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HONDA

SERVICE MANUAL

NSS250/A
NSS250S/AS

REFLEX®

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 recommend 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 turned 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 NSS250, NSS250S, NSS250A and NSS250AS.

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

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. Sections 4 through 20 describe parts of the vehicle, 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 procedures.

If you are not familiar with this motorcycle, read Technical Features in Section 23.

If you do not know the source of the trouble, go to Section 24, 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 molybdenum disulfide grease (containing more than 3 % molybdenum disulfide, NLGI # 2 or equivalent). Example: Molykote® BR-2 plus manufactured by Dow Corning, U. S. A. Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan</p>
	<p>Use molybdenum disulfide paste (containing more than 40 % molybdenum disulfide, NLGI # 2 or equivalent). Example: Molykote® G-n paste, manufactured by Dow Corning, U. S. A. Honda Moly 60 (U. S. A. only) Rocol ASP manufactured by Rocol Limited, U. K. Rocol Paste manufactured by Sumico Lubricant, Japan</p>
	<p>Use silicone grease.</p>
	<p>Apply a locking agent. Use a midium 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

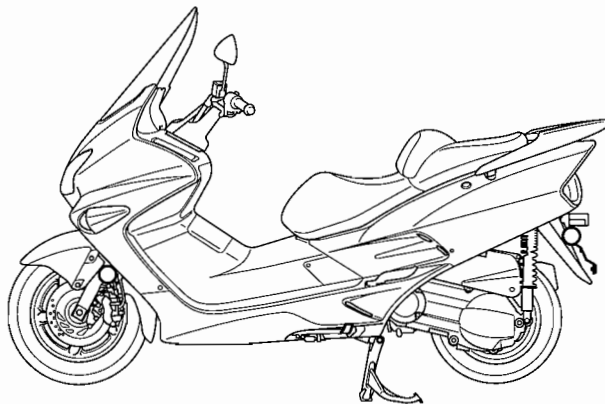
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SERVICE RULES

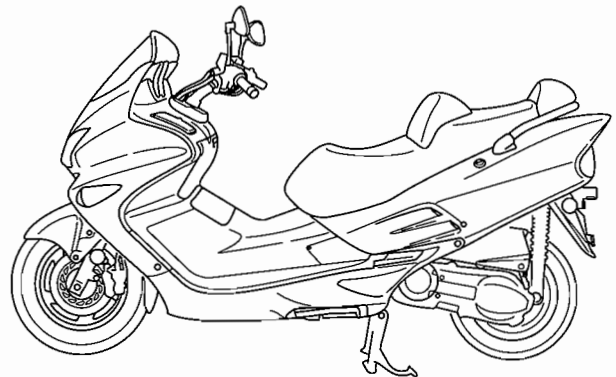
1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that don't meet Honda's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as show in the Cable and Harness Routing (NSS250/A: page 1-18 or NSS250S/AS: page 1-30).

MODEL IDENTIFICATION

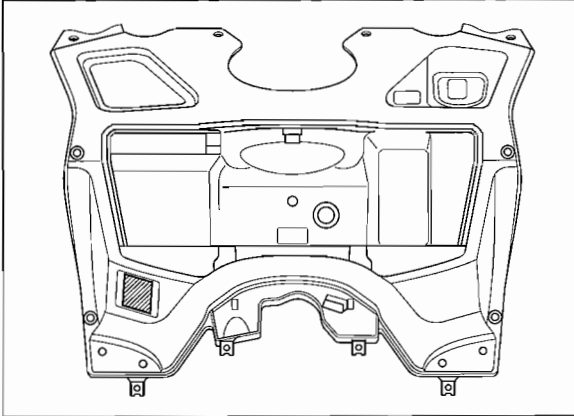
NSS250/A



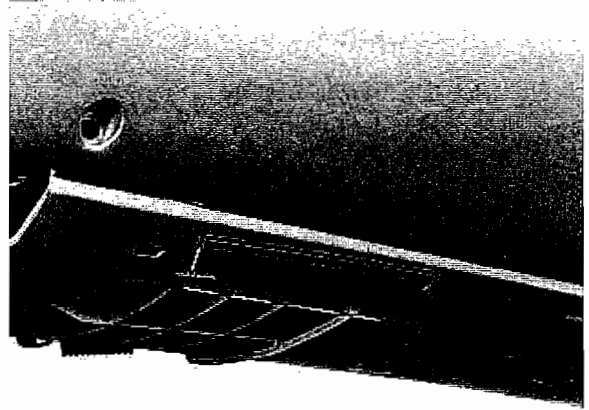
NSS250S/AS



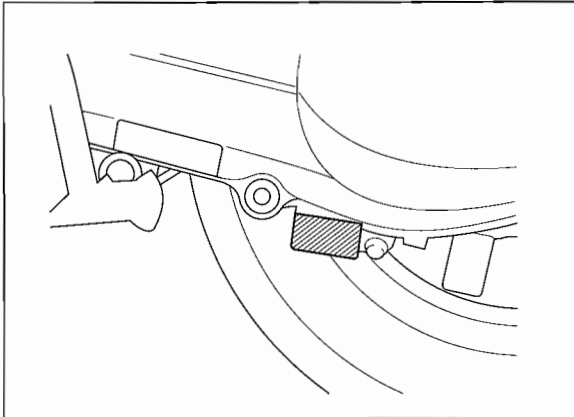
GENERAL INFORMATION



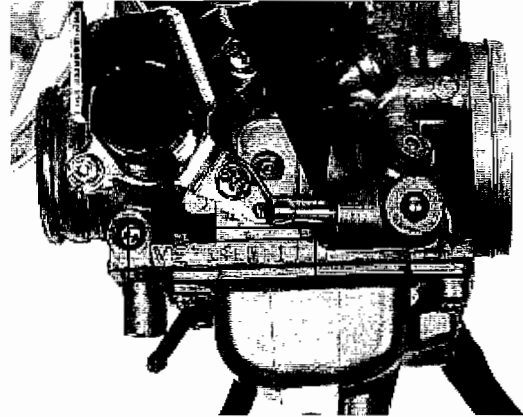
(1) The vehicle identification number (VIN) is attached as shown.



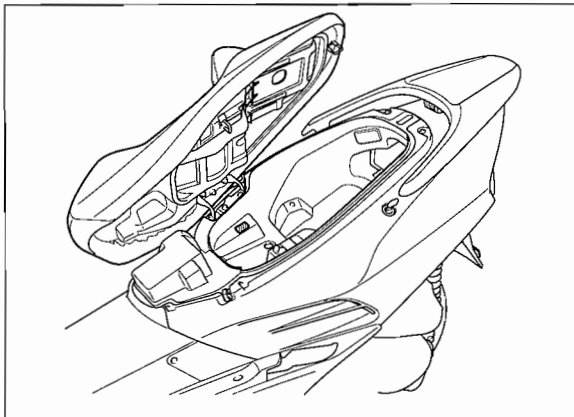
(2) The frame serial number is stamped on the left side of the frame.



(3) The engine serial number is stamped on the rear of the left crankcase.



(4) The carburetor identification numbers are stamped on the intake side of the carburetor body as shown.



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

SPECIFICATIONS

GENERAL		
	ITEM	SPECIFICATIONS
DIMENSIONS	Overall length (NSS250/A)	2,210 mm (87.0 in)
	(NSS250S/AS)	2,160 mm (85.0 in)
	Overall width	760 mm (29.9 in)
	Overall height (NSS250/A)	1,360 mm (53.5 in)
	(NSS250S/AS)	1,170 mm (46.1 in)
	Wheelbase	1,545 mm (60.8 in)
	Seat height	720 mm (28.3 in)
	Ground clearance	130 mm (5.1 in)
	Dry weight (NSS250)	170.0 kg (374.8 lbs)
	(NSS250A/AS)	172.0 kg (379.2 lbs)
	(NSS250S)	169.0 kg (372.6 lbs)
	Curb weight (NSS250)	179.0 kg (394.6 lbs)
	(NSS250A)	182.0 kg (401.2 lbs)
(NSS250S)	178.0 kg (392.4 lbs)	
(NSS250AS)	181.0 kg (399.0 lbs)	
	Maximum weight capacity	166 kg (366 lbs)
FRAME	Frame type	Under bone
	Front suspension	Telescopic fork
	Front wheel travel	100 mm (3.9 in)
	Front axle travel	88.7 mm (3.49 in)
	Rear suspension	Unit swing
	Rear axle travel	96 mm (3.8 in)
	Front tire size	110/90-13 M/C 56L
	Rear tire size	130/70-12 62L
	Tire brand	
	Bridgestone	Front: BRIDGESTONE HOOP B03F Rear: BRIDGESTONE HOOP B02
	Dunlop	Front: DUNLOP D305FG Rear: DUNLOP D305
	Front brake	Hydraulic single disc brake with 3 pots caliper
	Rear brake	Hydraulic single disc brake with 1 pot caliper
Caster angle	27°30'	
Trail length	95 mm (3.7 in)	
Fuel tank capacity	12.0 ℓ (3.17 US gal , 2.64 Imp gal)	
ENGINE	Bore and stroke	72.7 × 60.0 mm (2.86 × 2.36 in)
	Displacement	249 cm ³ (15.2 cu-in)
	Compression ratio	10.5 : 1
	Valve train	Chain drive and OHC
	Intake valve	7°BTDC (At 1 mm lift)
	opens	33°ABDC (At 1 mm lift)
	closes	37°BBDC (At 1 mm lift)
	Exhaust valve	3°ATDC (At 1 mm lift)
	opens	
	closes	
	Lubrication system	Forced pressure and wet sump
	Oil pump type	Trochoid
	Cooling system	Liquid cooled
Air filtration	Paper filter	
Engine dry weight	38.6 kg (85.1 lbs)	

GENERAL INFORMATION

GENERAL (Cont'd)		
	ITEM	SPECIFICATIONS
CARBURETOR	Carburetor type Throttle bore	CV (Constant Velocity) type, with butterfly valve 30 mm (1.2 in)
DRIVE TRAIN	Clutch system Primary reduction Final reduction Gear ratio	Dry, automatic centrifugal clutch 2.714 2.533 2.250–0.830
ELECTRICAL	Ignition system Starting system Charging system Regulator/rectifier Lighting system	Full transistor digital ignition Electric starter motor Triple phase output alternator SCR shorted/triple phase, full wave rectification Battery

GENERAL INFORMATION

Unit: mm (in)

LUBRICATION SYSTEM		STANDARD	SERVICE LIMIT
ITEM			
Engine oil capacity	At draining	1.1 ℓ (1.2 US qt , 1.0 Imp qt)	_____
	At disassembly	1.3 ℓ (1.4 US qt , 1.1 Imp qt)	_____
Recommended engine oil		Pro Honda GN4 4-stroke oil or 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)	0.25 (0.010)
	Side clearance	0.04—0.09 (0.002—0.004)	0.12 (0.005)

FUEL SYSTEM	SPECIFICATIONS
ITEM	
Carburetor identification number	VE3BL
Main jet	# 102
Slow jet	# 40
Starting enrichment (SE) valve resistance (at 20°C /68°F)	10 kΩ max
Pilot screw initial opening	See page 5-18
Float level	18.5 mm (0.73 in)
Idle speed	1,500 ± 100 rpm
Throttle grip freeplay	2—6 mm (1/16— 1/4 in)

COOLING SYSTEM	SPECIFICATIONS	
ITEM		
Coolant capacity	Radiator and engine	1.2 ℓ (1.3 US qt , 1.1 Imp qt)
	Reserve tank	0.2 ℓ (0.2 US qt , 0.2 Imp qt)
Radiator cap relief pressure	74—103 kPa (0.75—1.05 kgf/cm ² , 10.7—15 psi)	
Thermostat	Begin to open	69—72.5 °C (156—163 °F)
	Fully open	80 °C (176 °F)
	Valve lift	3.5 mm (0.14 in) minimum
Recommended antifreeze	Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors	
Standard coolant concentration	1:1 mixture with soft water	

GENERAL INFORMATION

CYLINDER HEAD/VALVES			Unit: mm (in)	
ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,569 kPa (16.0 kgf/cm ² , 228 psi) at 400 rpm	_____
Cylinder head warpage			_____	0.05 (0.002)
Valve, valve guide	Valve clearance	IN	0.12 (0.005)	_____
		EX	0.12 (0.005)	_____
	Valve stem O.D.	IN	4.975 – 4.990 (0.1959 – 0.1965)	4.90 (0.193)
		EX	4.955 – 4.970 (0.1951 – 0.1957)	4.90 (0.193)
	Valve guide I.D.	IN	5.000 – 5.012 (0.1969 – 0.1973)	5.03 (0.198)
		EX	5.000 – 5.012 (0.1969 – 0.1973)	5.03 (0.198)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.08 (0.003)
		EX	0.030 – 0.057 (0.0012 – 0.0022)	0.10 (0.004)
	Valve guide projection above cylinder head	IN	11.5 (0.45)	_____
		EX	11.5 (0.45)	_____
Valve seat width	IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.8 (0.07)	
	INNER	IN/EX	31.06 (1.223)	29.5 (1.16)
Valve spring free length	OUTER	IN/EX	40.42 (1.591)	38.4 (1.51)
	Rocker arm I.D.	IN/EX	12.000 – 12.018 (0.4724 – 0.4731)	12.10 (0.476)
Rocker arm	Rocker arm shaft O.D.	IN/EX	11.966 – 11.984 (0.4711 – 0.4718)	11.91 (0.469)
Camshaft	Cam lobe height	IN	34.231 – 34.351 (1.3477 – 1.3524)	34.181 (1.3457)
		EX	34.112 – 34.232 (1.3430 – 1.3477)	34.062 (1.3410)

PISTON/CYLINDER			Unit: mm (in)		
ITEM			STANDARD	SERVICE LIMIT	
Cylinder	I.D.		72.750 – 72.760 (2.8642 – 2.8646)	72.76 (2.865)	
	Out-of-round		_____	0.05 (0.002)	
	Taper		_____	0.05 (0.002)	
	Warpage		_____	0.05 (0.002)	
Piston, piston rings	Piston mark direction		"IN" mark facing toward the intake side	_____	
	Piston O.D.		72.720 – 72.740 (2.8630 – 2.8638)	72.65 (2.860)	
	Piston O.D. measurement point		18 mm (0.7 in) from bottom of skirt	_____	
	Piston pin bore I.D.		17.002 – 17.008 (0.6694 – 0.6696)	17.04 (0.671)	
	Piston pin O.D.		16.994 – 17.000 (0.6691 – 0.6693)	16.96 (0.668)	
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.02 (0.001)	
	Piston ring-to-ring groove clearance	Top		0.015 – 0.050 (0.0006 – 0.0020)	0.09 (0.004)
		Second		0.015 – 0.050 (0.0006 – 0.0020)	0.09 (0.004)
	Piston ring end gap	Top		0.15 – 0.30 (0.006 – 0.012)	0.50 (0.020)
		Second		0.30 – 0.45 (0.012 – 0.018)	0.65 (0.026)
Oil (side rail)			0.20 – 0.70 (0.008 – 0.028)	0.90 (0.035)	
Cylinder-to-piston clearance			0.010 – 0.040 (0.0004 – 0.0016)	0.10 (0.004)	
Connecting rod small end I.D.			17.016 – 17.034 (0.6699 – 0.6706)	17.06 (0.672)	
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.002)	

GENERAL INFORMATION

DRIVE PULLEY/DRIVEN PULLEY/CLUTCH		Unit: mm (in)	
ITEM		STANDARD	SERVICE LIMIT
Clutch	Clutch outer O.D.	135.0 – 135.2 (5.31 – 5.32)	135.5 (5.33)
	Lining thickness	4.0 (0.16)	0.5 (0.02)
Drive belt width		23.3 (0.92)	22.3 (0.88)
Movable drive face	Bushing I.D.	27.024 – 27.057 (1.0639 – 1.0652)	27.91 (1.099)
	Boss O.D.	26.995 – 27.031 (1.0628 – 1.0642)	26.93 (1.060)
	Weight roller O.D.	22.92 – 23.08 (0.902 – 0.909)	22.5 (0.89)
Driven pulley	Face spring free length	112.6 (4.43)	108.6 (4.28)
	Driven face O.D.	39.965 – 39.985 (1.5734 – 1.5742)	39.94 (1.572)
	Movable driven face I.D.	40.000 – 40.025 (1.5748 – 1.5758)	40.06 (1.577)

FINAL REDUCTION		SPECIFICATIONS
ITEM		
Final reduction oil capacity	At draining	0.16 ℓ (0.17 US qt, 0.14 Imp qt)
	At disassembly	0.20 ℓ (0.21 US qt, 0.18 Imp qt)
Recommended final reduction oil		Hypoid gear oil # 90

ALTERNATOR/STARTER CLUTCH		Unit: mm (in)	
ITEM		STANDARD	SERVICE LIMIT
Starter driven gear	Boss O.D.	42.195 – 42.208 (1.6612 – 1.6617)	42.15 (1.659)
	Bushing I.D.	22.026 – 22.045 (0.8672 – 0.8679)	22.10 (0.870)
Starter clutch outer I.D.		58.64 – 58.84 (2.309 – 2.317)	58.89 (2.318)

CRANKSHAFT/CRANKCASE		Unit: mm (in)	
ITEM		STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance	0.05 – 0.40 (0.002 – 0.016)	0.60 (0.024)
	Connecting rod radial clearance	0 – 0.008 (0.0 – 0.0003)	0.05 (0.002)
	Runout		0.10 (0.004)

GENERAL INFORMATION

Unit: mm (in)

FRONT WHEEL/SUSPENSION/STEERING ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		_____	1.5 (0.06)
Cold tire pressure	Rider only	175 kPa (1.75 kgf/cm ² , 25 psi)	_____
	Rider and passenger	175 kPa (1.75 kgf/cm ² , 25 psi)	_____
Axle runout		_____	0.20 (0.008)
Wheel rim runout	Radial	_____	2.0 (0.08)
	Axial	_____	2.0 (0.08)
Wheel balance weight		_____	60 g (2.1 oz) max.
Fork	Spring free length	270.3 (10.64)	265 (10.4)
	Tube runout	_____	0.20 (0.008)
	Recommended fork fluid	Pro Honda Suspension Fluid SS-8	_____
	Fluid level	63 (2.5)	_____
Fluid capacity		121 cm ³ (4.1 US oz, 4.3 Imp oz)	_____

Unit: mm (in)

REAR WHEEL/SUSPENSION ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		_____	2.0 (0.08)
Cold tire pressure	Rider only	200 kPa (2.00 kgf/cm ² , 29 psi)	_____
	Rider and passenger	250 kPa (2.50 kgf/cm ² , 36 psi)	_____
Wheel rim runout	Radial	_____	2.0 (0.08)
	Axial	_____	2.0 (0.08)
Wheel balance weight		_____	60 g (2.1 oz) max.

Unit: mm (in)

HYDRAULIC BRAKE ITEM			STANDARD	SERVICE LIMIT
Front	Specified brake fluid		Honda DOT 4 Brake Fluid	_____
	Brake disc thickness		3.8 – 4.2 (0.15 – 0.17)	3.5 (0.14)
	Brake disc runout		_____	0.30 (0.012)
	Master cylinder I.D.		11.000 – 11.043 (0.4331 – 0.4348)	11.055 (0.4352)
	Master piston O.D.		10.957 – 10.984 (0.4314 – 0.4324)	10.945 (0.4309)
	Caliper cylinder I.D.	Upper	27.000 – 27.050 (1.0630 – 1.0650)	27.060 (1.0654)
		Middle	22.650 – 22.700 (0.8917 – 0.8937)	22.710 (0.8941)
		Lower	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
	Caliper piston O.D.	Upper	26.935 – 26.968 (1.0604 – 1.0617)	26.910 (1.0594)
		Middle	22.585 – 22.618 (0.8892 – 0.8905)	22.560 (0.8882)
Lower		25.335 – 25.368 (0.9974 – 0.9987)	25.320 (0.9968)	
Rear	Specified brake fluid		Honda DOT 4 Brake Fluid	_____
	Brake disc thickness		4.8 – 5.2 (0.19 – 0.20)	4.0 (0.16)
	Brake disc runout		_____	0.30 (0.012)
	Master cylinder I.D.		14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)
	Master piston O.D.		13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)
	Caliper cylinder I.D.		33.960 – 34.010 (1.3370 – 1.3390)	34.020 (1.3394)
	Caliper piston O.D.		33.878 – 33.928 (1.3338 – 1.3357)	33.870 (1.3335)

GENERAL INFORMATION

BATTERY/CHARGING SYSTEM			SPECIFICATIONS
ITEM			
Battery	Capacity		12V-11 (10) Ah
	Current leakage	'01-'03	0.1 mA max.
		After '03	1.5 mA max.
	Voltage (20°C /68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
Charging current	Normal	1.1 A/5 – 10 h	
	Quick	5.5 A/0.5 h	
Alternator	Capacity	'01-'03	0.29 kW/5,000 rpm
		After '03	0.40 kW/5,000 rpm
	Charging coil resistance (20°C /68°F)		0.1 – 0.5 Ω

IGNITION SYSTEM			SPECIFICATIONS
ITEM			
Spark plug	Standard		DPR7EA-9 (NGK) , X22EPR-U9 (DENSO)
	For cold climate/below 5°C /41°F		DPR6EA-9 (NGK) , X20EPR-U9 (DENSO)
	For extended high speed riding		DPR8EA-9 (NGK) , X24EPR-U9 (DENSO)
Spark plug gap			0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil peak voltage			100 V minimum
Ignition pulse generator peak voltage			0.7 V minimum
Ignition timing ("F" mark)			11° BTDC at idle
Coolant temperature sensor resistance	At 20°C (68°F)		2 – 3 Ω
	At 80°C (176°F)		200 – 400 Ω
Throttle position (TP) sensor	Resistance (20°C /68°F)		4 – 6k Ω
	Input voltage		4.6 – 5.4 V

ELECTRIC STARTER		Unit: mm (in)	
ITEM		STANDARD	SERVICE LIMIT
Starter motor brush length		12.5 (0.49)	8.5 (0.33)

GENERAL INFORMATION

LIGHTS/METERS/SWITCHES		ITEM		SPECIFICATIONS
Bulbs	Headlight			12V-55W × 2
	Brake/tail light			12V-21/5W × 2
	Front turn signal/running light			12V-21/5W × 2
	Rear turn signal light			12V-21W × 2
	License light			12V-5W
	Instrument light			12V-1.7W × 3
	Turn signal indicator			12V-3W × 2
	High beam indicator			12V-1.7W
	Parking indicator			12V-1.7W
	Luggage box instrument light			12V-3.4W
Fuse	Main fuse			30A
	Sub fuse	LBS type		15A × 2, 10 A × 3
		ABS type		30A, 20A, 15A × 2, 10 A × 4
Fan motor switch	Start to close (ON)			98 – 102 °C (208 – 216 °F)
	Stop to open			91 – 99 °C (196 – 210 °F)
Thermosensor resistance		at 80°C /176°F		47 – 57 Ω
		at 120°C /248°F		14 – 18 Ω
Fuel pump flow capacity			Minimum 500 cm ³ (16.9 US oz, 17.6 Imp oz) /minute at 13 V	

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	9.8 (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)

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

- NOTES:
1. Apply sealant to the threads.
 2. Apply a locking agent to the threads.
 3. Apply molybdenum disulfide oil to the threads and flange surface.
 4. Apply grease to the threads.
 5. Stake.
 6. Apply oil to the threads and flange surface.
 7. Apply clean engine oil to the O-ring.
 8. U-nut
 9. ALOC bolt: replace with a new one.

ENGINE				
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
LUBRICATION SYSTEM:				
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:				
Throttle cable stay screw	2	5	5.1 (0.52 , 3.8)	NOTE 2 (page 5-16)
Carburetor insulator band screw	2	5	5.1 (0.52 , 3.8)	
Reed valve case stud bolt	2	6	7.8 (0.8 , 5.8)	
COOLING SYSTEM:				
Water pump impeller	1	7	12 (1.2 , 9)	
CYLINDER HEAD/VALVES:				
Adjusting hole cap	1	14	5.9 (0.6 , 4.3)	NOTE 6
Cylinder head nut	4	8	24 (2.4 , 17)	
Cam chain tensioner sealing bolt	1	11	22 (2.2 , 16)	
Spark plug	1	12	18 (1.8 , 13)	
Exhaust pipe stud bolt	2	8	8.8 (0.9 , 6.5)	
CYLINDER/PISTON:				
Cylinder stud bolt	4	8	8.8 (0.9 , 6.5)	(page 9-6)
DRIVE PULLEY/DRIVEN PULLEY/CLUTCH:				
Clutch/driven pulley nut	1	30	78 (8.0 , 58)	NOTE 6
Clutch outer nut	1	12	74 (7.5 , 54)	
Drive pulley face nut	1	14	93 (9.5 , 69)	
Left crankcase cover bolt	4	6	9.8 (1.0 , 7)	
FINAL REDUCTION:				
Final drive oil drain bolt	1	8	13 (1.3 , 9)	
Final drive oil level check bolt	1	8	13 (1.3 , 9)	
Final drive oil filler bolt	1	8	13 (1.3 , 9)	
Transmission cover bolt	7	8	25 (2.5 , 18)	

GENERAL INFORMATION

ENGINE (Cont'd)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
ALTERNATOR/STARTER CLUTCH:				
Starter clutch outer bolt	3	8	29 (3.0 , 22)	NOTE 2
Flywheel nut	1	16	116 (11.8 , 85)	NOTE 6
Stator mount bolt	3	6	12 (1.2 , 9)	
CRANKSHAFT/CRANKCASE:				
Cam chain tensioner slider bolt	1	6	9.8 (1.0 , 7)	
IGNITION SYSTEM:				
Timing hole cap	1	14	5.9 (0.6 , 4.3)	

FRAME

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
FRAME/BODY PANELS/EXHAUST SYSTEM:				
Exhaust pipe joint nut	2	8	29 (3.0 , 22)	
Exhaust pipe band bolt	1	8	22 (2.2 , 16)	
Muffler mount bolt	4	10	49 (5.0 , 36)	
COOLING SYSTEM:				
Thermosensor	1	PT1/8	9.8 (1.0 , 7)	NOTE 1
Engine coolant temperature (ECT) sensor	1	12	15 (1.5 , 11)	
Fan motor switch	1	16	17 (1.7 , 12)	
ENGINE MOUNTING:				
Engine hanger adjust bolt	1	22	15 (1.5 , 11)	
Engine hanger lock nut	1	22	42 (4.3 , 31)	
Engine hanger pivot nut	1	12	78 (8.0 , 58)	
Sub-bracket pivot nut	1	10	69 (7.0 , 51)	
Sub-bracket stopper nut	1	8	26 (2.7 , 20)	
Tension rod nut	1	8	20 (2.0 , 14)	
Engine mount nut	1	12	59 (6.0 , 43)	
FRONT WHEEL/SUSPENSION/STEERING:				
Front fender socket bolt	4	6	12 (1.2 , 9)	
Steering bearing adjusting nut	1	26	74 (7.5 , 54)	(page 14-26)
Steering stem top thread	1	26	2.5 (0.25 , 1.8)	
Front brake disc bolt	4	8	42 (4.3 , 31)	NOTE 9
Front pulser ring Torx bolt (ABS type)	4	5	7.8 (0.8 , 5.8)	NOTE 9
Front wheel speed sensor bolt (ABS type)	2	8	15 (1.5 , 11)	
Speedometer cable set screw	1	5	2.2 (0.22 , 1.6)	
Front axle nut	1	12	69 (7.0 , 51)	
Fork socket bolt	2	8	20 (2.0 , 14)	NOTE 2
Fork pinch bolt	4	10	49 (5.0 , 36)	
REAR WHEEL/SUSPENSION:				
Rear brake disc bolt	4	5	42 (4.3 , 31)	NOTE 9
Rear pulser ring Torx bolt (ABS type)	4	8	7.8 (0.8 , 5.8)	NOTE 9
Rear wheel speed sensor bolt (ABS type)	2	8	15 (1.5 , 11)	
Swingarm mount bolt	2	10	49 (5.0 , 36)	
Rear axle nut	1	16	118 (12.0 , 87)	
Rear shock absorber mount bolt	4	10	39 (4.0 , 29)	

GENERAL INFORMATION

FRAME (Cont'd)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
HYDRAULIC BRAKE:				
Brake caliper bleed valve	3	8	5.9 (0.6 , 4.3)	
Brake pad pin	2	10	18 (1.8 , 13)	
Brake pad pin plug	1	10	2.5 (0.25 , 1.8)	
Master cylinder reservoir cap screw	4	4	1.5 (0.15 , 1.1)	
Brake lever pivot bolt	2	6	5.9 (0.6 , 4.3)	
Brake lever pivot nut	2	6	5.9 (0.6 , 4.3)	
Brake light switch screw	3	4	1.2 (0.12 , 0.9)	
Master cylinder holder bolt	4	6	12 (1.2 , 9)	
Brake hose oil bolt	7	10	34 (3.5 , 25)	
Brake pipe nut (LBS type)	4	10	17 (1.7 , 12)	
(ABS type)	6	10	17 (1.7 , 12)	
Front caliper mount bolt	2	8	31 (3.2 , 23)	NOTE 9
Front caliper body B bolt	3	8	32 (3.3 , 24)	NOTE 9
Front caliper pin bolt	1	8	23 (2.3 , 17)	NOTE 2
Front caliper bracket pin bolt	1	8	13 (1.3 , 9)	NOTE 2
Rear caliper mount bolt	2	8	31 (3.2 , 23)	NOTE 9
Rear caliper bolt	1	8	23 (2.3 , 17)	
Rear caliper pin bolt	1	12	27 (2.8 , 20)	
ABS modulator mount nut	2	6	9.8 (1.0 , 7)	
LIGHTS/METERS/SWITCHES:				
Side stand switch bolt	1	6	9.8 (1.0 , 7)	
Ignition switch bolt	2	8	26 (2.7 , 20)	
OTHERS:				
Side stand pivot bolt	1	10	9.8 (1.0 , 7)	
Side stand pivot nut	1	10	29 (3.0 , 22)	
Front/Rear reflector	4	6	5.1 (0.52 , 3.8)	NOTE 8

GENERAL INFORMATION

TOOLS

- NOTES: 1. Equivalent commercially available.
 2. Alternative tool.
 3. Newly provided tool.
 4. Newly designed tool.

DESCRIPTION	TOOL NUMBER	REMARKS	REF. SEC.
Carburetor float level gauge	07401-0010000		5
Universal bearing puller	07631-0010000	NOTE 1	11, 13
Adjustable pin spanner	07702-0020001		14
Universal holder	07725-0030000	NOTE 1	6, 10
Flywheel holder	07725-0040000	NOTE 1	10, 12
Remover weight	07741-0010201		6, 10, 11
Attachment, 32 × 35 mm	07746-0010100		10, 14
Attachment, 42 × 47 mm	07746-0010300		11, 15
Attachment, 52 × 55 mm	07746-0010400		11
Attachment, 24 × 26 mm	07746-0010700		14
Attachment, 22 × 24 mm	07746-0010800		11
Driver C	07746-0030100		6
Attachment, 30 mm	07746-0030300		13
Attachment, 35 mm	07746-0030400		6, 14
Pilot, 12 mm	07746-0040200		14
Pilot, 15 mm	07746-0040300		10, 11
Pilot, 17 mm	07746-0040400		15
Pilot, 20 mm	07746-0040500		11
Pilot, 25 mm	07746-0040600		10, 11
Pilot, 22 mm	07746-0041000		14
Pilot, 14 mm	07746-0041200		11, 14
Bearing remover shaft	07746-0050100		14
Bearing remover head, 12 mm	07746-0050300		14
Slider weight	07747-0010100		14
Fork seal driver attachment	07747-0010501	or 07947-3330000 (U.S.A. only)	14
Driver	07749-0010000		6, 10, 11, 14, 15
Valve spring compressor	07757-0010000		8
Valve seat cutter		NOTE 1	8
Seat cutter, 29 mm (45° EX)	07780-0010300	NOTE 2	
Seat cutter, 33 mm (45° IN)	07780-0010800	NOTE 2	
Flat cutter, 30 mm (32° EX)	07780-0012200	NOTE 2	
Flat cutter, 36 mm (32° IN)	07780-0013500	NOTE 2	
Interior cutter, 30 mm (60° EX)	07780-0014000	NOTE 2	
Interior cutter, 34 mm (60° IN)	07780-0014700	NOTE 2	
Cutter holder	07781-0010400		8
Snap ring pliers	07914-SA50001		10, 16
Lock nut wrench, 32 mm	07916-KM10000		14
Bearing remover handle	07936-3710100		11
Bearing remover head	07936-3710600		11
Bearing remover	07936-KC10500	(U.S.A. only)	
Remover weight	07936-371020A	or 07936-3710200 (U.S.A. only)	
Remover shaft	07936-KC10100		6, 11
Bearing remover, 15 mm	07936-KC10200		6, 11
Remover shaft assembly	07936-ZV10100		10
Valve guide driver	07942-MA60000		8
Ball race driver attachment	07945-3330300		14
Mechanical seal driver attachment	07945-4150400		6
Attachment, 28 × 30 mm	07946-1870100		6, 10, 14
Oil seal driver	07947-SB00200		14
Oil seal remover	07948-4630100	NOTE 2	14
Valve spring compressor attachment	07959-KM30101		8

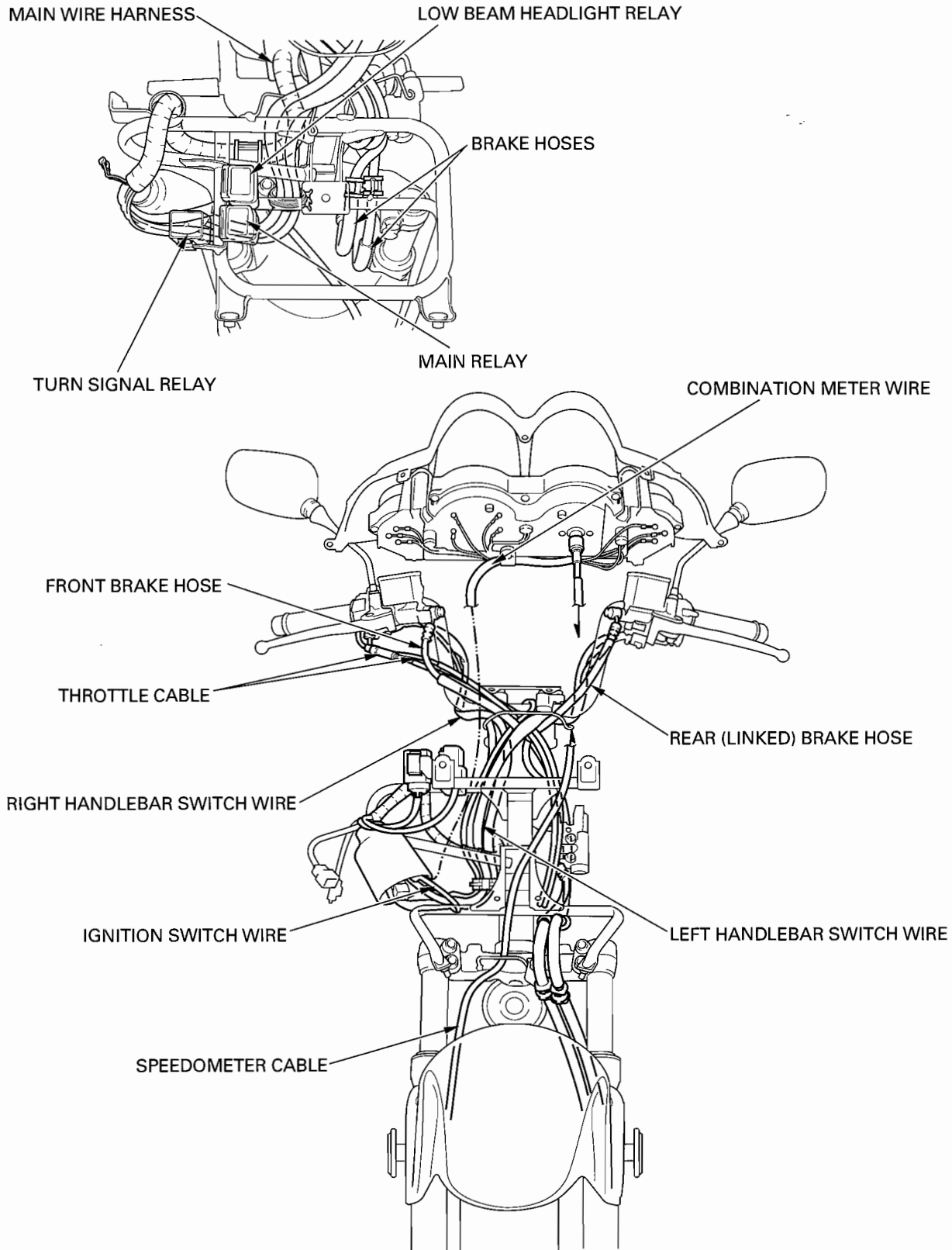
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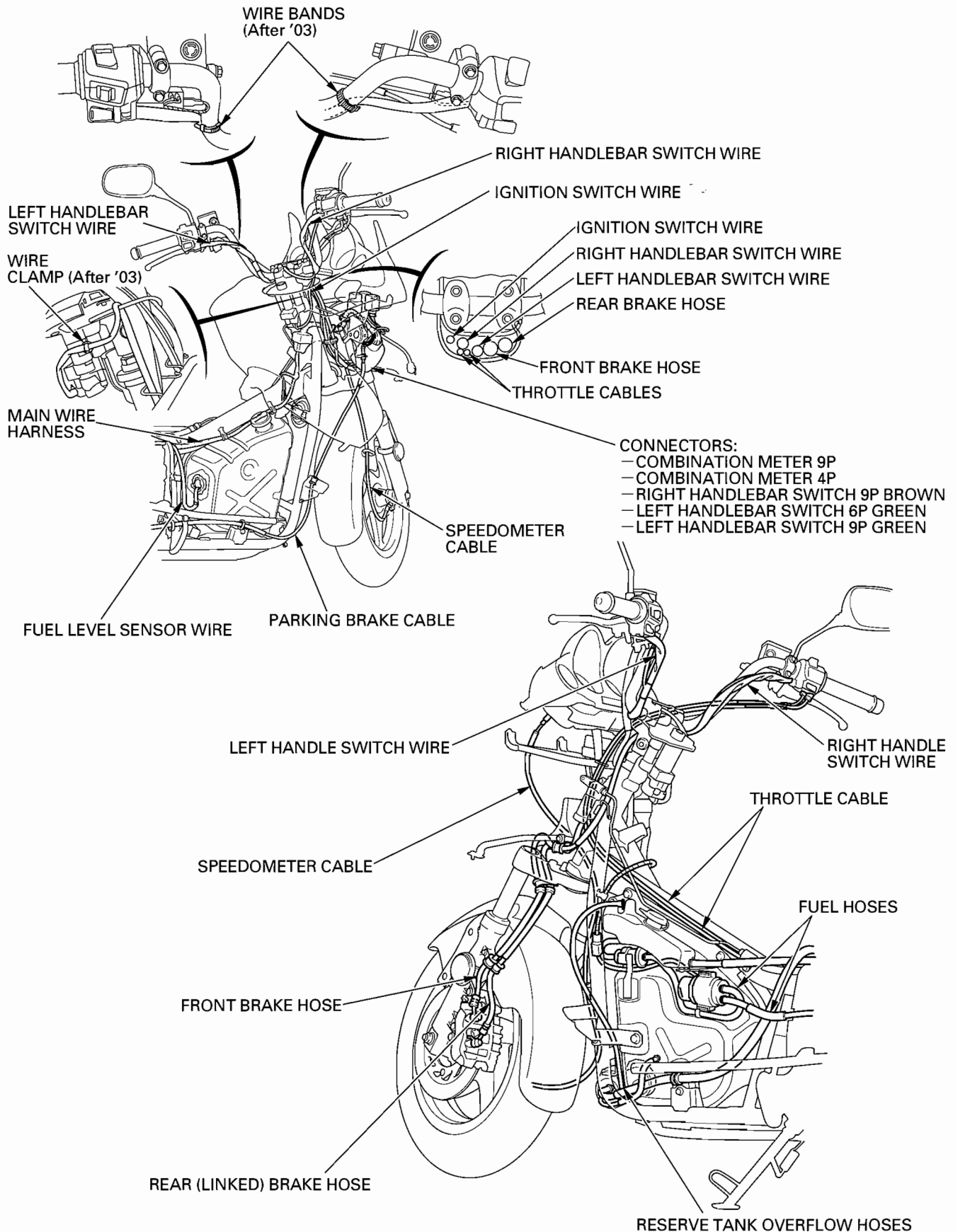
DESCRIPTION	TOOL NUMBER	REMARKS	REF. SEC.
Assembly collar	07965-VM00100		13
Assembly shaft	07965-VM00200	or 07931-ME4010B and	11, 13
Valve guide reamer	07984-MA60000	07931-HB3020A (U.S.A. only)	8
Socket wrench, 39 × 41 mm	07GMA-KS40100		10
Ball race remover	07GMD-KS40100		14
Brake spring compressor	07HAE-SG00100		16
Peak voltage adaptor	07HGJ-0020100	Peak voltage tester (U. S. A. only)	18, 20
Lock nut wrench	07KMA-KAB0100		7
Flywheel puller	07KMC-HE00100		12
Clutch spring compressor	07LME-GZ40200	or 07960-KM1000A (U.S.A. only)	10
Pilot screw wrench	07MMA-MT3010B	(U.S.A. only)	5
Case puller	07SMC-0010001	Not available in U.S.A.	13
Bearing remover set, 14 mm	07WMC-KFG0100		11
Plate	07XMF-KGB0300		13
Bearing remover shaft, 14 mm	07YMC-001010A	(U.S.A. only)	11
Bearing installer, 29.31 mm	07YMF-KFG0100		13
Thread adapter	07YMF-KFG0300		13
Assembly collar	07YMF-KPB0100		11
Vacuum/Pressure pump	A937X-041-XXXXXX		5
Vacuum pump	ST-AH-260-MC7	(U. S. A. only)	5
Pressure pump	ST-AH-255-MC7	(U. S. A. only)	5

FRAME		
LOCATION	MATERIAL	REMARKS
Steering head bearings and race sliding surface Speedometer gear and pinion Throttle grip pipe flange cable groove Final shaft 3 mm groove Center stand pivot Side stand pivot Seat lock pivot Dust seal lips	Multi-purpose grease	Apply grease 0.03–0.04 g (page 15-6).
Brake lever pivot Brake lever-to-master piston contacting area Caliper pin boots inside Caliper dust seals Throttle cable boot inside	Silicone grease	
Brake master pistons and cups Caliper piston outer surfaces Caliper piston seals	DOT 4 brake fluid	
Fork oil seal lips	Pro Honda Suspension Fluid SS-8	
Handle grip rubber inside Air cleaner connecting tube-to-housing mating area	Honda bond A or equivalent	
Fork socket bolt threads Caliper pin bolt threads	Locking agent	

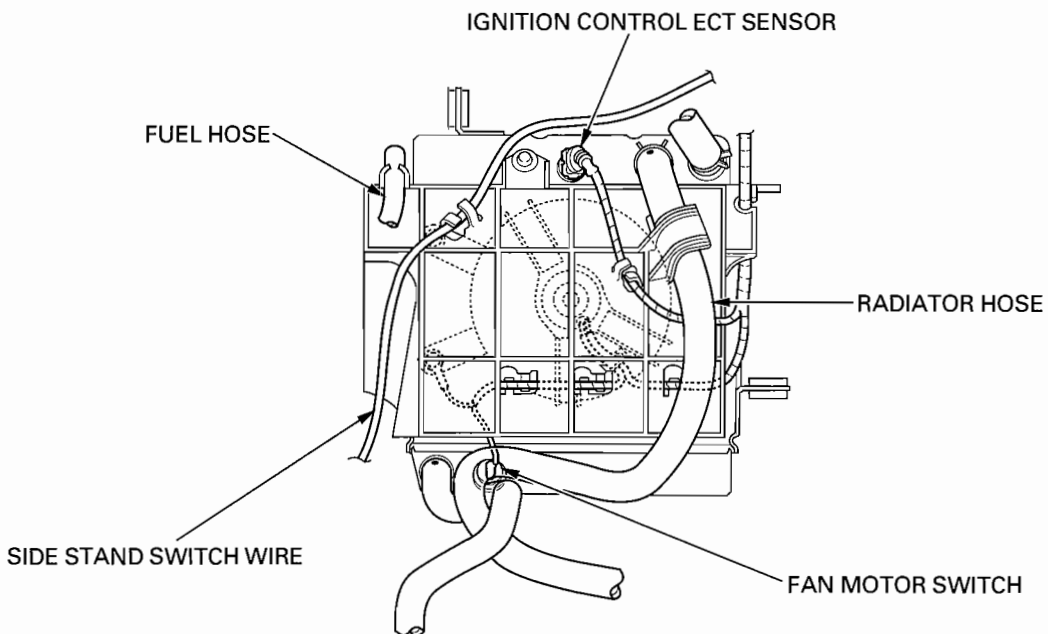
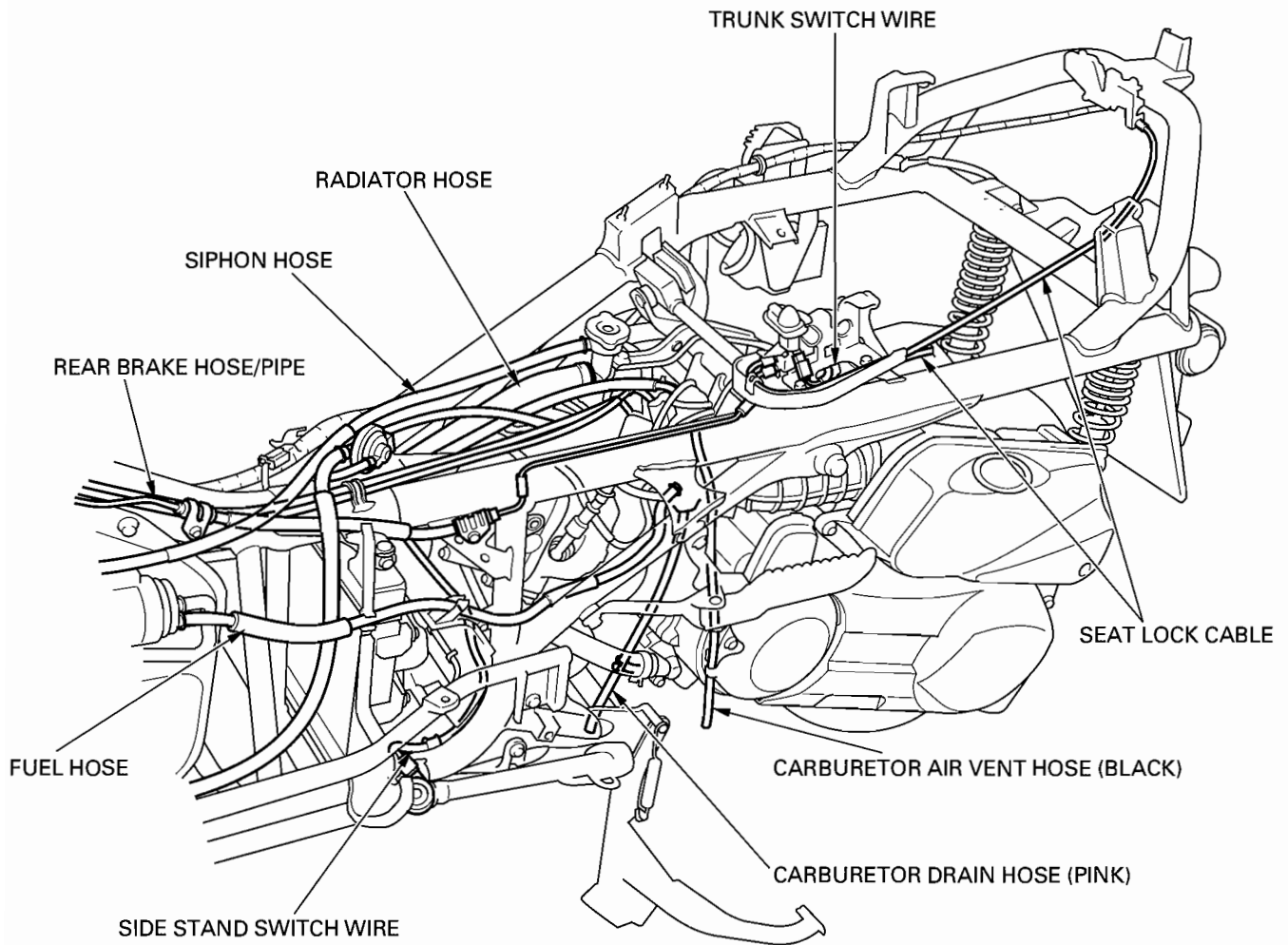
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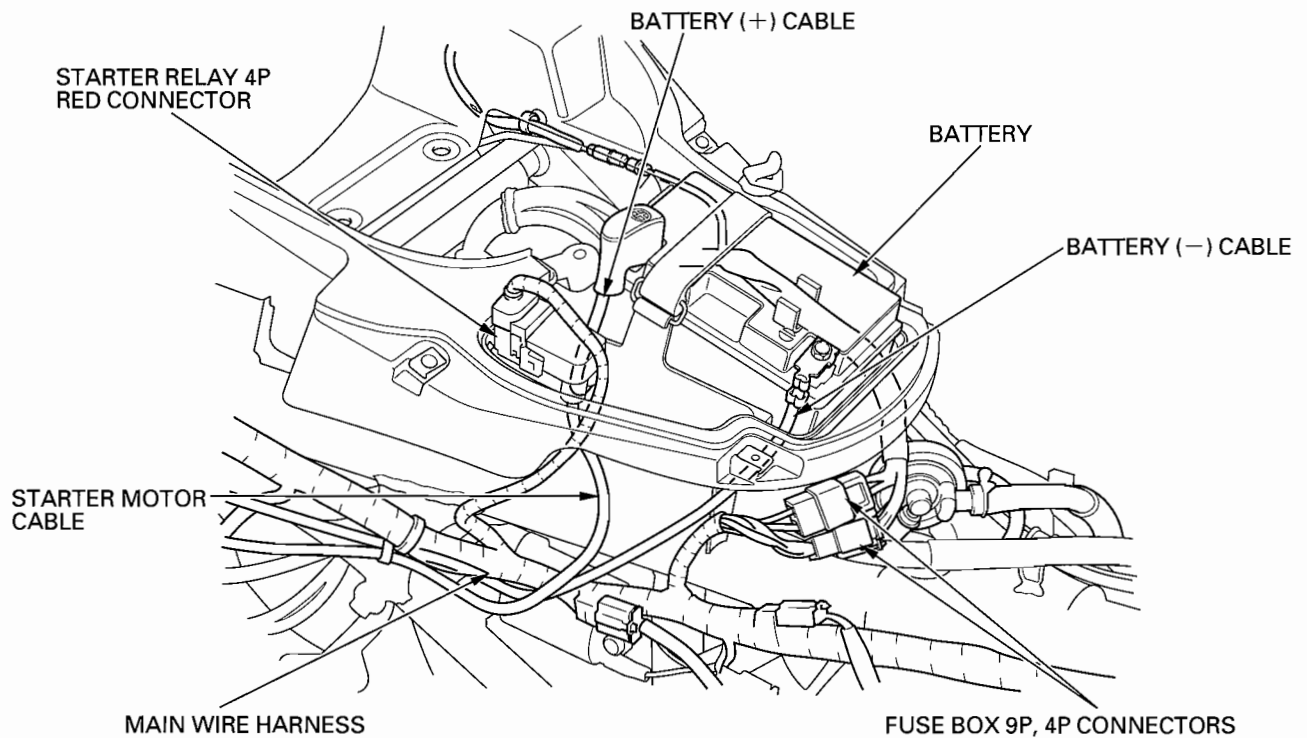
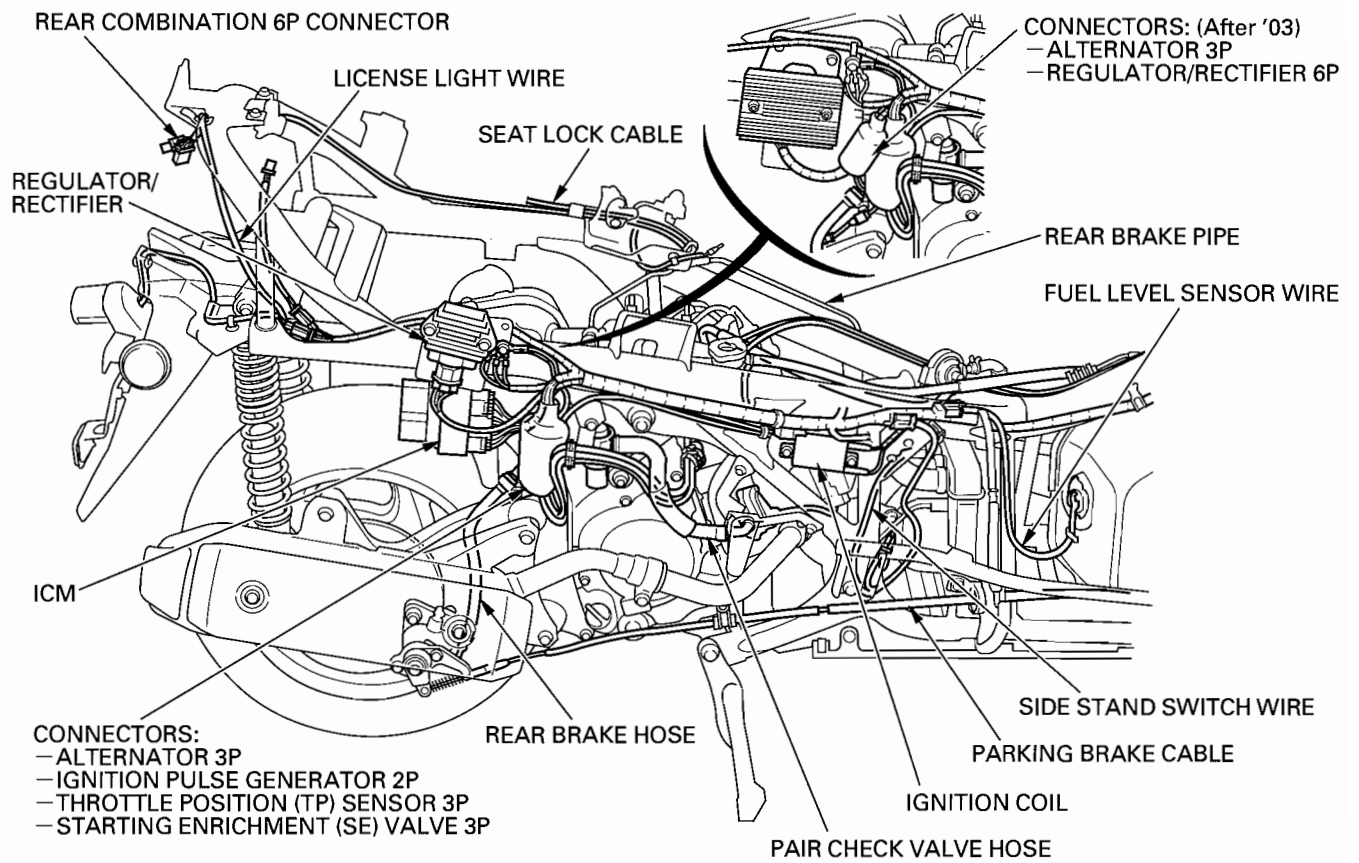
CABLE & HARNESS ROUTING, NSS250



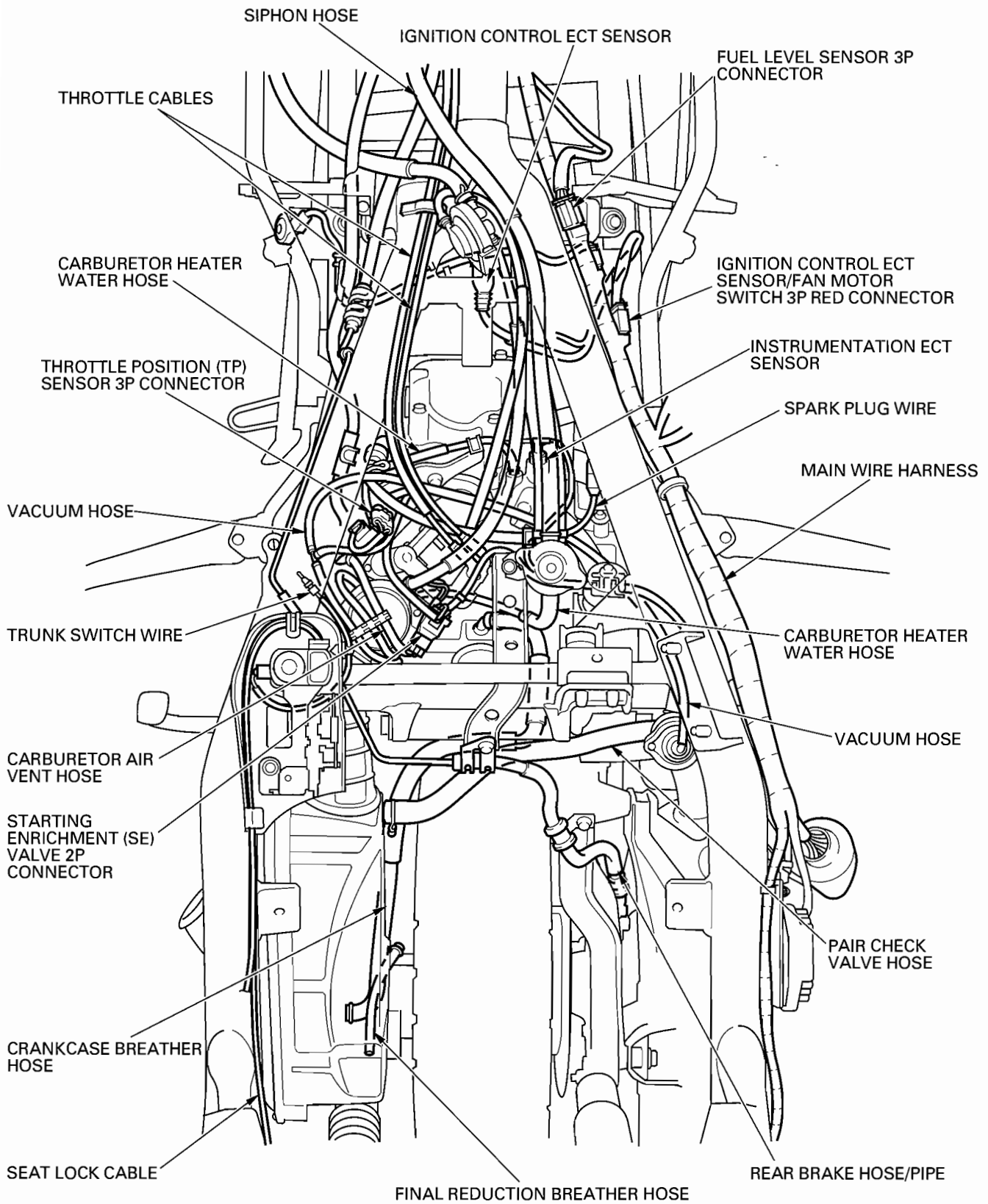


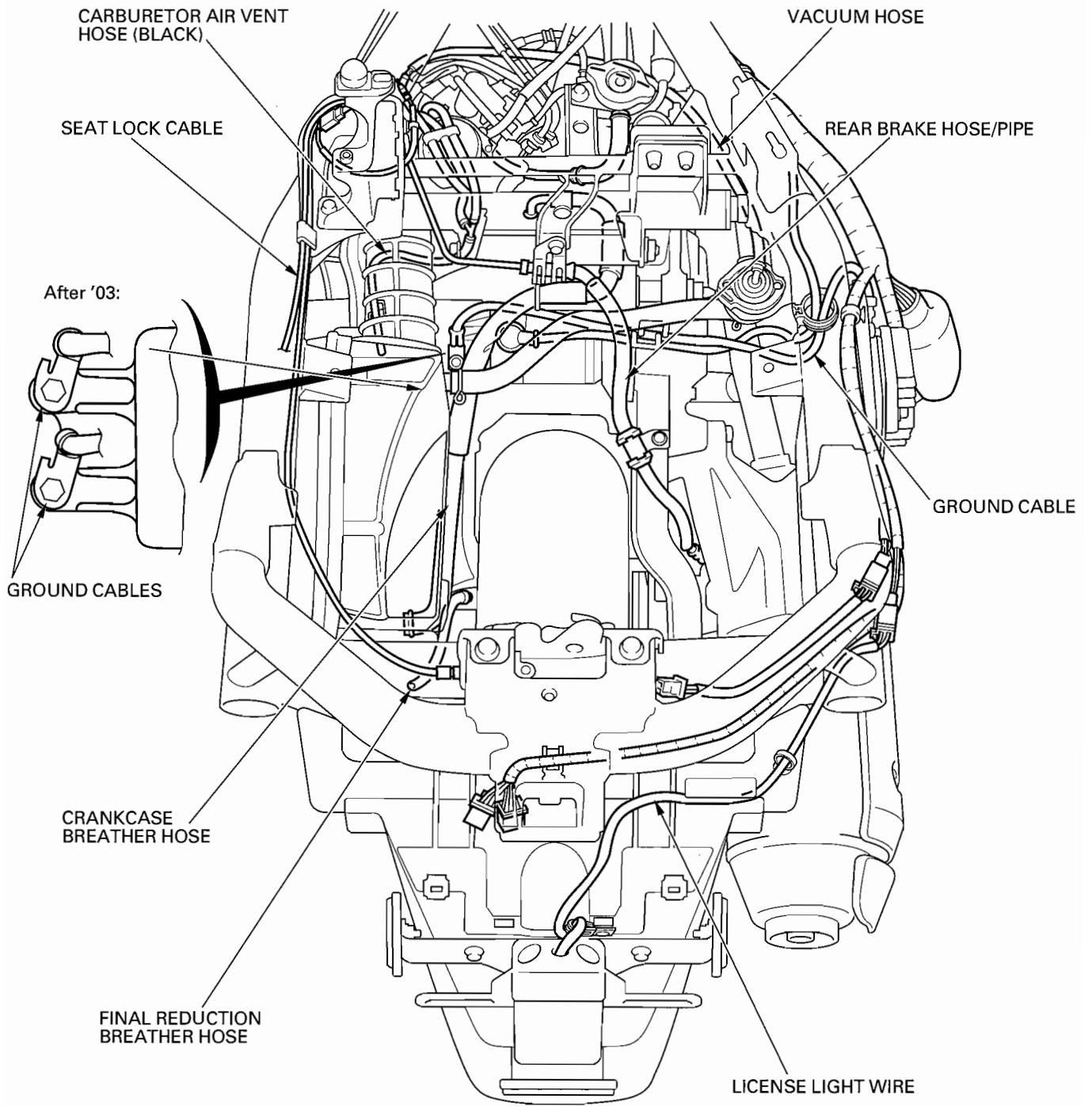
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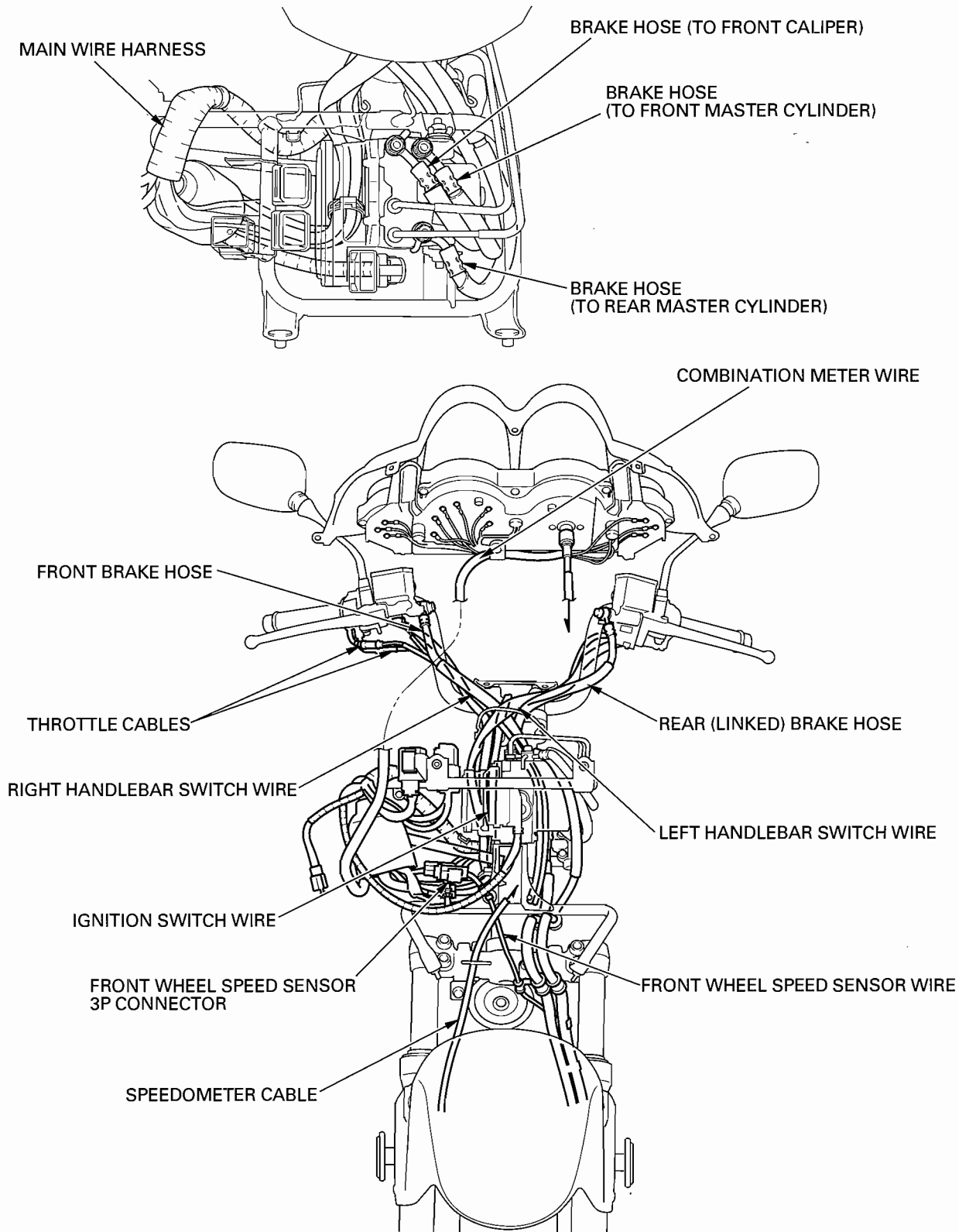


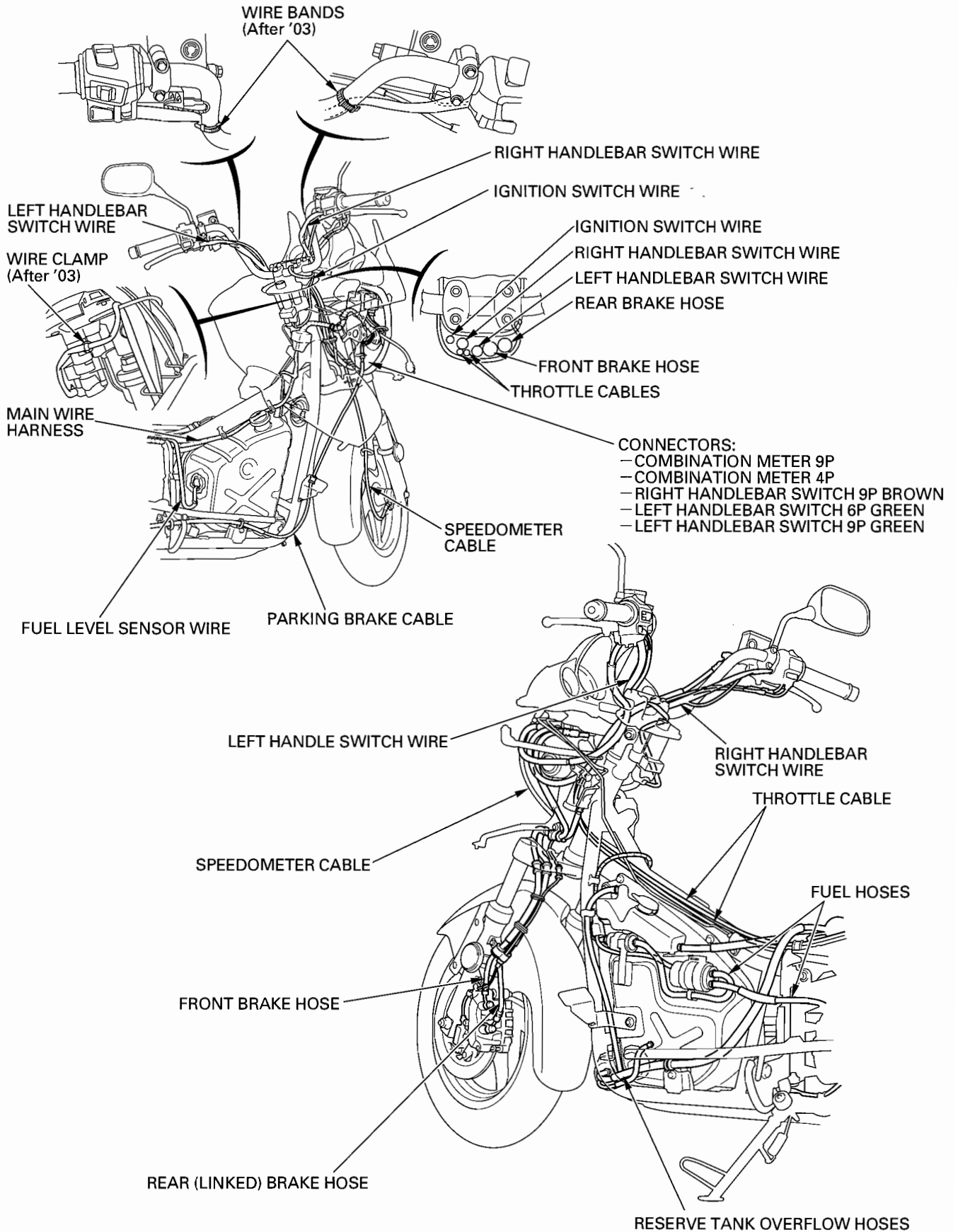


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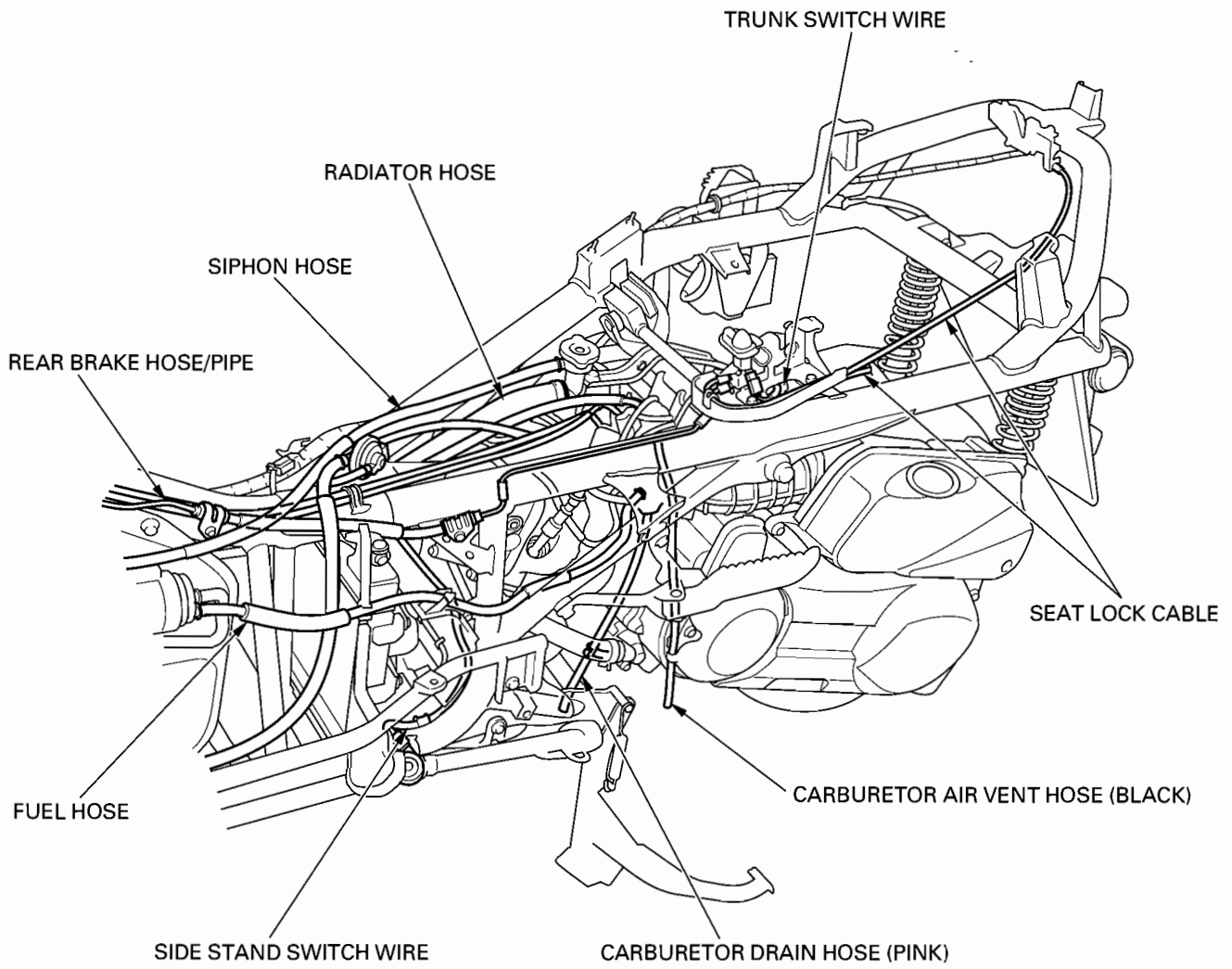
CABLE & HARNESS ROUTING, NSS250A

- Follow the illustrations for the NSS250 except these illustrations.

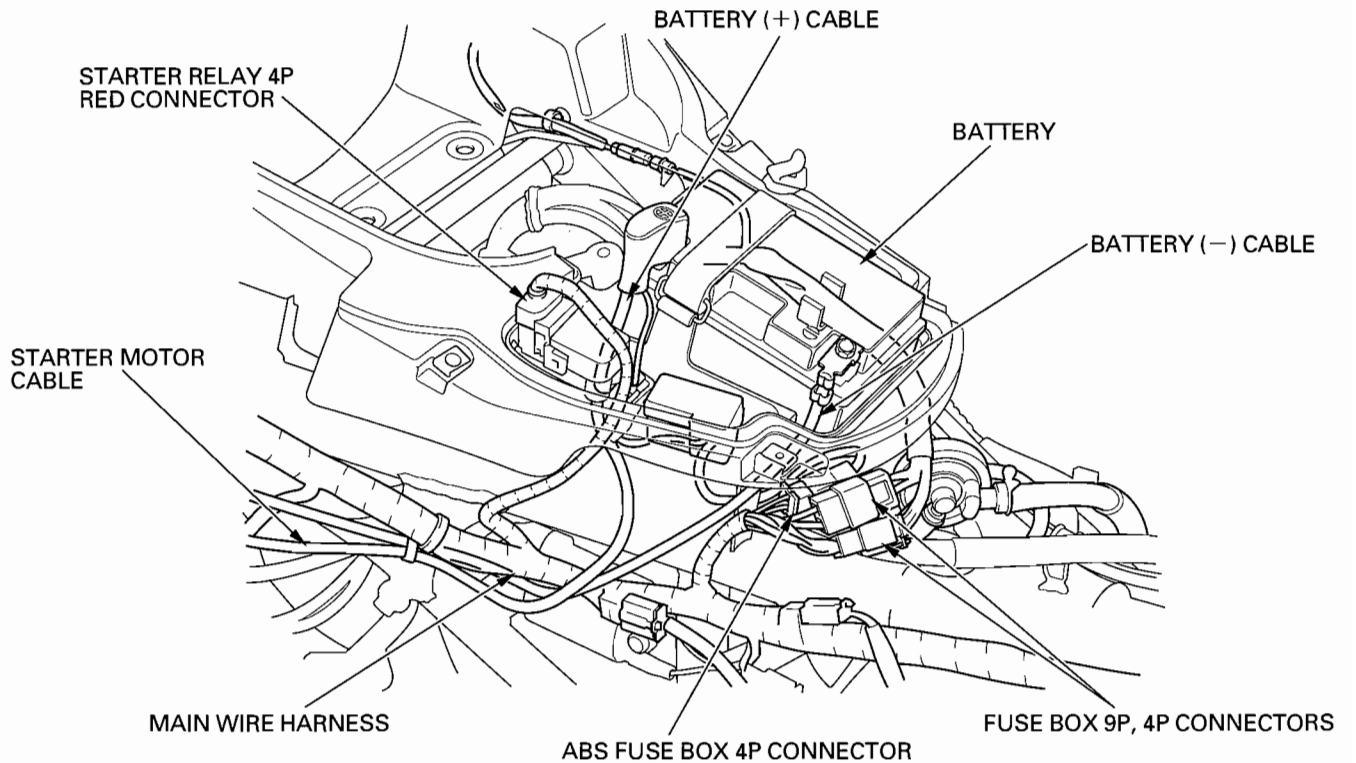
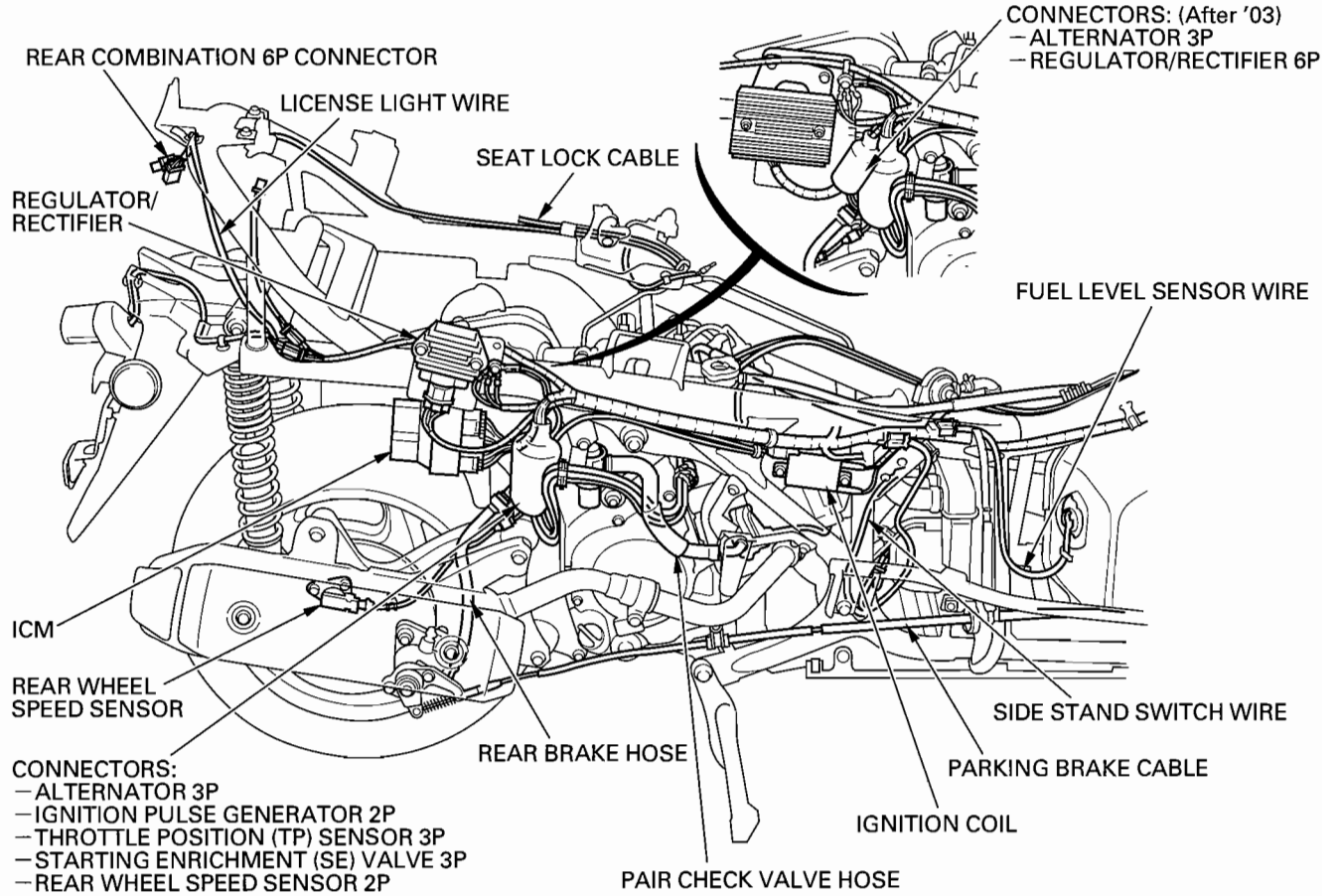




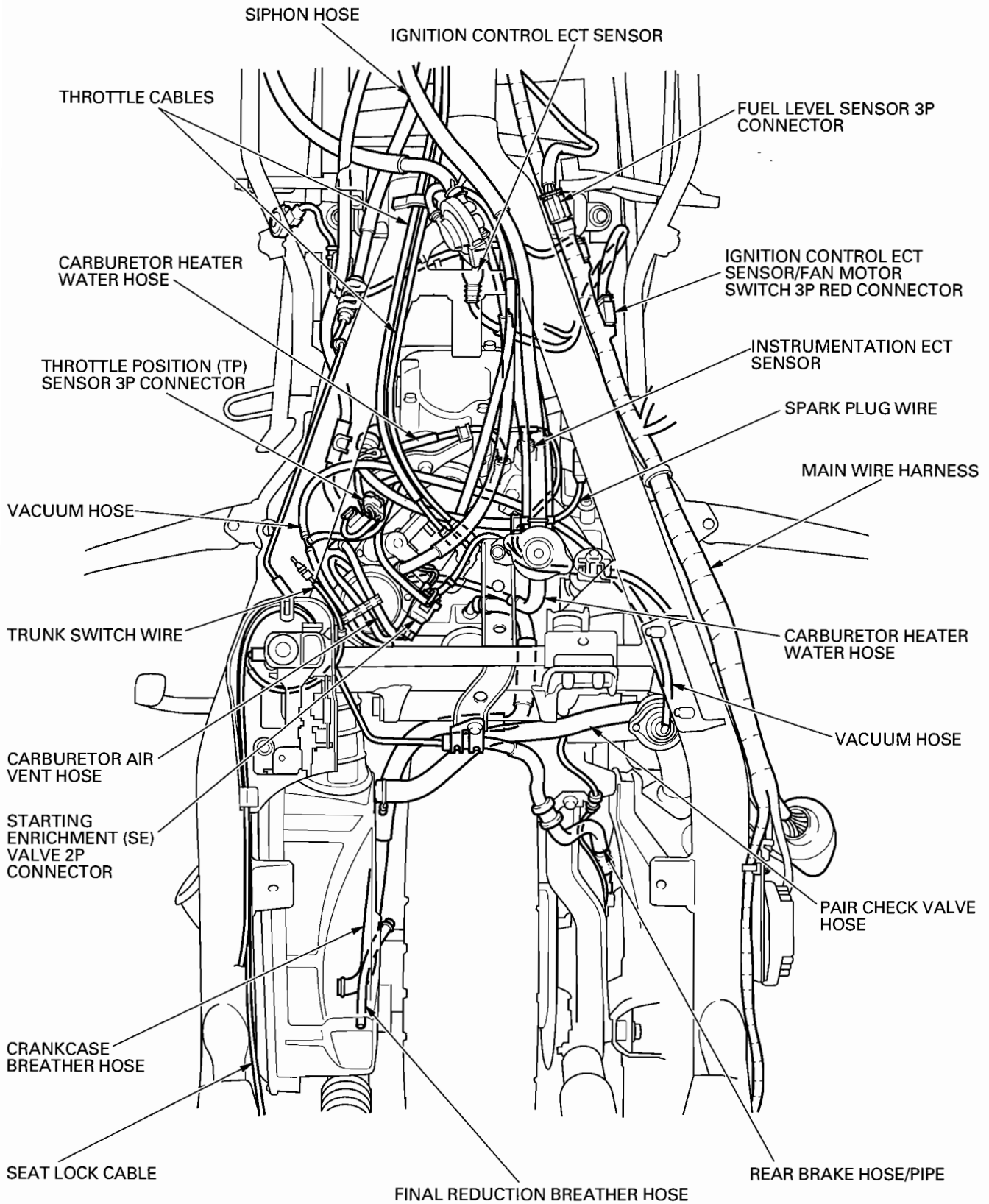
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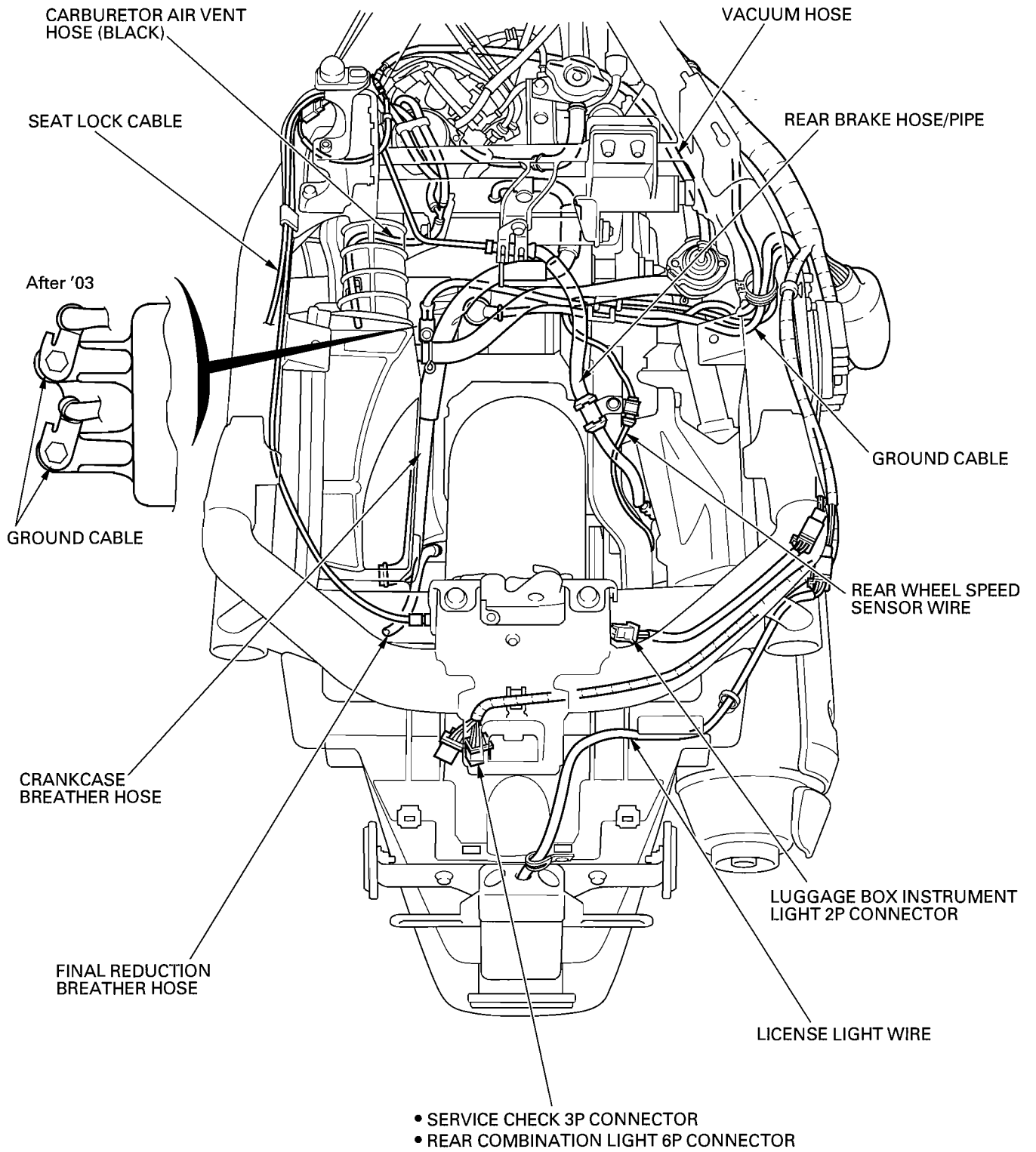


GENERAL INFORMATION



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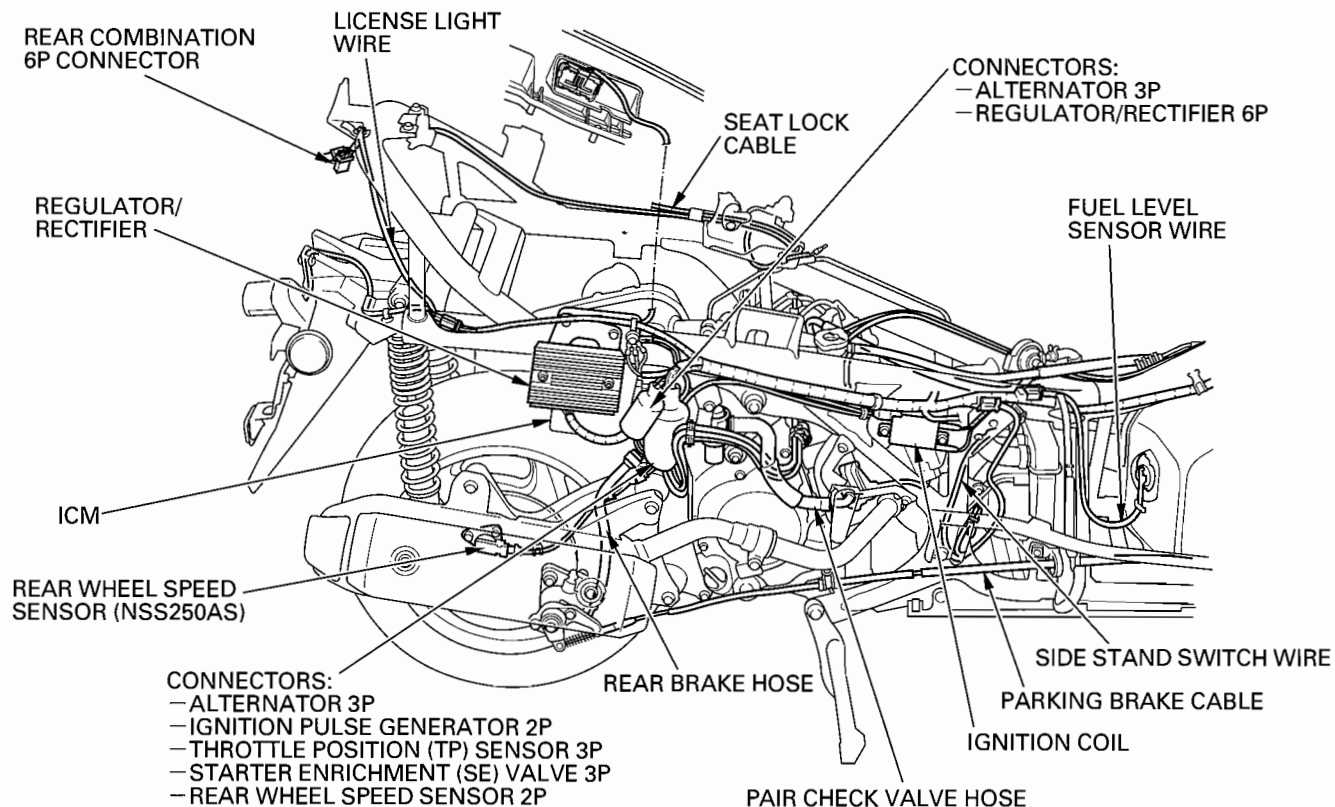
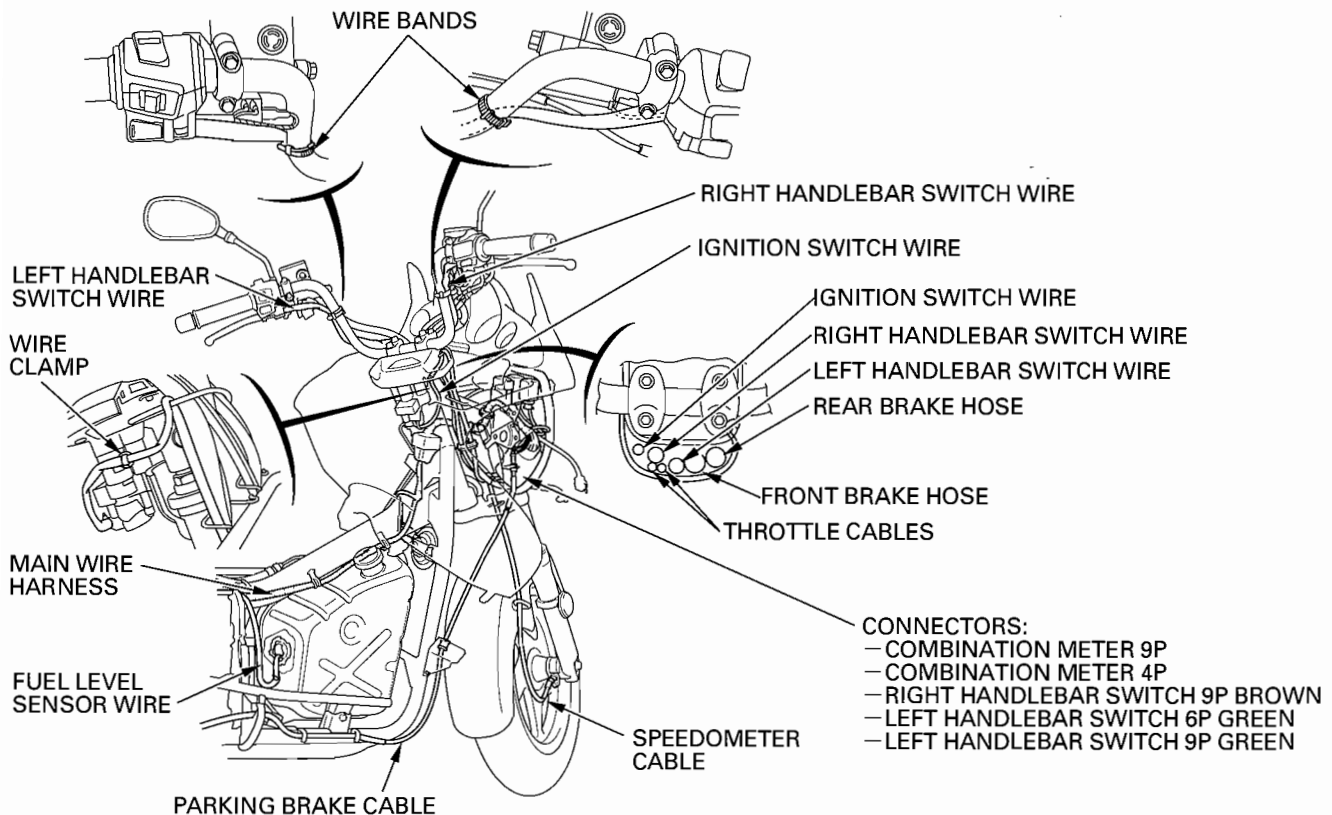


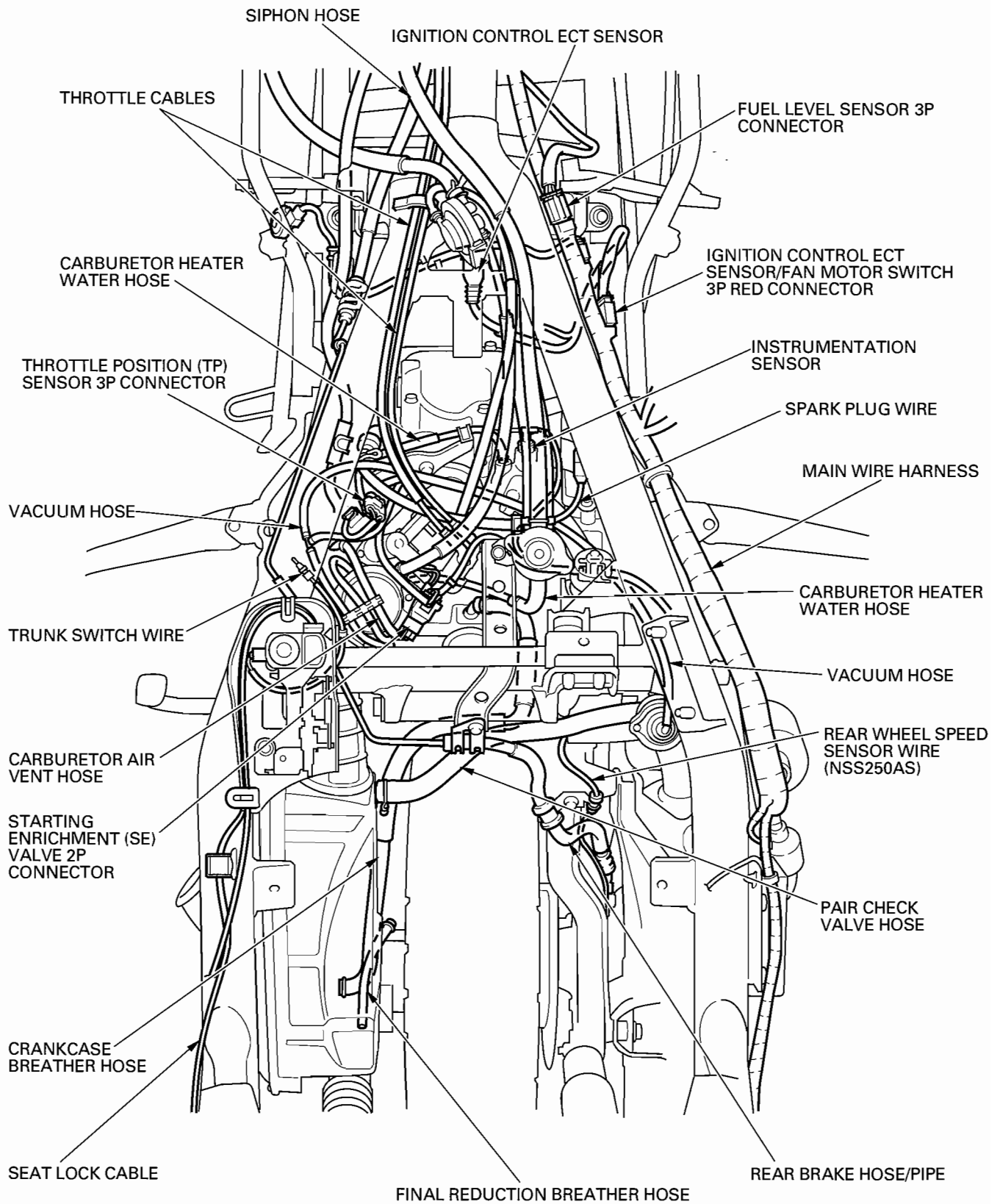


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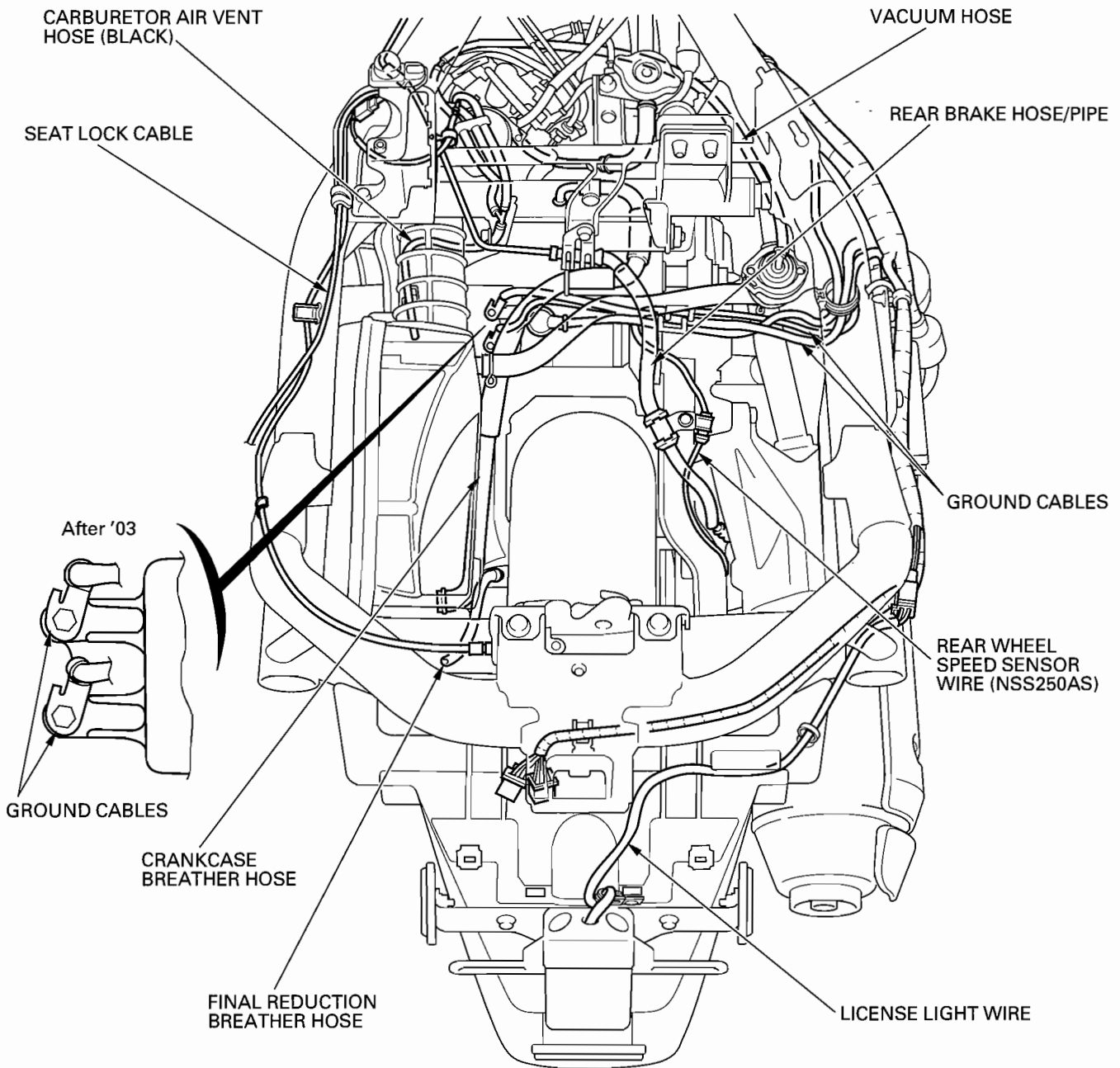
CABLE & HARNESS ROUTING, NSS250S/AS

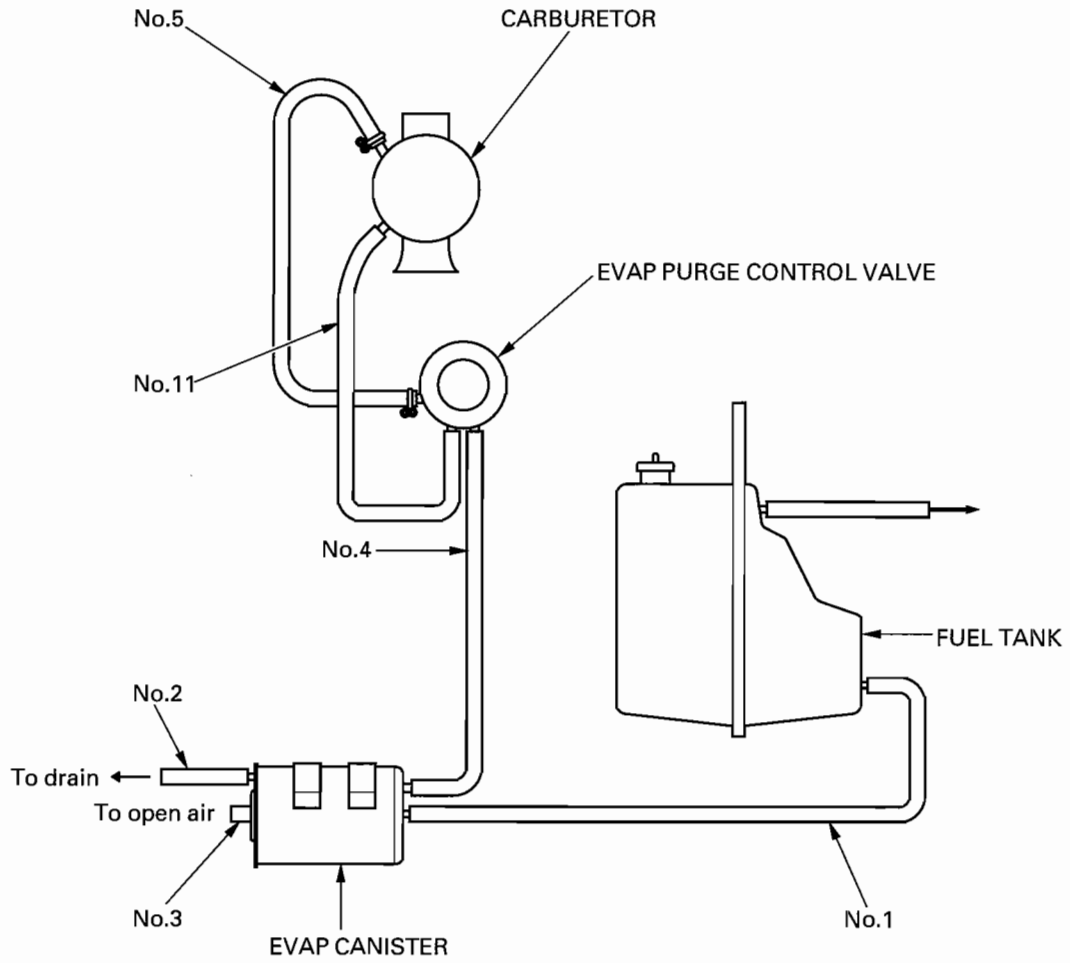
• Follow the illustrations for the NSS250 except these illustrations.





