

2002-2006



SERVICE MANUAL

CHF50/P/S
METROPOLITAN™

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 CHF50.

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 by the California Air Resources Board (CARB).

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 are not familiar with this motorcycle, read Technical Feature in Section 20.

If you don't know the source of the trouble, go to section 21 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.

	<p>Replace the part(s) with new one(s) before assembly.</p>
	<p>Use recommended engine oil, unless otherwise specified.</p>
	<p>Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1 : 1).</p>
	<p>Use multi-purpose grease (Lithium based multi-purpose grease NLGI #2 or equivalent).</p>
	<p>Use <i>molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent).</i> Example: Molykote® BR-2 plus manufactured by Dow Corning U.S.A. Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan</p>
	<p>Use <i>molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent).</i> 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</p>
	<p>Use silicone grease.</p>
	<p>Apply a locking agent. Use a middle strength locking agent unless otherwise specified.</p>
	<p>Apply sealant.</p>
	<p>Use DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified.</p>
	<p>Use Fork or Suspension Fluid.</p>

1. GENERAL INFORMATION

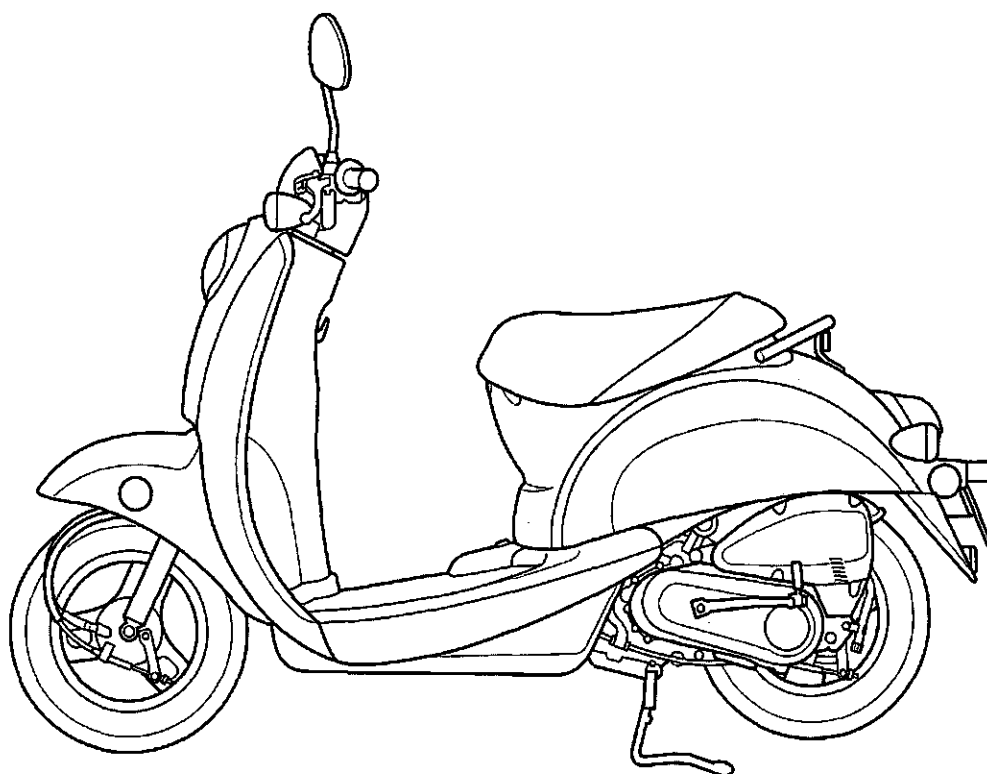
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GENERAL INFORMATION

SERVICE RULES

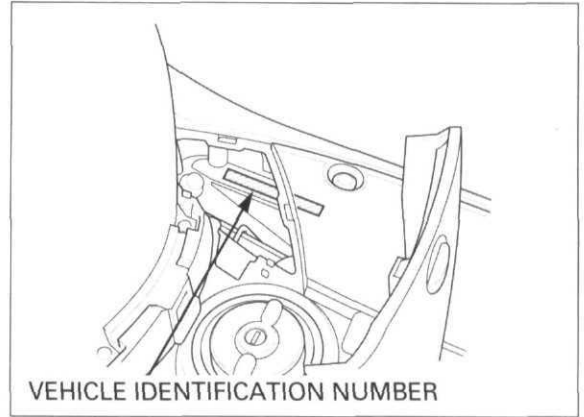
1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda's design specifications may cause damage to the scooter.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the scooter. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown in the Cable and Harness Routing (page 1-14).

MODEL IDENTIFICATION

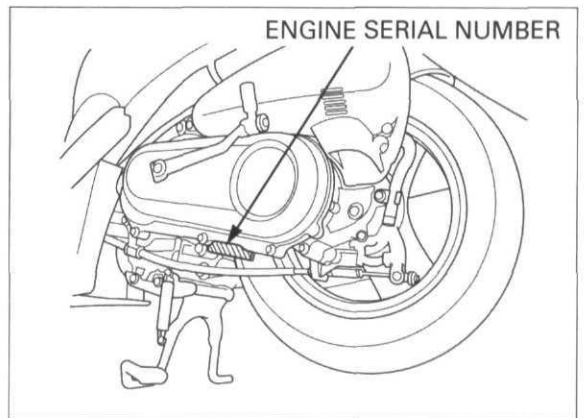


SERIAL NUMBERS

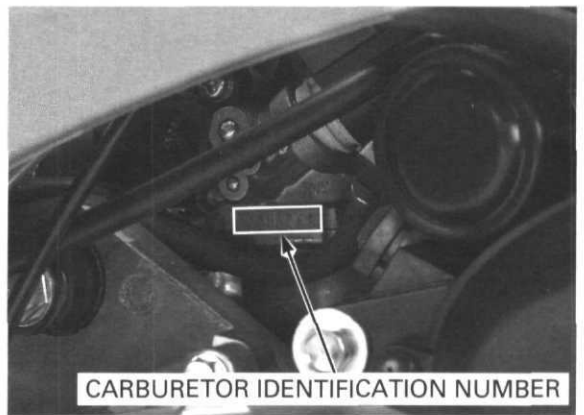
The Vehicle Identification Number (V.I.N) is stamped on the left side of the frame.



The engine serial number is stamped on the left side of the belt case.

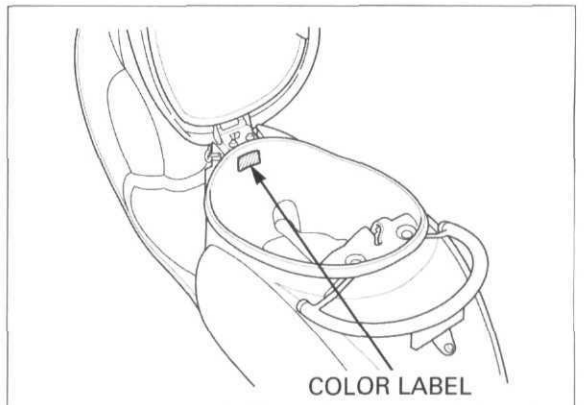


The carburetor identification numbers are stamped on the left side of the carburetor body.



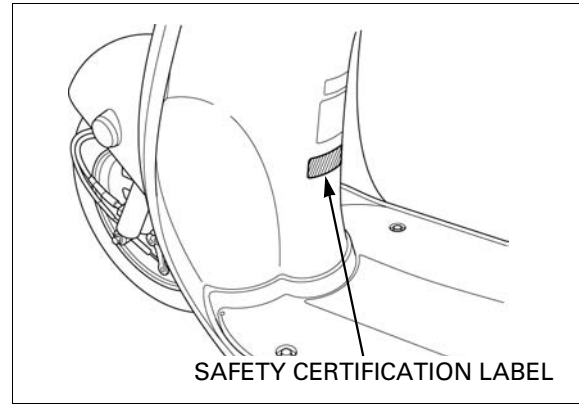
LABELS

The color label is attached as shown. When ordering color-coded parts, always specify the designated color code.

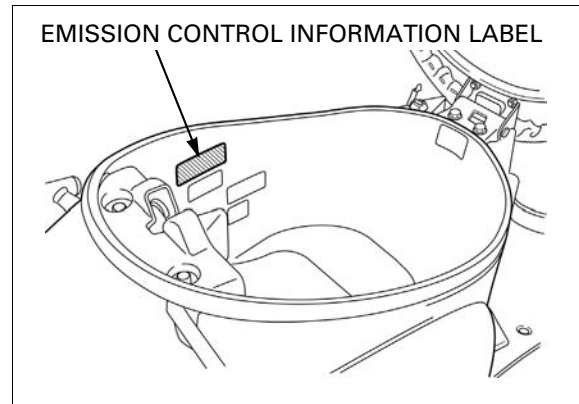


GENERAL INFORMATION

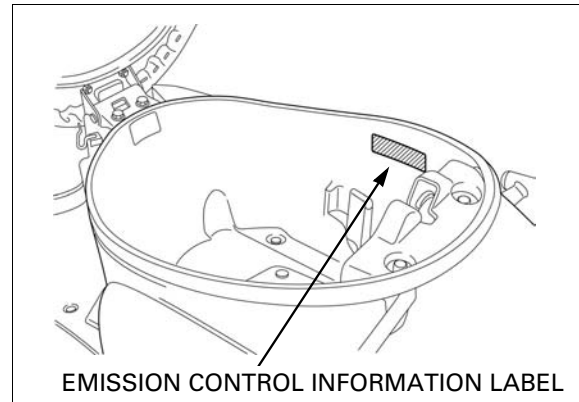
The safety certification label is attached on the leg shield.



The Emission Control Information Label (After '05 model) is attached on the left side of the luggage box inside.



The Emission Control Information Label (Canada type only: After '05 model) is attached on the right side of the luggage box inside.



GENERAL SPECIFICATIONS

DIMENSIONS	ITEM	SPECIFICATION
	Overall length Overall width Overall height Wheelbase Seat height Ground clearance Curb weight ('02 - '05 model) (After '05 model) Maximum weight capacity	1,685 mm (66.3 in) 630 mm (24.8 in) 1,005 mm (39.6 in) 1,190 mm (46.9 in) 719 mm (28.3 in) 115 mm (4.5 in) 79 kg (174 lbs) 80 kg (176 lbs) 126 kg (278 lbs)
FRAME	Frame type Front suspension Front wheel travel Front axle travel Rear suspension Rear axle travel Front tire size Rear tire size Tire brand IRC Front brake Rear brake Caster angle Trail length Fuel tank capacity	Under bone Telescopic fork 55 mm (2.2 in) 49 mm (1.9 in) Unit swing 65 mm (2.6 in) 90/90-10 50J 90/90-10 50J Front/Rear: MB65/TL Internal expanding shoe Internal expanding shoe 26°30' 72 mm (2.8 in) 5.0 liter (1.32 US gal, 1.10 Imp gal)
ENGINE	Bore and stroke Displacement Compression ratio Valve train Intake valve opens closes Exhaust valve opens closes [P type: '02 - '05 model] Intake valve opens closes Exhaust valve opens closes Lubrication system Oil pump type Cooling system Air filtration Engine dry weight	37.8 X 44.0 mm (1.49 X 1.73 in) 49.4 cm ³ (3.01 cu-in) 11.9 : 1 Chain drive and OHC 10° BTDC (at 1 mm lift) 15° ABDC (at 1 mm lift) 20° BBDC (at 1 mm lift) 10° ATDC (at 1 mm lift) -15° BTDC (at 1 mm lift) 10° ABDC (at 1 mm lift) -15° BBDC (at 1 mm lift) 15° ATDC (at 1 mm lift) Forced pressure and wet sump Trochoid Liquid cooled Paper filter 20.3 kg (44.8 lbs)
CARBURETOR	Carburetor type Throttle bore	CV (Constant Velocity) type, with flat valve 18 mm (0.7 in)
DRIVE TRAIN	Clutch system Primary reduction [P-type: '02 - '05 model] Final reduction [P-type: '02 - '05 model] Gear ratio [P-type: '02 - '05 model]	Dry, automatic centrifugal clutch 3.500 3.500 3.461 3.916 2.800 - 0.860 2.800 - 1.080
ELECTRICAL	Ignition system Starting system Charging system Lighting system	DC-CDI Starter ACG Triple phase output alternator Battery

GENERAL INFORMATION

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	0.6 liter (0.6 US qt, 0.5 Imp qt)	–
	At disassembly	0.7 liter (0.7 US qt, 0.6 Imp qt)	–
Recommended engine oil		Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or an equivalent motor oil API service classification: SG or higher JASO T 903 standard: MA Viscosity: SAE 10W-30	–
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.20 (0.006 – 0.008)	0.22 (0.009)
	Side clearance	0.05 – 0.10 (0.002 – 0.004)	0.12 (0.005)

FUEL SYSTEM SPECIFICATIONS ('02 - '05 model)

ITEM	SPECIFICATIONS
Carburetor identification number	NVK00E
[P type]	NVK00F
Main jet	#72
Slow jet	#35 X #35
Pilot screw initial opening	2-3/4 turns out
[P type]	2-1/8 turns out
Float level	13 mm (0.5 in)
Idle speed	2,000 ± 100 rpm
Starting enrichment (SE) valve resistance (20°C/68°F)	2.8 – 5.2 Ω
Throttle grip free play	2 – 6 mm (1/16 – 1/4 in)

FUEL SYSTEM SPECIFICATIONS (After '05 model)

ITEM	SPECIFICATIONS
Carburetor identification number	'06 – '07 model NVK00J
After '07 model	NVK00K
Main jet	#72
Slow jet	#35 X #35
Pilot screw initial opening	2-1/4 turns out
Float level	13 mm (0.5 in)
Idle speed	2,000 ± 100 rpm
Starting enrichment (SE) valve resistance (20°C/68°F)	2.8 – 5.2 Ω
Throttle grip free play	2 – 6 mm (1/16 – 1/4 in)

COOLING SYSTEM SPECIFICATIONS

ITEM	STANDARD	
Coolant capacity	Radiator and engine	0.3 liter (0.3 US qt, 0.3 Imp qt)
	Reserve tank	0.18 liter (0.19 US qt, 0.16 Imp qt)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kgf/cm ² , 16 – 20 psi)
Thermostat	Begin to open	74 – 78 °C (165 – 172 °F)
	Fully open	100 °C (212 °F)
	Valve lift	8 mm (0.3 in) minimum
Standard coolant concentration		1:1 mixture with soft water

CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT	
Cylinder compression			1,393 kPa (14.2 kgf/cm ² , 202 psi) at 1,500 rpm	-	
Cylinder head warpage			-	0.05 (0.002)	
Valve, valve guide	Valve clearance	IN	0.10 ± 0.03 (0.004 ± 0.001)	-	
		EX	0.19 ± 0.03 (0.007 ± 0.001)	-	
	Valve stem O.D.	IN	4.475 - 4.490 (0.1762 - 0.1768)	4.465 (0.1758)	
		EX	4.465 - 4.480 (0.1758 - 0.1764)	4.455 (0.1754)	
	Valve guide I.D.	IN/EX	4.500 - 4.512 (0.1772 - 0.1776)	4.54 (0.179)	
	Stem-to-guide clearance	IN	0.010 - 0.037 (0.0004 - 0.0015)	0.075 (0.0030)	
		EX	0.020 - 0.047 (0.0008 - 0.0019)	0.085 (0.0033)	
	Valve guide projection above cylinder head	IN	9.05 - 9.35 (0.356 - 0.368)	-	
EX		9.05 - 9.35 (0.356 - 0.368)	-		
Valve seat width		IN/EX	1.0 (0.04)	1.5 (0.06)	
Valve spring free length		IN/EX	33.5 (1.32)	32.2 (1.27)	
Rocker arm	Rocker arm I.D.		IN/EX	10.000 - 10.015 (0.3937 - 0.3943)	10.10 (0.400)
	Rocker arm shaft O.D.		IN/EX	9.972 - 9.987 (0.3926 - 0.3932)	9.91 (0.390)
	Side spring free length			16.5 (0.65)	15 (0.6)
Camshaft	Cam lobe height	IN	29.2365 - 29.3165 (1.15104 - 1.15419)	29.2065 (1.14986)	
		EX	29.2907 - 29.3707 (1.15318 - 1.15633)	29.2607 (1.15199)	
	[P type: '02 - '05 model]	IN	27.8909 - 27.9709 (1.09806 - 1.10121)	27.8623 (1.09694)	
		EX	27.9503 - 28.0303 (1.10040 - 1.10355)	27.9217 (1.09928)	

KICKSTARTER/DRIVE PULLEY/DRIVEN PULLEY/CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch	Clutch outer I.D.	107.0 - 107.2 (4.21 - 4.22)	107.5 (4.23)
	Lining thickness	-	2.0 (0.08)
Drive belt width		18.15 (0.715)	17.15 (0.68)
Movable drive face	Bushing I.D.	20.035 - 20.085 (0.7888 - 0.7907)	20.13 (0.793)
	Boss O.D.	20.010 - 20.025 (0.7878 - 0.7884)	19.97 (0.786)
	Weight roller O.D.	15.92 - 16.08 (0.627 - 0.633)	15.4 (0.61)
Driven pulley	Face spring free length	79.6 (3.13)	75.3 (2.96)
	Driven face O.D.	33.950 - 33.970 (1.3366 - 1.3374)	33.70 (1.327)
	Movable driven face I.D.	34.015 - 34.035 (1.3392 - 1.3400)	34.29 (1.350)

FINAL REDUCTION SPECIFICATIONS

ITEM	SPECIFICATIONS
Final reduction oil capacity (at disassembly)	0.1 liter (0.11 US qt, 0.09 Imp qt)
Recommended final reduction oil	Hypoid gear oil #90

GENERAL INFORMATION

CRANKSHAFT/PISTON/CYLINDER SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Crankshaft	Connecting rod side clearance	0.10 – 0.40 (0.004 – 0.016)	0.60 (0.024)	
	Connecting rod radial clearance	0.004 – 0.016 (0.0002 – 0.0006)	0.05 (0.002)	
	Runout	–	0.10 (0.004)	
Cylinder	I.D.	37.800 – 37.810 (1.4882 – 1.4886)	37.76 (1.487)	
	Out-of-round	–	0.05 (0.002)	
	Taper	–	0.05 (0.002)	
	Warpage	–	0.05 (0.002)	
Piston, piston pin, piston rings	Piston O.D.	37.775 – 37.795 (1.4872 – 1.4880)	37.72 (1.485)	
	Piston O.D. measurement point	10 mm (0.4 in) from bottom of skirt	–	
	Piston pin bore I.D.	10.002 – 10.008 (0.3938 – 0.3940)	10.04 (0.395)	
	Piston pin O.D.	9.994 – 10.000 (0.3935 – 0.3937)	9.98 (0.393)	
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)
	Piston ring-to-ring groove clearance	Top	0.020 – 0.050 (0.0008 – 0.0020)	0.08 (0.003)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.08 (0.003)
	Piston ring end gap	Top	0.05 – 0.15 (0.002 – 0.006)	0.40 (0.016)
		Second	0.05 – 0.17 (0.002 – 0.007)	0.40 (0.016)
Oil (side rail)		0.10 – 0.60 (0.004 – 0.024)	0.80 (0.031)	
Cylinder-to-piston clearance		0.005 – 0.035 (0.0002 – 0.0014)	0.08 (0.003)	
Connecting rod small end I.D.		10.013 – 10.028 (0.3942 – 0.3948)	10.05 (0.396)	
Connecting rod-to-piston pin clearance		0.013 – 0.034 (0.0005 – 0.0013)	0.06 (0.002)	

FRONT WHEEL/BRAKE/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	0.8 (0.03)
Cold tire pressure		125 kPa (1.25 kgf/cm ² , 18 psi)	–
Axle runout		–	0.20 (0.008)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Brake	Right brake lever free play	10 – 20 (3/8 – 13/16)	–
	Drum I.D.	95.0 (3.74)	95.5 (3.76)
	Lining thickness	3.5 (0.14)	1.0 (0.04)
Fork	Spring free length	128.5 (5.06)	125.9 (4.96)

REAR WHEEL/BRAKE/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	0.8 (0.03)
Cold tire pressure		200 kPa (2.00 kgf/cm ² , 28 psi)	–
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Brake	Left brake lever free play	10 – 20 (3/8 – 13/16)	–
	Drum I.D.	95.0 (3.74)	95.5 (3.76)
	Lining thickness	3.5 (0.14)	1.0 (0.04)

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS	
Battery	Capacity	12V – 6 Ah	
	Current leakage	0.1 mA max.	
	Voltage (20 °C/68 °F)	Fully charged	13.0 – 13.2V
		Needs charging	Below 12.3V
	Charging current	Normal	0.6A/5 – 10h
Quick		3A/1h	
Alternator	Capacity	190 W/5,000 rpm	
	Charging coil resistance (20 °C/68 °F)	0.05 – 0.5 Ω	

IGNITION SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	Standard	CR8EH-9 (NGK), U24FER9 (DENSO)
	For cold climate (below 5 °C/41 °F)	CR7EH-9 (NGK), U22FER9 (DENSO)
	For extended high speed riding	CR9EH-9 (NGK), U27FER9 (DENSO)
Spark plug gap		0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil peak voltage		80 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		10°BTDC at 2,000 rpm
Throttle position sensor	Resistance (20 °C/68 °F)	4 – 6kΩ
	Input voltage	4.7 – 5.3 V

LIGHTS/METERS/SWITCHES SPECIFICATIONS

ITEM		SPECIFICATIONS
Bulbs	Headlight (high/low beam)	12V-35/35W
	Brake/tail light	12V-23/8W
	Front turn signal light	12V-21W X 2
	Rear turn signal light	12V-21W X 2
	License light	12V-5W
	Instrument light	12V-1.7W X 2
	Turn signal indicator	12V-3.4W
	High beam indicator	LED
	Water temp indicator	LED
Fuse	Main fuse	15A
	Sub fuse	10A X 2
ECT sensor resistance	At 50 °C/122 °F	690 – 860 Ω
	At 130 °C /266 °F	68 – 83 Ω
Fuel pump	Resistance (20 °C/68 °F)	2.6 – 3.2 Ω
	Flow capacity	100 cm ³ (3.4 US oz, 3.5 Imp oz) minimum/minute

GENERAL INFORMATION

STANDARD TORQUE VALUES

FASTENER TYPE	TORQUE N-m (kgf-m, lbf-ft)	FASTENER TYPE	TORQUE N-m (kgf-m, lbf-ft)
5 mm hex bolt and nut	4.9 (0.5, 3.6)	5 mm screw	3.9 (0.4, 2.9)
6 mm hex bolt and nut	10 (1.0, 7)	6 mm screw	8.8 (0.9, 6.5)
8 mm hex bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head)	8.8 (0.9, 6.5)
10 mm hex bolt and nut	34 (3.5, 25)	6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
12 mm hex bolt and nut	54 (5.5, 40)	8 mm flange bolt and nut	26 (2.7, 20)
		10 mm flange bolt and nut	39 (4.0, 29)

ENGINE & FRAME TORQUE VALUES

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

NOTE:

1. Apply oil to the threads and seating surface.
2. Apply sealant to the threads.
3. Apply a locking agent to the threads.
4. ALOC bolt: replace with a new one.
5. U-nut.

ENGINE

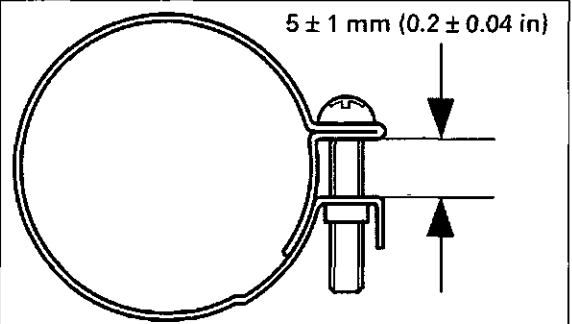
MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Spark plug	1	10	12 (1.2, 9)	
Engine oil drain bolt	1	12	25 (2.5, 18)	

LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Engine oil strainer cap	1	30	20 (2.0, 14)	
Engine oil pump cover screw	1	3	2.0 (0.2, 1.4)	

FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Float chamber screw	3	4	2.1 (0.21, 1.5)	
Vacuum chamber cover screw	2	4	2.1 (0.21, 1.5)	
SE valve setting plate screw	1	4	2.1 (0.21, 1.5)	
Insulator band screw ('02 - '03 model)	2	5	-	
	2	5	3.0 (0.30, 2.2)	
Insulator band screw (After '03: V.I.N After 5018998)				

COOLING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Coolant drain bolt	1	12	0.9 (0.1, 0.7)	
Radiator cover screw	4	4	0.9 (0.1, 0.7)	

GENERAL INFORMATION

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Cylinder head bolt	4	6	12 (1.2, 9)	NOTE 1
Cam sprocket bolt	2	5	8.8 (0.9, 6.5)	NOTE 1
Cam chain tensioner lifter screw ('02 - '05 model)	1	6	3.9 (0.4, 2.9)	
PCV joint bolt (After '05 model)	1	6	10 (1.0, 7)	

KICKSTARTER/DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Clutch outer nut	1	10	39 (4.0, 29)	
Drive pulley face nut	1	12	32 (3.3, 24)	NOTE 1

FINAL REDUCTION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Final drive oil check bolt	1	8	13 (1.3, 9)	

ALTERNATOR/STARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Alternator/starter bolt	3	6	12 (1.2, 9)	
Flywheel nut	1	12	44 (4.5, 33)	
Radiator cooling fan bolt	3	6	7.8 (0.8, 5.8)	

CRANKSHAFT/PISTON/CYLINDER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Crankcase bolt	9	6	12 (1.2, 9)	NOTE 1

LIGHTS/METERS/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
ECT sensor	1	PT 1/8	10 (1.0, 7)	NOTE 2

FRAME

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Brake cable adjust lock nut	2	8	6.8 (0.7, 5)	

ENGINE MOUNTING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Engine hanger link bolt (frame side)	2	10	39 (4.0, 29)	
Engine mounting nut (engine side)	1	10	49 (5.0, 36)	NOTE 5

FRONT WHEEL/BRAKE/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Front axle nut	1	10	44 (4.5, 33)	NOTE 5
Front brake arm nut	1	5	5.8 (0.6, 4.3)	
Handlebar post nut	1	10	42 (4.3, 31)	NOTE 5
Steering stem lock nut	1	BC1	69 (7.0, 51)	
Equalizer cover bolt	1	6	12 (1.2, 9)	NOTE 3

GENERAL INFORMATION

REAR WHEEL/BRAKE/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear axle nut	1	14	118 (12.0, 87)	NOTE 1, 5
Rear brake arm bolt	1	5	4.9 (0.5, 3.8)	NOTE 4
Rear shock absorber mounting bolt	2	8	26 (2.7, 20)	

OTHERS

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front/rear frame assembly bolt	4	10	44 (4.5, 33)	

LUBRICATION & SEAL POINTS

ENGINE

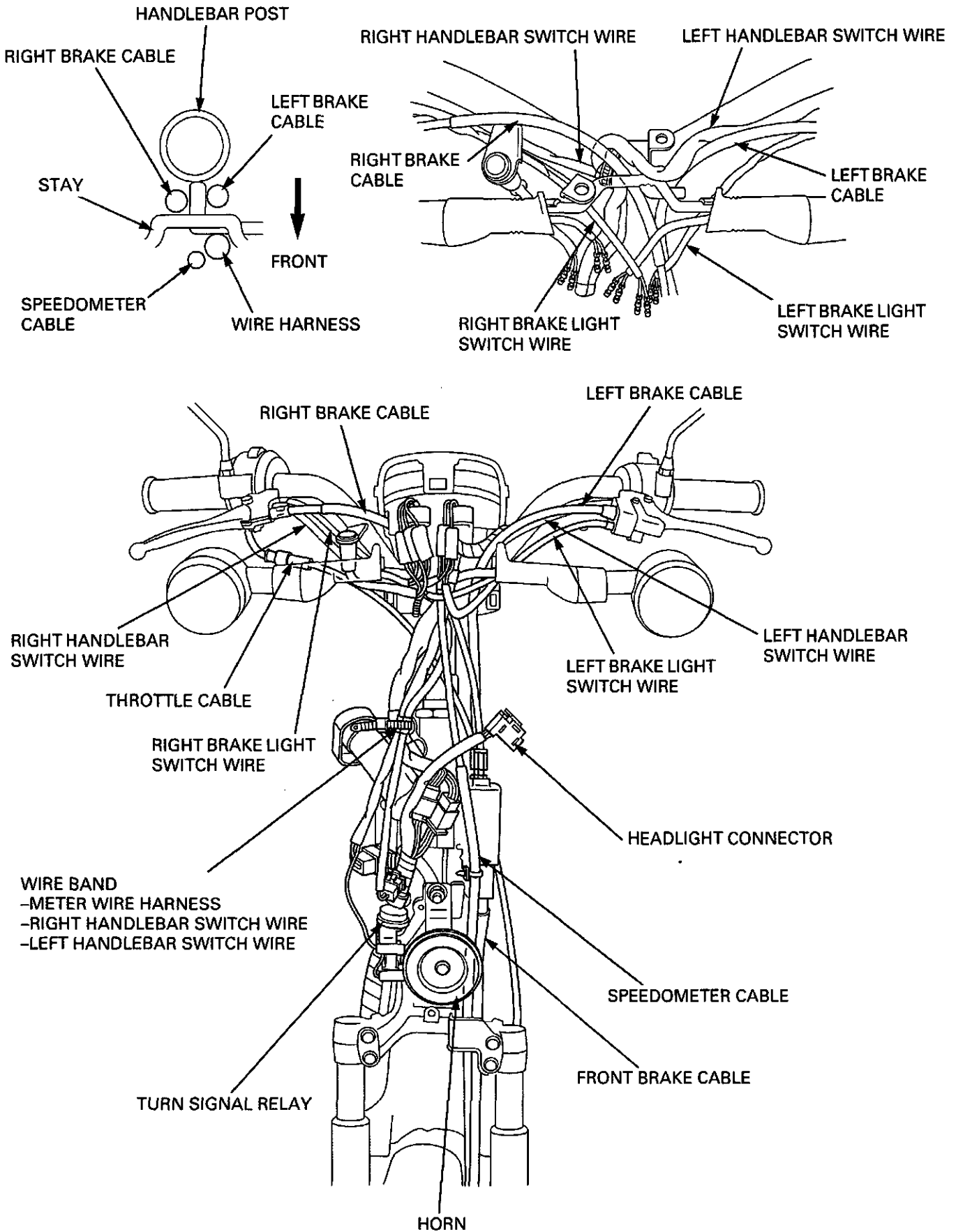
LOCATION	MATERIAL	REMARKS
ECT sensor threads	Liquid sealant (Three Bond 1207B or equivalent)	Do not apply sealant to the sensor threads head. (See page 12-11)
Crankcase mating surface Transmission case mating surface		(See page 10-11)
Kickstarter spindle seating surface Kickstarter driven gear seating surface/friction spring sliding surface	Molybdenum disulfide paste	Apply 0.2 – 0.5g.
Final shaft seating surface (belt case side) Countershaft seating surface	Molybdenum disulfide grease	Apply 0.3 – 0.5g. Apply 0.5 – 1.0g.
Rocker arm sliding surface Valve stem (valve guide sliding surface) Camshaft cam lobes Piston pin outer surface	Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	
Driven face bearing	Multi-purpose grease	
Oil pump drive, driven gear teeth Camshaft bearing Rocker arm shaft sliding surface Cylinder head bolt threads and seating surfaces (6 X 119 mm) Piston and cylinder sliding surfaces Cam sprocket bolt threads and seating surfaces Drive pulley face nut threads and seating surface Piston ring whole surface Crankcase bolt threads and seating surface Connecting rod big end bearing Crankshaft main journal bearings Cam chain Oil seal lips and outer surfaces Sprocket teeth Each O-ring whole surface	Engine oil	Fill up 3 cc. Fill up 2 cc per each bearing.

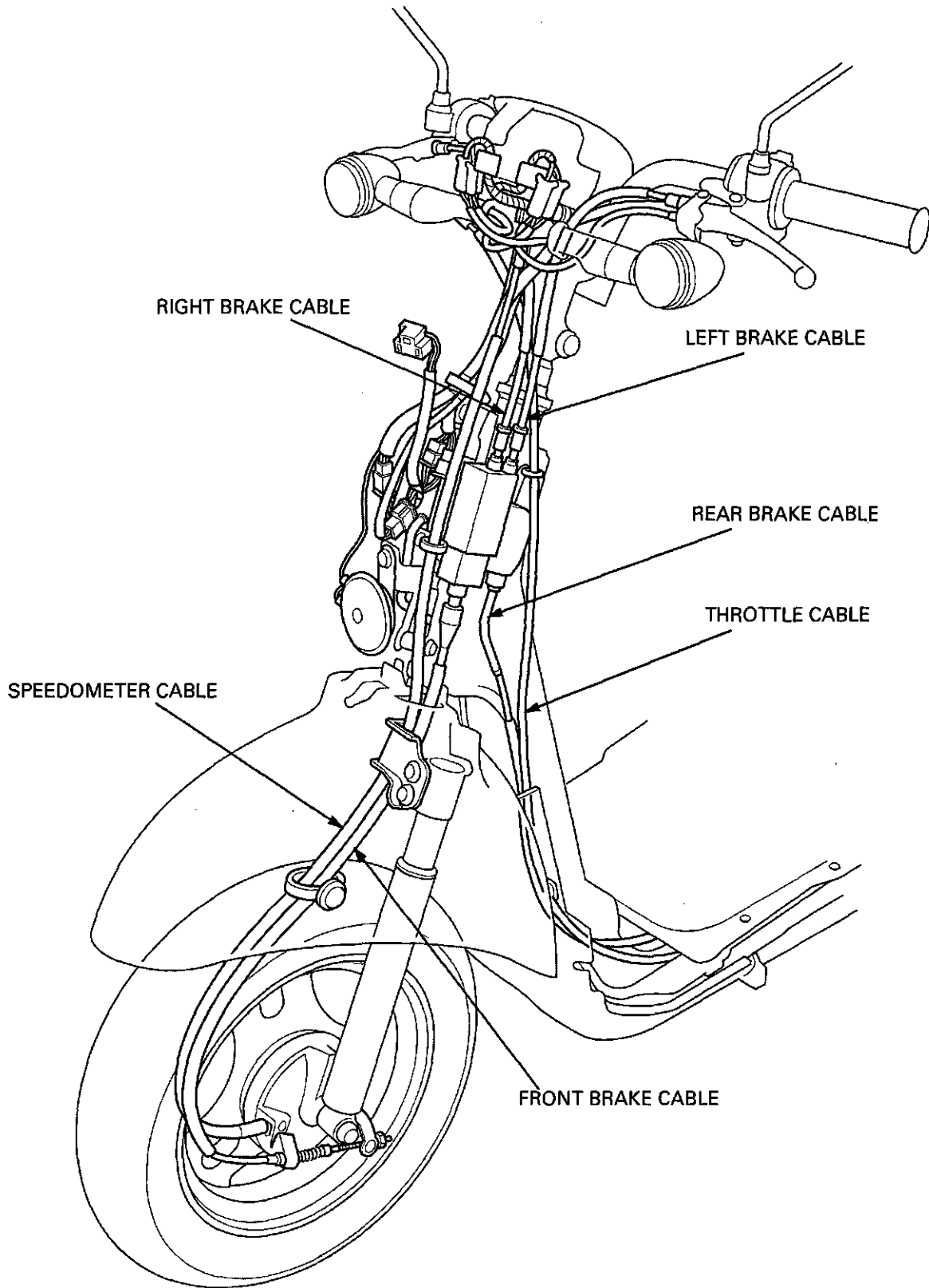
FRAME

LOCATION	MATERIAL	REMARKS
Front wheel dust seal lips Speedometer gear teeth Speedometer gear inner surface Speedometer gear pinion shaft Brake cams Brake panel anchor pins Front brake panel dust seal lips Fork spring taper area Fork rebound spring Fork guide bushing inner surface Fork dust seal lips Fork dust seal-to-snap ring area Throttle grip pipe flange cable groove Brake lever pivots Steering stem bearings and race sliding surface Seat catch hook sliding area Main stand pivot	Multi-purpose grease	Apply grease 3g. Apply grease 0.2 – 0.3g. Apply grease 6.5 – 8g. Fill up 1.5 – 2g Apply grease 0.1 – 0.2g. Apply 1.5 – 2g per each bearing.
Brake equalizer sliding surface	Silicone grease	Apply 0.1g.
Front/rear brake cam felt seat	Engine oil	
Rear axle nut threads and seating surface		
Throttle cable outer inside Brake cable outer inside Seat lock cable outer inside Main stand lock cable outer inside	Cable lubricant	
Handlebar grip rubber inside	Honda bond A or equivalent	
Air cleaner connecting tube-to-housing mating area	Locking agent	
Equalizer cover bolt threads		

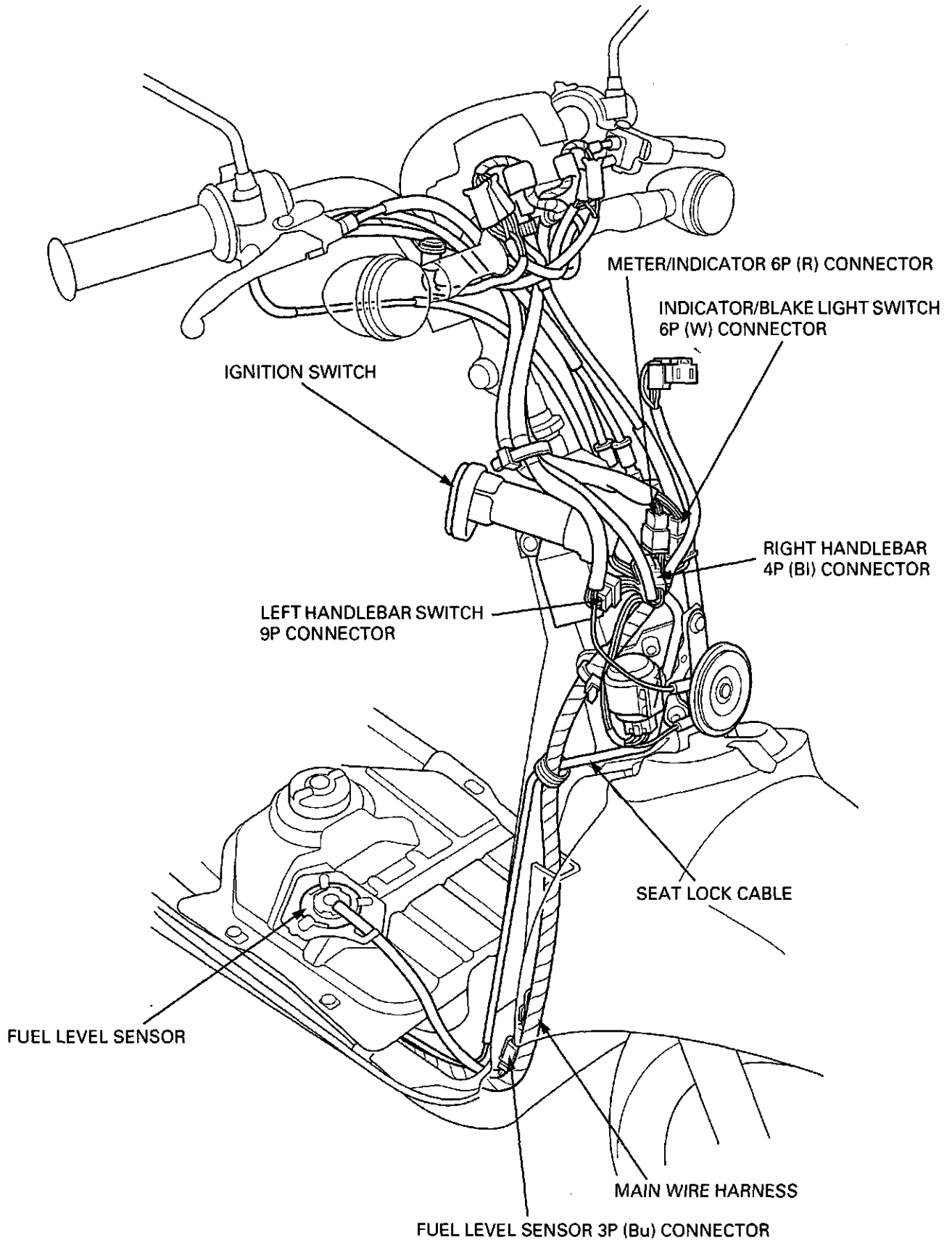
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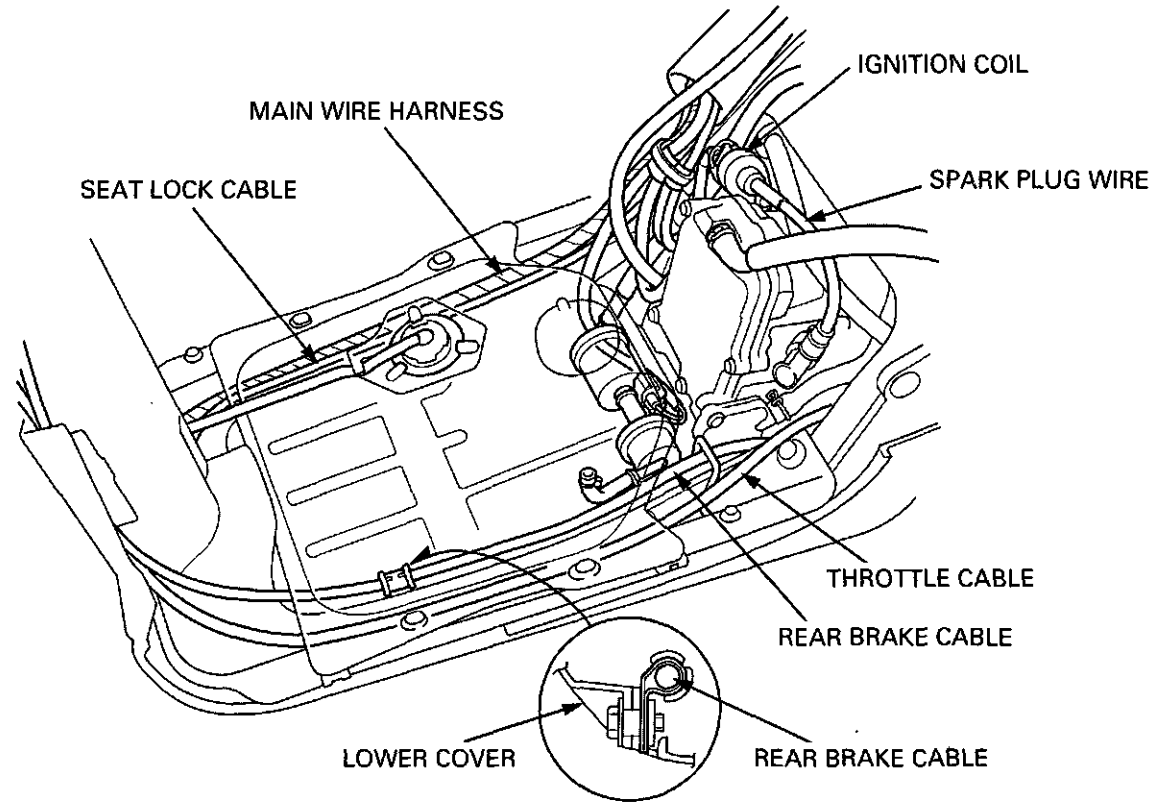
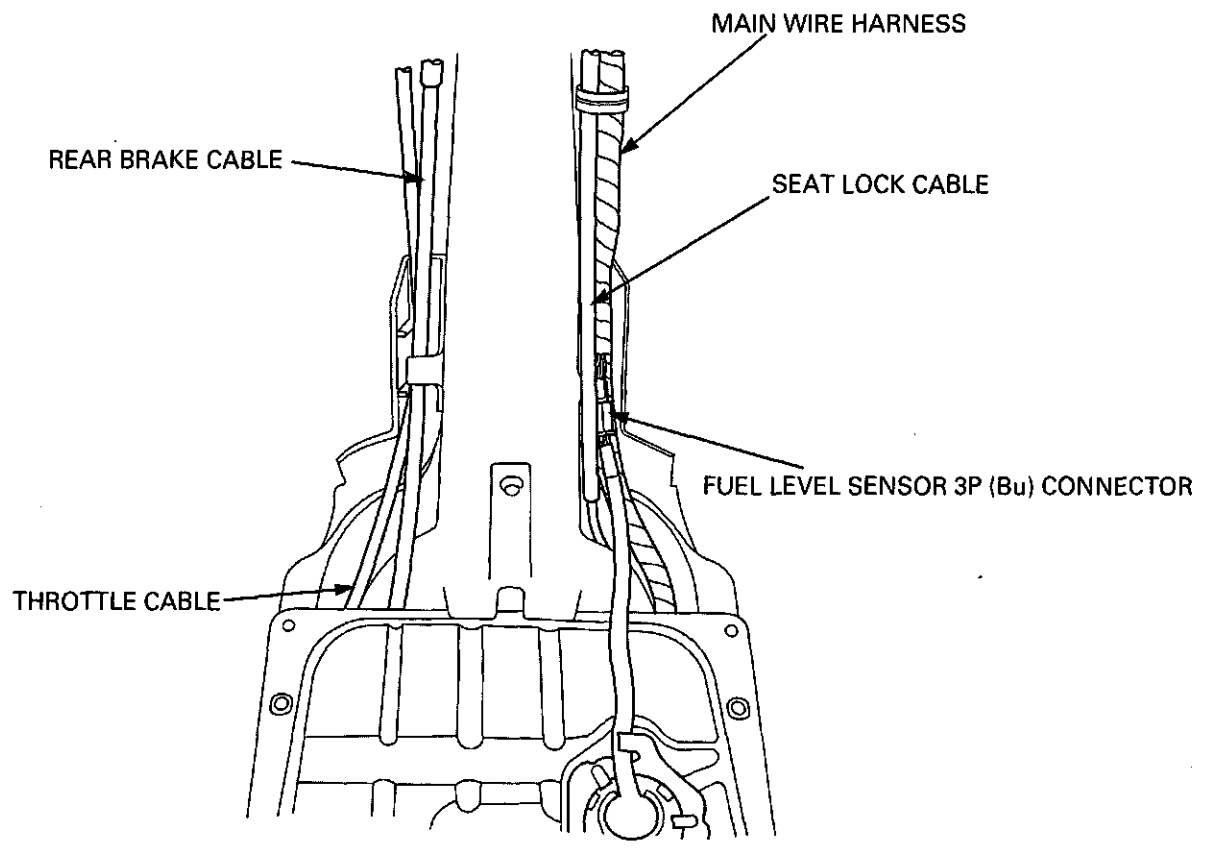
CABLE & HARNESS ROUTING ('02 - '05 model)



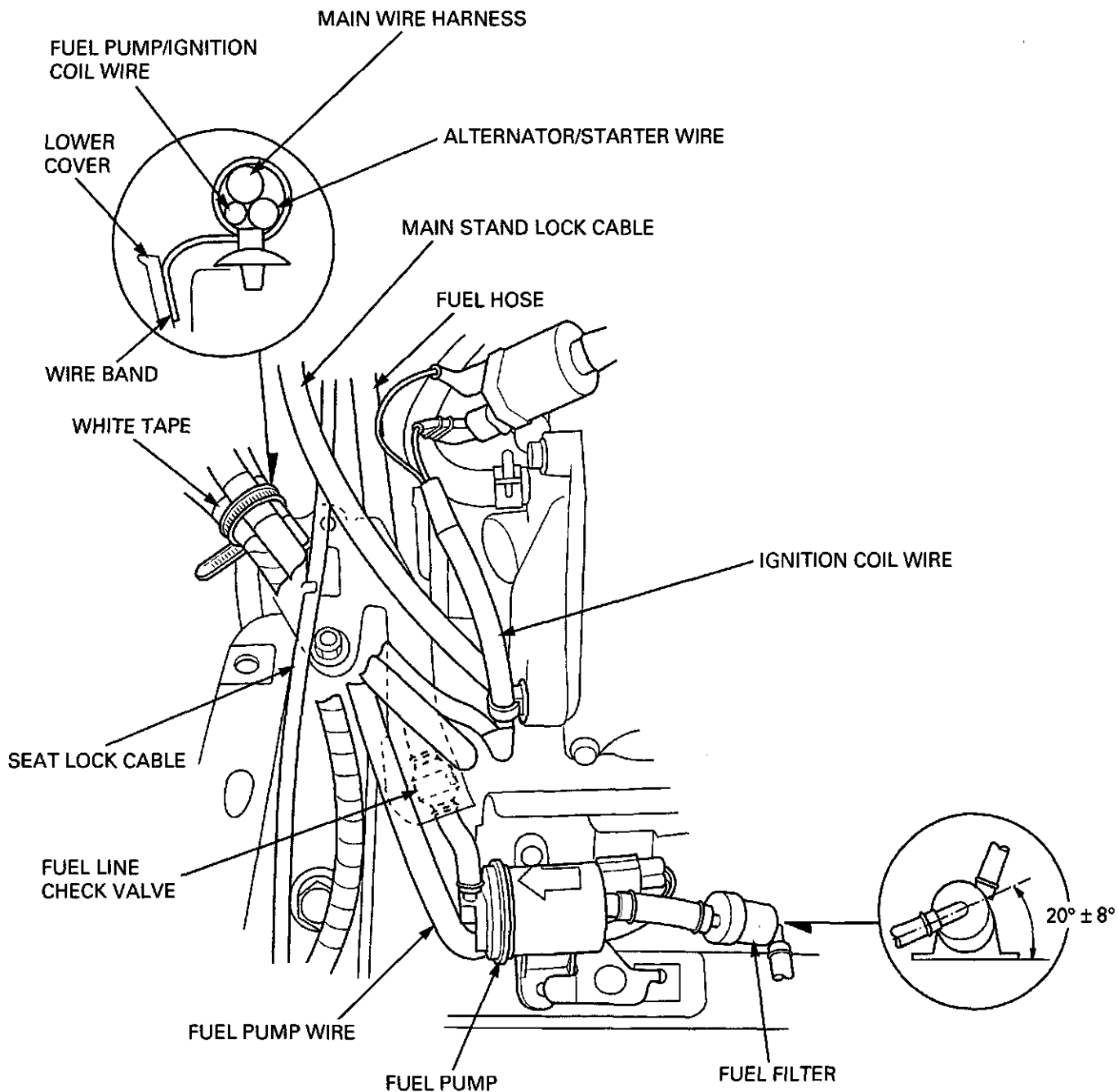


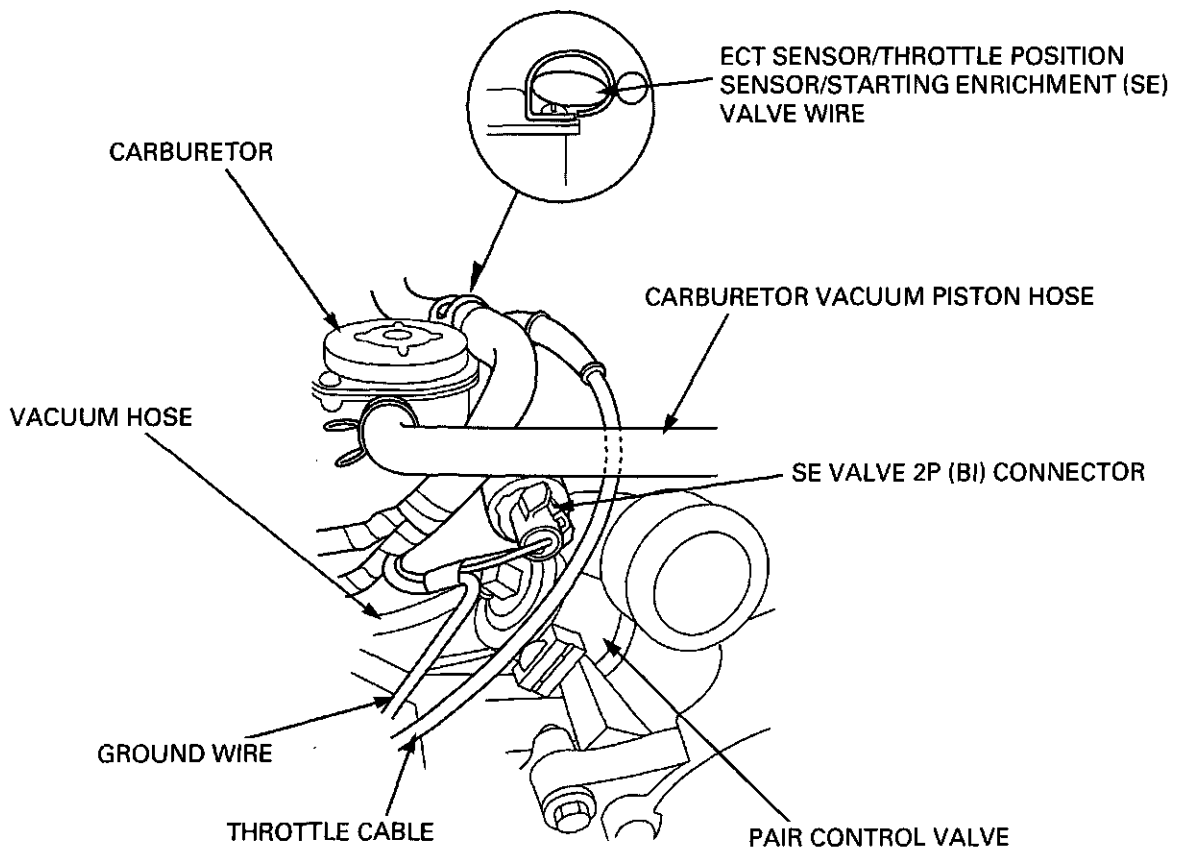
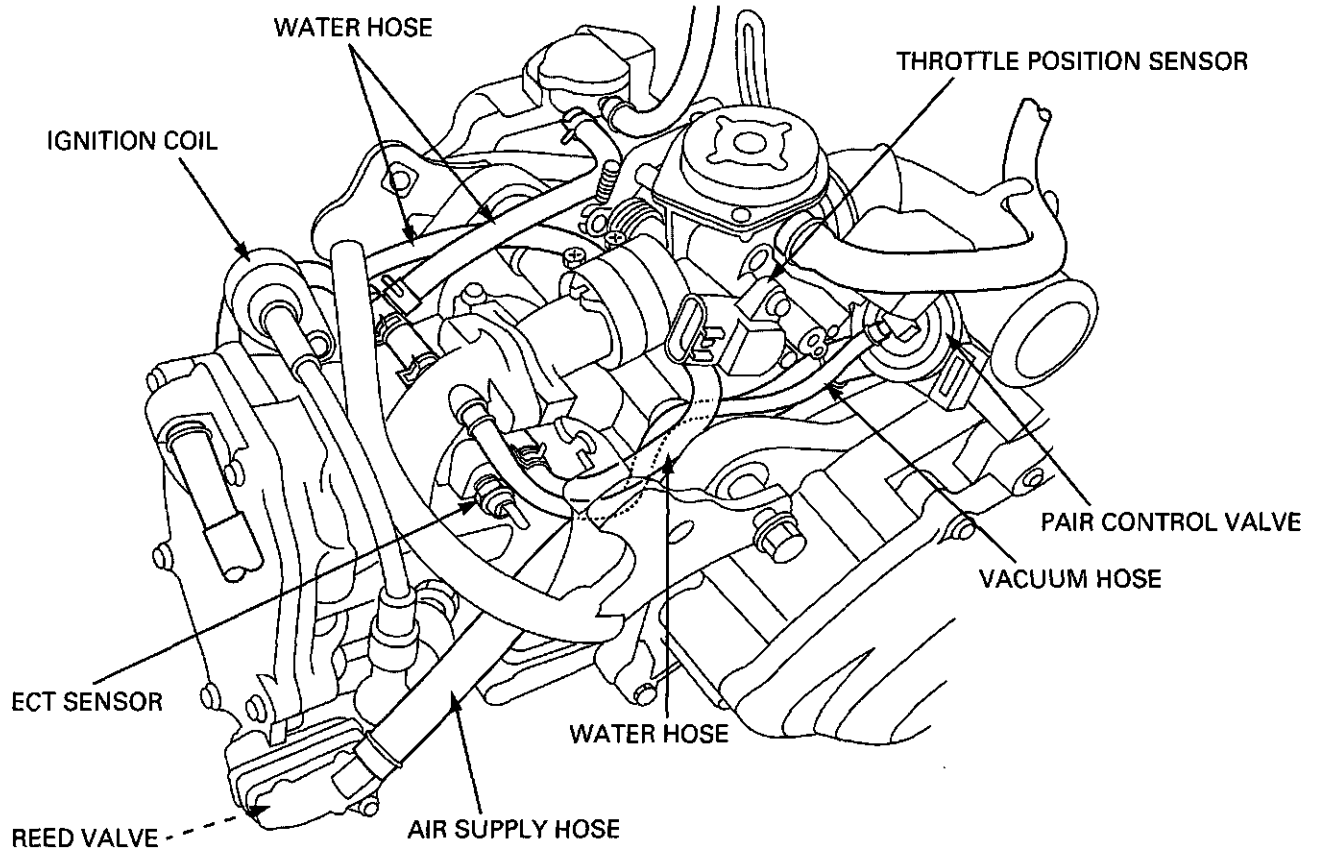
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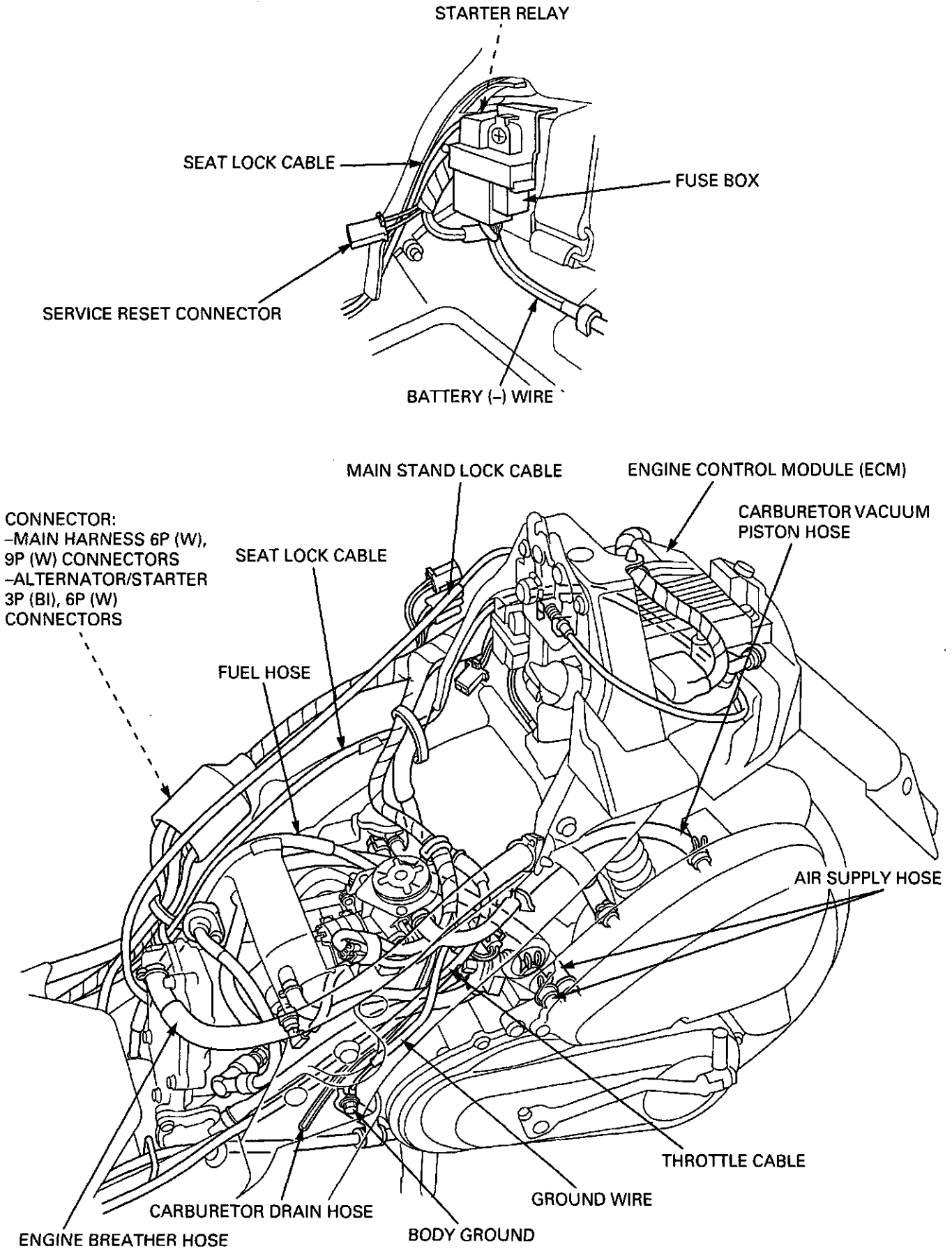


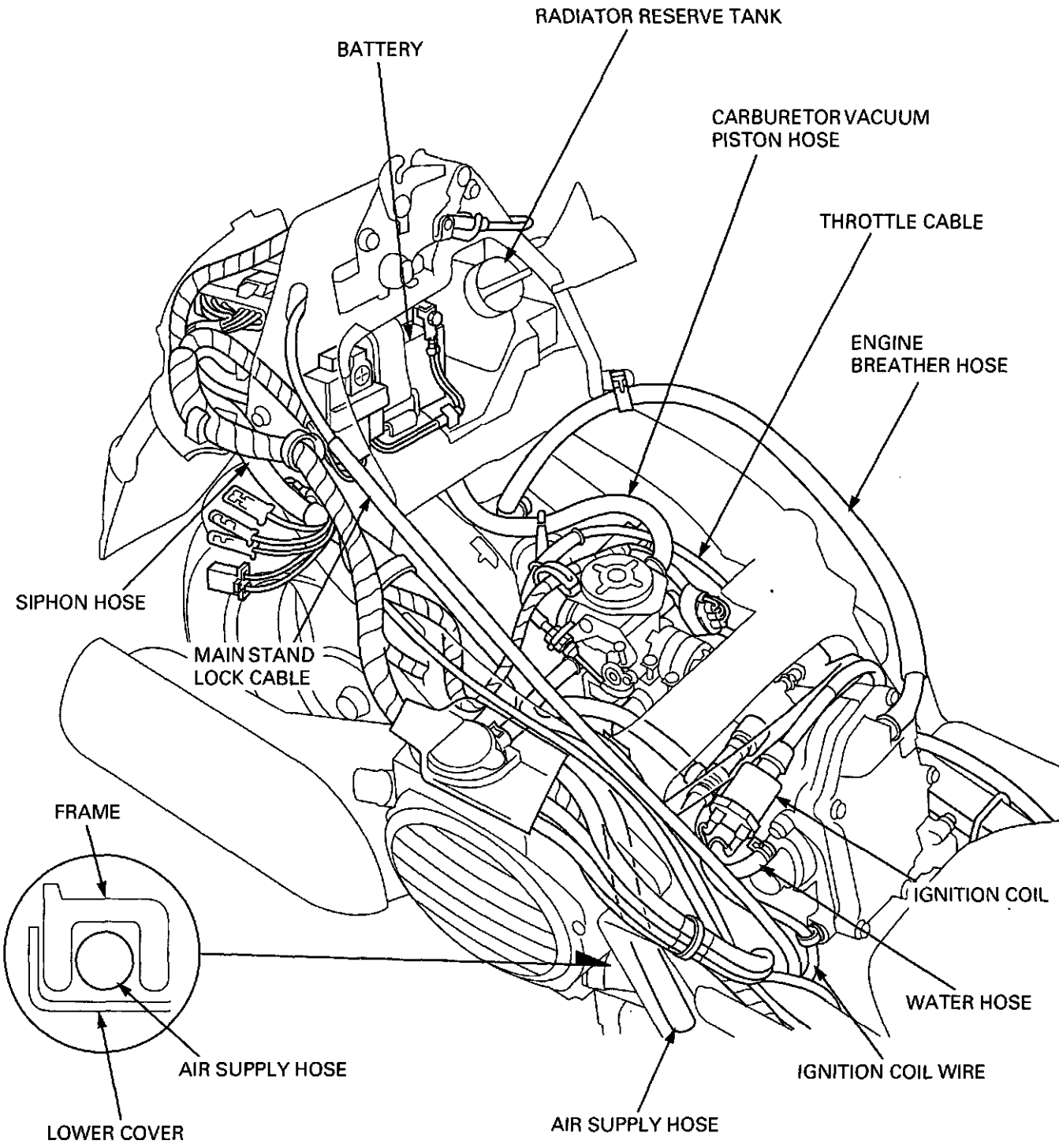
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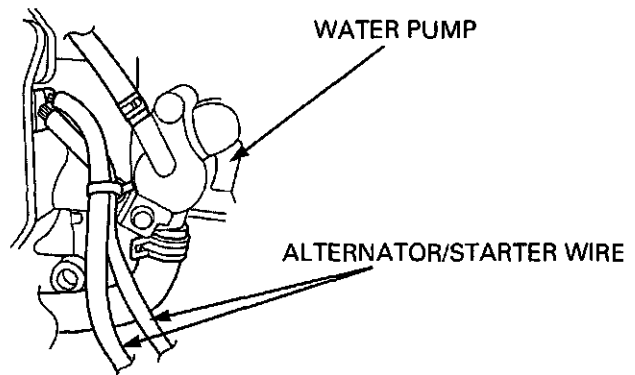
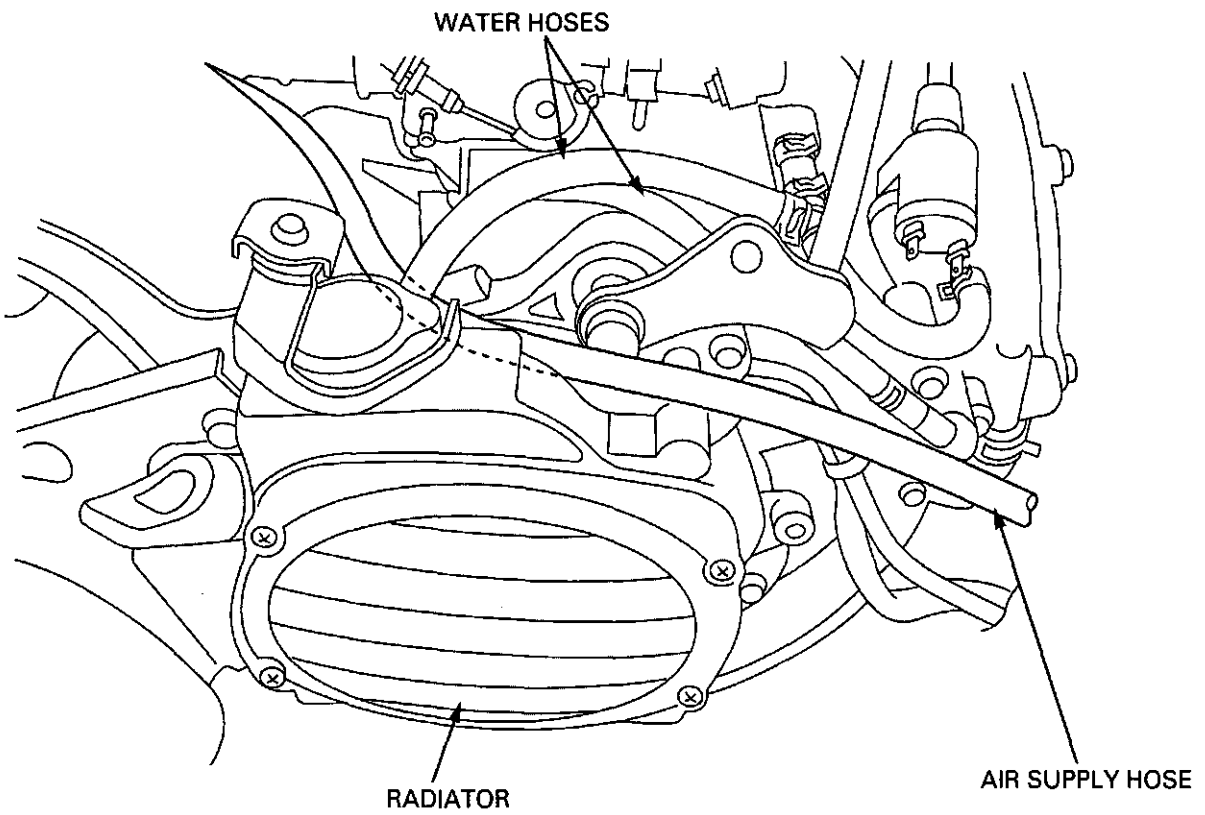
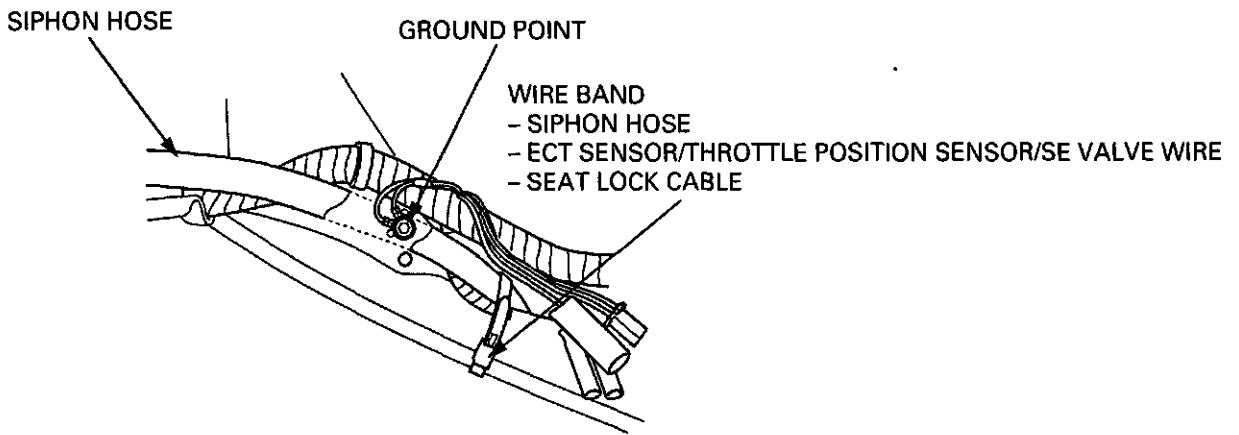


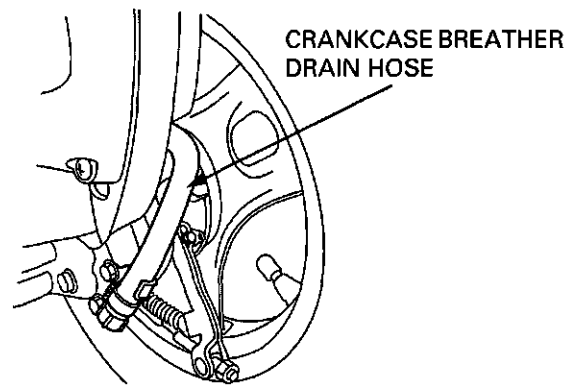
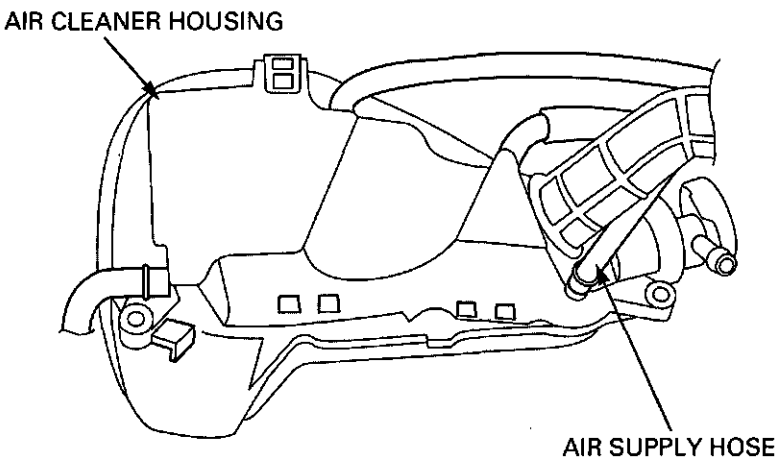
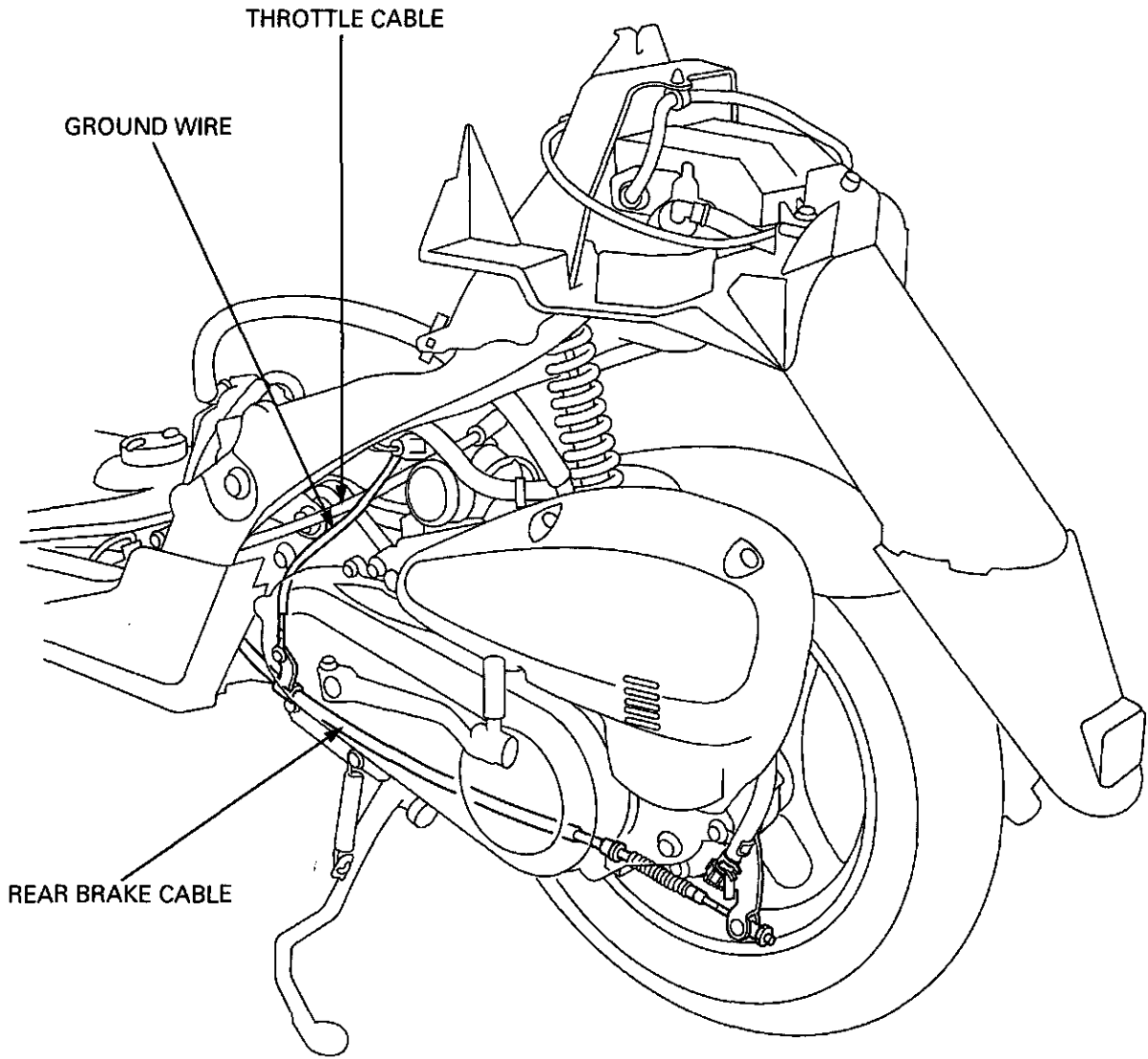
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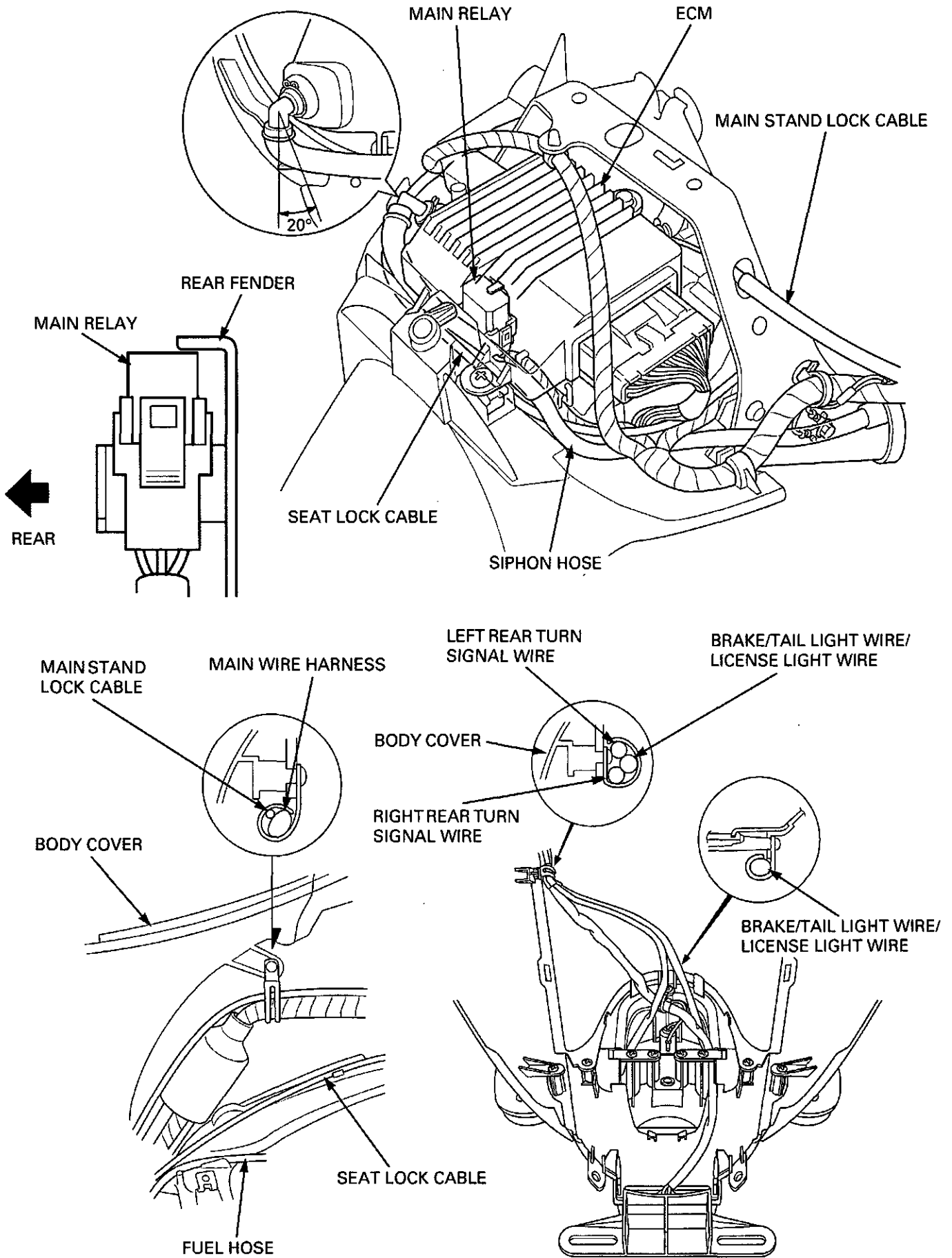


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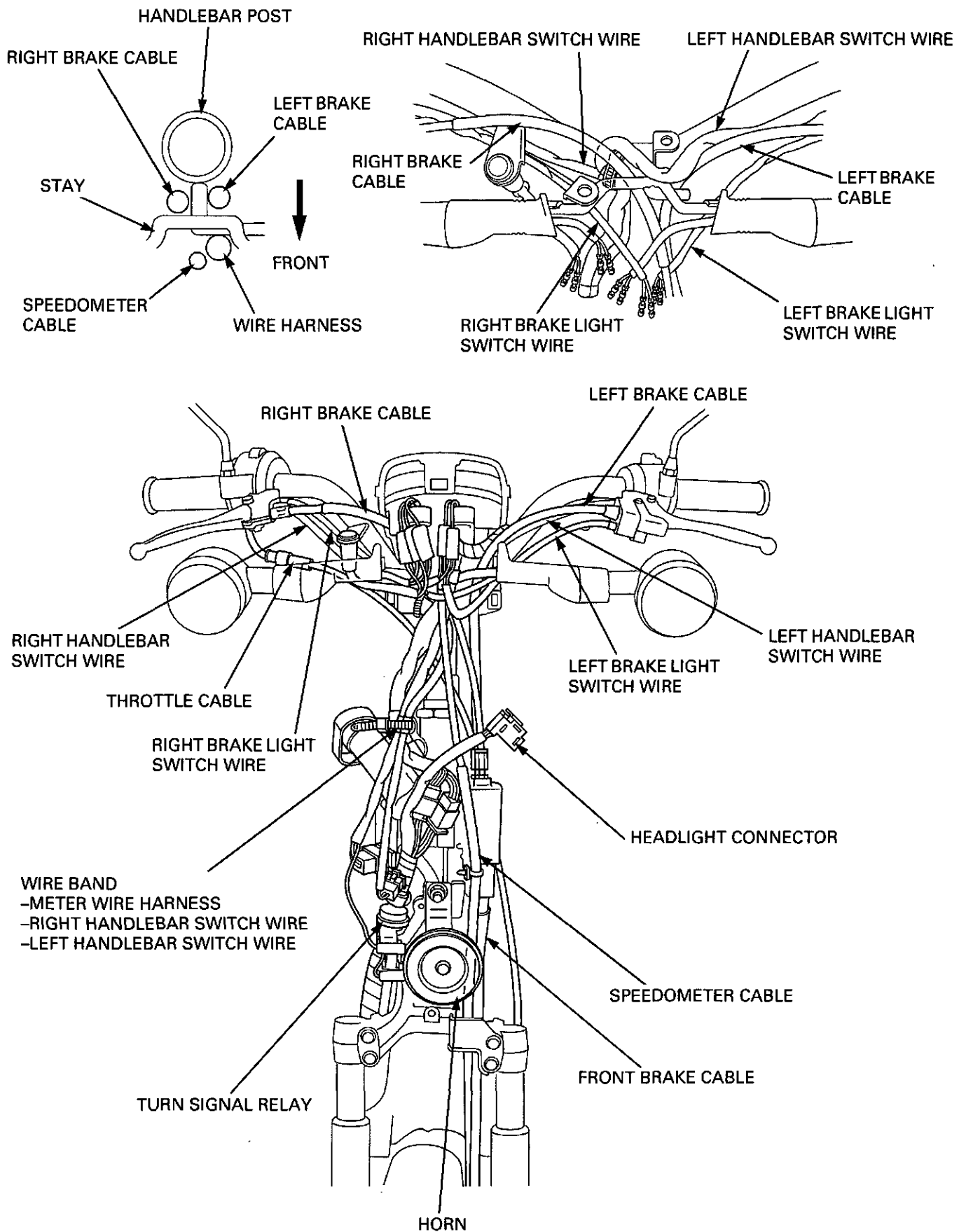




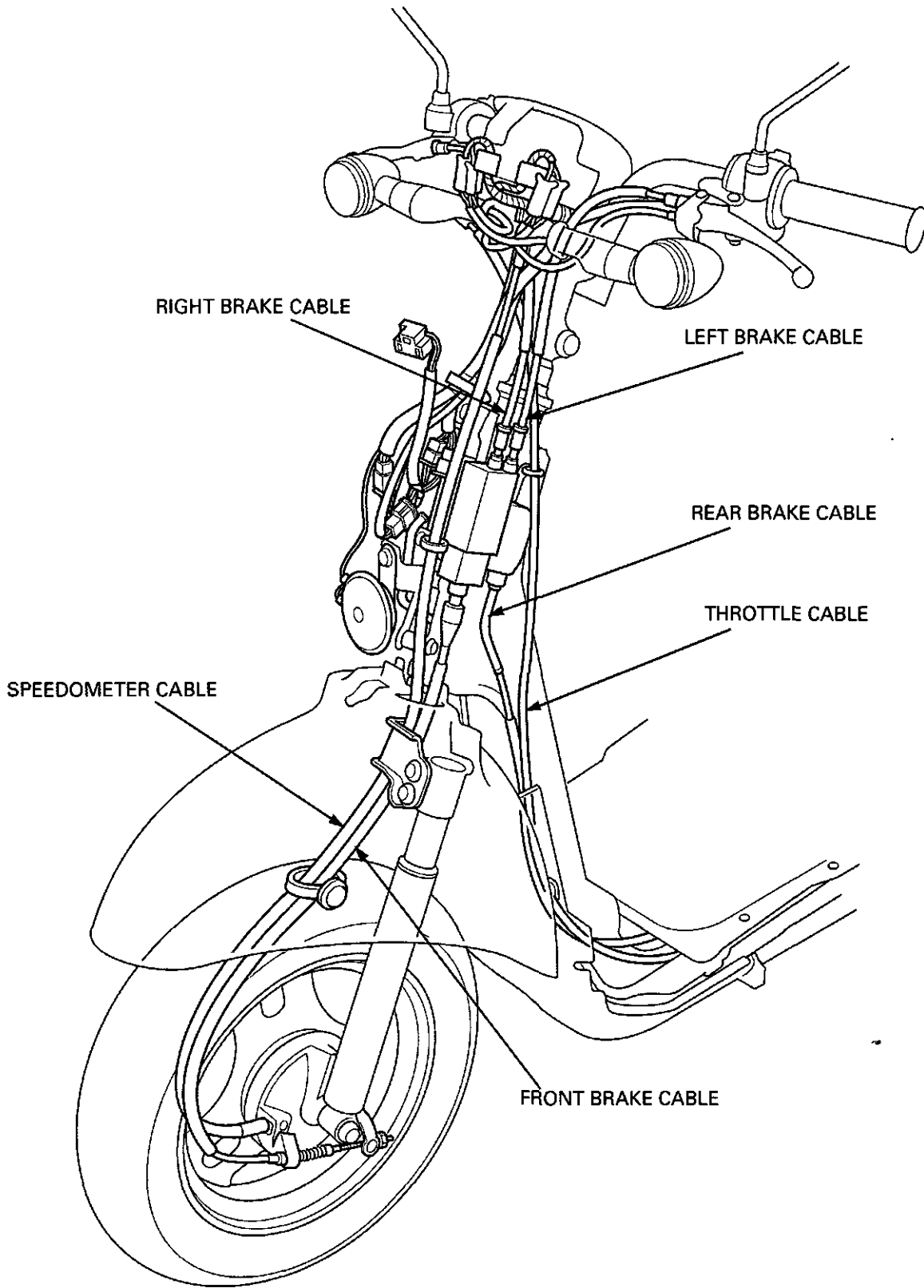
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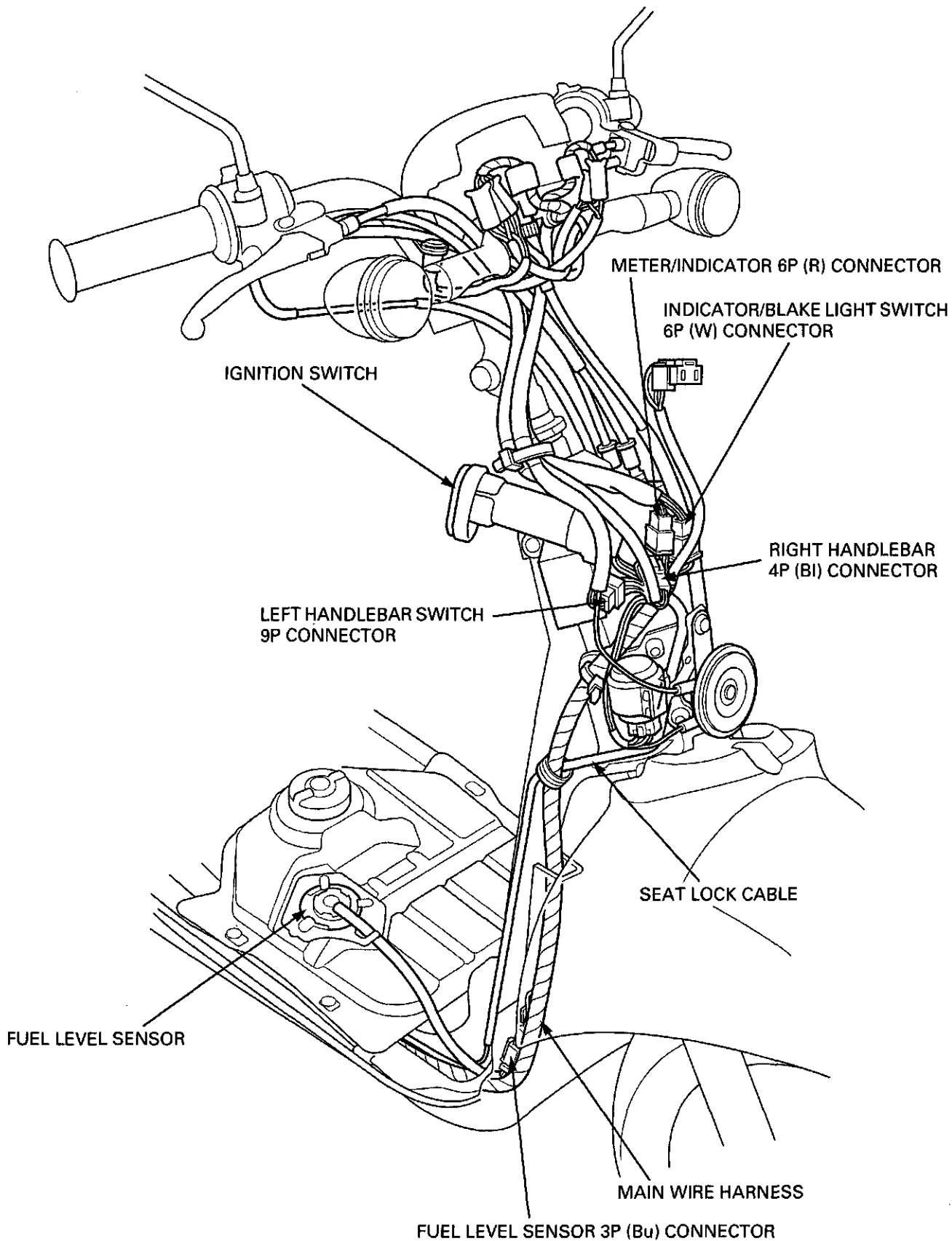


CABLE & HARNESS ROUTING (After '05 model)

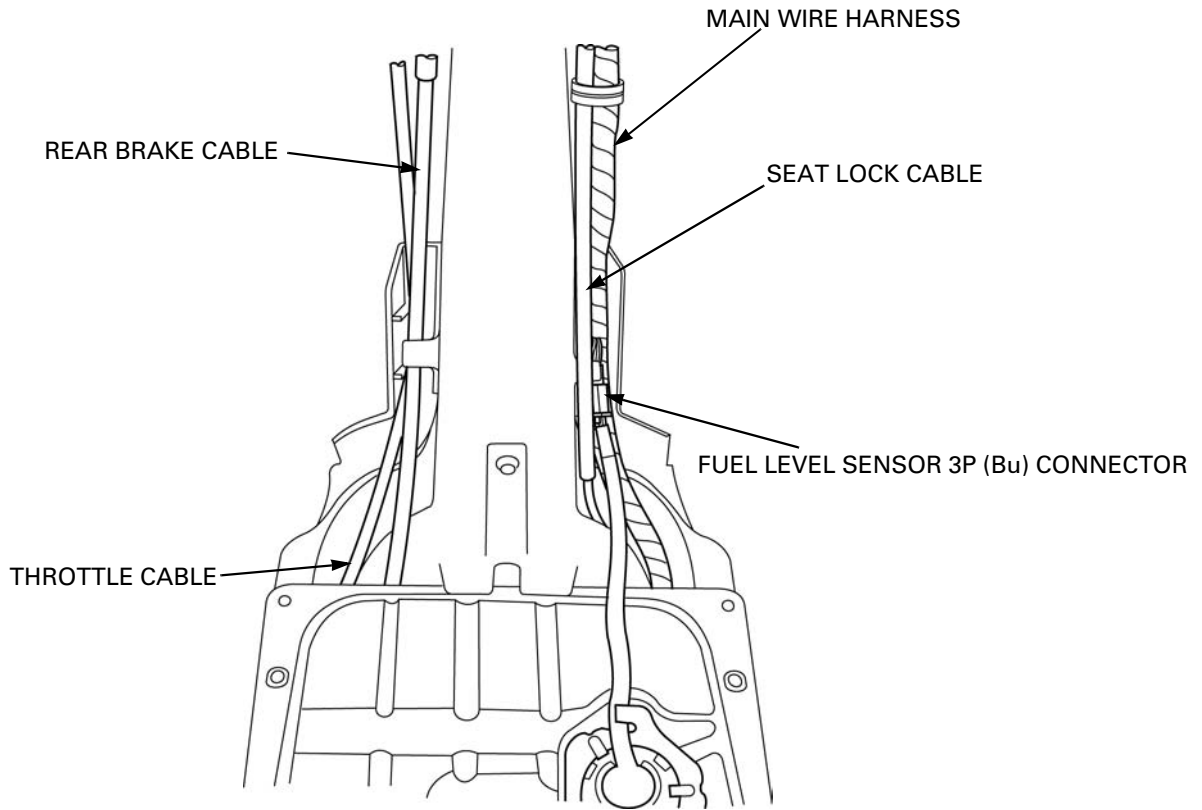


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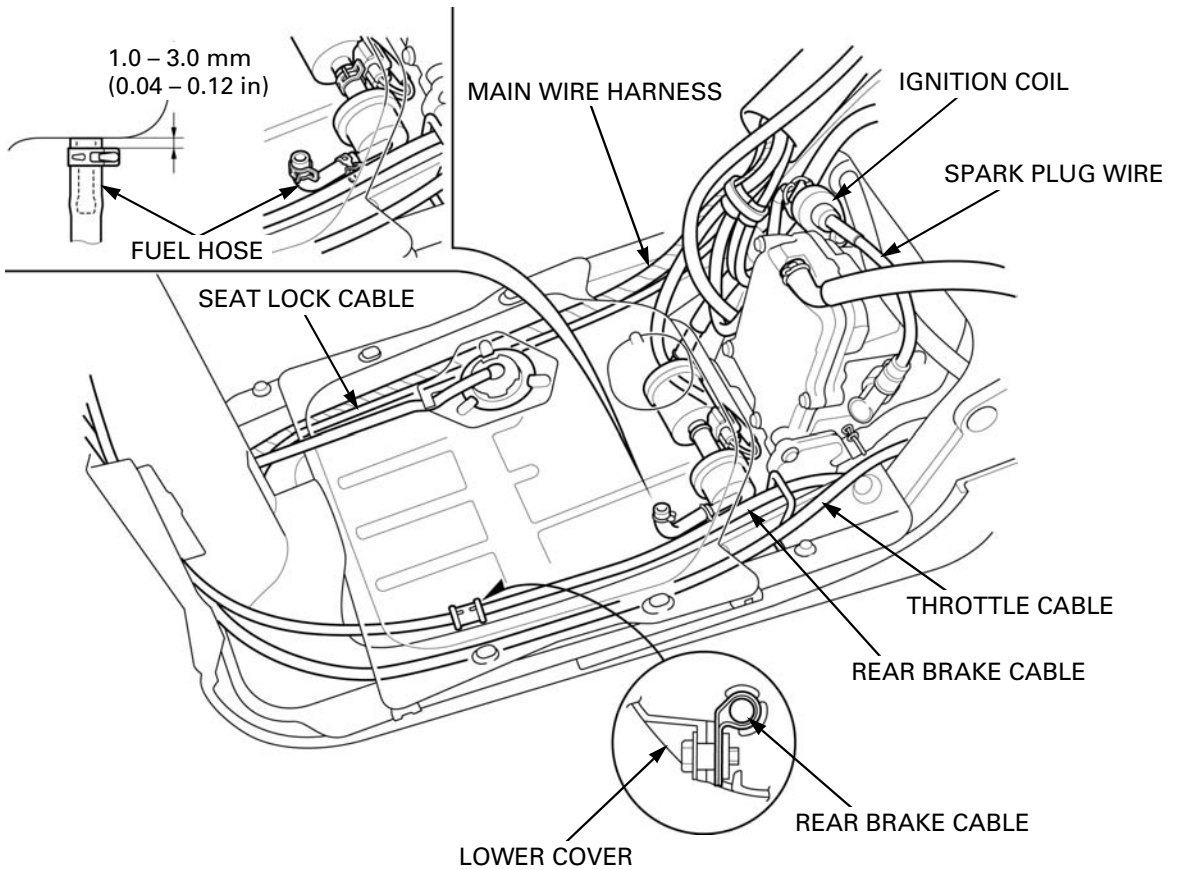


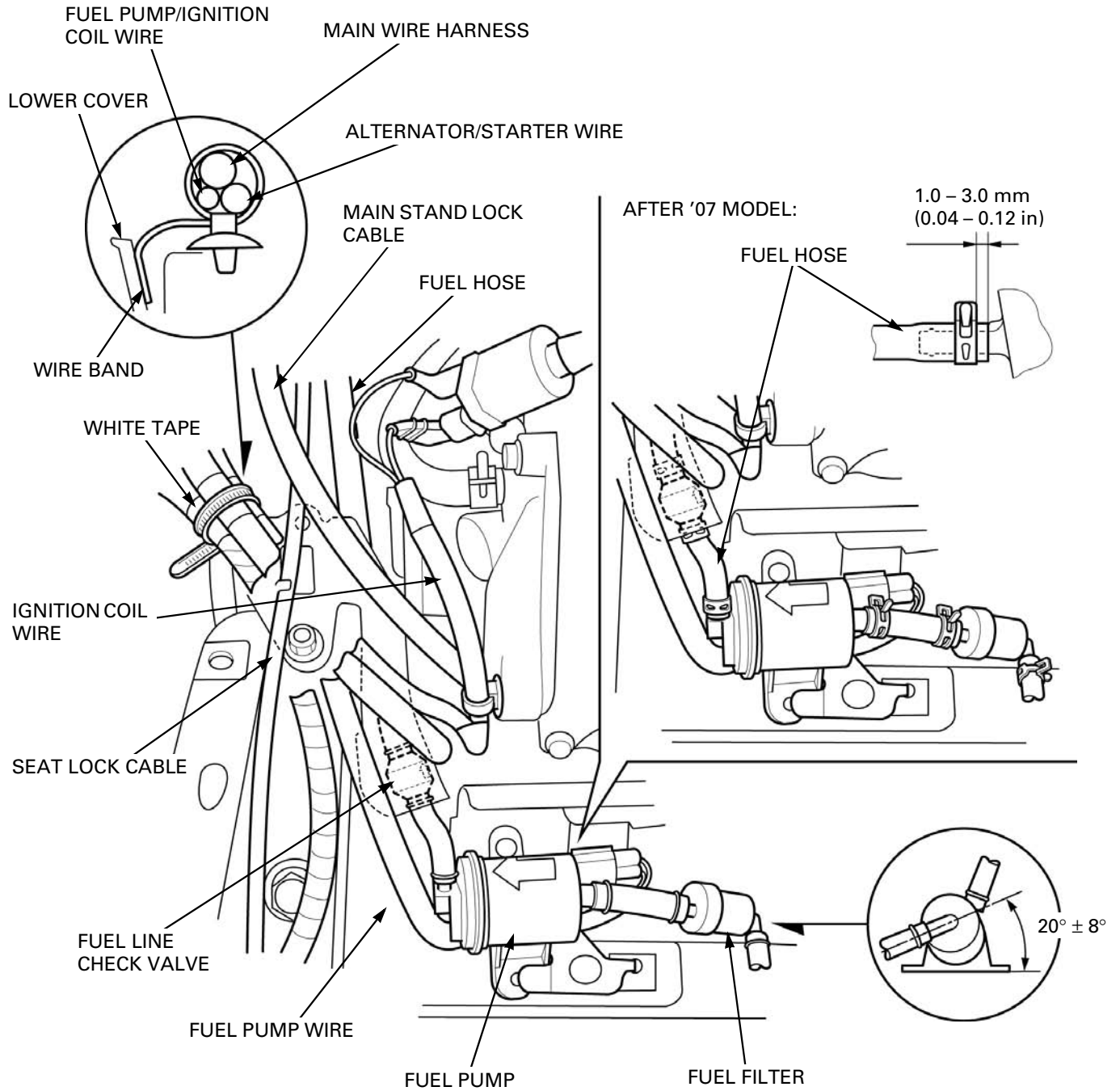


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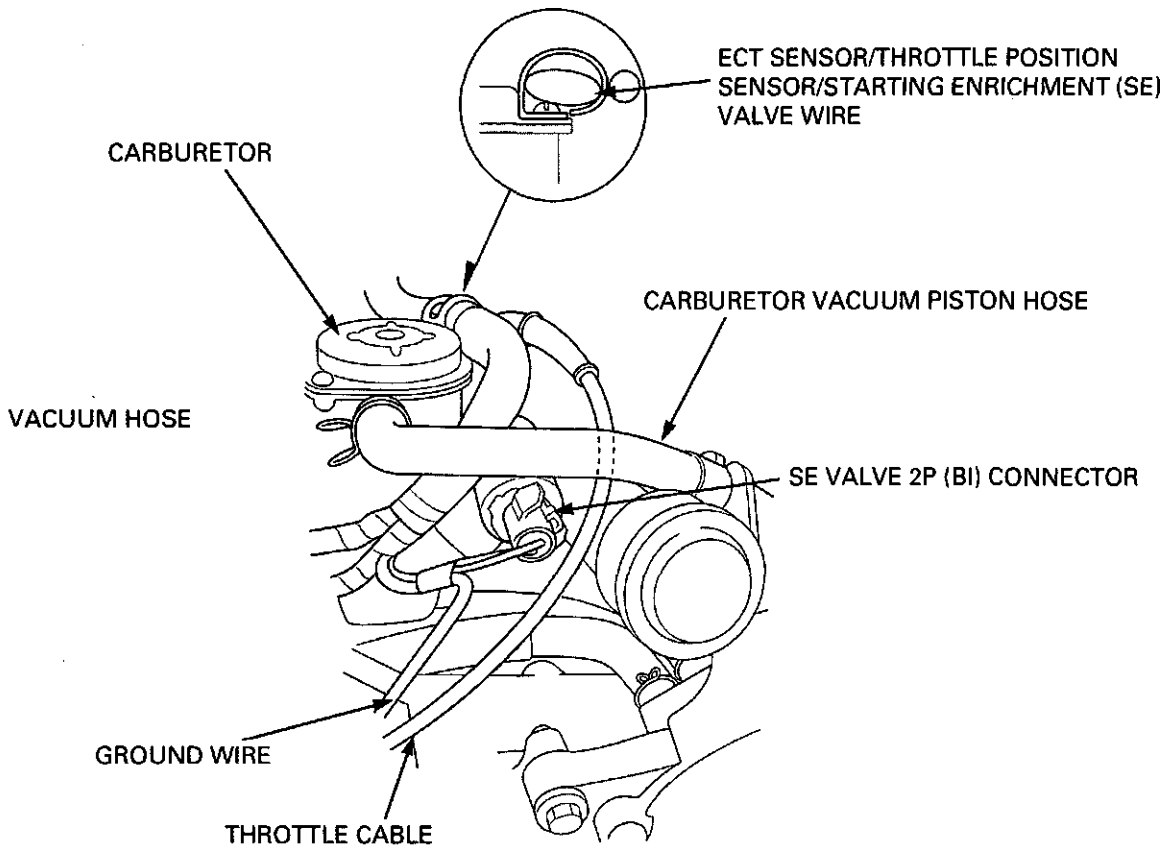
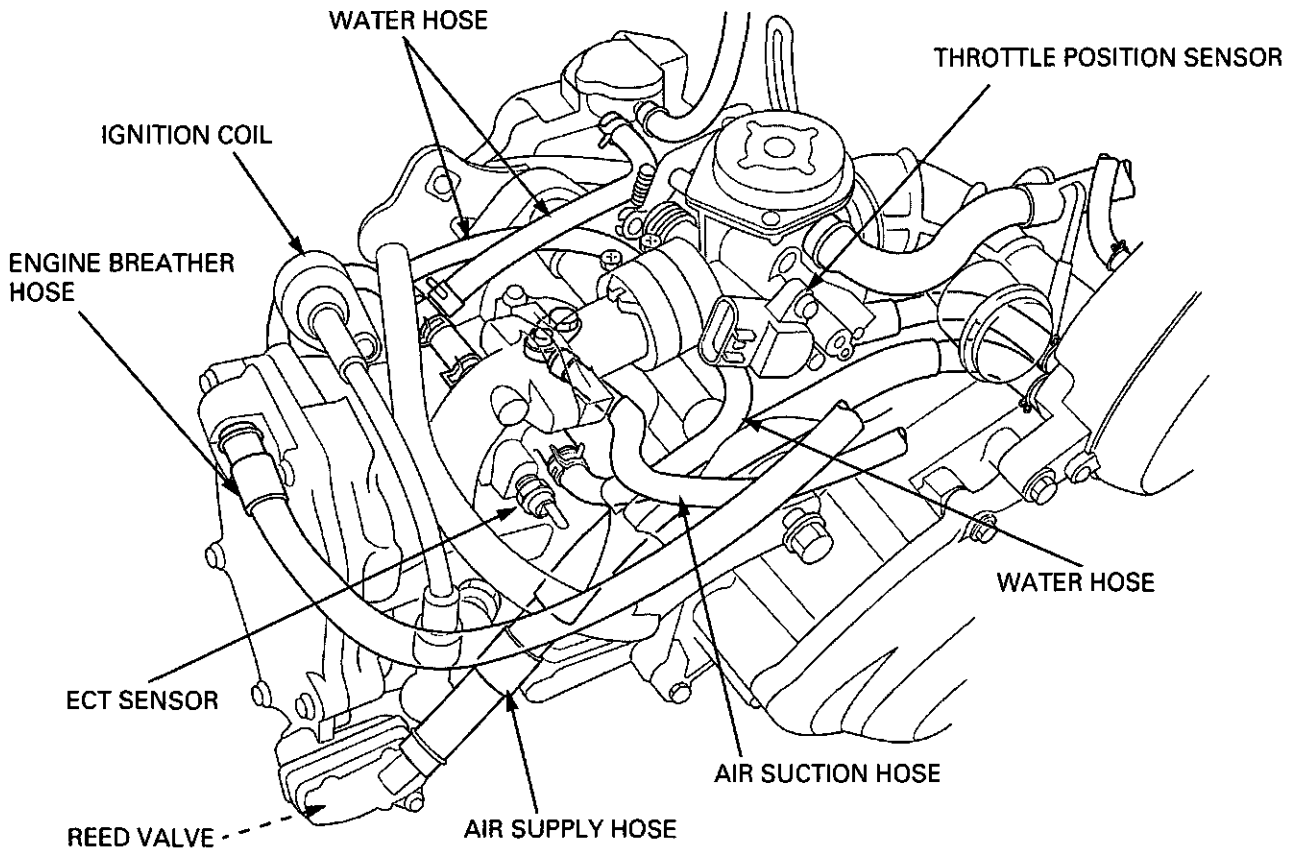


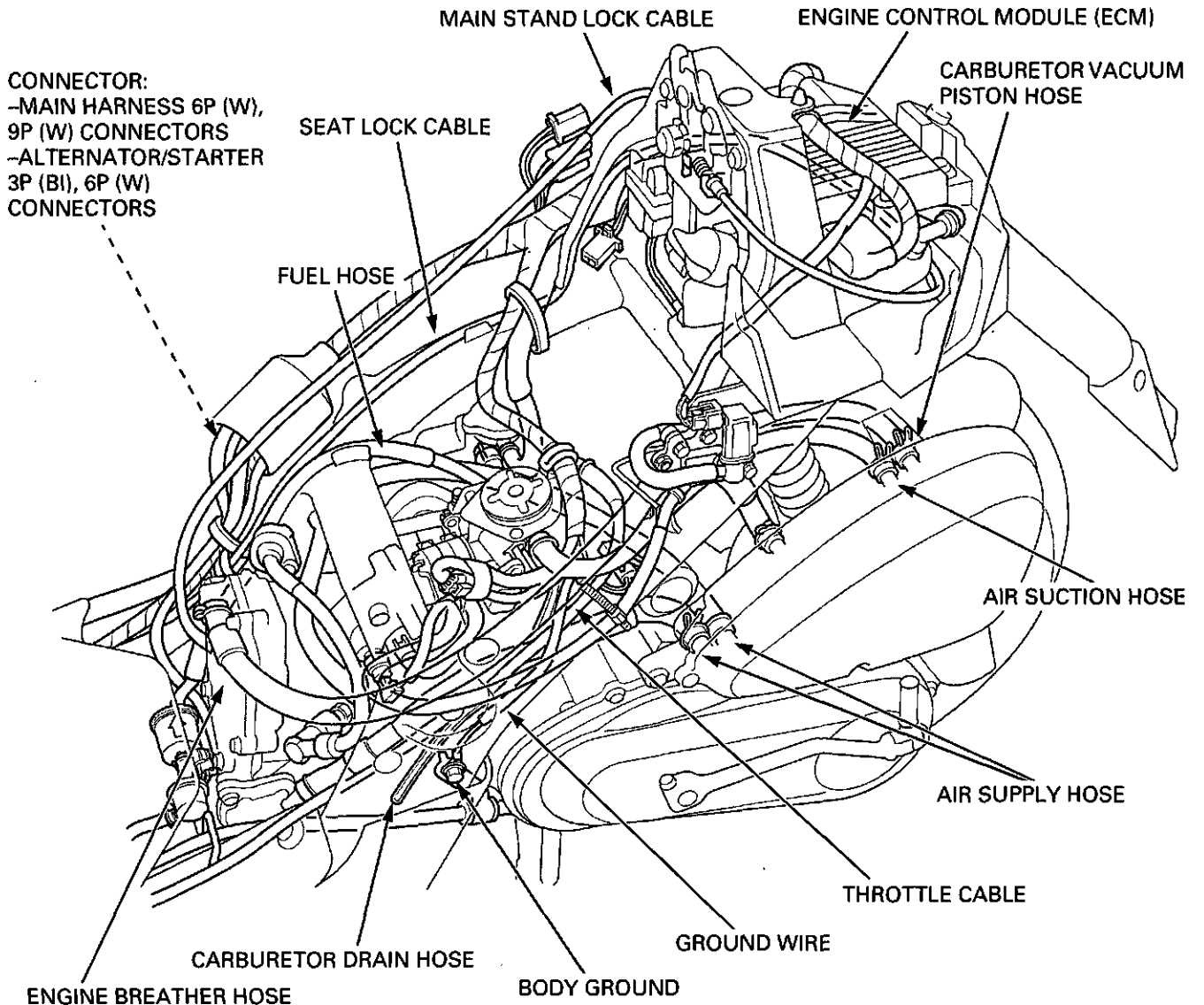
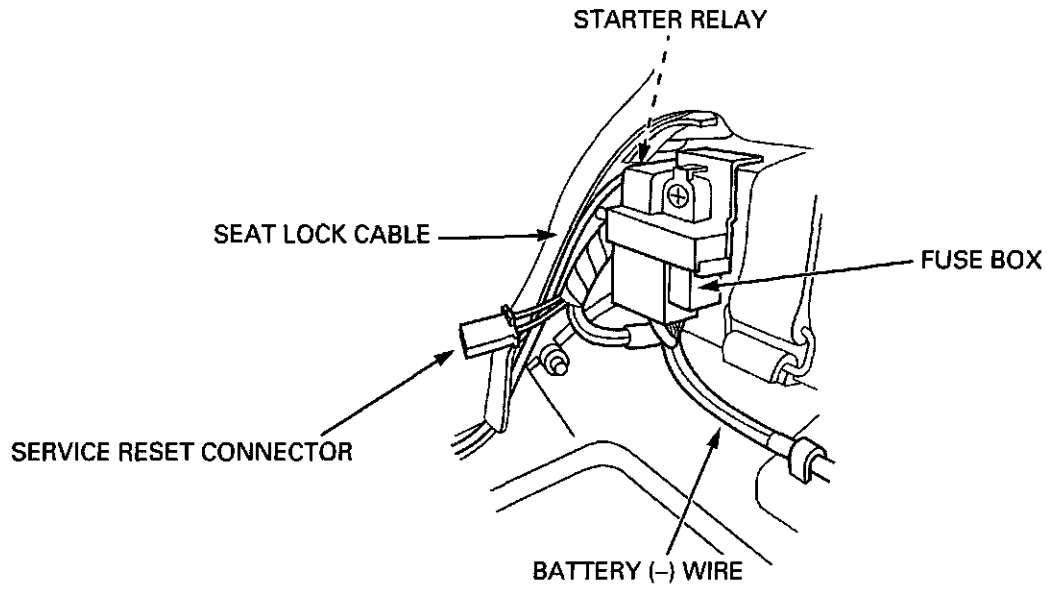
AFTER '07 MODEL:



