the reverse order of removal.

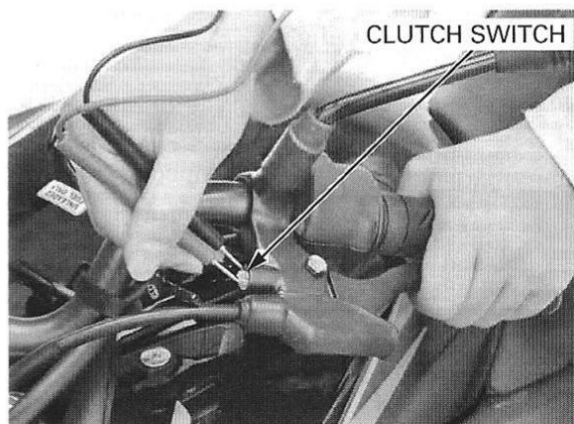
Adjust the rear brake light switch (page 3-22).



CLUTCH SWITCH

Disconnect the clutch switch wire connectors and check for continuity between the switch terminals.

There should be continuity with the clutch lever squeezed and no continuity with the lever released.



SIDESTAND SWITCH

INSPECTION

Remove the left side cover (page 2-10).

Disconnect the sidestand switch 3P (Natural) connector.

Check for continuity between the switch side connector terminals.

There should be continuity with the sidestand retracted and no continuity with the sidestand lowered.

When replacing the sidestand switch, remove the drive sprocket cover (page 3-16) and sidestand switch (page 3-23).



NEUTRAL SWITCH

INSPECTION

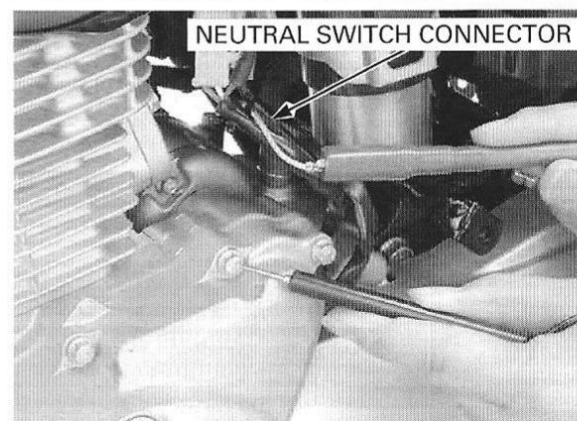
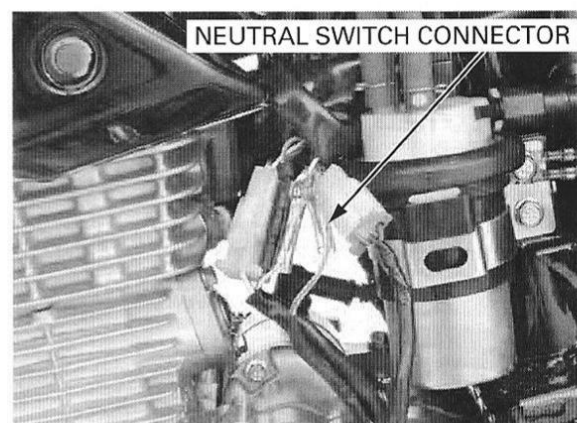
Remove the left side cover (page 2-10).

Disconnect the neutral switch wire connector.

Shift the transmission into the neutral.

Check for continuity between the switch side connector terminal and ground.

There should be continuity when the transmission is in neutral, and no continuity when the transmission is in gear except neutral.

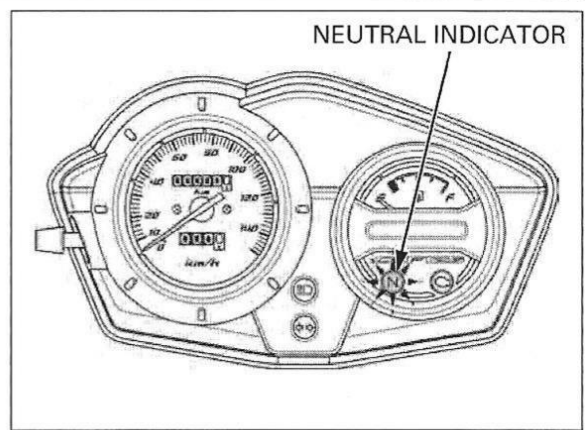


LIGHTS/METER/SWITCHES

Make sure that the neutral indicator comes on with the ignition switch ON and transmission is in neutral.