GENERAL INFORMATION





GENERAL INFORMATION

EMISSION CONTROL SYSTEMS

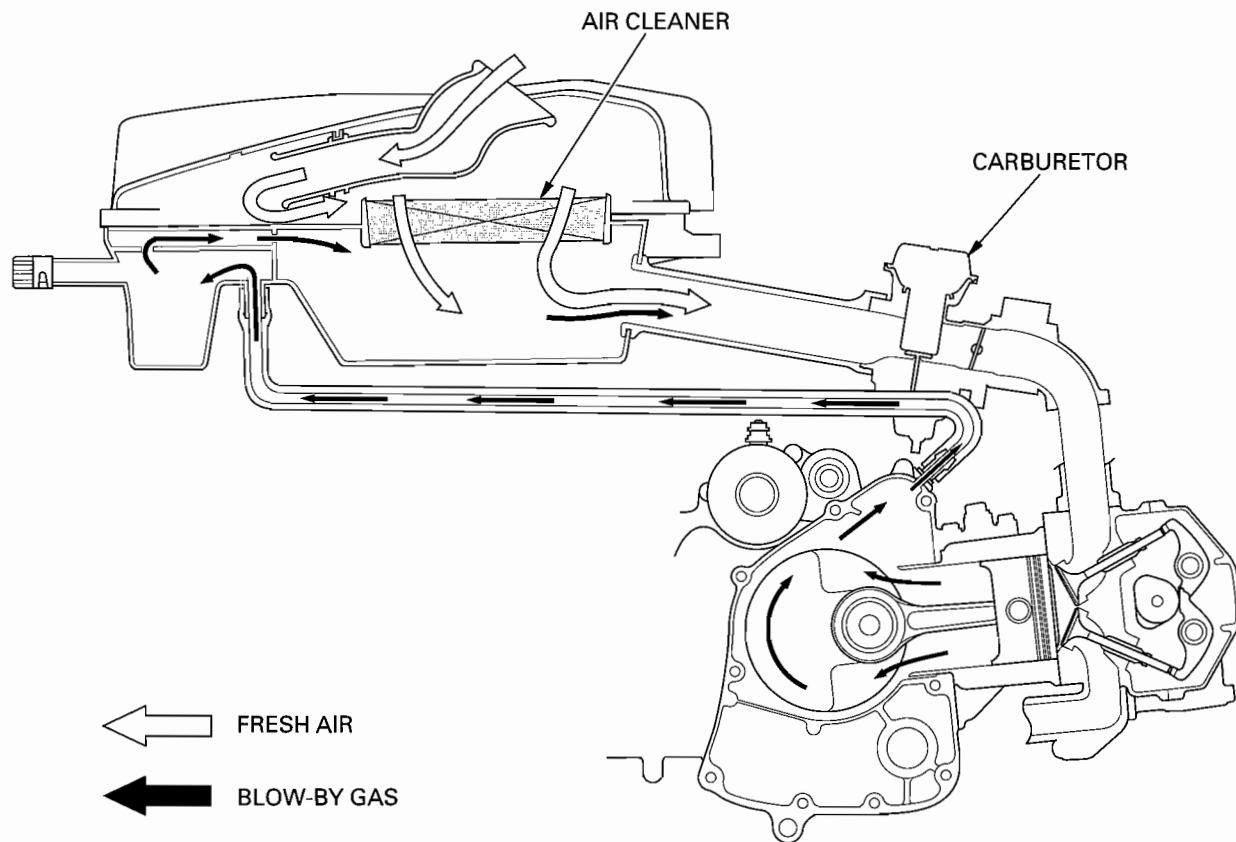
SOURCE OF EMISSIONS

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

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

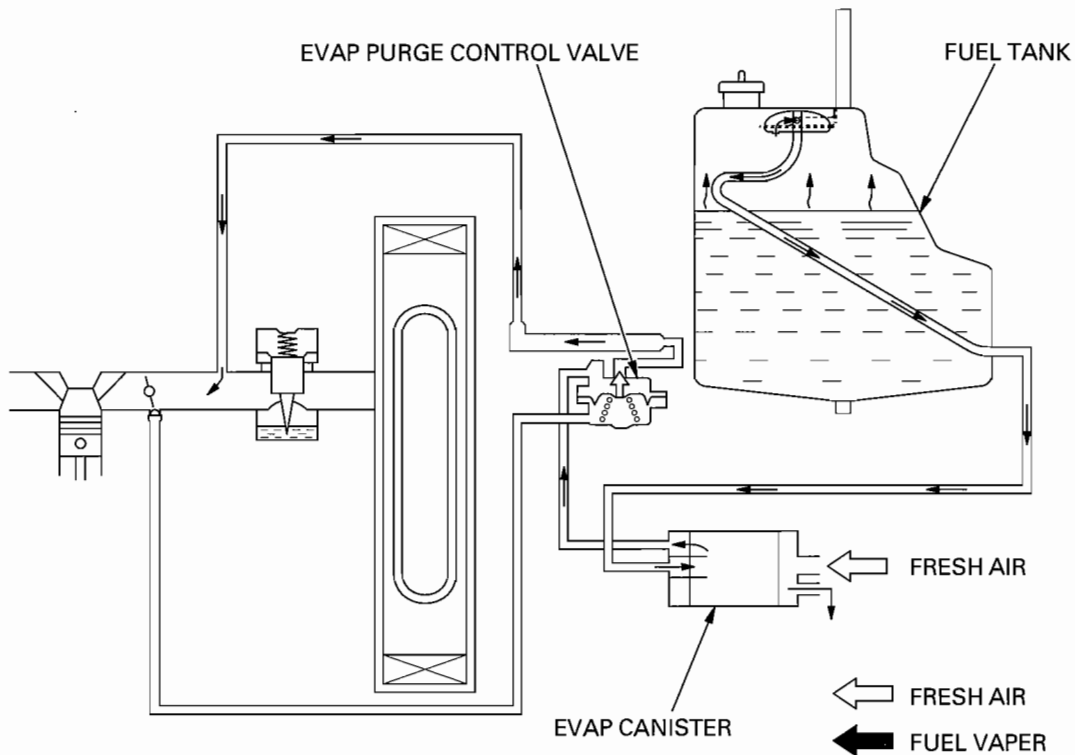
CRANKCASE EMISSION CONTROL SYSTEM

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.



EVAPORATIVE EMISSION CONTROL SYSTEM

Fuel vapor from the fuel tank and carburetor is routed into the evaporative emission (EVAP) canister where it is absorbed and stored while the engine is stopped. When the engine is running and the evaporative emission (EVAP) purge control valve is open, fuel vapor in the EVAP canister is drawn into the engine through the carburetor. At the same time, the EVAP carburetor air vent (CAV) solenoid valve is open and air is drawn into the carburetor through the valve.



NOISE EMISSION CONTROL SYSTEM

TAMPERING WITH THE NOISE CONTROL SYSTEM IS PROHIBITED: Federal law or Canadian Provincial Law prohibits 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 new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use; (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

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

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

GENERAL INFORMATION

Oxidation Catalyst

The oxidation catalyst (OC) converts hydrocarbons and carbon monoxide in the exhaust gas to carbon dioxide and water vapor.

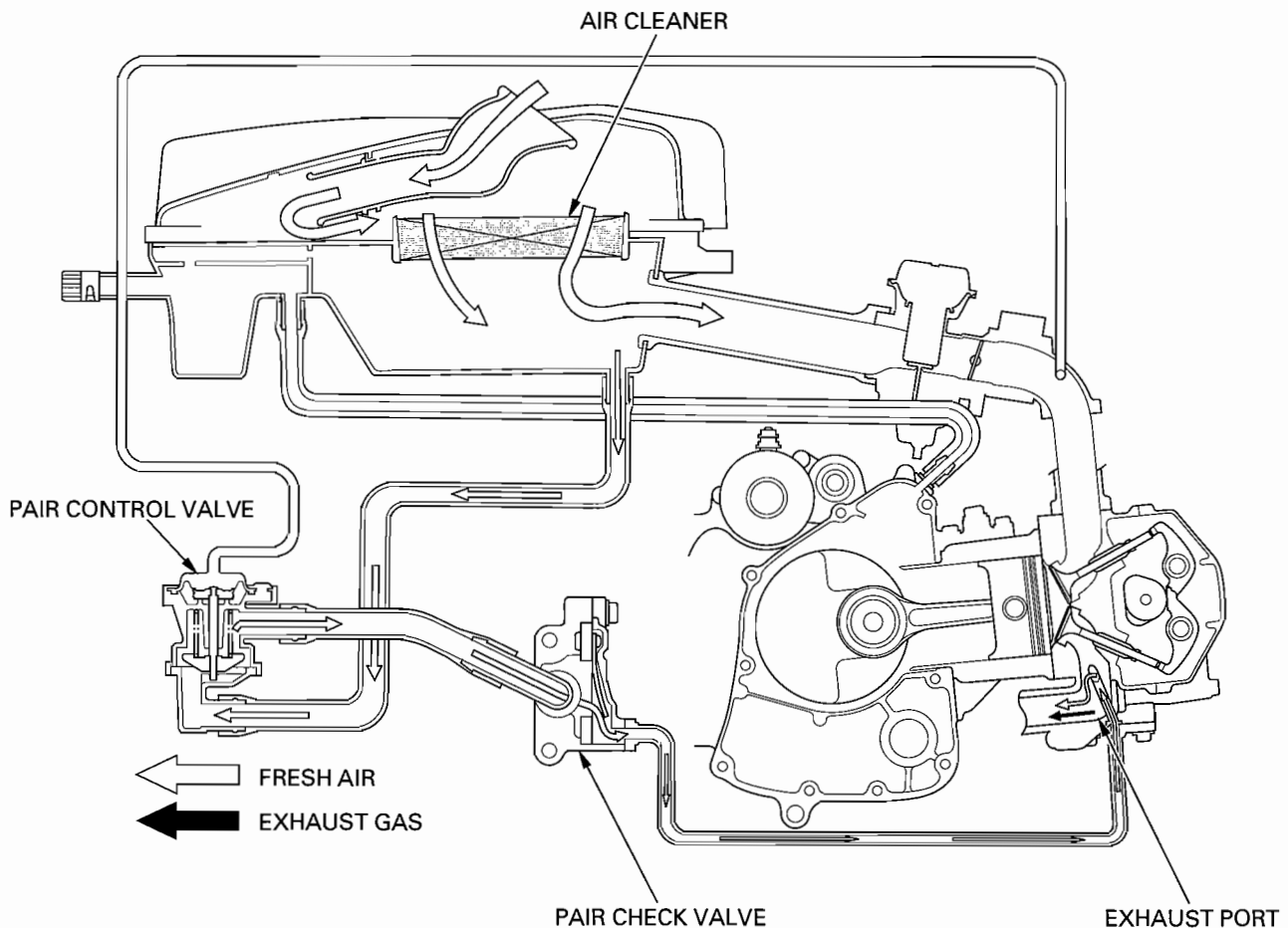
EXHAUST EMISSION CONTROL SYSTEM

PULSE SECONDARY AIR INJECTION 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.

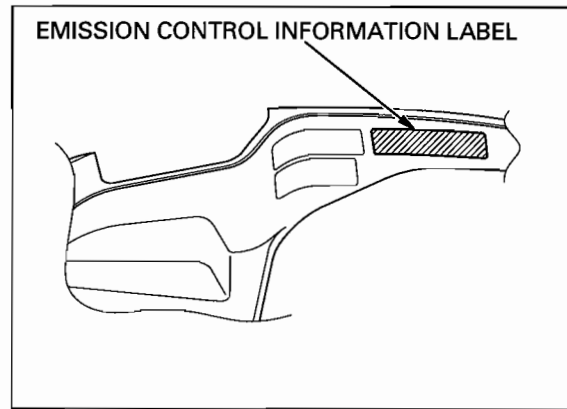
This model has the pulse secondary air injection (PAIR) control valve; it consists of check valves built into the pulse secondary air injection (PAIR) control valve. A pulse secondary air injection (PAIR) check valve prevents reverse air flow through the system. The pulse secondary air injection (PAIR) 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 pulse secondary air injection system should be made, although periodic inspection of the components recommended.



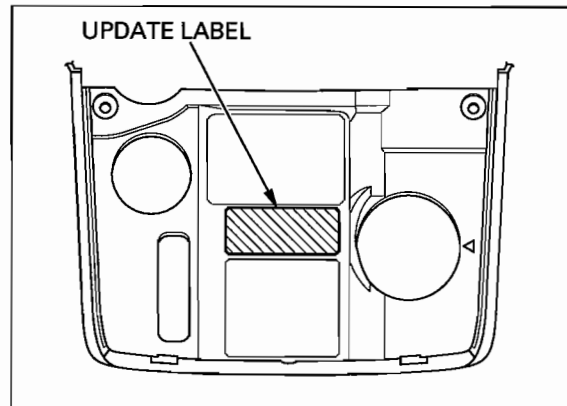
EMISSION CONTROL INFORMATION LABELS

The Emission Control Information Label is located on the side wall of the luggage box as shown. The seat must be opened to read it. It gives base tune-up specifications.



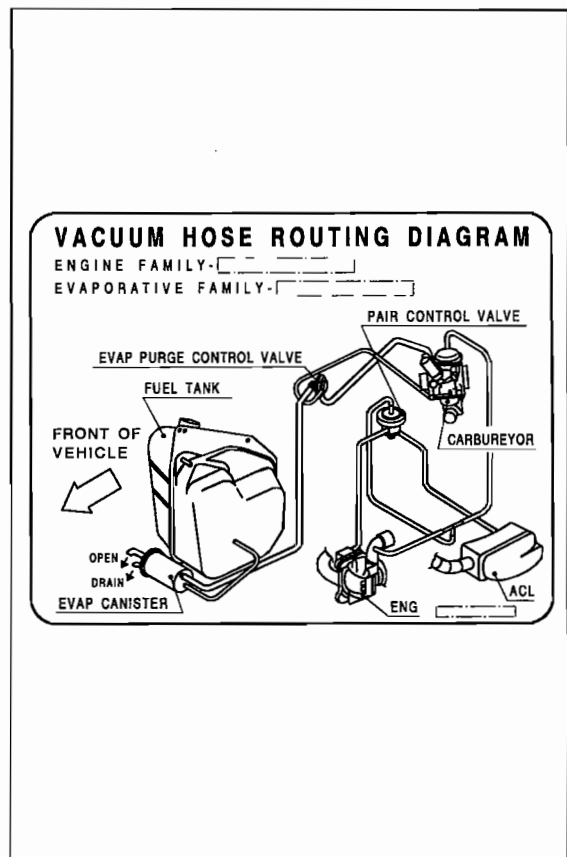
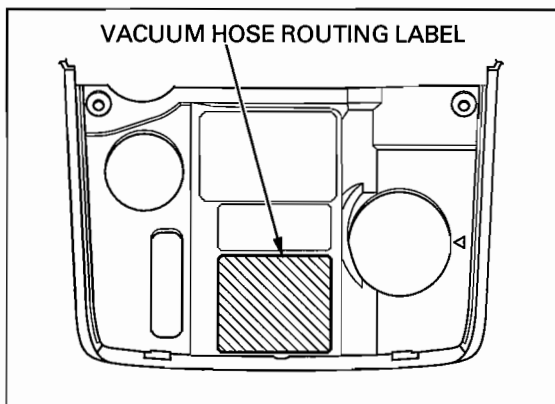
VEHICLE EMISSION CONTROL INFORMATION UPDATE LABEL

After making a high altitude carburetor adjustment, attach the update label onto the fuel/reserve tank lid wall as shown. Instructions for obtaining the update label are given in Service Letter No.132. When readjusting the carburetor back to the low altitude specifications, be sure to remove this update label.

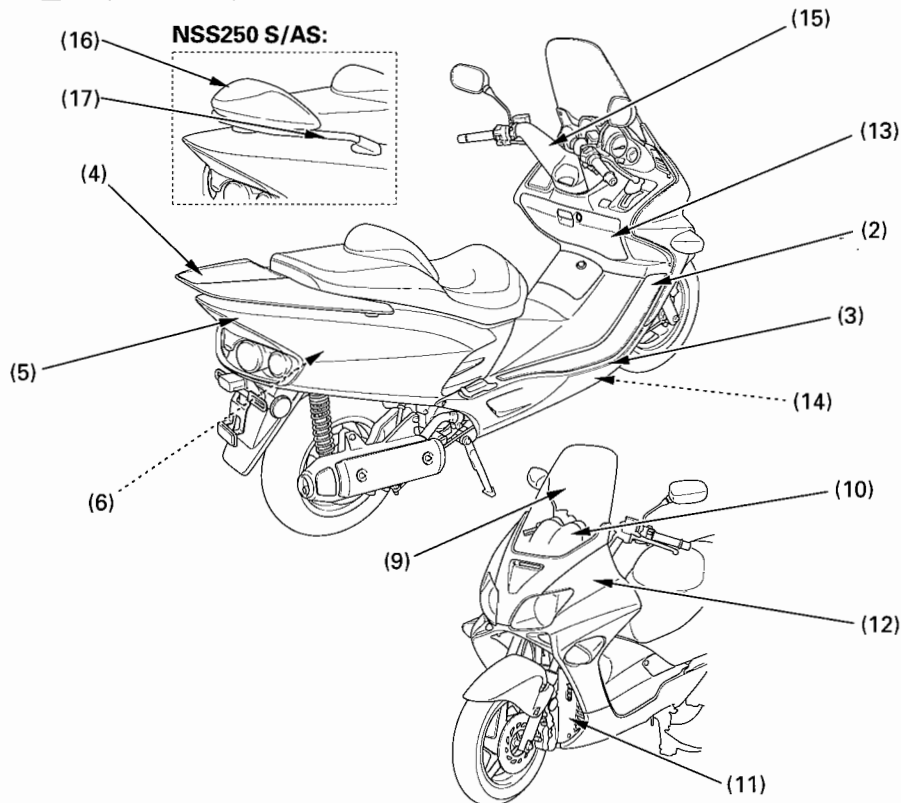


NEW VACUUM HOSE ROUTING DIAGRAM LABEL ('01-'04 ONLY)

The Vacuum Hose Routing Diagram Label is on the fuel/reserve tank lid wall as shown.



BODY PANEL LOCATIONS



- (1) Seat (page 2-3)
- (2) Floor Mat (page 2-3)
- (3) Floor Skirt (page 2-4)
- (4) Rear Spoiler (page 2-4)
- (5) Body Cover (page 2-5)
- (6) Luggage Box (page 2-7)

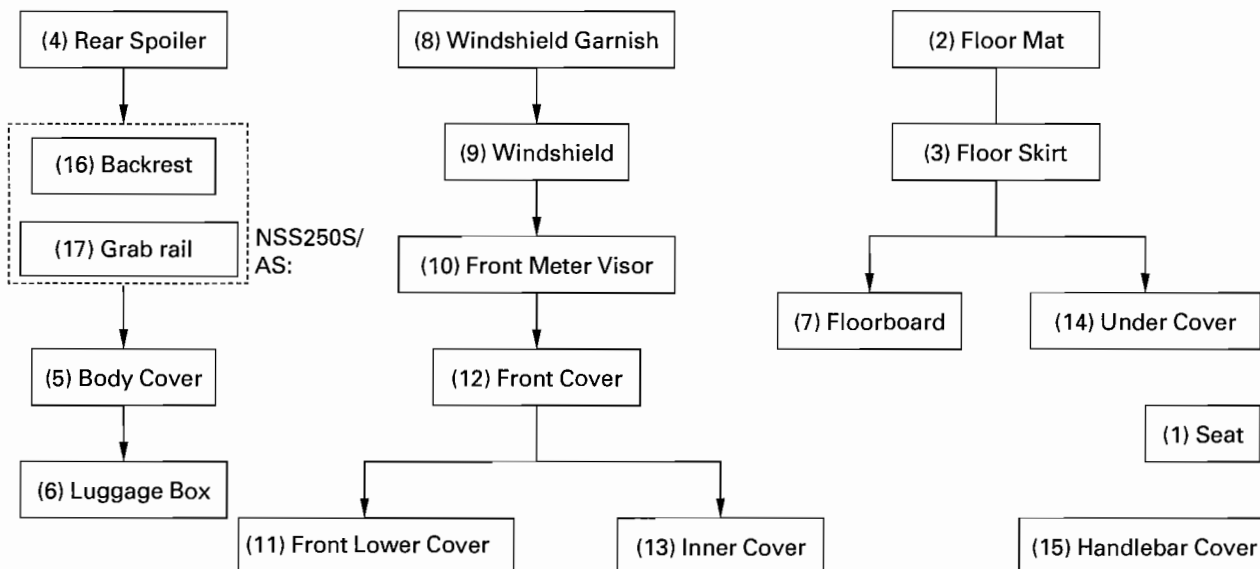
- (7) Floorboard (page 2-8)
- (8) Windshield Garnish (page 2-9)
- (9) Windshield (page 2-9)
- (10) Front Meter Visor (page 2-10)
- (11) Front Lower Cover (page 2-11)
- (12) Front Cover (page 2-10)

- (13) Inner Cover (page 2-12)
- (14) Under Cover (page 2-12)
- (15) Handlebar Cover (page 2-13)
- (16) Backrest (page 2-10)
- (17) Grab rail (page 2-10)

NSS250S/AS:

BODY PANEL REMOVAL CHART

• This chart shows the removal order of the various frame and body panels.



2. FRAME/BODY PANELS/EXHAUST SYSTEM

BODY PANEL LOCATIONS	2-0	LUGGAGE BOX	2-7
BODY PANEL REMOVAL CHART	2-0	FLOOR BOARD	2-8
SERVICE INFORMATION	2-1	WINDSHIELD	2-9
TROUBLESHOOTING	2-1	BACKREST (NSS250S/AS ONLY)	2-10
TRIM CLIP	2-2	GRAB RAIL (NSS250S/AS ONLY)	2-10
SEAT	2-3	FRONT COVER	2-11
FLOOR MAT	2-3	INNER COVER	2-13
FLOOR SKIRT	2-4	UNDER COVER	2-13
REAR SPOILER (NSS250/A ONLY)	2-4	HANDLEBAR COVER	2-14
BODY COVER (NSS250/A ONLY)	2-5	MUFFLER	2-14

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the body panels, fuel tank 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 clamp 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.

TORQUE VALUES

Exhaust pipe joint nut	29 N·m (3.0 kgf·m , 22 lbf·ft)
Exhaust pipe band bolt	22 N·m (2.2 kgf·m , 16 lbf·ft)
Muffler mount bolt	49 N·m (5.0 kgf·m , 36 lbf·ft)

TROUBLESHOOTING

Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

TRIM CLIP

TRIM CLIP 1

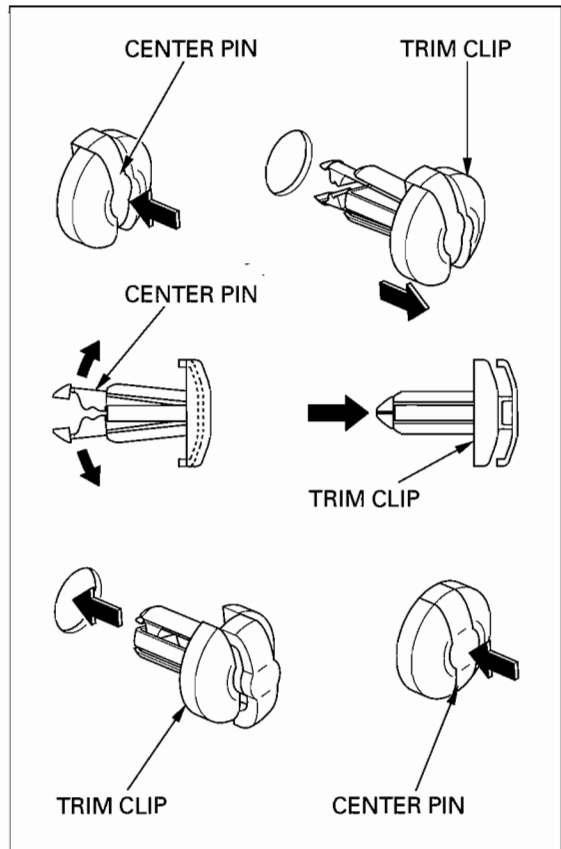
REMOVAL

Release by pushing the center pin.
Remove the trim clip.

INSTALLATION

Raise the center pin by spreading apart the pin ends and then push the pin back.

Install the trim clip.
Lock by pushing the center pin flush.



TRIM CLIP 2

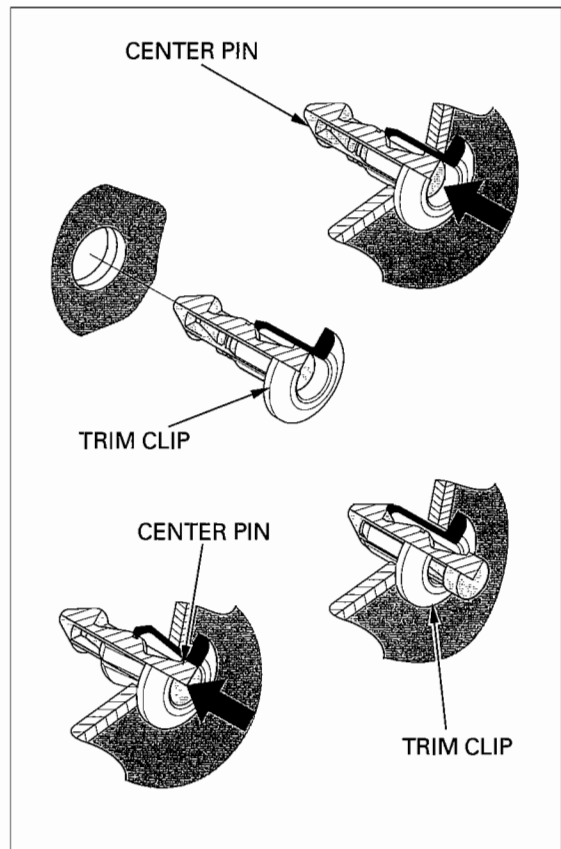
REMOVAL

Release by pushing the center pin.
Remove the trim clip.

INSTALLATION

Raise the center pin by pushing the pin tip back.

Install the trim clip.
Lock by pushing the center pin flush.



SEAT

REMOVAL

Unlock the seat with the ignition key.
Open the seat.

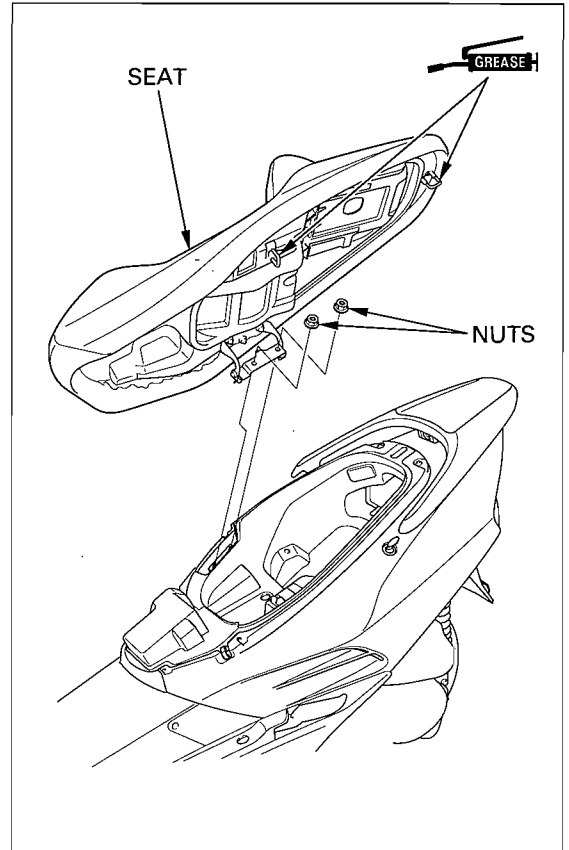
Remove the nuts and the seat.

INSTALLATION

Apply grease to the seat catches.

To lock the seat, push the front and rear seat lock securely. Installation is in the reverse order of removal.

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



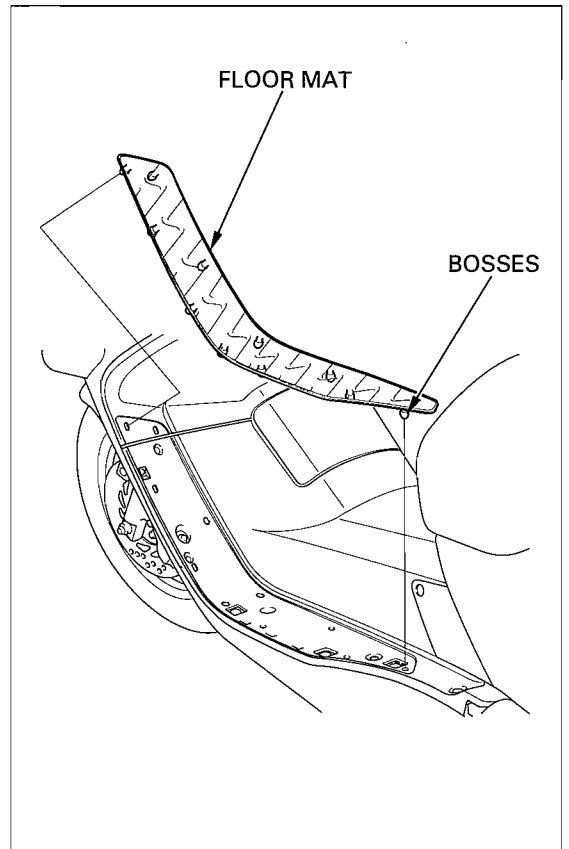
FLOOR MAT

REMOVAL

Release the bosses on the reverse side of the mat and remove the floor mat.

INSTALLATION

Align the bosses on the reverse side of the mat and install the floor mat securely.



FLOOR SKIRT

REMOVAL

Remove the floor mat (page 2-3).

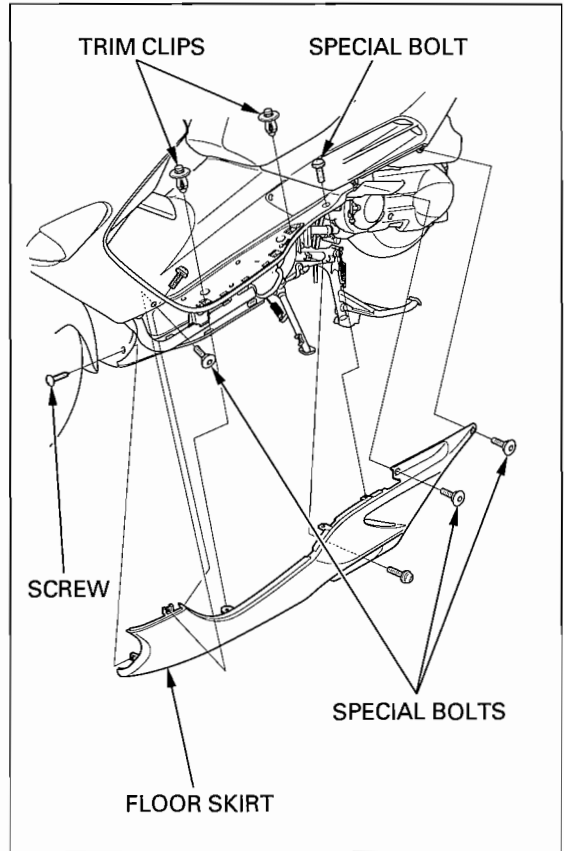
Remove the trim clips.
Remove the set screws, screw and special bolts.

Release the front end tabs on the front skirt from the front cover and front lower cover.

Be careful not to damage the tabs on the floor skirt. Release the tabs on the front skirt from the grooves on the floor board, then remove the front skirt.

INSTALLATION

When installing, make sure the tabs on the floor skirt are attached to the step floor. Installation is in the reverse order of removal.



REAR SPOILER (NSS250/A ONLY)

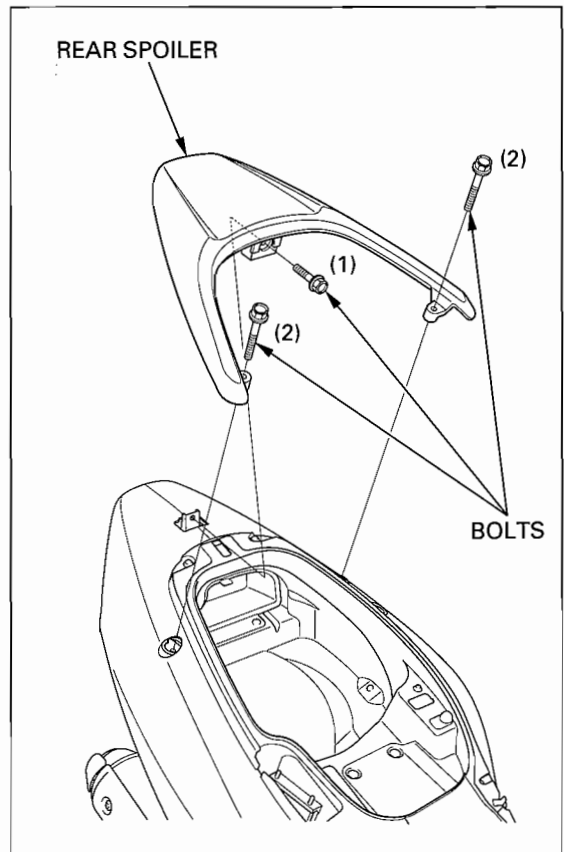
REMOVAL

Unlock the seat with the ignition key.
Open the seat.

Remove the bolts and rear spoiler.

INSTALLATION

During installation, tighten the bolts in the numerical order as shown. Installation is in the reverse order of removal.



BODY COVER (NSS250/A ONLY)

REAR CENTER COVER

REMOVAL

Remove the set screws.
Release the tabs on the rear center cover, then remove the rear center cover.

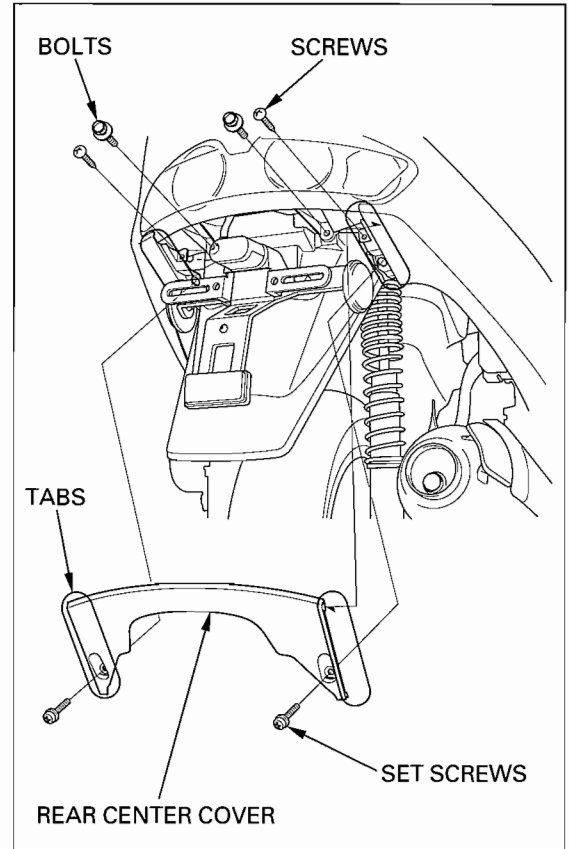
Be careful not to damage the tabs on the rear center cover.

BODY COVER

REMOVAL

Remove the seat (page 2-3).
Remove the rear spoiler (page 2-4).
Remove the rear center cover (see above).

Remove the screws and bolts.

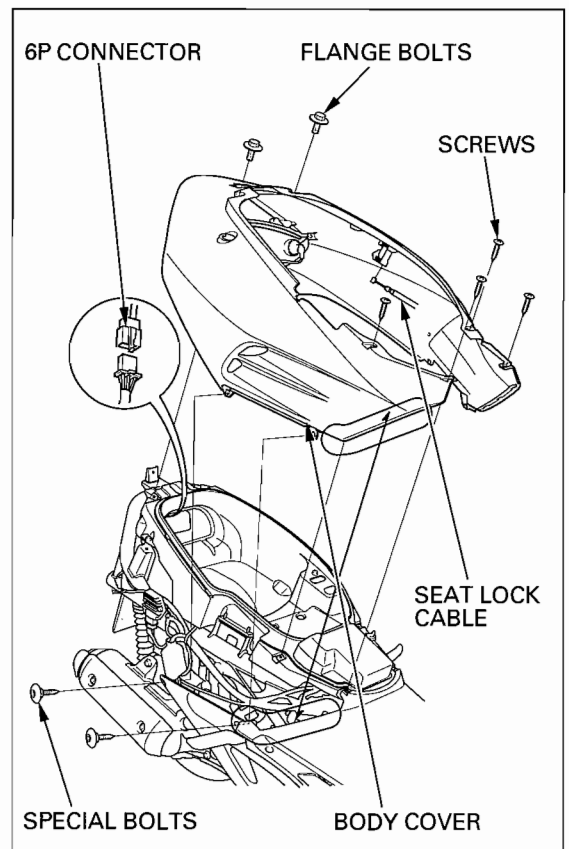


Remove the maintenance lid (page 20-3).

Disconnect the rear combination light 6P connector.

Remove the screws, flange bolts and special bolts.
Disconnect the seat lock cable from the key cylinder.
Remove the body cover.

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

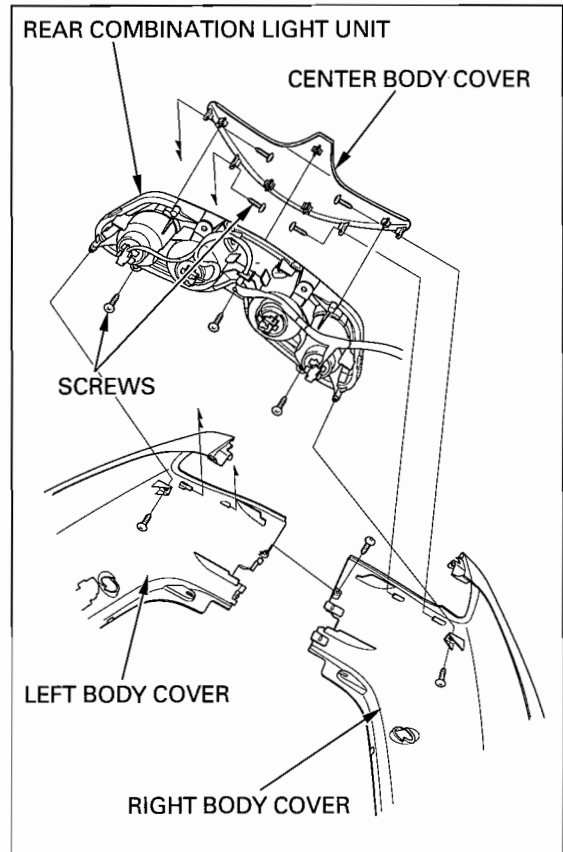


FRAME/BODY PANELS/EXHAUST SYSTEM

DISASSEMBLY/ASSEMBLY

Remove the screws and rear combination light unit. Remove the screws and release the tabs on the right/left/center body covers. Disassemble the right/left/center body covers.

Assembly is in the reverse order of disassembly.



INSTALLATION

Connect the seat lock cable to the key cylinder.

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

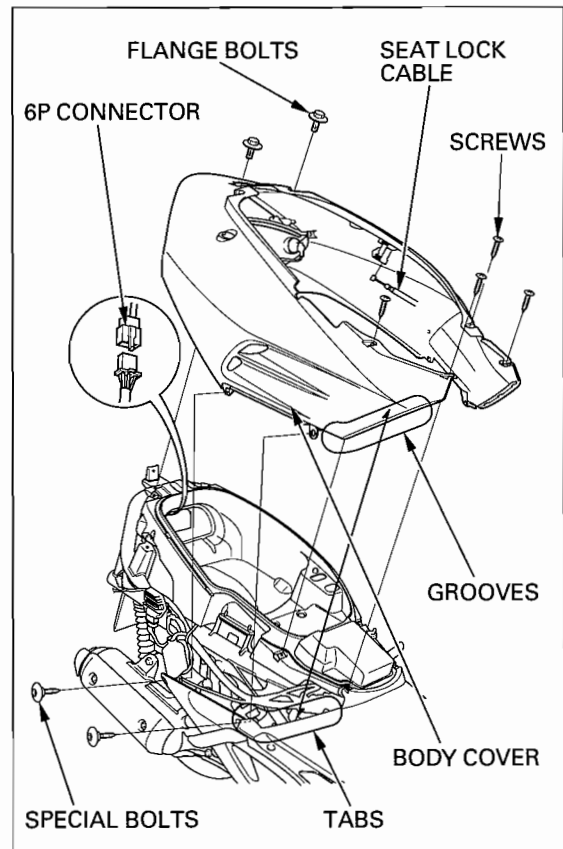
Align the grooves on the body cover with the tabs on the floor board, then install the body cover.

Install and tighten the screws, flange bolts and special bolts.

Route the wire harness and cables correctly (page 1-18).

Connect the rear combination light 6P connector.

Install the maintenance lid (page 20-3).



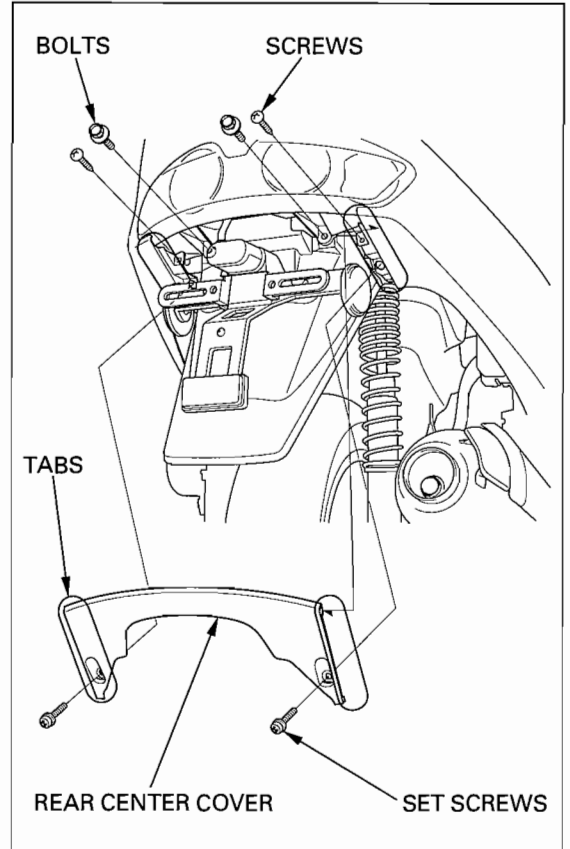
Install and tighten the screws and bolts securely.

Install the rear center cover (see below).
 Install the rear spoiler (page 2-4).
 Install the seat (page 2-3).

REAR CENTER COVER

INSTALLATION

Align the tabs on the rear center cover with the body cover.
 Install and tighten the set screws securely.



LUGGAGE BOX

UPPER LUGGAGE BOX

REMOVAL

Remove the body cover (page 2-5).
 Remove the floor board (page 2-8).
 Remove the battery (page 17-4).
 Remove the starter relay (page 19-12).

Disconnect the fuse box 9P and two 4P connectors.
 Disconnect the trunk switch connector (LBS type only).
 Disconnect the fuse box 4P and 1P connector (ABS type only).

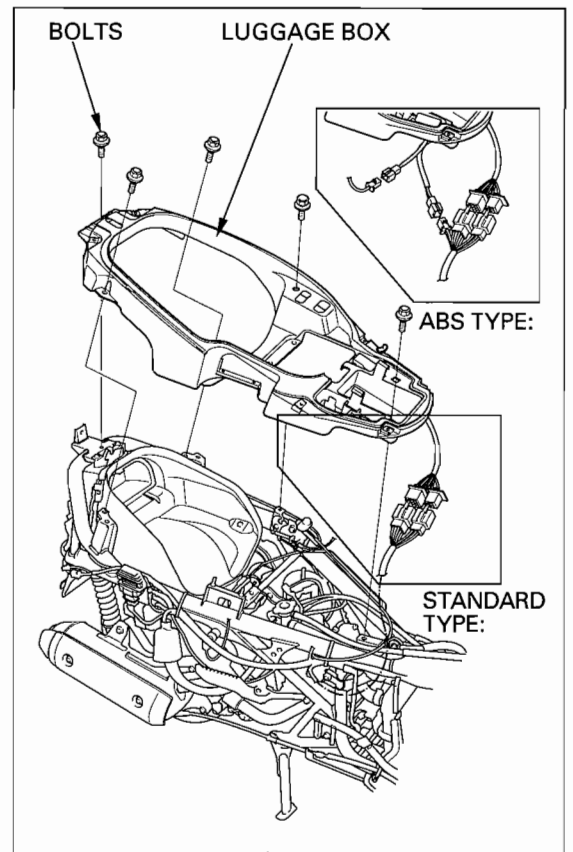
Remove the bolts and upper luggage box.

INSTALLATION

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

Installation is in the reverse order of removal.

Route the fuse box wires correctly (page 1-18).



FRAME/BODY PANELS/EXHAUST SYSTEM

LOWER LUGGAGE BOX

REMOVAL

Remove the upper luggage box (page 2-7).

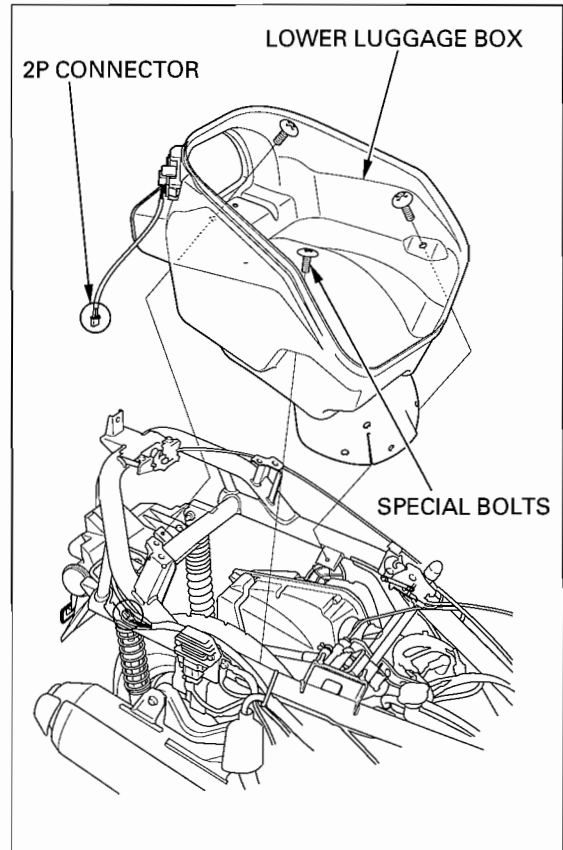
Disconnect the trunk light 2P connector.
Remove the special bolts and lower luggage box.

INSTALLATION

Installation is in the reverse order of removal.

*During installation,
be careful not to
damage the wire
harness.*

Route the trunk light wire correctly (page 1-18).



FLOOR BOARD

REMOVAL

Remove the floor skirt (page 2-4).

Unlock the fuel/reserve tank lid with the ignition key.
Open the fuel/reserve tank lid.

Remove the fuel tank cap and reserve tank cap.

Remove the screws and bolts.

*Be careful not to
damage the tabs
on the inner cover
and rear center
cover.*

Release the front end tabs of the floor board from the inner cover by sliding the floor cover board to rearward.

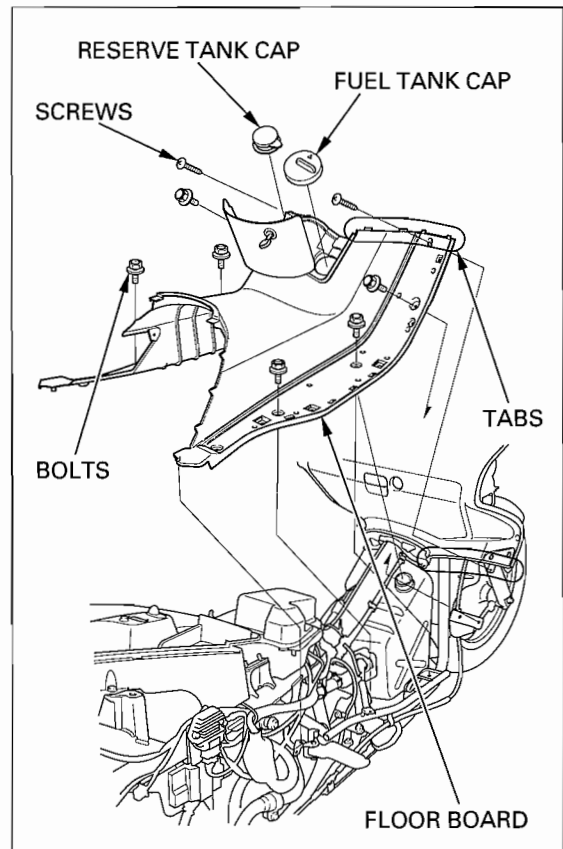
Remove the floor board.

INSTALLATION

Installation is in the reverse order of removal.

*During installation,
be careful not to
damage the wire
harness.*

After installation, make sure the tabs on the floor board are attached to the inner cover.



WINDSHIELD

WINDSHIELD GARNISH

REMOVAL

Remove the screws and set screws.
Release the rear end tabs on the windshield garnish from the grooves on the front cover.

Release the front hook on the windshield garnish from the grooves on the front cover.
Remove the windshield garnish.

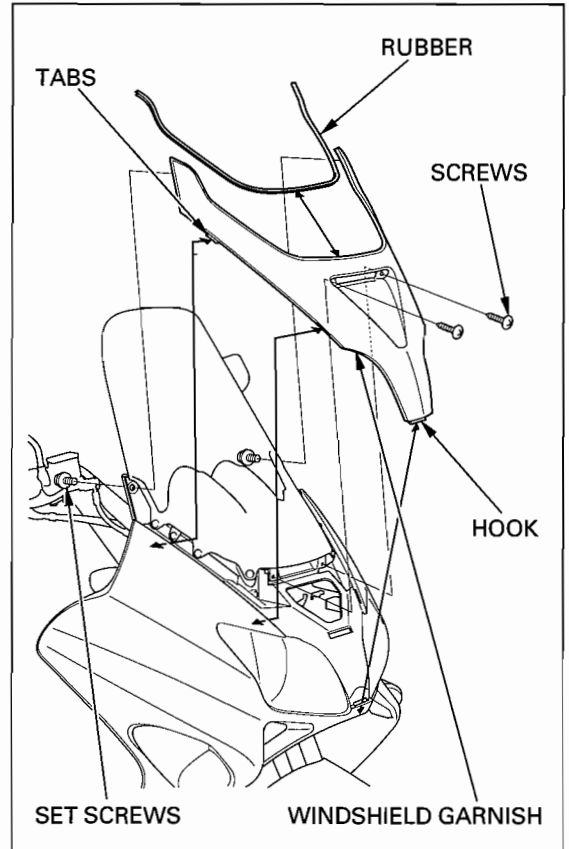
Be careful not to damage the tabs on the windshield garnish.

Remove the rubber from the windshield garnish.

INSTALLATION

Installation is in the reverse order of removal.

After installation, make sure the tabs on the windshield garnish are attached to the front cover.



WINDSHIELD

REMOVAL

Remove the windshield garnish (see above).

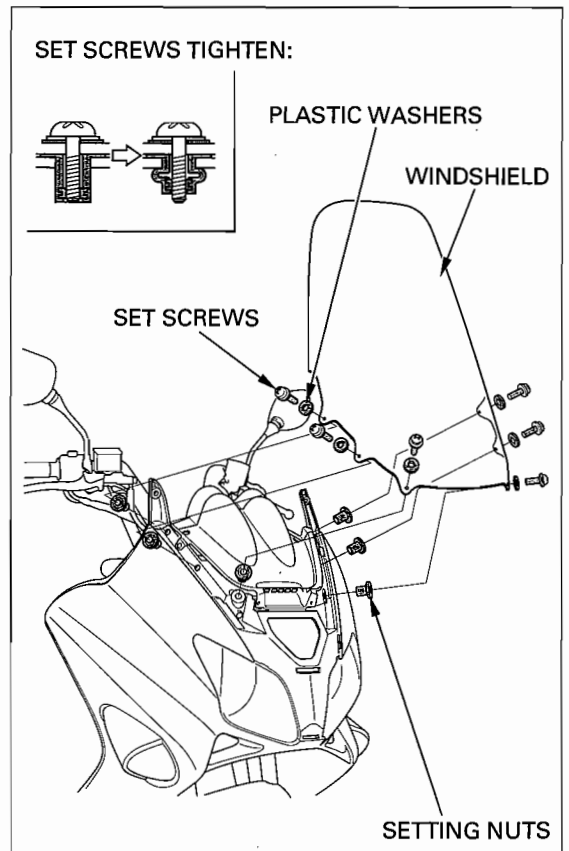
Remove the set screws and plastic washers.
Remove the windshield.

Be careful not to scratch or damage the windshield surface.

Remove the setting nuts.

INSTALLATION

Install the setting nuts.
Install the windshield, aligning the holes on the windshield with the setting nuts.
Install the plastic washers and set screws.
Tighten the set screws securely as shown.



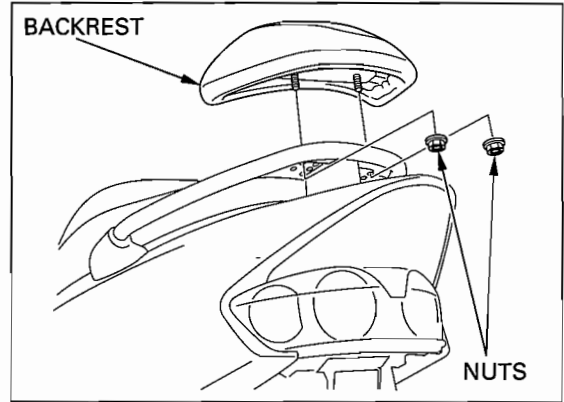
BACKREST (NSS250S/AS ONLY)

REMOVAL

Remove the nuts and backrest.

INSTALLATION

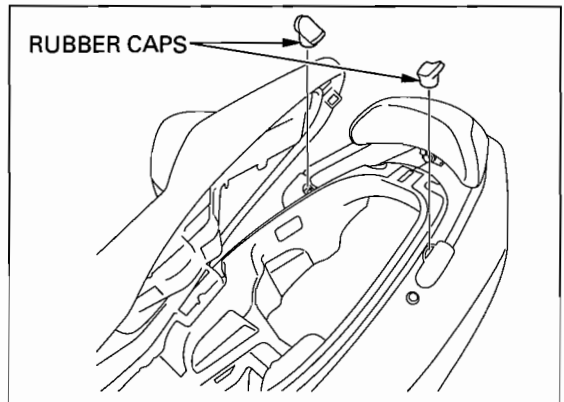
Installation is in the reverse order of removal.



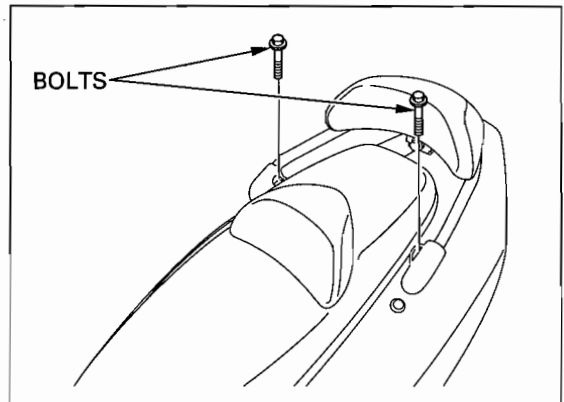
GRAB RAIL (NSS250S/AS ONLY)

REMOVAL

Unlock the seat with the ignition key.
Open the seat.
Remove the rubber caps.



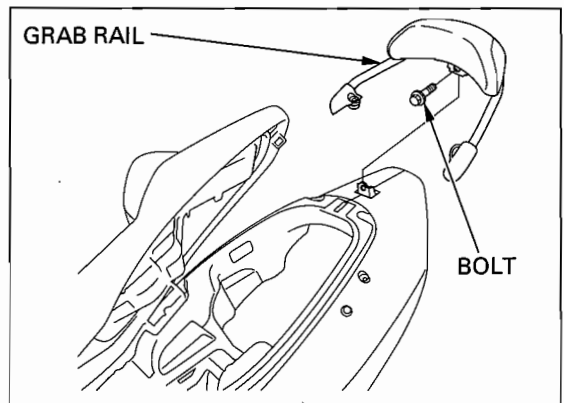
Close the seat.
Remove the bolts.



Unlock the seat with the ignition key.
Remove the bolt and grab rail.

INSTALLATION

Installation is in the reverse order of removal.

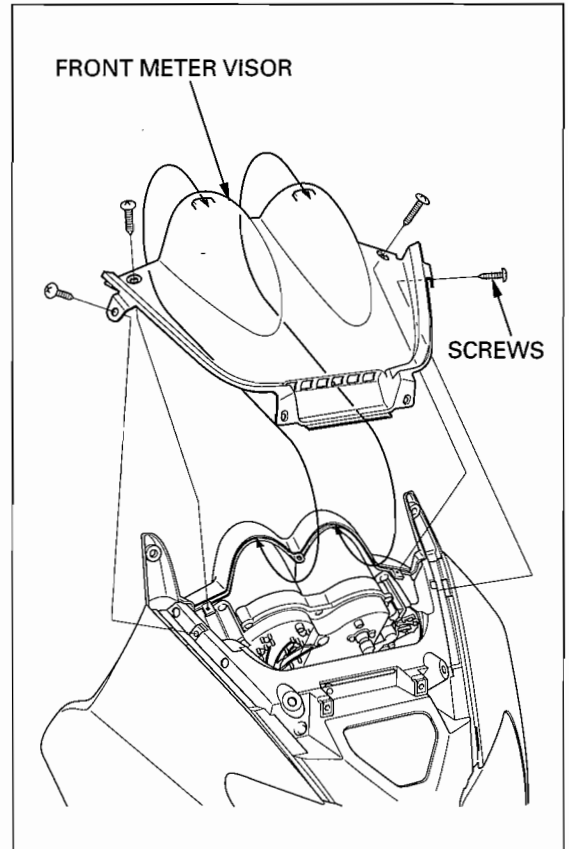


FRONT COVER

FRONT METER VISOR REMOVAL/INSTALLATION

Remove the windshield (page 2-9).

Be careful not to damage the tabs on the front cover. Remove the screws and front meter visor. Installation is in the reverse order of removal.

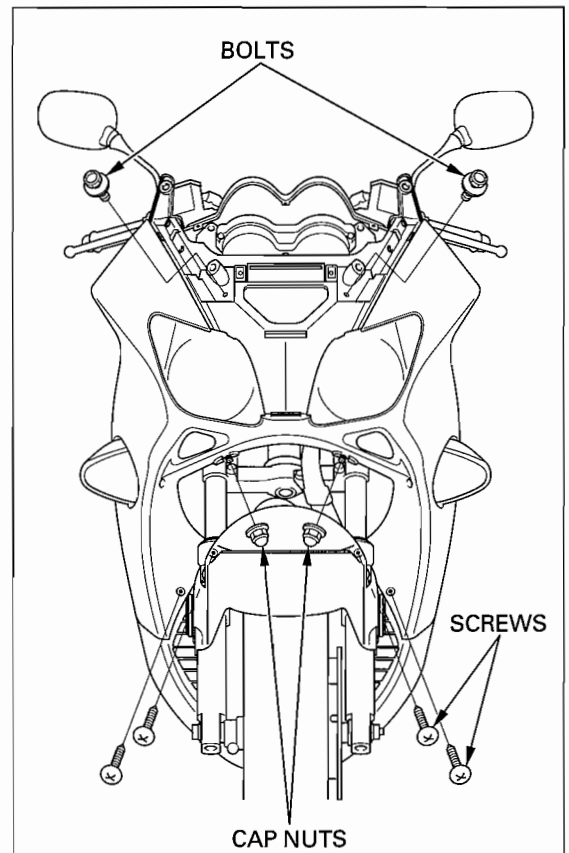


FRONT COVER

REMOVAL

Remove the front meter visor (see above).

Remove the bolts, cap nuts and screws.



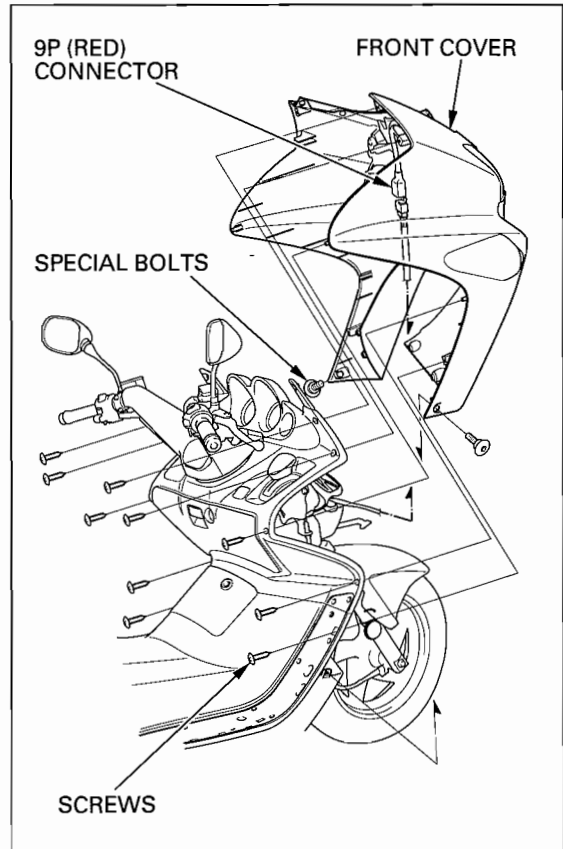
FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the special bolts and screws.
Release the tabs on the front cover from the inner cover and floor board.
Remove the front cover.
Disconnect the headlight/front turn signal unit 9P (Red) connector (LBS type).
Disconnect the headlight/front turn signal unit 9P (Green) connector (ABS type).

During 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 front cover are attached to the inner cover and step floor.



FRONT LOWER COVER

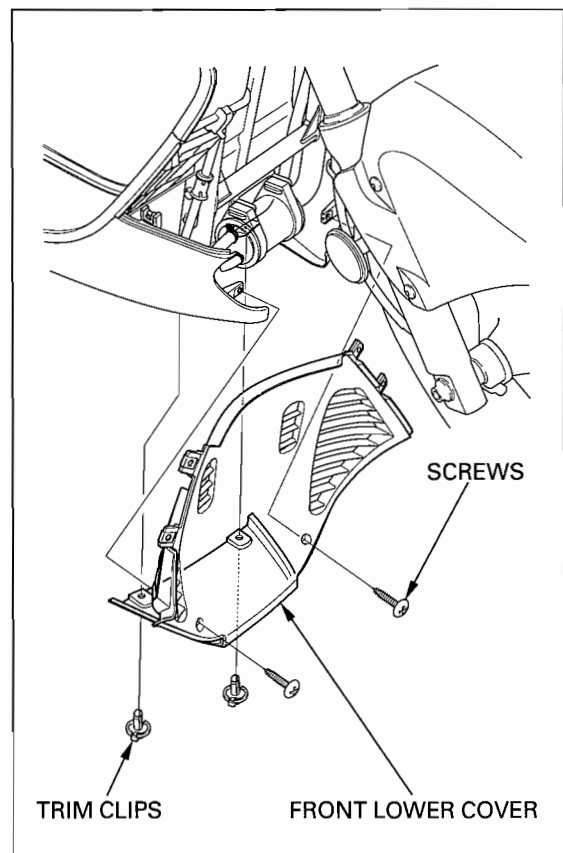
REMOVAL

Remove the front cover (page 2-11).

Remove the screws and trim clips.
Remove the front lower cover.

INSTALLATION

Installation is in the reverse order of removal.



INNER COVER

REMOVAL

Remove the floor skirt (page 2-4).
Remove the front cover (page 2-11).

Unlock the fuel/reserve tank lid with the ignition key.
Open the fuel/reserve tank lid.

Remove the special screw, parking brake lever and rod.
Remove the rubber cover.

Remove the special screw and screws.
Remove the inner cover.

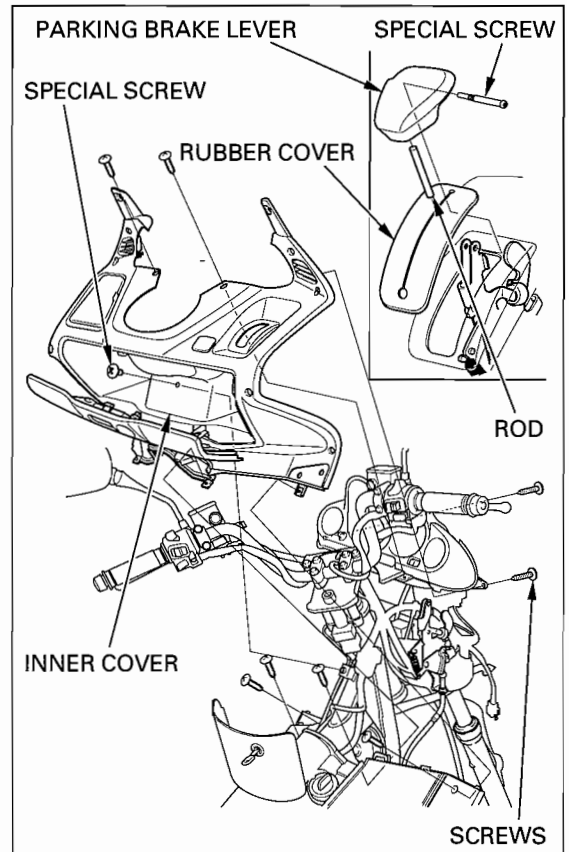
INSTALLATION

During installation, be careful not to damage the wire harness and the rubber cover.

Install the inner cover, aligning the groove with the parking brake lever.

After installation, check the parking brake lever operation (page 16-33).

Installation is in the reverse order of removal.



UNDER COVER

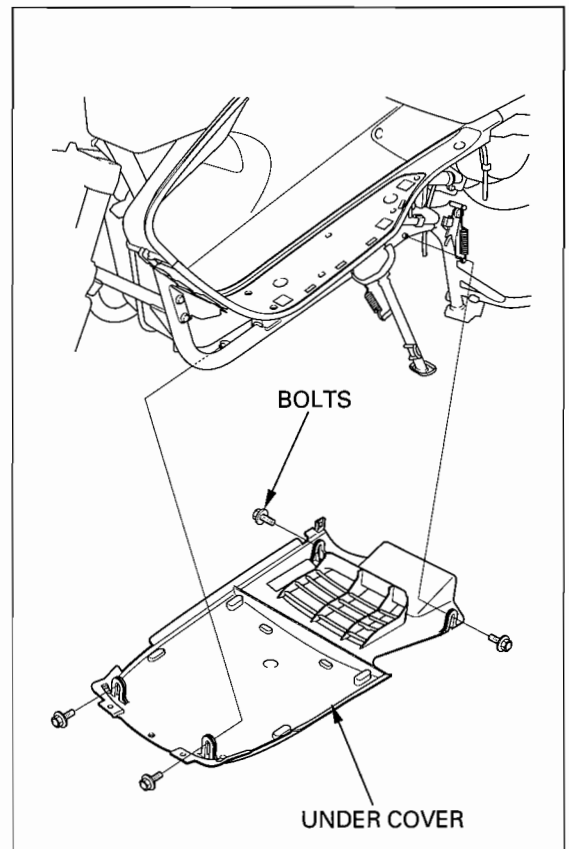
REMOVAL

Remove the floor skirt (page 2-4).
Remove the front lower cover (page 2-11).

Remove the bolts and under cover.

INSTALLATION

Installation is in the reverse order of removal.



HANDLEBAR COVER

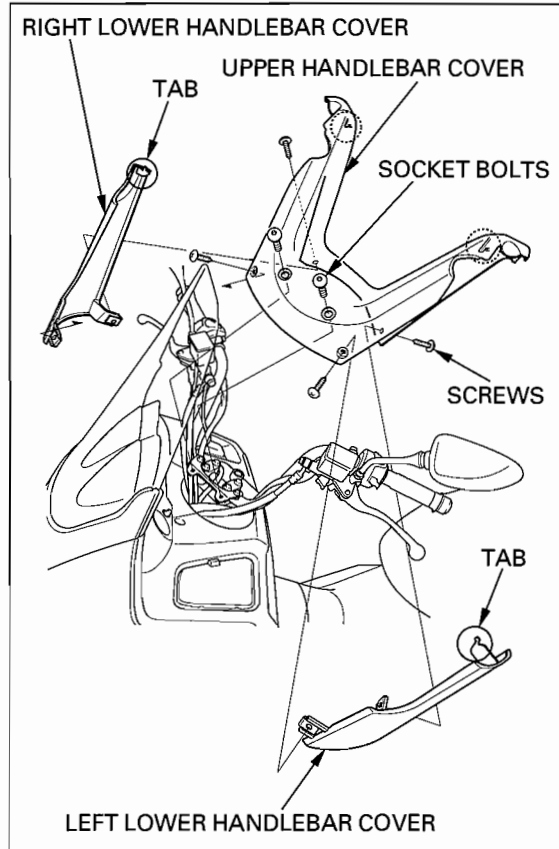
REMOVAL

Remove the screws, right lower handlebar cover and left lower handlebar cover.
Remove the socket bolts and upper handlebar cover.

INSTALLATION

At installation, be careful not to damage the wire harness. Installation is in the reverse order of removal.

When installing, align the tabs on the right and left lower handlebar cover with the tabs on the upper handlebar cover.



MUFFLER

REMOVAL

Remove the right floor skirt (page 2-4).

Loosen the exhaust pipe band bolt.
Remove the exhaust pipe joint nuts.
Remove the muffler mount bolts, muffler and exhaust pipe.
Remove the gaskets.

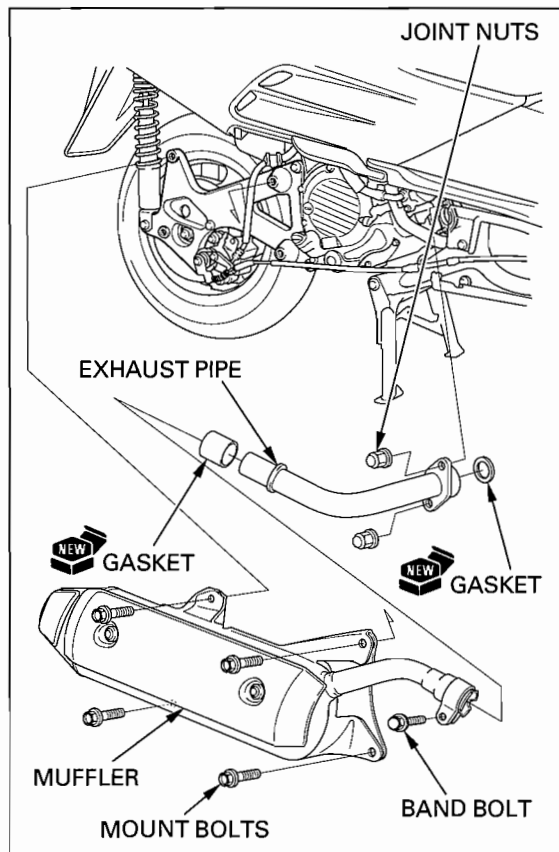
INSTALLATION

Replace the gaskets with new ones.
Installation is in the reverse order of removal by loosely tightening all fasteners.
Tighten the joint nuts first, then tighten the mount bolts and band bolt to the specified torque.

TORQUE:

- Exhaust pipe joint nut:** 29 N·m (3.0 kgf·m , 22 lbf·ft)
- Exhaust pipe band bolt:** 22 N·m (2.2 kgf·m , 16 lbf·ft)
- Muffler mount bolt:** 49 N·m (5.0 kgf·m , 36 lbf·ft)

After installation, inspect the exhaust system for leaks.



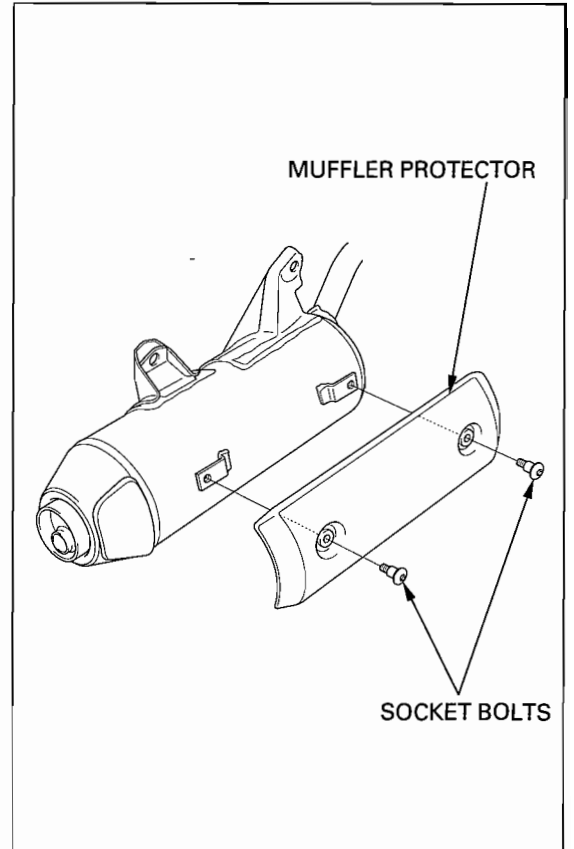
MUFFLER PROTECTOR

REMOVAL

The muffler protector can be serviced with the muffler installed in the engine.
Remove the socket bolts and muffler protector.

INSTALLATION

Installation is in the reverse order of removal.



MEMO

3. MAINTENANCE

SERVICE INFORMATION	3-1	EVAPORATIVE EMISSION CONTROL SYSTEM	3-12
MAINTENANCE SCHEDULE	3-3	FINAL DRIVE OIL	3-12
FUEL LINE	3-4	BRAKE FLUID	3-14
THROTTLE OPERATION	3-4	BRAKE PAD WEAR	3-15
AIR CLEANER	3-5	BRAKE SYSTEM	3-15
CRANKCASE BREATHER	3-6	BRAKE LOCK OPERATION	3-16
SPARK PLUG	3-6	HEADLIGHT AIM	3-16
VALVE CLEARANCE	3-7	SIDESTAND	3-16
ENGINE OIL	3-8	SUSPENSION	3-17
ENGINE OIL STRAINER SCREEN	3-9	NUTS, BOLTS, FASTENERS	3-17
ENGINE IDLE SPEED	3-10	WHEELS/TIRES	3-18
RADIATOR COOLANT	3-10	STEERING HEAD BEARINGS	3-18
COOLING SYSTEM	3-11		
SECONDARY AIR SUPPLY SYSTEM	3-12		

SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

ITEM		SPECIFICATIONS
Throttle grip freeplay		2–6 mm (1/16–1/4 in)
Spark plug	Standard	DPR7EA-9 (NGK), X22EPR-U9 (DENSO)
	For cold climate (below 5°C/41°F)	DPR6EA-9 (NGK), X20EPR-U9 (DENSO)
	For extended high speed riding	DPR8EA-9 (NGK), X24EPR-U9 (DENSO)
Spark plug gap		0.80–0.90 mm (0.031–0.035 in)
Recommended engine oil		Pro Honda GN4 4-stroke oil or equivalent motor oil API service classification SG or Higher JASO T 903 standard: MA Viscosity: SAE 10W-30
Engine oil capacity	After draining	1.1 ℓ (1.2 US qt, 1.0 Imp qt)
	After disassembly	1.3 ℓ (1.4 US qt, 1.1 Imp qt)
Engine idle speed		1,500 ± 100 rpm
Final reduction oil capacity	After draining	0.16 ℓ (0.17 US qt, 0.14 Imp qt)
	After disassembly	0.20 ℓ (0.21 US qt, 0.18 Imp qt)
Recommended final reduction oil		Hypoid gear oil # 90
Recommended brake fluid		Honda DOT 4 Brake Fluid

MAINTENANCE

ITEM		SPECIFICATIONS		
Cold tire pressure	Rider only	Front	175 kPa (1.75 kgf/cm ² , 25 psi)	
		Rear	200 kPa (2.00 kgf/cm ² , 29 psi)	
	Rider and passenger	Front	175 kPa (1.75 kgf/cm ² , 25 psi)	
		Rear	250 kPa (2.50 kgf/cm ² , 36 psi)	
Tire size		Front	110/90-13 M/C 56L	
		Rear	130/70-12 62L	
Tire brand		Bridgestone	Front	BRIDGESTONE HOOP B03F
			Rear	BRIDGESTONE HOOP B02
		Dunlop	Front	DUNLOP D305FG
			Rear	DUNLOP D305
Minimum tread depth		Front	1.5 mm (0.06 in)	
		Rear	2.0 mm (0.08 in)	

TORQUE VALUES

Spark plug	18 N·m (1.8 kgf·m , 13 lbf·ft)
Adjusting hole cap	5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)
Timing hole cap	5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)
Engine oil strainer cap	20 N·m (2.0 kgf·m , 14 lbf·ft)
Final drive oil drain bolt	13 N·m (1.3 kgf·m , 9 lbf·ft)
Final drive oil level check bolt	13 N·m (1.3 kgf·m , 9 lbf·ft)
Final drive oil filler bolt	13 N·m (1.3 kgf·m , 9 lbf·ft)
Master cylinder reservoir cap screw	1.5 N·m (0.15 kgf·m , 1.1 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 your Honda dealer.

ITEMS	FREQUENCY	WHICHEVER COMES FIRST NOTE	ODOMETER READING (NOTE 1)								REFER TO PAGE		
			X 1,000 mi	0.6	4	8	12	16	20	24			
			X 100 km	10	64	128	192	256	320	384			
EMISSION RELATED ITEMS	* FUEL LINE				I			I					3-4
	* THROTTLE OPERATION				I			I					3-4
	AIR CLEANER	NOTE 2					R					R	3-5
	CRANKCASE BREATHER	NOTE 3			C	C	C	C	C	C	C	C	3-6
	SPARK PLUG				I	R	I	R	I	R	I	R	3-6
	* VALVE CLEARANCE				I		I		I		I		3-7
	ENGINE OIL		'01 - '05	R	R	R	R	R	R	R	R	R	3-8
	NEW	After '05	INITIAL = 600 mi (1,000 km) or 1 month : R REGULAR = Every 4,000 mi (6,400 km) or 6 months : R										
	* ENGINE OIL STRAINER SCREEN					C		C		C		C	3-9
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	RADIATOR COOLANT	NOTE 4				I		I		I		R	3-10
	* COOLING SYSTEM					I		I		I		I	3-11
	* SECONDARY AIR SUPPLY SYSTEM					I		I		I		I	3-12
* EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE 7						I				I	3-12	
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	BELT CASE AIR CLEANER				C	C	C	C	C	C	C	C	10-2
	* FINAL DRIVE OIL	NOTE 6											3-12
	BRAKE FLUID	NOTE 4			I	I	R	I	I	R	I	R	3-14
	BRAKE PAD WEAR				I	I	I	I	I	I	I	I	3-15
	BRAKE SYSTEM				I		I		I		I		3-15
	* BRAKE LIGHT SWITCH					I		I		I		I	20-11
	* BRAKE LOCK OPERATION				I	I	I	I	I	I	I	I	3-16
	* HEADLIGHT AIM					I		I		I		I	3-16
	** CLUTCH SHOE WEAR				I	I	I	I	I	I	I	I	10-7
	SIDE STAND					I		I		I		I	3-16
	* SUSPENSION					I		I		I		I	3-17
	* NUTS, BOLTS, FASTENERS			I		I		I		I		I	3-17
** WHEELS/TIRES					I		I		I		I	3-18	
** STEERING HEAD BEARINGS					I		I		I		I	3-18	

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

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

- NOTES:
- At higher odometer readings, repeat at the frequency interval established here.
 - Service more frequently when riding in unusually wet or dusty areas.
 - Service more frequently when riding in rain or at full throttle.
 - Replace every 2 years, or at indicated odometer interval, whichever comes first. Replacement requires mechanical skill.
 - Inspect every 8,000 mi (12,800 km) after replacement.
 - Replace every 2 years. Replacement requires mechanical skill.
 - California type only.

MAINTENANCE

FUEL LINE

Remove the floor board (page 2-8).

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 cables. 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 cables, and overhaul and lubricate the throttle grip housing.

For cable lubrication: Disconnect the throttle cables at their upper ends. Thoroughly lubricate the cables and their pivot points with a commercially available cable lubricant or a lightweight oil.

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

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

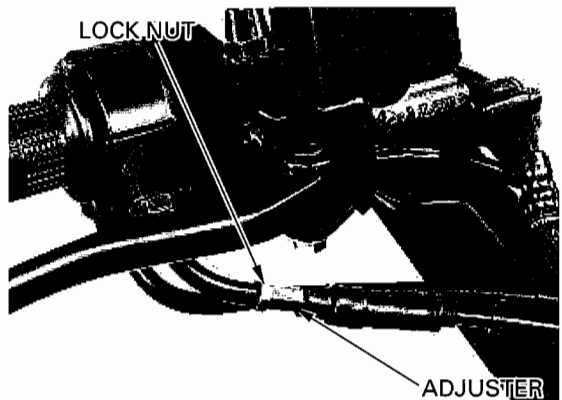
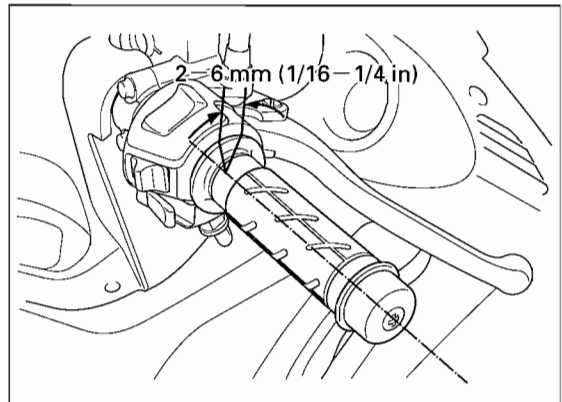
With the engine idling, turn the handlebar all the way to the right and left to ensure that the idle speed does not change. If idle speed increases, check the throttle grip free play and throttle cable connection.

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

THROTTLE GRIP FREE PLAY:
2–6 mm (1/16–1/4 in)

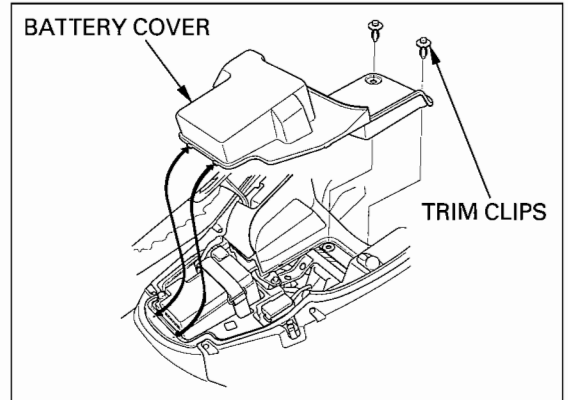
Throttle grip free play can be adjusted at either end of the throttle cable. Minor adjustments are made with the upper adjuster.