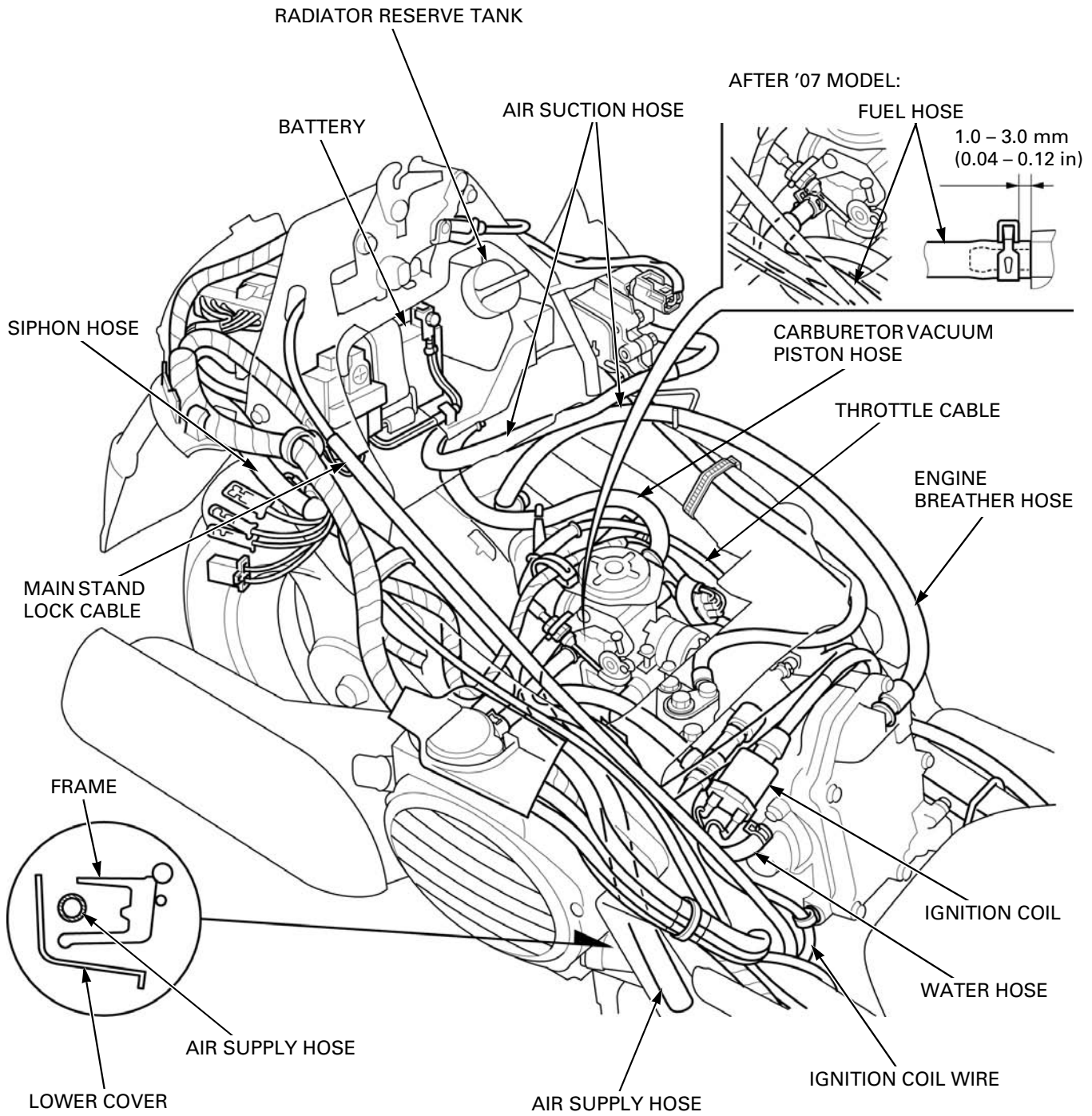


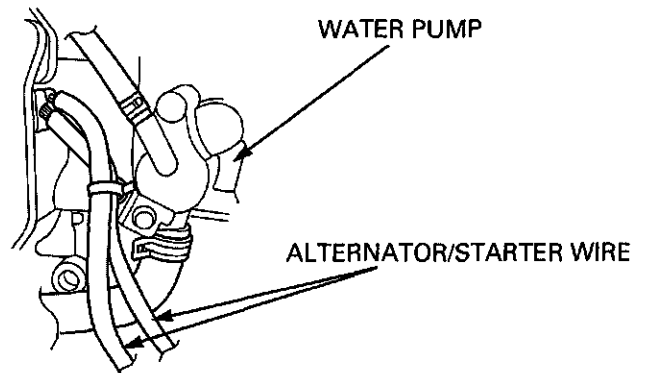
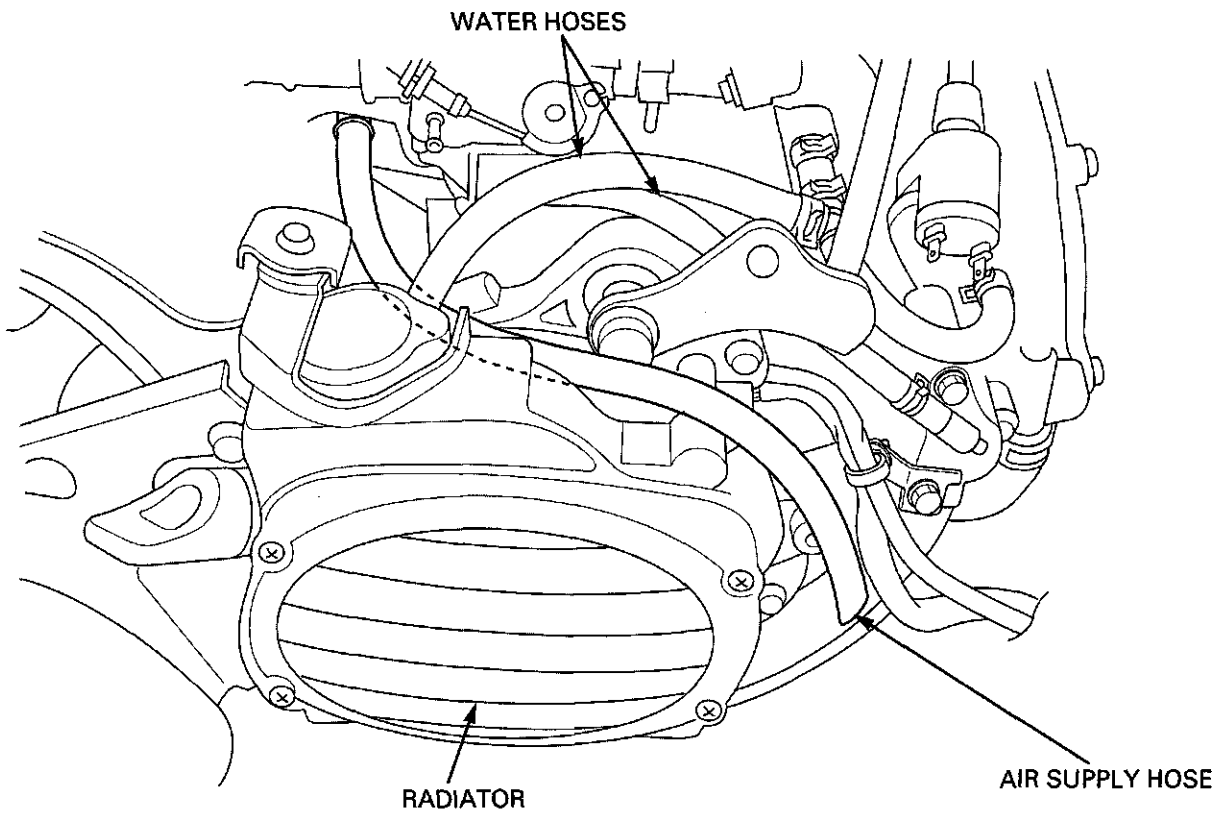
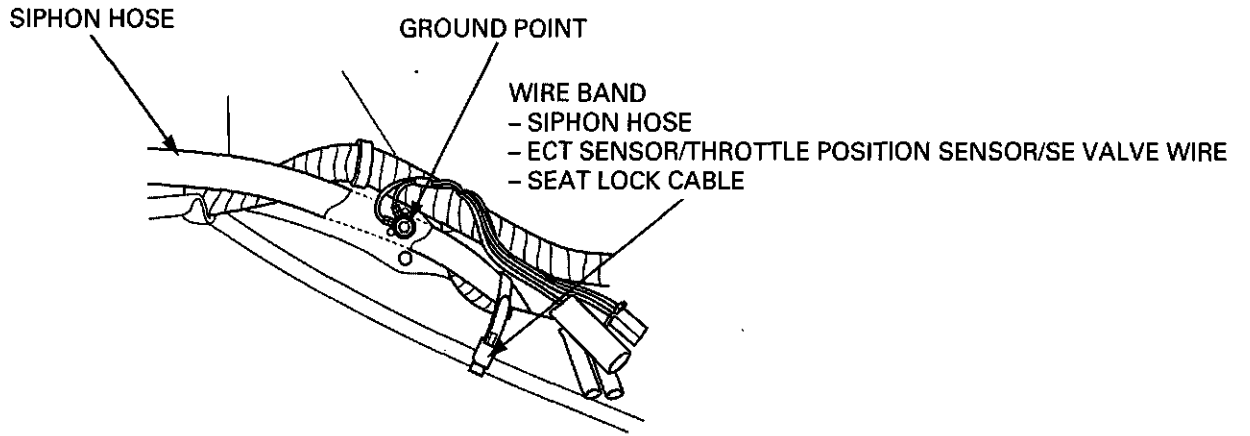
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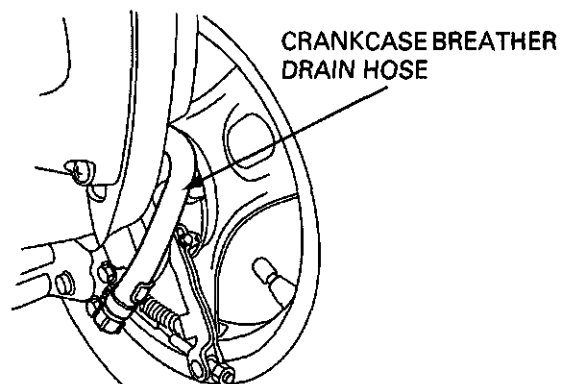
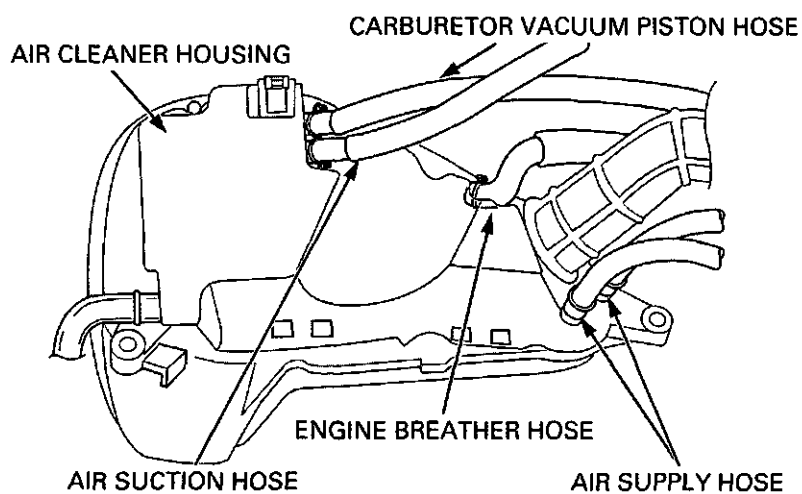
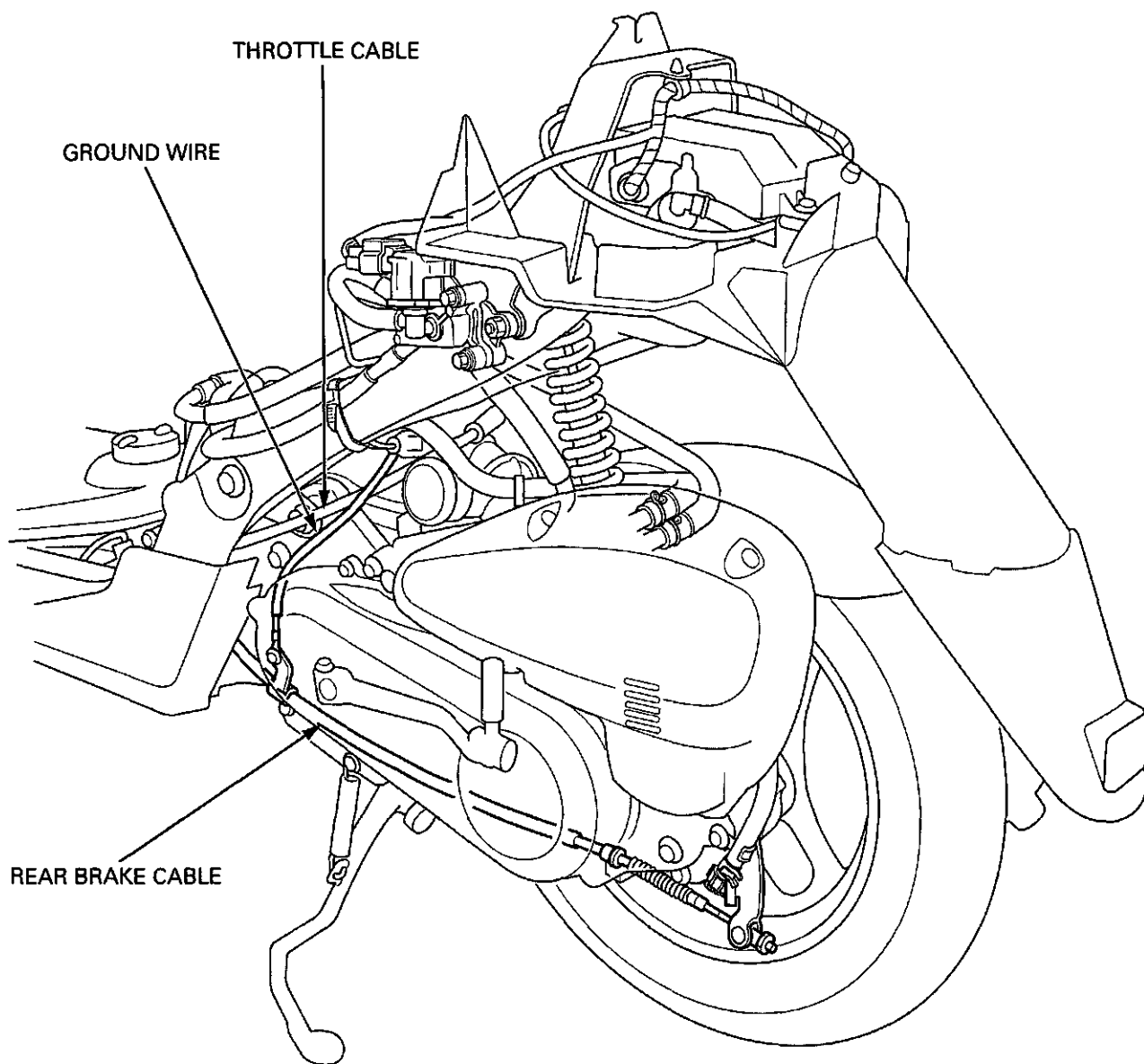


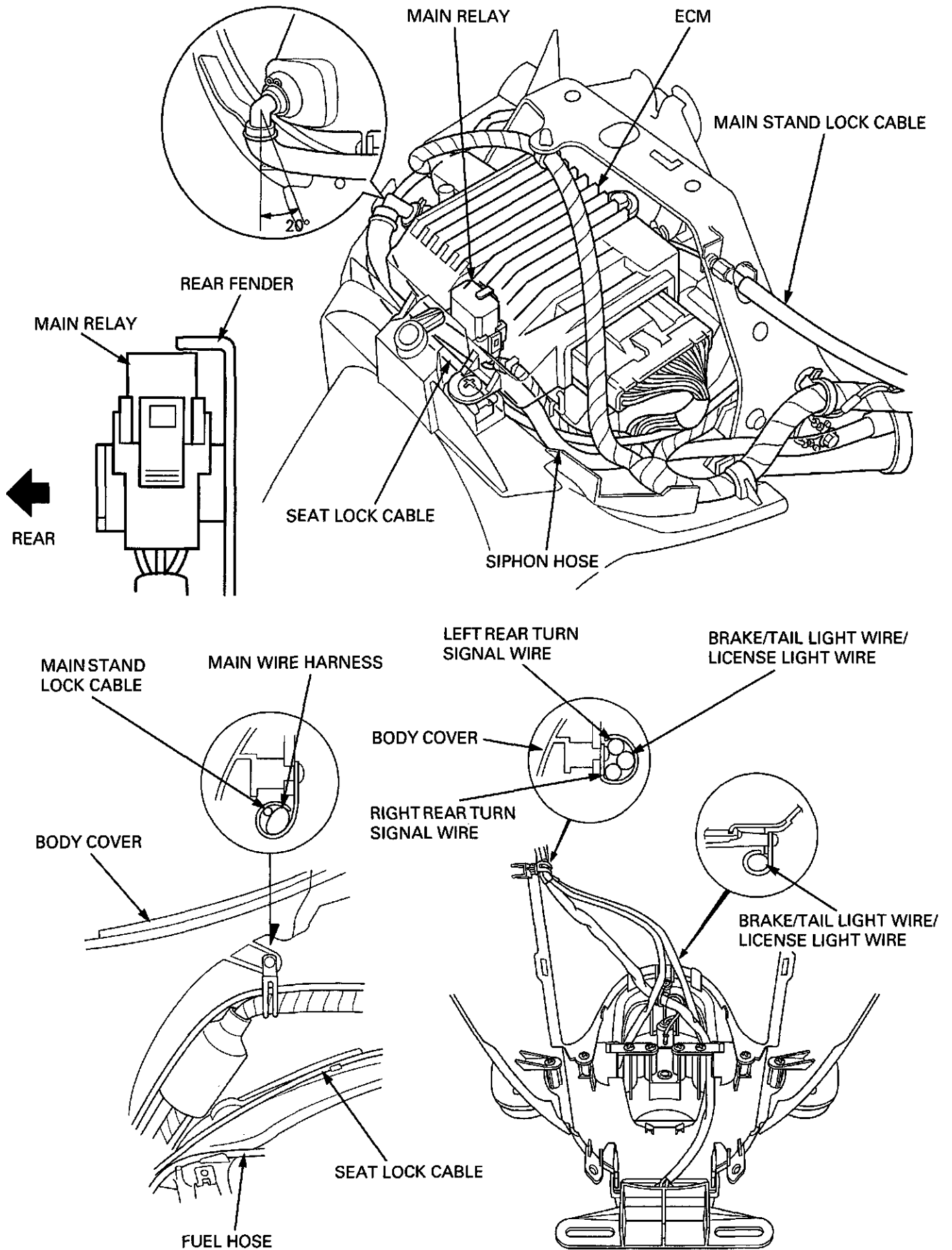
GENERAL INFORMATION





GENERAL INFORMATION





GENERAL INFORMATION

EMISSION CONTROL SYSTEMS

SOURCE OF EMISSIONS

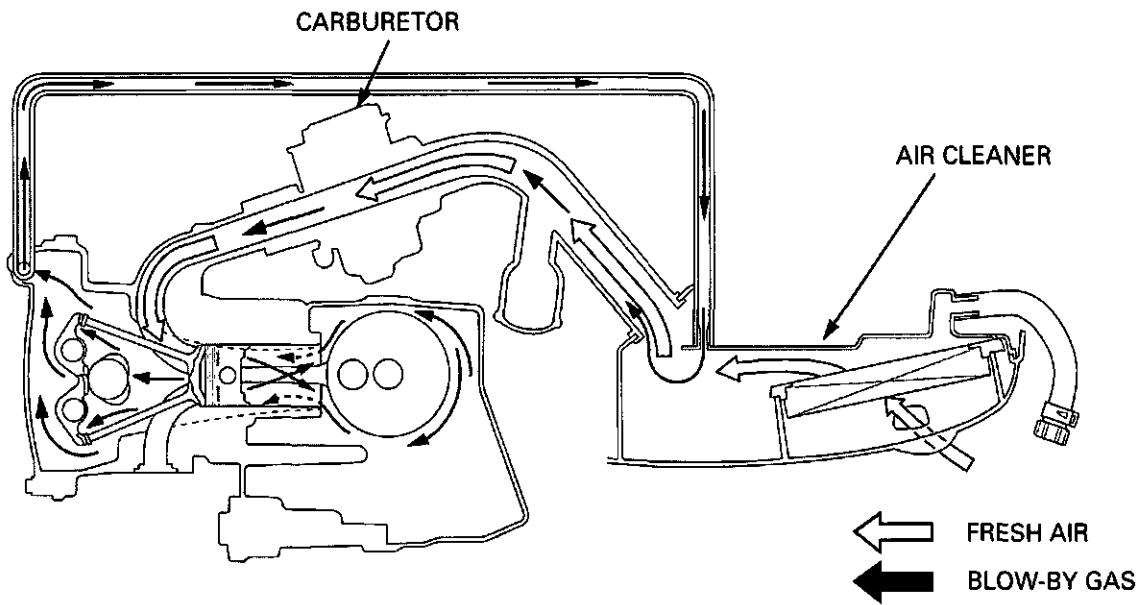
The combustion process produces carbon monoxide, oxides of nitrogen and hydrocarbons. Control of oxides of nitrogen and hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but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

Honda Motor Co., Ltd. utilizes lean carburetor settings as well as other systems, to reduce carbon monoxide and hydrocarbons.

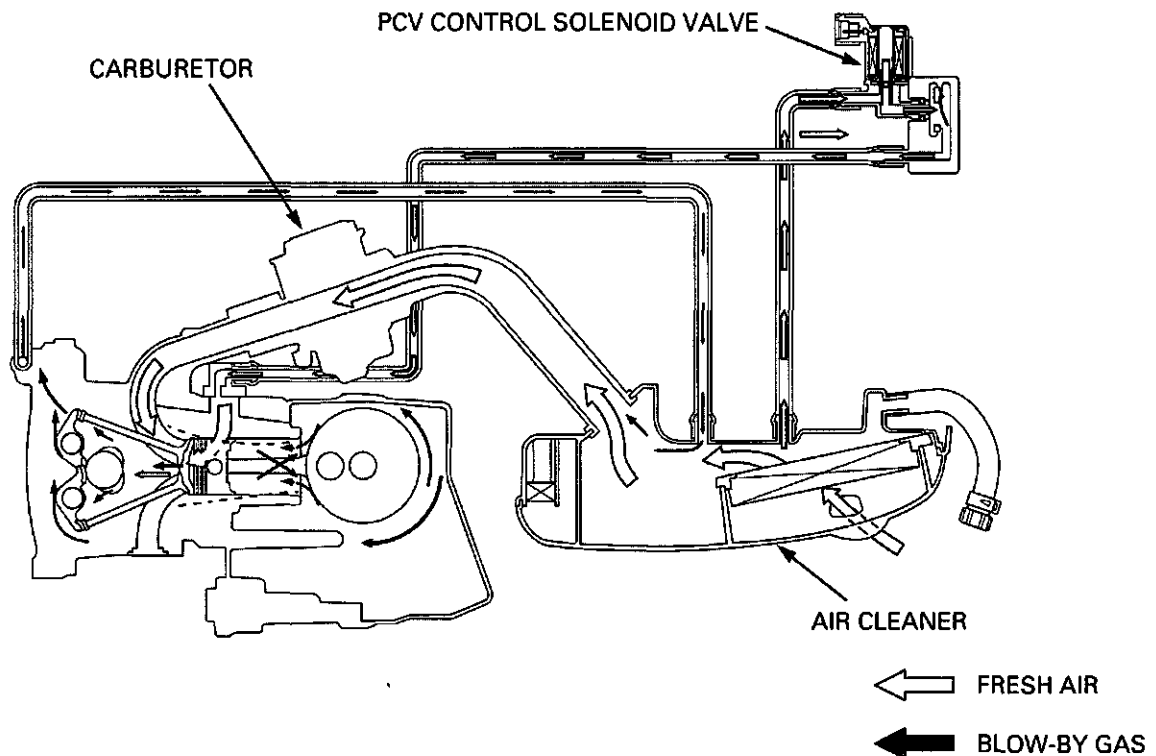
CRANKCASE EMISSION CONTROL SYSTEM

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

'02 - '05 model:



After '05 model:



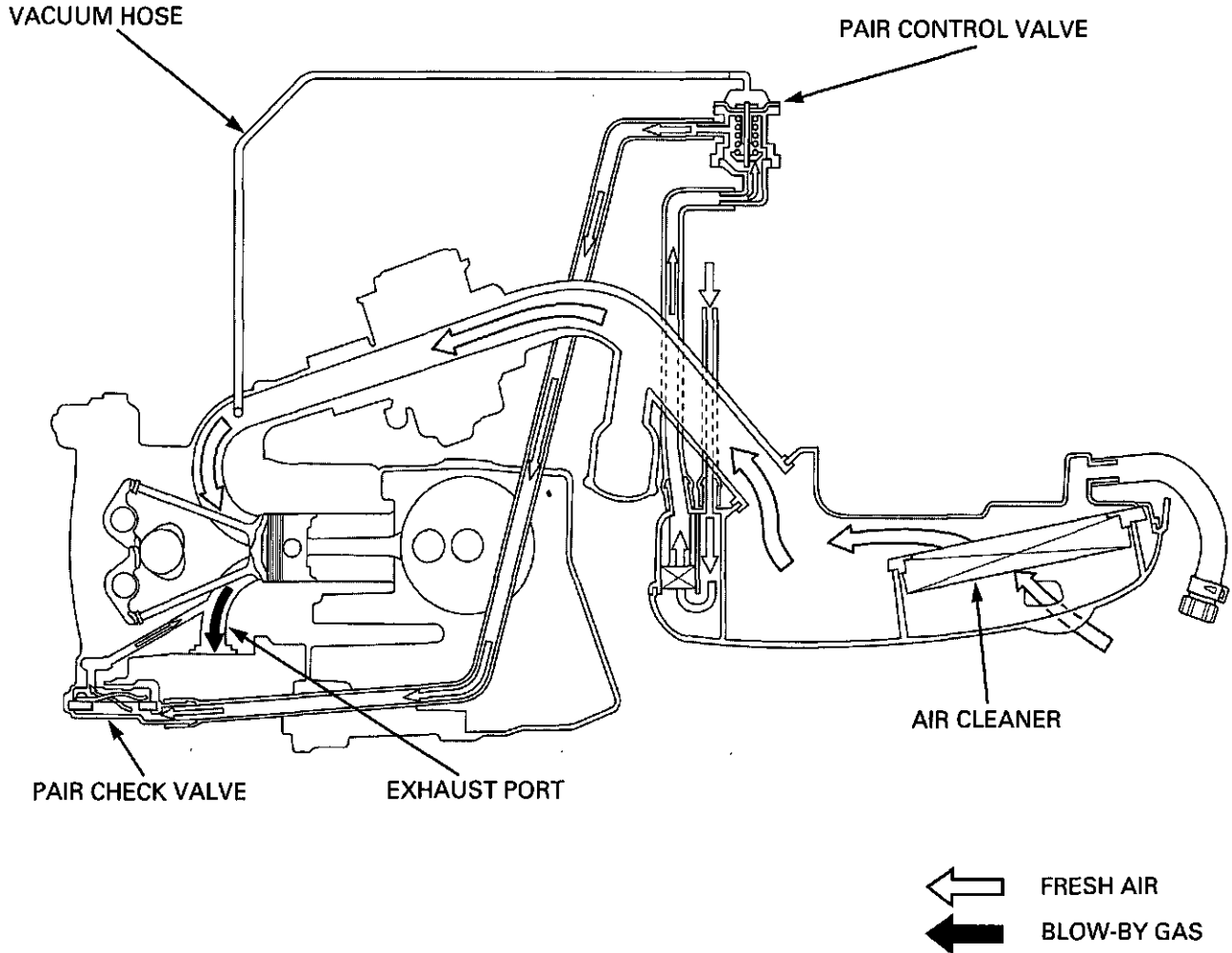
EXHAUST EMISSION CONTROL SYSTEM ('02 - '05 model)

SECONDARY AIR SUPPLY SYSTEM

The exhaust emission control system consists of a secondary air supply system which introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port whenever there is a negative pressure pulse in the exhaust system. This charge of fresh air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water vapor.

This model has the pulse secondary air injection (PAIR) control valve; it consists of check valves built into the PAIR control valve. A PAIR check valve prevents reverse air flow through the system. The PAIR control valve reacts to high intake manifold vacuum and will cut off the supply of fresh air during engine deceleration, thereby preventing afterburn in the exhaust system.

No adjustment to the PAIR system should be made, although periodic inspection of the components recommended.



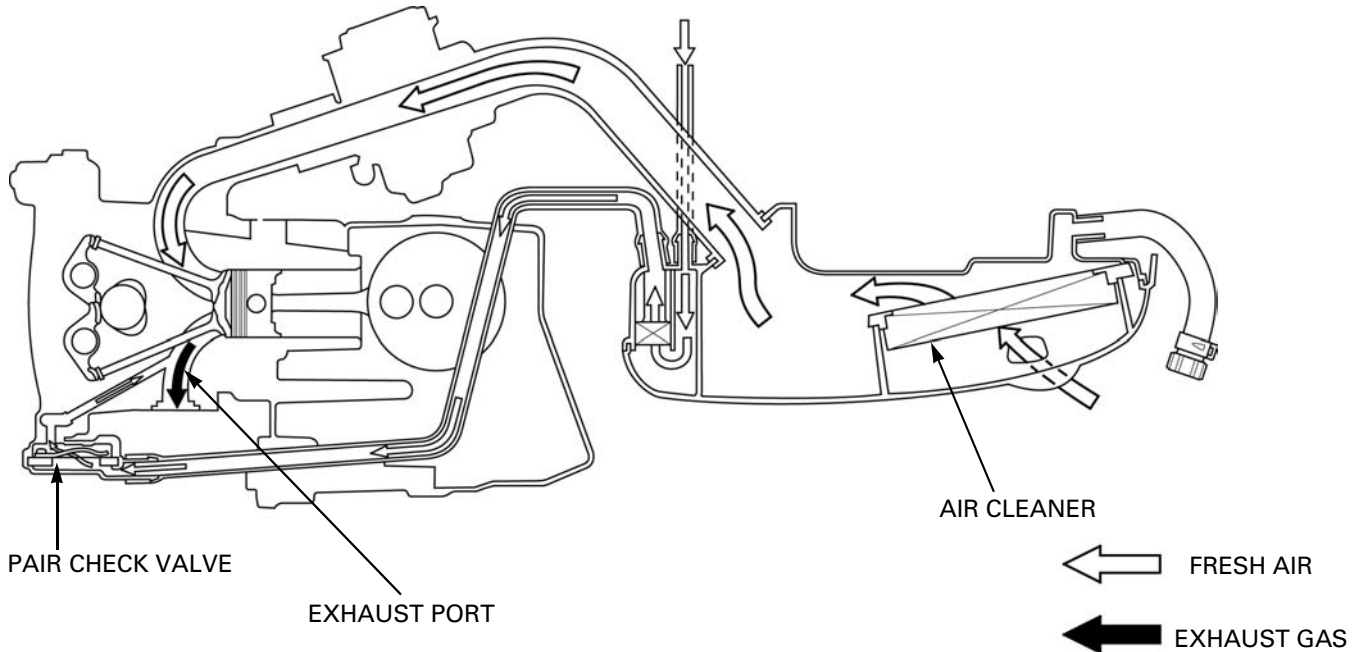
GENERAL INFORMATION

EXHAUST EMISSION CONTROL SYSTEM (After '05 model)

SECONDARY AIR SUPPLY SYSTEM

The secondary air supply system introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port whenever there is a negative pressure pulse in the exhaust system. This charge of fresh air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water vapor.

No adjustment to the PAIR system should be made, although periodic inspection of the components is recommended.



OXIDATION CATALYTIC CONVERTER

This scooter is equipped with an oxidation catalytic converter.

This oxidation catalytic converter is in the exhaust system. Through chemical reactions, it converts HC and CO in the engine's exhaust to carbon dioxide (CO₂) and water vapor.

NOISE EMISSION CONTROL SYSTEM

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

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

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

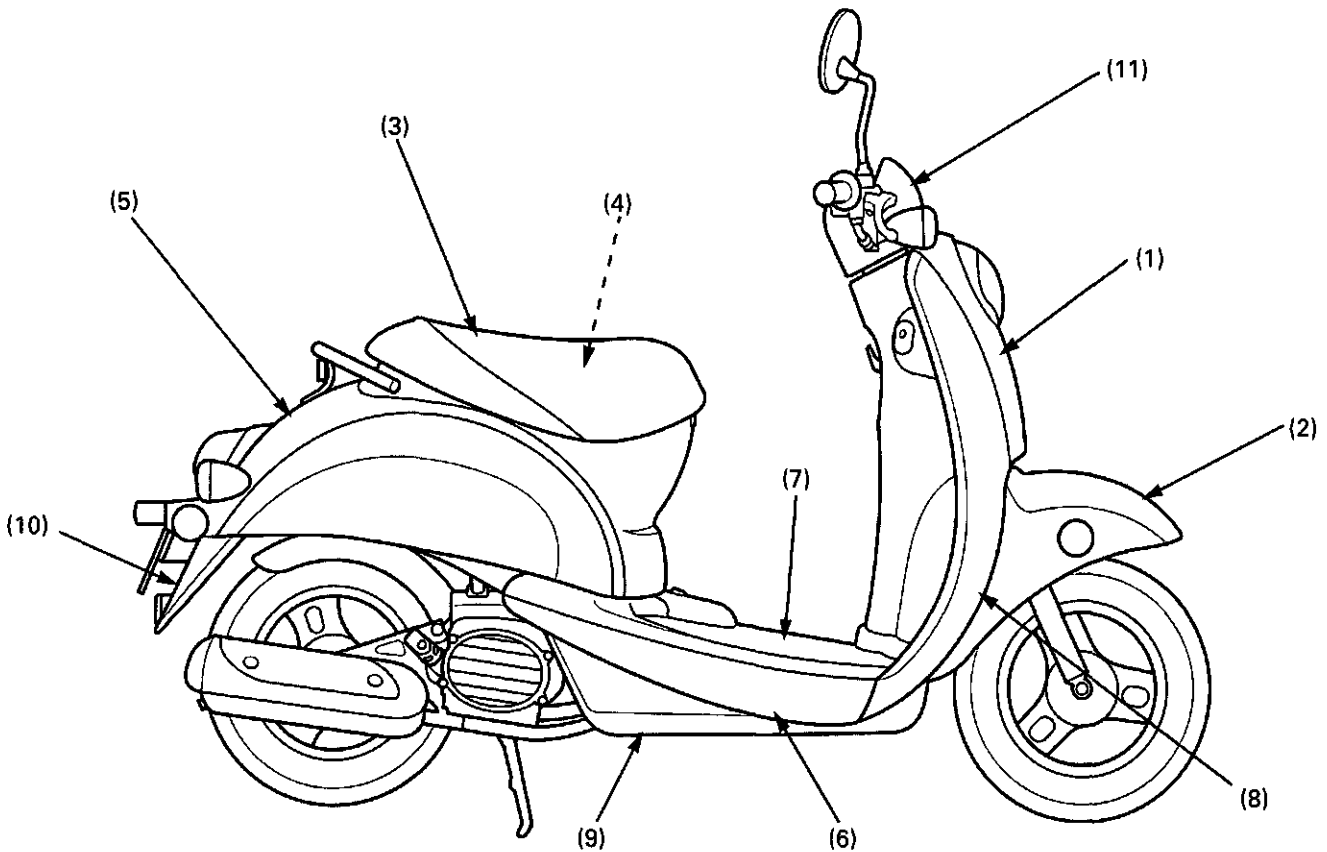
FUEL PERMEATION EMISSION CONTROL SYSTEM (After '07)

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

2. FRAME/BODY PANELS/EXHAUST SYSTEM

BODY PANEL LOCATIONS	2-2	BODY COVER	2-7
BODY PANEL REMOVAL CHART	2-2	SIDE COVER	2-8
SERVICE INFORMATION	2-3	STEP FLOOR	2-9
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FRONT COVER	2-4	REAR FENDER	2-11
FRONT FENDER	2-5	FRONT METER COVER	2-12
SEAT	2-5	MUFFLER	2-13
LUGGAGE BOX	2-6		

BODY PANEL LOCATIONS



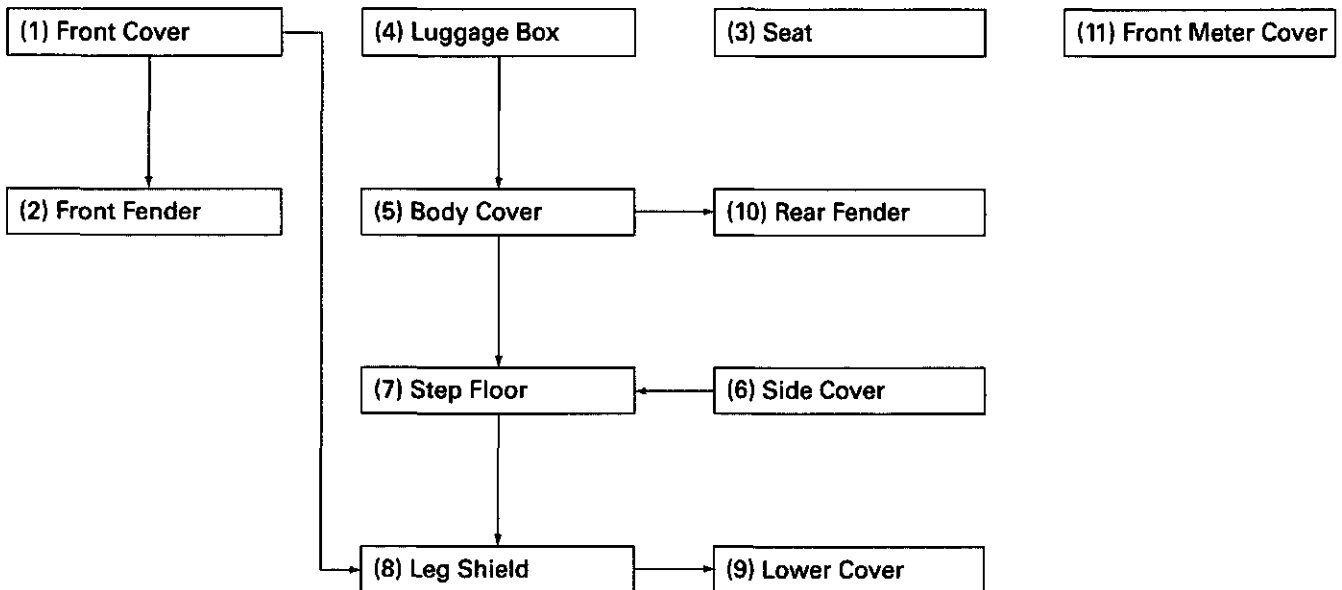
- (1) Front Cover (page 2-4)
- (2) Front Fender (page 2-5)
- (3) Seat (page 2-5)
- (4) Luggage Box (page 2-6)

- (5) Body Cover (page 2-7)
- (6) Side Cover (page 2-8)
- (7) Step Floor (page 2-9)
- (8) Leg shield (page 2-9)

- (9) Lower Cover (page 2-10)
- (10) Rear Fender (page 2-11)
- (11) Front Meter Cover (page 2-12)

BODY PANEL REMOVAL CHART

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



SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the body panels and exhaust system.
- Always replace the exhaust pipe gaskets after removing the exhaust pipe from the engine.
- When installing the exhaust system, loosely install all of the exhaust pipe fasteners. Always tighten the exhaust joints first, then tighten the mounting fasteners. If you tighten the mounting fasteners first, the exhaust pipe may not seat properly.
- Always inspect the exhaust system for leaks after installation.

TROUBLESHOOTING

Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

TRIM CLIPS

REMOVAL

Push the center of the trim clip pin.

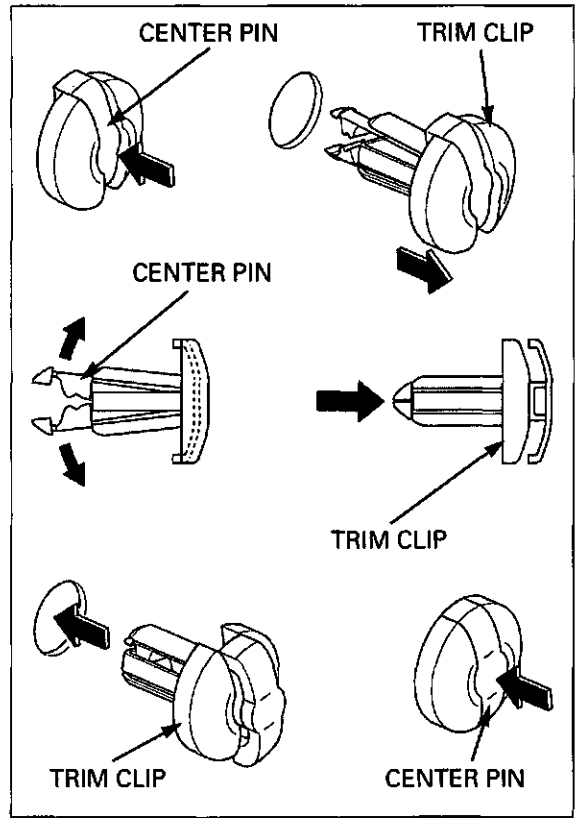
Remove the trim clip.

INSTALLATION

Raise the center pin by pushing the retaining tabs back.

Install the trim clip.

Push the center pin until the pin flush with the outer casing.



FRONT COVER

REMOVAL

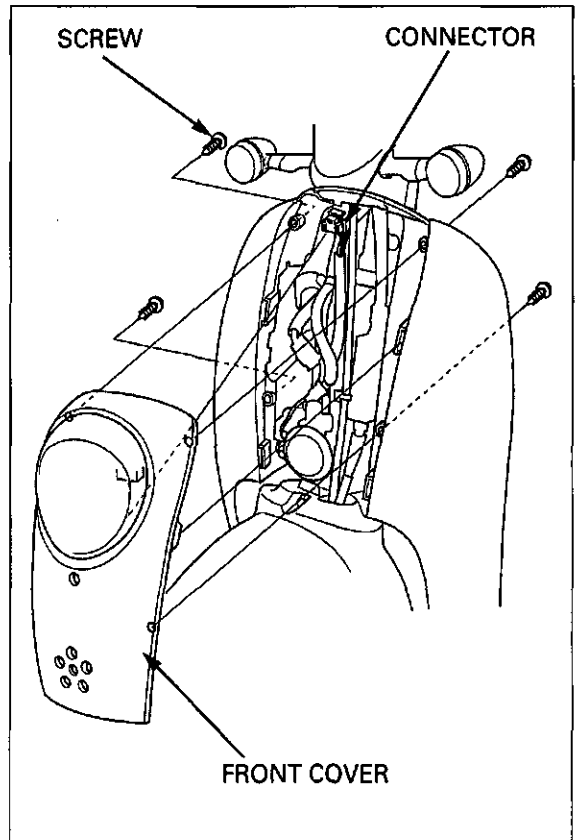
Remove the four screws and front cover from the leg shield.

Disconnect the headlight connector and remove the front cover.

INSTALLATION

Installation is in the reverse order of removal.

At installation, be careful not to damage the wire harness.



FRONT FENDER

REMOVAL

Remove the front cover (page 2-4).

Be careful not to damage the tabs on fender B.

Remove fender B bolts.

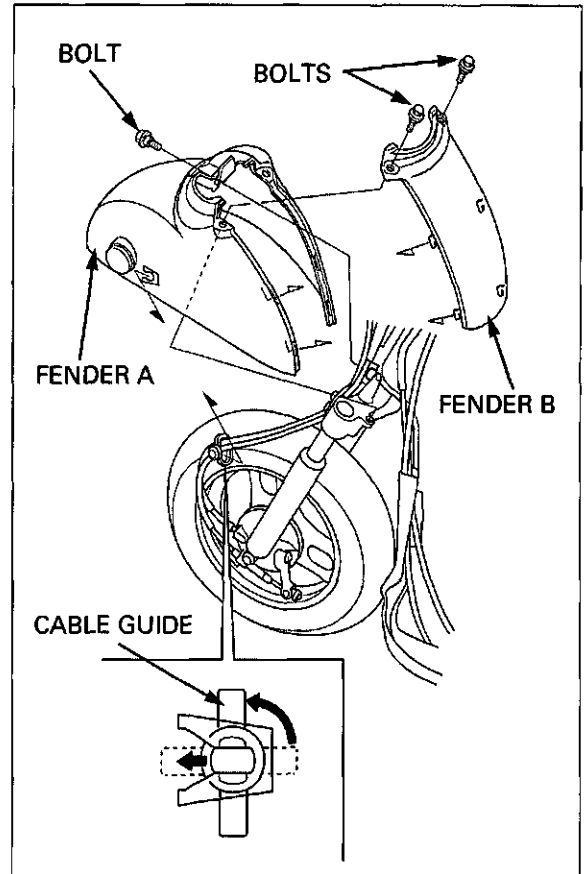
Release the tabs on fender B, then remove fender B.

Turn the cable guide and remove it from fender A.

Remove fender A bolt and fender A.

INSTALLATION

Installation is in the reverse order of removal.



SEAT

REMOVAL

Open the seat.

Remove the nuts and the seat.

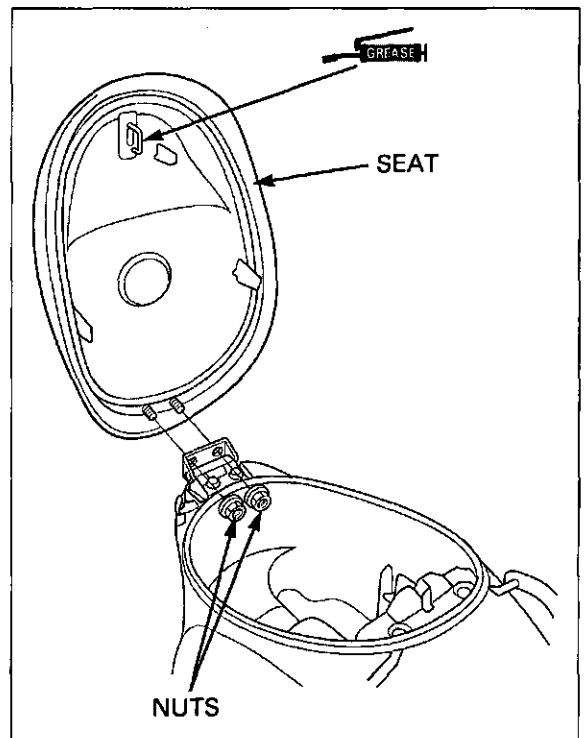
INSTALLATION

Apply the grease to the seat catch.

Installation is in the reverse order of removal.

After installation, check the seat installation by moving the seat.

When locking the seat, push the seat lock of the seat securely.

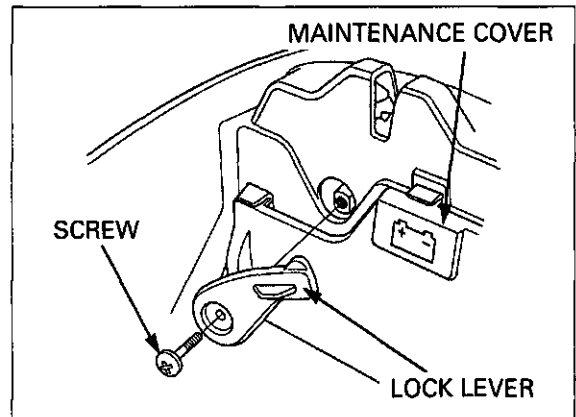


LUGGAGE BOX

REMOVAL

Open the seat.

Remove the screw and main stand lock lever.
Remove the maintenance cover.

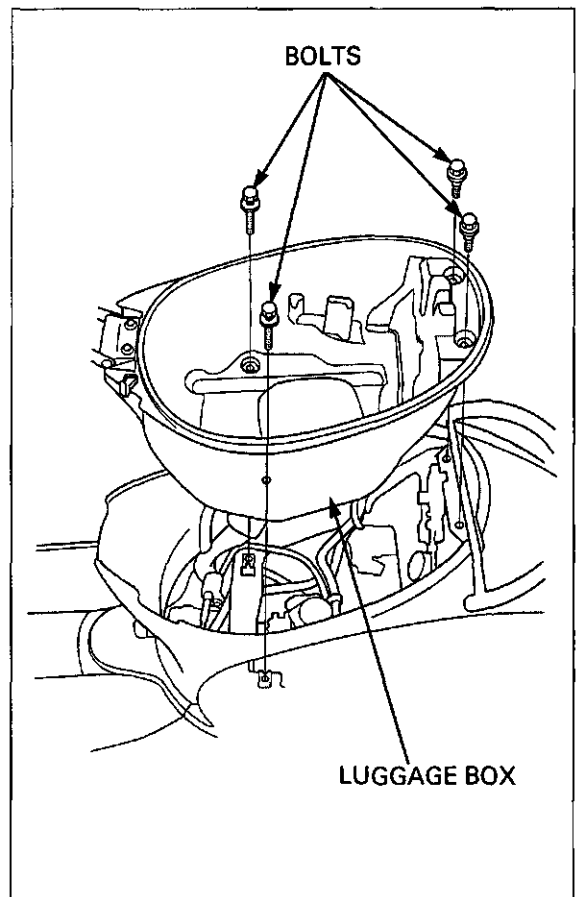


Remove the four bolts and luggage box.

INSTALLATION

At installation, be careful not to damage the wire harness.

Installation is in the reverse order of removal.



BODY COVER

REMOVAL

Remove the luggage box (page 2-6).
Open the fuel tank lid.

Remove the bolt and rear grip.
Disconnect the brake/tail/license light 3P connector and turn signal connectors.
Disconnect the main harness and seat lock cable from the clamp.
Remove the four trim clips.

Remove the screws and body cover.

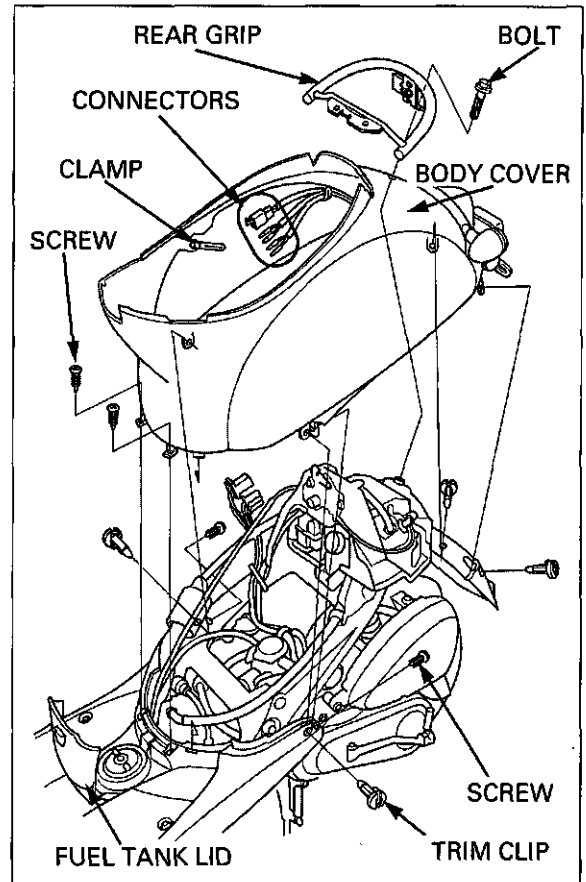
INSTALLATION

Installation is in the reverse order the removal.

Route the wire harness and cables correctly (page 1-14).

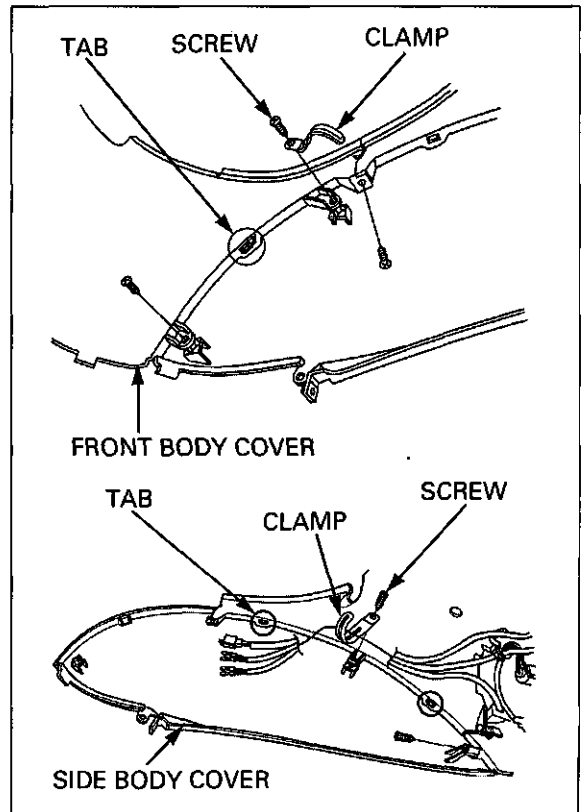
Be careful not to damage the tabs on the body cover.

At installation, be careful not to damage the wire harness.



DISSEMBLY/ASSEMBLY

Remove the screws, clamp and release the tabs on the front/side body cover.

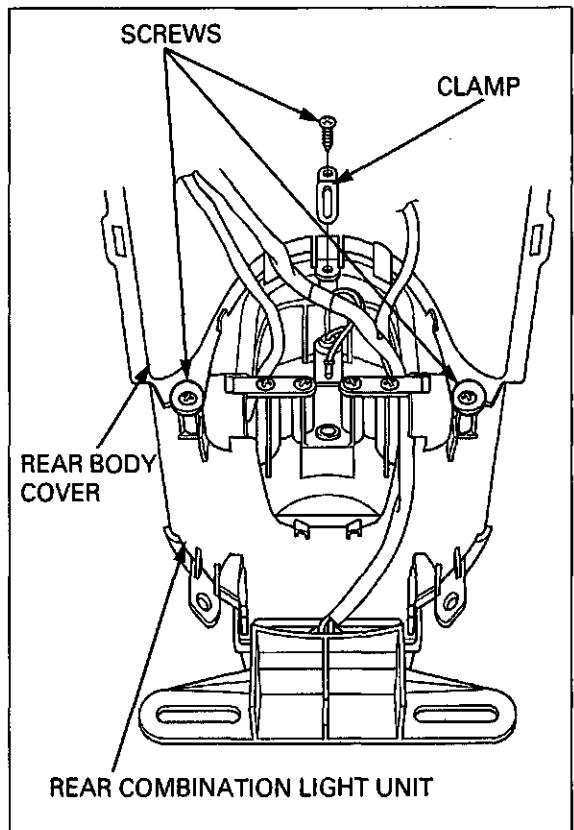


FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the screws, clamp and rear combination light unit.

Align the grooves with the tabs.

Assembly is in the reverse order disassembly.



SIDE COVER

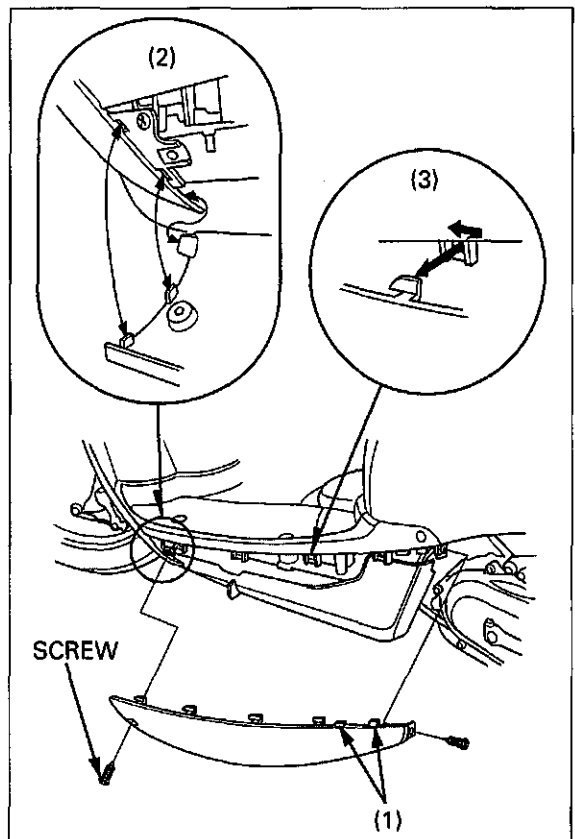
REMOVAL/INSTALLATION

Remove the two screws.

Remove the side cover as follows.

1. Pull out the rear side tabs on the outside of the floor panel.
2. Remove the front tabs from the leg shield.
3. Move the side cover back and remove the four tabs.
4. Remove the side cover.

Installation is in the reverse order of removal.



STEP FLOOR

REMOVAL

Remove the following:

- Body cover (page 2-7)
- Side cover (page 2-8)

Remove the screws and bolts.

Be careful not to damage the tabs.

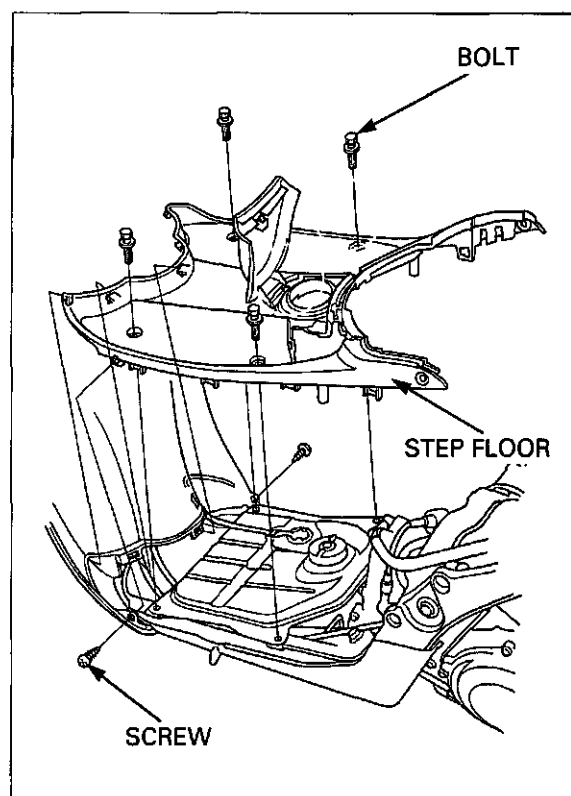
Release the front end tabs of the step floor from the leg shield.

INSTALLATION

At installation, be careful not to damage the wire harness.

Installation is in the reverse order of removal.

After installation, make sure the tabs on the step floor are attached on the leg shield.



LEG SHIELD

REMOVAL

Remove the following:

- Front cover (page 2-4)
- Step floor (see above)

Be careful not to damage the tabs on the shield cover.

Release the tabs on the shield cover, then remove the shield cover.

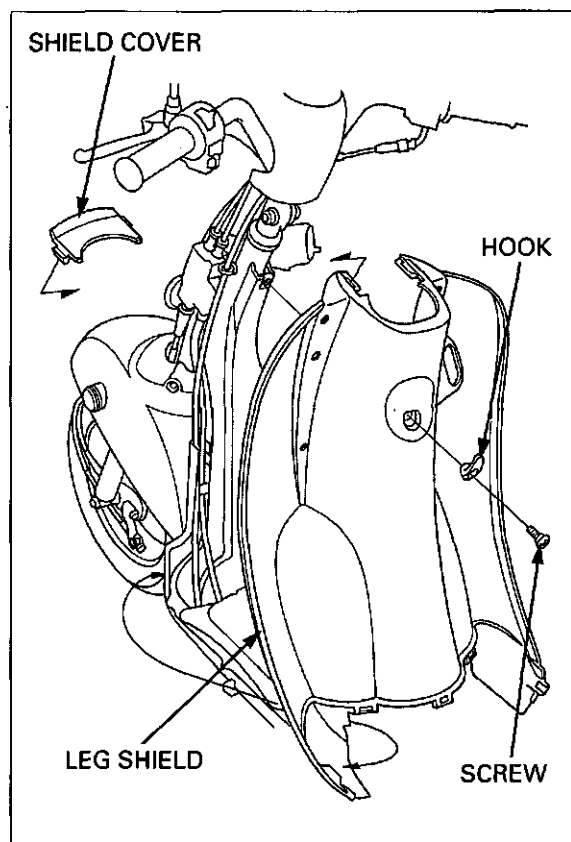
Remove the screw and luggage hook.

Remove the leg shield.

INSTALLATION

At installation, be careful not to damage the wire harness.

Installation is in the reverse order of removal.



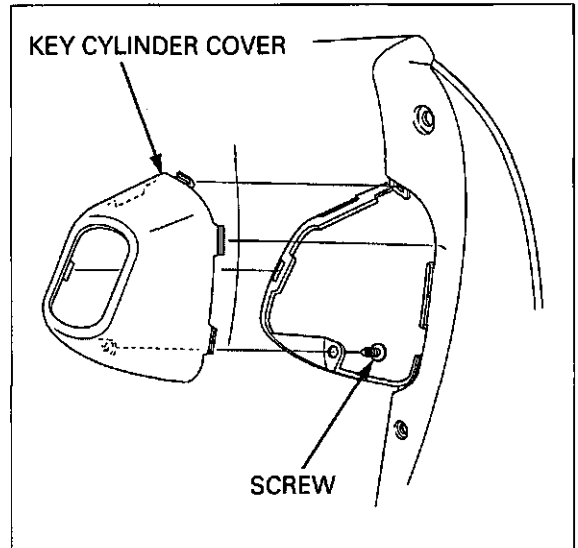
FRAME/BODY PANELS/EXHAUST SYSTEM

DISASSEMBLY/ASSEMBLY

Be careful not to damage the tab on the key cylinder cover.

Remove the screw and key cylinder cover.

Assembly is in the reverse order of disassembly.



LOWER COVER

REMOVAL

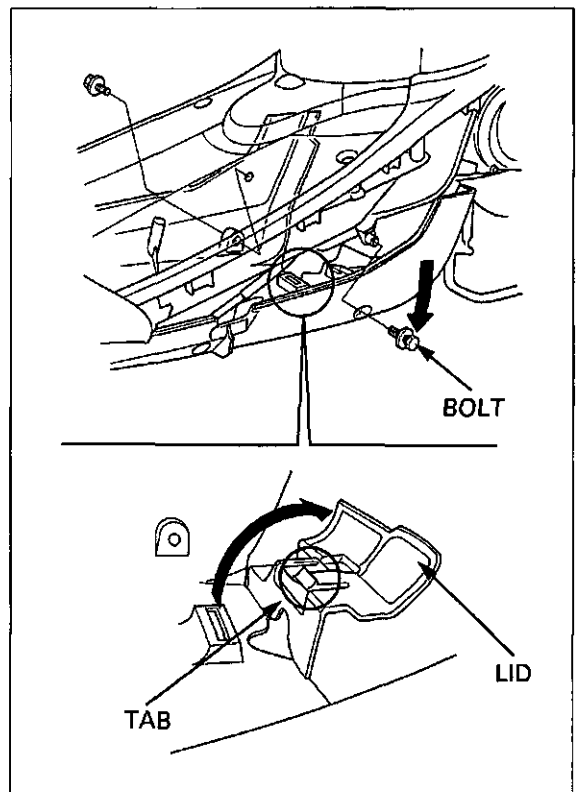
Remove the following:

- Side cover (page 2-8)
- Step floor (page 2-9)
- Leg shield (page 2-9)

Remove a tab and open the lower cover lid.

Remove the lower cover rear side bolts.

Remove the lower cover rear side from the bolt hole stud.



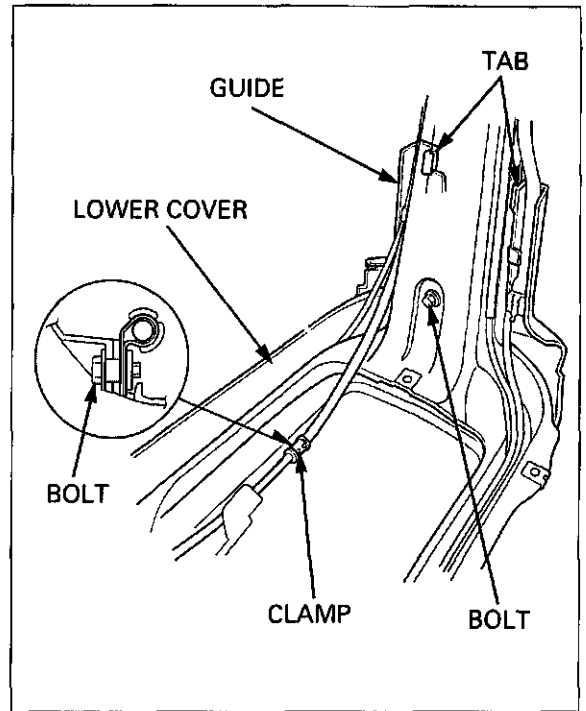
Be careful not to damage the brake cable.

- Remove the bolt while holding a cable clamp.
- Remove the cable and wires from the lower cover guide.
- Remove the lower cover front side bolts.
- Remove the tabs from the frame.
- Remove the lower cover.

INSTALLATION

Route the wire harness and cables correctly (page 1-14).

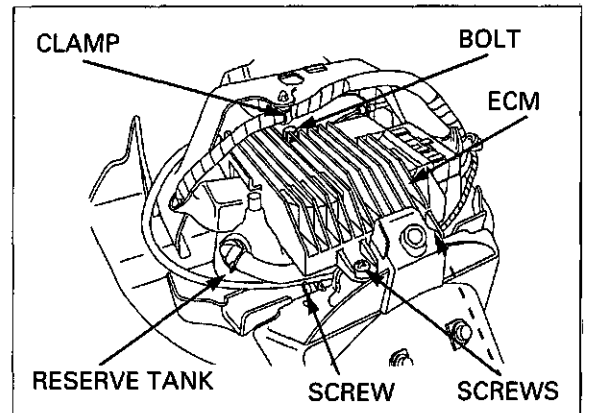
Installation is in the reverse order of removal.



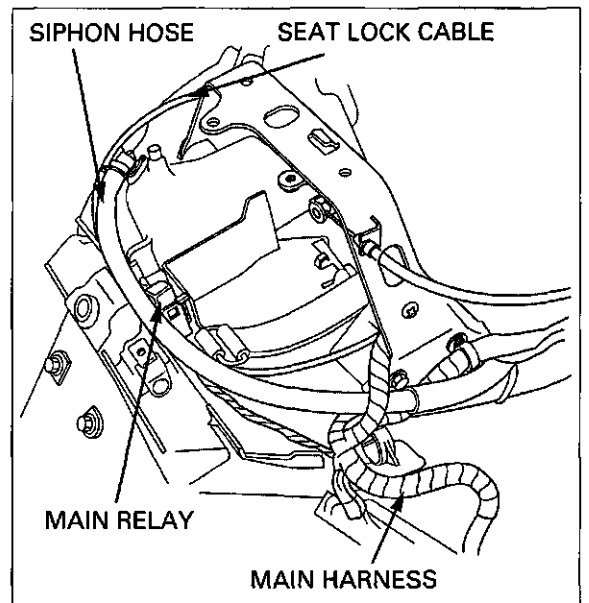
REAR FENDER

REMOVAL

- Remove the battery (page 15-6).
- Remove the screws, bolt, harness clamp and ECM.
- Remove the screw and radiator reserve tank from the rear fender.



Remove the seat lock cable, siphon hose, main relay and main harness from the guide of the rear fender.



FRAME/BODY PANELS/EXHAUST SYSTEM

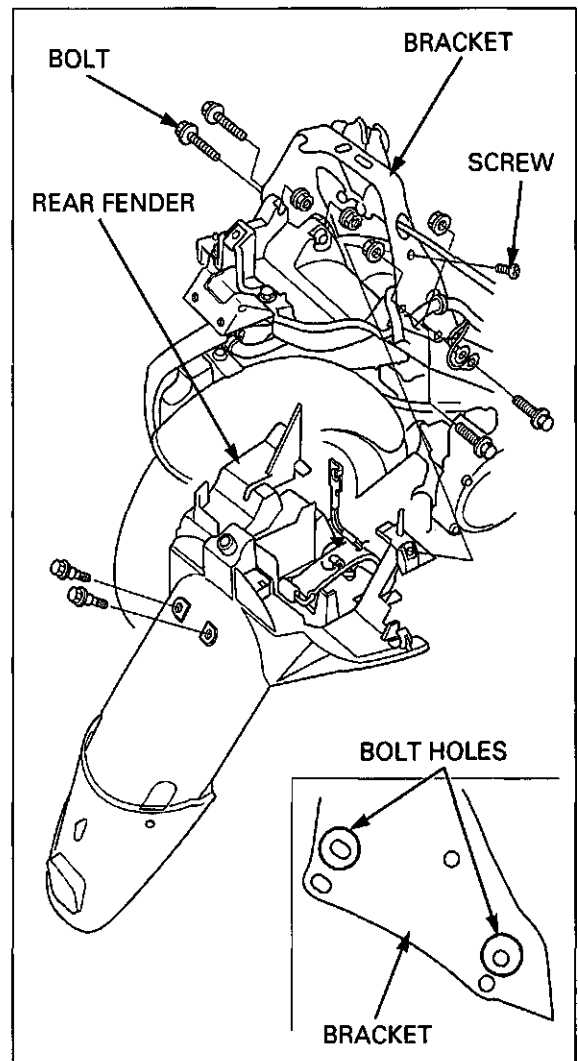
Remove the screw, bolts, nuts and seat catch bracket.

Remove the two bolts, nuts and rear fender.

INSTALLATION

Route the wire harness and cables correctly (page 1-14).

Installation is in the reverse order of removal.



FRONT METER COVER

REMOVAL

Remove the screws.

Remove two tabs from the rear meter cover while pulling the bottom of the front meter cover out.

Be careful not to damage the meter cover.

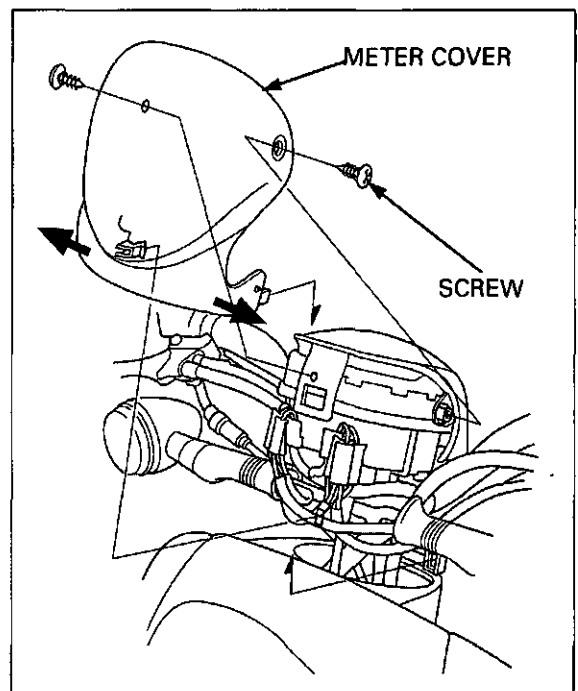
Remove the top of the front meter cover from the two screw hole bosses.

Remove the front meter cover

INSTALLATION

Installation is in the reverse order of removal.

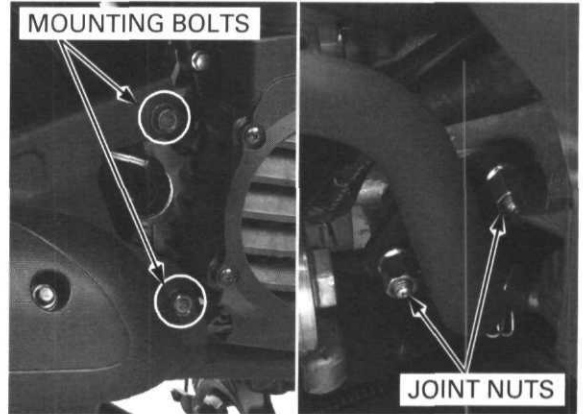
Refer to page 18-10 for removal of a rear meter cover.



MUFFLER

REMOVAL

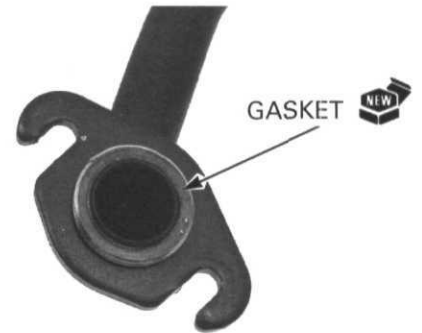
Remove the exhaust pipe joint nuts.
 Remove the muffler mounting bolts and muffler.
 Remove the gasket.



INSTALLATION

Replace the gasket with a new one.
 Installation is in the reverse order of removal by loosely tightening all fasteners.
 Tighten the joint nut first, then tighten the mount bolts.

After installation, inspect the exhaust system for leaks.

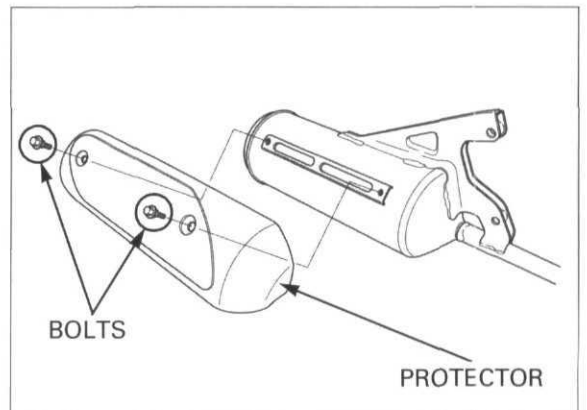


MUFFLER PROTECTOR

REMOVAL/INSTALLATION

The muffler protector can be serviced with the muffler installed in the engine.

Remove the bolts and muffler protector.
 Installation is in the reverse order of removal.



MEMO

3. MAINTENANCE

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MAINTENANCE

SERVICE INFORMATION

GENERAL

- Place the scooter on a level surface before starting any work.

SPECIFICATIONS

ITEM		SPECIFICATIONS	
Throttle grip free play		2 – 6 mm (1/16 – 1/4 in)	
Spark plug		NGK	DENSO
	Standard	CR8EH-9	U24FER9
	For cold climate (below 5°C/41°F)	CR7EH-9	U22FER9
	For extended high speed riding	CR9EH-9	U27FER9
Spark plug gap		0.80 – 0.90 mm (0.031 – 0.035 in)	
Valve clearance	IN	0.10 ± 0.03 mm (0.004 ± 0.001 in)	
	EX	0.19 ± 0.03 mm (0.007 ± 0.001 in)	
Engine oil capacity	After draining	0.6 liter (0.6 US qt, 0.5 Imp qt)	
	At disassembly	0.7 liter (0.7 US qt, 0.6 Imp qt)	
Recommended engine oil		Pro Honda GN4 or HP4 (Without molybdenum additives) 4-stroke oil or equivalent motor oil API service classification: SG or Higher Viscosity: SAE 10W-40	
Engine idle speed		2,000 ± 100 rpm	
Brake lever free play	Left	10 – 20 mm (3/8 – 13/16 in)	
	Right	10 – 20 mm (3/8 – 13/16 in)	
Tire size	Front	90/90-10 50J	
	Rear	90/90-10 50J	
Cold tire pressure	Front	125 kPa (1.25 kgf/cm ² , 18 psi)	
	Rear	200 kPa (2.00 kgf/cm ² , 28 psi)	
Minimum tire tread depth	Front	0.8 mm (0.03 in)	
	Rear	0.8 mm (0.03 in)	

TORQUE VALUES

Spark plug	12 N·m (1.2 kgf·m, 9 lbf·ft)
Engine oil drain bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)
Engine oil strainer cap	20 N·m (2.0 kgf·m, 14 lbf·ft)
Brake cable adjust lock nut	6.8 N·m (0.7 kgf·m, 5 lbf·ft)

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	ODOMETER READING (NOTE 1)					REFER TO PAGE
			X1,000 mi	0.6	2.5	5	7.5	
			X1,000 km	1	4	8	12	
EMISSION RELATED ITEMS	* FUEL LINE					I	3-4	
	* THROTTLE OPERATION			I	I	I	3-4	
	AIR CLEANER	NOTE 2				R	3-5	
	CRANKCASE BREATHER	NOTE 3			C	C	3-6	
	SPARK PLUG					R	3-6	
	* VALVE CLEARANCE		EVERY 15,000 mi (24,000 km) I					3-8
	ENGINE OIL	'02 - '05 model		R	R	R	R	3-10
		After '05 model	Initial = 600 mi (1,000 km) or 1 month: R Regular = Every 2,500 mi (4,000 km) or 6 months: R					
	* ENGINE OIL STRAINER SCREEN						C	3-11
	* ENGINE IDLE SPEED			I	I	I	I	3-12
	RADIATOR COOLANT	NOTE 4						3-13
	* COOLING SYSTEM						I	3-13
	* SECONDARY AIR SUPPLY SYSTEM						I	3-14
	NON-EMISSION RELATED ITEMS	BRAKE SHOES WEAR			I	I	I	3-15
BRAKE SYSTEM				I	I	I	3-16	
* BRAKE LOCK OPERATION				I	I	I	3-18	
* HEADLIGHT AIM				I	I	I	3-18	
** CLUTCH SHOES WEAR					I		9-15	
* SUSPENSION				I	I	I	3-19	
* NUTS, BOLTS, FASTENERS				I		I	3-20	
** WHEELS/TIRES					I	I	3-20	
** STEERING HEAD BEARINGS			I		I	3-20		

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

NOTES:

1. At higher odometer readings, repeat at the intervals 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.

MAINTENANCE

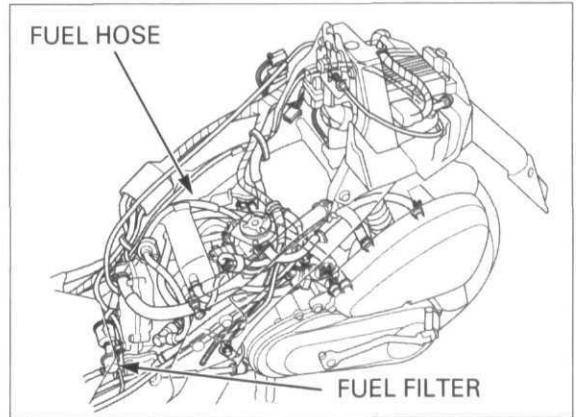
FUEL LINE

Remove the luggage box (page 2-6).
Remove the body cover (page 2-7).

Check the fuel lines for deterioration, damage or leakage.

Visually inspect the fuel filter for contamination.

Replace the fuel lines or filter if necessary.



THROTTLE OPERATION

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

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

For cable lubrication: Disconnect the throttle cable at their pivot points with a commercially available cable lubricant or a light weight oil.

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

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

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

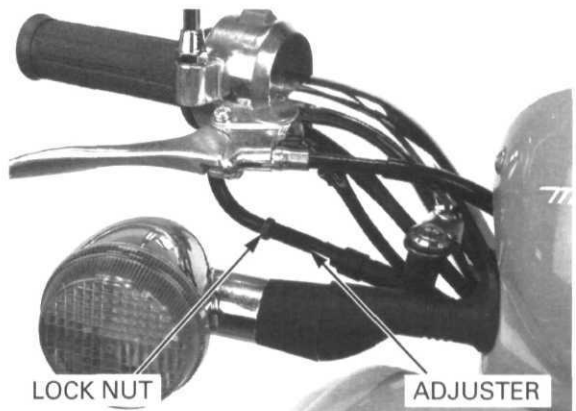
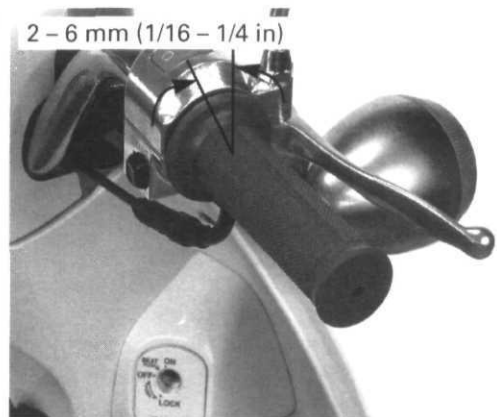
Measure the throttle grip free play at the throttle grip flange.

FREE PLAY: 2 – 6 mm (1/16 – 1/4 in)

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

Minor adjustment are made with the upper adjuster.

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

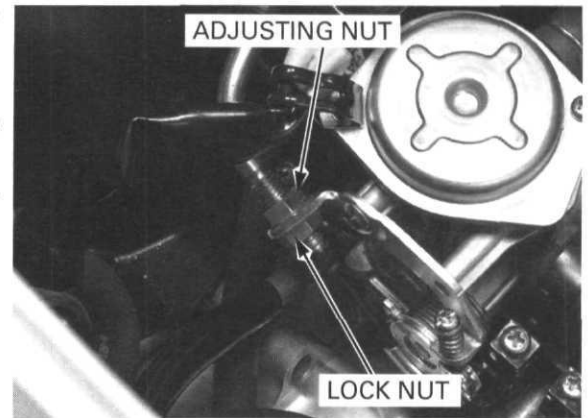


Major adjustments are made with the lower adjusters.

Remove the luggage box (page 2-6).

Loosen the lock nut, turn the adjusting nut as required and tighten the lock nut.

Recheck the throttle operation and install the luggage box.

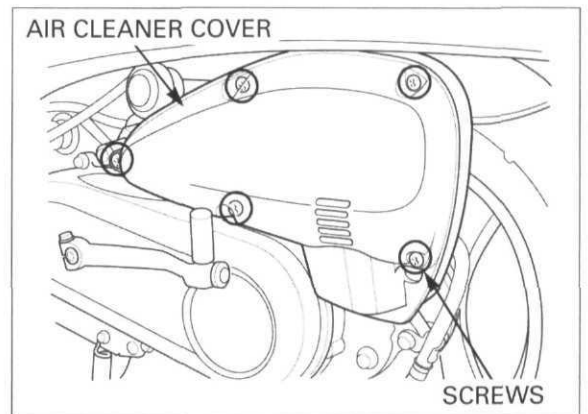


AIR CLEANER

NOTE:

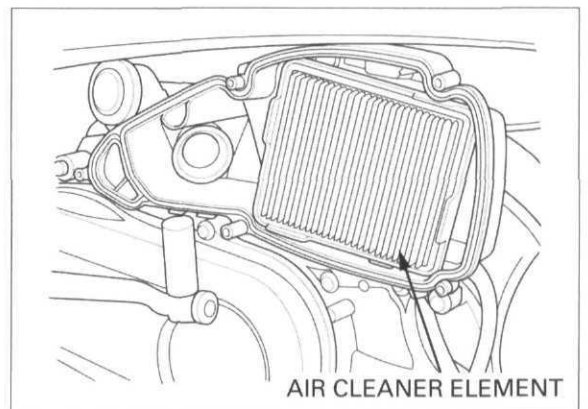
- The viscous paper element type air cleaner cannot be cleaned because the element contains a dust adhesive.
- If the scooter is used in unusually wet or dusty areas, more frequent inspections are required.

Remove the five screws and air cleaner cover.



Replace the element in accordance with the maintenance schedule or any time it is excessively dirty or damaged.

Install the new air cleaner element, cover and tighten the screws.



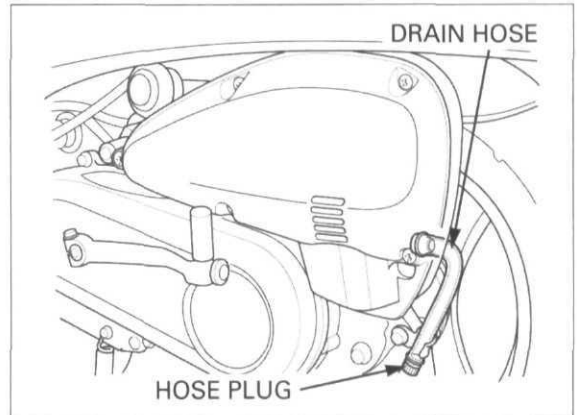
MAINTENANCE

CRANKCASE BREATHER

NOTE:

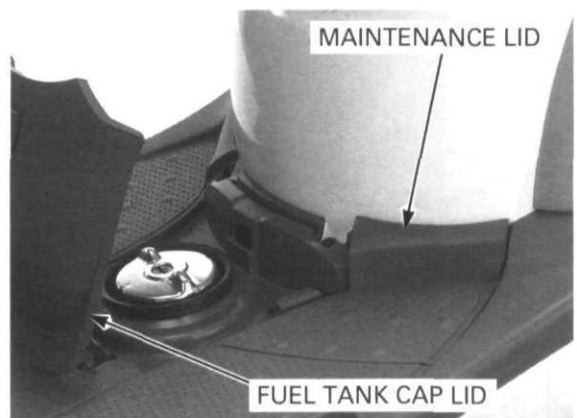
- Service more frequently when ridden in rain, at full throttle, or after the motorcycle is washed or overturned. Service if the deposit level can be seen in the transparent section of the drain hose.

Remove the crankcase breather drain hose plug from the hose end and drain deposits into a suitable container, then install the crankcase breather drain hose plug securely.



SPARK PLUG

Open the fuel tank cap lid and remove the plug maintenance lid.

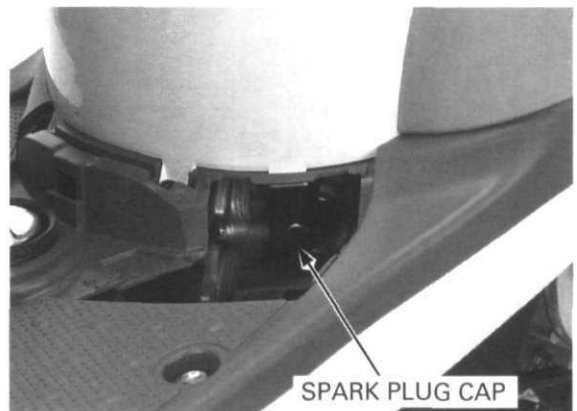


Disconnect the spark plug cap and clean around the spark plug bases.

NOTE:

- Clean around the spark plug bases with compressed air before removing the plugs, and make sure that no debris is allowed to enter the combustion chamber.

Remove the spark plug.



Check the insulator for cracks or damage, and the electrodes for wear, fouling or discoloration. Replace the plug if necessary. If the electrode is contaminated with carbon deposits, clean the electrode using a spark plug cleaner.

Replace the plug if necessary.

Always use the specified spark plug on this scooter.

SPECIFIED SPARK PLUG:

Standard:

CR8EH-9 (NGK), U24FER9 (DENSO)

For cold climate (below 5°C/41 °F):

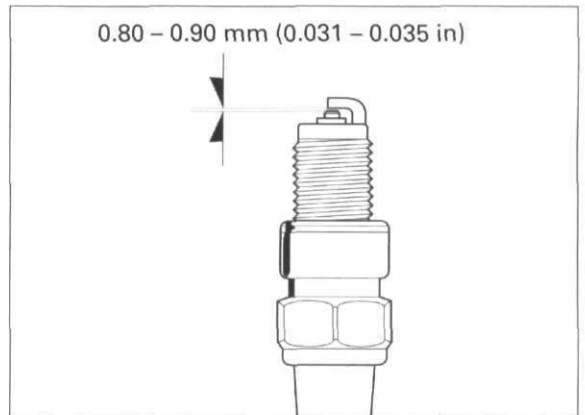
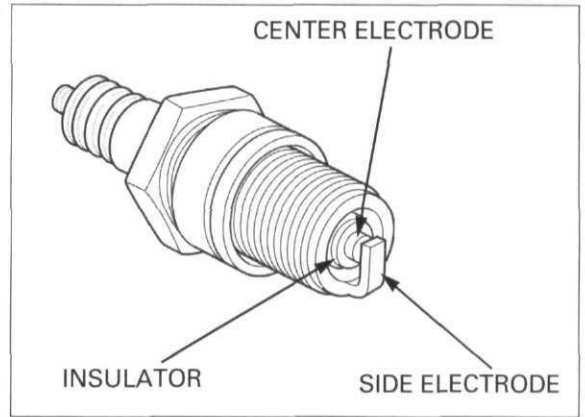
CR7EH-9 (NGK), U22FER9 (DENSO)

For extended high speed riding:

CR9EH-9 (NGK), U27FER9 (DENSO)

Measure the spark plug gap between the center and side electrodes with a wire type feeler gauge. If necessary, adjust the gap by bending the side electrode carefully.

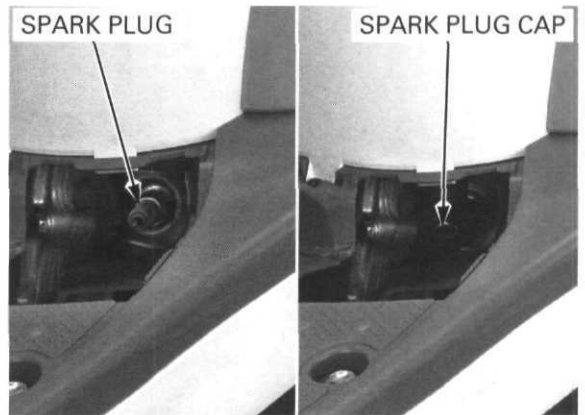
SPARK PLUG GAP: 0.80 – 0.90 mm (0.031 – 0.035 in)



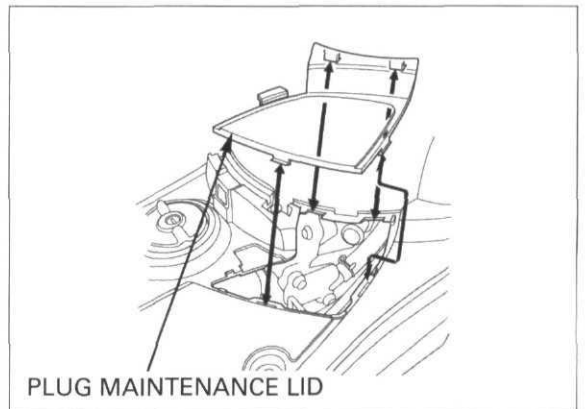
Install the spark plug in the cylinder head and hand tighten, then torque to specification.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the spark plug cap.



Install the plug maintenance lid. Close the fuel tank cap lid.



VALVE CLEARANCE

INSPECTION

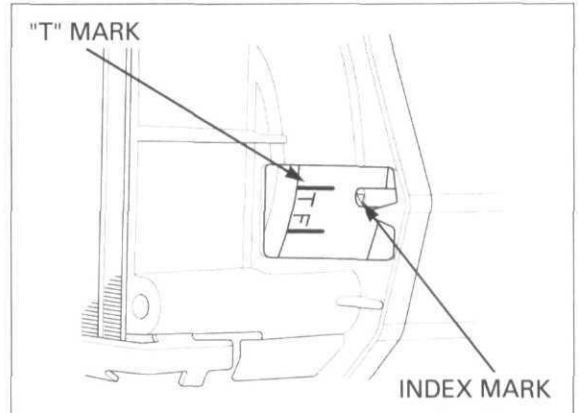
NOTE:

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

Remove the following:

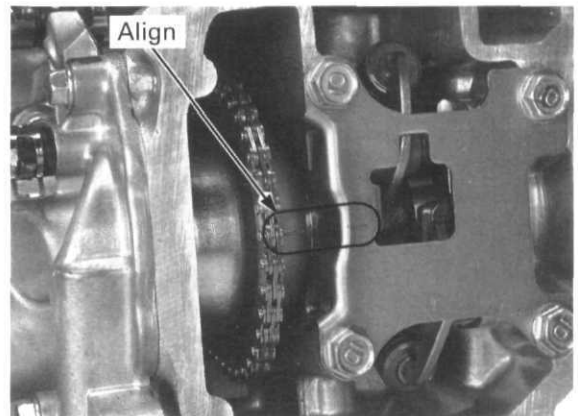
- Radiator cover (page 6-7)
- Belt case cover (page 9-5)
- Cylinder head cover (page 8-6)

Rotate the drive pulley (crankshaft) counterclockwise and align the "T" mark on the flywheel with the index mark.



Make sure the index line on the cam sprocket aligns with the index mark on the stopper plate and the lobe of the camshaft faces the cylinder side (TDC on the compression stroke).

If the lobe of the camshaft is not aligned, turn the drive pulley (crankshaft) one revolution and realign the index line with the index mark.

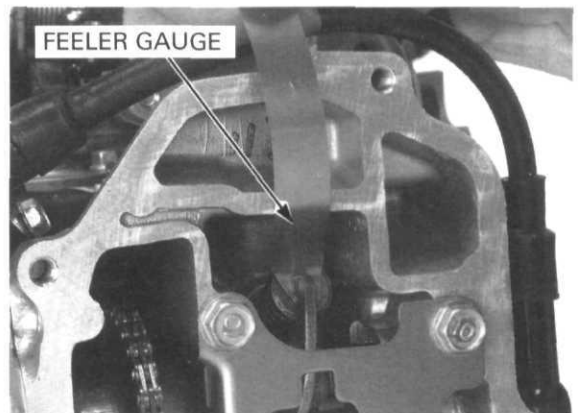


Measure the valve clearance by inserting a feeler gauge between the valve lifter and shim.

VALVE CLEARANCE:

IN: 0.10 ± 0.03 mm (0.004 ± 0.001 in)

EX: 0.19 ± 0.03 mm (0.007 ± 0.001 in)



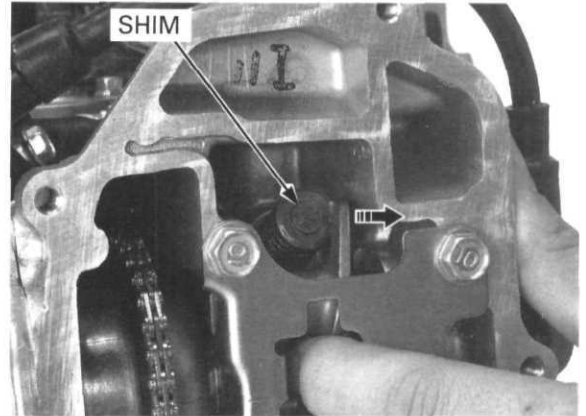
ADJUSTMENT

Shift the rocker arm to the spring side and remove the shim.

NOTE:

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

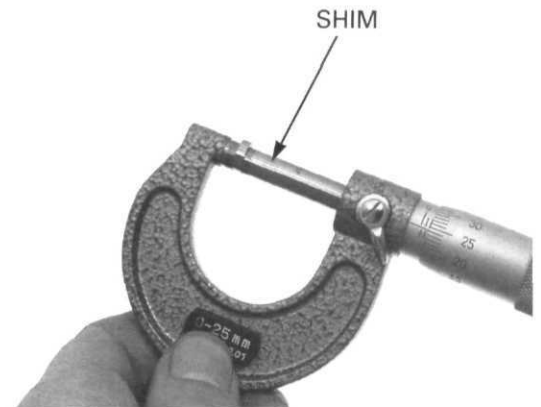
Clean the valve shim contact area with compressed air.



Measure the shim thickness and record it.

NOTE:

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



Calculate the new shim thickness using the equation below.

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

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

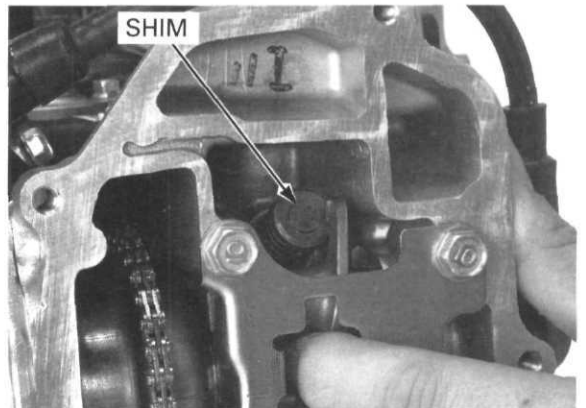
- Make sure of the correct shim thickness by measuring the shim with a micrometer.
- Reface the valve seat if carbon deposits result in a calculated dimension of over 2.900 mm.



Install the newly selected shim on the valve retainer. Rotate the camshaft by rotating the drive pulley (crankshaft) counterclockwise several times. Recheck the valve clearance.

Install the following:

- Cylinder head cover (page 8-22)
- Belt case cover (page 9-5)
- Radiator cover (page 6-8)



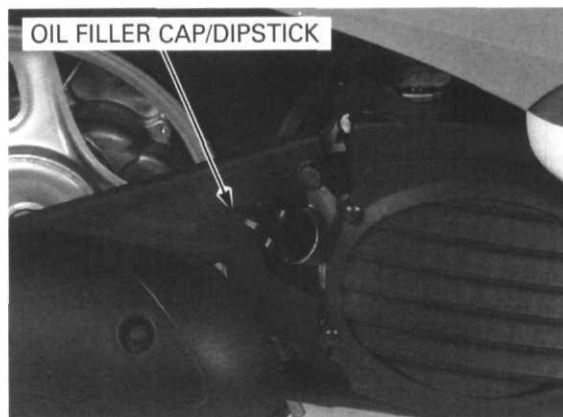
ENGINE OIL

OIL LEVEL CHECK

Start the engine and let it idle for a few minutes.

Stop the engine and place the scooter on its centerstand on a level surface.

Wait for 2 or 3 minutes after stopping the engine. Remove the oil filler cap/dipstick and wipe the oil from the dipstick with a clean cloth.

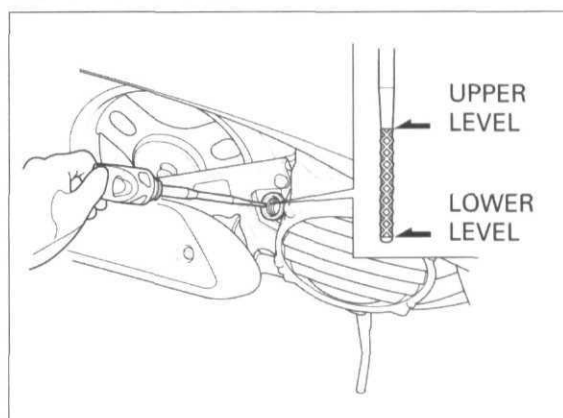


Insert the dipstick without screwing it in, remove it and check the oil level.

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

RECOMMENDED ENGINE OIL:

Pro Honda GN4 or HP4 (without molybdenum additives) 4-stroke oil or equivalent motor oil
API service classification: SG or Higher
Viscosity: SAE 10W-40

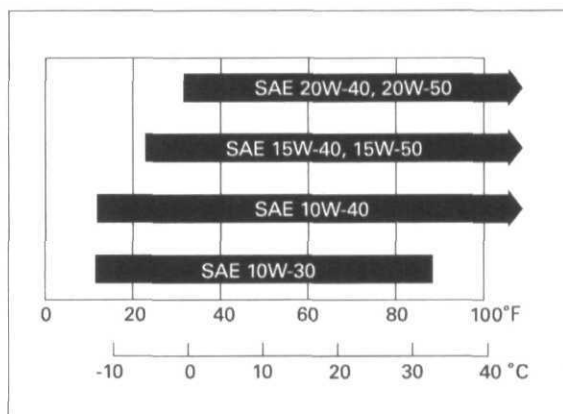


NOTE:

- Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range.

Reinstall the oil filler cap/dipstick.

For engine oil change, see page 3-11.

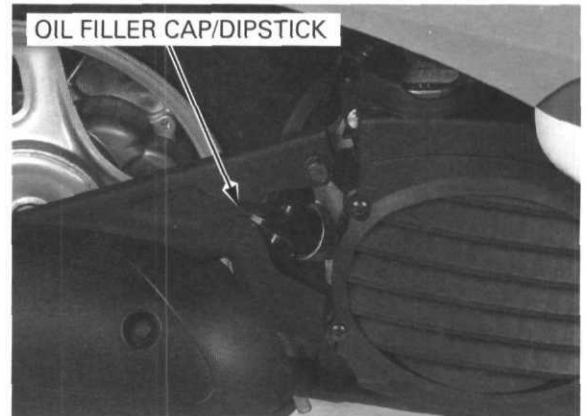


ENGINE OIL STRAINER SCREEN

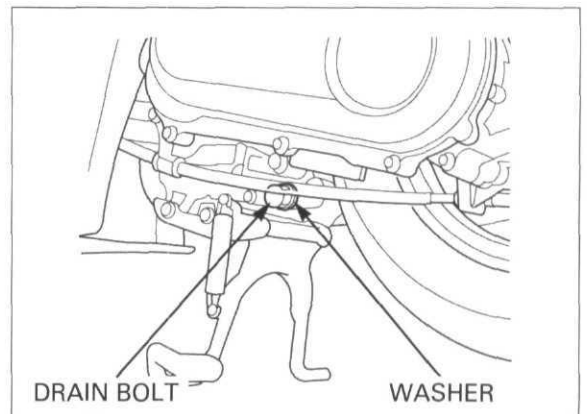
NOTE:

- Change the oil with the engine warm and the scooter on its centerstand to assure complete and rapid draining.

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

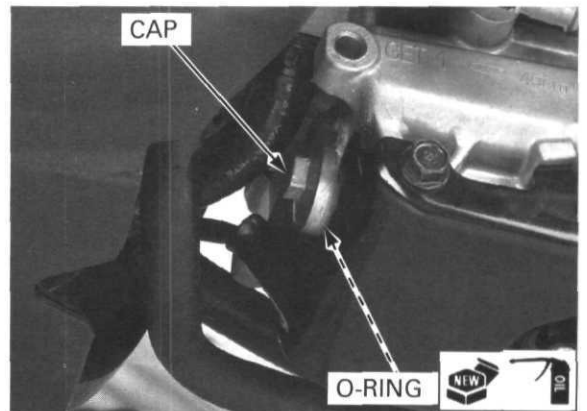


Remove the drain bolt and washer, and drain the oil.



Remove the oil strainer cap, spring and strainer screen.

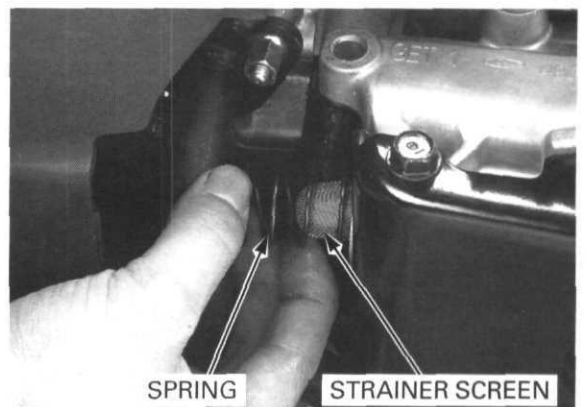
Clean the oil strainer.



Install the oil strainer screen and spring into the crankcase as shown.

Install and tighten the oil strainer cap with a new O-ring.

TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)



MAINTENANCE

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

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)

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

OIL CAPACITY:

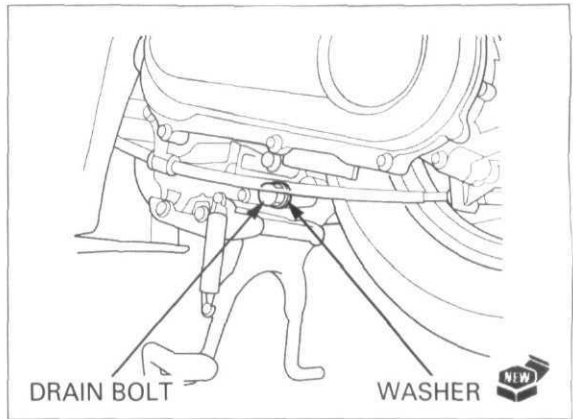
0.6 liter (0.6 US qt, 0.5 Imp qt) at draining

0.7 liter (0.7 US qt, 0.6 Imp qt) at disassembly

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

Install the oil filler cap/dipstick.

Make sure there are no oil leaks.



ENGINE IDLE SPEED

NOTE:

- Inspect and adjust the idle speed after all other engine maintenance items have been performed and are within specifications.
- The engine must be warm for accurate idle speed inspection and adjustment.

Warm up the engine.

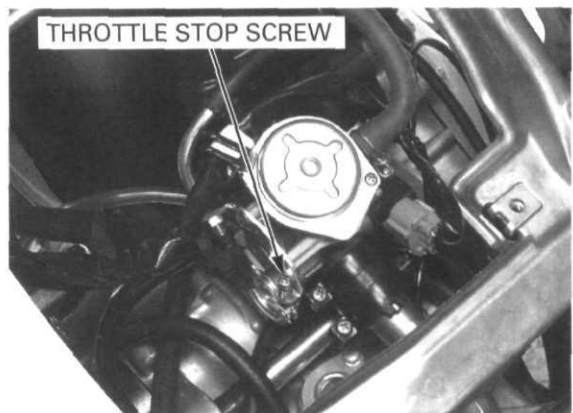
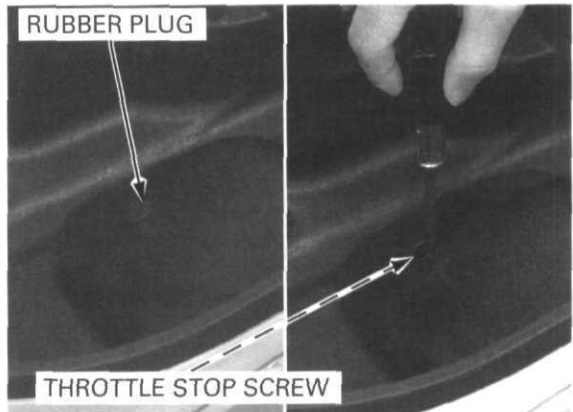
Place the scooter on its centerstand.

Remove the plug maintenance lid and connect a tachometer.

Open the seat and remove the rubber plug.

Check the idle speed and adjust by turning the throttle stop screw as required.

IDLE SPEED: 2,000 ± 100 rpm

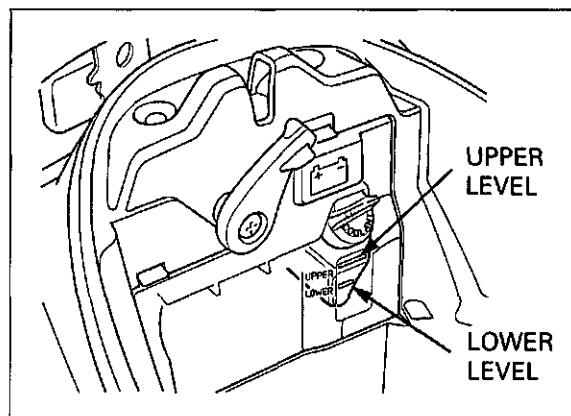


RADIATOR COOLANT

Place the scooter on its centerstand and open the seat.

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

The level should be between the "UPPER" and "LOWER" level lines with the scooter upright on a level surface.



If the level is low, remove the maintenance cover, reserve tank cap and fill the tank to the "UPPER" level line with a 1:1 mixture of distilled water and antifreeze (coolant mixture preparation: page 6-5).

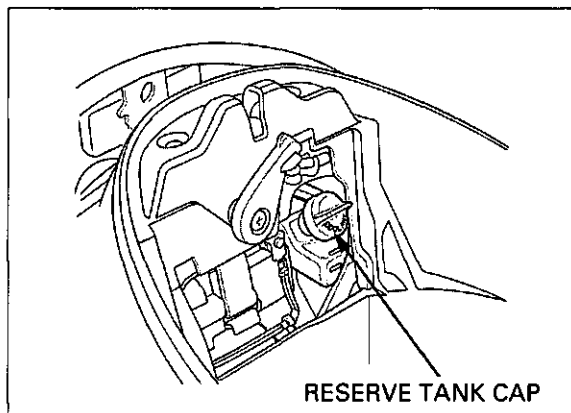
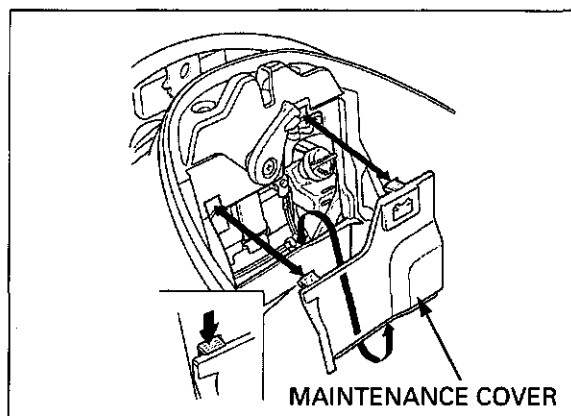
NOTICE

Using coolant with silicate inhibitors may cause premature wear of water pump seals or blockage of radiator passages. Using tap water may cause engine damage.

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

If the reserve tank becomes completely empty, there is the possibility of air getting into the cooling system (page 6-7).

Install the removed parts in the reverse order of removal.



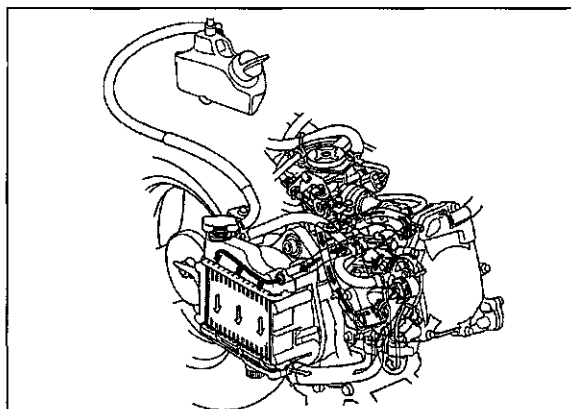
COOLING SYSTEM

Remove the luggage box (page 2-6).

Check for coolant leakage from the water pump, water hoses and hose joints.

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

Check that all hose clamps are tight.

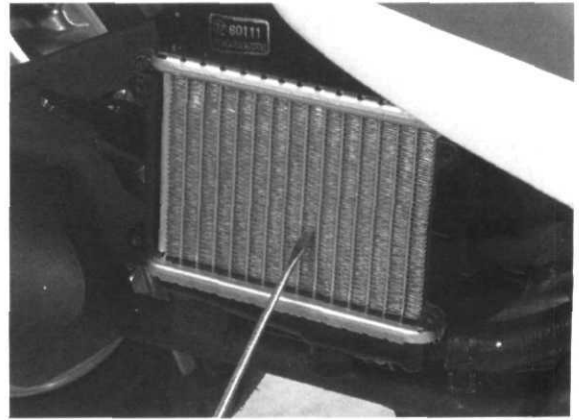


MAINTENANCE

Remove the radiator cover (page 6-5).

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

Install the radiator cover (page 6-8).
Install the luggage box (page 2-6).



SECONDARY AIR SUPPLY SYSTEM: ('02 - '05 model)

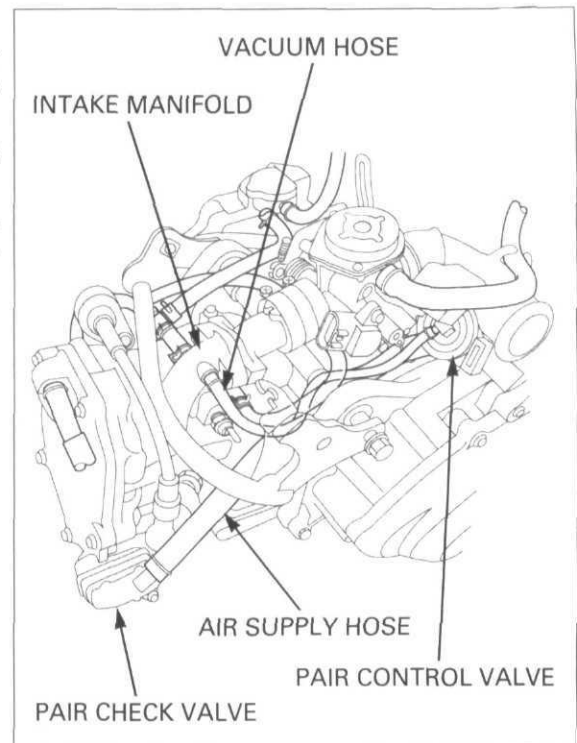
Remove the luggage box (page 2-6).

Check the air supply hoses between the air cleaner case and PAIR control valve and PAIR check valves for damage or loose connections.

If the hoses show any signs of heat damage, inspect the PAIR check valves (page 5-23).

Check the vacuum hose between the intake manifold vacuum joint and PAIR control valve for deterioration, damage or loose connections. Also check that hose is not kinked or pinched.

Install the luggage box (page 2-6).



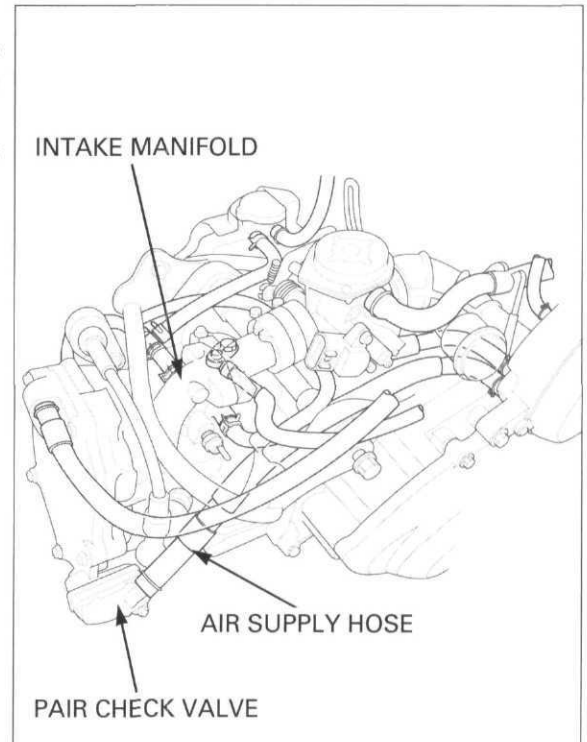
SECONDARY AIR SUPPLY SYSTEM: (After '05 model)

Remove the luggage box (page 2-6).

Check the air supply hoses between the air cleaner case and PAIR check valves for damage or loose connections.

If the hoses show any signs of heat damage, inspect the PAIR check valves (page 5-23).

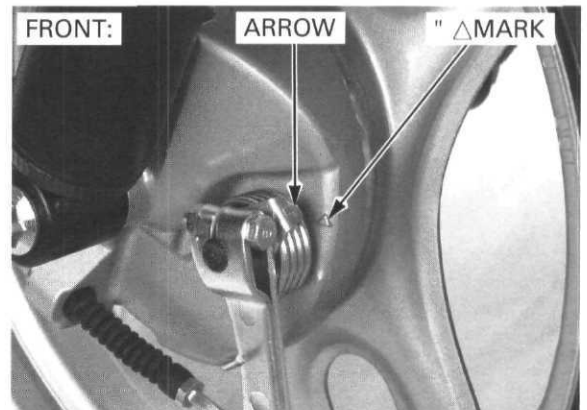
Install the luggage box (page 2-6).



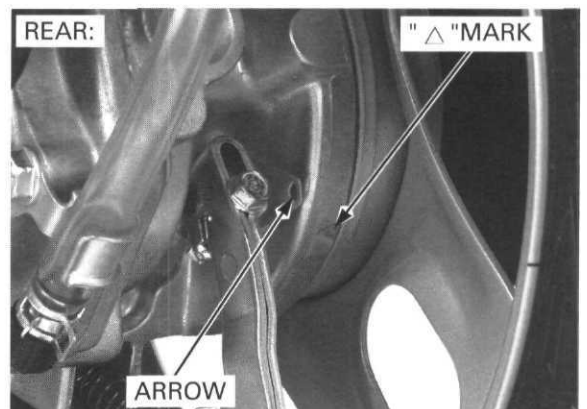
BRAKE SHOES WEAR

Check the brake shoes and brake drum if the arrow on the indicator plate aligns with the "△" mark on the brake panel when the brake lever is applied.

Refer to page 13-9 for front brake shoes replacement.



Refer to page 14-5 for rear brake shoes replacement.



MAINTENANCE

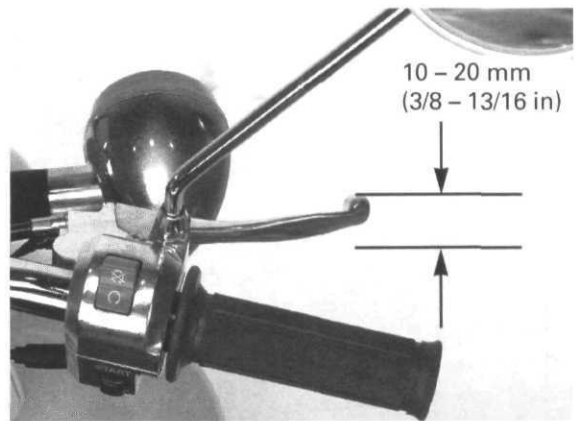
BRAKE SYSTEM

NOTE:

- Adjust the right brake lever first, then adjust the left lever.

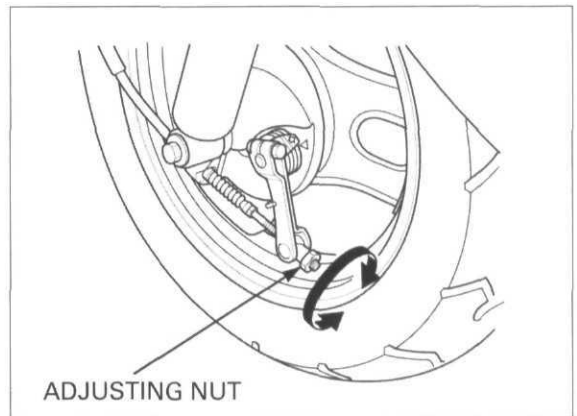
Measure the right brake lever free play at the end of the lever.