If the neutral indicator does not come on, inspect the following:

- Ignition switch
- Sub fuse A (10 A)
- Neutral indicator light bulb
- Diode
- Open or short circuit in Red wire between the ignition switch and starter relay switch
- Open or short circuit in Black and/or Red/black wires between the neutral indicator light and ignition switch
- Open or short circuit in Light green/red and/or Light green/black wires between the neutral indicator light and neutral switch

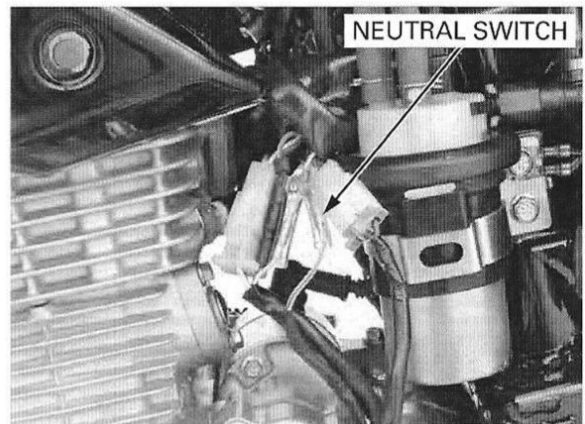


REMOVAL

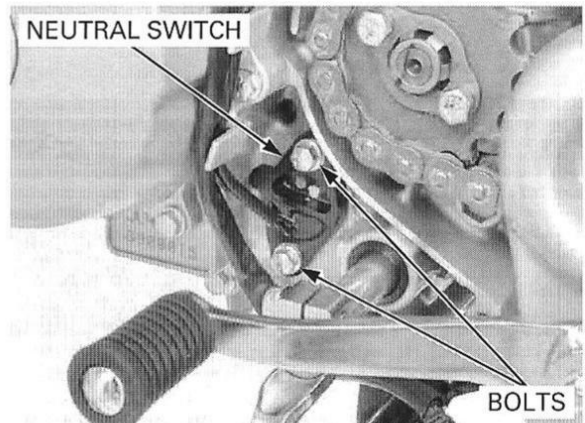
Remove the following:

- Left side cover (page 2-10)
- Drive sprocket cover (page 3-16)

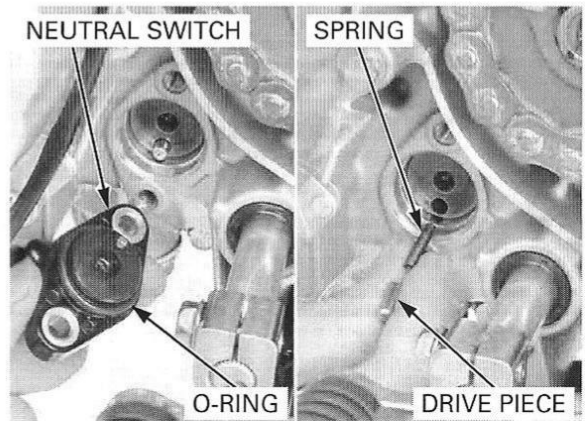
Disconnect the neutral switch wire connector.



Remove the bolts and neutral switch.



Remove the neutral switch and O-ring.
Remove the drive piece and spring.



INSTALLATION

Check the drive piece and spring for wear or damage, replace them if necessary.

- Bent drive piece by force or crushed contact point will cause poor electricity connection.

Shift the transmission into neutral.

Install the spring and drive piece.

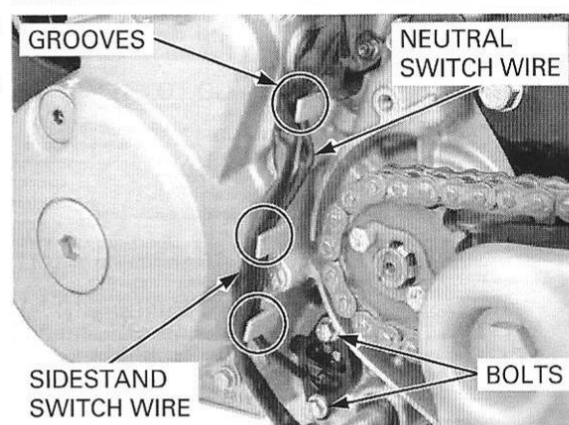
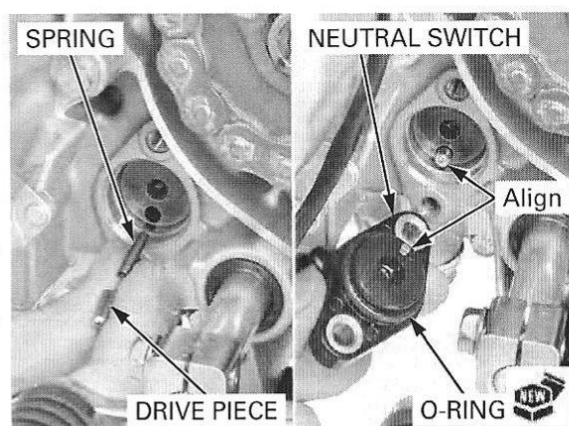
Apply engine oil to a new O-ring, and install it to the neutral switch.