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



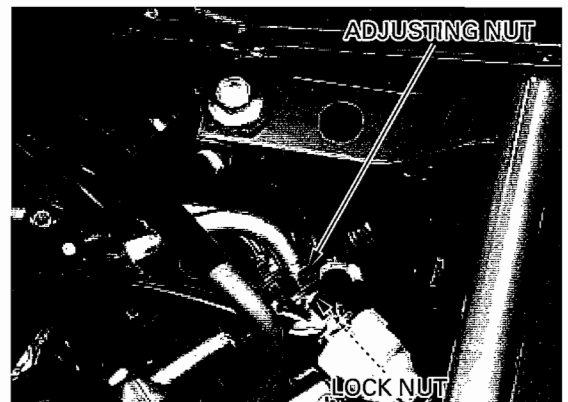
Major adjustments are made with the lower adjuster.

Unlock and open the seat with the ignition key.
Remove the trim clips and battery cover.



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

Recheck the throttle operation and install the battery cover.

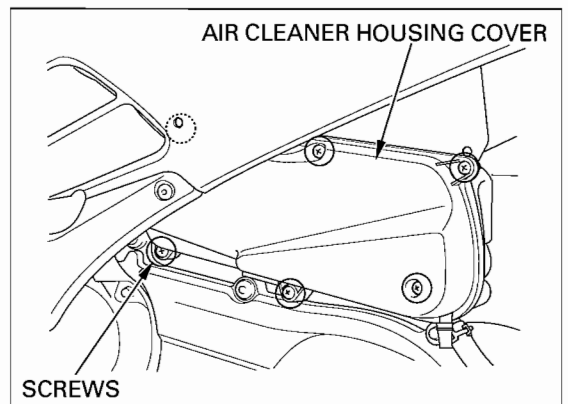


AIR CLEANER

NOTE:

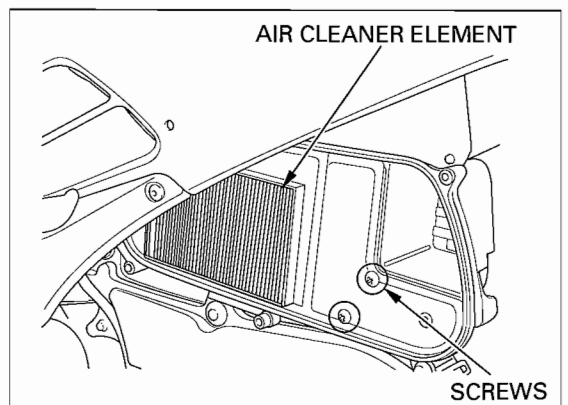
- The viscous paper element type air cleaner cannot be cleaned because the element contains a dust adhesive.
- If the motorcycle is used in wet or dusty areas, more frequent inspections are required.

Remove the six air cleaner housing cover screws.
Remove the air cleaner housing cover.
Remove the two screws and the element.



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

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



CRANKCASE BREATHER

NOTE:

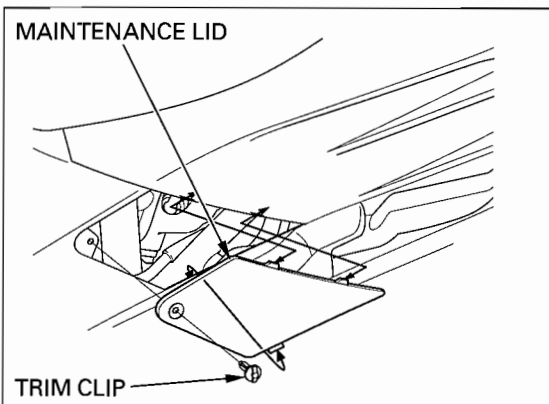
- Service more frequently when operated in rain, at full throttle, or after the scooter is washed. Service if the deposits level can be seen in the transparent section of the breather hose.

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



SPARK PLUG

Remove the trim clip (page 2-3) and plug maintenance lid.



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

NOTE:

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

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:

DPR7EA-9 (NGK), X22EPR-U9 (DENSO)

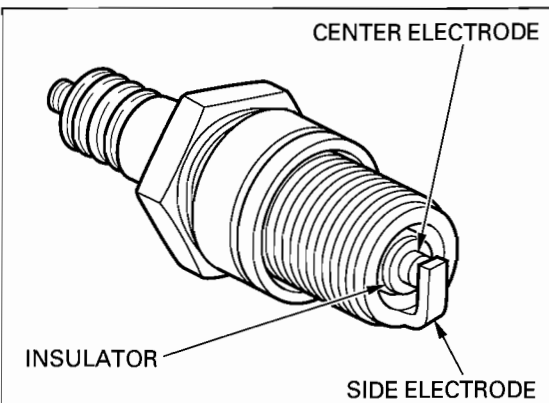
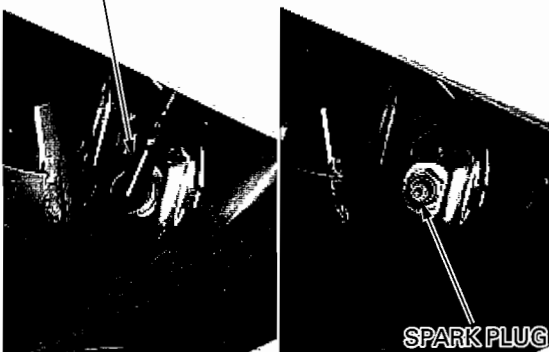
For cold climate (below 5°C/41°F):

DPR6EA-9 (NGK), X20EPR-U9 (DENSO)

For extended high speed riding:

DPR8EA-9 (NGK), X24EPR-U9 (DENSO)

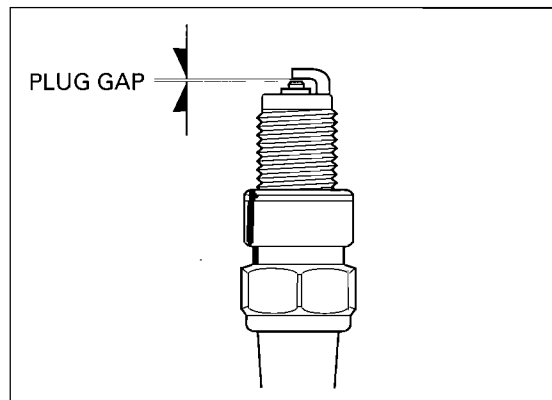
SPARK PLUG CAP



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)

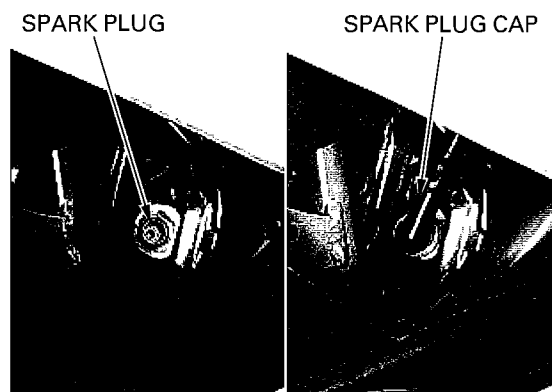


Install the spark plug in the cylinder head and hand tighten, then torque to specification.

TORQUE: 18 N·m (1.8 kgf·m , 13 lbf·ft)

Install the spark plug cap.

Install the removed parts in the reverse order of removal.



VALVE CLEARANCE

INSPECTION

NOTE:

- Inspect and adjust the valve clearance while the engine is cold.

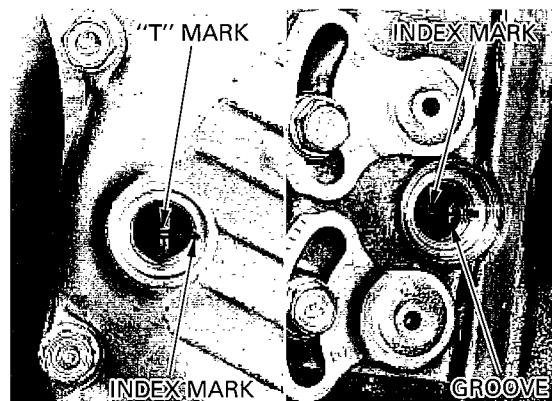
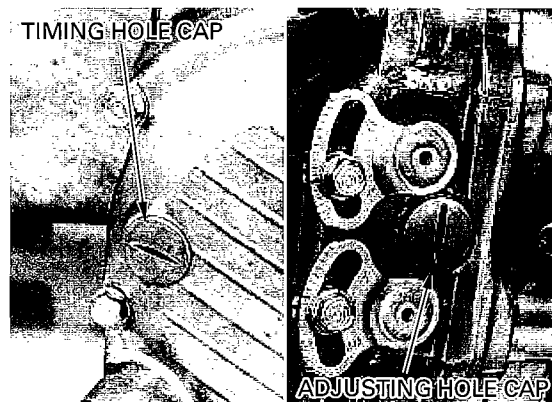
Remove the plug maintenance lid (page 3-6).
Remove the belt case air cleaner (page 10-3).

Remove the timing hole cap and adjusting hole cap.

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

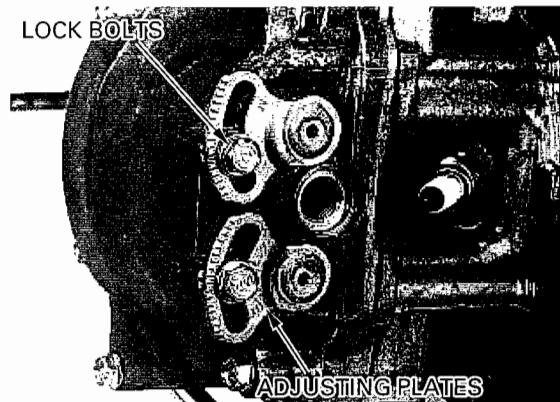
Make sure the camshaft groove aligns with the index mark on the head cover (TDC on the compression stroke).

If the camshaft groove is not aligned, turn the crankshaft one revolution and realign the "T" mark with the index mark.



MAINTENANCE

Loosen the adjusting plate lock bolts.
Move the intake and exhaust adjusting plates outward (away from each other) fully, until resistance is felt.
Then move them inward (toward each other), equivalent of one graduation.
Tighten the adjusting plate lock bolts securely.



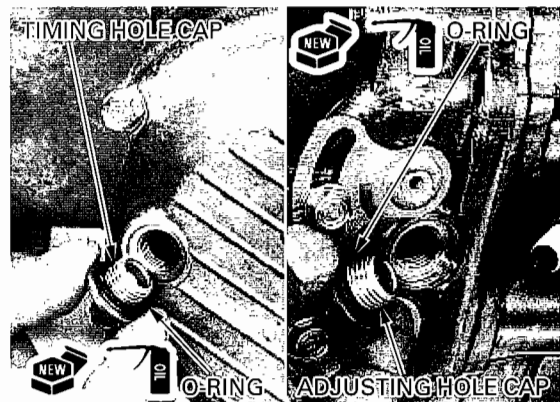
Coat a new O-ring with engine oil and install it onto the adjusting hole cap.
Install and tighten the adjusting hole cap.

TORQUE: 5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)

Coat a new O-ring with engine oil and install it onto the timing hole cap.
Install and tighten the timing hole cap.

TORQUE: 5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)

Install the removed parts in the reverse order of removal.



ENGINE OIL

⚠ CAUTION

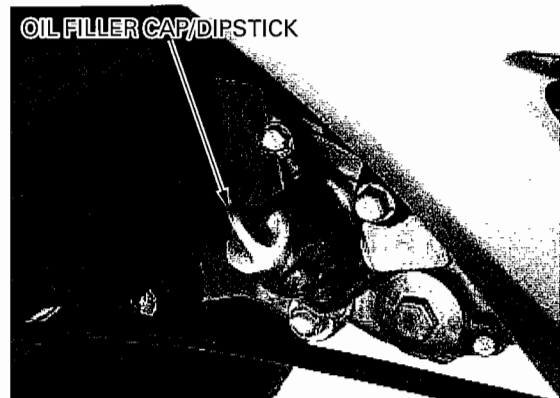
Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.

NOTE:

- Check the oil level after starting the engine and allowing the oil to circulate through the engine thoroughly. It is especially important on a dry sump engine, due to the comparatively large volume of oil.
- Do not snap the throttle while idling or the oil level reading will be inaccurate.

Place the scooter on its center stand.
Start the engine and let it idle for a few minutes.
Stop the engine.
Wait a few minutes and remove the oil filler cap/dipstick.
Wipe the oil from the dipstick with a clean cloth.

Insert the dipstick into the oil filler hole without screwing it in.



LOWER LEVEL



UPPER LEVEL

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

RECOMMENDED ENGINE OIL:

Pro Honda GN4 4-stroke oil or equivalent motor oil

API service classification SG or Higher

JASO T 903 standard: MA

Viscosity: SAE 10W-30

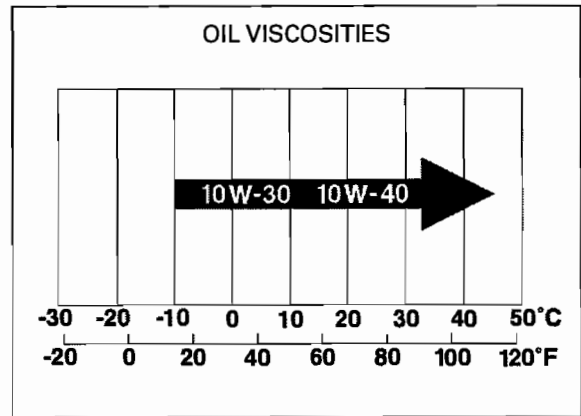
NEW

NOTE:

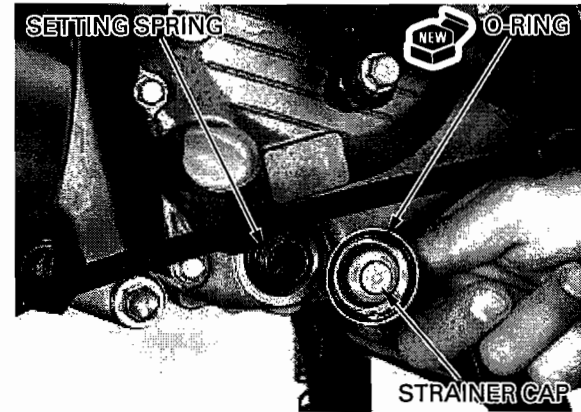
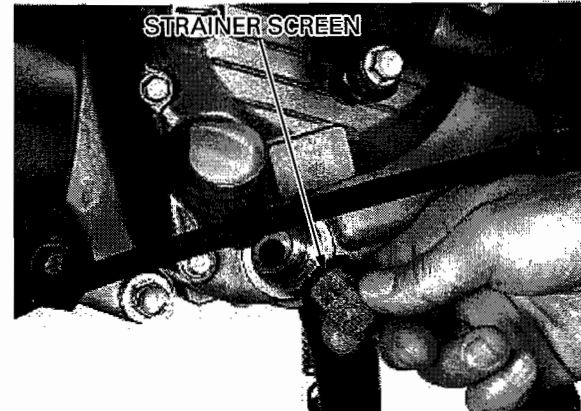
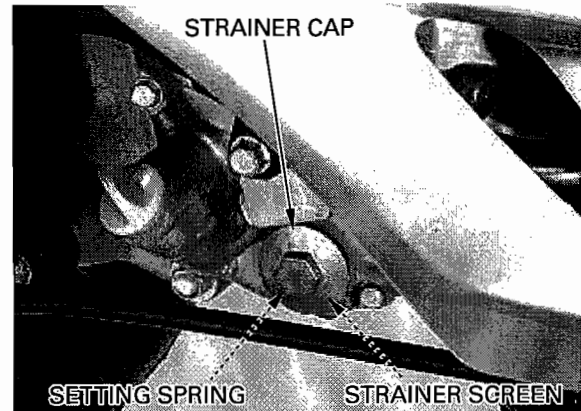
- Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range.

Reinstall the filler cap/dipstick.

For engine oil change, see below.



NEW



ENGINE OIL STRAINER SCREEN

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

- Warm up the engine.
- Stop the engine.
- Remove the oil filler cap/dipstick and oil strainer cap, and drain the oil.

Clean the oil strainer.

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.

After draining the oil completely, install the strainer screen and setting spring into the engine.

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

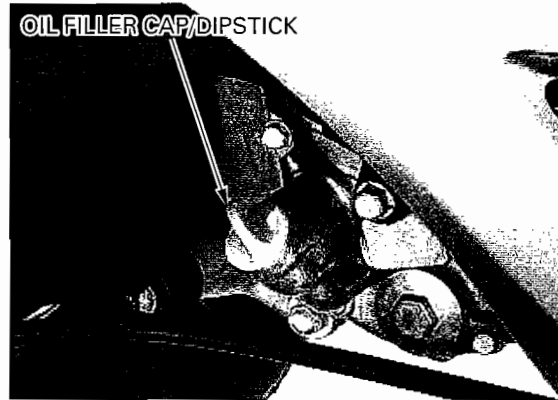
TORQUE: 20 N·m (2.0 kgf·m , 14 lbf·ft)

MAINTENANCE

Fill the crankcase with the recommended oil.

OIL CAPACITY: 1.1 ℓ (1.2 US qt , 1.0 Imp qt)
at draining
1.3 ℓ (1.4 US qt , 1.1 Imp qt)
at disassembly

Reinstall the oil filler cap/dipstick.
Check the engine oil level (page 3-8).
Make sure there are no oil leaks.



ENGINE IDLE SPEED

NOTE:

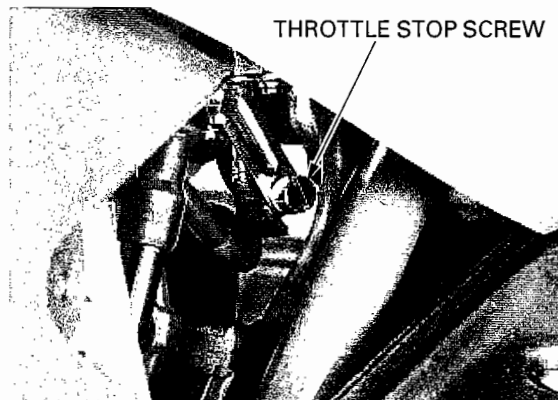
- Inspect and adjust the idle speed after all other engine maintenance items have been performed and are within specification.
- The engine must be warm for accurate idle speed inspection and adjustment.

Warm up the engine.
Place the scooter on its center stand.

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

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

IDLE SPEED: 1,500 ± 100 rpm



RADIATOR COOLANT

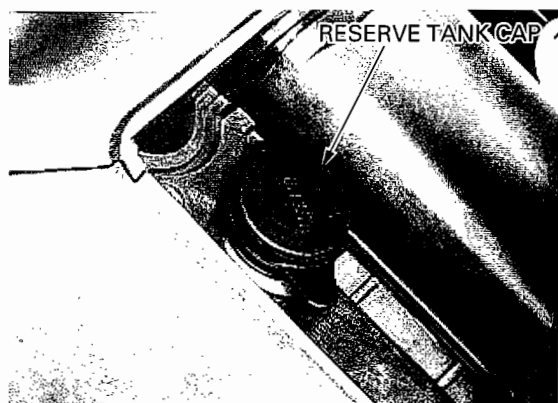
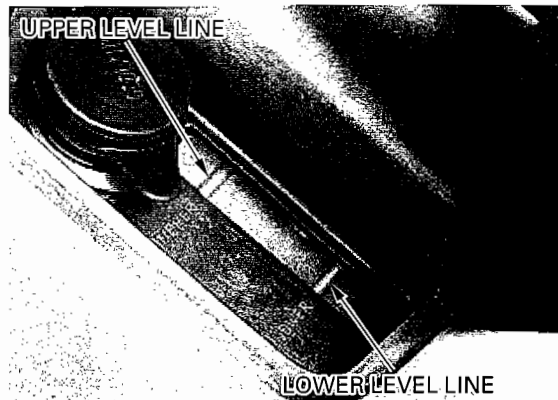
Place the scooter on its center stand.
Unlock and open the fuel/reserve tank lid with the ignition key.

Check the coolant level in 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 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 6-4).

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.



RECOMMENDED ANTIFREEZE:

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

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

If the reserve tank becomes completely empty, there is a possibility of air getting into the cooling system.

Be sure to remove any air from the cooling system (page 6-5).

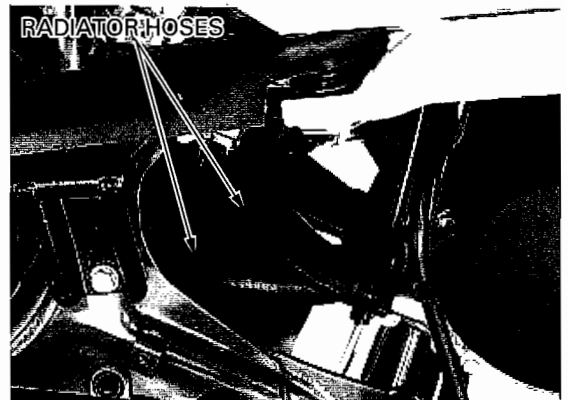
COOLING SYSTEM

Remove the floor skirt (page 2-4).

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

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

Check that all hose clamps are tight.

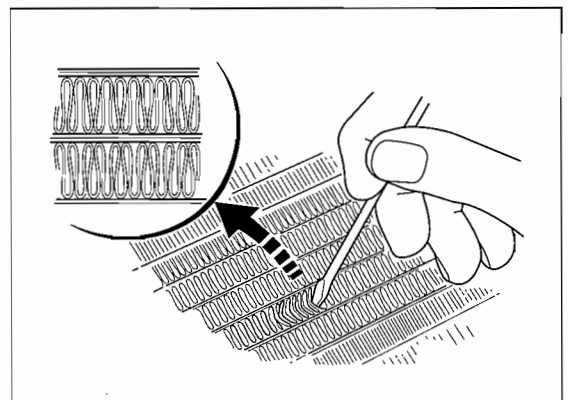
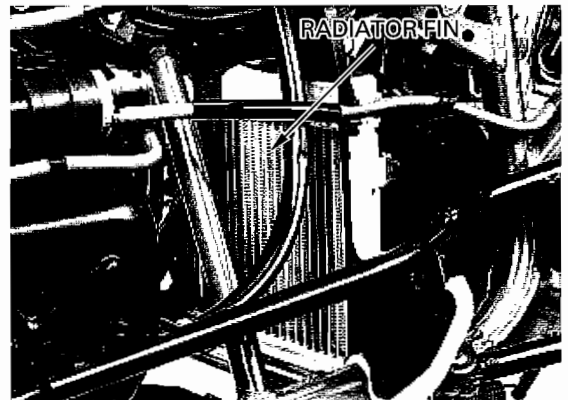


Remove the floor board (page 2-8).

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 step floor (page 2-8).



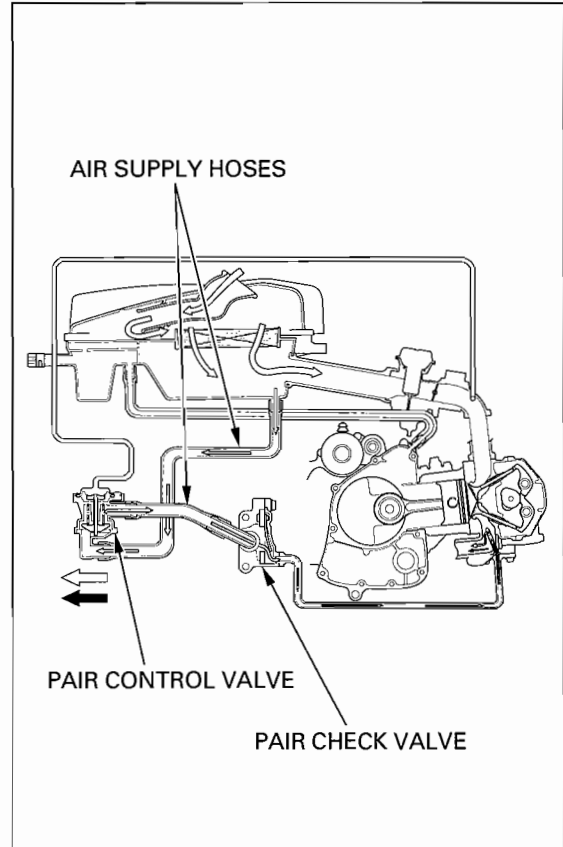
SECONDARY AIR SUPPLY SYSTEM

Check the air supply hoses between the pulse secondary air injection (PAIR) control valve and PAIR check valves for damage or loose connections. Check the air supply hoses for cracks or deterioration.

If the hoses show any signs of heat damage, inspect the PAIR check valves (page 5-21).

Check the vacuum hoses between the rear cylinder head vacuum joint and PAIR control valve for deterioration, damage or loose connections. Also check that hoses are not kinked or pinched.

For PAIR control valve inspection, see page 5-20.

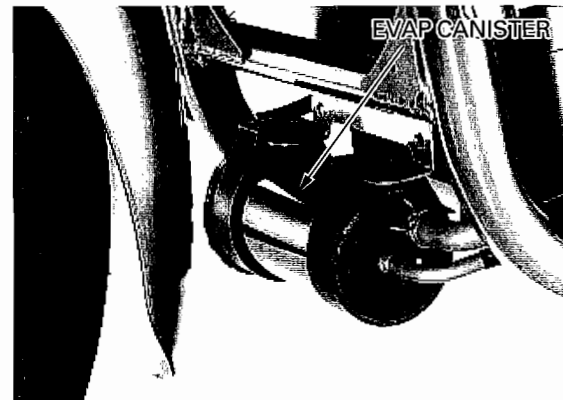


EVAPORATIVE EMISSION CONTROL SYSTEM

Check the hoses between the fuel tank, EVAP canister, EVAP purge control valve and carburetor for deterioration, damage or loose connections.

Check the EVAP canister for cracks or other damage.

Refer to the Vacuum Hose Routing Diagram Label (page 1-34) and Cable & Harness Routing (page 1-18) for hose connections.



FINAL DRIVE OIL

LEVEL CHECK

Avoid getting oil inside the crankcase.

Place the scooter on its center stand.

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

Remove the final drive oil check bolt and check whether the oil flows out from the check bolt hole. If the level is low (no oil flows out), add the recommended oil as described below.

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)

Remove the left crankcase cover (page 10-3).



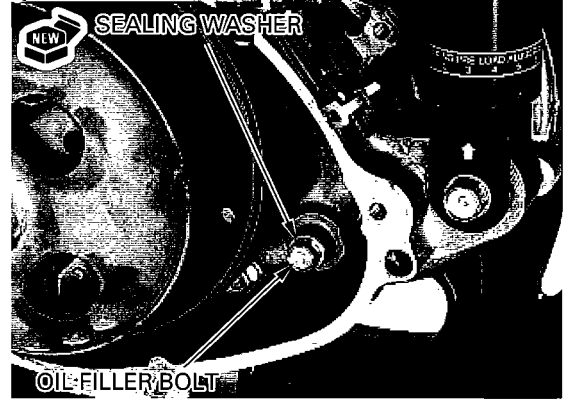
Remove the final drive oil filler bolt.
 Pour the recommended oil through the oil filler bolt hole until it reaches the lower edge of the oil filler bolt hole.

RECOMMENDED FINAL REDUCTION OIL:
 Hypoid gear oil # 90

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

TORQUE: 13 N·m (1.3 kgf·m , 9 lbf·ft)

Install the left crankcase cover (page 10-4).

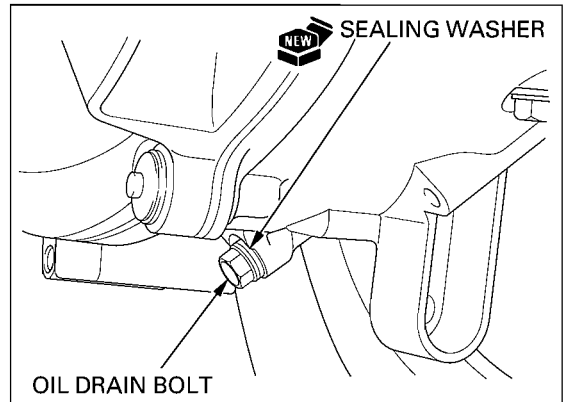


OIL CHANGE

Remove the left crankcase cover (page 10-3).

Remove the final drive oil drain bolt and the final drive oil filler bolt, slowly turn the rear wheel and drain the oil.
 After draining the oil completely, install the oil drain bolt with a new sealing washer and tighten it.

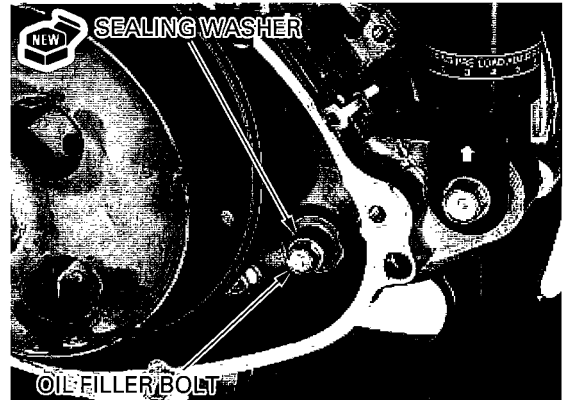
TORQUE: 13 N·m (1.3 kgf·m , 9 lbf·ft)



Be sure to clean any oil out of the belt case.

Fill the transmission case with the recommended oil to the correct level (page 3-12).

OIL CAPACITY: 0.16 ℓ (0.17 US qt , 0.14 Imp qt) at draining
 0.20 ℓ (0.21 US qt , 0.18 Imp qt) at disassembly



BRAKE FLUID

NOTICE

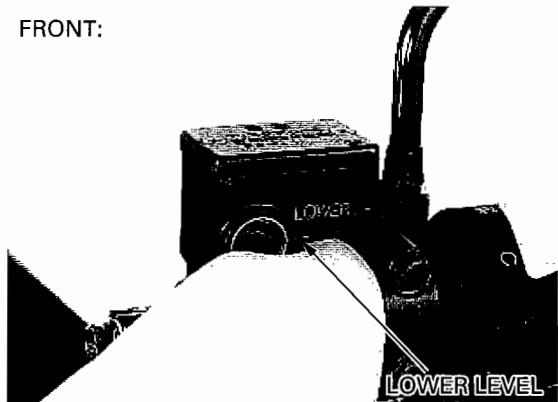
- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic or rubber parts. Place a shop towel over these parts whenever the system is serviced.

NOTE:

- When the fluid level is low, check the brake pads for wear (page 3-15). A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper pistons are pushed out, and this accounts for a low reservoir level. If the brake pads are not worn and the fluid level is low, check the entire system for leaks (page 3-15).

FRONT BRAKE

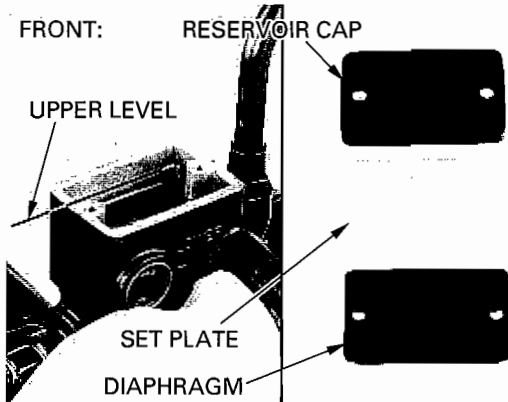
Place the scooter on a level surface and support it upright.
Turn the handlebar to the left so the reservoir is level and check the fluid level in the front brake reservoir.



If the level is near the "LOWER" level line, remove the reservoir cap, set plate and diaphragm, and fill the reservoir with DOT 4 brake fluid from a sealed container to the "UPPER" level line.

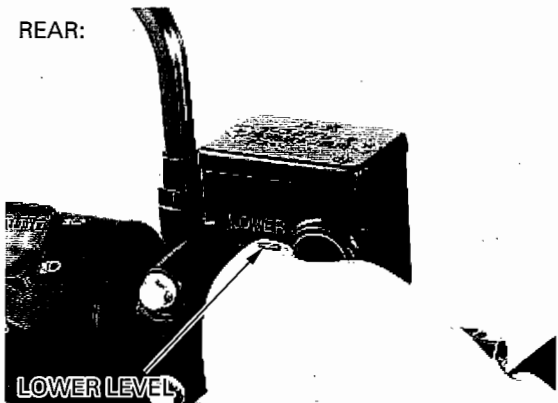
Install the diaphragm, set plate and reservoir cap and tighten the cap screws to the specified torque.

TORQUE: 1.5 N·m (0.15 kgf·m , 1.1 lbf·ft)



REAR BRAKE

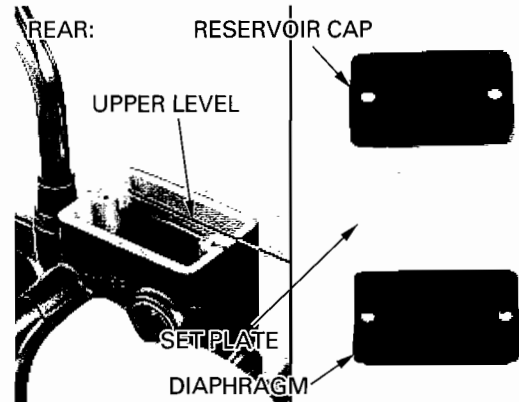
Place the scooter on a level surface and support it upright.
Turn the handlebar to the right so the reservoir is level and check the fluid level in the rear brake reservoir.



If the level is near the "LOWER" level line, remove the reservoir cap, set plate and diaphragm, and fill the reservoir with DOT 4 brake fluid from a sealed container to the upper level line.

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

TORQUE: 1.5 N·m (0.15 kgf·m , 1.1 lbf·ft)



BRAKE PAD WEAR

FRONT BRAKE PAD

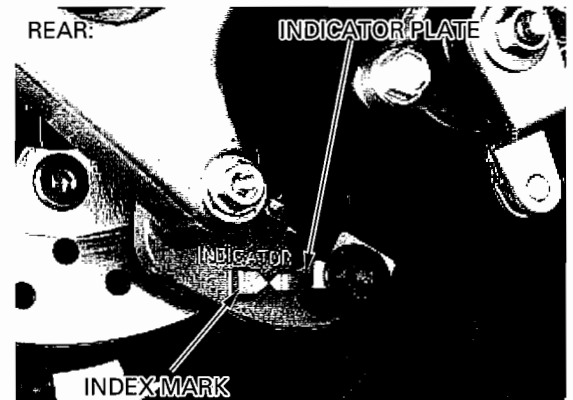
Check the brake pad for wear.
 Replace the brake pads if the wear limit groove of either pad is worn out.
 Refer to page 16-9 for brake pad replacement.



REAR BRAKE PAD

Check the brake pad for wear.
 Replace the brake pads if the indicator plate is aligned with the index mark on the caliper bracket.

Refer to page 16-11 for brake pad replacement.

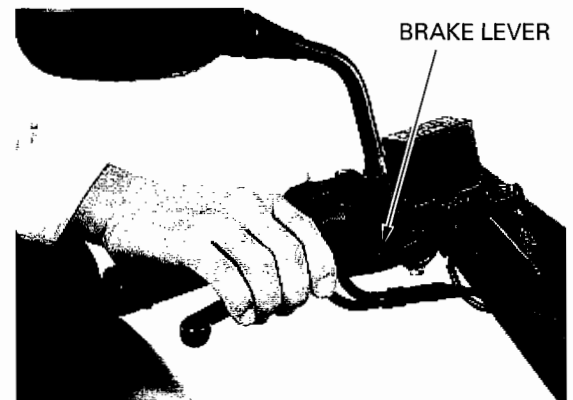


BRAKE SYSTEM

Firmly apply the brake lever and check that no air has entered the system.
 If the lever or pedal feels soft or spongy when operated, bleed the air from the system.

Refer to page 16-5 for air bleeding procedures.

Inspect the brake hoses, pipes and fittings for deterioration, cracks, damage or signs of leakage.
 Tighten any loose fittings.
 Replace hoses, pipes and fittings as required.



MAINTENANCE

BRAKE LOCK OPERATION

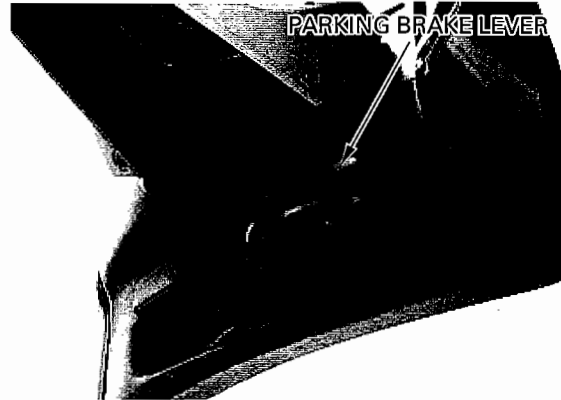
INSPECTION

Release the parking brake by pushing the rear part down and move the parking brake lever forward.

Pull the parking brake lever slowly and check the parking brake lever stroke.

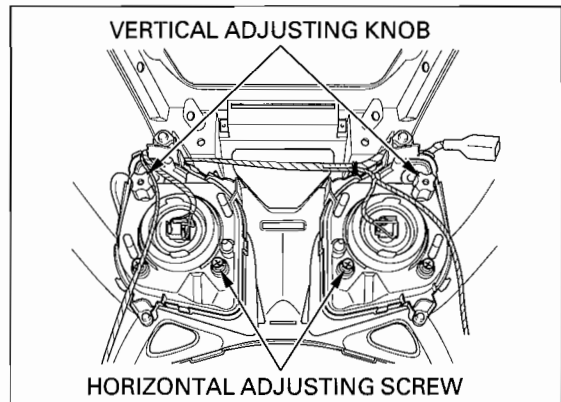
PARKING BRAKE LEVER STROKE: 2–4 notches

If the lever stroke is out of specification, adjust the parking brake lever (page 16-33).



HEADLIGHT AIM

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

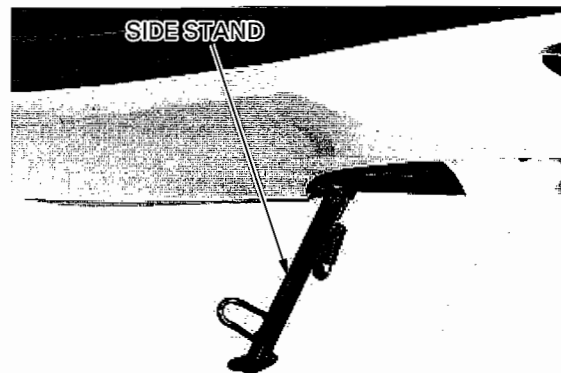


SIDE STAND

Support the scooter on its center stand.
Check the side stand spring for damage or loss of tension.
Check the side stand assembly for smooth of movement and lubricate the side stand pivot if necessary.

Check the side stand ignition cut-off system:
– Start the engine.
– Fully lower the side stand while running the engine.
– The engine should stop as the side stand is lowered.

If there is a problem with the system, check the side stand switch (page 20-19).



SUSPENSION

FRONT SUSPENSION

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

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

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

Replace damaged components.

Tighten all nuts and bolts.

Refer to section 14 for fork service.



REAR SUSPENSION

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

Check both shock absorber assemblies for signs of leaks, damage or loose fasteners.

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

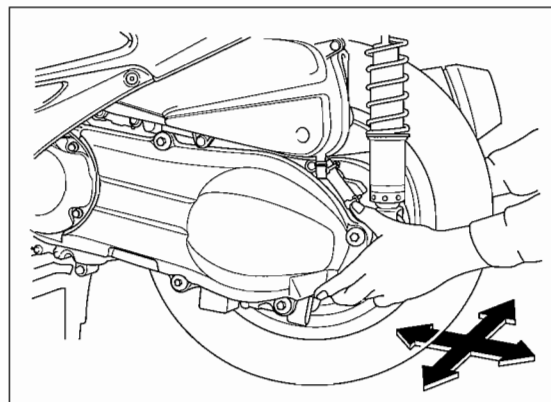
Refer to section 15 for shock absorber service.



Raise the rear wheel off the ground by placing the scooter on its center stand.

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

Replace the bushings if any looseness is noted (section 7).



NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-11).

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

MAINTENANCE

WHEELS/TIRES

Tire pressure should be checked when the tires are cold. Check the tire pressure with the tire pressure gauge.

RECOMMENDED TIRE PRESSURE:

Driver only:

Front: 175 kPa (1.75 kgf/cm², 25 psi)

Rear: 200 kPa (2.00 kgf/cm², 29 psi)

Driver and passenger:

Front: 175 kPa (1.75 kgf/cm², 25 psi)

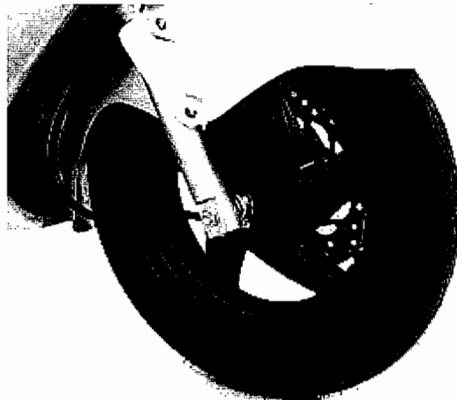
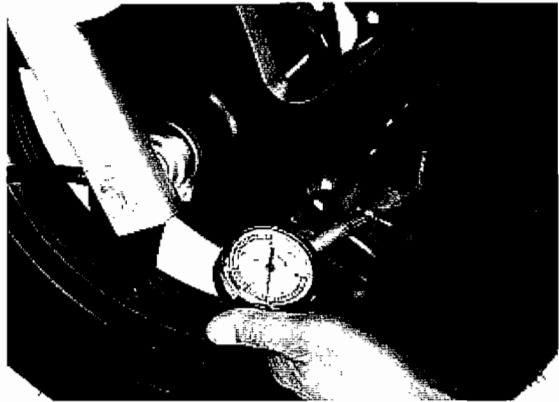
Rear: 250 kPa (2.50 kgf/cm², 36 psi)

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

Check the front and rear wheels for trueness (refer to section 14 and 15).

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

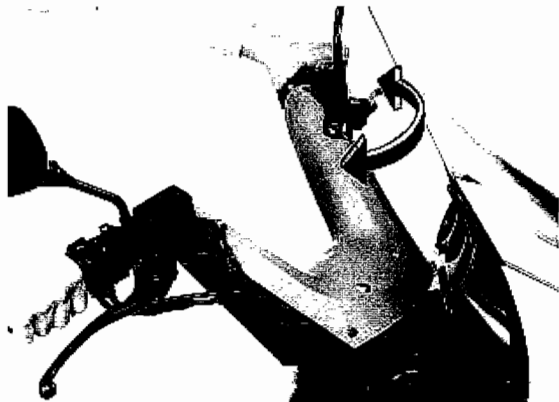
MINIMUM TIRE TREAD DEPTH: 1.5 mm (0.06 in)
2.0 mm (0.08 in)



STEERING HEAD BEARINGS

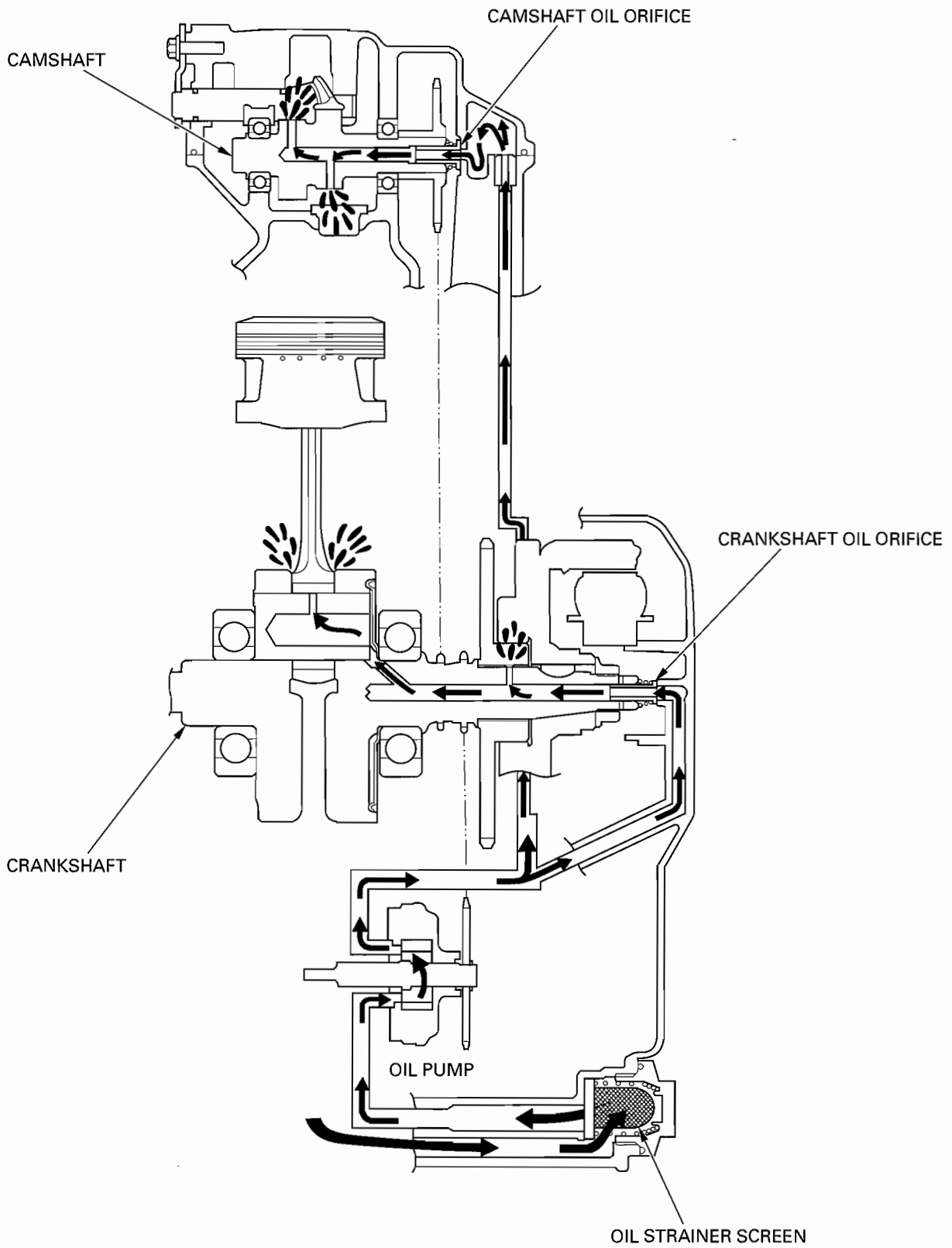
Check that the control cables do not interfere with handlebar rotation. Raise the front wheel off the ground and support the motorcycle securely. Check that the handlebar moves freely from side to side.

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (section 14).



MEMO

LUBRICATION SYSTEM DIAGRAM



4. LUBRICATION SYSTEM

LUBRICATION SYSTEM DIAGRAM	4-0	TROUBLESHOOTING	4-1
SERVICE INFORMATION	4-1	OIL PUMP	4-2

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 bases, 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 and that oil pressure is correct.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	1.1 ℓ (1.2 US qt, 1.0 Imp qt)	_____
	At disassembly	1.3 ℓ (1.4 US qt, 1.1 Imp qt)	_____
Recommended engine oil		Pro Honda GN4 4-stroke oil or 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)	0.25 (0.010)
	Side clearance	0.04—0.09 (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
- Coolant mixing with oil (white appearance)
 - Faulty water pump mechanical seal
 - Faulty cylinder head gasket
- Worn piston ring

LUBRICATION SYSTEM

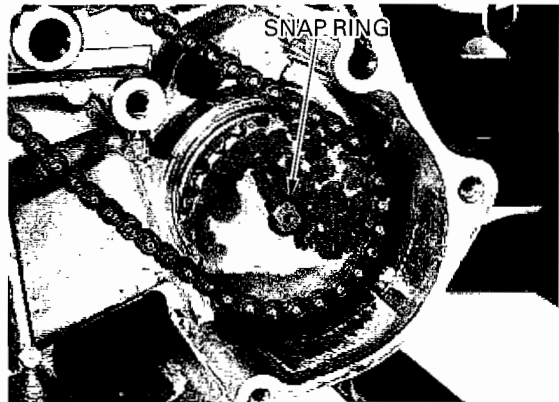
OIL PUMP

REMOVAL

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

Remove the flywheel (page 12-4).

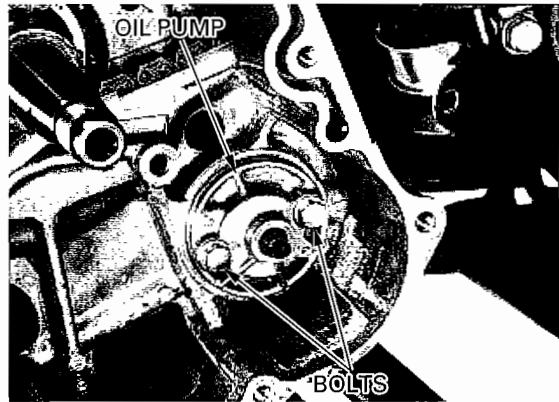
Remove the snap ring.



Remove the oil pump driven sprocket and drive chain.

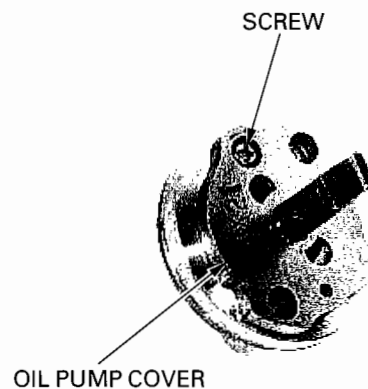


Remove the bolts and oil pump from the right crankcase.

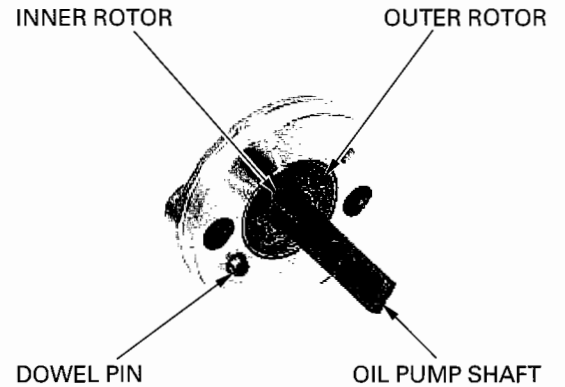


DISASSEMBLY

Remove the screw and oil pump cover.



Remove the dowel pin, oil pump shaft, oil pump outer rotor and inner rotor.



INSPECTION

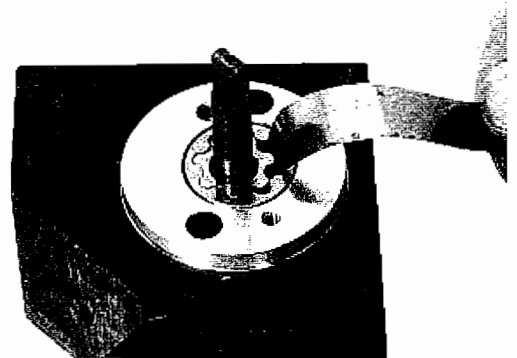
NOTE:

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

Temporarily install the oil pump shaft. Install the outer and inner rotors into the oil pump body.

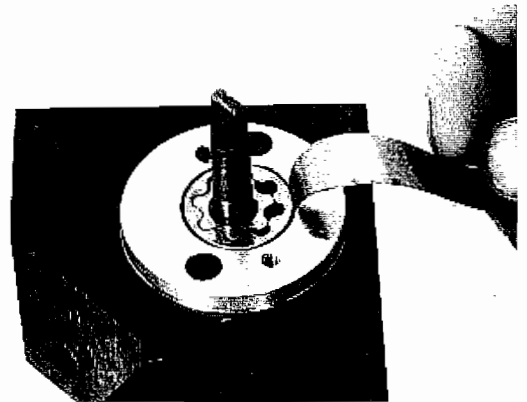
Measure the tip clearance.

SERVICE LIMIT: 0.20 mm (0.008 in)



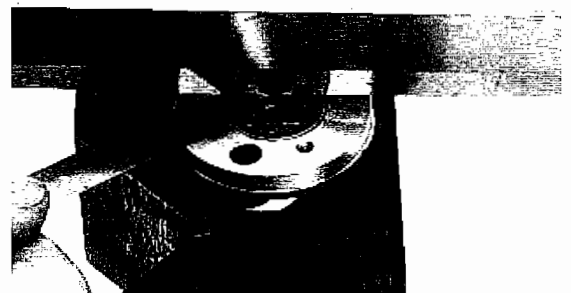
Measure the pump body clearance.

SERVICE LIMIT: 0.25 mm (0.010 in)



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

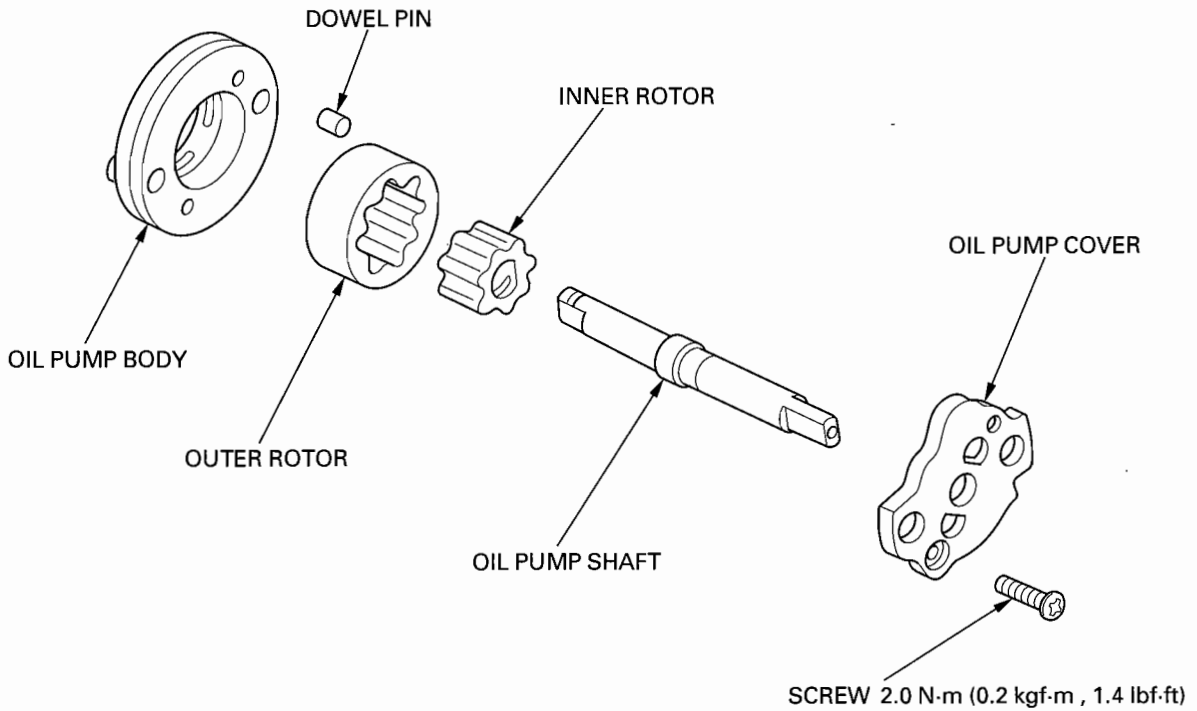
SERVICE LIMIT: 0.12 mm (0.005 in)



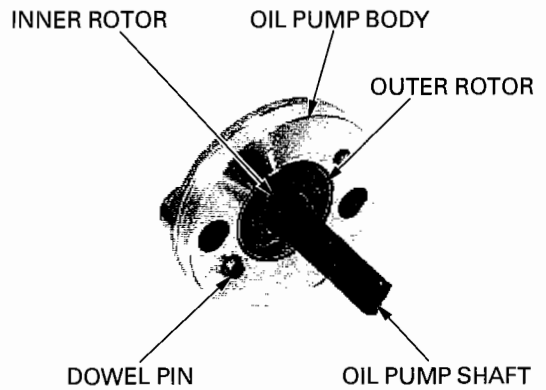
LUBRICATION SYSTEM

ASSEMBLY

Coat all of the parts with clean engine oil.

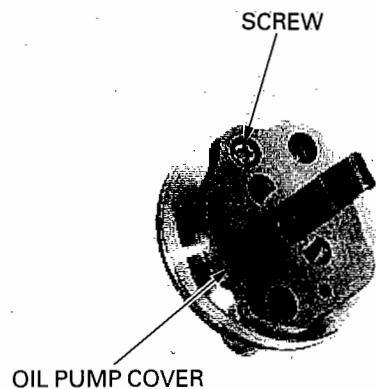


Install the outer rotor into the oil pump body.
Install the inner rotor over the oil pump shaft by aligning the flat surface.
Install the inner rotor/oil pump shaft into the oil pump body.
Install the dowel pin into the oil pump body.



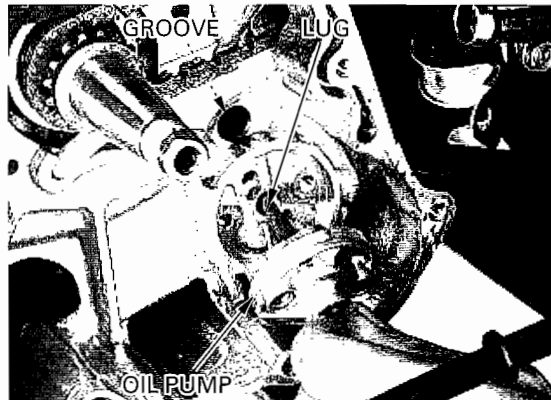
Install the oil pump cover onto the oil pump body.
Install and tighten the oil pump cover screw to the specified torque.

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

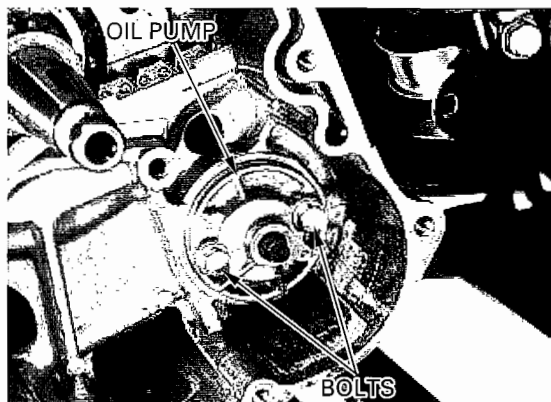


INSTALLATION

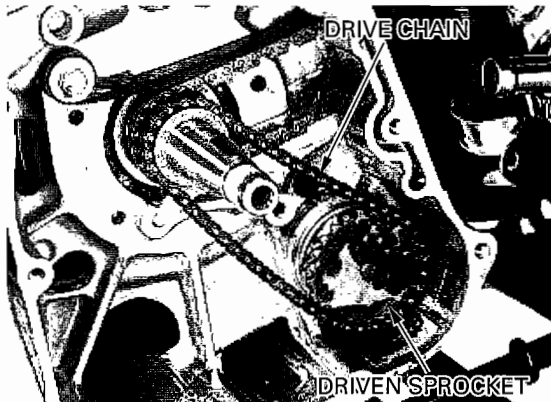
Install the oil pump while rotating the pump shaft to seat the lug into the groove in the water pump shaft.



Align the bolt holes in the oil pump and right crankcase. Install and tighten the mounting bolts securely.



Install the oil pump driven sprocket and drive chain by aligning the flat surfaces of the sprocket and pump shaft.



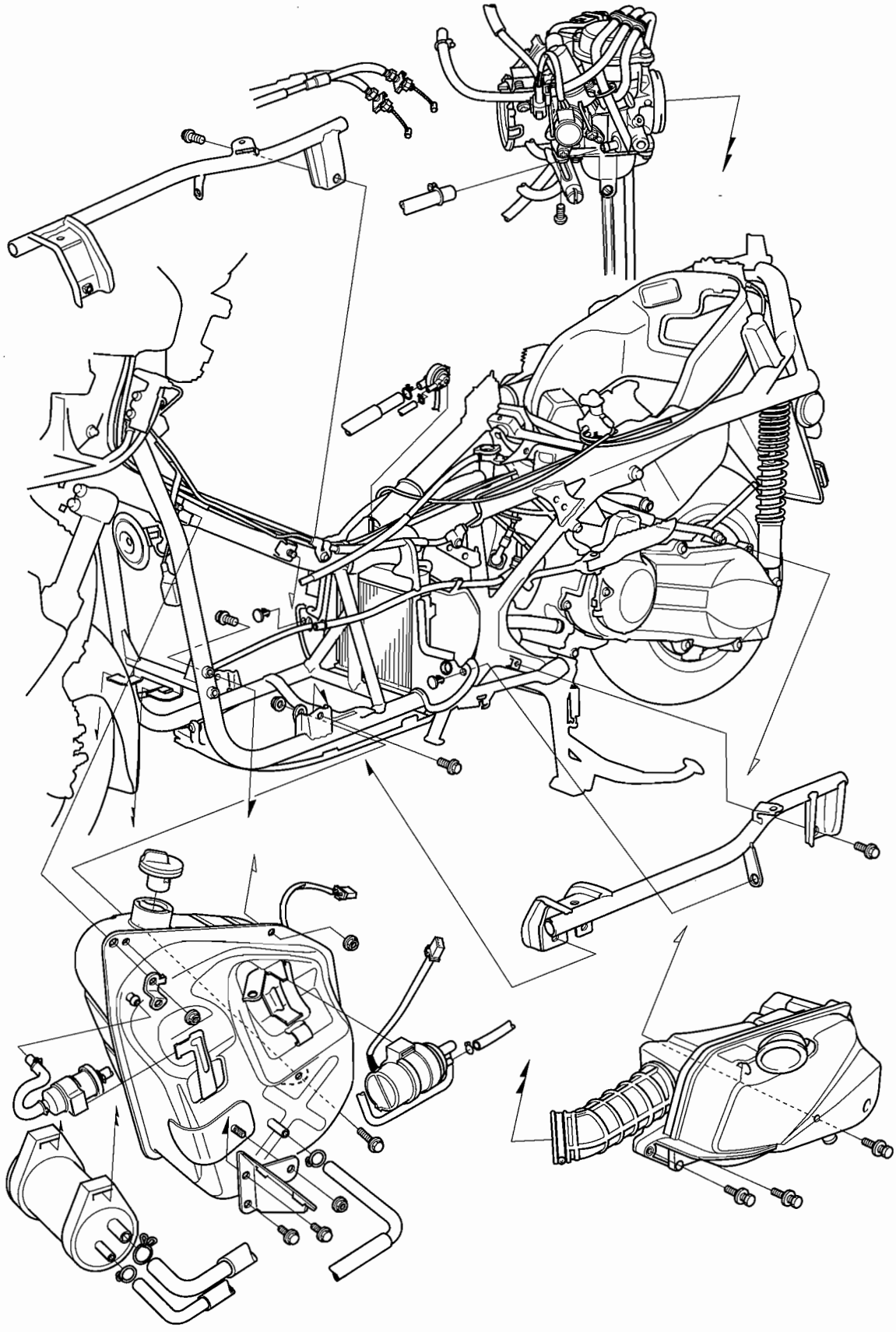
Install the snap ring with the chamfered edge facing in.

Install the flywheel (page 12-8).

After installation, fill the crankcase with the recommended oil and check that there are no oil leaks.



FUEL SYSTEM



5. FUEL SYSTEM

SERVICE INFORMATION	5-1	STARTING ENRICHMENT (SE) VALVE	5-17
TROUBLESHOOTING	5-2	PILOT SCREW ADJUSTMENT	5-18
AIR CLEANER HOUSING	5-3	HIGH ALTITUDE ADJUSTMENT	5-19
CARBURETOR REMOVAL	5-4	SECONDARY AIR SUPPLY SYSTEM	5-20
CARBURETOR DISASSEMBLY	5-5	EVAPORATIVE EMISSION CONTROL SYSTEM	5-23
CARBURETOR ASSEMBLY	5-10	FUEL TANK	5-24
CARBURETOR INSTALLATION	5-15		

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 section 20.
- For throttle position (TP) sensor inspection, refer to section 18.
- The starting enrichment (SE) valve system is battery powered, as opposed to the (DC) conventional alternator (AC) powered SE thermal valve. The ignition control module (ICM) operates the SE valve by receiving the signals from the ignition pulse generator (i.e. engine speed) and engine coolant temperature (ECT) sensor (page 18-0).
- Before disassembling the carburetor, place a suitable container under the carburetor drain tube. Loosen the drain bolt and drain the carburetors.
- After removing the carburetor, wrap the intake port of the engine with a shop towel or cover it with piece of tape to prevent any foreign material from dropping into the engine.
- When disassembling fuel system parts, note the location of the O-rings. Replace them with new ones during reassembly.

SPECIFICATIONS

ITEM	SPECIFICATIONS
Carburetor identification number	VE3BL
Main jet	# 102
Slow jet	# 40
Starting enrichment (SE) valve resistance (at 20°C/68°F)	10 k Ω max
Pilot screw initial opening	See page 5-18
Float level	18.5 mm (0.73 in)
Idle speed	1,500 \pm 100 rpm
Throttle grip free play	2–6 mm (1/16–1/4 in)

TORQUE VALUES

- | | |
|---------------------------------|-------------------------------------------------------------------------|
| Throttle cable stay screw | 5.1 N·m (0.52 kgf·m , 3.8 lbf·ft) Apply a locking agent to the threads. |
| Carburetor insulator band screw | 5.1 N·m (0.52 kgf·m , 3.8 lbf·ft) Bands end must contact. |
| Reed valve case stud bolt | 7.8 N·m (0.8 kgf·m , 5.8 lbf·ft) |

TOOLS

- | | |
|------------------------------|-------------------------------|
| Carburetor float level gauge | 07401-0010000 |
| Pilot screw wrench | 07MMA-MT3010B (U. S. A. only) |
| Vacuum/Pressure pump | A937X-041-XXXXX or |
| – Vacuum pump | ST-AH-260-MC7 (U. S. A. only) |
| – Pressure pump | ST-AH-255-MC7 (U. S. A. only) |

TROUBLESHOOTING

Engine won't to start

- No fuel in tank
- No fuel to carburetor
 - Fuel filter clogged
 - Fuel hose clogged
 - Float level misadjusted
 - Fuel tank breather hole clogged
- 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
- Improper throttle operation
- No spark at plug (faulty ignition system—section 18)

Lean mixture

- Fuel jets clogged
- Float valve faulty
- Float bowl fuel level too low
- Fuel line restricted
- Carburetor air vent hose clogged
- Intake air leak
- Vacuum piston faulty
- Fuel pump faulty (section 20)

Rich mixture

- Float valve faulty
- Air jets clogged
- Float bowl fuel level too high
- Air cleaner element contaminated
- Flooded carburetor
- Starting enrichment (SE) valve in on position

Engine stalls, hard to start, rough idling

- Fuel line restricted
- Fuel mixture too lean/rich
- Fuel contaminated/deteriorated
- Intake air leak
- Idle speed misadjusted
- Float level misadjusted
- Fuel tank breather hole clogged
- Pilot screw misadjusted
- Slow circuit or starting enrichment (SE) circuit clogged
- Emission control system malfunction
- Ignition malfunction (section 18)
- Fuel pump faulty (section 20)

Afterburn when decelerating

- Lean mixture in slow circuit
- Air cut-off valve malfunction
 - Emission control system malfunctions
 - Secondary air supply system faulty
 - Loose, disconnected or deteriorated hoses of the emission control system
- Ignition malfunction (section 18)

Backfiring or misfiring during acceleration

- Ignition system malfunction (section 18)
- Fuel mixture too lean

AIR CLEANER HOUSING

REMOVAL

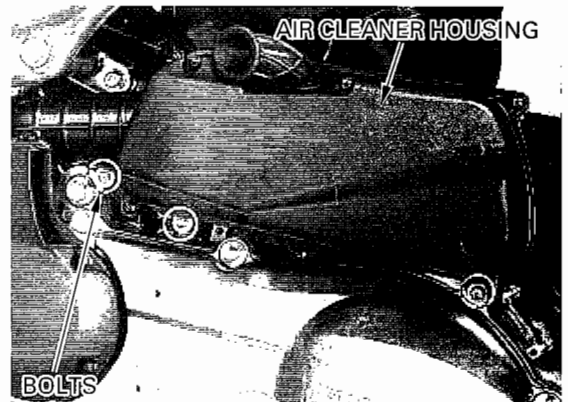
Refer to page 3-5 for air cleaner element replacement.

Remove the left floor skirt (page 2-4).
Remove the cace cover protector (page 10-3).

Loosen the connecting hose band screw.



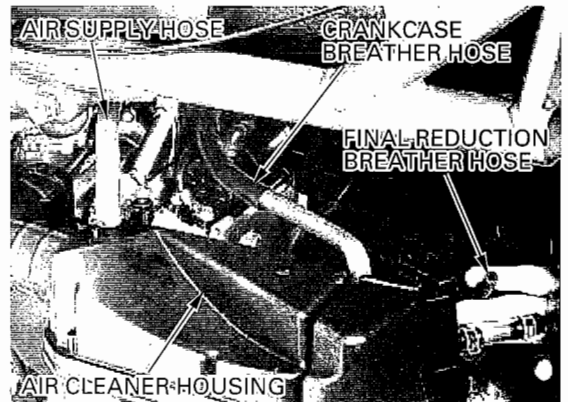
Remove the bolts.



Be careful not to damage the joint area of the connecting hose and housing.

Disconnect the crankcase breather hose, final reduction breather hose and air supply hose.

Remove the air cleaner housing.

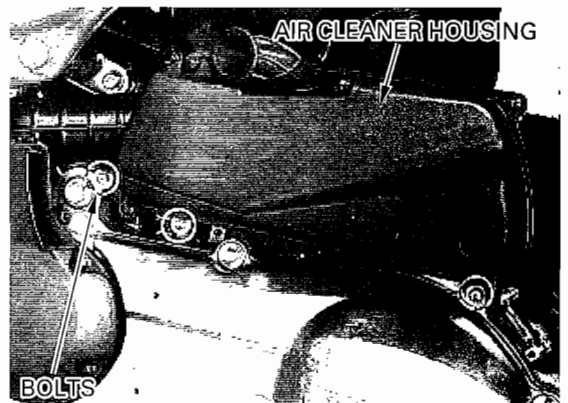


INSTALLATION

Installation is in the reverse order of removal.

Install the wires and hoses properly (page 1-18).

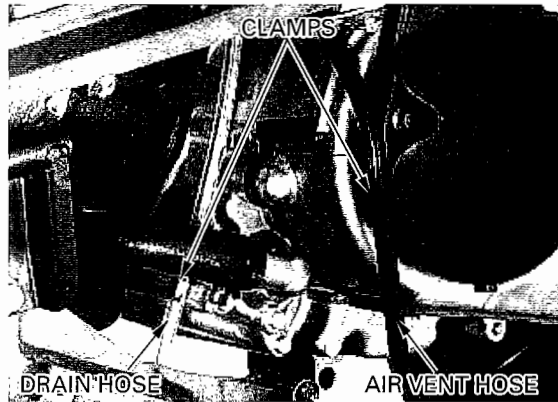
Install the removed parts in the reverse order of removal.



CARBURETOR REMOVAL

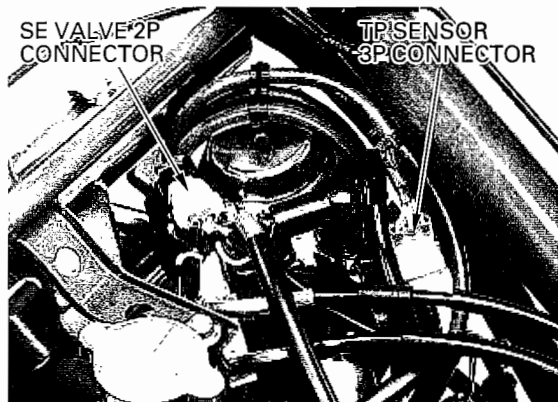
Remove the upper luggage box (page 2-7).
Remove the air cleaner housing (page 5-3).

Remove the carburetor drain hose and air vent hose from the clamps on the left side of the engine.

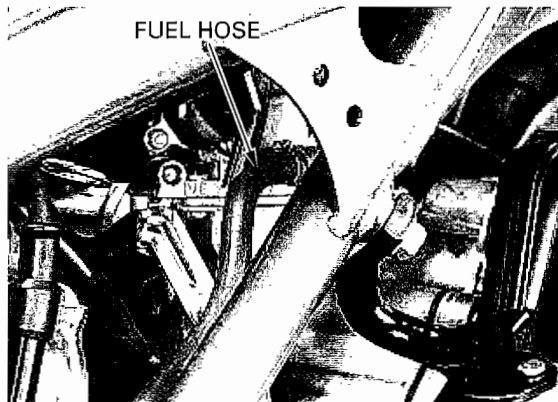


Disconnect the following:

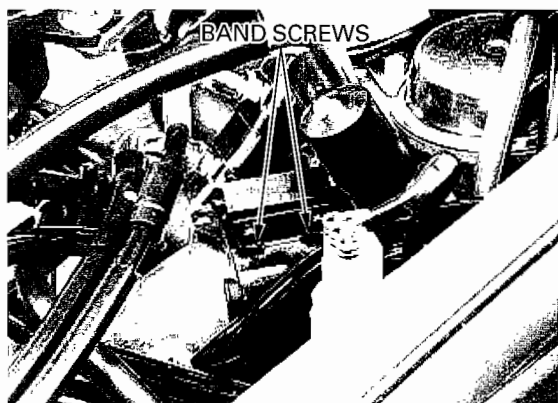
- Throttle position (TP) sensor 3P connector
- Starting enrichment (SE) valve 2P connector



Disconnect the fuel hose.

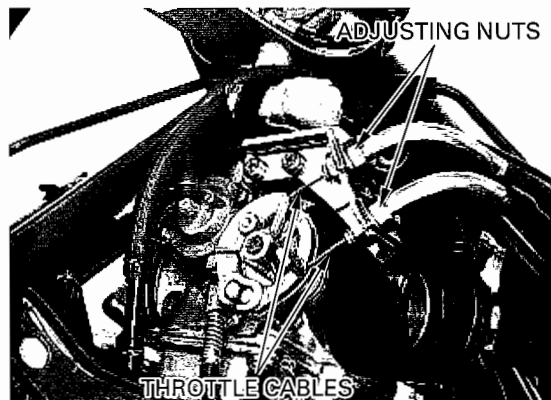


Loosen the insulator band screws.

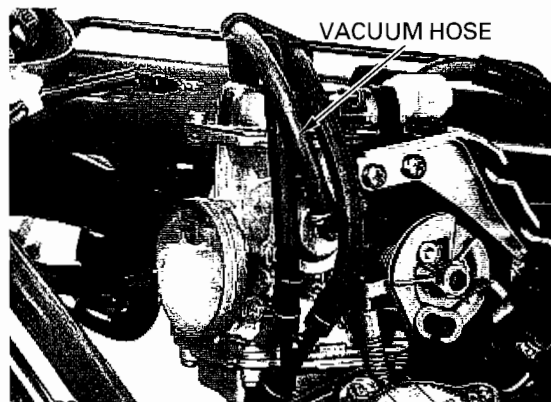


Loosen the throttle cable adjusting nuts.

Remove the throttle cables from the cable stay and disconnect the throttle cables from the throttle drum.



Disconnect the vacuum hose from the carburetor.

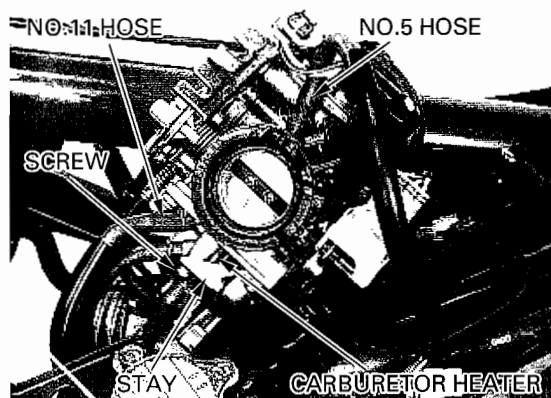


Remove the screw, throttle stop screw stay and carburetor heater.
Disconnect the No.5 and No.11 hoses.

Remove the carburetor/insulator as an assembly.

After removing the carburetor assembly, do not place it upside down or the air intake might be deformed.

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.



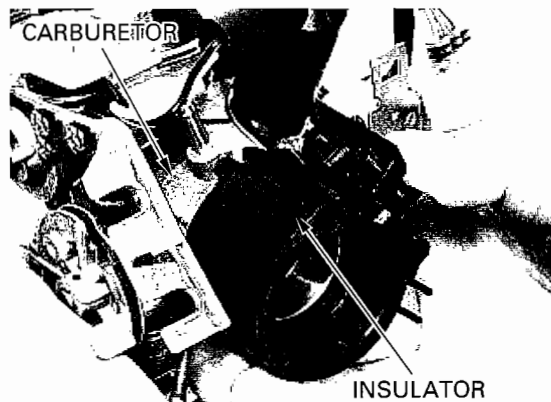
CARBURETOR DISASSEMBLY

NOTE:

- Do not remove the throttle position (TP) sensor from the carburetor. Removing the throttle position (TP) sensor can cause the throttle position (TP) sensor to be misaligned resulting in improper ignition timing. If throttle position (TP) sensor replacement is necessary, replace the carburetor as an assembly.

For throttle position sensor inspection refer to section 18.

Remove the carburetor insulator from the carburetor.



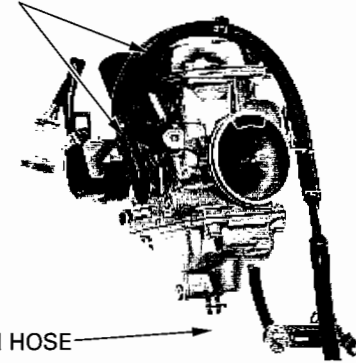
FUEL SYSTEM

Disconnect the following from the carburetor.

- Carburetor air vent hoses
- Carburetor drain hose

AIR VENT HOSES

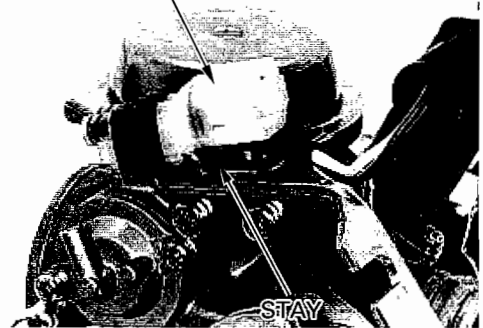
DRAIN HOSE



SE VALVE

Remove the SE valve 2P connector from the stay.

2P CONNECTOR

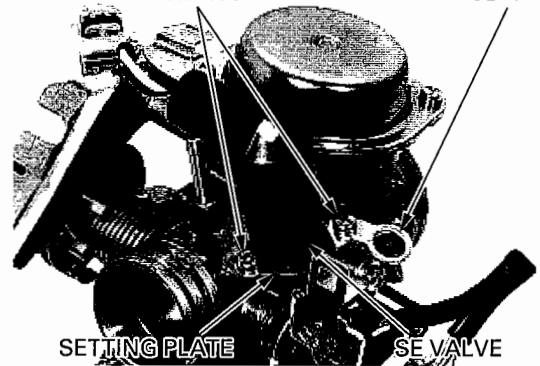


Remove the screws, clamp and setting plate.

Remove the SE valve from the carburetor and be careful not to damage the valve and needle.

SCREWS

CLAMP

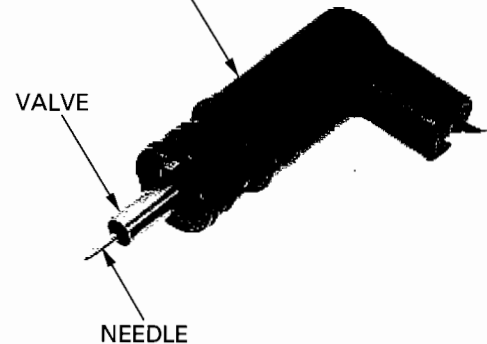


Inspect the valve and needle for stepped wear or damage.

SE VALVE

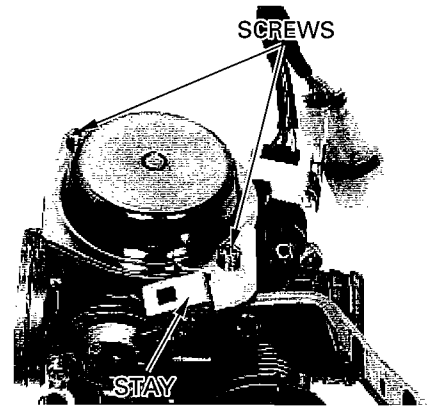
VALVE

NEEDLE



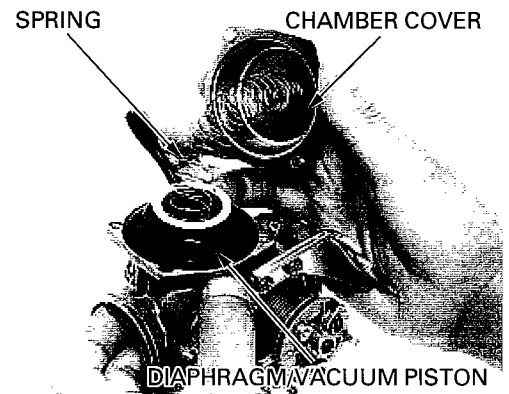
VACUUM CHAMBER

The vacuum chamber cover is under spring pressure. Remove the screws and stay while holding the vacuum chamber cover.



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

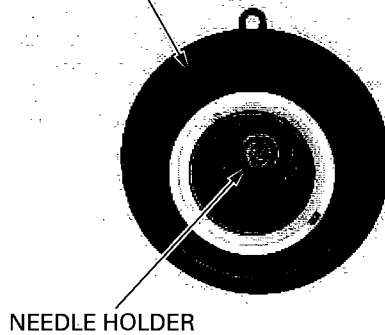
Check the piston for smooth operation up and down in the carburetor body.



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.

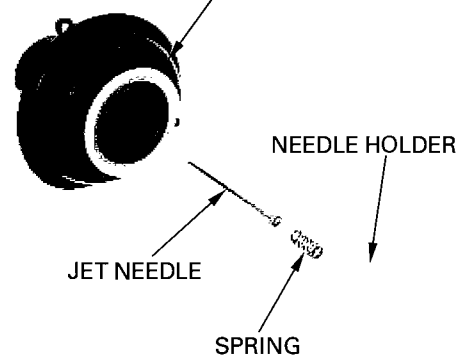
Remove the needle holder, spring and jet needle from the vacuum piston.

DIAPHRAGM/VACUUM PISTON



Check the following:
 - Jet needle for stepped wear
 - Vacuum piston for wear or damage
 - Diaphragm for pin holes, deterioration or damage

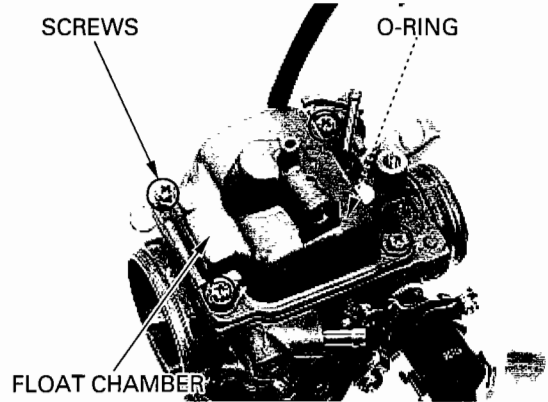
DIAPHRAGM/VACUUM PISTON



FUEL SYSTEM

FLOAT CHAMBER

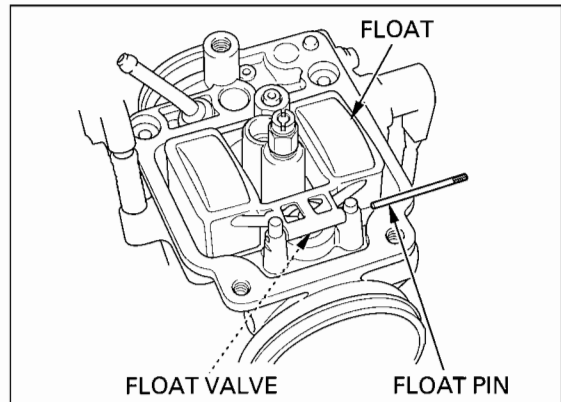
Remove the screws, float chamber and O-ring.



Tap the float pin gently with a suitable pin (O.D. 2 mm).

Remove the float pin, float and float valve.

Check the float for damage or fuel in the float.

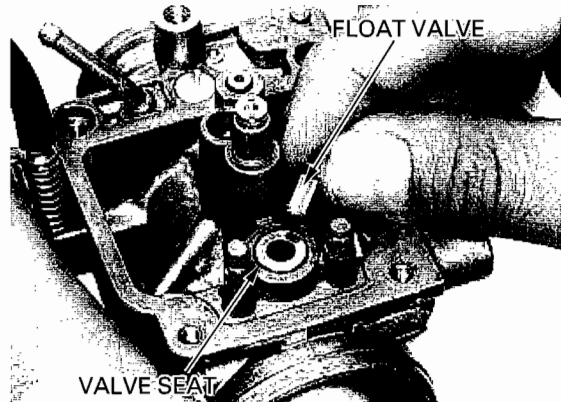


Inspect the float valve seat for scores, scratches, clogs and damage.

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.



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

Remove the following:

- Main jet
- Needle jet holder
- Slow jet

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

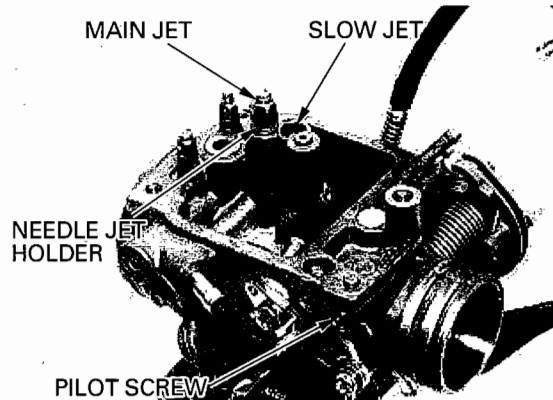
Turn the pilot screw in and record the number of turns it takes before it seats lightly.

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

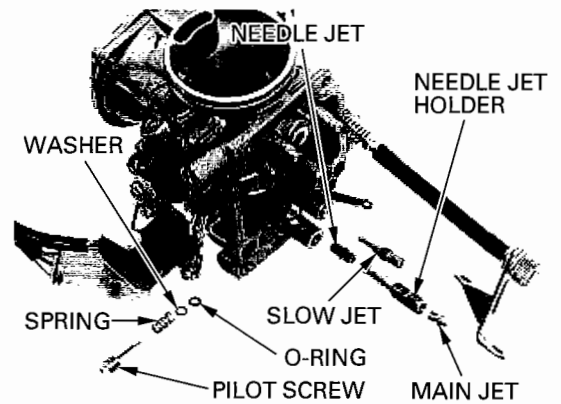
TOOL:

Pilot screw wrench

07MMA-MT3010B
(U. S. A. only)

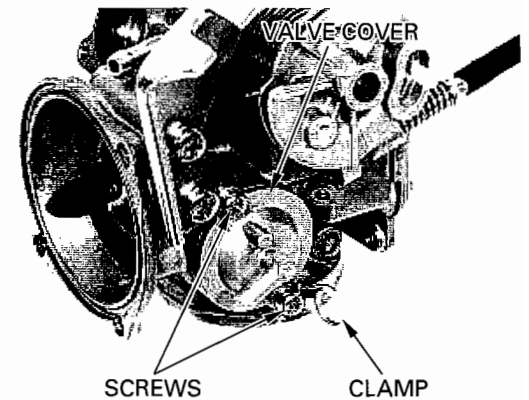


Inspect each jet for wear or damage and replace if necessary.



AIR CUT-OFF VALVE

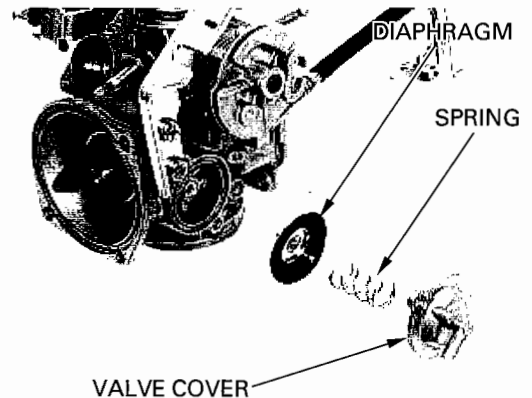
The air cut-off valve cover is under spring pressure. Remove the screws and clamp while holding the valve cover.



Be careful not to damage the diaphragm. Remove the air cut-off valve cover, spring and diaphragm.

- Check the following:
- Diaphragm for pin holes, deterioration or damage
 - Spring for deterioration
 - Needle of diaphragm for wear
 - Air passages for clogging

Blow open air passage in the cover with compressed air.



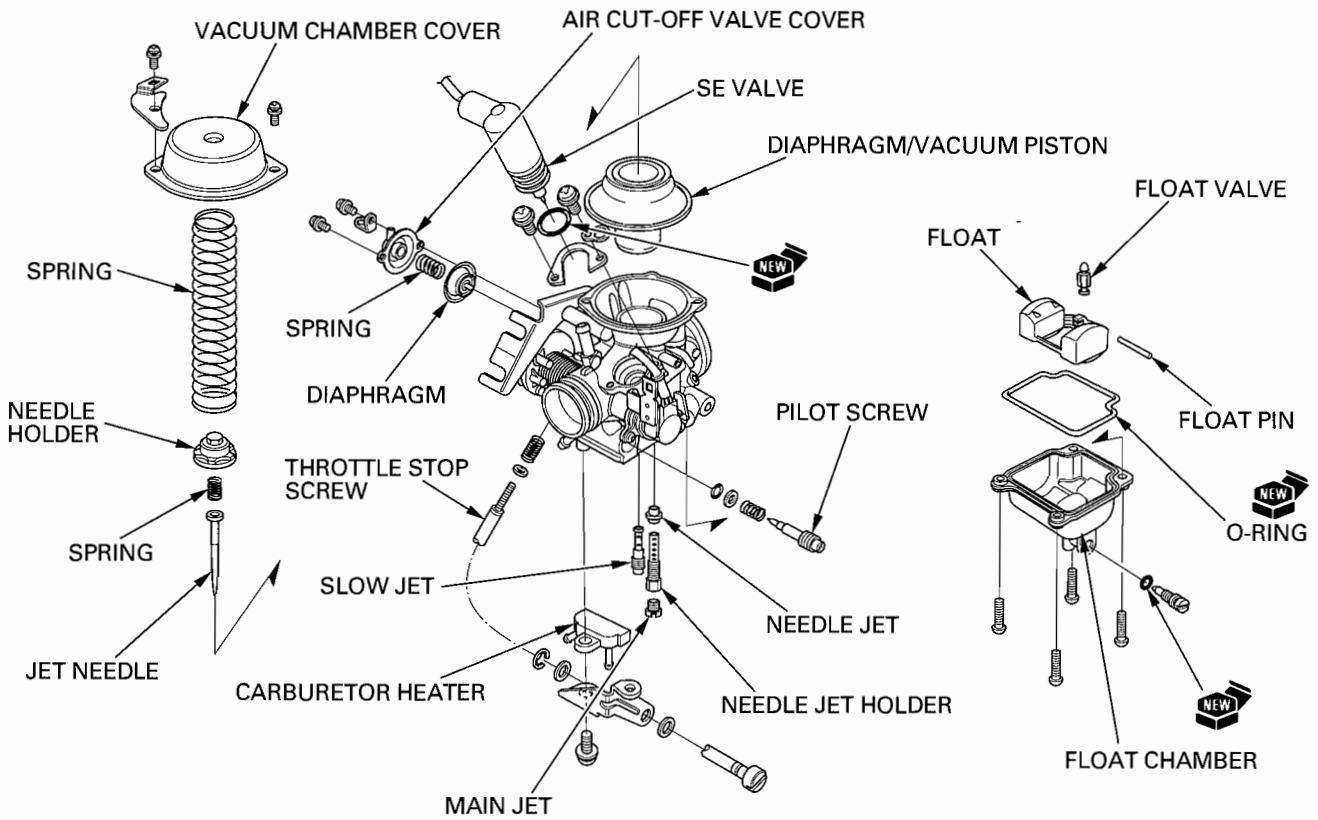
CARBURETOR CLEANING

- Remove the following:
- Air cut-off valve
 - Diaphragm/vacuum piston
 - Main jet, needle jet holder and slow jet
 - Pilot screw/spring/washer/O-ring

Do not clean the air and fuel passages with wire; this will damage the carburetor body. Blow open all air and fuel passages in the carburetor body with compressed air.

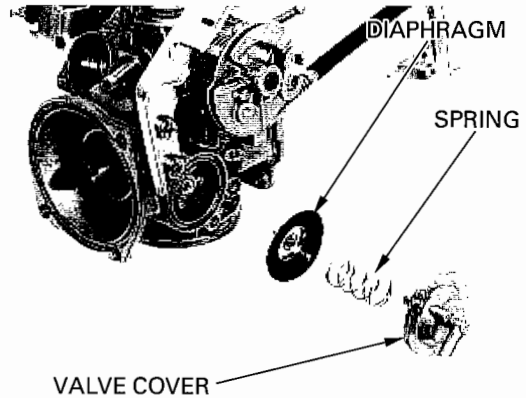


CARBURETOR ASSEMBLY

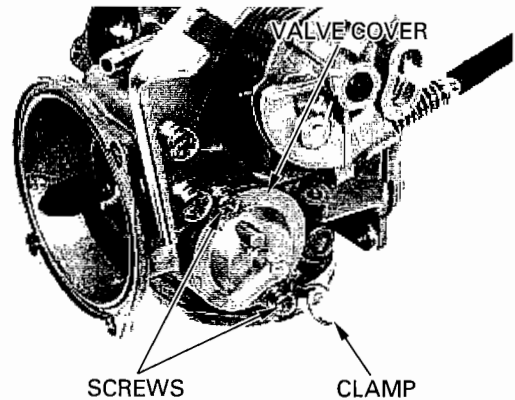


AIR CUT-OFF VALVE

Install the diaphragm and spring.
 Install and hold the air cut-off valve cover, being careful not to pinch the diaphragm.