FREE PLAY: 10 – 20 mm (3/8 – 13/16 in)



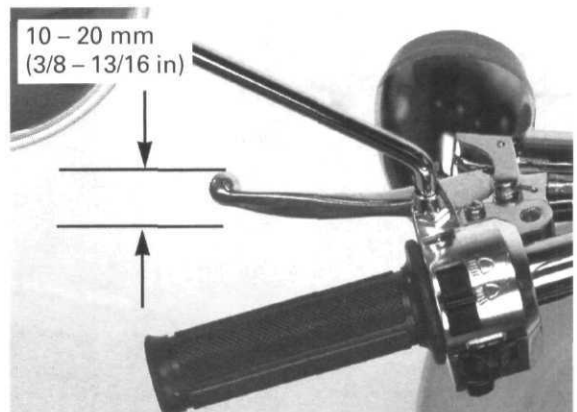
Make sure the cutout on the adjusting nut is seated on the joint pin.

Adjust the right brake lever free play by turning the front brake arm adjusting nut.



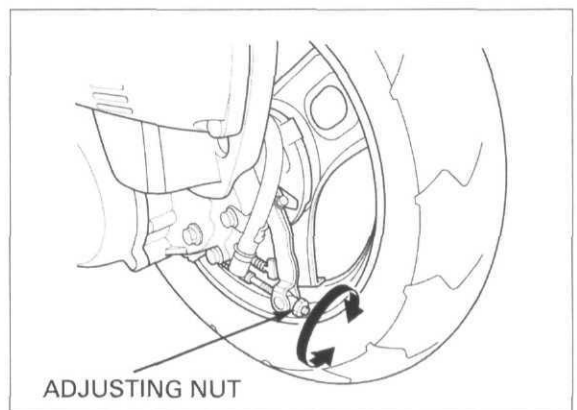
Measure the left brake lever free play at the end of the lever.

FREE PLAY: 10 – 20 mm (3/8 – 13/16 in)



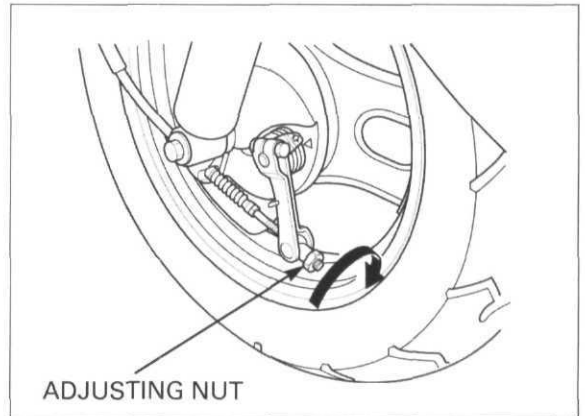
Make sure the cutout on the adjusting nut is seated on the joint pin.

Adjust the left brake lever free play by turning the rear brake arm adjusting nut.

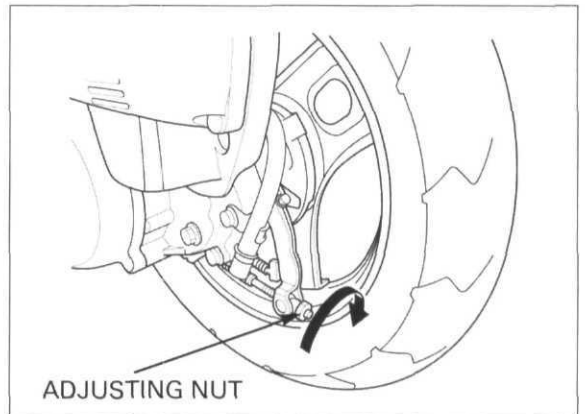


If a brake cable is replaced: When a brake cables is replaced, adjust the brake lever free play as follows.

1. Tighten the front brake arm adjust nut all the way in.

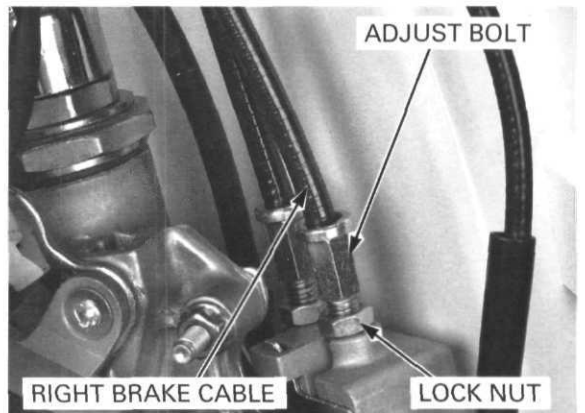


2. Tighten the rear brake arm adjust nut all the way in.



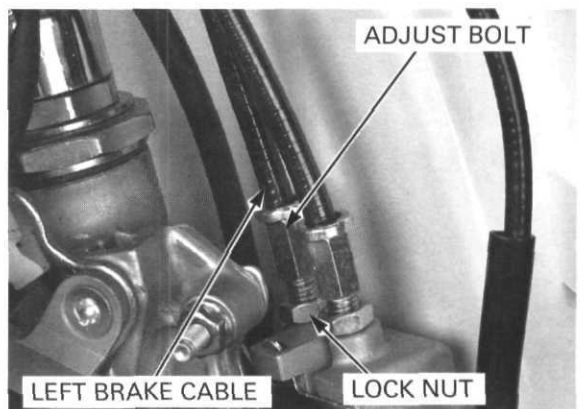
3. Remove the front cover (page 2-4).
Loosen the lock nut of the right brake cable, turn the adjust bolt until there is no brake lever free play.
Tighten the lock nut.

TORQUE 6.8 N·m (0.7 kgf·m, 5 lbf·ft)



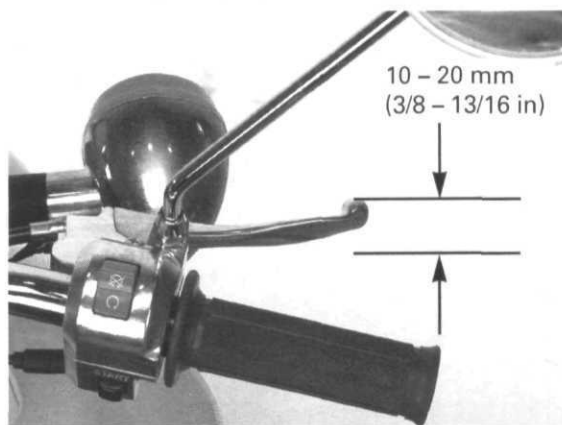
4. Loosen the lock nut of the left brake cable, turn the adjust bolt until there is no brake lever free play.
Tighten the lock nut.

TORQUE 6.8 N·m (0.7 kgf·m, 5 lbf·ft)



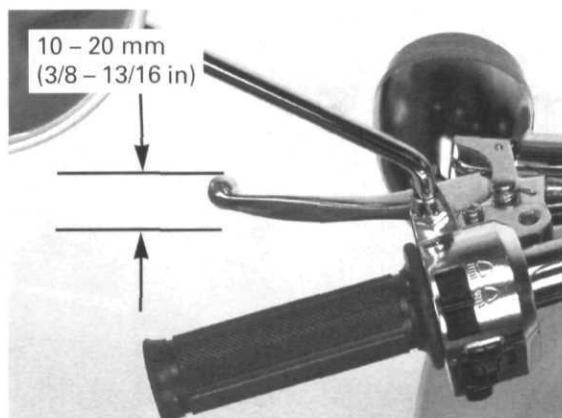
MAINTENANCE

5. Turn and adjust the front brake arm adjust nut so that free play of the right brake lever is 10 – 20 mm (3/8 – 13/16 in).



6. Turn the rear brake arm adjust nut so that free play of the left brake lever is 10 – 20 mm (3/8 – 13/16 in).

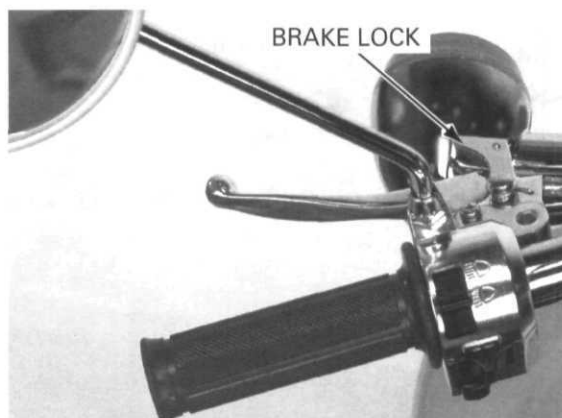
7. Install the front cover (page 2-4).



BRAKE LOCK OPERATION

Check the brake lock operation.

The brake lock will not function if the left brake lever is not adjusted properly (page 3-16).

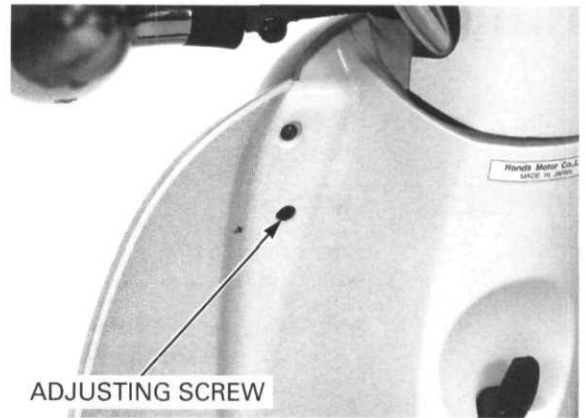


HEADLIGHT AIM

Adjust the headlight beam as specified by local laws and regulations. Adjust vertically by turning the vertical adjusting screw.



Adjust horizontally by turning the horizontal adjusting screw.



ADJUSTING SCREW

SUSPENSION

FRONT

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

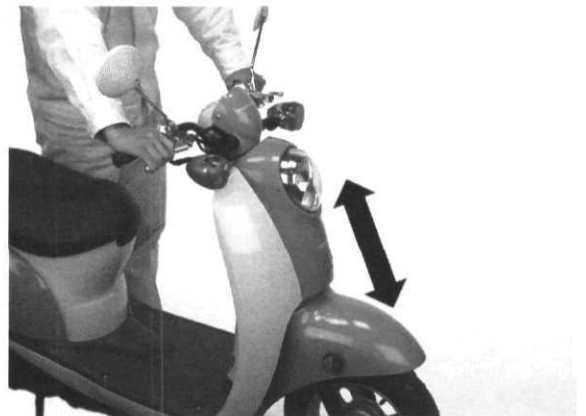
Check the action of the forks by operating the front brakes and compressing the front suspension several times.

Check the entire assembly for damage or loose fasteners.

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

Refer to page 13-13 for fork service.



REAR

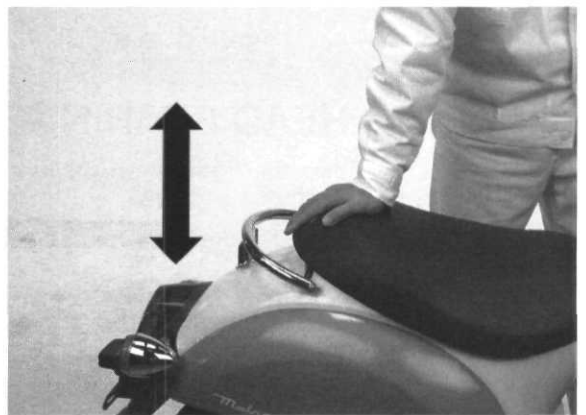
Check the action of the shock absorber by compressing it several times.

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

Refer to page 14-8 for shock absorber service.



Raise the rear wheel off the ground and support the scooter securely.

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

Replace the bushings if any looseness is noted (page 7-5).



MAINTENANCE

NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-10).

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

WHEELS/TIRES

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

RECOMMENDED TIRE PRESSURE:

FRONT: 125 kPa (1.25 kgf/cm², 18 psi)

REAR: 200 kPa (2.00 kgf/cm², 28 psi)



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

Check the front wheel (page 13-6) and rear wheel (page 14-4) for trueness.

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: 0.8 mm (0.03 in)

REAR: 0.8 mm (0.03 in)



STEERING HEAD BEARINGS

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

Raise the front wheel off the ground and support the scooter securely.

Check that the handlebar moves freely from side-to-side.

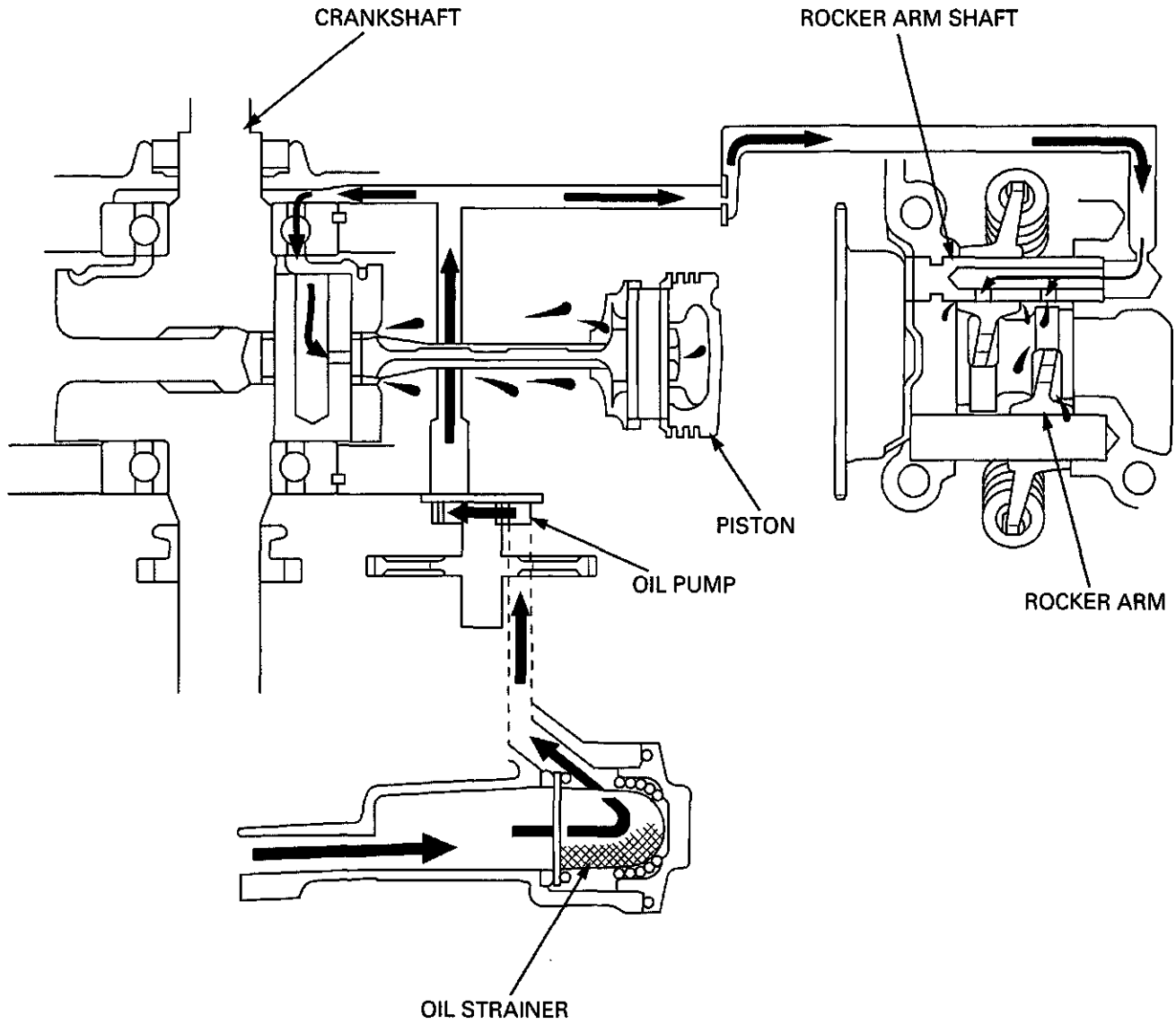
If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 13-22).



4. LUBRICATION SYSTEM

LUBRICATION SYSTEM DIAGRAM	4-2	TROUBLESHOOTING.....	4-3
SERVICE INFORMATION	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.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	0.6 liter (0.6 US qt, 0.5 Imp qt)	-
	At disassembly	0.7 liter (0.7 US qt, 0.6 Imp qt)	-
Recommended engine oil		Pro Honda GN4 or HP4 (Without molybdenum additives) 4-stroke oil or equivalent motor oil API service classification: SG or Higher Viscosity: SAE 10W-40	-
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.20 (0.006 – 0.008)	0.22 (0.009)
	Side clearance	0.05 – 0.10 (0.002 – 0.004)	0.12 (0.005)

TORQUE VALUES

Engine oil strainer cap	20 N·m (2.0 kgf·m, 14 lbf·ft)
Engine oil pump cover screw	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)

TROUBLESHOOTING

Engine oil level too low

- Oil consumption
- External oil leak
- Worn piston ring or incorrect piston ring installation
- Worn cylinder
- Worn valve guide or seal

Oil contamination

- Oil not changed often enough
- Faulty cylinder head gasket
- Worn piston ring

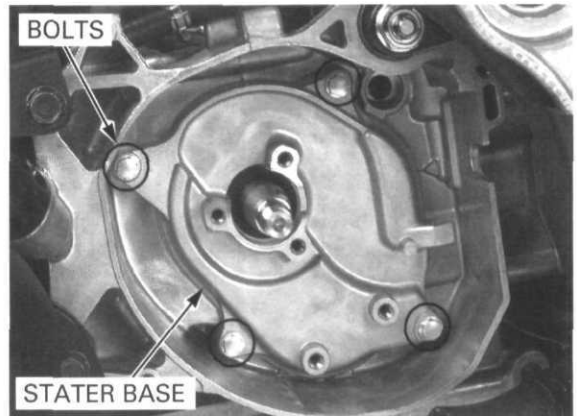
LUBRICATION SYSTEM

OIL PUMP

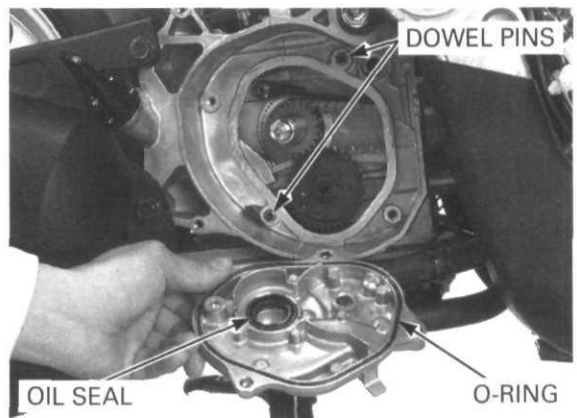
REMOVAL

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

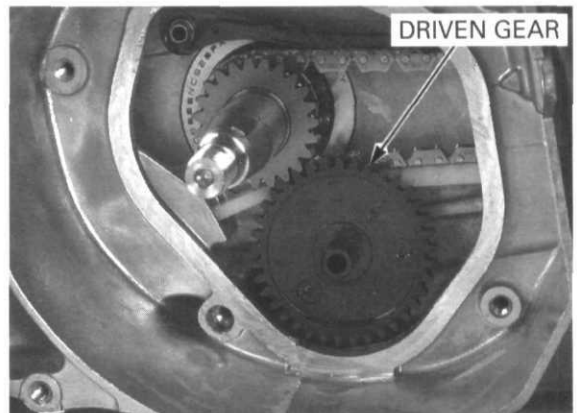
Drain the engine oil (page 3-11).
Remove the alternator/starter assembly (page 11-4).
Remove the four bolts and stater base.



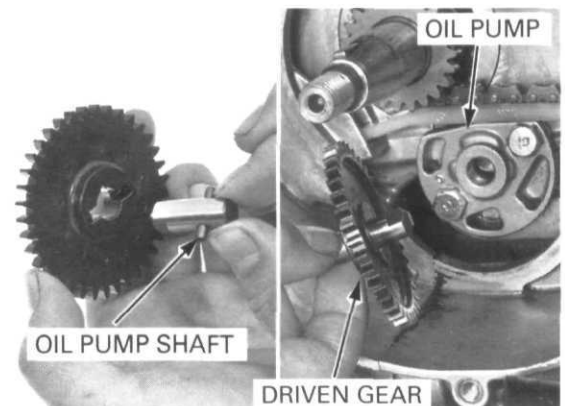
Remove the dowel pins, O-ring and oil seal.



'02 - '05 model: Remove the oil pump driven gear.

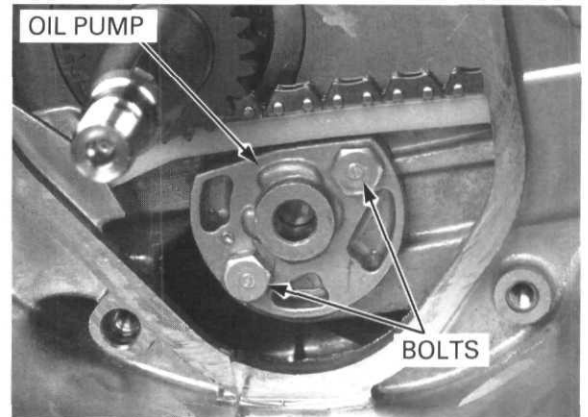


After '05 model: Remove the oil pump shaft with driven gear.



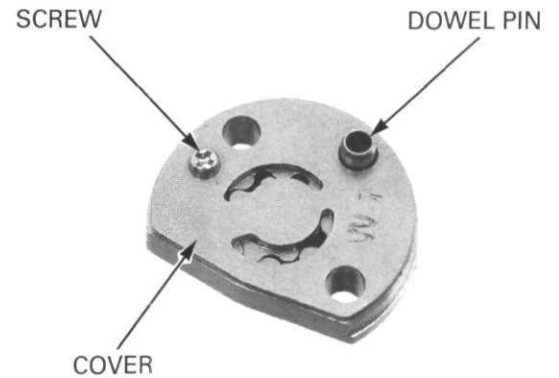
Be careful not to drop the bolts into the crankcase.

Remove the bolts and oil pump from the crankcase.

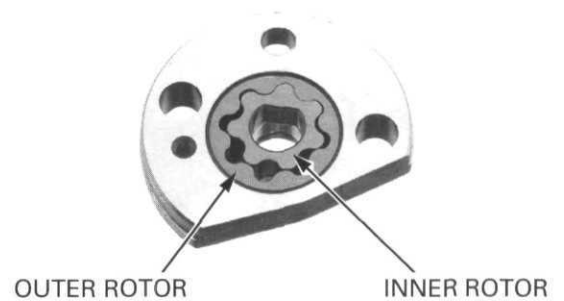


DISASSEMBLY

Remove the dowel pin, screw and oil pump cover.



Remove the oil pump outer rotor and inner rotor.



INSPECTION

NOTE:

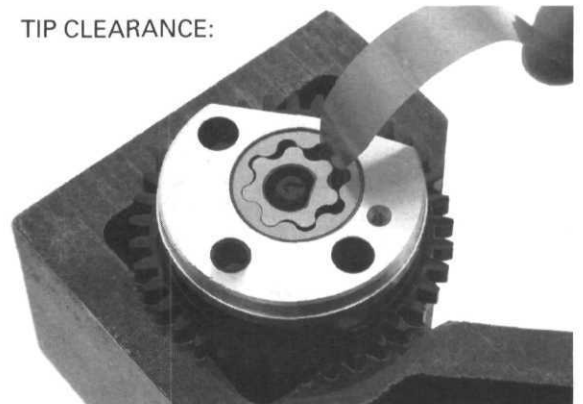
- Measure at several points and use the largest reading to compare the service limit.

Temporarily install the outer, inner rotors and driven gear into the oil pump body.

Measure the tip clearance.

SERVICE LIMIT: 0.20 mm (0.008 in)

TIP CLEARANCE:

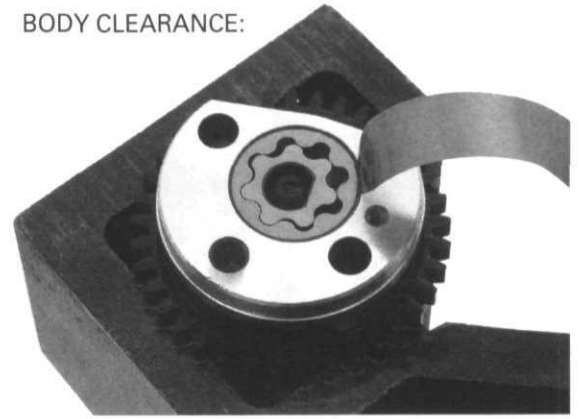


LUBRICATION SYSTEM

Measure the pump body clearance.

SERVICE LIMIT: 0.22 mm (0.009 in)

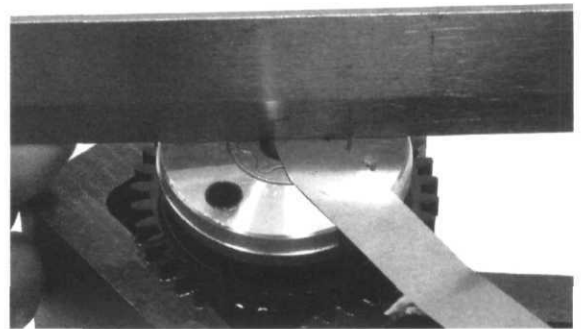
BODY CLEARANCE:



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

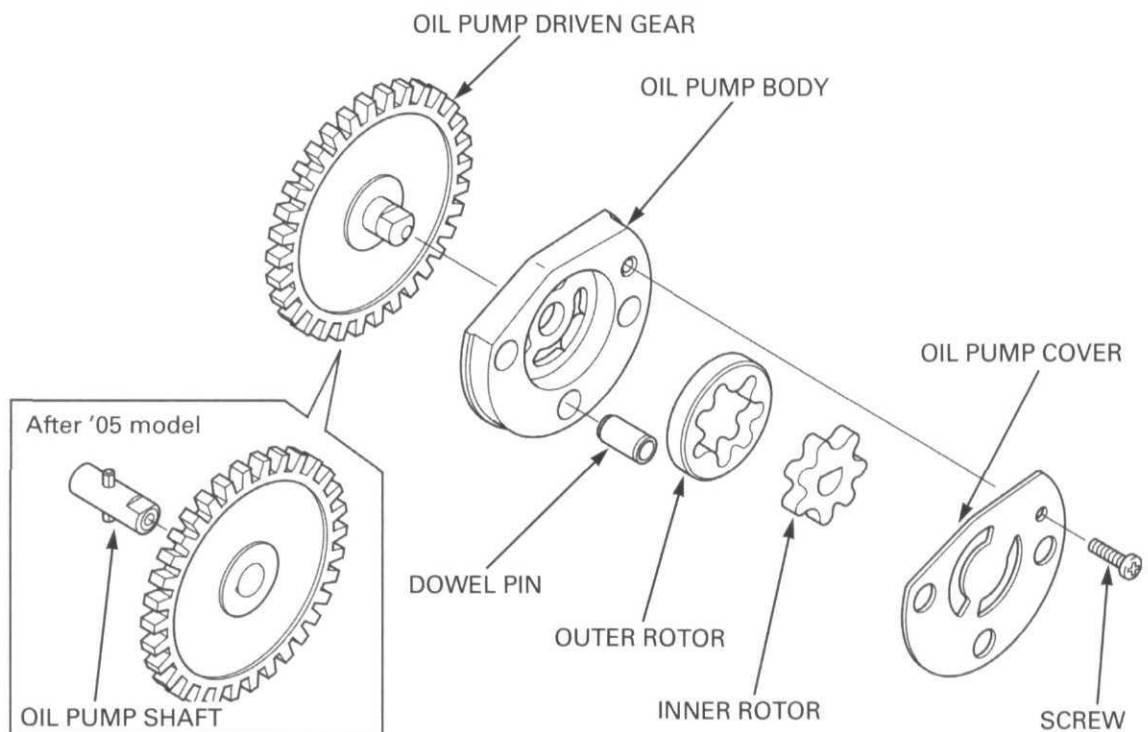
SERVICE LIMIT: 0.12 mm (0.005 in)

SIDE CLEARANCE:



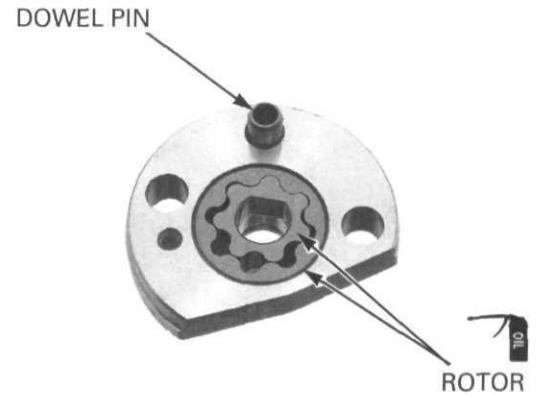
ASSEMBLY

Dip all parts in clean engine oil before assembly.



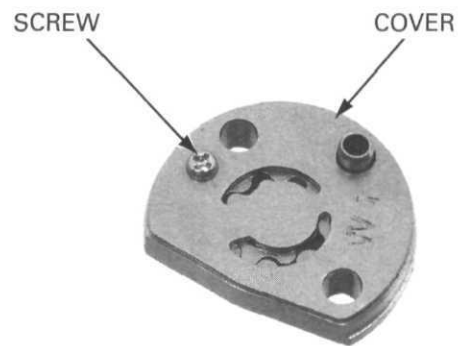
Apply engine oil to the inner rotor, outer rotor and install it onto the oil pump body.

Install the dowel pin into the oil pump body.



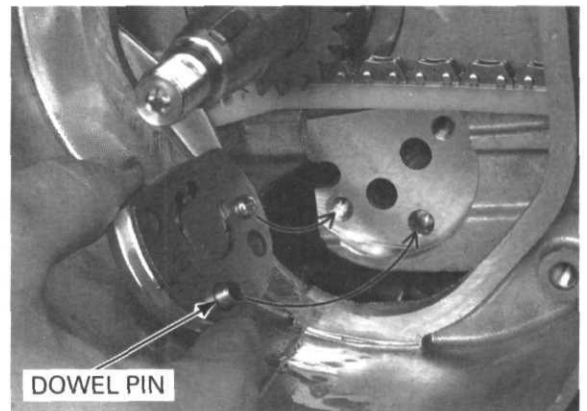
Install the oil pump cover onto the oil pump body.
Install and tighten the oil pump cover screw to the specified torque.

TORQUE: 2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)

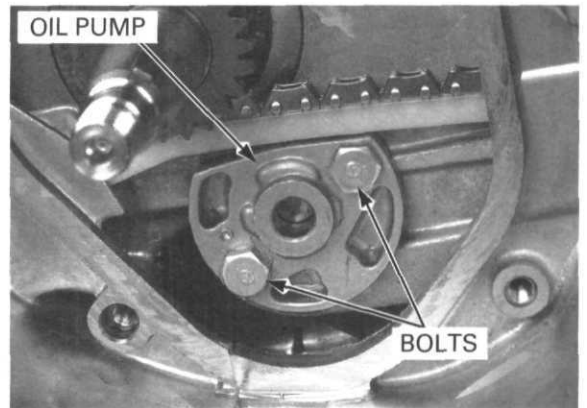


INSTALLATION

Install the oil pump while aligning the dowel pin into the hole in the crankcase.

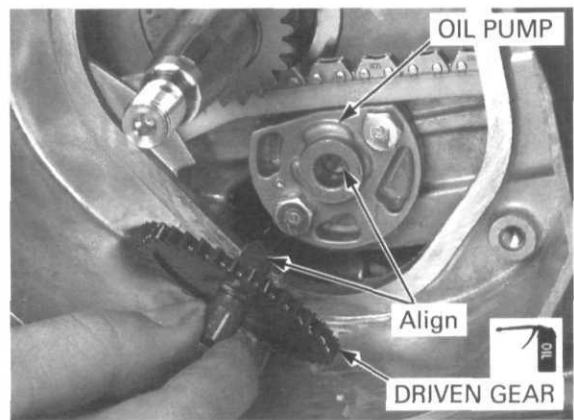


Install and tighten the mounting bolts securely.

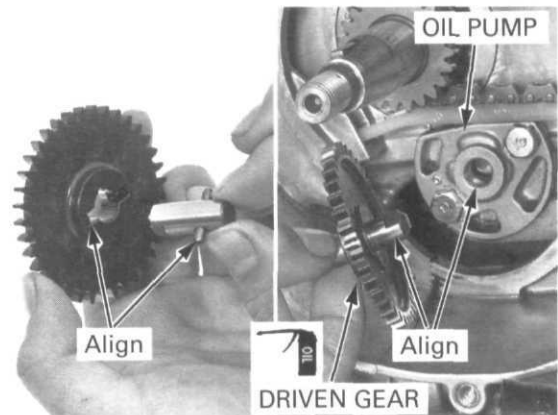


LUBRICATION SYSTEM

'02 -'05 model: Apply engine oil to the drive gear and driven gear sliding surface.
Install the driven gear while aligning the cut-out in the driven gear and oil pump.

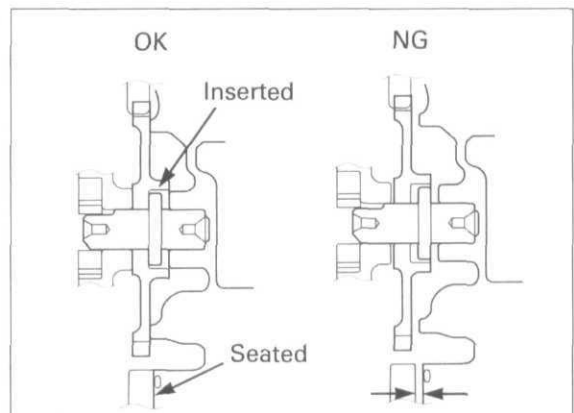


After '05 model: Set the oil pump shaft to the oil pump driven gear while aligning its pin and cut-out.
Apply engine oil to the drive gear and driven gear sliding surface.
Install the oil pump shaft with driven gear while aligning the cut-out in the shaft and oil pump.



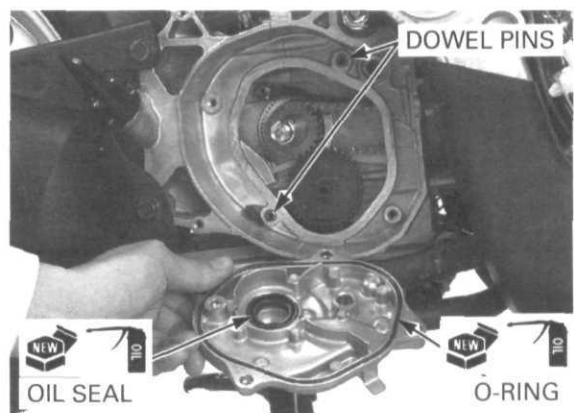
NOTE:

- Check the proper alignment of the oil pump shaft and oil pump driven gear at the following points.
 - The oil pump shaft pin must be inserted into the cut-out.
 - The stator base must be seated on the crankcase surface.



Apply engine oil to a new oil seal lip and install it into the stator base.
Apply engine oil to a new O-ring and install it into the stator base.

Install the dowel pins into the crankcase.



Install the stator base on the crankcase.

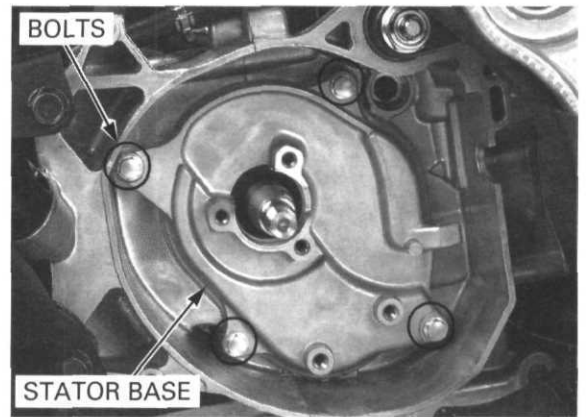
NOTE:

- Check that the stator base must be seated on the crankcase surface (no clearance) before tightening the bolts. If the stator base is un-seated, check the oil pump driven shaft and oil pump driven gear alignment again.

Tighten the four bolts securely.

Install the alternator/starter assembly (page 11-5).

After installation, fill the crankcase with the recommended engine oil (page 3-10) and check that there are no oil leaks.

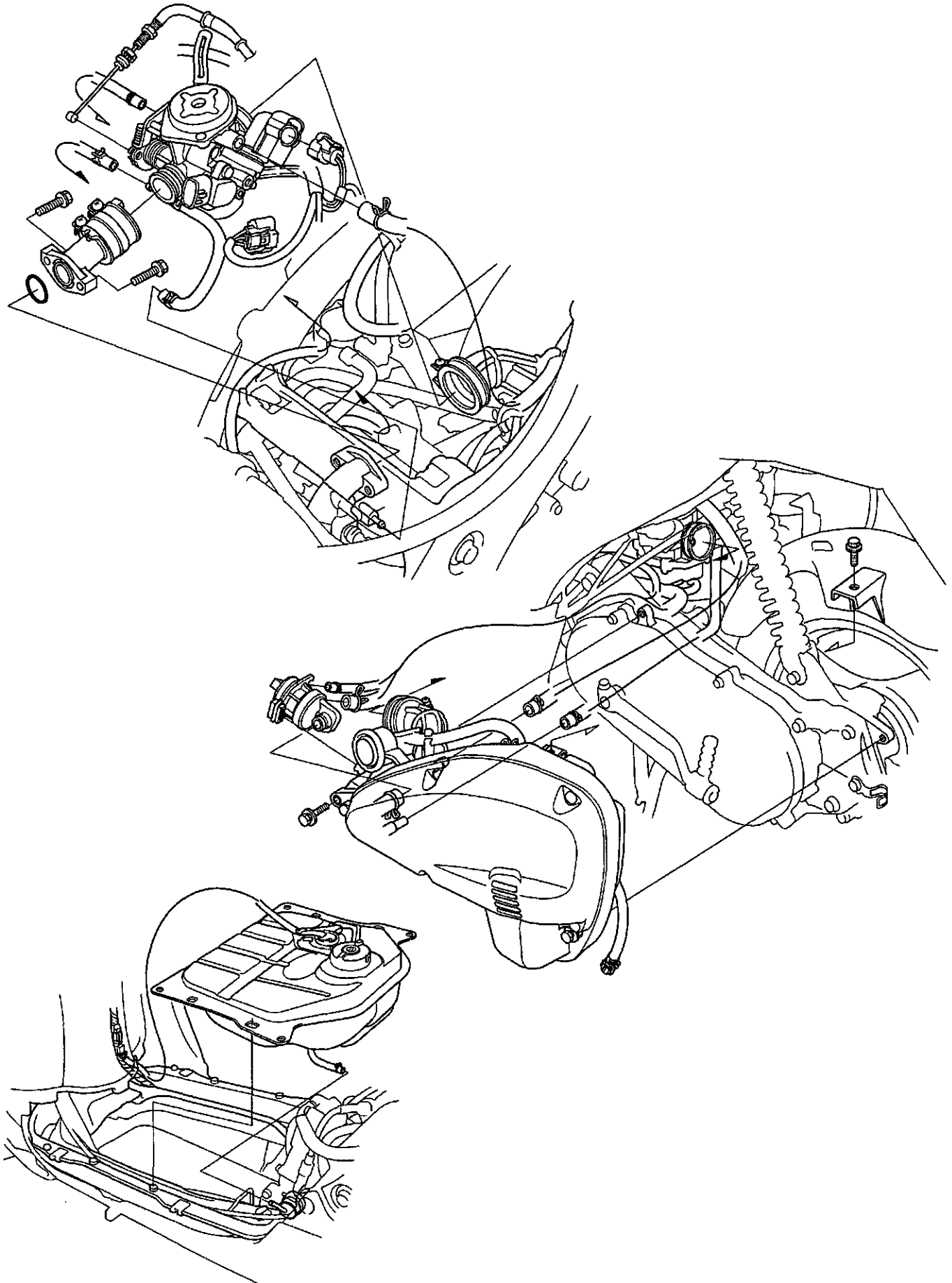


MEMO

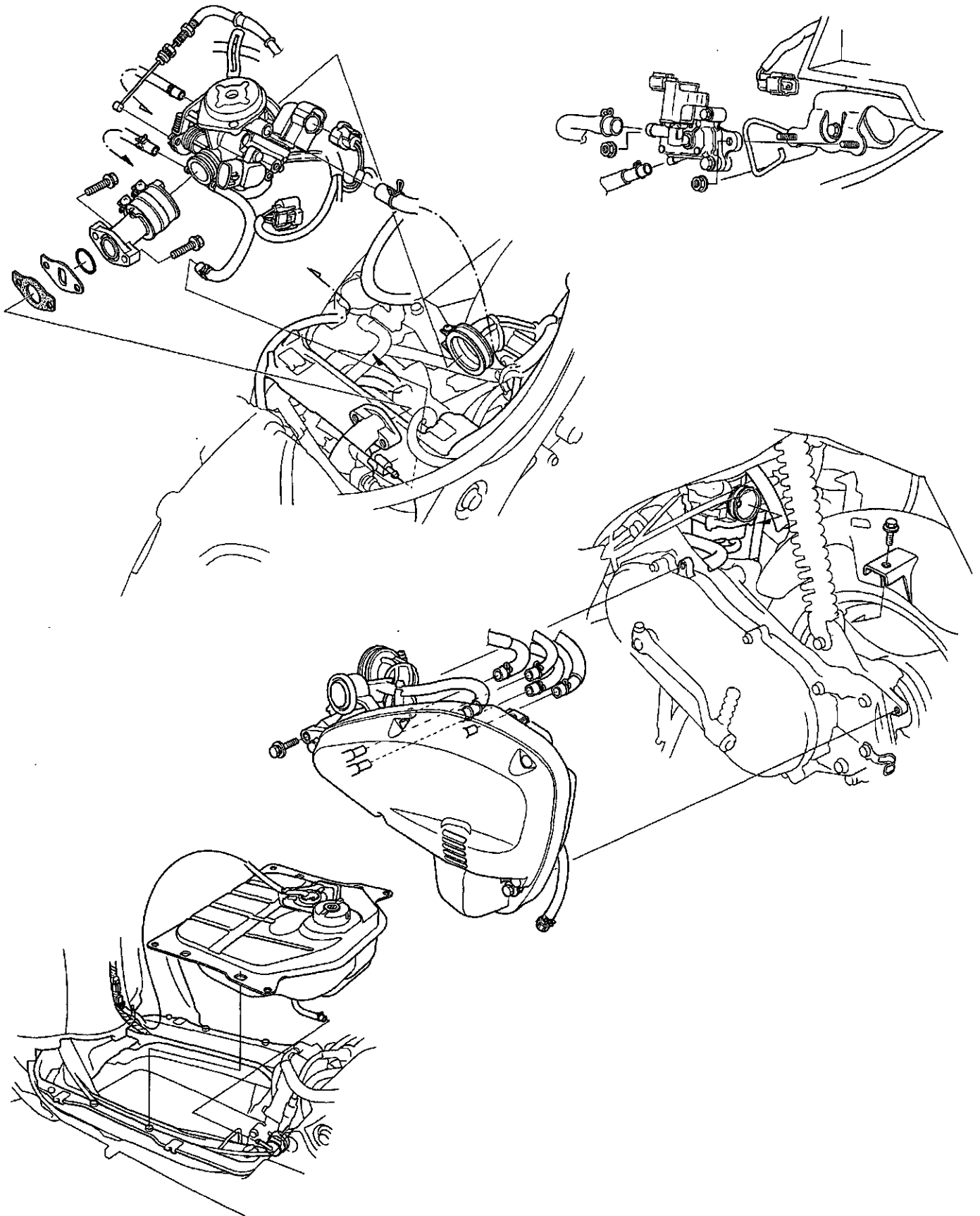
COMPONENT LOCATION: ('02 - '05 model).....	5-2	CARBURETOR INSTALLATION	5-16
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FUEL SYSTEM

COMPONENT LOCATION: ('02 - '05 model)



COMPONENT LOCATION: (After '05 model)



FUEL SYSTEM

SERVICE INFORMATION

GENERAL

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- For fuel pump inspection, refer to page 4-5.
- For throttle sensor inspection, refer to page 16-8.
- When disassembling fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- Before disassembling the carburetor, place a suitable container under the carburetor drain hose. Loosen the bolt and drain the carburetor.
- After removing the carburetor, wrap the intake port of the engine with a shop towel or cover it with pieces of tape to prevent any foreign material from dropping into the engine.

SPECIFICATIONS: ('02 -'05 model)

ITEM	SPECIFICATIONS
Carburetor identification number	NVK00E
[P type]	NVK00F
Main jet	#72
Slow jet	#35 X #35
Pilot screw	2-3/4 turns out
[P type]	2-1/8 turns out
Float level	13 mm (0.51 in)
Idle speed	2,000 ± 100 rpm
Starting enrichment (SE) valve resistance (20°C/68°F)	2.8 – 5.2 Ω
Throttle grip free play	2 – 6 mm (1/16 – 1/4 in)

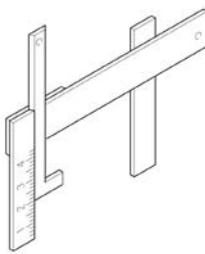
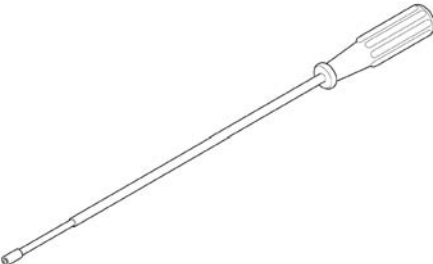
SPECIFICATIONS: (After '05 model)

ITEM	SPECIFICATIONS
Carburetor identification number	'06 – '07 model NVK00J
	After '07 model NVK00K
Main jet	#72
Slow jet	#35 X #35
Pilot screw	2-1/4 turns out
Float level	13 mm (0.51 in)
Idle speed	2,000 ± 100 rpm
Starting enrichment (SE) valve resistance (20°C/68°F)	2.8 – 5.2 Ω
Throttle grip free play	2 – 6 mm (1/16 – 1/4 in)

TORQUE VALUES

Float chamber screw	2.1 N·m (0.21 kgf·m, 1.5 lbf·ft)
Vacuum chamber cover screw	2.1 N·m (0.21 kgf·m, 1.5 lbf·ft)
SE valve setting plate screw	2.1 N·m (0.21 kgf·m, 1.5 lbf·ft)
Insulator band screw (After '03: V.I.N After 5018998)	3.0 N·m (0.30 kgf·m, 2.2 lbf·ft)

TOOLS

Carburetor float level gauge 07401-0010000 	Pilot screw wrench 07KMA-MS60101  or 07MMA-MT3010B or 07MMA-MT3010A (U.S.A. only)
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TROUBLESHOOTING

Engine won't to start

- No fuel in tank
- No fuel to carburetor
 - Fuel filter clogged
 - Fuel hose clogged
 - Fuel tank breather hole clogged
 - Fuel pump faulty (page 4-4)
- Too much fuel getting to the engine
 - Air cleaner clogged
 - Flooded carburetor
- Intake air leak
- Fuel contaminated/deteriorated
- Faulty starting enrichment (SE) valve
- Clogged starting enrichment (SE) circuit
- Clogged carburetor slow circuit
- Improper throttle operation
- No spark at plug (faulty ignition system – page 16-5)

Engine stall, hard to start, rough idling

- Fuel line restricted
- Fuel mixture too lean/rich
- Fuel contaminated/deteriorated
- Intake air leak
- Idle speed misadjusted
- Pilot screw misadjusted
- Fuel tank breather hole clogged
- Air cleaner clogged
- Slow circuit clogged
- Faulty starting enrichment (SE) valve
- Fuel pump faulty (page 4-4)
- ECT sensor faulty (page 18-16)
- Ignition malfunction (page 16-5)

Lean mixture

- Fuel jets clogged
- Float valve faulty
- Float level too low
- Fuel line restricted
- Carburetor air vent hose clogged
- Blocked fuel fill cap air vent hole
- Intake air leak
- Vacuum piston faulty
- Fuel pump faulty (page 4-4)

Rich mixture

- Air jet clogged
- Float valve faulty
- Float level too high
- Starting enrichment (SE) valve stuck open
- Air cleaner element contaminated
- Flooded carburetor

Backfiring or misfiring during acceleration

- Fuel mixture too lean
- Ignition system malfunction (page 16-5)

Afterburn when engine braking is used

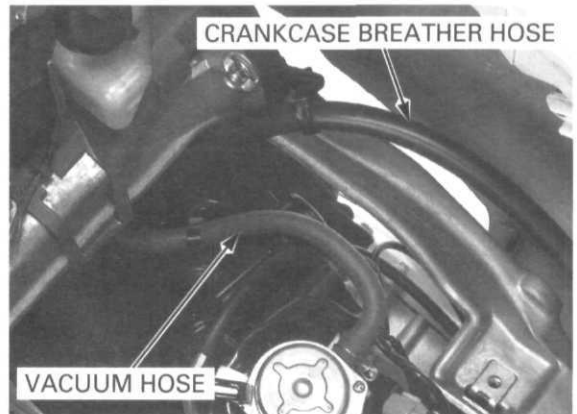
- Lean mixture in slow circuit
- Air cut-off valve malfunction
- Ignition malfunction (page 16-5)

FUEL SYSTEM

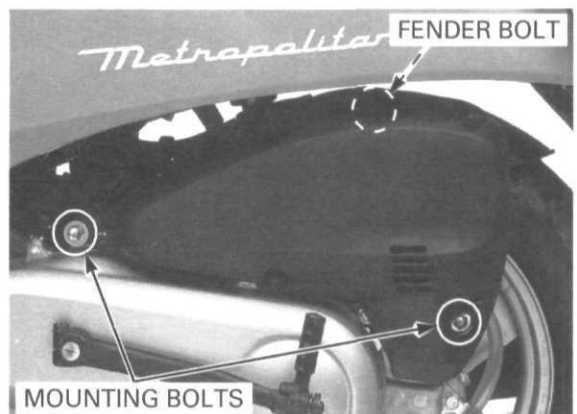
AIR CLEANER HOUSING: (‘02 - ‘05 model)

REMOVAL/INSTALLATION

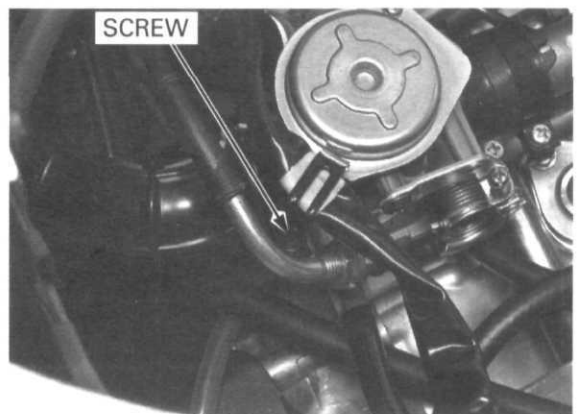
- Refer to page 3-5 for air cleaner element replacement.
- Remove the luggage box (page 2-6).
Disconnect the crankcase breather hose and vacuum hose from the air cleaner housing.



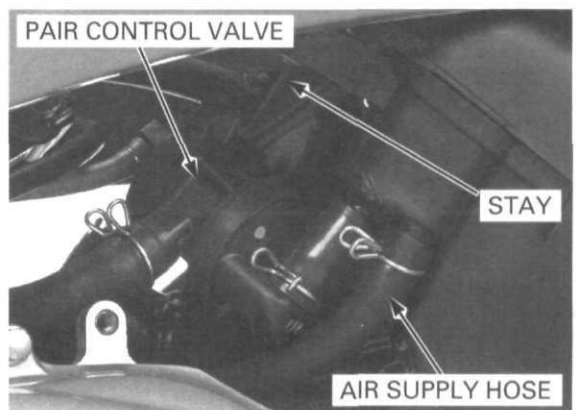
Remove the rear fender bolt and air cleaner housing mounting bolts.



Loosen the connecting hose band screw and remove the connecting hose from the carburetor.



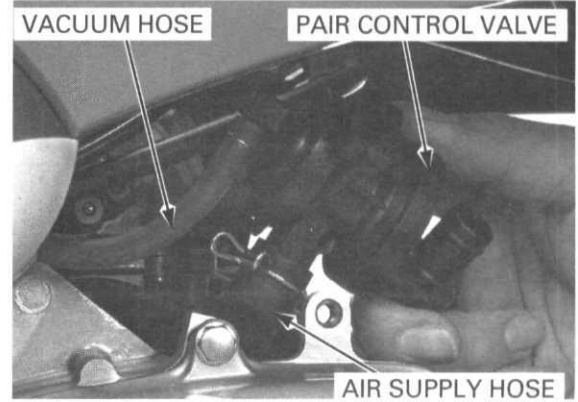
- Disconnect the air supply hose.
Remove the PAIR control valve from the hose joint and stay.
Remove the air cleaner housing.



Disconnect the vacuum hose, air supply hose and the PAIR control valve.

Installation is in the reverse order of removal.

Install the wires and hoses properly (page 1-14).



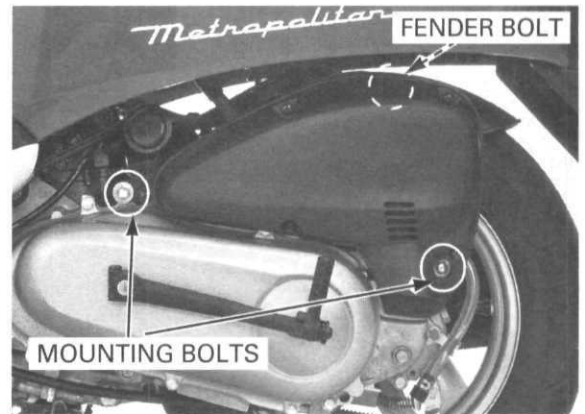
AIR CLEANER HOUSING: (After '05 model)

REMOVAL/INSTALLATION

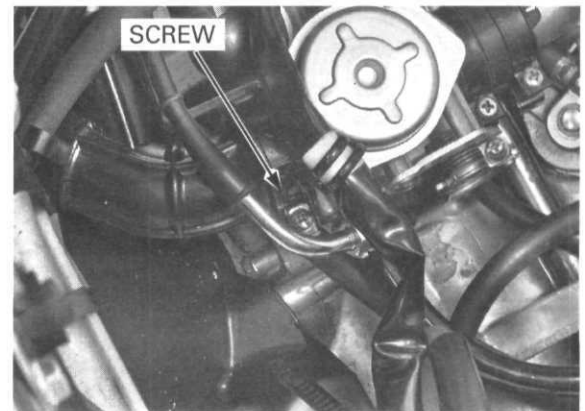
*Refer to page 3-5
for air cleaner
element
replacement.*

Remove the luggage box (page 2-6).

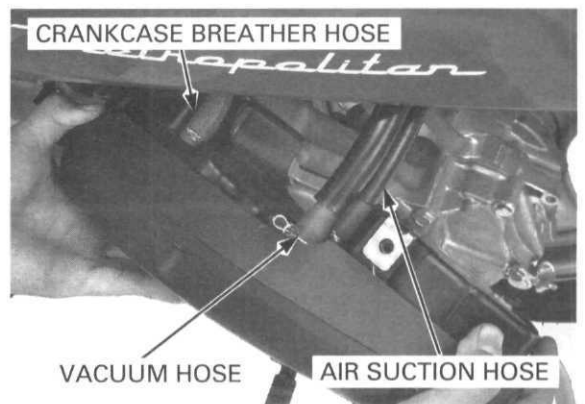
Remove the rear fender bolt and air cleaner housing mounting bolts.



Loosen the connecting hose band screw and disconnect the connecting hose from the carburetor.

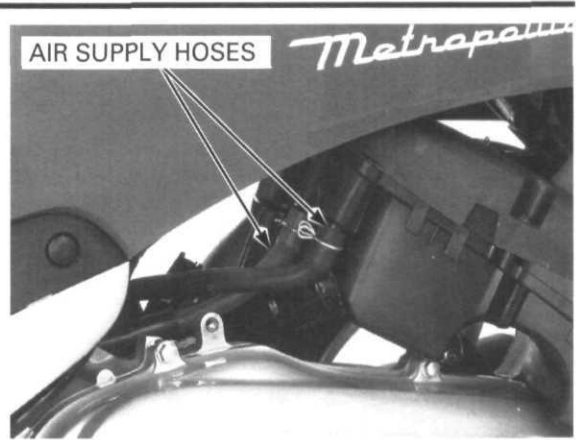


Disconnect the crankcase breather hose, vacuum hose and air suction hose from the air cleaner housing.



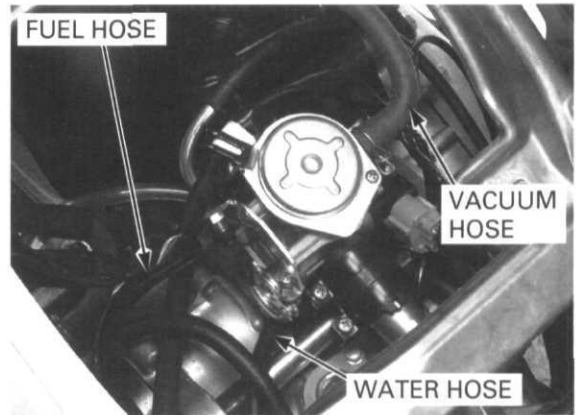
FUEL SYSTEM

Disconnect the open air and air supply hoses.
Remove the air cleaner housing assembly.
Installation is in the reverse order of removal.
Install the wires and hoses properly (page 1-14).

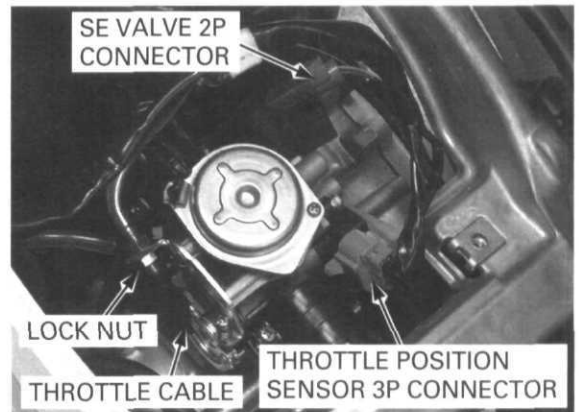


CARBURETOR REMOVAL

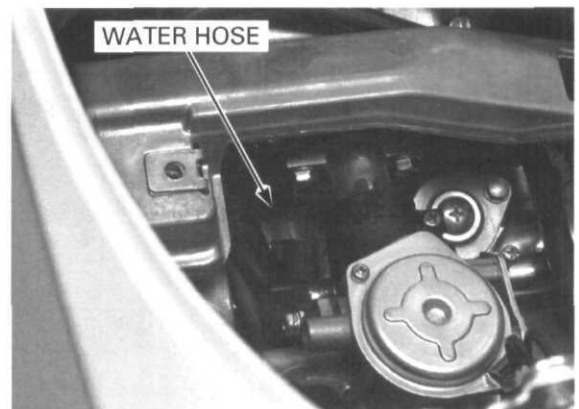
Remove the luggage box (page 2-6).
Disconnect the vacuum hose, fuel hose and water hose from the carburetor.



Disconnect the throttle position sensor 3P connector and starting enrichment (SE) valve 2P connector.
Loosen the throttle cable lock nut.
Remove the throttle cable from the cable holder and disconnect the throttle cable from the throttle drum.



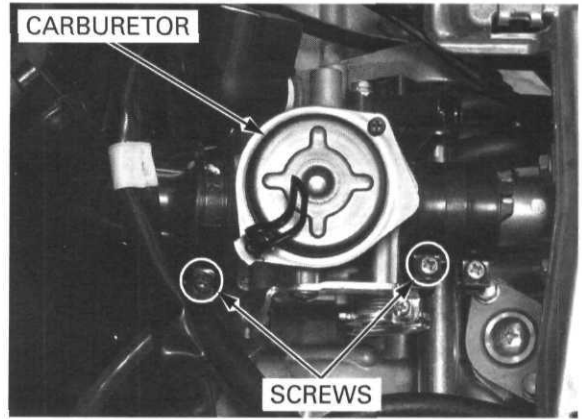
Disconnect the water hose and install the plug into the hose joint.



Loosen the connecting hose band screw and insulator band screw.

Be careful not to damage the insulator and connecting hose.

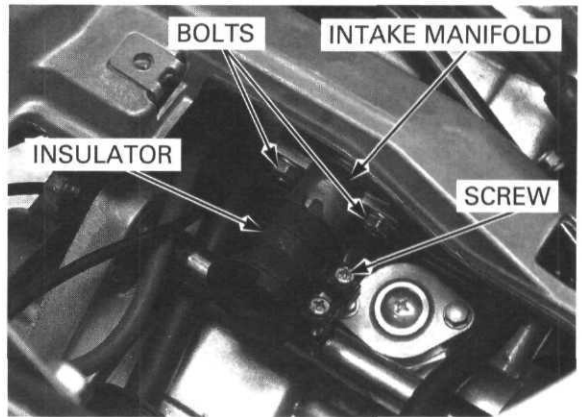
Remove the carburetor as an assembly.



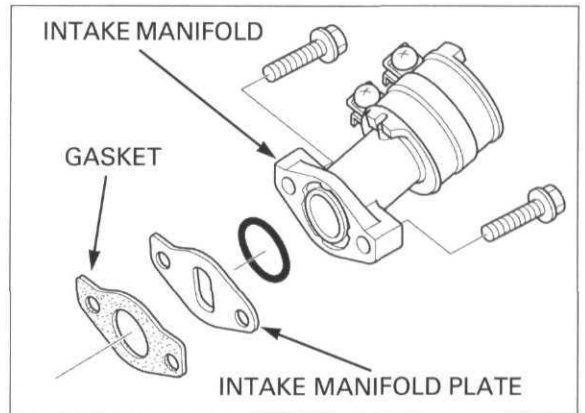
Loosen the insulator band screw and remove the insulator from the intake manifold.

Remove the bolts, intake manifold and O-ring.

Seal the cylinder head intake port with a shop towel or cover it with a piece of tape to prevent any foreign material from dropping into the engine.



After '05 model: Remove the intake manifold plate and gasket.



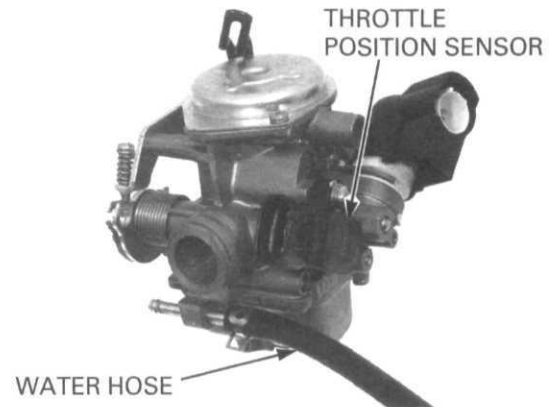
CARBURETOR DISASSEMBLY

NOTE:

- Do not remove the throttle position sensor unless it is necessary to replace it or disassemble the carburetor. If the sensor is removed, be sure to reset the data (page 16-8).

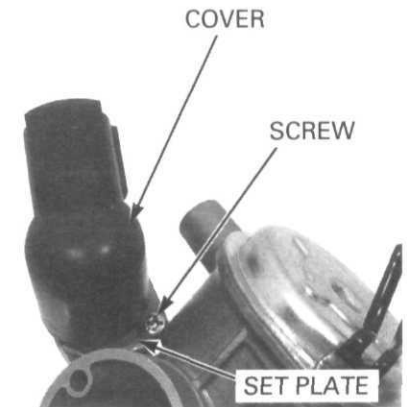
Remove the followings from the carburetor.

- Water hose
- Throttle position sensor (page 16-9)

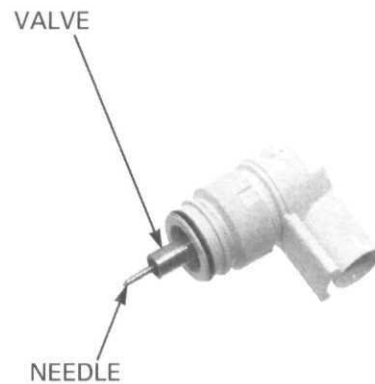


STARTING ENRICHMENT (SE) VALVE

Remove the SE valve cover, screw, set plate and SE valve.



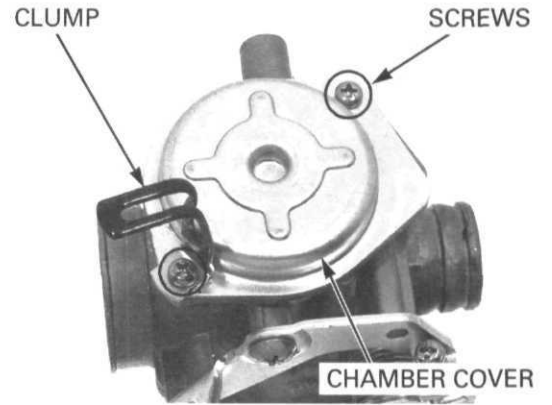
Inspect the valve and needle for stepped wear or damage.



VACUUM CHAMBER

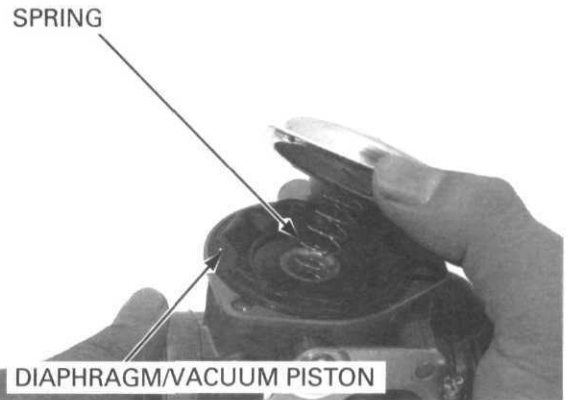
The vacuum chamber cover is under spring pressure.

Remove the screws and clamp while holding the vacuum chamber cover.



Remove the vacuum chamber cover, compression spring and diaphragm/vacuum piston.

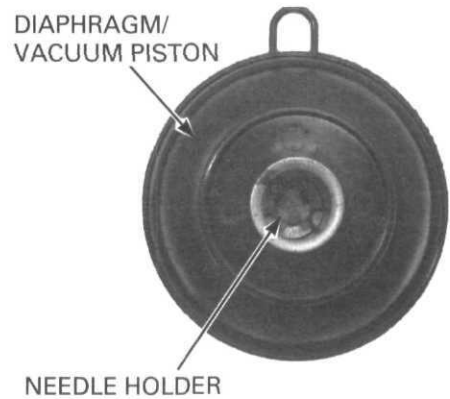
Check the piston for smooth operation up and down in the carburetor body.



Be careful not to damage the diaphragm.

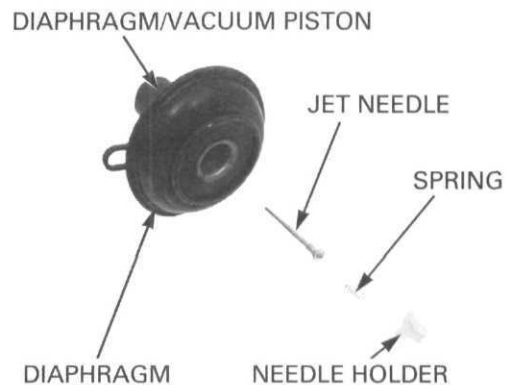
Turn the needle holder counterclockwise while pressing it in and remove the holder flanges from the piston grooves.

Remove the needle holder, spring and jet needle from the vacuum piston.



Check the followings:

- Jet needle for stepped wear
- Vacuum piston for wear or damage
- Diaphragm for pin holes, deterioration or damage

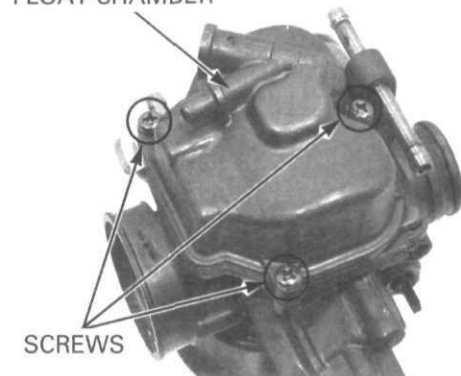


FUEL SYSTEM

FLOAT CHAMBER

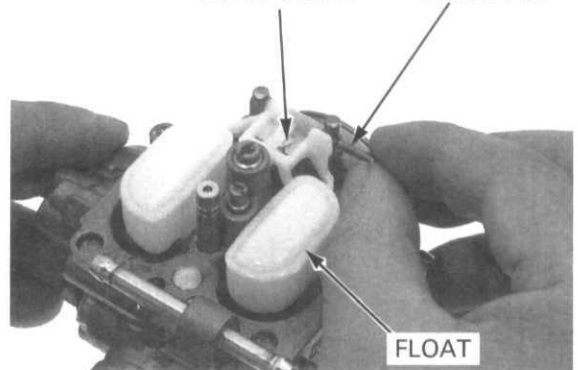
Remove the screws, float chamber and O-ring.

FLOAT CHAMBER



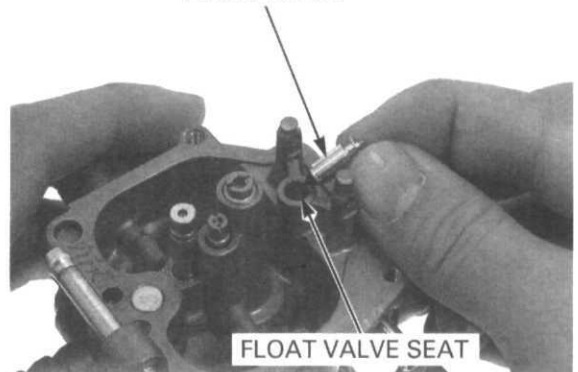
Remove the float pin, float and float valve.
Check the float for damage or fuel in the float.

FLOAT VALVE FLOAT PIN



Inspect the float valve seat for scores, scratches, clogs and damage.
Check the tip of the float valve where it contacts the valve seat for stepped wear or contamination.
Replace the valve if the tip is worn or contaminated.
Check the operation of the float valve.

FLOAT VALVE



FLOAT VALVE SEAT

Handle the jets with care. They can easily be scored or scratched.

Remove the following:

- Main jet
- Needle jet
- Slow jet

Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.

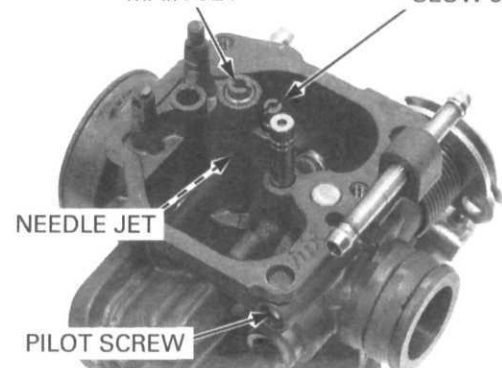
Turn the pilot screw in and record the number of turns it takes before it seats lightly.

TOOL:
Pilot screw wrench

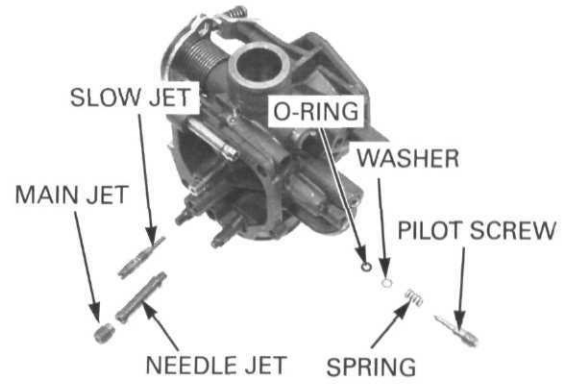
**07KMA-MS60101 or
07MMA-MT3010B or
07MMA-MT3010A
(U.S.A. only)**

Remove the pilot screw, spring, washer and O-ring.

MAIN JET SLOW JET



Inspect each jet for wear or damage and replace if necessary.



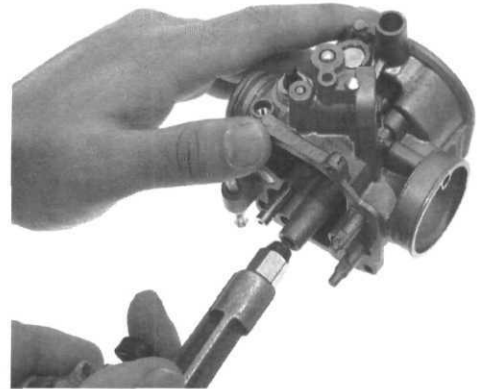
CARBURETOR CLEANING

Remove the following:

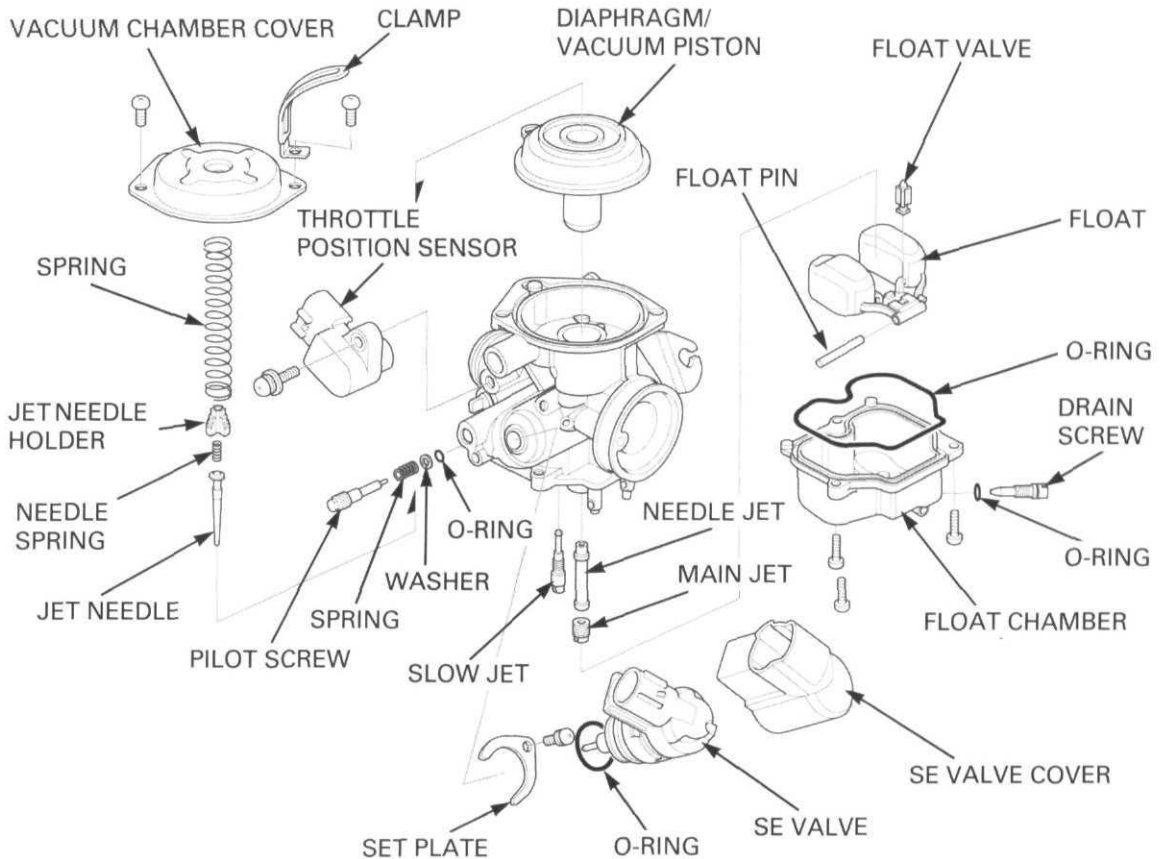
- SE valve/throttle sensor
- Diaphragm/vacuum piston
- Float/float valve
- Main jet/needle jet/slow jet
- Pilot screw/spring/washer/O-ring

Cleaning the air and fuel passages with a piece of wire will damage the carburetor body.

Blow open all air and fuel passages in the carburetor body with compressed air.



CARBURETOR ASSEMBLY



FUEL SYSTEM

FLOAT CHAMBER

Handle the jets with care. They can easily be scored or scratched.

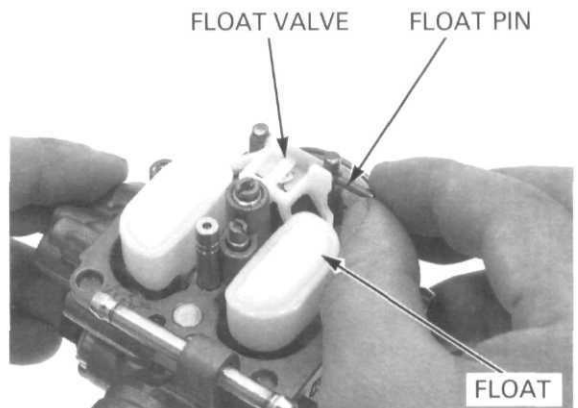
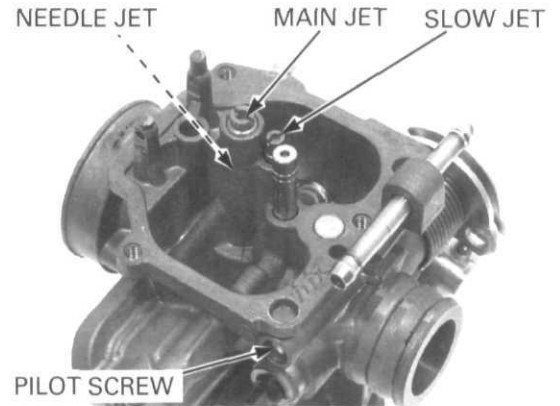
Install the following:

- Slow jet
- Needle jet
- Main jet

Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.

Install the pilot screw and return it to its original position as noted during removal. Perform the pilot screw adjustment procedure if a new pilot screw is installed (page 5-18).

Install the float and float valve in the carburetor body, then install the float pin through the body and float.



FLOAT LEVEL INSPECTION

NOTE:

- Check the float level after checking the float valve, valve seat and float.

Set the float level gauge so that it is perpendicular to the float chamber face at the highest point of the float.

With the float valve seated and the float arm just touching the valve, measure the float level with the special tool as shown.

FLOAT LEVEL: 13 mm (0.51 in)

TOOL:

Carburetor float level gauge 07401-0010000

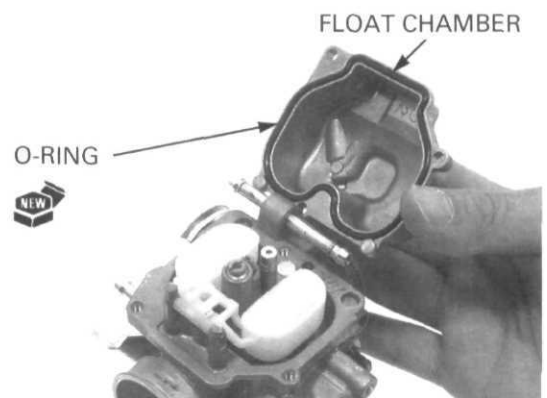
The float cannot be adjusted. Replace the float assembly if the float level is out of specification.



Install a new O-ring in the float chamber. Install the float chamber.

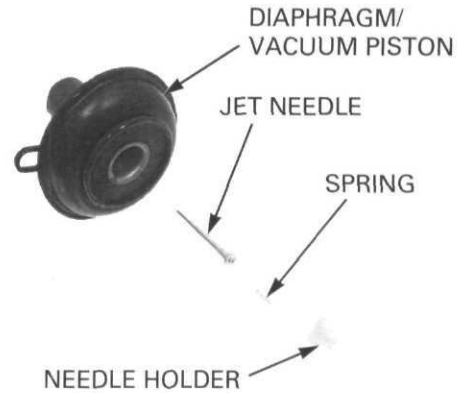
Install and tighten the float chamber screws securely.

TORQUE: 2.1 N·m (0.21 kgf·m, 1.5 lbf·ft)

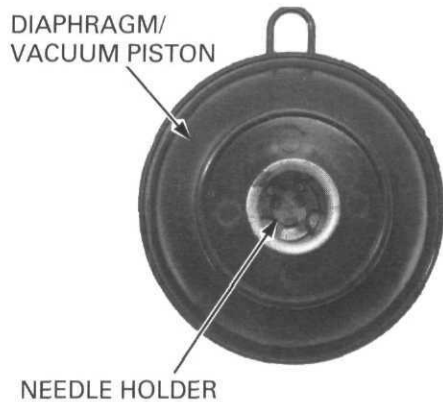


VACUUM CHAMBER

Install the jet needle, spring into the vacuum piston.



Press the needle holder into the vacuum piston and turn the needle holder clockwise until you feel a click.



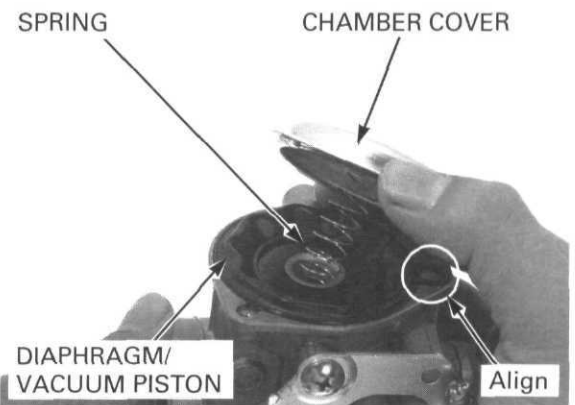
Be careful not to damage the jet needle.

Install the diaphragm/vacuum piston in the carburetor body, aligning the diaphragm tab with the groove in the carburetor body.

Hold the vacuum piston almost full open so the diaphragm is not pinched by the chamber cover.

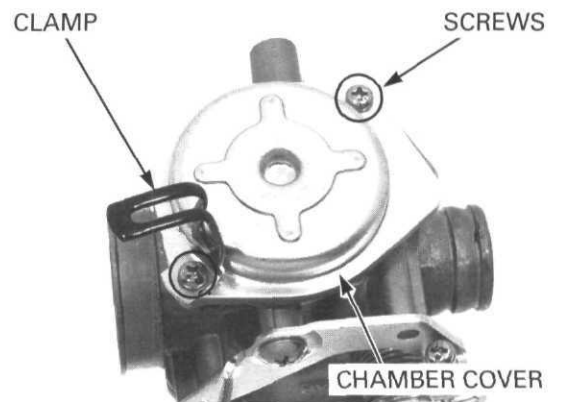
Be careful not to pinch the diaphragm, and to keep the spring straight when compressing the spring.

Install the chamber cover with the spring, being careful not to damage the spring.



Install the clamp and screws. Tighten the screws securely.

TORQUE: 2.1 N·m (0.21 kgf·m, 1.5 lbf·ft)

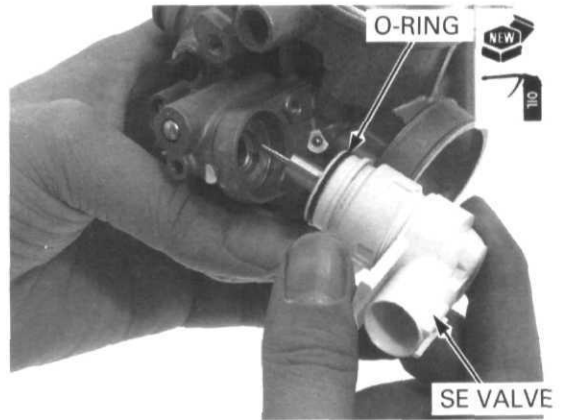


FUEL SYSTEM

STARTING ENRICHMENT (SE) VALVE

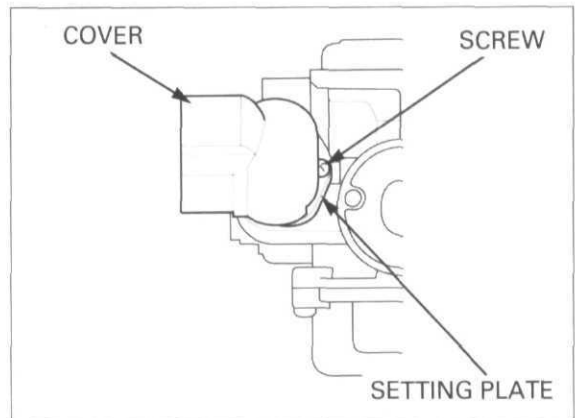
Coat a new O-ring with oil and install it to the SE valve.

Install the SE valve into the carburetor until it fully seated.



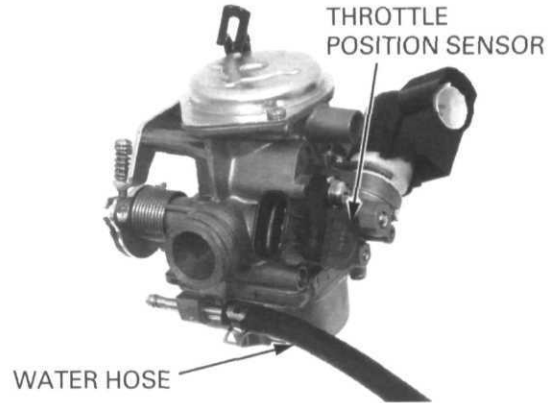
Install the setting plate onto the SE valve groove. Install the SE valve into the carburetor body as shown. Install and tighten the screw securely.

TORQUE: 2.1 N·m (0.21 kgf·m, 1.5 lbf·ft)



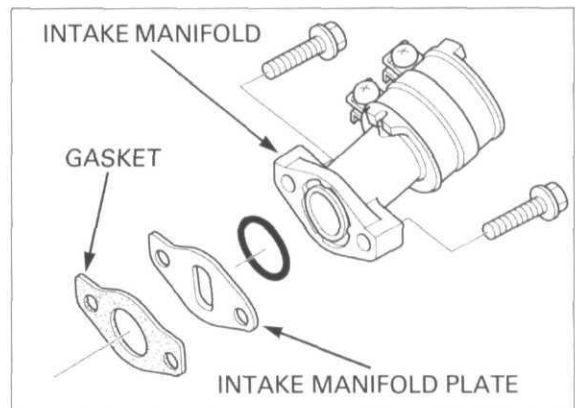
Install the throttle position sensor (page 16-9).

Connect the water hose to the carburetor.

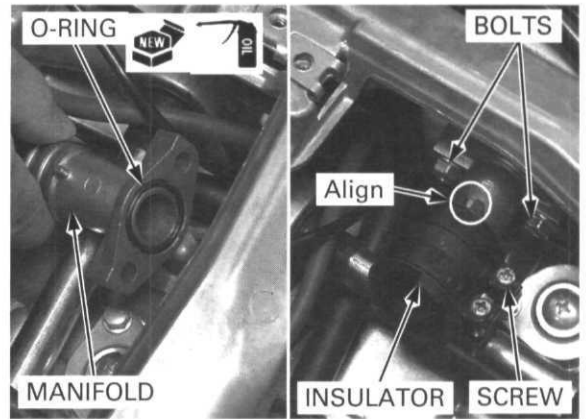


CARBURETOR INSTALLATION

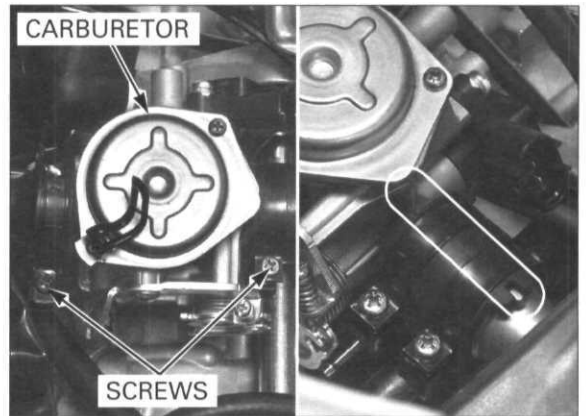
After '05 model: Install the intake manifold plate and gasket.



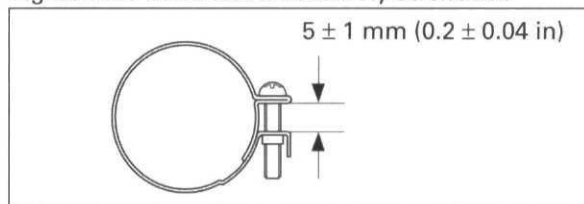
Coat a new O-ring with oil and install it to the intake manifold groove.
 Install the intake manifold and tighten the bolts.
 Install the insulator while aligning the groove in the insulator with the tab on the intake manifold.
 Tighten the insulator band screw.



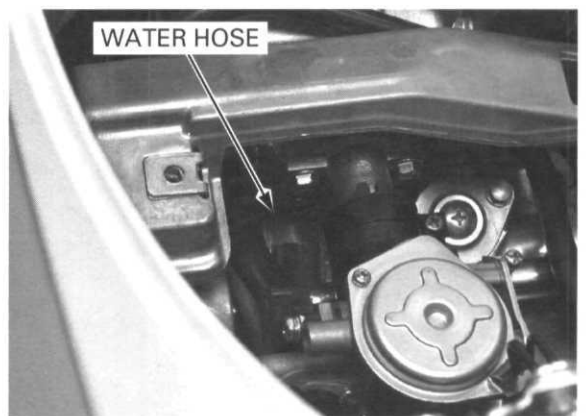
Install the carburetor body into the insulator and the connecting hose.
 Align the tab of the carburetor and the tab of the intake manifold and adjust the level position of the carburetor.



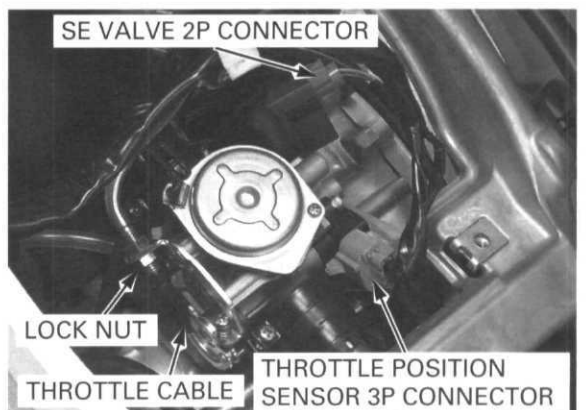
'02 - '03 model Tighten the band screws securely as shown.



After '03: V.I.N After 5018998: Tighten the band screws to the specified torque.
TORQUE: 3.0 N·m (0.30 kgf·m, 2.2 lbf·ft)
 Connect the water hose into the cylinder.



Connect the throttle cable to the throttle drum and install them in the cable holder.
 Loosely tighten the throttle cable adjusting nuts.
 Connect the followings:
 - Throttle position sensor 3P connector
 - SE valve 2P connector



FUEL SYSTEM

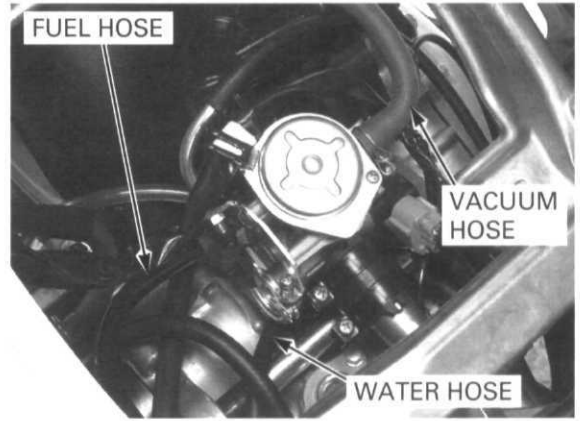
Connect the fuel hose, vacuum hose and water hose on the carburetor.

After installing the carburetor, check for the following:

- Engine idle speed (page 3-12)
- Throttle grip free play (page 3-4)

If the throttle position sensor is removed, be sure to reset the data (page 16-10).

Install the luggage box (page 2-6).



PILOT SCREW ADJUSTMENT: ('02 - '05 model)

- The pilot screw is factory pre-set and no adjustment is necessary unless the pilot screw is replaced.
- The engine must be warm for accurate adjustment. Ten minutes of stop-and-go riding is sufficient.
- Use a tachometer with graduations of 50 rpm or smaller that will accurately indicate a 50 rpm change.

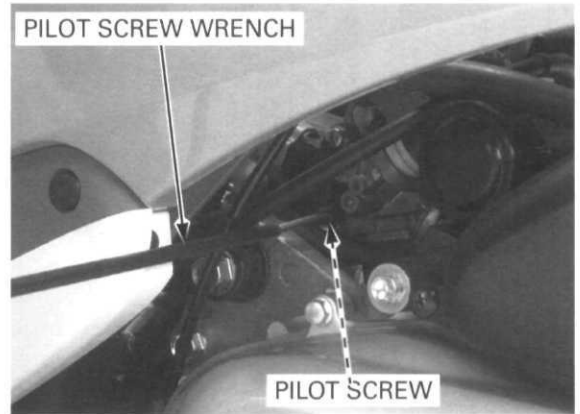
Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.

1. Turn the pilot screw clockwise until it seats lightly, and then back it out to the specification given.

TOOL:

Pilot screw wrench

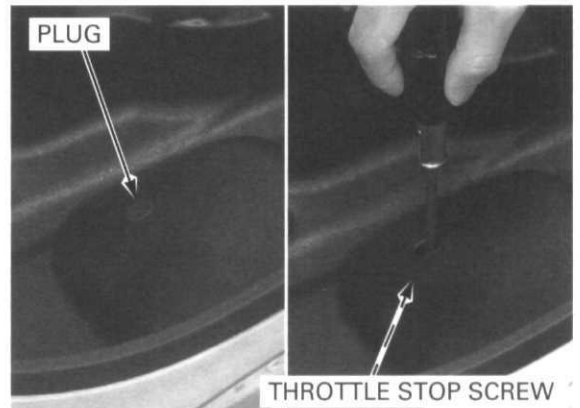
07KMA-MS60101 or
07MMA-MT3010B or
07MMA-MT3010A
(U.S.A. only)



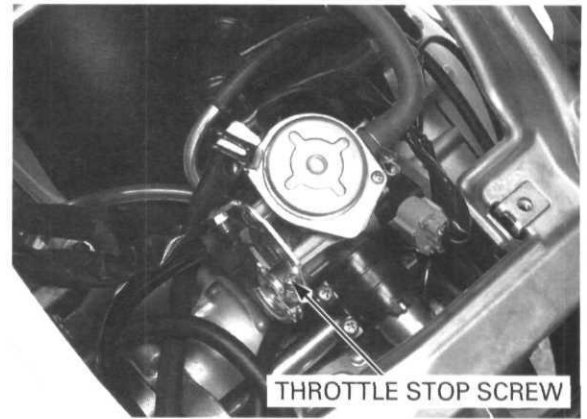
INITIAL OPENING: 2-3/4 turns out
[P-type]: 2-1/8 turns out

2. Warm the engine up to operating temperature
3. Stop the engine and connect a tachometer according to the tachometer manufacturer's instructions.
4. Open the seat and remove the rubber plug.
5. Start the engine and adjust the idle speed with the throttle stop screw.

IDLE SPEED: 2,000 ± 100 rpm



6. Turn the pilot screw in or out slowly to obtain the highest engine speed.
7. Readjust the idle speed with the throttle stop screw.
8. Make sure the engine does not miss or run erratically. Repeat steps 5 and 6 until engine speed increases smoothly.



PILOT SCREW ADJUSTMENT: (After '05 model)

IDLE DROP PROCEDURE

- The pilot screw is factory pre-set and no adjustment is necessary unless the pilot screw is replaced.
- The engine must be warm for accurate adjustment. Ten minutes of stop-and-go riding is sufficient.
- Use a tachometer with graduations of 50 rpm or smaller that will accurately indicate a 50 rpm change.

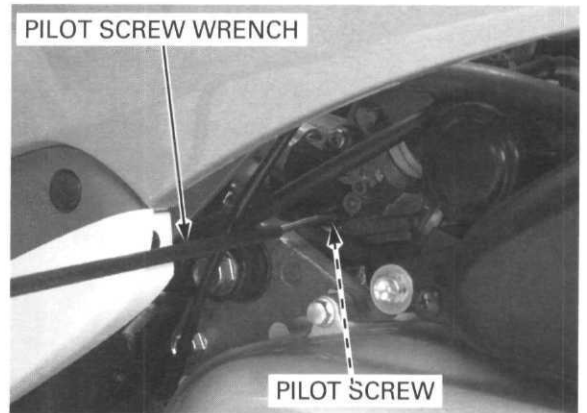
Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.

1. Turn the pilot screw clockwise until it seats lightly, and then back it out to the specification given.

TOOL:

Pilot screw wrench

**07KMA-MS60101 or
07MMA-MT3010B or
07MMA-MT3010A
(U.S.A. only)**

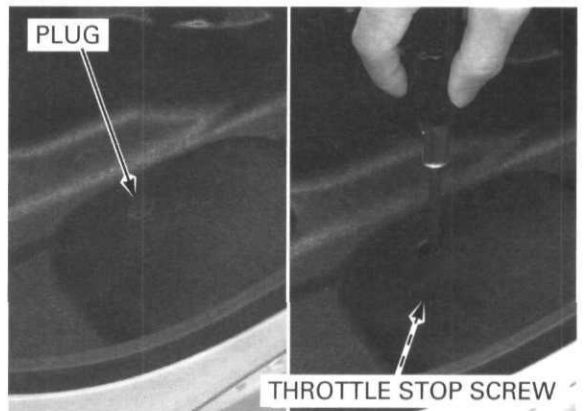


INITIAL OPENING: 2-1/4 turns out

2. Warm the engine up to operating temperature. Stop and go riding for 10 minutes is sufficient.
3. Stop the engine and connect a tachometer according to the tachometer manufacturer's instructions.
4. Open the seat and remove the rubber plug.
5. Start the engine and adjust the idle speed with the throttle stop screw.

TENTATIVE IDLE SPEED: 2,000 ± 100 rpm

6. Turn the pilot screw in or out slowly to obtain the highest engine speed.



FUEL SYSTEM

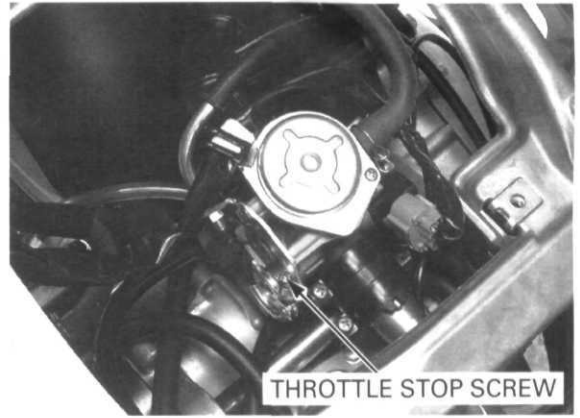
7. Lightly open the throttle 2 or 3 times, then adjust the idle speed with the throttle stop screw.
8. Turn the pilot screw in until the engine speed drops by 50 rpm.
9. Turn the pilot screw counterclockwise to final opening from the position obtained in step 8.

FINAL OPENING: 1/4 turns out

10. Readjust the idle speed with the throttle stop screw.

IDLE SPEED: 2,000 ± 100 rpm

11. Disconnect the tachometer and install the rubber plug.



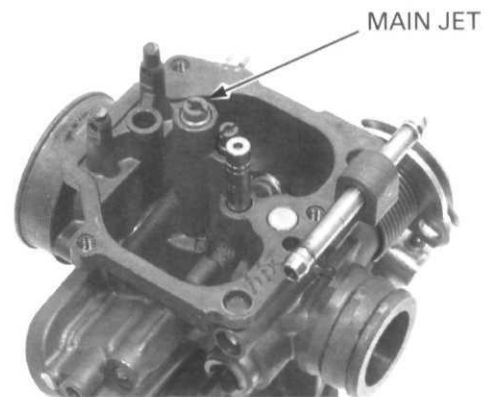
HIGH ALTITUDE ADJUSTMENT (After '05 model)

This adjustment must be made at high altitude to ensure proper high altitude operation.

When the vehicle is to be operated continuously above 2,000 m (6,500 feet), the carburetor must be readjusted as described below to improve driveability and decrease exhaust emissions.

Replace the standard main jet with the high altitude type.

HIGH ALTITUDE MAIN JET: #70



Warm up the engine to operating temperature. Ride the scooter for approximately 10 minutes.

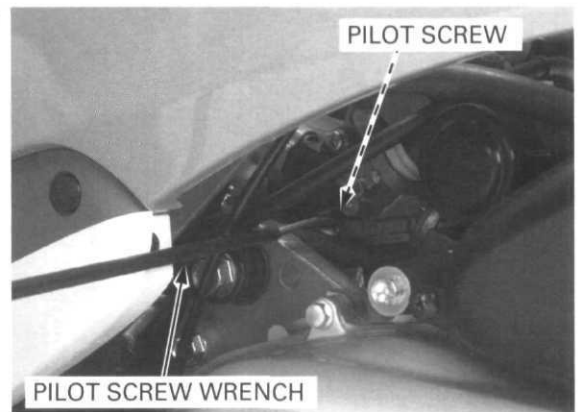
TOOL:

Pilot screw wrench

07KMA-MS60101 or
07MMA-MT3010B or
07MMA-MT3010A
(U.S.A. only)

HIGH ALTITUDE PILOT SCREW OPENING:

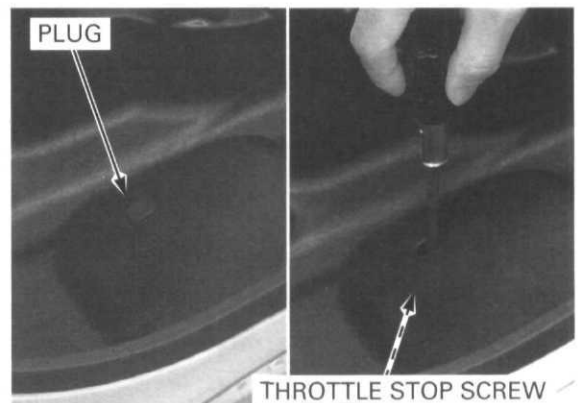
1/2 turn in from the factory preset position



Open the seat and remove the rubber plug

Adjust the idle speed with the throttle stop screw.

IDLE SPEED: 2,000 ± 100 rpm



Do not attach the label to any part that can be easily removed from the vehicle.

Attach the Vehicle Emission Control Information Update Label on the left side of the rear frame as shown.

See Service Letter No. 132 for information on obtaining the label.

NOTICE

Sustained operation at an altitude lower than 1,500 m (5,000 feet) with the carburetor adjusted for high altitude settings may cause the engine to idle roughly and stall in traffic. It may also cause engine damage due to overheating.

When the vehicle is to be operated continuously below 1,500 m (5,000 feet), readjust the carburetor as follows.

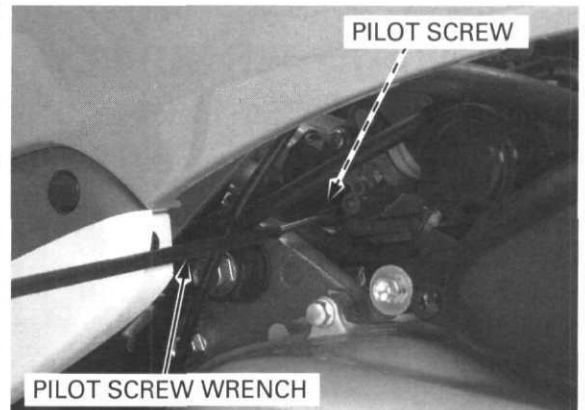
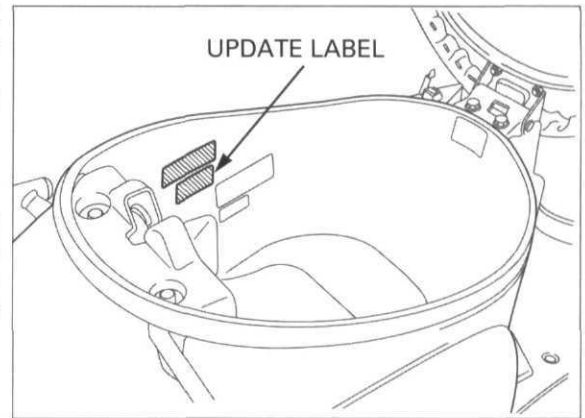
Warm up the engine to operating temperature. Ride the scooter for approximately 10 minutes. Turn the pilot screw out 1/4 turn from the high altitude setting.

Replace the high altitude main jet with the standard type.

STANDARD ALTITUDE MAIN JET: #72

Adjust the idle speed at low altitude with the throttle stop screw.

Remove the Vehicle Emission Control Information Update Label that is attached on the rear frame after adjusting for low altitude.



STARTING ENRICHMENT (SE) VALVE RESISTANCE INSPECTION

The SE valve resistance inspection can be done with the carburetor in the engine.

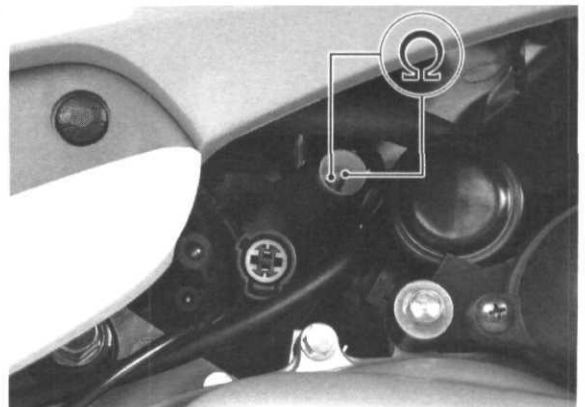
Disconnect the SE valve 2P connector.



Measure the resistance between the connector terminals.

STANDARD: 2.8 – 5.2 Ω (at 20°C/68°F)

If the resistance is abnormal, replace the SE valve.



OPERATION INSPECTION

Remove the carburetor (page 5-8).
Remove the float chamber (page 5-12).

Insert a vinyl hose into the starter jet (fuel enrichment circuit) and blow into the hose.

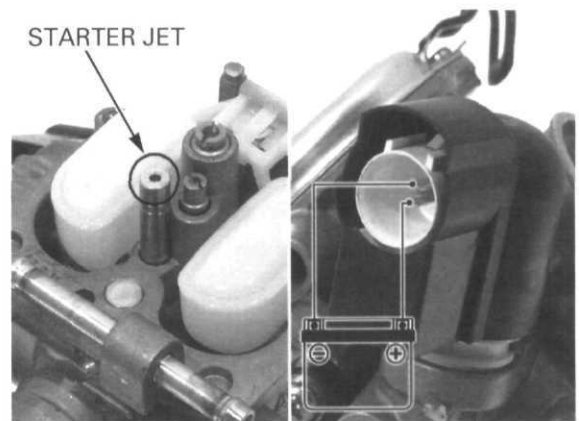
Air should flow into the circuit.

Connect the 12 V battery to the SE valve 2P connector terminals and wait 5 minutes.
Insert a vinyl hose into the starter jet (fuel enrichment circuit) and blow into the hose.

Air should not flow into the circuit.

If operation is abnormal, replace the SE valve.

Install the carburetor (page 5-16).



SECONDARY AIR SUPPLY SYSTEM

SYSTEM INSPECTION

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

Remove the air cleaner housing cover (page 3-5).
Remove the secondary air cleaner element.

Check that the secondary air intake ports are clean and free of carbon deposits.

If the ports are carbon fouled, check the PAIR check valve (page 5-23).

Wash away any accumulated dust or dirt, by gently squeezing it in non flammable or high flash-point solvent.

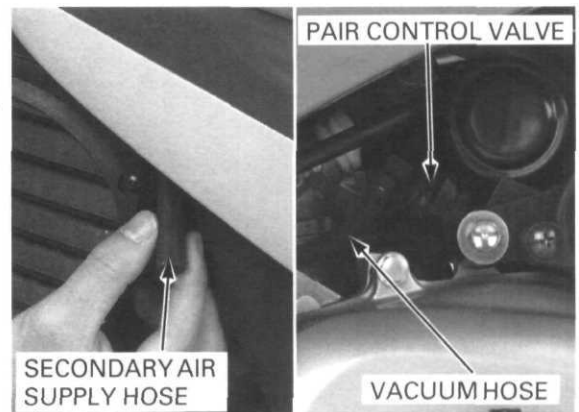
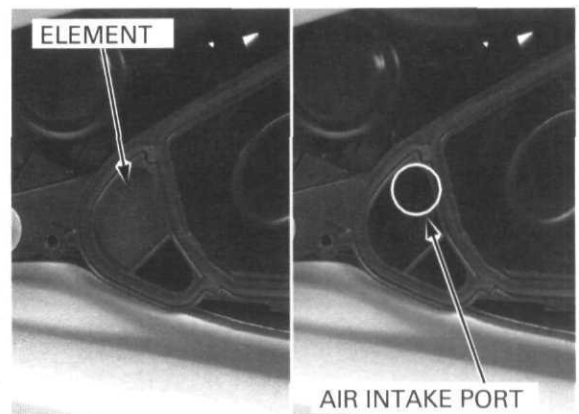
Install the secondary air cleaner element and air cleaner housing cover (page 3-5).

'02 - '05 model only:

Pull out the secondary air supply hose from the inner side of the lower cover.

Disconnect the PAIR control valve vacuum hose from the PAIR control valve and plug it to keep air from entering.

Connect the vacuum pump to the PAIR control valve vacuum hose joint.



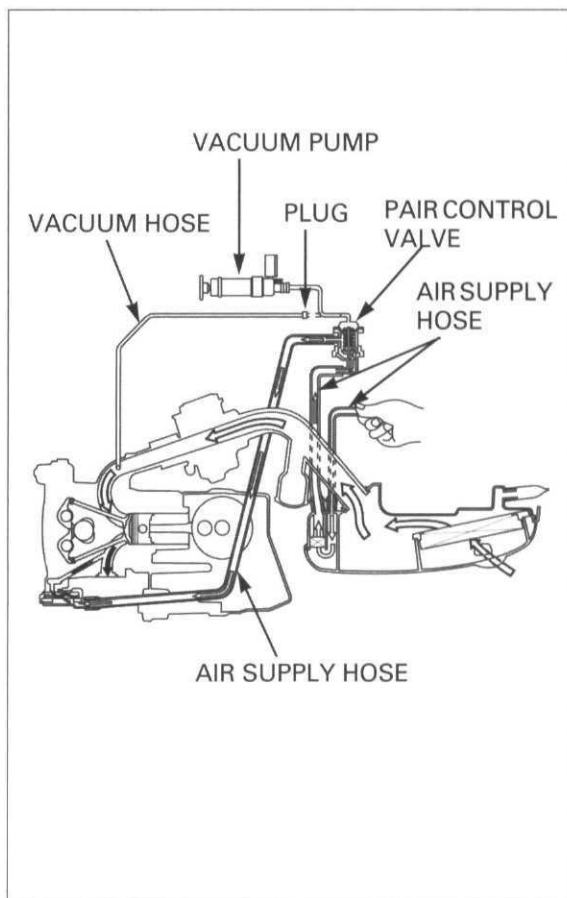
Start the engine and open the throttle slightly to be certain that air is sucked in through the secondary air intake ports of the air cleaner housing. If the air is not drawn in, check the air supply hose for clogs.

With the engine running, gradually apply vacuum to the PAIR control valve.

Check that the air intake port stops drawing air, and that the vacuum does not bleed.

SPECIFIED VACUUM: 450 mm Hg

If air is drawn in, or if the specified vacuum is not maintained, install a new PAIR control valve.



PAIR CONTROL VALVE REMOVAL/ INSTALLATION ('02 - '05 model only)

Remove the air cleaner housing (page 5-6) .

Disconnect the vacuum hose, air supply hose and PAIR control valve.

Route the hoses properly.

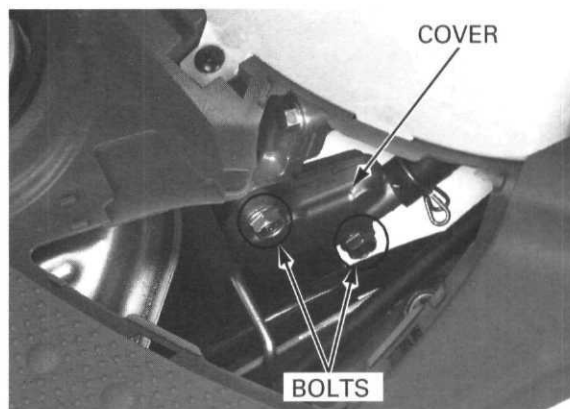
Install the removed parts in the reverse order of removal.



PAIR CHECK VALVE INSPECTION

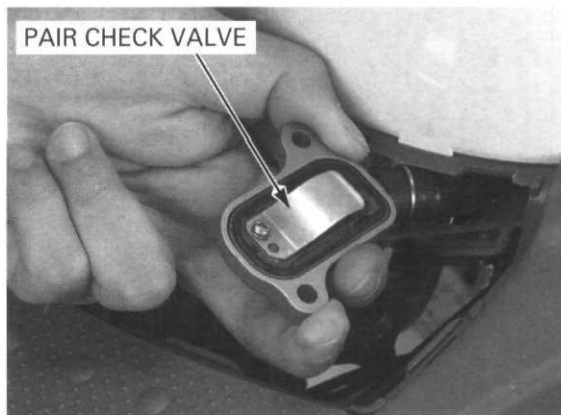
Remove the plug maintenance lid (page 3-6).

Remove the bolts and PAIR check valve cover.



FUEL SYSTEM

Remove the PAIR check valve from the valve cover.

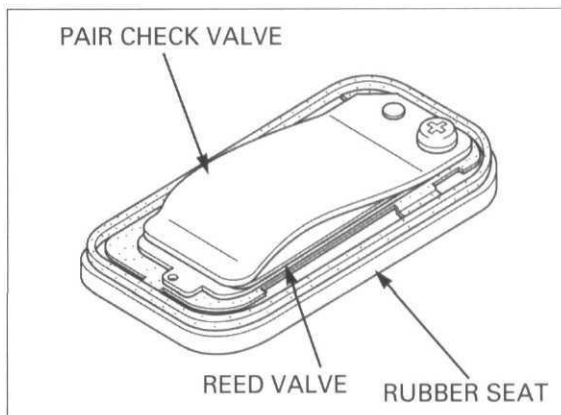


Check the reed valve for damage or fatigue. Replace if necessary.

Replace the PAIR check valve if the rubber seat is cracked, deteriorated or damaged, or if there is clearance between the reed and seat.

Install the PAIR check valve in the reverse order of the removal.

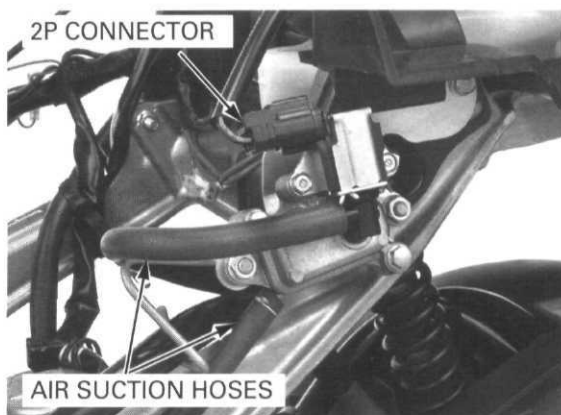
Install the plug maintenance lid (page 3-6).



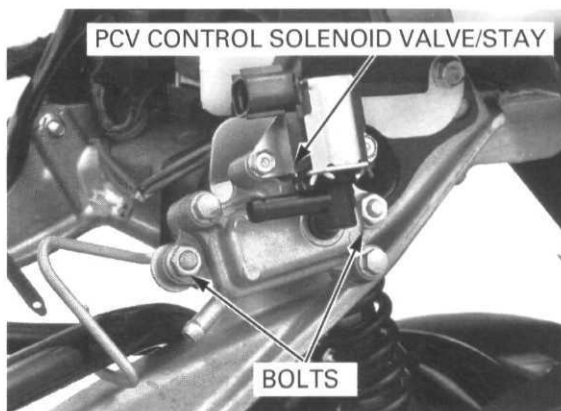
PCV CONTROL SOLENOID VALVE/PCV REED VALVE (After '05 model)

REMOVAL/INSTALLATION

Disconnect the air suction hoses and the PCV control solenoid valve 2P connector.