Install the neutral switch by aligning its drive piece contact point with the drive piece.

Install and tighten the neutral switch mounting bolts.

Route the neutral switch and sidestand switch wires to the left crankcase cover grooves properly.

Installation is in the reverse order of removal.



FUEL GAUGE/FUEL LEVEL SENSOR

SYSTEM INSPECTION

- Before starting the inspection, check for loose or poor contact on the fuel level sensor 2P (Black) and combination meter 6P (Natural) connectors.

If the needle does not move

1. Fuel Level Sensor Inspection

Remove the left side cover (page 2-10).

Disconnect the fuel level sensor 2P (Black) connector.

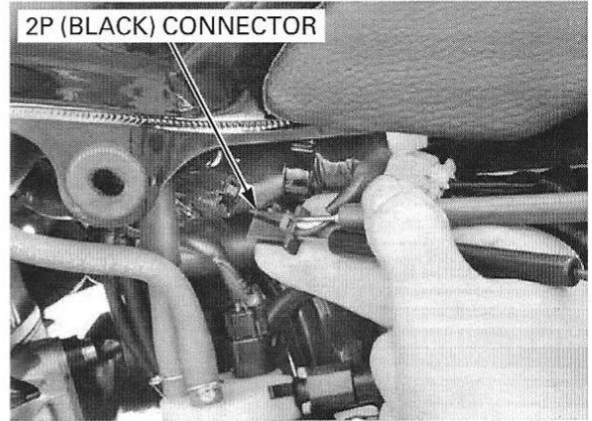
Measure the resistance at the fuel level sensor terminals.

STANDARD: 6 – 96 Ω (20°C/68°F)

Is the resistance within 6 – 96 Ω (20°C/68°F)?

YES – GO TO STEP 2.

NO – Inspect the fuel level sensor (page 18-18)



2. Fuel Level Sensor Output Line Inspection

Remove the front cowl (page 2-5).

Disconnect the combination meter 6P (Natural) connector.

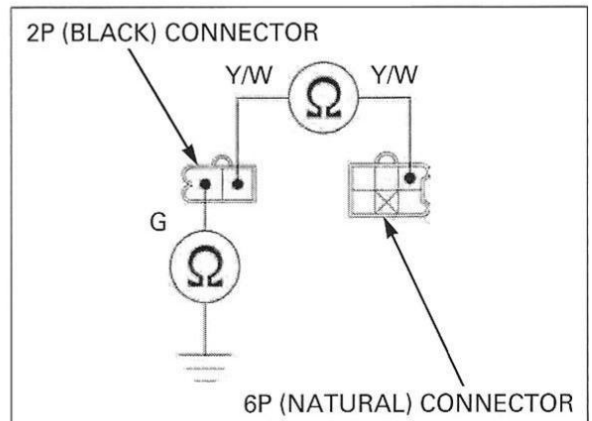
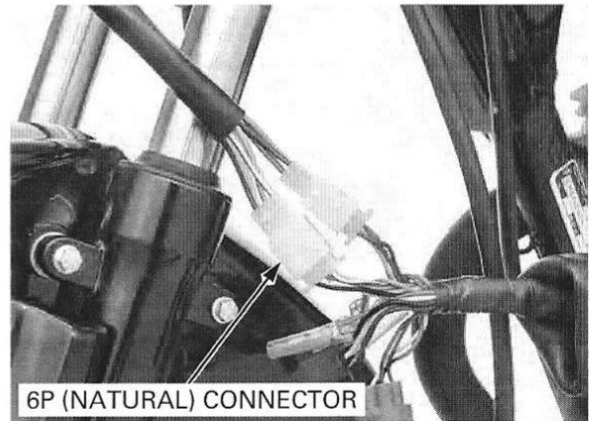
Check the continuity between the fuel level sensor 2P (Black) connector terminal and wire harness side of the combination meter 6P (Natural) connector.

**CONNECTION: Yellow/white – Yellow/white
Green – Ground**

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in Yellow/white or Green wire



3. Fuel Gauge Power Input Line Inspection

Remove the combination meter (page 18-7).

Connect the fuel level sensor 2P (Black) and combination meter 6P (Natural) connectors.