Set the clamp in the position as shown and tighten the screws securely.



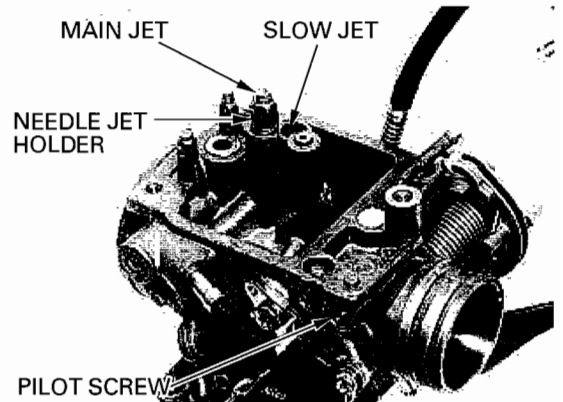
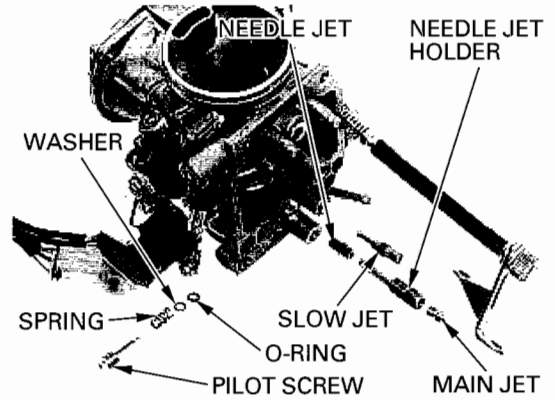
FLOAT CHAMBER

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

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

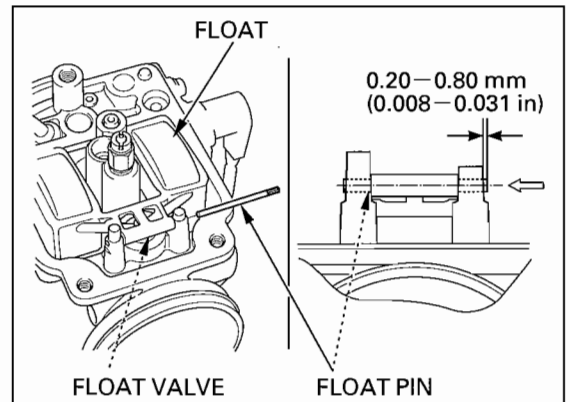
Install the following:
 - Slow jet
 - Needle jet holder
 - Main jet

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.

Tap the float pin gently with a suitable pin (O.D. 2 mm).



FLOAT LEVEL INSPECTION

NOTE:

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

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

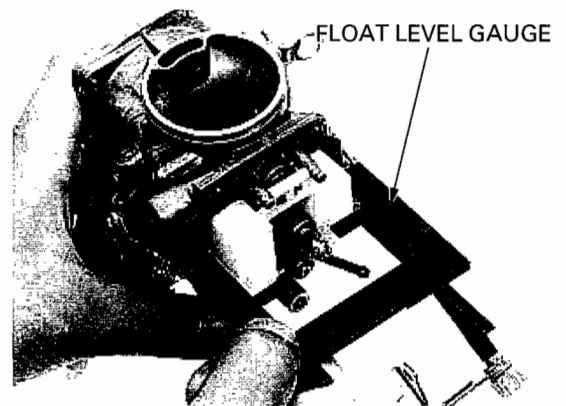
With the float valve seated and the float arm just touching the valve, measure the float level with the special tool as shown.

FLOAT LEVEL: 18.5 mm (0.73 in)

TOOL:

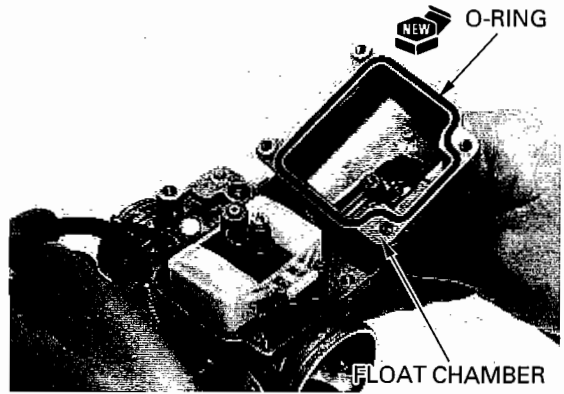
Carburetor float level gauge 07401-0010000

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

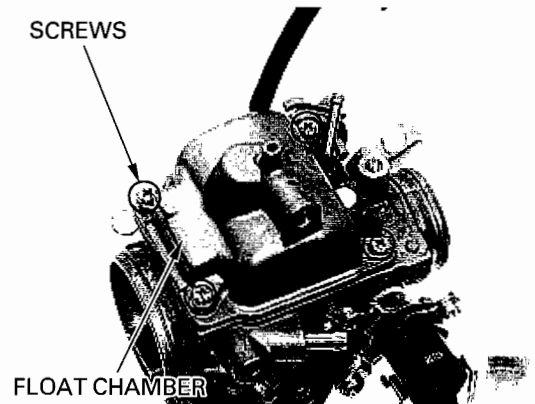


FUEL SYSTEM

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

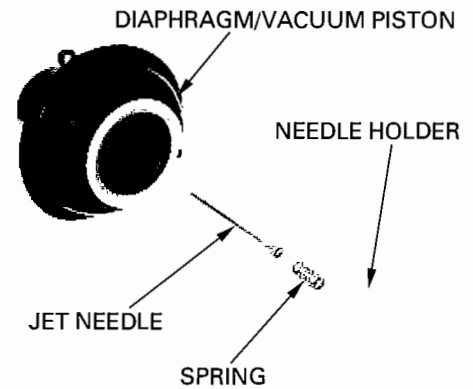


Install and tighten the float chamber screws securely.

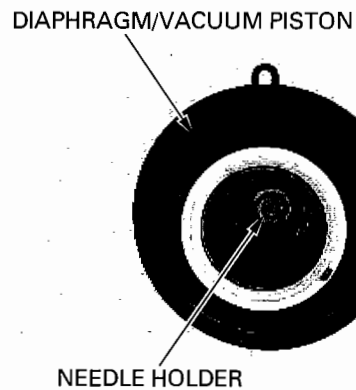


VACUUM CHAMBER

Install the jet needle and spring into the vacuum piston.



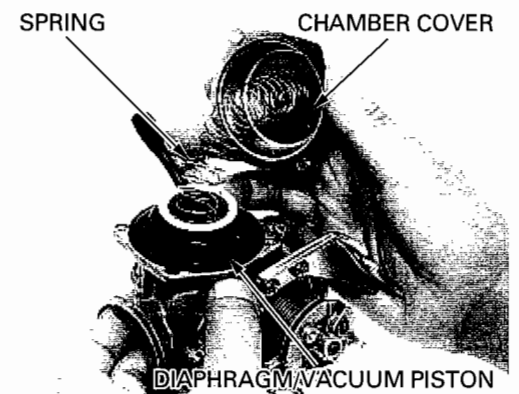
Press the needle holder into the vacuum piston and turn the needle holder clockwise until you hear a click or feel it lock into place.



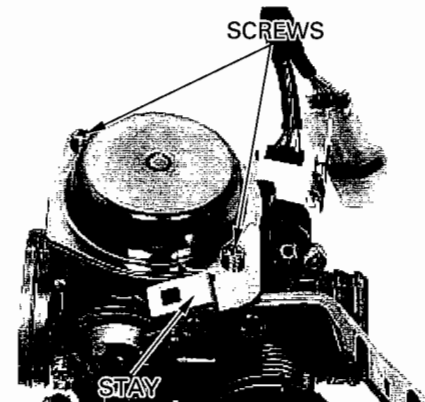
Be careful not to damage the jet needle. Install the diaphragm/vacuum piston in the carburetor body, aligning the diaphragm tab with the groove of the carburetor body. Hold the vacuum piston almost fully open so the diaphragm is not pinched by the chamber cover.



Be careful not to pinch the diaphragm, and to keep the spring straight when compressing it. Install the chamber cover with the spring, being careful not to damage the spring.



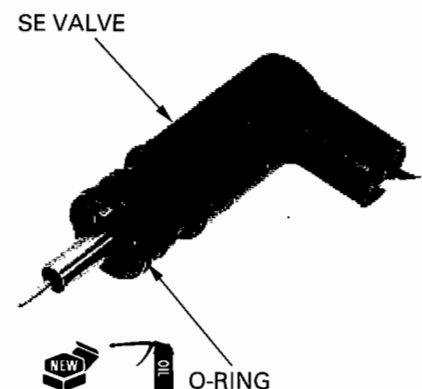
Install the stay.
Install and tighten the vacuum chamber cover screws securely.



SE VALVE

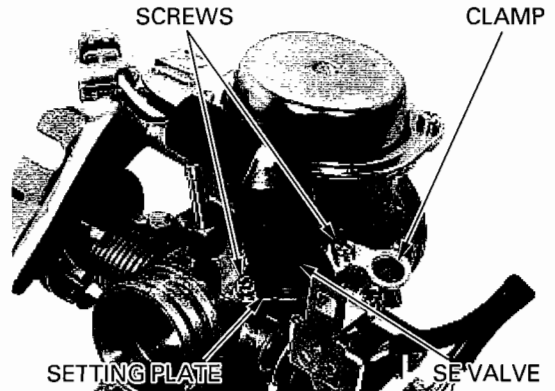
Coat a new O-ring with oil and install it to the SE valve.

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



FUEL SYSTEM

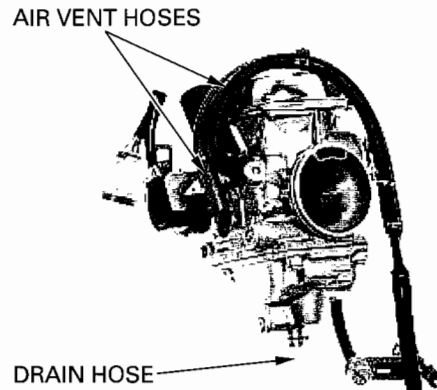
Set the setting plate and clamp in position as shown, aligning the setting plate with the groove in the SE valve and tighten the screws securely.



Install SE valve 2P connector to the stay.

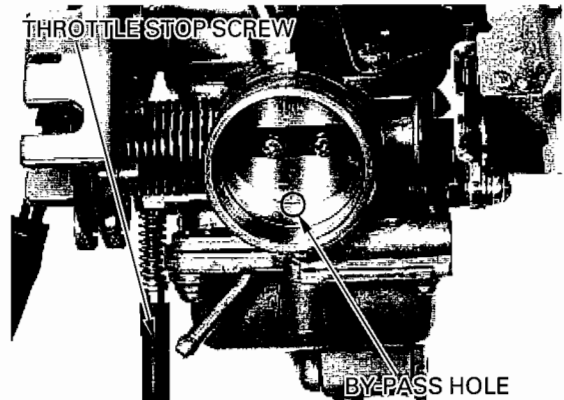


Connect the following to the carburetor:
– Carburetor air vent hoses
– Carburetor drain hose

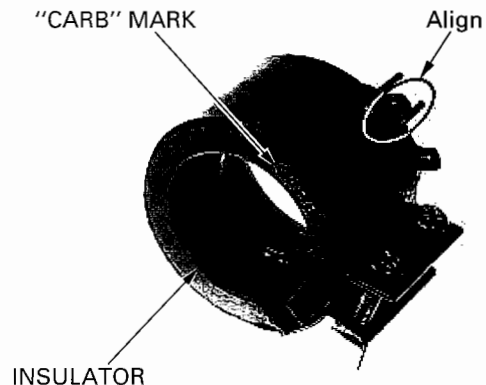


Turn the throttle stop screw to align the throttle valve with the outside (engine side) by-pass hole in the carburetor.

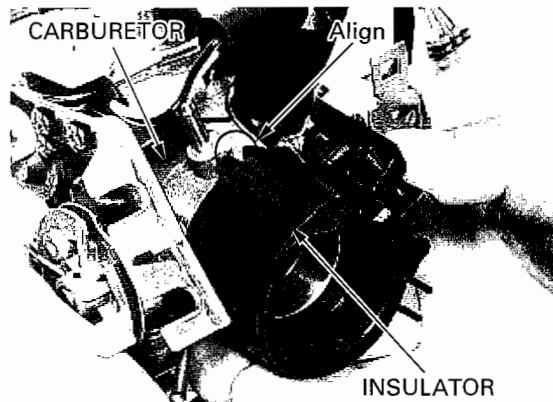
Check the throttle valve for smooth operation by turning the throttle drum.



Align the insulator band holder with the projection on the insulator.
Install the insulator to the carburetor with the "CARB" mark facing the carburetor.

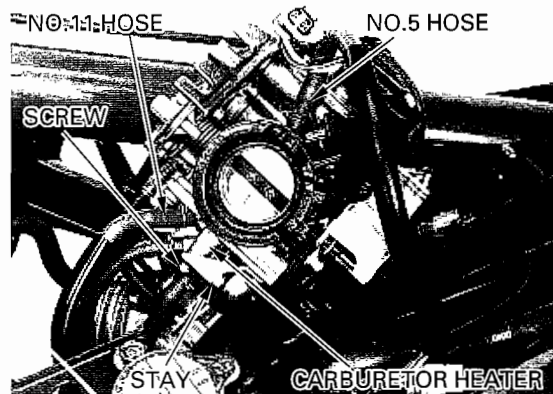


Align the insulator holder with the projection on the carburetor.

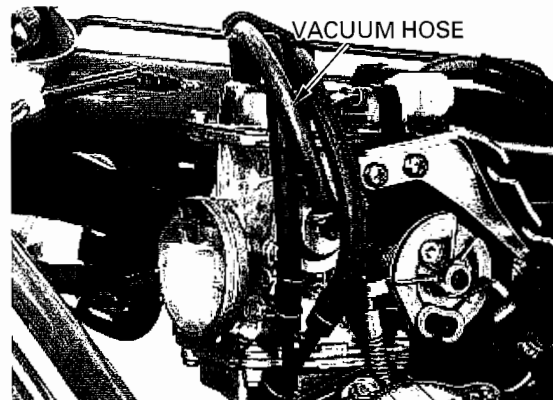


CARBURETOR INSTALLATION

Install the carburetor heater and throttle stop screw stay to the carburetor.
Install and tighten the screw securely.
Connect the No.5 and No.11 hoses.



Connect the vacuum hose to the carburetor.



FUEL SYSTEM

Connect the throttle cables to the throttle drum and install them in the cable stay.

Loosely tighten the throttle cable adjusting nuts.



Install the carburetor/insulator as an assembly to the manifold by aligning the insulator groove with the projection on the manifold.

Tighten the carburetor insulator band screws until the band ends contact each other.

TORQUE: 5.1 N·m (0.52 kgf·m , 3.8 lbf·ft)



Connect the fuel hose to the fuel joint on the carburetor.



Connect the following:

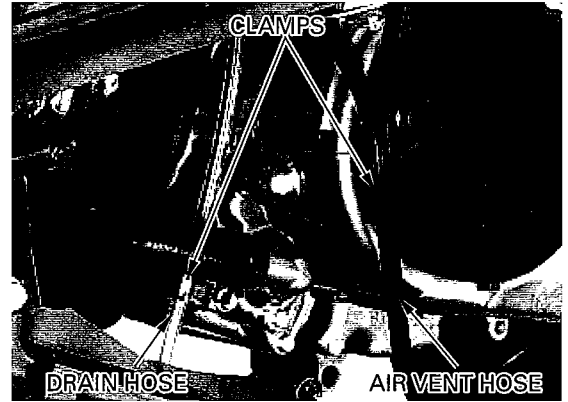
- Throttle position (TP) sensor 3P connector
- SE valve 2P connector



Install the carburetor drain hose and air vent hose to the clamps on the left side of the engine.

Route the cable, wire harness and hoses correctly (page 1-18).

Install the air cleaner housing (page 5-3).
Install the upper luggage box (page 2-7).



STARTING ENRICHMENT (SE) VALVE RESISTANCE INSPECTION

Remove the battery cover (page 17-4).

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

Disconnect the SE valve 2P connector.

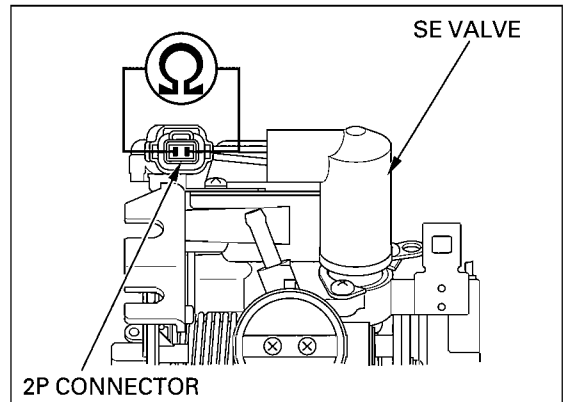


Measure the resistance between the SE valve wire connectors.

STANDARD: 10 k Ω max (at 20C°/68°F)

If resistance is abnormal, replace the SE valve.

Install the battery cover (page 17-4).

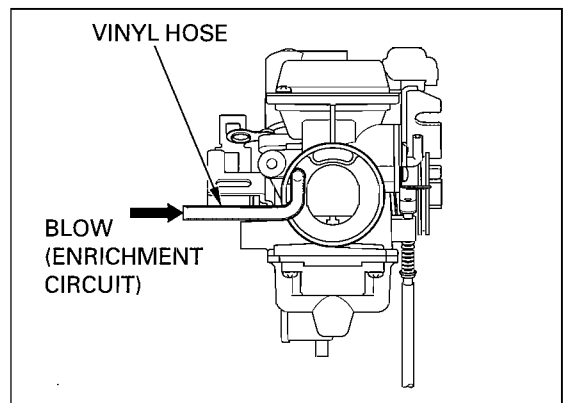


OPERATION INSPECTION

Remove the carburetor (page 5-4).

The engine should be stopped for at least 30 minutes prior to inspecting the SE valve operation. This will give the carburetor sufficient time to cool. Insert the vinyl hose into the fuel enrichment circuit and blow into the hose.

Air should flow into the circuit.



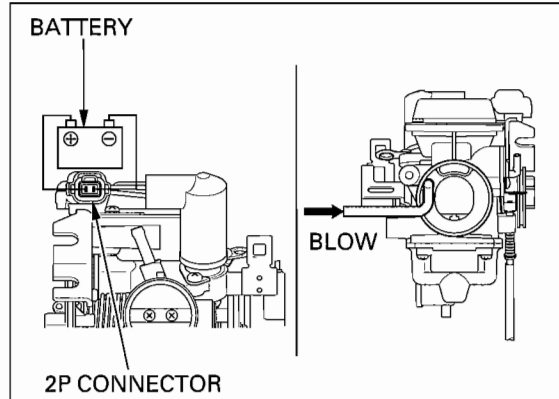
FUEL SYSTEM

Connect a 12-V battery to the SE valve 2P connector terminals and wait 5 minutes.
Insert the vinyl hose into the 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 5-15).



PILOT SCREW ADJUSTMENT

IDLE DROP PROCEDURE

NOTE:

- The pilot screw is factory pre-set. Adjustment is not necessary unless the carburetor is overhauled or a new pilot screw is installed.
- 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.

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

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:

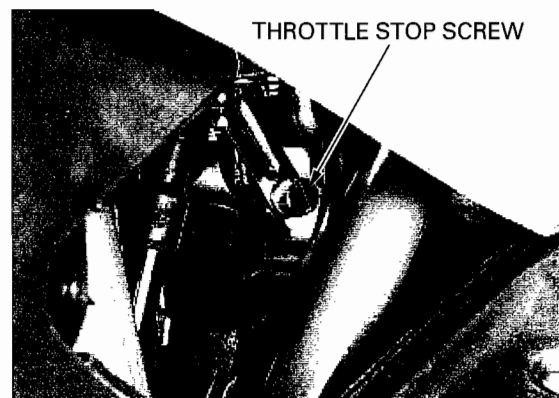
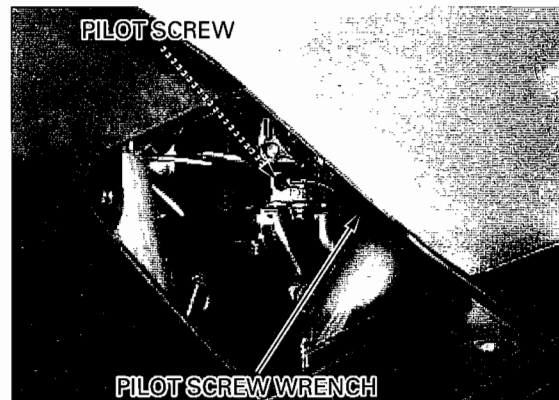
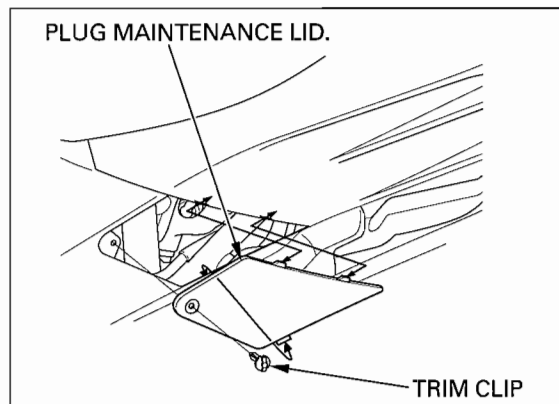
Pilot screw wrench 07MMA-MT3010B
(U. S. A. only)

INITIAL OPENING: 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. Start the engine and adjust the idle speed with the throttle stop screw.

IDLE SPEED: 1,500 ± 100 rpm

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



HIGH ALTITUDE ADJUSTMENT

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

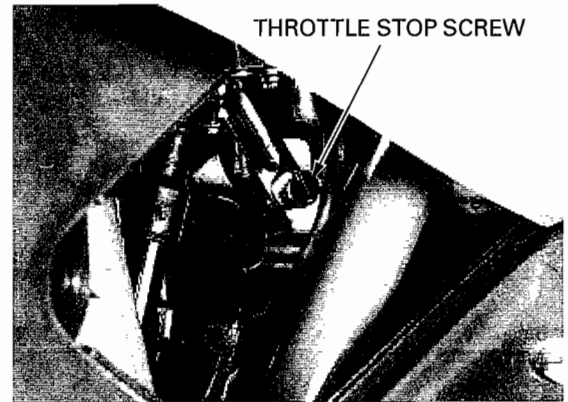
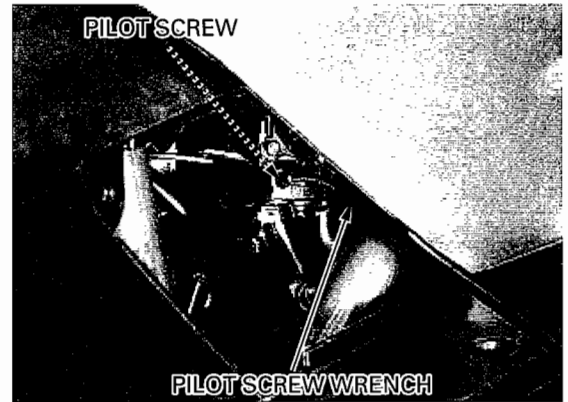
This adjustment must be made at high altitude to ensure proper high altitude operation.

When the vehicle is to be operated continuously above 2,000 m (6,500 feet), the carburetor must be readjusted as follows to improve driveability and decrease exhaust emissions. Warm up the engine to operating temperature for approximately 10 minutes. Turn the pilot screw clockwise 3/4 of a turn.

TOOL:

Pilot screw wrench 07MMA-MT3010B
(U. S. A. only)

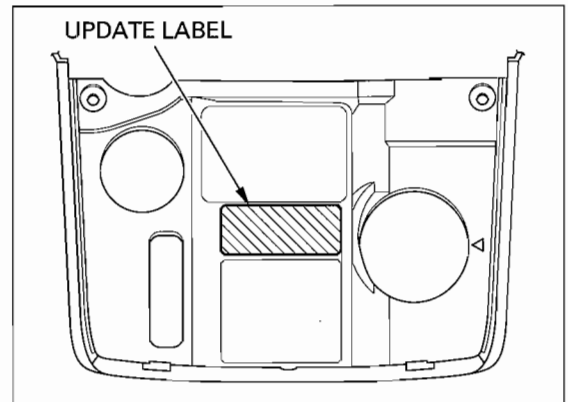
HIGH ALTITUDE SETTING: 3/4 turn in



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

Attach a Vehicle Emission Control Information Update Label on the fuel/reserve tank lid wall as shown in the label position illustration.

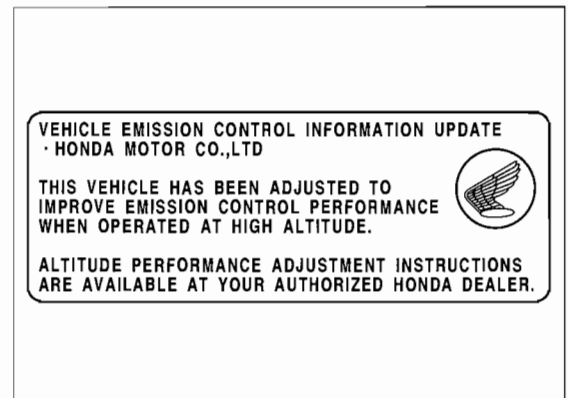
Sustained operation at an altitude lower than 1,500 m (5,000 feet) with the carburetor adjusted for high altitude may cause the engine to idle roughly and the engine to stall in traffic. It may also cause engine damage due to overheating.



When the vehicle is to be operated continuously below 1,500 m (5,000 feet), turn the pilot screw counterclockwise 1/2 of a turn to its original position and adjust the idle speed.

IDLE SPEED: 1,500 ± 100 rpm

Be sure to make these adjustments at low altitude. Remove the Vehicle Emission Control Information Update Label that is attached to the fuel/reserve tank lid wall after adjusting for low altitude.



SECONDARY AIR SUPPLY SYSTEM

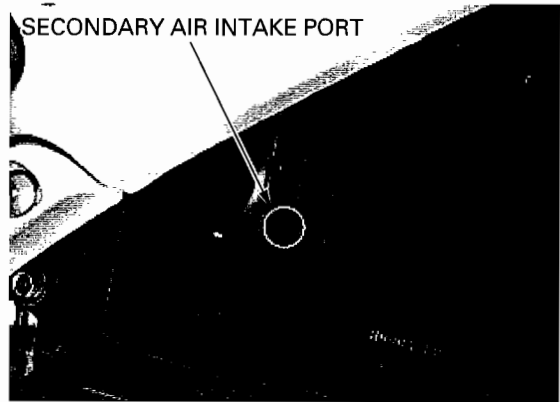
SYSTEM INSPECTION

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

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

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

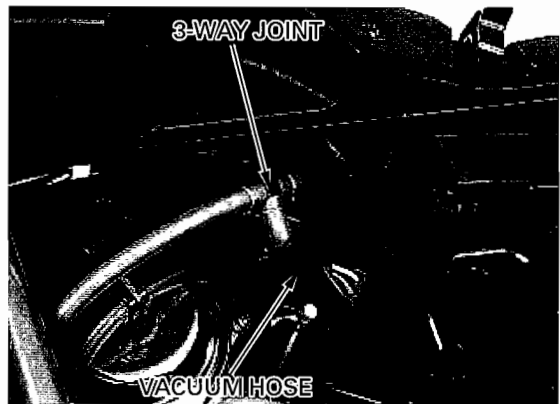
If the ports are carbon fouled, check the pulse secondary air injection (PAIR) control valve.



Remove the battery cover (page 17-4).

Disconnect the PAIR control valve vacuum hose from the 3-way joint and plug it to keep air from entering.

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



Start the engine and open the throttle slightly to be certain that air is drawn 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.

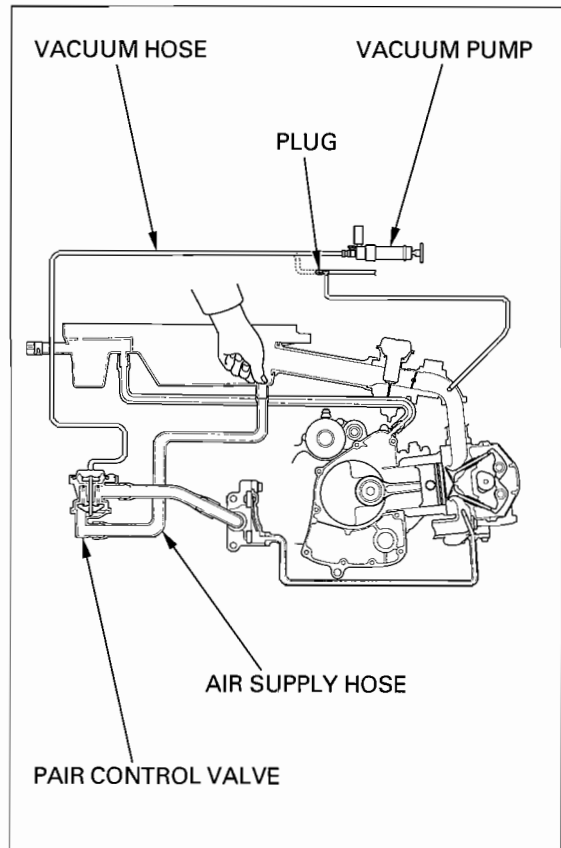
With the engine running, gradually apply vacuum to the PAIR control valve.

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

SPECIFIED VACUUM: 360 mm Hg

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

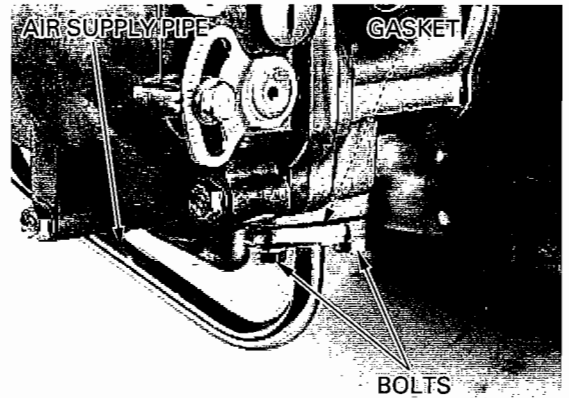
If afterburn occurs on deceleration, even when the secondary air supply system is normal, check the air cut-off valve.



PAIR CHECK VALVE INSPECTION

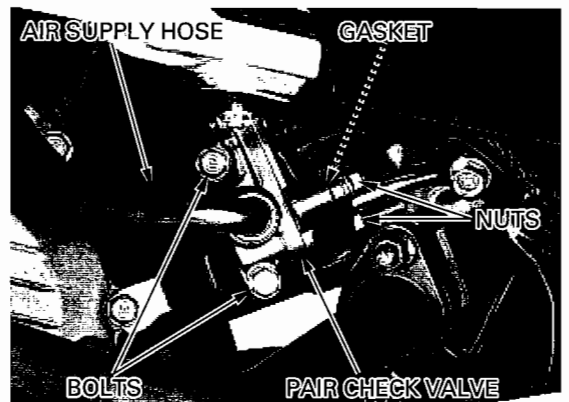
Remove the right floor skirt (page 2-4).

Remove the bolts, nuts (see photo below) air supply pipe and gaskets.

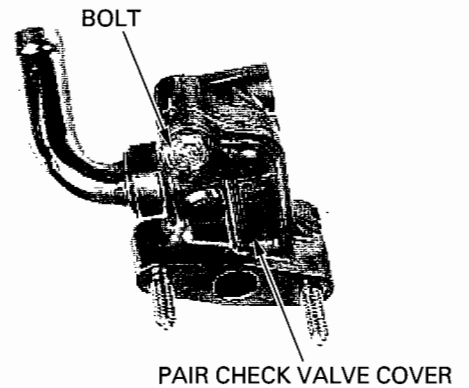


If you plan to disassemble the valve, loosen the cover bolt before removing the assembly from the scooter.

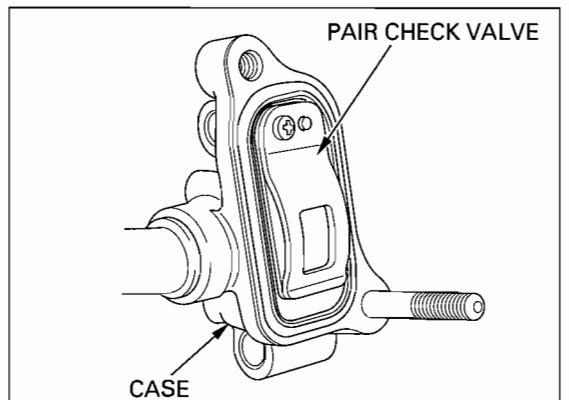
Disconnect the air supply hose.
Remove the bolts and PAIR check valve.



Remove the bolt and PAIR check valve cover.

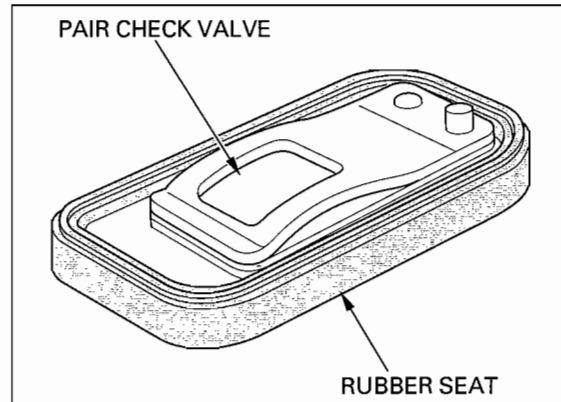


Remove the PAIR check valve from the valve case.



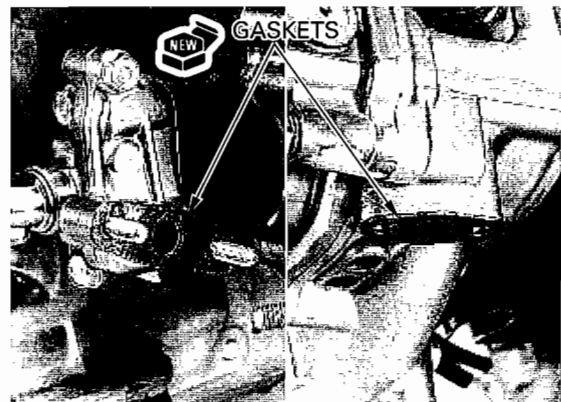
FUEL SYSTEM

Check the reed 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.



Installation is in the reverse order of removal.

During installation, replace the gaskets with new ones.

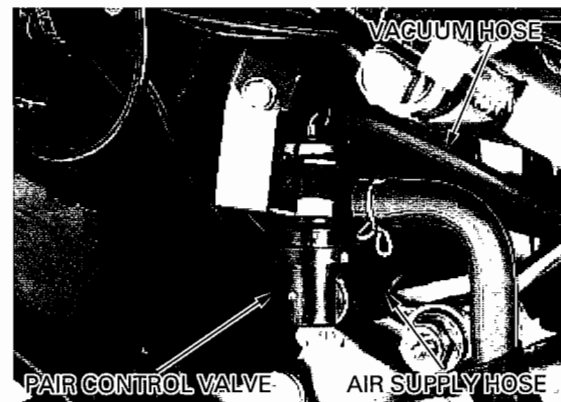


PAIR CONTROL VALVE REMOVAL/INSTALLATION

Remove the body cover (page 2-5).

Disconnect the air supply hoses and vacuum hose.
Remove the PAIR control valve from the stay.

Installation is in the reverse order of removal.



EVAPORATIVE EMISSION CONTROL SYSTEM

NOTE:

- Refer to the Vacuum Hose Routing Diagram on page 1-24 for the hose connections.

EVAPORATIVE EMISSION (EVAP) CANISTER REMOVAL/INSTALLATION

Remove the floor skirt (page 2-4).
Remove the front lower cover (page 2-12).

Disconnect the No.1 and No.4 hoses from the EVAP canister.
Remove the EVAP canister from the stays on the frame.

Installation is in the reverse order of removal.

EVAPORATIVE EMISSION (EVAP) PURGE CONTROL VALVE

REMOVAL/INSTALLATION

Remove the upper luggage box (page 2-7).

Disconnect the No.4, No.5 and No.11 hoses from the EVAP purge control valve.
Remove the EVAP purge control valve from the stay on the frame.

Installation is in the reverse order of removal.

INSPECTION

NOTE:

- The EVAP purge control valve should be inspected if hot restart is difficult.

Remove the EVAP purge control valve (see above).

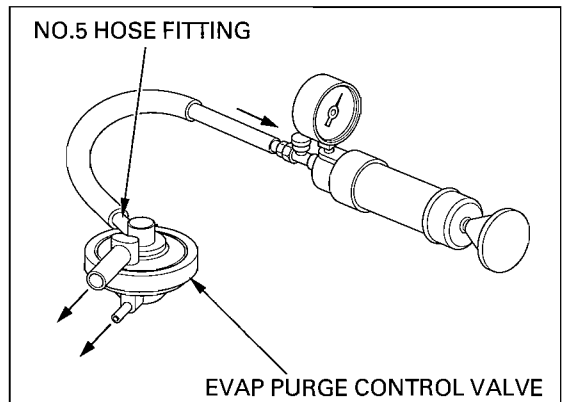
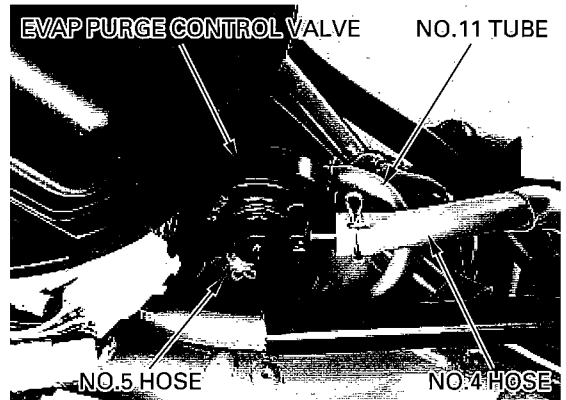
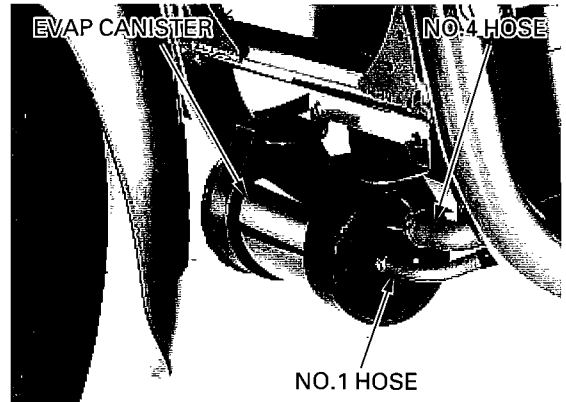
Connect the vacuum pump to the No.5 hose fitting (outlet port) that goes to the carburetor. Apply the specified vacuum to the EVAP purge control valve.

TOOL:

Vacuum/pressure pump A937X-041-XXXXX or
Vacuum pump ST-AH-260 MC7
(U. S. A. only)

SPECIFIED VACUUM: 30 mm Hg (1.1 in Hg)

The specified vacuum should be maintained.
Replace the EVAP purge control valve if vacuum is not maintained.

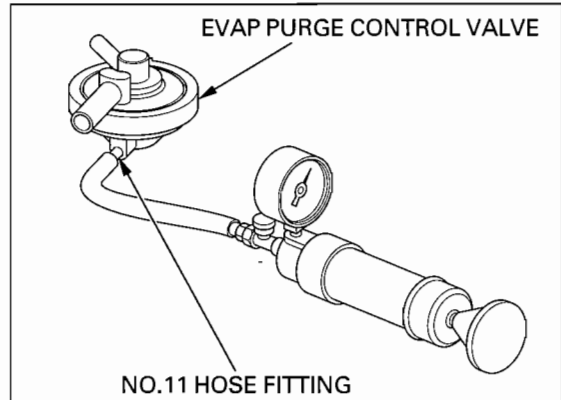


FUEL SYSTEM

Remove the vacuum pump and connect it to the No. 11 hose fitting (vacuum port) that goes to the carburetor.
Apply the specified vacuum to the EVAP purge control valve.

SPECIFIED VACUUM: 30 mm Hg (1.1 in Hg)

The specified vacuum should be maintained.
Replace the EVAP purge control valve if vacuum is not maintained.



Connect a pressure pump to the No.4 hose fitting (input port) that goes to the EVAP canister.

TOOL:

Vacuum/pressure pump A937X-041-XXXXX or
Pressure pump ST-AH-255 MC7
(U.S.A. only)

NOTICE

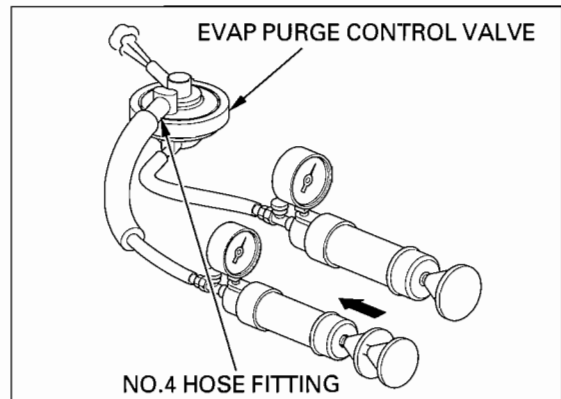
Damage to the EVAP purge control valve may result from a high pressure air source. Use a hand-operated air pump only.

While applying the specified vacuum to the EVAP purge control valve vacuum port, pump air through the input port.

SPECIFIED VACUUM: 30 mm Hg (1.1 in Hg)

Air should flow through the EVAP purge control valve and out the outlet port that goes to the carburetor.
Replace the EVAP purge control valve if air does not flow out.

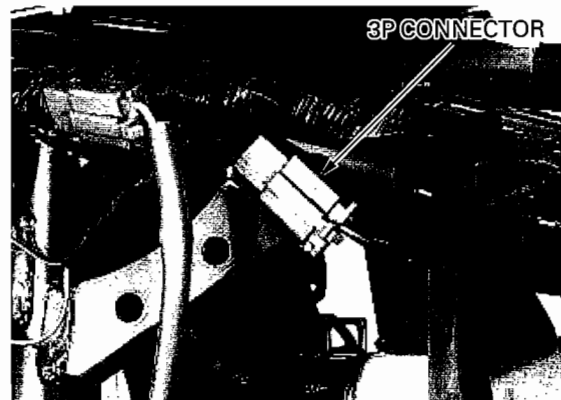
Remove the pumps and install the EVAP purge control valve in the reverse order of removal.



FUEL TANK

Remove the floor board (page 2-8).
Remove the radiator reserve tank (page 6-16).
Remove the fuel pump (page 20-16).

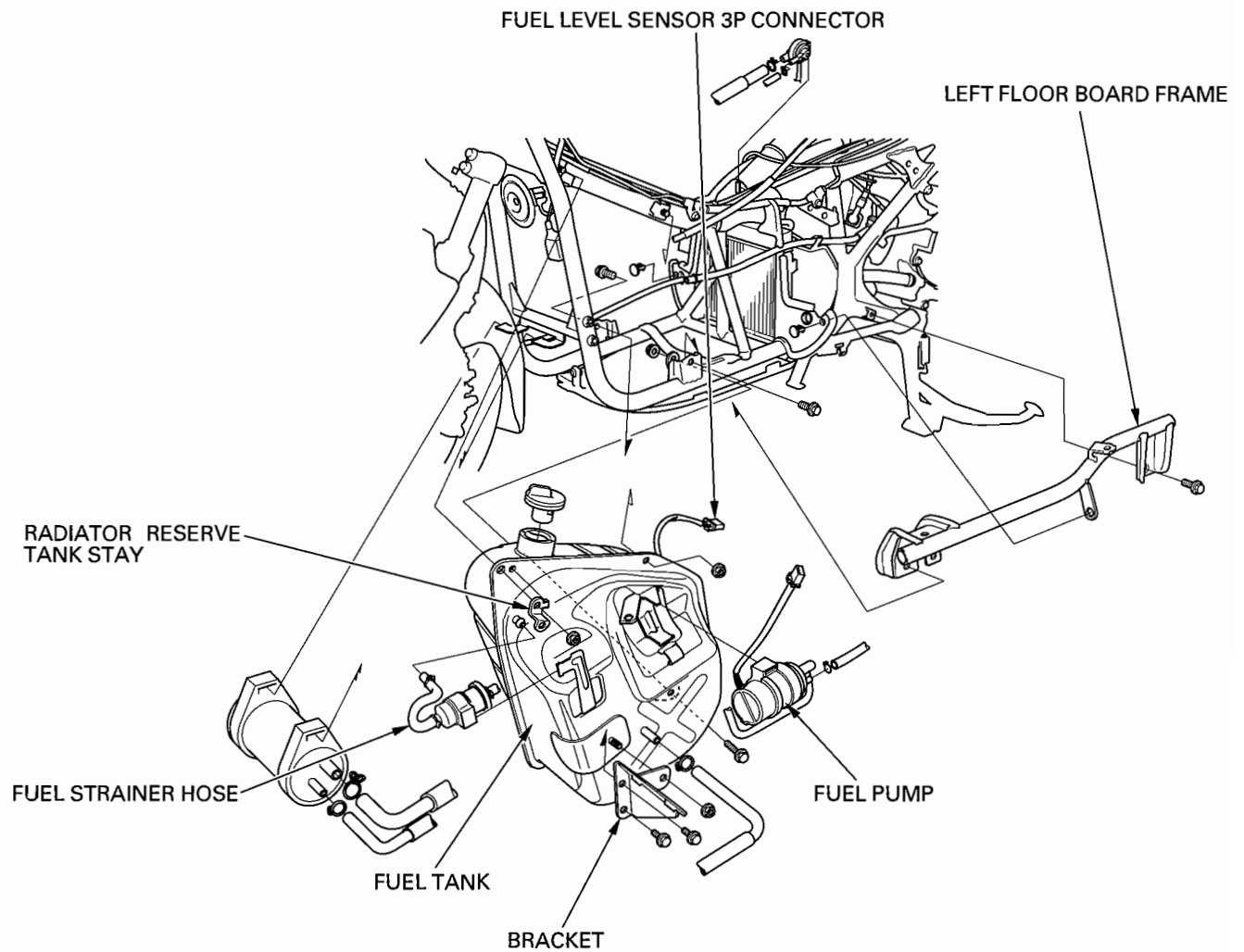
Disconnect the No.1 and No.4 hoses from the EVAP canister.
Disconnect the fuel level sensor 3P connector.



Disconnect the fuel strainer hose from the fuel tank.
Remove the bolts and left floor board frame.
Remove the bolts, nut and bracket.
Remove the nut and radiator reserve tank stay.
Remove the bolts, nut and fuel tank cap.
Remove the fuel tank from the left side of the scooter.

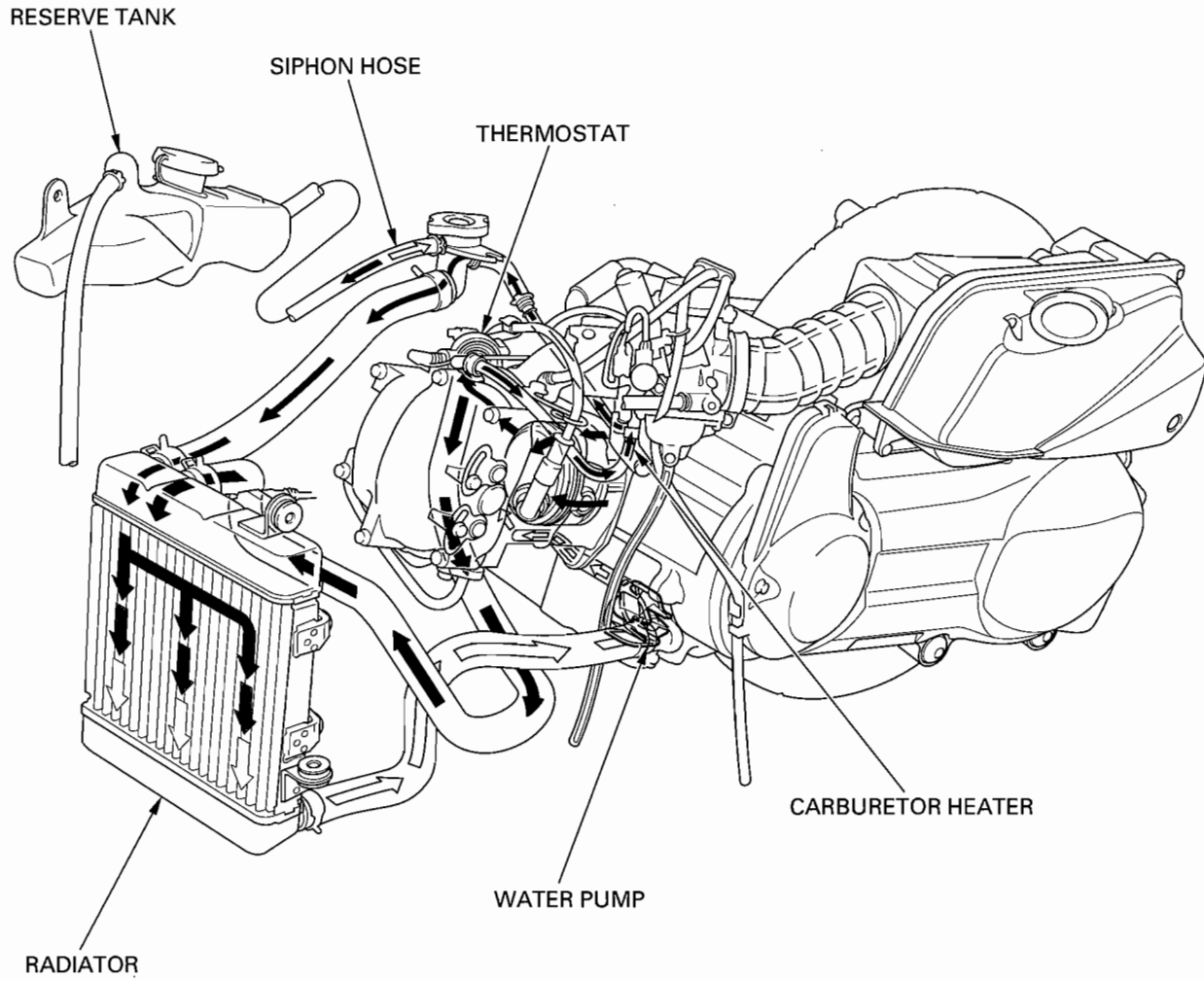
Be careful not to damage the radiator fins and frame.

Installation is in the reverse order of removal.



COOLING SYSTEM

SYSTEM FLOW PATTERN



6. COOLING SYSTEM

SYSTEM FLOW PATTERN	6-0	THERMOSTAT	6-6
SERVICE INFORMATION	6-1	WATER PUMP	6-7
TROUBLESHOOTING	6-2	RADIATOR	6-13
SYSTEM TESTING	6-3	RADIATOR RESERVE TANK	6-16
COOLANT REPLACEMENT	6-4		

SERVICE INFORMATION

GENERAL

6

⚠ 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

Do not use coolant with silicate inhibitors. It may cause premature wear of water pump seals or may block 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.
- Refer to section 18 for engine coolant temperature (ECT) sensor inspection.
- Refer to section 20 for fan motor switch and thermosensor inspection.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	1.2 ℓ (1.3 US qt , 1.1 Imp qt)
	Reserve tank	0.2 ℓ (0.2 US qt , 0.2 Imp qt)
Radiator cap relief pressure		74 – 103 kPa (0.75 – 1.05 kgf/cm ² , 10.7 – 15 psi)
Thermostat	Begin to open	69 – 72.5 °C (156 – 163 °F)
	Fully open	80 °C (176 °F)
	Valve lift	3.5 mm (0.14 in) minimum
Recommended antifreeze		Pro Honda HP coolant or an equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors
Standard coolant concentration		1:1 mixture with soft water

COOLING SYSTEM

TORQUE VALUES

Water pump impeller	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Thermosensor	9.8 N·m (1.0 kgf·m , 7 lbf·ft)	Apply sealant to the threads.
Engine coolant temperature (ECT) sensor	15 N·m (1.5 kgf·m , 11 lbf·ft)	
Fan motor switch	17 N·m (1.7 kgf·m , 12 lbf·ft)	

TOOLS

Universal holder	07725-0030000
Remover weight	07741-0010201
Driver C	07746-0030100
Inner driver, 35 mm	07746-0030400
Driver	07749-0010000
Remover shaft	07936-KC10100
Bearing remover, 15 mm	07936-KC10200
Mechanical seal driver attachment	07945-4150400
Attachment, 28 × 30 mm	07946-1870100

TROUBLESHOOTING

Engine temperature too high

- Faulty radiator cap
- Faulty temperature gauge or thermosensor
- Air in system
- Thermostat stuck closed
- Insufficient coolant
- Passages blocked in radiator, hoses or water jacket
- Faulty cooling fan motor
- Faulty fan motor switch
- Faulty water pump

Engine temperature too low

- Faulty temperature gauge or thermosensor
- Thermostat stuck open
- Faulty fan motor switch

Coolant leak

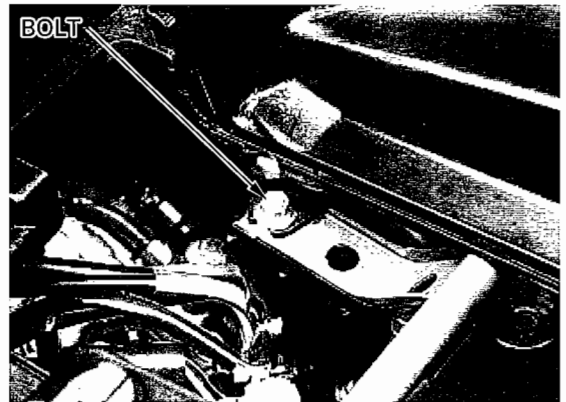
- Faulty water pump mechanical seal
- Deteriorated O-rings
- Faulty radiator cap
- Damaged or deteriorated cylinder head gasket
- Loose hose connection or clamp
- Damaged or deteriorated hoses

SYSTEM TESTING

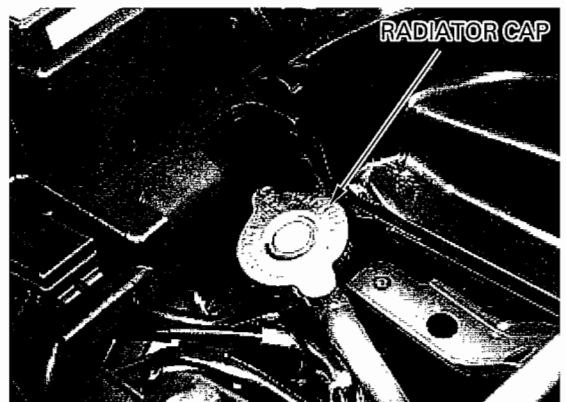
COOLANT (HYDROMETER TEST)

Remove the battery cover (page 17-4).

Remove the bolt and pull out the radiator cap (filler neck) to the lid opening.



Remove the radiator cap.

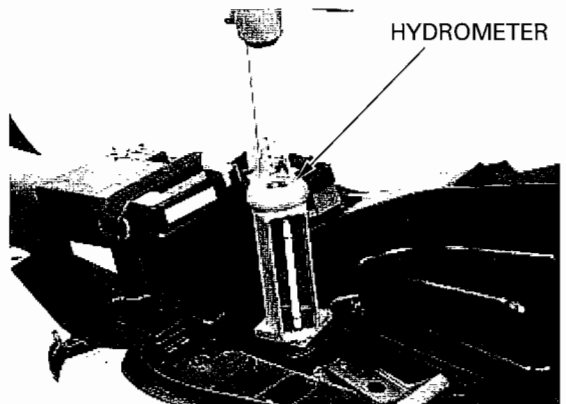


COOLANT (HYDROMETER TEST)

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

For maximum corrosion protection, a 1:1 solution of ethylene glycol and distilled water is recommended (page 6-4).

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	1.049	1.047	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 (page 6-3).

Before installing the cap in the tester, wet the sealing surface.

Pressurize test the radiator cap. Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low. It must hold the specified pressure for at least 6 seconds.

RADIATOR CAP RELIEF PRESSURE:

74–103 kPa (0.75–1.05 kgf/cm², 10.7–15 psi)

Excessive pressure can damage the cooling system components. Do not exceed 103 kPa (1.05 kgf/cm², 15 psi).

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

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



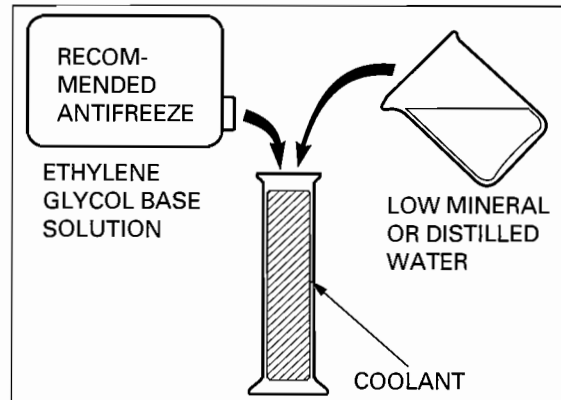
COOLANT REPLACEMENT PREPARATION

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.

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 antifreeze.

RECOMMENDED MIXTURE:

1:1 (Distilled water and antifreeze)

RECOMMENDED ANTIFREEZE:

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

REPLACEMENT/AIR BLEEDING

Remove the radiator cap (page 6-3).

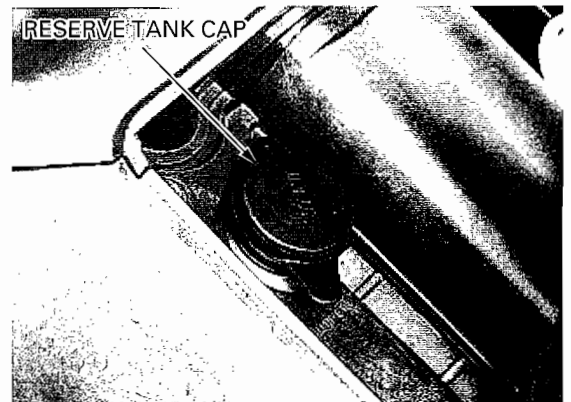
Remove the drain bolt and drain the coolant from the system. Place the scooter on its side stand to allow the coolant to drain completely.



Unlock and open the fuel/reserve tank lid using the ignition key.

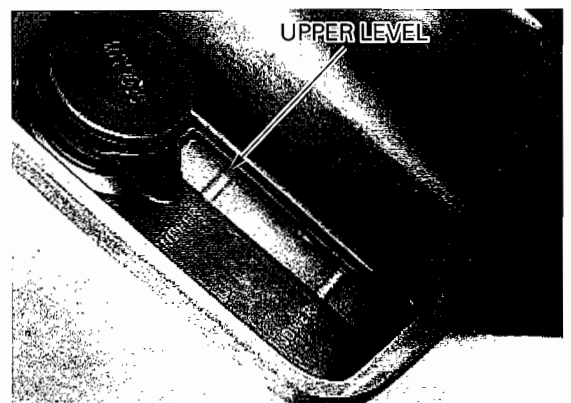
Remove the reserve tank cap and drain the coolant from the reserve tank.

Reinstall the drain bolt with the new sealing washer securely.



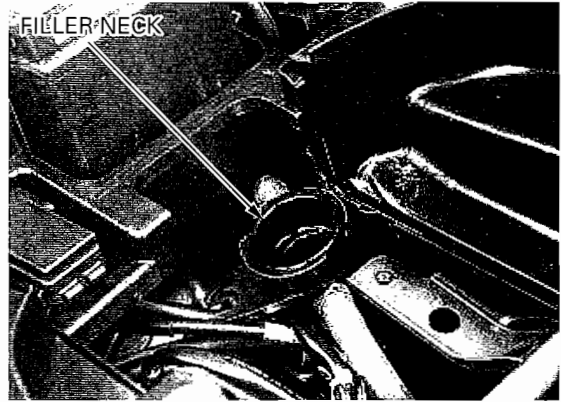
Place the scooter on its center stand on a flat, level surface.

Fill the reserve tank to the upper level line.



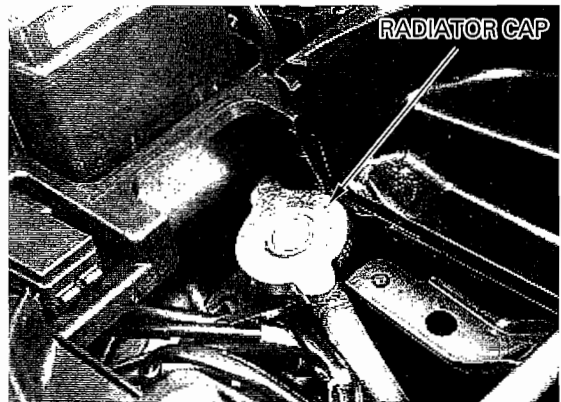
COOLING SYSTEM

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



Bleed air from the system as follows:

1. Start the engine and let it idle for 2–3 minutes.
2. Snap the throttle three or four times to bleed air from the system.
3. Stop the engine and add coolant up to the 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.

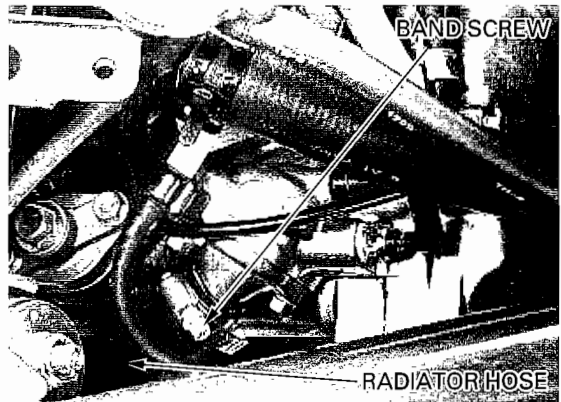


THERMOSTAT

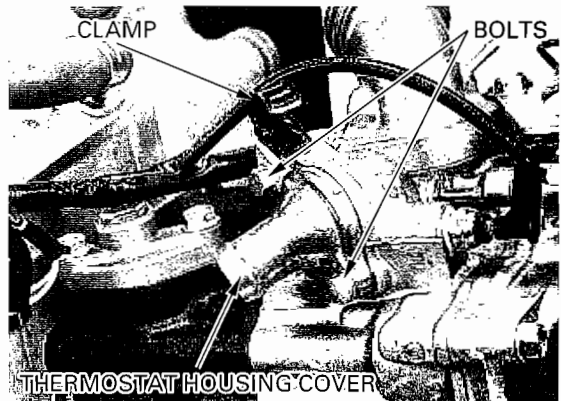
REMOVAL

Remove the floor skirt (page 2-4).
Drain the coolant (page 6-5).

Loosen the hose band screw and disconnect the radiator hose from the thermostat housing cover.



Remove the bolts, clamp, and thermostat housing cover.



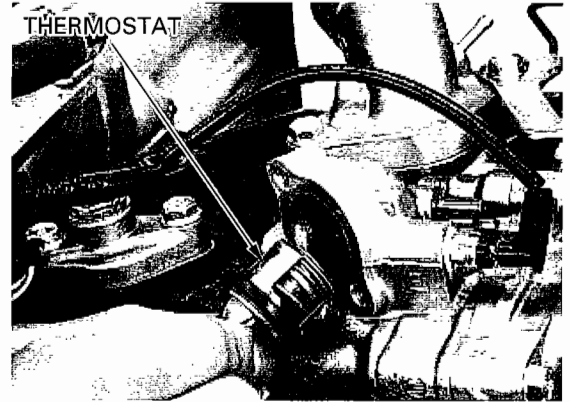
Remove the thermostat.

INSTALLATION

Installation is in the reverse order of removal.

When installing the thermostat, install it with the hole facing up.

Fill the system with recommended coolant and bleed the air (page 6-5).
Install the floor skirt (page 2-4).



INSPECTION

Visually inspect the thermostat for damage.

Keep flammable materials away from the electric heating element.

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

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

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

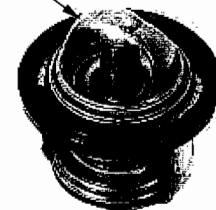
THERMOSTAT BEGINS TO OPEN:

69 – 72.5 °C (156 – 163 °F)

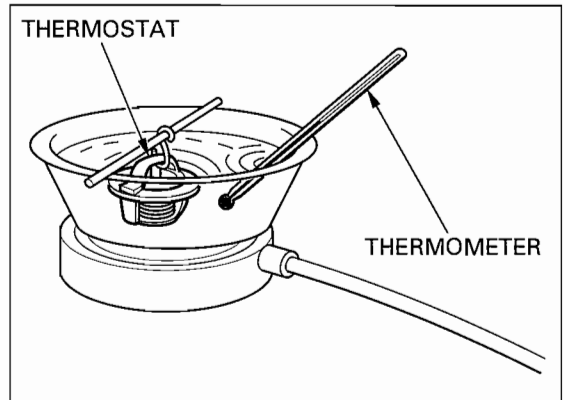
VALVE LIFT:

3.5 mm (0.14 in) minimum at 80°C (176°F)

THERMOSTAT



THERMOSTAT



WATER PUMP

MECHANICAL SEAL INSPECTION

Inspect the telltale hole for signs of coolant leakage. If there is leakage, the mechanical seal is defective and it should be replaced (page 6-9).



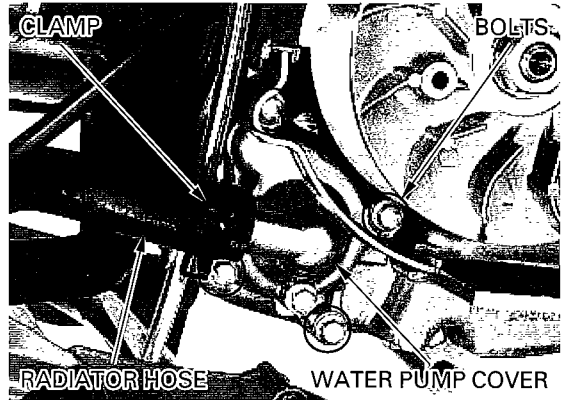
COOLING SYSTEM

REMOVAL

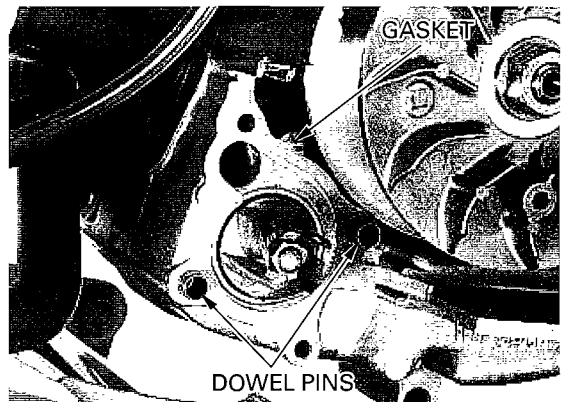
Drain the coolant (page 6-5).
Remove the left crankcase cover (page 10-3).

Remove the clamp and disconnect the radiator hose.

Remove the bolts and the water pump cover.

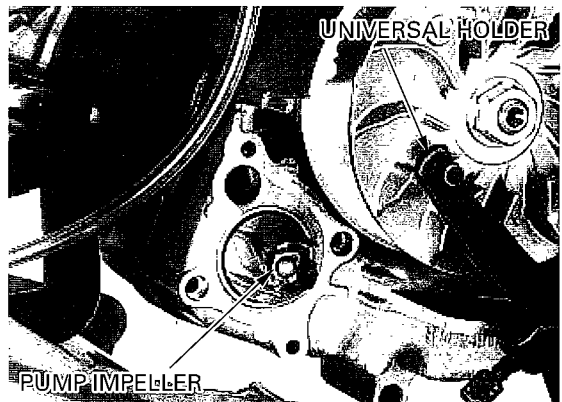


Remove the gasket and dowel pins.



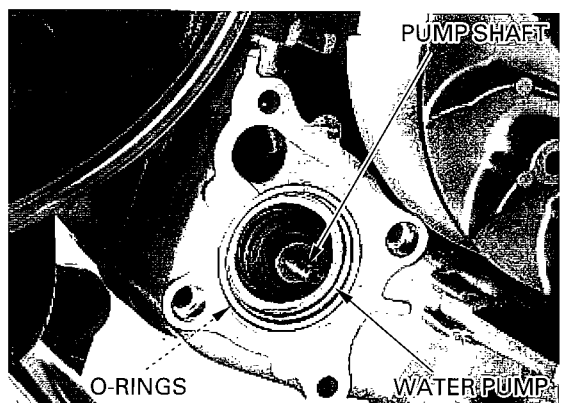
Hold the drive pulley face with the universal holder and remove the pump impeller.

TOOL:
Universal holder 07725-0030000



Install a nut (thread diameter 7 mm) onto the water pump shaft and pull it to remove the water pump out of the crankcase.

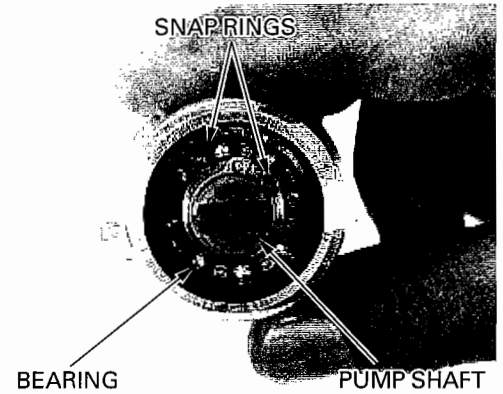
Remove the O-rings from water pump.



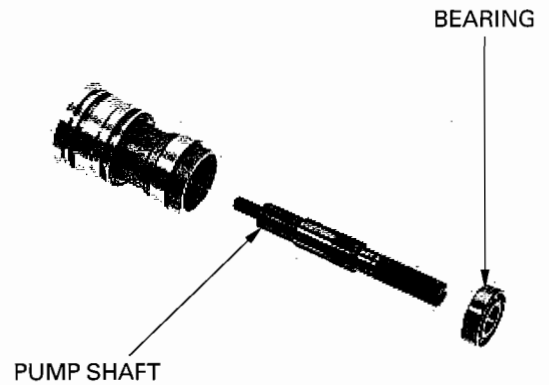
MECHANICAL SEAL REPLACEMENT

REMOVAL

Remove the snap rings.
Remove the water pump shaft and bearing.



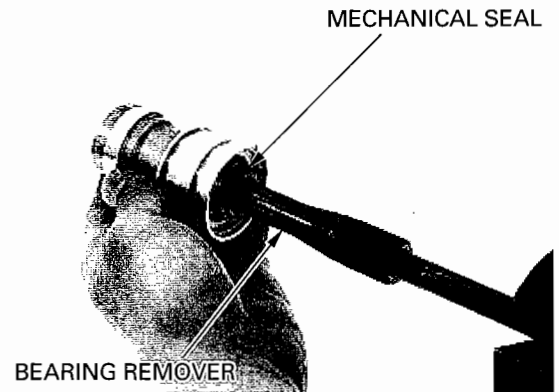
Replace the bearing if it is worn or damaged.
Replace the water pump shaft if it is worn or damaged.



Remove the mechanical seal using the special tools.

TOOLS:

Remover weight	07741-0010201
Remover shaft	07936-KC10100
Bearing remover, 15 mm	07936-KC10200



Remove the oil seal.



COOLING SYSTEM

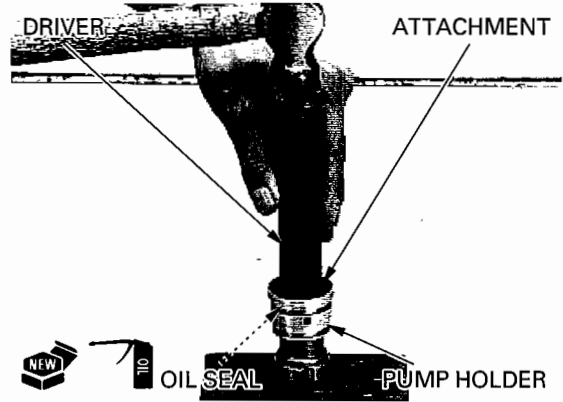
INSTALLATION

Coat a new oil seal outer surface and seal lip with engine oil.

Drive the oil seal into the pump holder squarely with the marks facing up until it is seated.

TOOLS:

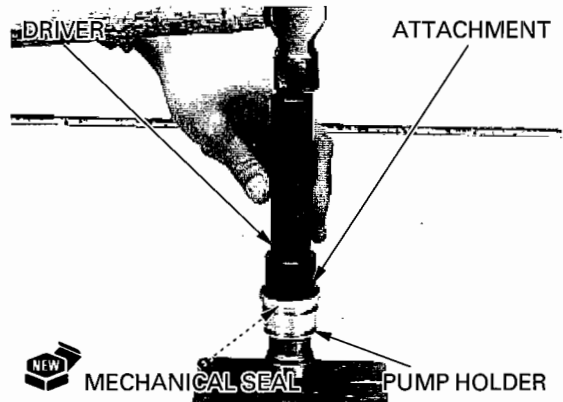
Driver 07749-0010000
Attachment, 28 × 30 mm 07946-1870100



Drive a new mechanical seal into the pump holder.

TOOLS:

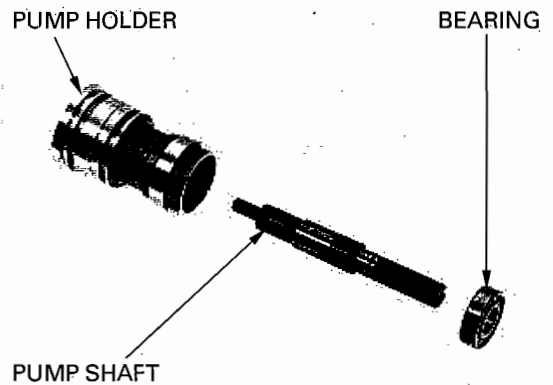
Driver 07749-0010000
Mechanical seal driver attachment 07945-4150400



Do not apply molybdenum oil to the mechanical seal sliding surface of the pump shaft.

Clean any oil from the pump shaft and apply molybdenum oil solution to the shaft journal.

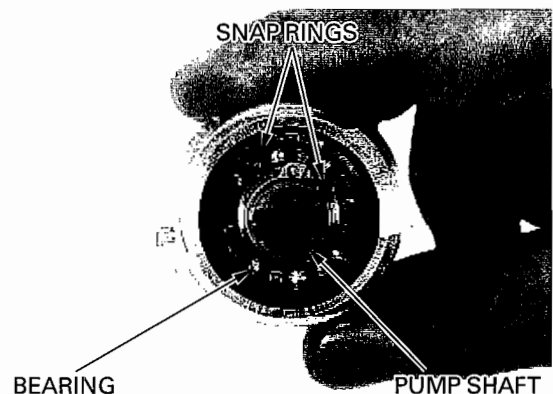
Install the bearing onto the pump shaft and secure it with the snap ring.



When installing the pump shaft assembly, be careful not to damage the oil seal lip and mechanical seal lip.

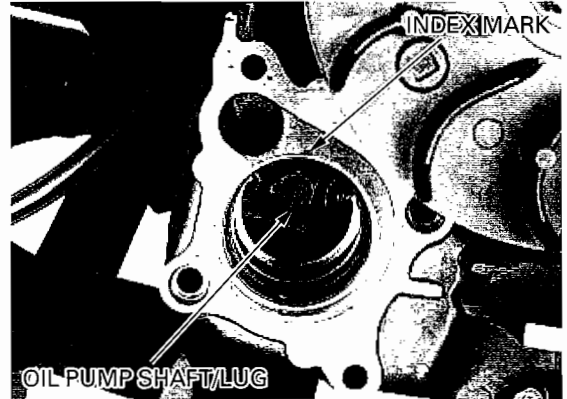
Install the pump shaft assembly into the pump holder and secure it with the snap ring.

Make sure the snap rings are fully seated in the grooves and the pump shaft rotates smoothly after installation.



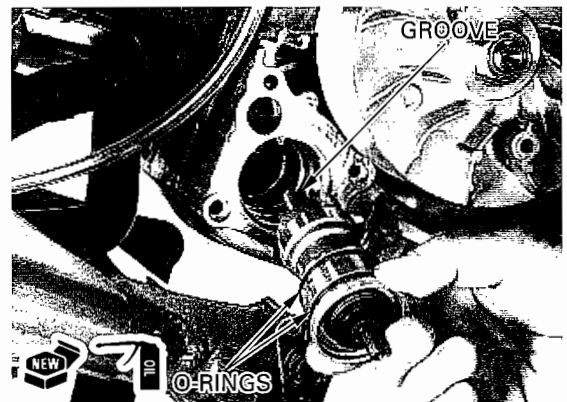
INSTALLATION

Align the lug of the oil pump shaft with the index mark of the crankcase vertically by turning the drive pulley face.



Coat new O-rings with engine oil and install them into the grooves in the pump holder.

Align the end groove of the pump shaft with the index mark of the pump holder.

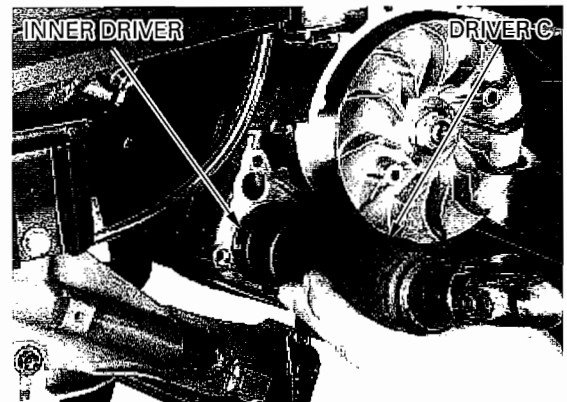


Install the water pump into the crankcase, aligning the index marks of the pump holder and crankcase.

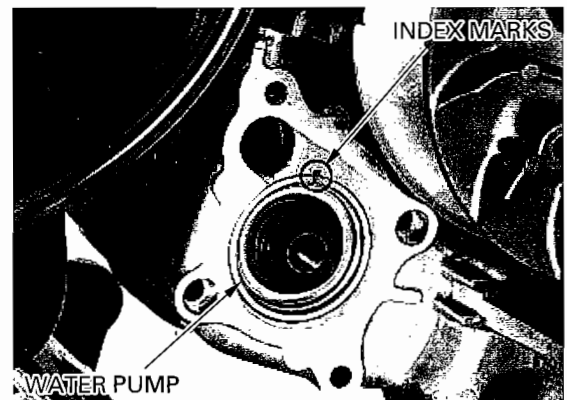
Press the water pump gradually until it seats.

TOOLS:

- | | |
|----------------------------|---------------|
| Driver C | 07746-0030100 |
| Inner driver, 35 mm | 07746-0030400 |



Make sure the index marks of the pump holder and crankcase align.
Make sure the pump shaft rotates smoothly by turning the drive pulley face.



COOLING SYSTEM

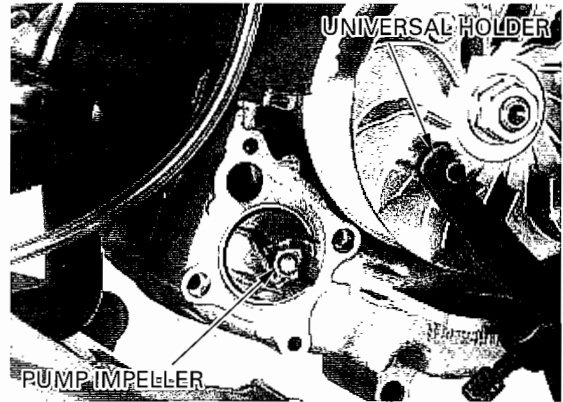
Install the impeller.

Hold the drive pulley face with the universal holder and tighten the pump impeller to the specified torque.

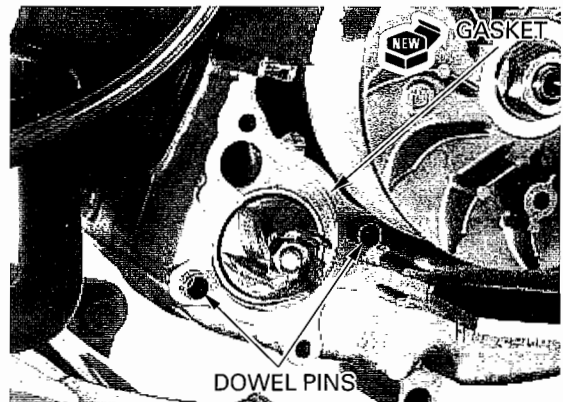
TOOL:

Universal holder 07725-0030000

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

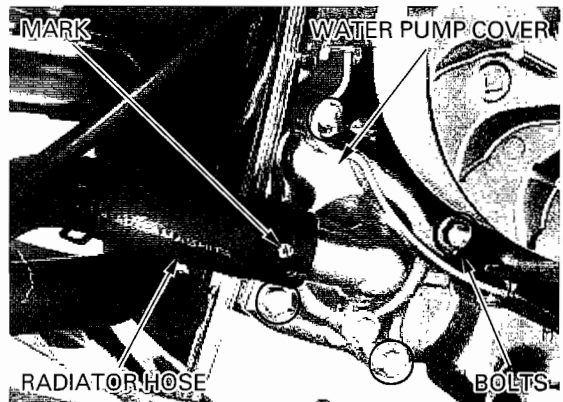


Clean the mating surfaces of the water pump cover and crankcase.
Install the dowel pins and a new gasket.



Install the water pump cover and tighten the bolts securely.

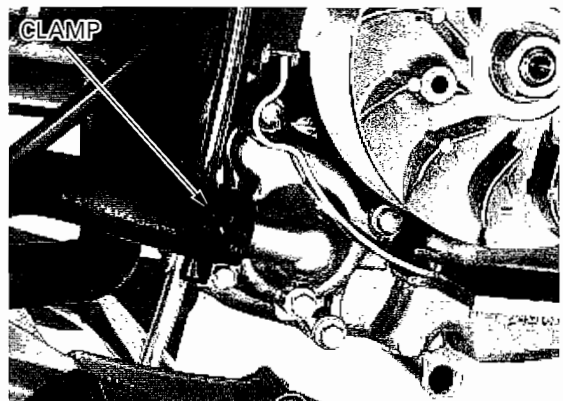
Connect the radiator hose with the mark facing outside.



Install the clamp securely.

Install the left crankcase cover (page 10-4).

Fill the system with the recommended coolant and bleed any air (page 6-5).



RADIATOR

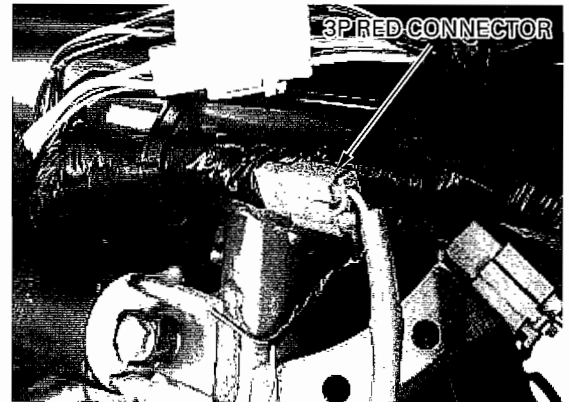
NOTE:

- The fan motor can be removed with the radiator installed in the frame.

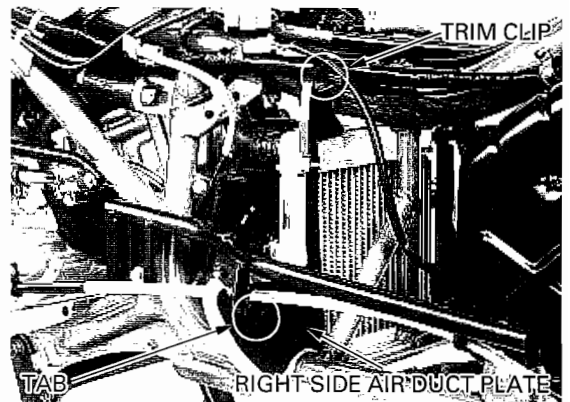
REMOVAL/INSTALLATION

Drain the coolant (page 6-5).
 Remove the step floor (page 2-8).
 Remove the under cover (page 2-12).

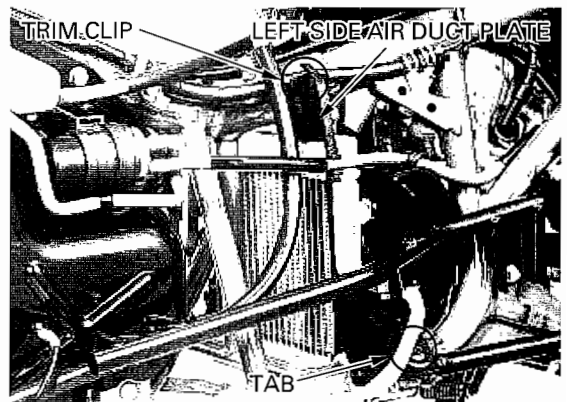
Disconnect the engine coolant temperature (ECT) sensor/fan motor switch 3P red connector.



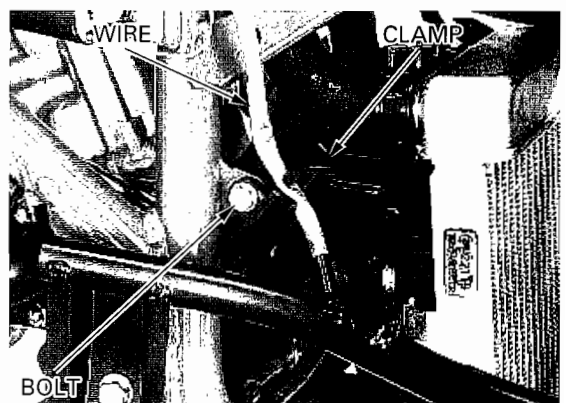
Remove the trim clip.
 Remove the tab from the frame.
 Remove the right side air duct plate.



Remove the trim clip.
 Remove the tab from the frame.
 Remove the left side air duct plate.



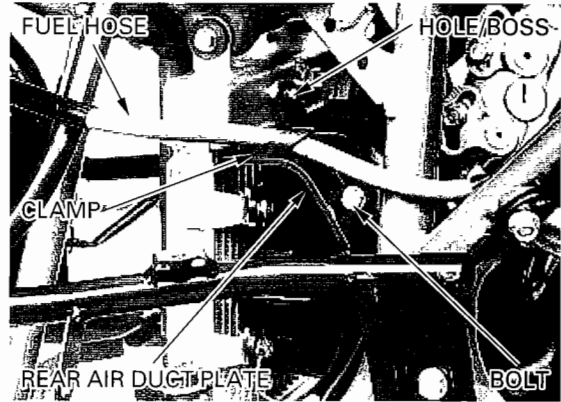
Remove the engine coolant temperature (ECT) sensor/fan motor switch wire from the clamp from the rear air duct plate.
 Remove the bolt.



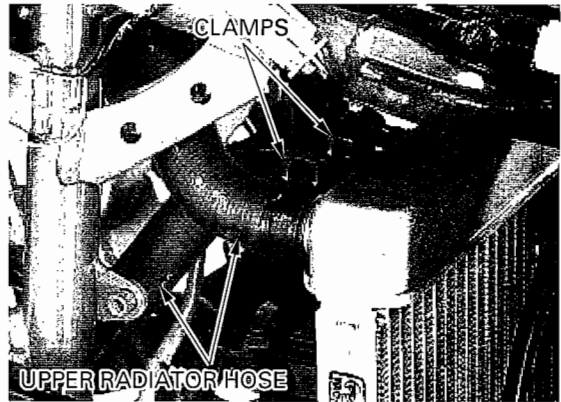
COOLING SYSTEM

Release the hole on the rear air duct plate from the boss on the radiator.
Remove the wire harness, fuel hose and radiator hose from the clamp on the rear air duct plate.

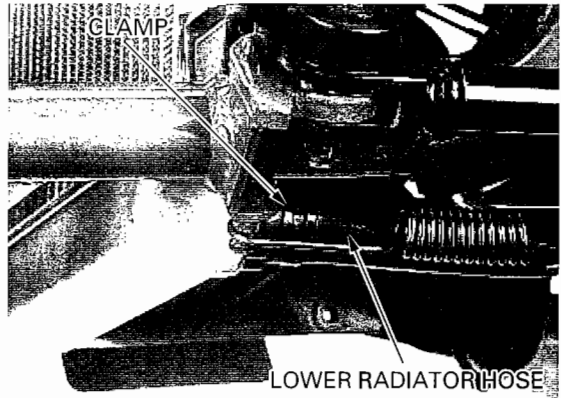
Remove the bolt and the rear air duct plate.



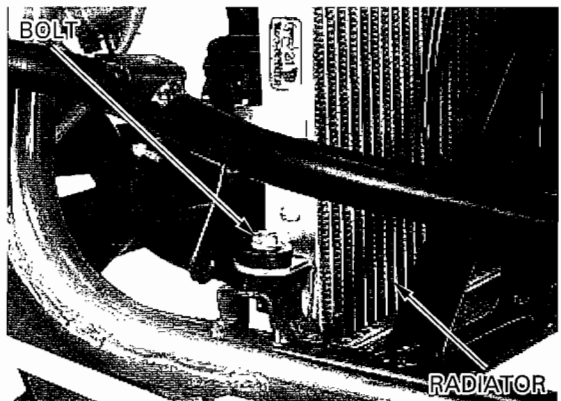
Remove the clamps and disconnect the upper radiator hoses.



Remove the clamp and disconnect the lower radiator hose.



Be careful not to damage the radiator core. Remove the mounting bolts and radiator.



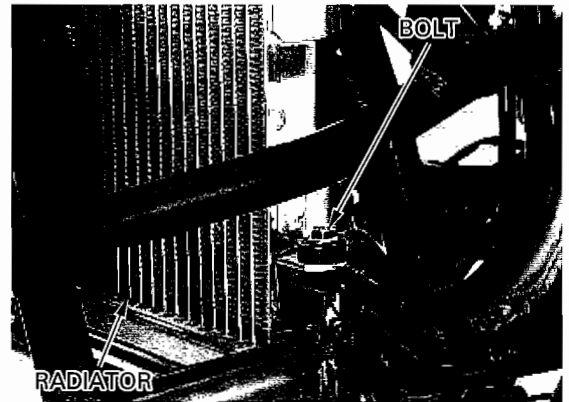
Installation is in the reverse order of removal.

Route the wire harness and hoses correctly (page 1-18).

Fill the system with the recommended coolant and bleed any air (page 6-5).

Install the floor board (page 2-8).

Install the under cover (page 2-12).

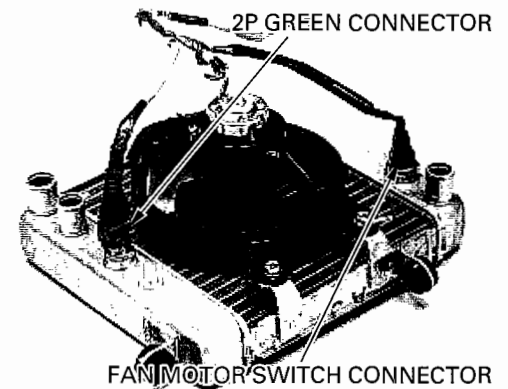


DISASSEMBLY

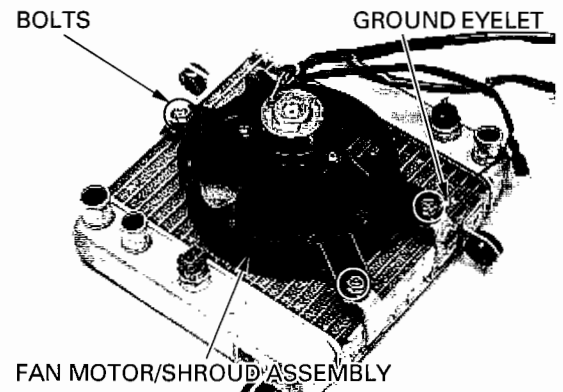
NOTE:

- Refer to section 18 for engine coolant temperature (ECT) sensor inspection.
- Refer to section 20 for fan motor switch and thermosensor inspection.

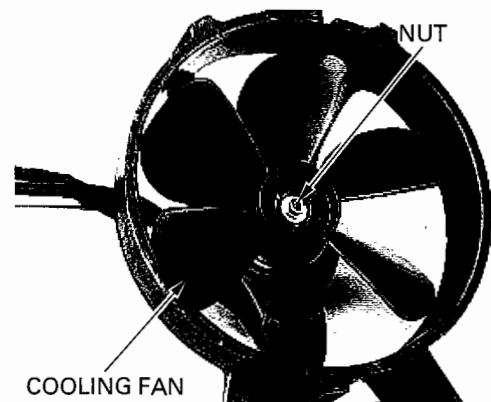
Disconnect the fan motor switch connector and ECT 2P green connector.



Remove the bolts, ground eyelet and the fan motor/shroud assembly.

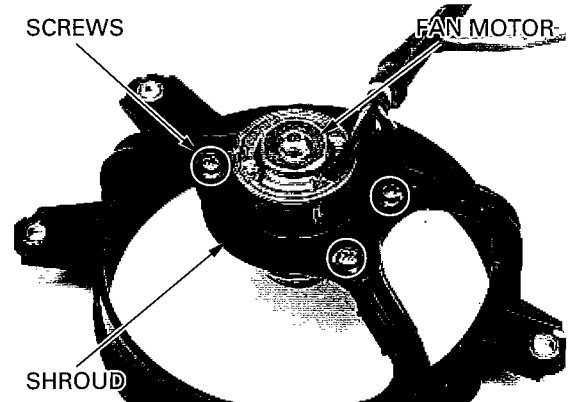


Remove the nut and cooling fan.