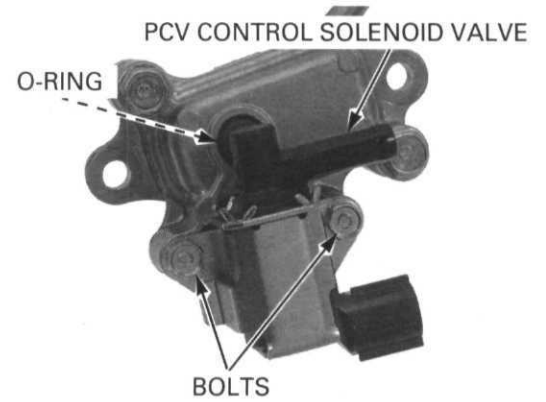


Remove the bolts and the PCV control solenoid valve/stay.

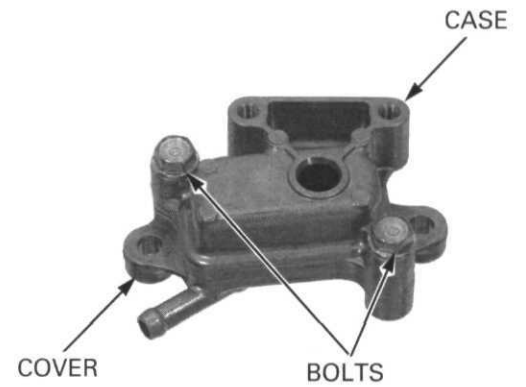


Remove the bolts and PCV solenoid valve from the PCV reed valve case.

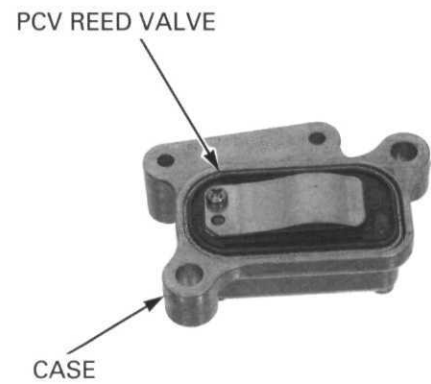
Remove the O-ring from the solenoid valve.



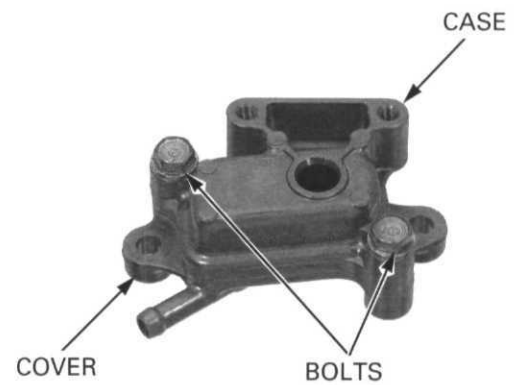
Remove the bolts and cover from the case.



Remove the PCV reed valve from the case.
Install the PCV reed valve to the case securely.

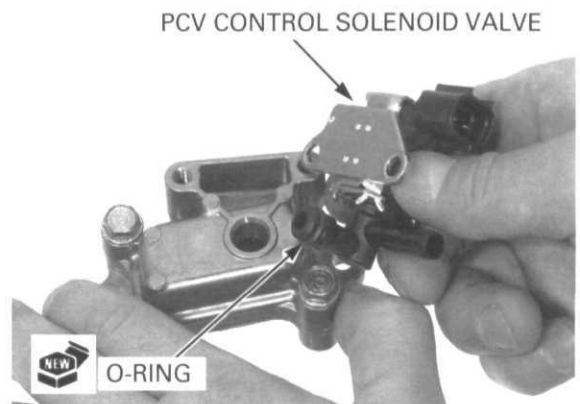


Install the cover to the case and tighten the bolts securely.

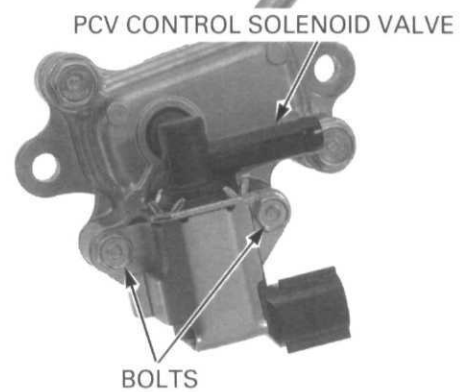


FUEL SYSTEM

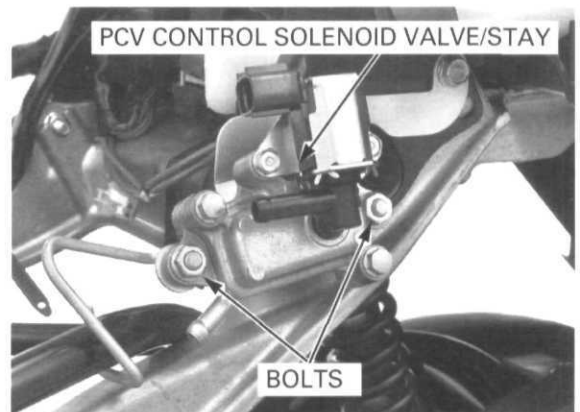
Replace the O-ring with a new one and install it to the solenoid valve.



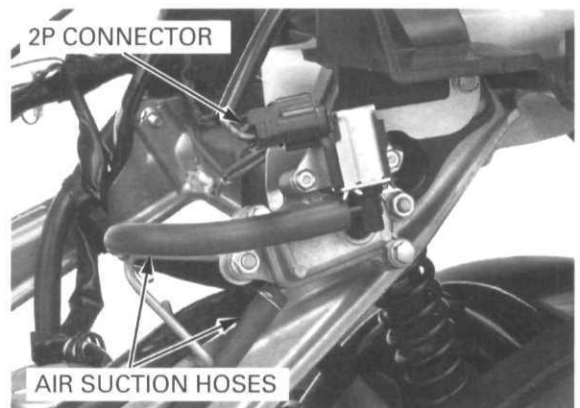
Tighten the solenoid valve bolts securely.



Install and tighten the bolts securely.



Connect the air suction hoses and the PCV control solenoid valve 2P connector.

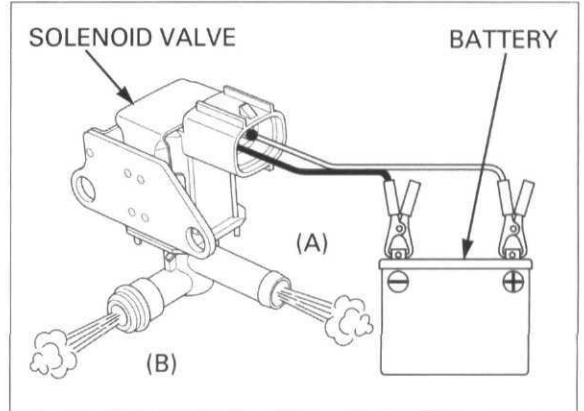


INSPECTION

Remove the PCV control solenoid valve and PCV reed valve (page 5-24).

PCV CONTROL SOLENOID VALVE

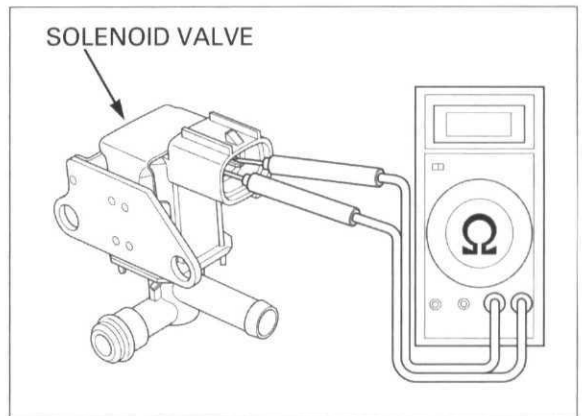
Check that the air should flow (A) to (B), only when the 12V battery is connected to the PCV control solenoid valve terminals.



Check the resistance between the terminals of the PCV control solenoid valve.

STANDARD: 22 – 26 Ω (at 20°C/68°F)

If the resistance is out of specification, replace the PCV control valve.



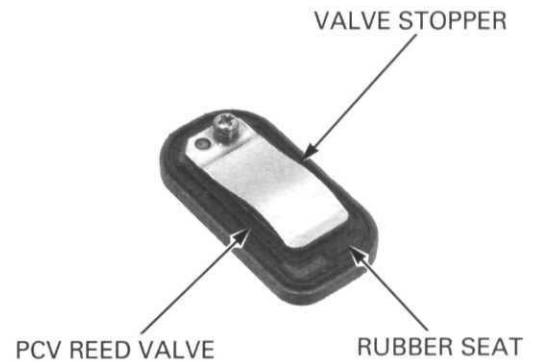
PCV REED VALVE

Check the followings:

- PCV reed valve for wear or damage
- Valve seat for wear or damage
- Valve stopper for damage

Check the no clearance between the PCV reed valve and valve seat.

Replace the PCV reed valve as an assembly, if necessary.

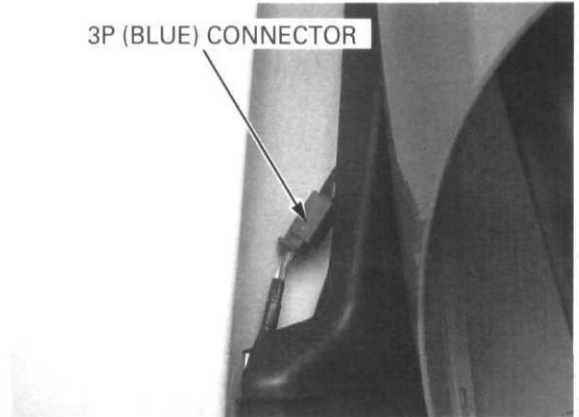


FUEL SYSTEM

FUEL TANK

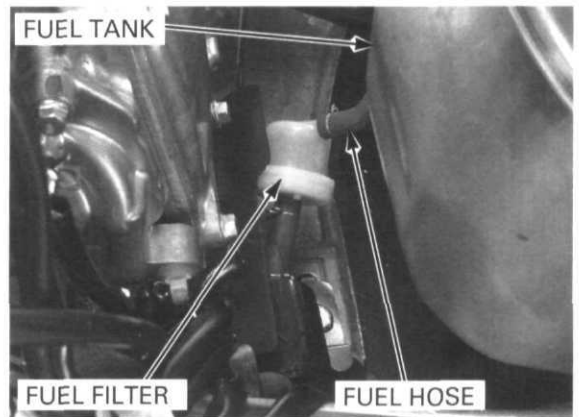
Remove the step floor (page 2-9).

Pull out the fuel level sensor 3P (Bu) connector from the back-side of the under cover and disconnect the fuel level sensor 3P (Bu) connector.

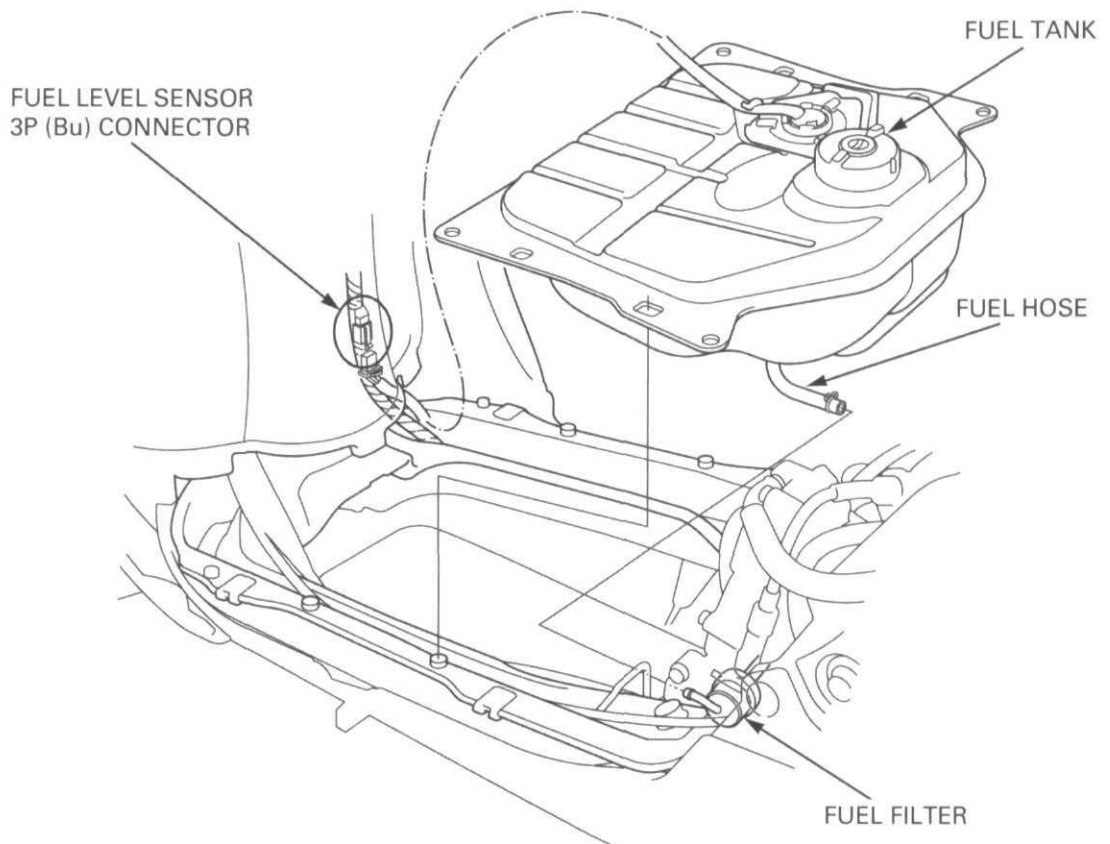


Lift the fuel tank and attach the clamp to the fuel hose.

Disconnect the fuel hose from the fuel filter and remove the fuel tank.



Installation is in the reverse order of removal.

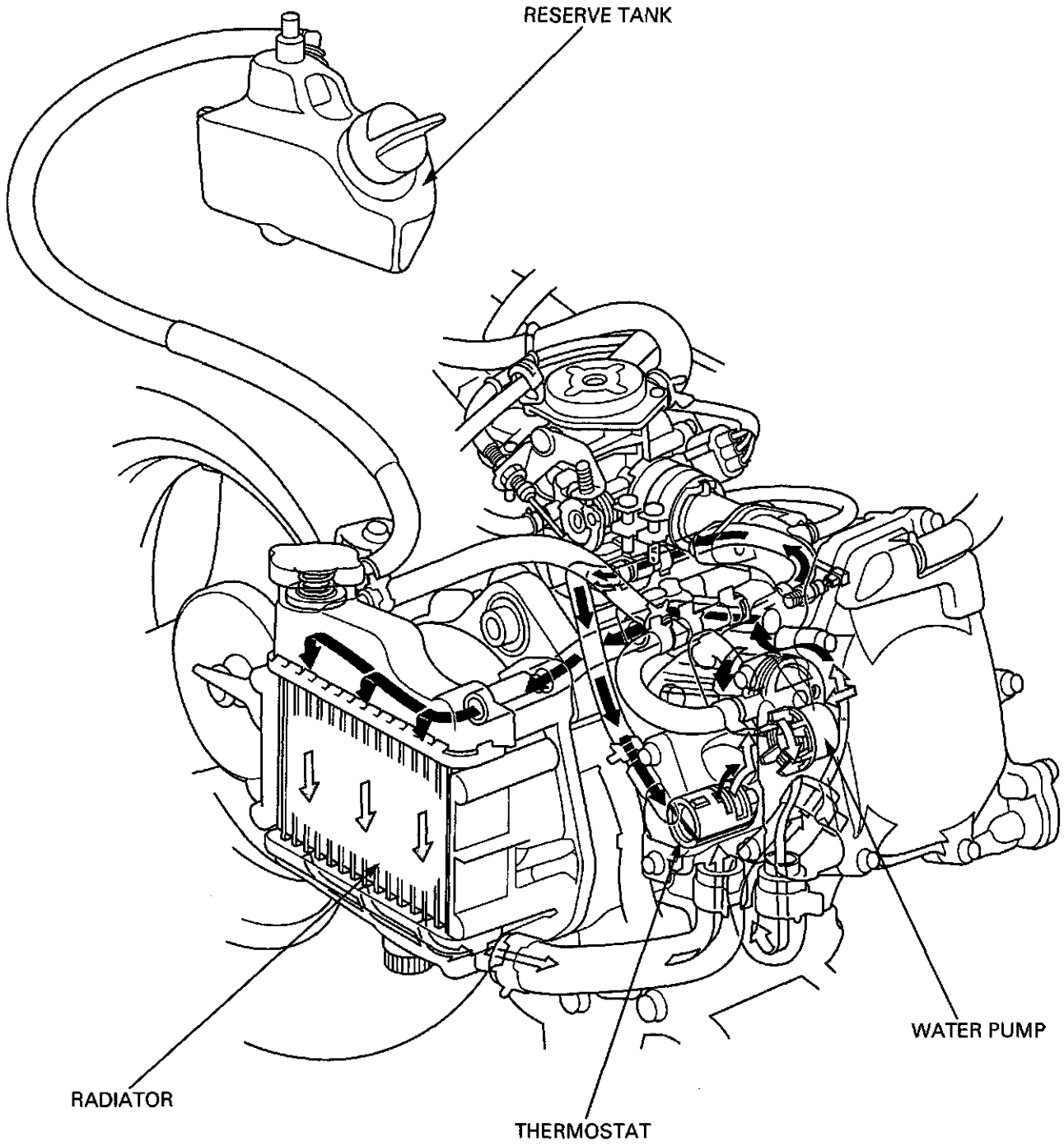


6. COOLING SYSTEM

SYSTEM FLOW PATTERN	6-2	COOLANT REPLACEMENT.....	6-6
SERVICE INFORMATION	6-3	WATER PUMP/THERMOSTAT.....	6-9
TROUBLESHOOTING	6-4	RADIATOR	6-13
COOLANT SYSTEM TESTING.....	6-5	RADIATOR RESERVE TANK.....	6-15

COOLING SYSTEM

SYSTEM FLOW PATTERN



SERVICE INFORMATION

GENERAL

⚠ WARNING

Removing the radiator cap while the engine is hot can allow the coolant to spray out, seriously scalding you. Always let the engine and radiator cool down before removing the radiator cap.

NOTICE

Using coolant with silicate corrosion inhibitors may cause premature wear of water pump seals or blockage of radiator passages. Using tap water may cause engine damage.

- Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- When the coolant temperature exceeds 120 °C (248 °F), the coolant temperature indicator will blink. The ECM will then control the ignition and reduce engine speed to 9 mph (15 km/h). At this time, check the cooling system and engine for leaks or damage. If everything is OK, then check the coolant indicator circuit and thermosensor (page 18-14).
- This scooter has adopted a magnetic-coupling water pump.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	0.3 liter (0.3 US qt, 0.3 Imp qt)
	Reserve tank	0.18 liter (0.2 US qt, 0.2 Imp qt)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kgf/cm ² , 16 – 20 psi)
Thermostat	Begin to open	74 – 78 °C (165 – 172 °F)
	Fully open	100 °C (212 °F)
	Valve lift	8 mm (0.3 in) minimum
Standard coolant concentration		50 % mixture with soft water

TORQUE VALUES

Coolant drain bolt 0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)
 Radiator cover screw 0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)

COOLING SYSTEM

TROUBLESHOOTING

Engine temperature too high

- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passage blocked in radiator, hoses or water jacket
- Air in system
- Faulty water pump
- Faulty temperature gauge or ECT sensor

Engine temperature too low

- Faulty temperature gauge or ECT sensor
- Thermostat stuck open

Coolant leak

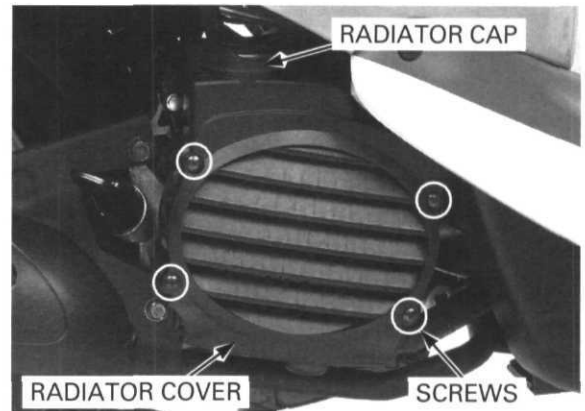
- Deteriorated O-rings
- Faulty radiator cap
- Damaged or deteriorated cylinder head gasket
- Loose hose connection or clamp
- Damaged or deteriorated hoses

COOLANT SYSTEM TESTING

COOLANT (HYDROMETER TEST)

Remove the four screws and radiator cover.

Remove the radiator cap.

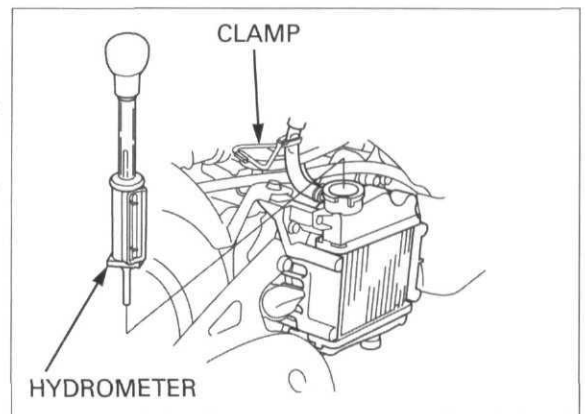


Pinch the siphon hose with a hose clamp.

Test the coolant gravity using a hydrometer (see below for "Coolant specific gravity chart").

For maximum corrosion protection, a 1:1 solution of ethylene glycol and distilled water is recommended (page 6-6).

Look for contamination and replace the coolant if necessary.



COOLANT SPECIFIC GRAVITY CHART

		Coolant temperature °C (°F)										
		0 (32)	5 (41)	10 (50)	15 (59)	20 (68)	25 (77)	30 (86)	35 (95)	40 (104)	45 (113)	50 (122)
Coolant ratio%	5	1.009	1.009	1.008	1.008	1.007	1.006	1.005	1.003	1.001	0.999	0.997
	10	1.018	1.017	1.017	1.016	1.015	1.014	1.013	1.011	1.009	1.007	1.005
	15	1.028	1.027	1.026	1.025	1.024	1.022	1.020	1.018	1.016	1.014	1.012
	20	1.036	1.035	1.034	1.033	1.031	1.029	1.027	1.025	1.023	1.021	1.019
	25	1.045	1.044	1.043	1.042	1.040	1.038	1.036	1.034	1.031	1.028	1.025
	30	1.053	1.052	1.051	1.047	1.046	1.045	1.043	1.041	1.038	1.035	1.032
	35	1.063	1.062	1.060	1.058	1.056	1.054	1.052	1.049	1.046	1.043	1.040
	40	1.072	1.070	1.068	1.066	1.064	1.062	1.059	1.056	1.053	1.050	1.047
	45	1.080	1.078	1.076	1.074	1.072	1.069	1.066	1.063	1.060	1.057	1.054
	50	1.086	1.084	1.082	1.080	1.077	1.074	1.071	1.068	1.065	1.062	1.059
	55	1.095	1.093	1.091	1.088	1.085	1.082	1.079	1.076	1.073	1.070	1.067
60	1.100	1.098	1.095	1.092	1.089	1.086	1.083	1.080	1.077	1.074	1.071	

COOLING SYSTEM

RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Remove the radiator cap.

Wet the sealing surfaces of the cap, then install the cap onto the tester.

Pressurize the radiator cap using the tester.

Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low.

The cap must hold the specified pressure for at least 6 seconds.

RADIATOR CAP RELIEF PRESSURE:

108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)

Pressurize the radiator, engine and hoses using the tester, and check for leaks.

Repair or replace components if the system will not hold the specified pressure for at least 6 seconds.

Remove the tester and install the radiator cap.

NOTICE

Excessive pressure can damage the cooling system components. Do not exceed 137 kPa (1.4 kgf/cm², 20 psi).



COOLANT REPLACEMENT

PREPARATION

NOTICE

Using coolant with silicate corrosion inhibitors may cause premature wear of water pump seals or blockage of radiator passages. Using tap water may cause engine damage.

NOTE:

- The effectiveness of coolant decreases with the accumulation of rust or if there is a change in the mixing proportion during usage. Therefore, for best performance change the coolant regularly as specified in the maintenance schedule.

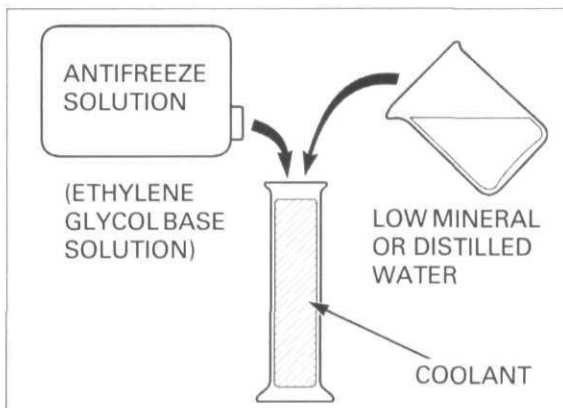
Mix only distilled, low mineral water with the recommended antifreeze.

RECOMMENDED ANTIFREEZE:

Pro Honda HP coolant or an equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors

RECOMMENDED MIXTURE:

1:1 (distilled water and recommended antifreeze)

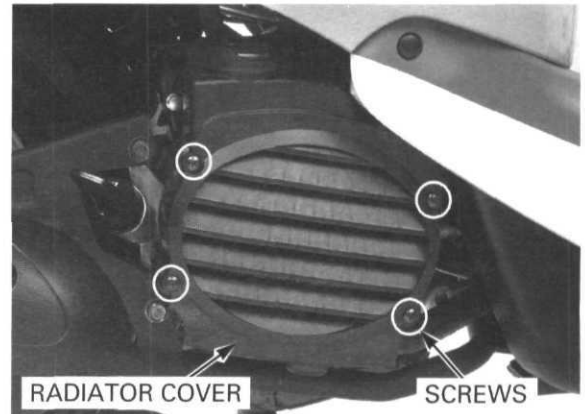


REPLACEMENT/AIR BLEEDING

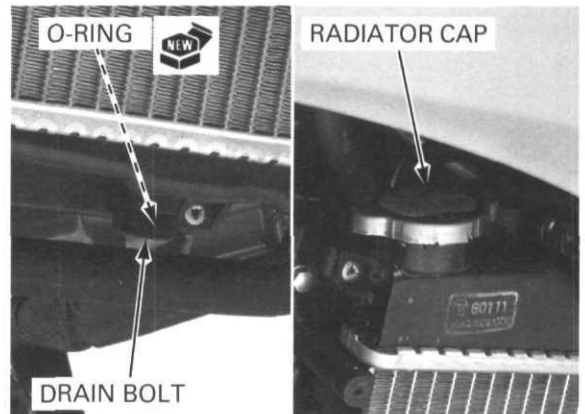
NOTE:

- When filling the system or reserve tank with coolant, or checking the coolant level, place the scooter on its centerstand on a flat, level surface.

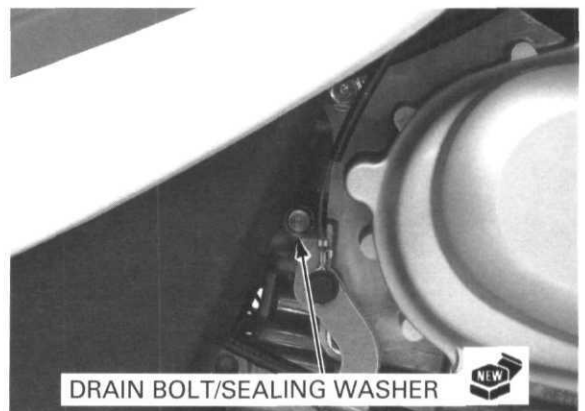
Remove the four screws and radiator cover.



Remove the radiator cap.
Drain the coolant from the system by removing the drain bolt and O-ring.



Remove the cylinder drain bolt and drain the coolant from the cylinder.

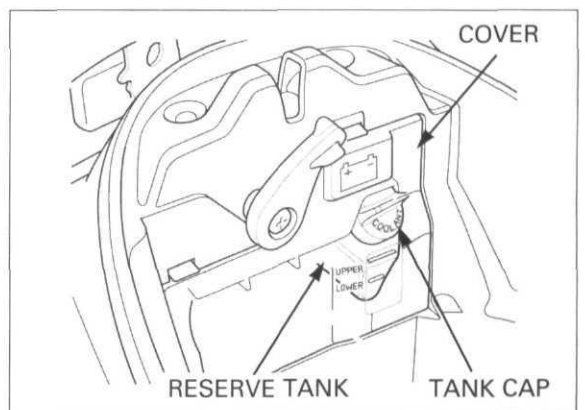


Unlock and open the seat using the ignition key.
Remove the maintenance cover.
Remove the reserve tank cap and drain the coolant from the reserve tank.

Reinstall the drain bolt with a new O-ring onto the radiator.

TORQUE: 0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)

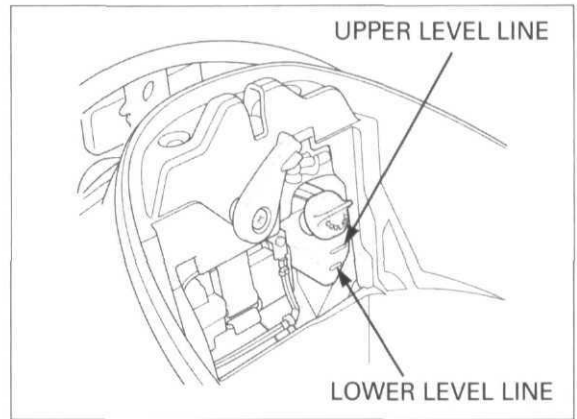
Reinstall the drain bolt with a new sealing washer onto the cylinder.



COOLING SYSTEM

Place the scooter on its centerstand on a flat, level surface.

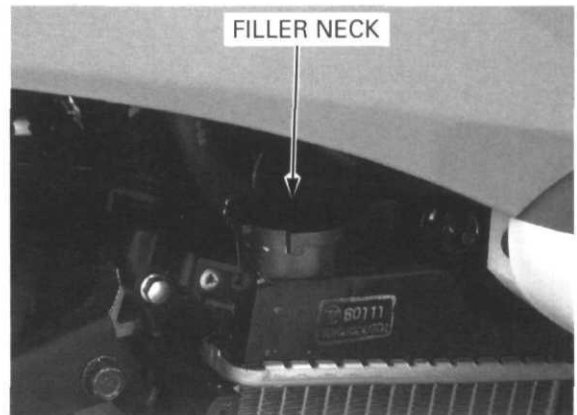
Fill the reserve tank to the upper level line.



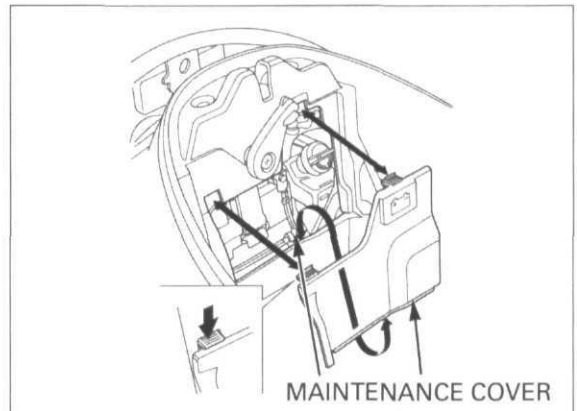
Fill the system with the recommended coolant through the filler opening to the filler neck.

Bleed air from the system as follow:

1. Start the engine and let it idle for 2 – 3 minutes.
2. Snap the throttle three or four times to bleed air from the system.
3. Stop the engine and add coolant to the proper level if necessary. Reinstall the radiator cap.
4. Check the level of coolant in the reserve tank and fill to the upper level if it is low.

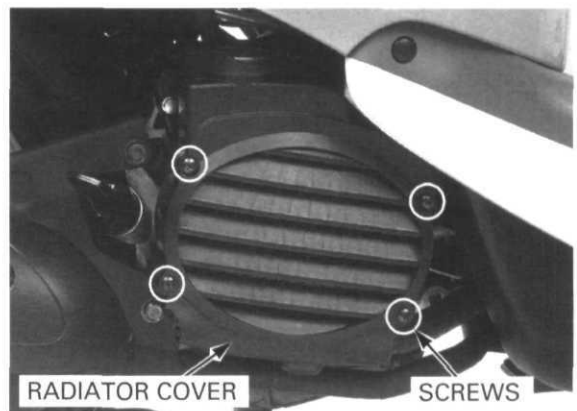


Install the maintenance cover and close the seat.



Install the radiator cover and tighten the screws to the specified torque.

TORQUE: 0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)



WATER PUMP/THERMOSTAT

REMOVAL

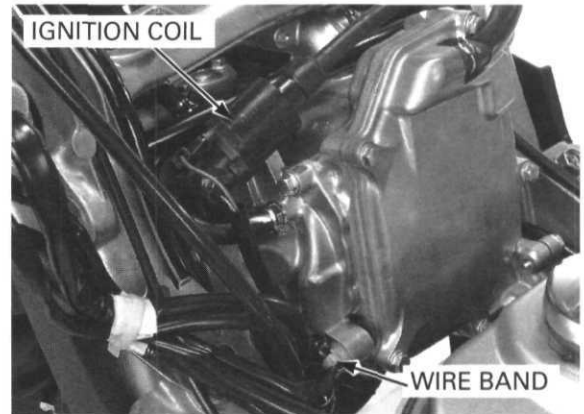
WATER PUMP

Drain the coolant (page 6-7).

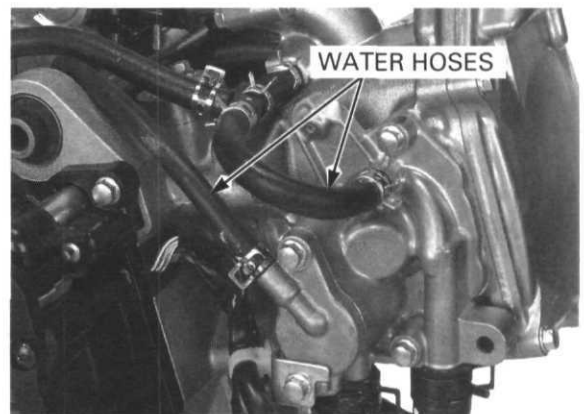
Remove the following:

- Step floor (page 2-9)
- Lower cover (page 2-10)
- Ignition coil (page 16-7)

Remove the ignition coil wire from the wire band.

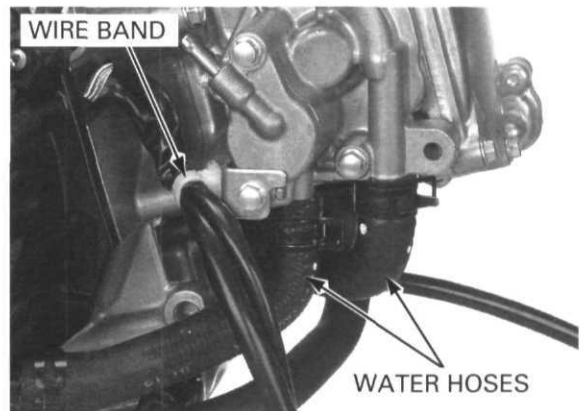


Remove the clamp and disconnect the water hoses.

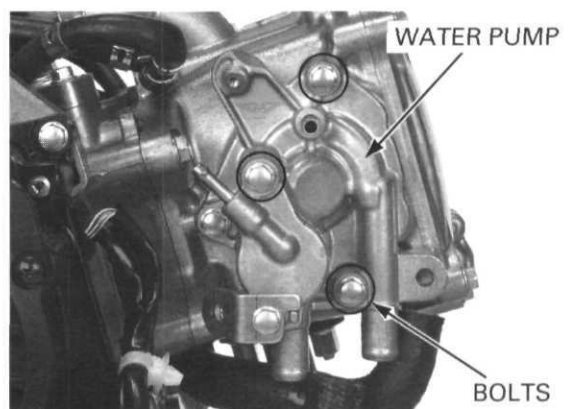


Remove the wire band from the water pump stay.

Remove the clamp and disconnect the water hoses.

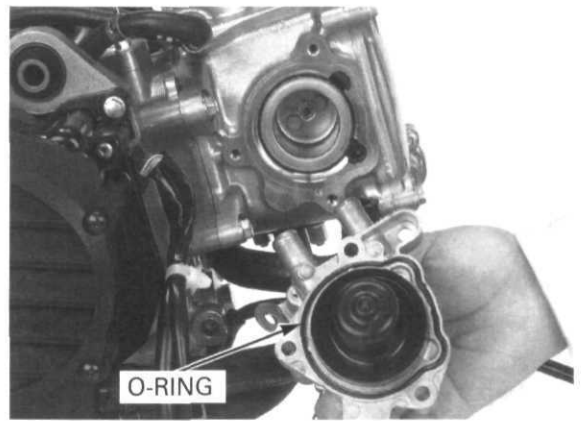


Remove the bolts and the water pump.



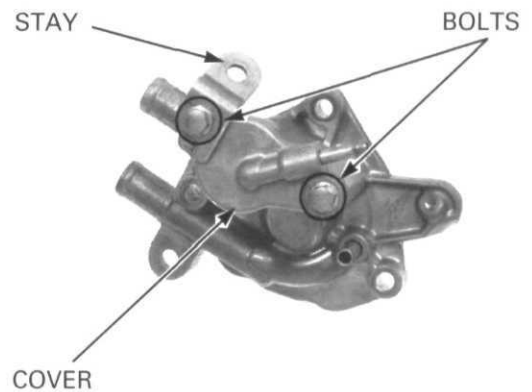
COOLING SYSTEM

Remove the O-ring from the water pump.



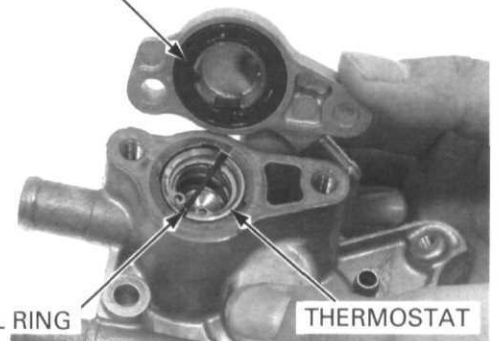
THERMOSTAT

Remove the bolts, stay and thermostat housing cover.



Remove the rubber seal from the thermostat housing cover.

RUBBER SEAL



Be careful not to damage the seal ring.

Remove the thermostat.

SEAL RING

THERMOSTAT

THERMOSTAT INSPECTION

Visually inspect the thermostat for damage.

Keep flammable materials away from the electric heating element.

Do not let the thermostat or thermometer touch the pan, or you will get false readings.

Heat a pan of water with an electric heating element to operating temperature for 5 minutes. Suspend the thermostat in the heated water to check its operation.

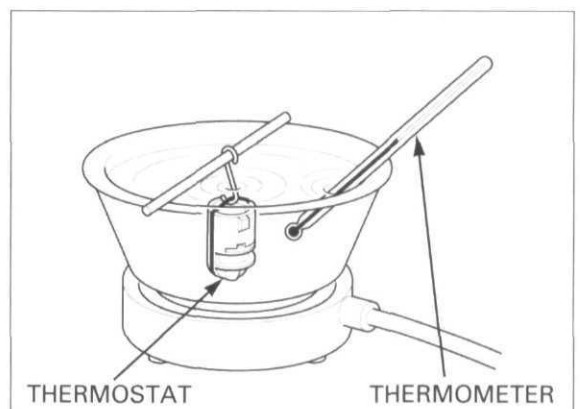
Replace the thermostat if the valve stays open at room temperature, or if it responds at temperatures other than those specified.

THERMOSTAT BEGIN TO OPEN:

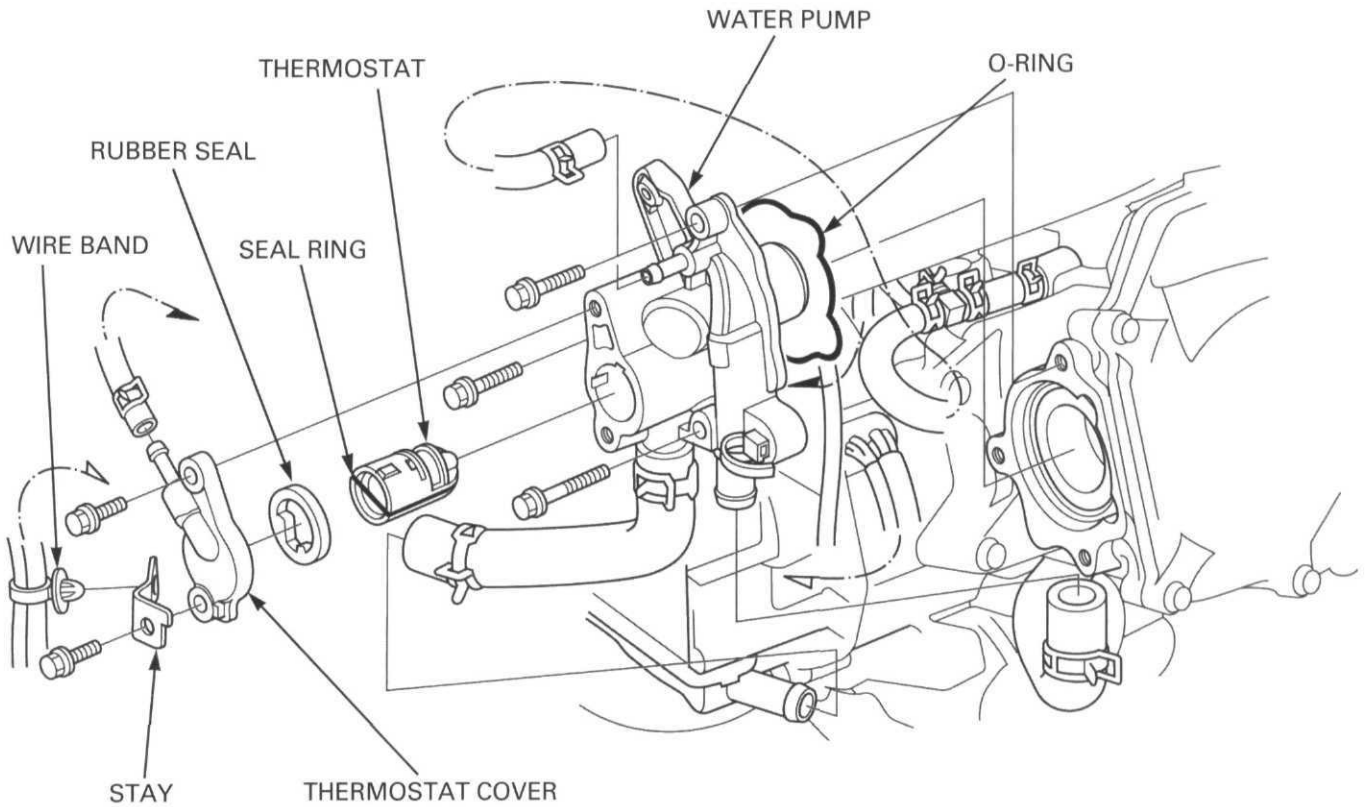
74 – 78 °C (165 – 172 °F)

VALVE LIFT:

8 mm (0.3 in) minimum at 100 °C (212 °F)

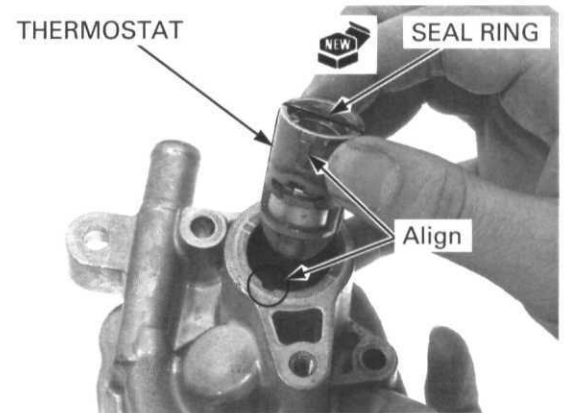


INSTALLATION

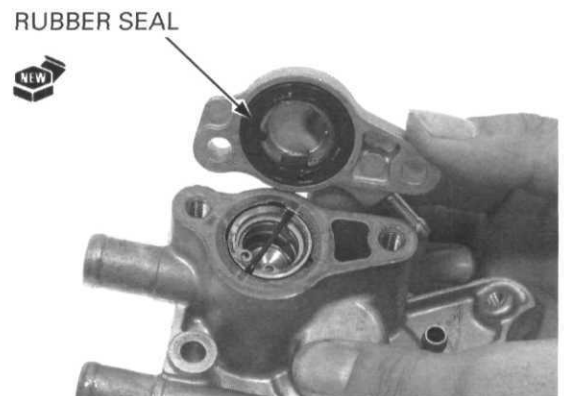


THERMOSTAT

Coat a new seal ring with coolant and install it into the groove in the thermostat. Install the thermostat into the water pump, align the tab of the thermostat with the groove in the water pump.

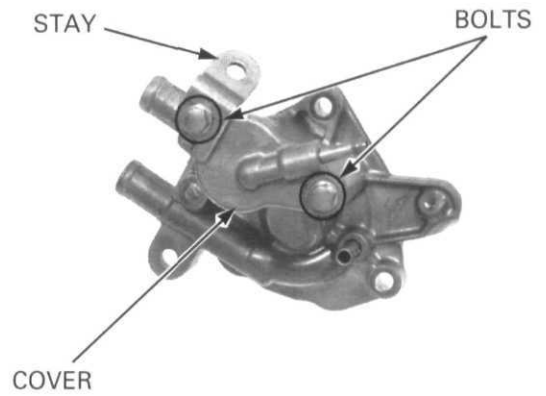


Install a new rubber seal into the thermostat housing cover groove.



COOLING SYSTEM

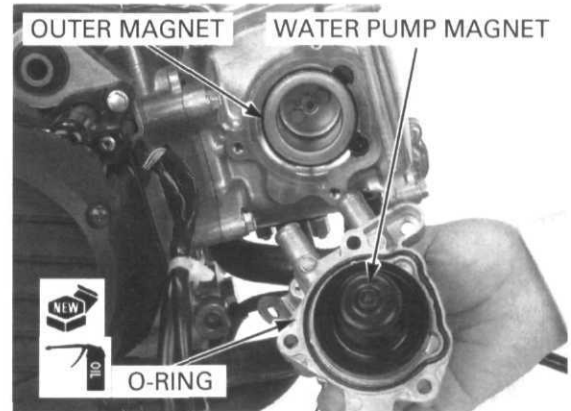
Install the thermostat housing cover, stay and tighten the bolts securely.



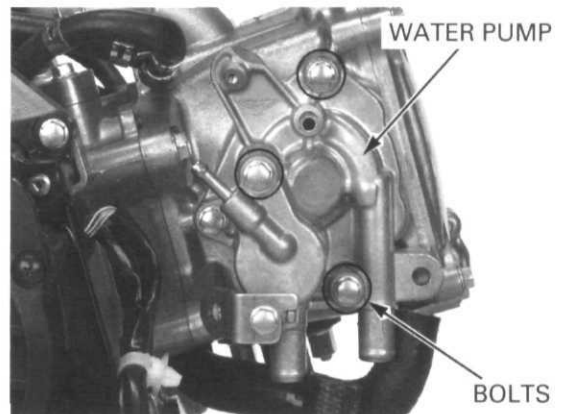
WATER PUMP

Clean the inside of the outer magnet and the water pump magnet, and check that no nuts or bolts are magnetically attached to the magnet.

Coat a new O-ring with engine oil and install it into the groove into the water pump.

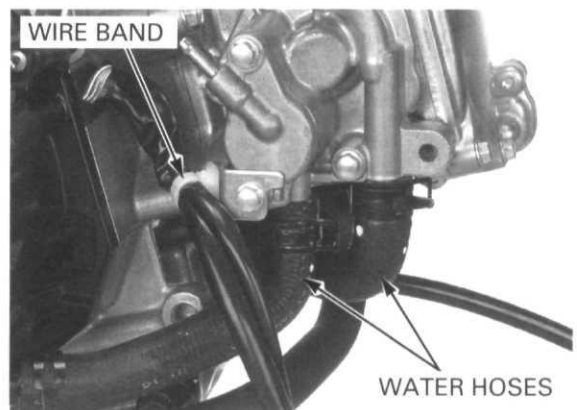


Install the water pump into the cylinder head and tighten the bolts securely.

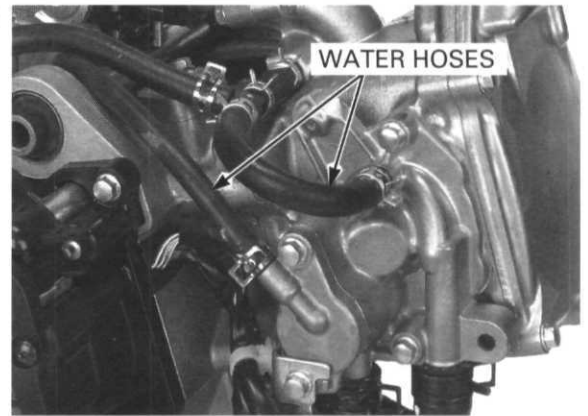


Connect the water hoses and install the clamp securely.

Install the wire band onto the stay.



Connect the water hoses and install the clamp securely.

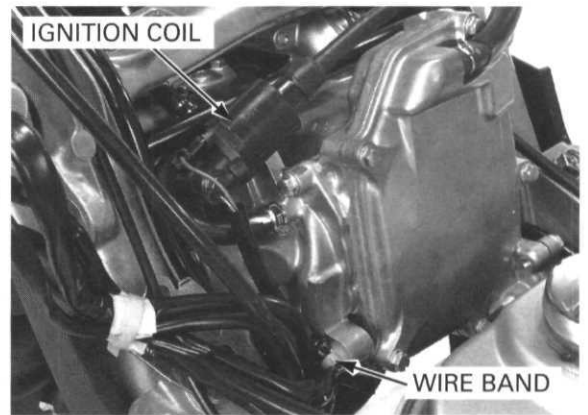


Install the ignition coil wire onto the wire band.

Install the following:

- Ignition coil (page 16-7)
- Lower cover (page 2-10)
- Step floor (page 2-9)

Fill the system with the recommended coolant and bleed any air (page 6-7).

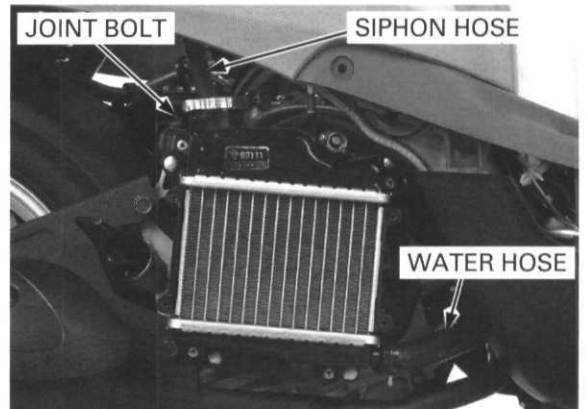


RADIATOR

REMOVAL

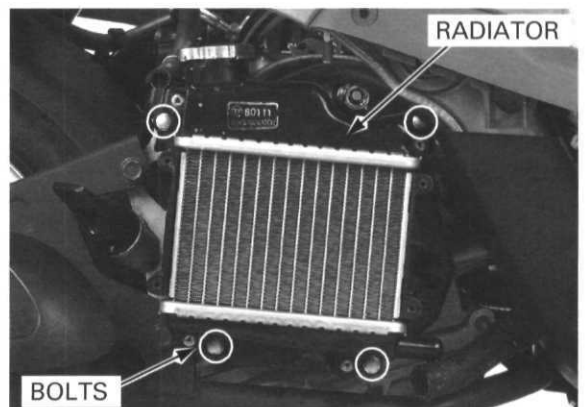
Drain the coolant (page 6-7).
Remove the right side cover (page 2-8).
Remove the radiator cover.

Remove the radiator joint bolt.
Disconnect the siphon hose and water hose from the radiator.



Remove the radiator mounting bolts.
Remove the radiator from the water pipe.

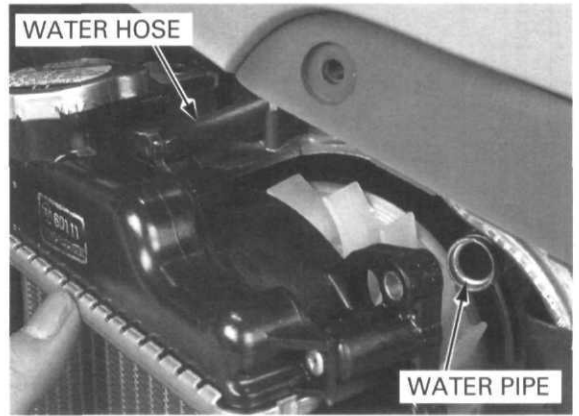
Be careful not to damage the radiator fins while servicing the radiator.



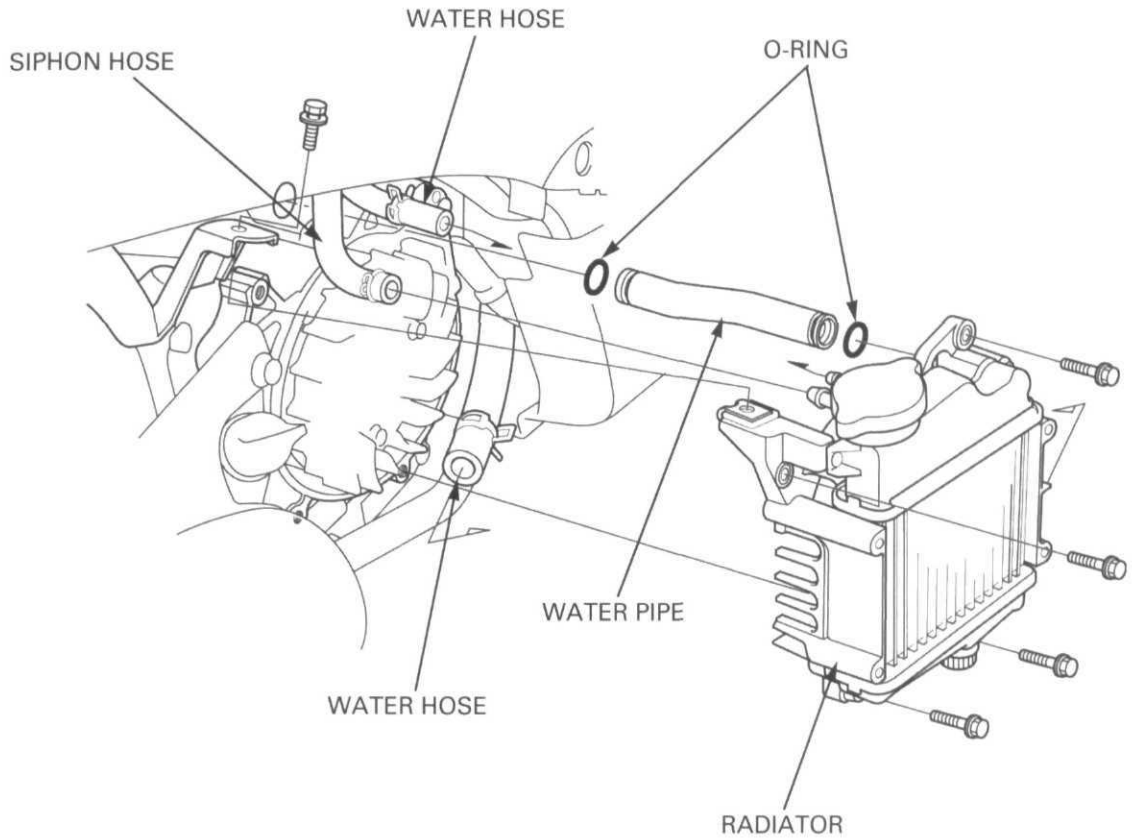
COOLING SYSTEM

Disconnect the water hose from the radiator and remove the radiator.

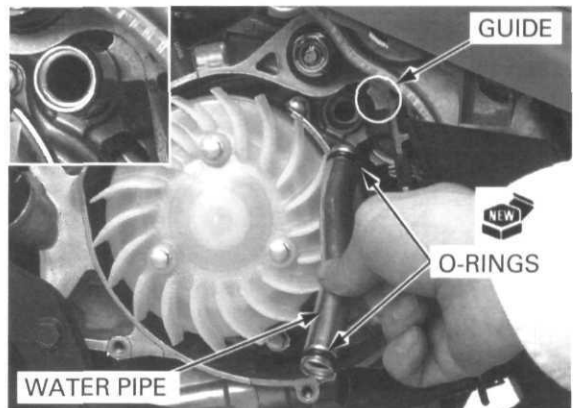
Remove the water pipe and O-rings.



INSTALLATION

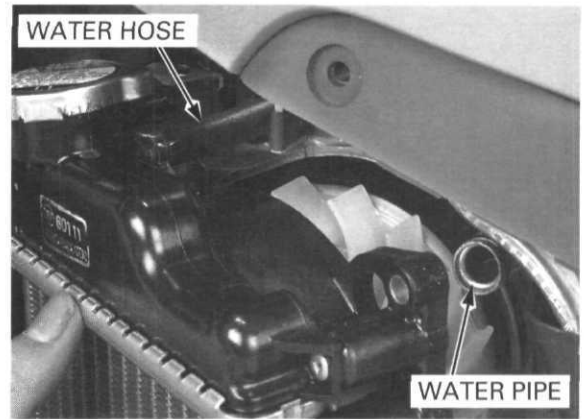


Coat a new O-rings with coolant and install them into the grooves in the water pipe.
Install the water pipe and align the guide of the crankcase with the water pipe as shown.



Connect the water hose onto the radiator.

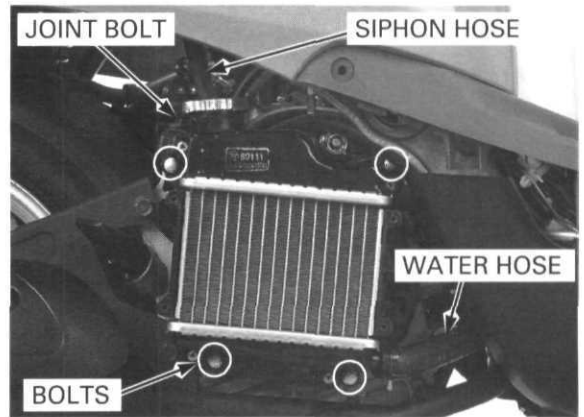
Install the radiator onto the crankcase, aligning the water pipe and pipe joint of the radiator.



Install and tighten the bolts securely.
Connect the siphon hose and water hose.

Install the right side cover (page 2-8).

Fill the system with the recommended coolant and bleed any air (page 6-7).



RADIATOR RESERVE TANK

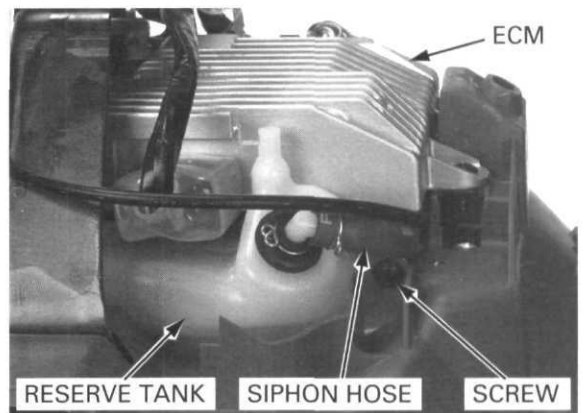
REMOVAL

Remove the body cover (page 2-7).

Remove the ECM (page 15-11).

Disconnect the siphon hose from the radiator reserve tank.

Remove the screw and radiator reserve tank from the rear fender.

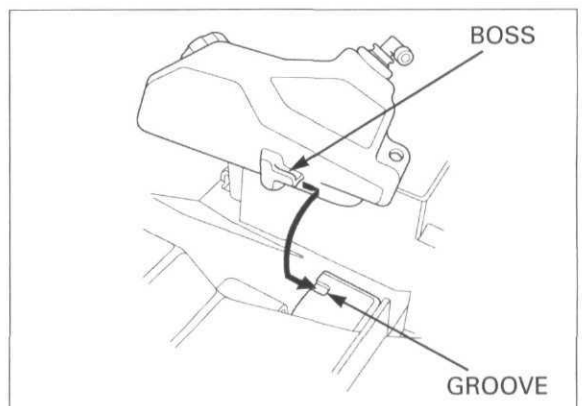


INSTALLATION

Installation is in the reverse order of removal.

When installing the radiator reserve tank, align the boss on the tank with the groove in the rear fender.

Place the scooter on its centerstand and add the recommended coolant to the upper level line.



MEMO

7. ENGINE REMOVAL/INSTALLATION

COMPONENT LOCATION:
('02 - '05 model)..... 7-2

COMPONENT LOCATION:
(After '05 model) 7-3

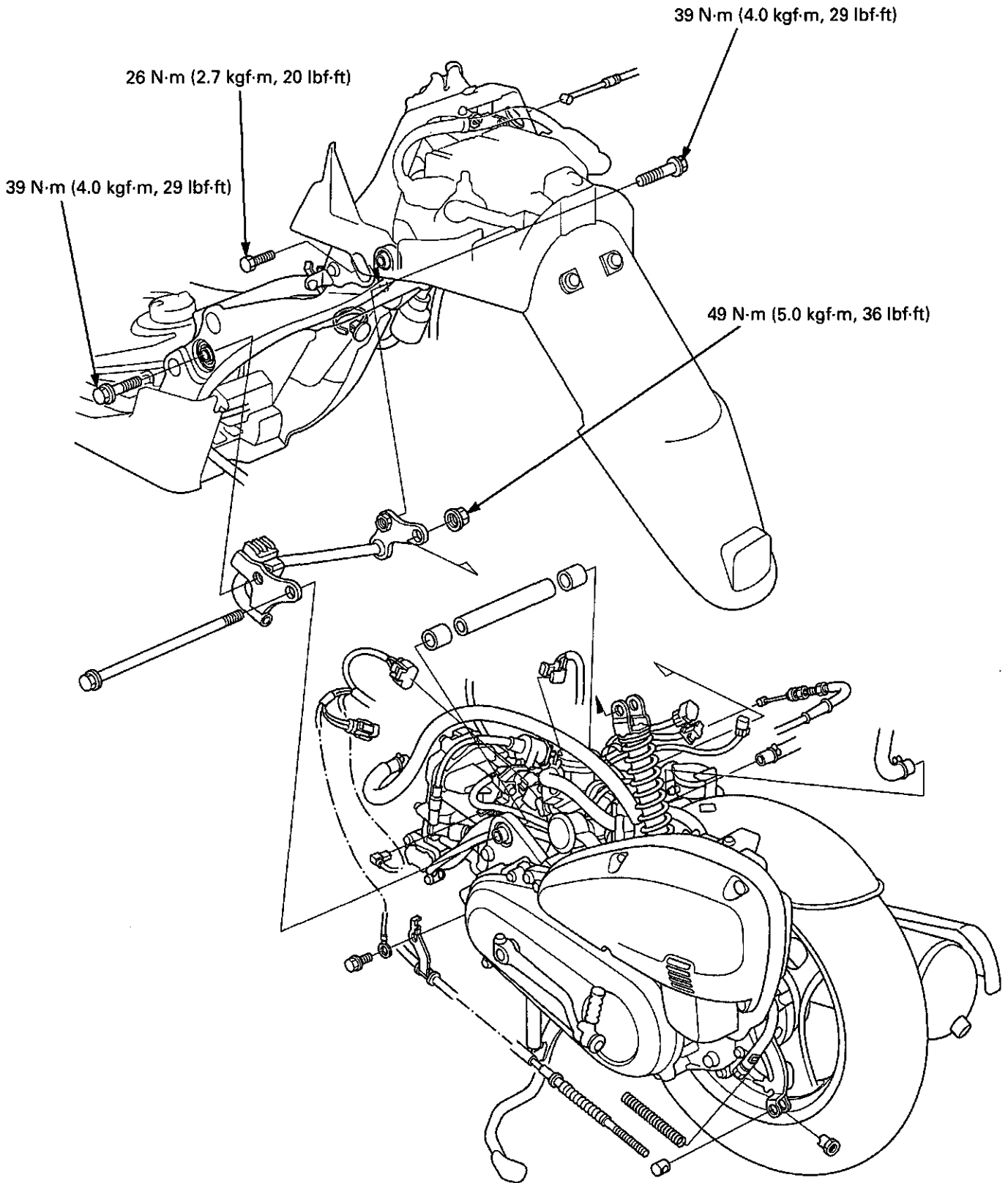
SERVICE INFORMATION..... 7-4

ENGINE REMOVAL 7-5

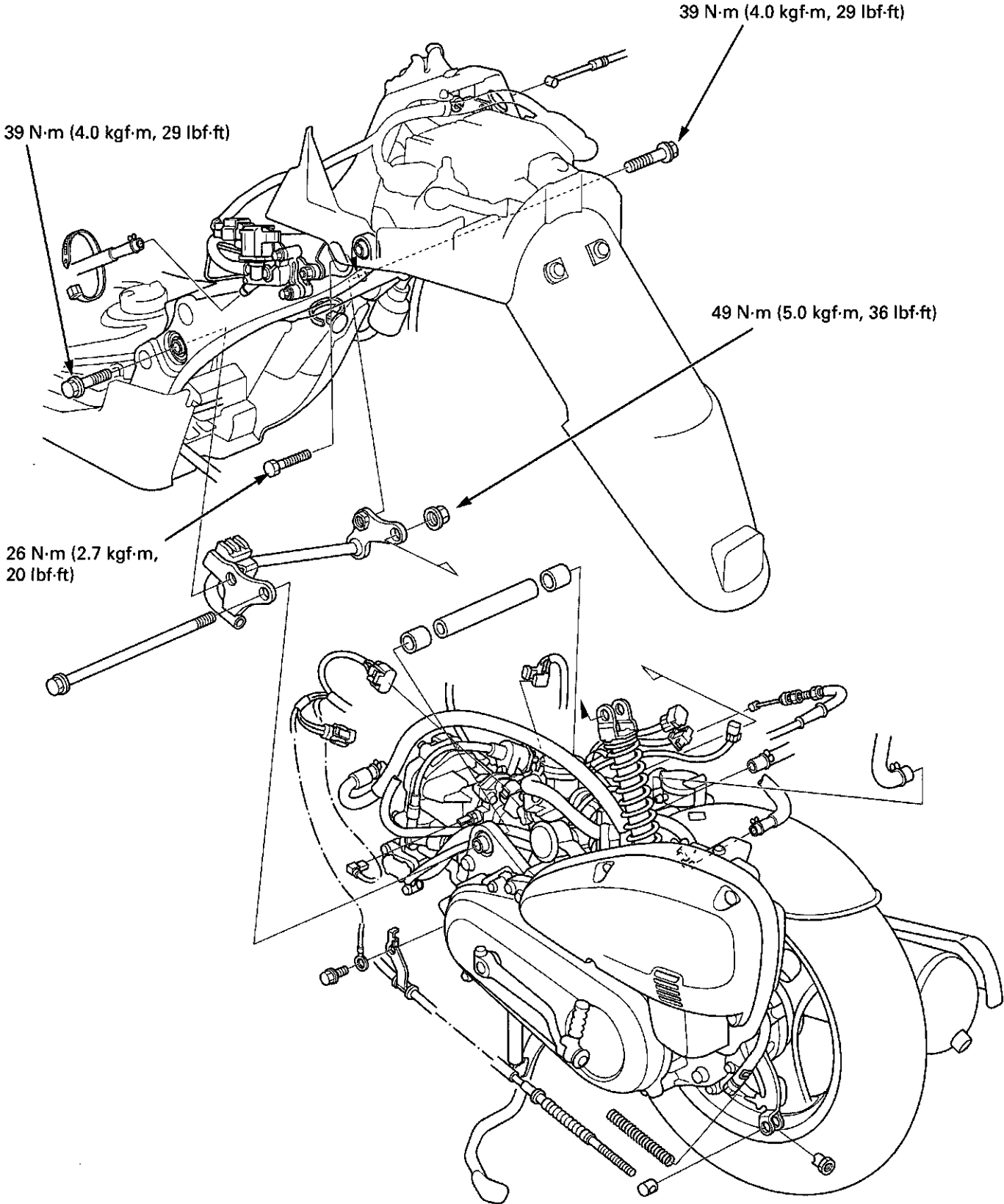
ENGINE INSTALLATION..... 7-8

ENGINE REMOVAL/INSTALLATION

COMPONENT LOCATION: ('02 - '05 model)



COMPONENT LOCATION: (After '05 model)



ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

GENERAL

- Support the engine using a jack or other adjustable support to ease of engine mounting bolt removal.
- When removing/installing the engine, tape the frame around the engine beforehand for frame protection.
- The following components require engine removal for service.
 - Crankshaft/piston/cylinder (page 12-5)
- The following components can be serviced with the engine installed in the frame.
 - Kick starter/drive pulley/driven pulley/clutch (page 9-6)
 - Final reduction (page 10-5)
 - Alternator/starter (page 11-4)
 - Cylinder head/valve (page 8-7)
 - Water pump (page 6-9)
 - Carburetor (page 5-8)
 - Oil pump (page 4-4)

SPECIFICATION

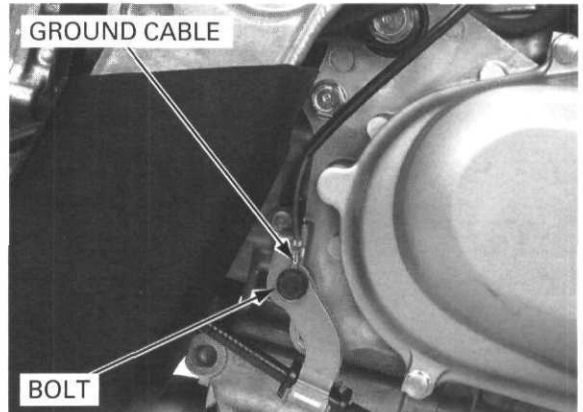
ITEM		SPECIFICATIONS
Engine dry weight		20.3 kg (44.8 lbs)
Coolant capacity	Radiator and engine	0.3 liter (0.3 US qt, 0.3 Imp qt)
Engine oil capacity	At draining	0.6 liter (0.6 US qt, 0.5 Imp qt)
	At disassembly	0.7 liter (0.7 US qt, 0.6 Imp qt)

TORQUE VALUES

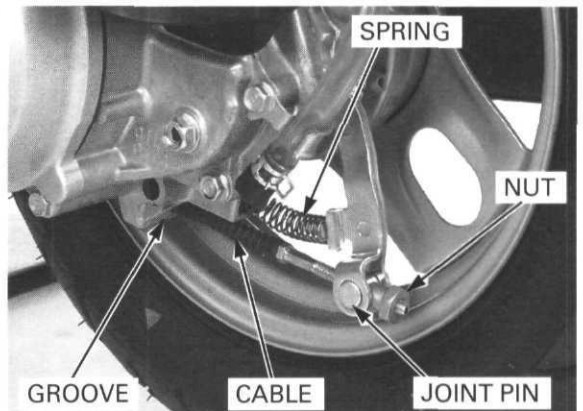
Engine hanger link bolt (frame side)	39 N·m (4.0 kgf·m, 29 lbf·ft)	
Engine mounting nut (engine side)	49 N·m (5.0 kgf·m, 36 lbf·ft)	U-nut
Rear shock absorber mounting bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)	

ENGINE REMOVAL

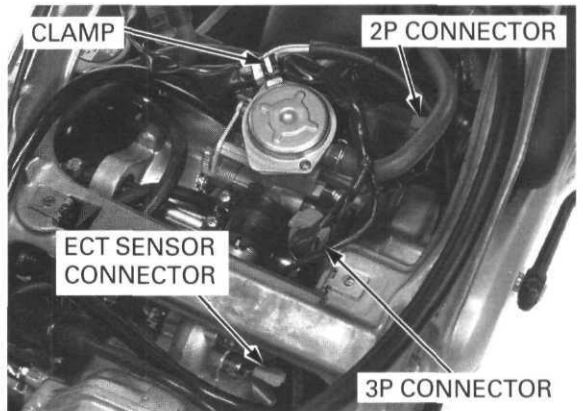
Remove the step floor (page 2-9).
 Drain the engine oil (page 3-11).
 Drain the coolant from the system (page 6-7).
 Remove the bolt and disconnect the ground cable.



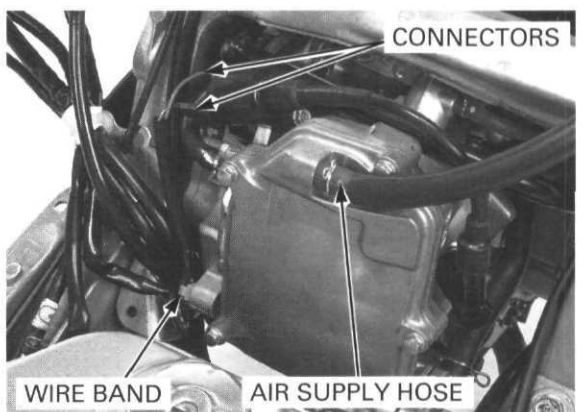
Remove the rear brake arm adjusting nut, joint pin and spring
 Remove the brake cable from the belt case groove.



Disconnect the ECT sensor connector, throttle position sensor 3P (G) connector and SE valve 2P (BI) connector.
 Remove the wires from the clamp.



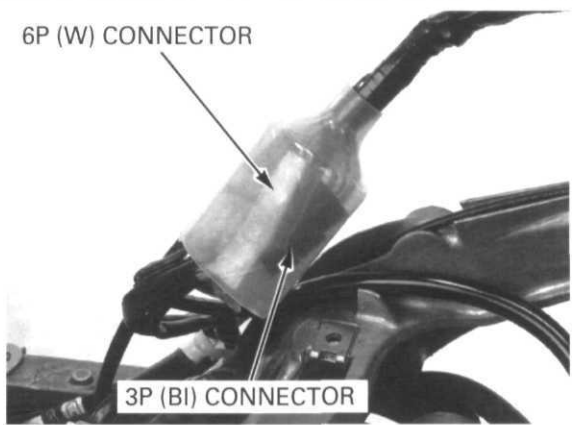
Disconnect the air supply hose from the cylinder head cover.
 Disconnect the ignition coil connectors and remove the wire from the wire band.



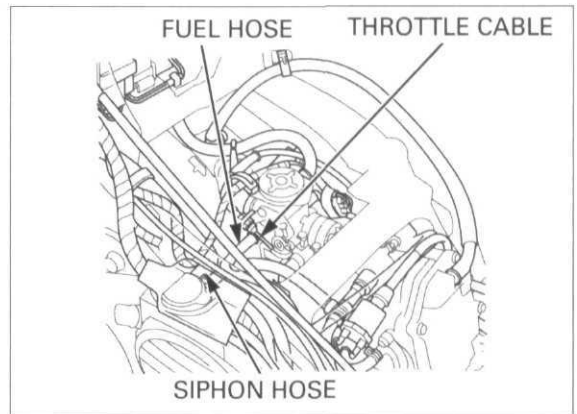
ENGINE REMOVAL/INSTALLATION

Disconnect the alternator/starter 3P (BI) and 6P (W) connectors.

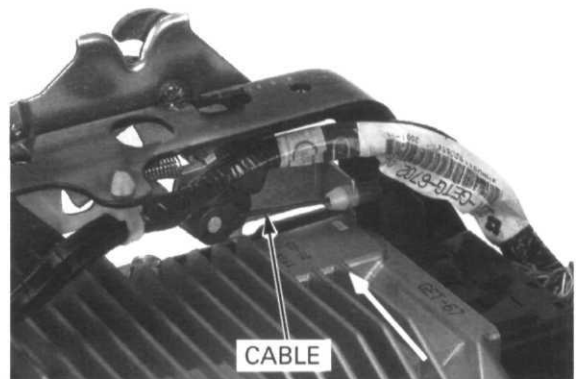
Remove the wire from the wire band.



Disconnect the siphon hose from the radiator.
Disconnect the fuel hose from the carburetor.
Disconnect the throttle cable from the throttle drum.

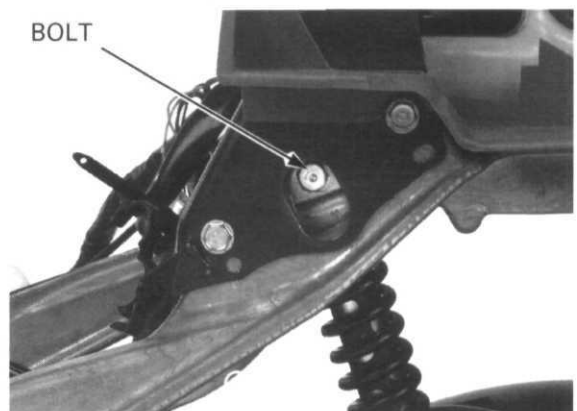


Disconnect the main stand lock cable.



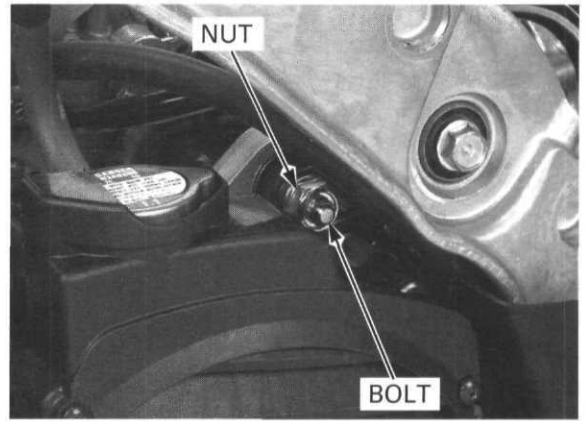
Place a floor jack or other adjustable support under the frame.

Remove the rear shock absorber upper mounting bolt.



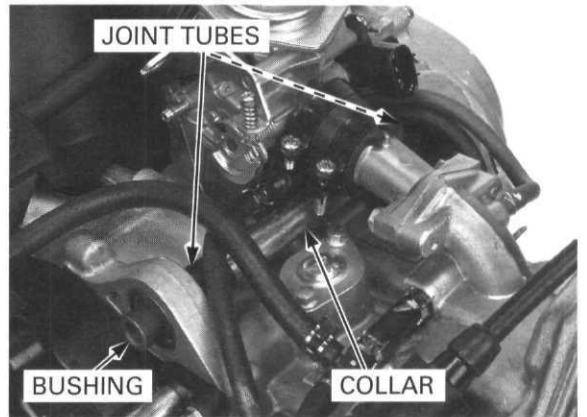
Remove the engine mounting nut.

Pull out the engine mounting bolt, then remove the engine from the frame.

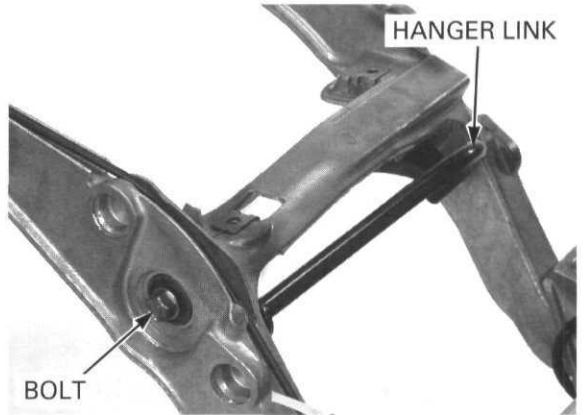


Move the joint tubes inside and remove the mounting collar from the engine.

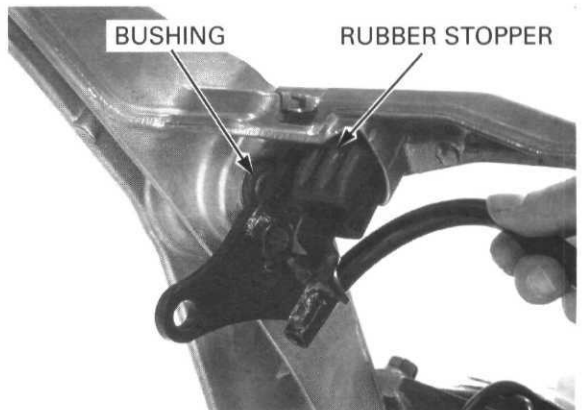
Check the bushings for wear, deterioration or damage.



Remove the two bolts and engine hanger link.



Check the rubber stopper and the mounting bushings for damage, wear or deterioration.



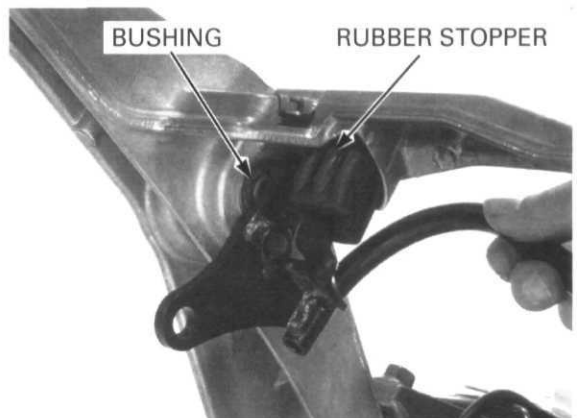
ENGINE REMOVAL/INSTALLATION

ENGINE INSTALLATION

NOTE:

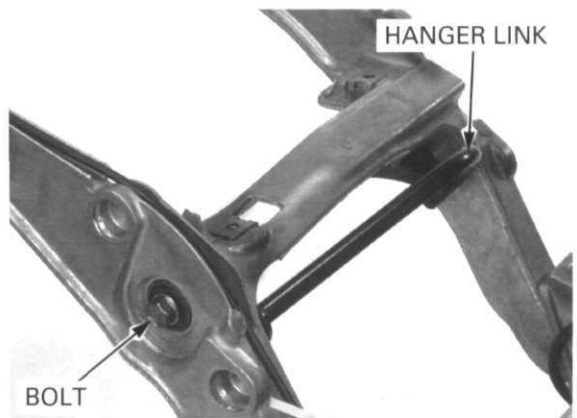
- Before installing the engine, route the wires, hoses, and cables properly (page 1-14).
- A hoist or equivalent is required to support the scooter when installing the engine.

Install the engine hanger link, aligning the rubber stopper with the frame.

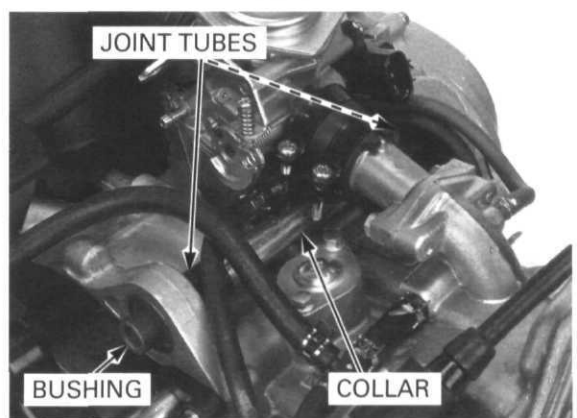


Install and tighten the engine hanger link bolts to the specified torque.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)



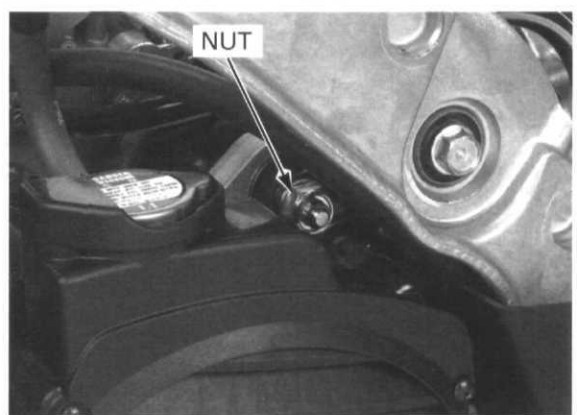
Install the mounting bushings, joint tube and collar as shown.



Set the engine to the frame and install the engine mounting bolt.

Install and tighten the engine mounting nut to the specified torque.

TORQUE: 49 N·m (5.0 kgf·m, 36 lbf·ft)



Install and tighten the rear shock absorber upper mounting bolt to the specified torque.

TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)

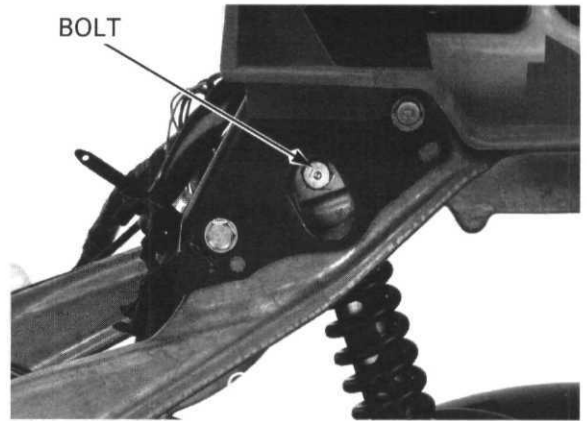
Install the removed parts in the reverse order of removal.

After installing the engine, check for the following:

- Left brake lever free play (page 3-16)
- Throttle grip free play (page 3-4)

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

Fill and bleed the cooling system (page 6-7).



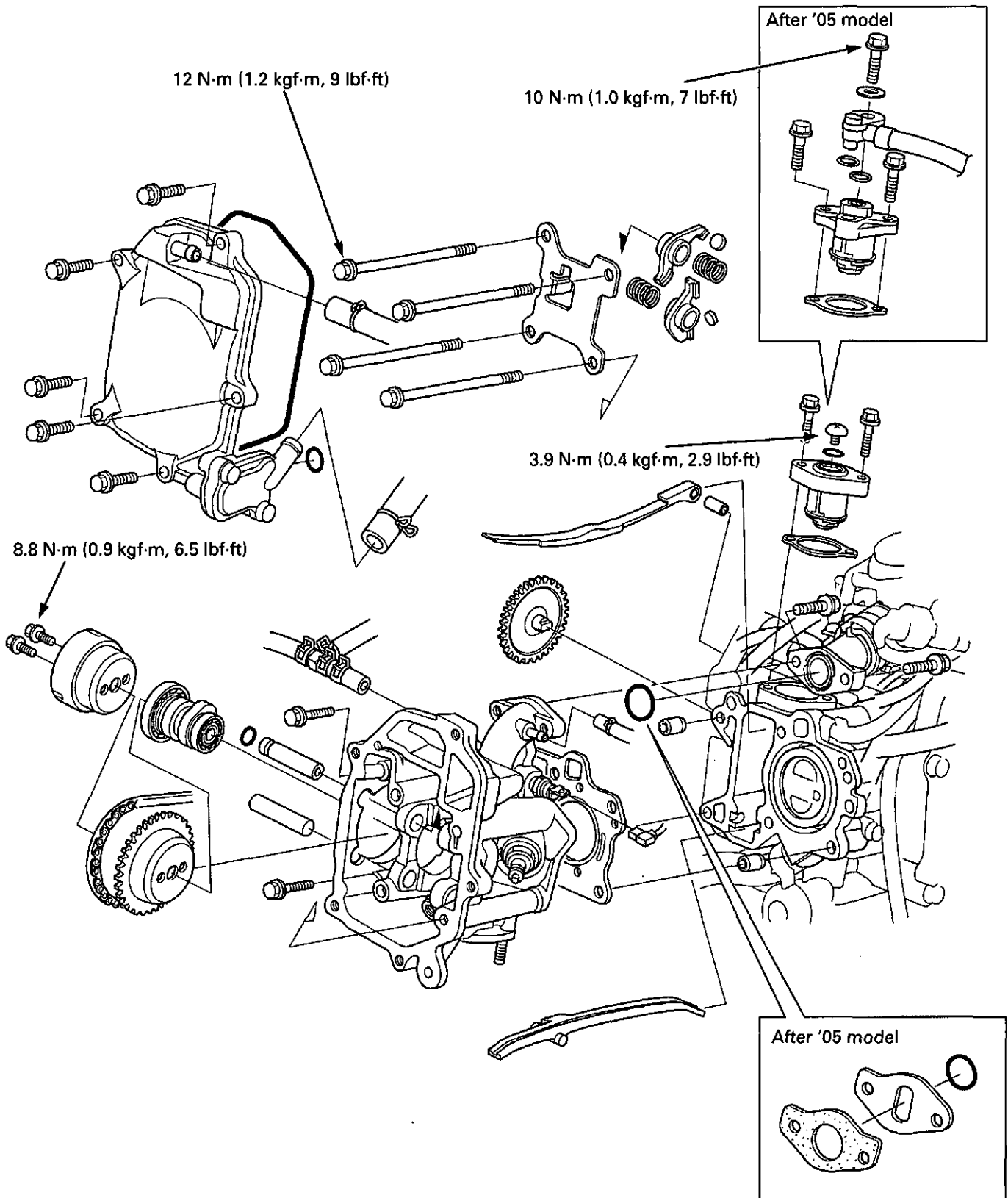
MEMO

8. CYLINDER HEAD/VALVES

COMPONENT LOCATION	8-2	CYLINDER HEAD DISASSEMBLY	8-11
SERVICE INFORMATION	8-3	VALVE GUIDE REPLACEMENT	8-13
TROUBLESHOOTING	8-5	VALVE SEAT INSPECTION/REFACING ..	8-14
CYLINDER COMPRESSION TEST.....	8-6	CYLINDER HEAD ASSEMBLY	8-17
CYLINDER HEAD COVER REMOVAL	8-6	CYLINDER HEAD INSTALLATION.....	8-18
CAMSHAFT/ROCKER ARM REMOVAL	8-7	CAMSHAFT/ROCKER ARM INSTALLATION	8-19
CYLINDER HEAD REMOVAL	8-10	CYLINDER HEAD COVER INSTALLATION	8-22

CYLINDER HEAD/VALVES

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves, rocker arms and camshaft.
- The cylinder head and valves can be serviced with the engine installed in the frame.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft and rocker arm lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling cylinder head.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.

SPECIFICATIONS

Unit: mm (in)

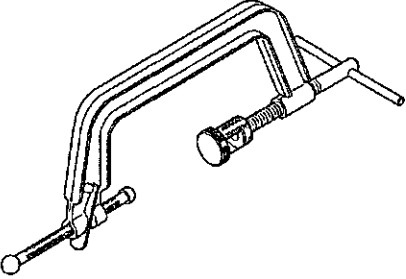






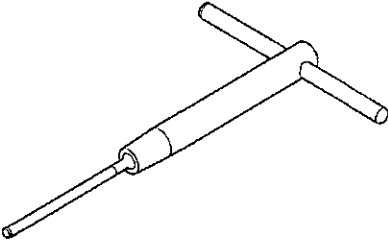
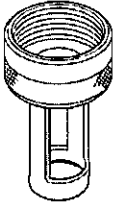
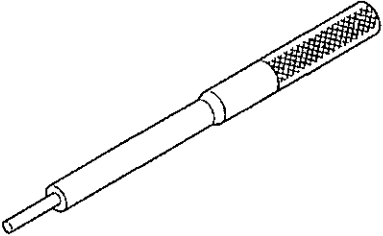
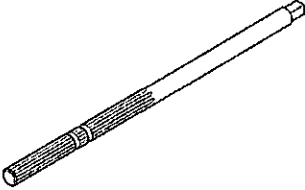
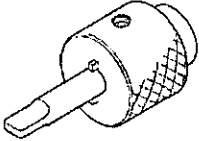
ITEM		STANDARD		SERVICE LIMIT
Cylinder compression		1,393 kPa (14.2 kgf/cm ² , 202 psi) at 1,500 rpm		-
Cylinder head warpage		-		0.05 (0.002)
Valve, valve guide	Valve clearance	IN	0.10 ± 0.03 (0.004 ± 0.001)	-
		EX	0.19 ± 0.03 (0.007 ± 0.001)	-
	Valve stem O.D.	IN	4.475 - 4.490 (0.1762 - 0.1768)	4.465 (0.1758)
		EX	4.465 - 4.480 (0.1758 - 0.1764)	4.455 (0.1754)
	Valve guide I.D.	IN/EX	4.500 - 4.512 (0.1772 - 0.1776)	4.54 (0.179)
	Stem-to-guide clearance	IN	0.010 - 0.037 (0.0004 - 0.0015)	0.075 (0.0030)
		EX	0.020 - 0.047 (0.0008 - 0.0019)	0.085 (0.0033)
	Valve guide projection above cylinder head	IN	9.05 - 9.35 (0.356 - 0.368)	-
EX		9.05 - 9.35 (0.356 - 0.368)	-	
Valve seat width	IN/EX	1.0 (0.04)	1.5 (0.06)	
Valve spring free length	IN/EX	33.5 (1.32)	32.2 (1.27)	
Rocker arm	Rocker arm I.D.	IN/EX	10.000 - 10.015 (0.3937 - 0.3943)	10.10 (0.400)
	Rocker arm shaft O.D.	IN/EX	9.972 - 9.987 (0.3926 - 0.3932)	9.91 (0.390)
	Side spring free length		16.5 (0.65)	15 (0.6)
Camshaft	Cam lobe height	IN	29.2365 - 29.3165 (1.15104 - 1.15419)	29.2065 (1.14986)
		EX	29.2907 - 29.3707 (1.15318 - 1.15633)	29.2607 (1.15199)
	[P-type]	IN	27.8909 - 27.9709 (1.09806 - 1.10121)	27.8623 (1.09694)
		EX	27.9503 - 28.0303 (1.10040 - 1.10355)	27.9217 (1.09928)

TORQUE VALUES

Cylinder head bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply oil to the threads and flange surface.
Cam sprocket bolt	8.8 N·m (0.9 kgf·m, 6.5 lbf·ft)	Apply oil to the threads and flange surface.
Cam chain tensioner lifter screw ('02 - '05 model)	3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)	
PCV joint bolt (After '05 model)	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Spark plug	12 N·m (1.2 kgf·m, 9 lbf·ft)	

CYLINDER HEAD/VALVES

TOOLS

<p>Valve spring compressor 07757-0010000</p> 	<p>Seat cutter, 20.5 mm (45° IN) 07780-0011000</p>  <p>or equivalent commercially available in U.S.A.</p>	<p>Seat cutter, 17 mm (45° EX) 07780-0011100</p>  <p>or equivalent commercially available in U.S.A.</p>
<p>Flat cutter, 22 mm (32° IN) 07780-0012601</p>  <p>or equivalent commercially available in U.S.A.</p>	<p>Flat cutter, 20 mm (32° EX) 07780-0013200</p>  <p>or equivalent commercially available in U.S.A.</p>	<p>Interior cutter, 20.5 mm (60° IN) 07780-0014300</p>  <p>or equivalent commercially available in U.S.A.</p>
<p>Interior cutter, 17 mm (60° EX) 07780-0014600</p>  <p>or equivalent commercially available in U.S.A.</p>	<p>Cutter holder, 4.5 mm 07781-0010600</p>  <p>or equivalent commercially available in U.S.A.</p>	<p>Valve spring compressor attachment 07GME-KT70200</p>  <p>or equivalent commercially available in U.S.A.</p>
<p>Valve guide driver, 4.5 mm 07HMD-ML00101</p> 	<p>Valve guide reamer, 4.508 mm 07HMH-ML00101</p>  <p>or 07HMH-ML0010B or 07HMH-ML0010A (U.S.A. only)</p>	<p>Cam chain tensioner stopper 070MG-0010100</p>  <p>or 07AMG-001A100 (U.S.A. only)</p>

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problem can be diagnosed by a compression test or by tracing engine noises to the top-end with a sounding rod or stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather drain hose. If the hose is smoky, check for a seized piston ring (page 12-8).

Compression too low, hard starting or poor performance at low speed

- Valves:
 - Incorrect valve adjustment
 - Burned or bent valve
 - Incorrect valve timing
 - Broken valve spring
 - Uneven valve seating
- Cylinder head:
 - Leaking or damaged head gasket
 - Warped or cracked cylinder head
 - Loose spring plug
- Worn cylinder, piston or piston rings (page 12-8).

Compression too high, overheating or knocking

- Excessive carbon build-up on piston head or on combustion chamber

Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Worn cylinder, piston or piston rings (page 12-8).

Excessive noise

- Incorrect valve adjustment
- Sticking valve or broken valve spring
- Worn or damaged camshaft
- Worn or damaged cam chain
- Worn cam sprocket teeth
- Worn rocker arm and/or shaft
- Worn or damaged cam chain tensioner
- Worn cylinder, piston or piston rings (page 12-8)

Rough idle

- Low cylinder compression

CYLINDER HEAD/VALVES

CYLINDER COMPRESSION TEST

Warm up the engine to normal operating temperature.

Stop the engine and remove the spark plug cap and spark plug.

Install a compression gauge into the spark plug hole.

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 until the gauge reading stops rising. The maximum reading is usually reached within 4 – 7 seconds.

COMPRESSION PRESSURE:

1,393 kPa (14.2 kg/cm², 202 psi) at 1,500 rpm

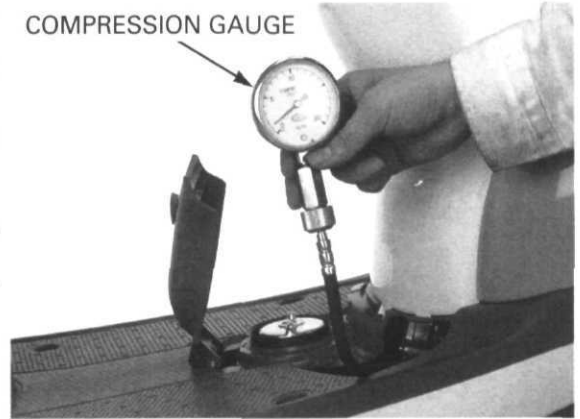
Low compression can be caused by:

- Blown cylinder head gasket
- Improper valve adjustment
- Valve leakage
- Worn piston ring or cylinder

High compression can be caused by:

- Carbon deposits in the combustion chamber or on piston head

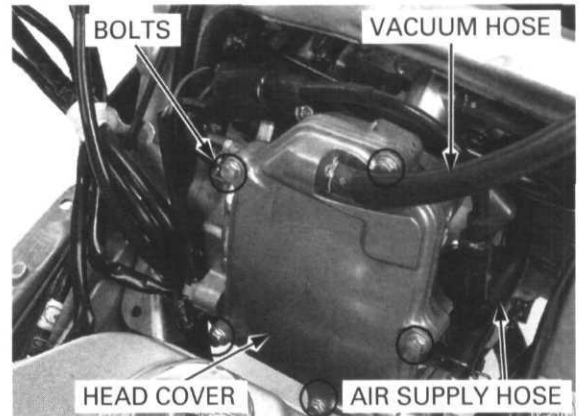
COMPRESSION GAUGE



CYLINDER HEAD COVER REMOVAL

Remove the fuel tank (page 5-28).

Disconnect the vacuum hose and air supply hose. Remove the bolts and cylinder head cover.



Remove the O-rings from the cylinder head cover.



CAMSHAFT/ROCKER ARM REMOVAL

Remove the following:

- Belt case cover (page 9-5)
- Water pump (page 6-9)
- Cylinder head cover (page 8-6)

Rotate the drive pulley (crankshaft) counterclockwise and align the index line on the cam sprocket with the index mark on the stopper plate.

Make sure the cam lobe faces the cylinder side (TDC on the compression stroke).

If the cam lobe is facing the rocker arm side (TDC on exhaust stroke), rotate the crankshaft counterclockwise 360 (one full turn) so the cam lobe faces the cylinder side.

Shift the rocker arms to the spring side and remove the shims.

NOTE:

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

'02 - '05 model: Remove the screw and O-ring from the cam chain tensioner lifter.

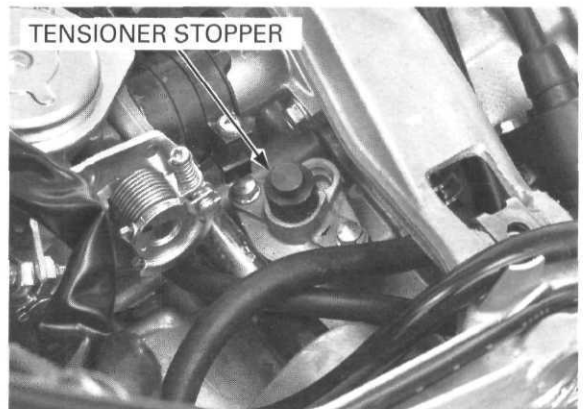
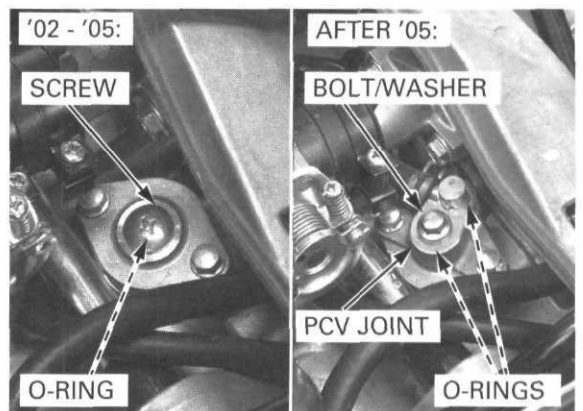
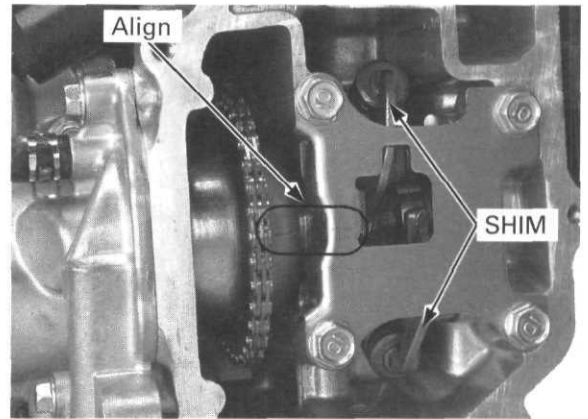
After '05 model: Remove the bolts, washer, PCV joint and O-rings.

Install the screwdriver into the tensioner body and turn the tool clockwise until it stops turning.

Turn the tensioner shaft clockwise with a special tool to hold the tensioner in the fully retracted position.

TOOL:

Cam chain tensioner stopper 070MG-0010100 or
07AMG-001A100
(U.S.A. only)

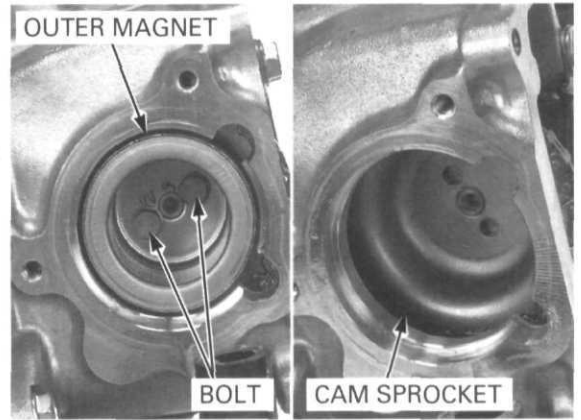


CYLINDER HEAD/VALVES

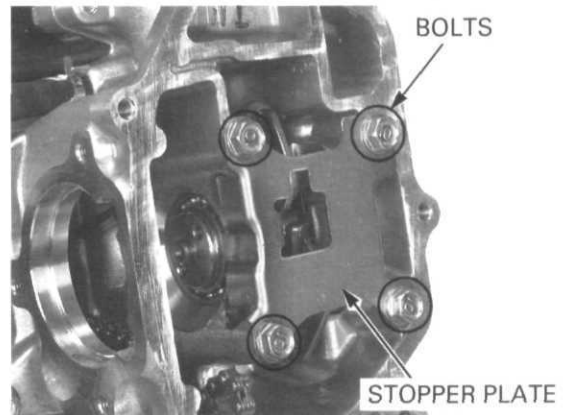
Remove the two bolts and outer magnet while holding the crankshaft.

Remove the cam sprocket from the camshaft and cam chain off the cam sprocket.

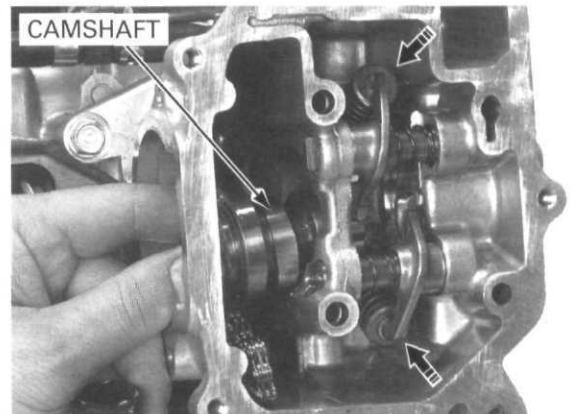
Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.



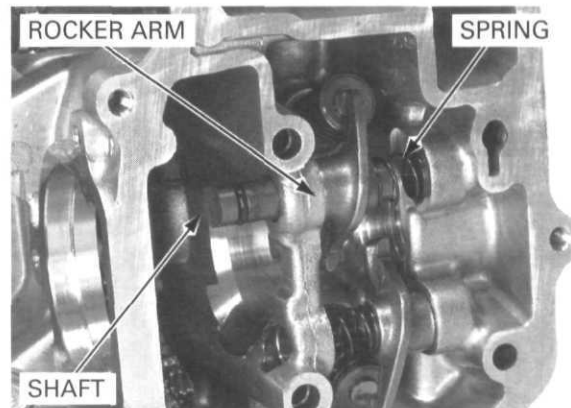
Remove the bolts and stopper plate.



Remove the camshaft while pressing down the valve side of the rocker arm.



Remove the rocker arm shafts, rocker arms and springs.



INSPECTION

CAMSHAFT

Check the camshaft bearing for wear or damage. Turn the bearing outer race. The bearings should turn smoothly and quietly. Also check that the inner race fits tightly on the camshaft.



Check the cam lobe for excessive wear and damage. Measure the height of each cam lobe.

SERVICE LIMITS:

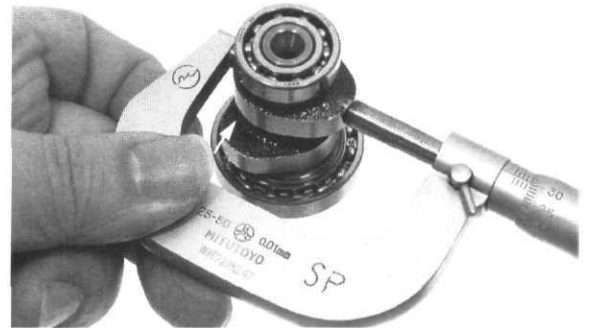
IN: 29.2065 mm (1.14986 in)

EX: 29.2607 mm (1.15199 in)

[P-type]

IN: 27.8623 mm (1.09694 in)

EX: 27.9217 mm (1.09928 in)



ROCKER ARM/SHAFT

Check the rocker arm shafts and rocker arms for wear or damage.

Measure the I.D. of each rocker arm.

SERVICE LIMIT: IN/EX:10.10 mm (0.400 in)

Measure the O.D. of each rocker arm shaft.

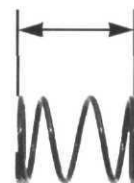
SERVICE LIMIT: IN/EX:9.91 mm (0.390 in)



SIDE SPRING

Measure the free length of the springs.

SERVICE LIMIT: IN/EX:15 mm (0.6 in)



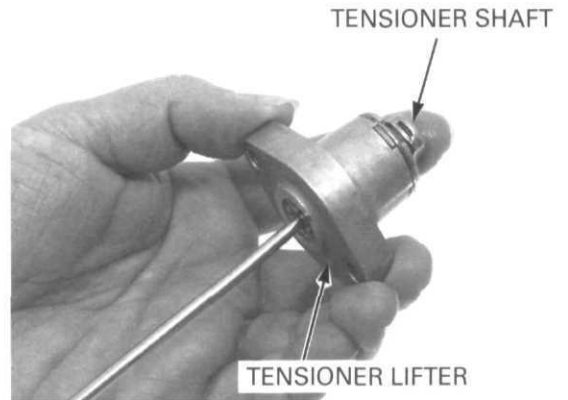
CYLINDER HEAD/VALVES

CAM CHAIN TENSIONER LIFTER

Remove the two bolts and tensioner lifter.

Check the lifter operation:

- The tensioner shaft should not go into the body when it is pushed.
- When it is turned clockwise with a screwdriver, the tensioner shaft should be pulled into the body. The shaft should spring out of the body as soon as the screwdriver is released.

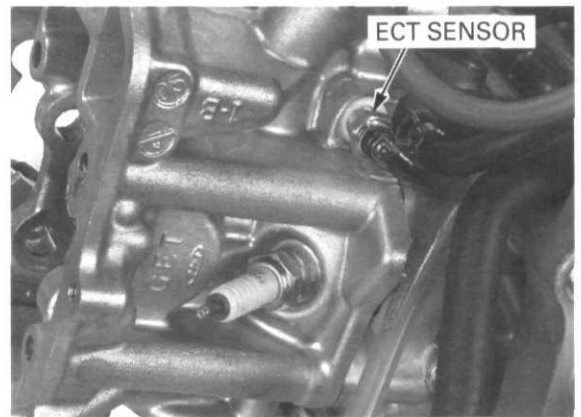


CYLINDER HEAD REMOVAL

Remove the following:

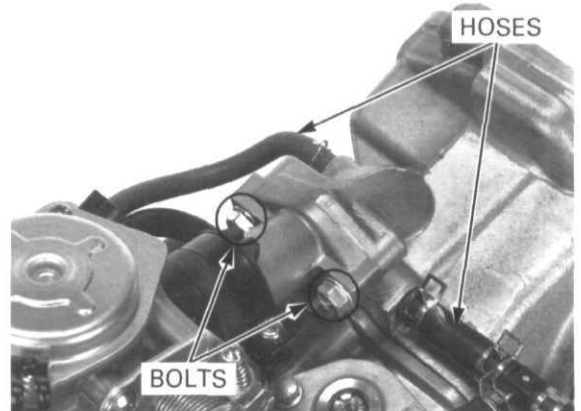
- Muffler (page 2-13)
- Camshaft/rocker arm (page 8-7)

Disconnect the ECT sensor connector.

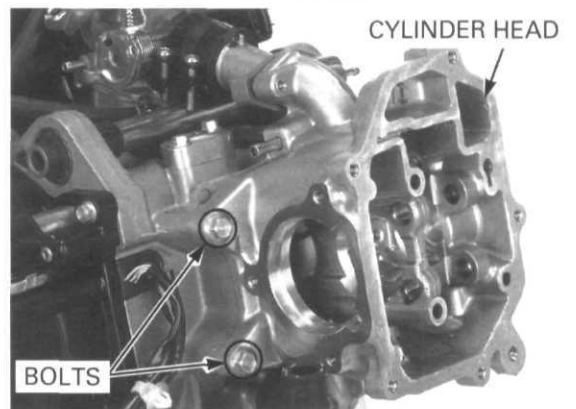


Disconnect the vacuum hose and water hose.

Remove the manifold joint bolts.



Remove the bolts and cylinder head.

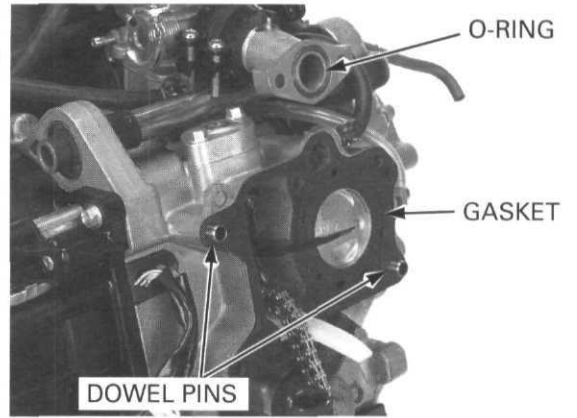


Be careful not to damage the mating surface.

Remove the gasket and dowel pins.

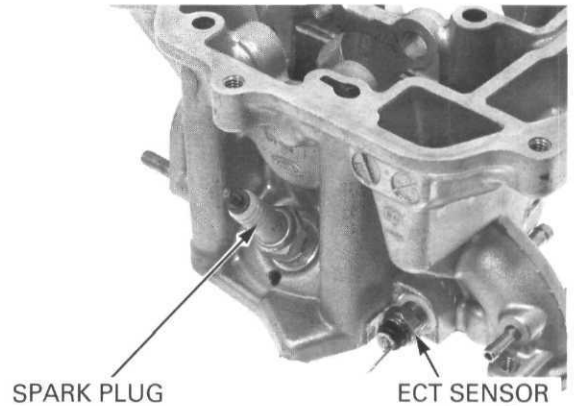
After '05 model: Remove the intake manifold plate and gasket (page 5-9).

Remove the O-ring from the intake manifold groove.



CYLINDER HEAD DISASSEMBLY

Remove the spark plug and ECT sensor from the cylinder head.



To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.

Remove the valve spring cotters using the valve spring compressor.

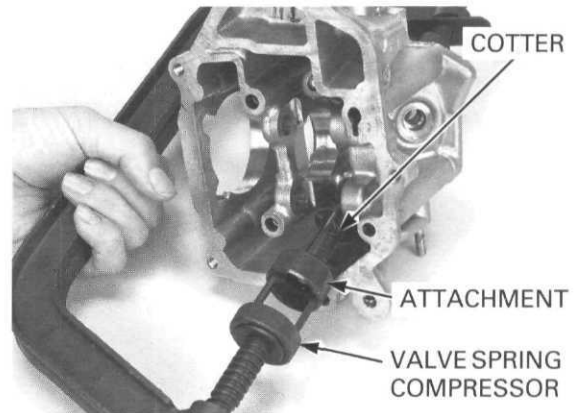
TOOL:

Valve spring compressor

07757-0010000

Valve spring compressor attachment

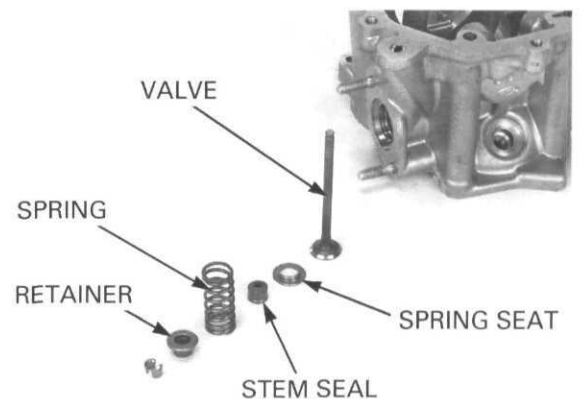
07GME-KT70200



Mark all parts during disassembly so they can be placed back in their original locations.

Remove the valve spring compressor, then remove the following:

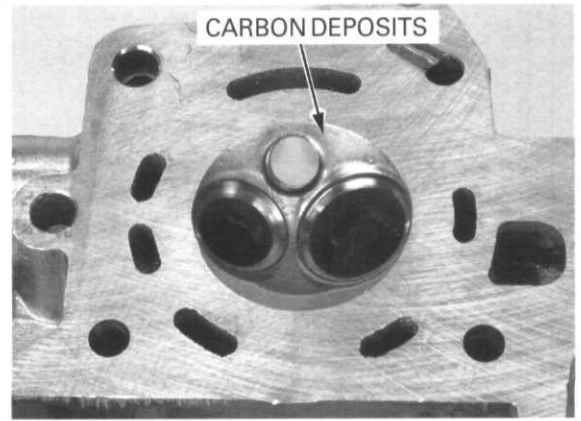
- retainers
- valve springs
- spring seats
- valves
- stem seals



Avoid damaging the mating and valve seat surfaces.