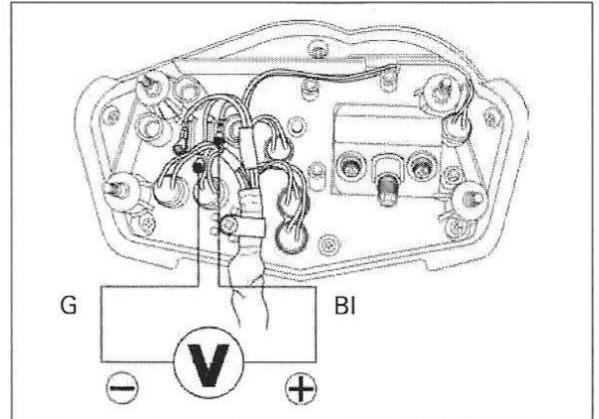
Turn the ignition switch ON and measure the voltage between the combination meter terminals.

CONNECTION: Black (+) – Green (–)

Is there battery voltage?

YES – GO TO STEP 4.

NO – • Open short circuit in Black wire
• Open circuit in Green wire



4. Fuel Gauge Inspection

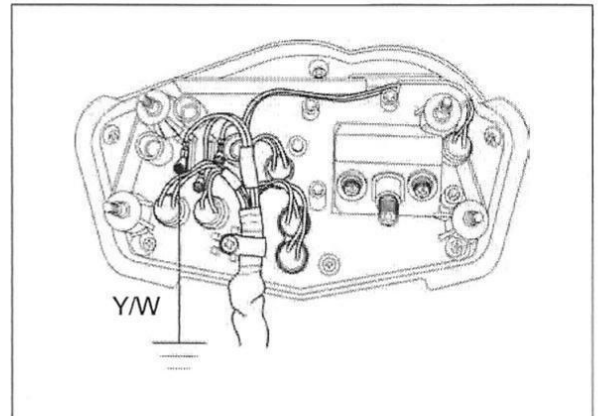
Ground the combination meter terminal with a jumper wire.

CONNECTION: Yellow/white – Ground

Is the needle moves?

YES – Open or short circuit in Yellow/white

NO – Faulty fuel gauge



REMOVAL/INSTALLATION

Remove the fuel tank (page 5-53).

Drain the remaining fuel into an approved gasoline container.

Remove the fuel level sensor mounting nuts, fuel level sensor and O-ring.

Install a new O-ring to the fuel tank.

Install the fuel level sensor into the fuel tank.

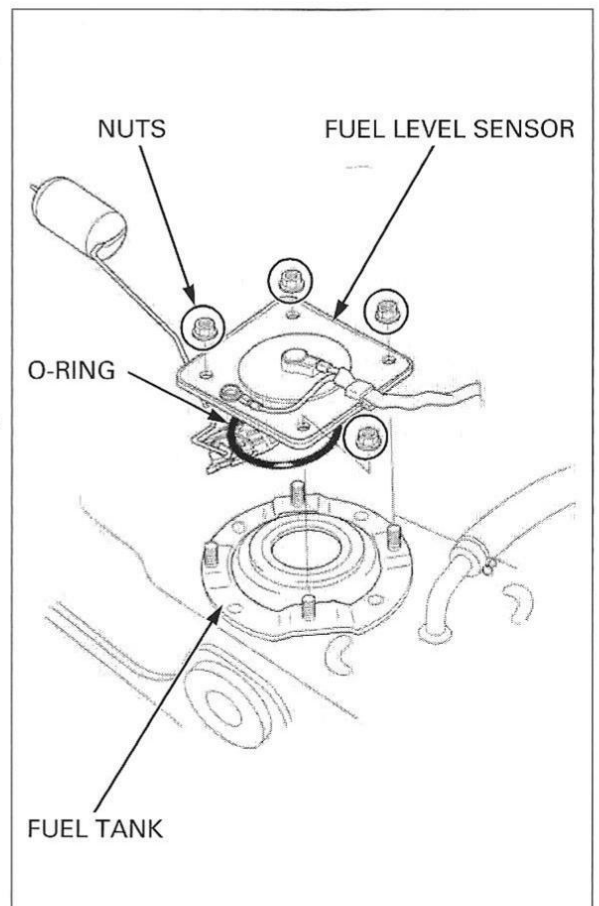
Install and tighten the fuel level sensor mounting nut to the specified torque in a crisscross pattern in 2 or 3 steps.

TORQUE: 9 N·m (0.9 kgf·m, 6.6 lbf·ft)

Install the removed parts in the reverse order of removal.

- Route the wire properly (page 1-16).

Be careful not to damage the float arm.