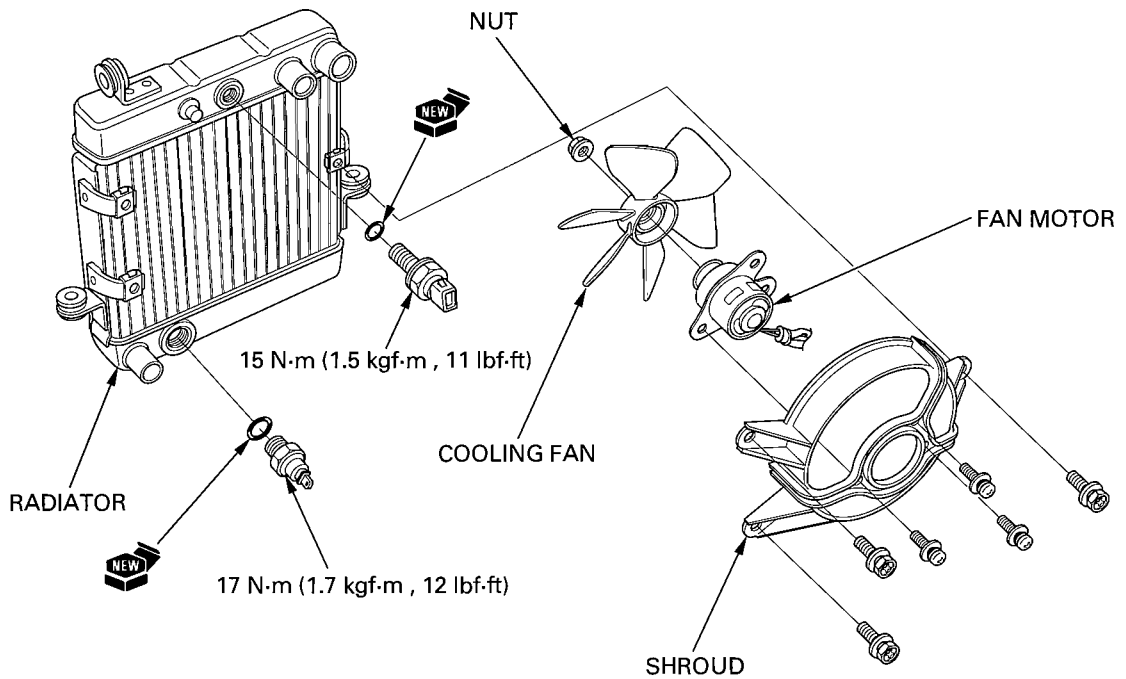
COOLING SYSTEM

Remove the screws and the fan motor from the shroud.



ASSEMBLY

Assembly is in the reverse order of disassembly.



RADIATOR RESERVE TANK

REMOVAL

Remove the inner cover (page 2-12).

Remove the bolt and radiator reserve tank from the fuel tank.

Open the reserve tank cap and drain the coolant from the reserve tank.

Disconnect the siphon hose.



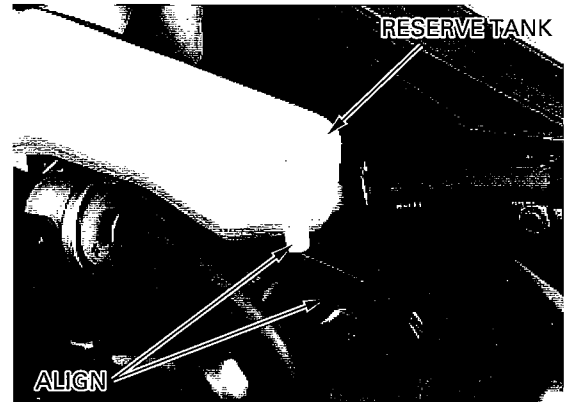
INSTALLATION

Installation is in the reverse order of removal.

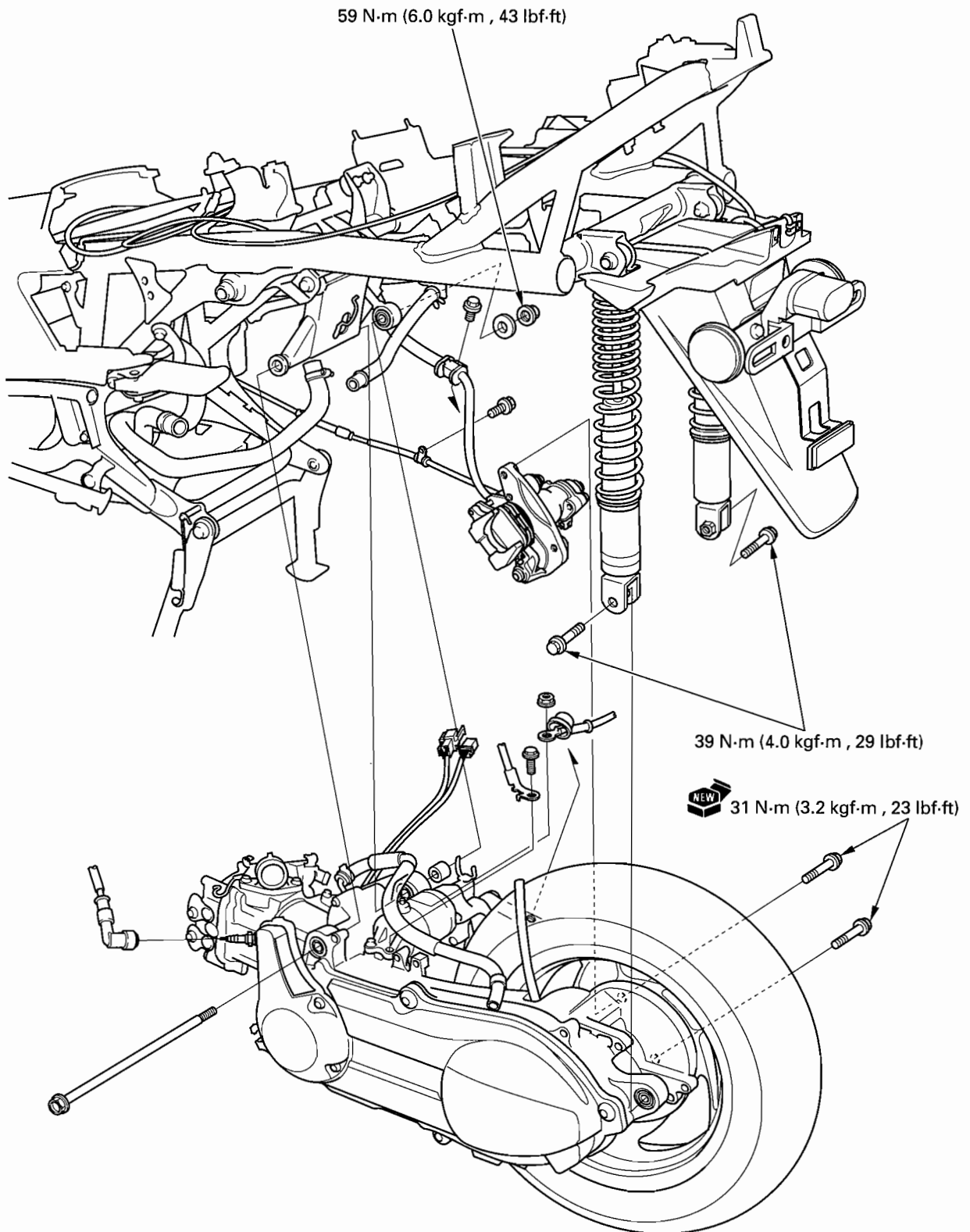
When installing the radiator reserve tank, align the boss on the tank with the hole in the fuel tank.

Add the recommended coolant to the upper level line with the center stand down.

Install the inner cover (page 2-13).



ENGINE REMOVAL/INSTALLATION



7. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION	7-1	ENGINE HANGER BRACKET	7-5
ENGINE REMOVAL	7-2	ENGINE INSTALLATION	7-10

SERVICE INFORMATION

GENERAL

- During engine removal and installation, support the scooter on its center stand.
- Support the engine using a jack or other adjustable support to ease removal of the engine hanger bolts.
- When using the lock nut wrench for the adjusting bolt lock nut, use a deflecting beam type torque wrench 20 inches long. The lock nut wrench increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the lock nut. The specification given below is the actual torque applied to the lock nut, not the reading on the torque wrench. Do not overtighten the lock nut. The specification later in the text gives both actual and indicated.
- The following components can be serviced with the engine installed in the frame.
 - Oil pump (Section 4)
 - Carburetor (Section 5)
 - Water pump (Section 6)
 - Cylinder head cover/camshaft (Section 8)
 - Drive and driven pulleys/clutch (Section 10)
 - Final reduction (Section 11)
 - Alternator/starter clutch (Section 12)
- The following components require engine removal for service.
 - Cylinder head (Section 8)
 - Cylinder/piston (Section 9)
 - Crankshaft/crankcase (Section 13)

SPECIFICATIONS

ITEM		SPECIFICATIONS
Engine dry weight		38.6 kg (85.1 lbs)
Coolant capacity	Radiator and engine	1.2 ℓ (1.3 US qt, 1.1 Imp qt)
Engine oil capacity	At draining	1.1 ℓ (1.2 US qt, 1.0 Imp qt)
	At disassembly	1.3 ℓ (1.4 US qt, 1.1 Imp qt)

TORQUE VALUES

Engine hanger adjust bolt	15 N·m (1.5 kgf·m, 11 lbf·ft)	
Engine hanger lock nut	42 N·m (4.3 kgf·m, 31 lbf·ft)	
Engine hanger pivot nut	78 N·m (8.0 kgf·m, 58 lbf·ft)	
Sub-bracket pivot bolt	69 N·m (7.0 kgf·m, 51 lbf·ft)	
Sub-bracket stopper nut	26 N·m (2.7 kgf·m, 20 lbf·ft)	
Tension rod nut	20 N·m (2.0 kgf·m, 14 lbf·ft)	
Engine mount nut	59 N·m (6.0 kgf·m, 43 lbf·ft)	
Rear shock absorber mount bolt	39 N·m (4.0 kgf·m, 29 lbf·ft)	
Rear caliper mount bolt	31 N·m (3.2 kgf·m, 23 lbf·ft)	ALOC bolt: replace with a new one.

TOOL

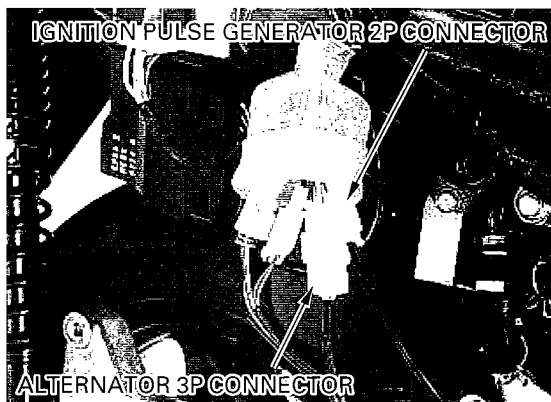
Lock nut wrench	07KMA-KAB0100
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ENGINE REMOVAL/INSTALLATION

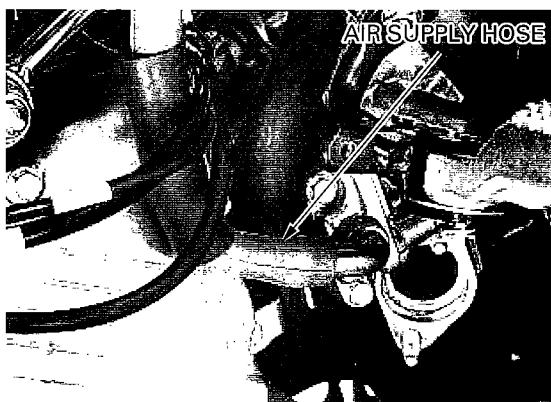
ENGINE REMOVAL

Remove the body cover (page 2-5).
Remove the luggage box (page 2-7).
Remove the muffler (page 2-14).
Remove the carburetor (page 5-4).
Drain the coolant from the system (page 6-5).
Remove the rear wheel speed sensor (ABS type only; page 21-24).

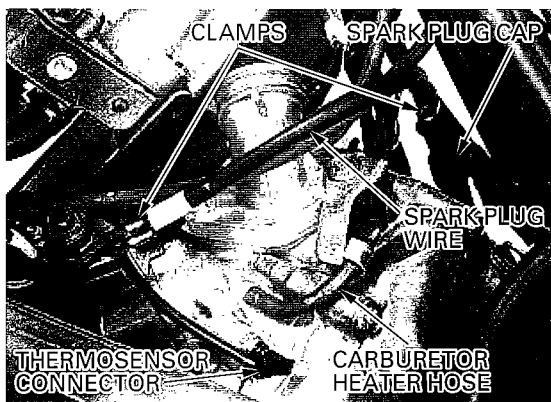
Disconnect the alternator 3P connector and ignition pulse generator 2P connector.



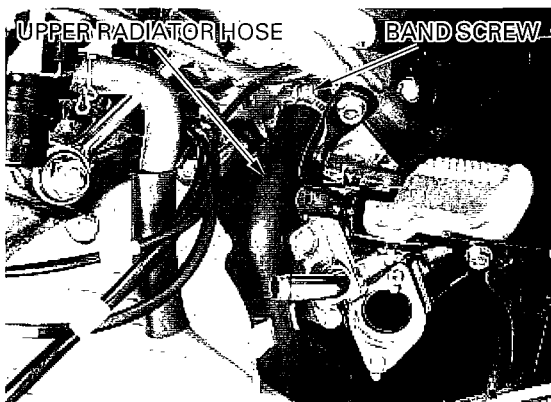
Disconnect the air supply hose.



Remove the spark plug cap from the spark plug.
Remove the spark plug wire from the clamps.
Disconnect the carburetor heater hose.
Disconnect the thermosensor connector.

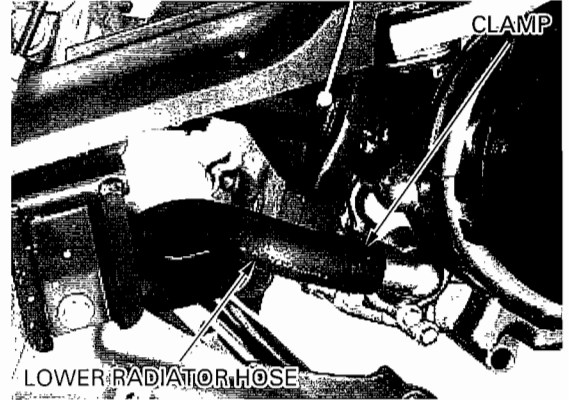


Loosen the band screw and disconnect the upper radiator hose from the engine.

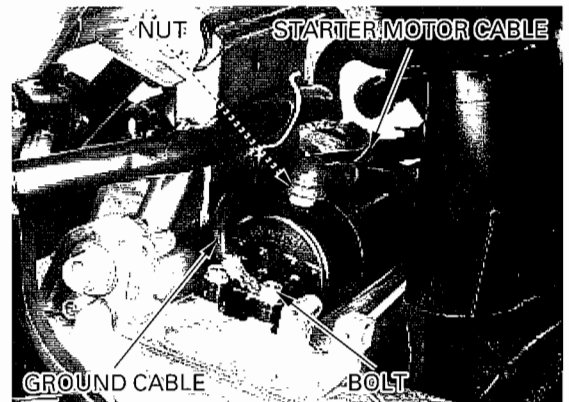


ENGINE REMOVAL/INSTALLATION

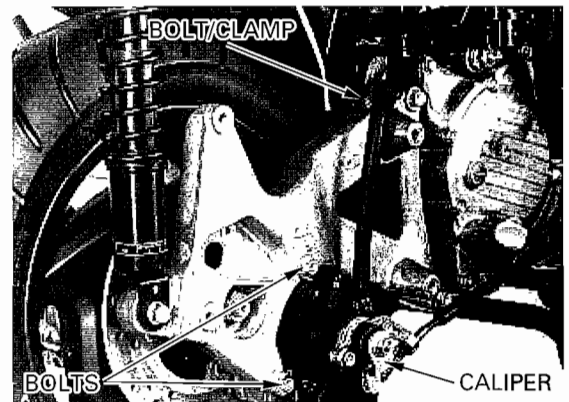
Remove the clamp and disconnect the lower radiator hose from the engine.



Remove the nut and disconnect the starter motor cable.
Remove the bolt and disconnect the ground cable.

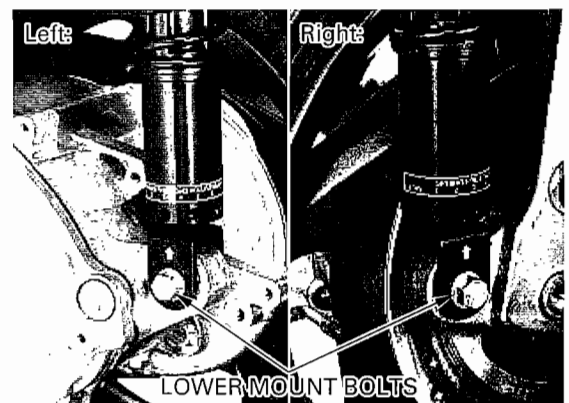


Remove the bolt and rear brake hose clamp.
Remove the bolts and rear brake caliper.



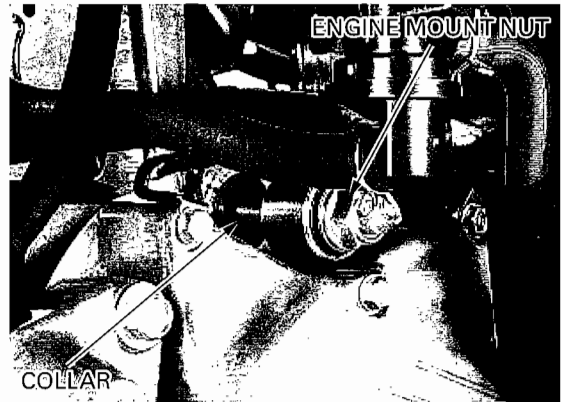
Place a floor jack or other adjustable support under the engine.

Remove the rear shock absorber lower mount bolts.

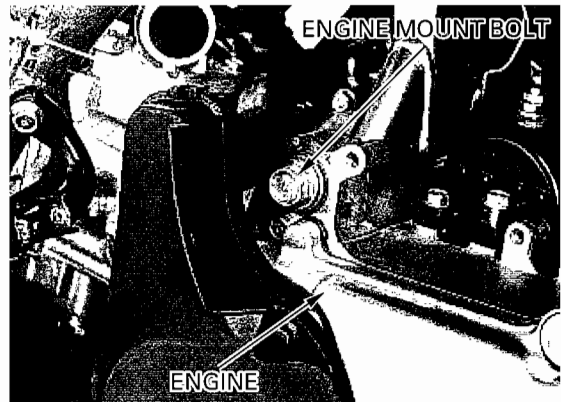


ENGINE REMOVAL/INSTALLATION

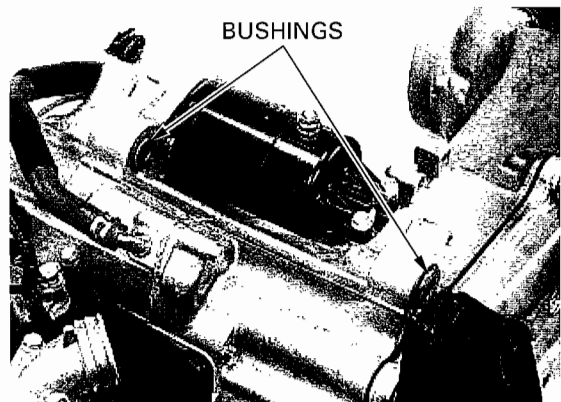
Remove the engine mount nut and collar.



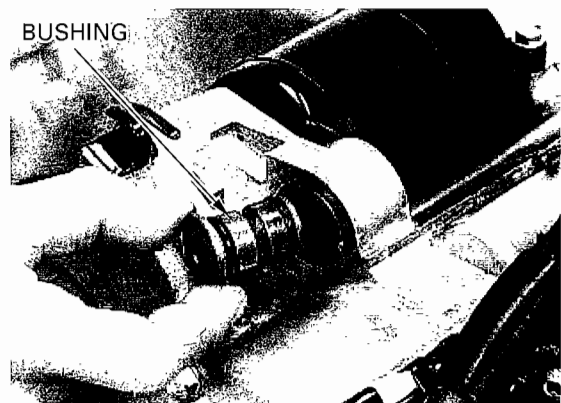
Pull out the engine mount bolt, then remove the engine from the frame.



Remove the engine mount bushings.



Check the bushings for wear or damage.



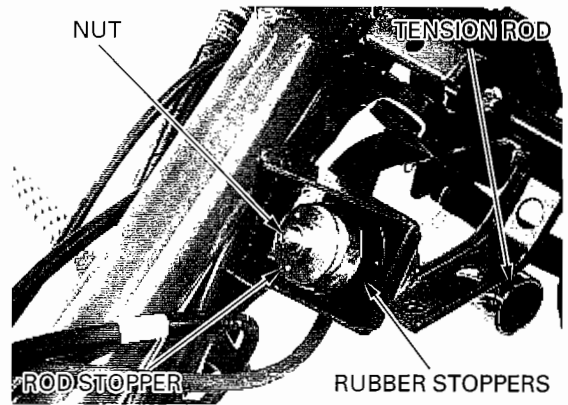
ENGINE HANGER BRACKET

REMOVAL

Remove the engine (page 7-2).

TENSION ROD

Remove the nut.
Remove the tension rod, rubber stoppers and rod stopper.

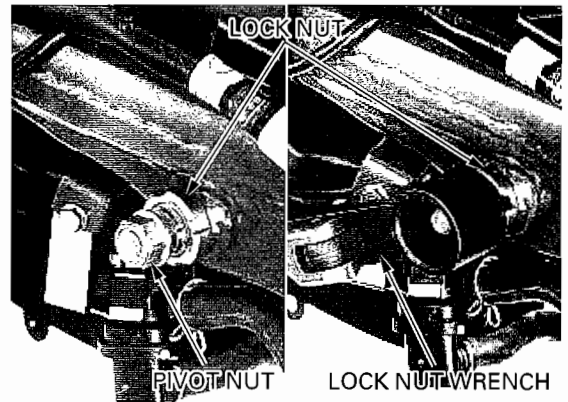


ENGINE HANGER BRACKET

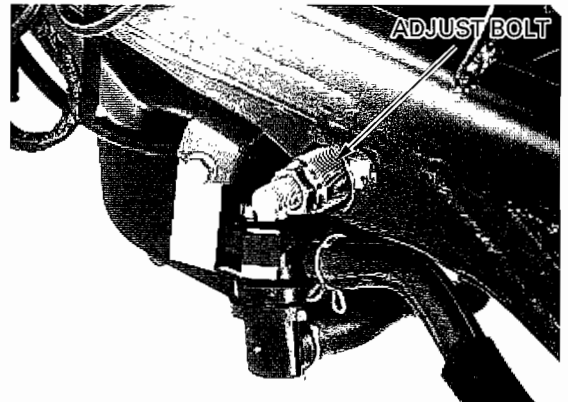
Remove the engine hanger pivot nut and engine hanger lock nut.

TOOL:

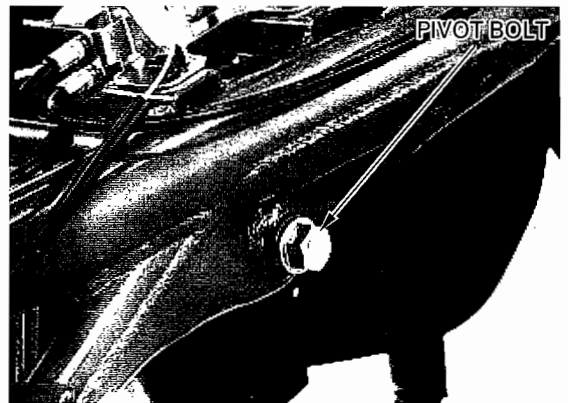
Lock nut wrench 07KMA-KAB0100



Hold the engine hanger pivot bolt, then loosen the engine hanger adjust bolt.



Pull out the engine pivot bolt, then remove the engine hanger bracket from the frame.



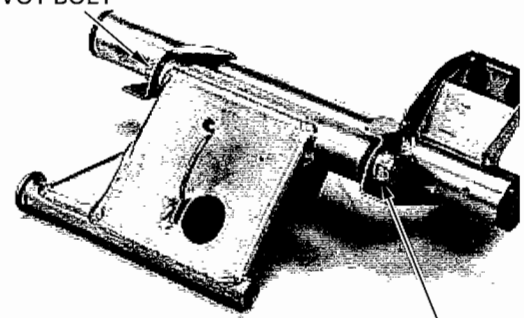
ENGINE REMOVAL/INSTALLATION

DISASSEMBLY

ENGINE HANGER BRACKET

Remove the sub-bracket pivot nut and bolt.

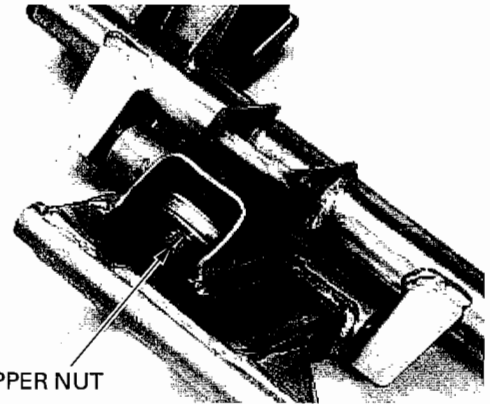
PIVOT BOLT



PIVOT NUT

Remove the sub-bracket stopper nut.

STOPPER NUT



Separate the engine hanger bracket and sub-bracket.

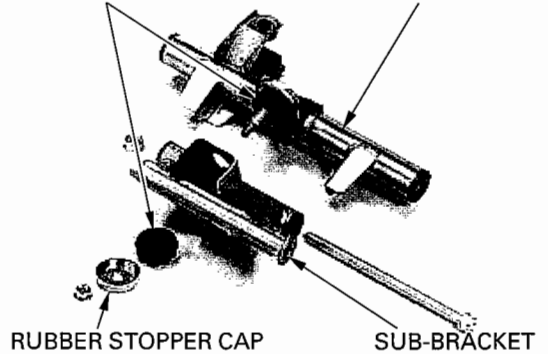
Remove the rubber stopper cap and rubber stoppers.

RUBBER STOPPERS

HANGER BRACKET

RUBBER STOPPER CAP

SUB-BRACKET



INSPECTION

TENSION ROD

Check the rubber stoppers for damage, wear or deterioration.

Check the pivot bushing for damage, wear or deterioration.

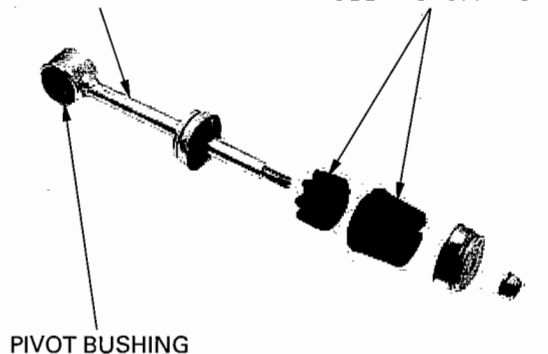
Check the tension rod for bend or damage.

Replace them if necessary.

TENSION ROD

RUBBER STOPPERS

PIVOT BUSHING

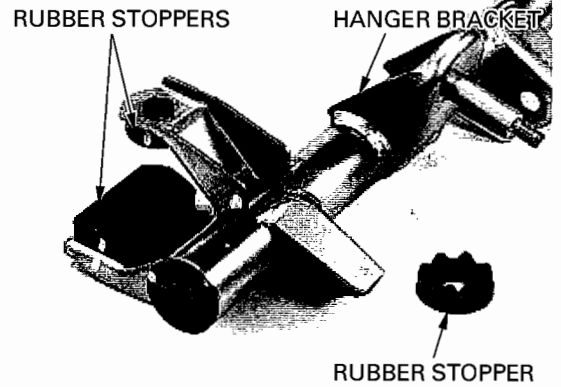


ENGINE REMOVAL/INSTALLATION

ENGINE HANGER BRACKET

Check the rubber stoppers for damage, wear or deterioration.
Check the engine hanger bracket for damage.

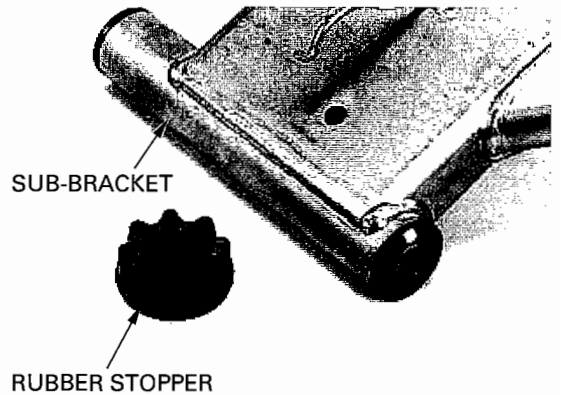
Replace them if necessary.



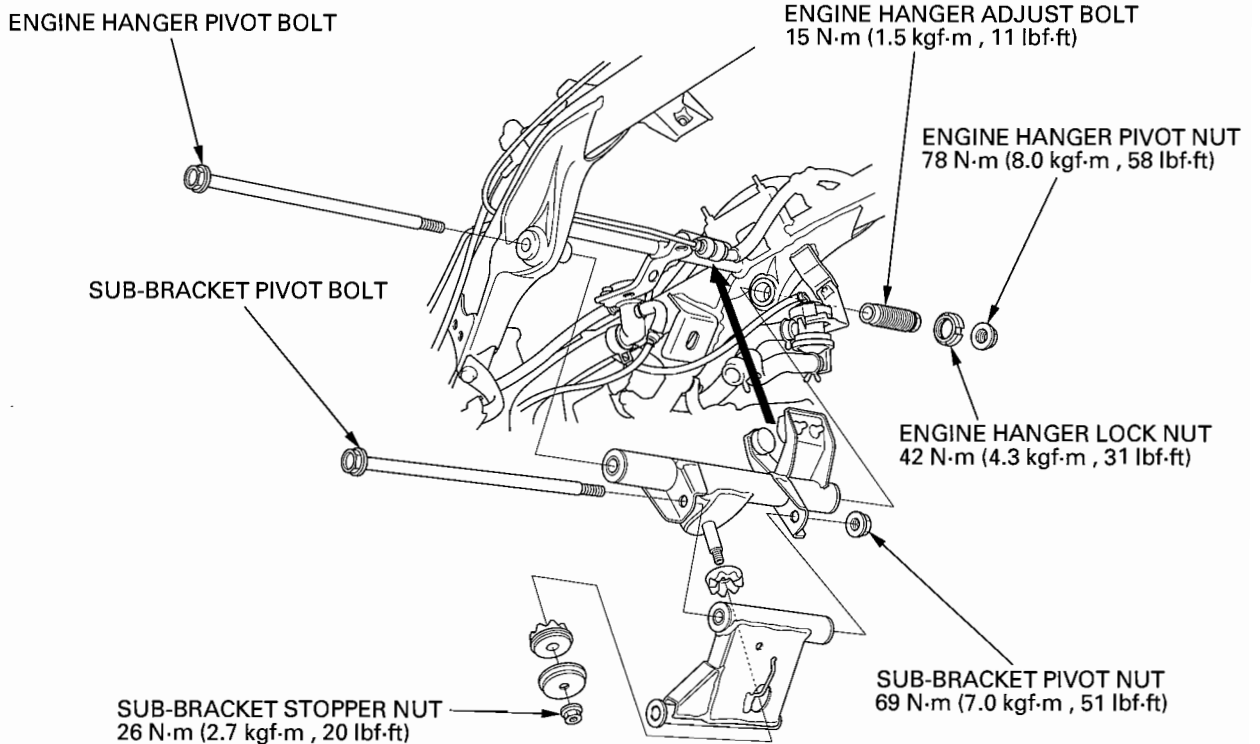
SUB-BRACKET

Check the rubber stopper for damage, wear or deterioration.
Check the sub-bracket for damage.

Replace them if necessary.



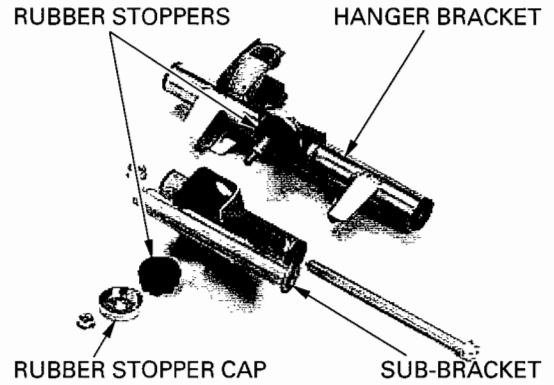
ASSEMBLY/INSTALLATION



ENGINE REMOVAL/INSTALLATION

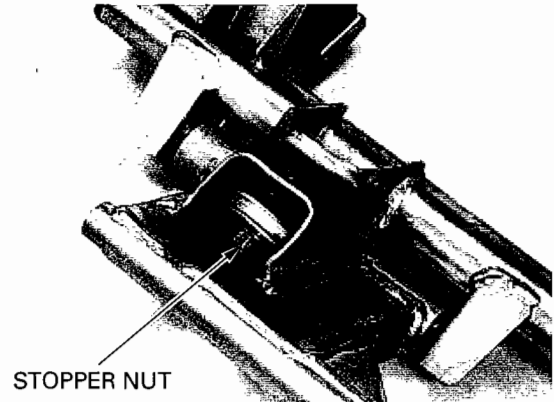
ENGINE HANGER BRACKET

Install the rubber stoppers to the engine hanger bracket and sub-bracket.
Assemble the engine hanger bracket and sub-bracket.
Install the stopper rubber cap.



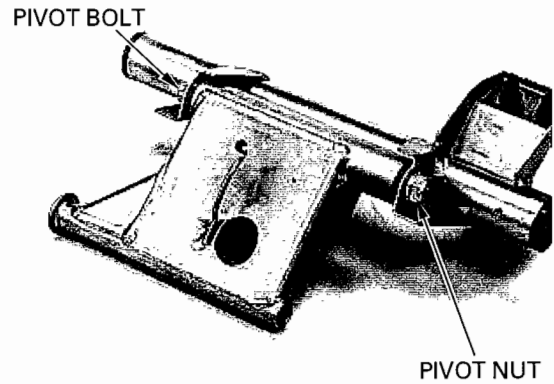
Install and tighten the sub-bracket stopper nut to the specified torque.

TORQUE: 26 N·m (2.7 kgf·m , 20 lbf·ft)

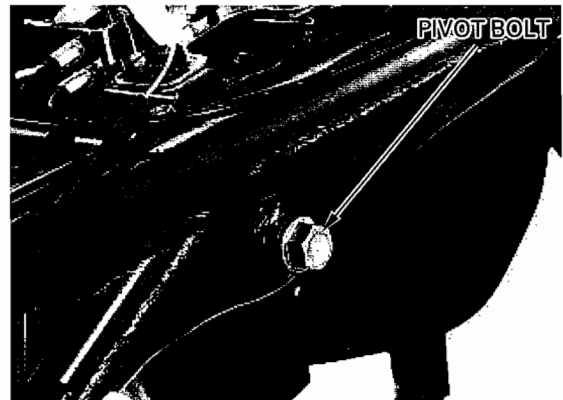


Install the sub-bracket pivot bolt.
Install and tighten the sub-bracket pivot nut to the specified torque.

TORQUE: 69 N·m (7.0 kgf·m , 51 lbf·ft)

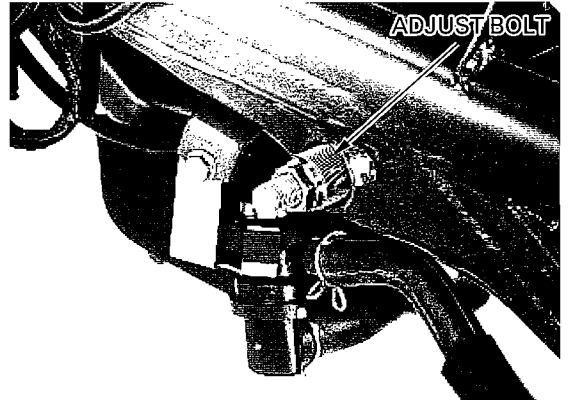


Set the engine hanger bracket to the frame.
Install the engine hanger pivot bolt.

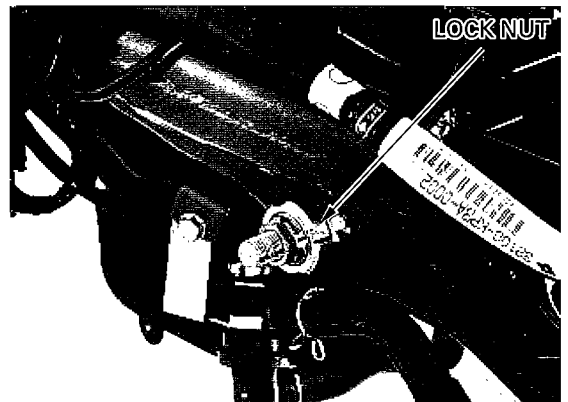


Tighten the engine hanger adjust bolt to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m , 11 lbf·ft)



Install the engine hanger lock nut.

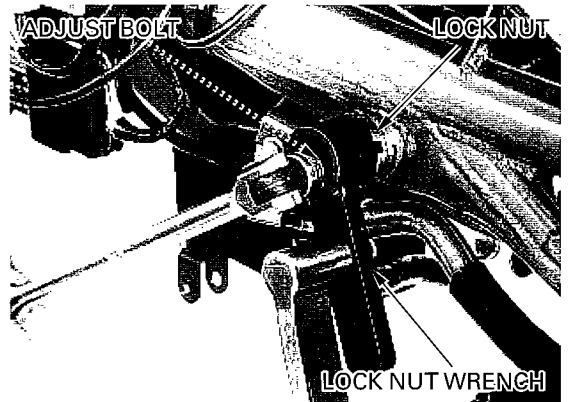


Refer to torque wrench reading information, on page 7-1 "Service Information"

Tighten the engine hanger lock nut to the specified torque while holding the engine hanger adjust bolt.

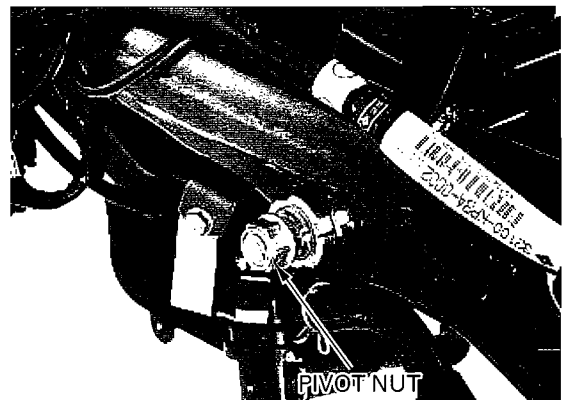
TOOL:
Lock nut wrench 07KMA-KAB0100

TORQUE: Actual: 42 N·m (4.3 kgf·m , 31 lbf·ft)
Indicated: 38 N·m (3.9 kgf·m , 28 lbf·ft)



Install and tighten the engine hanger pivot nut to the specified torque.

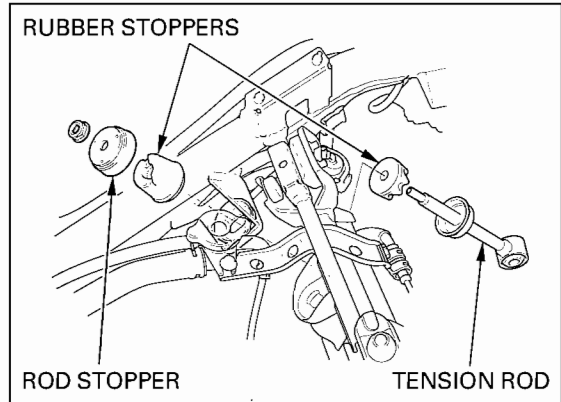
TORQUE: 78 N·m (8.0 kgf·m , 58 lbf·ft)



ENGINE REMOVAL/INSTALLATION

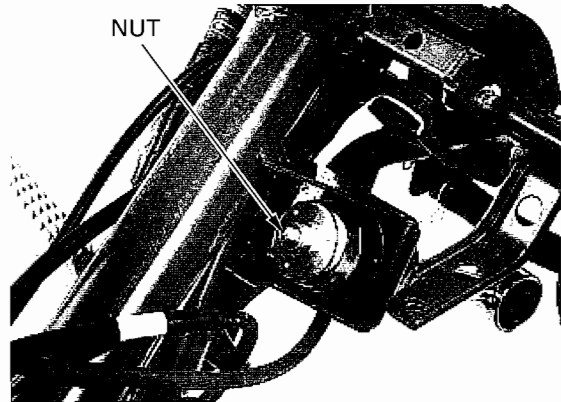
TENSION ROD

Install the rubber stoppers, tension rod and rod stopper to the frame.



Install and tighten the tension rod nut to the specified torque.

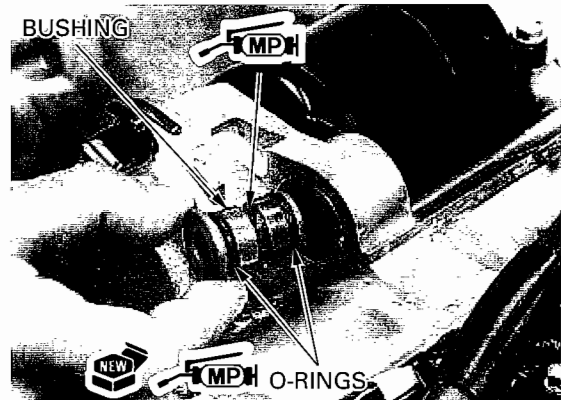
TORQUE: 20 N·m (2.0 kgf·m , 14 lbf·ft)



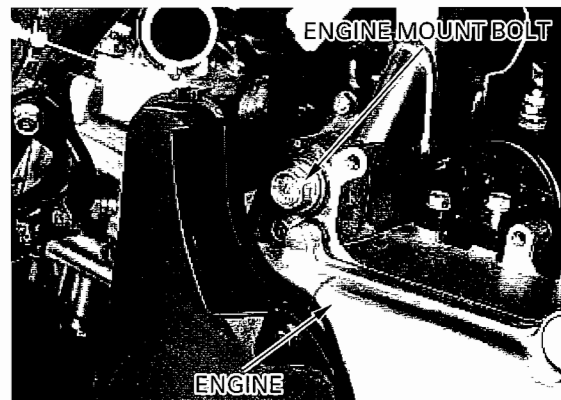
ENGINE INSTALLATION

Coat new O-rings with molybdenum disulfide paste and install them into the side grooves in each bushing.

Pack each center groove with 0.5–0.7g of molybdenum disulfide paste.



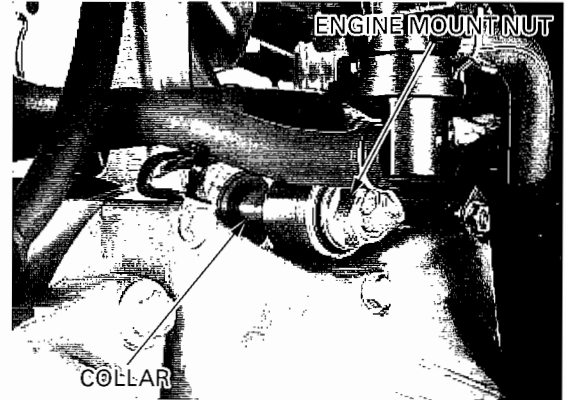
Set the engine to the frame and install the engine mount bolt.



ENGINE REMOVAL/INSTALLATION

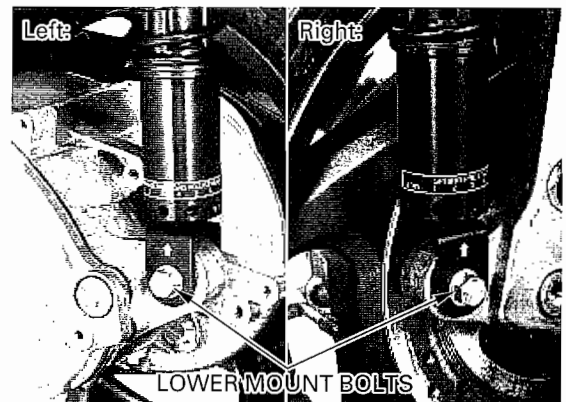
Install the collar and the engine mount nut to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m , 43 lbf·ft)



Install and tighten the rear shock absorber lower mount bolts to the specified torque.

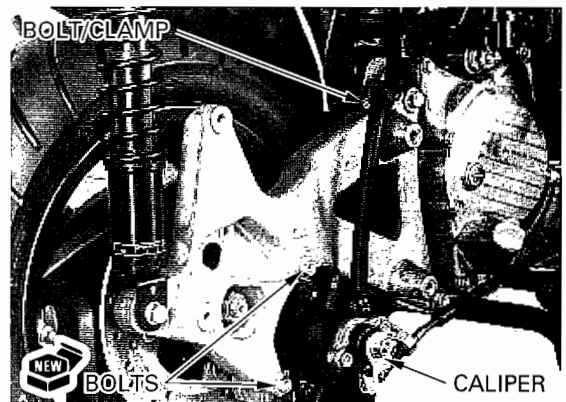
TORQUE: 39 N·m (4.0 kgf·m , 29 lbf·ft)



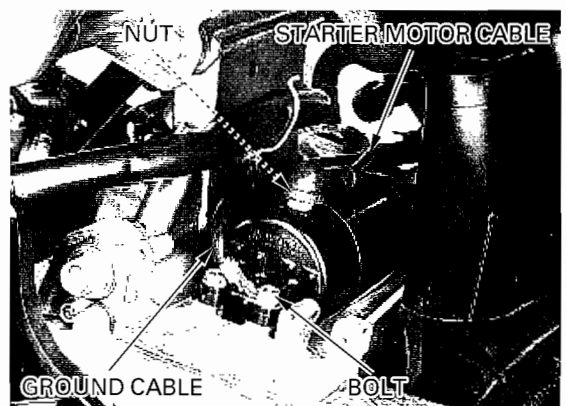
Install the rear caliper.
Install and tighten the new rear caliper mount bolts to the specified torque.

TORQUE: 31 N·m (3.2 kgf·m , 23 lbf·ft)

Install the rear brake hose clamp and tighten the bolts securely.



Route the hoses, cables and wire harness correctly (page 1-18). Connect the starter motor cable and tighten the nut securely.
Connect the ground cable and tighten the bolt securely.

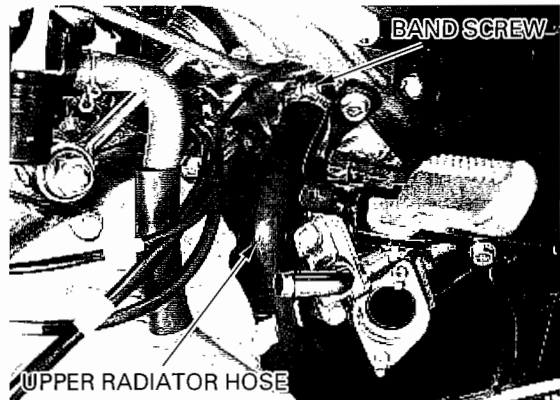


ENGINE REMOVAL/INSTALLATION

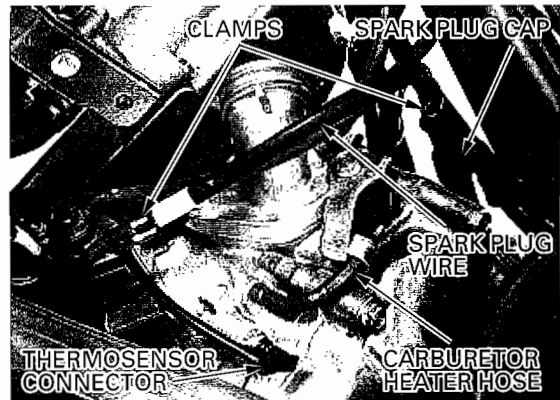
Connect the lower radiator hose with the mark facing out and secure it with the hose clamp.



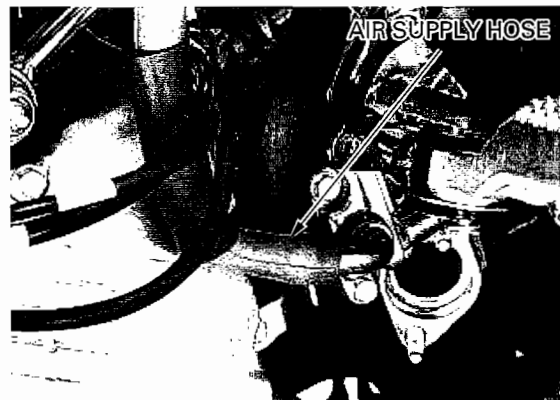
Connect the upper radiator hose and tighten the hose band screw securely.



Connect the thermosensor connector.
Connect the carburetor heater hose.
Install the spark plug wire to the clamps.
Connect the spark plug cap to the spark plug.



Connect the air supply hose.



Connect the alternator 3P connector and ignition pulse generator 2P connector.

Install the rear wheel speed sensor (ABS type only: page 21-24)

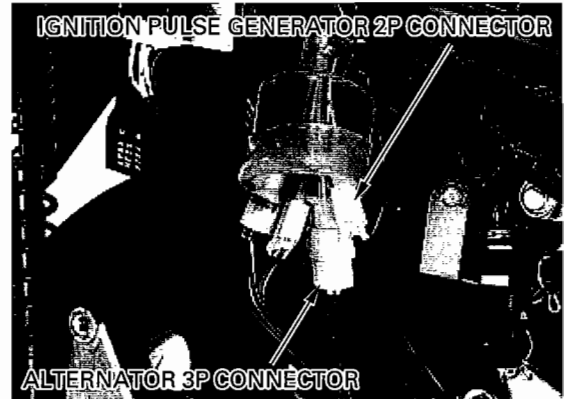
Fill and bleed the cooling system (page 6-5).

Install the carburetor (page 5-15).

Install the muffler (page 2-14).

Install the luggage box (page 2-8).

Install the body cover (page 2-5).



8. CYLINDER HEAD/VALVES

SERVICE INFORMATION	8-1	VALVE GUIDE REPLACEMENT	8-9
TROUBLESHOOTING	8-2	VALVE SEAT INSPECTION/REFACING	8-10
CYLINDER COMPRESSION TEST	8-3	CYLINDER HEAD ASSEMBLY	8-13
CYLINDER HEAD COVER REMOVAL	8-3	CYLINDER HEAD INSTALLATION	8-14
CAMSHAFT REMOVAL	8-4	CAMSHAFT INSTALLATION	8-16
CYLINDER HEAD REMOVAL	8-6	CYLINDER HEAD COVER INSTALLATION	8-18
CYLINDER HEAD DISASSEMBLY	8-7		

SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves, camshaft and rocker arms. To service these parts, the engine must be removed from the frame. However, the camshaft and rocker arm service may be done with the engine installed in the frame.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft and rocker arm lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before reassembling the 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			1,569 kPa (16.0 kgf/cm ² , 228 psi) at 400 rpm	_____
Cylinder head warpage			_____	0.05 (0.002)
Valve, valve guide	Valve clearance	IN	0.12 (0.005)	_____
		EX	0.12 (0.005)	_____
	Valve stem O.D.	IN	4.975 – 4.990 (0.1959 – 0.1965)	4.90 (0.193)
		EX	4.955 – 4.970 (0.1951 – 0.1957)	4.90 (0.193)
	Valve guide I.D.	IN	5.000 – 5.012 (0.1969 – 0.1973)	5.03 (0.198)
		EX	5.000 – 5.012 (0.1969 – 0.1973)	5.03 (0.198)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.08 (0.003)
		EX	0.030 – 0.057 (0.0012 – 0.0022)	0.10 (0.004)
Valve guide projection above cylinder head	IN	11.5 (0.45)	_____	
	EX	11.5 (0.45)	_____	
Valve seat width		IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.8 (0.07)
Valve spring free length	INNER	IN/EX	31.06 (1.223)	29.5 (1.16)
	OUTER	IN/EX	40.42 (1.591)	38.4 (1.51)
Rocker arm	Rocker arm I.D.	IN/EX	12.000 – 12.018 (0.4724 – 0.4731)	12.10 (0.476)
	Rocker arm shaft O.D.	IN/EX	11.966 – 11.984 (0.4711 – 0.4718)	11.91 (0.469)
Camshaft	Cam lobe height	IN	34.231 – 34.351 (1.3477 – 1.3524)	34.181 (1.3457)
		EX	34.112 – 34.232 (1.3430 – 1.3477)	34.062 (1.3410)

CYLINDER HEAD/VALVES

TORQUE VALUES

Adjusting hole cap	5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)	
Cylinder head nut	24 N·m (2.4 kgf·m , 17 lbf·ft)	Apply oil to the threads and flange surface.
Cam chain tensioner sealing bolt	22 N·m (2.2 kgf·m , 16 lbf·ft)	
Spark plug	18 N·m (1.8 kgf·m , 13 lbf·ft)	
Exhaust pipe stud bolt	8.8 N·m (0.9 kgf·m , 6.5 lbf·ft)	
Timing hole cap	5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)	

TOOLS

Valve spring compressor	07757-0010000	
Valve seat cutters		
Seat cutter, 29 mm (45°EX)	07780-0010300	equivalent commercially available in U.S.A.
Seat cutter, 33 mm (45°IN)	07780-0010800	
Flat cutter, 30 mm (32°EX)	07780-0012200	
Flat cutter, 36 mm (32°IN)	07780-0013500	
Interior cutter, 30 mm (60°EX)	07780-0014000	
Interior cutter, 34 mm (60°IN)	07780-0014700	
Cutter holder	07781-0010400	
Valve guide driver	07942-MA60000	
Valve spring compressor attachment	07959-KM30101	
Valve guide reamer	07984-MA60000	

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problems can be diagnosed by a compression test or by tracing engine noises to the top-end with a sounding rod or stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather hose. If the hose is smoky, check for a seized piston ring (Section 9).

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 spark plug
- Cylinder/piston (section 9)

Compression too high, overheating or knocking

- Excessive carbon build-up on piston crown or in the combustion chamber

Excessive smoke

- Cylinder head:
 - Worn valve stem or valve guide
 - Damaged stem seal
- Cylinder/piston (section 9)

Excessive noise

- Cylinder head:
 - Incorrect valve clearance
 - Sticking valve or broken valve spring
 - Worn or damaged camshaft
 - Worn or damaged rocker arm and/or shaft
 - Worn or damaged cam chain
 - Worn or damaged cam chain tensioner
 - Worn cam sprocket teeth
- Cylinder/piston (section 9)

Rough idle

- Low cylinder compression

CYLINDER COMPRESSION TEST

Warm up the engine to normal operating temperature.

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

Install a compression gauge.

To avoid discharging the battery, do not operate the starter motor for more than 7 seconds. Open the throttle all the way and crank the engine with the starter motor until the gauge reading stops rising. The maximum reading is usually reached within 4–7 seconds.

Compression pressure:

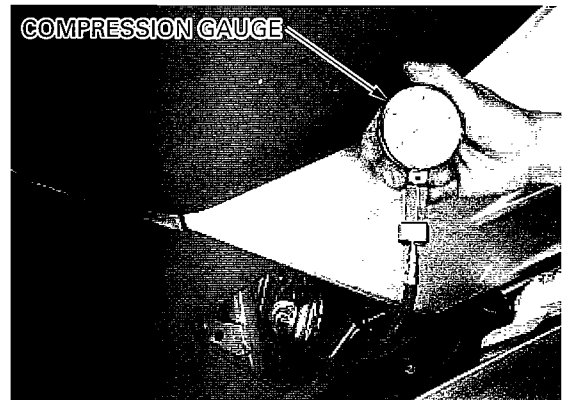
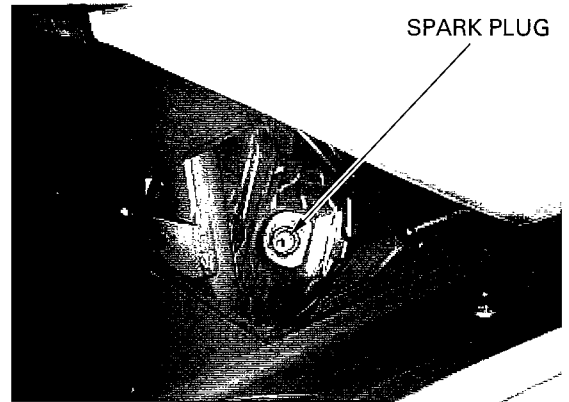
1,569 kPa (16.0 kgf/cm², 228 psi) at 400 rpm

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 combustion chamber or on piston head



CYLINDER HEAD COVER REMOVAL

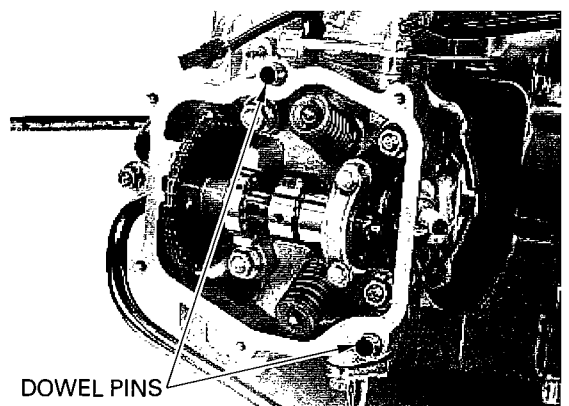
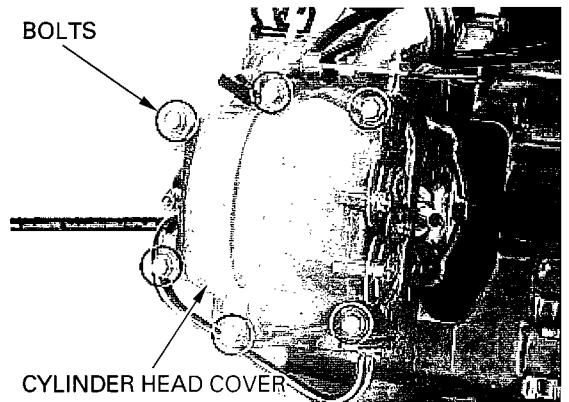
- When the cylinder head/valves or cylinder is to be serviced, remove the engine from the frame.

Align the "T" mark on the flywheel with the index mark on the right crankcase cover (page 3-7).

The position can be obtained by confirming that there is slack in the rocker arm (TDC on the compression stroke).

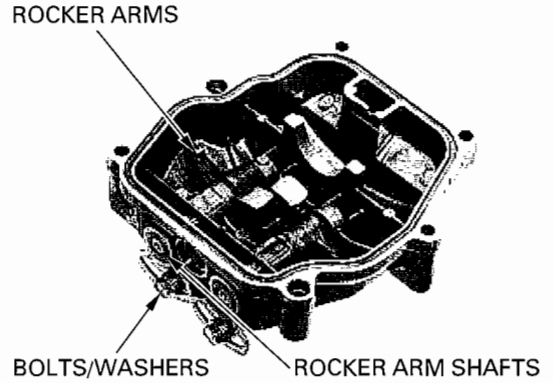
Remove the bolts and the cylinder head cover/O-ring.

Remove the dowel pins.



CYLINDER HEAD/VALVES

Remove the lock bolts and washers.
Remove the rocker arm shafts and rocker arms.



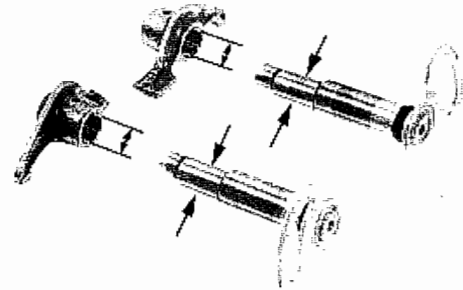
INSPECTION

Check the rocker arm shafts and rocker arms for wear or damage.
Measure the I.D. of each rocker arm.

SERVICE LIMIT: 12.10 mm (0.476 in)

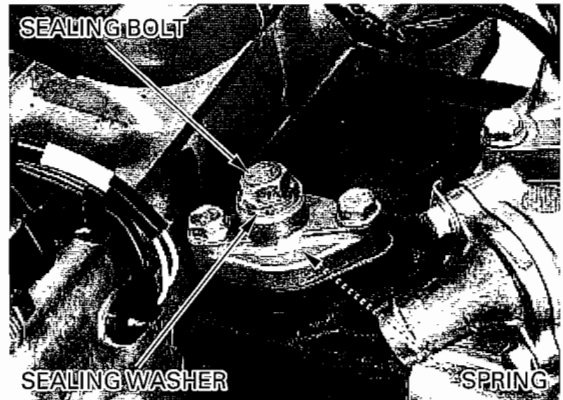
Measure the O.D. of each rocker arm shaft.

SERVICE LIMIT: 11.91 mm (0.469 in)

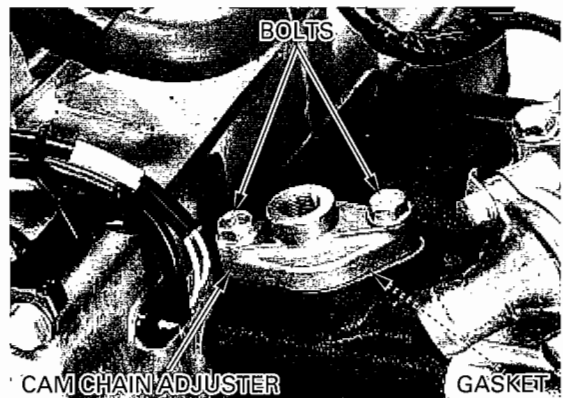


CAMSHAFT REMOVAL

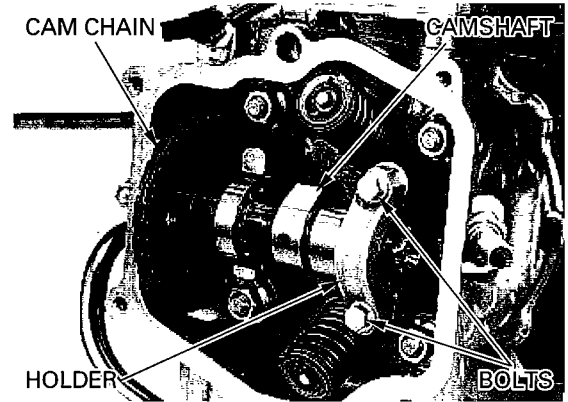
Remove the sealing bolt, sealing washer and spring from the cam chain adjuster.



Loosen the bolts alternately. Remove the bolts, cam chain adjuster and gasket.

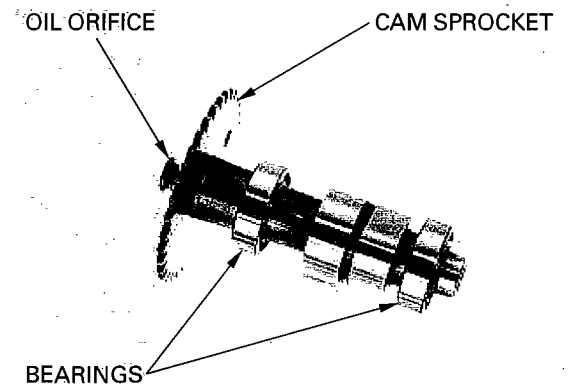


Remove the bolts and camshaft holder.
 Remove the cam chain from the cam sprocket.
 Attach a piece of wire to the cam chain to prevent it from falling into the crankcase and remove the camshaft from the cylinder head.



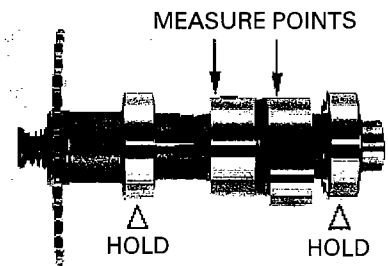
INSPECTION

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 sprocket and oil orifice for wear or damage. Check the cam lobes for excessive wear and oil holes for clogs.



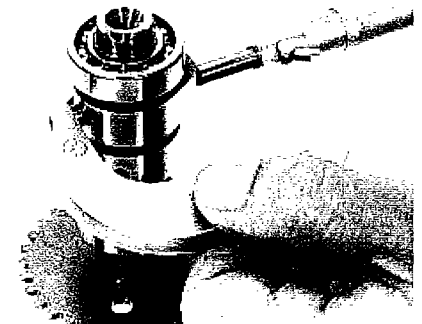
Measure the camshaft runout using a dial indicator.

SERVICE LIMIT: 0.02 mm (0.001 in)



Measure the height of each cam lobe.

SERVICE LIMITS: IN: 34.181 mm (1.3457 in)
EX: 34.062 mm (1.3410 in)

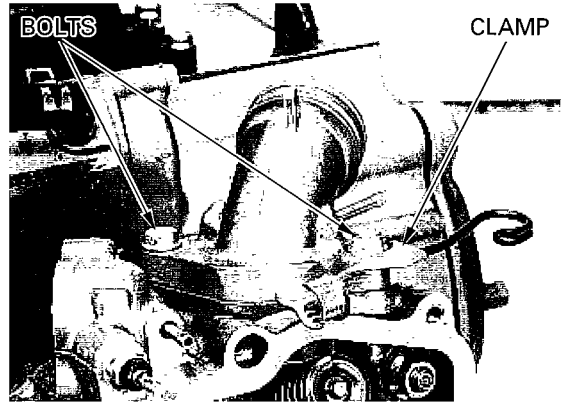


CYLINDER HEAD/VALVES

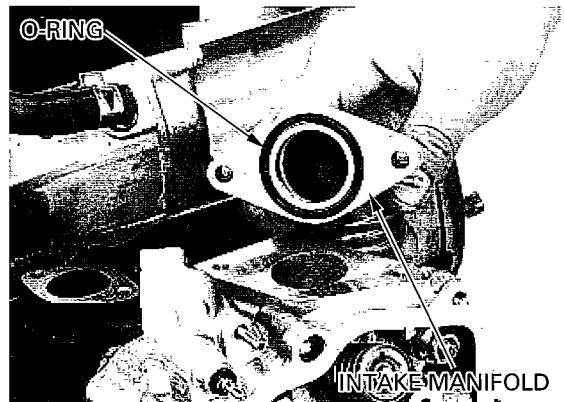
CYLINDER HEAD REMOVAL

Remove the engine (section 7).
Remove the camshaft (page 8-4).
Remove the thermostat (page 6-6).

Remove the bolts and clamp.



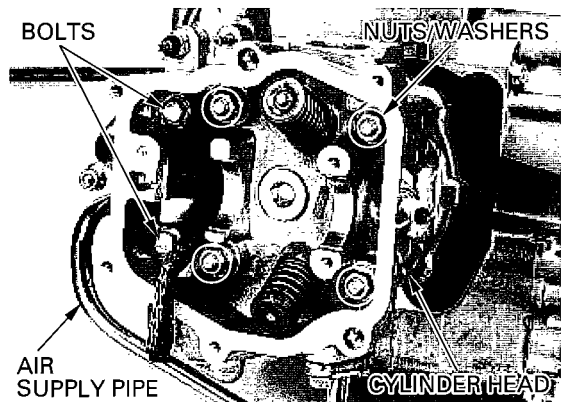
Remove the intake manifold and O-ring.



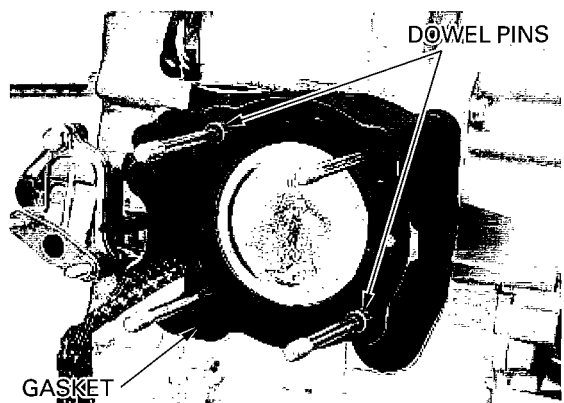
Remove the nuts, bolts and air supply pipe (page 5-20).

Remove the bolts, nuts and washers.

Be careful not to damage the mating surface. Remove the cylinder head.



Remove the gasket and dowel pins.



CYLINDER HEAD DISASSEMBLY

Remove the spark plug (page 3-6).

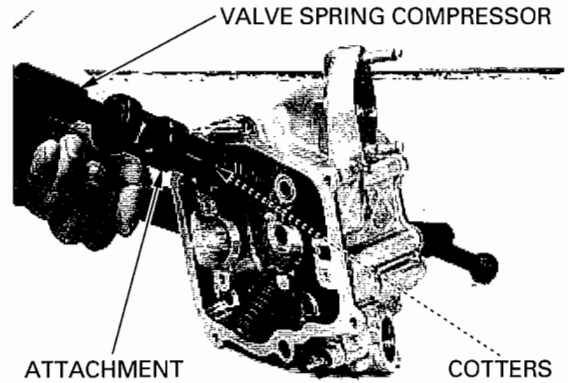
To prevent loss of tension, do not compress the valve spring more than necessary to remove the cotters.

Remove the valve spring cotters using the valve spring compressor.

TOOLS:

Valve spring compressor 07757-0010000

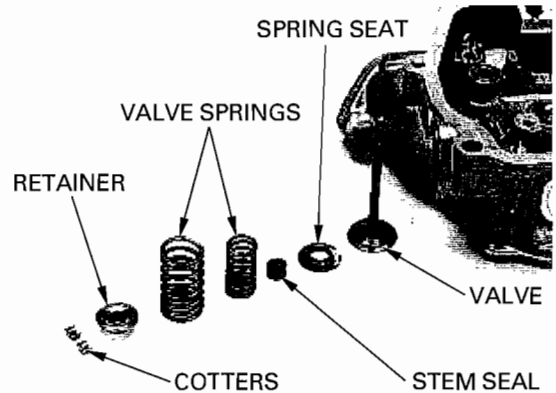
Valve spring compressor attachment 07959-KM30101



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

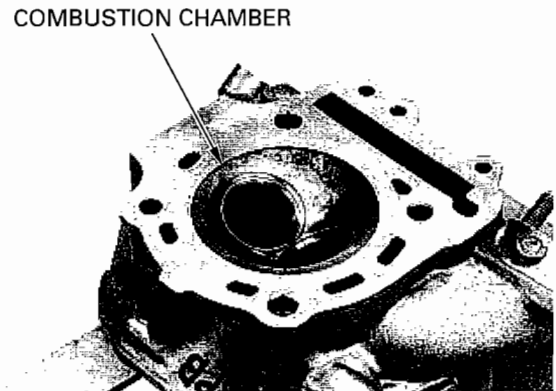
Remove the valve spring compressor, then remove the following:

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



Avoid damaging the mating and valve seat surfaces.

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



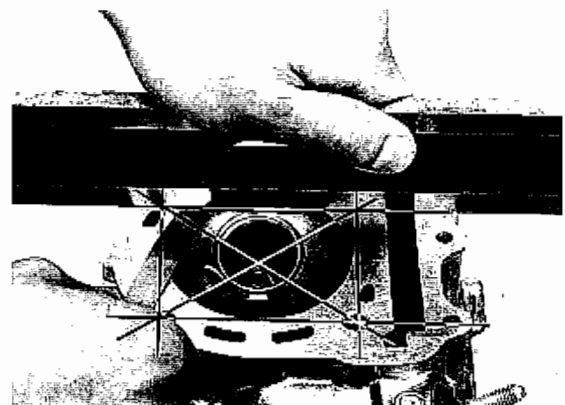
INSPECTION

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)

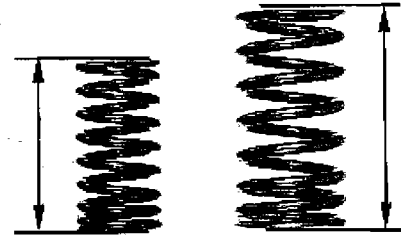


CYLINDER HEAD/VALVES

VALVE SPRINGS

Measure the free length of the inner and outer valve springs.

SERVICE LIMITS: Inner (IN/EX): 29.5 mm (1.16 in)
Outer (IN/EX): 38.4 mm (1.51 in)

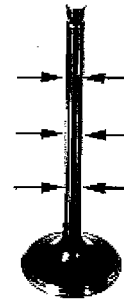


VALVE STEM/VALVE GUIDE

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 LIMITS: IN/EX: 4.90 mm (0.193 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 07984-MA60001

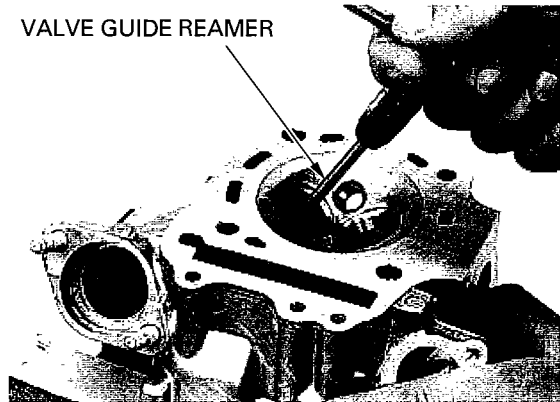
Measure each valve guide I.D. and record it.

SERVICE LIMITS: IN/EX: 5.03 mm (0.198 in)

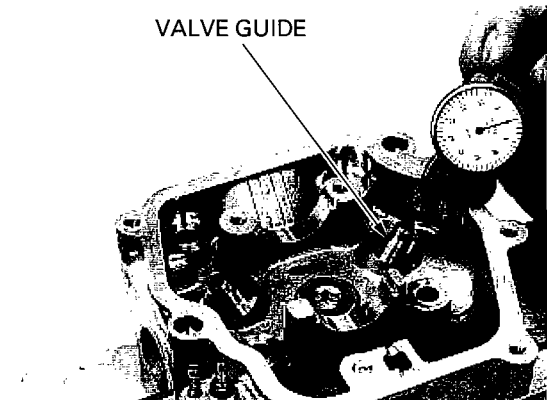
Subtract each valve stem O.D. from the corresponding guide I.D. to obtain the stem-to-guide clearance.

SERVICE LIMITS: IN: 0.08 mm (0.003 in)
EX: 0.10 mm (0.004 in)

VALVE GUIDE REAMER



VALVE GUIDE



Inspect and reface the valve seats whenever the valve guides are replaced (page 8-9). 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.

VALVE GUIDE REPLACEMENT

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

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

Put on heavy gloves, then 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.

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

TOOL:

Valve guide driver 07942-MA60000

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

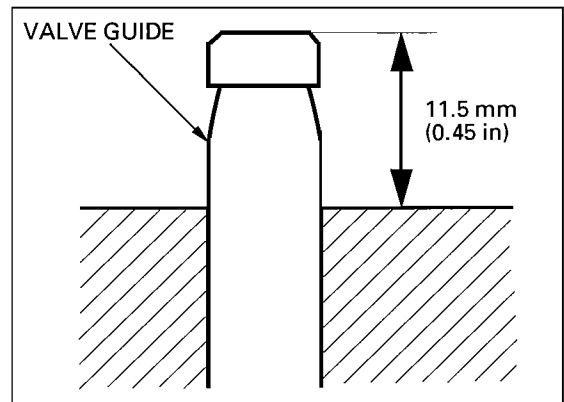
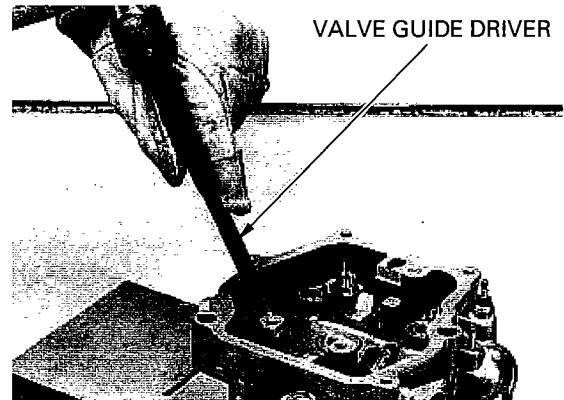
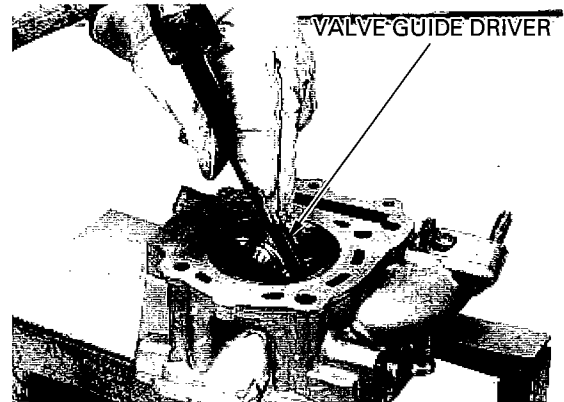
TOOL:

Valve guide driver 07942-MA60000

VALVE GUIDE PROJECTION ABOVE CYLINDER HEAD:

IN/EX: 11.5 mm (0.45 in)

Let the cylinder head cool to room temperature.



Take care not to tilt or lean the reamer in the guide while reaming.

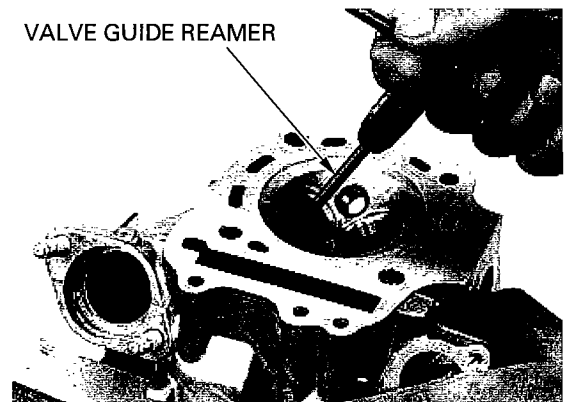
Ream the new valve guides. Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

TOOL:

Valve guide reamer 07984-MA60000

Use cutting oil on the reamer during this operation.

Clean the cylinder head thoroughly to remove any metal particles after reaming, and reface the valve seat (page 8-10).



VALVE SEAT INSPECTION/REFACING

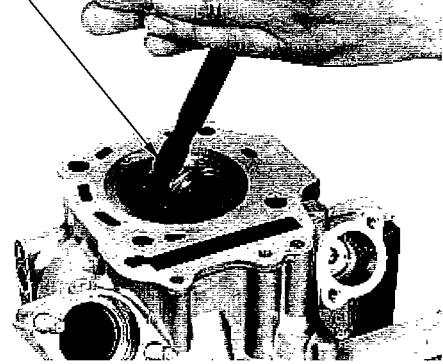
INSPECTION

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

Apply a light coat of Prussian Blue to each valve face.

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

HAND-LAPPING TOOL

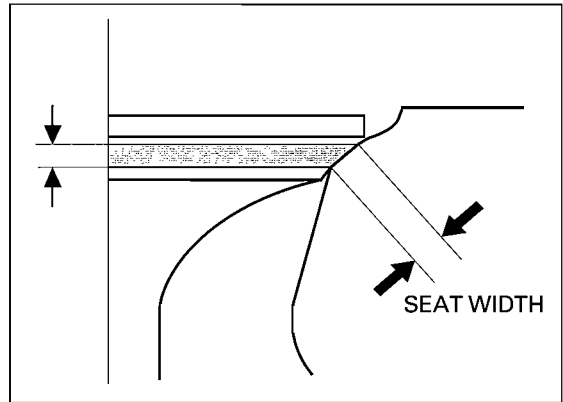


The valve cannot be ground. If the valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.

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.

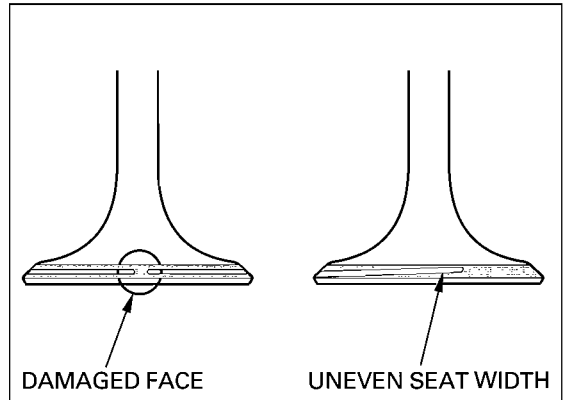
STANDARD : 0.90–1.10 mm (0.035–0.043 in)
SERVICE LIMIT : 1.8 mm (0.07 in)

If the valve seat width is not within specification, reface the valve seat (page 8-11).

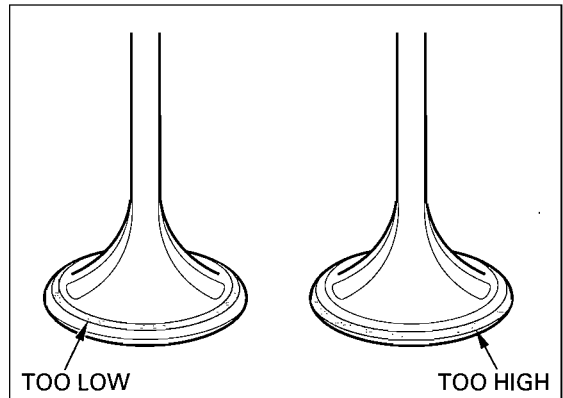


Inspect the valve seat face for:

- 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.



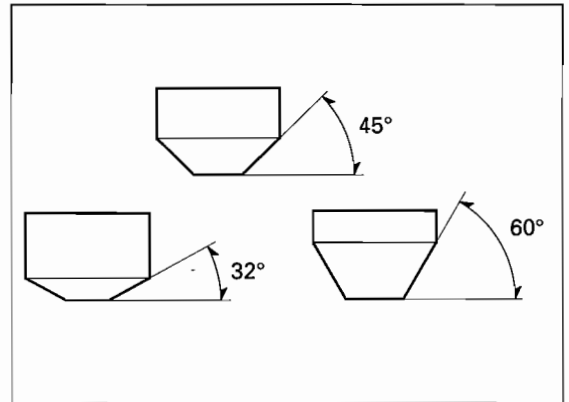
- Contact area (too low or too high area):
 - Reface the valve seat.



VALVE SEAT REFACING

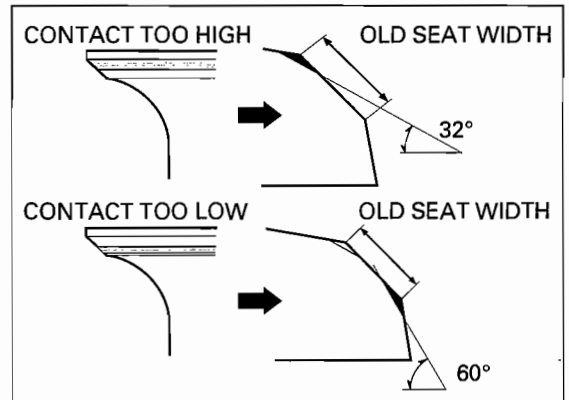
NOTE:

- 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 specification, using a 45° finish cutter.



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

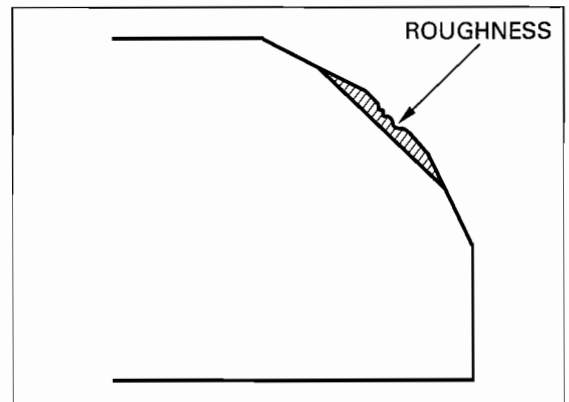
TOOLS:

- Seat cutter, 33 mm (45° IN) 07780-0010800
- Seat cutter, 29 mm (45° EX) 07780-0010300
- Cutter holder 07781-0010400

TOOLS:

- Flat cutter, 28 mm (IN) 07780-0012100
- Flat cutter, 35 mm (EX) 07780-0012300
- Cutter holder, 5.5 mm 07781-0010101

or equivalent commercially available in U.S.A.



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

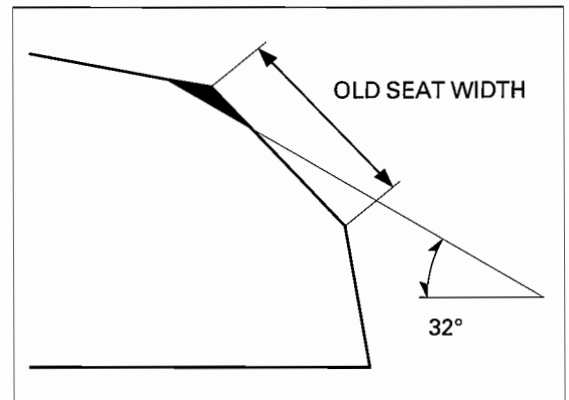
TOOLS:

- Flat cutter, 36 mm (32° IN) 07780-0013500
- Flat cutter, 30 mm (32° EX) 07780-0012200
- Cutter holder 07781-0010400

TOOLS:

- Flat cutter, 28 mm (IN) 07780-0012100
- Flat cutter, 35 mm (EX) 07780-0012300
- Cutter holder, 5.5 mm 07781-0010101

or equivalent commercially available in U.S.A.



CYLINDER HEAD/VALVES

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

TOOLS:

Interior cutter, 34 mm (60° IN) 07780-0014700

Interior cutter, 30 mm (60° EX) 07780-0014000

Cutter holder 07781-0010400

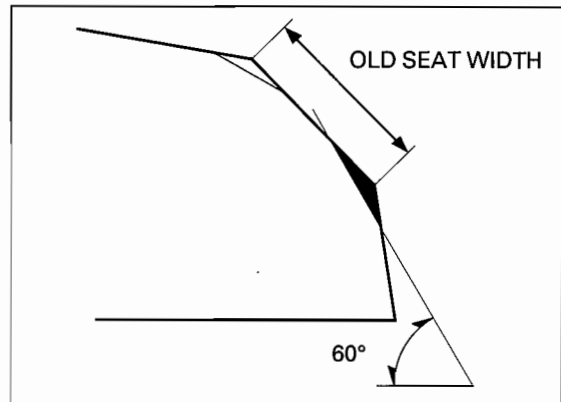
TOOLS:

Seat cutter, 27.5 mm (IN) 07780-0010200

Seat cutter, 35 mm (EX) 07780-0010400

Cutter holder, 5.5 mm 07781-0010101

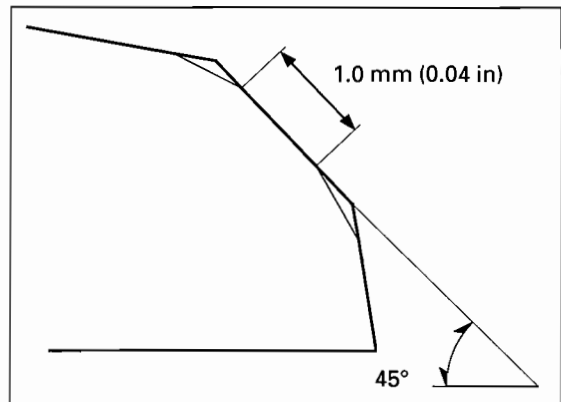
or equivalent commercially available in U.S.A.



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

VALVE SEAT WIDTH: 1.0 mm (0.04 in)

Make sure all pitting and irregularities are removed.

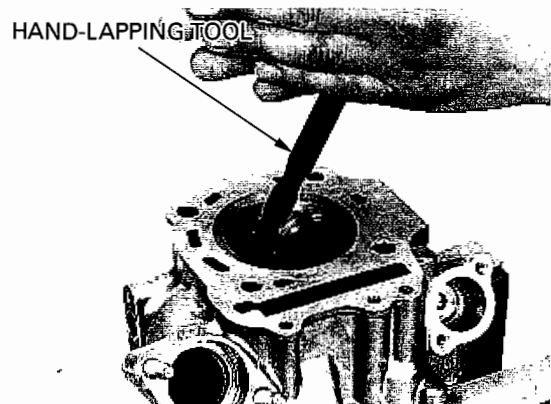


Excessive lapping pressure may deform or damage the seat. Do not allow lapping compound to enter the guides.

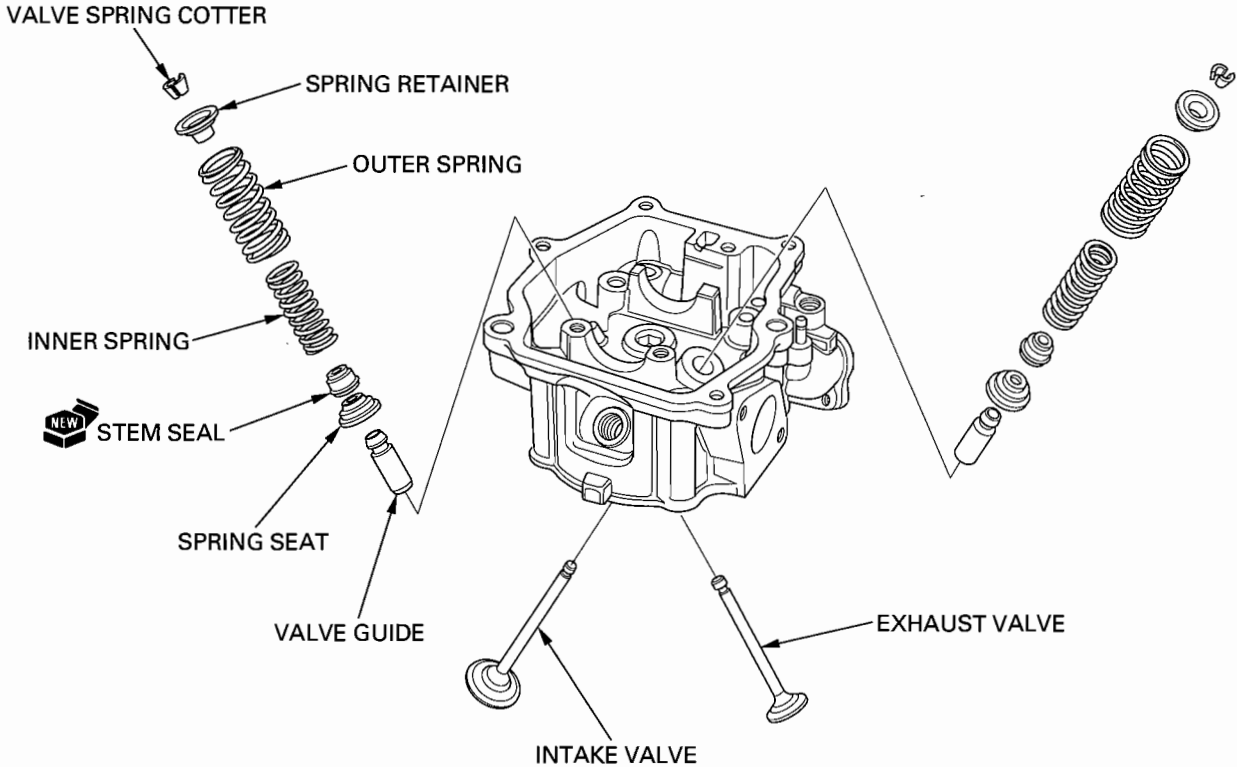
After cutting the seat, apply lapping compound to the valve face and lap the valve using light pressure.

Change the angle of the lapping tool frequently to prevent uneven seat wear.

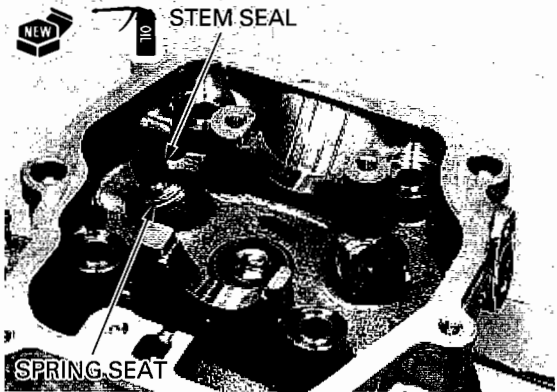
After lapping, wash any residual compound off the cylinder head and valve, and recheck the seat contact.



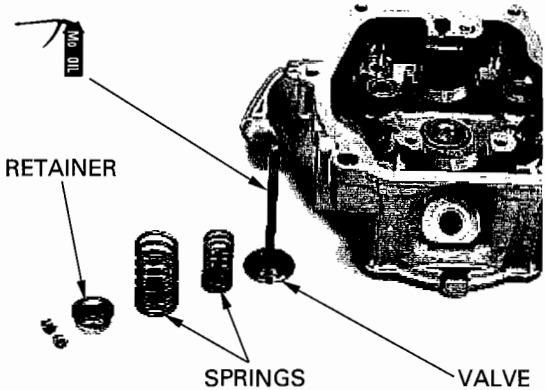
CYLINDER HEAD ASSEMBLY



Blow through the oil passage in the cylinder head with compressed air.
Apply engine oil to the inner surface of the new stem seals.
Install the spring seats and stem seals.



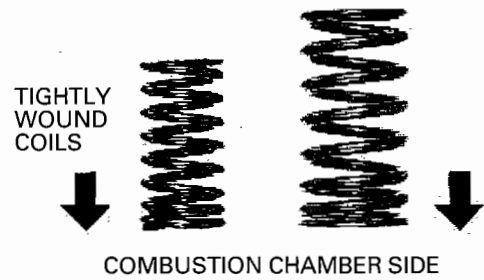
Lubricate the stem sliding surface with molybdenum oil solution.
Insert the valve into the valve guide while turning it slowly to avoid damage to the stem seal.



CYLINDER HEAD/VALVES

Install the inner and outer valve springs with the tightly wound coils facing the combustion chamber.

Install the spring retainer.



Grease the cotters to ease installation.

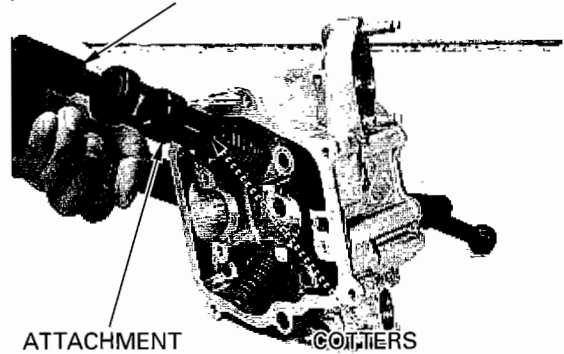
Install the valve spring cotters using the spring compressor.