CYLINDER HEAD/VALVES

Remove the carbon deposits from the combustion chamber and clean off the head gasket surface.



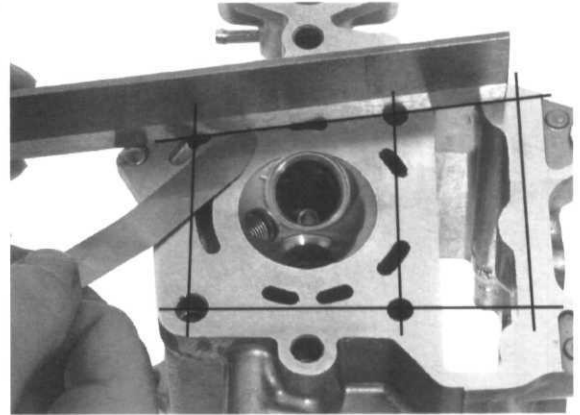
INSPECTION

CYLINDER HEAD

Check the spark plug hole and valve areas for cracks.

Check the cylinder head for warpage with a straight edge and feeler gauge.

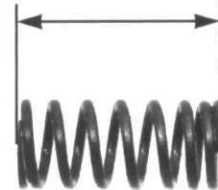
SERVICE LIMIT: 0.05 mm (0.002 in)



VALVE SPRINGS

Measure the free length of the valve springs.

SERVICE LIMIT: IN/EX: 32.2 mm (1.27 in)



VALVE/VALVE GUIDE

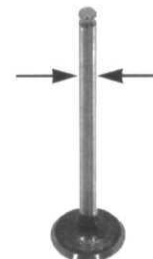
Check that the valve moves smoothly in the guide. Check each valve for bends, burns, scratches or abnormal wear.

Measure each valve stem O.D. and record it.

SERVICE LIMIT:

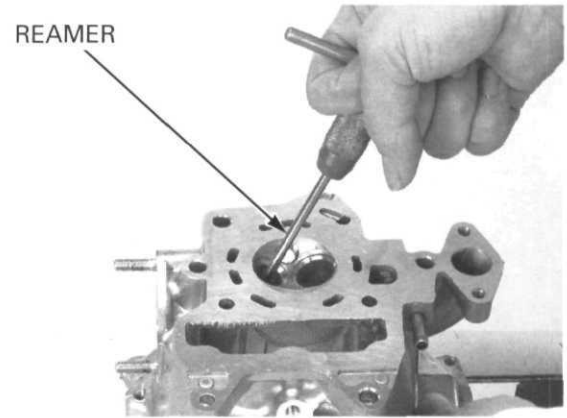
IN: 4.465 mm (0.1758 in)

EX: 4.455 mm (0.1754 in)



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.

TOOL:
Valve guide reamer, 4.5 mm 07HMH-ML00101 or
07HMH-ML0010B or
07HMH-ML0010A
(U.S.A. only)



Measure each valve guide I.D. and record it.

SERVICE LIMIT: IN/EX: 4.54 mm (0.179 in)

Subtract each valve stem O.D. from the corresponding guide I.D. to obtain the stem-to-guide clearance.

SERVICE LIMIT:
IN: 0.075 mm (0.0030 in)
EX: 0.085 mm (0.0033 in)

Inspect and reface the valve seats whenever the valve guides are replaced (page 8-13).

If the stem-to-guide clearance exceeds the service limit, determine if a new guide with standard dimensions would bring the clearance within tolerance.

If so, replace any guides as necessary and ream to fit.

If the stem-to-guide clearance exceeds the service limit with new guide, also replace the valve.

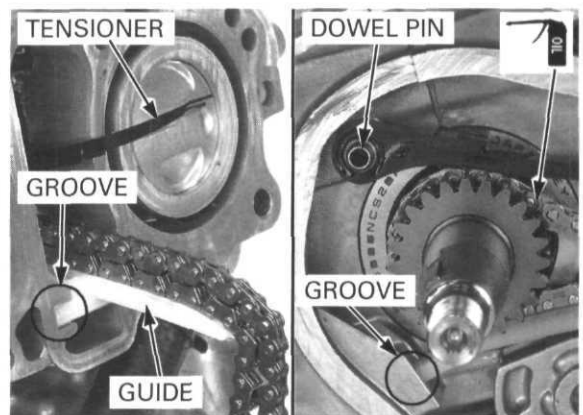
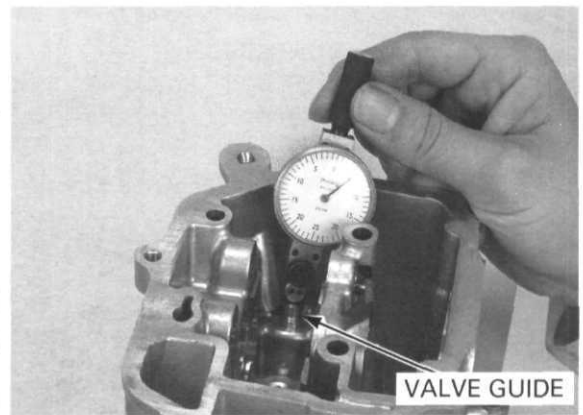
CAM CHAIN TENSIONER/GUIDE

Check the tensioner and guide for excessive wear or damage.

If necessary replacement in the following procedure.

Remove the oil pump driver gear (page 4-4).
Remove the dowel pin and cam chain tensioner.
Remove the cam chain guide from the cylinder and crankcase grooves.
Remove the cam chain.

Installation is in the reverse order of removal.



VALVE GUIDE REPLACEMENT

Chill the valve guides in a freezer for about 1 hour.

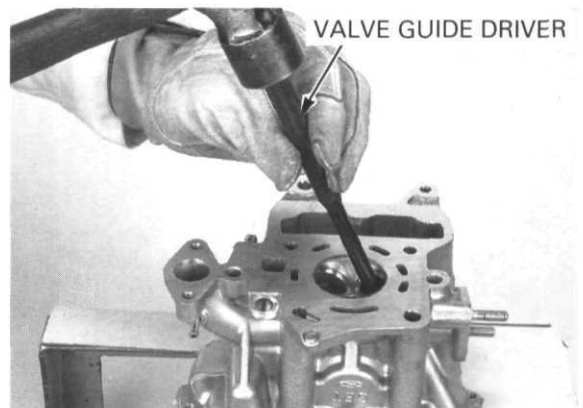
Be sure to wear heavy gloves to avoid burns when handling the heated cylinder head.

Heat the cylinder head to 130 °C – 140 °C (275 °F – 290 °F) with a hot plate or oven. Do not heat the cylinder head beyond 150 °C (300 °F). Use temperature indicator sticks, available from welding supply stores, to be sure the cylinder head is heated to the proper temperature.

Using a torch to heat the cylinder head may cause warpage.

Support the cylinder head and drive the valve guides out of the cylinder head from the combustion chamber side.

TOOL:
Valve guide driver, 4.5 mm 07HMD-ML00101



CYLINDER HEAD/VALVES

Remove the new valve guides from the freezer.

Drive the new guides into the cylinder head from the camshaft side while the cylinder head is still heated.

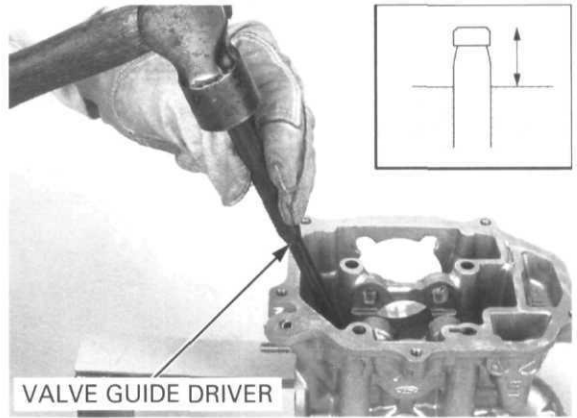
TOOL:

Valve guide driver 07HMD-ML00101

VALVE GUIDE PROJECTION:

IN/EX: 9.05 – 9.35 mm (0.356 – 0.368 in)

Let the cylinder head cool to room temperature.



Ream the new valve guides after installation.

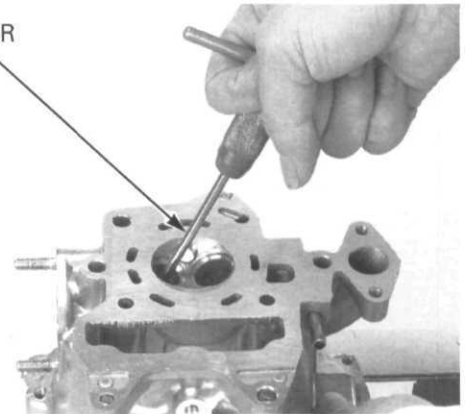
Take care not to tilt or lean the reamer in the guide while reaming. Use cutting oil on the reamer during this operation.

Insert the reamer from the combustion chamber side of the head and also always rotate the reamer clockwise.

TOOL:

Valve guide reamer, 4.5 mm 07HMH-ML00101 or 07HMH-ML0010B or 07HMH-ML0010A (U.S.A. only)

REAMER



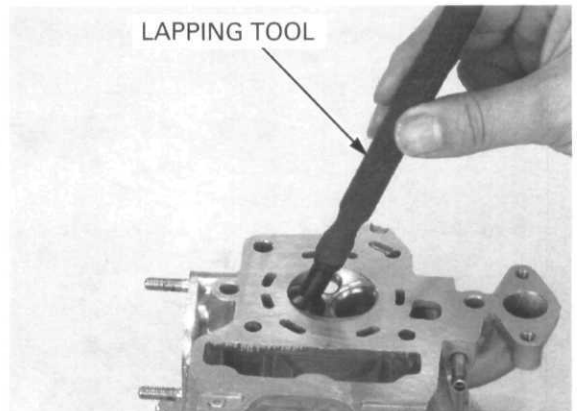
Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat as described below.

VALVE SEAT INSPECTION/REFACING

Clean the intake and exhaust valves thoroughly to remove carbon deposits.

Apply a light coat of Prussian Blue to the valve seats.

Tap the valve against the valve seat several times using a hand-lapping tool, without rotating the valve, to make a clear pattern.



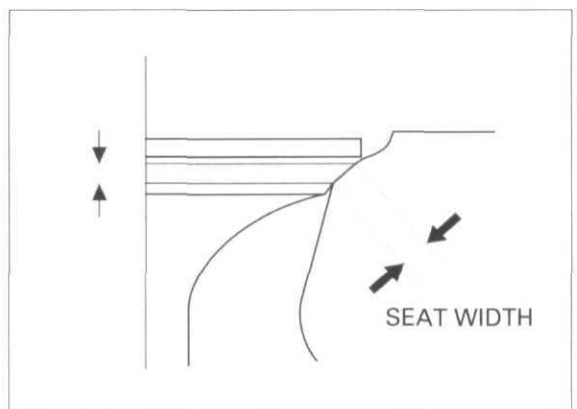
The valves cannot be ground. If the valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.

Remove the valve and inspect the valve seat face. The valve seat contact should be within the specified width and even all around the circumference.

STANDARD: 1.0 mm (0.04 in)

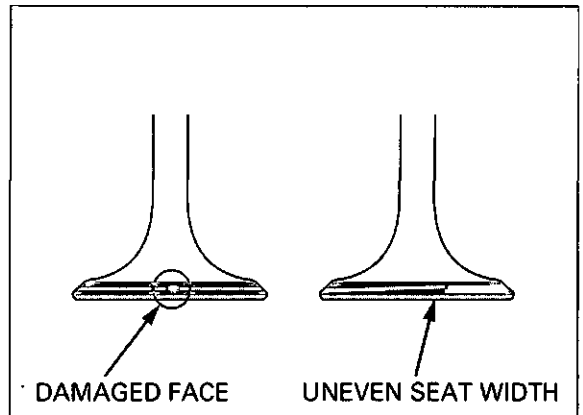
SERVICE LIMIT: 1.5 mm (0.06 in)

If the valve seat width is not within specification, reface the valve seat (page 8-15).

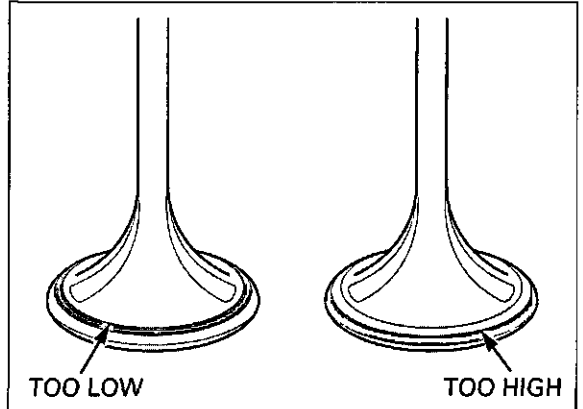


Inspect the valve seat face for:

- Damaged face:
 - Replace the valve and reface the valve seat
- Uneven seat width:
 - Bent or collapsed valve stem; Replace the valve and reface the valve seat



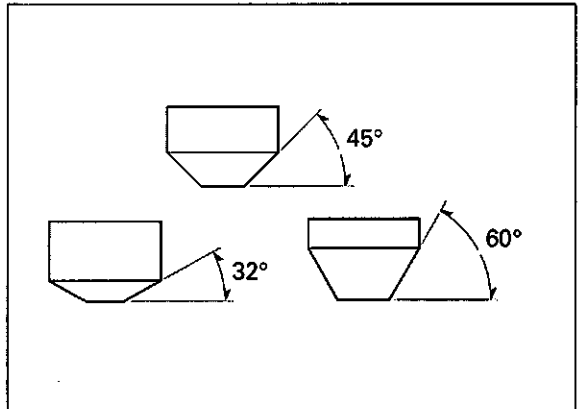
- Contact area (too low or too high area):
 - Reface the valve seat



VALVE SEAT REFACING

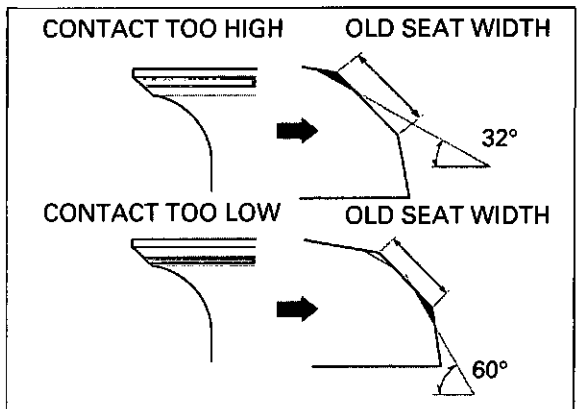
NOTE:

- Follow the refacing manufacturer's operating instructions.
- Be careful not to grind the seat more than necessary.



If the contact area is too high on the valve, the seat must be lowered using a 32° flat cutter.

If the contact area is too low on the valve, the seat must be raised using a 60° interior cutter. Refinish the seat to specifications, using a 45° finish cutter.



CYLINDER HEAD/VALVES

Reface the seat with a 45-degree cutter whenever a valve guide is replaced.

Use a 45° seat cutter, remove any roughness or irregularities from the seat.

TOOLS:

Seat cutter, 20.5 mm (45° IN)

Seat cutter, 17 mm (45° EX)

Cutter holder, 4.5 mm

07780-0011000

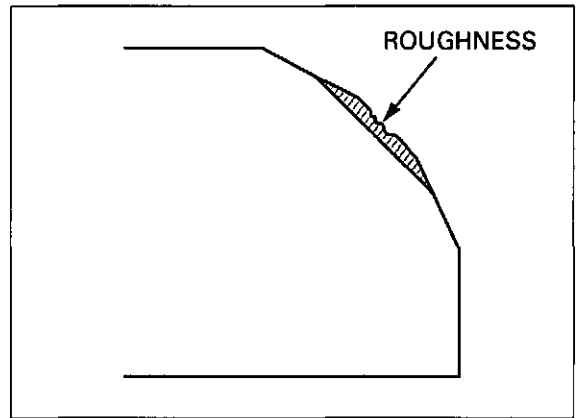
07780-0011100

07781-0010600 or

equivalent

commercially

available in U.S.A.



Use a 32° flat cutter, remove 1/4 of the existing valve seat material.

TOOLS:

Flat cutter, 22 mm (32° IN)

Flat cutter, 20 mm (32° EX)

Cutter holder, 4.5 mm

07780-0012601

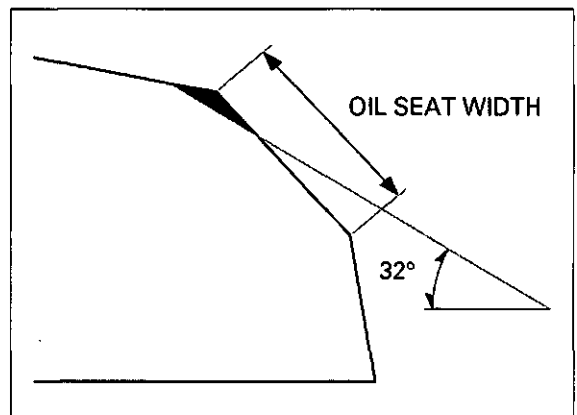
07780-0013200

07781-0010600 or

equivalent

commercially

available in U.S.A.



Use a 60° interior cutter, remove 1/4 of the existing valve seat material.

TOOLS:

Interior cutter, 20.5 mm (60° IN)

Interior cutter, 17 mm (60° EX)

Cutter holder, 4.5 mm

07780-0014300

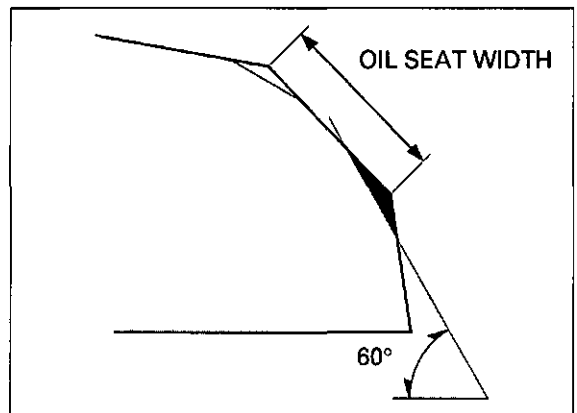
07780-0014600

07781-0010600 or

equivalent

commercially

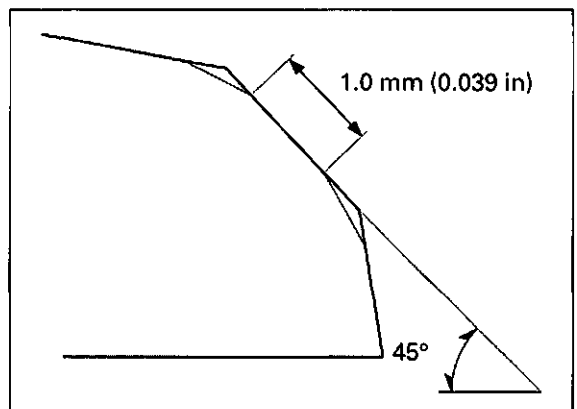
available in U.S.A.



Using a 45° seat cutter, cut the seat to the proper width.

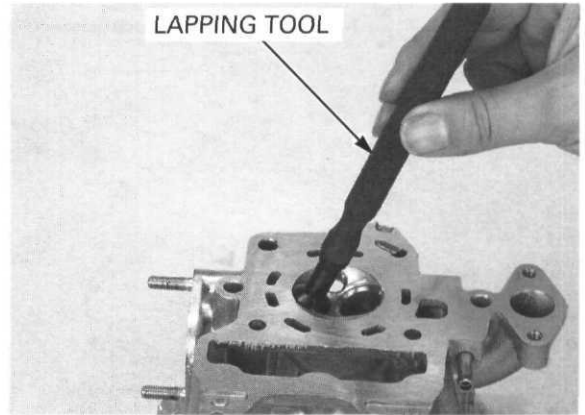
VALVE SEAT WIDTH: 1.0 mm (0.039 in)

Make sure all pitting and irregularities are removed.

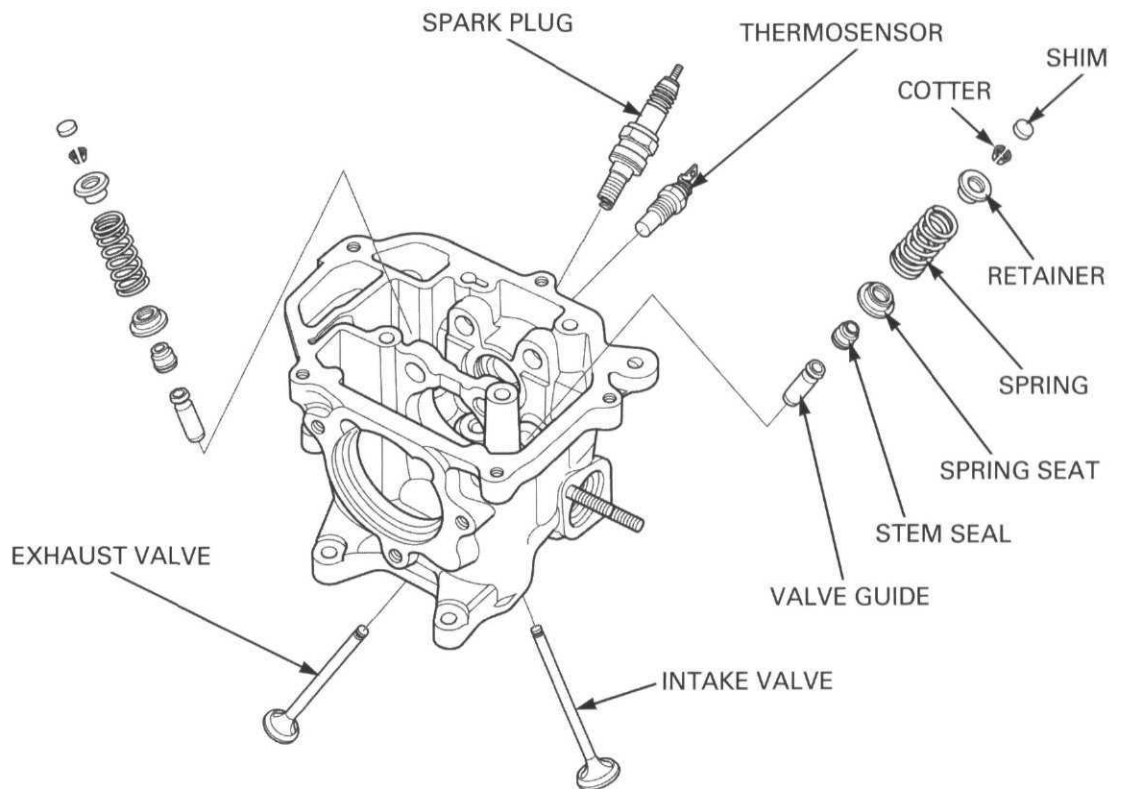


Excessive lapping pressure may deform or damage the seat. Do not allow lapping compound to enter the guides.

After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure. Change the angle of the lapping tool frequently to prevent uneven seat wear, After lapping, wash any residual compound off the cylinder head and valve and recheck the seat contact.



CYLINDER HEAD ASSEMBLY



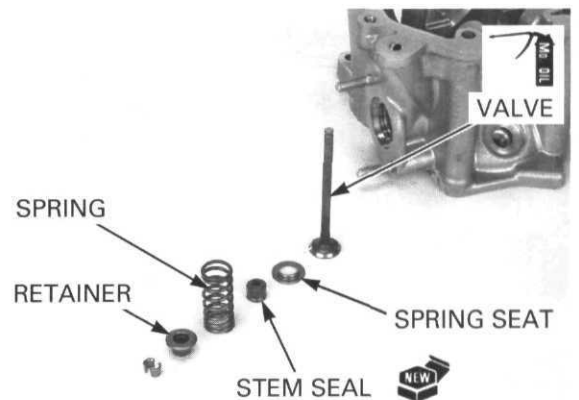
Blow out the oil passage in the cylinder head with compressed air.

Apply engine oil to the inner surface of new stem seals.

Install the spring seats and stem seals.

Lubricate the valve stem sliding surface with molybdenum oil solution.

Insert the valves into the guide while turning it slowly to avoid damage to the stem seal.

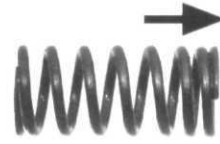


CYLINDER HEAD/VALVES

Install the valve springs with the tightly wound coils should facing the combustion chamber.

Install the spring retainer.

COMBUSTION CHAMBERS



Grease the cotters to ease installation.

Install the valve spring cotters using the spring compressor.

To prevent loss of tension, do not compress the valve spring more than necessary to remove the cotters.

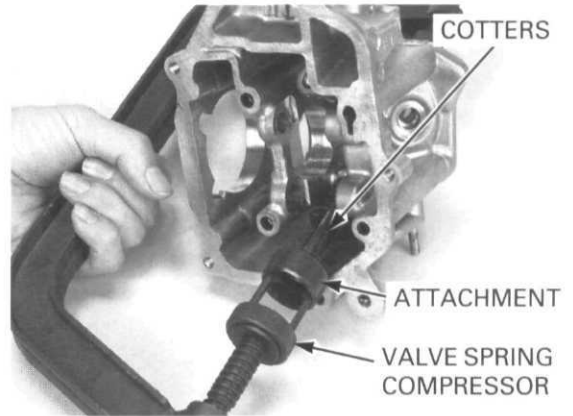
TOOLS:

Valve spring compressor

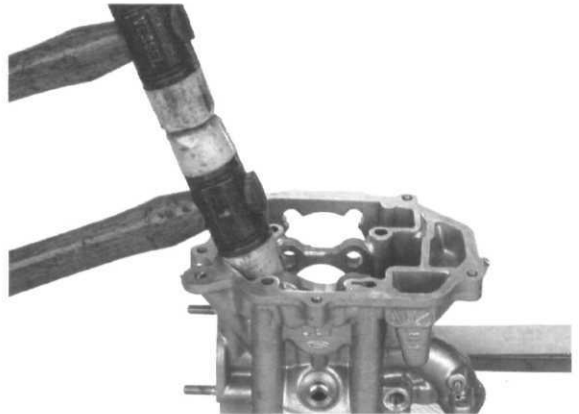
07757-0010000

Valve spring compressor attachment

07GME-KT70200



Support the cylinder head so the valve heads will not contact anything that cause damage. Tap the valve stems gently with two plastic hammers as shown to seat the cotters firmly.



CYLINDER HEAD INSTALLATION

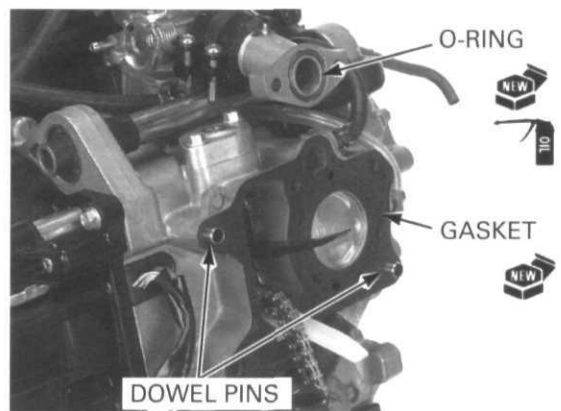
Clean the mating surface of the cylinder and cylinder head.

Install the cam chain, cam chain guide and tensioner (page 8-13).

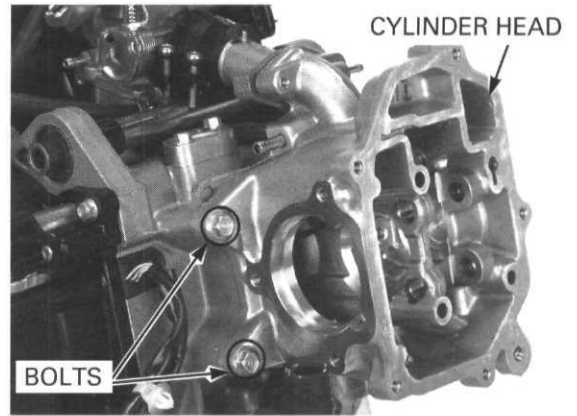
Install the dowel pins and a new gasket onto the cylinder.

Coat a new O-ring with engine oil and install it into the groove in the intake manifold.

After '05 model: Install the intake manifold plate and gasket (page 5-16).



Route the cam chain through the cylinder head and install the cylinder head onto the cylinder.
Install the cylinder head mounting bolts.

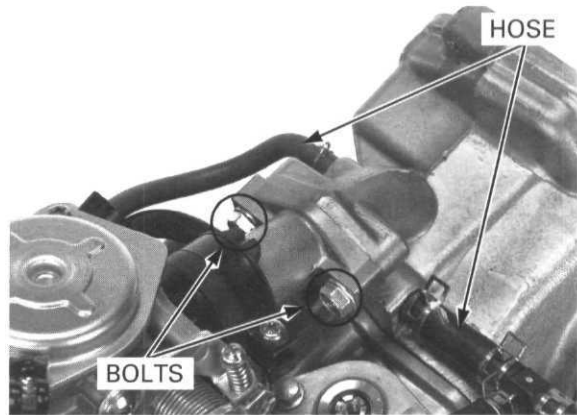


Install the intake manifold joint bolts and tighten them securely.
Connect the vacuum hose and water hose.
Install and tighten the spark plug to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the following:

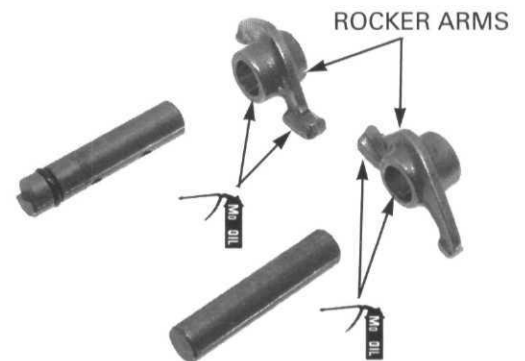
- thermostat (page 18-16)
- muffler (page 2-13)
- camshaft/rocker arm (see below)



CAMSHAFT/ROCKER ARM INSTALLATION

ROCKER ARM HOLDER ASSEMBLY

Apply molybdenum oil solution to the sliding and slipper surfaces of the rocker arms.

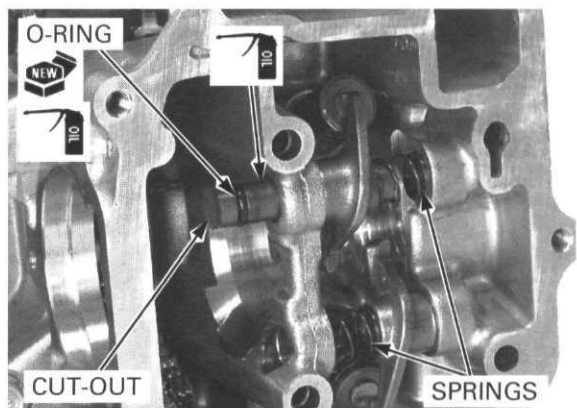


Install the rocker arm and side spring as shown.

Coat a new O-ring with engine oil and install it to the intake rocker arm shaft.

Install the intake shaft with the cut-out facing outside.

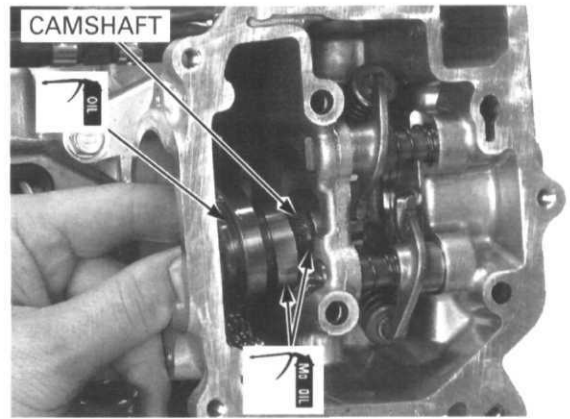
Apply engine oil to the sliding surfaces of the rocker arm shafts and install it to the cylinder head.



CYLINDER HEAD/VALVES

Apply oil to the camshaft bearings.
Apply molybdenum oil solution to the cam lobe.

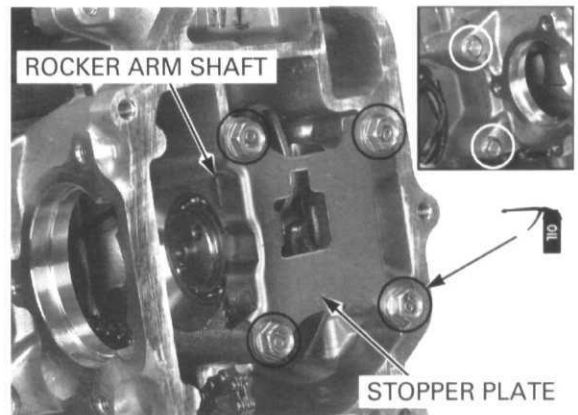
Install the camshaft with the cam lobe facing the cylinder side while pressing down on the valve side of the rocker arm.



Apply engine oil to the cylinder head bolt threads and sealing surfaces.
Install the stopper plate onto the cylinder head as shown.
Install the bolts and tighten them in a crisscross pattern in two or three steps to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

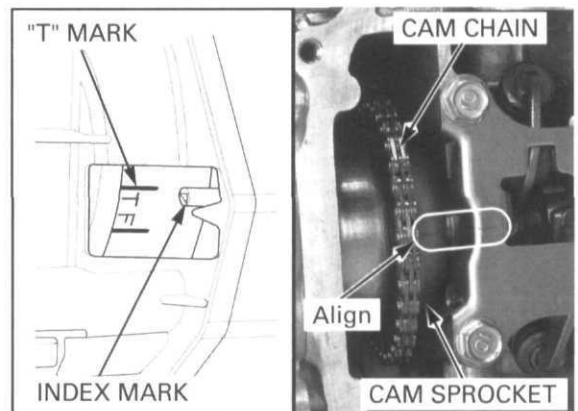
If the cylinder head is removed, tighten the outside bolts of the cylinder head.



Remove the radiator cover.
Turn the drive pulley (crankshaft) counterclockwise and align the "T" mark on the flywheel with the index mark while holding the cam chain.

Make sure the cam lobe faces the cylinder side (TDC on the compression stroke).

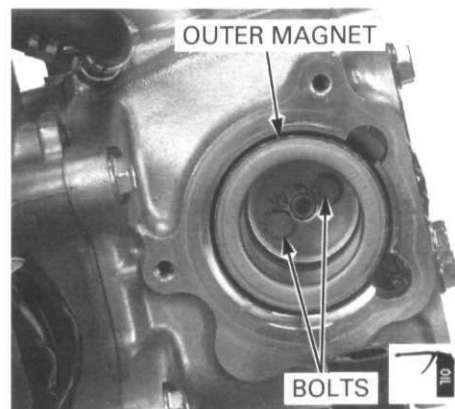
Install the cam sprocket onto the cam chain, aligning the index line on the cam sprocket with the index mark on the stopper plate.



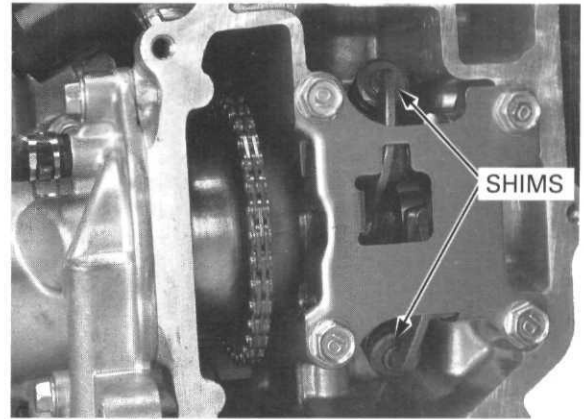
Apply engine oil to the cam sprocket bolt threads and sealing surfaces.

Clean the inside of the outer magnet and check that no nuts or bolts are attached to the magnet.
Install the outer magnet and bolts.
Tighten the bolts to the specified torque while holding the crankshaft.

TORQUE: 8.8 N·m (0.9 kgf·m, 6.5 lbf·ft)



Install the valve shims in their original locations.

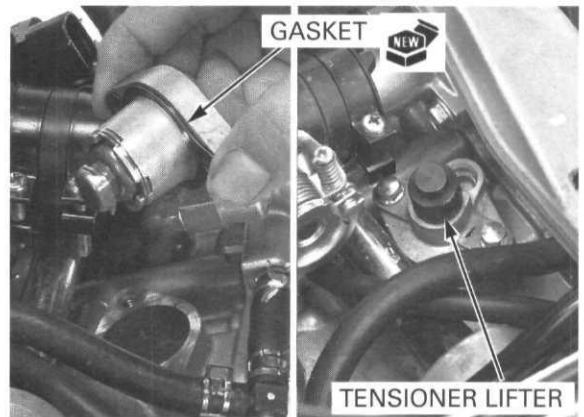


Turn the tensioner shaft clockwise with the special tool to hold the tensioner in the fully retracted position.

TOOL:
Cam chain tensioner stopper 070MG-0010100 or 07AMG-001A100 (U.S.A. only)

Install a new gasket into the cam chain tensioner lifter.

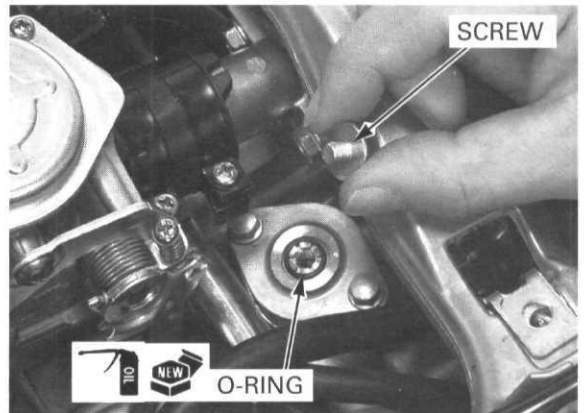
Install the cam chain tensioner onto the cylinder and tighten the bolts securely.



'02 - '05 model: Remove the special tool to cancel the lock of the tensioner lifter.

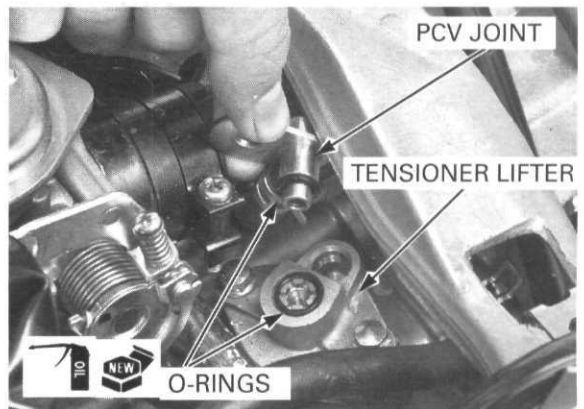
Coat a new O-ring with engine oil.
 Install and tighten the lifter screw to the specified torque.

TORQUE: 3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)



After '05 model: Remove the special tool to cancel the lock of the tensioner lifter.

Coat new O-rings with engine oil.
 Install new O-rings to the PCV joint and cam chain tensioner lifter groove.
 Install the PCV joint to the cam chain tensioner.



CYLINDER HEAD/VALVES

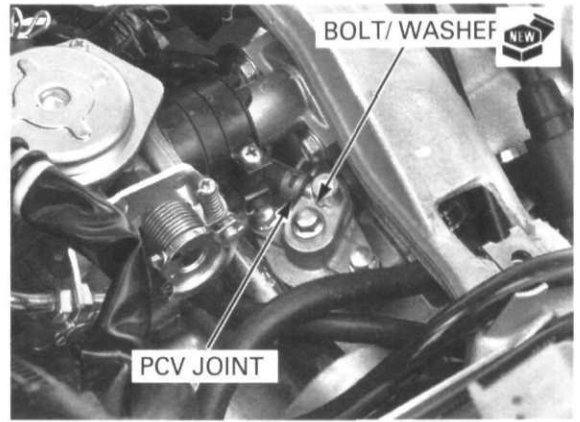
Install the bolt and a new washer.
Tighten the bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Make sure the index line on the cam sprocket aligns with the index mark on the stopper plate when the "T" mark on the flywheel is aligned with the index mark on the crankcase.

Install the following:

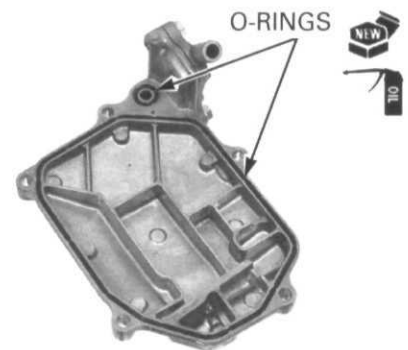
- Water pump (page 6-9)
- Belt case cover (page 9-5)



CYLINDER HEAD COVER INSTALLATION

Clean the gasket groove of the cylinder head cover.

Coat a new O-rings with engine oil and install them into the grooves in the cylinder head cover.

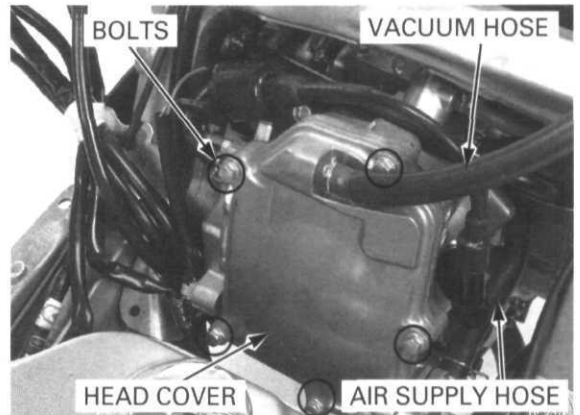


Install the cylinder head cover to the cylinder head.

Install the bolts and tighten them in a crisscross pattern in two or three steps.

Connect the vacuum hose and air supply hose.

Install the fuel tank (page 5-28).



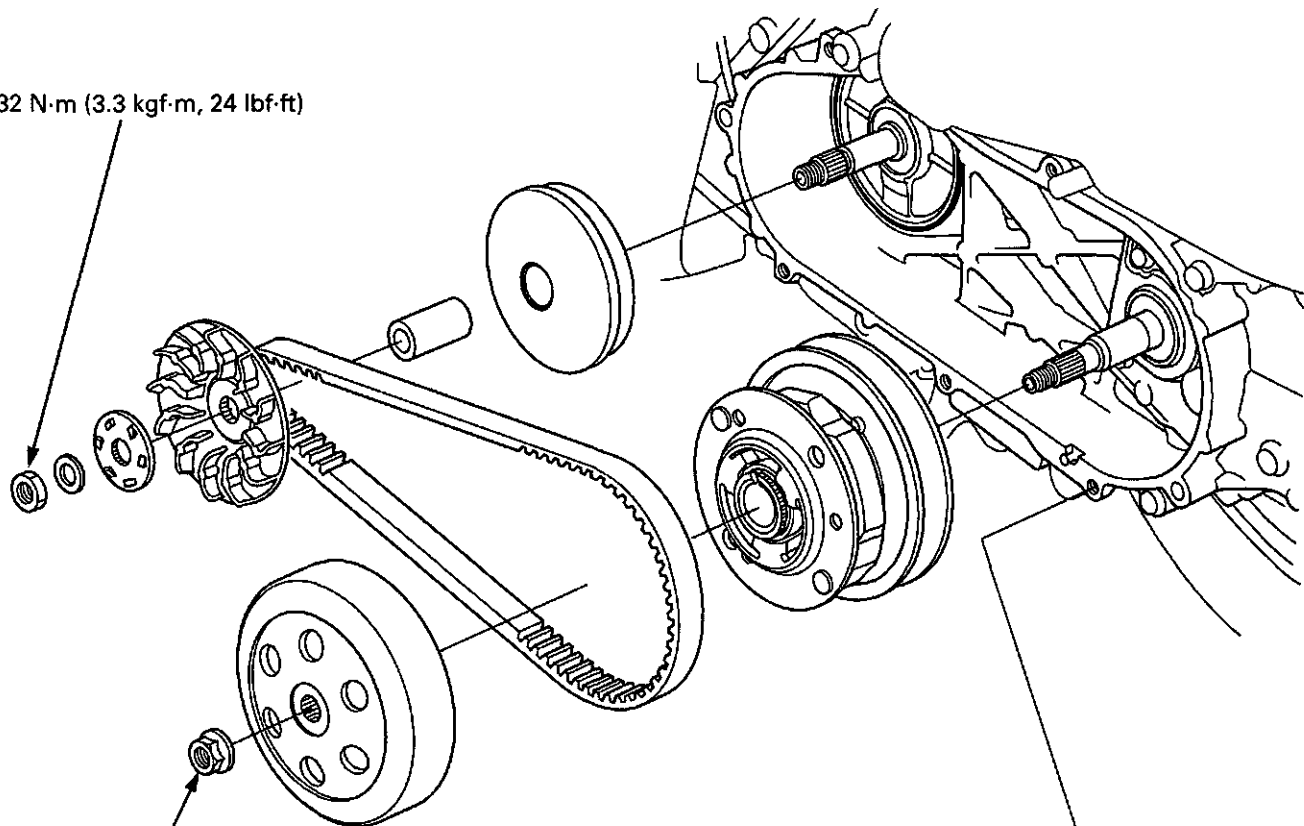
9. KICKSTARTER/DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

COMPONENT LOCATION	9-2	KICKSTARTER	9-6
SERVICE INFORMATION	9-3	DRIVE PULLEY	9-9
TROUBLESHOOTING	9-4	CLUTCH/DRIVEN PULLEY	9-12
BELT CASE COVER	9-5		

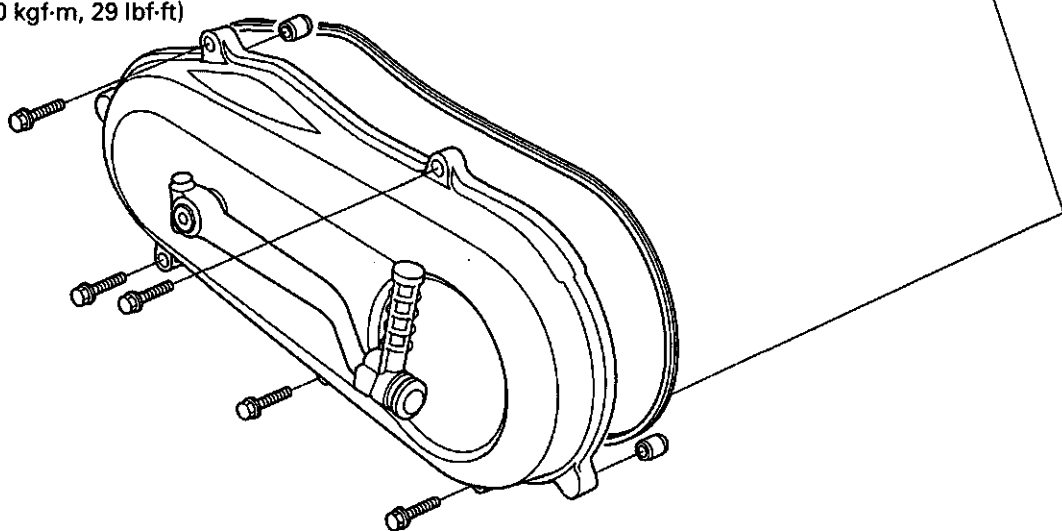
KICKSTARTER/DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

COMPONENT LOCATION

32 N·m (3.3 kgf·m, 24 lbf·ft)



39 N·m (4.0 kgf·m, 29 lbf·ft)



SERVICE INFORMATION

GENERAL

- This section covers maintenance of the kickstarter, drive pulley, driven pulley and clutch.
- These services can be done with the engine installed in the frame.
- Avoid getting grease and oil on the V-belt and pulley drive faces in order to prevent belt slippage.
- Do not apply grease to the movable drive face and weight rollers.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch	Clutch outer I.D.	107.0 – 107.2 (4.21 – 4.22)	107.5 (4.23)
	Lining thickness	-	2.0 (0.08)
Drive belt width		18.15 (0.715)	17.15 (0.68)
Movable drive face	Bushing I.D.	20.035 – 20.085 (0.7888 – 0.7907)	20.13 (0.793)
	Boss O.D.	20.010 – 20.025 (0.7878 – 0.7884)	19.97 (0.786)
	Weight roller O.D.	15.92 – 16.08 (0.627 – 0.633)	15.4 (0.61)
Driven pulley	Face spring face length	79.6 (3.13)	75.3 (2.96)
	Driven face O.D.	33.950 – 33.970 (1.3366 – 1.3374)	33.70 (1.327)
	Movable driven face I.D.	34.015 – 34.035 (1.3392 – 1.3400)	34.29 (1.350)

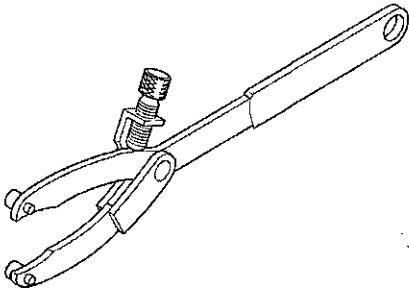
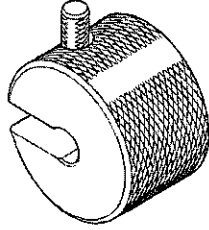
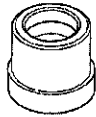


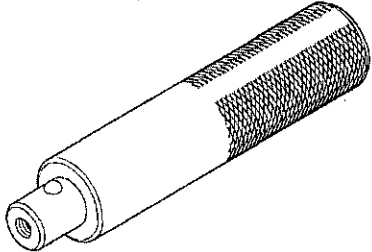
TORQUE VALUES

Drive pulley face nut
Clutch outer nut

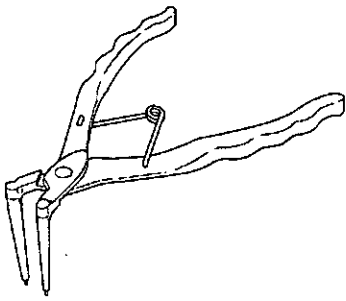
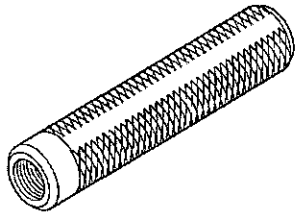
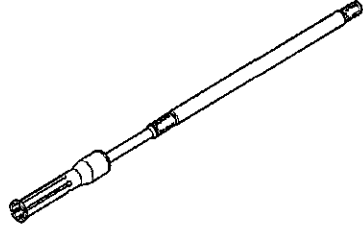
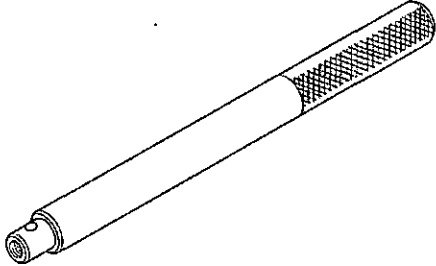
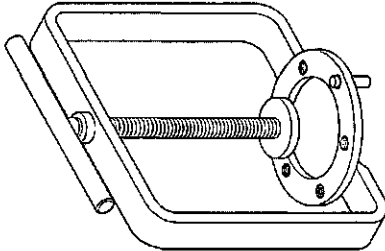
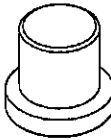
32 N·m (3.3 kgf·m, 24 lbf·ft)
39 N·m (4.0 kgf·m, 29 lbf·ft)

Apply oil to the threads and flange surface

TOOLS

<p>Universal holder 07725-0030000</p> 	<p>Remover weight 07741-0010201</p>  <p>or 07936-371020A or 07936-3710200 (U.S.A. only)</p>	<p>Attachment, 22 x 24 mm 07746-0010800</p> 
<p>Pilot, 12 mm 07746-0040200</p> 	<p>Pilot, 17 mm 07746-0040400</p> 	<p>Driver 07749-0010000</p> 

KICKSTARTER/DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

<p>Snap ring pliers 07914-SA50001</p> 	<p>Remover handle 07936-3710100</p> 	<p>Bearing remover, 17 mm 07936-3710300</p> 
<p>Driver 07949-3710001</p> 	<p>Clutch spring compressor 07LME-GZ40200</p>  <p>or 07960-KM1000A (U.S.A. only)</p>	<p>Puller attachment 07YMC-GCS0100</p> 

TROUBLESHOOTING

Engine starts but scooter won't move

- Worn drive belt
- Damaged ramp plate
- Worn or damaged clutch shoe
- Broken driven face spring

Engine stalls or scooter creeps

- Broken clutch shoe spring

Poor performance at high speed or lack of power

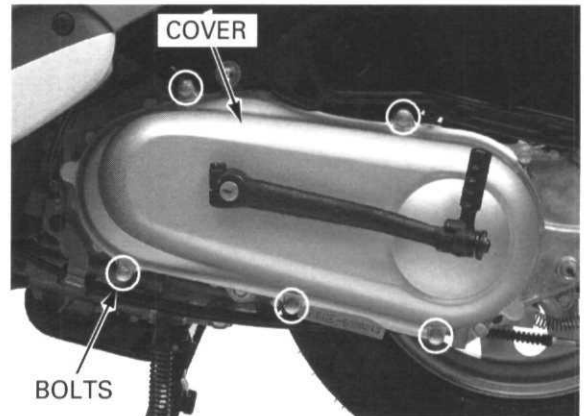
- Worn drive belt
- Weak driven face spring
- Worn weight rollers
- Contaminated pulley faces

BELT CASE COVER

REMOVAL

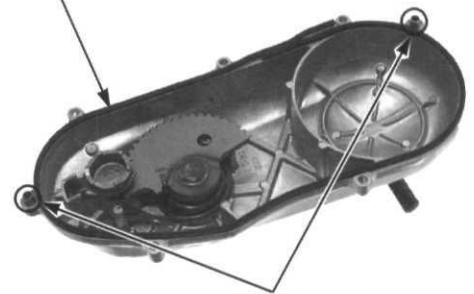
Remove the air cleaner housing cover (page 3-5).

Remove the bolts and the belt case cover.



Remove the rubber seal and dowel pins from the belt case cover.

RUBBER SEAL



DOWEL PINS

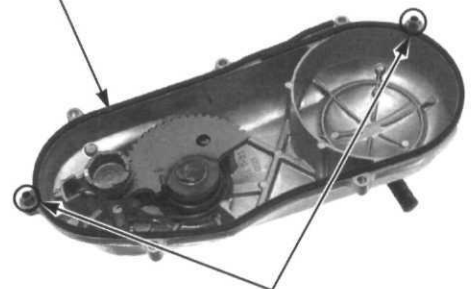
INSTALLATION

Check the rubber seal and replace it if it is necessary.

Clean the rubber seal groove in the belt case cover.

Install the dowel pins and the rubber seal onto the belt case cover.

RUBBER SEAL

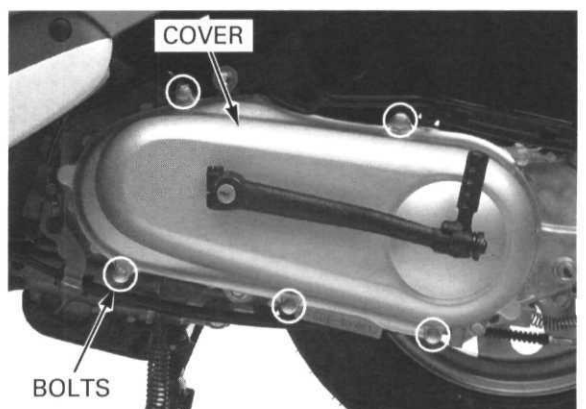


DOWEL PINS

Install the belt case cover onto the belt case by aligning the dowel pins with the holes.

Install and tighten the belt case cover bolts in a crisscross pattern in two or three steps.

Install the air cleaner housing cover (page 3-5).



BOLTS

KICKSTARTER

DISASSEMBLY

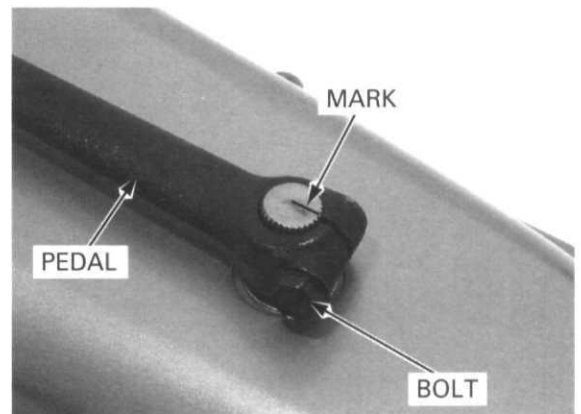
Remove the belt case cover (page 9-5).

Remove the kickstarter driven gear while turning the kickstarter pedal.



When disassembling, mark the pedal position to ensure that it is reinstalled in the original location.

Remove the bolt and kickstarter pedal.



Release the hook end of the return spring from the belt case cover.

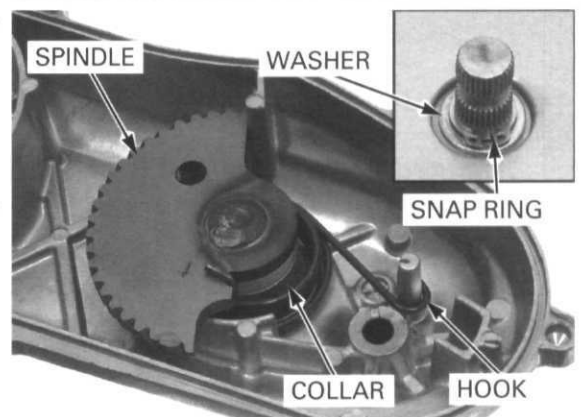
Remove the snap ring and washer.

TOOL:

Snap ring pliers

07914-SA50001

Remove the kickstarter spindle, return spring, collar and spindle bushing.

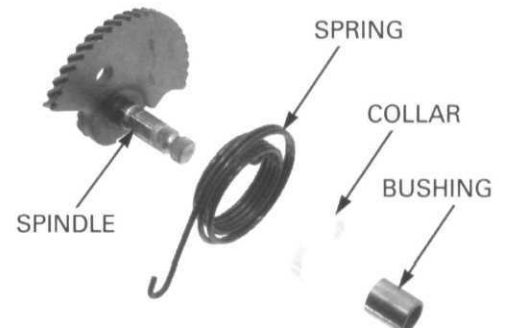


INSPECTION

Check the kickstarter spindle and spindle gear for wear or damage.

Check the return spring for fatigue or damage.

Check the collar and bushing for wear or damage.



KICKSTARTER/DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

Check the kickstarter driven gear and ratchet plate for wear or damage.
Check the friction spring for fatigue or damage.

DRIVEN GEAR



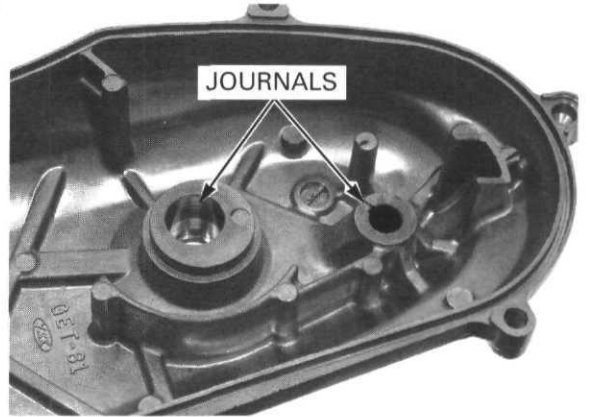
SPRING

RATCHET PLATE



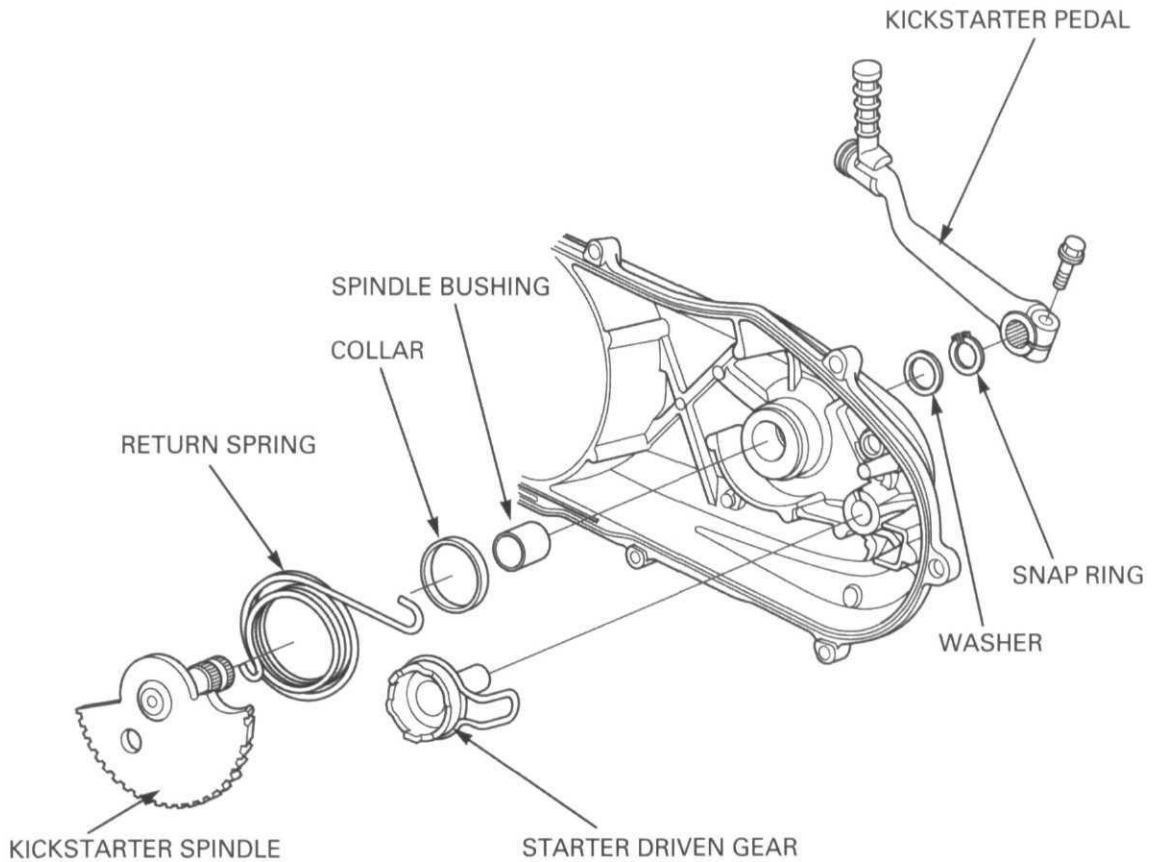
Check the journals of the belt case cover for wear or damage.

JOURNALS



KICKSTARTER/DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

ASSEMBLY

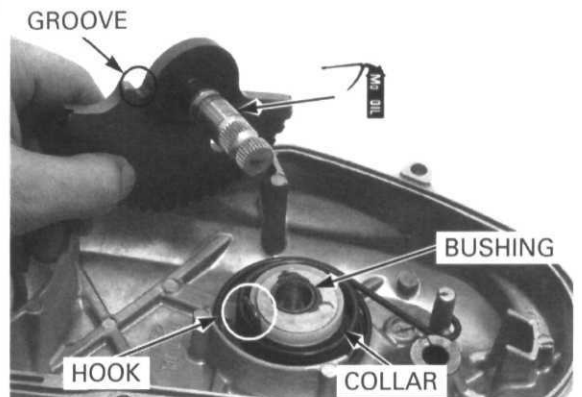


Install the spindle bushing and collar onto the belt case cover.

Install the return spring as shown.

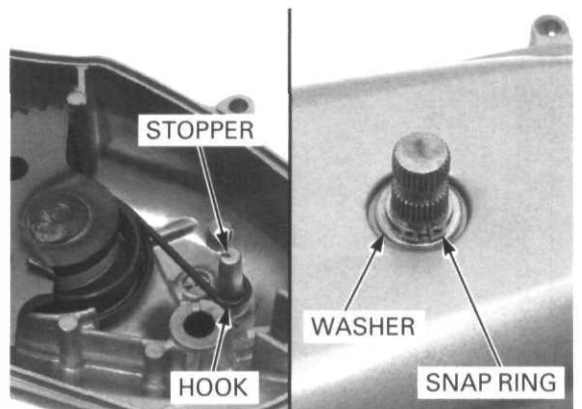
Apply molybdenum solution to the kickstarter spindle sliding surface.

Install the kickstarter spindle to the belt case cover and hook the return spring end onto the groove on the kickstarter spindle.

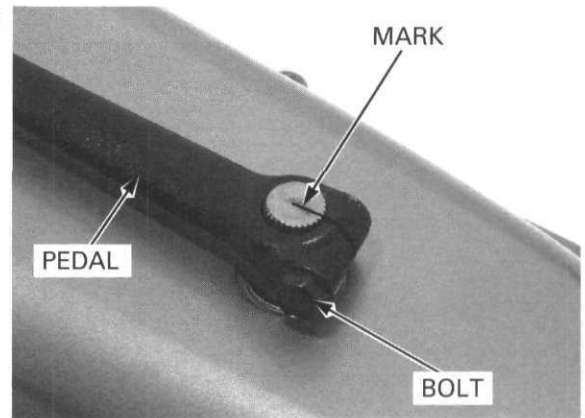


Install the thrust washer and snap ring in the groove of the spindle.

Hook the return spring end onto the stopper on the belt case cover.



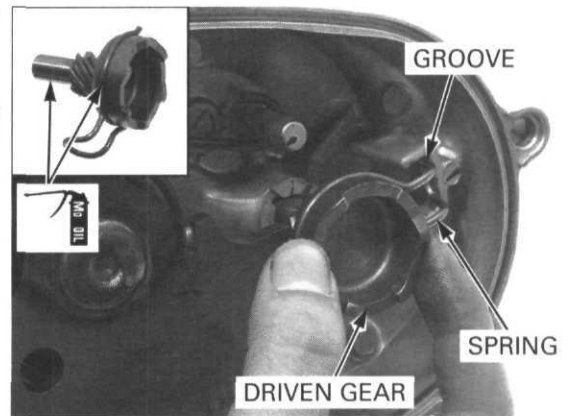
Install the kickstarter pedal to its original position as marked during removal.
Install and tighten the bolt securely.



Apply molybdenum solution to the kickstarter driven gear journal and spring surface.

Turn and hold the kickstarter pedal.
Install the kickstarter driven gear, aligning the spring with groove of the belt case cover and kickstarter gear with driven gear.

Install the belt case cover (page 9-5).



DRIVE PULLEY

REMOVAL

Remove the belt case cover (page 9-5).

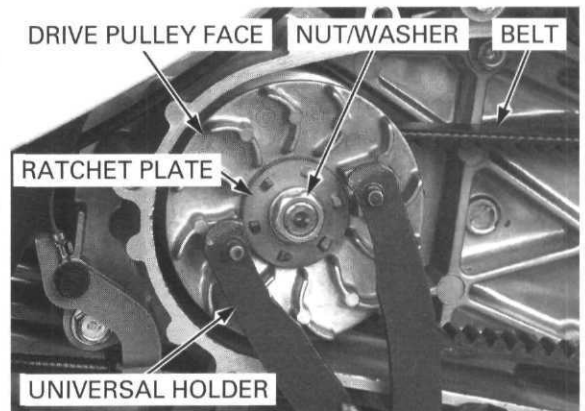
Hold the drive pulley face with special tool and loosen the drive pulley face nut.

TOOL:

Universal holder 07725-0030000

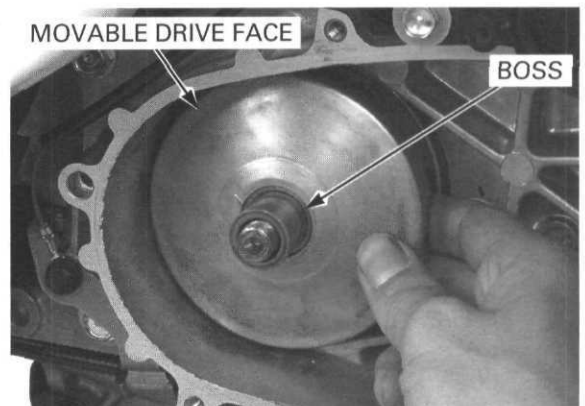
Remove the nut, washer, ratchet plate and drive pulley face.

Remove the drive belt from the crankshaft.



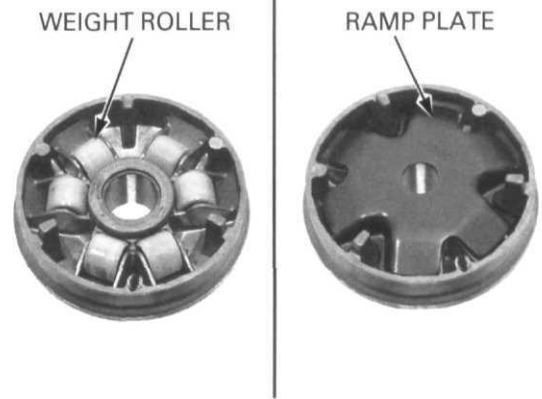
Remove the movable drive face assembly while holding the back of the ramp plate.

Remove the drive face boss from the movable drive face assembly.



KICKSTARTER/DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

Remove the ramp plate and weight rollers.

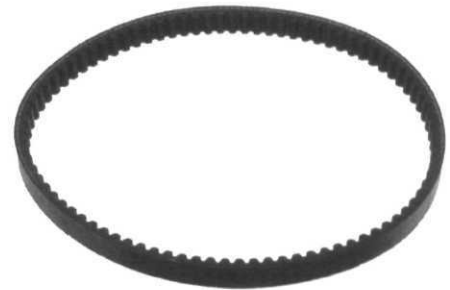


INSPECTION

DRIVE BELT

Check the drive belt for cracks, separation or abnormal or excessive wear.
Measure the drive belt width.

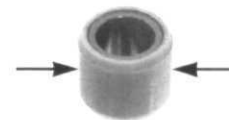
SERVICE LIMIT: 17.15 mm (0.68 in)



WEIGHT ROLLER

Check each roller for wear or damage.
Measure the weight roller O.D.

SERVICE LIMIT: 15.4 mm (0.61 in)



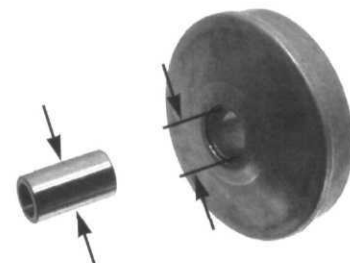
MOVABLE DRIVE FACE

Check the drive face boss for wear or damage.
Measure the boss O.D.

SERVICE LIMIT: 19.97 mm (0.786 in)

Measure the face bushing I.D.

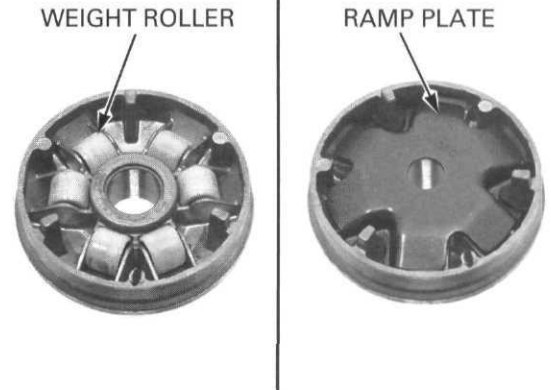
SERVICE LIMIT: 20.13 mm (0.793 in)



ASSEMBLY

Clean any oil and grease from the pulley faces and weight rollers.

Install the weight rollers on the movable drive face.
Install the ramp plate.



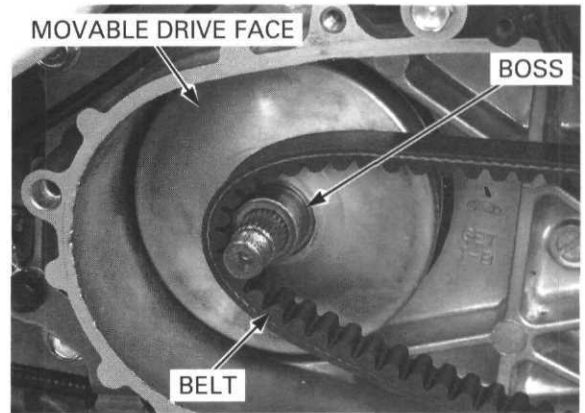
INSTALLATION

Clean any oil and grease from the pulley faces and the drive belt.

Install the drive face boss into the movable drive face assembly.

Install the movable drive face assembly onto the crankshaft while holding the ramp plate.

Install the drive belt onto the drive face boss.



Install the drive pulley face, ratchet plate and washer.

Apply oil to the drive pulley face nut threads and seating surface and install the nut.

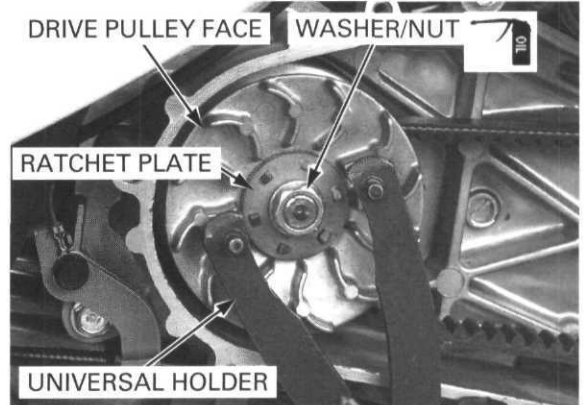
Hold the drive pulley face with the special tool and tighten the nut to the specified torque.

TOOL:

Universal holder 07725-0030000

TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

Install the belt case cover (page 9-5).



CLUTCH/DRIVEN PULLEY

REMOVAL

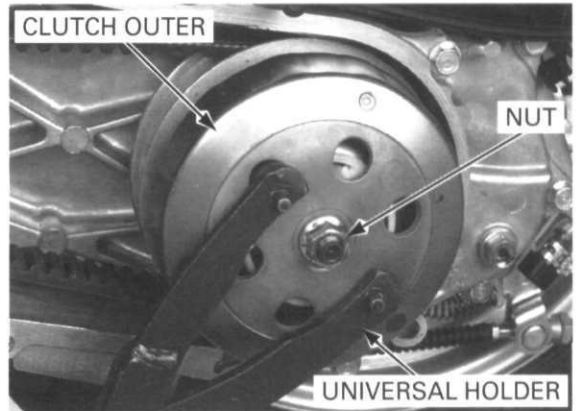
Remove the drive pulley (page 9-9).

Hold the clutch outer with the special tool and loosen the clutch outer nut.

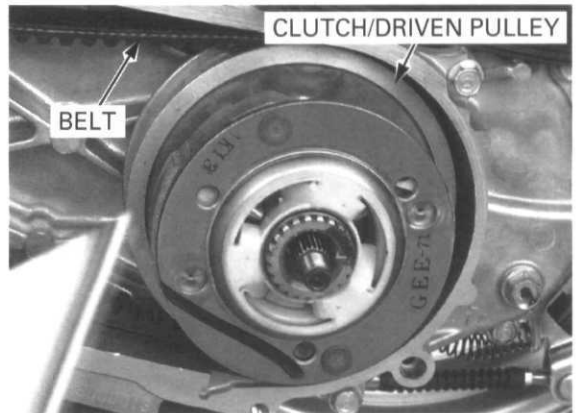
TOOL:

Universal holder 07725-0030000

Remove the nut and clutch outer.



Remove the clutch/driven pulley assembly.
Remove the drive belt from the driven pulley.



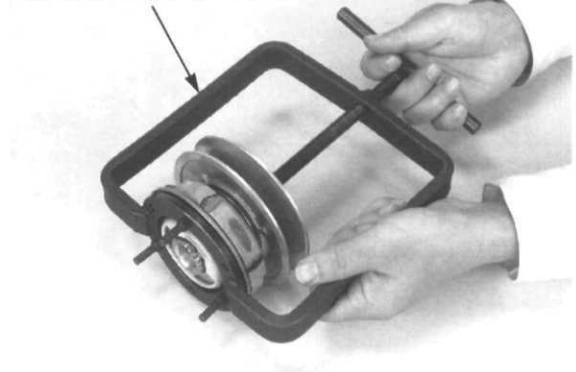
DISASSEMBLY

Set the clutch spring compressor onto the clutch/driven pulley, aligning the bosses with the holes in the clutch.

TOOL:

Clutch spring compressor 07LME-GZ40200 or 07960-KM1000A (U.S.A. only)

SPRING COMPRESSOR



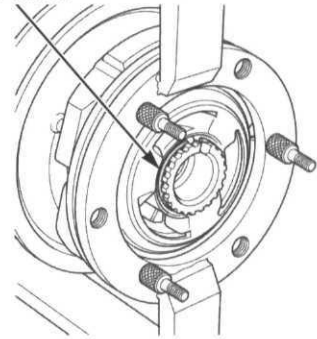
To prevent loss of tension, do not compress the clutch spring more than necessary to remove the stopper ring.

Compress the clutch/driven pulley and remove the stopper ring.

CAUTION

Do not remove the special tool when the stopper ring is removed. If so, some parts may pop out.

STOPPER RING



Install the gear puller or equivalent tool and special tool as shown.

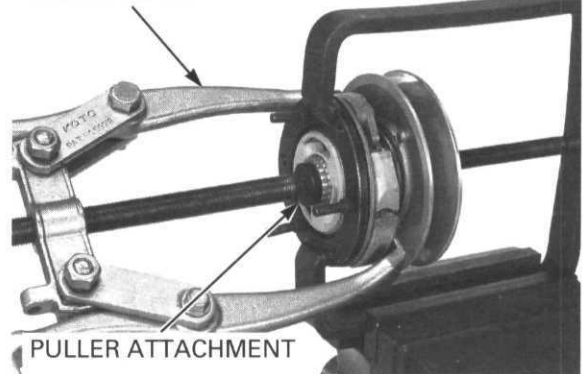
TOOL:

Puller attachment

07YMC-GCS0100

Loosen the clutch spring compressor gradually and tighten the gear puller gradually. Repeat this procedure and remove the clutch assembly from the driven face.

GEAR PULLER

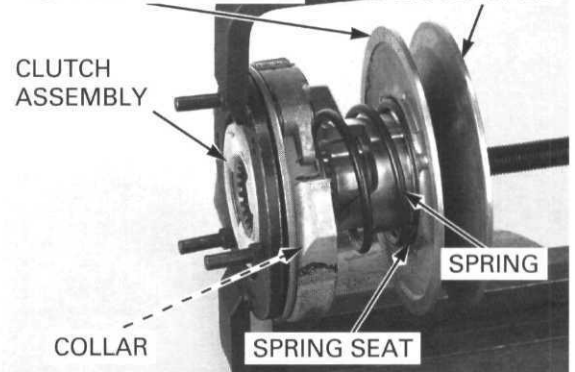


PULLER ATTACHMENT

Remove the following:

- Clutch assembly
- Spring collar
- Driven face spring
- Spring seat
- Movable driven face
- Driven face

MOVABLE DRIVEN FACE DRIVEN FACE

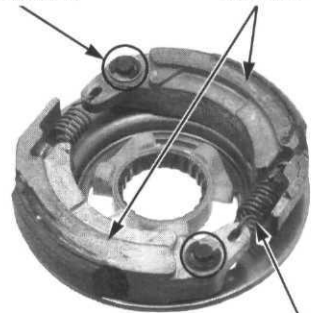


CLUTCH DISASSEMBLY

Remove the E-clip and washer.
Remove the clutch shoes and shoe springs.

E-CLIP/WASHER

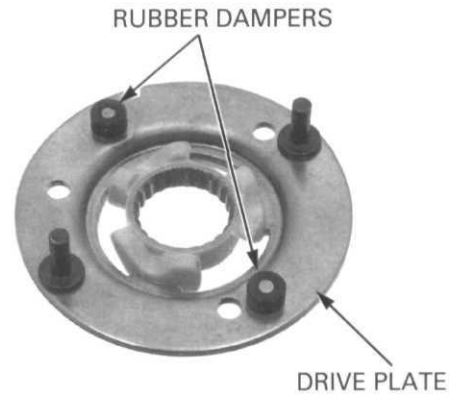
SHOES



SPRING

KICKSTARTER/DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

Remove the rubber dampers from the drive plate.



DRIVEN FACE BEARING REPLACEMENT

Remove the snap ring.

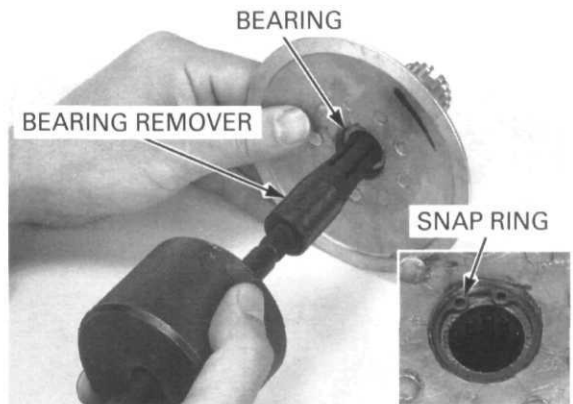
TOOL:

Snap ring pliers 07914-SA50001

Remove the driven face needle bearing using the special tools.

TOOL:

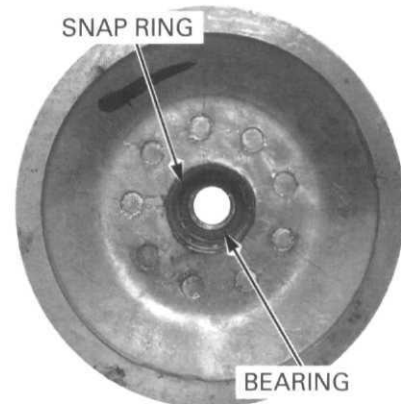
Bearing remover, 17 mm 07936-3710300
Remover handle 07936-3710100
Remover weight 07741-0010201 or
07936-371020A or
07936-3710200
(U.S.A. only)



Remove the snap ring, then remove the ball bearing.

TOOL:

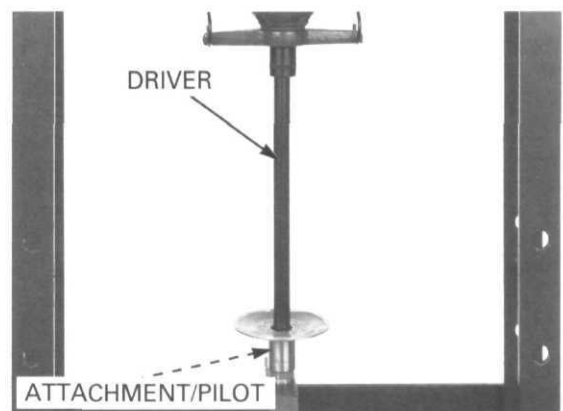
Snap ring pliers 07914-SA50001



Apply grease to a new ball bearing.
Install the ball bearing into the driven face with the marked side facing up.

TOOLS:

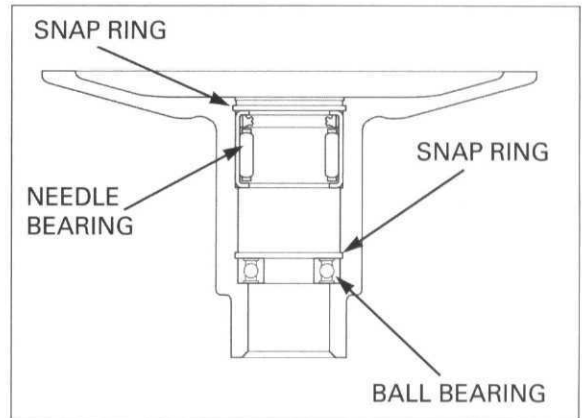
Driver 07949-3710001
Attachment, 22 X 24 mm 07746-0010800
Pilot, 12 mm 07746-0040200



Install the snap ring to the groove in the driven face securely.

TOOL:
Snap ring pliers

07914-SA50001



Apply grease to a new needle bearing. Press the needle bearing into the driven face with the marked side facing up.

TOOLS:

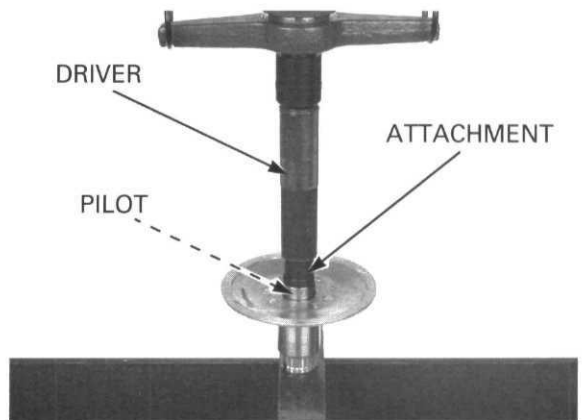
Driver
Attachment, 22 X 24 mm
Pilot, 17 mm

07749-0010000
07746-0010800
07746-0040400

Install the snap ring to the groove in the driven face securely.

TOOL:
Snap ring pliers

07914-SA50001

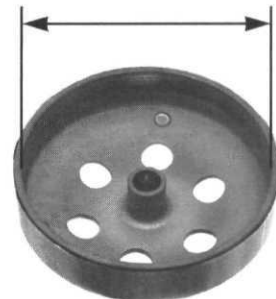


INSPECTION

CLUTCH OUTER

Check the clutch outer for wear or damage. Measure the clutch outer I.D.

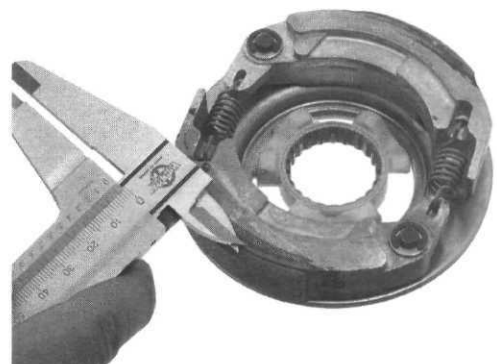
SERVICE LIMIT: 107.5 mm (4.23 in)



CLUTCH SHOE LINING

Check the clutch shoe for wear or damage. Measure the thickness of each shoe.

SERVICE LIMIT: 2.0 mm (0.08 in)

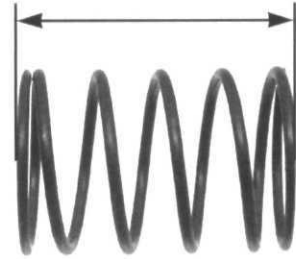


KICKSTARTER/DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

DRIVEN FACE SPRING

Measure the driven face spring free length.

SERVICE LIMIT: 75.3 mm (2.96 in)



DRIVEN FACE/MOVABLE DRIVEN FACE

Check the driven face for scratches, scoring or damage.

Measure the driven face boss O.D.

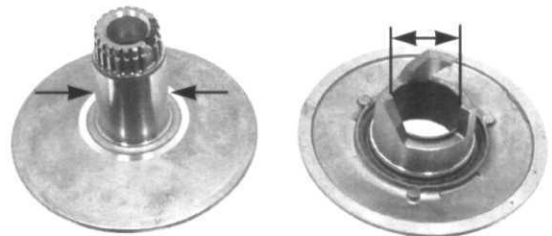
SERVICE LIMIT: 33.70 mm (1.327 in)

Check the movable driven face for scratches, scoring or damage.

Check the guide grooves for stepped wear or damage.

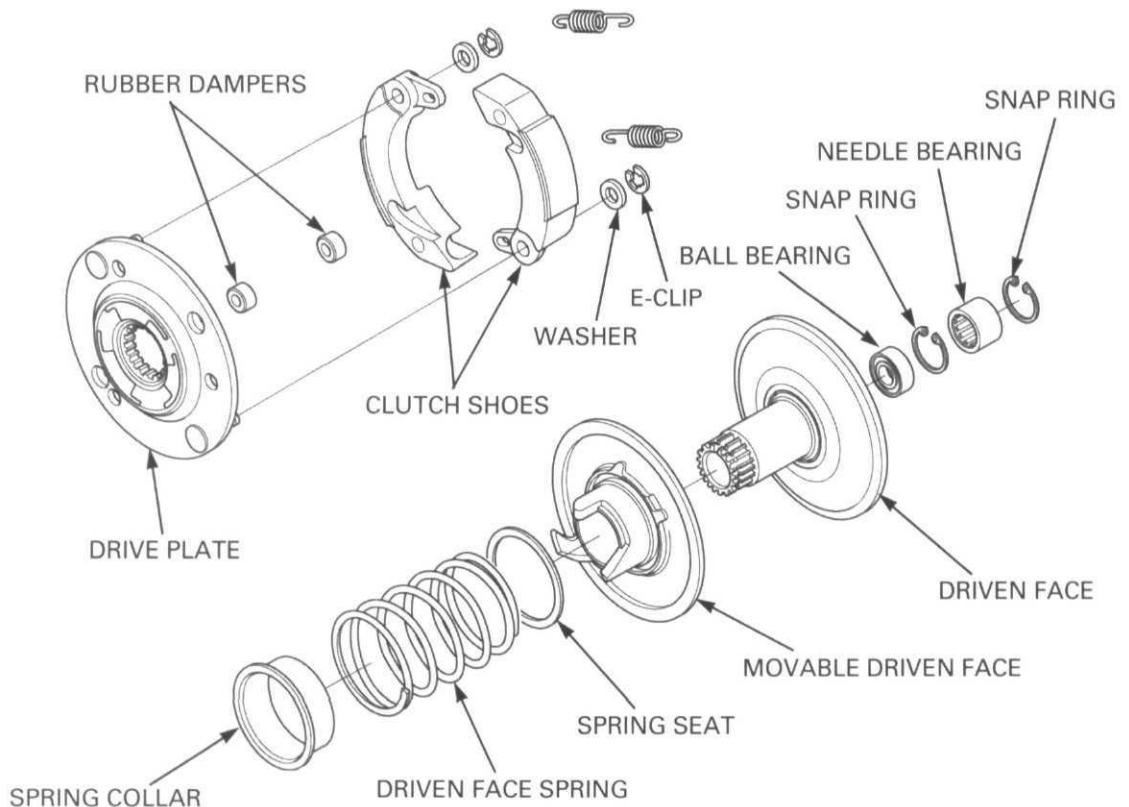
Measure the movable driven face I.D.

SERVICE LIMIT: 34.29 mm (1.350 in)



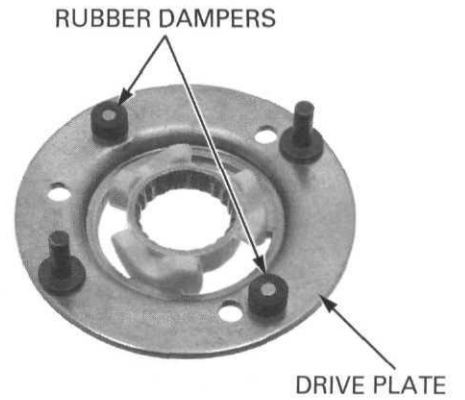
ASSEMBLY

Clean any oil and grease from the pulley faces and clutch outer.

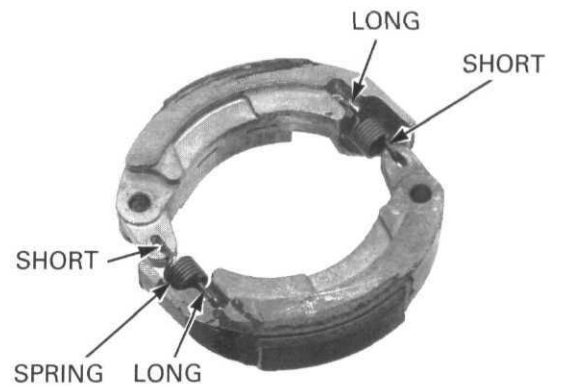


KICKSTARTER/DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

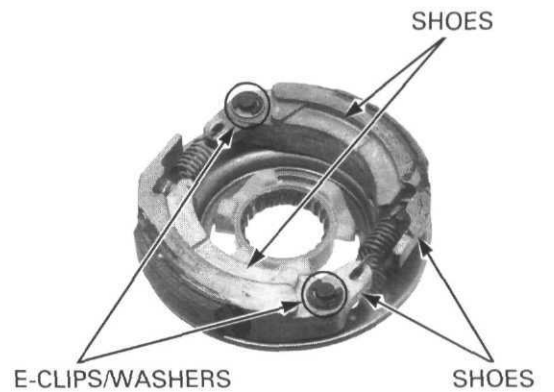
Install the rubber dampers onto the drive plate.



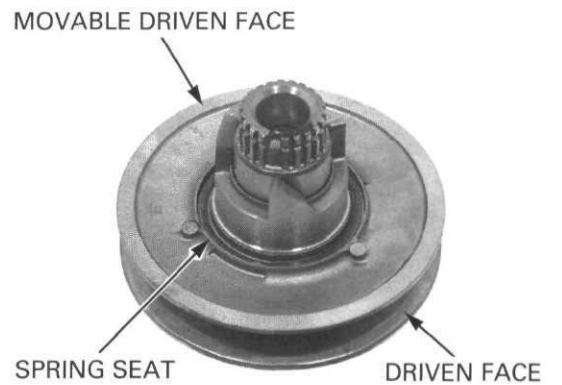
Install the shoe springs into the clutch shoes as shown.



Install the clutch shoes assembly into the drive plate.
Install the washers and E-clips.



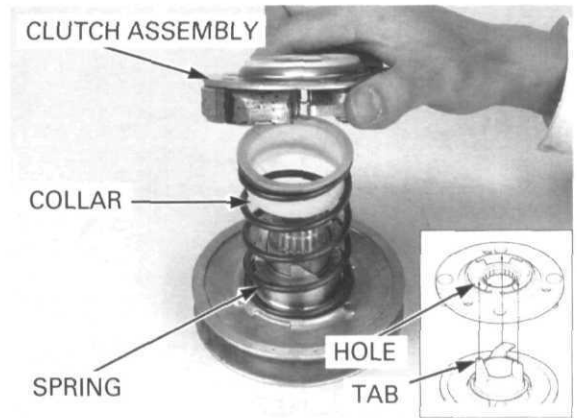
Assemble the movable driven face, spring seat and driven face.



KICKSTARTER/DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

Install the driven face spring and spring collar.

Install the clutch assembly while aligning the tab of the drive plate with the hole of the clutch assembly.



To prevent loss of tension, do not compress the clutch spring more than necessary to assemble the stopper ring.

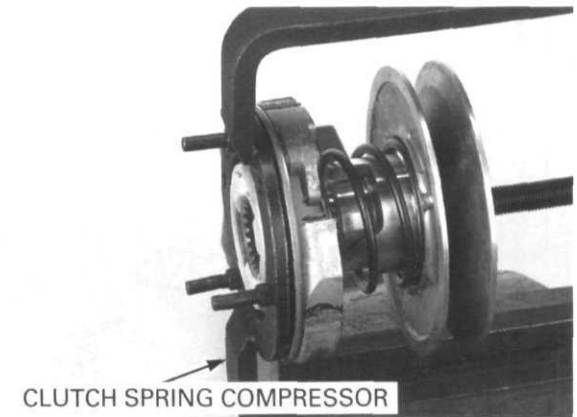
Set the clutch spring compressor over the clutch/driven pulley assembly and compress the driven face spring.

TOOL:

Clutch spring compressor

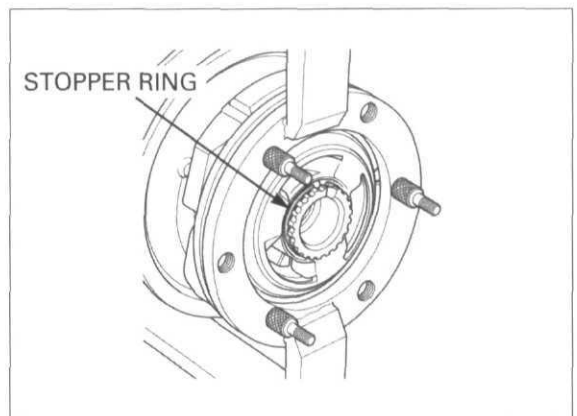
**07LME-GZ40200 or
07960-KM1000A
(U.S.A. only)**

Align the spline of the driven face with the spline of the drive plate while compressing the clutch spring compressor.



Install the stopper ring securely.

Remove the spring compressor from the clutch/driven pulley assembly.

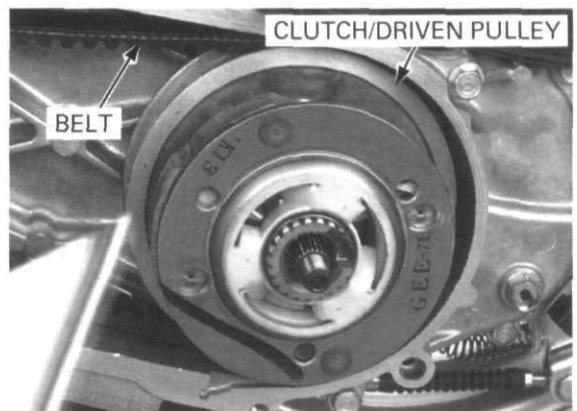


INSTALLATION

Install the drive belt into the driven pulley.

Do not get grease on the driven face inside on the drive shaft splines.

Install the clutch/driven pulley assembly onto the driveshaft.



Install the clutch outer and clutch outer nut.

Hold the clutch outer with the special tool and tighten the clutch outer nut to the specified torque.

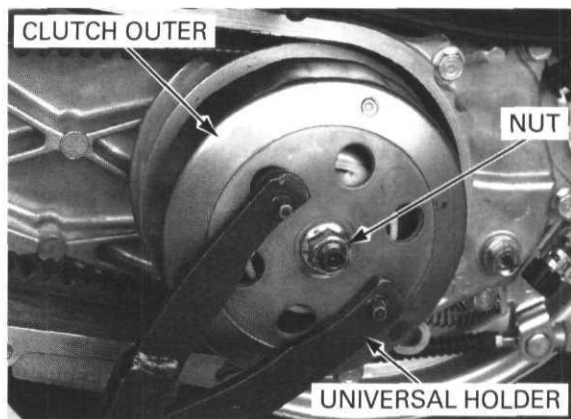
TOOL:

Universal holder

07725-0030000

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

Install the drive pulley (page 9-11).



MEMO

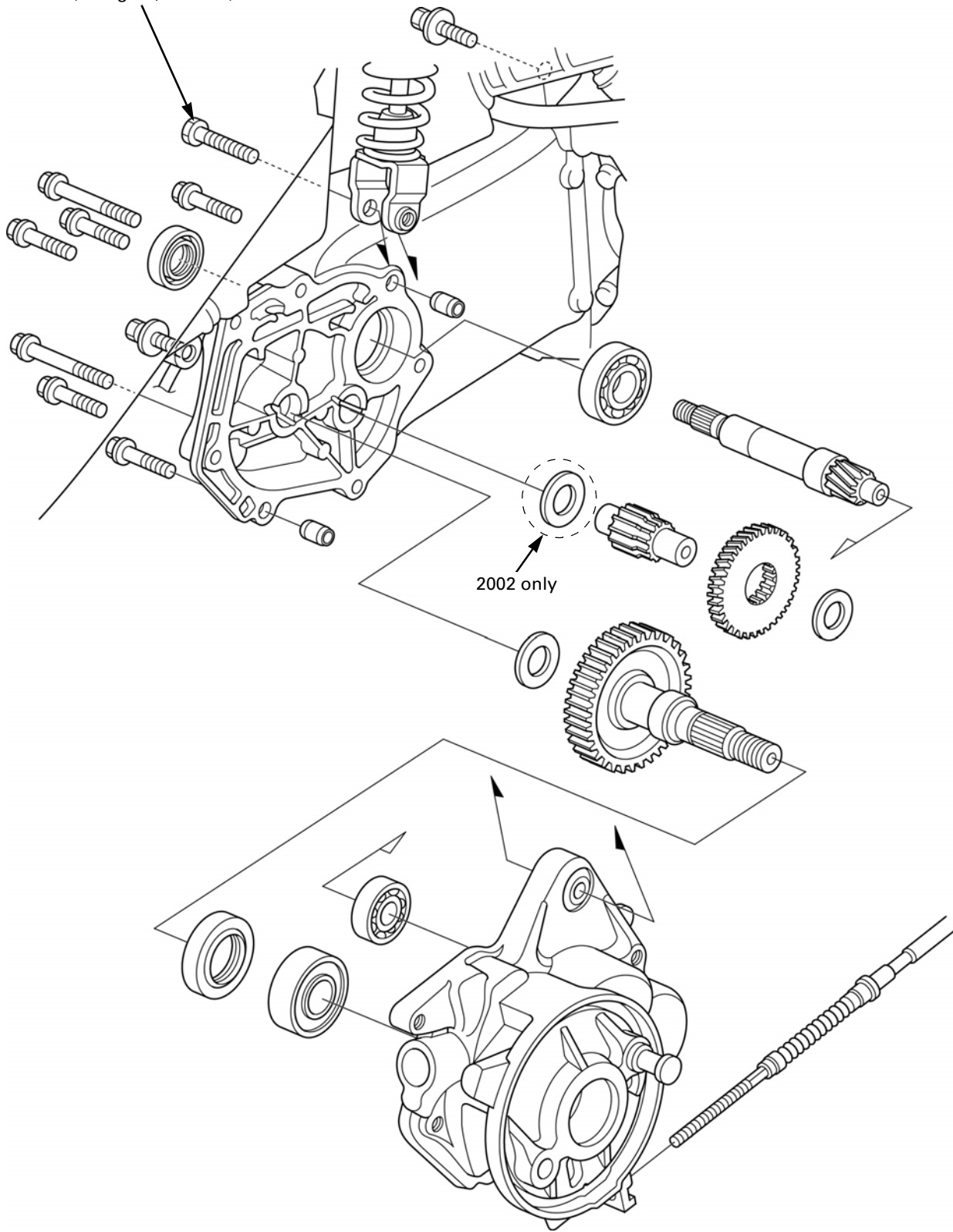
10. FINAL REDUCTION

COMPONENT LOCATION	10-2	FINAL REDUCTION DISASSEMBLY	10-5
SERVICE INFORMATION	10-3	BEARING REPLACEMENT	10-8
TROUBLESHOOTING	10-4	FINAL REDUCTION ASSEMBLY	10-9
FINAL REDUCTION OIL	10-5		

FINAL REDUCTION

COMPONENT LOCATION

26 N·m (2.7 kgf·m, 20 lbf·ft)



SERVICE INFORMATION

GENERAL

- This section covers maintenance of the final reduction.
- These services can be done with the engine installed in the frame.
- When installing the driveshaft, be sure to use the special tool; position the special tool against the bearing inner race and pull the driveshaft into the bearing.

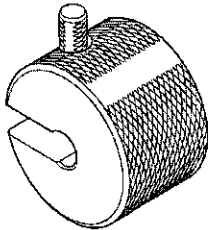
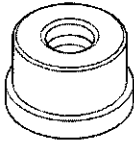
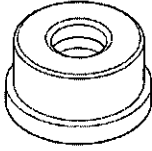


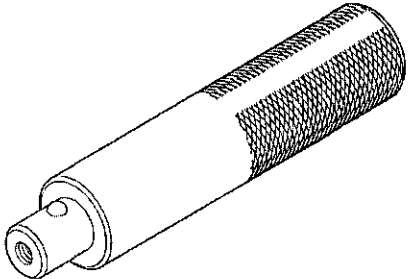
SPECIFICATIONS

ITEM	SPECIFICATIONS
Final reduction oil capacity (at disassembly)	0.1 liter (0.11 US qt, 0.09 Imp qt)
Recommended final reduction oil	Hypoid gear oil #90

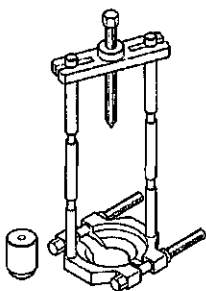
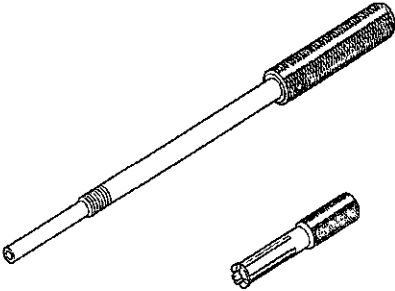
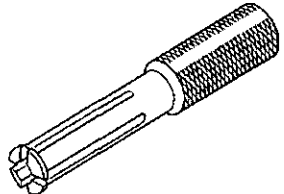
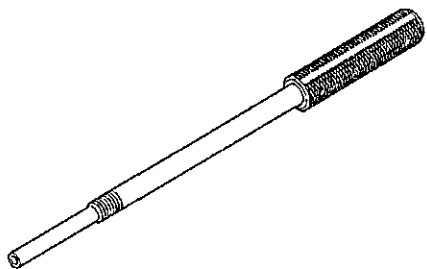
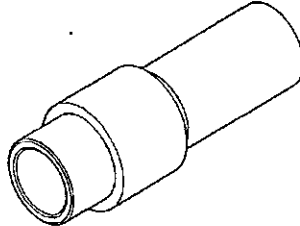
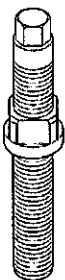
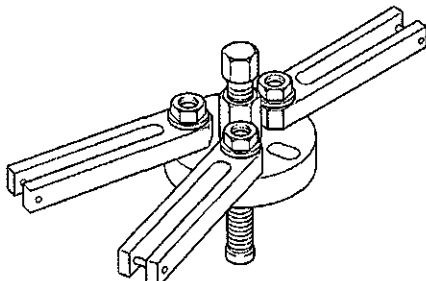
TORQUE VALUES

Final drive oil check bolt	13 N·m (1.3 kgf·m, 9 lbf·ft)
Rear shock absorber mounting bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)

TOOLS

<p>Bearing remover weight 07741-0010201</p>  <p>or 07936-371020A or 07936-3710200 (U.S.A. only)</p>	<p>Attachment, 32 x 35 mm 07746-0010100</p> 	<p>Attachment, 37 x 40 mm 07746-0010200</p> 
<p>Pilot, 12 mm 07746-0040200</p> 	<p>Pilot, 17 mm 07746-0040400</p> 	<p>Driver 07749-0010000</p> 

FINAL REDUCTION

<p>Universal bearing puller 07931-4630000</p>  <p>or equivalent commercially available in U.S.A.</p>	<p>Bearing remover set, 12 mm 07936-1660101</p>  <p>not available in U.S.A. or Bearing remover, 12 mm 07936-166010A (U.S.A. only)</p>	<p>Bearing remover head, 12 mm 07936-1660110</p>  <p>not available in U.S.A.</p>
<p>Bearing remover shaft 07936-1660120</p>  <p>not available in U.S.A.</p>	<p>Assembly collar 07965-GM00100</p> 	<p>Assembly shaft 07965-GM00300</p> 
<p>Case puller 07SMC-0010001</p> 		

TROUBLESHOOTING

Engine does start but scooter won't move

- Damaged transmission
- Seized transmission
- Faulty drive and driven pulleys/clutch (page 9-9)

Abnormal noise

- Worn, seized or chipped gears
- Worn or damaged transmission bearing

Oil leak

- Oil level too high
- Worn or damaged oil seal

FINAL REDUCTION OIL

LEVEL CHECK

Make sure the final reduction case has no oil leaks.

Place the scooter on its centerstand.

Start the engine and let it idle for a few minutes. Remove the final drive oil check bolt and check whether the oil flows out from the check bolt hole.

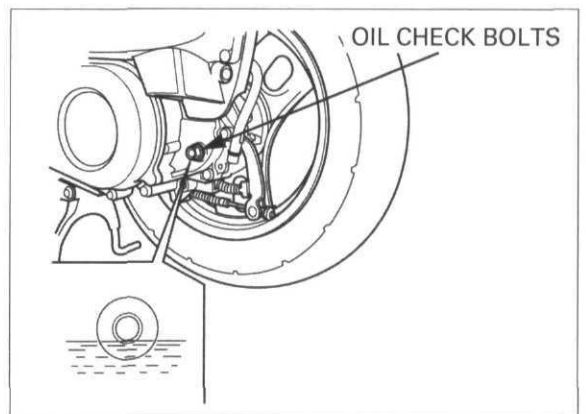
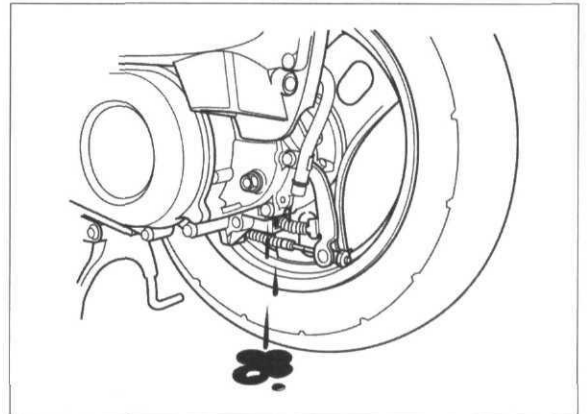
If the level is low (oil does not flow out), add the recommended oil as described below.

RECOMMENDED FINAL REDUCTION OIL:

Hypoid gear oil #90

Install the final drive oil check bolt with a new sealing washer and tighten it.

TORQUE: 13 N·m (1.3 kgf·m, 9 lbf·ft)



FINAL REDUCTION DISASSEMBLY

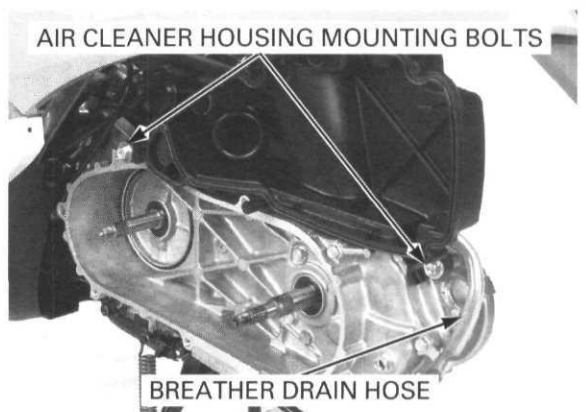
TRANSMISSION DISASSEMBLY

Remove the following:

- Clutch/driven pulley (page 9-12)
- Rear wheel (page 14-4)
- Rear brake (page 14-5)

Remove the air cleaner housing bolts.

Remove the breather drain hose from the clamp.

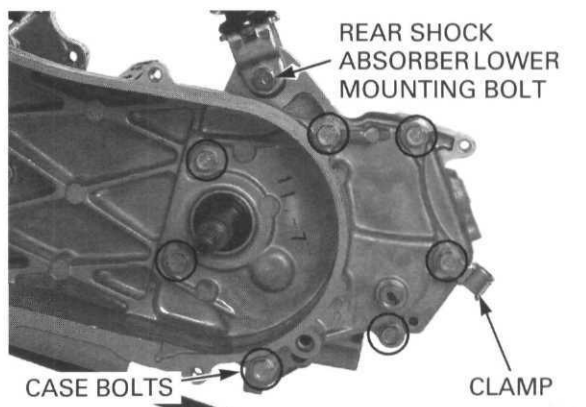


Remove the brake cable from the transmission case.

Remove the rear shock absorber lower mounting bolt.

Remove the seven bolts and hose clamp.

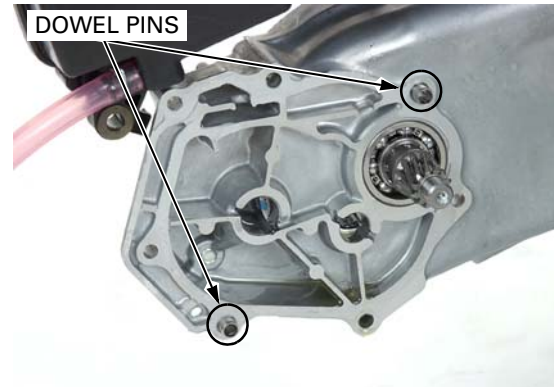
Remove the transmission case and drain all oil from the transmission case.



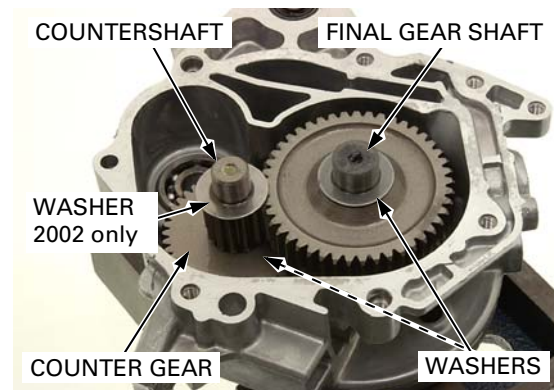
FINAL REDUCTION

Remove the dowel pins.

Clean any sealant from the transmission case mating surface.



Remove the thrust washers and countershaft.
Remove the final gear shaft, counter gear and side washer.



DRIVESHAFT REMOVAL

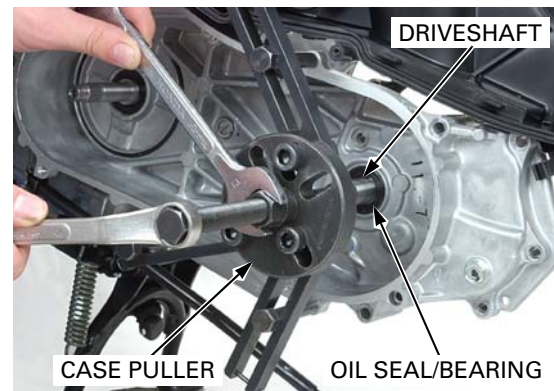
Remove the driveshaft using the special tools.

TOOL:

Case puller

07SMC-0010001

Remove the driveshaft oil seal and bearing.

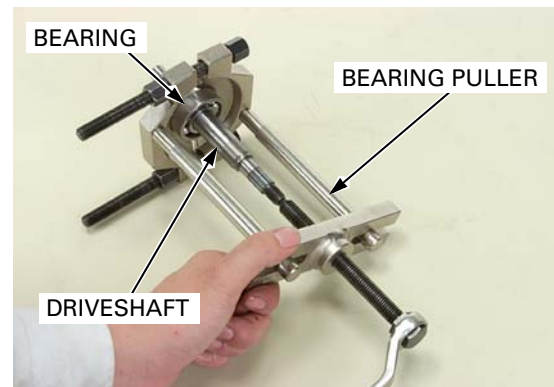


If the bearing is left on the driveshaft, remove it with the special tool.

TOOL:

Universal bearing puller

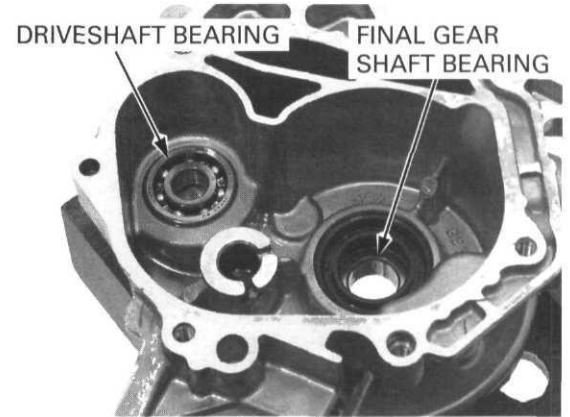
07931-4630000 or equivalent commercially available in U.S.A.