FUEL LEVEL SENSOR INSPECTION

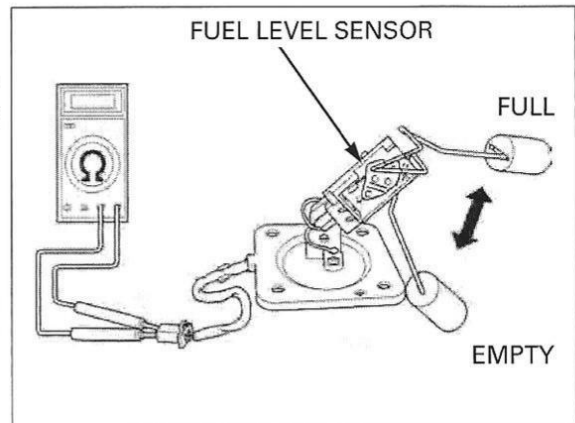
Remove the fuel level sensor (page 18-17).

Check the fuel level sensor and arm for damage. Inspect the resistance at the fuel level sensor 2P (Black) connector terminal with moving the float at the top (Full) and bottom (Empty) positions.

STANDARD RESISTANCE (20°C/68°F)

FULL: 6 – 10 Ω

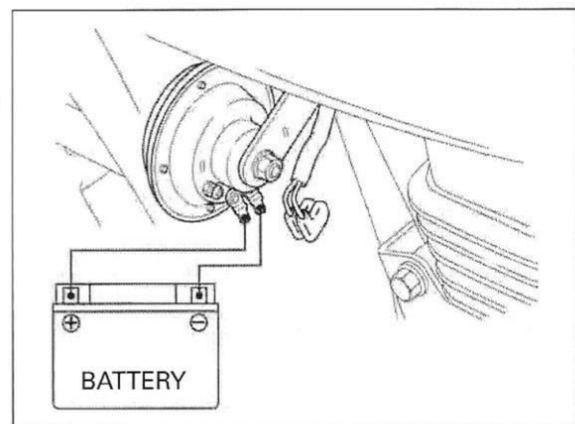
EMPTY: 90 – 96 Ω

**HORN****INSPECTION**

Disconnect the horn connectors from the horn.

Connect a 12 V battery to the horn terminals.

The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.

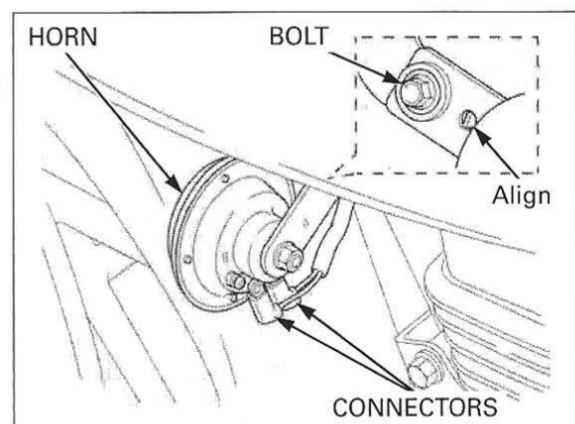
**REMOVAL/INSTALLATION**

Disconnect the horn connectors.

Remove the bolt and horn.

Install the horn by aligning its hole with the tab of the stay, then the bolt securely.

Connect the horn connectors.



TURN SIGNAL RELAY

INSPECTION

1. Recommended Inspection

Check the following:

- Battery condition
- Burned out bulb or non-specified wattage
- Burned sub fuse B (10 A)
- Ignition and turn signal switches function
- Loose connectors

Are the above items in good condition?

YES - GO TO STEP 2.

NO - Replace or repair the malfunction part(s)

2. Turn Signal Circuit Inspection

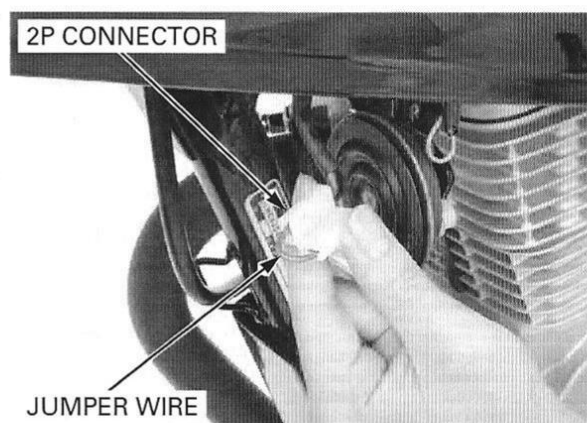
Disconnect the turn signal relay 2P connector from the turn signal relay (page 18-19).

Short the Black and Gray terminals of the turn signal relay connector with a jumper wire. Turn the ignition switch ON, and check the turn signal light by turning the turn signal switch to left or right.

Is the light come on?