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

TOOLS:

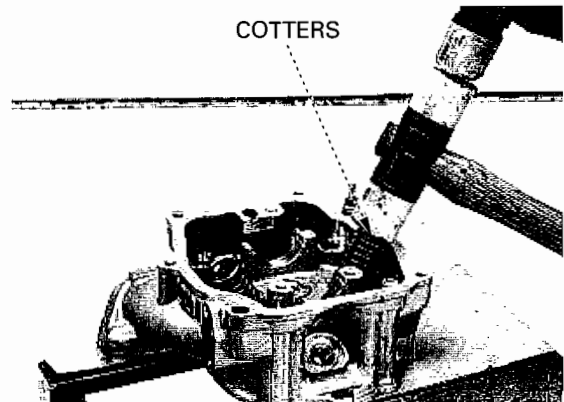
Valve spring compressor 07757-0010000
Valve spring compressor attachment 07959-KM30101

VALVE SPRING COMPRESSOR



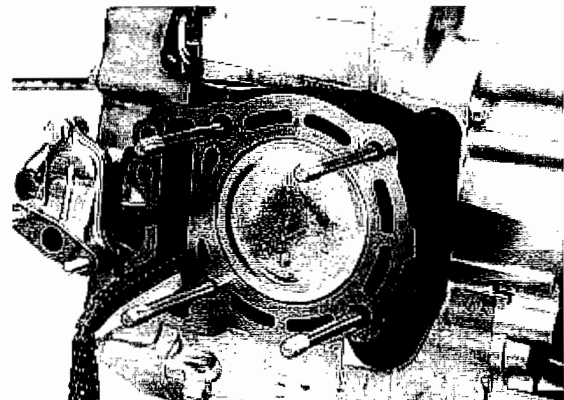
Support the cylinder head so the valve heads do not contact anything that may cause damage. Tap the valve stems gently with two plastic hammers as shown, to seat the cotters firmly.

Install the spark plug (page 3-7).

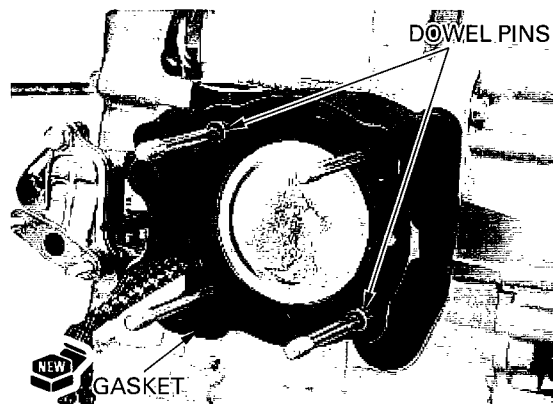


CYLINDER HEAD INSTALLATION

Clean the mating surfaces of the cylinder and cylinder head.



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



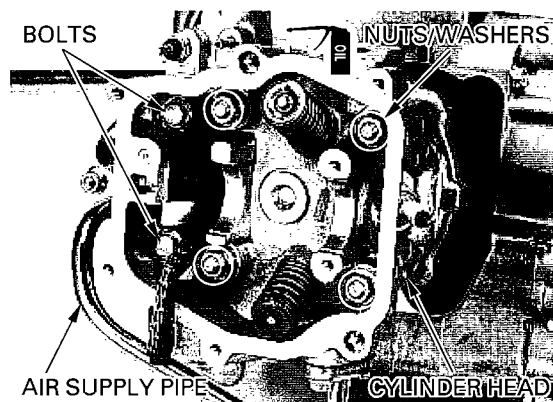
Route the cam chain through the cylinder head and install the cylinder head onto the cylinder.

Apply engine oil to the cylinder head nut threads and sealing surfaces.
Tighten the cylinder head nuts to the specified torque.

TORQUE: 24 N-m (2.4 kgf-m , 17 lbf-ft)

Tighten the bolts securely.

Install the air supply pipe (page 5-22).



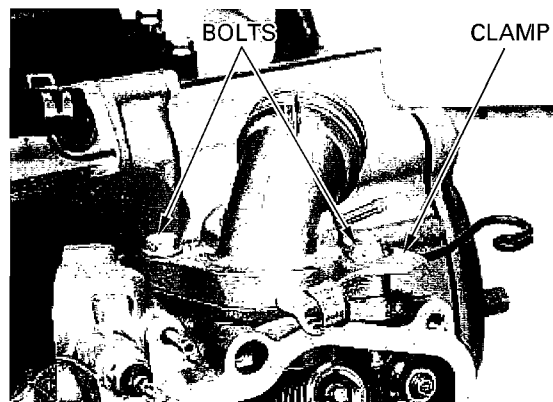
Coat a new O-ring with engine oil and install it into the groove in the intake manifold.

Install the intake manifold to the cylinder head.



Install the clamp and bolts.
Tighten the bolts securely.

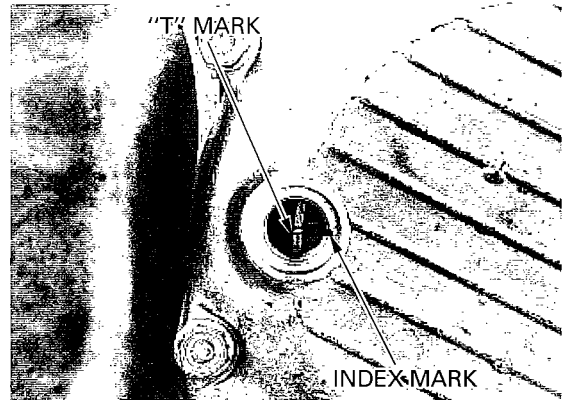
Install the thermostat (page 6-7).
Install the camshaft (page 8-16).
Install the engine (section 7).



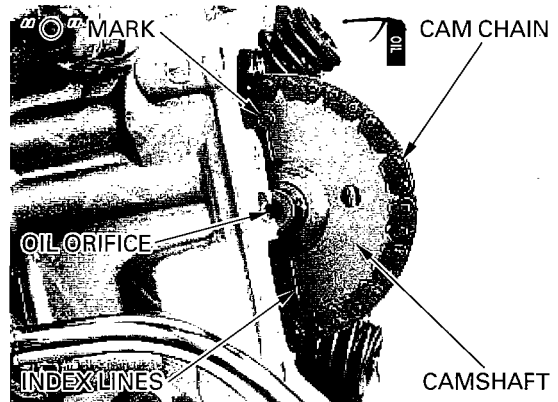
CYLINDER HEAD/VALVES

CAMSHAFT INSTALLATION

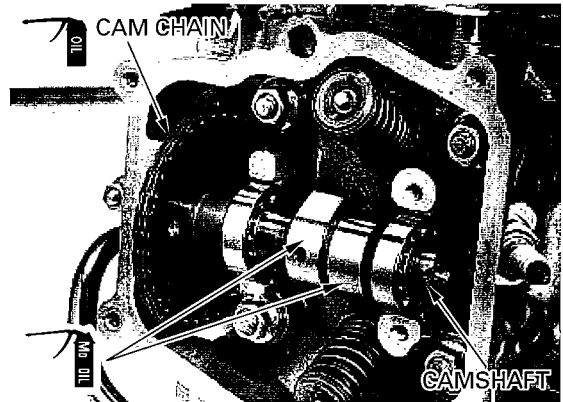
Turn the drive pulley (crankshaft) counterclockwise and align the "T" mark on the flywheel with the index mark in the right crankcase cover while holding the cam chain.



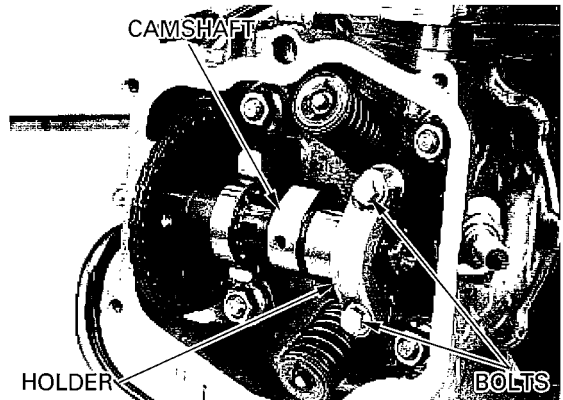
Be careful not to damage the oil orifice and head mating surface. Install the camshaft onto the cam chain and cylinder head so the "O" mark is facing up, and the index lines on the sprocket are aligned with the upper surface of the cylinder head.



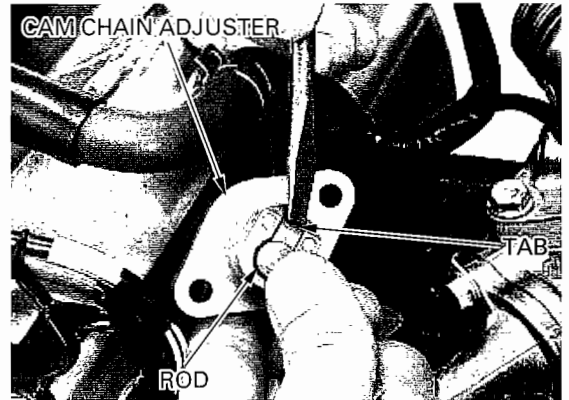
Apply molybdenum oil solution to the cam lobes.



Install the camshaft holder while pressing the camshaft against the cylinder head wall to the right, then install the holder bolts. Tighten the bolts securely.



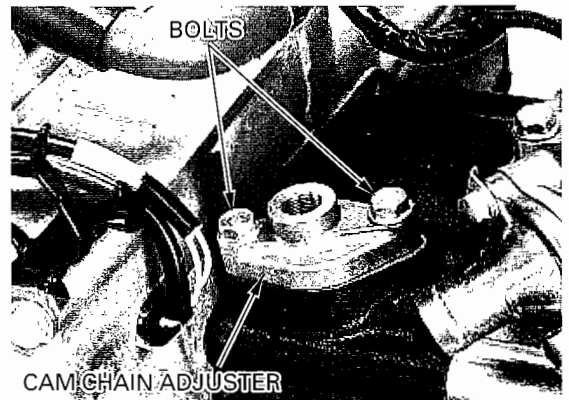
Retract the push rod while pushing the tab and release the tab to lock it.



Install a new gasket and cam chain adjuster onto the cylinder head.

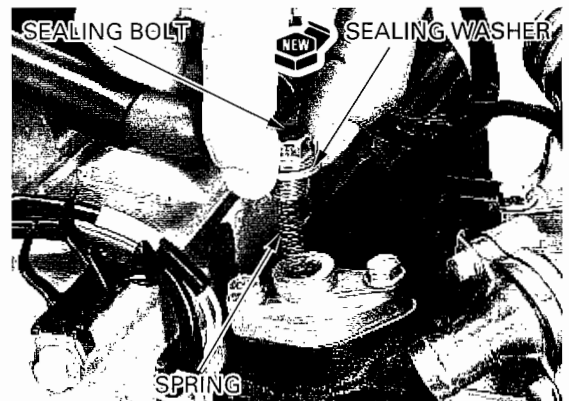


Install and tighten the bolts securely.



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

TORQUE: 22 N·m (2.2 kgf·m , 16 lbf·ft)

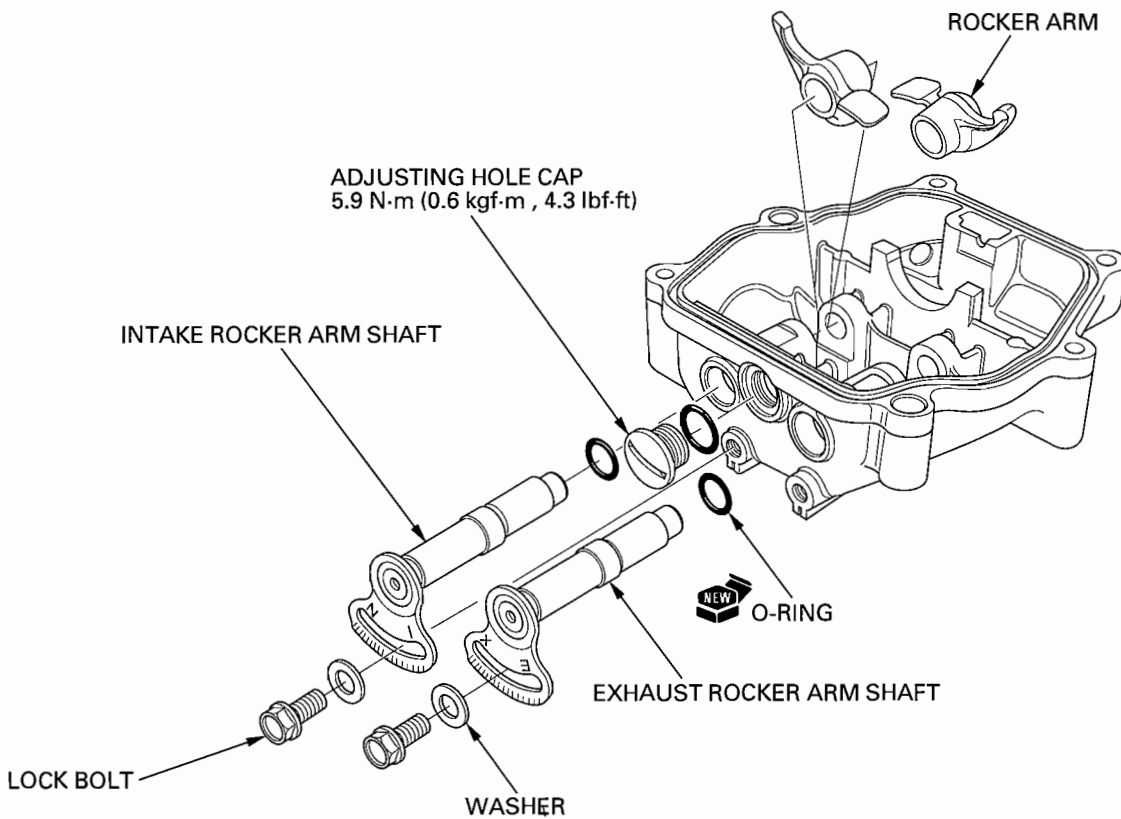


CYLINDER HEAD/VALVES

Make sure the index lines on the cam sprocket align with the upper surface of the cylinder head when the "T" mark on the flywheel is aligned with the index groove in the right crankcase cover.

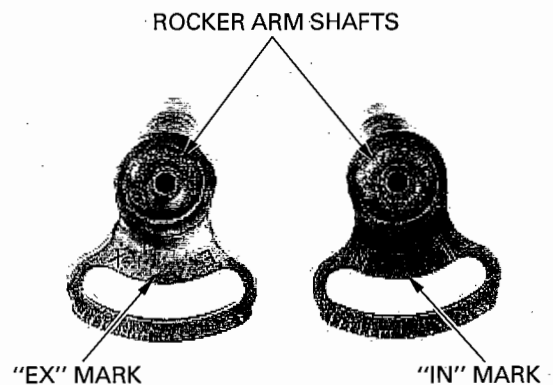


CYLINDER HEAD COVER INSTALLATION



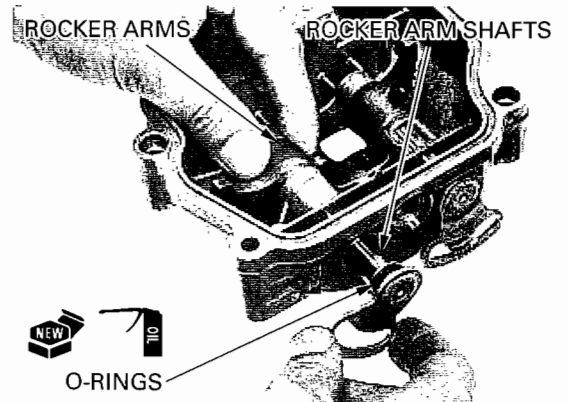
NOTE:

- The rocker arm shafts have the following identification marks.
"IN": Intake rocker arm shaft
"EX": Exhaust rocker arm shaft

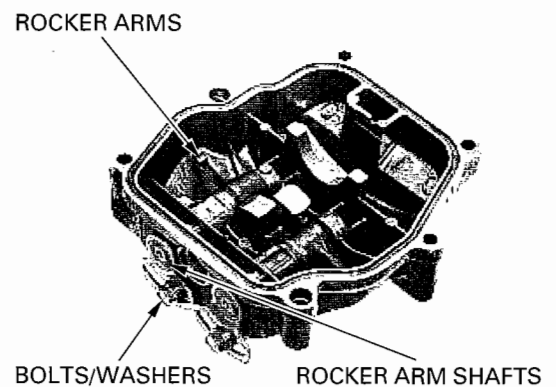


Coat new O-rings with engine oil and install them into the grooves in the rocker arm shafts.

Apply engine oil to the sliding surfaces of the rocker arms and rocker arm shafts. Install the rocker arms and shafts into the head cover.

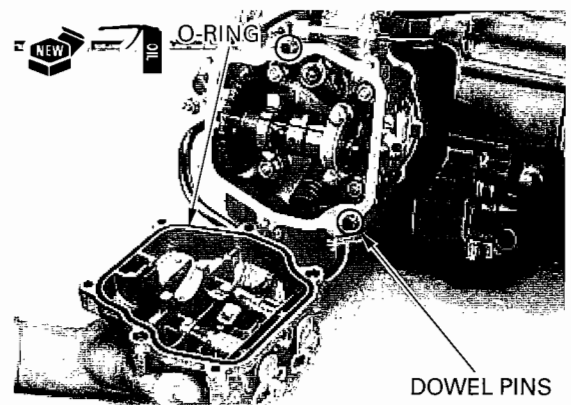


Tighten the lock bolts when adjusting the valve clearance. Temporarily install the lock bolts and washer.



Install the dowel pins.

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



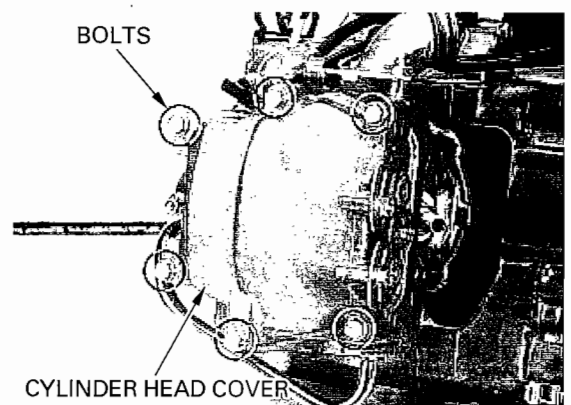
Install the head cover onto the cylinder head.

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

After installation, adjust the valve clearance (page 3-7).

Install the following:

- Timing hole and adjusting hole caps (page 3-8)
- Belt case air cleaner (page 10-4)
- Engine (section 7)



9. CYLINDER/PISTON

SERVICE INFORMATION	9-1	STUD BOLT REPLACEMENT	9-6
TROUBLESHOOTING	9-2	CYLINDER/PISTON INSTALLATION	9-6
CYLINDER/PISTON REMOVAL	9-3		

SERVICE INFORMATION

GENERAL

- This section covers maintenance of the cylinder and piston.
- Take care not to damage the cylinder wall and piston.
- Be careful not to damage the mating surfaces by using a screwdriver when disassembling the cylinder.
- Clean all disassembled parts with clean solvent and dry them using compressed air before inspection.
- Camshaft lubricating oil is fed through the oil passage in the cylinder. Clean the oil passage before installing the cylinder.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	72.750–72.760 (2.8642–2.8646)	72.76 (2.865)	
	Out-of-round	————	0.05 (0.002)	
	Taper	————	0.05 (0.002)	
	Warpage	————	0.05 (0.002)	
Piston, piston rings	Piston mark direction	“IN” mark facing toward the intake side	————	
	Piston O.D.	72.720–72.740 (2.8630–2.8638)	72.65 (2.860)	
	Piston O.D. measurement point	18 mm (0.7 in) from bottom of skirt	————	
	Piston pin bore I.D.	17.002–17.008 (0.6694–0.6696)	17.04 (0.671)	
	Piston pin O.D.	16.994–17.000 (0.6691–0.6693)	16.96 (0.668)	
	Piston-to-piston pin clearance	0.002–0.014 (0.0001–0.0006)	0.02 (0.001)	
	Piston ring-to-ring groove clearance	Top	0.015–0.050 (0.0006–0.0020)	0.09 (0.004)
		Second	0.015–0.050 (0.0006–0.0020)	0.09 (0.004)
	Piston ring end gap	Top	0.15–0.30 (0.006–0.012)	0.50 (0.020)
		Second	0.30–0.45 (0.012–0.018)	0.65 (0.026)
Oil (side rail)		0.20–0.70 (0.008–0.028)	0.90 (0.035)	
Cylinder-to-piston clearance		0.010–0.040 (0.0004–0.0016)	0.10 (0.004)	
Connecting rod small end I.D.		17.016–17.034 (0.6699–0.6706)	17.06 (0.672)	
Connecting rod-to-piston pin clearance		0.016–0.040 (0.0006–0.0016)	0.06 (0.002)	

TORQUE VALUE

Cylinder stud bolt 8.8 N·m (0.9 kgf·m , 6.5 lbf·ft) see page 9-6.

TROUBLESHOOTING

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

- Leaking cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston
- Bent connecting rod

Compression too high, overheating or knocking

- Excessive carbon 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 (section 8)

Abnormal noise

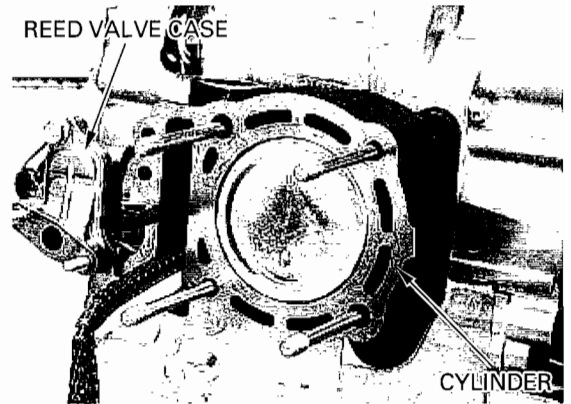
- Worn piston pin or piston pin hole
- Worn connecting rod small end
- Worn cylinder, piston or piston rings
- Excessive carbon build-up

CYLINDER/PISTON REMOVAL

Remove the cylinder head (page 8-6).
Remove the bolts and reed valve case (page 5-21).

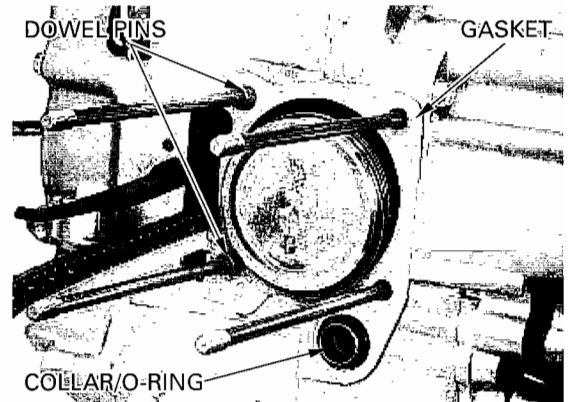
Do not strike the cylinder too hard and do not damage the mating surface with a screwdriver.

Remove the cylinder.



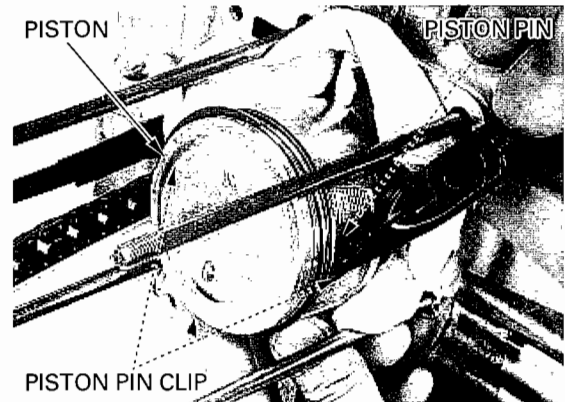
Remove the dowel pins, water joint collar and O-ring.

Remove the gasket.



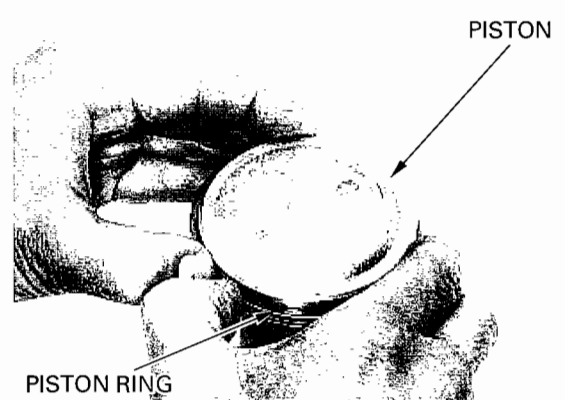
Place clean shop towels in the crankcase to keep the piston pin clips, or other parts, from falling into the crankcase.

Remove the piston pin clips using pliers.
Remove the piston pin from the piston.
Remove the piston.



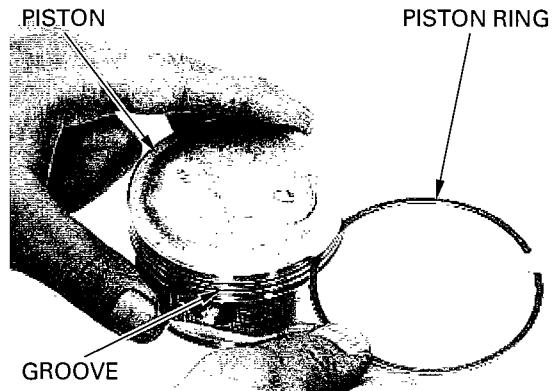
Do not damage the piston ring by spreading the ends too far.

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



CYLINDER/PISTON

Clean carbon deposits from the ring grooves with a ring that will be discarded. Never use a wire brush; it will scratch the groove.



INSPECTION

PISTON RING

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

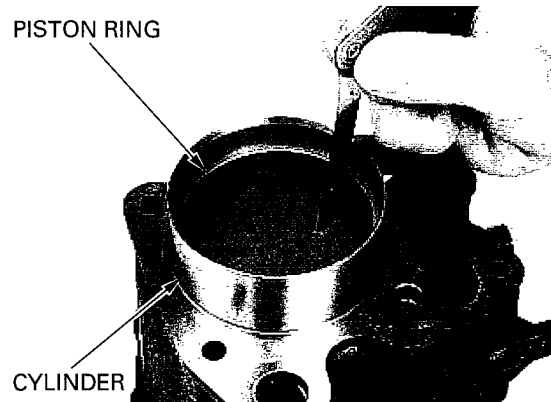
Push the ring until the outer surface of the piston ring is nearly flush with the piston and measure the ring-to-groove clearance.

SERVICE LIMITS: Top/second: 0.09 mm (0.004 in)



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

SERVICE LIMITS: Top: 0.50 mm (0.020 in)
Second: 0.65 mm (0.026 in)
Oil (side rail): 0.90 mm (0.035 in)



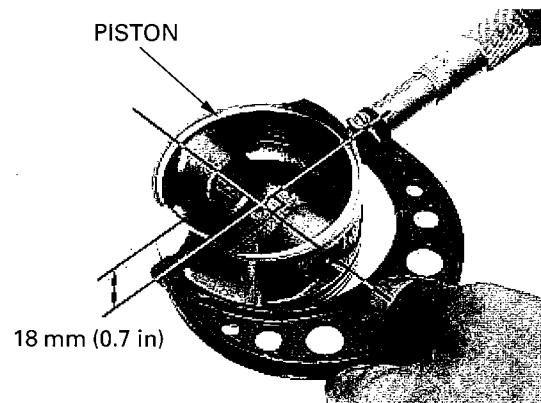
PISTON/PISTON PIN

Measure the piston O.D. at the point 18 mm (0.7 in) from the bottom and 90° to the piston pin hole.

SERVICE LIMIT: 72.65 mm (2.860 in)

Calculate the cylinder-to-piston clearance (cylinder I.D.: page 9-5).

SERVICE LIMIT: 0.10 mm (0.004 in)



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

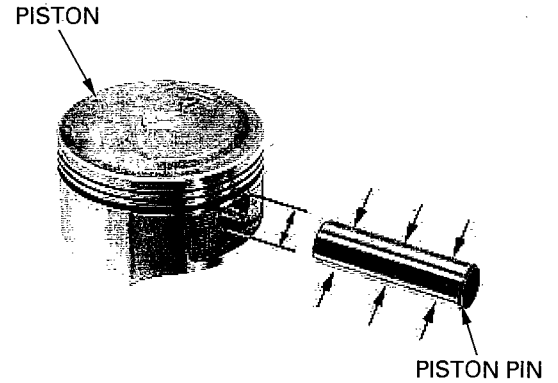
SERVICE LIMIT: 17.04 mm (0.671 in)

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

SERVICE LIMIT: 16.96 mm (0.668 in)

Calculate the piston-to-piston pin clearance.

SERVICE LIMIT: 0.02 mm (0.001 in)

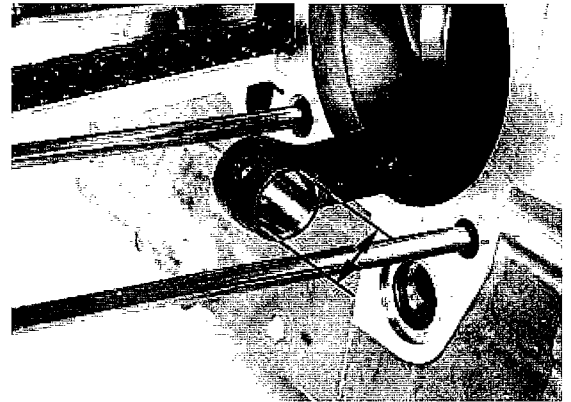


Measure the connecting rod small end I.D.

SERVICE LIMIT: 17.06 mm (0.672 in)

Calculate the connecting rod-to-piston pin clearance.

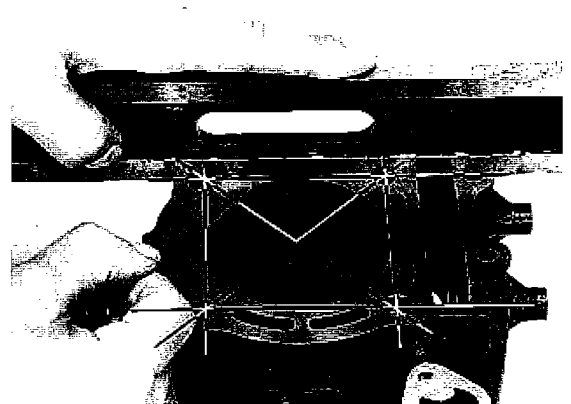
SERVICE LIMIT: 0.06 mm (0.002 in)



CYLINDER

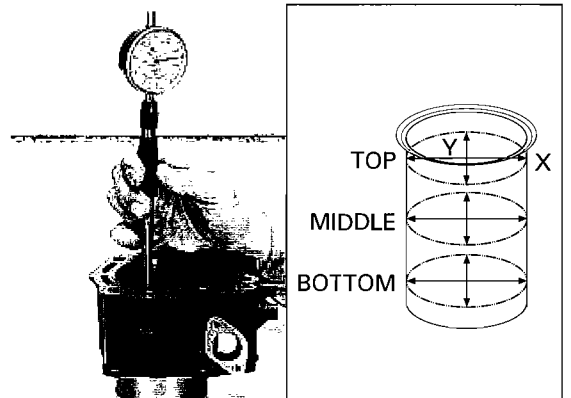
Check the cylinder for warpage with a straight edge and feeler gauge in the directions shown.

SERVICE LIMIT: 0.05 mm (0.002 in)



Check the cylinder wall for wear or damage. Measure and record the cylinder I.D. at three levels in the X and Y axes. Take the maximum reading to determine the taper and out-of-round.

SERVICE LIMITS: Taper : 0.05 mm (0.002 in)
Out-of-round: 0.05 mm (0.002 in)



CYLINDER/PISTON

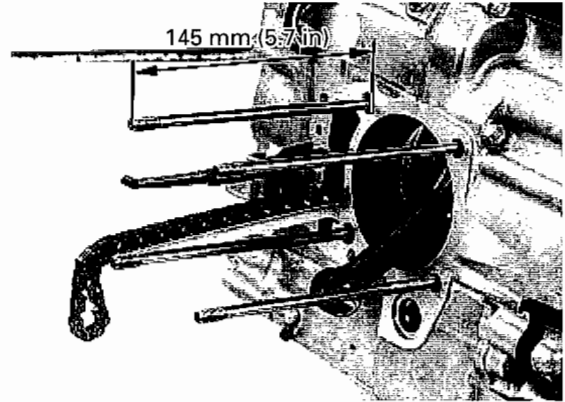
STUD BOLT REPLACEMENT

Remove the stud bolts from the crankcase.

Install new stud bolts into the crankcase.

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

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



CYLINDER/PISTON INSTALLATION

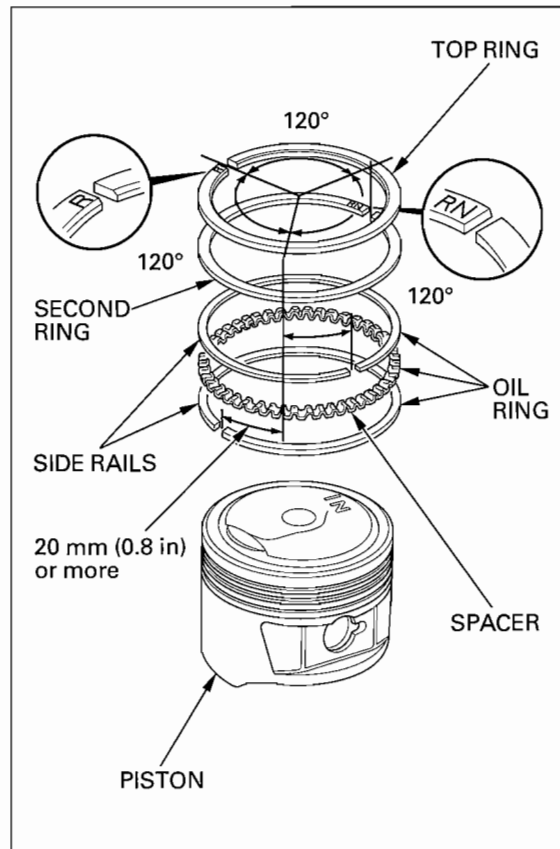
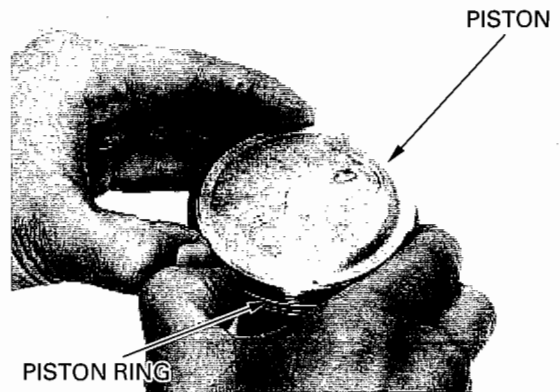
PISTON RING INSTALLATION

Be careful not to damage the piston and rings Carefully install the piston rings into the piston ring grooves with the marks facing up.

NOTE:

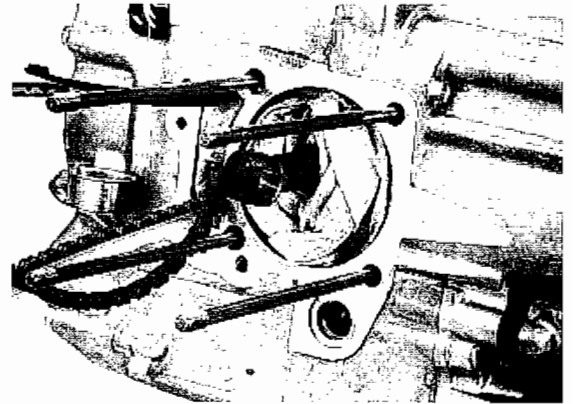
- Do not confuse the top and second rings.
- To install the oil ring, install the spacer first, then install the side rails.

Stagger the piston ring end gaps 120° degrees apart from each other.
Stagger the side rail end gaps as shown.



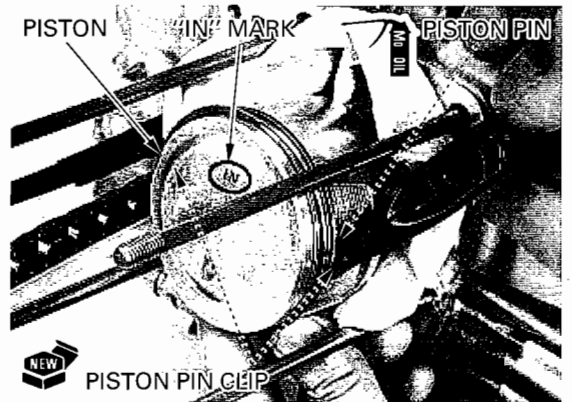
CYLINDER/PISTON INSTALLATION

Clean any gasket material from the cylinder mating surfaces of the crankcase and oil passage.



Place a clean shop towel over the crankcase to prevent the clip from falling into the crankcase.

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

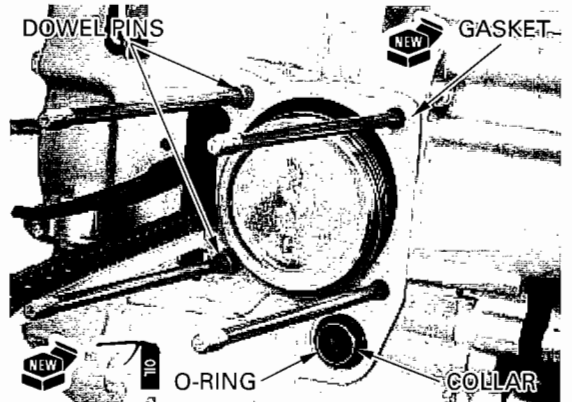


Install the piston with the "IN" mark facing the intake side. Install the piston pin and new pin clips.

NOTE:

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

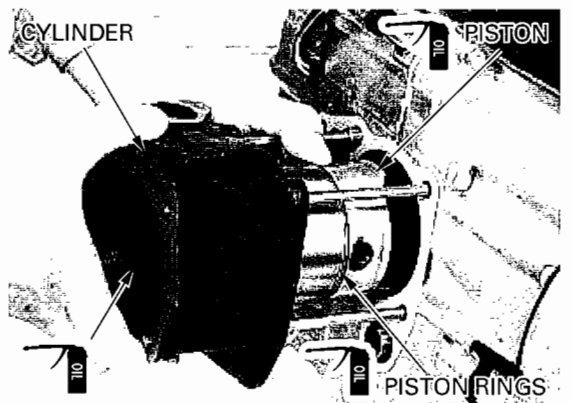
Install the dowel pins and a new gasket. Coat a new O-ring with engine oil and install the joint collar and O-ring.



Apply engine oil to the cylinder wall, piston and piston ring outer surfaces.

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

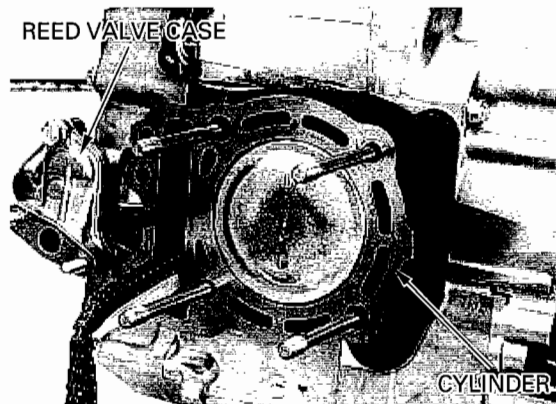
Pass the cam chain through the cylinder and install the cylinder over the piston while compressing the piston rings with your fingers.



CYLINDER/PISTON

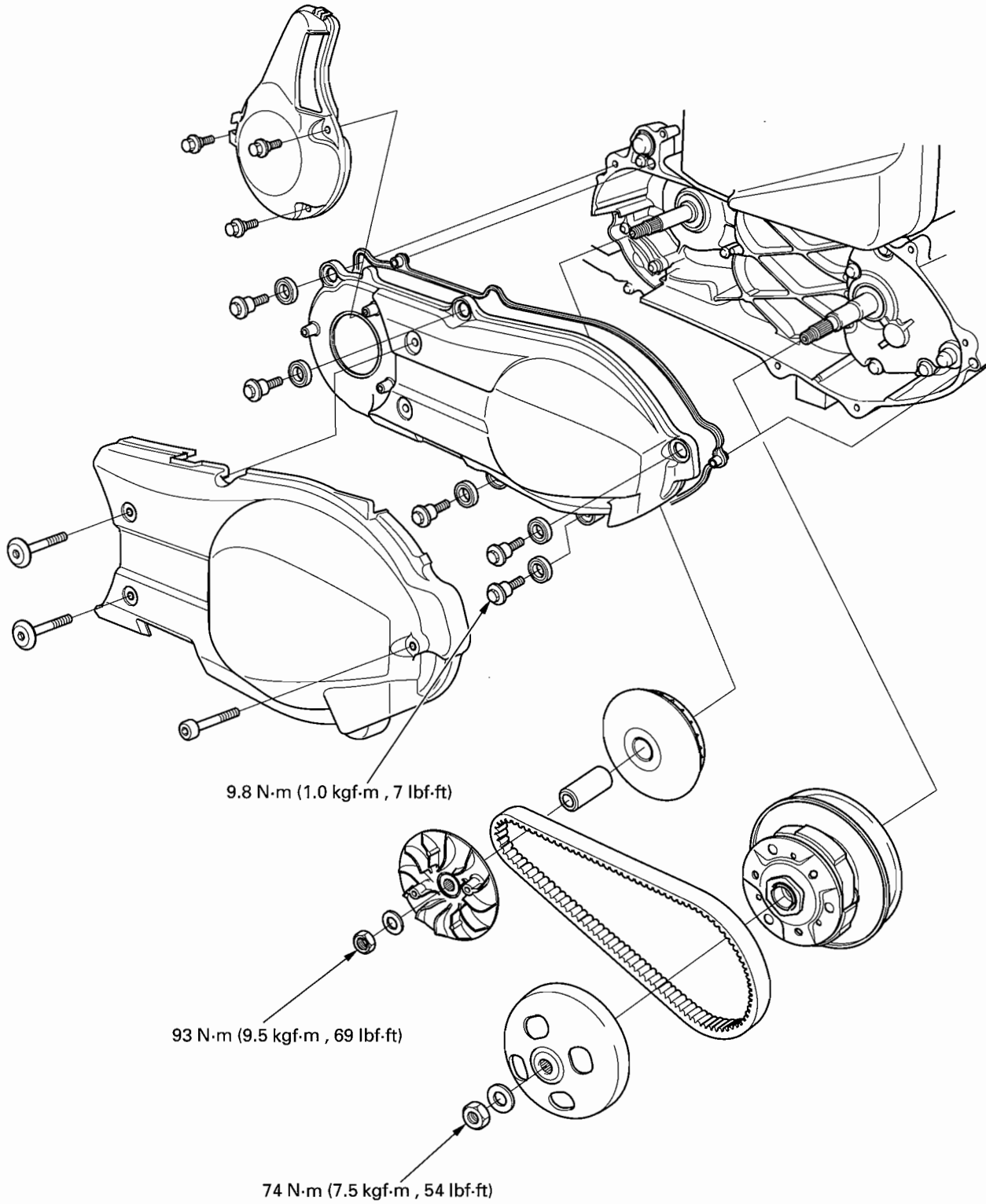
Make sure the cylinder touches the crankcase evenly.

Install the reed valve case (page 5-22).
Install the cylinder head (page 8-14).



MEMO

DRIVE PULLEY/DRIVEN PULLEY/CLUTCH



10. DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

SERVICE INFORMATION	10-1	DRIVE PULLEY	10-5
TROUBLESHOOTING	10-2	CLUTCH/DRIVEN PULLEY	10-9
LEFT CRANKCASE COVER	10-3		

SERVICE INFORMATION

GENERAL

- This section covers maintenance of the drive pulley, driven pulley and clutch.
- These services can be done with the engine installed in the frame.
- Avoid getting grease and oil on the 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 O.D.	135.0 – 135.2 (5.31 – 5.32)	135.5 (5.33)
	Lining thickness	4.0 (0.16)	0.5 (0.02)
Drive belt width		23.3 (0.92)	22.3 (0.88)
Movable drive face	Bushing I.D.	27.024 – 27.057 (1.0639 – 1.0652)	27.91 (1.099)
	Boss O.D.	26.995 – 27.031 (1.0628 – 1.0642)	26.93 (1.060)
	Weight roller O.D.	22.92 – 23.08 (0.902 – 0.909)	22.5 (0.89)
Driven pulley	Face spring free length	112.6 (4.43)	108.6 (4.28)
	Driven face O.D.	39.965 – 39.985 (1.5734 – 1.5742)	39.94 (1.572)
	Movable driven face I.D.	40.000 – 40.025 (1.5748 – 1.5758)	40.06 (1.577)

10

TORQUE VALUES

Clutch/driven pulley nut	78 N·m (8.0 kgf·m , 58 lbf·ft)	
Clutch outer nut	74 N·m (7.5 kgf·m , 54 lbf·ft)	
Drive pulley face nut	93 N·m (9.5 kgf·m , 69 lbf·ft)	Apply oil to the threads and flange surface.
Left crankcase cover bolt	9.8 N·m (1.0 kgf·m , 7 lbf·ft)	

TOOLS

Universal holder	07725-0030000
Flywheel holder	07725-0040000
Remover weight	07741-0010201
Attachment, 32 × 35 mm	07746-0010100
Pilot, 15 mm	07746-0040300
Pilot, 25 mm	07746-0040600
Driver	07749-0010000
Snap ring pliers	07914-SA50001
Remover shaft assembly	07936-ZV10100
Attachment, 28 × 30 mm	07946-1870100
Socket wrench, 39 × 41 mm	07GMA-KS40100
Clutch spring compressor	07LME-GZ40200 or 07960-KM1000A (U.S.A. only)

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

LEFT CRANKCASE COVER

REMOVAL

Remove the left floor skirt (page 2-4).

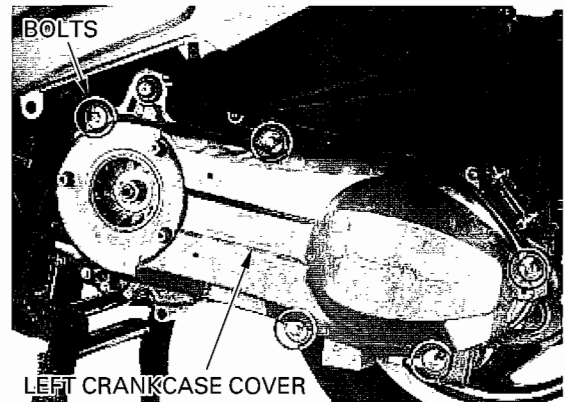
Remove the carburetor air vent hose from the belt case air cleaner.

Remove the bolts and the belt case air cleaner.

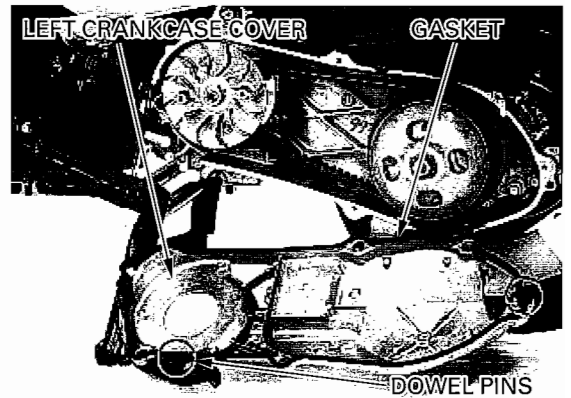
Remove the bolts and left crankcase cover protector.



Remove the bolts and the left crankcase cover.

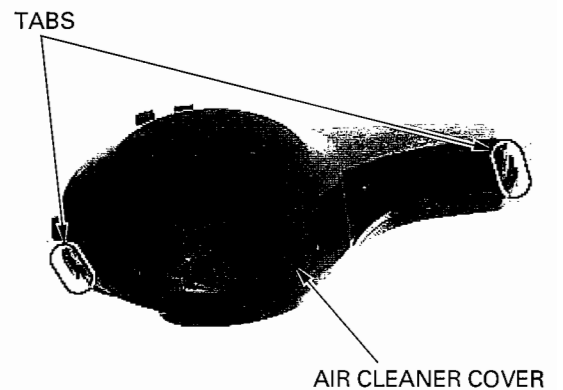


Remove the gasket and dowel pins from the left crankcase cover.



BELT CASE AIR CLEANER

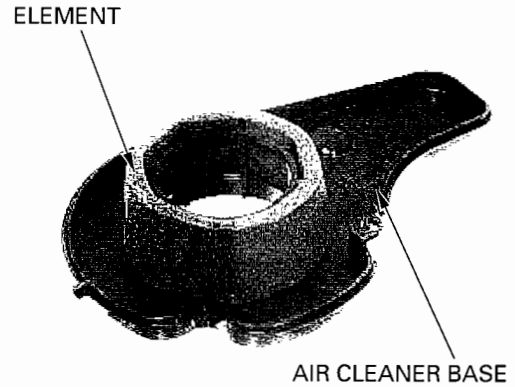
Release the two tabs and remove the air cleaner cover from the base.



DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

Check the air cleaner element.
Remove the element from the base and wash it in cleaning solvent if necessary.
Dry the element thoroughly, then install it onto the base.

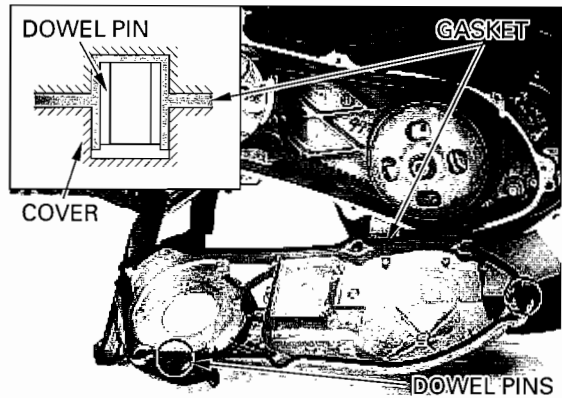
Install the air cleaner cover on the base and secure it with the two tabs.



INSTALLATION

Check the left crankcase cover gasket and replace it if it is deteriorated or damaged.
Clean the gasket groove in the left crankcase cover.

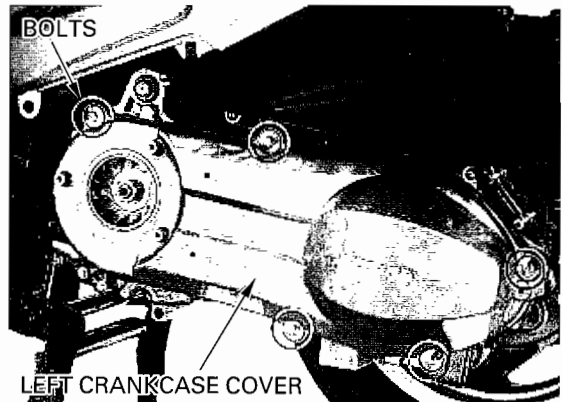
Install the dowel pins and the gasket onto the left crankcase cover.



Install the left crankcase cover onto the crankcase by aligning the dowel pins with the holes.

Install and tighten the left crankcase cover bolts to the specified torque.

TORQUE: 9.8 N·m (1.0 kgf·m , 7 lbf·ft)



Install the left crankcase cover protector and tighten the bolts securely.

Install the belt case air cleaner and tighten the bolts securely.

Install the carburetor air vent hose into the clamp of the belt case air cleaner.

Install the left floor skirt (page 2-4).



DRIVE PULLEY

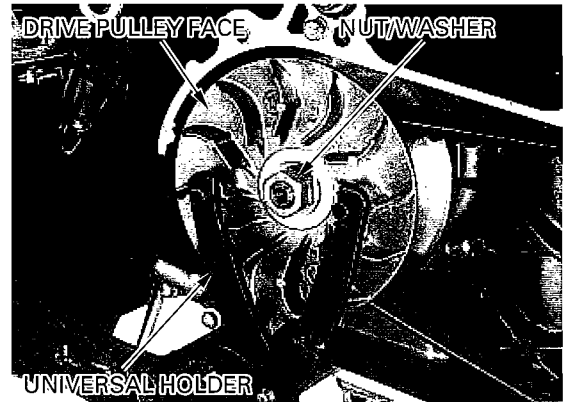
REMOVAL

Remove the left crankcase cover (page 10-3).

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

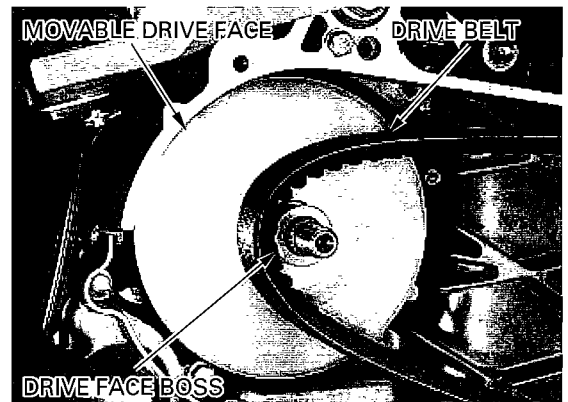
TOOL:
Universal holder 07725-0030000

Remove the nut, washer and drive pulley face.



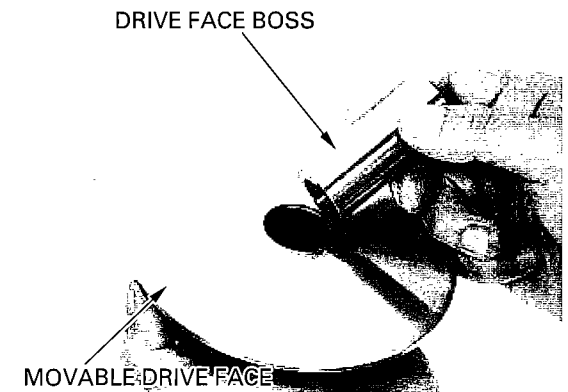
Remove the drive belt from the crankshaft.

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

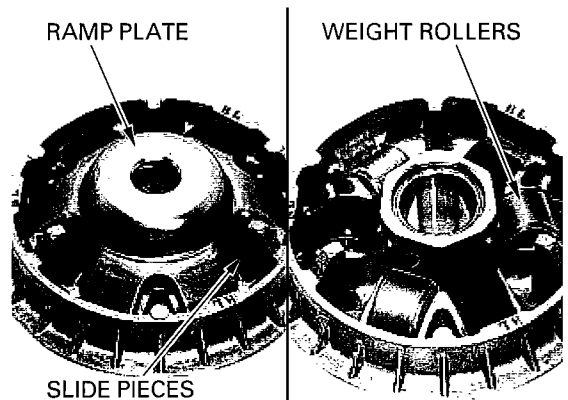


DISASSEMBLY

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



Remove the ramp plate, slide pieces and weight rollers.



DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

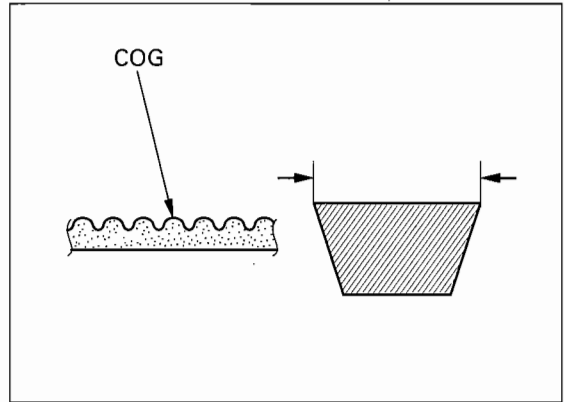
INSPECTION

DRIVE BELT

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

SERVICE LIMIT: 22.3 mm (0.88 in)

Remove the clutch/driven pulley, then replace the drive belt if necessary.

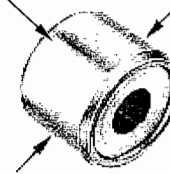


WEIGHT ROLLER

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

SERVICE LIMIT: 22.5 mm (0.89 in)

WEIGHT ROLLER



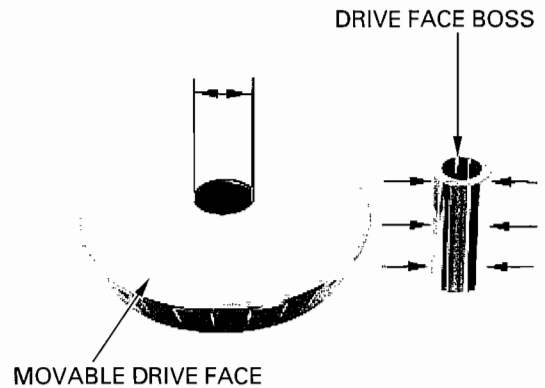
MOVABLE DRIVE FACE

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

SERVICE LIMIT: 26.93 mm (1.060 in)

Measure the face bushing I.D.

SERVICE LIMIT: 27.91 mm (1.099 in)



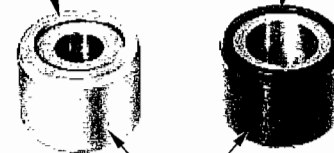
ASSEMBLY

Install the weight rollers (Black: large I.D.) to the original position on the movable drive face.

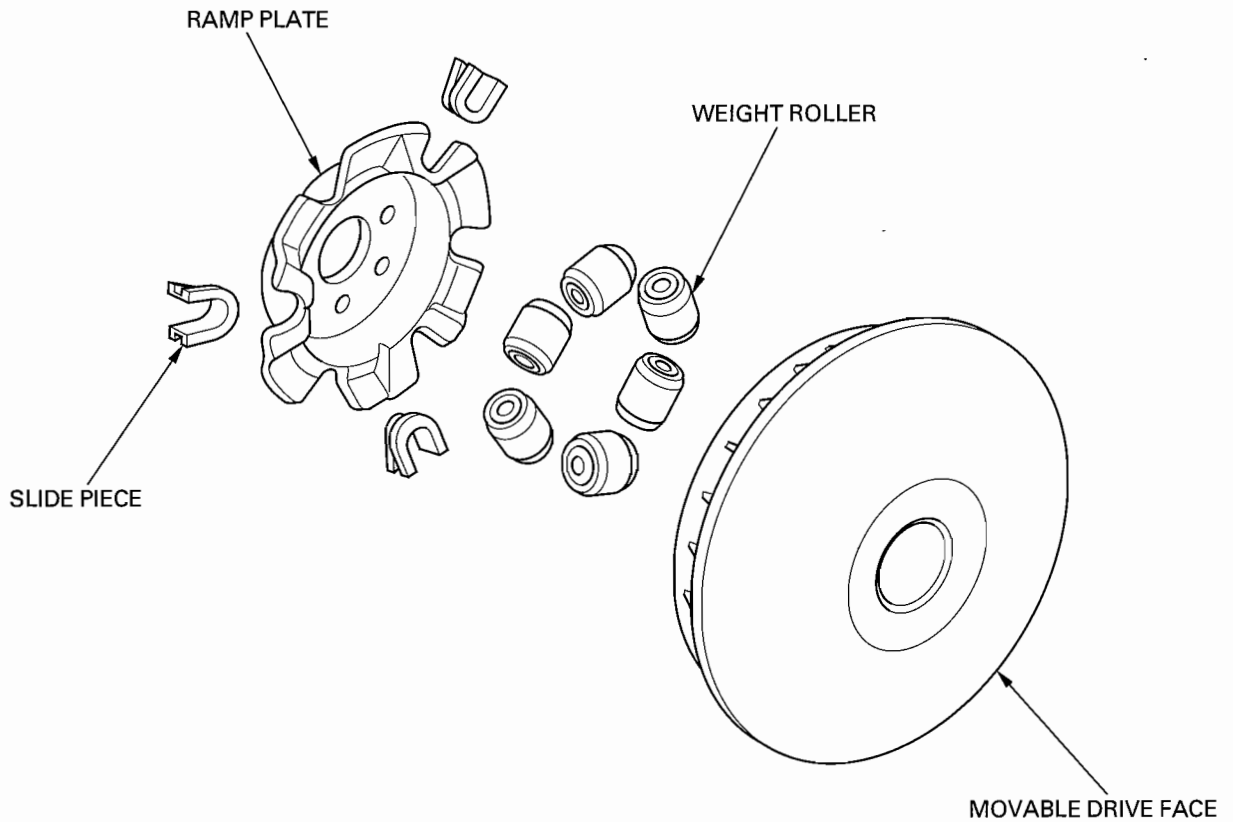
Clean any oil and grease from the pulley faces and weight rollers.

SMALL I.D. (BEIGE)

LARGE I.D. (BLACK)

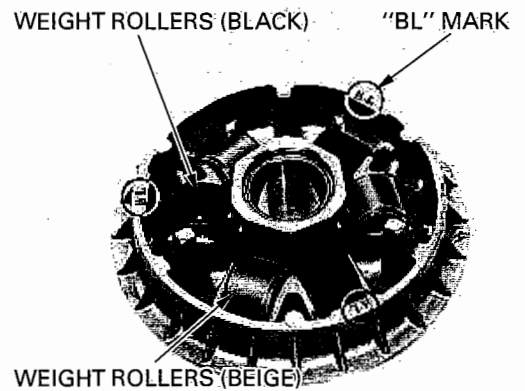


WEIGHT ROLLERS

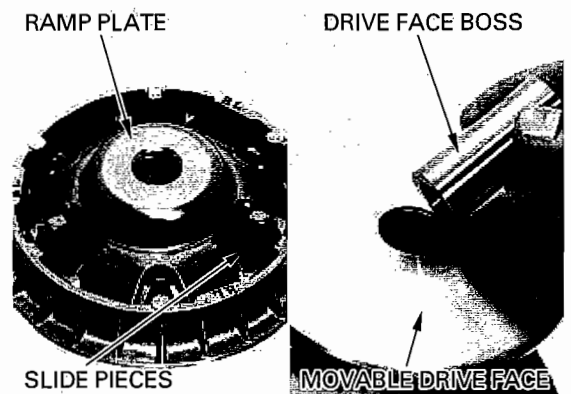


Install the weight rollers (Black: large I.D.) to the "BL" mark on the movable drive face.

Install the weight rollers (Beige: small I.D.) to the movable drive face.



Install the slide pieces to the ramp plate.
Install the ramp plate to the movable drive face.
Install the drive face boss into the movable drive face assembly.

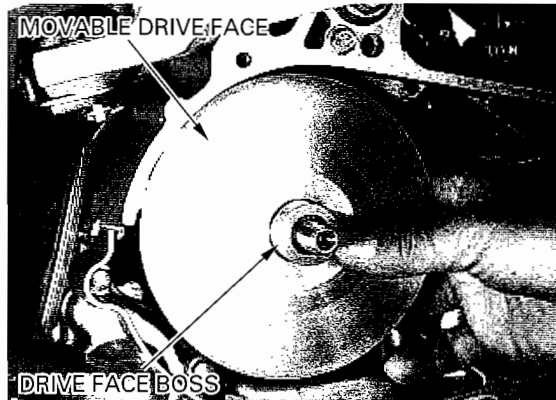


DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

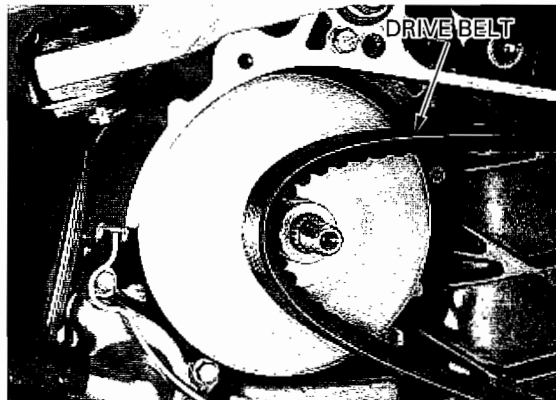
INSTALLATION

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

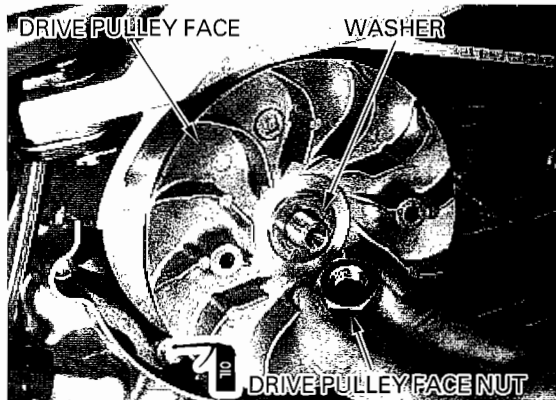
Install the movable drive face assembly onto the crankshaft while holding the ramp plate.



Install the drive belt onto the drive face boss.



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



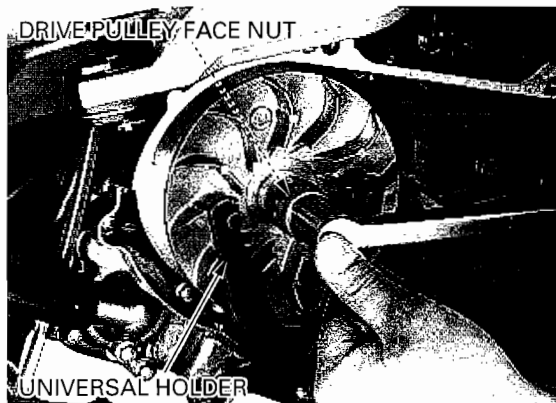
Hold the drive face with the special tool and tighten the nut to the specified torque.

TOOL:

Universal holder 07725-0030000

TORQUE: 93 N-m (9.5 kgf-m , 69 lbf-ft)

Install the left crankcase cover (page 10-4).



CLUTCH/DRIVEN PULLEY

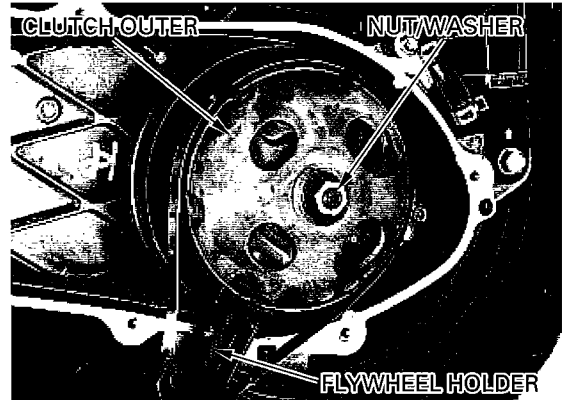
REMOVAL

Remove the drive pulley (page 10-5).

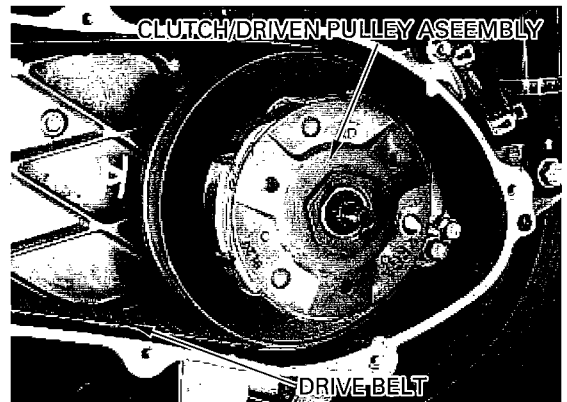
Hold the clutch outer with the special tool and loosen the clutch outer nut.

TOOL:
Flywheel holder 07725-0040000

Remove the nut, washer and clutch outer.



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



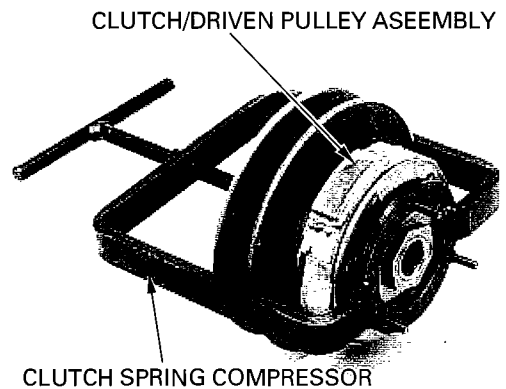
DISASSEMBLY

To prevent loss of tension, do not compress the clutch spring more than necessary to remove the clutch/driven pulley nut.

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

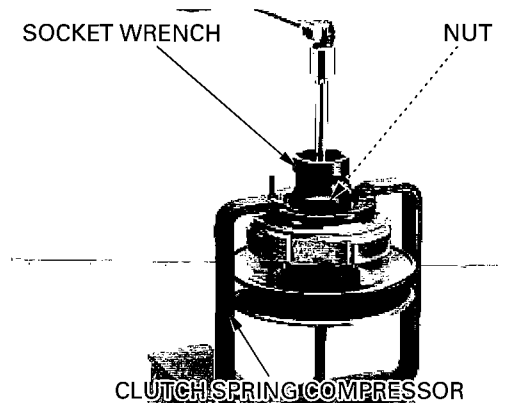
TOOL:
Clutch spring compressor 07LME-GZ40200 or 07960-KM1000A (U. S. A. Only)

When using the U. S. A. only tool, position the pins in the holes marked B.



Hold the clutch spring compressor in a vise.
Remove the clutch/driven pulley nut using the socket wrench.

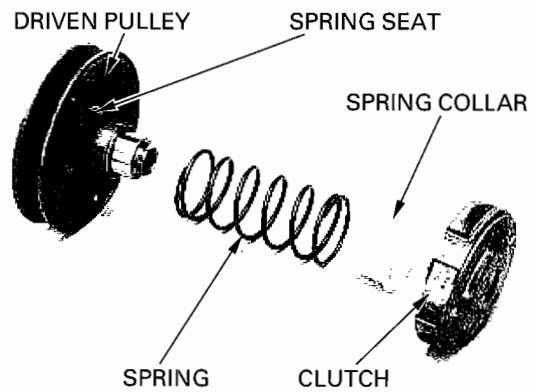
TOOL:
Socket wrench, 39 × 41 mm 07GMA-KS40100



DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

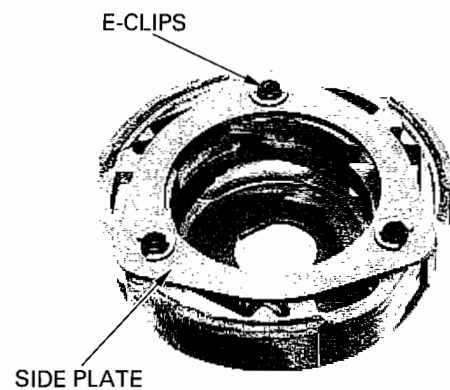
Loosen the spring compressor and remove the following:

- Clutch assembly
- Driven pulley
- Driven face spring
- Spring seat
- Spring collar

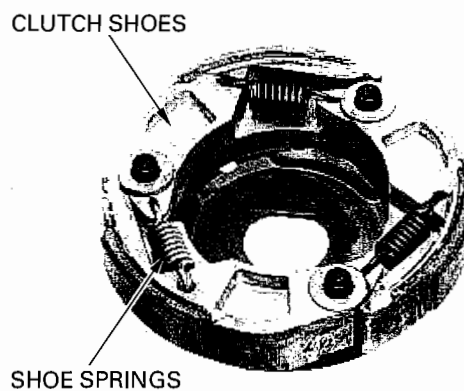


CLUTCH DISASSEMBLY

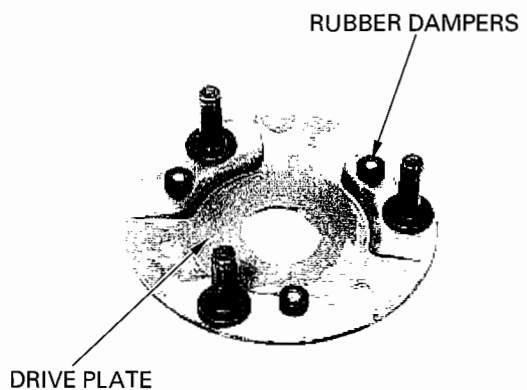
Remove the E-clips and clutch side plate.



Remove the clutch shoes and shoe springs.

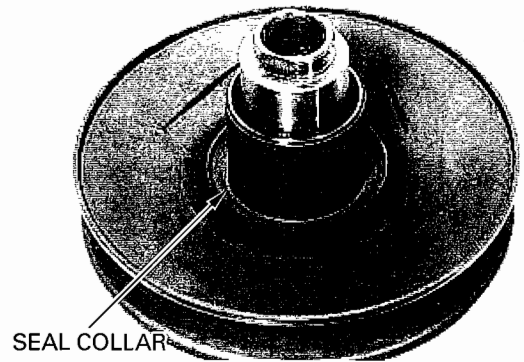


Remove the rubber dampers from the drive plate.

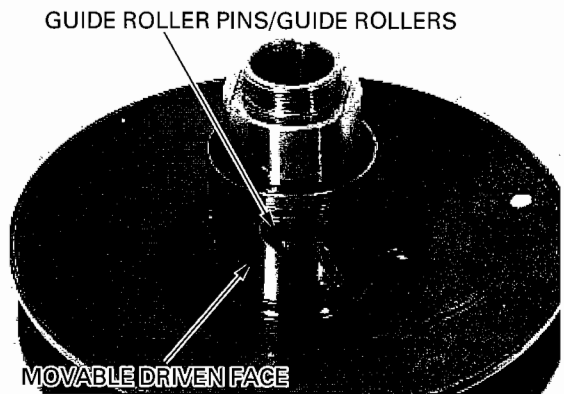


DRIVEN PULLEY DISASSEMBLY

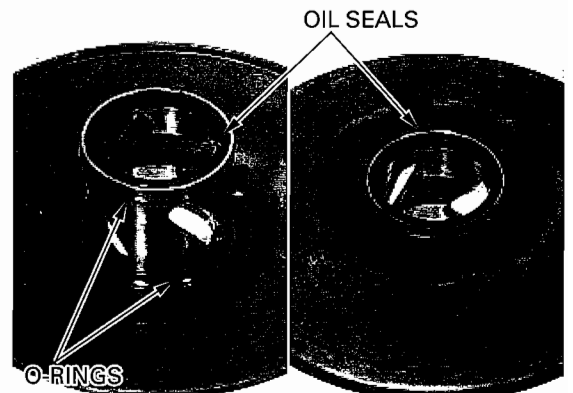
Remove the seal collar.



Remove the guide roller pins, guide rollers and the movable driven face.



Remove the O-rings and oil seals from the movable driven face.



DRIVEN FACE BEARING REPLACEMENT

Remove the driven face needle bearing using the special tools.

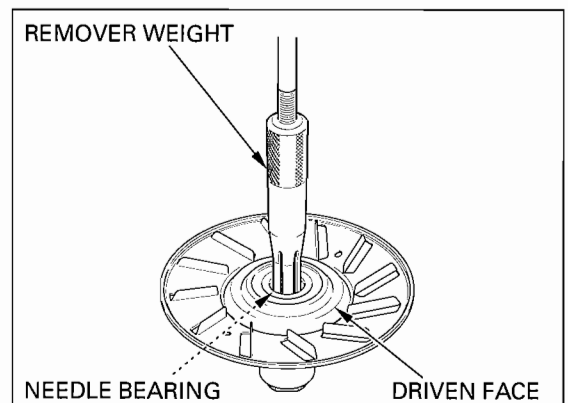
TOOLS:

Remover weight

07741-0010201

Remover shaft assembly

07936-ZV10100



DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

Remove the snap ring, then remove the ball bearing.

TOOL:

Snap ring pliers 07914-SA50001

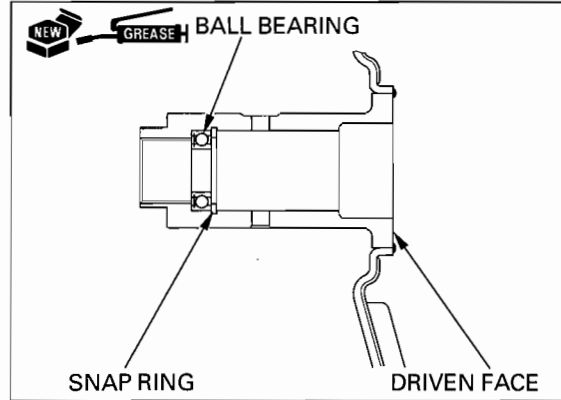
Apply grease to a new ball bearing.
Install the ball bearing into the driven face with the marked side facing up.

TOOL:

Driver 07749-0010000

Attachment 32 × 35 mm 07746-0010100

Pilot, 15 mm 07746-0040300



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

TOOL:

Snap ring pliers 07914-SA50001

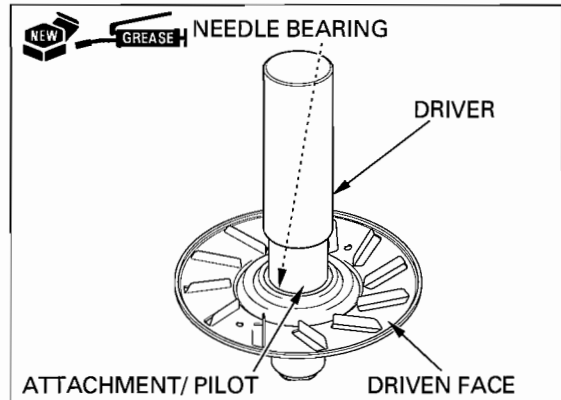
Apply grease to the driven face inner surface.
Apply grease to a new needle bearing.
Press the needle bearing into the driven face with the marked side facing up.

TOOL:

Driver 07749-0010000

Attachment, 28 × 30 mm 07946-1870100

Pilot, 25 mm 07746-0040600

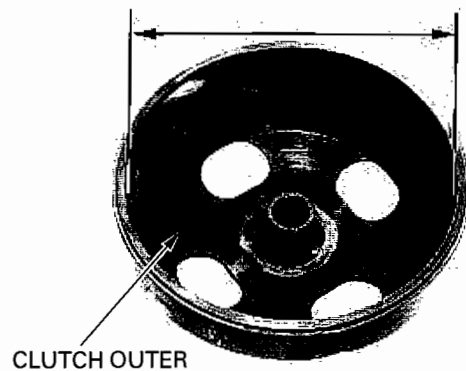


INSPECTION

CLUTCH OUTER

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

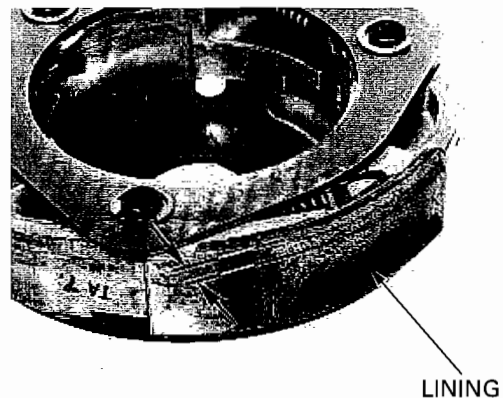
SERVICE LIMIT: 135.5 mm (5.33 in)



CLUTCH SHOE LINING

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

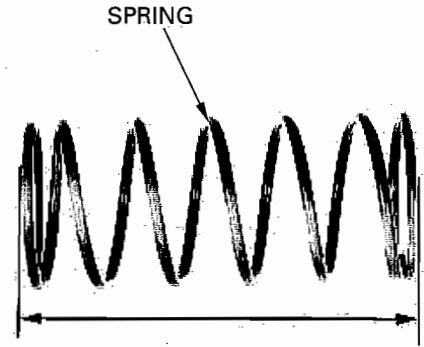
SERVICE LIMIT: 0.5 mm (0.02 in)



DRIVEN FACE SPRING

Measure the driven face spring free length.

SERVICE LIMIT: 108.6 mm (4.28 in)

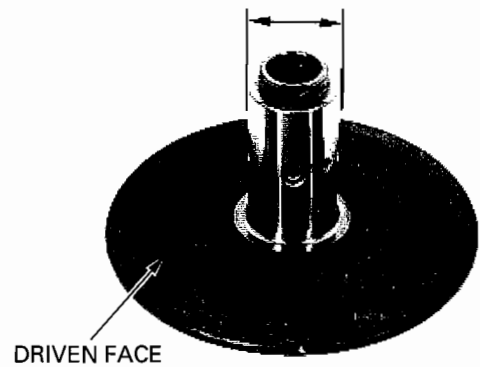


DRIVEN FACE

Check the driven face for scratches, scoring or damage.

Measure the driven face boss O.D.

SERVICE LIMIT: 39.94 mm (1.572 in)



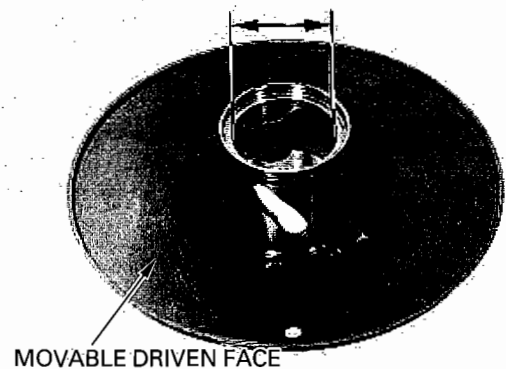
MOVABLE DRIVEN FACE

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

Check the guide grooves for stepped wear or damage.

Measure the movable driven face I.D.

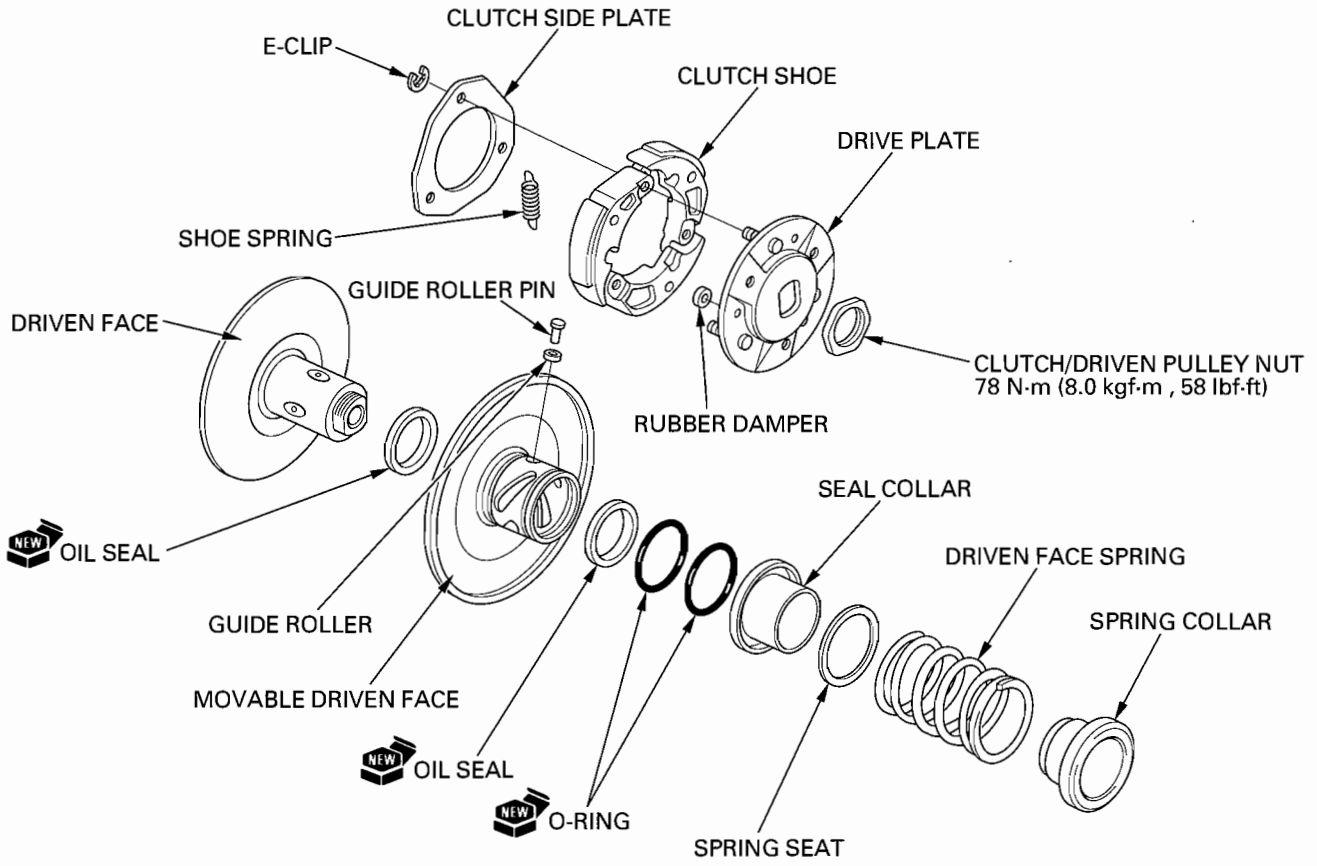
SERVICE LIMIT: 40.06 mm (1.577 in)



ASSEMBLY

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

DRIVE PULLEY/DRIVEN PULLEY/CLUTCH



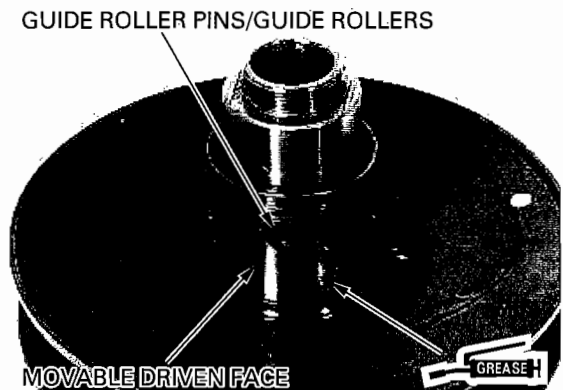
DRIVEN PULLEY ASSEMBLY

Clean any oil from the drive belt sliding surfaces on the driven face.

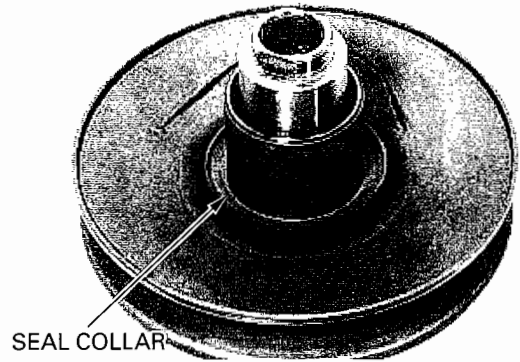
Apply grease to new oil seal lips and install them into the movable driven face.
 Coat new O-rings with grease and install them into the movable driven face grooves.



Install the movable driven face onto the driven face.
 Install the guide rollers and guide roller pins.
 Apply 4–5 g of grease to each guide groove.

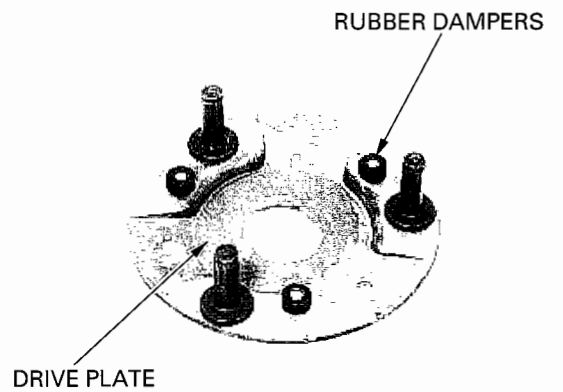


Install the seal collar.

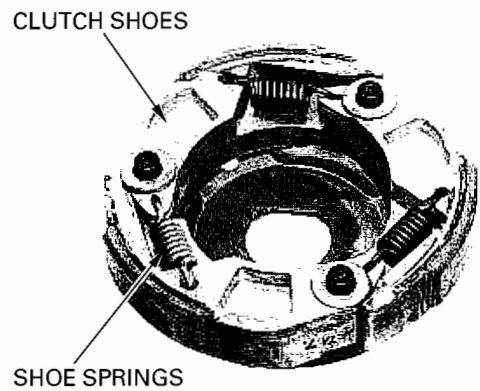


CLUTCH ASSEMBLY

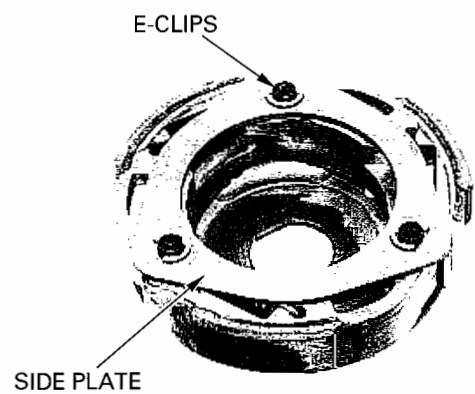
Install the rubber dampers onto the drive plate.



Install the clutch shoes and shoe springs onto the drive plate.



Install the clutch side plate and secure it with the E-clips.

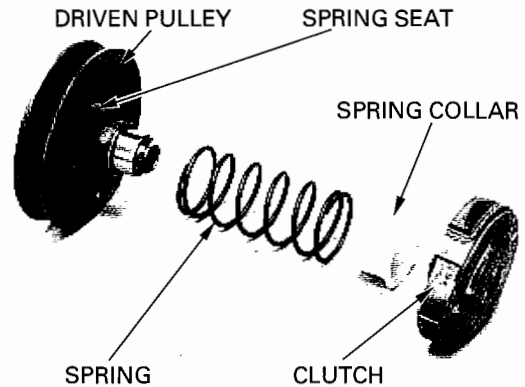


DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

CLUTCH/DRIVEN PULLEY ASSEMBLY

Assemble the following:

- Spring collar
- Spring seat
- Driven face spring
- Driven pulley
- Clutch assembly



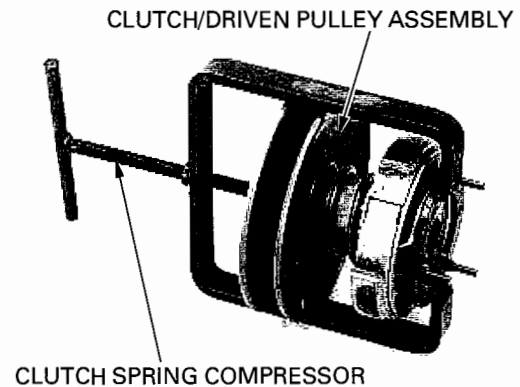
To prevent loss of tension, do not compress the clutch spring more than necessary to assemble the clutch/driven pulley nut.

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)



Hold the spring compressor in a vice.

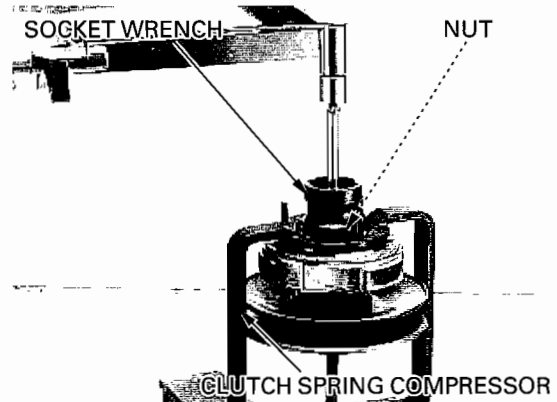
Install and tighten the clutch/driven pulley nut using the socket wrench to the specified torque.

TOOL:

Socket wrench, 39 × 41 mm 07GMA-KS40100

TORQUE: 78 N·m (8.0 kgf·m , 58 lbf·ft)

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

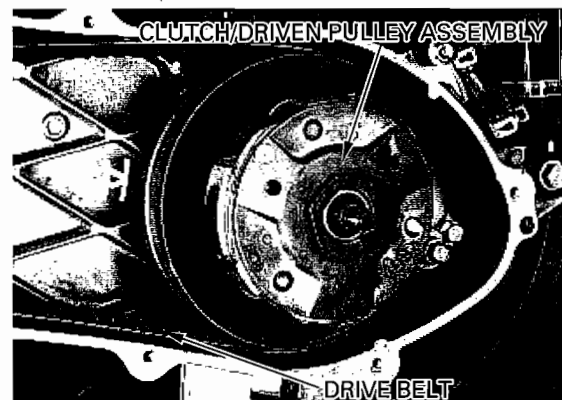


INSTALLATION

Install the drive belt into the driven pulley.

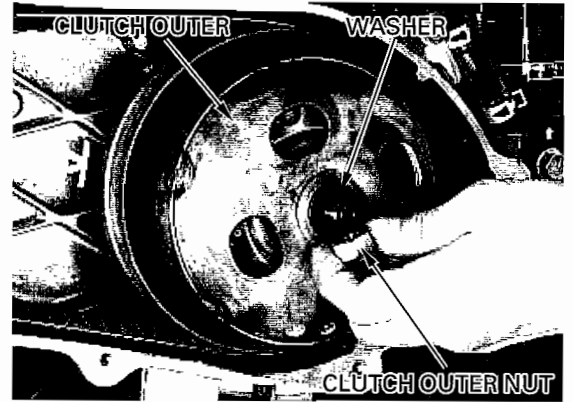
Do not get grease on the driven face.

Install the clutch/driven pulley assembly onto the driveshaft.



DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

Install the clutch outer, washer and clutch outer nut.



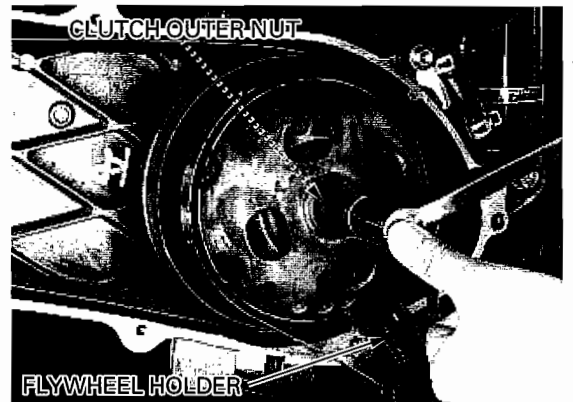
Hold the clutch outer with the special tool and tighten the clutch outer nut to the specified torque.