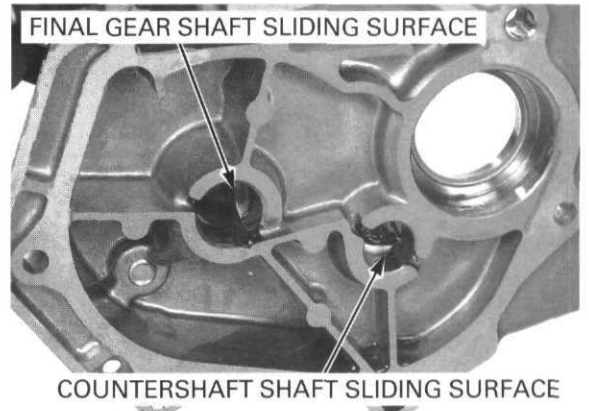
INSPECTION

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the case.

Remove and discard the bearing if the races do not turn smoothly and quietly, or if they fit loosely in the case.



Check the countershaft and final gear shaft sliding surfaces for wear or damage.

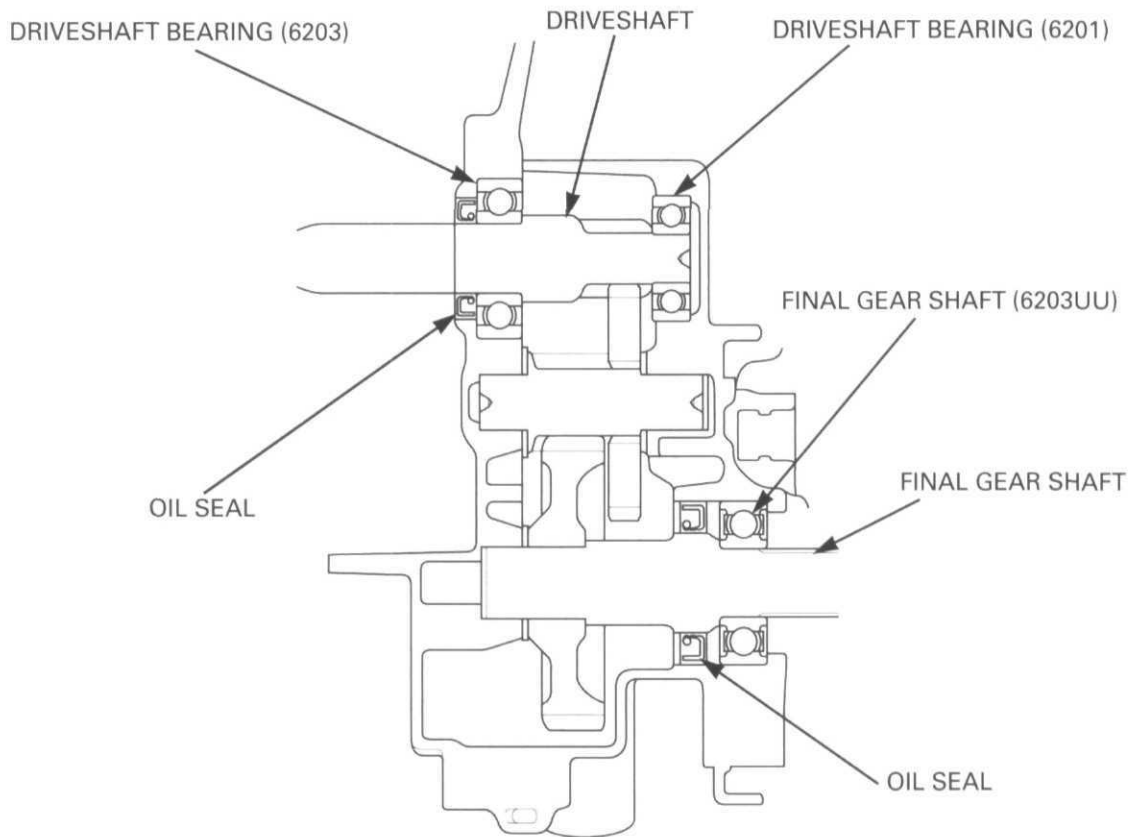


Check the driveshaft, final gear shaft, countershaft and counter gear for wear or damage.



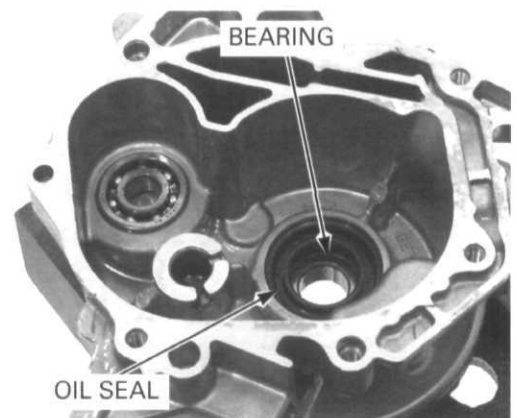
FINAL REDUCTION

BEARING REPLACEMENT



Be careful not to damage the transmission case mating surface.

Remove the final gear shaft oil seal and bearing.



Remove the driveshaft bearing using the special tools.

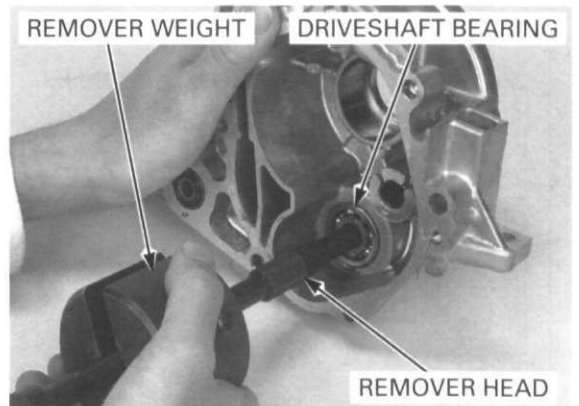
TOOLS:

Bearing remover set, 12 mm

07936-166010
not available in U.S.A.

- Bearing remover head, 12 mm

07936-1660110
not available in U.S.A.



- Bearing remover shaft 07936-1660120
not available in
U.S.A.
- Bearing remover, 12 mm 07936-166010A
(U.S.A. only)
- Remover weight 07741-0010201 or
07936-371020A or
07936-3710200
(U.S.A. only)

Apply engine oil to new bearing cavities.
Drive new bearings into the transmission case using
the special tool.

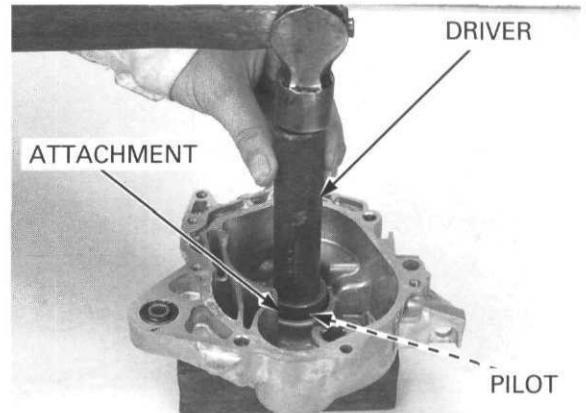
TOOLS:

Driveshaft bearing:

- Driver 07749-0010000
- Attachment, 32 X 35 mm 07746-0010100
- Pilot, 12 mm 07746-0040200

Final gear shaft bearing:

- Driver 07749-0010000
- Attachment, 37 X 40 mm 07746-0010200
- Pilot, 17 mm 07746-0040400



Apply oil to a new final gear shaft oil seal lip and
outer surface.
Install the final gear shaft oil seal.

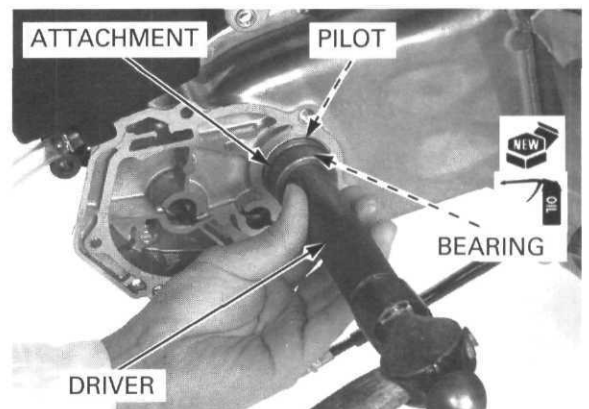


FINAL REDUCTION ASSEMBLY

Apply engine oil to new bearing cavities.
Drive new driveshaft bearing into the belt case
using the special tools.

TOOLS:

- Driver 07749-0010000
- Attachment, 37 X 40 mm 07746-0010200
- Pilot, 17 mm 07746-0040400



FINAL REDUCTION

Install the driveshaft into the belt case cover.
Position the assembly collar against the driveshaft bearing inner race.
Thread the assembly shaft onto the driveshaft.
Hold the assembly shaft and draw the driveshaft into the bearing inner race by turning the nut.

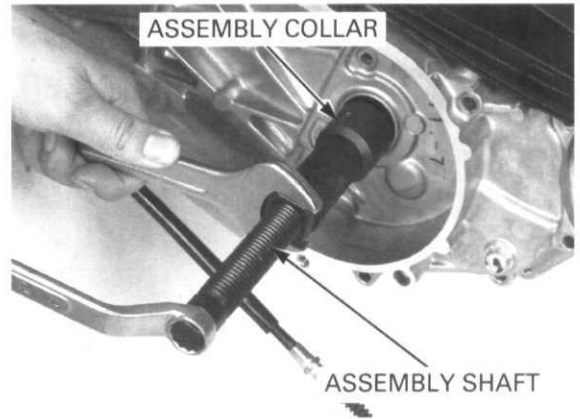
TOOLS:

Assembly shaft

07965-GM00300

Assembly collar

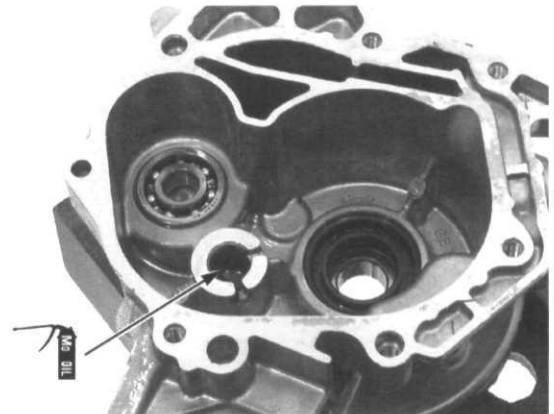
07965-GM00100



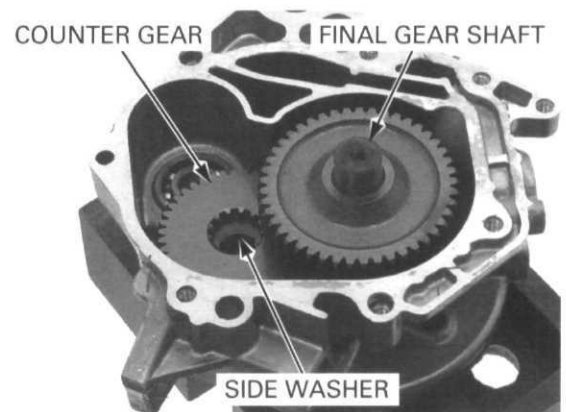
Apply oil to a new driveshaft oil seal lip and outer surface.
Install the driveshaft oil seal.



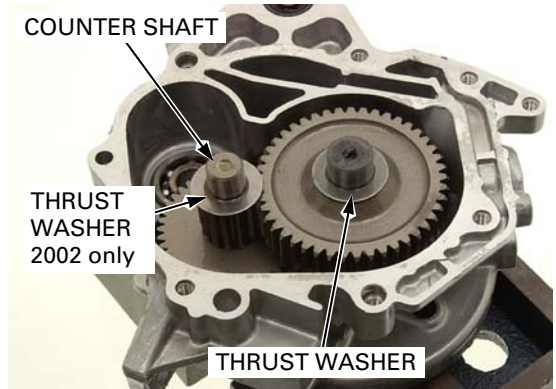
Apply molybdenum oil solution to the countershaft sliding surface.



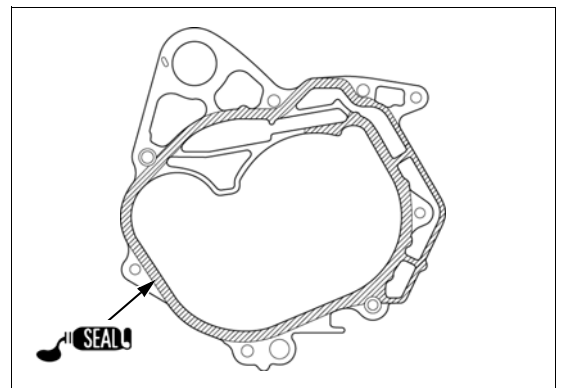
Install the side washer, counter gear and final gear shaft into the transmission case.



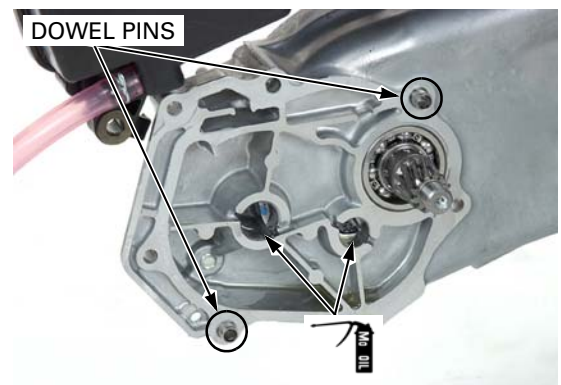
Install the countershaft into the transmission case.
Install the thrust washers onto the countershaft and final gear shaft.



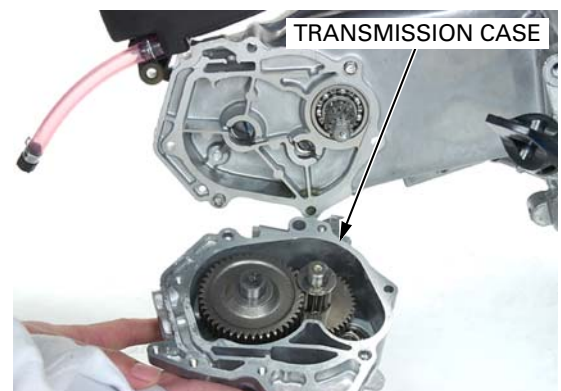
Apply sealant to the transmission case mating surface.



Install the dowel pins.
Apply molybdenum oil solution to the countershaft and final gear shaft sliding surface.



Install the transmission case.



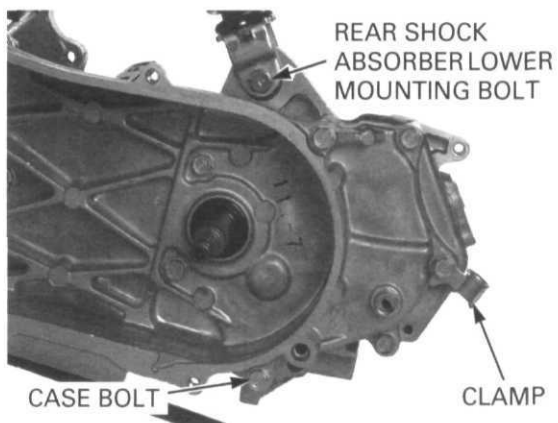
FINAL REDUCTION

Install the clamp, bolt and tighten it to the securely.

Install the rear shock absorber lower mounting bolt and tighten it to the specified torque.

TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)

Install the brake cable into the transmission case holder.



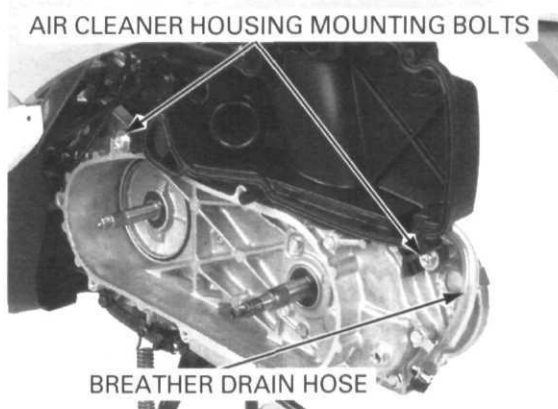
Install the air cleaner housing and tighten the bolts securely.

Install the crankcase breather drain hose into the clamp.

Install the following:

- Rear brake (page 14-7)
- Rear wheel (page 14-4)
- Clutch/driven pulley (page 9-18)

Fill the transmission case with the recommended oil (page 3-10).



11. ALTERNATOR/STARTER

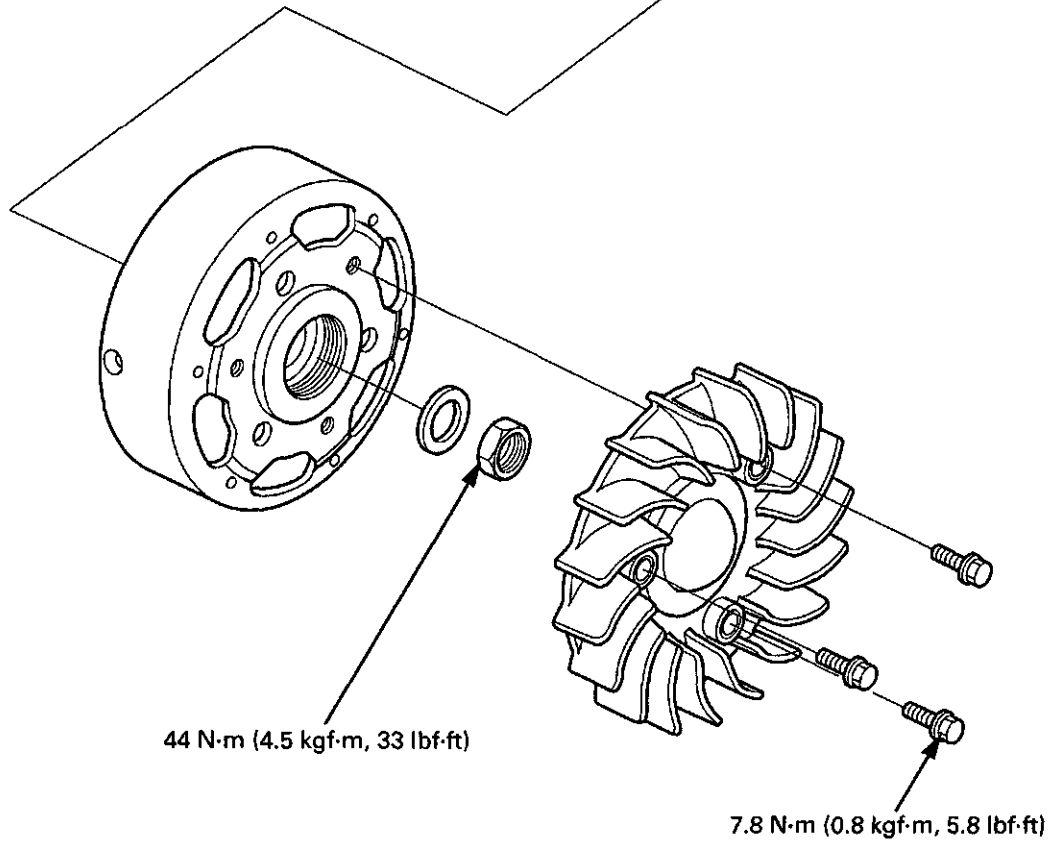
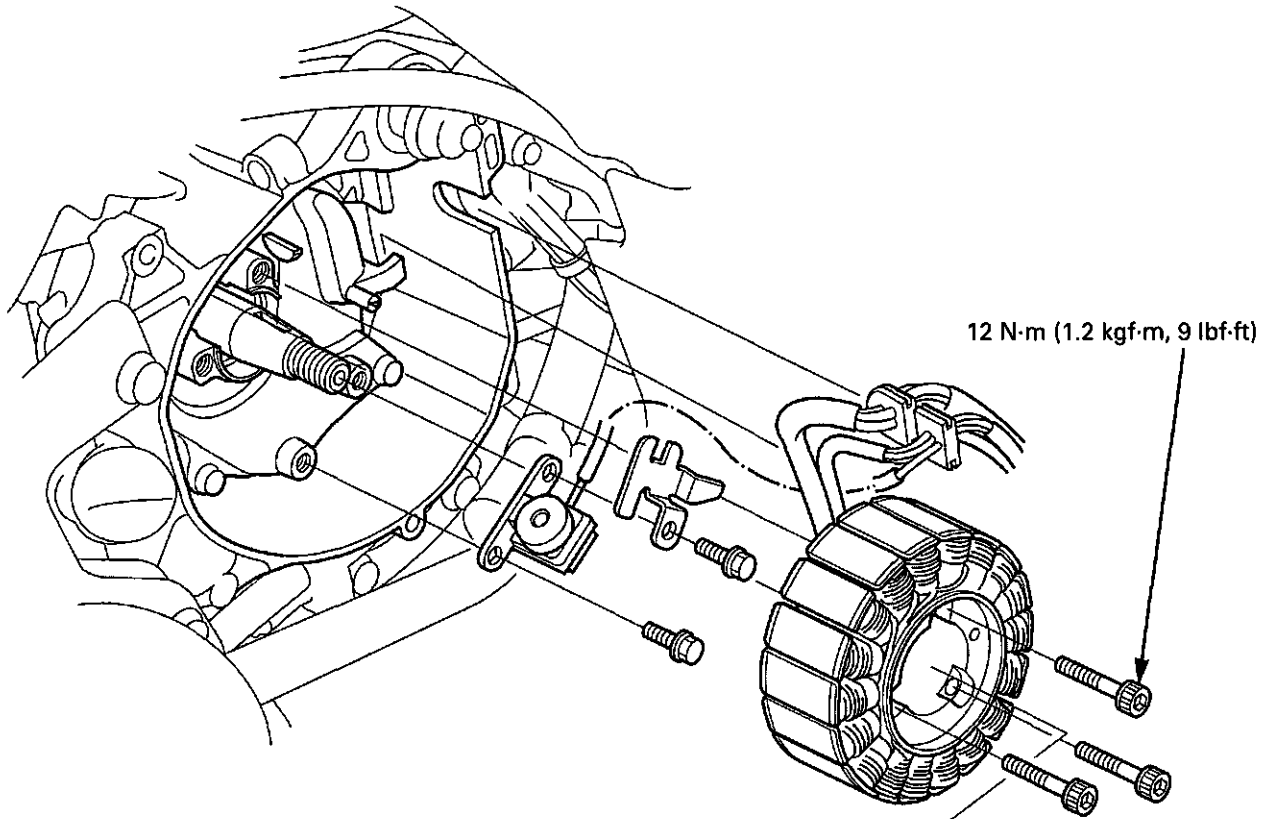
COMPONENT LOCATION 11-2

ALTERNATOR/STARTER..... 11-4

SERVICE INFORMATION 11-3

ALTERNATOR/STARTER

COMPONENT LOCATION

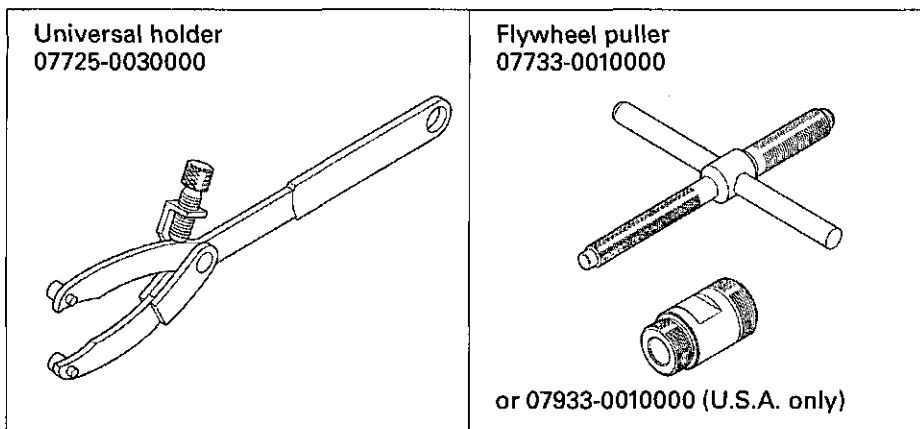


SERVICE INFORMATION**GENERAL**

- Always turn the ignition switch to "OFF" before servicing the alternator/starter. The alternator/starter could suddenly start when the ignition switch is turned to "ON", causing serious injury.
- This section covers the removal and installation of the flywheel, alternator/starter and ignition pulse generator.
- These service can be done with the engine installed in the frame.
- Refer to page 15-8 for alternator/starter inspection.

TORQUE VALUES

Flywheel nut	44 N·m (4.5 kgf·m, 33 lbf·ft)
Alternator/starter bolts	12 N·m (1.2 kgf·m, 9 lbf·ft)
Radiator cooling fan bolt	7.8 N·m (0.8 kgf·m, 5.8 lbf·ft)

TOOLS

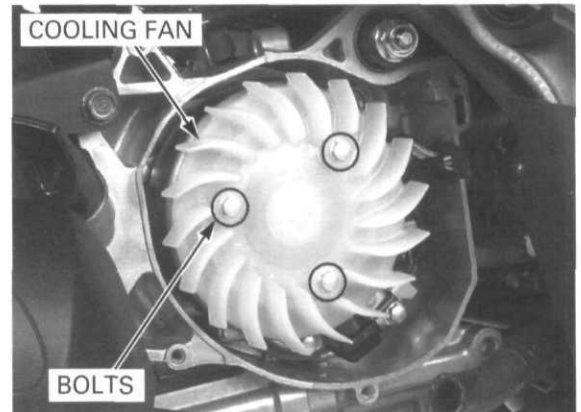
ALTERNATOR/STARTER

REMOVAL

Remove the luggage box (page 2-6).

Remove the radiator (page 6-13).

Remove the three bolts and cooling fan.



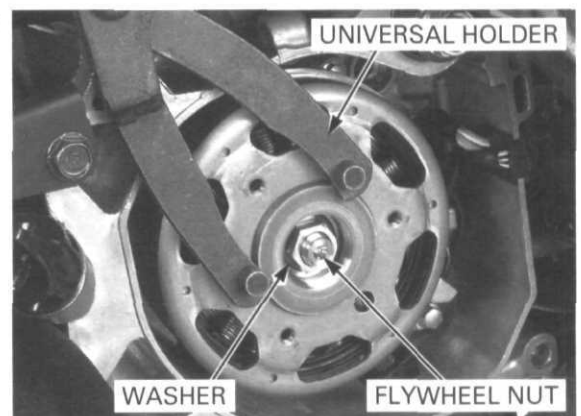
Hold the flywheel with the special tool and loosen the flywheel nut.

TOOL:

Universal holder

07725-0030000

Remove the flywheel nut and washer.

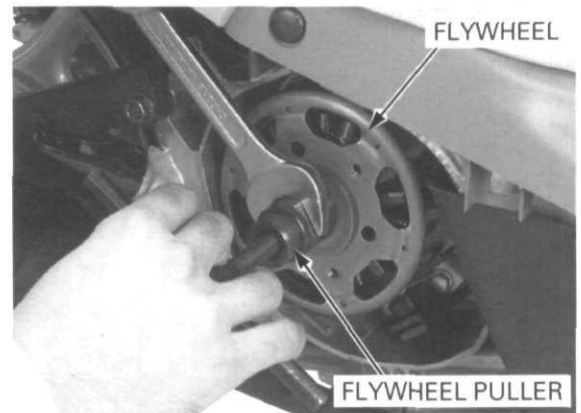


Remove the flywheel using the special tools.

TOOL:

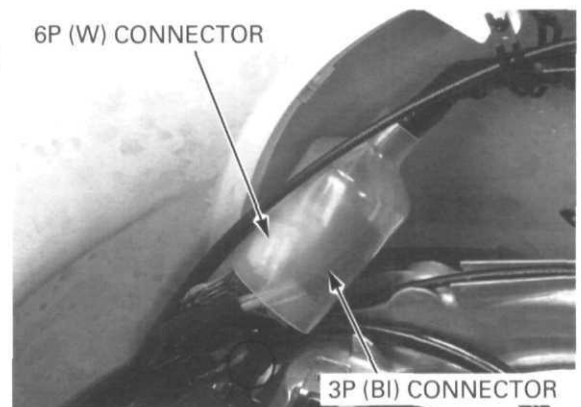
Flywheel puller

**07733-0010000 or
07933-0010000
(U.S.A. only)**

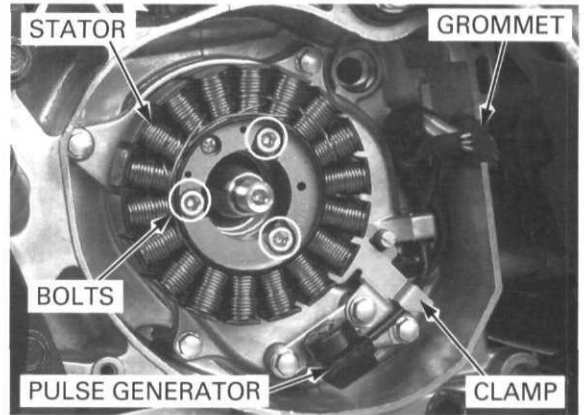


Remove the step floor (page 2-9).

Disconnect the alternator/starter 3P (BI) and 6P (W) connectors.



Remove the grommet from the crankcase groove.
Remove the two bolts, clamp and ignition pulse generator.
Remove the bolts and stator.

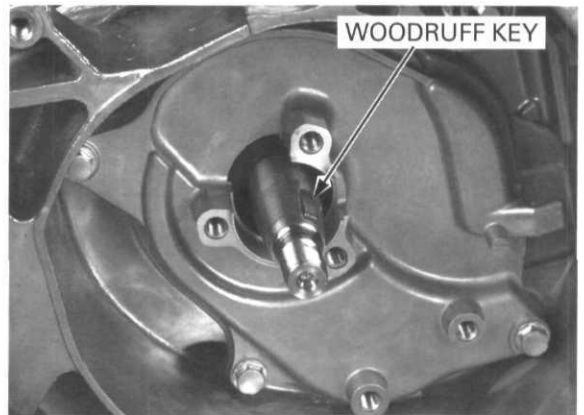


Remove the woodruff key from the crankshaft.

INSTALLATION

Clean any oil from the tapered portion of the crankshaft and flywheel.

Install the woodruff key in the crankshaft key groove.



Install the stator and tighten the bolts to the specified torque.

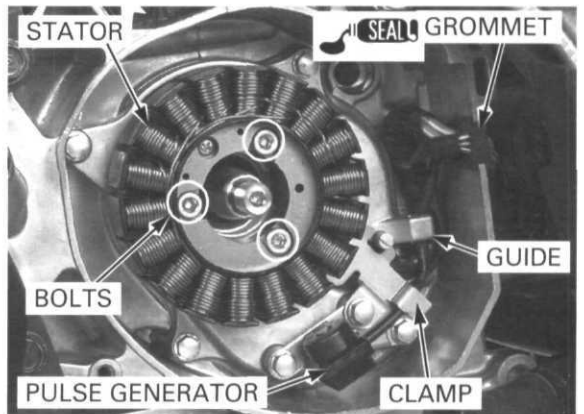
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Apply sealant to the grommet seating surface and install it to the crankcase groove properly.

Install the ignition pulse generator and wire clamp properly as shown.

Tighten the bolts securely.

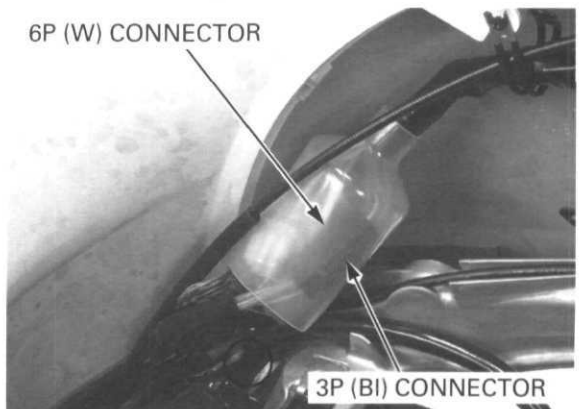
Route the alternator/starter wires under the guide of the stator base.



Route and clamp the alternator/starter wire properly (page 1-14).

Connect the alternator/starter 3P (BI) and 6P (W) connectors.

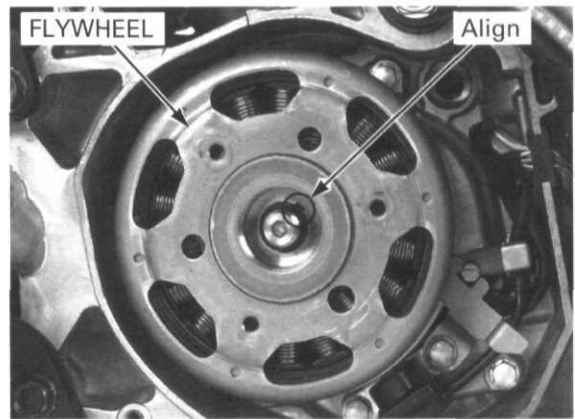
Install the step floor (page 2-9).



ALTERNATOR/STARTER

Clean any oil from the tapered portion of the flywheel I.D.

Install the flywheel onto the crankshaft, aligning the key way with the woodruff key.

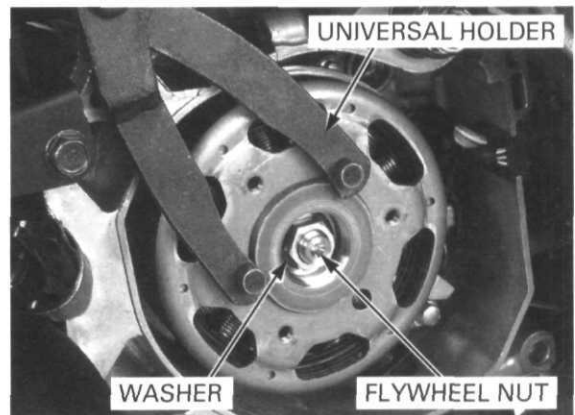


Install the washer and flywheel nut.
Hold the flywheel with the special tool and tighten the flywheel nut to the specified torque.

TOOL:

Universal holder 07725-0030000

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)

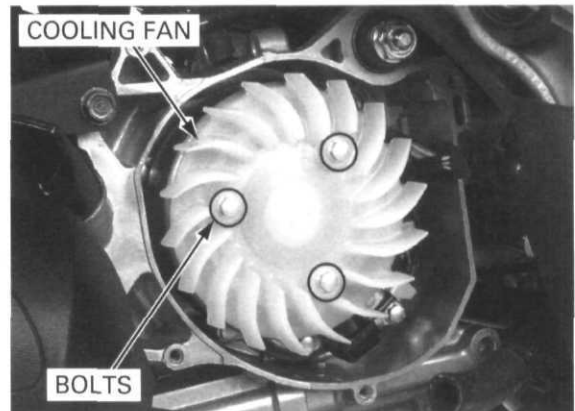


Install the cooling fan and tighten the bolts to the specified torque.

TORQUE: 7.8 N·m (0.8 kgf·m, 5.8 lbf·ft)

Install the radiator (page 6-14).

Install the luggage box (page 2-6).

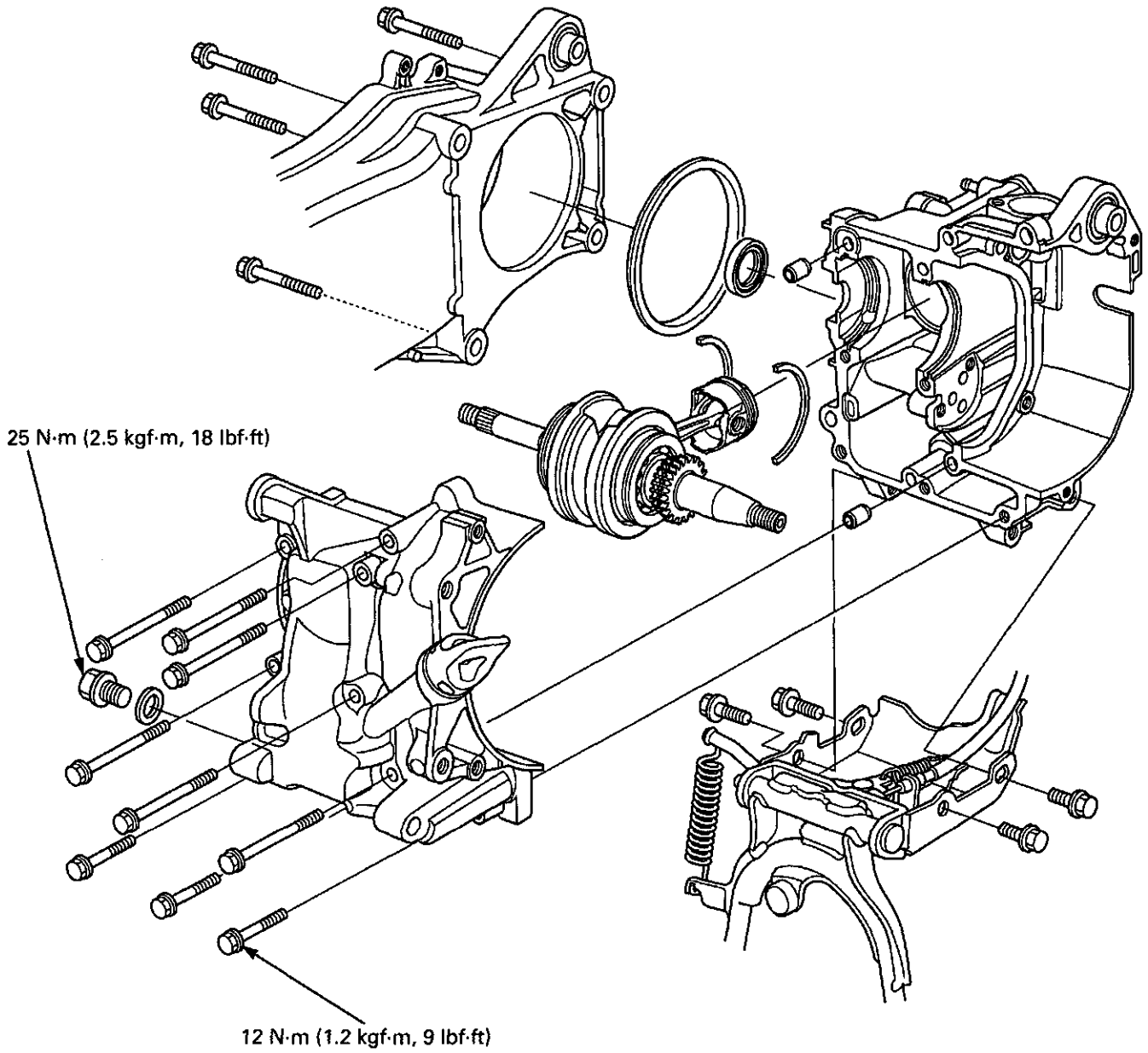


12. CRANKSHAFT/PISTON/CYLINDER

COMPONENT LOCATION	12-2	CRANKCASE SEPARATION	12-5
SERVICE INFORMATION	12-3	CRANKSHAFT/PISTON	12-5
TROUBLESHOOTING	12-4	CRANKCASE ASSEMBLY	12-11

CRANKSHAFT/PISTON/CYLINDER

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers the crankcase separation to service the crankshaft, piston and cylinder.
- The following parts must be removed before separating the crankcase.
 - Oil pump (page 4-4)
 - Water pump (page 6-9)
 - Carburetor (page 5-8)
 - Engine (page 7-5)
 - Cylinder head/Valves (page 8-7)
 - Drive pulley (page 9-9)
 - Alternator/Starter (page 11-4)
- Be careful not to damage the crankcase mating surfaces when separating and assembling the crankcase halves.
- Take care not to damage the cylinder wall and piston.
- Clean all disassembled parts with clean solvent and dry them using compressed air before inspection.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Crankshaft	Connecting rod side clearance	0.10 – 0.40 (0.004 – 0.016)	0.60 (0.024)	
	Connecting rod radial clearance	0.004 – 0.016 (0.0002 – 0.0006)	0.05 (0.002)	
	Runout	–	0.10 (0.0039)	
Cylinder	I.D.	37.800 – 37.810 (1.4882 – 1.4886)	37.76 (1.487)	
	Out-of-round	–	0.05 (0.002)	
	Taper	–	0.05 (0.002)	
	Warpage	–	0.05 (0.002)	
Piston, piston ring, piston pin	Piston O.D.	37.775 – 37.795 (1.4872 – 1.4880)	37.72 (1.485)	
	Piston O.D. measurement point	10 mm (0.39 in) from bottom of skirt	–	
	Piston pin bore I.D.	10.002 – 10.008 (0.3938 – 0.3940)	10.04 (0.395)	
	Piston pin O.D.	9.994 – 10.000 (0.3935 – 0.3937)	9.98 (0.393)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)	
	Piston ring-to-ring groove clearance	Top	0.020 – 0.050 (0.0008 – 0.0020)	0.08 (0.003)
		Second	0.015 – 0.050 (0.006 – 0.0020)	0.08 (0.003)
	Piston ring end gap	Top	0.05 – 0.15 (0.002 – 0.006)	0.40 (0.016)
		Second	0.05 – 0.17 (0.002 – 0.007)	0.40 (0.016)
		Oil (side rail)	0.10 – 0.60 (0.004 – 0.024)	0.80 (0.031)
Cylinder-to-piston clearance		0.005 – 0.035 (0.0002 – 0.0014)	0.08 (0.003)	
Connecting rod small end I.D.		10.013 – 10.028 (0.3942 – 0.3948)	10.05 (0.396)	
Connecting rod-to-piston pin clearance		0.013 – 0.034 (0.0005 – 0.0013)	0.06 (0.002)	

TORQUE VALUES

- Crankcase bolt 12 N·m (1.2 kgf·m, 9 lbf·ft)
- Engine oil drain bolt 25 N·m (2.5 kgf·m, 18 lbf·ft)

Apply oil to the threads and seating surface

TROUBLESHOOTING

Compression too low, hard starting or poor performance at low speed

- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston
- Cylinder head/valve problem (page 8-12)

Compression too high, overheating or knocking

- Excessive carbon build-up on piston head or on combustion chamber

Excessive smoke

- Worn cylinder, piston or piston ring
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall
- Cylinder head/valve problem (page 8-12)

Abnormal noise

- Worn piston pin or piston pin hole
- Worn connecting rod small end
- Worn cylinder, piston or piston rings
- Worn crankshaft bearing
- Worn connecting rod big end bearing

CRANKCASE SEPARATION

Remove the engine from the frame (page 7-5).

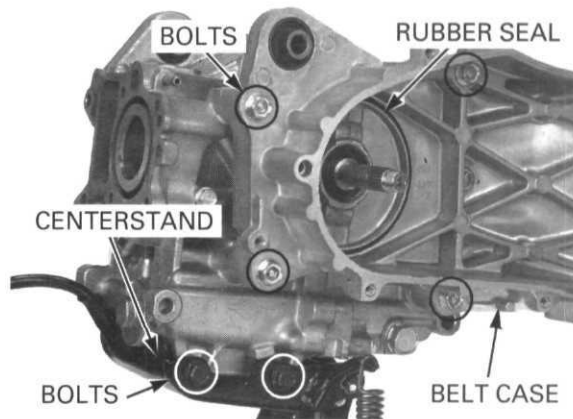
Remove the following:

- Cylinder head/cam chain (page 8-10)
- Oil pump (page 4-4)
- Drive pulley (page 9-9)

Remove the four bolts and centerstand from the crankcase.

Remove the four bolts and belt case.

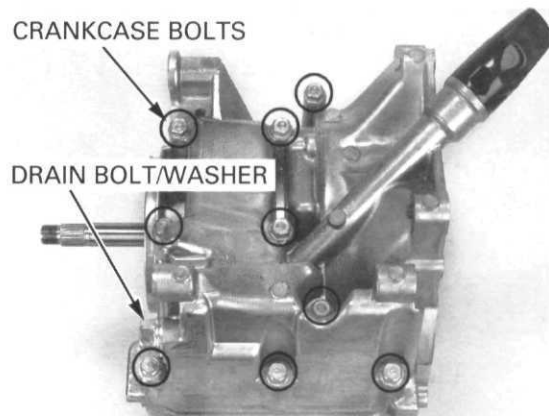
Remove the rubber seal.



Remove the drain bolt and sealing washer.

Loosen the crankcase bolts in a crisscross pattern in two or three steps.

Remove the crankcase bolts.

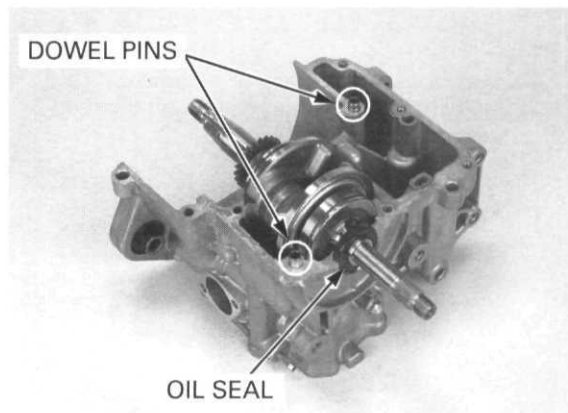


Be careful not to damage the crankcase mating surface.

Place the upper crankcase facing down and separate the upper and lower crankcase halves.

Remove the dowel pins and oil seal.

Clean any sealant from the crankcase mating surface.



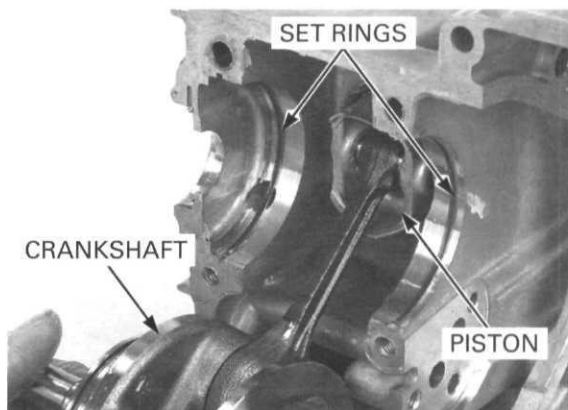
CRANKSHAFT/PISTON

CRANKSHAFT REMOVAL

Separate the upper and lower crankcase halves.

Remove the crankshaft and piston from the upper crankcase.

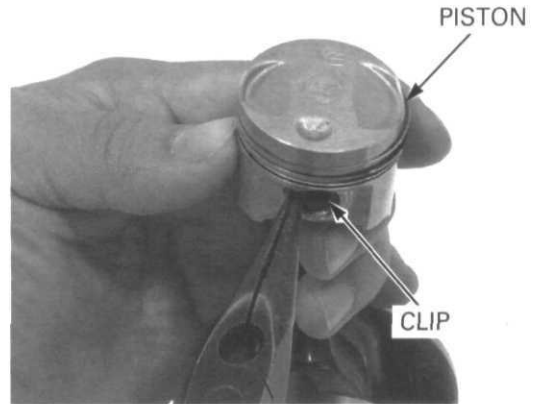
Remove the set rings.



CRANKSHAFT/PISTON/CYLINDER

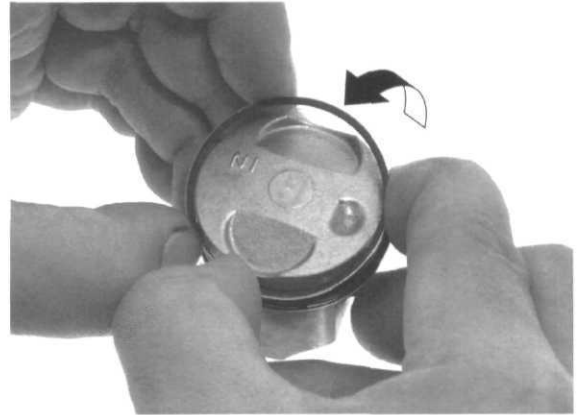
PISTON REMOVAL

Remove the piston pin clips with pliers.
Remove the piston pin out of the piston.



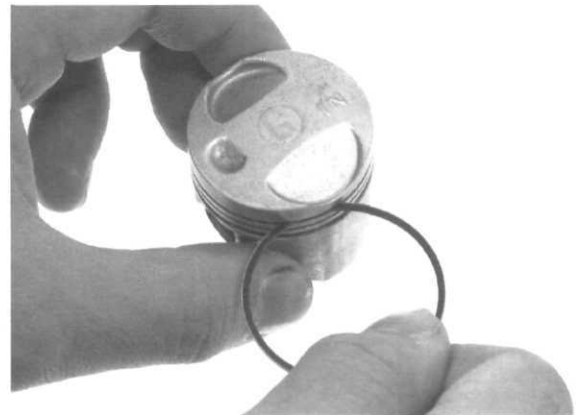
Do not damage the piston ring by spreading the ends too far.

Spread each piston ring and remove it by lifting up at a point opposite the gap.



Never use a wire brush, it will scratch the groove.

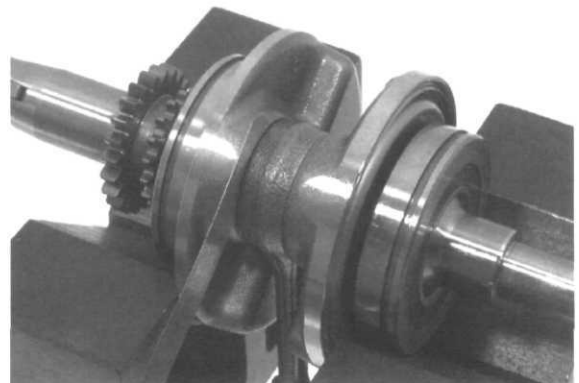
Clean carbon deposits from the ring grooves with a ring that will be discarded.



CRANKSHAFT INSPECTION

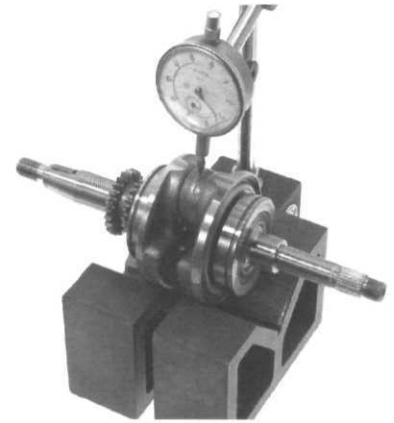
Measure the connecting rod big end side clearance with a feeler gauge.

SERVICE LIMIT: 0.60 mm (0.024 in)

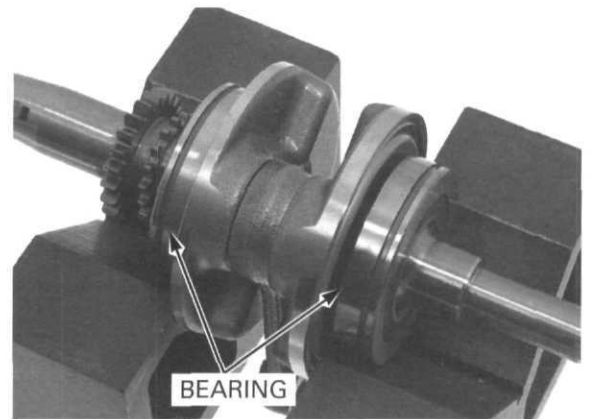


Set the crankshaft on V-blocks and read the runout points as shown, using a dial indicator. Actual runout is 1/2 of total indicator reading.

SERVICE LIMIT: 0.05 mm (0.002 in)

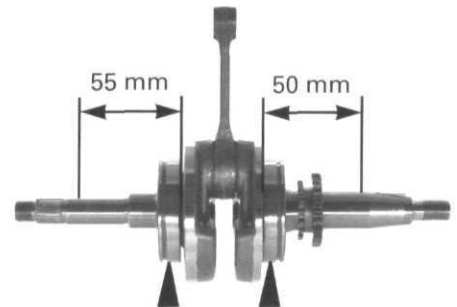


Turn the outer race of the crankshaft bearing with your finger. The bearing should turn smoothly and quietly. Also check that the bearing inner race fits tightly on the crankshaft. Replace the crankshaft assembly if the bearings do not turn smoothly, quietly, or if they fit loosely on the crankshaft.

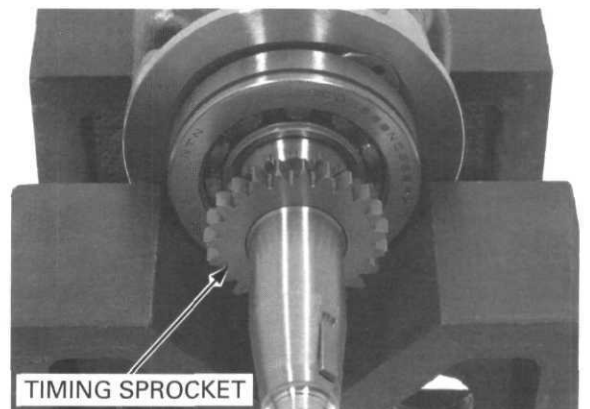


Set the crankshaft on a truing stand or V-blocks and measure the runout using a dial indicator.

SERVICE LIMIT: 0.10 mm (0.0039 in)



Check the timing sprocket teeth for wear or damage.



PISTON/CYLINDER INSPECTION

Inspect the piston rings for movement by rotating the rings. The rings should be able to move in their grooves without catching.

Push the ring until the outer surface of the piston ring is nearly flush with the piston and measure the ring-to-groove clearance.

SERVICE LIMIT:

Top: 0.08 mm (0.003 in)

Second: 0.08 mm (0.003 in)

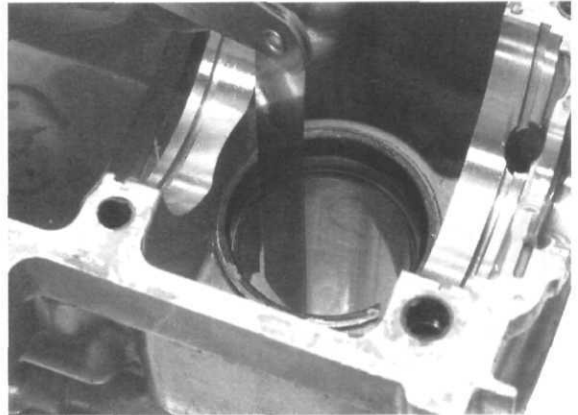


Insert each piston ring into the bottom of the cylinder squarely using the piston. Measure the ring end gap.

SERVICE LIMIT:

Top/Second: 0.40 mm (0.016 in)

Oil (side rail): 0.80 mm (0.031 in)



Measure the piston pin hole. Take the maximum reading to determine I.D.

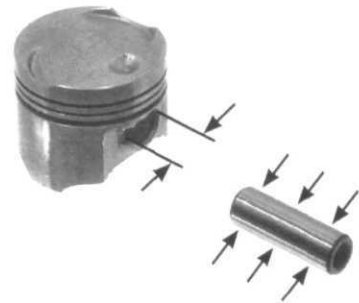
SERVICE LIMIT: 10.04 mm (0.395 in)

Measure the piston pin O.D. at piston and connecting rod sliding areas.

SERVICE LIMIT: 9.98 mm (0.393 in)

Calculate the piston-to-piston pin clearance.

SERVICE LIMIT: 0.04 mm (0.002 in)

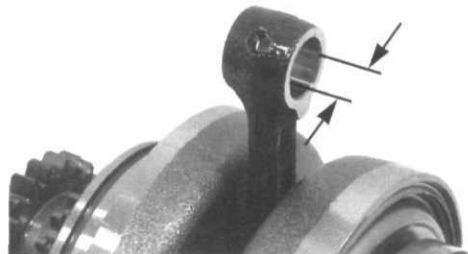


Measure the connecting rod small end I.D.

SERVICE LIMIT: 10.05 mm (0.396 in)

Calculate the connecting rod-to-piston pin clearance.

SERVICE LIMIT: 0.06 mm (0.002 in)

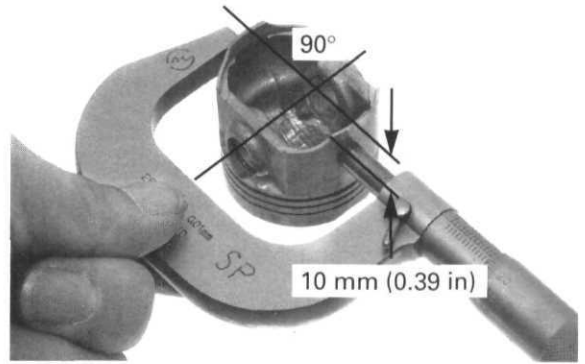


Measure the piston O.D. at the point 10 mm (0.39 in) from the bottom and 90° to the piston pin hole.

SERVICE LIMIT: 37.72 mm (1.485 in)

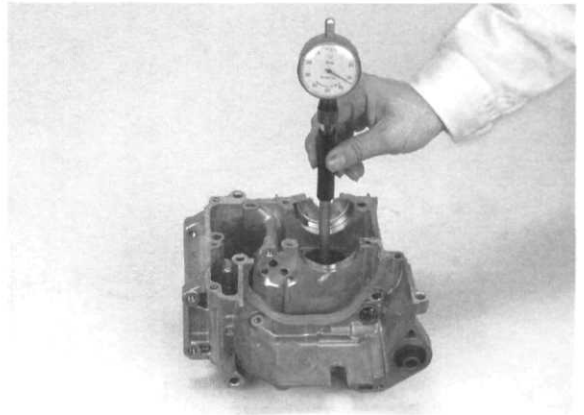
Calculate the cylinder-to-piston clearance (cylinder I.D.: see below).

SERVICE LIMIT: 0.08 mm (0.003 in)



Inspect the cylinder bore for wear or damage. Measure the cylinder I.D. in the X and Y axes at three levels. Take the maximum reading to determine the cylinder wear.

SERVICE LIMIT: 37.76 mm (1.487 in)

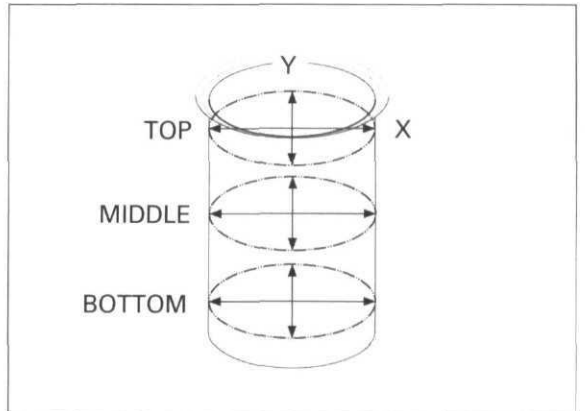


Calculate the taper and out-of-round at three levels in the X and Y axes. Take the maximum reading to determine both measurements.

SERVICE LIMIT:

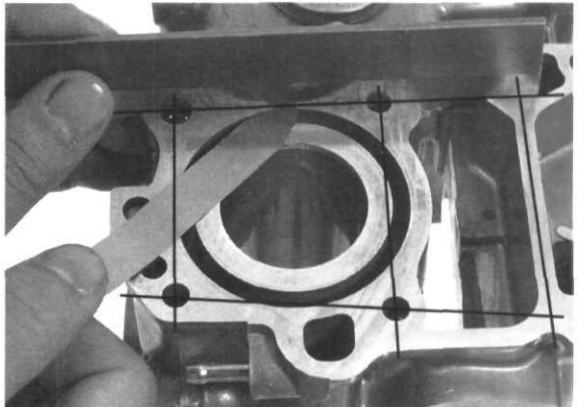
Taper: 0.05 mm (0.002 in)

Out of round: 0.05 mm (0.002 in)



Check the cylinder for warpage with a straight edge and feeler gauge in the directions shown.

SERVICE LIMIT: 0.05 mm (0.002 in)



CRANKSHAFT/PISTON/CYLINDER

PISTON INSTALLATION

Be careful not to damage the piston and rings.

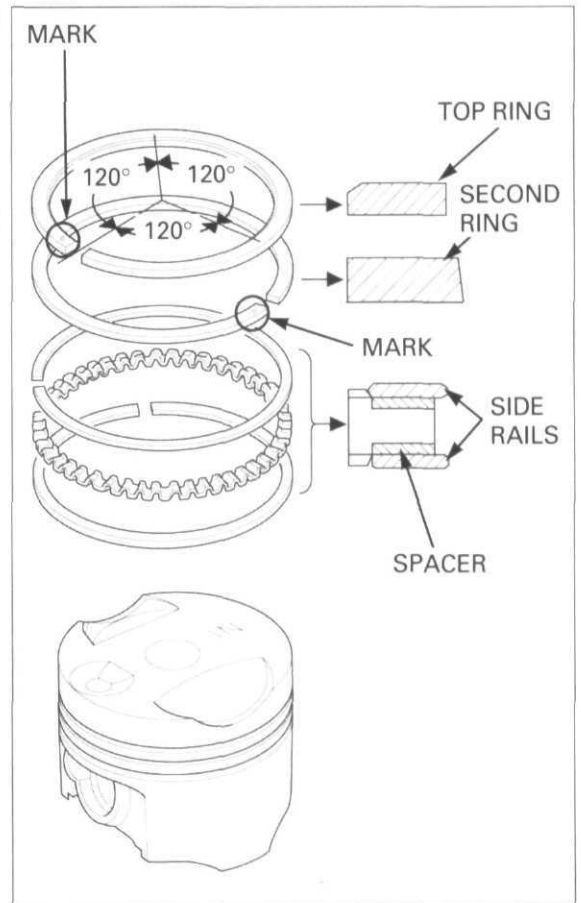
Carefully install the piston rings into the piston ring grooves with the markings facing up

NOTE:

- Do not confuse the top and second rings.
- To install the oil ring, install the spacer first, then install the side rails.

Stagger the piston ring end gaps 120 degrees apart from each other.

Stagger the side rail end gaps as shown.



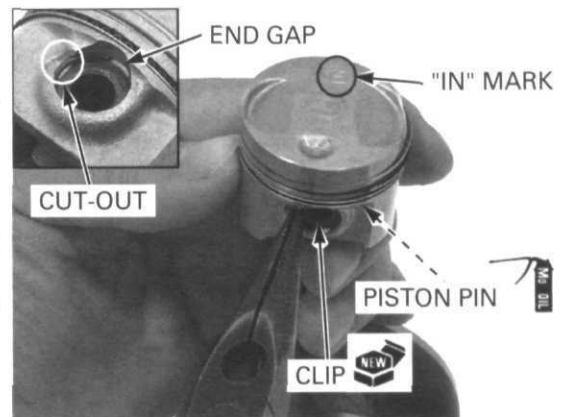
Apply molybdenum disulfide oil to the piston pin. Apply engine oil to the connecting rod small end and piston pin hole.

Install the piston with the "IN" mark facing the intake side.

Install the piston pin and new pin clips.

NOTE:

- Make sure the piston pin clips are seated securely.
- Do not align the piston pin clip end gap with the piston cut-out.

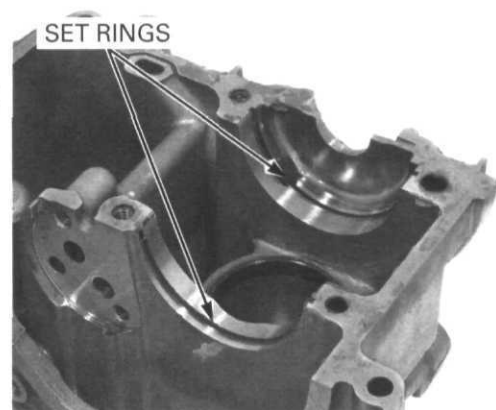


CRANKSHAFT INSTALLATION

Be careful not to damage the crankcase mating surface.

Clean the insides of the crankcases. Check for cracks or other damage. Clean the crankcase mating surface. Dress any roughness or irregularities with an oil stone.

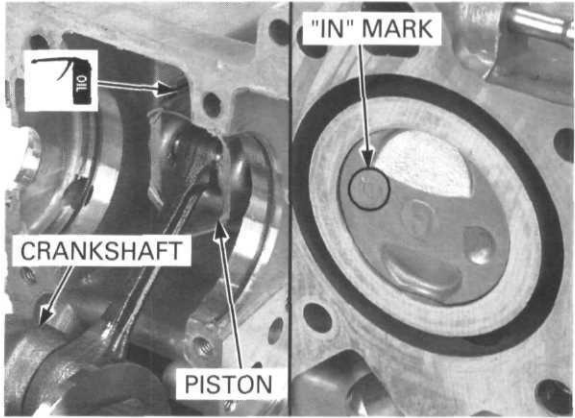
Install the set ring into the crankcase grooves.



Apply engine oil to the connecting rod big end bearing (3 cm³), connecting rod journal bearings (2 cm³ each), cylinder wall, piston and piston ring outer surface.

Be careful not to damage the piston rings and cylinder walls.

Install the piston with the "IN" mark facing the cam chain side while compressing the piston rings with your fingers. Align the crankshaft bearing groove with the set ring.

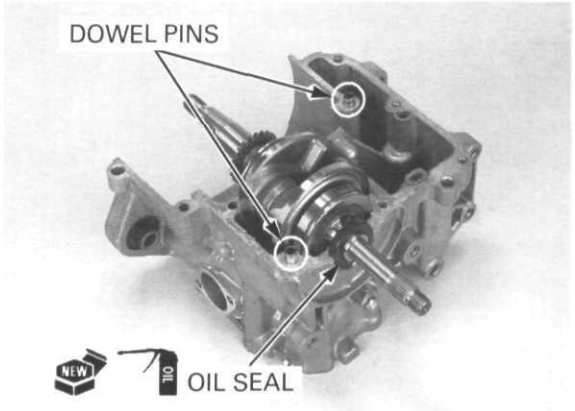


CRANKCASE ASSEMBLY

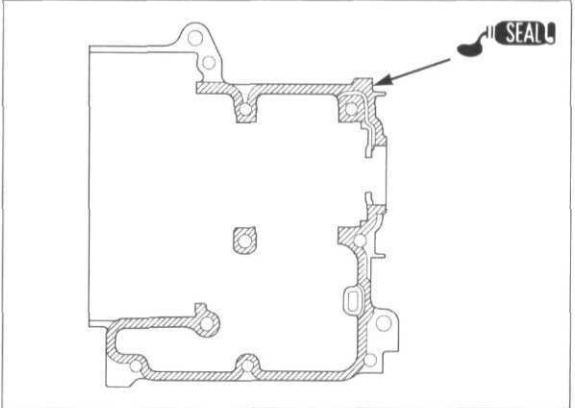
Apply oil to a new crankshaft oil seal lip and outer surface.

Install the crankshaft oil seal until it is flush with the crankcase surface.

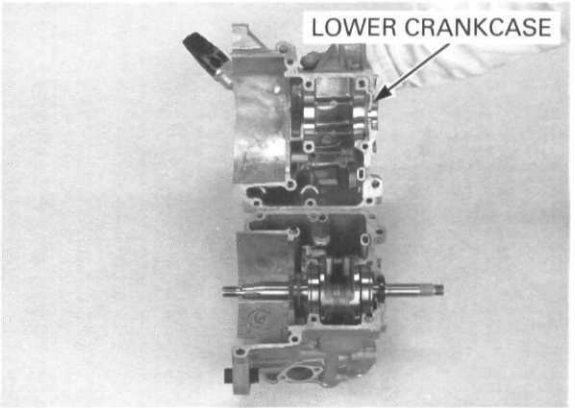
Install the dowel pins into the upper crankcase.



Apply sealant to the lower crankcase mating surface.



Install the lower crankcase over the upper crankcase.



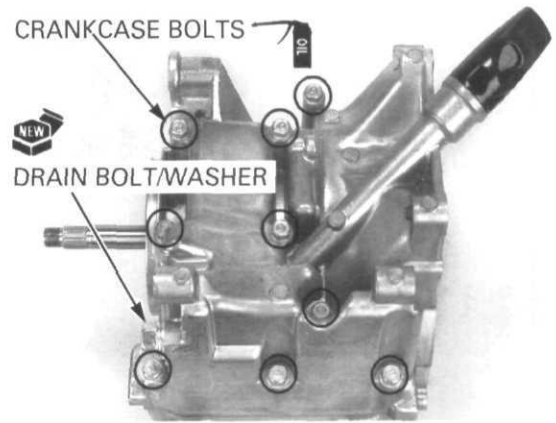
CRANKSHAFT/PISTON/CYLINDER

Apply engine oil to the crankcase bolt threads and seating surface.
Install the bolts and tighten them in a crisscross pattern in two or three steps.

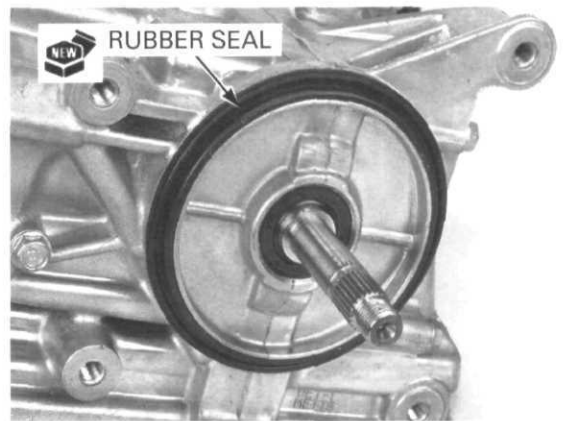
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the new sealing washer and drain bolt.
Tighten the bolt to the specified torque.

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)



Clean the belt case mating surface of the crankcase.
Install a new rubber seal onto the crankcase.

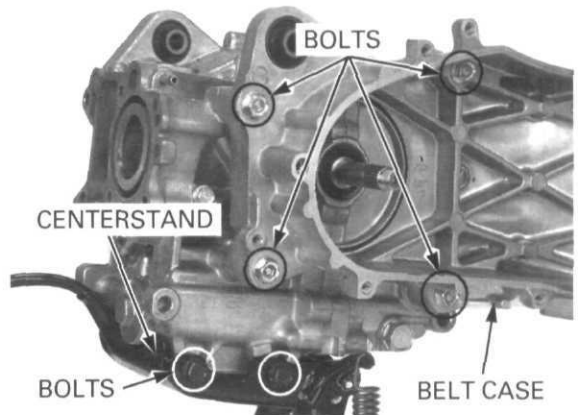


Install the belt case and tighten the bolts securely.
Install the centerstand, bolts and tighten the bolts securely.

Install the following:

- Drive pulley (page 9-11)
- Oil pump (page 4-7)
- Cylinder head/cam chain (page 8-18)

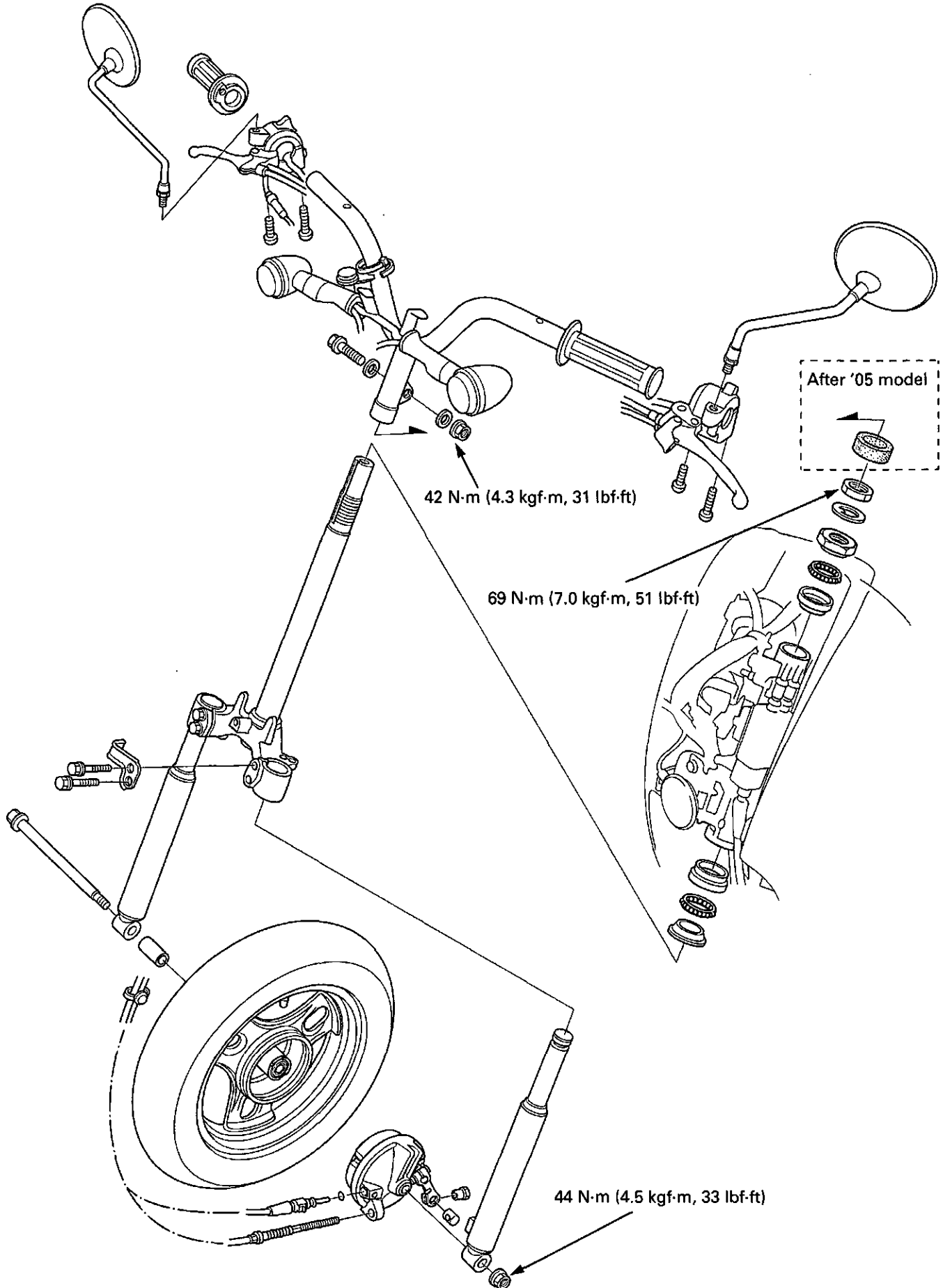
Install the engine into the frame (page 7-8).



13. FRONT WHEEL/BRAKE/SUSPENSION/STEERING

COMPONENT LOCATION	13-2	FORK	13-13
SERVICE INFORMATION	13-3	HANDLEBAR.....	13-17
TROUBLESHOOTING	13-5	EQUALIZER.....	13-20
FRONT WHEEL	13-6	STEERING STEM.....	13-21
FRONT BRAKE	13-9		

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.
- This section covers the front wheel, fork, handlebar, brake and steering.
- A jack or other support is required to support the vehicle.
- Use genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.

SPECIFICATIONS

Unit: mm (in)


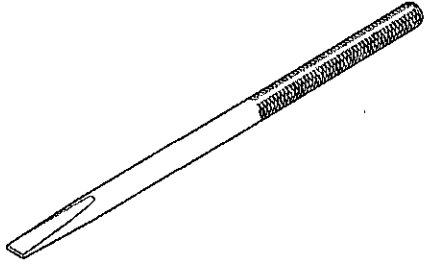
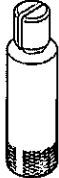
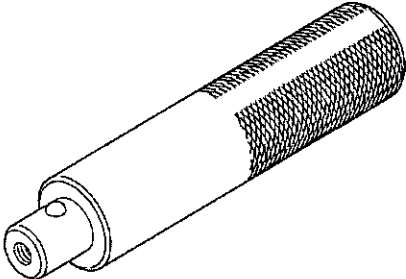
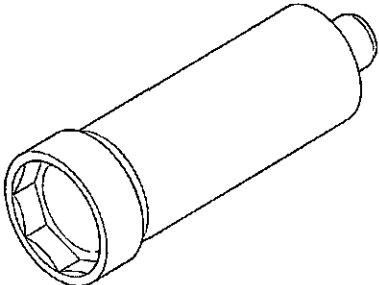
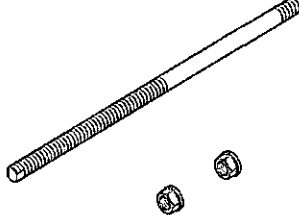
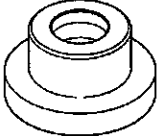
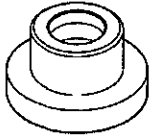
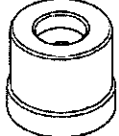
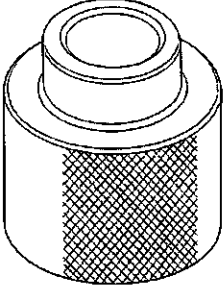
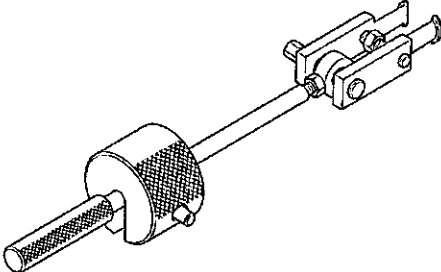
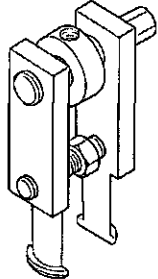
ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		-	0.8 (0.03)
Cold tire pressure		125 kPa (1.25 kgf/cm ² , 18 psi)	-
Axle runout		-	0.20 (0.008)
Wheel rim runout	Radial	-	2.0 (0.08)
	Axial	-	2.0 (0.08)
Brake	Right brake lever free play	10 – 20 (3/8 – 13/16)	-
	Brake drum I.D.	95.0 (3.74)	95.5 (3.76)
	Brake lining thickness	3.5 (0.14)	1.0 (0.04)
Fork spring free length		128.5 (5.06)	125.9 (4.96)

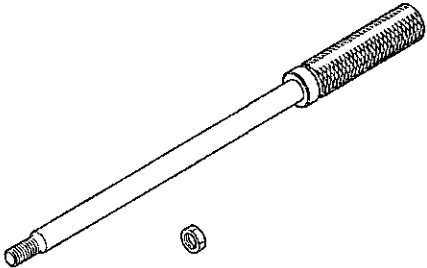
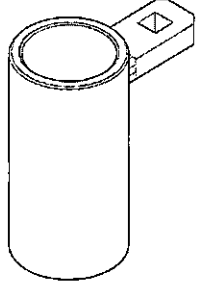
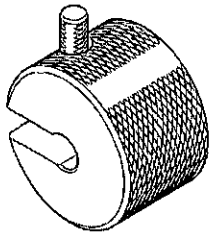
TORQUE VALUES

Front axle nut	44 N·m (4.5 kgf·m, 33 lbf·ft)	U-nut
Front brake arm nut	5.8 N·m (0.6 kgf·m, 4.3 lbf·ft)	
Handlebar post nut	42 N·m (4.3 kgf·m, 31 lbf·ft)	U-nut
Steering stem top cone race	11 N·m (1.1 kgf·m, 8 lbf·ft)	
Steering stem lock nut	69 N·m (7.0 kgf·m, 51 lbf·ft)	
Equalizer cover bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads

FRONT WHEEL/BRAKE/SUSPENSION/STEERING

TOOLS

<p>Pilot, 10 mm 07746-0040100</p> 	<p>Bearing remover shaft 07746-0050100</p> 	<p>Bearing remover head, 10 mm 07746-0050200</p> 
<p>Driver 07749-0010000</p> 	<p>Socket wrench, 32 mm 07916-KM10000</p> 	<p>Installer shaft 07VMF-KZ30200</p> 
<p>Stem race installer, 29 x 50 mm 07XMF-GEE0200 (two required)</p>  <p>not available in U.S.A</p>	<p>Stem race installer, 26 x 47 mm 07XMF-GEE0100</p>  <p>not available in U.S.A</p>	<p>Attachment, 28 x 30 mm 07946-1870100</p> 
<p>Fork seal driver, 27 mm 07947-1180001</p> 	<p>Adjustable bearing remover set 07JAC-PH80000</p>  <p>not available in U.S.A</p>	<p>Remover head 07JAC-PH80100</p>  <p>U.S.A. only: Adjustable bearing puller, 25 - 40 mm 07736-A01000B or 07736-A01000A (used with commercially available 3/8 x 18 slide hammer)</p>

<p>Remover shaft 07JAC-PH80200</p>  <p>not available in U.S.A</p>	<p>Lock nut wrench, 45 x 54 mm 07SMA-GBC0100</p> 	<p>Remover weight 07741-0010201</p>  <p>not available in U.S.A</p>
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TROUBLESHOOTING

Hard steering

- Steering top cone race too tight
- Faulty steering head bearing
- Bent steering stem
- Insufficient tire pressure
- Faulty tire

Steers to one side or does not track straight

- Bent fork
- Bent front axle
- Wheel installed incorrectly
- Bent frame
- Worn wheel bearings
- Worn or damaged engine mounting bushings (page 7-5)

Front wheel wobbles

- Bent rim
- Worn or damaged front wheel bearings

Front wheel turns hard

- Faulty wheel bearings
- Brake drag (page 13-9)
- Bent front axle

Soft suspension

- Weak fork spring
- Low tire pressure

Suspension noisy

- Loose fork fasteners
- Faulty front fork

Poor brake performance

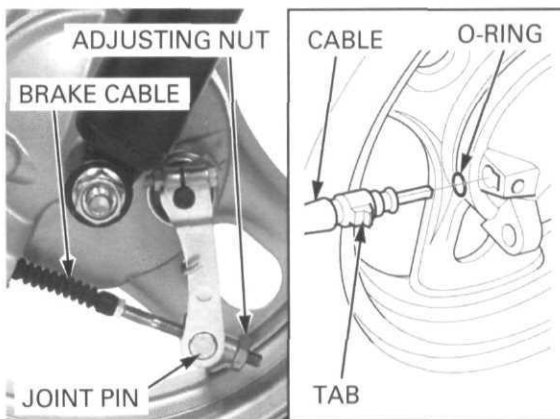
- Incorrect adjustment of right brake lever
- Contaminated brake shoes
- Worn brake shoes
- Worn brake cam
- Worn brake drum
- Faulty equalizer adjustment (page 13-20)

FRONT WHEEL

REMOVAL

Remove the front brake arm adjusting nut and disconnect the brake cable from the brake arm. Remove the joint pin from the brake arm.

Disconnect the speedometer cable from the brake panel and remove the O-ring.

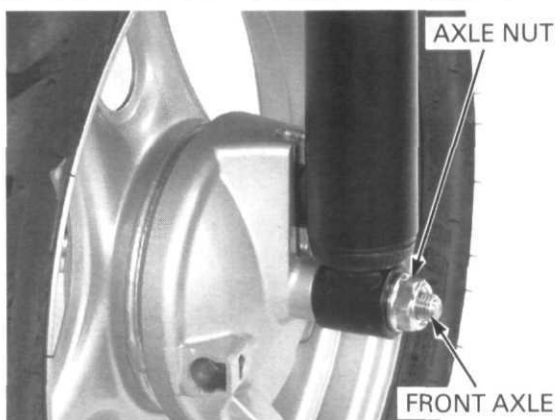


Loosen the front axle nut.

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

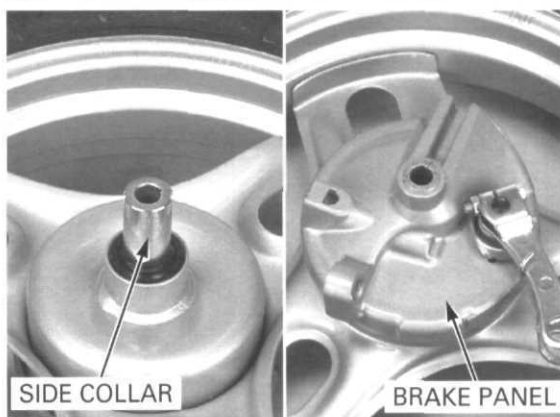
Remove the front axle nut.

Remove the front axle out and remove the front wheel.



Remove the side collar from the right side of the wheel.

Remove the brake panel from the left side of the wheel.

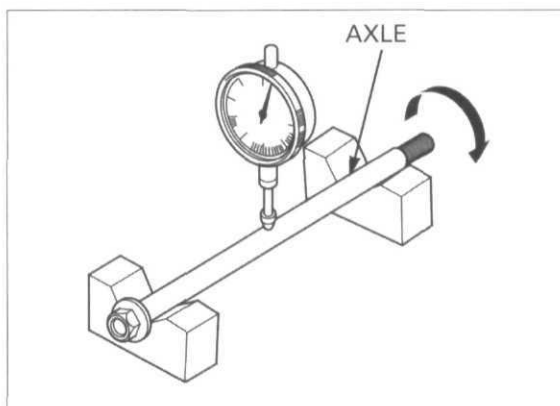


INSPECTION

AXLE

Place the axle in V-blocks and measure the runout. Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)



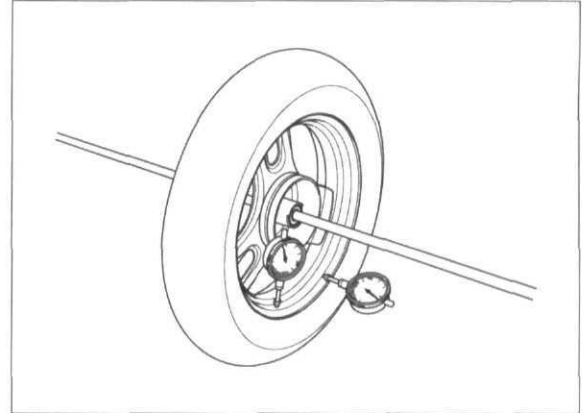
WHEEL

Check the rim runout by placing the wheel in a truing stand. Spin the wheel slowly and read the runout using a dial indicator. Actual runout is 1/2 the total indicator reading.

SERVICE LIMITS:

Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)

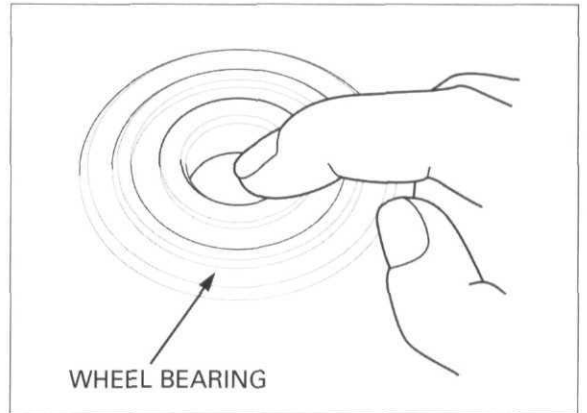


WHEEL BEARING

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

Replace the wheel bearings in pairs.

Remove and discard the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the hub.



DISASSEMBLY

Remove the dust seal.



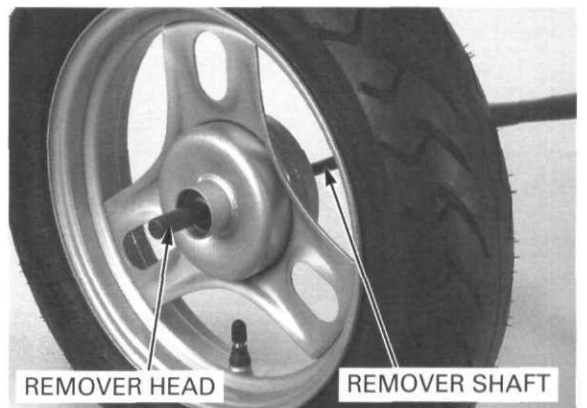
Replace the wheel bearing in pairs. Do not reuse old bearings.

Install the bearing remover head into the bearing. From the opposite side of the wheel, 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:

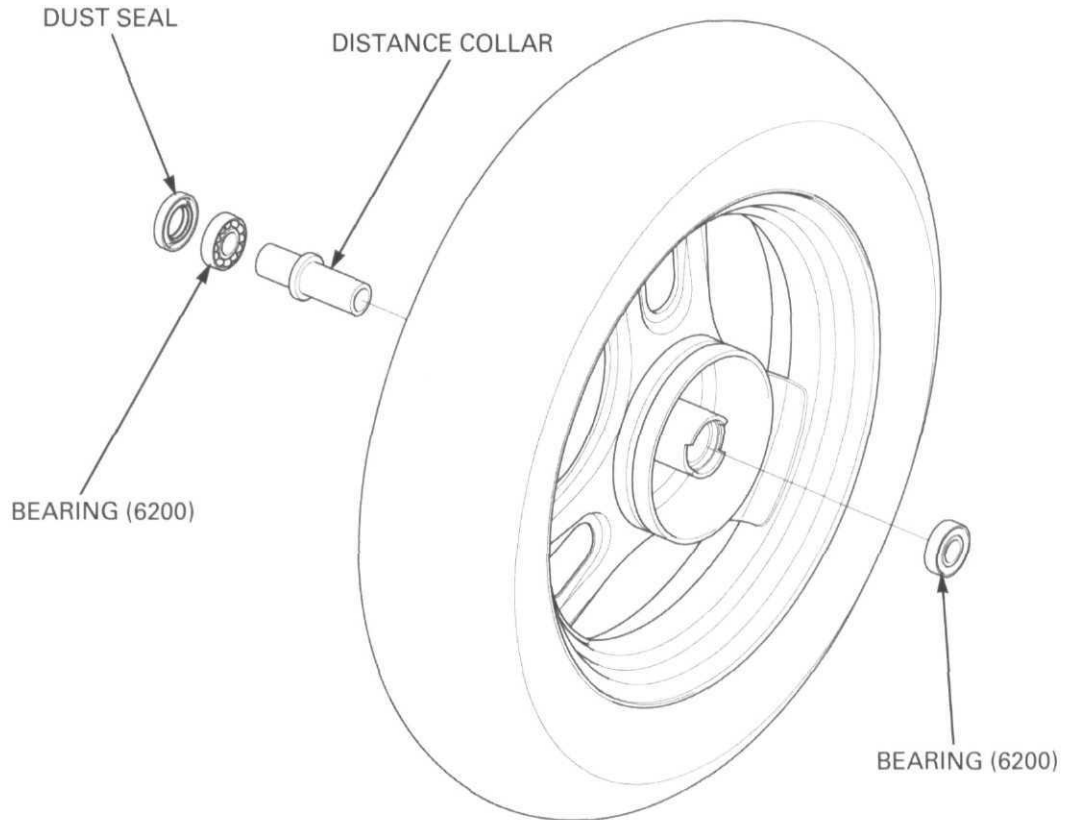
Bearing remover shaft 07746-0050100

Bearing remover head, 10 mm 07746-0050200



FRONT WHEEL/BRAKE/SUSPENSION/STEERING

ASSEMBLY



Pack the new bearing cavities with grease.

Drive the new left bearing (brake drum side) squarely with the sealed side facing up until it is fully seated.

Install the distance collar.

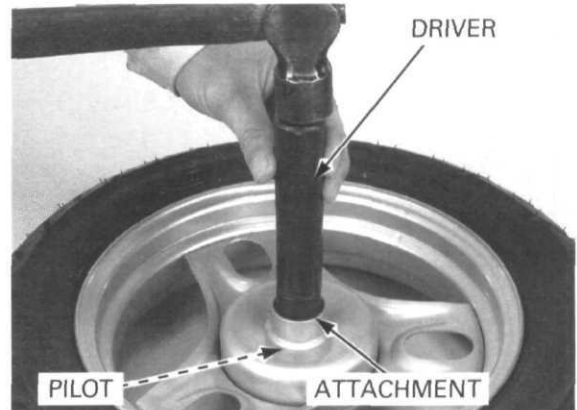
Drive the new right bearing squarely with the sealed side facing up until it is fully seated using the same tools.

TOOLS:

Driver	07749-0010000
Attachment, 28 X 30 mm	07946-1870100
Pilot, 10 mm	07746-0040100

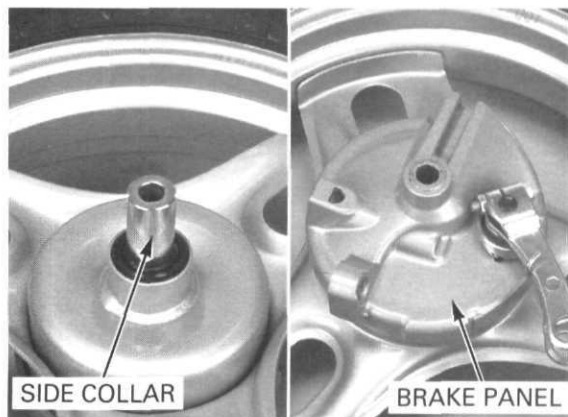
Apply grease to new dust seal lips.

Install the dust seal into the left wheel hub until it is flush with the wheel hub.



INSTALLATION

Install the brake panel while aligning the tab of the speedometer gear with the groove in the wheel hub.
Install the side collar.

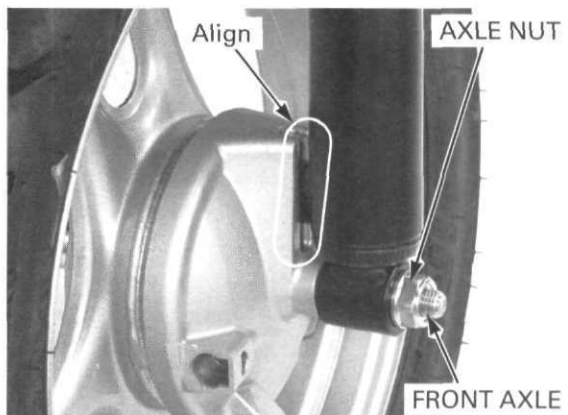


Install the front wheel between the fork legs while aligning the brake panel groove with the boss on the left fork leg.

Install the front axle from the right side.

Install the axle nut and tighten it to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)

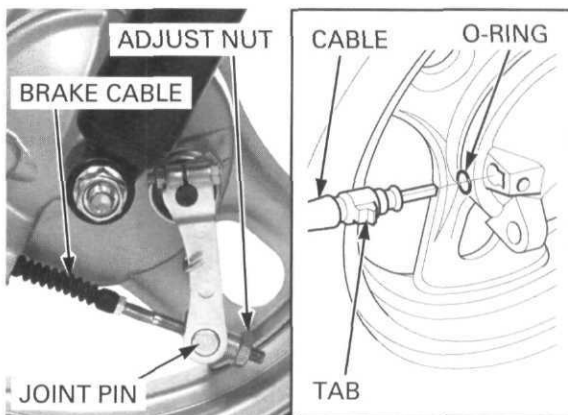


Apply oil to a new O-ring and install it on the speedometer cable.

Connect the speedometer cable into the brake panel while aligning the tab of the speedometer cable with the hole of the brake panel.

Install the joint pin and connect the brake cable into the brake arm.

Adjust the right brake lever free play (page 3-16).



FRONT BRAKE

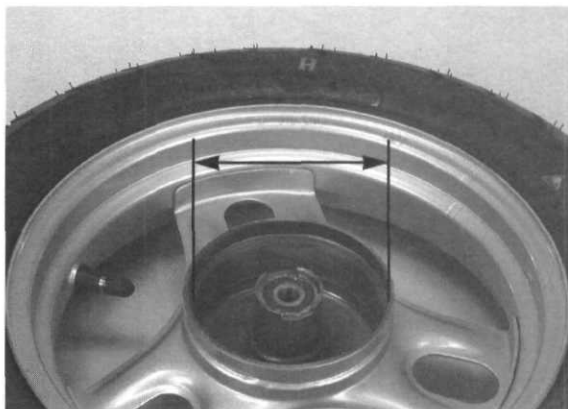
REMOVAL

Remove the brake panel from the front wheel (page 13-6).

INSPECTION

Measure the front brake drum I.D.

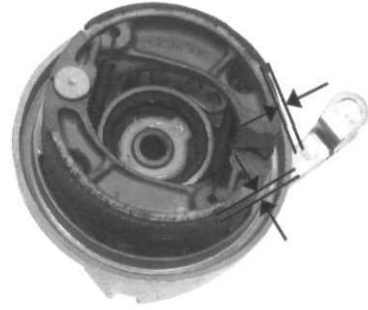
SERVICE LIMIT: 95.5 mm (3.76 in)



FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Measure the brake lining thickness.

SERVICE LIMIT: 1.0 mm (0.04 in)

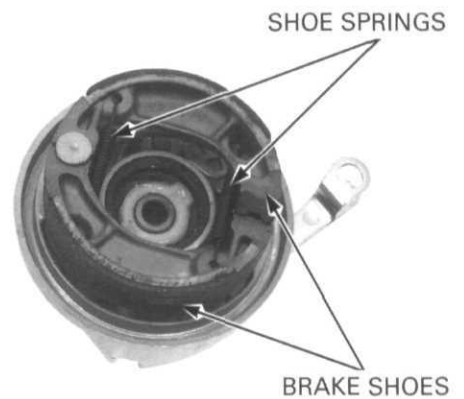


DISASSEMBLY

NOTE:

- Always replace the brake shoes as a set.
- Mark all parts during disassembly so they can be placed back in the original locations.

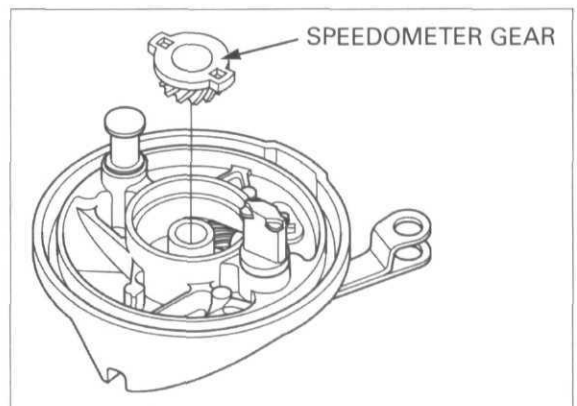
Pull the brake shoes away from the anchors and remove the shoes.



Remove the dust seal.

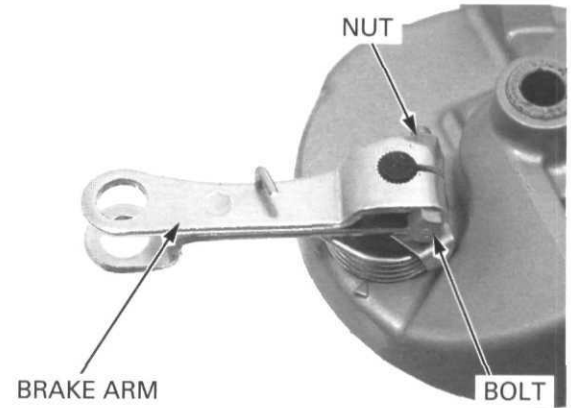


Remove the speedometer gear.



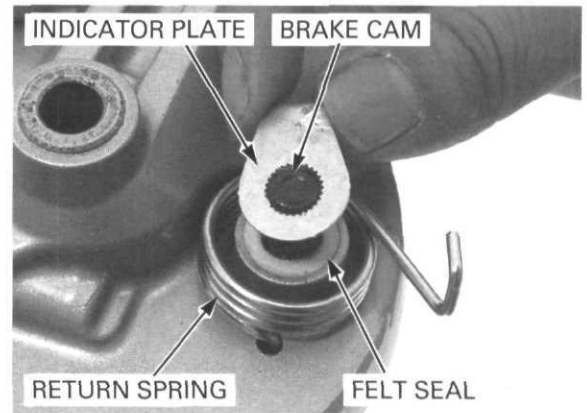
FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Remove the nut, bolt and brake arm.

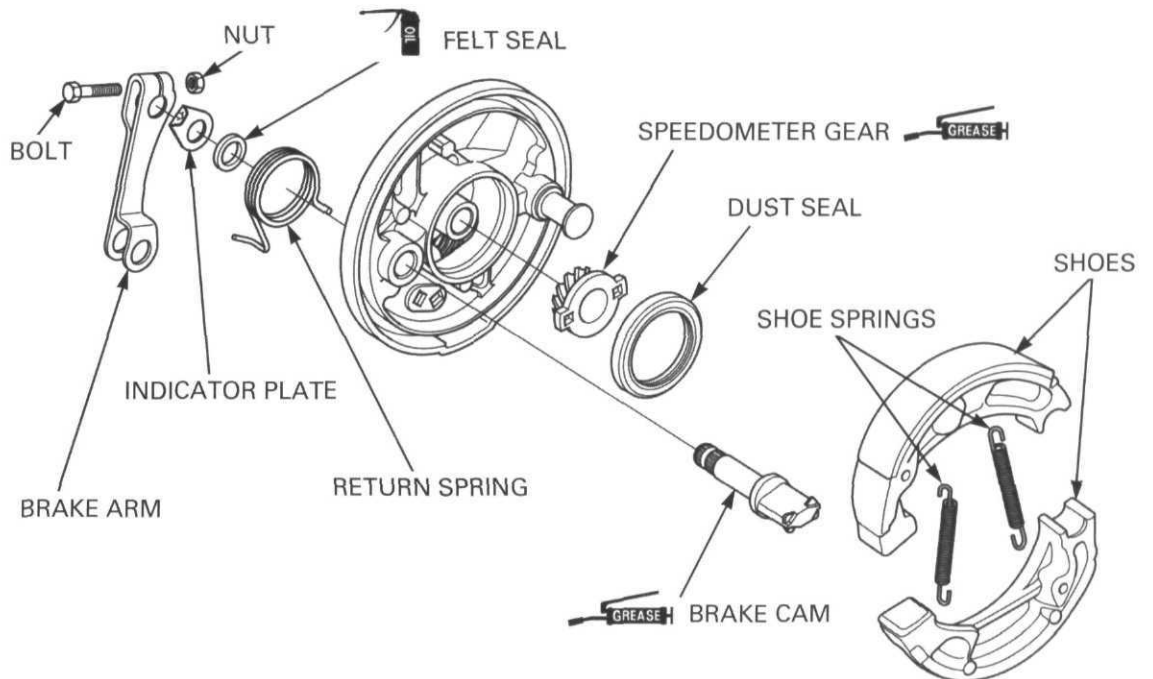


Remove the wear indicator, felt seal and return spring.

Remove the brake cam from the brake panel.

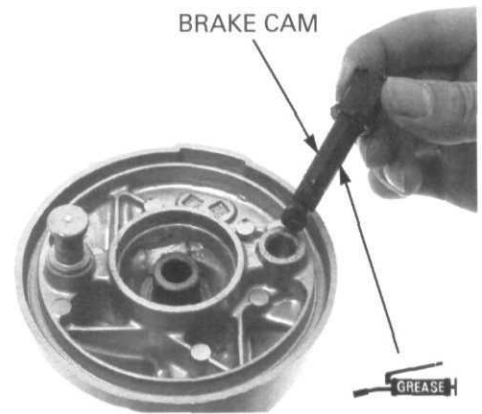


ASSEMBLY



FRONT WHEEL/BRAKE/SUSPENSION/STEERING

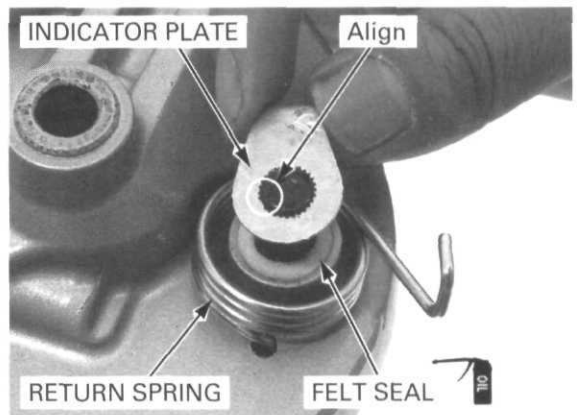
Apply grease to the brake cam spindle.
Install the brake cam into the brake panel.



Apply oil to the felt seal and install it into the brake panel.

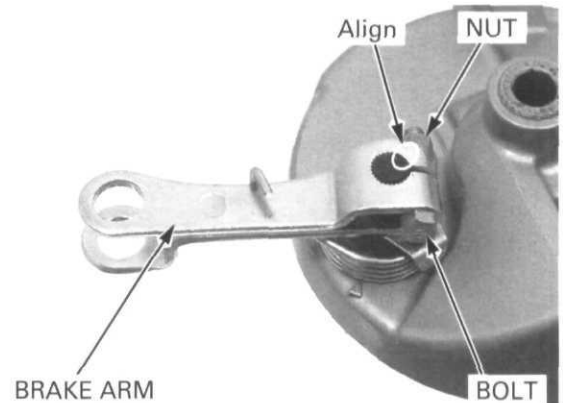
Install the return spring as shown.

Install the wear indicator onto the brake cam by aligning its wide tooth with the wide groove in the brake cam

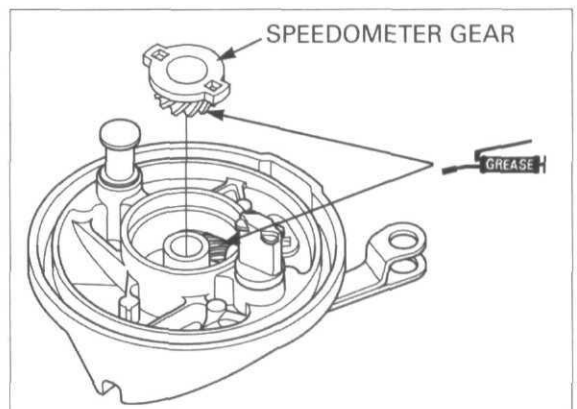


Install the brake arm by aligning the punch marks on the arm and brake cam.
Install the brake arm pinch bolt and nut as shown and tighten it to the specified torque.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)



Apply grease to the speedometer gear and pinion gear sliding surface.
Install the speedometer gear.



Apply grease to a new dust seal lip and install it into the brake panel.

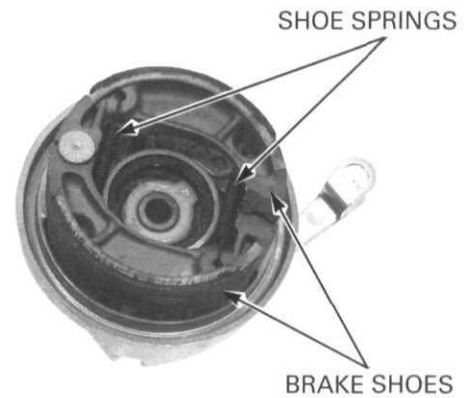
Apply grease to the anchor pin and brake cam sliding surfaces.



Install the brake shoes and springs as shown. Wipe any excess grease off the brake cam and anchor pin.

INSTALLATION

Install the front wheel (page 13-9).

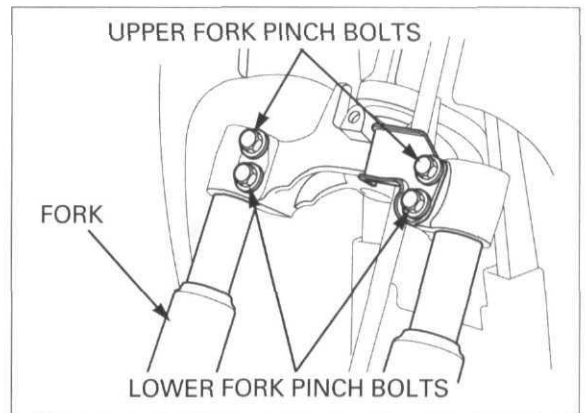


FORK

REMOVAL

Remove the front fender (page 2-5).
Remove the front wheel (page 13-6).

Remove the upper fork pinch bolt.
Loosen the lower fork pinch bolt and remove the fork tube from the steering stem.



DISASSEMBLY

Remove the dust seal.



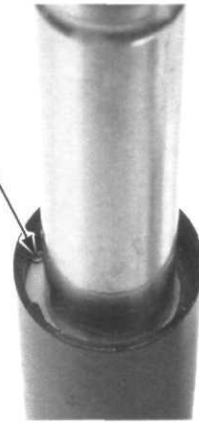
FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Clean the grease within the bottom case.
Press the fork tube into the bottom case and remove the snap ring.

NOTICE

Be careful the fork tube does not pop out from the spring pressure, when removing the snap ring.

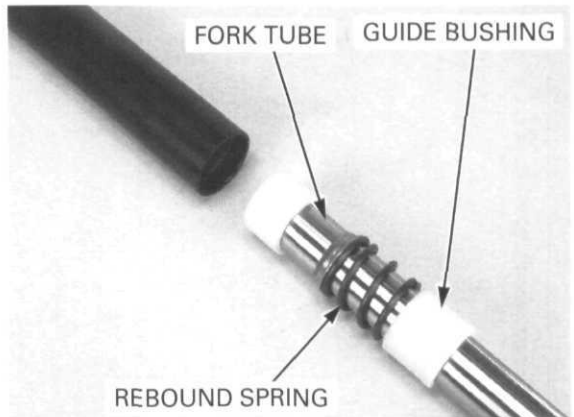
SNAP RING



Pull the fork tube out from the fork tube.
Remove the guide bushing and rebound spring from the fork tube.

FORK TUBE

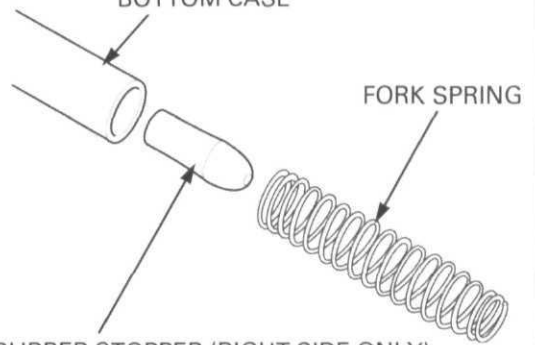
GUIDE BUSHING



REBOUND SPRING

Remove the fork spring and rubber stopper (right side only) from the bottom case.

BOTTOM CASE



FORK SPRING

RUBBER STOPPER (RIGHT SIDE ONLY)

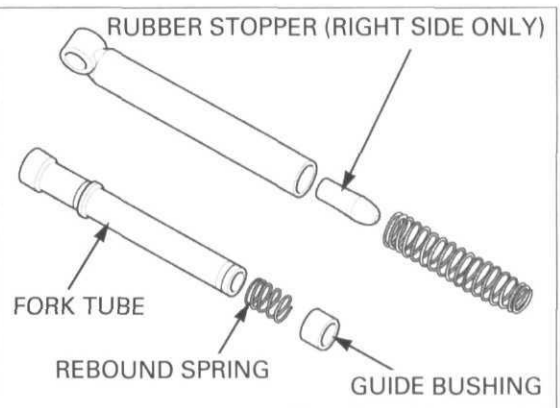
INSPECTION

Check the fork tube, rubber stopper and guide bushing for excessive or abnormal wear.

Check the rebound spring for fatigue or damage.

Replace the components if necessary.

RUBBER STOPPER (RIGHT SIDE ONLY)



FORK TUBE

REBOUND SPRING

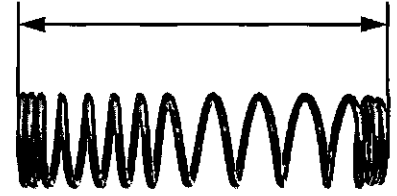
GUIDE BUSHING

FRONT WHEEL/BRAKE/SUSPENSION/STEERING

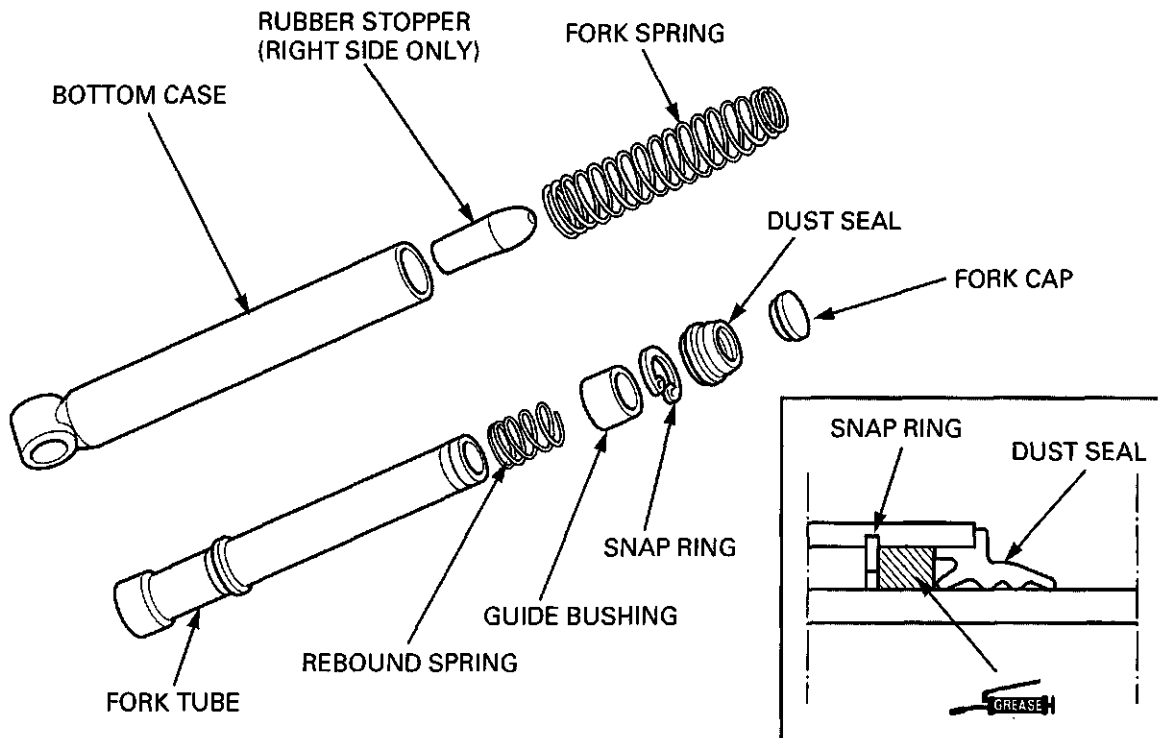
Check the fork spring for fatigue or damage.

Measure the fork spring free length.

SERVICE LIMIT: 125.9 mm (4.96 in)

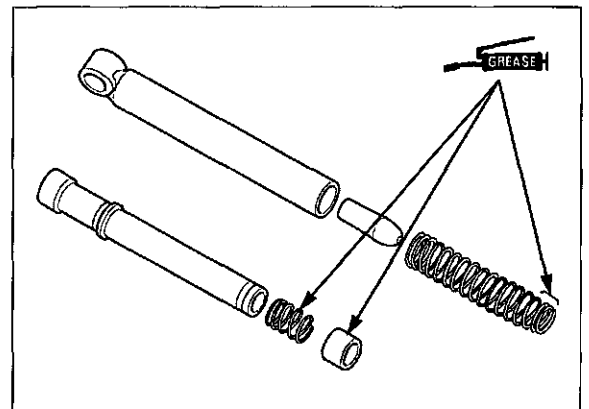


ASSEMBLY



Apply 6.5 – 8g of grease to the following parts.

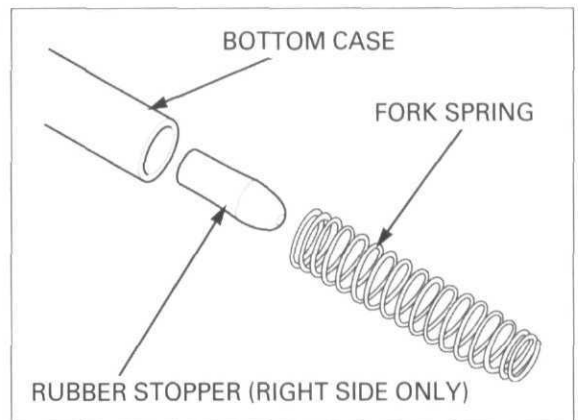
- rebound spring
- guide bushing inner surface
- fork spring tightly wound end



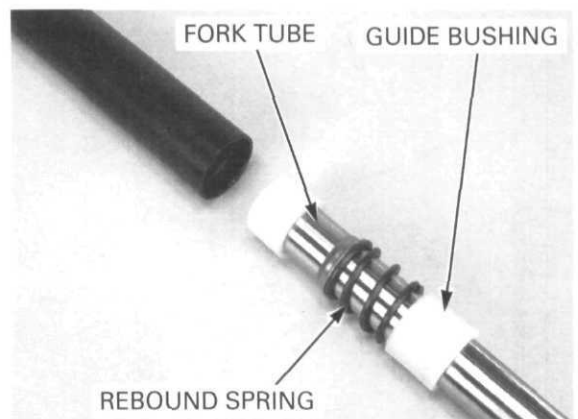
FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Right side only Install the rubber stopper into the bottom case as shown.