YES - • Faulty turn signal relay
• Poor connection of the connector

NO - Open circuit in Black or Gray wires



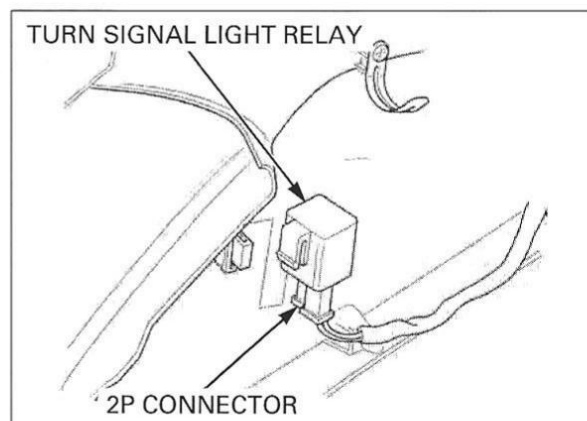
REMOVAL/INSTALLATION

Remove the left front cowl panel (page 2-5).

Disconnect the turn signal relay 2P connector from the relay.

Remove the turn signal relay from the front cowl.

Installation is in the reverse order of removal.



FUSE BOX

INSPECTION

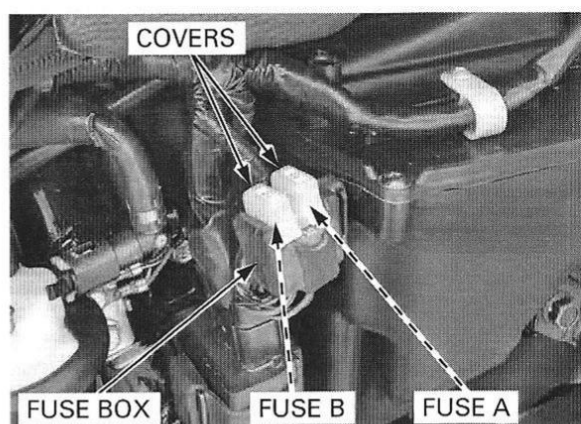
Remove the left side cover (page 2-10).

Open the fuse box covers and pull the sub fuse A and B.

Check the sub fuses are in good condition, replace them if necessary.

Close the fuse box covers.

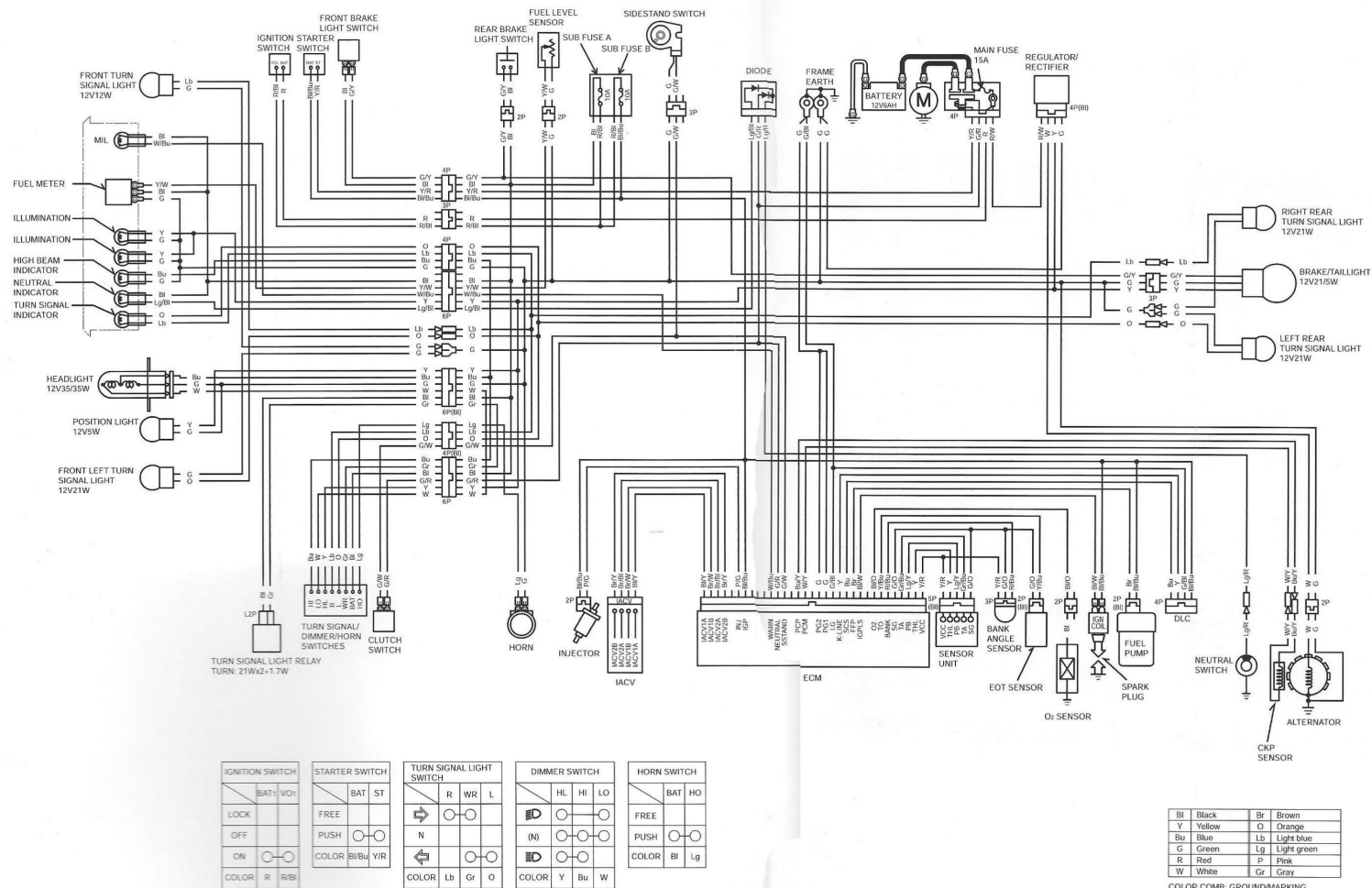
Install the left side cover (page 2-10).