TOOL:

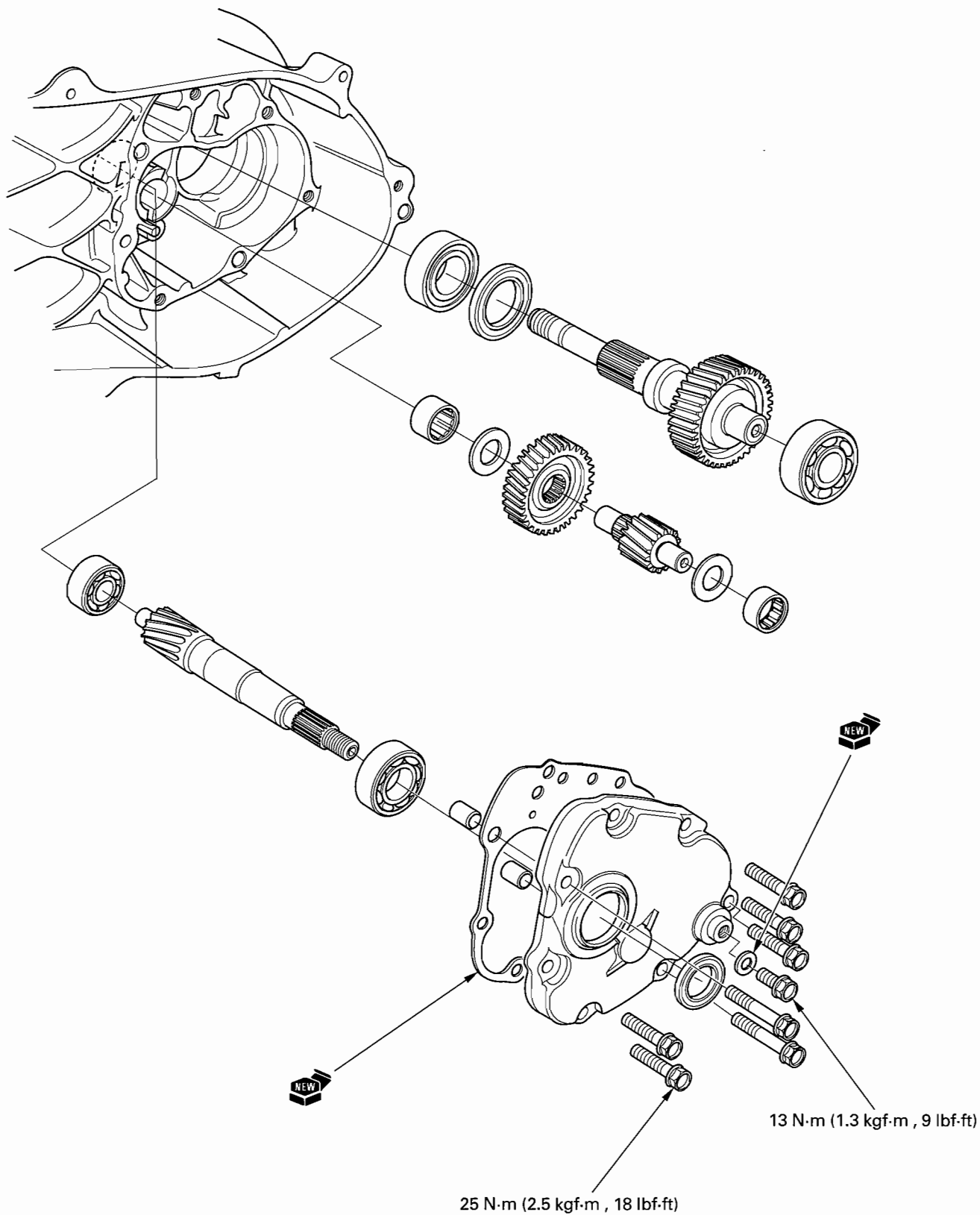
Flywheel holder 07725-0040000

TORQUE: 74 N·m (7.5 kgf·m , 54 lbf·ft)

Install the drive pulley (page 10-8).



FINAL REDUCTION



11. FINAL REDUCTION

SERVICE INFORMATION	11-1	FINAL REDUCTION INSPECTION	11-4
TROUBLESHOOTING	11-2	BEARING REPLACEMENT	11-5
FINAL REDUCTION DISASSEMBLY	11-3	FINAL REDUCTION ASSEMBLY	11-8

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.
- Refer to page 3-12 for final drive oil inspection and change.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Final reduction oil capacity	At draining	0.16 ℓ (0.17 US qt , 0.14 Imp qt)
	At disassembly	0.20 ℓ (0.21 US qt , 0.18 Imp qt)
Recommended final reduction oil		Hypoid gear oil # 90

11

TORQUE VALUES

Final drive oil drain bolt	13 N·m (1.3 kgf·m , 9 lbf·ft)
Final drive oil level check bolt	13 N·m (1.3 kgf·m , 9 lbf·ft)
Final drive oil filler bolt	13 N·m (1.3 kgf·m , 9 lbf·ft)
Transmission cover bolt	25 N·m (2.5 kgf·m , 18 lbf·ft)

TOOLS

Universal bearing puller	07631-0010000	or equivalent commercially available in U. S. A.
Remover weight	07741-0010201	
Attachment, 42 × 47 mm	07746-0010300	
Attachment, 52 × 55 mm	07746-0010400	
Attachment, 22 × 24 mm	07746-0010800	
Pilot, 15 mm	07746-0040300	
Pilot, 20 mm	07746-0040500	
Pilot, 25 mm	07746-0040600	
Pilot, 14 mm	07746-0041200	
Driver	07749-0010000	
Bearing remover handle	07936-3710100	
Bearing remover head	07936-3710600	
Remover shaft	07936-KC10100	
Bearing remover head, 15 mm	07936-KC10200	
Crank assembly shaft	07965-VM00200	
Bearing remover set, 14 mm	07WMC-KFG0100	
Assembly collar	07YMF-KPB0100	
Bearing remover	07936-KC10500	(U. S. A. only)
Remover weight	07936-371020A	or 07936-3710200 (U. S. A. only)
Bearing remover shaft, 14 mm	07YMC-001010A	(U. S. A. only)

TROUBLESHOOTING

Engine starts but scooter won't move

- Damaged transmission
- Seized transmission
- Faulty drive and driven pulleys/clutch (section 10)

Abnormal noise

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

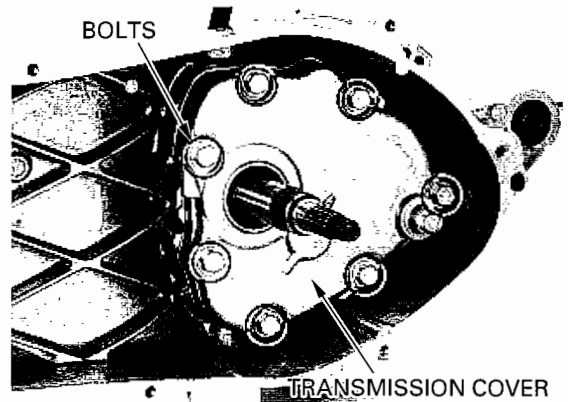
Oil leak

- Oil level too high
- Worn or damaged oil seal
- Cracked crankcase

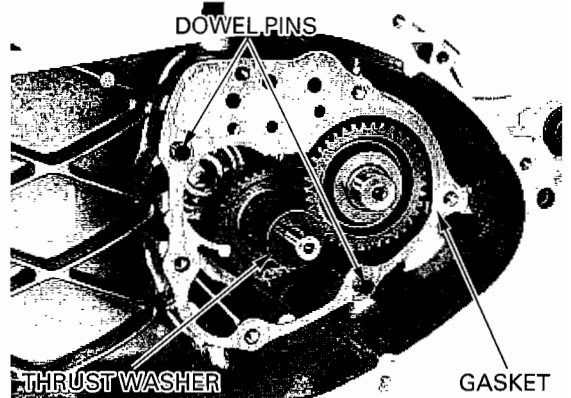
FINAL REDUCTION DISASSEMBLY

TRANSMISSION DISASSEMBLY

- Drain the final drive oil (page 3-12).
- Remove the clutch/driven pulley assembly (page 10-9).
- Remove the rear wheel (page 15-3).
- Remove the bolts and transmission cover.



- Remove the thrust washer, dowel pins and gasket.

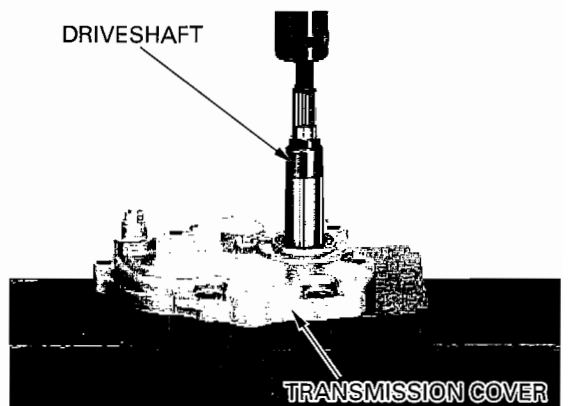


- Remove the final gear shaft, countershaft and thrust washer.



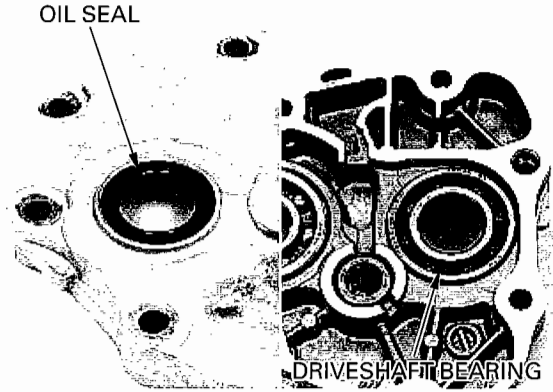
DRIVE SHAFT REMOVAL

- Be careful not to damage the transmission cover mating surface.*
- Press the driveshaft out of the transmission cover.
- Check the drive shaft for wear or damage.



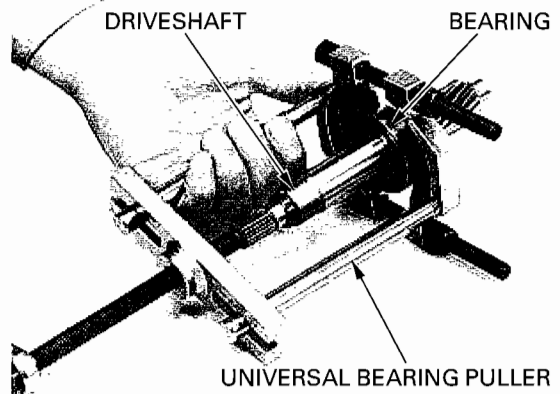
FINAL REDUCTION

Remove the driveshaft oil seal and bearing from the transmission cover.



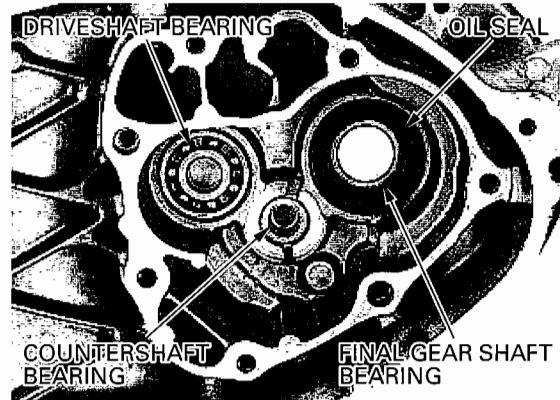
If the bearing is left on the driveshaft, remove it with the special tool.

TOOL:
Universal bearing puller 07631-0010000 or equivalent commercially available in U. S. A.

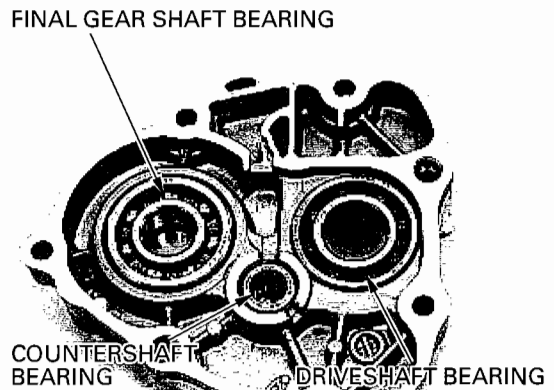


FINAL REDUCTION INSPECTION

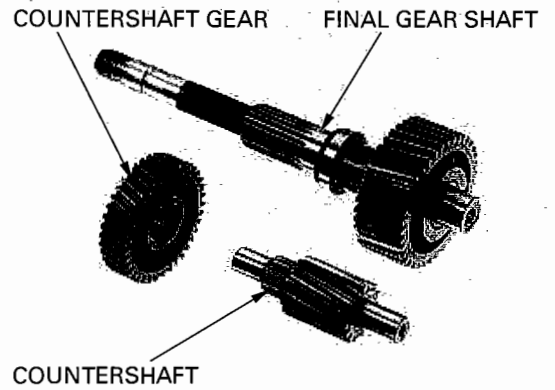
Check the oil seal and bearings in the left crankcase for wear or damage.



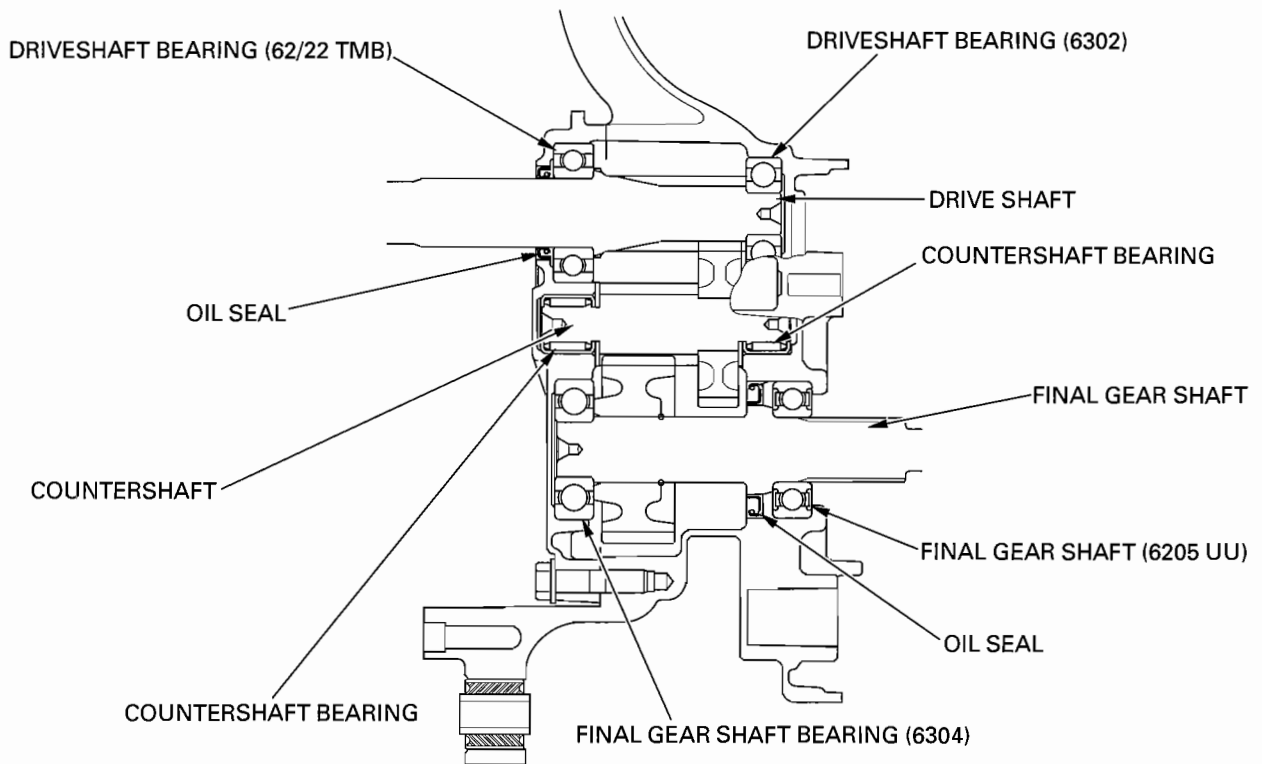
Check the bearings in the transmission cover for wear or damage.



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



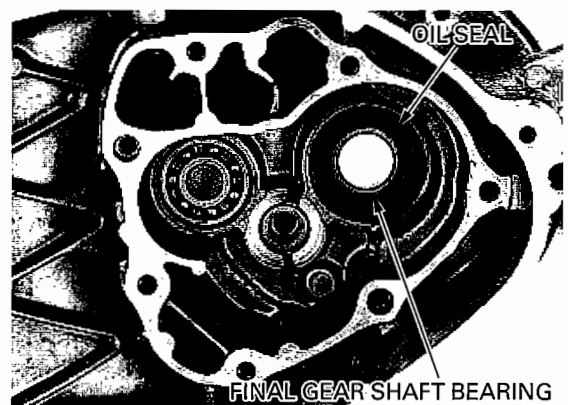
BEARING REPLACEMENT



LEFT CRANKCASE

Be careful not to damage the left crankcase mating surface.

Remove the final gear shaft oil seal and bearing.

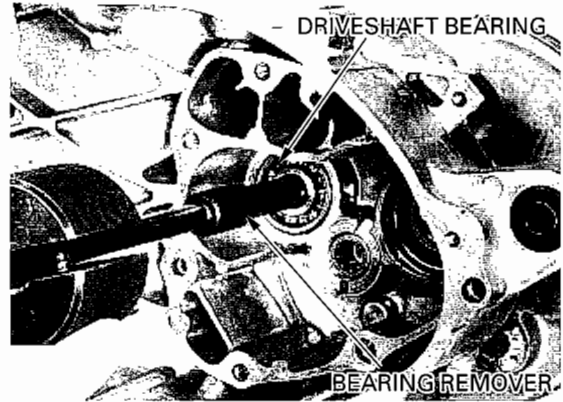


FINAL REDUCTION

Remove the driveshaft bearing using the special tools.

TOOLS:

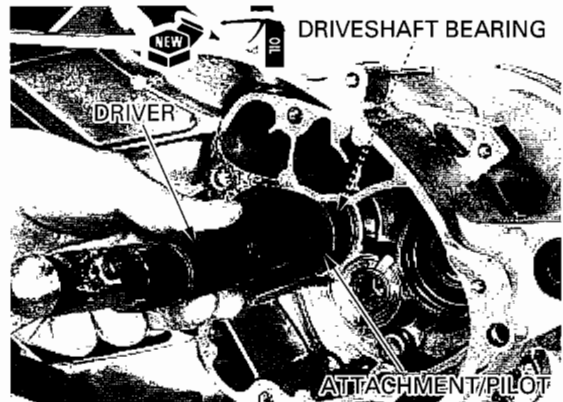
Remover shaft	07936-KC10100
Bearing remover head, 15 mm	07936-KC10200
Remover weight	07741-0010201
Bearing remover	07936-KC10500 (U. S. A. only)
Remover weight	07936-371020A or 07936-3710200 (U. S. A. only)



Apply engine oil to new bearings cavities.
Drive new bearings into the left crankcase.

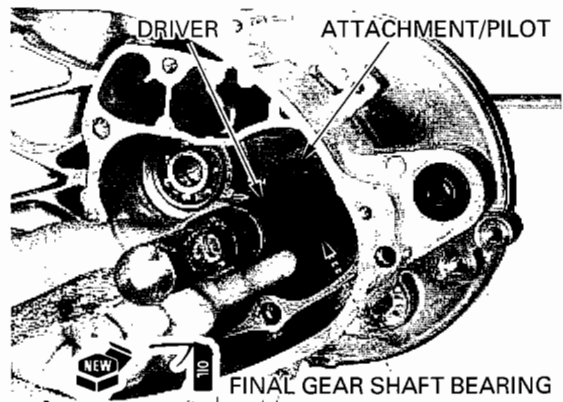
TOOLS:

Driveshaft bearing:	
Driver	07749-0010000
Attachment, 42 × 47 mm	07746-0010300
Pilot, 15 mm	07746-0040300

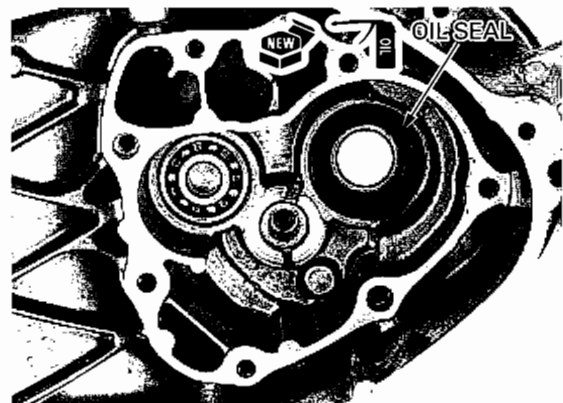


Final gear shaft bearing:

Driver	07749-0010000
Attachment, 52 × 55 mm	07746-0010400
Pilot, 25 mm	07746-0040600



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



TRANSMISSION COVER

Be careful not to damage the transmission cover mating surface.

Remove the final gear shaft bearing using the special tools.

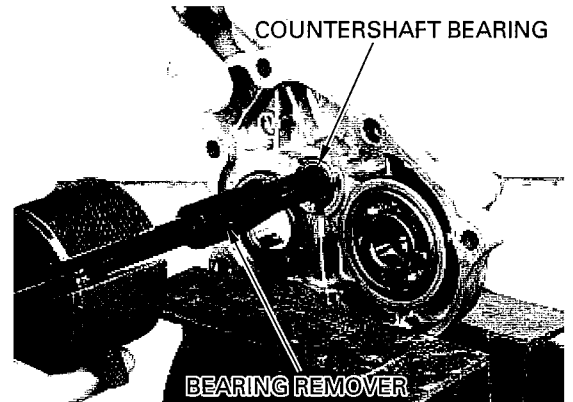
- TOOLS:**
Remover handle 07936-3710100
Bearing remover head 07936-3710600
Remover weight 07741-0010201



Remove the countershaft bearing using the special tools.

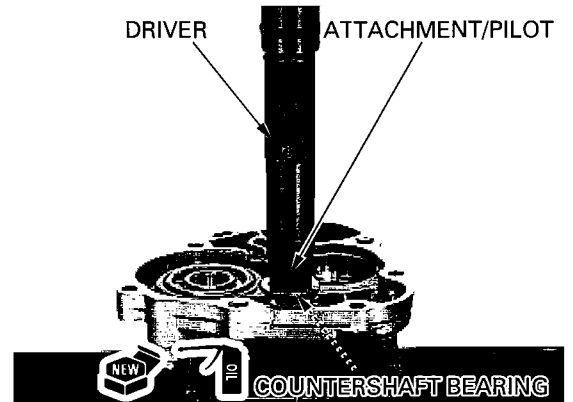
- TOOLS:**
Bearing remover set, 14 mm 07WMC-KFG0100
Bearing remover handle 07936-3710100
Remover weight 07741-0010201

- ALTERNATIVE TOOLS (U. S. A. only):**
Bearing remover shaft, 14 mm 07YMC-001010A
Bearing remover collet, 15 mm 07936-KC10200
Remover weight 07936-371020A or 07936-3710200



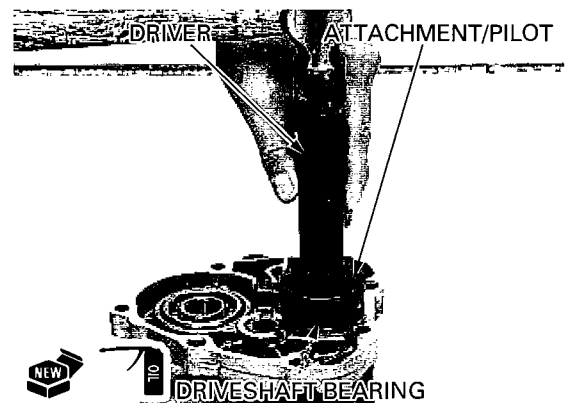
Apply engine oil to the needle rollers of a new countershaft bearing.
 Press the countershaft bearing into the transmission cover using the special tools.

- TOOLS:**
Driver 07749-0010000
Attachment, 22 × 24 mm 07746-0010800
Pilot, 14 mm 07746-0041200



Apply engine oil to new bearing cavities.
 Drive a new driveshaft bearing into the transmission cover using the special tools.

- TOOLS:**
Driver 07749-0010000
Attachment, 52 × 55 mm 07746-0010400
Pilot, 25 mm 07746-0040600

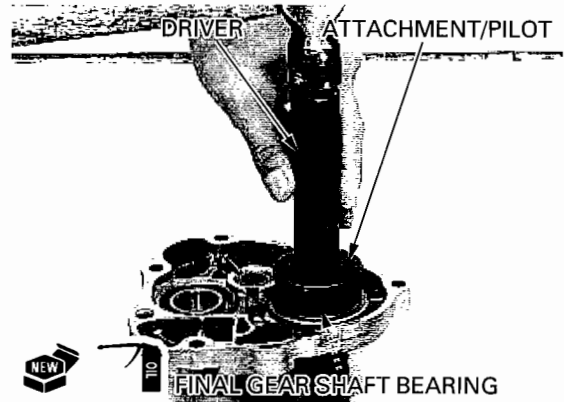


FINAL REDUCTION

Apply engine oil to new bearing cavities.
Drive a new final gear shaft bearing into the transmission cover using the special tools.

TOOLS:

Driver	07749-0010000
Attachment, 52 × 55 mm	07746-0010400
Pilot, 20 mm	07746-0040500



FINAL REDUCTION ASSEMBLY

DRIVESHAFT INSTALLATION

Install the driveshaft into the transmission 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:

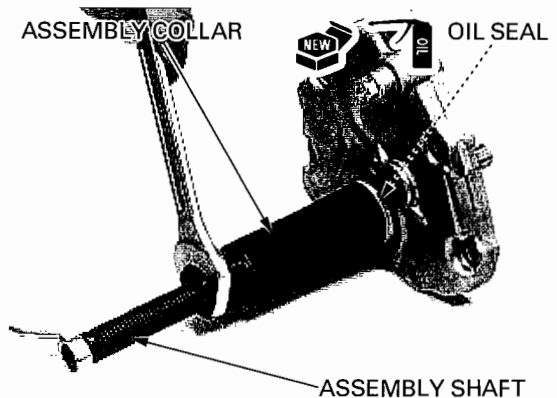
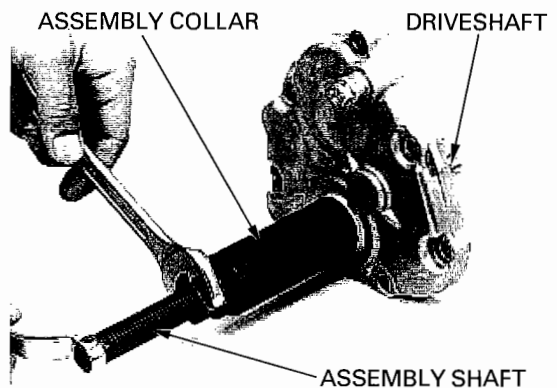
Assembly shaft	07965-VM00200
Assembly collar	07YMF-KPB0100

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

Install the driveshaft oil seal until it is flush with the transmission cover surface, using the special tools.

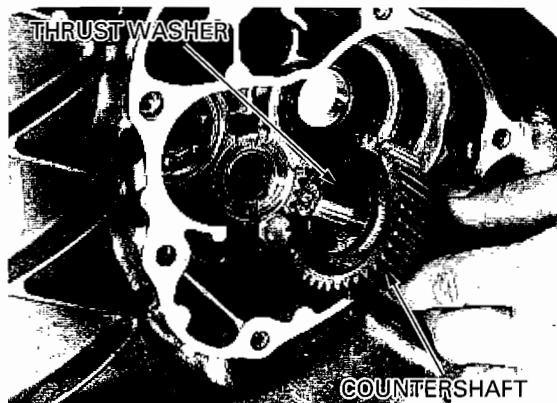
TOOLS:

Assembly shaft	07965-VM00200
Assembly collar	07YMF-KPB0100

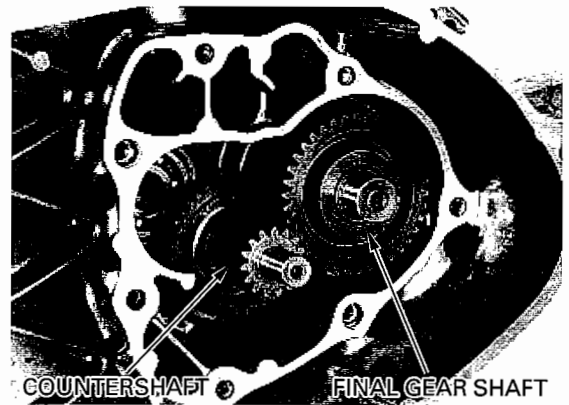


TRANSMISSION ASSEMBLY

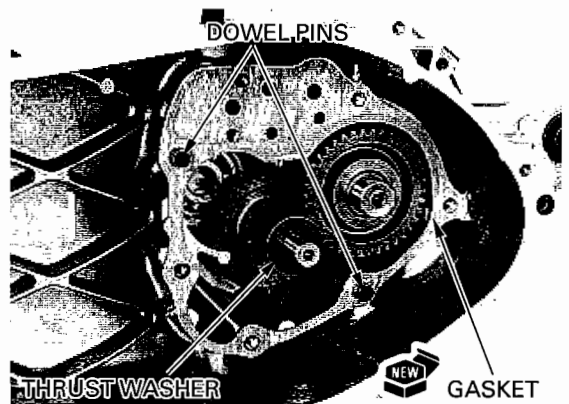
Install the thrust washer on the left crankcase side of the countershaft.



Install the countershaft and final gear shaft into the left crankcase.



Install the dowel pins and new gasket.
Install the thrust washer onto the countershaft.



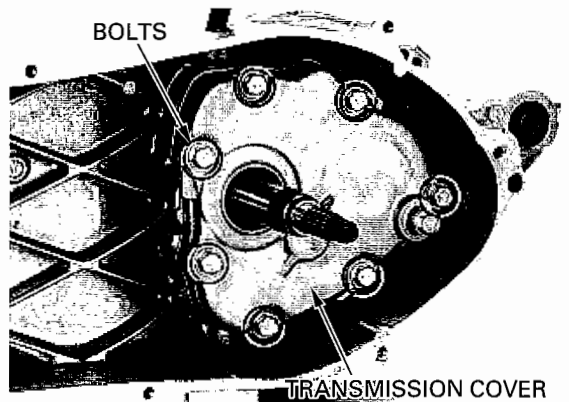
Install the transmission cover and tighten the bolts
in a crisscross pattern in two or three steps.

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

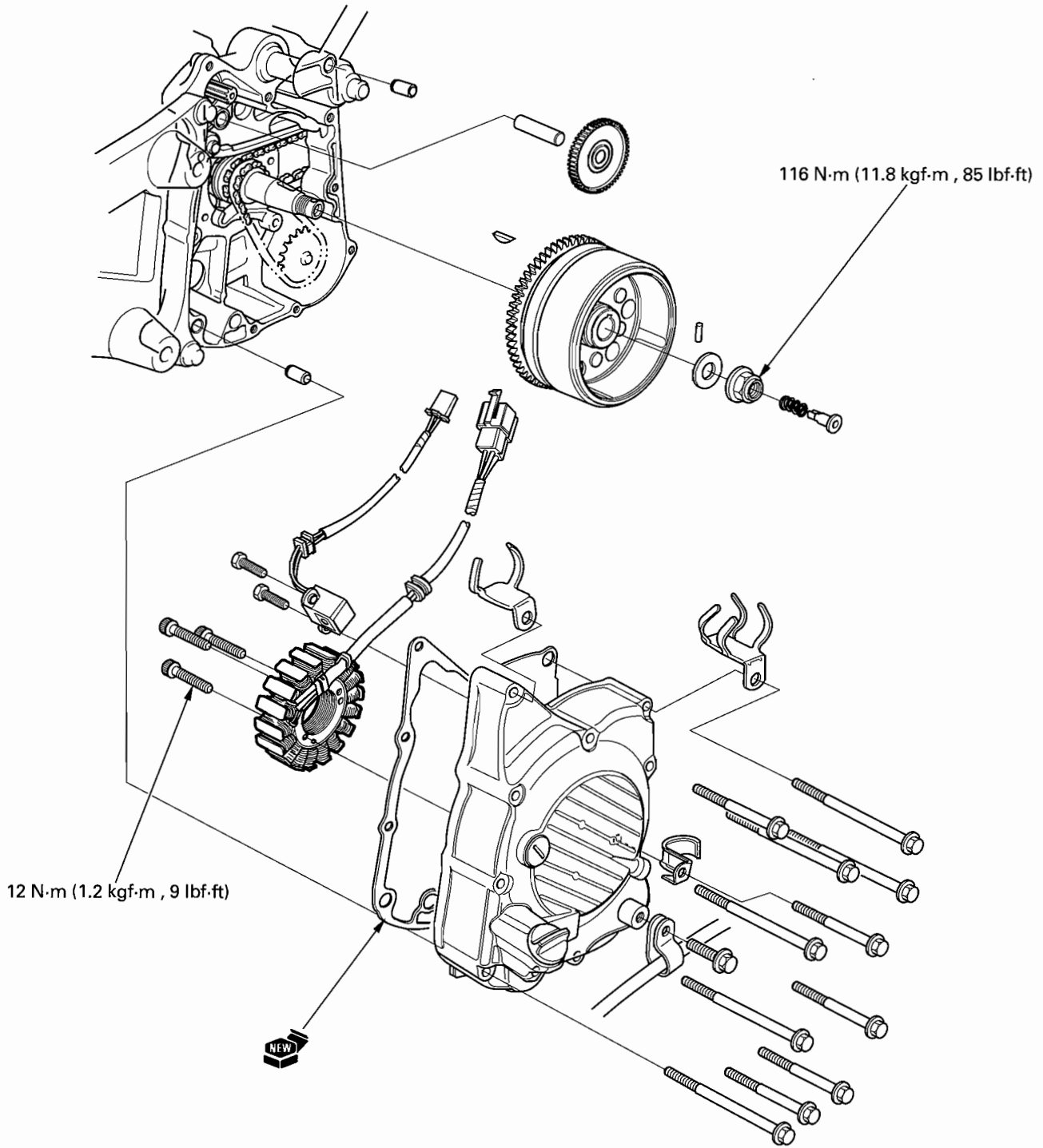
Fill the transmission case with the recommended
oil (page 3-12).

Install the clutch/driven pulley assembly
(page 10-16).

Install the rear wheel (page 15-6).



ALTERNATOR/STARTER CLUTCH



12. ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION	12-1	ALTERNATOR STATOR	12-2
TROUBLESHOOTING	12-1	FLYWHEEL/STARTER CLUTCH	12-4

SERVICE INFORMATION

GENERAL

- This section covers maintenance of the starter reduction gear, alternator, ignition pulse generator, flywheel and starter clutch.
- These services can be done with the engine installed in the frame.
- Refer to section 17 for alternator inspection, and to Section 18 for ignition pulse generator inspection.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Starter driven gear	Boss O.D.	42.195 – 42.208 (1.6612 – 1.6617)	42.15 (1.659)
	Bushing I.D.	22.026 – 22.045 (0.8672 – 0.8679)	22.10 (0.870)
Starter clutch outer I.D.		58.64 – 58.84 (2.309 – 2.317)	58.89 (2.318)

TORQUE VALUES

Starter clutch outer bolt	29 N·m (3.0 kgf·m , 22 lbf·ft)	Apply a locking agent to the threads. Apply oil to the threads and flange surface.
Flywheel nut	116 N·m (11.8 kgf·m , 85 lbf·ft)	
Stator mount bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)	

TOOLS

Flywheel holder	07725-0040000
Flywheel puller	07KMC-HE00100

TROUBLESHOOTING

Starter motor turns, but engine does not turn

- Faulty starter clutch
- Damaged starter reduction gear

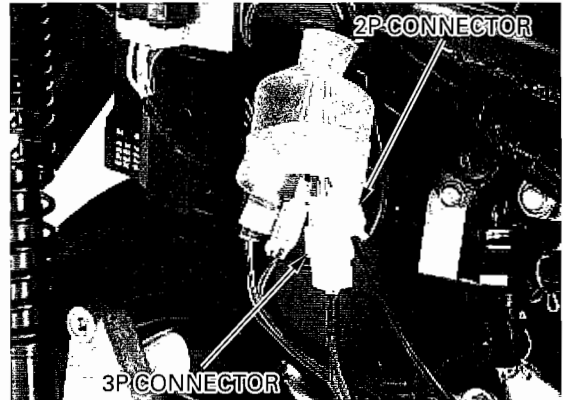
ALTERNATOR/STARTER CLUTCH

ALTERNATOR STATOR

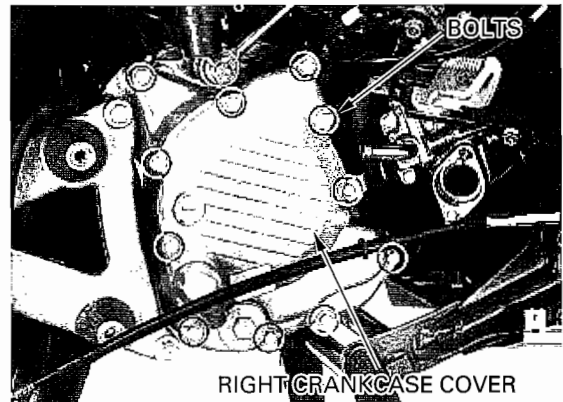
RIGHT CRANKCASE COVER REMOVAL

Drain the engine oil (page 3-9).
Remove the muffler (page 2-13).

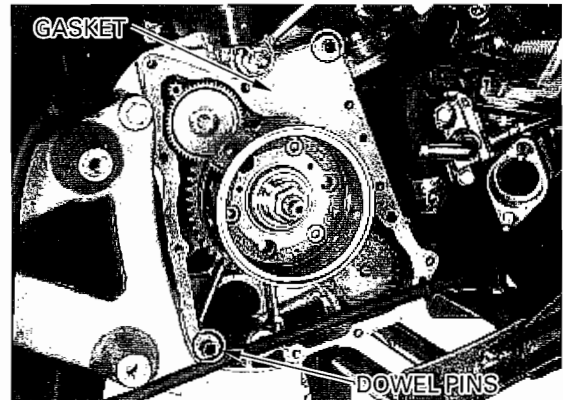
Disconnect the alternator 3P connector and ignition pulse generator 2P connector, and free the wires from the clamps.



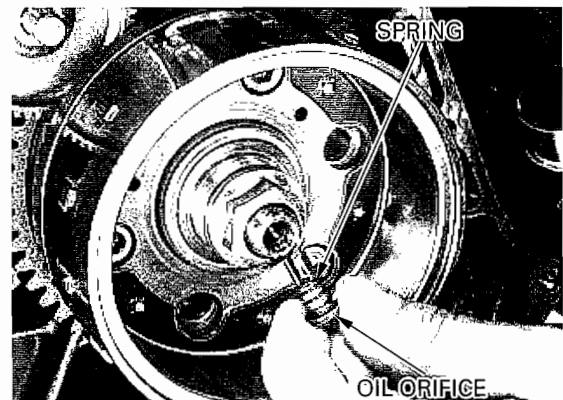
Loosen the bolts in two or three steps in a crisscross pattern. Remove the bolts, clamps and right crankcase cover.



Remove the dowel pins and gasket.



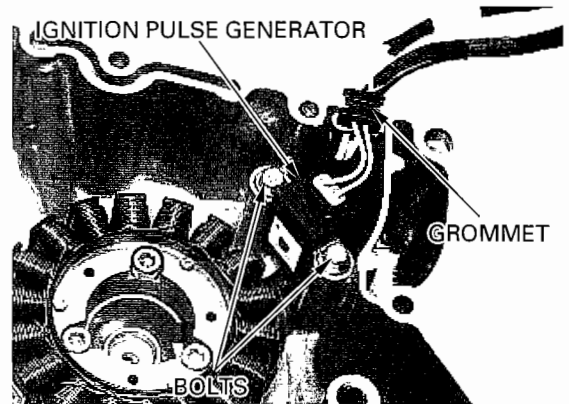
Remove the oil orifice and spring.



STATOR/IGNITION PULSE GENERATOR REMOVAL/INSTALLATION

REMOVAL

Remove the bolts, grommet and ignition pulse generator from the right crankcase cover.



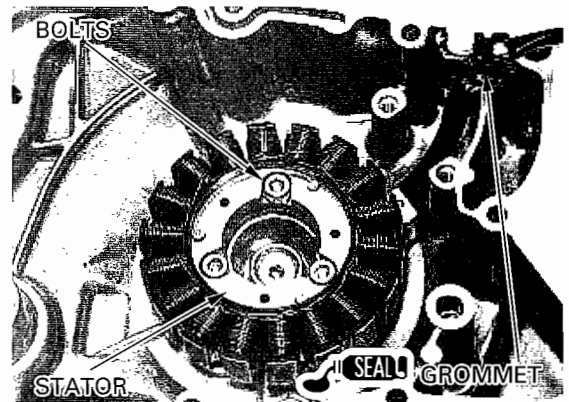
Remove the stator mount bolts, grommet and the stator from the right crankcase cover.

INSTALLATION

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

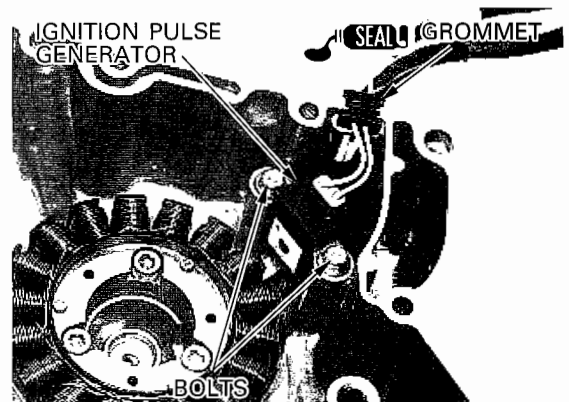
TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

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



Install the ignition pulse generator and tighten the bolts securely.

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

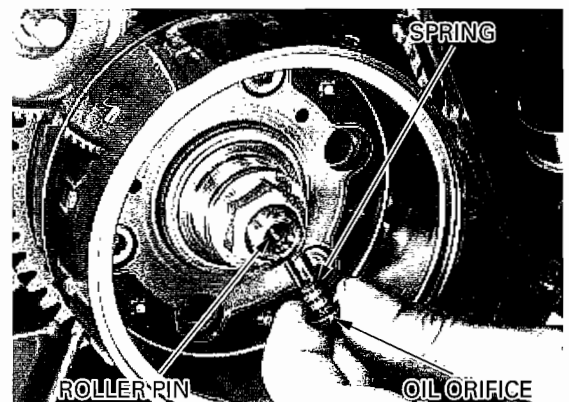


RIGHT CRANKCASE COVER INSTALLATION

Be careful not to damage the right crankcase and cover mating surfaces.

Clean the mating surfaces of the right crankcase and cover.

Install the oil orifice and spring, aligning the groove in the orifice with the roller pin in the crankshaft.

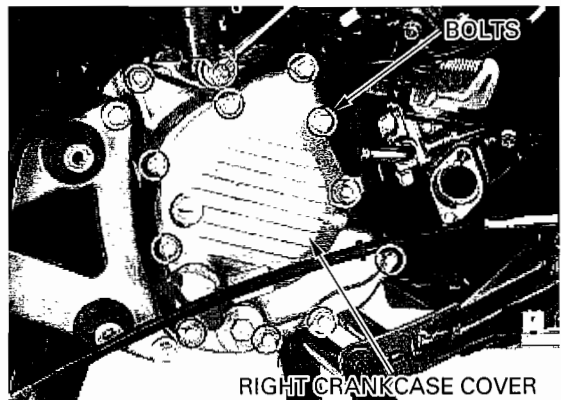


ALTERNATOR/STARTER CLUTCH

Apply oil to the oil orifice end.
Install the dowel pins and a new gasket.



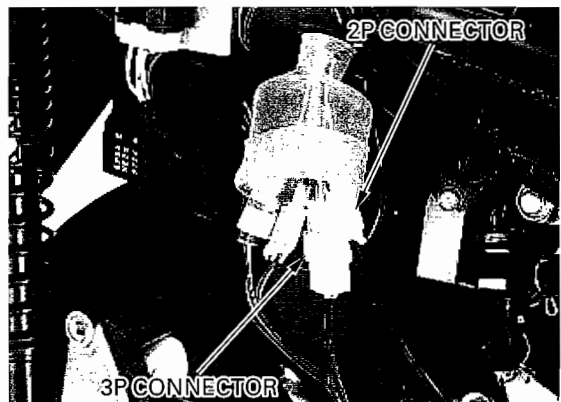
Install the right crankcase cover, clamps and bolts.
Install and tighten the bolts in a crisscross pattern
in two or three steps.



Route and clamp the alternator and ignition pulse
generator wires properly (page 1-18).

Connect the alternator 3P connector and ignition
pulse generator 2P connector.

Install the muffler (page 2-13).
Fill the crankcase with the recommended engine oil
(page 3-10).

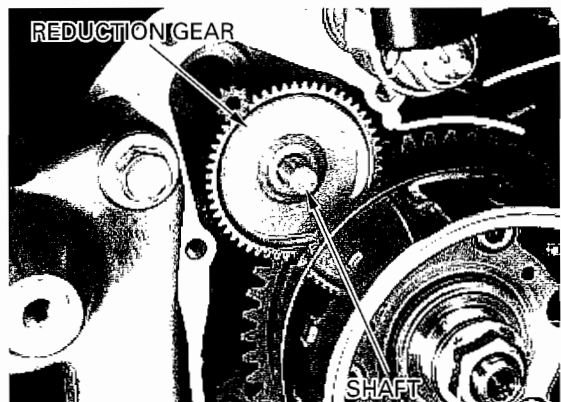


FLYWHEEL/STARTER CLUTCH

REMOVAL

Remove the right crankcase cover (page 12-2).

Pull the reduction gear shaft out and remove the
reduction gear.

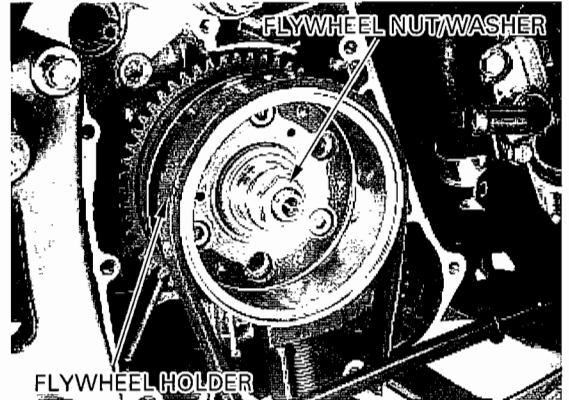


ALTERNATOR/STARTER CLUTCH

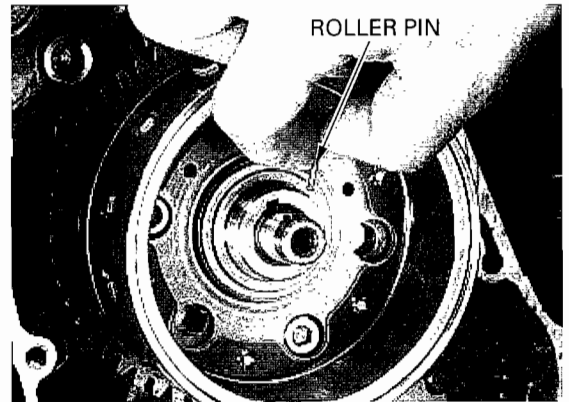
Hold the flywheel with the special tool and loosen the flywheel nut.

TOOL:
Flywheel holder 07725-0040000
or equivalent
commercially
available in U.S.A.

Remove the flywheel nut and washer.

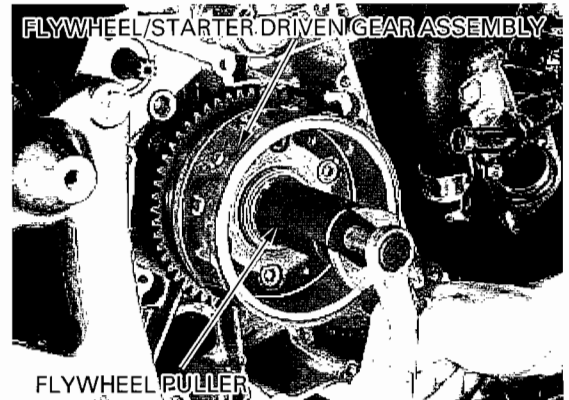


Remove the roller pin.

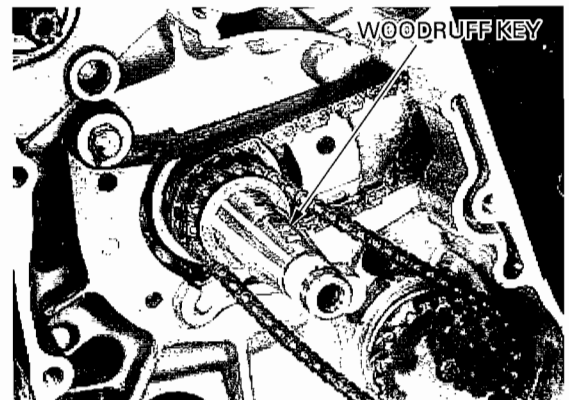


Remove the flywheel/starter driven gear assembly using the special tool.

TOOL:
Flywheel puller 07KMC-HE00100



Remove the woodruff key from the crankshaft.



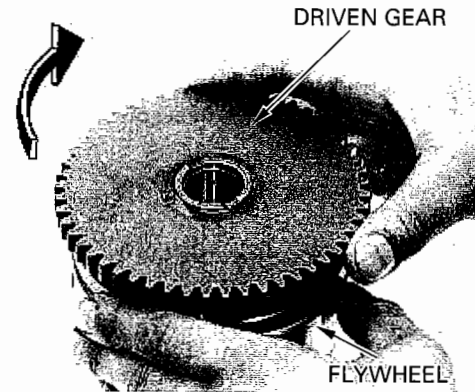
ALTERNATOR/STARTER CLUTCH

DISASSEMBLY

Check the operation of the sprag clutch by turning the driven gear.

You should be able to turn the driven gear clockwise smoothly, but the gear should not turn counterclockwise.

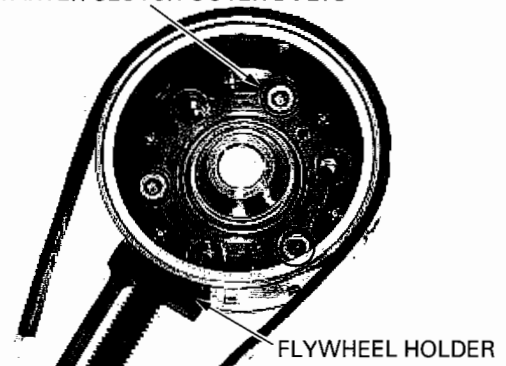
Remove the starter driven gear by turning the driven gear.



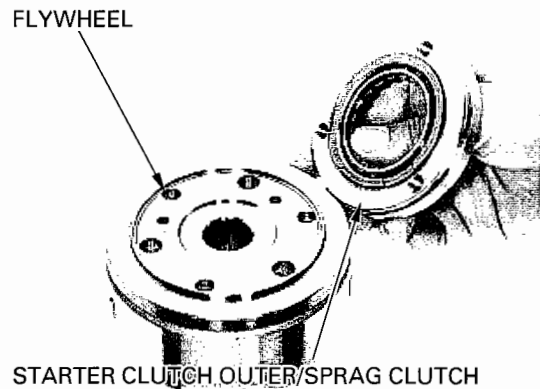
Hold the flywheel with the special tool and remove the starter clutch outer bolts.

TOOL:
Flywheel holder 07725-0040000

STARTER CLUTCH OUTER BOLTS



Remove the starter clutch outer and sprag clutch from the flywheel.



INSPECTION

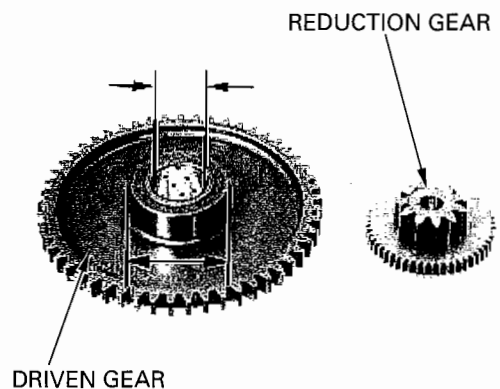
Check the starter driven gear and reduction gear teeth for wear or damage.

Measure the starter driven gear boss O.D..

SERVICE LIMIT: 42.15 mm (1.659 in)

Measure the starter driven gear bushing I.D..

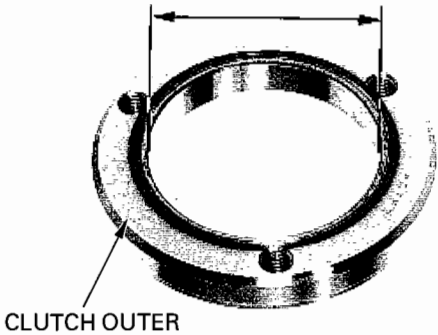
SERVICE LIMIT: 22.10 mm (0.870 in)



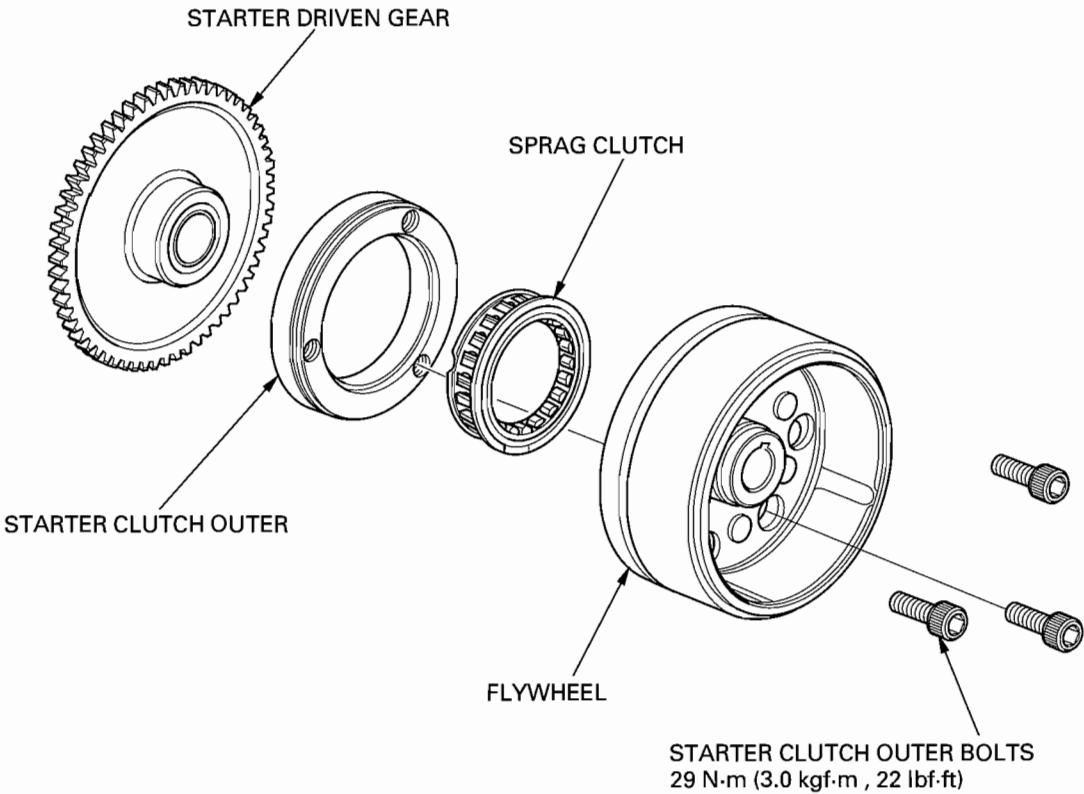
Check the starter clutch outer and sprag clutch for abnormal wear or damage.

Measure the starter clutch outer I.D..

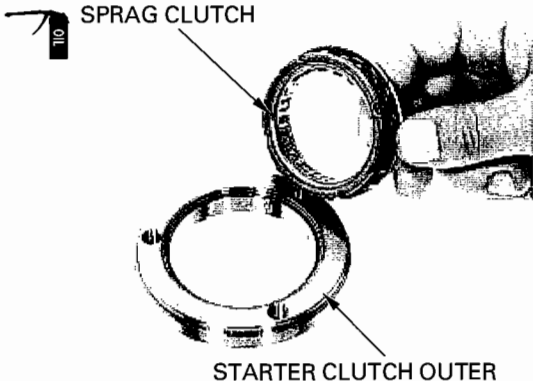
SERVICE LIMIT: 58.89 mm (2.318 in)



ASSEMBLY

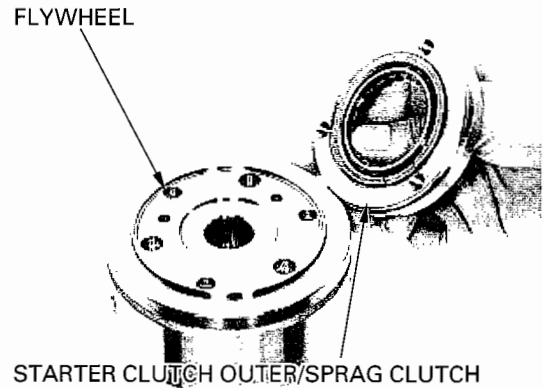


Apply oil to the sprag clutch outer surfaces.
Install the sprag clutch into the starter clutch outer as shown.



ALTERNATOR/STARTER CLUTCH

Install the starter clutch assembly onto the flywheel.



Align the bolt holes on the starter clutch outer and flywheel.

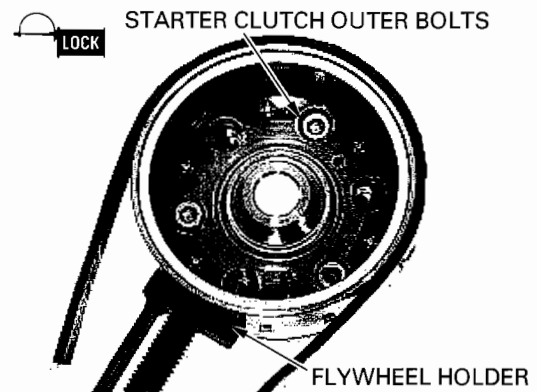
Apply locking agent to the starter clutch bolt threads and install them.

Hold the flywheel with the special tool and tighten the starter clutch outer bolts to the specified torque.

TOOL:

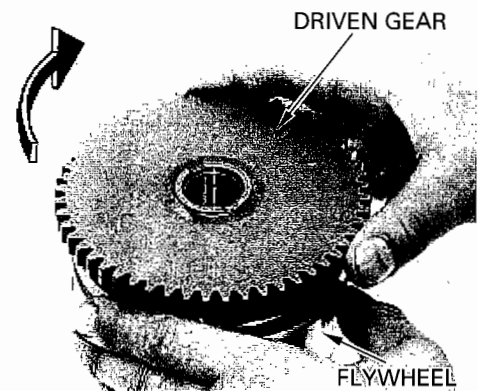
Flywheel holder 07725-0040000

TORQUE: 29 N·m (3.0 kgf·m , 22 lbf·ft)



Apply molybdenum oil solution to the starter driven gear bushing.

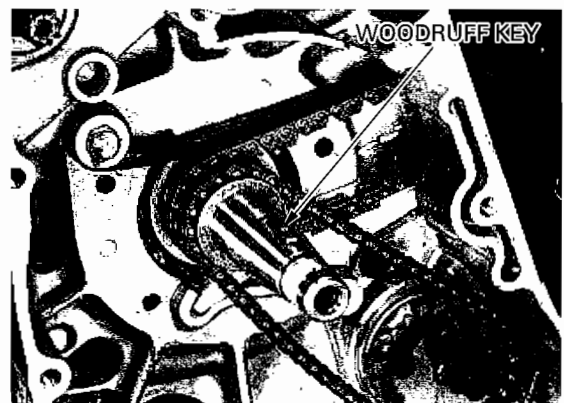
Install the starter driven gear by turning the driven gear clockwise.



INSTALLATION

Clean any oil from the tapered portion of the crankshaft.

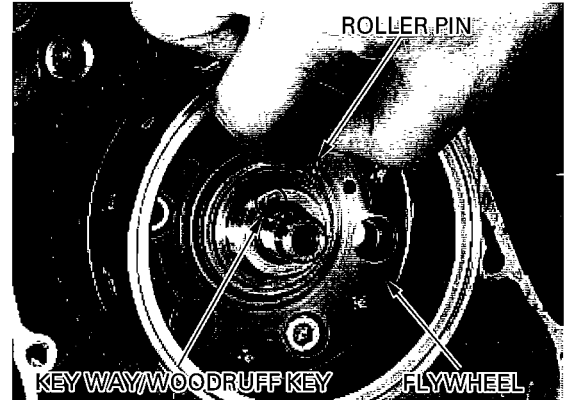
Install the woodruff key in the crankshaft key groove.



ALTERNATOR/STARTER CLUTCH

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 roller pin into the crankshaft.

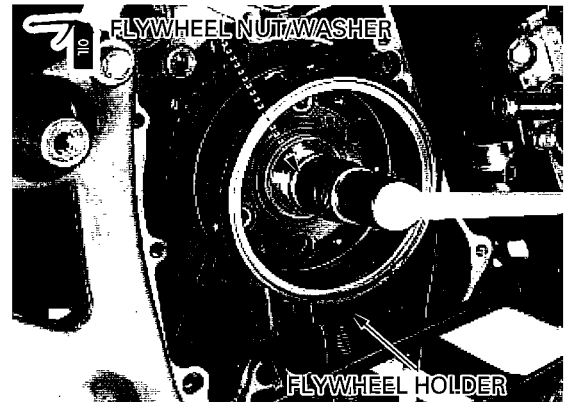


Apply oil to the washer and flywheel nut threads and seating surface.
Install the washer and flywheel nut to the crankshaft.

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

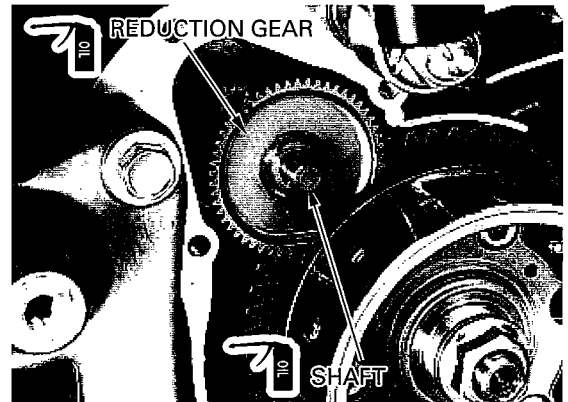
TOOL:
Flywheel holder 07725-0040000

TORQUE: 116 N-m (11.8 kgf-m , 85 lbf-ft)

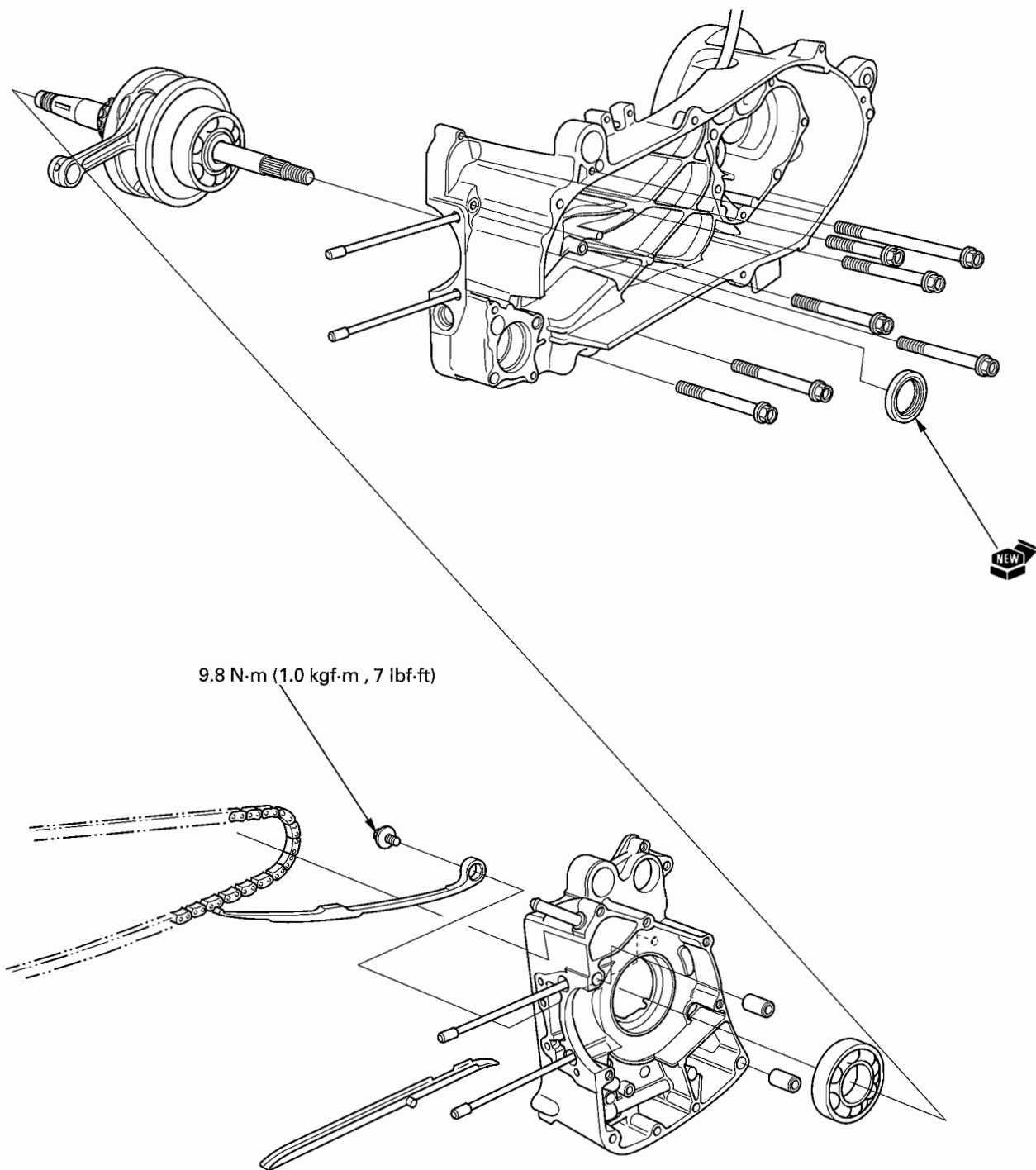


Apply oil to the reduction gear and shaft.
Set the reduction gear properly and insert the shaft.

Install the right crankcase cover (page 12-3).



CRANKSHAFT/CRANKCASE



13. CRANKSHAFT/CRANKCASE

SERVICE INFORMATION	13-1	CRANKSHAFT INSPECTION	13-3
TROUBLESHOOTING	13-1	CRANKCASE ASSEMBLY	13-4
CRANKCASE SEPARATION	13-2		

SERVICE INFORMATION

GENERAL

- This section covers the crankcase separation to service the crankshaft.
- The following components must be removed before separating the crankcase.
 - Oil pump (section 4)
 - Water pump (section 6)
 - Engine (section 7)
 - Cylinder head (section 8)
 - Cylinder, piston (section 9)
 - Drive pulley/clutch/driven pulley (section 10)
 - Flywheel, starter clutch (section 12)
 - Starter motor (section 19)
- In addition to parts listed above, remove the following parts when the left crankcase half must be replaced:
 - Final reduction (section 11)
- Be careful not to damage the crankcase mating surfaces when separating and assembling the crankcase halves.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance	0.05 – 0.40 (0.002 – 0.016)	0.60 (0.024)
	Connecting rod radial clearance	0 – 0.008 (0.0 – 0.0003)	0.05 (0.002)
	Runout	_____	0.10 (0.004)

13

TORQUE VALUE

Cam chain tensioner slider bolt 9.8 N·m (1.0 kgf·m , 7 lbf·ft)

TOOLS

Bearing installer, 29.31 mm	07YMF-KFG0100
Plate	07XMF-KGB0300
Assembly collar	07965-VM00100
Assembly shaft	07965-VM00200 or 07931-ME4010B and 07931-HB3020A (U. S. A. only)
Attachment, 30 mm	07746-0030300
Thread adapter	07YMF-KFG0300
Case puller	07SMC-0010001
Universal bearing puller	07631-0010000 or 07736-A01000B or equivalent commercially available in U. S. A.

TROUBLESHOOTING

Abnormal engine noise

- Worn connecting rod small end
- Worn or damaged connecting rod big end bearing
- Worn or damaged crankshaft bearings

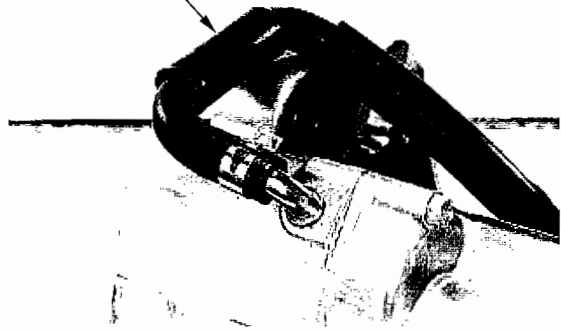
CRANKSHAFT/CRANKCASE

CRANKCASE SEPARATION

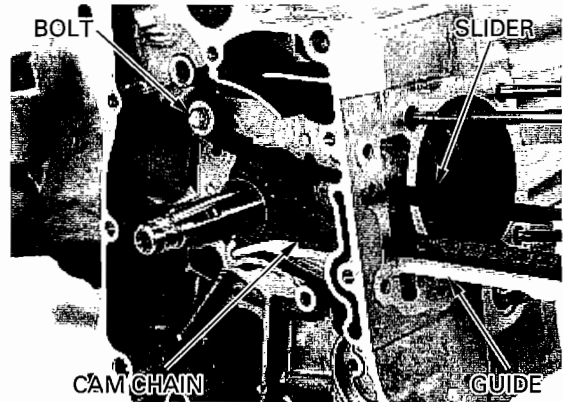
Remove the engine from the frame (section 7).
Remove the parts required for crankcase separation (page 13-1).

Disconnect the crankcase breather hose from the right crankcase.

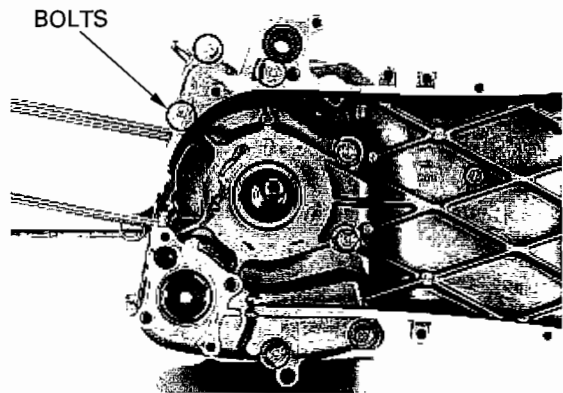
CRANKCASE BREATHER HOSE



Remove the cam chain guide, bolt and tensioner slider from the crankcase.
Remove the cam chain from the drive sprocket.



Remove the bolts.

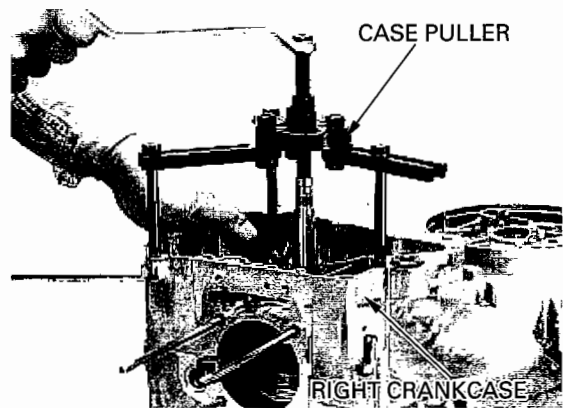


Be careful not to damage the crankcase mating surface.

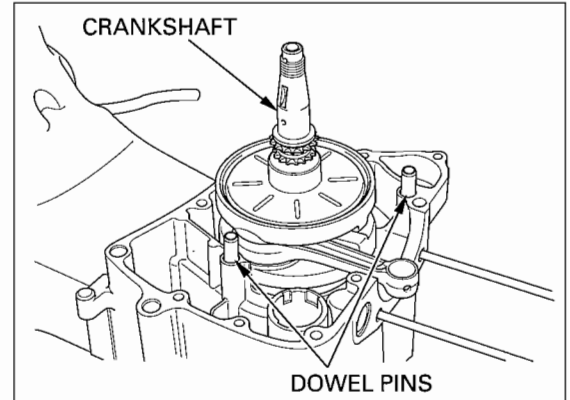
Place the crankcase assembly with the left side down and separate the right crankcase from the left crankcase using the special tool.

TOOL:
Case puller

07SMC-0010001
(Not available in U. S. A.)



Remove the dowel pins and crankshaft.



Remove the oil seal from the left crankcase.

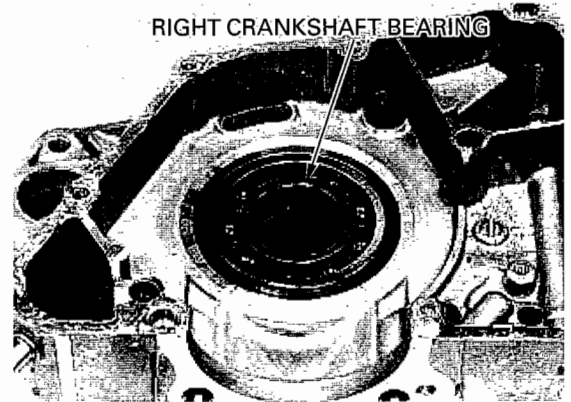


Remove the right crankshaft bearing from the right crankcase.

If the right crankshaft bearing is removed with the crankshaft, remove the bearing using the bearing puller and discard the bearing.

TOOL:
Universal bearing puller 07631-0010000 or equivalent commercially available in U.S.A.

If the left crankshaft bearing is abnormal, replace the crankshaft assembly.

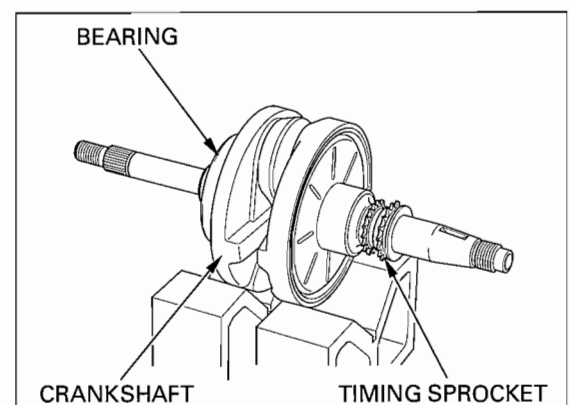


CRANKSHAFT INSPECTION

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.

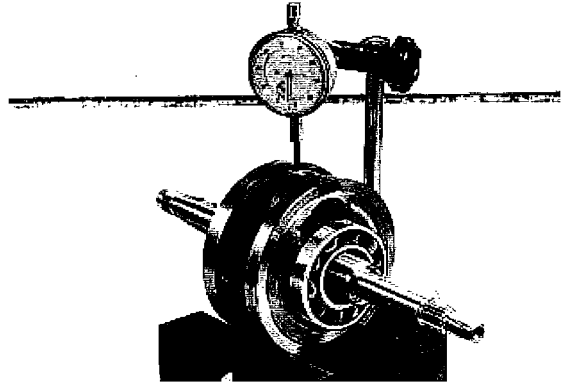
Check the timing sprocket teeth for wear or damage.



CRANKSHAFT/CRANKCASE

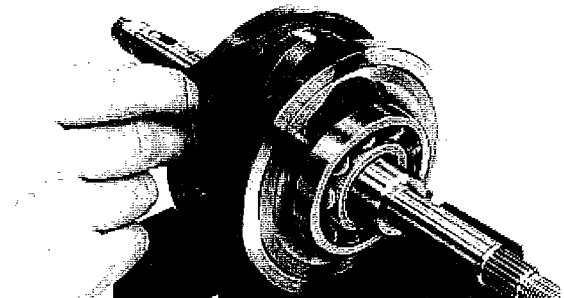
Measure the connecting rod big end radial clearance.

SERVICE LIMIT: 0.05 mm (0.002 in)



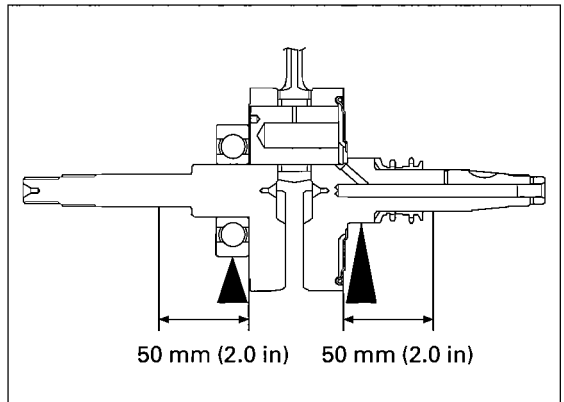
Measure the connecting rod big end side clearance with a feeler gauge.

SERVICE LIMIT: 0.60 mm (0.024 in)



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

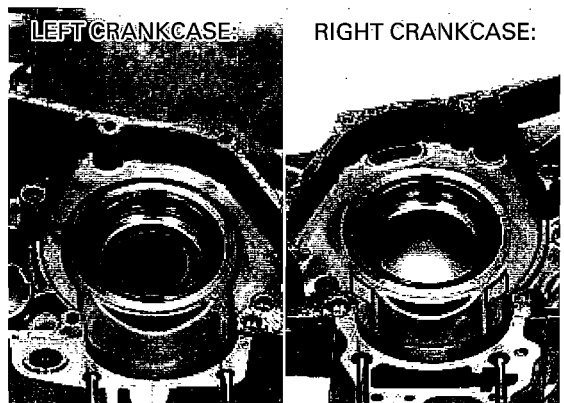
SERVICE LIMIT: 0.10 mm (0.004 in)



CRANKCASE ASSEMBLY

Be careful not to damage the crankcase mating surface.

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



Apply molybdenum grease to the right crankcase bearing install surfaces.
Install the right crankcase bearing into the right crankcase using the following special tools and hydraulic press.

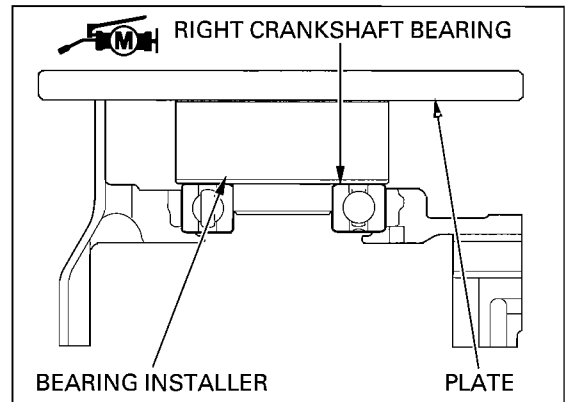
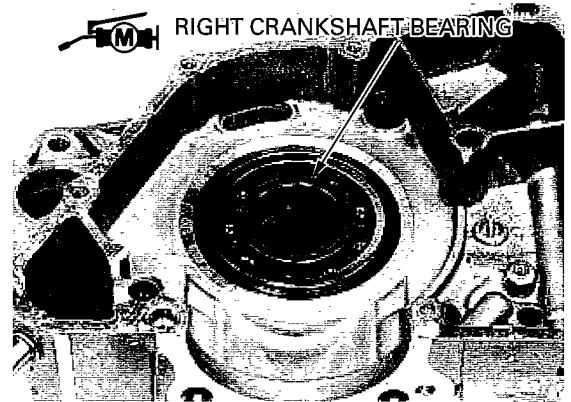
TOOLS:

Bearing installer, 29.31 mm 07YMF-KFG0100
Plate 07XMF-KGB0300

Measure the length between the bearing outer surface to the outer edge of the right crankcase mating surface.

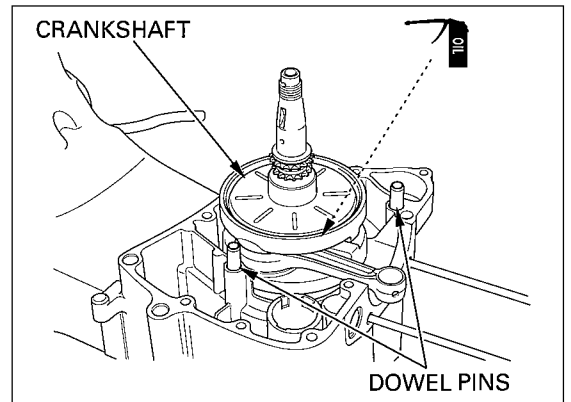
INSTALL LENGTH:

29.27 – 29.35 mm (1.152 – 1.156 in)



Apply 3 cc of engine oil to the connecting rod big end.
Apply 2 cc of engine oil to each crankshaft bearing.
Install the crankshaft into the left crankcase, noting the connecting rod position.

Install the dowel pins.

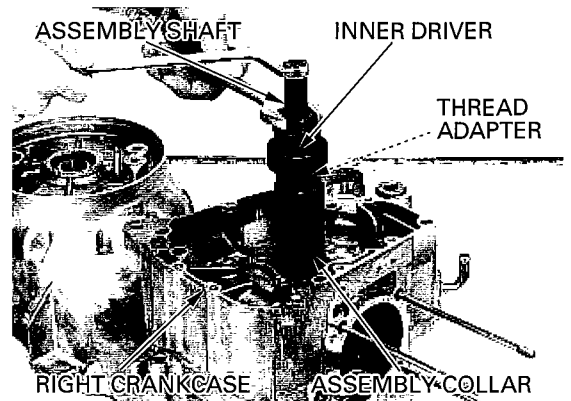


Apply sealant to the right crankcase mating surface.

Install the right crankcase over the left crankcase.
Assemble the right and left crankcase using the special tool.

TOOLS:

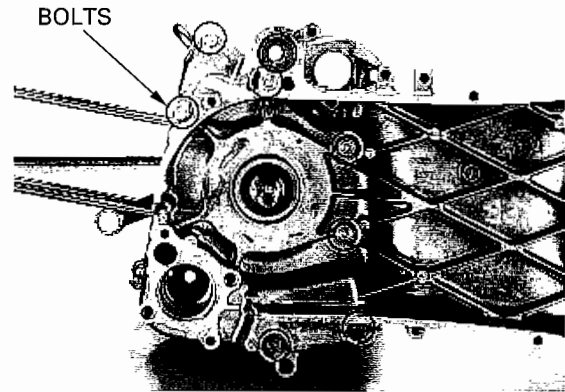
Assembly collar 07965-VM00100
Assembly shaft 07965-VM00200 or
07931-ME4010B and
07931-HB3020A
(U. S. A. only)
Attachment, 30 mm 07746-0030300
Thread adapter 07YMF-KFG0300 or
07JMF-KY7010A
(U. S. A. only)



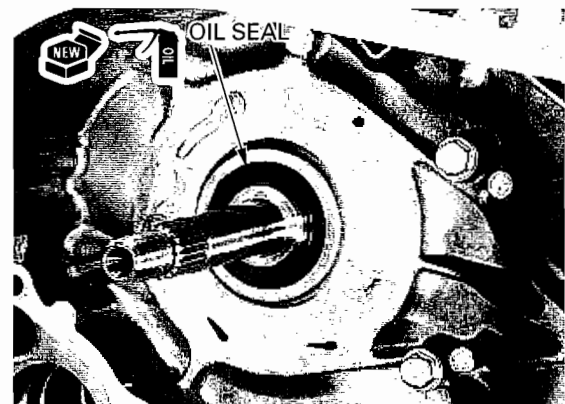
CRANKSHAFT/CRANKCASE

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

Make sure the crankshaft turns smoothly.



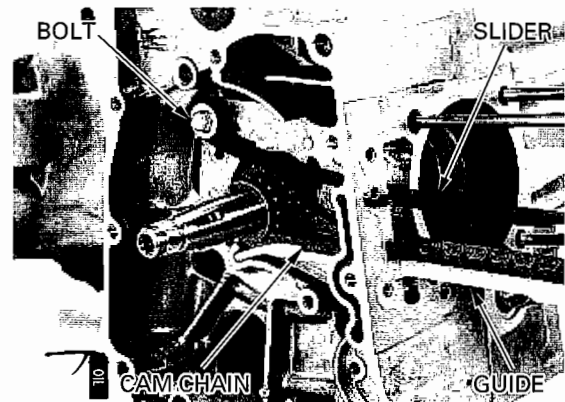
Apply oil to a new crankshaft oil seal lip and outer surface.
Install the crankshaft oil seal until it is flush with the crankcase surface.



Apply oil to the cam chain and install it on the drive sprocket of the crankshaft.
Install the cam chain guide into the crankcase, aligning the lug with the groove in the crankcase.

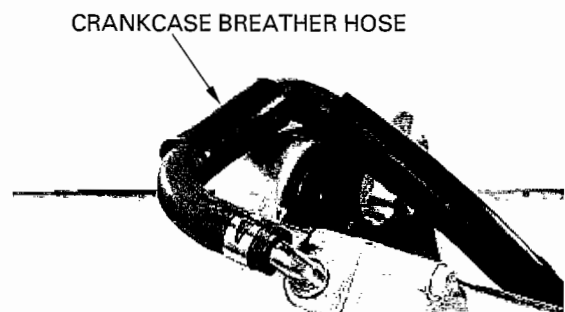
Install the cam chain tensioner slider and tighten the bolt to the specified torque.

TORQUE: 9.8 N·m (1.0 kgf·m , 7 lbf·ft)



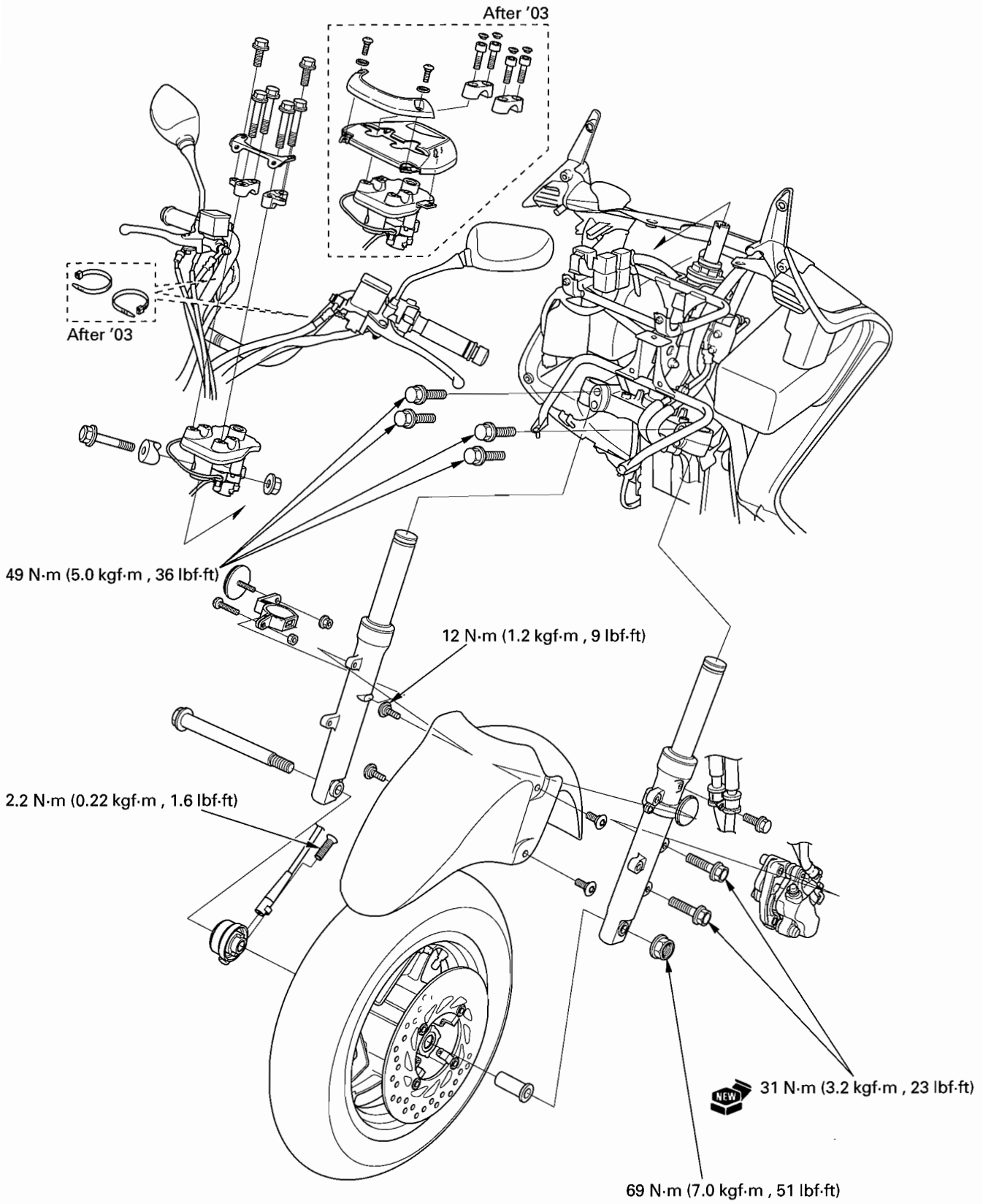
Connect the crankcase breather hose to the right crankcase.

Install the removed parts in the reverse order of removal.



MEMO

FRONT WHEEL/SUSPENSION/STEERING



14. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION	14-1	STEERING HANDLE	14-16
TROUBLESHOOTING	14-2	STEERING STEM	14-23
FRONT WHEEL	14-3	HANDLE COVER (NSS250S/AS ONLY)	14-28
FORK	14-8		

SERVICE INFORMATION

GENERAL

- A contaminated brake disc or pad reduces stopping power. Discard contaminated parts and clean a contaminated disc with a high quality brake degreasing agent.
- This section covers the front wheel, fork, handle, and steering.
- A jack or other support is required to support the vehicle.
- Do not twist or bend the brake hose and pipe when servicing.
- Use genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.
- Refer to section 16 for brake system information.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	1.5 (0.06)
Cold tire pressure	Rider only	175 kPa (1.75 kgf/cm ² , 25 psi)	—
	Rider and passenger	175 kPa (1.75 kgf/cm ² , 25 psi)	—
Axle runout		—	0.20 (0.008)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel balance weight		—	60 g (2.1 oz) max.
Fork	Spring free length	270.3 (10.64)	265 (10.4)
	Tube runout	—	0.20 (0.008)
	Recommended fork fluid	Pro Honda Suspension Fluid SS-8	—
	Fluid level	63 (2.5)	—
	Fluid capacity	121 cm ³ (4.1 US oz, 4.3 Imp oz)	—

14

TORQUE VALUES

Steering stem lock nut	74 N·m (7.5 kgf·m, 54 lbf·ft)	see page 14-26.
Steering bearing adjusting nut	2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)	
Front brake disc bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)	Alcock bolt: replace with a new one.
Speedometer cable set screw	2.2 N·m (0.22 kgf·m, 1.6 lbf·ft)	
Front axle nut	69 N·m (7.0 kgf·m, 51 lbf·ft)	
Fork socket bolt	20 N·m (2.0 kgf·m, 14 lbf·ft)	Apply a locking agent to the threads.
Fork pinch bolt	49 N·m (5.0 kgf·m, 36 lbf·ft)	
Front caliper mount bolt	31 N·m (3.2 kgf·m, 23 lbf·ft)	Alcock bolt: replace with a new one.
Front fender socket bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	

FRONT WHEEL/SUSPENSION/STEERING

TOOLS

Adjustable spanner	07702-0020001
Attachment, 32 × 35 mm	07746-0010100
Attachment, 24 × 26 mm	07746-0010700
Inner driver, 35 mm	07746-0030400
Pilot, 12 mm	07746-0040200
Pilot, 22 mm	07746-0041000
Pilot, 14 mm	07746-0041200
Bearing remover shaft	07746-0050100
Bearing remover head, 12 mm	07746-0050300
Slider weight	07747-0010100
Fork seal driver attachment	07747-0010501 or 07947-3330000 (U. S. A. only)
Driver	07749-0010000
Lock nut wrench, 32 mm	07916-KM1000
Ball race driver attachment	07945-3330300
Attachment, 28 × 30 mm	07946-1870100
Oil seal driver	07947-SB00200
Oil seal remover	07948-4630100 or equivalent commercially available in U. S. A.
Ball race remover	07GMD-KS40100

TROUBLESHOOTING

Hard steering

- Steering stem top thread too tight
- Worn or damaged steering bearings
- Worn or damaged steering bearing races
- Bent steering stem
- Insufficient tire pressure
- Faulty front tire

Steers to one side or does not track straight

- Damaged or loose steering bearings
- Bent fork
- Bent front axle: wheel installed incorrectly
- Bent frame
- Faulty front tire
- Worn or damaged front wheel bearings
- Worn or damaged engine mounting bushings (section 7)

Front wheel wobbles

- Bent rim
- Worn or damaged front wheel bearings
- Faulty front tire
- Loose front axle fasteners

Wheel turns hard

- Faulty front wheel bearings
- Bent front axle
- Brake drag (section 16)

Soft suspension

- Weak fork spring
- Insufficient fluid in fork
- Deteriorated fork fluid
- Incorrect fork fluid weight
- Low tire pressure

Hard suspension

- Bent fork tube
- Too much fluid in fork
- Incorrect fork fluid weight
- Clogged fork fluid passage
- High tire pressure

Front suspension noise

- Worn slider or fork tube bushing
- Insufficient fluid in fork
- Loose fork fasteners

FRONT WHEEL

REMOVAL

Remove the screw and disconnect the speedometer cable.



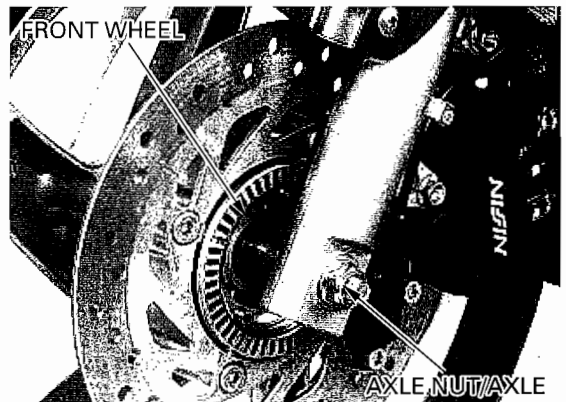
Loosen the front axle nut.

Support the scooter securely using a hoist or equivalent and raise the front wheel off the ground.

Remove the front axle nut.

Pull the front axle out and remove the front wheel.

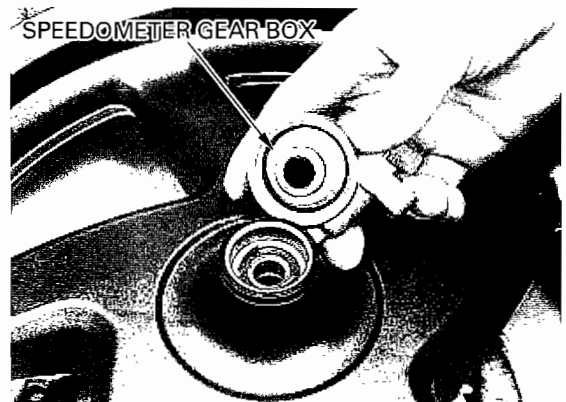
Do not operate the front and rear brake lever after removing the front wheel.



Remove the side collar from the left side of the wheel.



Remove the speedometer gear box from the right side of the wheel.