Install the fork spring with the tightly wound end facing down.



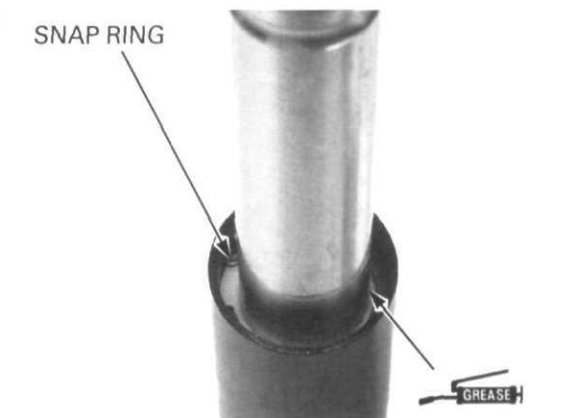
Install the rebound spring and guide bushing into the fork tube.
Install the fork tube into the bottom case.



Press the fork tube into the bottom case until the snap ring groove is visible.

Install the snap ring into the groove in the bottom case.

Apply grease to the fork tube as shown.

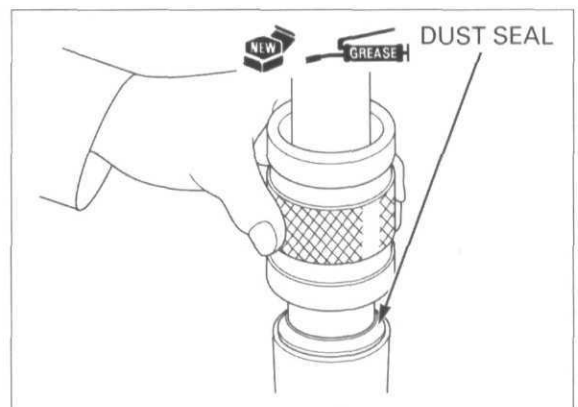


Coat a new dust seal lip with grease and install it into the bottom case using the special tool.

TOOLS:

Fork seal driver, 27 mm

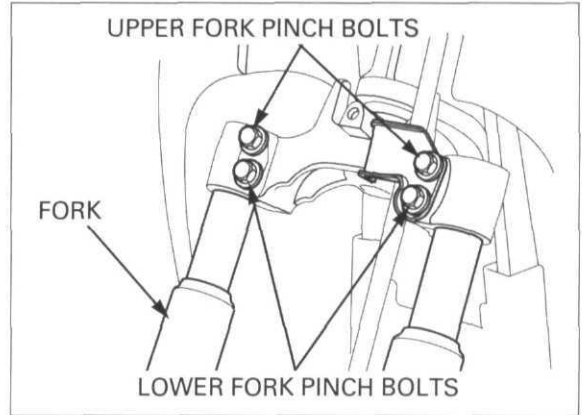
07947-1180001



INSTALLATION

Install the fork into the steering stem and align the groove in the fork tube with the upper bolt hole in the stem, then install the upper pinch bolt. Tighten the fork pinch bolts securely.

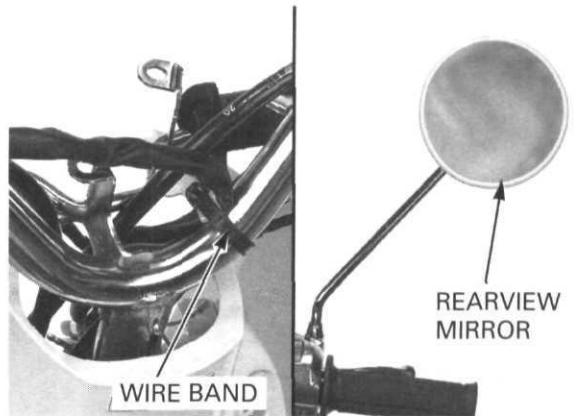
Install the front wheel (page 13-9).
Install the front fender (page 2-5).



HANDLEBAR

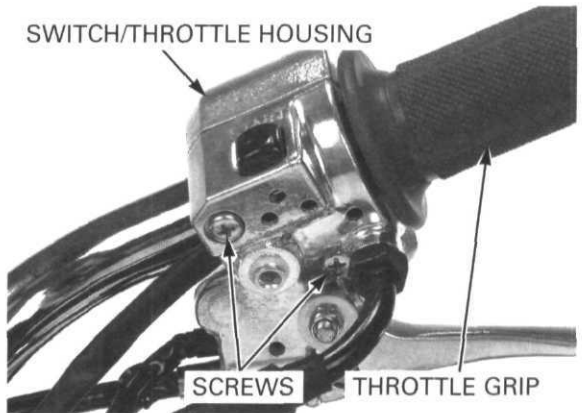
REMOVAL

Remove the front cover (page 2-4).
Remove the speedometer (page 18-9).
Remove the wire band from the handlebar.
Remove the rearview mirrors.

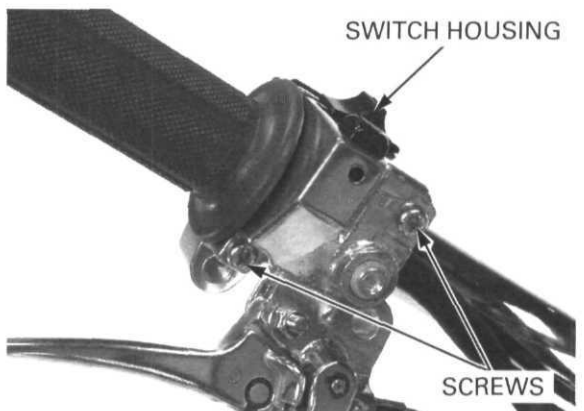


Remove the screws and right handlebar switch/throttle housing.

Disconnect the throttle cable from the throttle pipe and remove it.

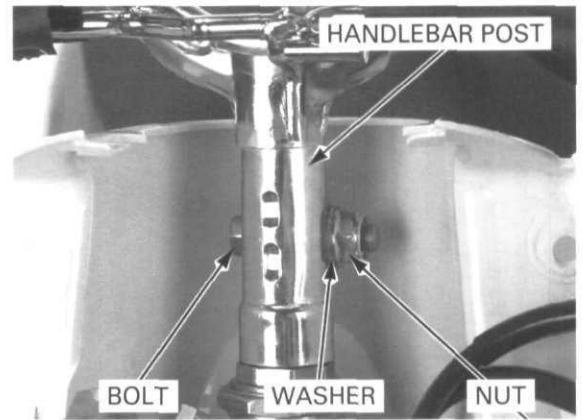


Remove the screws and left handlebar switch housing.

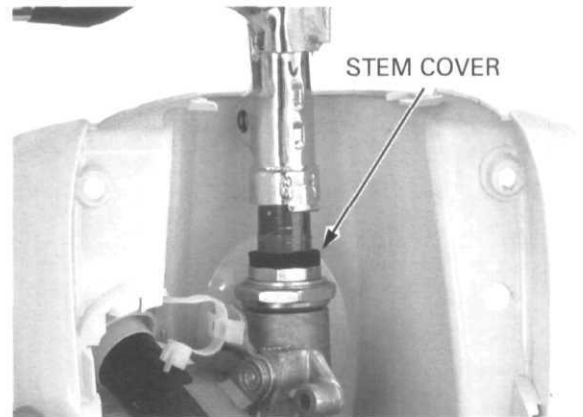


FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Remove the handlebar post nut, bolt, washer and handlebar post from the steering stem.



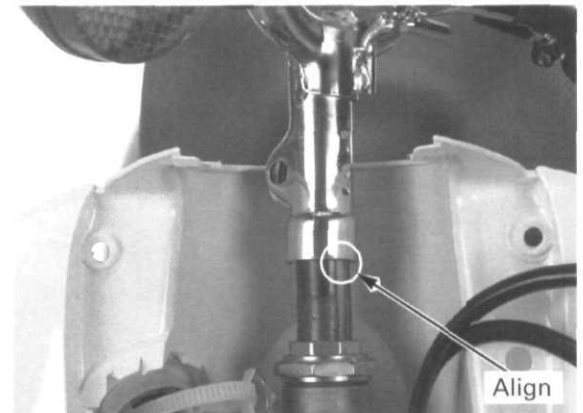
After '05 model only: Remove the stem cover.



INSTALLATION

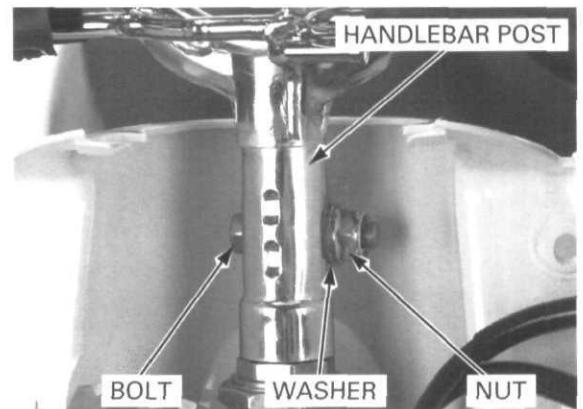
After '05 model only: Install the stem cover.

Install the handlebar post into the steering stem while aligning the tab of the handlebar post with the groove in the steering stem.



Install the bolt, washer and nut.
Tighten the nut to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

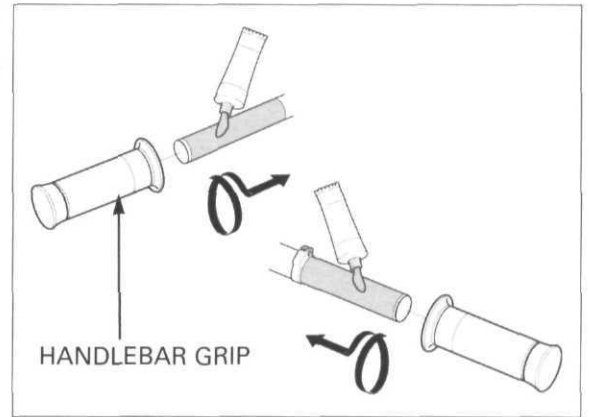


FRONT WHEEL/BRAKE/SUSPENSION/STEERING

If the handlebar grips were removed, apply Honda Bond A or Honda Hand Grip Cement (U.S.A. only) to the inside of the grip and to the clean surfaces of the right and left handlebar.

Allow the adhesive to dry for 1 hour before using.

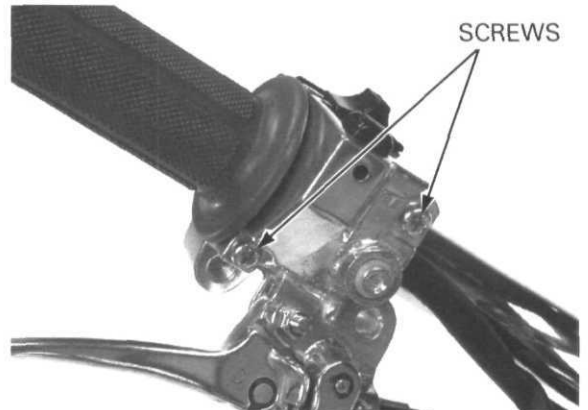
Wait 3 – 5 minutes and install the grip. Rotate the grip for even application of the adhesive.



Install the left handlebar switch housing aligning its locating pin with the hole in the handlebar.



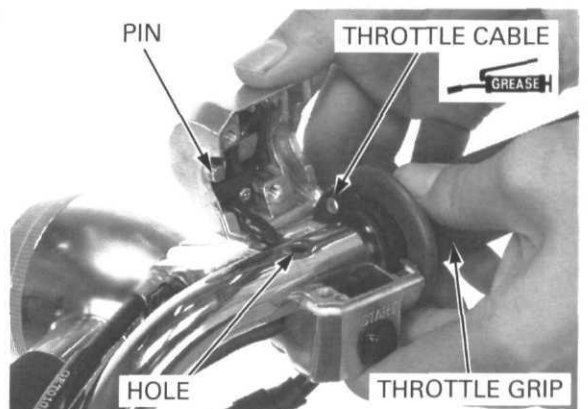
Install the screws and tighten the forward screw first, then the rear screw.



Apply grease to the sliding surface of the throttle pipe.

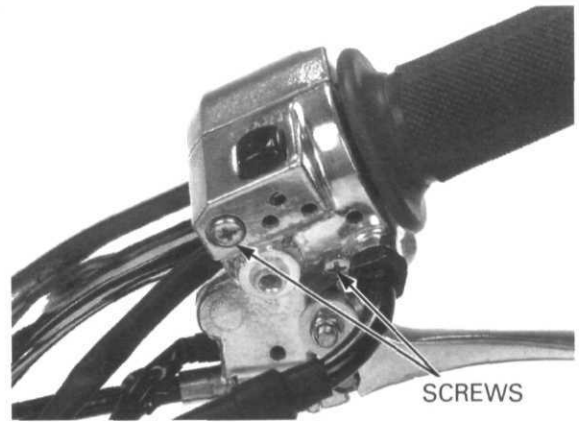
Connect the throttle cable end to the throttle pipe. Install the throttle pipe into the handlebar.

Install the right handlebar switch/throttle housing by aligning its locating pin with the hole in the handlebar.

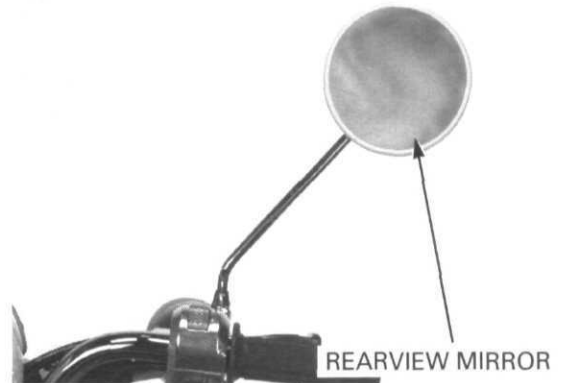


FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Install the screws and tighten the forward screw first, then the rear screw.



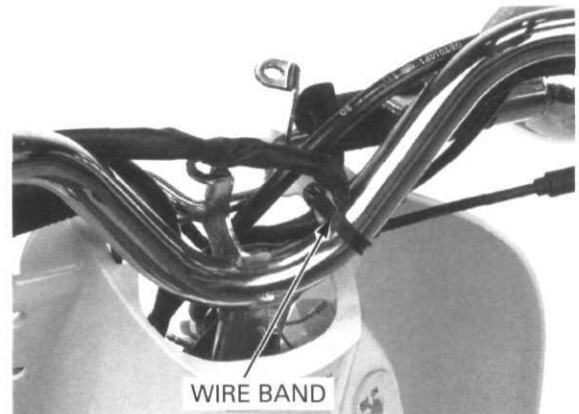
Install the rearview mirrors.



Install the wire bands.
Install the front cover (page 2-4).

Install the following:

- Speedometer (page 18-10)
- Front cover (page 2-4).

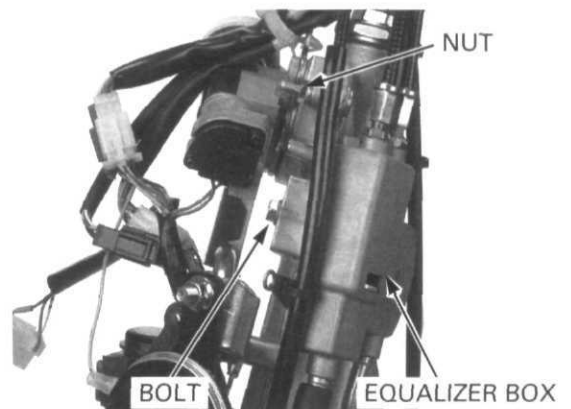


EQUALIZER

REMOVAL/INSTALLATION

Remove the leg shield (page 2-9).

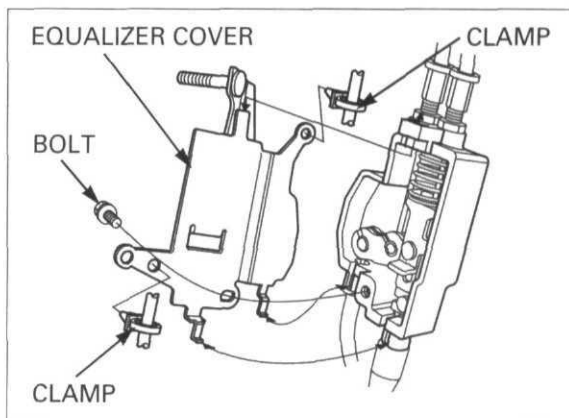
Remove the bolt, nut and equalizer box from frame.



Be careful not to bend the tab of the cover during removal.

Remove the cable clamps, bolt and equalizer box cover.

Remove the front brake arm adjusting nut and rear brake arm adjusting nut.



Disconnect the front brake cable and rear brake cable from the equalizer box.

Loosen the lock nut of the left and right brake cable and remove the adjust bolts from the equalizer box. Remove the equalizer from the equalizer box and disconnect the left, front and rear brake cables from the equalizer.

Disconnect the right brake cable from the equalizer and remove the spring.

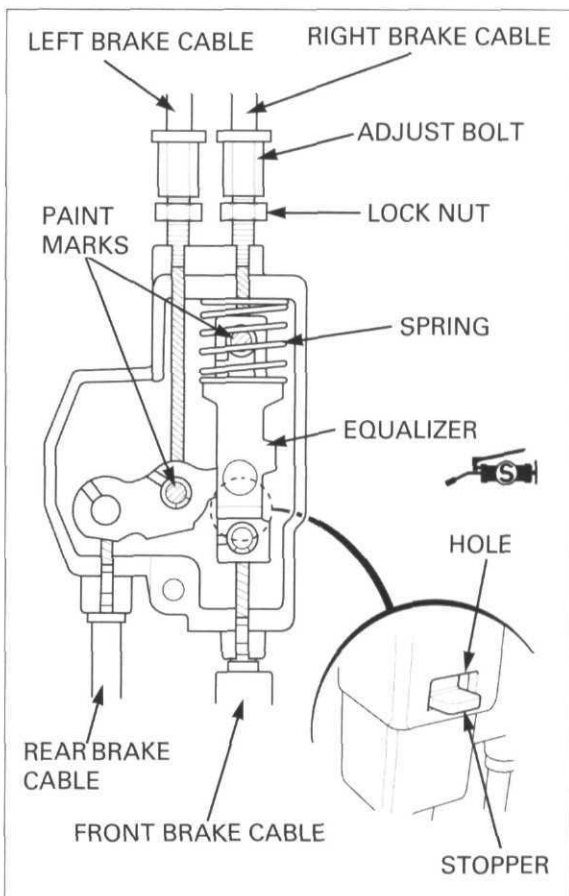
Installation is in the reverse order of removal.

NOTE:

- Apply silicone grease to the sliding surface of the equalizer.
- Connect the left and right brake cables into the equalizer with the paint marks facing the cover.
- Set the stopper tab of the equalizer through the hole of the equalizer cover.
- Apply a locking agent to the equalizer cover bolt threads.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

- Adjust the brake cables before leg shield installation (page 3-17).



STEERING STEM

REMOVAL

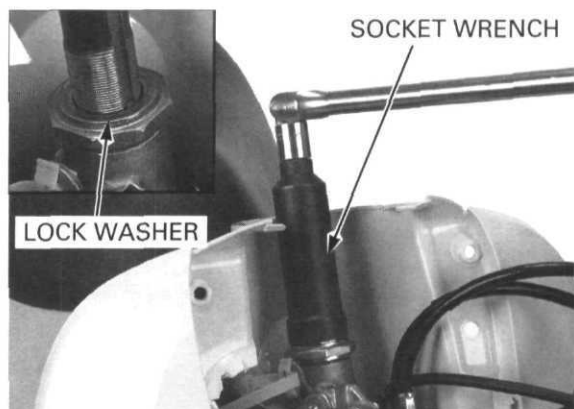
Remove the fork (page 13-13).
Remove the handlebar (page 13-17).

Remove the steering stem lock nut using the special tool.

TOOLS:

Socket wrench, 32 mm **07916-KM10000**

Remove the lock washer.



FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Loosen the top cone race.

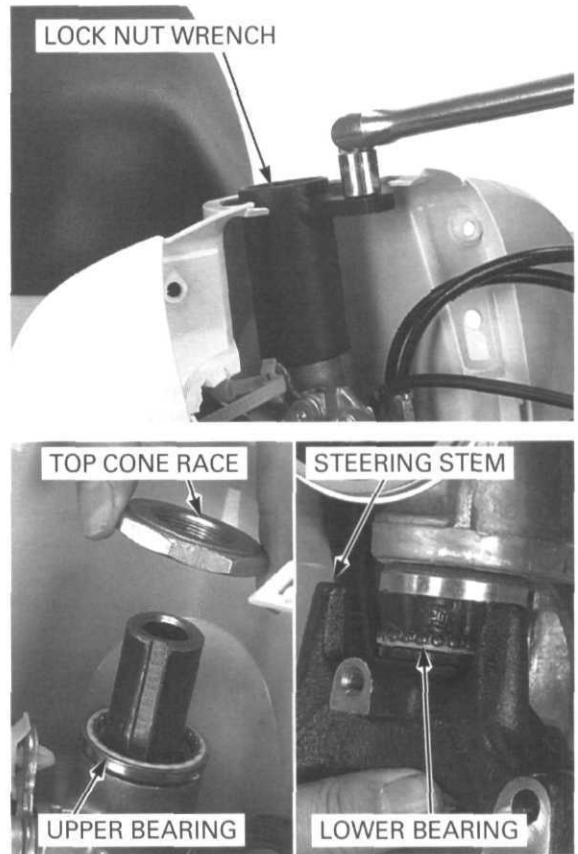
TOOLS:

Lock nut wrench, 45 X 54 mm 07SMA-GBC0100

Hold the steering stem and remove the steering top cone race.

Remove the upper bearing.

Remove the steering stem and lower bearing.



BEARING REPLACEMENT

Always replace the bearings and races as a set

Remove the upper/lower bearing outer races.

TOOLS:

Not available in U.S.A.

Adjustable bearing remover set 07JAC-PH80000

-Remover head 07JAC-PH80100

-Remover shaft 07JAC-PH80200

-Remover weight 07741-0010201

U.S.A. only

Adjustable bearing puller,

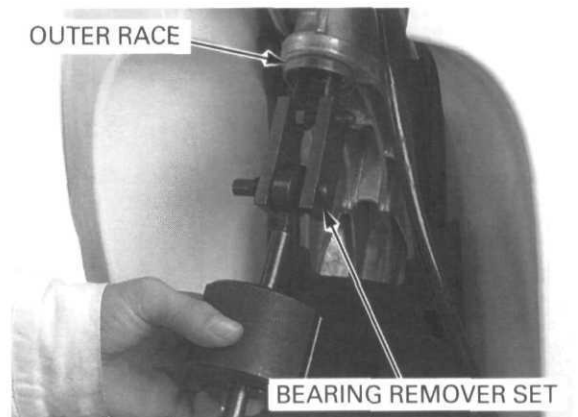
25 - 40 mm

07736-A01000B or

07736-A01000A

Slide hammer, 3/8 X 16

Commercially available



Install a new lower bearing outer race and the special tools as shown.

TOOLS:

Stem race installer, 29 X 50 mm 07XMF-GEE0200

(two required)

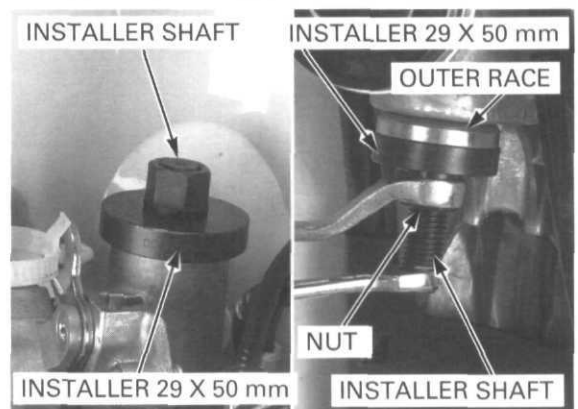
not available in

U.S.A.

Installer shaft

07VMF-KZ30200

While holding the installer shaft with the wrench, turn the lower nut gradually until the groove in installer attachment B aligns with the lower end of the steering head. This will allow you to install the lower bearing outer race.



FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Install a new upper bearing outer race and the special tools as shown.

TOOLS:

Stem race installer, 26 X 47 mm 07XMF-GEE0100
not available in U.S.A.

Stem race installer, 29 X 50 mm 07XMF-GEE0200
not available in U.S.A.

Installer shaft 07VMF-KZ30200

While holding the installer shaft with the wrench, turn the lower nut gradually until the groove in installer attachment A aligns with the upper groove of the steering head. This will allow you to install the upper bearing outer race.

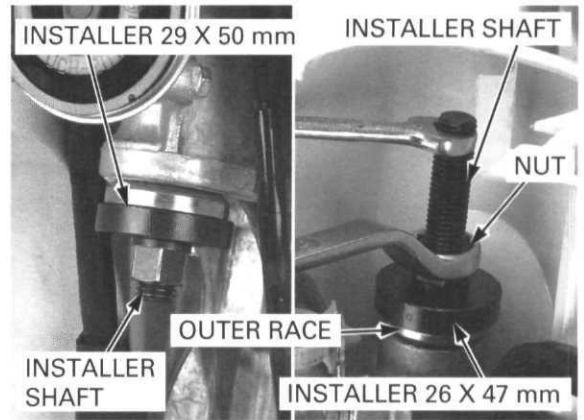
Install the steering stem lock nut onto the steering stem to prevent the threads from being damaged when removing the bottom cone race from the steering stem.

Remove the lower bearing inner race with a chisel or equivalent tool, being careful not to damage the steering stem.

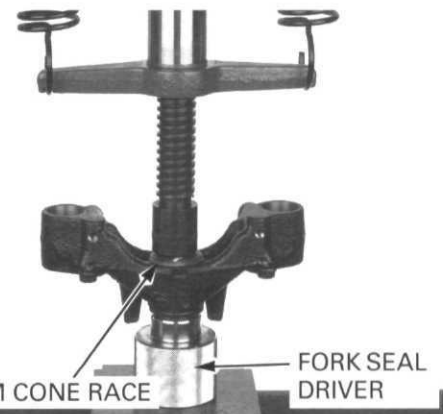
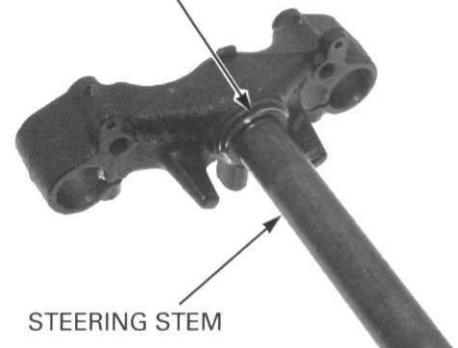
Apply grease to a new lower bearing inner race using a hydraulic press.

TOOLS:

Fork seal driver, 27 mm 07947-1180001

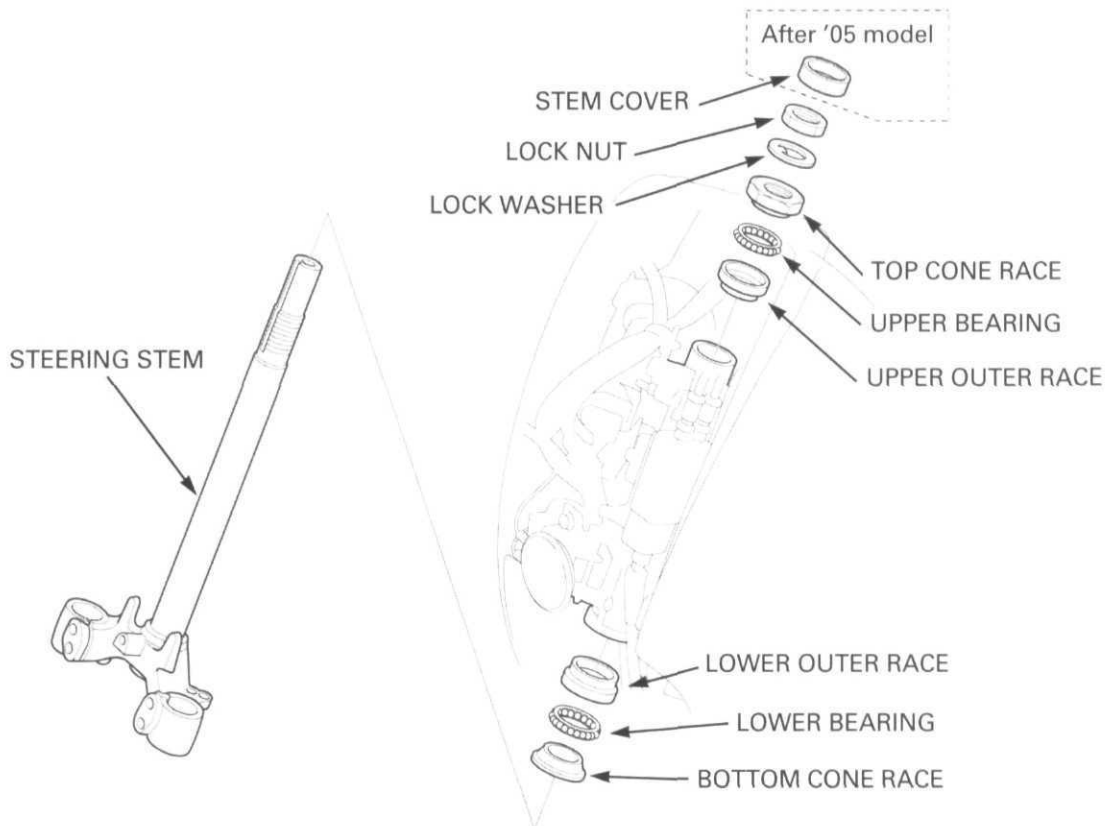


BOTTOM CONE RACE

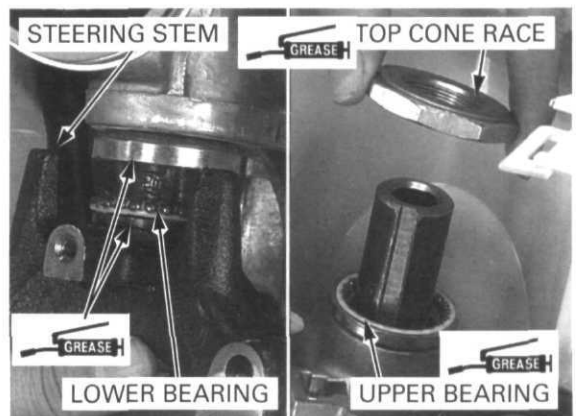


FRONT WHEEL/BRAKE/SUSPENSION/STEERING

INSTALLATION



Apply grease to each new bearing and inner race.
Install the lower bearing onto the stem.
Insert the steering stem into the steering head pipe.
Install the upper bearing and top cone race.



Tighten the steering top cone race to the specified torque.

TOOL:

Lock nut wrench, 45 X 54 mm 07SMA-GBC0100

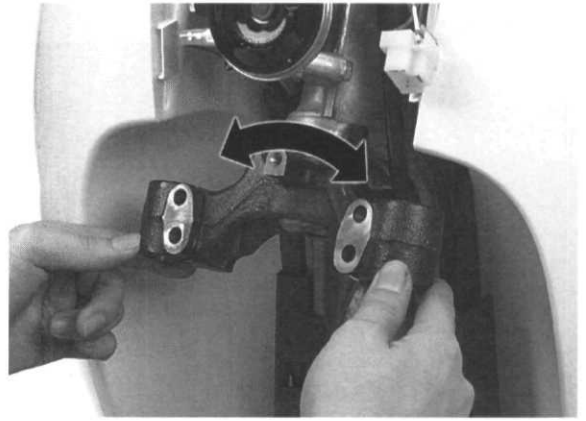
TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)



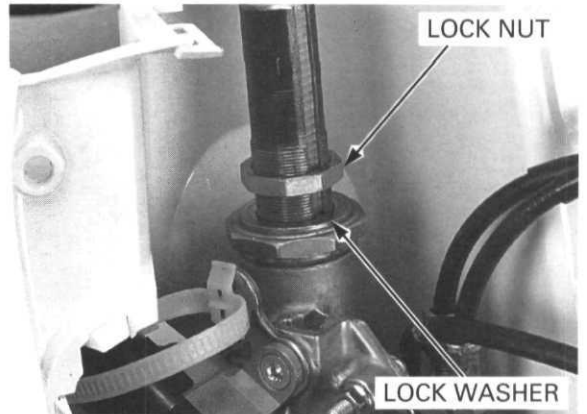
Turn the steering stem lock-to-lock several times to seat the bearing.

Temporarily loosen the steering stem top cone race.

Tighten the top cone race fully by hand, after loosening the top cone race 45 degrees.



Install the lock washer and lock nut.



Tighten the steering stem lock nut to the specified torque.

TOOL:

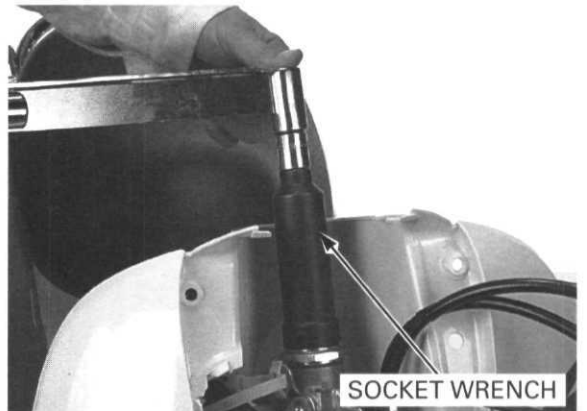
Socket wrench, 32 mm **07916-KM10000**

TORQUE: 69 N·m (7.0 kgf·m, 51 lbf·ft)

Make sure the steering stem moves smoothly without play or binding.

Install the fork (page 13-17).

Install the handlebar (page 13-18).



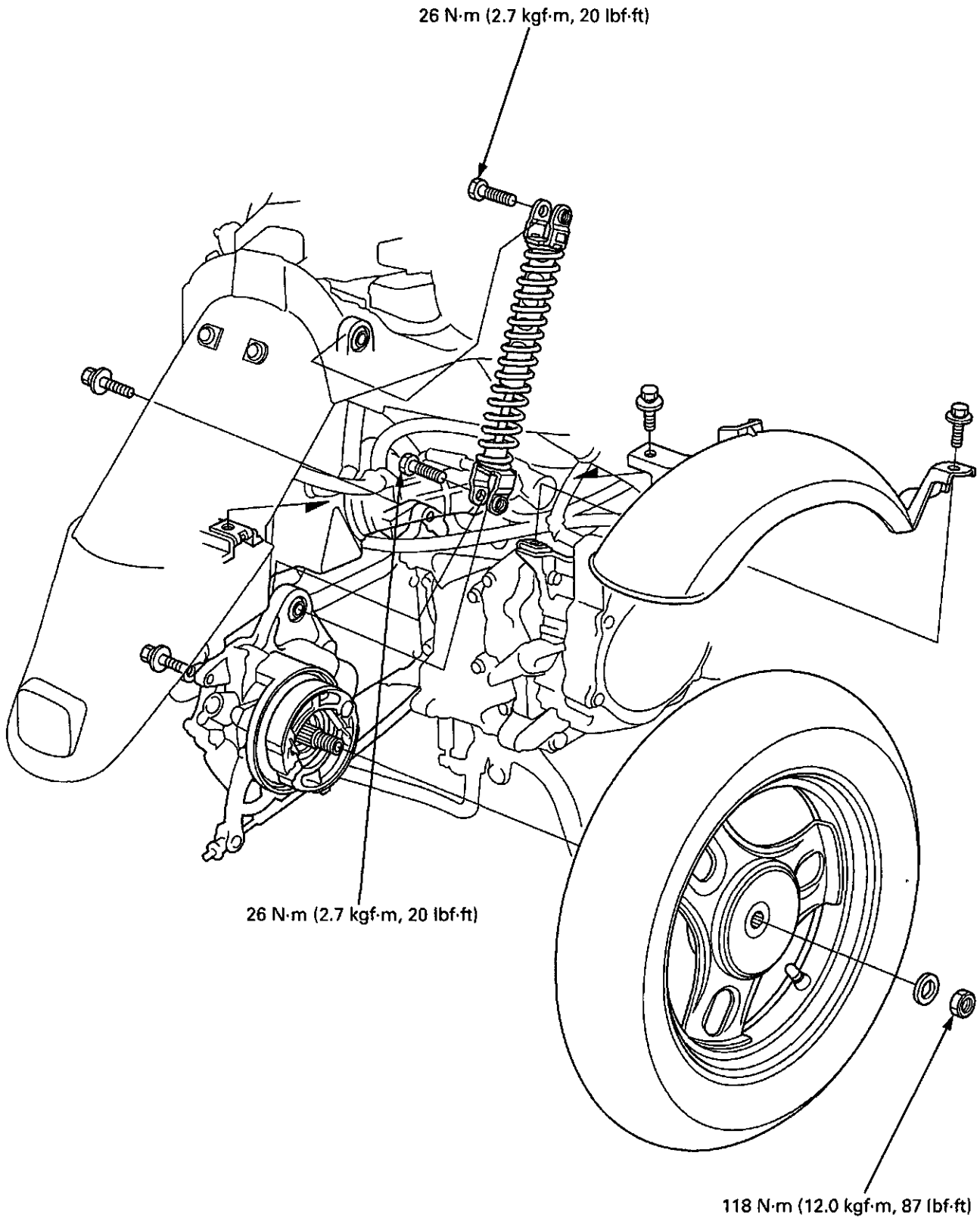
MEMO

14. REAR WHEEL/BRAKE/SUSPENSION

COMPONENT LOCATION	14-2	REAR WHEEL.....	14-4
SERVICE INFORMATION	14-3	REAR BRAKE	14-5
TROUBLESHOOTING	14-3	REAR SHOCK ABSORBER	14-8

REAR WHEEL/BRAKE/SUSPENSION

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.

- Use genuine Honda replacement bolts for all suspension pivots and mounting points.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	0.8 (0.03)
Cold tire pressure		200 kPa (2.00 kgf/cm ² , 28 psi)	–
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Left brake lever free play		10 – 20 (3/8 – 13/16)	–
Brake drum I.D.		95.0 (3.74)	95.5 (3.76)
Brake lining thickness		3.5 (0.14)	1.0 (0.04)

TORQUE VALUES

Rear axle nut	118 N·m (12.0 kgf·m, 87 lbf·ft)	Apply oil to the threads/U-nut
Rear brake arm bolt	4.9 N·m (0.5 kgf·m, 3.8 lbf·ft)	ALOC bolt
Rear shock absorber mounting bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)	

TROUBLESHOOTING

Rear wheel wobbles

- Bent rim
- Faulty tire
- Axle nut and/or engine mounting bolt not tightened properly
- Loose or worn final gear shaft bearing
- Insufficient tire pressure
- Unbalanced tire and wheel

Soft suspension

- Weak rear shock absorber spring
- Oil leakage from damper unit
- Low tire pressure

Hard suspension

- Bent damper rod
- High tire pressure

Rear suspension noisy

- Loose mounting fasteners
- Faulty shock absorber
- Weak rear suspension bushings

Poor brake performance

- Incorrect adjustment of left brake lever
- Contaminated brake shoes
- Worn brake shoe
- Worn brake cam
- Worn brake drum
- Improperly engaged brake arm serrations
- Faulty equalizer (page 13-20)

REAR WHEEL

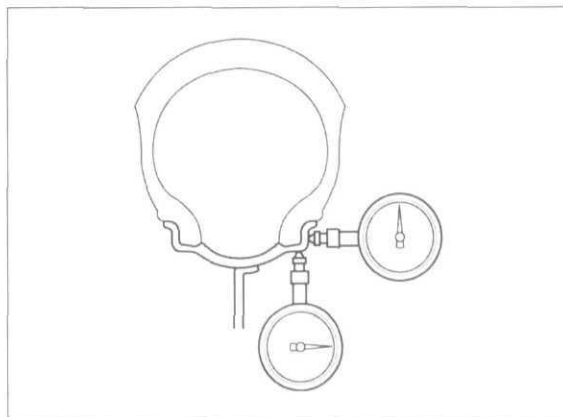
INSPECTION

Check the wheel rim runout using dial indicators. Actual runout is 1/2 the total indicator readings.

SERVICE LIMITS:

Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)



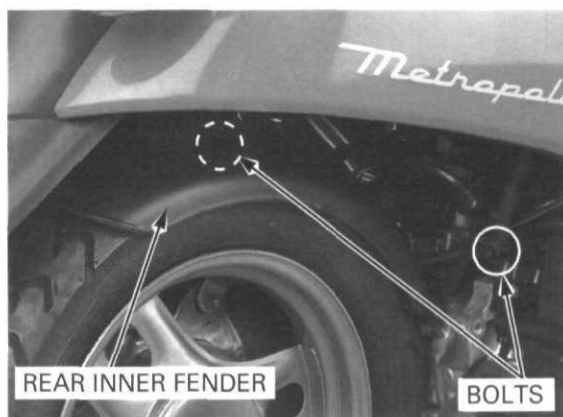
REMOVAL

Support the scooter securely on its centerstand.

Remove the muffler (page 2-13).

Remove the two bolts and rear inner fender.

Remove the rear axle nut, washer and rear wheel.



INSTALLATION

Install the rear wheel onto the final gear shaft, aligning the spline.

Install the washer onto the final gear shaft.

Apply oil to the threads and seating surface of the rear axle nut.

Tighten the rear axle nut to the specified torque.

TORQUE: 118 N·m (12.0 kgf·m, 87 lbf·ft)

Install the muffler (page 2-13).

Install the rear inner fender and tighten the two bolts securely.



REAR BRAKE

Remove the rear wheel (page 14-4).

INSPECTION

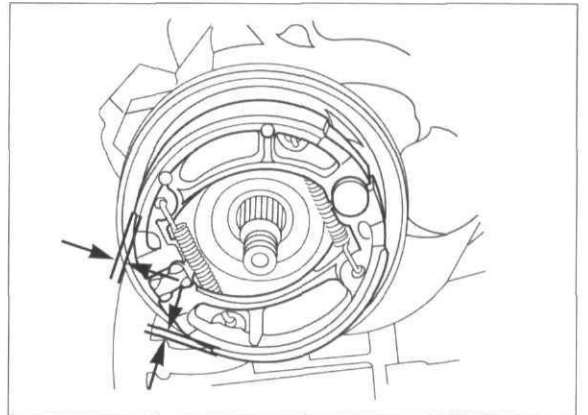
Measure the rear brake drum I.D.

SERVICE LIMIT: 95.5 mm (3.76 in)



Measure the brake lining thickness.

SERVICE LIMIT: 1.0 mm (0.04 in)

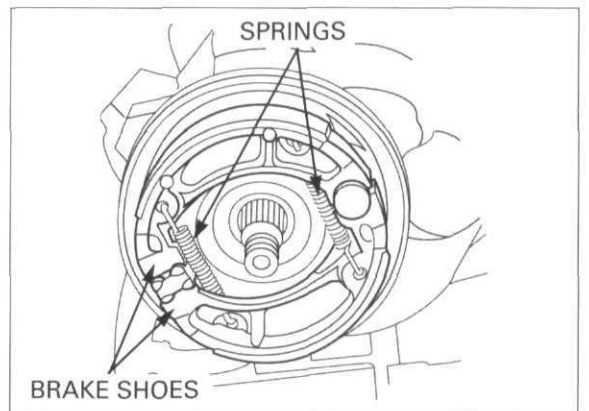


DISASSEMBLY

NOTE:

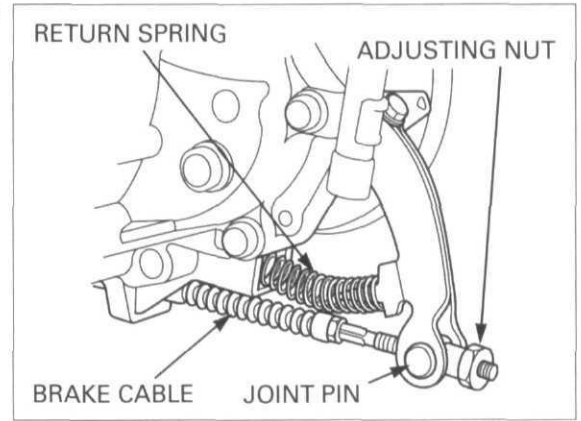
- Always replace the brake shoes as a set.
- Mark all parts during disassembly so they can be placed back in the original locations.

Loosen the rear brake adjusting nut.
Pull the brake shoes away from the anchor, then remove the shoes and springs.

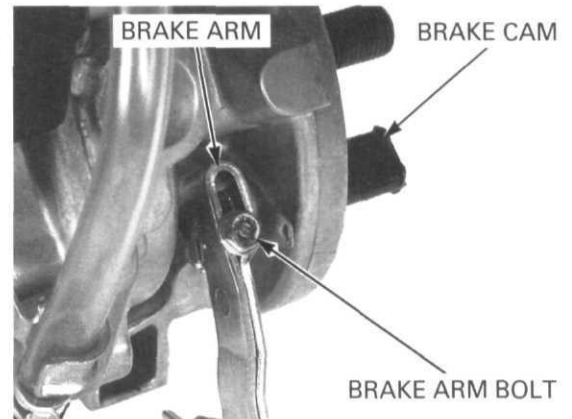


REAR WHEEL/BRAKE/SUSPENSION

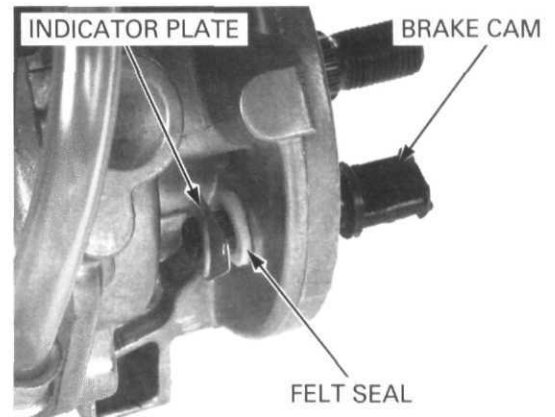
Remove the rear brake adjusting nut, then remove the rear brake cable from the joint pin. Remove the joint pin and return spring.



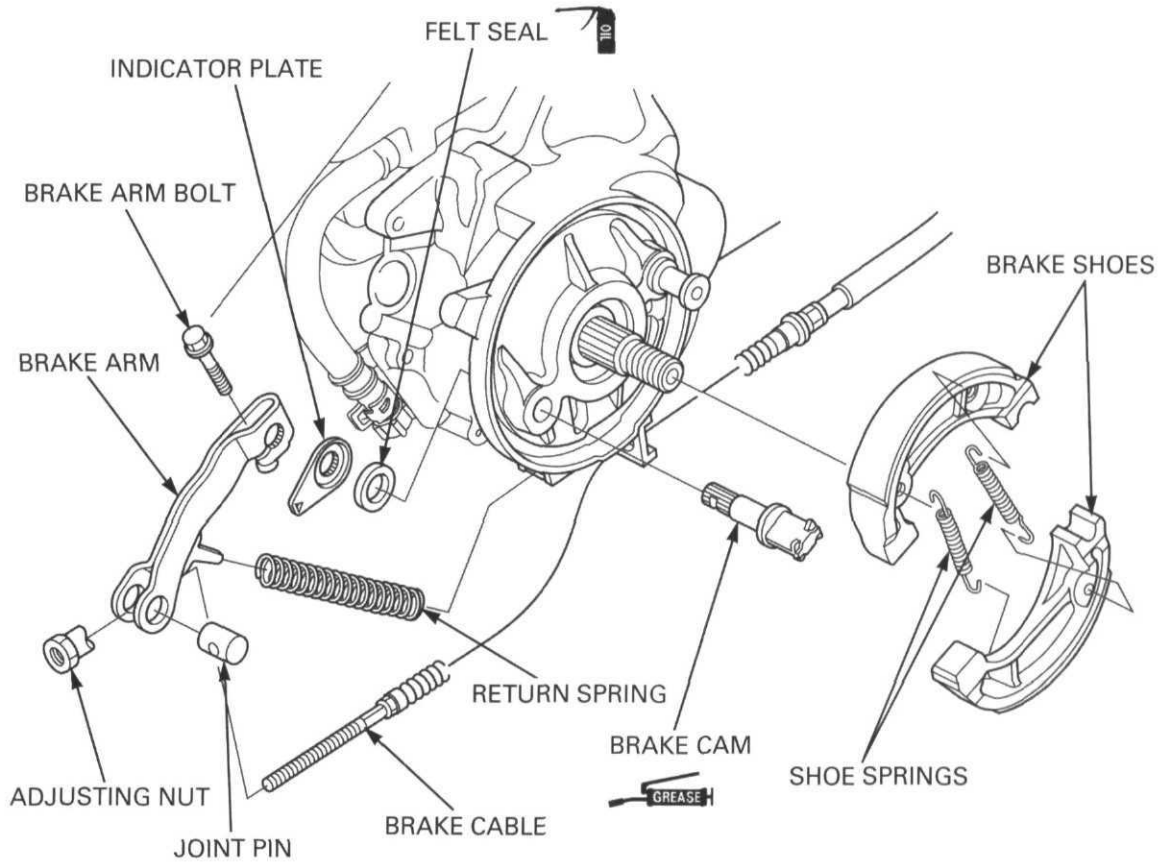
Remove the brake arm bolt. Remove the brake arm while pulling the brake cam out.



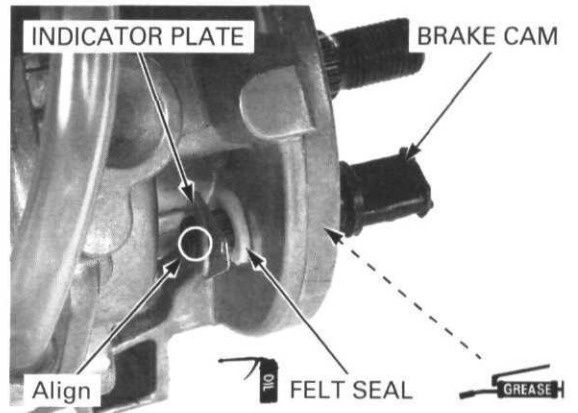
Remove the wear indicator plate and felt seal. Remove the brake cam from the brake panel.



ASSEMBLY

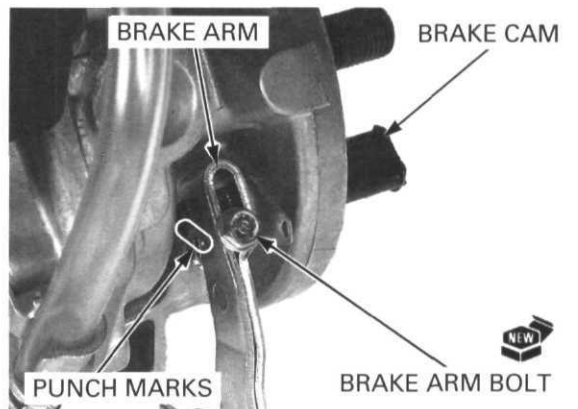


Apply grease to the brake cam sliding surface.
 Install the brake cam into the brake panel.
 Apply oil to the felt seal and install it into the brake panel.
 Install the wear indicator plate onto the brake cam by aligning its wide tooth with the wide groove on the brake cam.



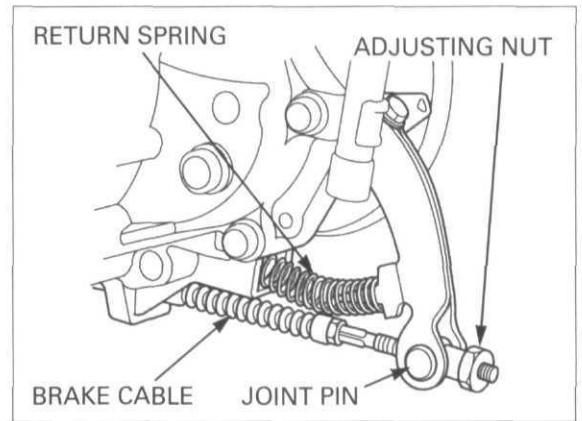
Install the brake arm aligning the punch marks on the brake arm and brake cam.
 Install a new brake arm bolt and tighten it to the specified torque.

TORQUE: 4.9 N·m (0.5 kgf·m, 3.8 lbf·ft)

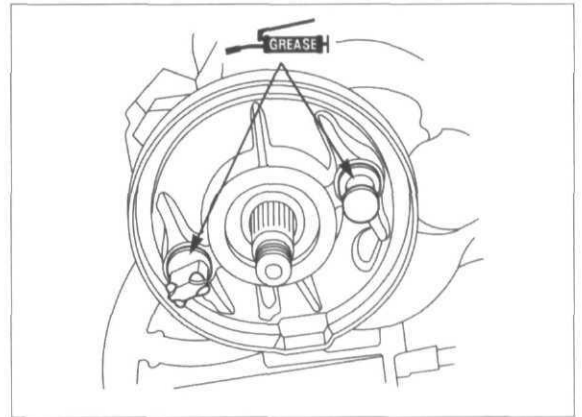


REAR WHEEL/BRAKE/SUSPENSION

Install the return spring between the belt case and brake arm.
Install the joint pin on the brake arm.
Insert the rear brake cable into the joint pin and install the rear brake adjusting nut.



Apply grease to the anchor pin and brake cam sliding surfaces.

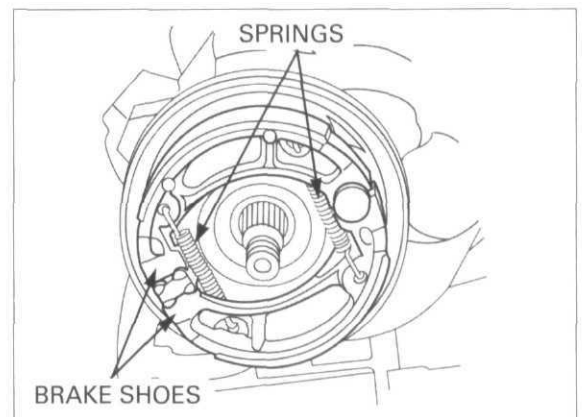


If the brake shoes and springs are reused, they must be placed back in the original locations.

Install the brake shoes and shoe springs onto the brake panel as shown.

Install the rear wheel (page 14-4).

Adjust the left brake lever free play (page 3-16).



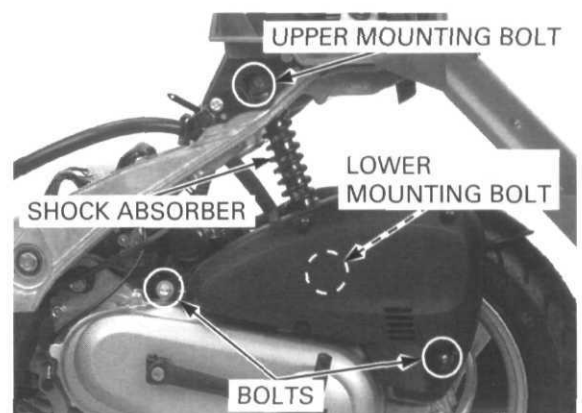
REAR SHOCK ABSORBER

REMOVAL

Remove the body cover (page 2-7).

Remove the air cleaner housing mounting bolts. Remove the rear shock absorber lower mounting bolt while pushing the air cleaner housing up. Pushing the housing up will allow better access to the lower mounting bolt.

Remove the rear shock absorber upper mounting bolt and rear shock absorber.



INSPECTION

Check the dumper unit for leakage or other damage.

Replace the shock absorber assembly if necessary.



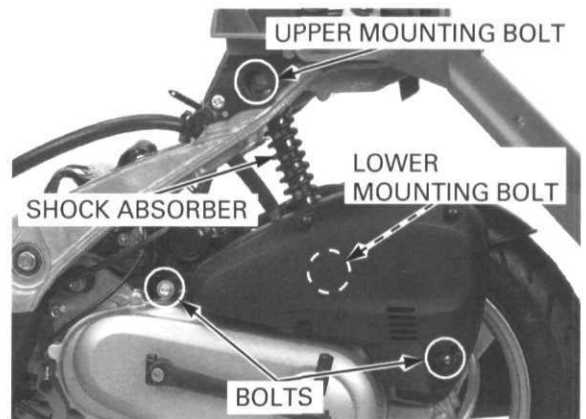
INSTALLATION

Install the rear shock absorber and tighten the upper and lower mounting bolts to the specified torque.

TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)

Install the air cleaner housing and tighten the mounting bolts securely.

Install the body cover (page 2-7).



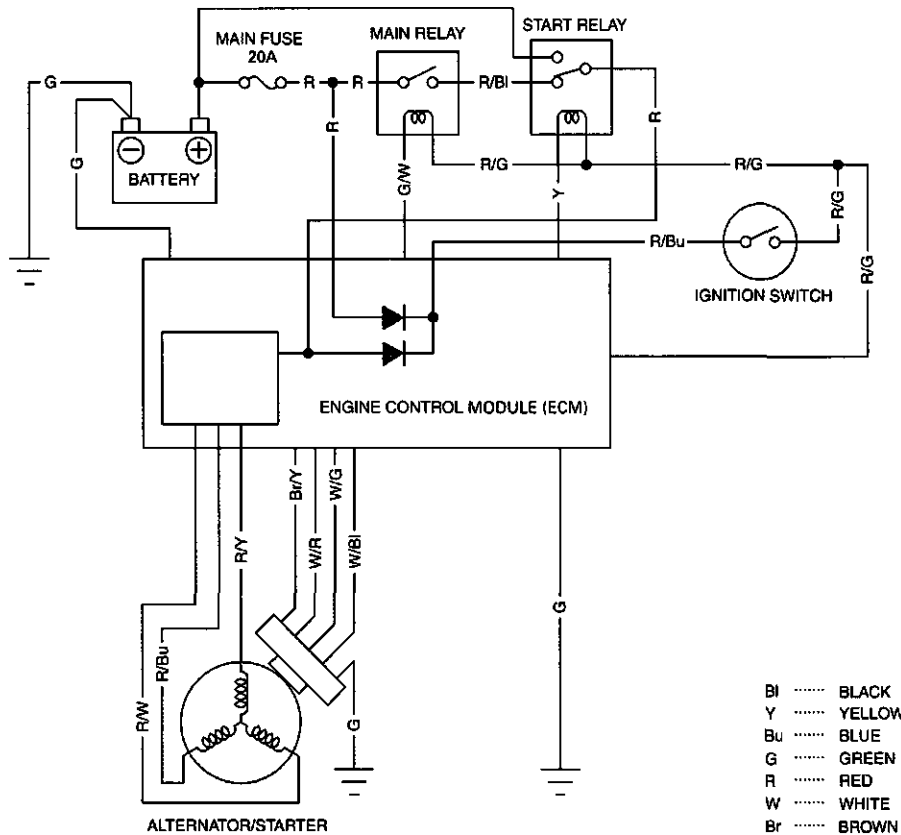
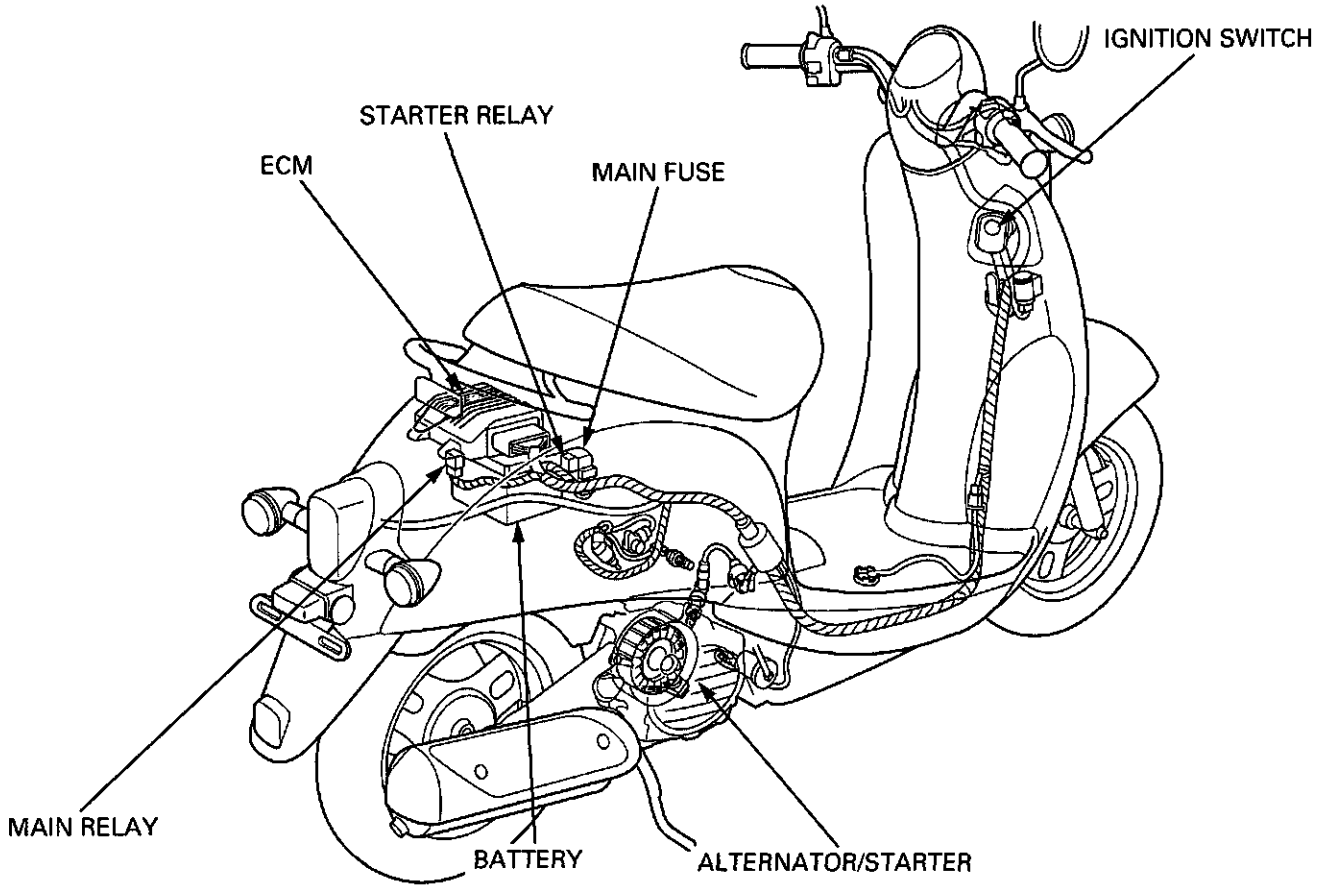
MEMO

15. BATTERY/CHARGING SYSTEM

SYSTEM DIAGRAM.....	15-2	CHARGING SYSTEM INSPECTION.....	15-7
SERVICE INFORMATION	15-3	ALTERNATOR CHARGING COIL	15-8
TROUBLESHOOTING	15-5	ENGINE CONTROL MODULE (ECM).....	15-9
BATTERY.....	15-6	MAIN RELAY	15-11

BATTERY/CHARGING SYSTEM

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 call a physician immediately.
-
- Always turn off the ignition switch before disconnecting any electrical component.
 - Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is in the "ON" position and current is present.
 - For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space.
 - For a battery remaining in a stored scooter, disconnect the negative battery cable from the battery.
 - The battery sealing caps should not be removed. Attempting to remove the sealing caps from the cells may damage the battery.
 - The maintenance free (MF) battery must be replaced when it reaches the end of its service life.
 - The battery can be damaged if overcharged or undercharged, or if left to discharge for long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2–3 years.
 - Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharging often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
 - Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and taillight on for long periods of time without riding the scooter.
 - The battery will self-discharge when the scooter is not in use. For this reason, charge the battery every 2 weeks to prevent sulfation from occurring.
 - Filling a new battery with electrolyte will produce some voltage, but in order to achieve its maximum performance, always charge the battery. Also, the battery life is lengthened when it is initially charged.
 - When checking the charging system, always follow the steps in the troubleshooting flow chart (page 15-5).
 - This scooter has alternator/starter. The alternator/starter has alternator and starter motor functions.
 - The regulator/rectifier is located in the ECM.
 - The alternator/starter service may be done with the engine in the frame. For alternator/starter removal/installation, see page 11-4.

BATTERY CHARGING

- 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 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.

BATTERY TESTING

Refer to the battery tester's Operation Manual for the recommended battery testing procedure. The recommended battery tester puts a "load" on the battery so the actual battery condition of the load can be measured.

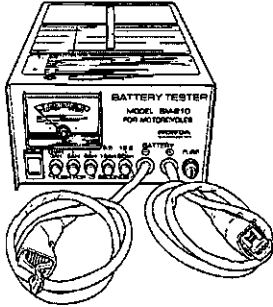
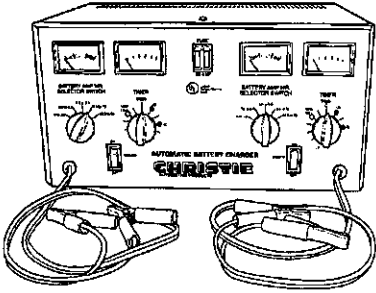
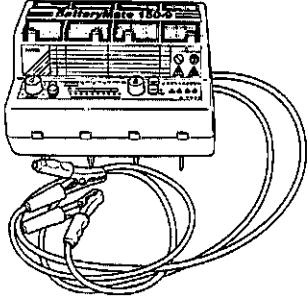
Recommended battery tester: BM-210-AH (U.S.A. only), BM-210 or BATTERY MATE (MTP08-0192, U.S.A. only) or equivalent

BATTERY/CHARGING SYSTEM

SPECIFICATIONS

ITEM		SPECIFICATION	
Battery	Capacity	12V – 6 Ah	
	Current leakage	0.1 mA max.	
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
Charging current	Normal	0.6 A/5 – 10 h	
	Quick	3A/1h	
Alternator	Capacity	190W/5,000 rpm	
	Charging coil resistance (20°C/68°F)	0.05 – 0.5 Ω	

TOOLS

<p>Battery tester BM-210-AH (U.S.A. only)</p> 	<p>Christie battery charger MC1012/2 (U.S.A. only)</p> 	<p>BatteryMate tester/charger MTP08-0192 (U.S.A. only)</p> 
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TROUBLESHOOTING**BATTERY IS DAMAGED OR WEAK****1. BATTERY TEST**

Remove the battery (page 15-6).

Check the battery condition using the recommended battery tester.

RECOMMENDED BATTERY TESTER:

BM-210-AH (U.S.A. only), BM-210 or Battery Mate (MTP08-0192, U.S.A. only) or equivalent

Is the battery in good condition?

No – Faulty battery.

YES – GO TO STEP 2.

2. CURRENT LEAKAGE TEST 1

Install the battery (page 15-6).

Check the battery current leakage test (Leak test; page 15-7).

Is the current leakage below 0.1 mA?

YES – GO TO STEP 4.

NO – GO TO STEP 3.

3. CURRENT LEAKAGE TEST 2

Disconnect the 6P connector of the ECM and check the battery current leakage test.

Is the current leakage below 0.1 mA?

NO – • Short circuit in wire harness.
• Faulty ignition switch.

YES – Faulty ECM.

4. CHARGING VOLTAGE INSPECTION

Measure and record the battery voltage using a digital multimeter (page 15-7).

Start the engine.

Measure the charging voltage (page 15-8).

Compare the measurement to the result of the following calculation.

STANDARD:

Measured battery voltage < Measured charging voltage < 15.5 V

Is the measured charging voltage within the standard voltage?

YES – Faulty battery.

NO – GO TO STEP 5.

5. STATOR COIL INSPECTION

Check the alternator charging coil (page 15-8).

Is the alternator charging coil resistance within 0.05 – 0.5 Ω (20°C/68°F)?

No – Faulty charging coil.

YES – GO TO STEP 6.

6. REGULATOR/RECTIFIER SYSTEM INSPECTION

Inspect the regulator/rectifier system on the ECM side (page 15-9).

Are the results of checked continuity and resistance correct?

YES – Faulty ECM.

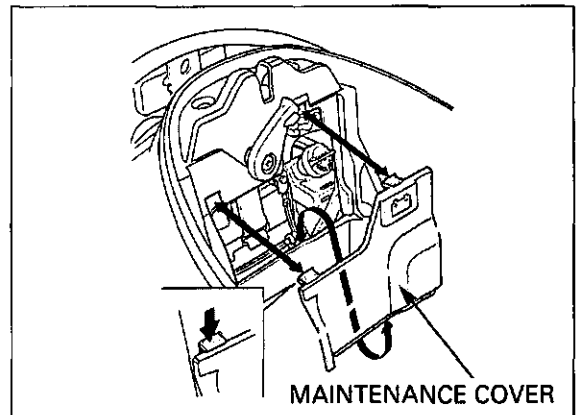
NO – • Faulty main relay or related circuit (page 15-11).
• Open or short circuit in wire harness.
• Poorly connected connector.
• Inspect the starter relay (page 17-6).

BATTERY

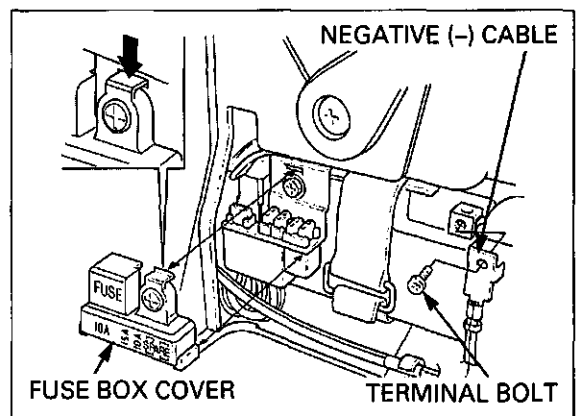
REMOVAL/INSTALLATION

Turn the ignition switch to OFF.

Open the seat and remove the maintenance cover while releasing the two tabs.



Remove the fuse box cover by releasing the tab. Remove the negative (-) terminal bolt and disconnect the negative (-) cable.

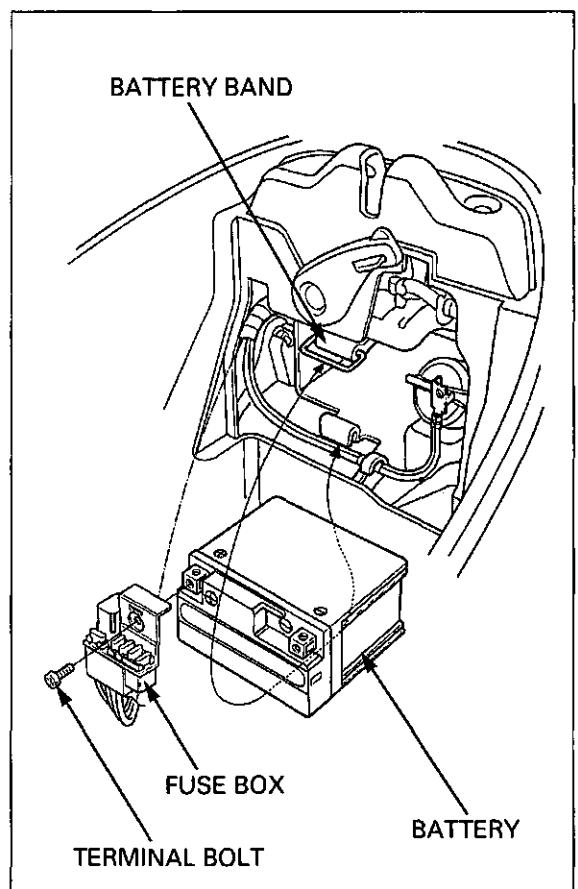


Remove the positive (+) terminal bolt and disconnect the fuse box/positive (+) cable. Remove the battery band and battery.

Install the battery in the reverse order of removal.

NOTE:

- Connect the positive (+) cable first, then connect the negative (-) cable.
- After connecting the battery cables, coat the terminals with dielectric grease.



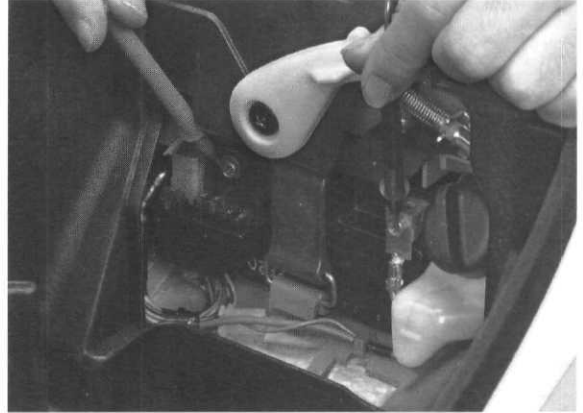
VOLTAGE INSPECTION

Measure the battery voltage using a commercially available digital multimeter.

VOLTAGE (20°C/68°F):

Fully charged: 13.0 – 13.2 V

Under charged: Below 12.3 V



BATTERY TESTING

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

TOOL:

Battery tester BM-210-AH (U.S.A only), BM-210 or BATTERY MATE (MTP08-0192, U.S.A. only) or equivalent

BATTERY CHARGING (U.S.A. only)

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

TOOL:

Battery charger Christie battery charger (MC1012/2, U.S.A. only) or BATTERY MATE (MTP08-0192, U.S.A. only) or equivalent

CHARGING SYSTEM INSPECTION

CURRENT LEAKAGE TEST

Turn the ignition switch to OFF and disconnect the negative (-) cable from the battery.

Connect the ammeter (+) probe to the negative (-) cable and the ammeter (-) probe to the battery (-) terminal.

With the ignition switch turned to "OFF" check for current leakage.

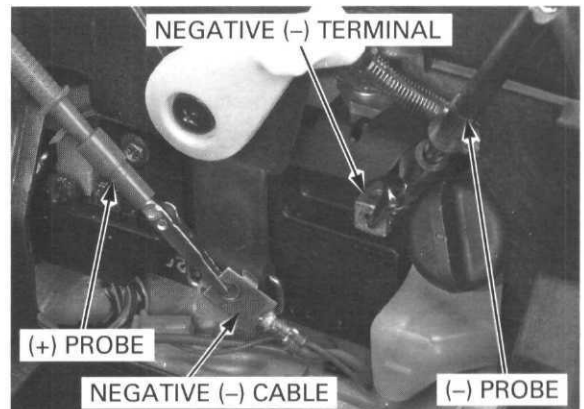
NOTE:

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition to the "ON" position. 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 the probable cause.

Locate the short by disconnecting connections one by one and measuring the current.



BATTERY/CHARGING SYSTEM

CHARGING VOLTAGE INSPECTION

NOTE:

- Make sure the battery is in good condition before performing this test.

Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.

Start the engine and warm it up to the operating temperature; then stop the engine. Connect the multimeter between the positive and negative terminals of the battery.

NOTE:

- To prevent a short, make absolutely certain which are the positive and negative terminals or cable.

With the headlight on high beam, restart the engine. Measure the voltage on the multimeter when the engine runs at 5,000 rpm.

Standard:

Measured BV < Measured CV < 15.5 V

– BV: Battery Voltage (page 15-7)

– CV: Charging Voltage (page 15-8)

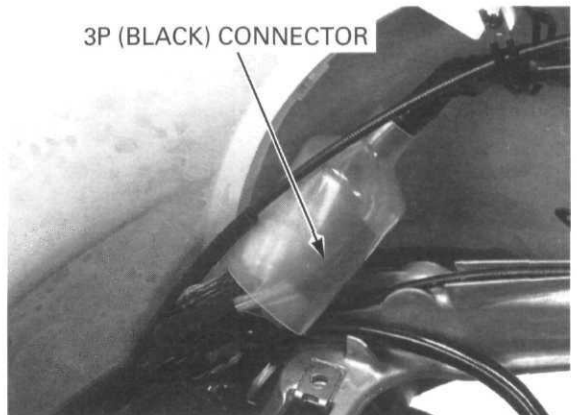


ALTERNATOR CHARGING COIL

INSPECTION

Remove the luggage box (page 2-6).

Disconnect the alternator/starter 3P (Black) connector.



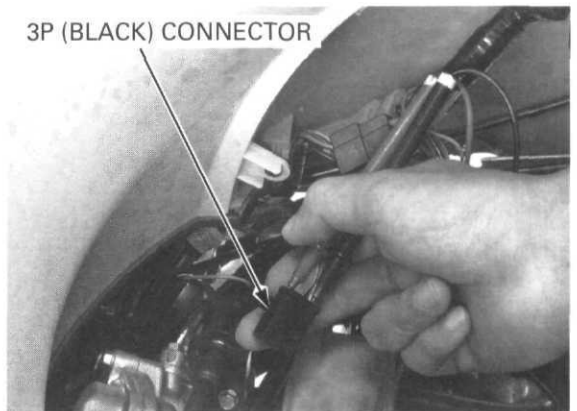
Measure the resistance between each wire terminals of the alternator side connector.

STANDARD: 0.05 – 0.5 Ω (20°C/68°F)

Check for continuity between each wire terminals of the alternator stator side connector and ground. There should be no continuity.

Replace the alternator stator if resistance is out of specification, or if any wire has continuity to ground.

Refer to page 11-4 for alternator stator replacement.



ENGINE CONTROL MODULE (ECM)

SYSTEM INSPECTION

Remove the body cover (page 2-7).

Turn the ignition switch to OFF.

Disconnect the ECM 26P connector.

Check the connector for loose contacts of corroded terminals.

Check the following at the harness side connectors terminals.

BATTERY LINE

Measure the voltage between the Red wire terminal and ground.

There should be battery voltage at all times.

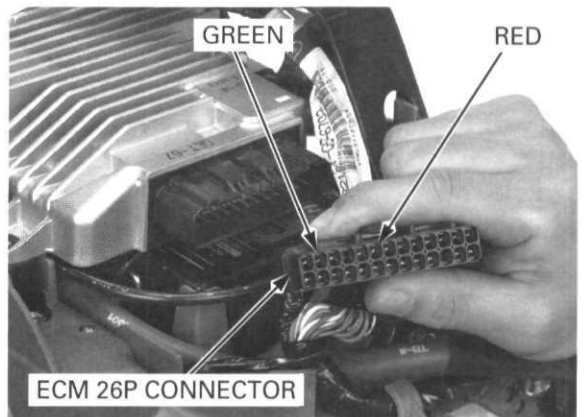
If there is no voltage, check for a blown main fuse (15A) and an open or short circuit in the wire harness.

GROUND LINE

Check the continuity between the Green wire terminal and ground.

There should be continuity at all time.

If there is no continuity, check for an open or short circuit in the wire harness.



REGULATOR/RECTIFIER CIRCUIT INSPECTION

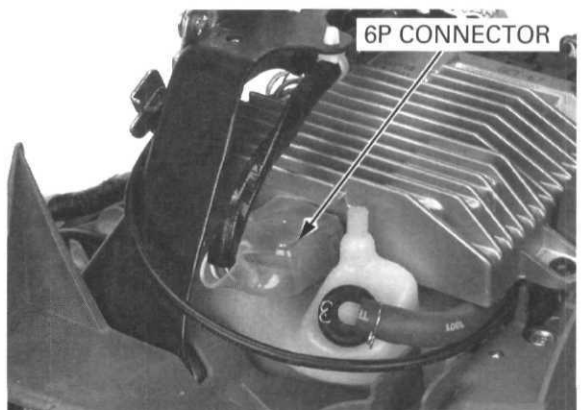
NOTE:

- The regulator/rectifier is located in the ECM.

Remove the body cover (page 2-7).

Disconnect the ECM 6P connector.

Check the connector for loose contacts of corroded terminals.



BATTERY/CHARGING SYSTEM

Check the following at the harness side connector terminals.

BATTERY LINE

Short the Green/White wire terminal on the body ground with a suitable jumper wire.

Measure the voltage between the Red wire terminal and ground.

When the ignition switch is turned to OFF, there is no voltage and when the ignition switch is turned to ON, there should be voltage.

If the measurements are abnormal, inspect the main relay (page 15-11).

GROUND LINE

Check the continuity between the Green wire terminal and ground.

There should be continuity at all time.

If there is no continuity, check for an open or short circuit in the wire harness.

CHARGING COIL LINE

Measure the resistance between the Red/yellow, Red/White and Red/blue wire terminals.

STANDARD: 0.05 – 0.5 Ω (20 °C/68 °F)

IGNITION SWITCH CIRCUIT INSPECTION

Remove the front cover (page 2-4).

Disconnect the ignition switch 3P (Black) connector. Measure the voltage between the Red/blue wire terminal and ground.

There should be battery voltage at all time.

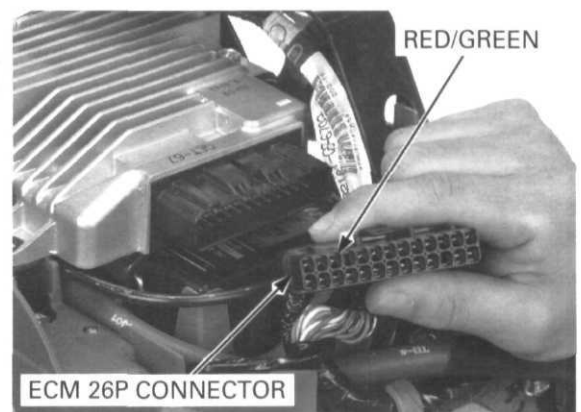
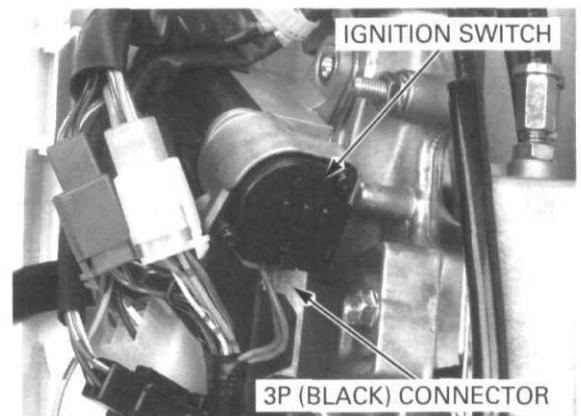
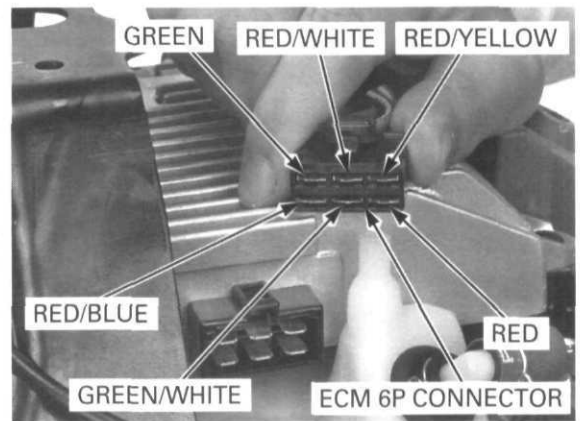
If there is no voltage, check the following:

- Open or short circuit in wire harness.
- ECM battery line (page 15-9).

Disconnect the ECM 26P connector.

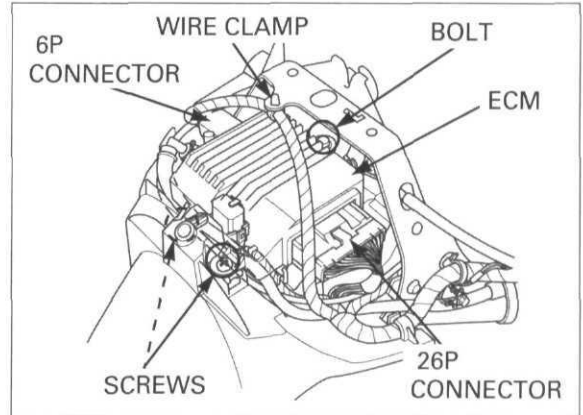
Check the continuity of the Red/green wire terminals between the ignition switch 3P connector and ECM 26P connector.

There should be continuity.



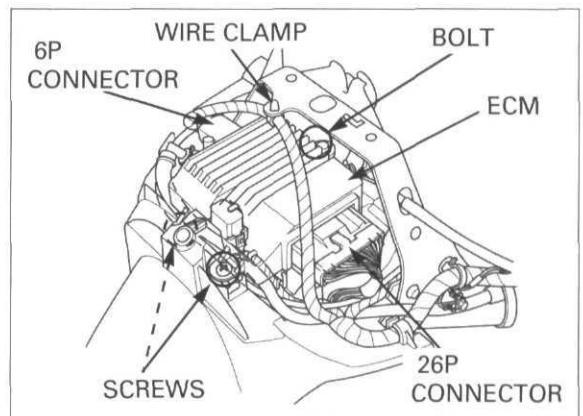
REMOVAL/INSTALLATION

Remove the body cover (page 2-7).
 Turn the ignition switch to OFF.
 Disconnect the ECM 6P and 26P connectors.
 Remove the wire clamp from the bracket.
 Remove the bolt, screws and ECM.
 Installation is in the reverse order of removal.

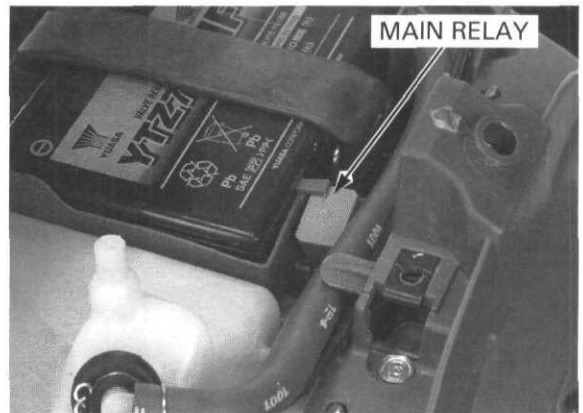


MAIN RELAY

Remove the body cover (page 2-7).
 Remove the ECM (see above).



Disconnect the main relay 3P connector, then remove the main relay.



SYSTEM INSPECTION

NOTE:

- Make sure the battery line and ignition switch circuit of the ECM is normal, before performing this inspection.

1. Main Relay Power Voltage Inspection

Measure the voltage between the Red wire terminal and ground.

Is there battery voltage?

NO – • Check for an open or short circuit in the wire harness.

YES – GO TO STEP 2.

BATTERY/CHARGING SYSTEM

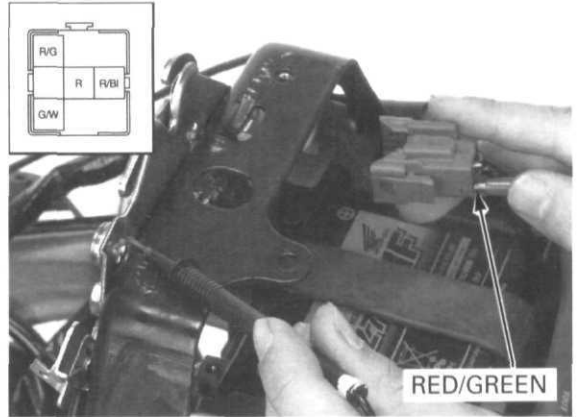
2. Main Relay Operation Voltage Inspection

Turn the ignition switch to ON.
Measure the voltage between the Red/green wire terminal and ground.

Is there battery voltage?

- NO** –
- Check for an open or short circuit in the wire harness.
 - Check the ignition switch (page 18-19)
 - Check for loose or poor contact of related terminals.

YES – GO TO STEP 3.



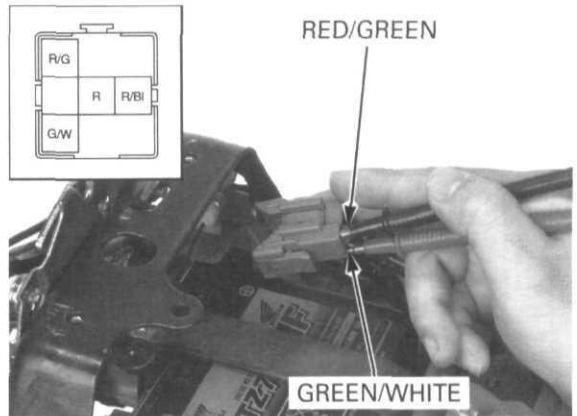
3. Main Relay Internal Circuit Voltage Inspection

Turn the ignition switch to ON.
Measure the voltage between the Red/green and Green/white wire terminals.

Is there battery voltage?

- NO** –
- Check for an open or short circuit in wire harness. If there is normal, replace the ECM.

YES – GO TO STEP 4.



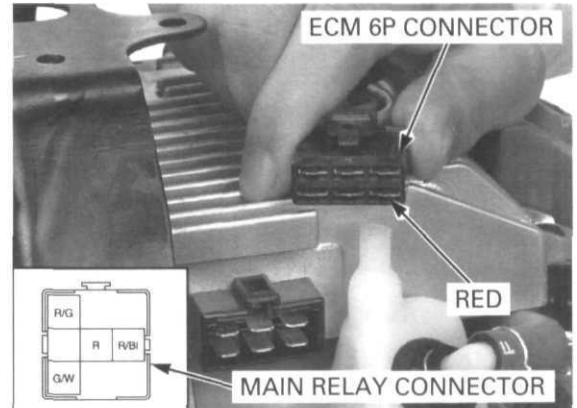
4. Starter Relay Circuit Inspection

Turn the ignition switch to OFF.
Disconnect the ECM 6P connector.
Check the continuity between the Red/black wire terminal at the main relay connector and the Red wire terminal at the ECM 6P connector.

Is there continuity exist?

- NO** –
- Check for an open or short circuit in wire harness.
 - Check the starter relay (page 17-6).

YES – Correct.



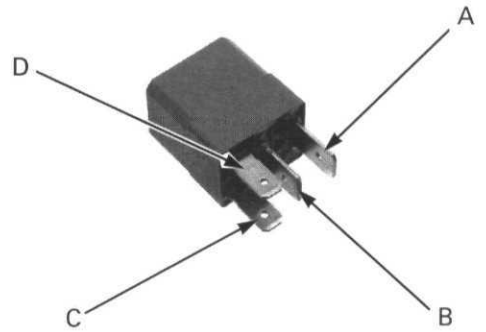
OPERATING INSPECTION

Check for continuity between the A and B terminals.

There is usually no continuity, there should be continuity when the battery is connected to C (+) and D (-) terminals.

INSTALLATION

Install the main relay in the reverse order of removal.



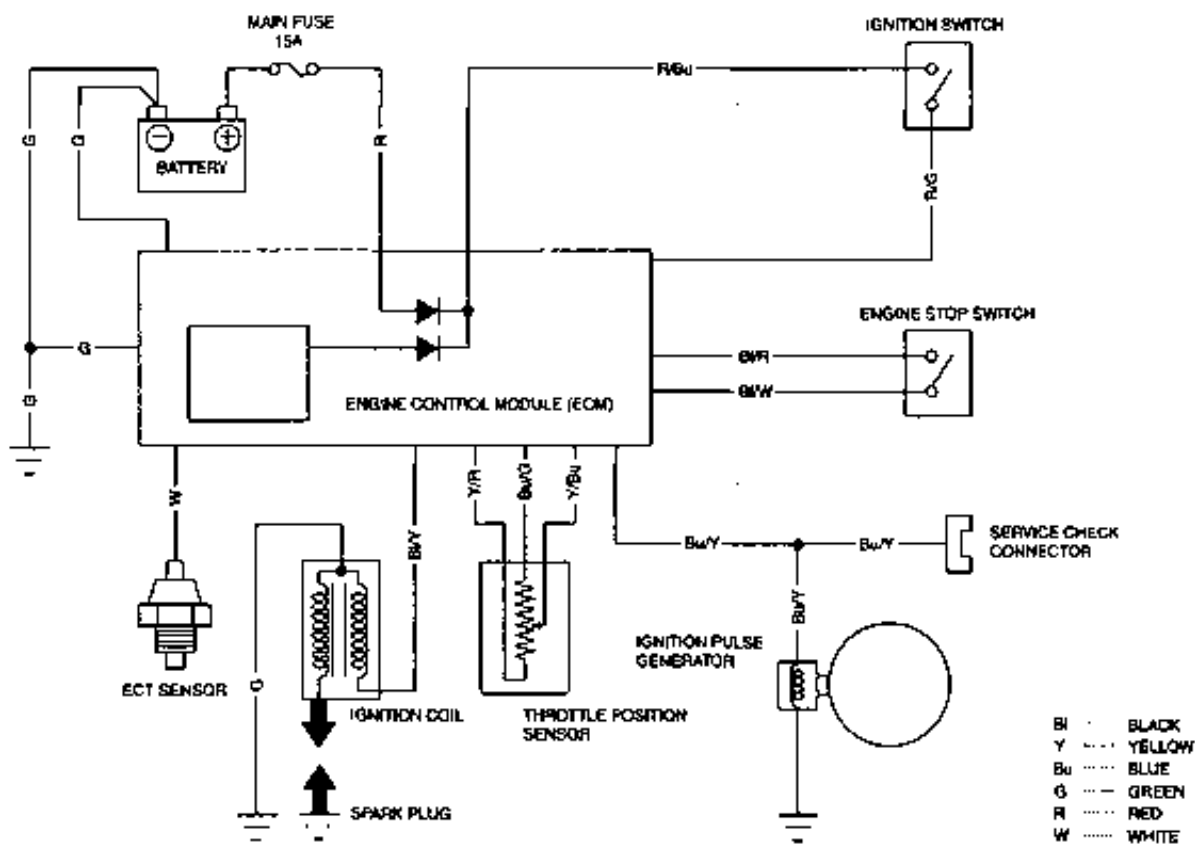
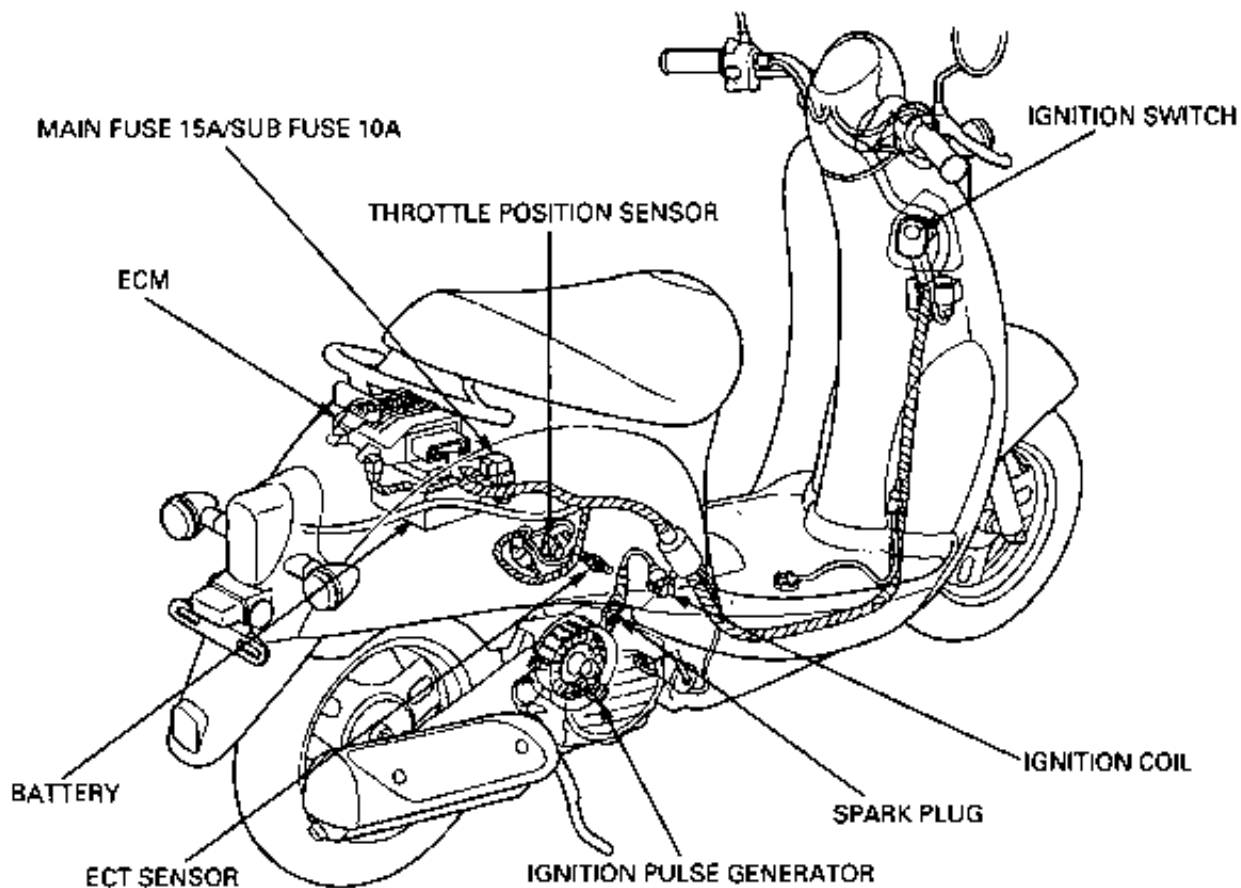
MEMO

16. IGNITION SYSTEM

SYSTEM DIAGRAM.....	16-2	IGNITION COIL.....	16-7
SERVICE INFORMATION.....	16-3	IGNITION TIMING.....	16-8
TROUBLESHOOTING.....	16-4	THROTTLE POSITION SENSOR.....	16-8
IGNITION SYSTEM INSPECTION.....	16-5		

IGNITION SYSTEM

SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

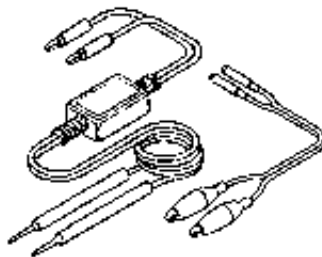
- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned to "ON" and current is present.
- When servicing the ignition system, always follow the steps in the troubleshooting sequence on page 16-4.
- The ignition timing cannot be adjusted since the Engine Control Module (ECM) is factory preset.
- The ECM may be damaged if dropped. Also, if the connector is disconnected when current is flowing, the excessive voltage may damage the ECM. Always turn the ignition switch to "OFF" before servicing.
- A faulty ignition system is often related to poor connected or corroded connectors. Check those connections before proceeding.
- Although the engine control unit is controlling ignition timing according to engine speed fundamentally, ignition timing is assisted also with the signal from the throttle position sensor and ECT sensor.
- Use a spark plug of the correct heat range. Using a spark plug with an incorrect heat range can damage the engine.
- For ignition switch and ECT sensor inspection, refer to page 18-16.
- For ignition pulse generator (alternator stator) removal/installation, refer to page 11-4.

SPECIFICATION

ITEM		SPECIFICATIONS
Spark plug	Standard	CR8EH-9 (NGK), U24FER9 (DENSO)
	For cold climate (below 5 °C/41 °F)	CR7EH-9 (NGK), U22FER9 (DENSO)
	For extended high speed riding	CR9EH-9 (NGK), U27FER9 (DENSO)
Spark plug gap		0.80 - 0.90 mm (0.031 - 0.035 in)
Ignition coil peak voltage		80 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		10° BTDC at 2,000 rpm
Throttle position sensor	Resistance (20 °C/68 °F)	4 - 6kΩ
	Input voltage	4.7 - 5.3 V

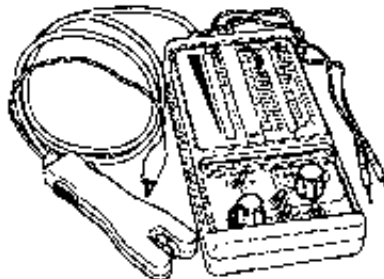
TOOLS

Peak voltage adaptor
07HGJ-0020100



with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

IgnitionMate peak voltage tester
(U.S.A. only)



IGNITION SYSTEM

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)
- Temporarily exchange the ignition coil with the other good one and preform the spark test. If there is spark, the exchanged ignition coil is faulty.

No spark at plug

	Unusual condition	Probable cause (check in numerical order)
Ignition coil primary voltage	Low peak voltage.	<ol style="list-style-type: none"> 1. Incorrect peak voltage adapter connections. (System is normal if measured voltage is over the specifications with reverse connections). 2. The multimeter impedance is too low; below 10 MΩ/DCV. 3. Cranking speed is too low. (Battery is undercharged.) 4. 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). (Does not apply to Imrie tester). 5. Poorly connected connectors or an open circuit in ignition system. 6. Faulty ignition coil. 7. Faulty ECM (in case when above No. 1 – 6 are normal).
	No peak voltage.	<ol style="list-style-type: none"> 1. Incorrect peak voltage adapter connections. (System is normal if measured voltage is over the specifications with reverse connections). 2. Battery is under charged. (Voltage drops largely when the engine is started.) 3. Short circuit in engine stop switch wire. 4. Faulty ignition switch or engine stop switch. 5. Loose or poorly connected ECM connectors. 6. Open circuit or poor connection in ground wire of the ECM. 7. Faulty peak voltage adapter. 8. Faulty ignition pulse generator (Measure peak voltage). 9. Faulty ECM (in case when above No.1 – 8 are normal).
	Peak voltage is normal, but no spark jumps at the plug.	<ol style="list-style-type: none"> 1. Faulty spark plug or leaking ignition coil secondary current. 2. Faulty ignition coil.
Ignition pulse generator	Low peak voltage.	<ol style="list-style-type: none"> 1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too slow. (Battery is undercharged.) 3. The sampling timing of the tester and measured pulse were not synchronized (system is normal if measured voltage is over the standard voltage at least once). 4. Faulty ignition pulse generator (in case when above No.1 – 3 are normal).
	No peak voltage.	<ol style="list-style-type: none"> 1. Faulty peak voltage adapter or Imrie tester. 2. Faulty ignition pulse generator.

IGNITION SYSTEM INSPECTION

NOTE:

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

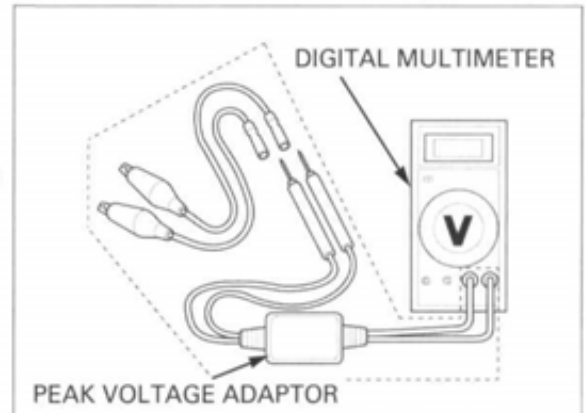
Connect the peak voltage adapter to the digital multimeter, or use the peak voltage tester.

TOOLS:

Peak voltage tester (U.S.A. only) or

Peak voltage adaptor 07HGJ-0020100
(not available in U.S.A.)

with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum) or IgnitionMate
peak voltage tester, MTP-08-0193 (U.S.A. only)



IGNITION COIL PRIMARY PEAK VOLTAGE

NOTE:

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

Remove the luggage box (page 2-6).

Open the fuel tank lid and remove the plug maintenance lid.



Disconnect the spark plug cap from the spark plug. Connect a known-good spark plug to the spark plug cap and ground the spark plug to the cylinder as done in a spark test.



IGNITION SYSTEM

With the ignition coil primary wire connected, connect the peak voltage adapter or tester probes to the ignition coil.

TOOLS:

Peak voltage tester (U.S.A. only) or
Peak voltage adaptor 07HGJ-0020100
(not available in U.S.A.)
with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum) or IgnitionMate
peak voltage tester, MTP-08-0193 (U.S.A. only)

CONNECTION:

Black/yellow (+) – Body ground (-)

Turn the ignition switch to ON and the engine stop switch to "Q".

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

Crank the engine with the kickstarter and measure the ignition coil primary peak voltage.

PEAK VOLTAGE: 80 V minimum

If the peak voltage is lower than specified value, follow the checks described in the troubleshooting chart (page 16-4).

Install the removed parts in the reverse order of removal.

IGNITION PULSE GENERATOR PEAK VOLTAGE

NOTE:

- Check cylinder compression and make sure the spark plug is installed correctly.

Remove the body cover (page 2-7).

Turn the ignition switch to OFF.

Disconnect the engine control module (ECM) 26P connector.

Connect the peak voltage adapter or tester probes to the wire harness side connector terminal and body ground.

TOOLS:

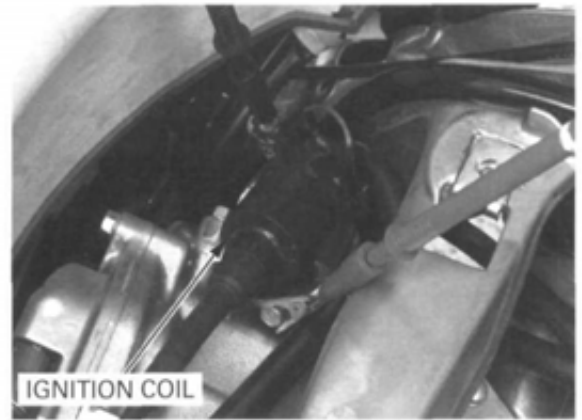
Peak voltage tester (U.S.A. only) or
Peak voltage adaptor 07HGJ-0020100
(not available in U.S.A.)
with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum) or IgnitionMate
peak voltage tester, MTP-08-0193 (U.S.A. only)

CONNECTION:

Blue/Yellow (+) – Body ground (-)

Crank the engine with the kickstarter and measure the ignition pulse generator peak voltage.

PEAK VOLTAGE: 0.7 V minimum



If the peak voltage measured at the ECM connector is abnormal, measure the peak voltage at the pulse generator connector.

Disconnect the alternator/starter 6P (W) connector and connect the peak voltage tester or adaptor probes to the connector terminals of the alternator/starter side.

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



- If the peak voltage measured at the ECM is abnormal and the one measured at the alternator/starter is normal, the wire harness has an open or short circuit, or loose connection.
- If the peak voltage is lower than standard value, follow the checks described in the troubleshooting chart (page 16-4).

Install the removed parts in the reverse order of removal.



IGNITION COIL

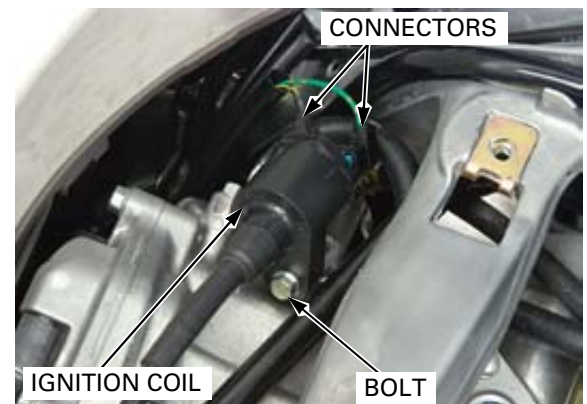
REMOVAL/INSTALLATION

Remove the luggage box (page 2-6).

Disconnect the spark plug cap from the plug. Disconnect the ignition coil primary wire connectors.

Remove the bolt and ignition coil.

Installation is in the reverse order of removal.



IGNITION SYSTEM

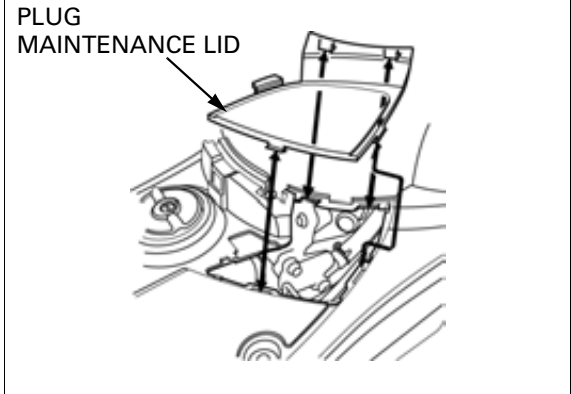
IGNITION TIMING

NOTE:

- The ignition timing is factory preset and need only be checked when an electrical system component is replaced.

Warm up the engine to normal operating temperature.

Stop the engine and remove the radiator cover (page 6-5) and plug maintenance lid.



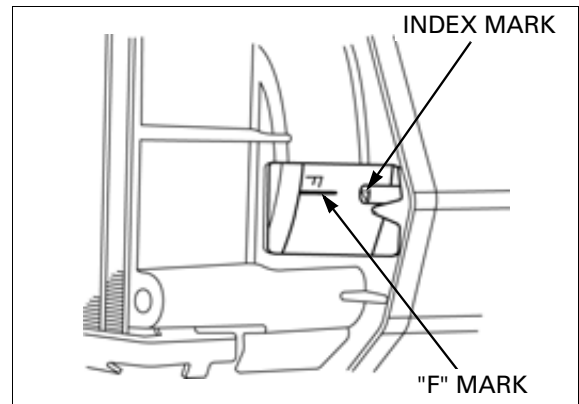
Read the instructions for timing light operation.

Connect the timing light to the spark plug wire.

Start the engine, let it idle and check the ignition timing.

The ignition timing is correct if the "F" mark on the flywheel aligns with the index mark at idle.

Install the removed parts in the reverse order of removal.



THROTTLE POSITION SENSOR

SYSTEM INSPECTION

Disconnect the ECM 26P connector.

Measure the resistance between the Yellow/red and Blue/green wire terminals.

STANDARD: 4 – 6 k Ω (20°C/68°F)

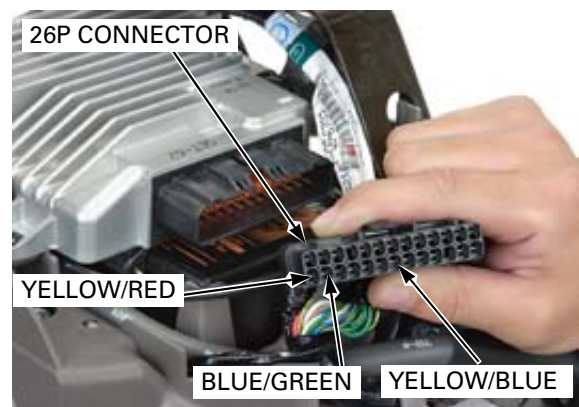
Measure the resistance between the Yellow/blue and Blue/green wire terminals at the wire harness side connector with the throttle operation.

Full open – Full closed position:

Resistance decrease

Full closed – Full open position:

Resistance increase



Disconnect the throttle position sensor 3P connector.

Check the 3P connector for loose contact or corroded terminals.

Measure the resistance between the Yellow/red and Yellow/blue wire terminals of the sensor side connector.

STANDARD: 4 – 6 kΩ (20°C/68°F)

Measure the resistance between the Blue/green and Yellow/blue wire terminals of the sensor side connector by turning the throttle.

Full open – Full closed position:

Resistance decrease

Full closed – Full open position:

Resistance increase

If the measurements are abnormal, replace the throttle position sensor (page 16-8).

If the measurement at the ECM 26P is abnormal and the one at the throttle position sensor 3P connector is normal, check for an open or short circuit, or the loose or poor connections in the wire harness.

INPUT VOLTAGE INSPECTION

Remove the luggage box (page 2-6).

Disconnect the throttle position sensor 3P connector.

Turn the ignition switch to ON and engine stop switch to "Q".

Measure the input voltage between the Yellow/red (+) and Blue/green (-) wire terminals of the wire harness side connector.

STANDARD: 4.7 – 5.3 V

If the input voltage is abnormal, or if there is no input voltage, check for an open or short circuit in the wire harness, or loose or poor ECM connector contact, or battery line and ignition switch circuit of ECM (page 15-9).

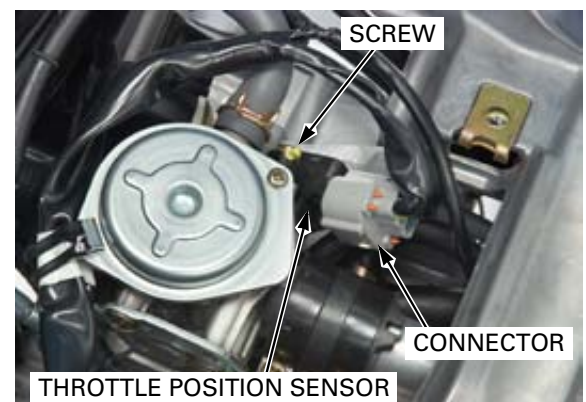
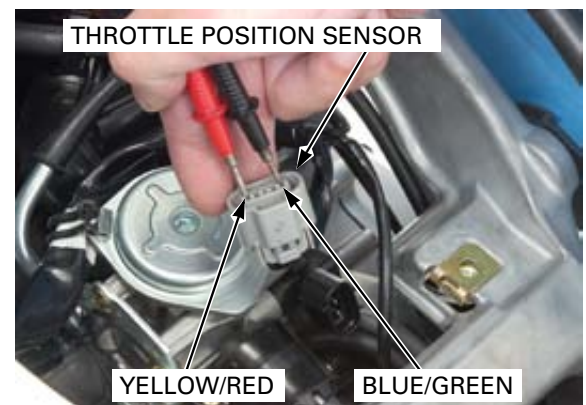
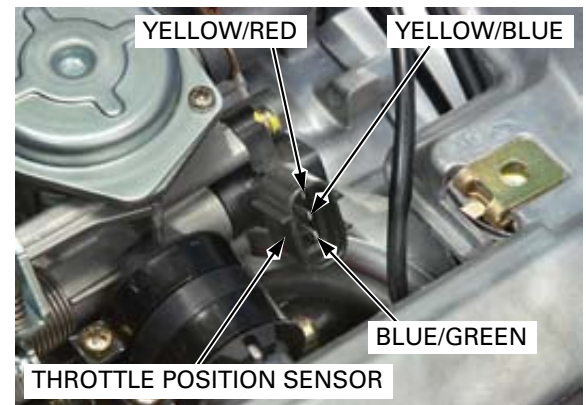
If the above check is normal, replace the ECM.

REMOVAL/INSTALLATION

Remove the luggage box (page 2-6).

Disconnect the throttle position sensor 3P connector.

Remove the screw and disconnect the throttle position sensor from the carburetor.



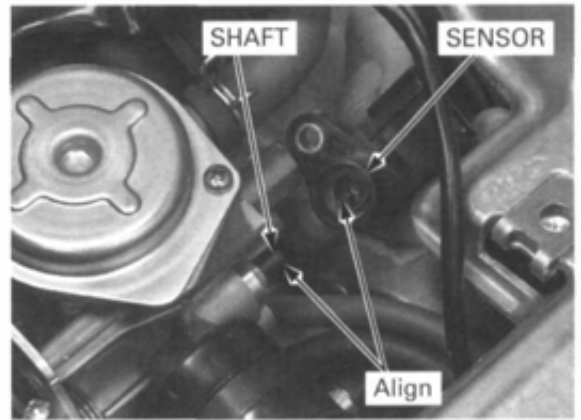
IGNITION SYSTEM

Install the throttle position sensor and align the tabs of the throttle position sensor with the flat surface of the throttle shaft.

NOTICE

The throttle position sensor may be damaged if you do not install it correctly.

Install and tighten the screw securely.
Connect the throttle position sensor 3P connector.
Install the luggage box (page 2-6).