19. WIRING DIAGRAM

WIRING DIAGRAM 19-3

WIRING DIAGRAM



20. TROUBLESHOOTING

ENGINE DOES NOT START OR
IS HARD TO START 20-2

ENGINE LACKS POWER 20-3

POOR PERFORMANCE AT LOW AND
IDLE SPEED 20-5

POOR PERFORMANCE
AT HIGH SPEED 20-6

POOR HANDLING 20-7

ENGINE DOES NOT START OR IS HARD TO START

1. Spark Plug Inspection

Remove and inspect the spark plug.

Is spark plug in good condition?

YES – GO TO STEP 2.

NO –

- Incorrect spark plug heat range
- Incorrect spark plug gap
- Dirty air cleaner element

2. Spark Test

Perform spark test.

Is the spark good?

YES – GO TO STEP 3.

NO –

- Faulty spark plug
- Fouled spark plug
- Loose or disconnected ignition system wires
- Broken or shorted spark plug wire
- Faulty ignition coil
- Faulty CKP sensor
- Faulty ignition switch
- Faulty ECM

3. Starter Motor Inspection

Check the starter motor operation.

Does the starter motor turn?

YES – GO TO STEP 4.

NO – Faulty electric starter system (page 17-4)

4. PGM-FI System Inspection

Check the PGM-FI system (page 5-10).

Is the PGM-FI system normal?

YES – GO TO STEP 5.

NO – Faulty PGM-FI system (page 5-14)

5. Cylinder Compression Inspection

Test cylinder compression.

Is the compression within specification?

YES –

- Valve clearance too small
- Valve stuck open
- Worn cylinder and piston rings
- Damaged cylinder head gasket
- Seized valve
- Improper valve timing

NO – GO TO STEP 6.

6. Engine Start Condition

Start by following normal procedure.

Does the engine start then stops?

YES –

- Faulty IACV
- Leaking intake manifold
- Improper ignition timing (Faulty ECM or CKP sensor)
- Contaminated fuel

ENGINE LACKS POWER

1. Drive Train Inspection

Raise the wheels off the ground, and spin them by hand.

Does the wheel spin freely?

YES – GO TO STEP 2.

NO –

- Brake dragging
- Worn or damaged wheel bearings
- Bent axle

2. Tire Pressure Inspection

Check tire pressure.

Is the tire pressures correct?

YES – GO TO STEP 3.

NO –

- Faulty tire valve
- Punctured tire

3. Clutch Inspection

Accelerate rapidly from low to second.

Does the engine speed change accordingly when clutch is engaged?

YES – GO TO STEP 4.

NO –

- Clutch slipping
- Improperly adjusted clutch lever freeplay
- Worn clutch discs/plates
- Warped clutch discs/plates
- Weak clutch spring
- Additive in engine oil

4. Engine Performance Inspection

Accelerate lightly.

Does the engine speed increase?

YES – GO TO STEP 5.

NO –

- Clogged air cleaner
- Clogged muffler
- Faulty IACV
- Faulty fuel pump

5. Ignition Timing Inspection

Check the ignition timing.

Is the ignition timing within specification?

YES – GO TO STEP 6.

NO –

- Faulty ECM
- Faulty CKP sensor
- Improper valve timing

6. Engine Oil Inspection

Check the engine oil level and condition.

Is there correct level and good condition?

YES – GO TO STEP 7.