DATA RESET

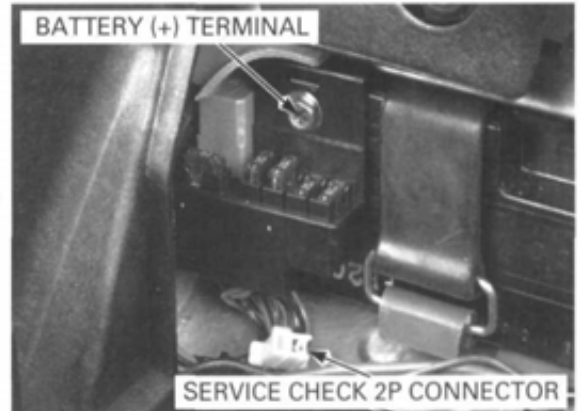
NOTE:

- You must reset the ECM input data when the throttle position sensor is removed.
- Do not touch and rotate the throttle grip while resetting the throttle position sensor.

Remove the fuse box cover.

1. Turn the ignition switch to OFF.
2. Short the Blue/Yellow wire terminal of the service check 2P connector and positive (+) terminal of the battery with the suitable jumper wire.
3. Turn the ignition switch to ON, check that the headlight lights up.
4. After 1 second or more passes, disconnect the jumper wire. Check that the headlight turns off the light. (The ECM is rewriting data.)
5. Check that the headlight lights up again. (The ECM ended rewriting data normally.)
6. Turn the ignition switch to OFF.

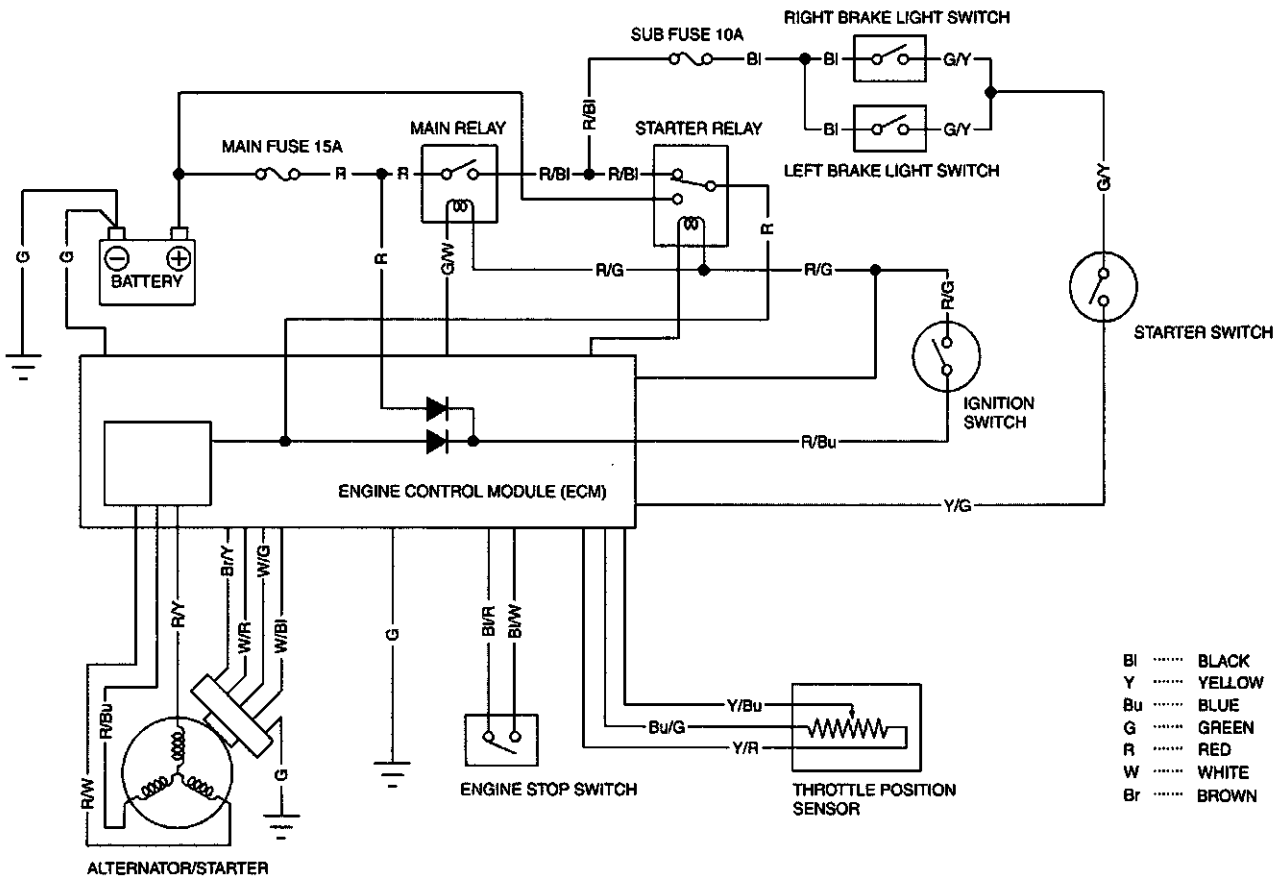
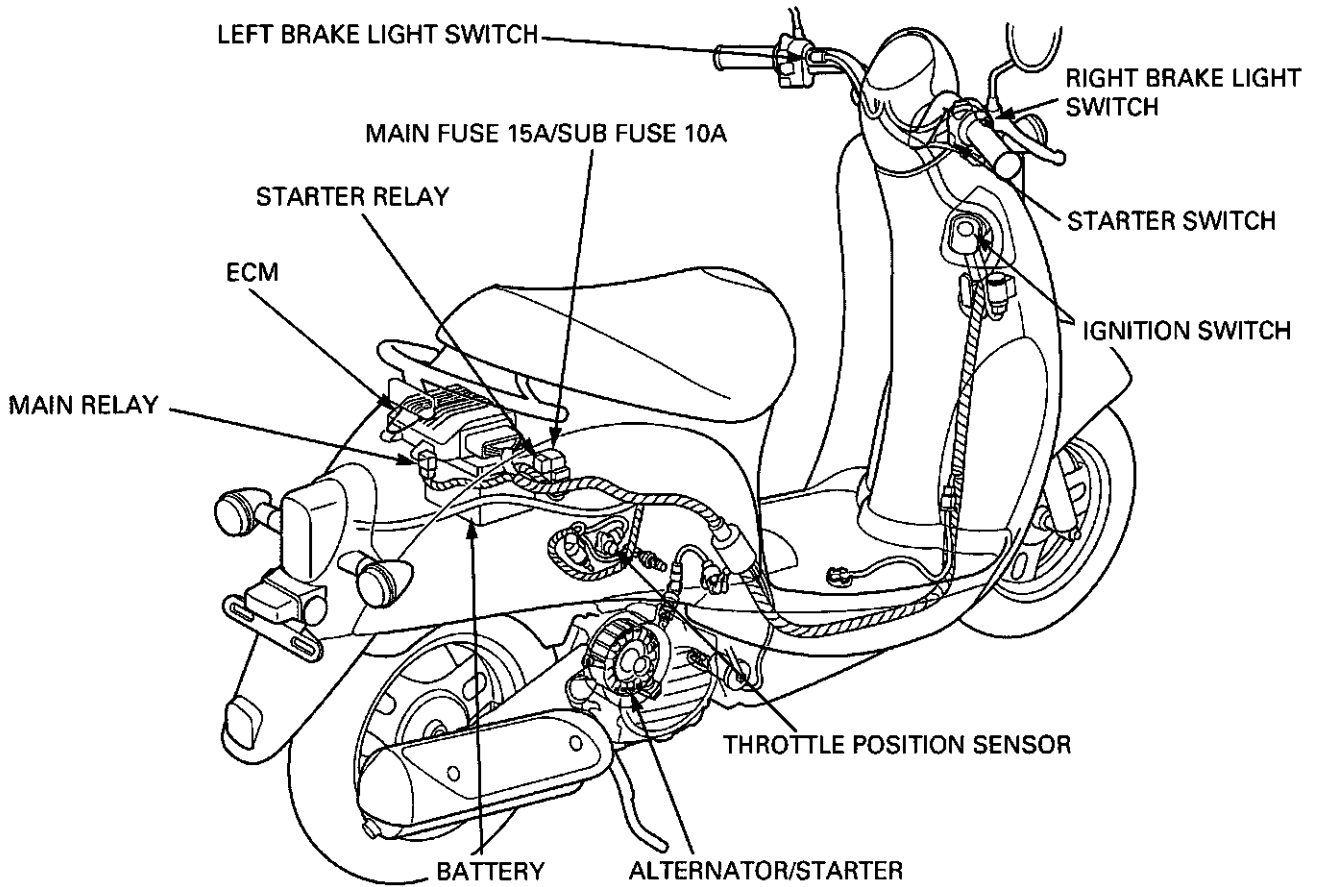
Install the fuse box cover.



17. ELECTRIC STARTER

SYSTEM DIAGRAM	17-2	STARTER RELAY	17-6
SERVICE INFORMATION	17-3	ENGINE CONTROL MODULE (ECM)	17-7
TROUBLESHOOTING	17-4		

ELECTRIC STARTER SYSTEM DIAGRAM



SERVICE INFORMATION**GENERAL**

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned to "ON" and current is present.
- When servicing the electric starter, always follow the steps in the troubleshooting sequence on page 17-4.
- This scooter has adopted an alternator/starter that functions like both an alternator and starter motor.
- A weak battery may be unable to turn the starter quickly enough, or supply adequate ignition current.
- For the alternator/starter removal/installation, see page 11-4.
- For the stator (page 15-8) and main relay (page 15-11) inspection.
- For the ignition switch inspection (page 18-19).
- For the starter switch inspection (page 18-19).
- For the brake light switch inspection (page 18-20).

TROUBLESHOOTING

Alternator/Starter does not turn (Flywheel does not turn)

1. Fuse Inspection

Check for a blown main fuse (15A) and sub fuse (10A).

Is either fuse blown?

YES – Replace the fuse.

NO – GO TO STEP 2.

2. Battery Inspection

Check if the battery is fully charged and is in good condition. Also check that there is no loose terminals or connections.

Is the battery in good condition?

YES – GO TO STEP 3.

NO – Fully charge or replace the battery.

3. Starter Relay Operation Check

With the ignition switch turned to ON, squeeze the brake lever, push the starter switch and check for a "Click" sound from the starter relay.

Is a "Click" heard?

YES – GO TO STEP 4.

NO – GO TO STEP 9.

4. Battery Ground Circuit Inspection

Check the battery ground circuit on the ECM (page 15-9).

Check for continuity between the Green wire terminal of the wire harness and body ground.

Does continuity exist?

YES – GO TO STEP 5.

NO – Open circuit in the Green wire between the 6P connector of the ECM and battery.

5. Stator Coil Inspection

Check the stator coil for resistance on the ECM side (page 17-6).

Is the resistance held within the standard?

YES – GO TO STEP 6.

NO –

- Open circuit in the Red/yellow, Red/blue and Red/white wires between the 6P connector of the ECM and 3P connector of alternator/starter.
- Faulty stator coil.
- Loose or poorly connected stator related connector.

6. Starter Switch Circuit Inspection

Inspect the starter switch circuit on the ECM (page 17-7).

Is the starter switch circuit in good condition?

YES – GO TO STEP 7.

NO –

- Open circuit in the Red wire between the 6P connector of the ECM and starter relay.

7. Starter Relay Inspection

Check the operation of the starter relay (page 17-6).

Is the starter relay in good condition?

YES –

- GO TO STEP 8. (if from step 6)
- GO TO STEP 10. (if from step 9)

NO – Faulty starter relay.

8. Angle Sensor Circuit Inspection

Inspect the angle sensor circuit on the alternator/starter 6P connector side (page 17-7).

Does continuity exist?; Is the voltage normal?

- NO** – • Open circuit in the green wire between the 6P connector of the alternator/starter and ground.
• Open circuit in the Brown/yellow, White/red, White/green and White/black wires between the 6P connector of the alternator/starter and ECM 26P connector.
• Faulty ECM.

YES – Faulty angle sensor (replacement of stator assembly required).

9. Starter Switch Circuit Inspection

Inspect the starter switch circuit on the ECM side (page 17-7).

Is the starter switch circuit normal?

YES – GO TO STEP 7.

- NO** – • Open circuit in the Green/yellow wire between the brake light switch and starter switch.
• Faulty starter switch.
• Open circuit in Yellow/green wire between starter switch and ECM.
• Loose or poorly connected connector of starter switch circuit.

10. Starter Relay Battery Voltage Line Inspection

Inspect the starter relay battery voltage line (page 17-6).

Is the battery voltage line normal?

YES – GO TO STEP 11.

- NO** – • Open circuit in the Red/Green wire between the starter relay and ignition switch.
• Loose or poorly connected connector.

11. Starter Relay Coil Ground Line

Inspect the starter relay coil ground line (page 17-6).

Is the starter relay coil ground circuit in good condition?

YES – Replace the ECM and inspect again.

NO – Open circuit in the Yellow wire between the starter relay and ECM.

STARTER RELAY

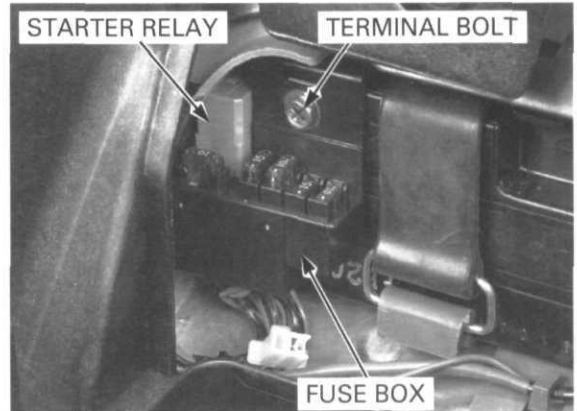
REMOVAL/INSTALLATION

Disconnect the battery negative (-) cable and remove the fuse box cover (page 15-6).

Remove the terminal bolt and disconnect the fuse box/battery positive (+) cable.

Remove the starter relay from the fuse box.

Install the starter relay in the reverse order of removal.

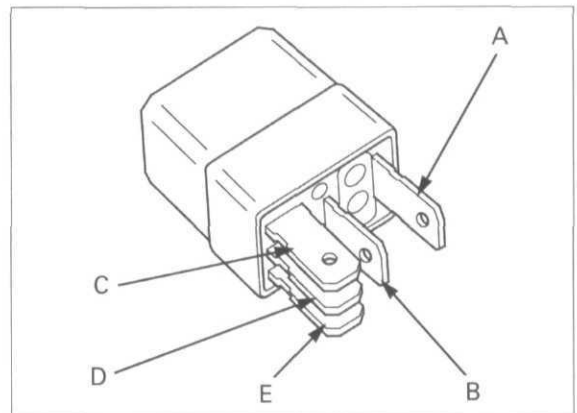


OPERATION INSPECTION

Remove the starter relay.

Check for continuity between the A and D terminals. There should be continuity at the terminals. There should be no continuity when the battery is connected to E (+) and C (-) terminals of the starter relay.

Check for continuity between the A and B terminals. There should be no continuity at the terminals. There should be continuity when the battery is connected to E (+) and C (-) terminals of the starter relay.



RELAY CIRCUIT INSPECTION

NOTE:

- Make sure the main relay and relative circuit is normal before performing this inspection.

Remove the starter relay.

Connect the fuse box/battery positive (+) cable and negative (-) cable.

BATTERY VOLTAGE LINE

Measure the voltage between the Red/green wire terminal (+) of the starter relay connector and ground (-).

If battery voltage is present only when the ignition switch is turned to ON, the circuit is normal.

GROUND LINE

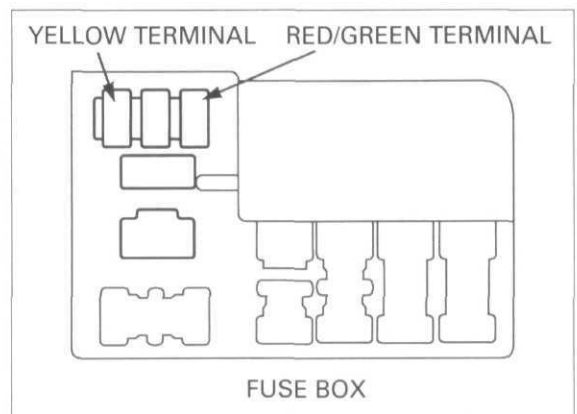
Remove the body cover (page 2-7).

Turn the ignition switch to OFF.

Disconnect the ECM 26P connector and check the connector for loose contacts or corroded terminals.

Check for continuity between the Yellow wire terminal of the ECM 26P connector and starter relay switch connector.

There should be continuity.



ENGINE CONTROL MODULE (ECM)

STARTER SWITCH CIRCUIT INSPECTION

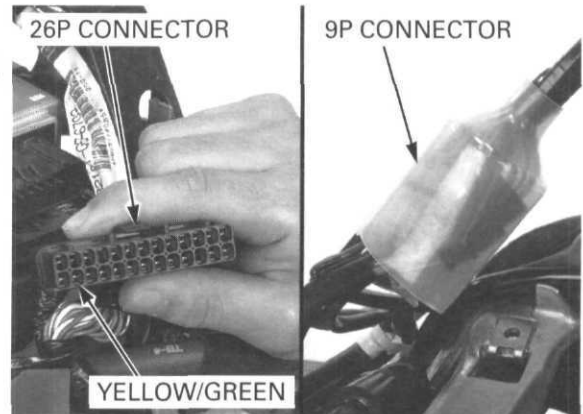
NOTE:

- Make sure the brake light circuit is normal before performing this inspection.

Disconnect the ECM 26P connector.

Check for continuity between the Yellow/green wire terminal of the ECM 26P connector and the Green/yellow wire terminal of the 9P connector.

There is usually no continuity, there should be continuity when pushing the starter switch.



ANGLE SENSOR CIRCUIT INSPECTION

Remove the luggage box (page 2-6).

Disconnect the alternator/starter 6P (W) connector and check the connector for loose contacts or corroded terminals.

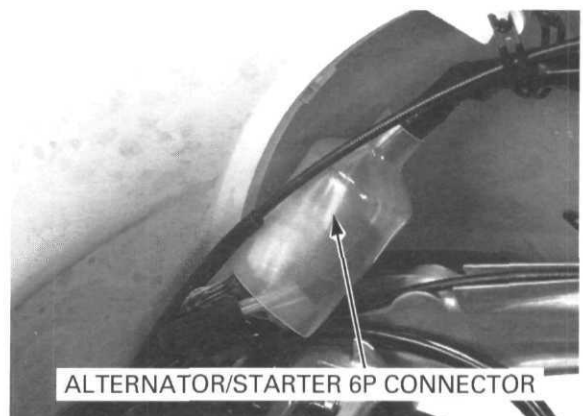
Check for continuity between the Green wire terminal of the harness side and ground. There should be continuity.

Turn the ignition switch to ON.

Measure the voltage between the following terminals of harness side:

STANDARD:

Brown/yellow and Green terminals:	about 10 V
White/red and Green terminals:	about 8.5 V
White/green and Green terminals:	about 8.5 V
White/black and Green terminals:	about 8.5 V

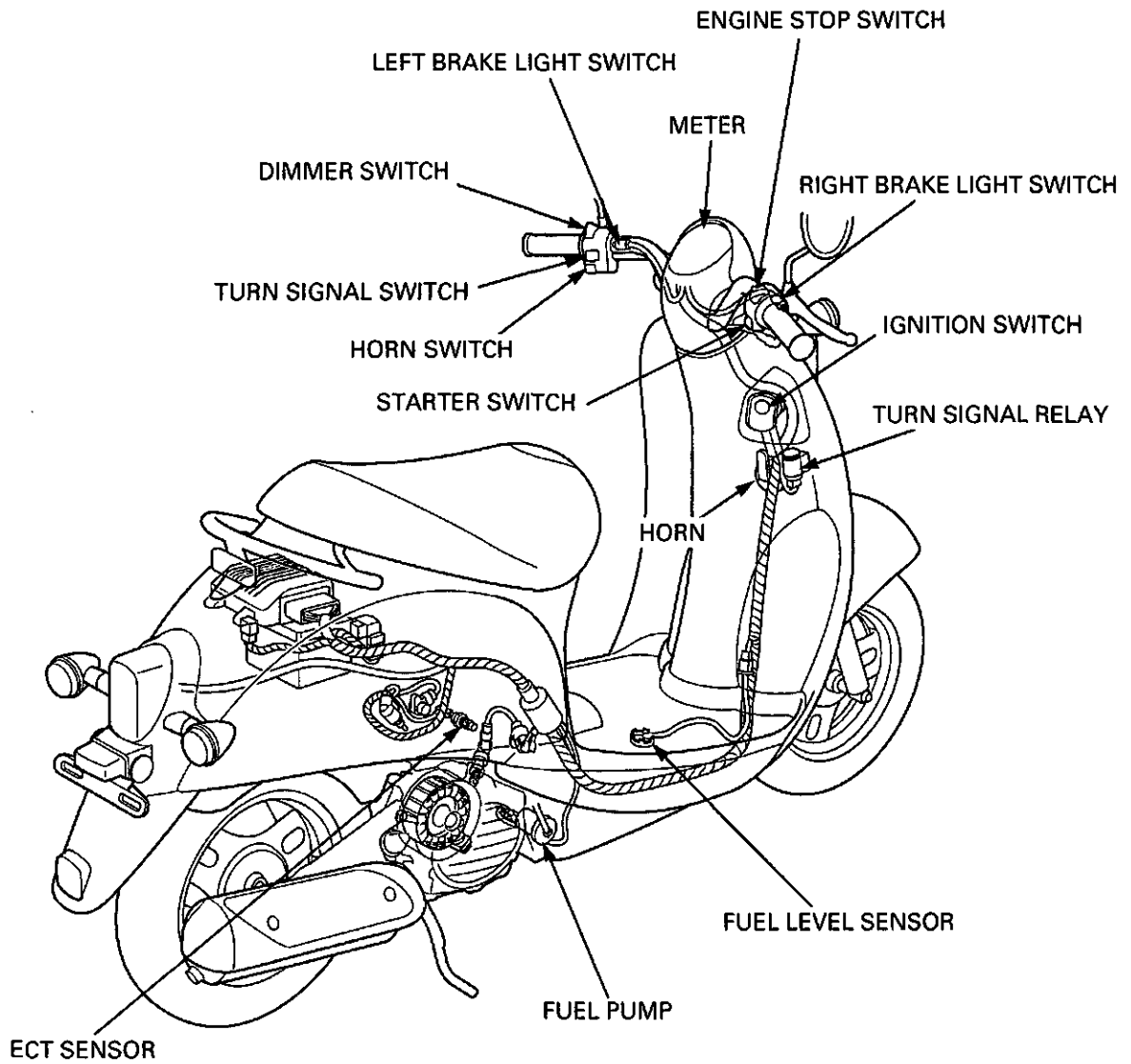


MEMO

18. LIGHTS/METERS/SWITCHES

SYSTEM LOCATION.....	18-2	FUEL GAUGE/FUEL LEVEL SENSOR...	18-12
SERVICE INFORMATION	18-3	COOLANT TEMPERATURE INDICATOR/ ECT SENSOR	18-14
HEADLIGHT.....	18-4	FUEL PUMP	18-16
TURN SIGNAL LIGHT.....	18-5	IGNITION SWITCH	18-19
BRAKE/TAIL LIGHT	18-7	HANDLEBAR SWITCHES.....	18-19
LICENSE LIGHT.....	18-8	BRAKE LIGHT SWITCH.....	18-20
TURN SIGNAL INDICATOR.....	18-9	HORN	18-21
SPEEDOMETER	18-9		

LIGHTS/METERS/SWITCHES
SYSTEM LOCATION



SERVICE INFORMATION

GENERAL

⚠ CAUTION

A halogen head light bulb becomes very hot while the head light is on, and remains hot for awhile after it is turned off. Be sure to let it cool down before servicing.

- Note the following when replacing the halogen headlight bulb.
 - Wear clean gloves while replacing the halogen headlight bulb. Do not put fingerprints on the headlight bulb, as they may create hot spots on the bulb and cause it to fail.
 - If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
 - Be sure to install the dust cover after replacing the bulb.
- 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 scooter.
- Route the wires and cables properly after servicing each component (page 1-14).
- The following color codes used are indicated through out this section.

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

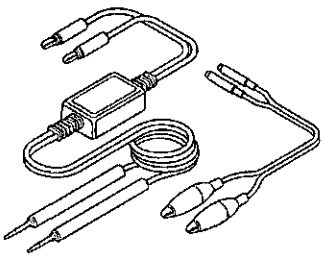
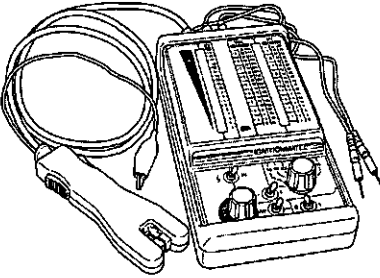
SPECIFICATIONS

	ITEM	SPECIFICATIONS
Bulbs	Headlight (high/low beam)	12V-35/35 W
	Brake/tail light	12V-23/8 W
	Front turn signal light	12V-21 W X 2
	Rear turn signal light	12V-21 W X 2
	License light	12V-5 W
	Instrument light	12V-1.7 W X 2
	Turn signal indicator	12V-3.4 W
	High beam indicator	LED
	Water temp indicator	LED
Fuse	Main fuse	15A
	Sub fuse	10A X 2
ECT Sensor resistance	At 50°C/122°F	690 – 860 Ω
	At 130°C/266°F	68 – 83 Ω
Fuel pump	Resistance (20°C/68°F)	2.6 – 3.2 Ω
	Flow capacity	100 cm ³ (3.4 US oz, 3.5 Imp oz) minimum/minute

TORQUE VALUES

ECT sensor 10 N·m (1.0 kgf·m, 7 lbf·ft) Apply sealant to the threads
 (Do not apply to the sensor head)

TOOLS

<p>Peak voltage adaptor 07HGJ-0020100</p>  <p>with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)</p>	<p>IgnitionMate peak voltage tester (U.S.A. only)</p> 
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HEADLIGHT

HEADLIGHT BULB REPLACEMENT

⚠ CAUTION

A halogen headlight bulb becomes very hot while the headlight is on, and remains hot for awhile after it is turned off. Be sure to let it cool down before servicing.

Remove the front cover (page 2-4).

Remove the dust cover.

Unhook the bulb retainer and replace the headlight bulb with a new one.

NOTICE

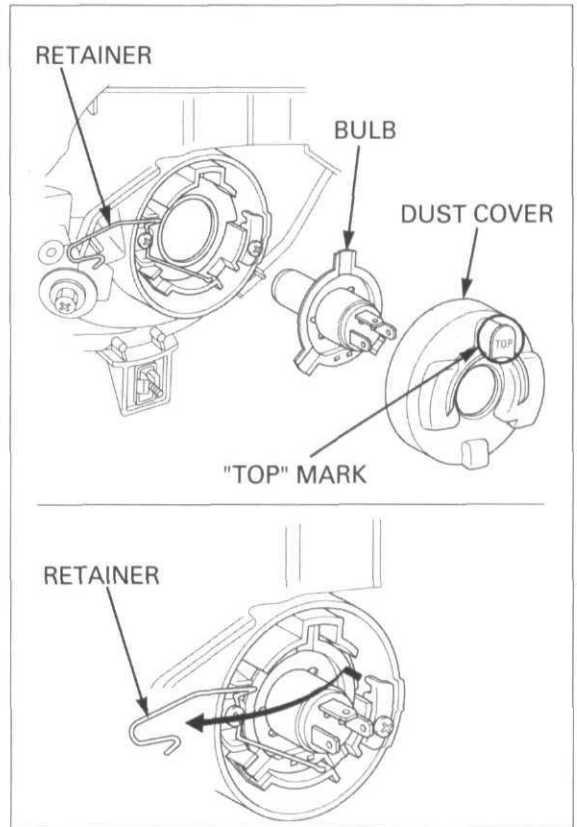
Avoid touching a halogen headlight bulb. Fingerprints can create hot spots that can cause a bulb to break.

If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.

Install the bulb into the headlight and hook the bulb retainer properly.

Install the dust cover properly on to the headlight with the "TOP" mark facing up.

Install the front cover (page 2-4).



INSPECTION

NOTE:

- Make sure that the following are before inspection.
 - Sub fuse (10A)
 - Starter relay operation (page 17-6)
 - Dimmer switch (page 18-20)

Headlight is not turned on

1. Headlight Circuit (1)

Remove the front cover (page 2-4).

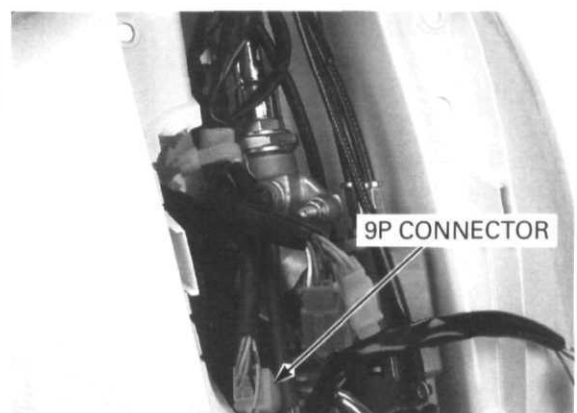
Measure the voltage between the Black/brown wire terminal (+) of the left handlebar switch 9P connector of the harness side and body ground (-).

There should be battery voltage while the engine is running.

Is there battery voltage?

YES - GO TO STEP 2.

- YES** -
- Open or short in Black/Brown circuit.
 - Poorly connected terminal.



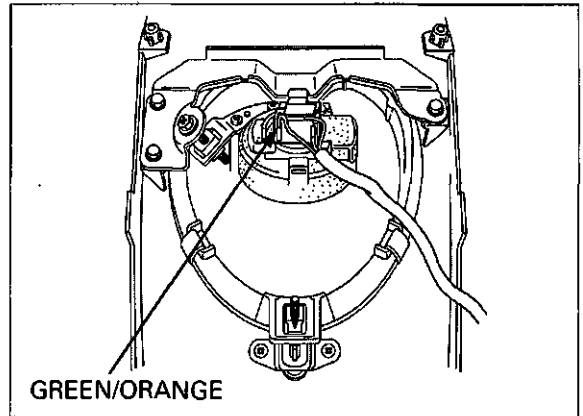
2. Headlight Circuit Inspection (2)

With the headlight connector plugged in, ground the Green/orange wire terminal with a jumper wire.

The headlight circuit is normal if the headlight is turned on when the ignition switch is turned ON while the engine is running.

Is the headlight turned on?

- NO** – Open circuit in the Blue wire between the 9P connector of the left handlebar switch and headlight.
- YES** – Check that the Green/orange wire is not open. If it is not an open circuit, replace the ECM with a new one.



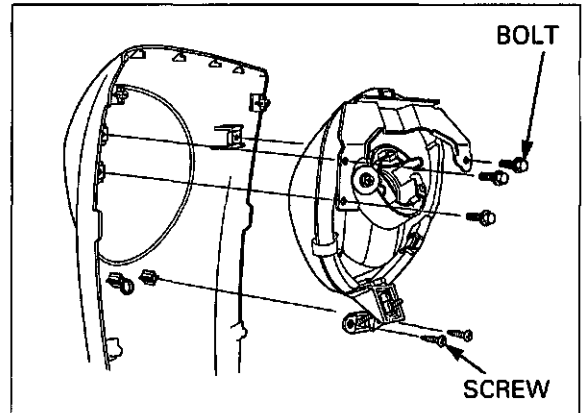
REMOVAL/INSTALLATION

Remove the front cover (page 2-4).

Remove the bolts, screws and headlight unit.

Install the headlight unit in the reverse order of removal.

Adjust the headlight beam vertically and horizontally (page 3-18).



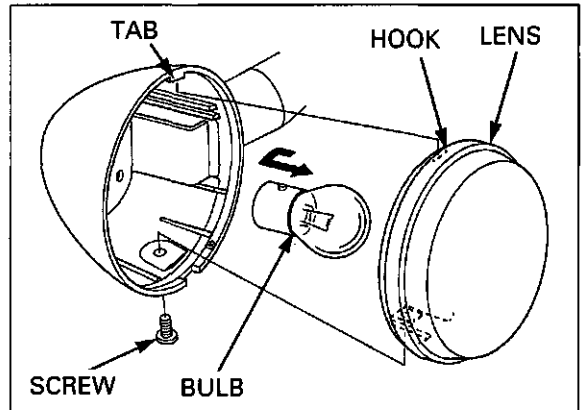
TURN SIGNAL LIGHT

BULB REPLACEMENT

Remove the screw and turn signal light lens. While pushing the bulb in, turn it counterclockwise to remove it, and replace it with a new one.

Make sure the rubber seal is installed in position and is in good condition, and replace it with a new one if necessary.

Install the lens by aligning the hook with the tab of the turn signal light, and tighten the screw.



INSPECTION

NOTE:

- The turn signal lights can be operated with the ignition switch turned to ON even though the engine is not started. The lights will not work if the battery voltage falls below the prescribed limit. However, they will be ready for operation after starting the engine.

LIGHTS/METERS/SWITCHES

All the turn signal lights do not operate.

1. Turn Signal Relay Inspection

Remove the front cover (page 2-4).
Disconnect the turn signal relay connector.
Using the jumper wire, short the Black and Gray wire terminals.
Turn the ignition switch to ON, and operate the turn signal switch.

Does turn signal light up?

NO – GO TO STEP 2.

YES –

- Faulty turn signal relay.
- Poorly connected terminal.



2. Turn Signal Switch Inspection

Inspect the turn signal switch for continuity (page 18-19).

Does continuity exist?

NO – Faulty turn signal switch.

YES –

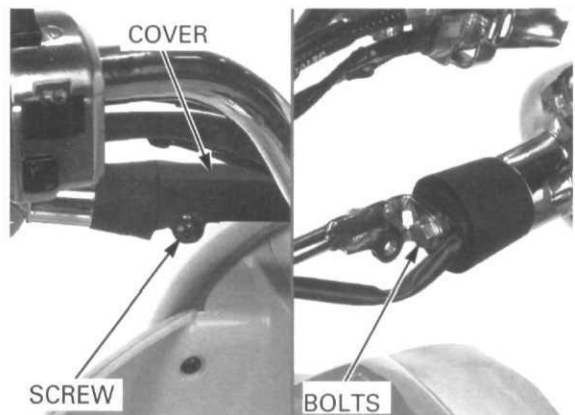
- Open circuit in Black/gray wire of the turn signal relay.
- Open circuit in the Green/black wire between the turn signal light and ECM.
- Faulty ECM.

REMOVAL/INSTALLATION

FRONT

Remove the front meter cover (page 2-12).
Disconnect the turn signal light connectors.

Remove the screw and cover.
Remove the bolt and turn signal light.



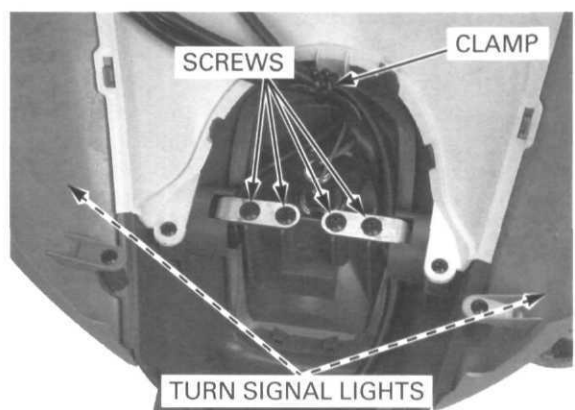
Route the wire harness correctly (page 1-14).

Install the turn signal light in the reverse order of removal.

REAR

Remove the body cover (page 2-7).

Remove the wires from the clamp.
Remove the screws and turn signal lights.



Route the wire harness correctly (page 1-14).

Install the turn signal lights in the reverse order of removal.

BRAKE/TAIL LIGHT

BULB REPLACEMENT

Remove the screws and brake/tail light lens. While pushing the bulb in, turn it counterclockwise to remove it, and replace it with a new one.

Make sure that the rubber seal is installed in position and is in good condition, and replace it with a new one if necessary.

Install the brake/tail light lens and tighten the screws.

INSPECTION

NOTE:

- Normally, the tail light will come on when the ignition switch is turned to ON even when the engine is not started, with the brake light ready for operation. The lights will not work when the battery voltage falls below the prescribed limit, but will go on or be ready for operation after starting the engine.

Brake/tail light does not operate

1. Operation of The Lights Inspection

Check if the tail light and brake light do not operate.

Which light does not operate?

Tail Light-

- Open circuit in the Black/brown wire between the sub fuse and 3P connector of the brake/tail light.
- Faulty starter relay.
- Blown sub fuse (10A).
- Faulty ECM.

Brake light- GO TO STEP 2.

Both tail light and brake light-

- Open circuit in the Green/black wire between the 3P connector of brake/tail light and ECM.
- Faulty ECM.

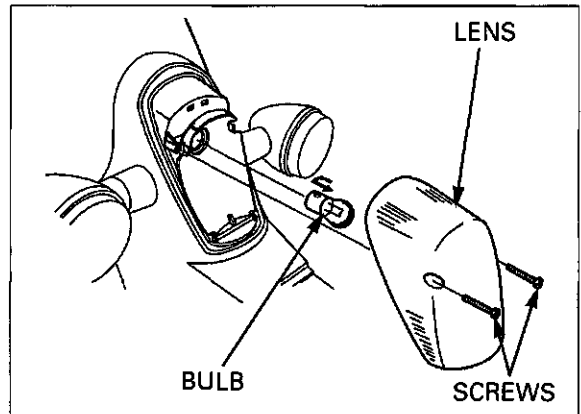
2. Brake Light Switch Inspection

Turn the ignition switch turned to ON. Squeeze the right or left brake levers and check operation of the brake/tail light.

Do either brake light not operate even if its brake lever is squeezed?

NO - Inspect the brake light switch (page 18-20).

YES - GO TO STEP 3.



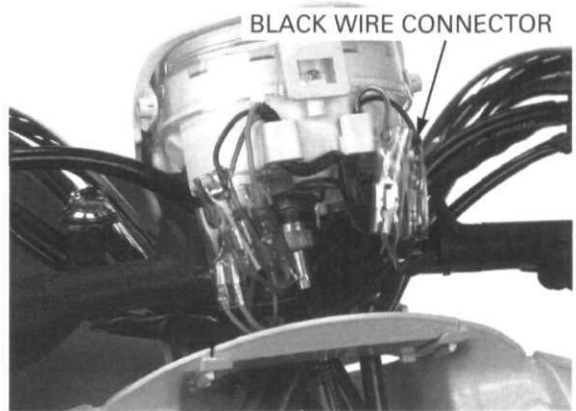
LIGHTS/METERS/SWITCHES

3. Brake Light Circuit Inspection

Remove the front meter cover (page 2-12).
With the ignition switch turned to ON, check that the battery voltage is present between the Black wire connector (+) of the brake light switch and body ground (-).
The brake light switch circuit is normal if battery voltage is present.

Is battery voltage present?

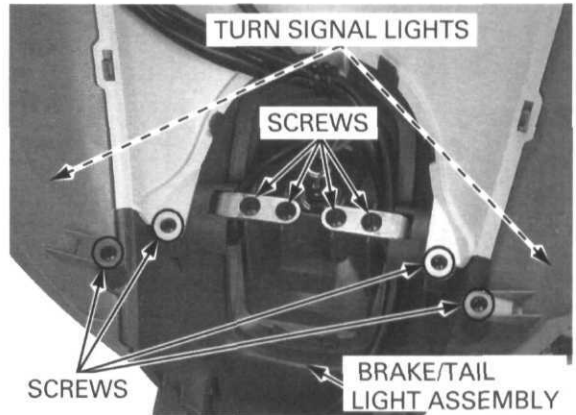
- NO** –
- Open circuit in the Black wire.
 - Faulty main relay (page 15-11).
 - Blown sub fuse (10A).
 - Faulty ignition switch (page 18-19).
 - Faulty ECM.
- YES** –
- Open circuit in the Green/yellow wire between the brake light switch and brake light.



REMOVAL/INSTALLATION

Remove the body cover (page 2-7).

Remove the screws and rear turn signal lights.
Remove the screws and brake/tail light assembly.



Route the wire harness correctly (page 1-14).

Install the brake/tail light in the reverse order of removal.

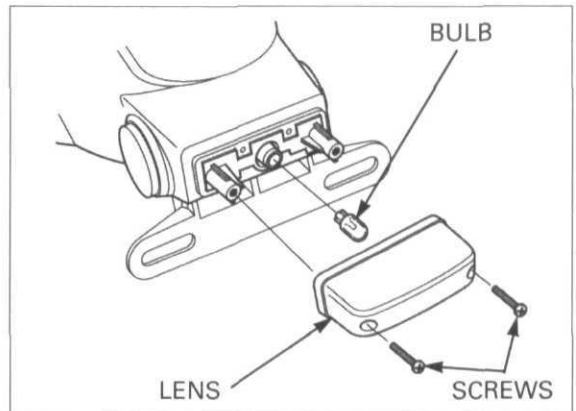
LICENSE LIGHT

BULB REPLACEMENT

Remove the two screws and license light lens.

Remove the bulb from the socket and replace it with a new one.

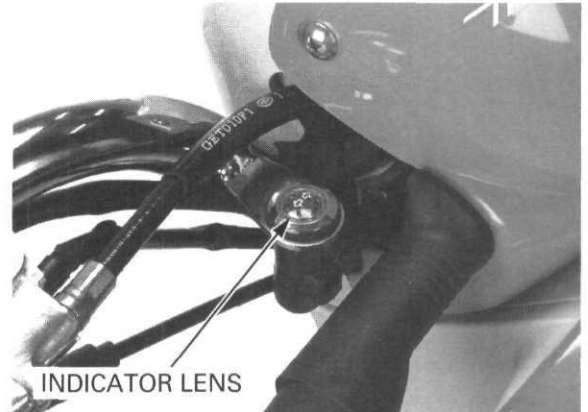
Install in the license light lens reverse order of removal.



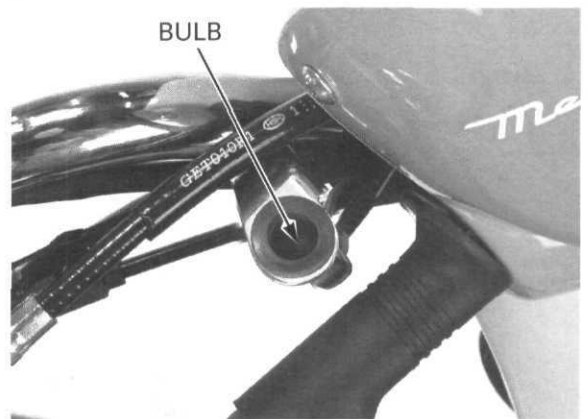
TURN SIGNAL INDICATOR

BULB REPLACEMENT

Remove the turn signal indicator lens.



Remove the bulb and replace with a new one.
Install the turn signal indicator lens.



SPEEDOMETER

BULB REPLACEMENT

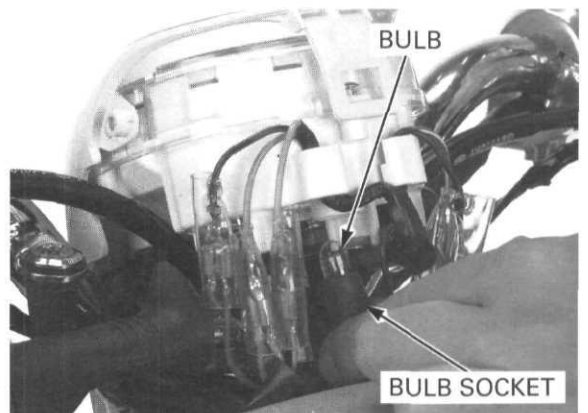
Remove the front meter cover (page 2-12).

Remove the bulb socket.

Remove the bulb from the bulb socket and replace the bulb with a new one.

Installation is in the reverse order of removal.

Install the front meter cover (page 2-12).



LIGHTS/METERS/SWITCHES

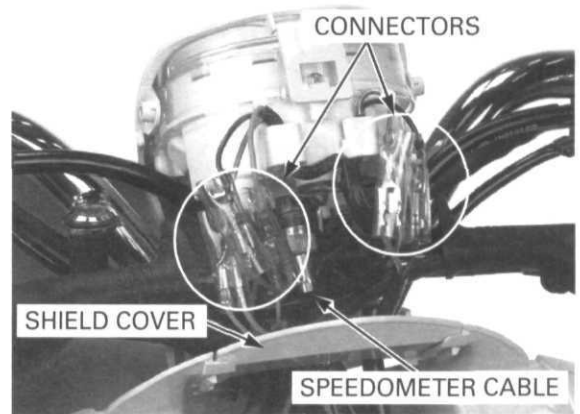
REMOVAL/INSTALLATION

Remove the following:

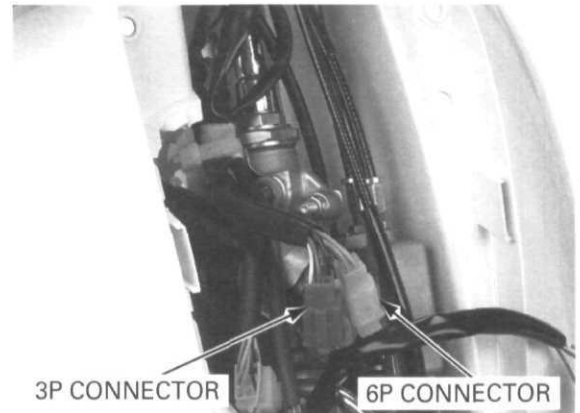
- Front cover (page 2-4).
- Front meter cover (page 2-12).

Remove the shield cover.

Disconnect the connectors and speedometer cable.



Disconnect the meter 6P and 3P connectors.



Remove the screws and speedometer.

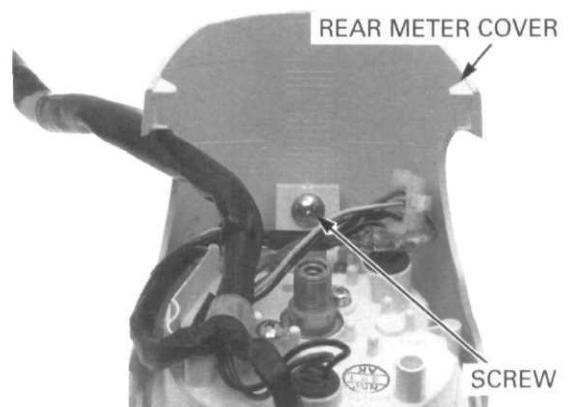
Installation is in the reverse order of removal.

*Route the cables
and wire harness
properly
(page 1-14).*

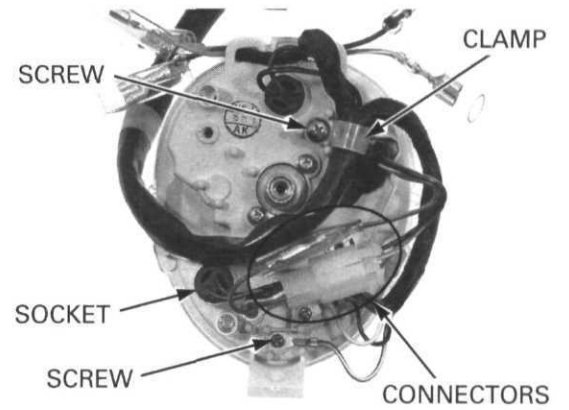


DISASSEMBLY

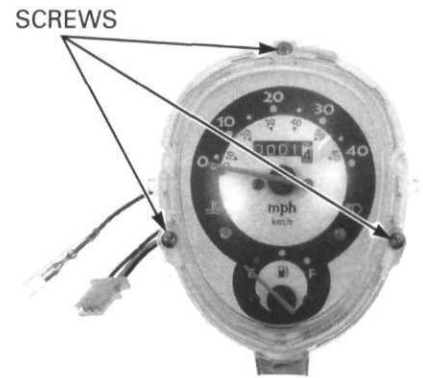
Remove the screw and rear meter cover.



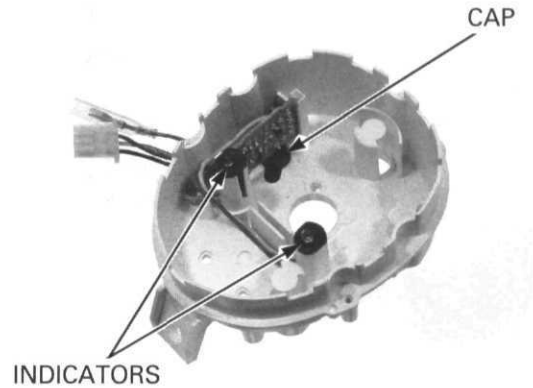
Remove the meter bulb sockets.
Remove the screw and clamp.
Disconnect the connectors.
Remove the screws and wires from the speedometer.



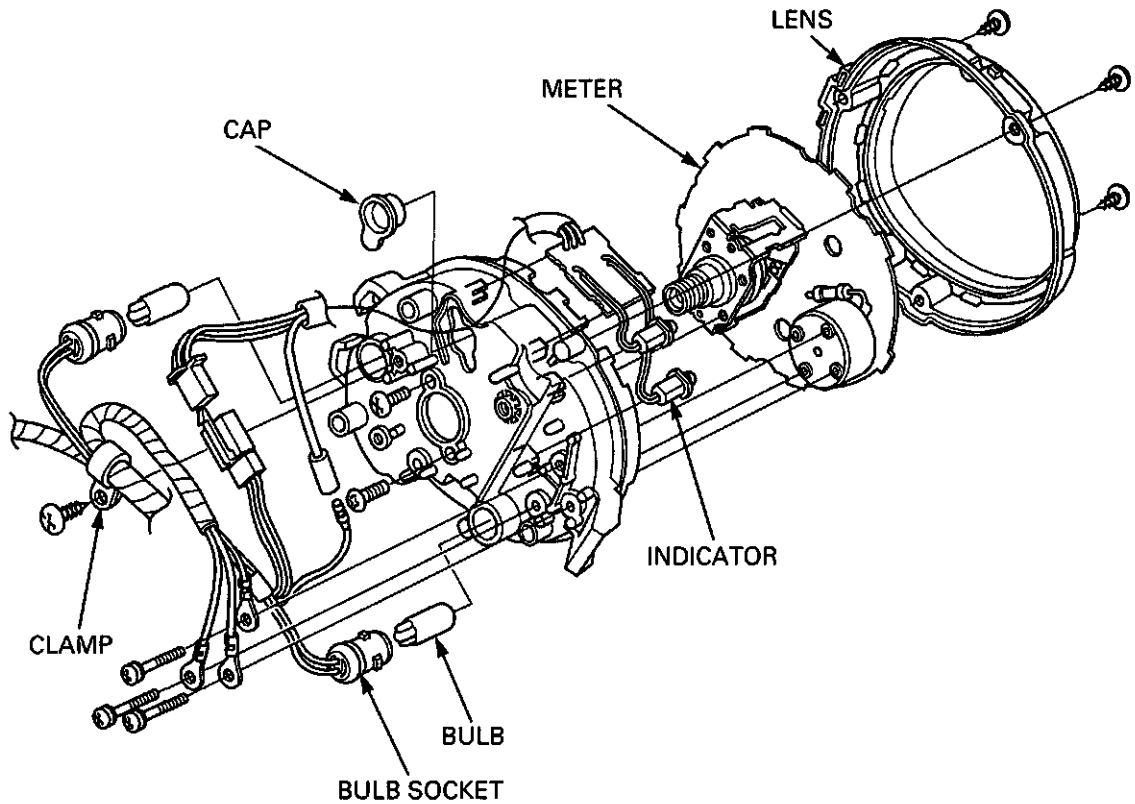
Remove the screws, meter lens and meter.



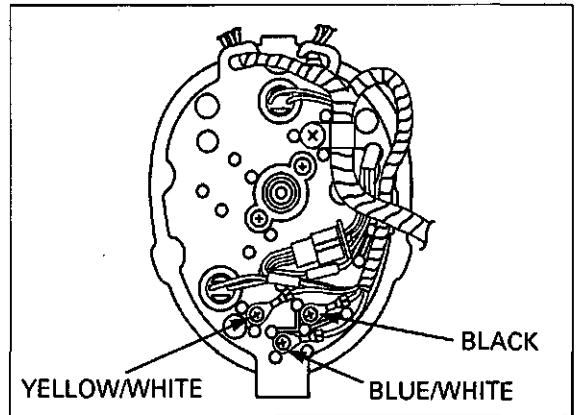
Remove the cap.
Remove the indicators and wire from the meter case.



ASSEMBLY



Assembly is in the reverse order of disassembly. Route the meter harness properly (as shown). Install the speedometer (page 18-10).



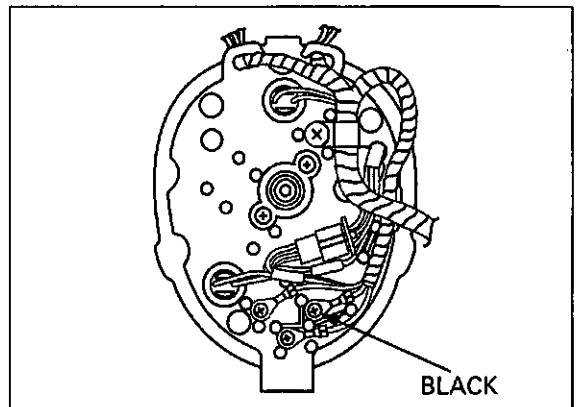
FUEL GAUGE/FUEL LEVEL SENSOR

SYSTEM INSPECTION

Remove the front meter cover (page 2-12).

Measure the voltage between the Black wire terminal and ground with the ignition switch turned to ON.

If there is no voltage, check for an open or short circuit in the wire harness.

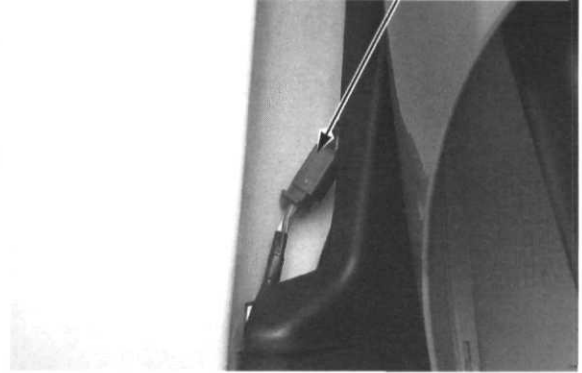


Pull out the fuel level sensor 3P (Bu) connector from the back-side of the lower cover and disconnect the fuel level sensor 3P (Bu) connector. Check the continuity between the Green terminal and ground at the wire harness side.

There should be continuity.

If there is no continuity, check for an open or short circuit in the wire harness.

FUEL LEVEL SENSOR 3P (Bu) CONNECTOR

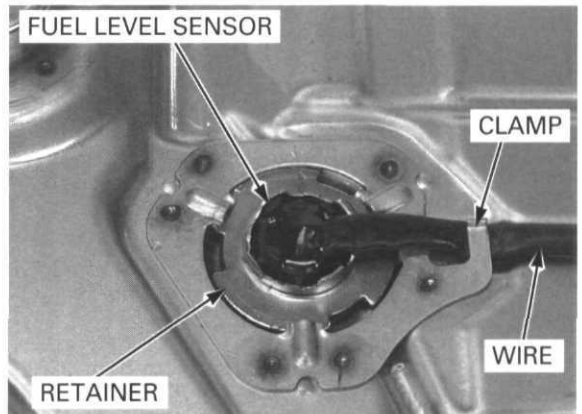


FUEL LEVEL SENSOR INSPECTION

Remove the step floor (page 2-9).

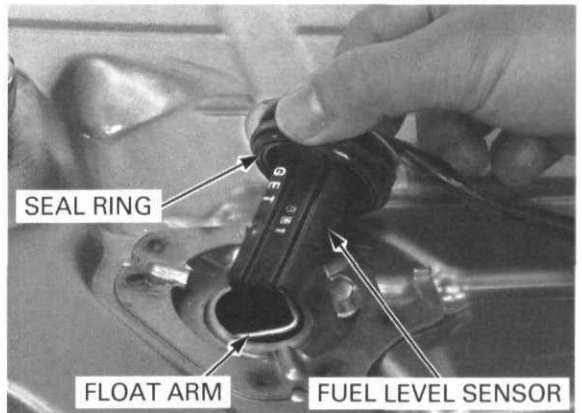
Pull out the fuel level sensor 3P (Bu) connector from the back-side of the lower cover. Disconnect the fuel level sensor 3P (Bu) connector.

Remove the wire harness from the clamp. Turn the sensor retainer counterclockwise to remove it.



Remove the fuel level sensor, being careful not to deform or damage the float arm.

Remove the seal ring.

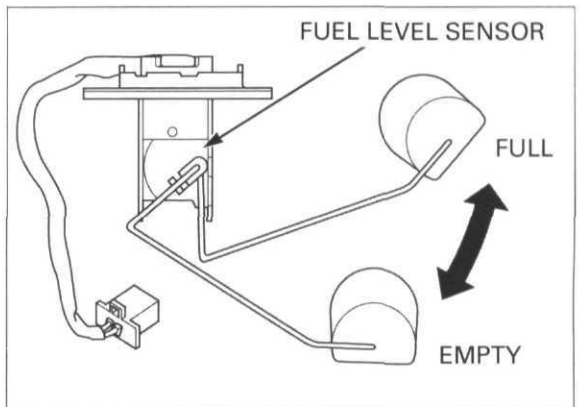


Measure the resistance between the connector terminals with the float upper (full) and lower (empty) positions.

(20°C/68°F)

	FLOAT POSITION	
	FULL	EMPTY
Green – Yellow/White	25 – 45 Ω	400 – 700 Ω
Green – Blue/White	400 – 700 Ω	25 – 45 Ω
Yellow/White – Blue/White	450 – 750 Ω	450 – 750 Ω

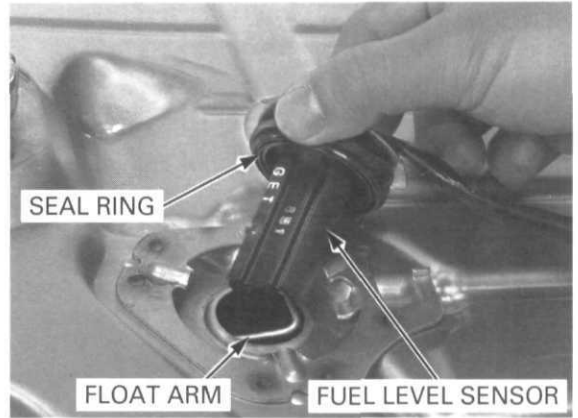
Replace the fuel level sensor if it is out of specification.



LIGHTS/METERS/SWITCHES

Install a new seal ring onto the fuel tank.

Install the fuel level sensor into the fuel tank, being careful not to deform or damage the front arm.

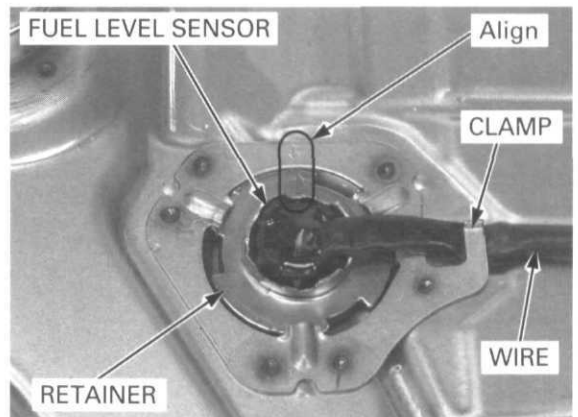


Align the groove on the fuel level sensor with the tab on the fuel tank.

Install the retainer aligning its cut-outs with the tabs on the fuel tank and turn the retainer clockwise to lock it until the arrows are aligned.

Install the wire to the clamp.

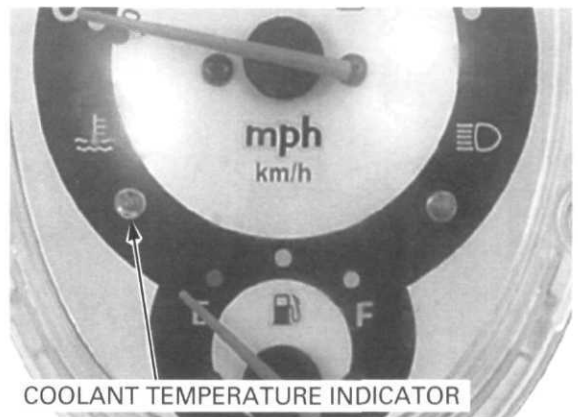
Install the step floor (page 2-9).



COOLANT TEMPERATURE INDICATOR/ECT SENSOR

NOTE:

- When the coolant temperature exceeds 120 °C (248 °F), the coolant temperature indicator will blink. The ECM will then control the ignition and reduce engine speed to 9 mph (15 km/h). At this time, check the cooling system and engine for leaks or damage. If everything is OK, then check the following.
- If the indicator lights up when the ignition switch ON, check the short-circuit of the Light green/red wire between the speedometer and ECM terminals.



SYSTEM INSPECTION

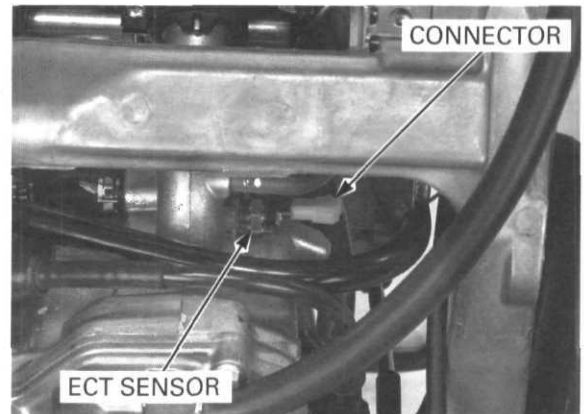
1. Coolant Temperature Indicator Circuit Inspection (1)

Remove the luggage box (page 2-6).

Warm up the engine.
 Stop the engine and disconnect the ECT sensor connector.
 Short the terminals of connector with a suitable jumper wire.
 Start the engine and make sure the temperature indicator lights after 10 seconds.

Does the indicator light?

- NO** – GO TO STEP 2.
- YES** – Inspect the ECT sensor (page 18-16).

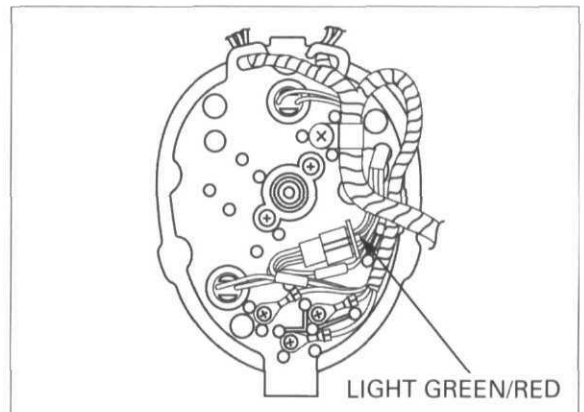


2. Coolant Temperature Indicator Circuit Inspection (2)

Remove the front meter cover (page 2-12).
 Ground the Light green/red wire terminal of the 3P connector with a jumper wire.
 Turn the ignition switch to ON, check that the indicator lights.

Does the indicator light?

- NO** – Faulty indicator (wire harness).
- YES** –
 - Open circuit of White wire between the ECM and ECT sensor.
 - Open circuit of Light green/red wire between the speedometer and ECM.
 - Faulty ECM.



When the indicator always lights during a operation

1. Coolant Temperature Indicator Circuit Inspection (short circuit)

Turn the ignition switch to ON (engine not started) and check that the indicator lights.

Does the indicator lights?

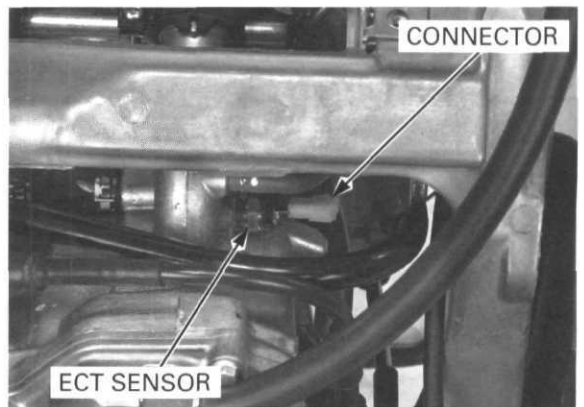
- NO** – GO TO STEP 2.
- YES** – Short circuit of Light green/red wire between the speedometer and ECM.

2. Ect Sensor Circuit Inspection

Remove the luggage box (page 2-6).
 Disconnect the ECT sensor connector.
 Ground the White wire with a suitable jumper wire.
 Start the engine, check that the indicator lights.

Does the indicator light?

- NO** – Inspect the ECT sensor (page 18-16).
- YES** –
 - Short circuit of White wire between the ECM and ECT sensor.
 - Faulty ECM.



LIGHTS/METERS/SWITCHES

ECT SENSOR INSPECTION

Remove the luggage box (page 2-6).
Drain the coolant (page 6-7).

Disconnect the ECT sensor connector and remove the ECT sensor.

Keep all flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.

Suspend the ECT sensor in a pan of coolant (1:1 mixture) on an electric heating element and measure the resistance between the ECT sensor terminal and body as the coolant heats up.

NOTE:

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

Temperature	50°C (122°F)	130°C (266°F)
Resistance	690 – 860 Ω	68 – 83 Ω

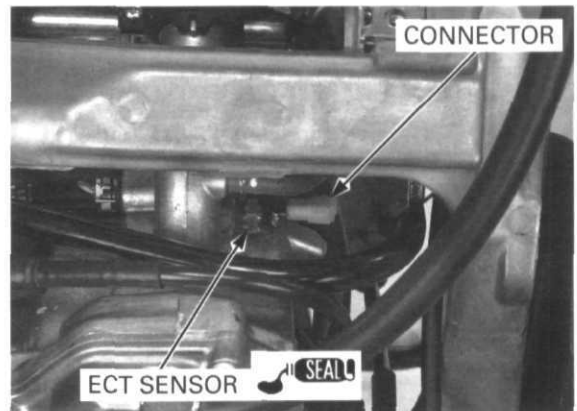
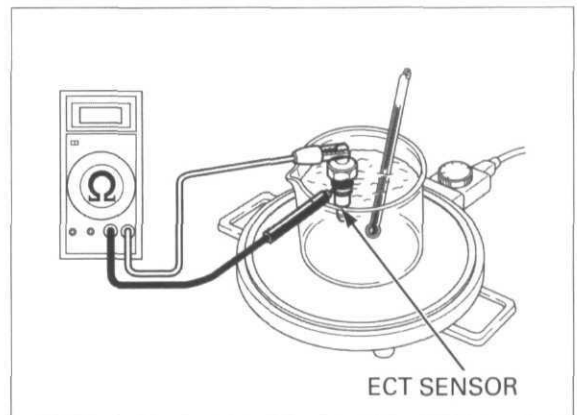
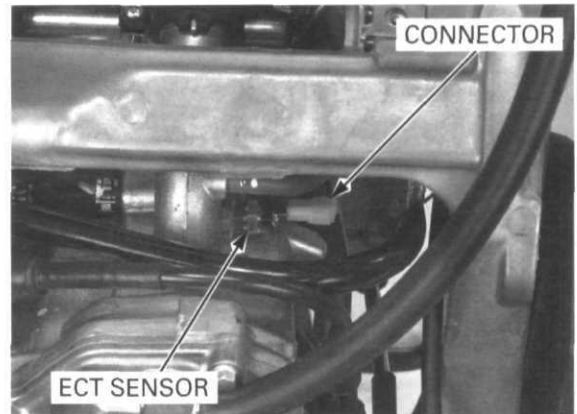
If the resistance is out of above range, replace the ECT sensor.

Apply sealant to the ECT sensor threads. Do not apply sealant to the sensor head.
Install and tighten the ECT sensor.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Connect the ECT sensor connector.

Fill and bleed the cooling system (page 6-7).
Install the luggage box (page 2-6).



FUEL PUMP

NOTE:

- When the ECM detects a problem in the fuel pump circuit while the engine is running, the engine speed will gradually lower via the ignition circuit until finally the ignition and engine will be stopped. After about 1 minute, power to the main relay is also stopped.

SYSTEM INSPECTION

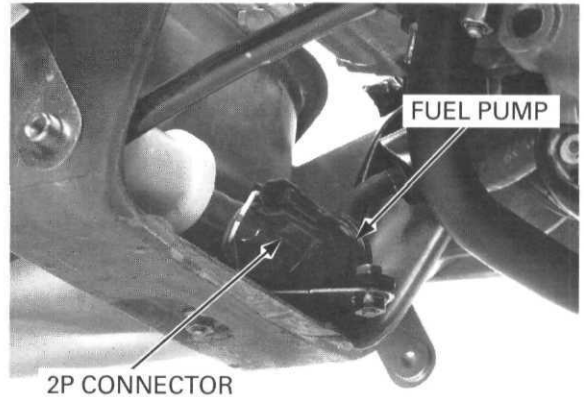
1. Fuel Pump Operation Check

Remove the lower cover (page 2-10).
Turn the ignition switch to ON, check for an operating sound from the fuel pump.

Is the operating sound heard?

NO – GO TO STEP 2.

YES – Inspect the discharge volume (page 18-18).



2. Fuel Pump Battery Voltage Inspection

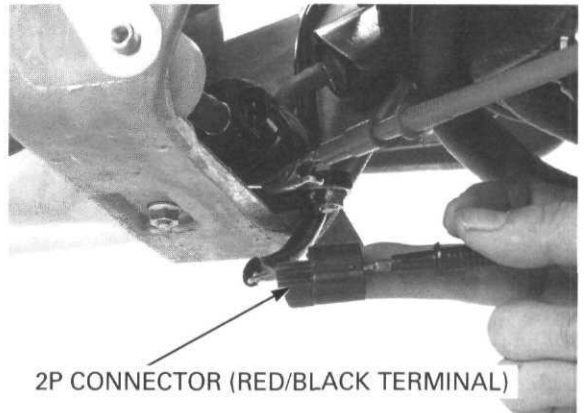
Disconnect the fuel pump 2P (Black) connector. Check for battery voltage between the Red/black wire terminal (+) of the wire harness side and ground (-).

There should be battery voltage with the ignition switch turned to ON and the engine stop switch turned to "Q".

Is there battery voltage?

NO – • Open circuit in Red/black wire between the fuel pump and main relay.
• Inspect the main relay (page 15-11).

YES – GO TO STEP 3.



3. Fuel Pump Circuit Inspection

Check for an open or short circuit in the White/yellow wire between the fuel pump and ECM.

Is there an open or short circuit?

NO – GO TO STEP 4.

YES – Open or short circuit in wire harness.

4. Fuel Pump Inspection

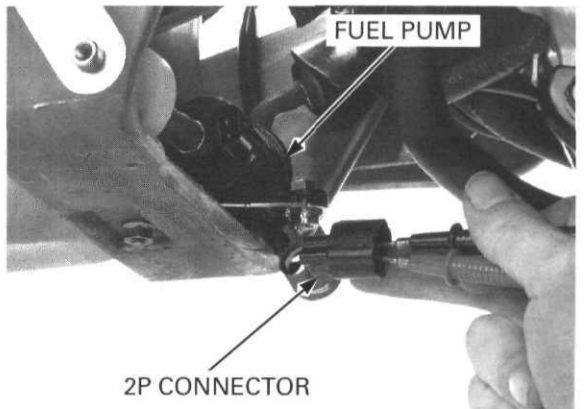
Check the resistance between the fuel pump terminals.

STANDARD: 2.6 – 3.2 Ω (20°C/68°F)

Is the resistance within the standard?

NO – Faulty fuel pump.

YES – Faulty ECM.



DISCHARGE VOLUME INSPECTION

Remove the luggage box (page 2-6).

Disconnect the fuel hose from the carburetor.
Hold a graduated beaker under the fuel hose.

Turn the ignition switch to ON and engine stop switch to "Q".

Let the fuel flow into the beaker for 5 seconds, then turn the ignition switch to OFF.

Multiply the amount in the beaker by 12 to determine the fuel pump flow capacity per minute.

FUEL PUMP FLOW CAPACITY:

100 cm³ (3.4 US oz, 3.5 Imp oz) minimum/minute

If the flow capacity is out of specification, replace the fuel pump.

Install the luggage box (page 2-6).

REMOVAL/INSTALLATION

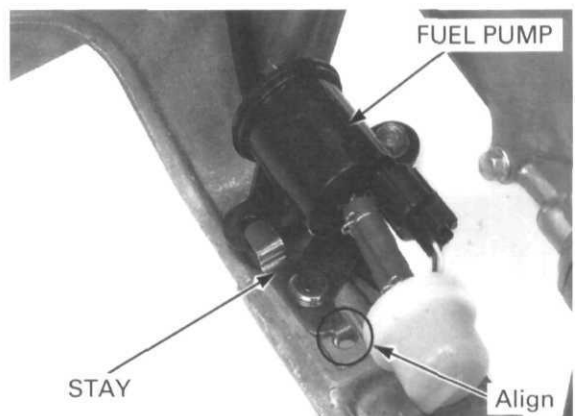
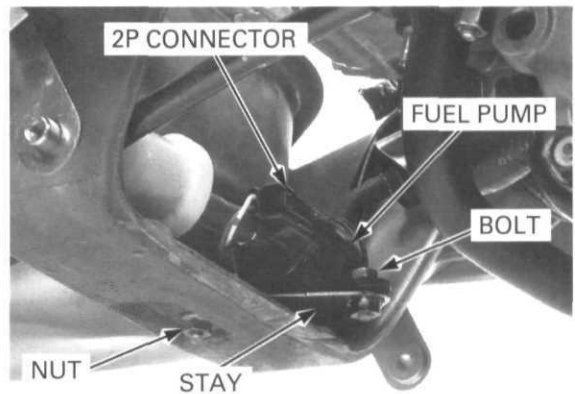
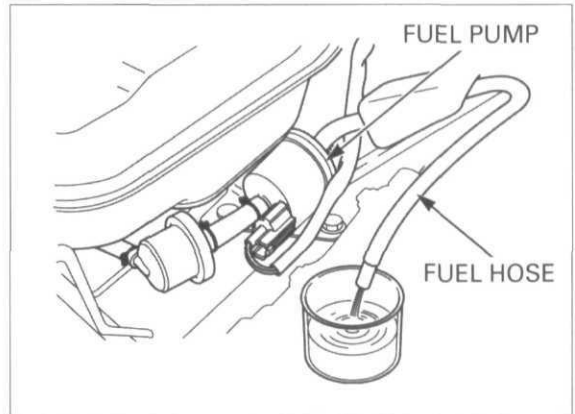
Remove the lower cover (page 2-10).

Disconnect the fuel pump 2P connector.

Disconnect the fuel hoses from the fuel pump.

Remove the bolt, nut, stay and fuel pump.

Installation is in the reverse order of removal.

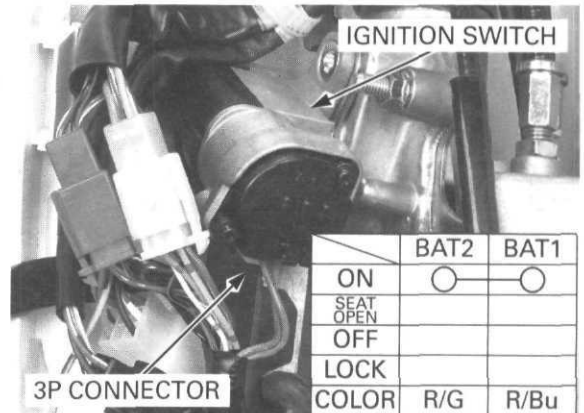


IGNITION SWITCH

INSPECTION

Remove the front cover (page 2-4).

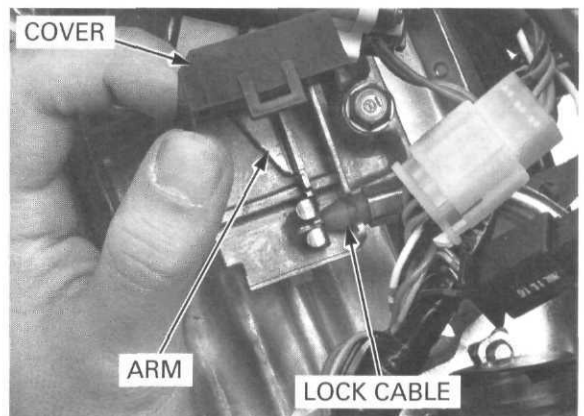
Disconnect the ignition switch 3P connector. Check for continuity between the connector terminals in each switch position. Continuity should exist between the color code wires as follows:



REMOVAL/INSTALLATION

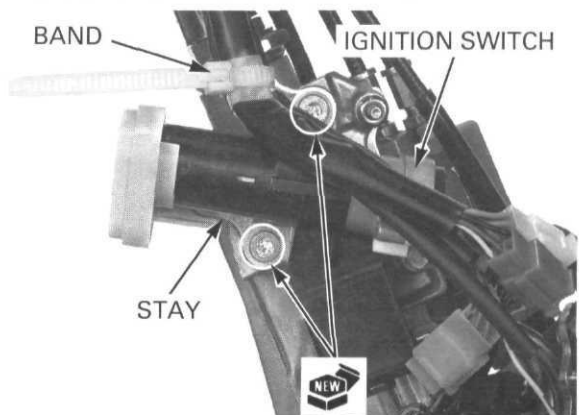
Remove the leg shield (page 2-9). Disconnect the ignition switch 3P connector.

Open the cover of the ignition switch. Remove the seat lock cable from the ignition switch and disconnect the cable from the arm.



Remove the wire band from the stay. Remove the two screws and ignition switch.

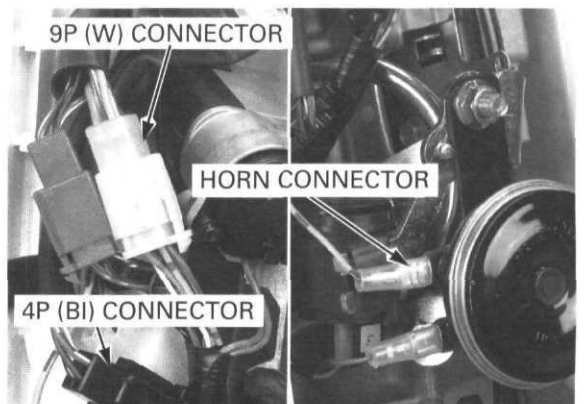
Use the new screw and install the removed parts of reverse order of removal.



HANDLEBAR SWITCHES

Remove the front cover (page 2-4).

Disconnect the right handlebar switch 4P (BI) connector and left handlebar switch 9P (W) connector. Check for continuity between the connector terminals in each switch position. Continuity should exist between the color code wires as shown in the charts below.



LIGHTS/METERS/SWITCHES

LEFT HANDLEBAR SWITCH

TURN SIGNAL SWITCH

	W	R	L
←	○	—	○
N			
→	○	○	
COLOR	Gr	Lb	O

DIMMER SWITCH

	HL	Lo	Hi
☹	○	○	
(N)	○	○	○
☺	○		○
COLOR	Bl/Br	W	Bu

HORN SWITCH

	HO	BAT2
FREE		
📢	○	○
COLOR	Lg	Bl

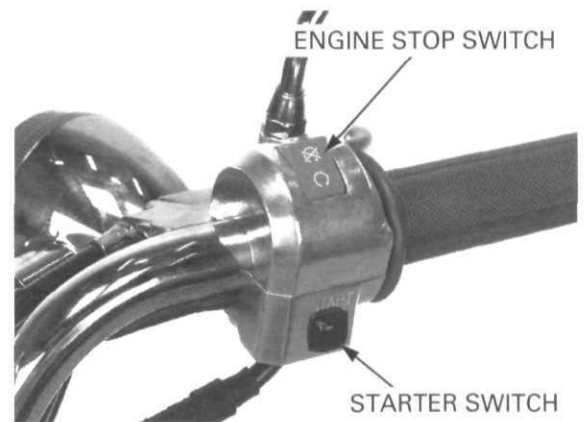
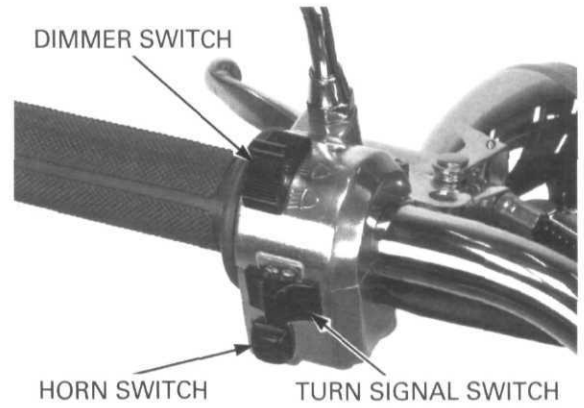
RIGHT HANDLEBAR SWITCH

STARTER SWITCH

	CDI	ST
FREE		
START	○	○
COLOR	Y/G	G/Y

ENGINE STOP SWITCH

	BAT	CONV
⊙	○	○
⊗		
COLOR	Bl/R	Bl/W



BRAKE LIGHT SWITCH

Remove the front meter cover (page 2-12).

Disconnect the brake light switch connectors and check for continuity between the switch side terminals.

There should be continuity with the brake lever squeezed, and there should be no continuity when the brake lever is released.



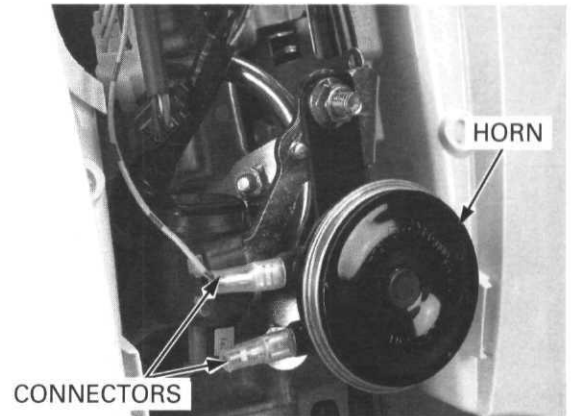
HORN

INSPECTION

Remove the front cover (page 2-4).

Disconnect the horn connectors from the horn.

Connect a 12V battery to the horn terminals.
The horn is normal if it sounds when the 12V battery
is connected across the horn terminals.



MEMO

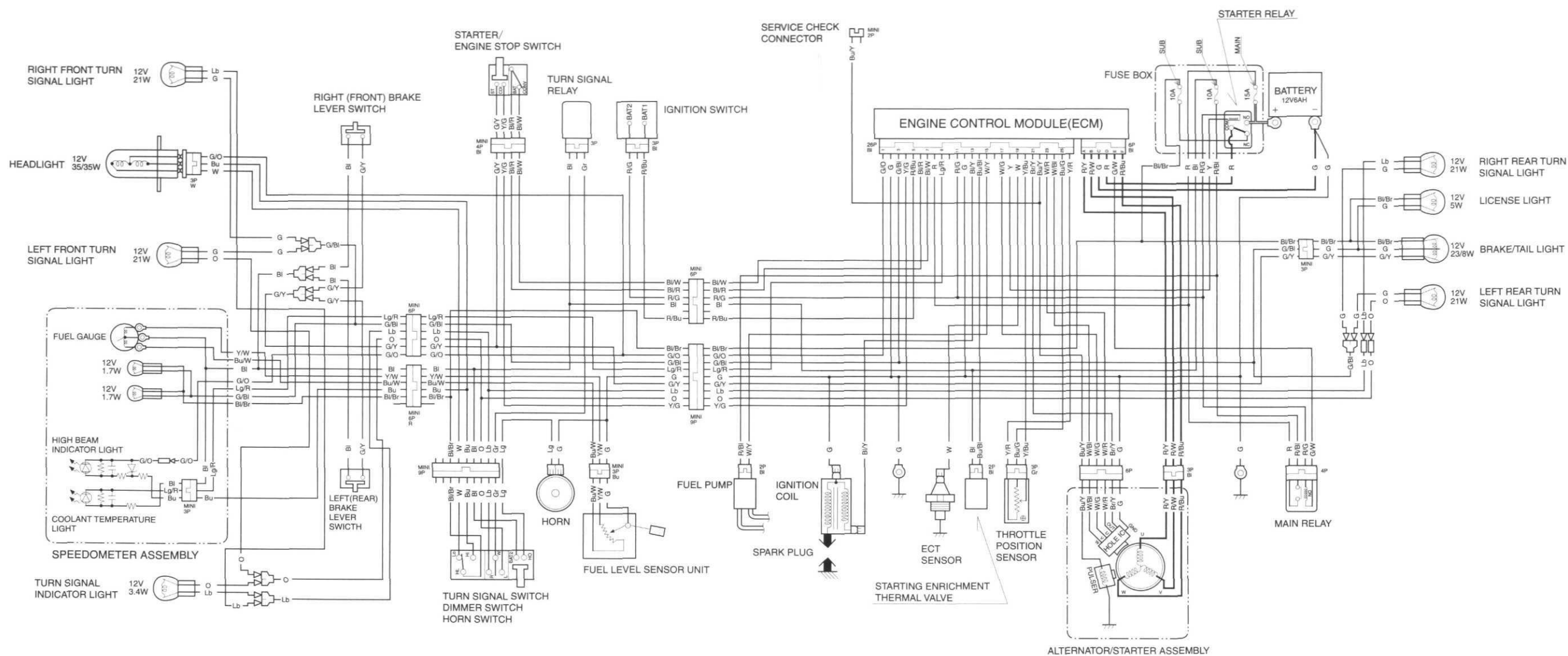
19. WIRING DIAGRAMS

STANDARD ('02 - '05 model)..... 19-3

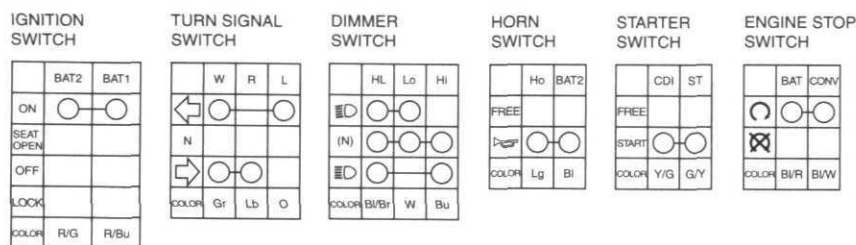
After '05 model 19-5

P-type ('02 - '05 model)..... 19-4

STANDARD ('02 - '05 model)



SWITCH CONTINUITY



1	H/L	H/L CONTROL	G/O	14	A/B	AUTO BYSTARTER	Bu/Bl
2	GND-L	LOAD CUT GND	G	15	F/P	FUEL PUMP	W/Y
3	L/C	LOAD CUT	G/Bl	16	(NC)		
4	ST-SW	STARTER SW	Y/G	17	IHV	HOLE IC <V>	W/G
5	C&L	C&L BATT1	R/Bu	18	S/RELAY	START RELAY	Y
6	BAT	CDIBAT	Bu/R	19	TH-SE	THERMO SENSOR	W
7	CONV	CDICONV	Bu/W	20	THR	THROTTLE	Y/Bu
8	B/CUT	BATTERY CUT	R	21	VOUT	HOLE IC <OUT>	Br/Y
9	WT-IND	WATER CAUTION	Lg/R	22	PUL	PULSER	Bu/Y
10	(NC)			23	IHU	HOLE IC <U>	W/R
11	BAT2	+12V <2>	R/G	24	IHW	HOLE IC <W>	W/Bl
12	GND	GND	G	25	THG	THROTTLE GND	Bu/G
13	IGN	IGN-COIL	Bu/Y	26	VTH	THROTTLE +5V	Y/R

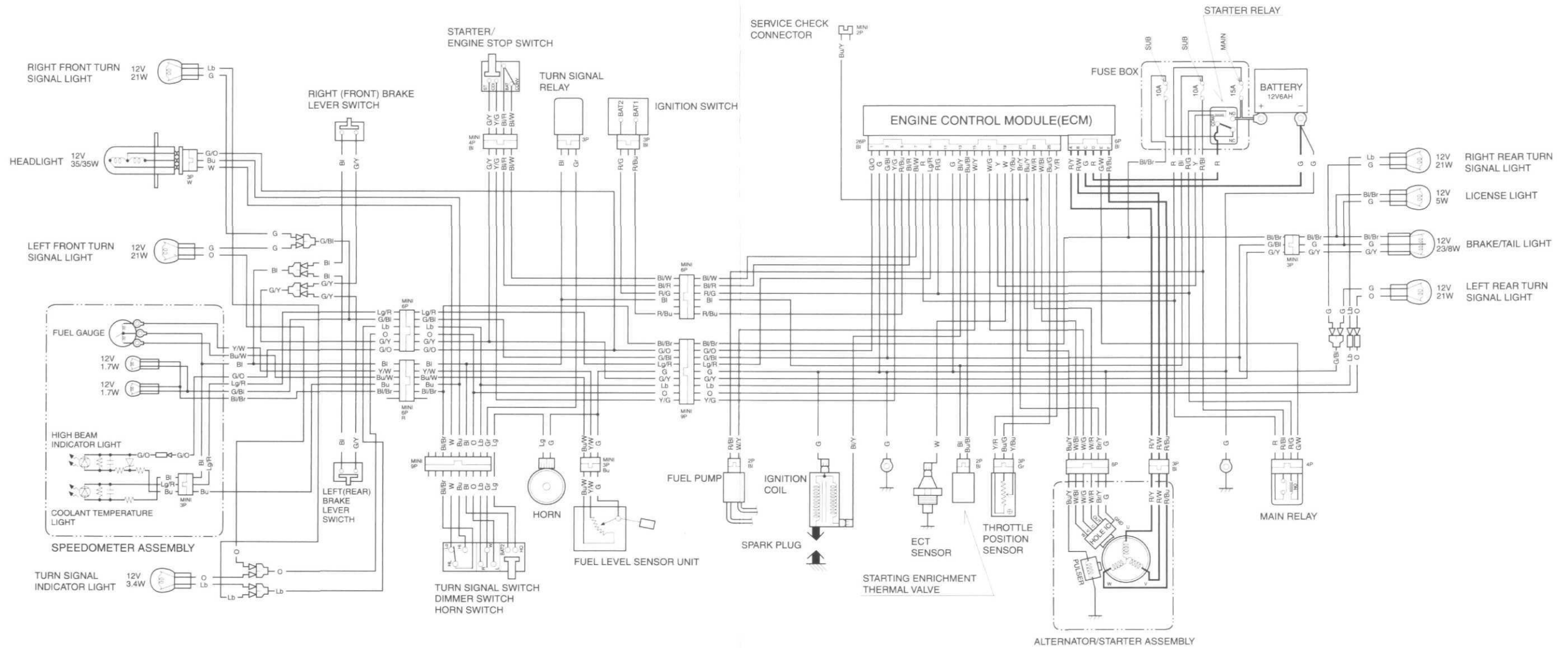
A	U	ACG U	R/Y
B	V	ACG V	R/W
C	-	BAT -	G
D	+	BAT +	R
E	R/GND	RELAY GND	G/W
F	W	ACG W	R/Bu

Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY

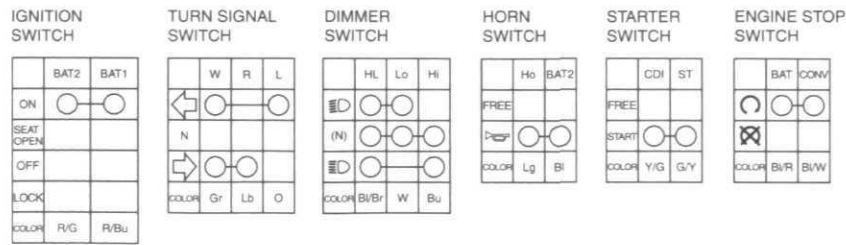
0030Z-GET-6700

WIRING DIAGRAMS

P-type ('02 - '05 model)



SWITCH CONTINUITY



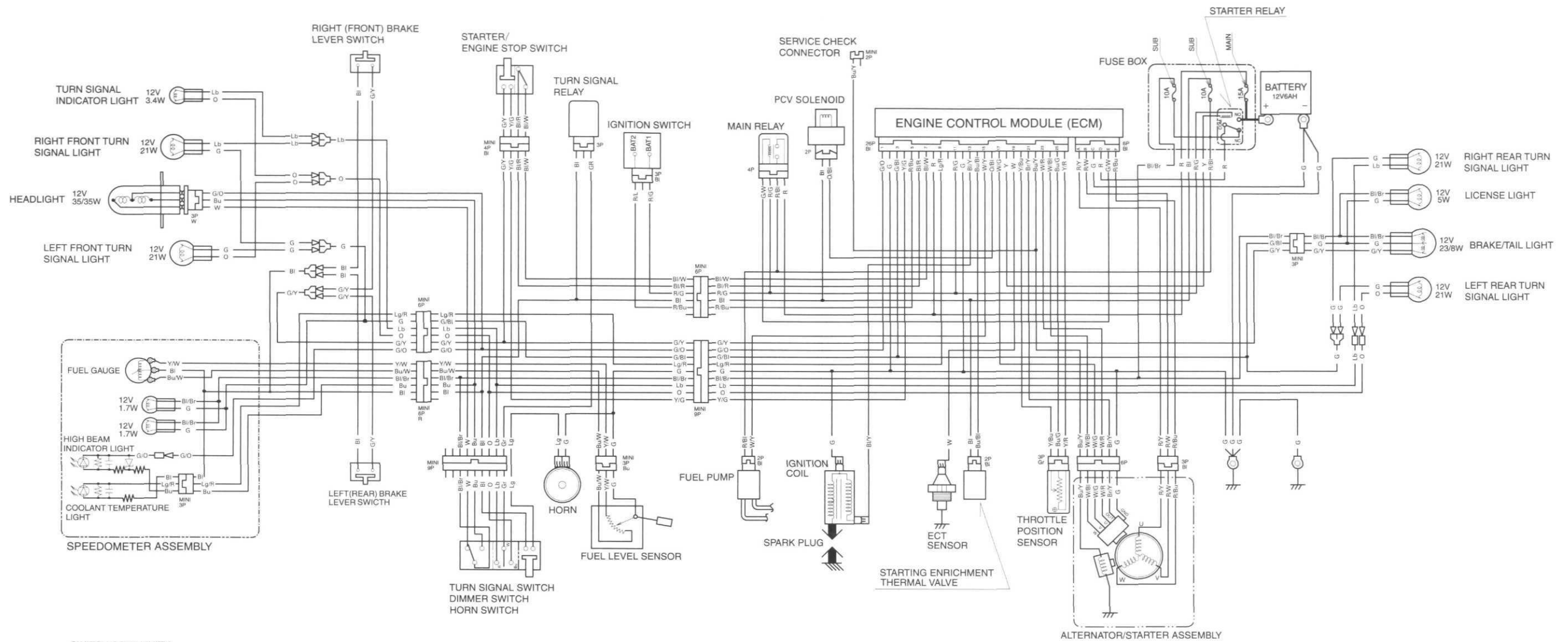
1	H/L	H/L CONTROL	G/O	14	A/B	AUTO BYSTARTER	Bu/Bl
2	GND-L	LOAD CUT GND	G	15	F/P	FUEL PUMP	W/Y
3	L/C	LOAD CUT	G/Bl	16	(NC)		
4	ST-SW	STARTER SW	Y/G	17	IHV	HOLE IC <V>	W/G
5	C&L	C&L BATT1	R/Bu	18	S/RELAY	START RELAY	Y
6	BAT	CDIBAT	Bi/R	19	TH-SE	THERMO SENSOR	W
7	CONV	CDICONV	Bi/W	20	THR	THROTTLE	Y/Bu
8	Bi/CUT	BATTERY CUT	R	21	VOUT	HOLE IC <OUT>	Br/Y
9	WT-IND	WATER CAUTION	Lg/R	22	PUL	PULSER	Bu/Y
10	BAT2	+12V <2>	R/G	23	IHU	HOLE IC <U>	W/R
11	(NC)			24	IHW	HOLE IC <W>	W/Bl
12	GND	GND	G	25	THG	THROTTLE GND	Bu/G
13	IGN	IGN-COIL	Bi/Y	26	VTH	THROTTLE +5V	Y/R

A	U	ACG U	R/Y
B	V	ACG V	R/W
C	-	BAT -	G
D	+	BAT +	R
E	R/GND	RELAY GND	G/W
F	W	ACG W	R/Bu

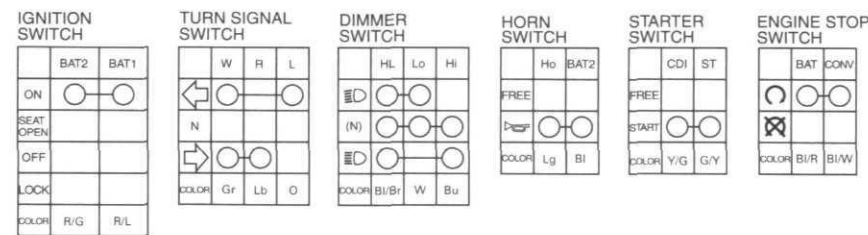
Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY

0030Z-GET-7700

After '05 model



SWITCH CONTINUITY



ENGINE CONTROL MODULE TERMINALS

1	H/L	H/L CONTROL	G/O	14	A/B	AUTO BYSTARTER	Bu/Bl
2	GND-L	LOAD CUT GND	G	15	F/P	FUEL PUMP	W/Y
3	L/C	LOAD CUT	G/Bl	16	PCV	PCV	O/Bl
4	ST-SW	STARTER SW	Y/G	17	I/HV	HOLE IC <V>	W/G
5	C&L	C&L BATT1	R/Bu	18	S/RELAY	START RELAY	Y
6	BAT	CDIBAT	Bl/R	19	TH-SE	THERMO SENSOR	W
7	CONV	CDICONV	Bl/W	20	THR	THROTTLE	Y/Bu
8	B/CUT	BATTERY CUT	R	21	VOUT	HOLE IC <OUT>	Br/Y
9	WT-IND	WATER CAUTION	Lg/R	22	PUL	PULSER	Bu/Y
10	(NC)			23	I/HU	HOLE IC <U>	W/R
11	BAT2	+12V <2>	R/G	24	I/HW	HOLE IC <W>	W/Bl
12	GND	GND	G	25	THG	THROTTLE GND	Bu/G
13	IGN	IGN-COIL	Bl/Y	26	VTH	THROTTLE +5V	Y/R

A	U	ACG U	R/Y
B	V	ACG V	R/W
C	-	BAT -	G
D	+	BAT +	R
E	R/GND	RELAY GND	G/W
F	W	ACG W	R/Bu

COLOR CODE			
Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY

0030Z-GET-A200

MEMO

20. TECHNICAL FEATURES

MAGNETIC-COUPLING WATER PUMP .. 20-2

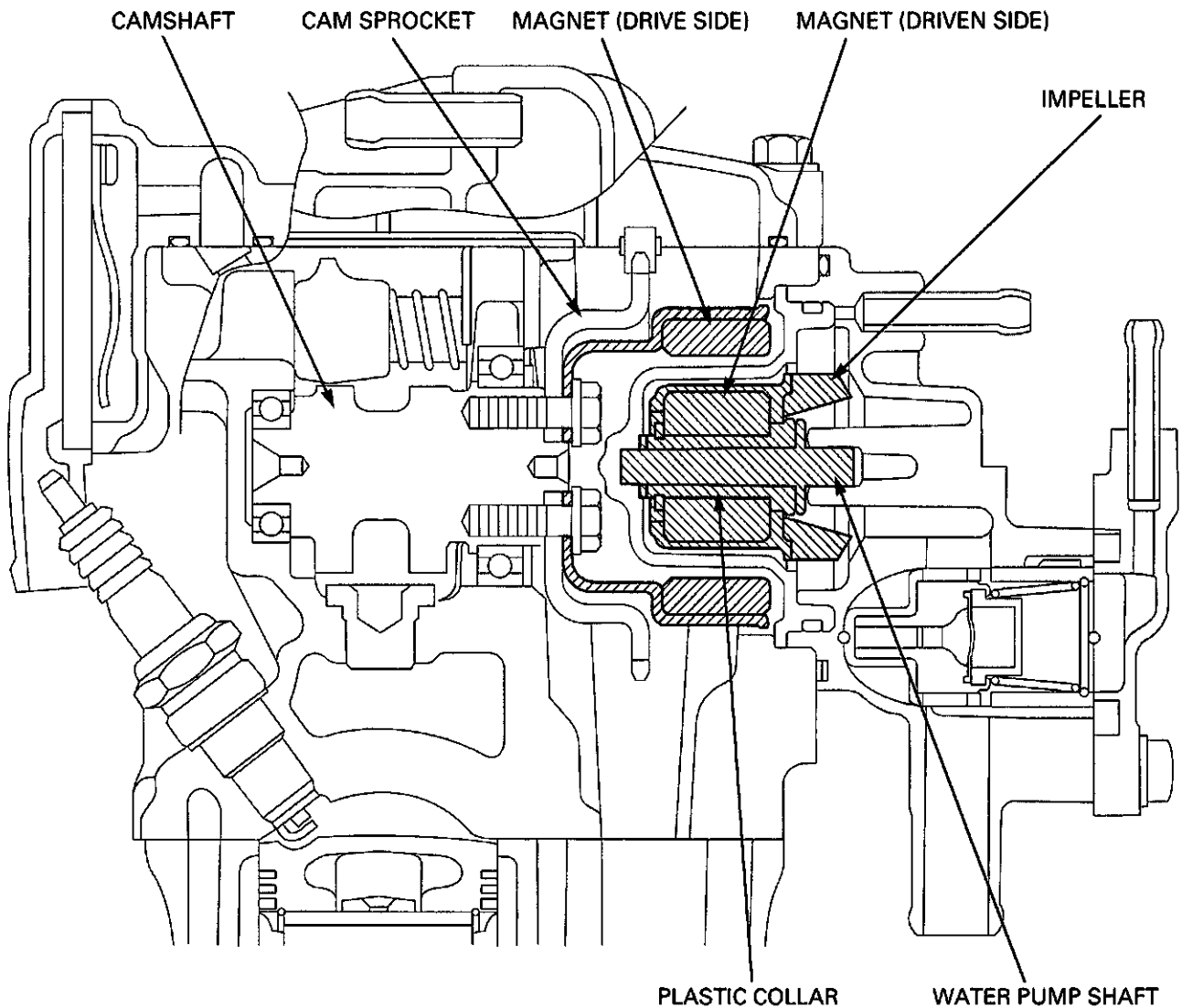
BRUSHLESS ALTERNATOR/STARTER .. 20-3

TECHNICAL FEATURES

MAGNETIC-COUPLING WATER PUMP

This scooter uses a magnetic-coupling water pump. Magnetic forces drive the impeller via the plastic case which separates the coolant from the engine oil. A plastic collar acts as a bearing.

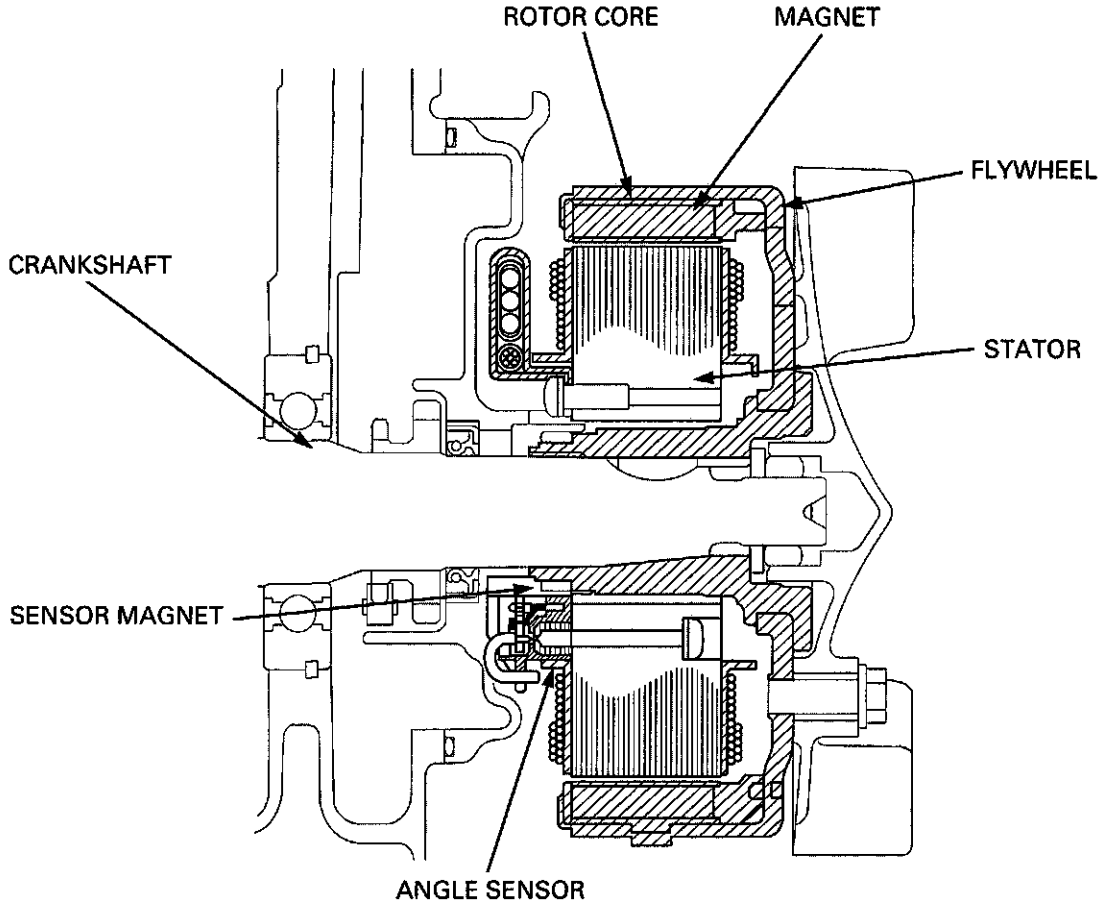
Compared to a conventional type water pump, this pump eliminates the mechanical seal, oil seal, and ball bearing, allowing for a compact pump with reduced friction.



BRUSHLESS ALTERNATOR/STARTER

This scooter uses a combined alternator/starter. The alternator operates as a 3-phase AC generator. The alternator/starter also functions as a starter motor by applying current to the stator coil from the ECM to turn the flywheel. This component uses no brush, resulting in a compact, light and maintenance-free alternator.

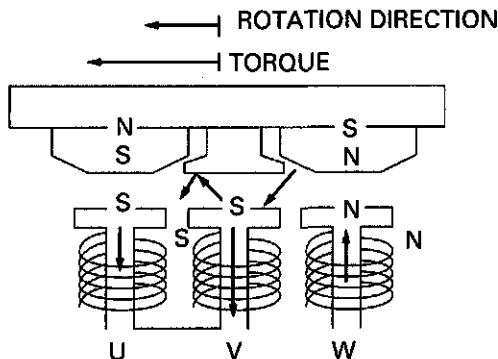
An angle sensor is attached to the stator to detect crankshaft position. Signals from a magnet that is integrated in the outer circumference of the flywheel boss are received by the sensor and sent to the ECM. The ECM adjusts current to the stator coil to turn the flywheel when starting, and to increase charging current under 3,500 rpm to enhance charging capability.



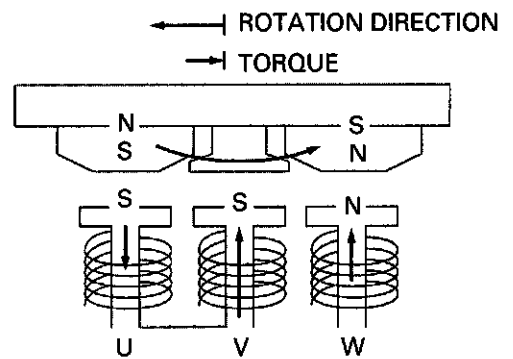
The flywheel is designed with inner magnets integrated in the rotor core. See below for benefits of this design.

- When functioning as a starter motor, the magnetic flux occurs from the magnet and from the rotor core due to the strong motor drive current, multiplying the magnetic force and providing a high torque from the alternator/starter.
- When functioning as an alternator, the magnetic flux from the magnet passes through the rotor core, reducing the magnetic force to allow low-friction spinning of the alternator/starter.

STARTER MOTOR:



ALTERNATOR/STARTER:



MEMO

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ENGINE DOES NOT START OR IS HARD TO START

1. Carburetor Inspection

Check the fuel flow to the carburetor.

Is fuel reaching the carburetor?

- NO** – • Clogged fuel hose or fuel filter
• Sticking float valve
• Clogged fuel cap breather
• Faulty fuel pump
• Loose or disconnected fuel pump system wire

YES – GO TO STEP 2.

2. Spark Test

Perform spark test.

Is the spark good?

- NO** – • Faulty spark plug
• Fouled spark plug
• Faulty ECM
• Broken or shorted spark plug wire
• Broken or shorted ignition coil
• Faulty ignition switch
• Faulty ignition pulse generator
• Faulty engine stop switch
• Loose or disconnected ignition system wires

YES – GO TO STEP 3.

3. Cylinder Compression Inspection

Test the cylinder compression.

Is the compression within specification?

- NO** – • Valve stuck open
• Worn cylinder and piston rings
• Seized valve
• Improper valve timing

YES – GO TO STEP 4.

4. Engine Start Condition

Start by following the normal procedure.

Does the engine start but then stops?

- YES** – • Carburetor incorrectly adjusted
• Intake manifold leaking
• Improper ignition timing (faulty ECM or ignition pulse generator)
• Contaminated fuel
• Faulty starting enrichment (SE) valve

NO – GO TO STEP 5.

5. Spark Plug Inspection

Remove and inspect the spark plug.

Is the spark plug in good condition?

- NO** – • Flooded carburetor
• Faulty starting enrichment (SE) valve
• Throttle valve open
• Air cleaner dirty
• Incorrect spark plug gap
• Incorrect spark plug heat range

- YES** – • Improper ignition timing
• Poor adjustment valve clearance

ENGINE LACKS POWER

1. Drive Train Inspection

Raise the front wheel off the ground and spin it by hand.

Does the wheel spin freely?

- NO** – • Brake dragging
• Worn or damaged wheel bearings
• Bent axle

YES – GO TO STEP 2.

2. Tire Pressure Inspection

Check the tire pressure.

Is the tire pressure correct?

- NO** – • Faulty tire valve
• Punctured tire

YES – GO TO STEP 3.

3. Clutch Inspection

Accelerate rapidly.

Does the engine speed change accordingly?

- NO** – • Clutch slipping
• Worn clutch shoes/outer
• Weak driven face spring
• Additive in engine oil
• Weight roller stuck

YES – GO TO STEP 4.

4. Engine Performance Inspection

Accelerate lightly.

Does the engine speed increase?

- NO** – • Faulty starting enrichment (SE) valve
• Clogged air cleaner
• Restricted fuel flow
• Clogged muffler
• Clogged fuel cap breather
• Faulty fuel pump

YES – GO TO STEP 5.

5. Spark Plug Inspection

Remove and inspect the spark plug.

Is the spark plug in good condition?

- NO** – • Plug not serviced frequently enough
• Incorrect spark plug heat range
• Incorrect spark plug gap

YES – GO TO STEP 6.

6. Engine Oil Inspection

Check the oil level and condition.

Is the engine oil in good condition?

- NO** – • Oil level too high
• Oil level too low
• Contaminated oil

YES – GO TO STEP 7.

TROUBLESHOOTING

7. Ignition Timing Inspection

Check the ignition timing.

Is the ignition timing within specification?

- NO** – • Faulty ECM
• Faulty ignition pulse generator
• Improper valve timing

YES – GO TO STEP 8.

8. Cylinder compression Inspection

Test the cylinder compression.

Is the compression within specification?

- NO** – • Valve clearance too small
• Worn cylinder and piston rings
• Improper valve timing
• Damaged cylinder head gasket

YES – GO TO STEP 9.

9. Carburetor Inspection

Check the carburetor for clogs.

Is the carburetor clogged?

YES – Carburetor not serviced frequently enough

NO – GO TO STEP 10.

10. Lubrication Inspection

Remove the cylinder head cover and inspect for signs of proper lubrication.

Is the valve train lubricated properly?

NO – Clogged oil passage

YES – GO TO STEP 11.

11. Overheating Inspection

Check for engine overheating.

Is the engine overheating?

- YES** – • Coolant level too low
• Faulty radiator fan
• Thermostat stuck closed
• Excessive carbon build-up in combustion chamber
• Use of poor quality fuel
• Clutch slipping
• Lean fuel mixture

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 advanced (faulty ECM)
• 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?

- NO** – • Plug not serviced frequently enough
• Incorrect spark plug heat range
• Incorrect spark plug gap

YES – GO TO STEP 2.

2. Ignition Timing Inspection

Check the ignition timing.

Is the ignition timing within specification?

- NO** – • Faulty ECM
• Faulty ignition pulse generator
• Improper valve timing

YES – GO TO STEP 3.

3. Carburetor pilot screw Inspection

Check the carburetor pilot screw adjustment.

Is the pilot screw in the correct position?

NO – page 5-18

YES – GO TO STEP 4.

4. Starting enrichment (SE) valve Inspection

Check the starting enrichment (SE) valve.

Is the starting enrichment (SE) valve OK?

NO – Faulty starting enrichment (SE) valve

YES – GO TO STEP 5.

5. Intake Pipe Leaking Inspection

Check for leaks at the intake manifold boot.

Does it leak?

- YES** – • Loose intake manifold mounting bolt
• Damaged insulator
• Damaged O-ring

NO – GO TO STEP 6.

6. Spark Test

Perform spark test.

Is the spark good ?

- NO** – • Faulty carbon or wet fouled spark plug
• Faulty ECM
• Faulty ignition coil
• Broken or shorted spark plug wire
• Faulty engine stop switch
• Faulty ignition pulse generator
• Faulty ignition switch
• Loose or disconnected ignition system wires

YES – • Carburetor not serviced frequently enough
• Improperly adjusted valve clearance

POOR PERFORMANCE AT HIGH SPEED

1. Ignition Timing Inspection

Check the ignition timing.

Is the ignition timing within specification?

- NO** – • Faulty ECM
• Faulty ignition pulse generator
• Improper valve timing

YES – GO TO STEP 2.

2. Fuel Line Inspection

Disconnect the fuel hose at the carburetor.

Does the fuel flow freely?

- NO** – • Clogged fuel line
• Clogged fuel cap breather
• Clogged fuel filter
• Faulty fuel pump
• Loose or disconnected fuel pump system line

YES – GO TO STEP 3.

3. Carburetor Inspection

Remove the carburetor and check for clogged jets.

Are the jets clogged?

YES – Clean the jets

NO – GO TO STEP 4.

4. Spark Plug Inspection

Remove and inspect the spark plug.

Is the spark plug in good condition?

- NO** – • Plug not serviced frequently enough
• Incorrect spark plug heat range
• Incorrect spark plug gap
• Faulty starting enrichment (SE) valve
• Air cleaner dirty

YES – GO TO STEP 5.

5. Valve Timing Inspection

Check the valve timing.

Is the valve timing correct?

NO – Cam sprocket not installed properly

YES – GO TO STEP 6.

6. Valve Spring Inspection

Check the valve springs.

Is the valve spring free length within specification?

NO – Faulty valve spring

YES – GO TO STEP 7.

7. Camshaft Inspection

Remove and inspect the camshaft.

Is the cam lobe height within specification?

NO – Faulty camshaft

YES – Camshaft is OK

POOR HANDLING

Steering is heavy

- Steering top cone race too tight
- Damaged steering head bearings

Either wheel wobbles

- Excessive wheel bearing play
- Bent rim
- Excessively worn engine mounting bushing
- Bent frame

The scooter pulls to one side

- Front and rear wheel not aligned
- Faulty shock absorber
- Bent fork
- Bent axle
- Bent frame

MEMO