NO –

- Oil level too high
- Oil level too low
- Contaminated oil

7. Spark Plug Inspection

Remove and inspect the spark plug.

Is the spark plug in good condition?

YES – GO TO STEP 8.

NO –

- Plugs not serviced frequently enough
- Incorrect spark plug heat range
- Incorrect spark plug gap

8. Cylinder compression Inspection

Test the cylinder compression.

Is the compression within specification?

YES – GO TO STEP 9.

NO –

- Valve clearance too small
- Valve stuck open
- Worn cylinder and piston rings
- Damaged cylinder head gasket
- Seized valve
- Improper valve timing

9. PGM-FI System Inspection

Check the PGM-FI system (page 5-10).

Is the PGM-FI system normal?

YES – GO TO STEP 10.

NO – Faulty PGM-FI system (page 5-14)

10. Lubrication Inspection

Remove the cylinder head cover and inspect for signs of proper lubrication.

Is the valve train lubricated properly?

YES – GO TO STEP 11.

NO –

- Clogged oil passage
- Clogged oil strainer

11. Over Heating Inspection

Check for engine over heating.

Is the engine over heating?

YES –

- Excessive carbon build-up in combustion chamber
- Use of poor quality fuel
- Wrong type of fuel
- Clutch slipping

NO – GO TO STEP 12.

12. Engine Knocking Inspection

Accelerate or run at high speed.

Is the engine knocking?

YES –

- Worn piston and cylinder
- Wrong type of fuel
- Excessive carbon build-up in combustion chamber
- Ignition timing too advance (Faulty ECM or CKP sensor)
- Lean fuel mixture

NO – Engine does not knock

POOR PERFORMANCE AT LOW AND IDLE SPEED

1. Spark Plug Inspection

Remove and inspect the spark plug.

Is the spark plug in good condition?

YES – GO TO STEP 2.

NO –

- Plug not serviced frequently enough
- Incorrect spark plug heat range
- Incorrect spark plug gap

2. Ignition Timing Inspection

Check the ignition timing.

Is the ignition timing within specification?

YES – GO TO STEP 3.

NO –

- Faulty ECM
- Faulty CKP sensor
- Improper valve timing

3. Fuel Pump Inspection

Inspect the fuel flow.

Is the fuel pump unit normal?

YES – GO TO STEP 4.

NO – Faulty fuel pump unit.

4. PGM-FI System Inspection

Check the PGM-FI system (page 5-10).

Is the PGM-FI system normal?

YES – GO TO STEP 5.

NO – Faulty PGM-FI system (page 5-14)

5. Spark Test

Perform spark test.

Is the spark good?

YES –

- Faulty IACV
- Improperly adjusted valve clearance

NO –

- Faulty spark plug
- Fouled spark plug
- Loose or disconnected ignition system wires
- Broken or shorted spark plug wire
- Faulty ignition coil
- Faulty CKP sensor
- Faulty ignition switch
- Faulty ECM

POOR PERFORMANCE AT HIGH SPEED

1. Ignition Timing Inspection

Check the ignition timing.

Is the ignition timing within specification?

YES – GO TO STEP 2.

NO –

- Faulty ECM
- Faulty CKP sensor
- Improper valve timing

2. Fuel Line Inspection

Disconnect the fuel hose at the fuel pump.

Does the fuel flow freely?

YES – GO TO STEP 3.

NO –

- Clogged fuel line
- Faulty fuel pump
- Loose or disconnected fuel pump system line

3. PGM-FI System Inspection

Check the PGM-FI system (page 5-10).

Is the PGM-FI system normal?

YES – GO TO STEP 4.

NO – Faulty PGM-FI system (page 5-14)

4. Spark Plug Inspection

Remove and inspect the spark plug.

Is the spark plug in good condition?

YES – GO TO STEP 5.

NO –

- Plug not serviced frequently enough
- Incorrect spark plug heat range
- Incorrect spark plug gap
- Dirty air cleaner element

5. Valve Timing Inspection

Check the valve timing.

Is the valve timing correct?

YES – GO TO STEP 6.

NO – Cam sprocket not installed properly

6. Valve Spring Inspection

Check the valve springs.

Are the valve spring free length within specified?

YES – Not weak

NO – Faulty valve spring

POOR HANDLING

Steering is heavy

- Steering bearing adjusting nut too tight
- Damaged steering head bearings

Either wheel is wobbling

- Excessive wheel bearing play
- Bent rim
- Excessively worn swingarm pivot bushings
- Bent frame

Motorcycle pulls to one side

- Front and rear wheels not aligned
- Faulty shock absorber
- Bent fork
- Bent swingarm
- Bent axle
- Bent frame

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HONDA

The Power of Dreams