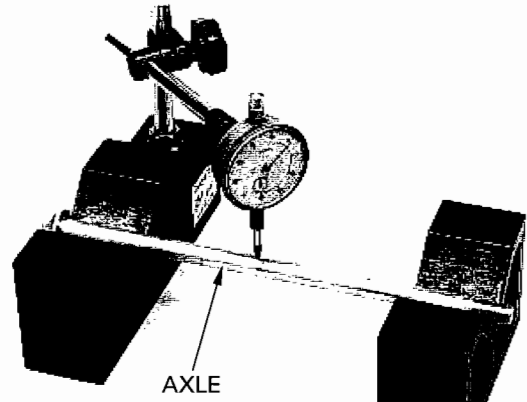
FRONT WHEEL/SUSPENSION/STEERING

INSPECTION

AXLE

Place the axle in V-blocks and measure the runout.
Actual runout is 1/2 the total indicator reading.

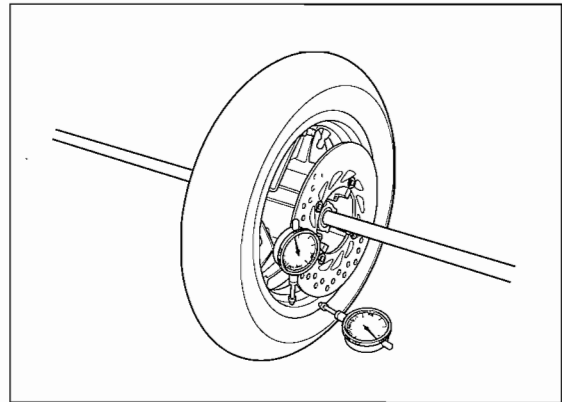
SERVICE LIMIT: 0.20 mm (0.008 in)



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.

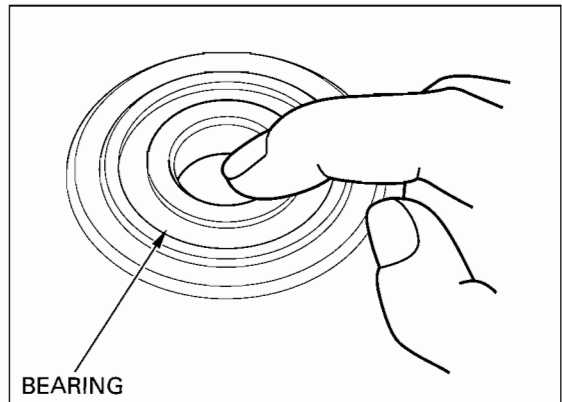
SERVICE LIMITS: Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)



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.

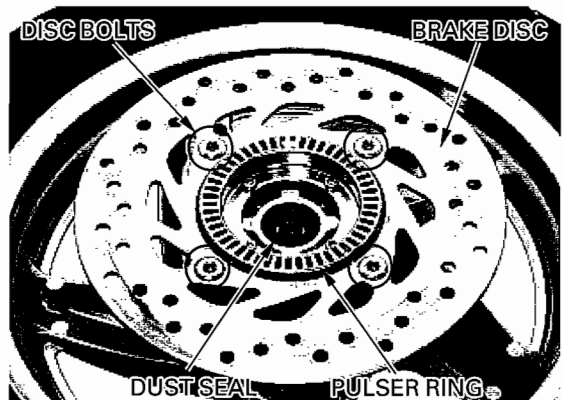


DISASSEMBLY

Remove the pulser ring (ABS type only: page 21-21).

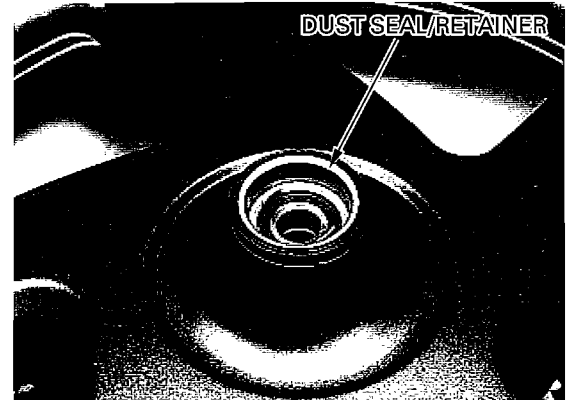
Remove the brake disc bolts and brake disc.

Remove the dust seal.



FRONT WHEEL/SUSPENSION/STEERING

Remove the dust seal/retainer.

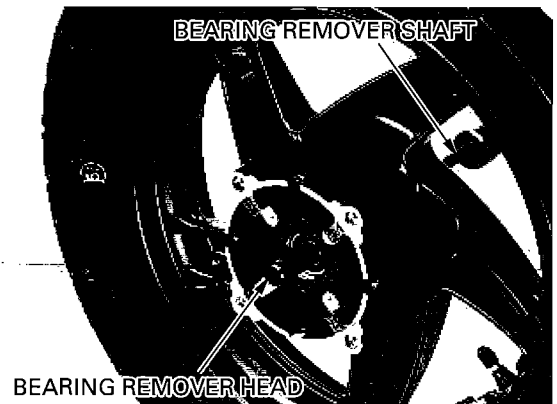


Replace the wheel bearings in pairs. Do not reuse old bearings.

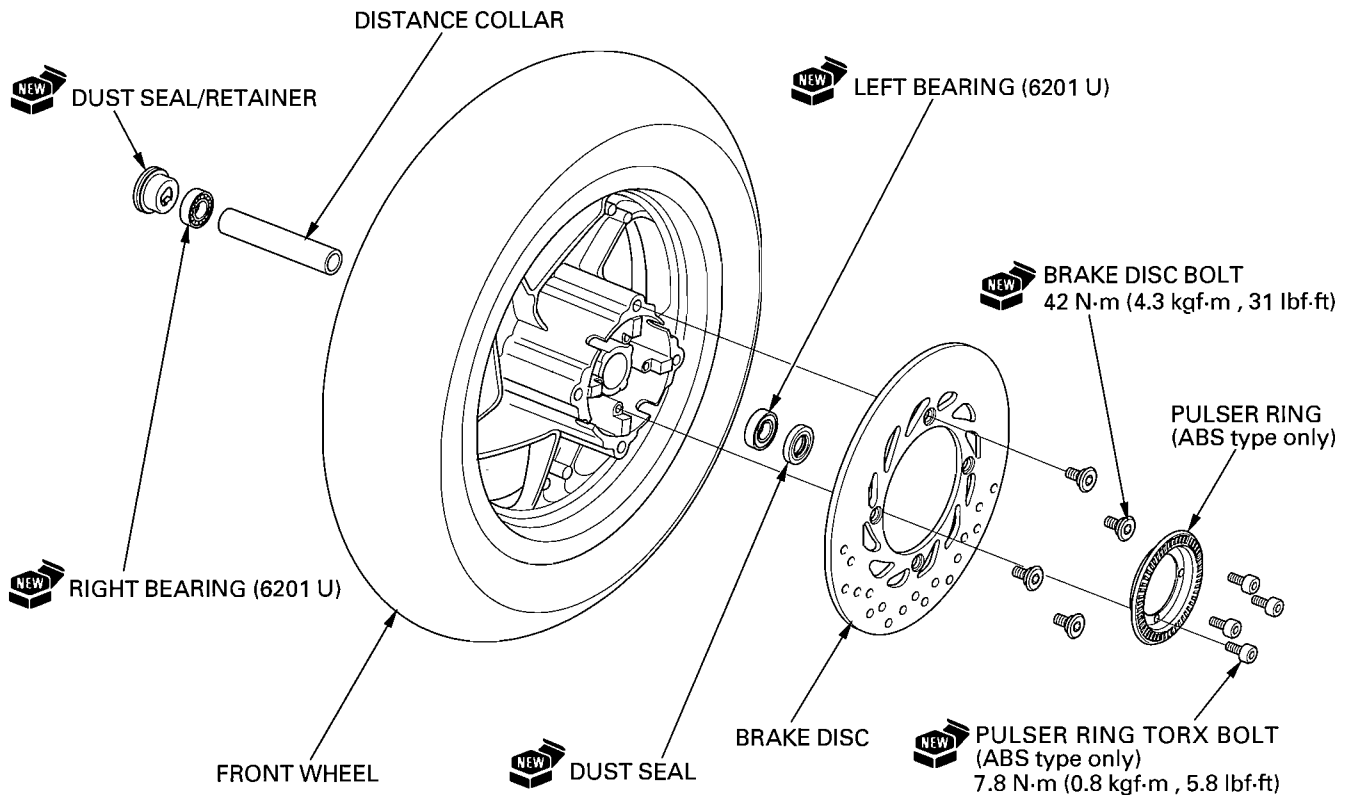
Install the bearing remover head into the bearing. From the opposite side of the wheel install the bearing remover shaft and drive the bearing out of the wheel hub. Remove the distance collar and drive out the other bearing.

TOOLS:

Bearing remover shaft 07746-0050100
Bearing remover head, 12 mm 07746-0050300



ASSEMBLY



FRONT WHEEL/SUSPENSION/STEERING

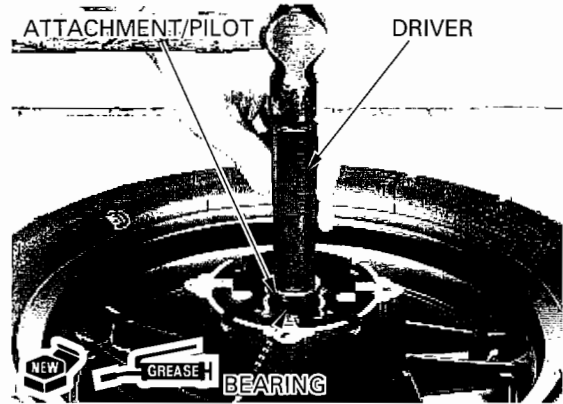
Pack the new bearing cavities with grease.
Drive the new left bearing (disc side) squarely with the sealed side facing up until it is fully seated.

TOOLS:

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

Install the distance collar.

Drive the new right bearing (speedometer gear box side) squarely with the sealed side facing up until it is fully seated using the same tools.



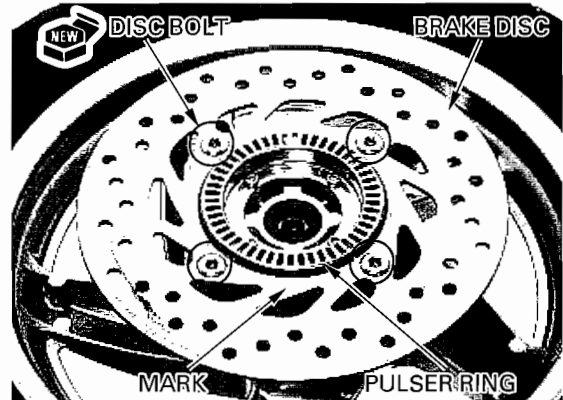
Apply grease to a new dust seal lips.
Install the dust seal into the left wheel hub until it is flush with the wheel hub.



Install the brake disc onto the wheel hub with the marked side facing out.
Install new disc bolts and tighten them to the specified torque.

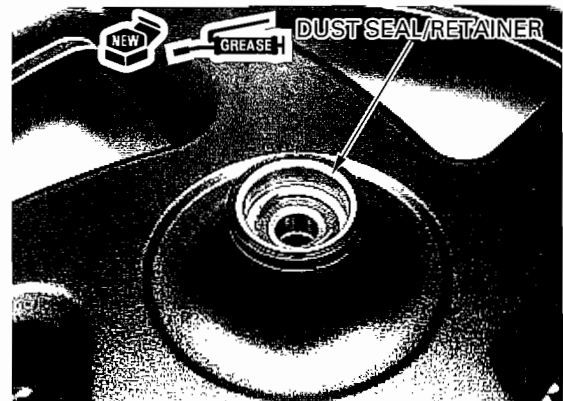
TORQUE: 42 N·m (4.3 kgf·m , 31 lbf·ft)

Install the pulser ring (ABS type only: page 21-21).



Be careful not to damage the seal lip. Apply grease to a new dust seal/retainer lip.
Install a new dust seal/retainer into the right wheel hub until it is seated.

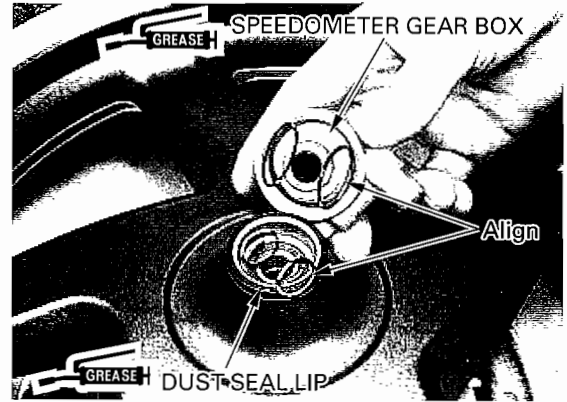
If the front wheel component parts are replaced, check the clearance between the pulser ring and wheel speed sensor (ABS type only: page 21-22).



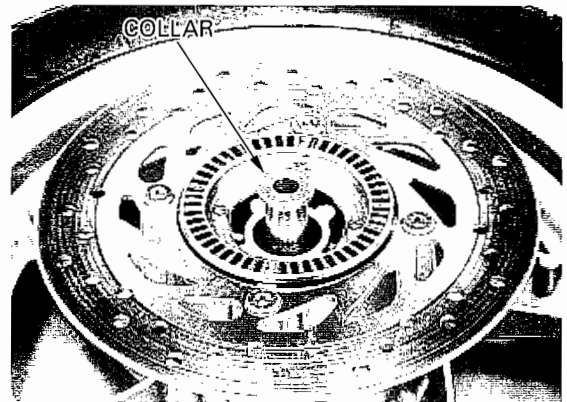
INSTALLATION

Apply grease to the inside of the speedometer gear box, and install the plain washers and speedometer gear.

Apply grease to the dust seal lip, and install the speedometer gear box over the right wheel hub.

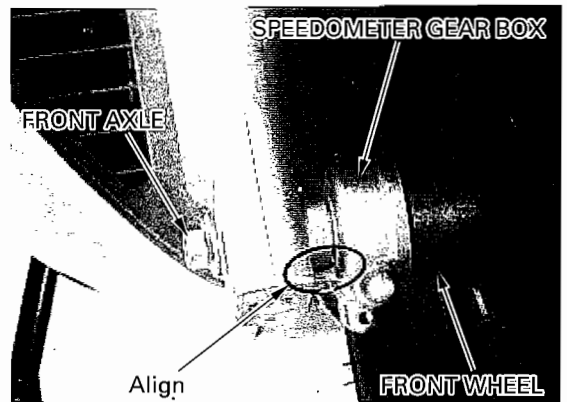


Install the side collar into the left wheel hub.



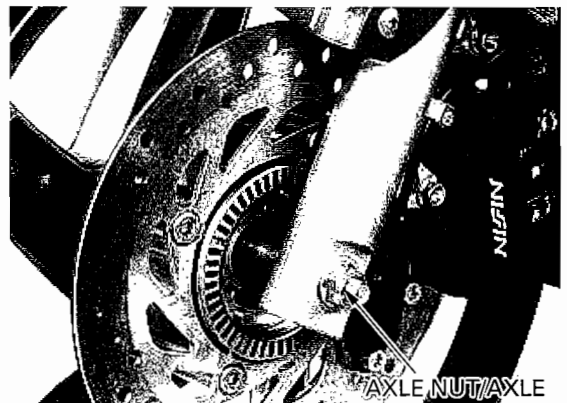
Be careful not to damage the brake pads.

Install the front wheel between the fork legs while inserting the disc between the pads so the lug on the speedometer gear box is positioned against the front of the stopper on the fork leg. Install the front axle from the right side.



Install the axle nut and tighten it.

TORQUE: 69 N·m (7.0 kgf·m , 51 lbf·ft)

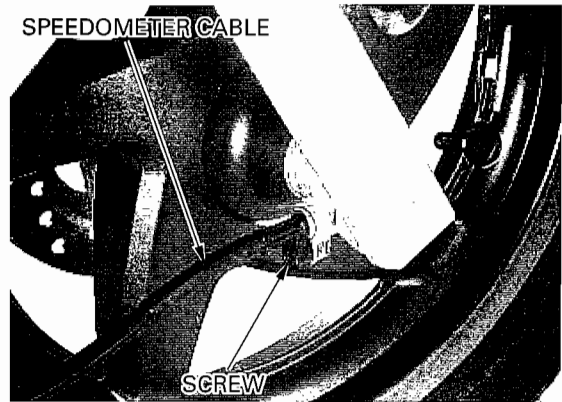


FRONT WHEEL/SUSPENSION/STEERING

Connect the speedometer cable to the speedometer gear box and secure it with the setting screw.

TORQUE: 2.2 N·m (0.22 kgf·m , 1.6 lbf·ft)

After installation, check the clearance between the pulser ring and wheel speed sensor (ABS type only: 21-21).



FORK

REMOVAL

Remove the front wheel (page 14-3).

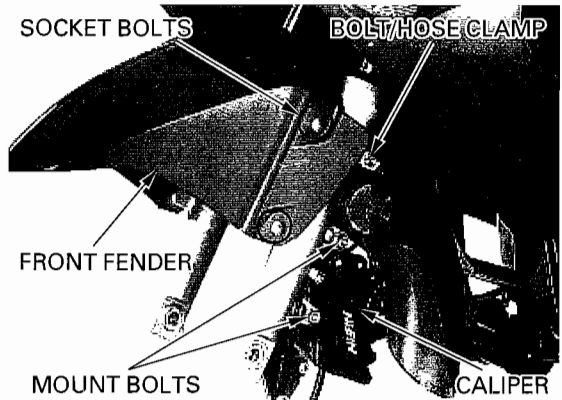
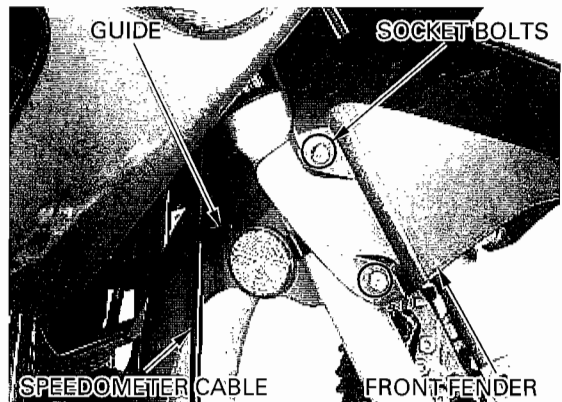
Remove the speedometer cable from the guide.

Remove the socket bolts and front fender.

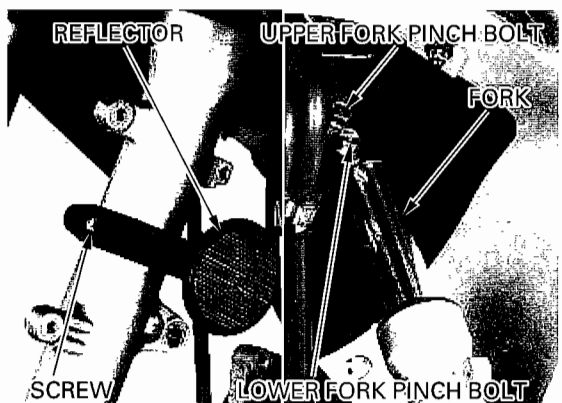
Remove the bolt and brake hose clamp.

*Support the brake caliper so it does not hang from the brake hose.
Do not twist the brake hose.*

Remove the mount bolts and front brake caliper from the fork leg.



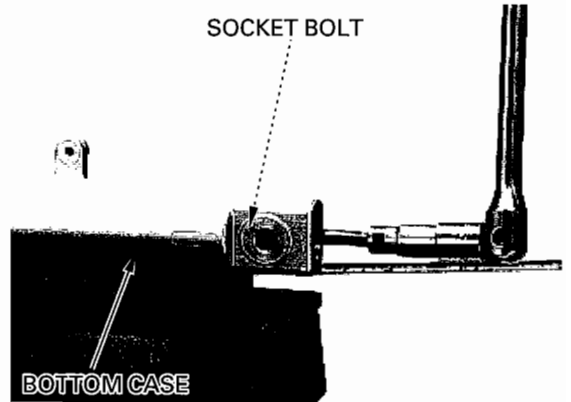
Remove the screw and reflector.
Remove the upper fork pinch bolt.
Loosen the lower fork pinch bolt and remove the fork tube from the steering stem.



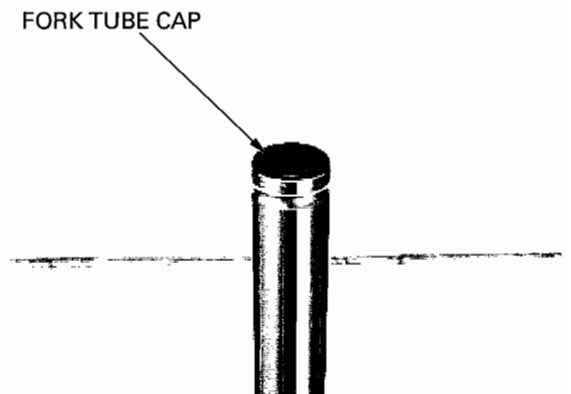
DISASSEMBLY

Hold the bottom case in a vise with a soft jaws or shop towel.

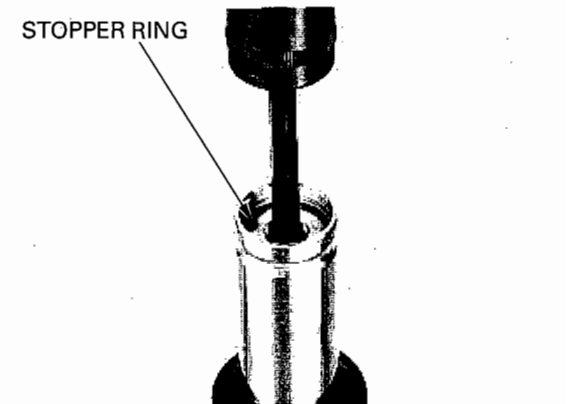
Remove the socket bolt after draining the fork fluid.
Loosen the fork socket bolt slightly, but do not remove it yet.



Be careful not to damage the fork tube.
Remove the fork tube cap.

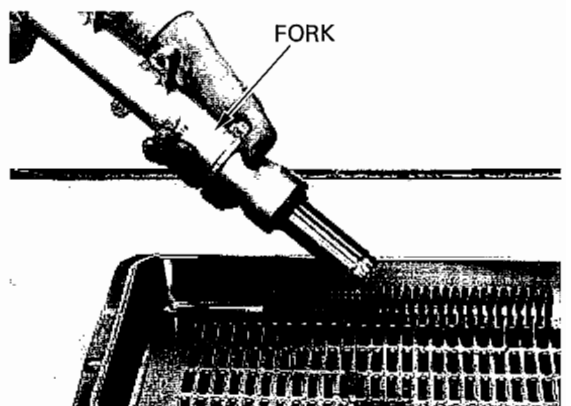


To prevent loss of tension, do not compress the fork spring more than necessary. The spring seat is under pressure. Use care when removing the fork assembly from the hydraulic press.
Press the spring seat into the fork tube using a hydraulic press and remove the stopper ring.



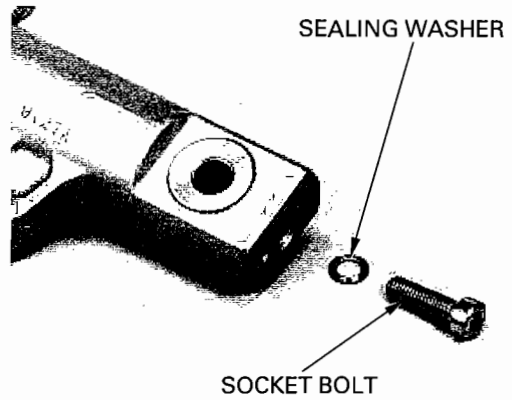
Remove the stopper ring, spring seat and fork spring.

Pour out the fork fluid by pumping the fork tube several times.

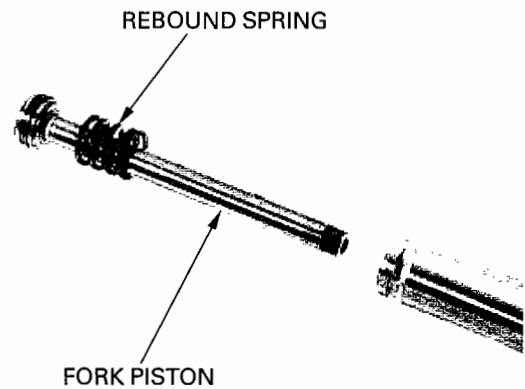


FRONT WHEEL/SUSPENSION/STEERING

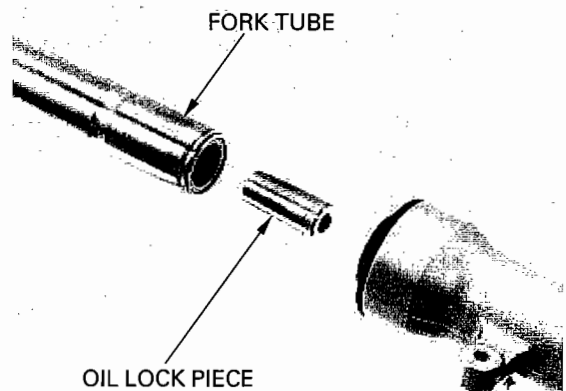
Remove the fork socket bolt and sealing washer.



Remove the fork piston and rebound spring.



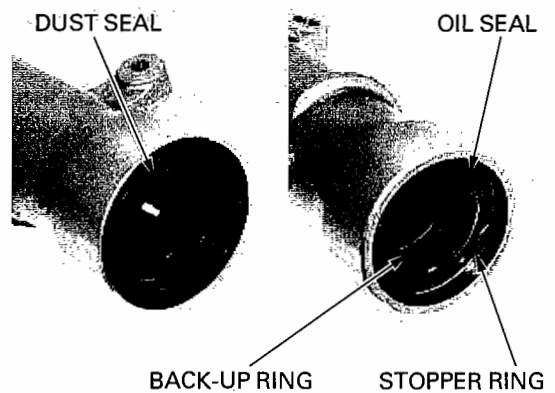
Remove the fork tube and oil lock piece.



Be careful not to damage the bottom case inner surface.

Remove the following:

- Dust seal
- Stopper ring
- Oil seal
- Back-up ring

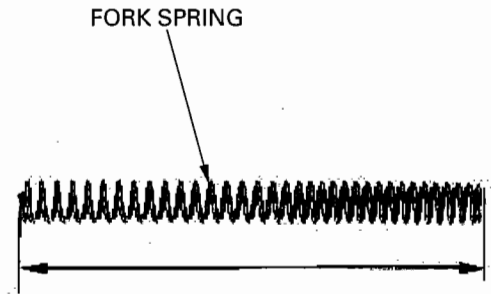


INSPECTION

FORK SPRING

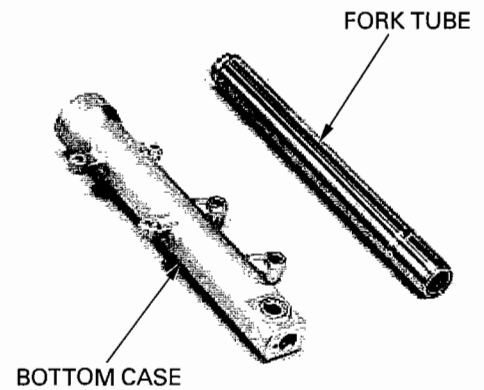
Check the fork spring for fatigue or damage.
Measure the fork spring free length.

SERVICE LIMIT: 265 mm (10.4 in)



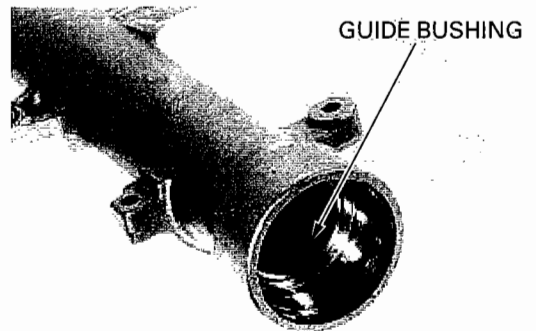
FORK TUBE/BOTTOM CASE

Check the fork tube and bottom case for score marks and excessive or abnormal wear.



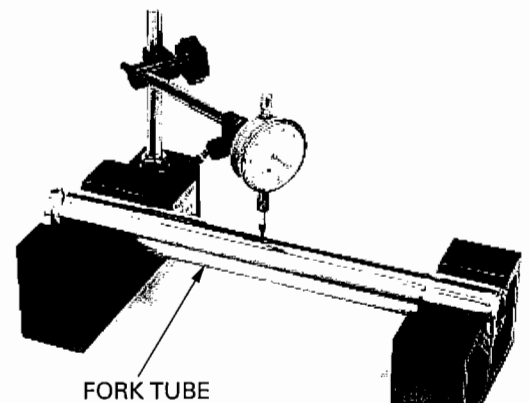
Visually inspect the guide bushing in the bottom case.

Replace the bushing if there is excessive scoring or scratching, or if the Teflon is worn so that the copper surface appears on more 3/4 of the entire surface.



Set the fork tube in V-blocks and measure the fork tube runout with a dial indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)



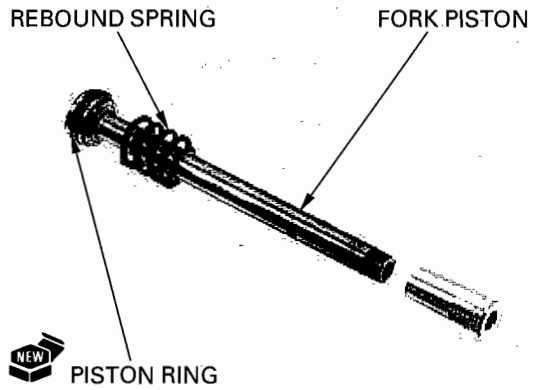
FRONT WHEEL/SUSPENSION/STEERING

FORK PISTON

Check the fork piston and piston ring for score marks and excessive or abnormal wear.

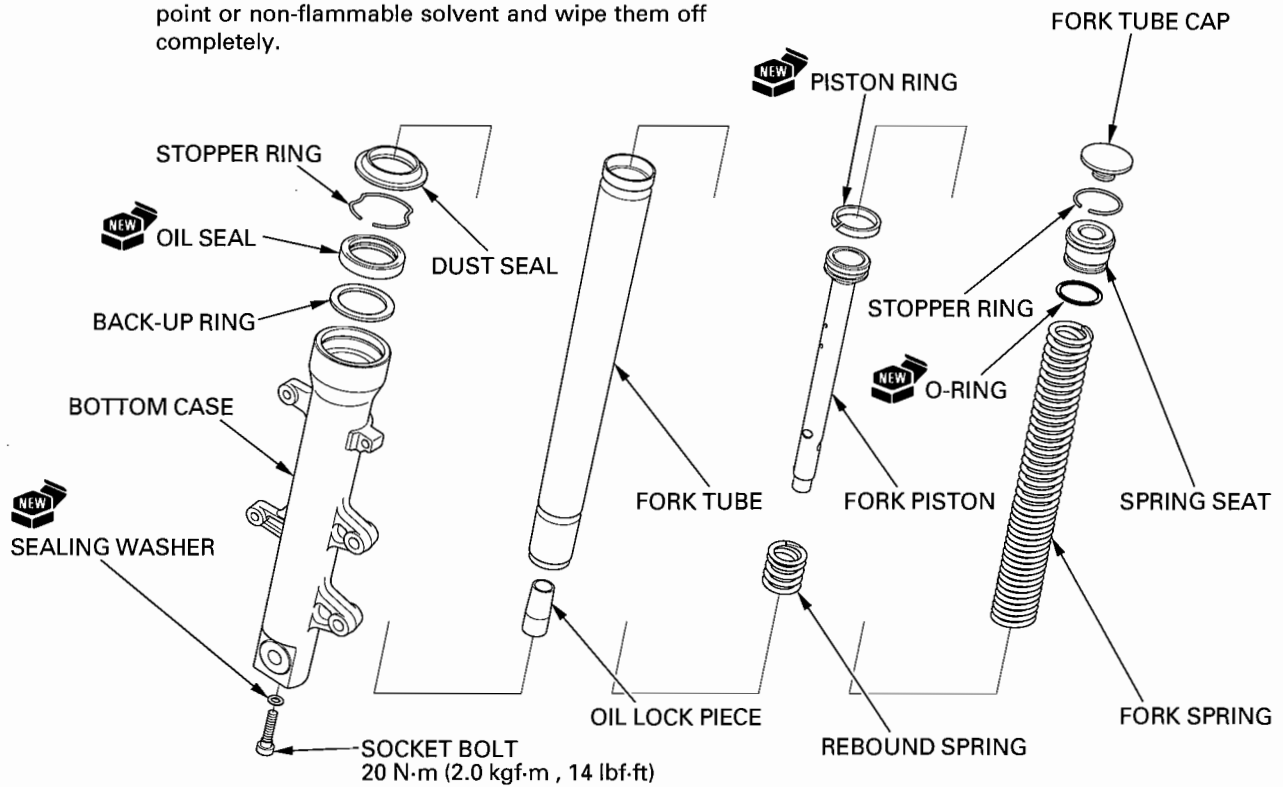
Check the rebound spring for fatigue or damage.

If the fork piston ring is removed, replace it with a new one.

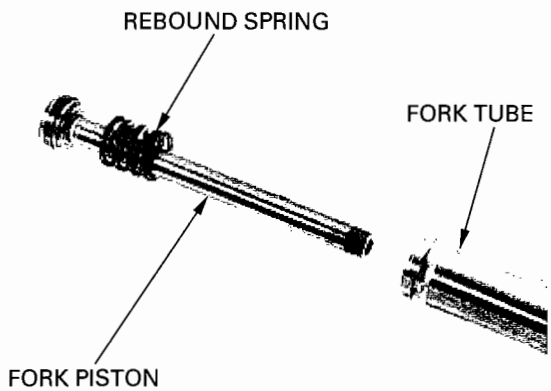


ASSEMBLY

Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them off completely.

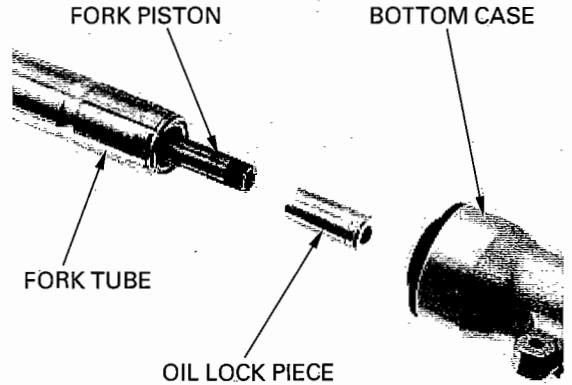


Install the rebound spring to the fork piston.
Install the fork piston/rebound spring into the fork tube.

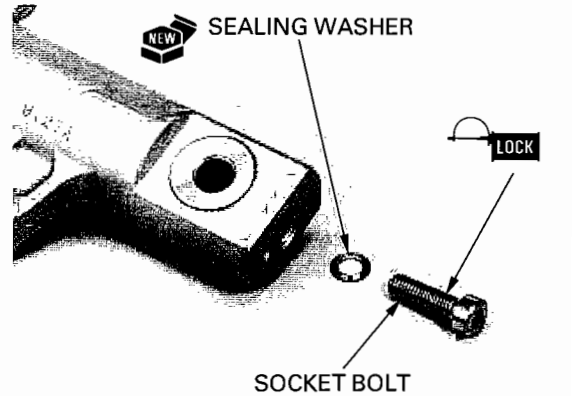


Install the oil lock piece to the fork piston.

Install the fork tube to the bottom case.



Apply locking agent to the socket bolt threads. Install the socket bolt with a new sealing washer into the fork piston.

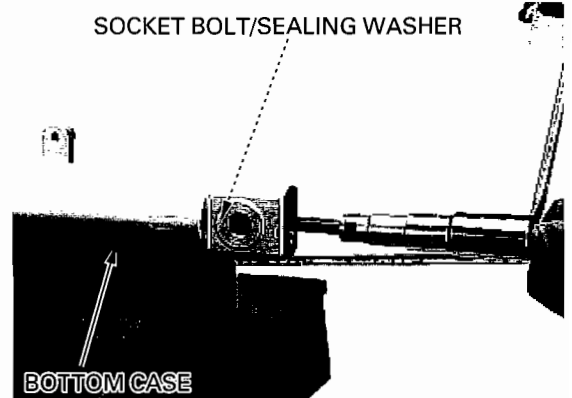


Hold the bottom case in a vise with a soft jaws or a shop towel.

Tighten the fork socket bolt to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m , 14 lbf·ft)

If the fork piston turns together with the socket bolt, temporarily install the fork spring and spring seat (page 14-14).



Install the back-up ring over the fork tube and rest it on the bottom case.

Coat a new oil seal lip with fork fluid and install it over the fork tube with the marked side facing up. Drive the oil seal into the bottom case until the stopper ring groove is visible.

TOOLS:

Slider weight

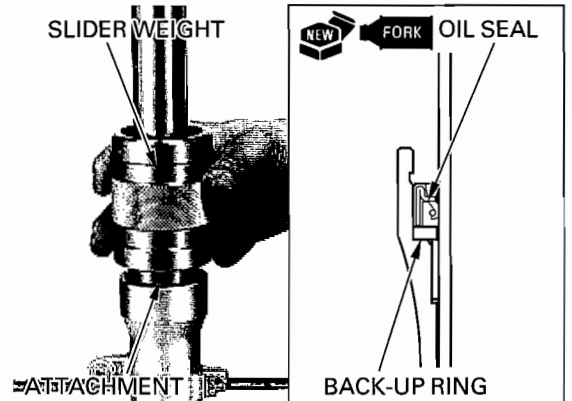
Fork seal driver attachment

07747-0010100

07747-0010501 or

07947-3330000

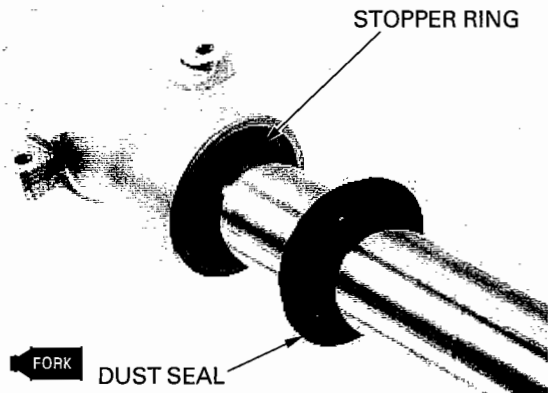
(U. S. A. only)



FRONT WHEEL/SUSPENSION/STEERING

Install the stopper ring into the groove in the bottom case, being careful not to scratch the fork tube.

Coat the dust seal lip with fork fluid and install it into the bottom case.



Pour the specified amount of the recommended fork fluid in the fork tube.

RECOMMENDED FLUID:

Pro Honda Suspension Fluid SS-8

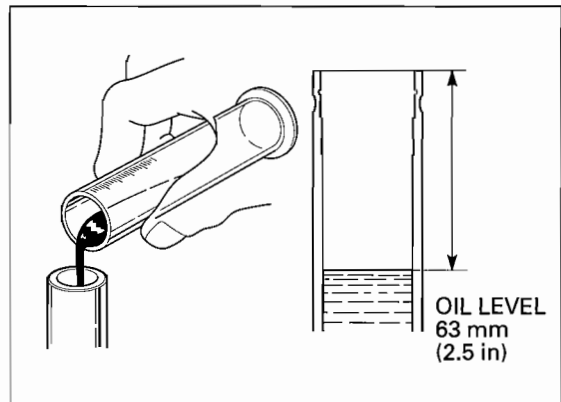
FORK FLUID CAPACITY:

121 cm³ (4.1 US oz , 4.3 Imp oz)

Slowly pump the fork tube several times to remove any trapped air.

Compress the fork tube fully and measure the oil level from the top of the fork tube.

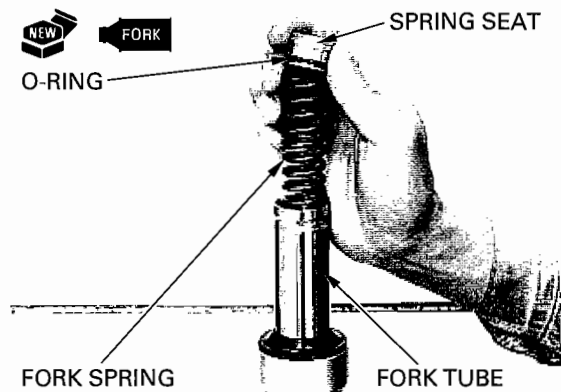
OIL LEVEL: 63 mm (2.5 in)



Pull the fork tube up fully.

Install the fork spring with the tightly wound end facing down.

Coat a new O-ring with fork fluid and install it into the groove in the spring seat.

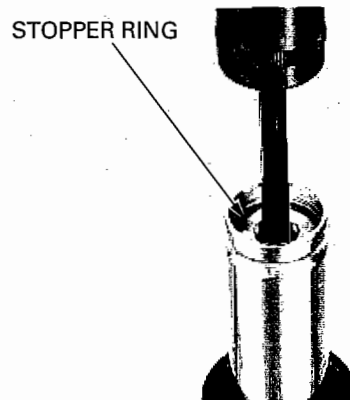


Be careful not to allow the fork assembly to slide down. To prevent loss of tension, do not compress the fork spring more than necessary.

Set the fork assembly, spring seat and stopper ring onto the hydraulic press.

Press the spring seat into the fork tube until the stopper ring groove is visible.

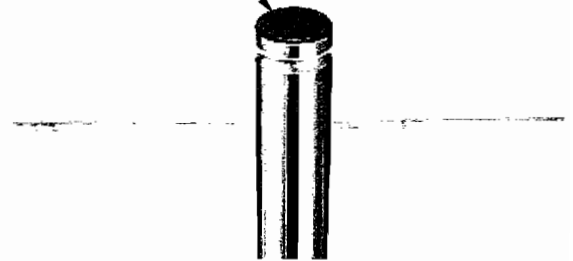
Install the stopper ring into the groove in the fork tube.



Install the fork tube cap onto the fork tube.

If the front fork bottom case is replaced, check the clearance between the pulser ring and wheel speed sensor (ABS type only: page 21-22).

FORK TUBE CAP

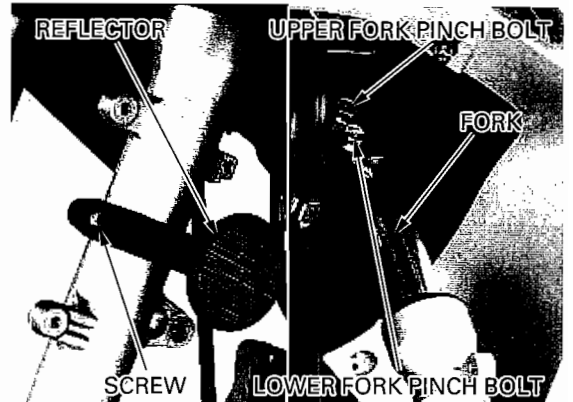


INSTALLATION

Install the fork into the steering stem and align the groove of the fork tube with the upper bolt hole in the stem, then install the upper pinch bolt. Tighten the fork pinch bolts to the specified torque.

TORQUE: 49 N·m (5.0 kgf·m , 36 lbf·ft)

Install the reflector and tighten the screw.



Install the brake caliper onto the fork leg with new mount bolts.

TORQUE: 31 N·m (3.2 kgf·m , 23 lbf·ft)

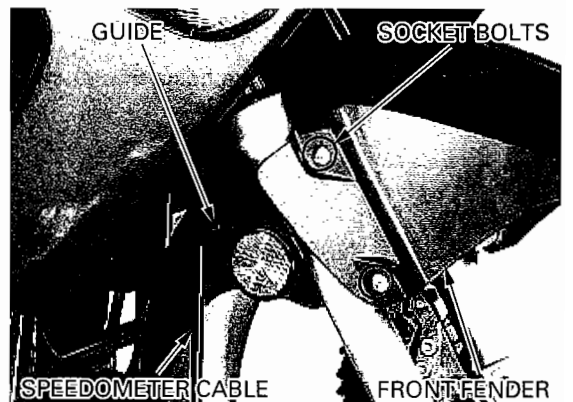
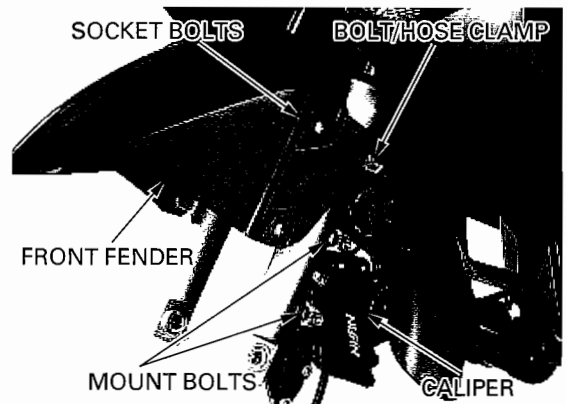
Install the brake hose clamp onto the fork leg with the bolt.

Install the front fender between the fork legs with the socket bolts.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

Install the speedometer cable to the guide.

Install the front wheel (page 14-7).

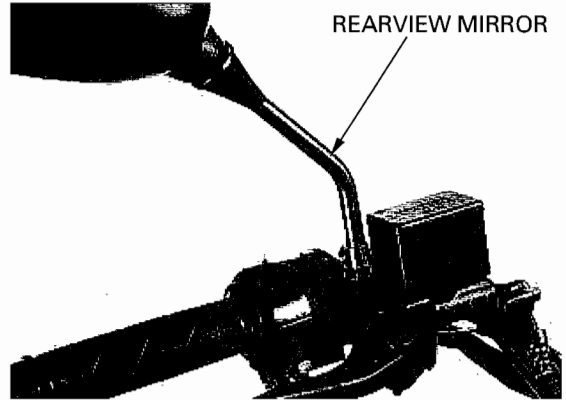


STEERING HANDLE

REMOVAL

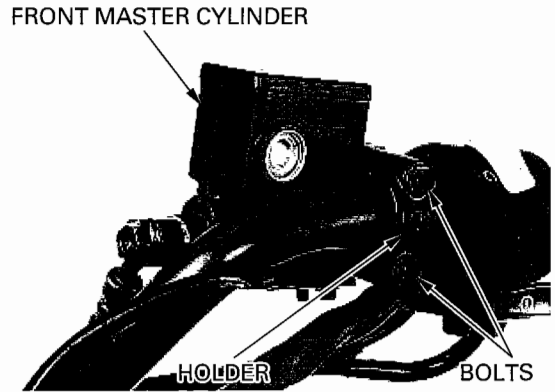
Remove the front cover (page 2-11).
Remove the handle cover (page 2-14).

Remove the rearview mirror.

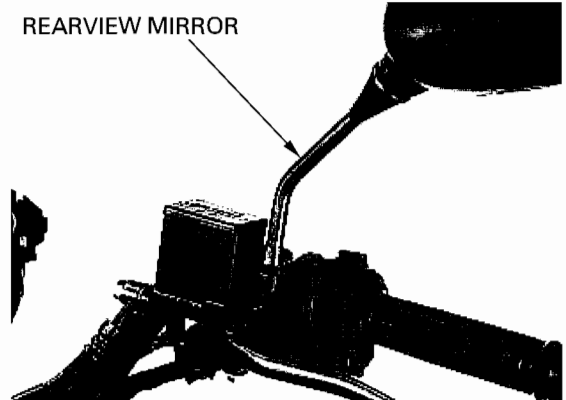


After '03 only. Remove the wire band.

Keep the master cylinder upright to prevent air from entering the hydraulic system. Remove the bolts, master cylinder holder and front master cylinder.

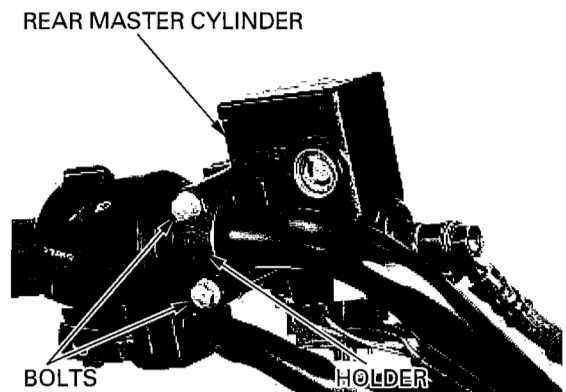


Remove the rearview mirror.



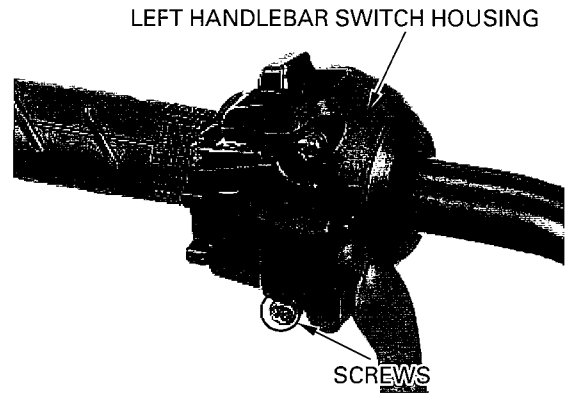
After '03 only. Remove the wire band.

Keep the master cylinder upright to prevent air from entering the hydraulic system. Remove the bolts, master cylinder holder and rear master cylinder.

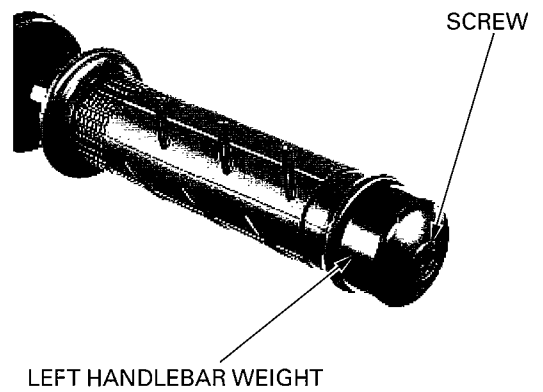


FRONT WHEEL/SUSPENSION/STEERING

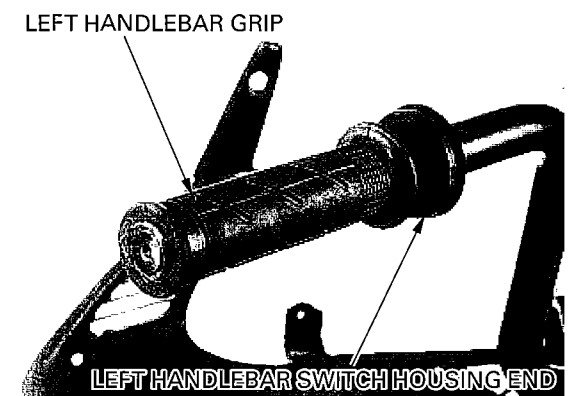
Remove the screws and left handlebar switch housing.



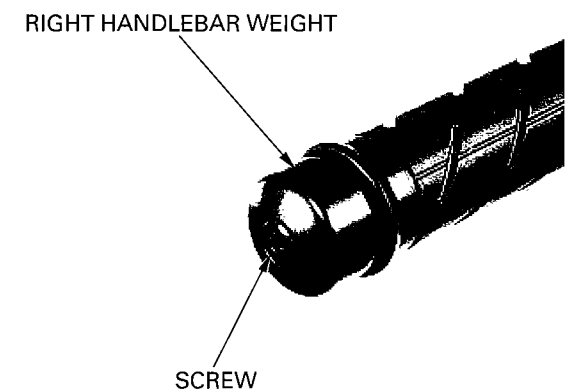
Hold the handlebar weight and remove the screw and the left handlebar weight.



Remove the left handlebar grip from the steering handle.
Remove the left handlebar switch housing end.



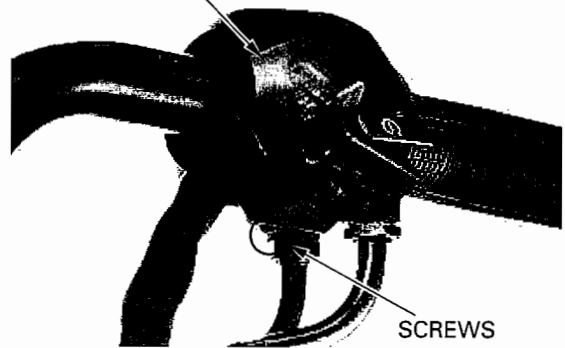
Hold the handlebar weight and remove the screw and the right handlebar weight.



FRONT WHEEL/SUSPENSION/STEERING

Remove the screws and right handlebar switch housing.

RIGHT HANDLEBAR SWITCH HOUSING

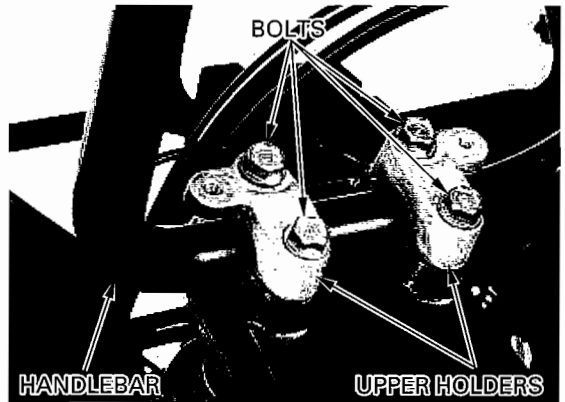


Remove the bolts and handlebar cover stay.

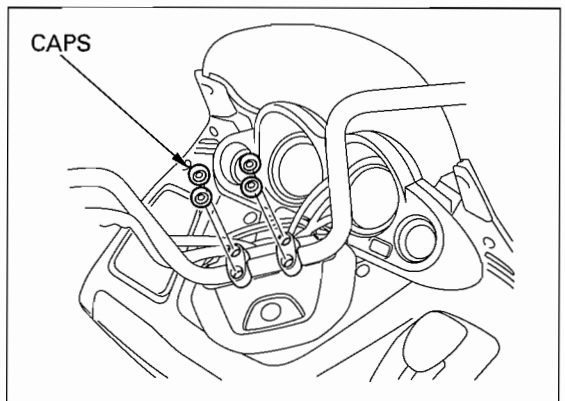
HANDLEBAR COVER STAY



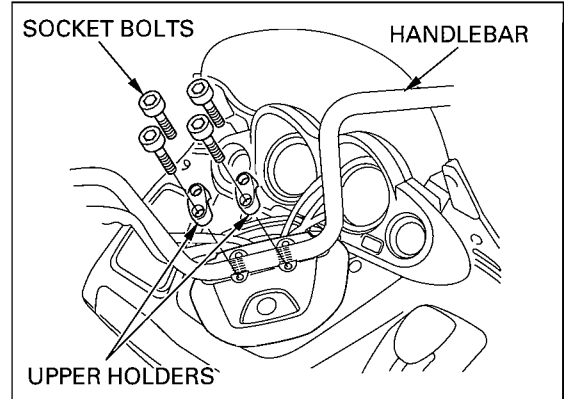
Remove the bolts and the upper holders.
Remove the handlebar.



NSS250S/AS: Remove the upper holder bolt caps.



NSS250S/AS: Remove the socket bolts, upper holders and handlebar.



Remove the throttle grip/right handlebar switch housing from the handlebar.

Disconnect the throttle cables end from the throttle grip.



Remove the handlebar post pinch nut, bolt and collar.

Remove the handlebar post from the steering stem.

INSTALLATION

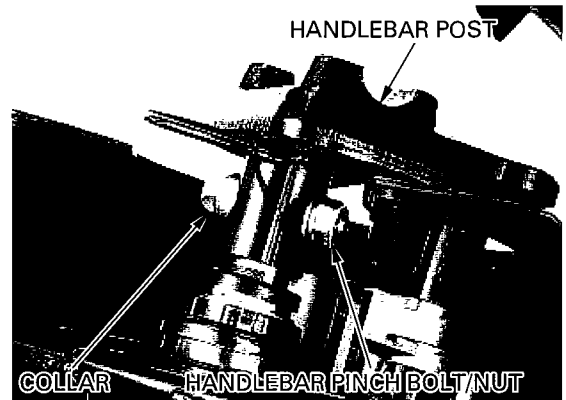
NOTE:

- Route the cables and wires properly (page 1-18).

Install the handlebar post over the steering stem, aligning the bolt hole with the groove in the stem.

Install the collar and pinch bolt.

Install and tighten the handlebar post pinch nut securely.



Apply grease to the throttle grip flange groove and throttle cable end.

Install the throttle grip to the right handlebar switch housing.

Connect the throttle cables to the throttle grip.

Install the right handle switch housing/throttle grip to the handlebar.



FRONT WHEEL/SUSPENSION/STEERING

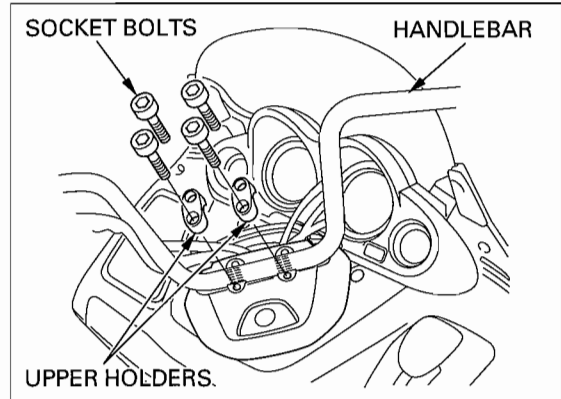
NSS250S/AS: Install the handlebar to the handlebar post.

Install the upper holders with the punch marks facing forward.

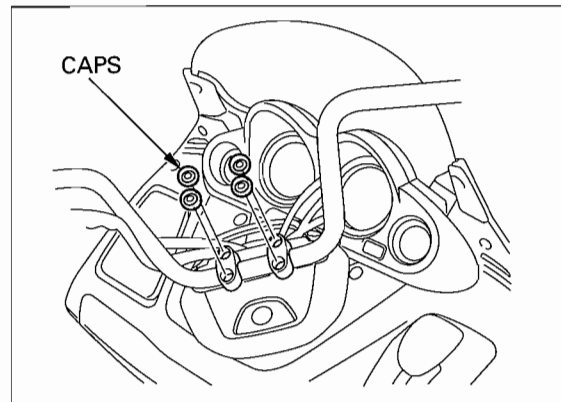
Align the punch mark on the handlebar with the cut out of the upper holder.

Install and tighten the forward handlebar holder socket bolts first, then tighten the rear bolts.

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



NSS250S/AS: Install the upper holder caps securely.



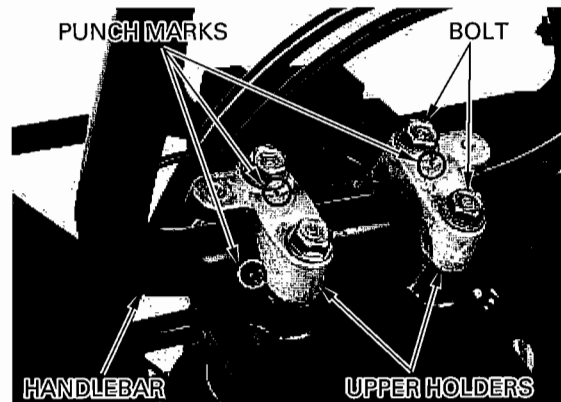
Install the handlebar to the handlebar post.

Install the upper holders with the punch marks facing forward.

Align the punch mark on the handlebar with the cut out of the upper holder.

Install the upper holder bolts.

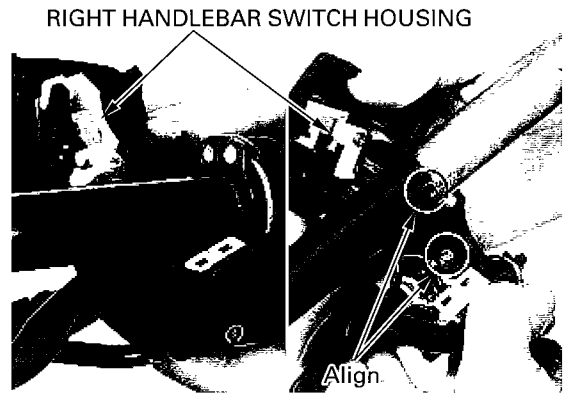
Tighten the forward bolts first, then tighten the rear bolts.



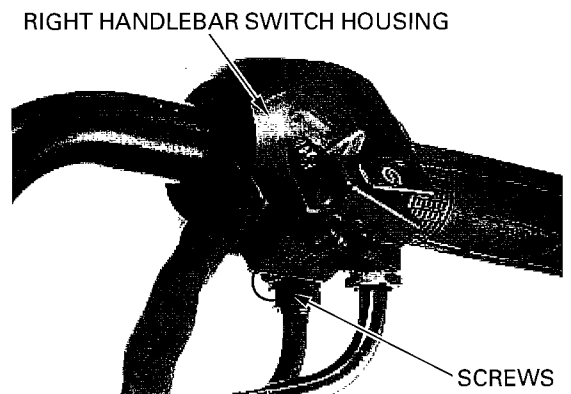
Install the handle cover stay and tighten the bolts securely.



Align the pin on the right handlebar switch housing with the hole on the handlebar.

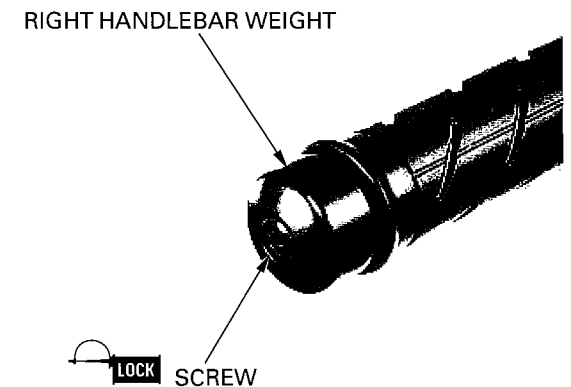


Install the screws and tighten the forward screw first, then tighten the rear screw.



Install the right handlebar weight to the steering handle.

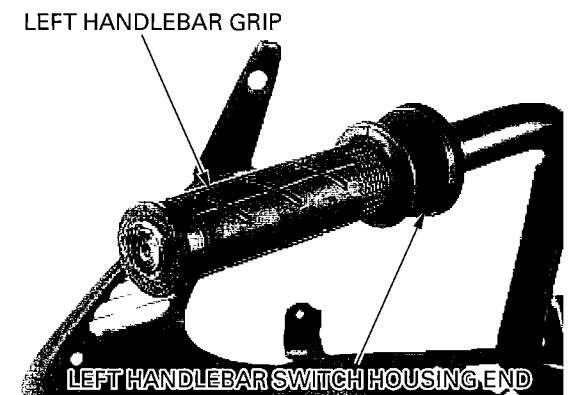
Clean and apply a locking agent to the screw threads.
Install and tighten the screw securely.



Install the left handlebar switch housing end onto the handlebar.

Allow the adhesive to dry for 1 hour before using.

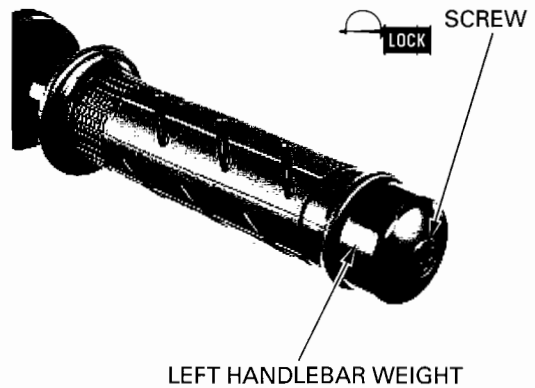
Apply Honda bond A or equivalent to the inside surface of the handle grip and to the clean surface of the handlebar. Wait 3–5 minutes and install the grip.
Rotate the grip for even application of the adhesive.



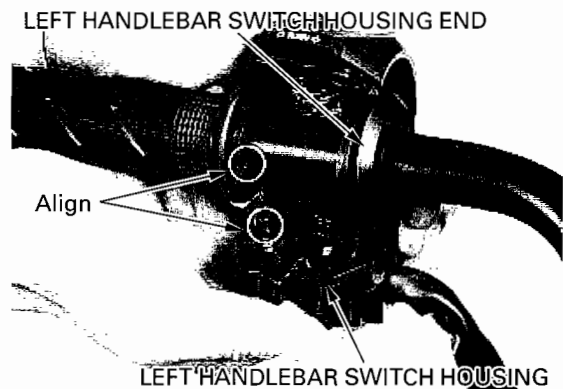
FRONT WHEEL/SUSPENSION/STEERING

Install the left handlebar weight to the steering handle.

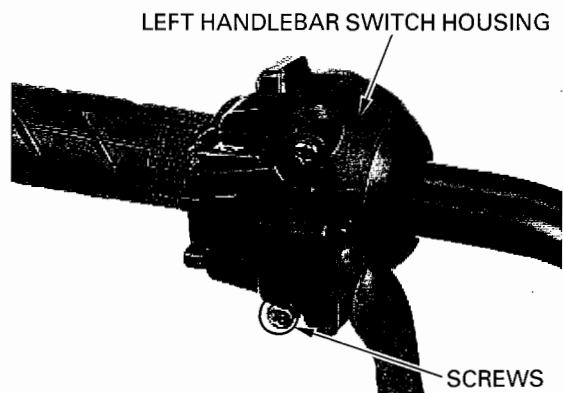
Clean and apply a locking agent to the screw threads.
Install and tighten the screw securely.



Align the pin on the left handlebar switch housing with the hole on the handlebar.
Install the left handlebar switch housing to the handlebar with aligning it with the groove on the left handlebar switch housing end.



Install the screws and tighten the forward screw first, then tighten the rear screw.

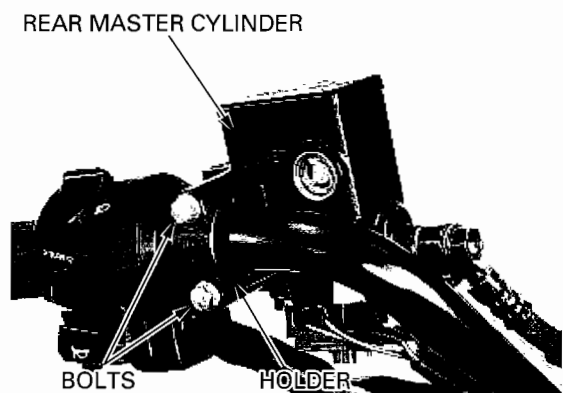


Install the rear master cylinder to the handlebar (page 16-21).

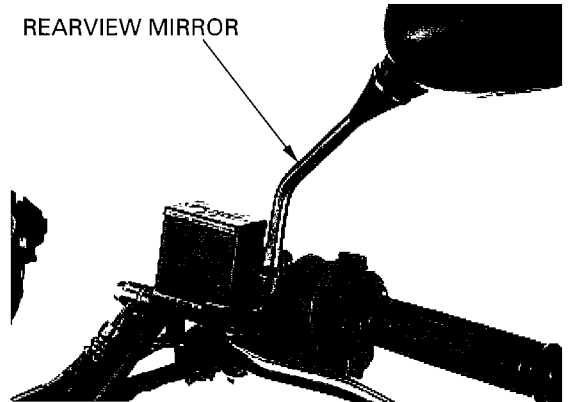
Install the master cylinder holder and bolts.
Tighten the upper bolt first, then tighten the lower bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

After '03 only. Install the wire band.



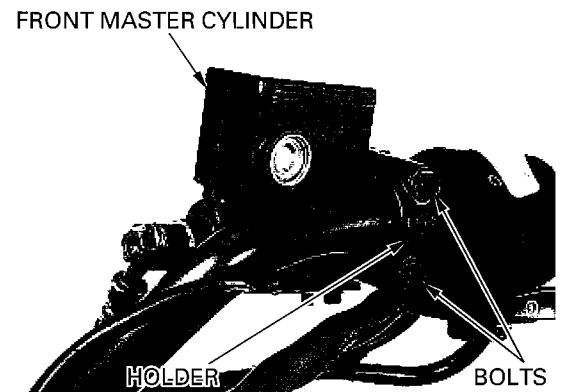
Install the rearview mirror.



Install the front master cylinder to the handlebar (page 16-17).

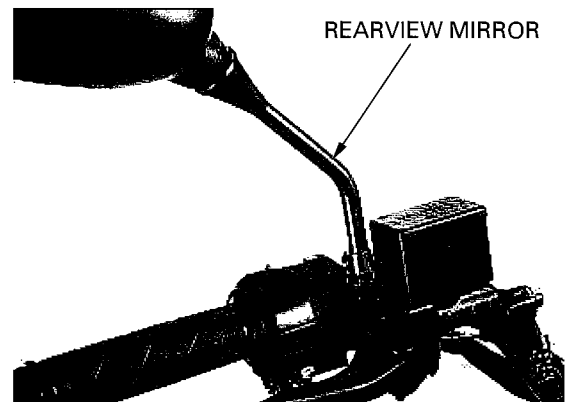
Install the master cylinder holder and bolts. Tighten the upper bolt first, then tighten the lower bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)



Install the rearview mirror.

Install the handlebar cover (page 2-14).
Install the front cover (page 2-12).

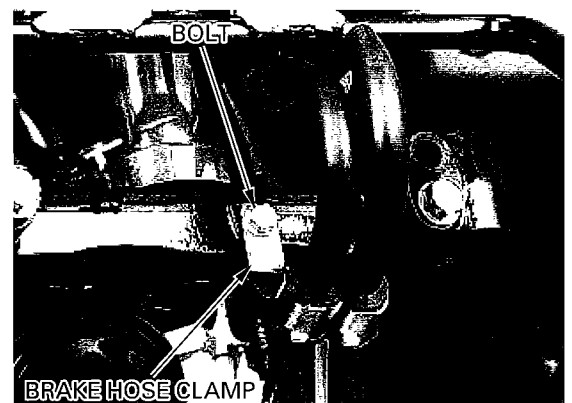


STEERING STEM

REMOVAL

Remove the fork (page 14-8).
Remove the handlebar (page 14-16).
Remove the handle cover: NSS250S/AS (page 14-28).

Remove the bolt and brake hose clamp from the steering stem.

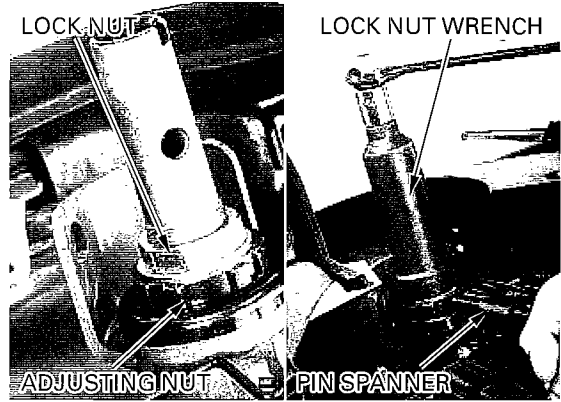


FRONT WHEEL/SUSPENSION/STEERING

Hold the steering bearing adjusting nut using the pin spanner and remove the steering stem lock nut.

TOOLS:

Pin spanner 07702-002001
Lock nut wrench, 32 mm 07916-KM10000

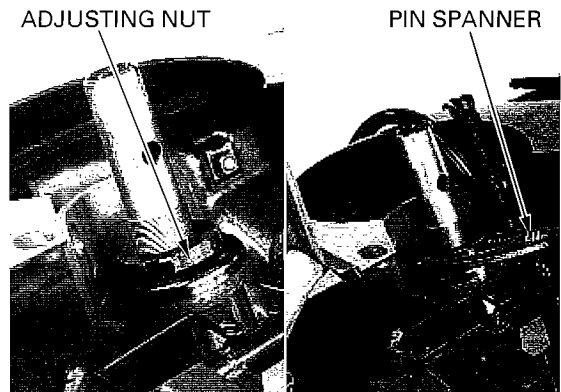


Loosen the steering bearing adjusting nut using the pin spanner.

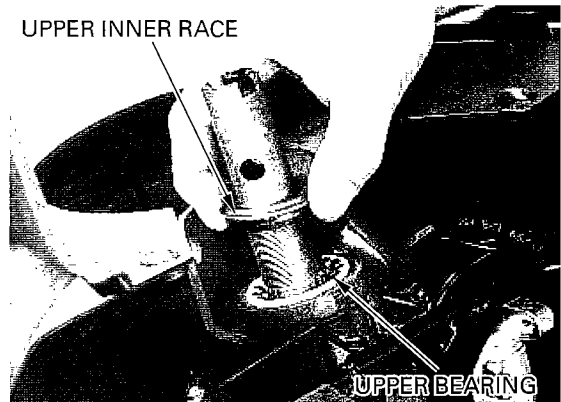
TOOL:

Adjustable pin spanner 07702-002001

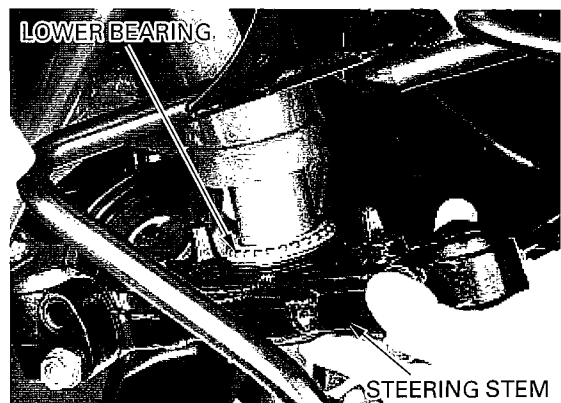
Hold the steering stem and remove the steering stem top thread.



Remove the upper inner race and upper bearing.



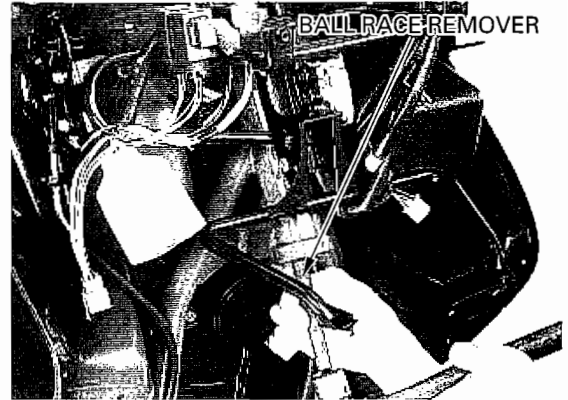
Remove the steering stem and lower bearing.



BEARING REPLACEMENT

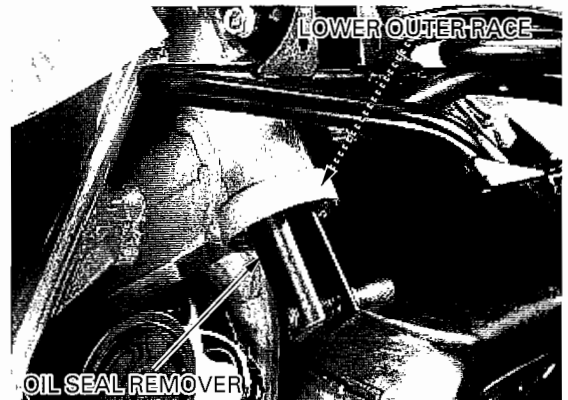
Always replace the bearings and races as a set. Remove the upper bearing outer race.

TOOL:
Ball race remover 07GMD-KS40100



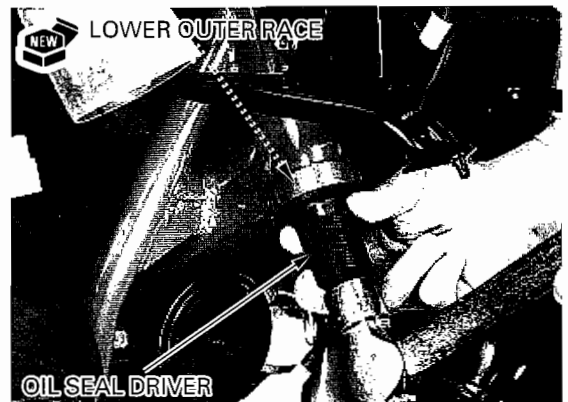
Remove the lower bearing outer race.

TOOL:
Oil seal remover 07948-4630100 or equivalent commercially available in U. S. A.



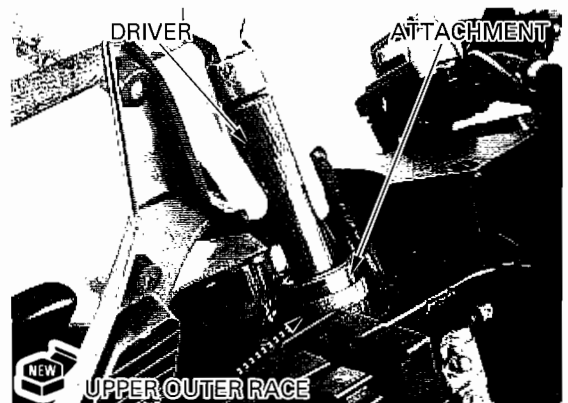
Drive a new lower bearing outer race into the steering head pipe.

TOOL:
Oil seal driver 07947-SB00200



Drive a new upper bearing race into the steering head pipe.

TOOLS:
Driver 07749-0010000
Ball race driver attachment 07945-3330300



FRONT WHEEL/SUSPENSION/STEERING

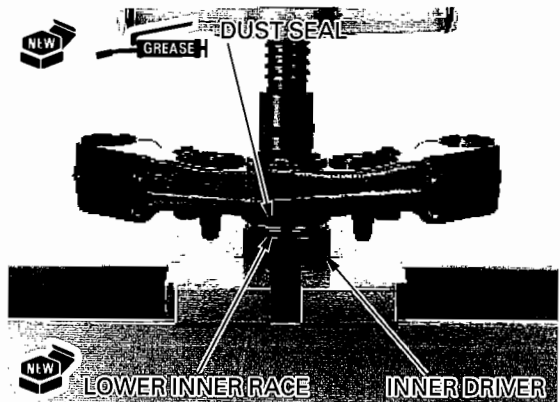
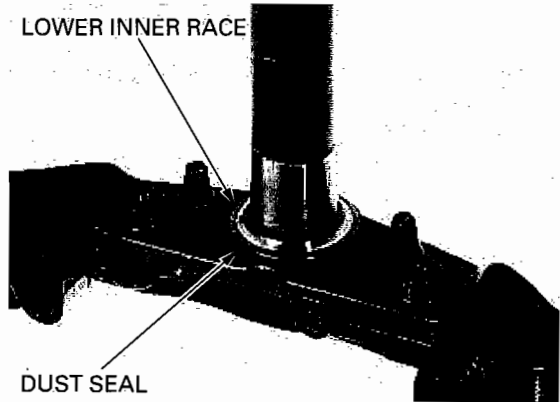
Install the steering stem lock nut onto the steering stem to prevent the threads from being damaged when removing the lower bearing inner race from the steering stem.

Remove the lower bearing inner race with a chisel or equivalent tool, being careful not to damage the steering stem.

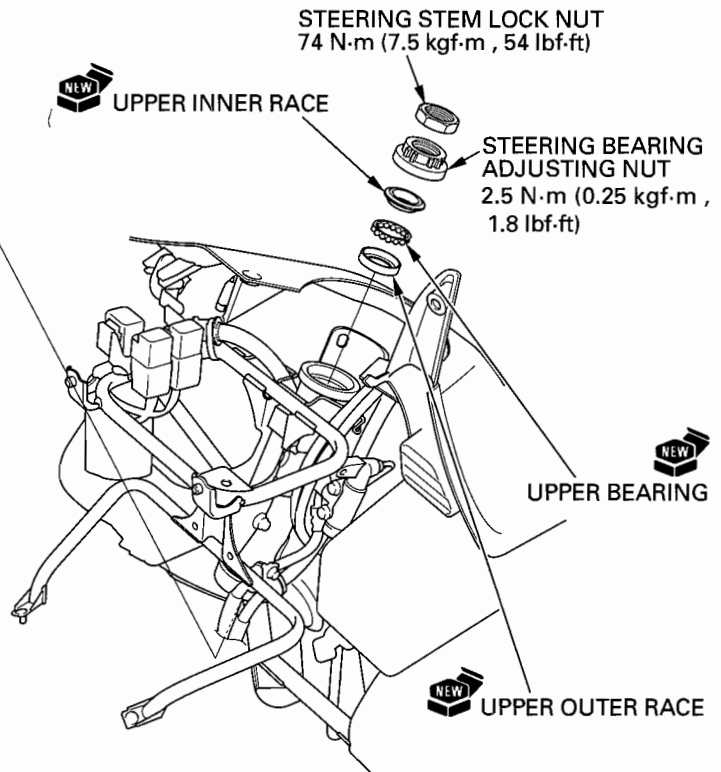
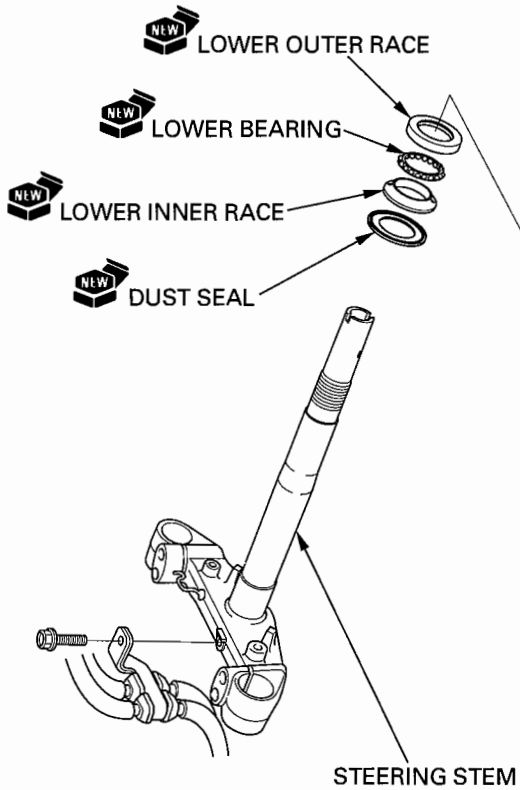
Remove the dust seal.

Apply grease to a new dust seal and new lower bearing inner race using a hydraulic press.

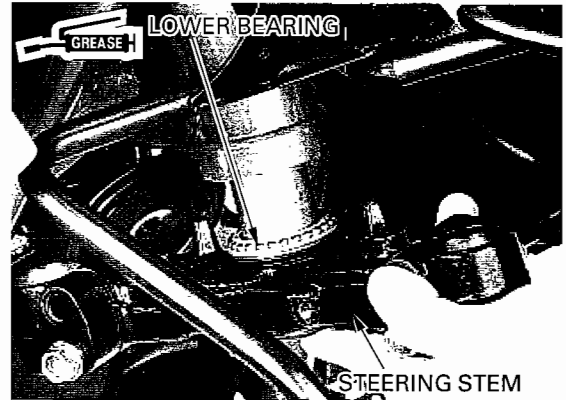
TOOL:
Attachment, 35 mm 07746-0030400



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.



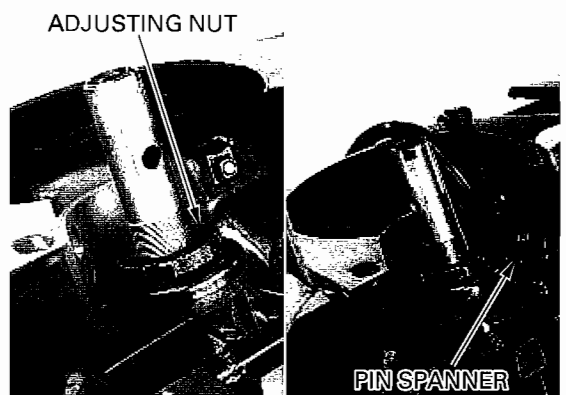
Install the upper bearing and upper inner race.



Install the steering bearing adjusting nut and tighten it to the specified torque.

TOOL:
Adjustable pin spanner 07702-0020001

TORQUE: 2.5 N·m (0.25 kgf·m , 1.8 lbf·ft)



Turn the steering stem lock-to-lock several times to seat the bearings.

Temporarily loosen the steering bearing adjusting nut.

Install the fork (page 14-15).
Install the front wheel (page 14-7).



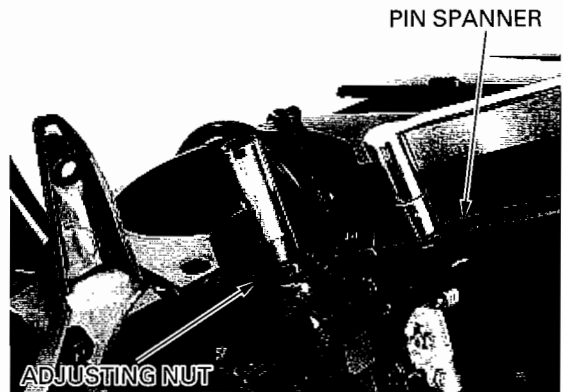
FRONT WHEEL/SUSPENSION/STEERING

Tighten the steering bearing adjusting nut to the specified torque with the front wheel is grounded.

TOOL:

Adjustable pin spanner 07702-0020001

TORQUE: 2.5 N·m (0.25 kgf·m , 1.8 lbf·ft)



Install the steering stem lock nut.
Hold the steering bearing adjusting nut using the pin spanner and tighten the steering stem lock nut to the specified torque.

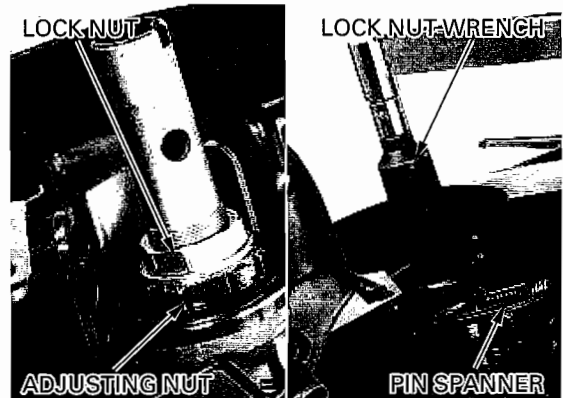
TOOLS:

Adjustable pin spanner 07702-0020001

Lock nut wrench, 32 mm 07916-KM10000

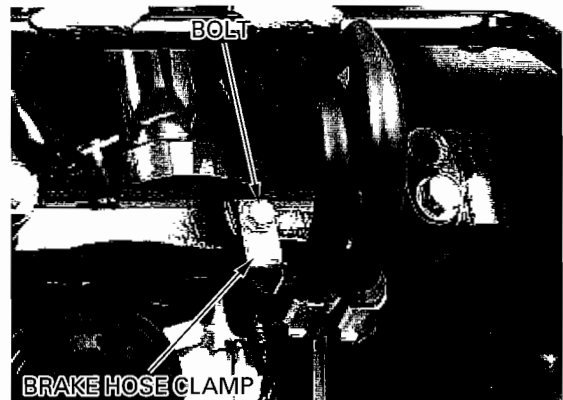
TORQUE: 74 N·m (7.5 kgf·m , 54 lbf·ft)

Make sure that the steering stem moves smoothly without play or binding.



Install the brake hose clamp and tighten the bolt securely.

Install the handle cover : NSS250S/AS (page 14-29).
Install the steering handle (page 14-19).

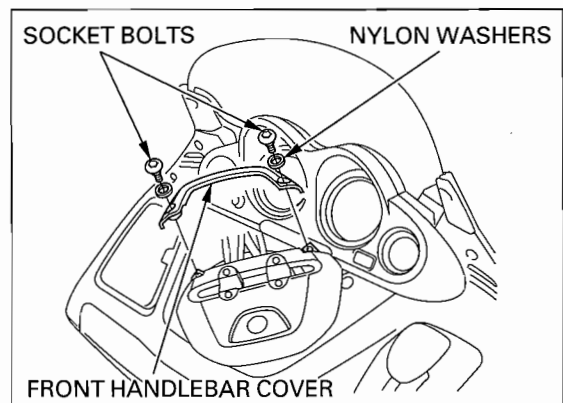


HANDLE COVER (NSS250S/AS ONLY)

REMOVAL

Remove the steering handle (page 14-16).

Remove the socket bolts, nylon washers and front handlebar cover.

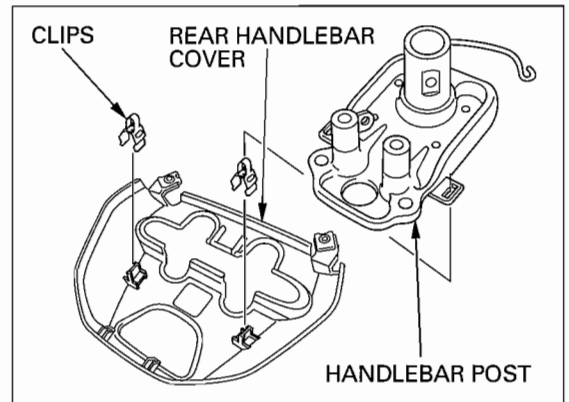


Remove the handlebar post (page 14-19).

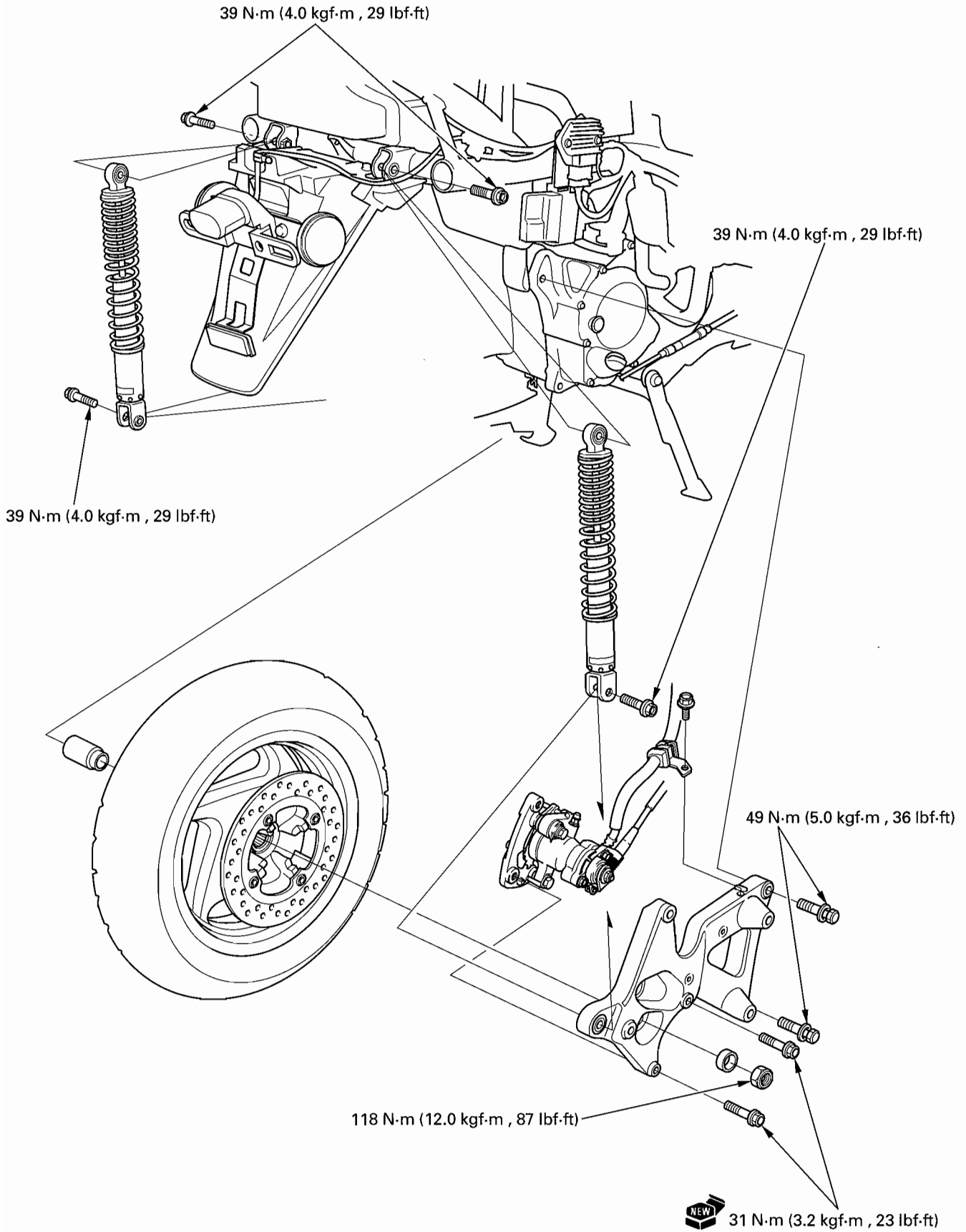
Compress the snapfit clips and remove the rear handlebar cover from handlebar post.

INSTALLATION

Installation is in the reverse order of removal.



REAR WHEEL/SUSPENSION



15. REAR WHEEL/SUSPENSION

SERVICE INFORMATION	15-1	REAR WHEEL/SWINGARM	15-3
TROUBLESHOOTING	15-2	REAR SHOCK ABSORBER	15-7

SERVICE INFORMATION

GENERAL

- A contaminated brake disc or pad reduces stopping power. Discard contaminated parts and clean a contaminated disc with a high quality brake degreasing agent.
- Riding on damaged rims impairs safe operation of the vehicle.
- This section covers the rear wheel and rear suspension.
- A jack or other support is required to support the vehicle.
- Do not twist or bend the brake hose when servicing.
- Use genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.
- Refer to section 16 for brake system information.

SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Minimum tire tread depth	—————	2.0 (0.08)
Cold tire pressure	Rider only	200 kPa (2.00 kgf/cm ² , 29 psi)
	Rider and passenger	250 kPa (2.50 kgf/cm ² , 36 psi)
Wheel rim runout	Radial	2.0 (0.08)
	Axial	2.0 (0.08)
Wheel balance weight	—————	60 g (2.1 oz) max.

TORQUE VALUES

Rear brake disc bolt	42 N·m (4.3 kgf·m , 31 lbf·ft)	ALOC bolt: replace with a new one.
Swingarm mount bolt	49 N·m (5.0 kgf·m , 36 lbf·ft)	
Rear axle nut	118 N·m (12.0 kgf·m , 87 lbf·ft)	
Rear shock absorber mount bolt	39 N·m (4.0 kgf·m , 29 lbf·ft)	
Rear caliper mount bolt	31 N·m (3.2 kgf·m , 23 lbf·ft)	ALOC bolt: replace with a new one.

TOOLS

Attachment, 42 × 47 mm	07746-0010300
Pilot, 17 mm	07746-0040400
Driver	07749-0010000

REAR WHEEL/SUSPENSION

TROUBLESHOOTING

Rear wheel wobbles

- Bent rim
- Faulty tire
- Axle nut and/or engine mount 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

Stiff suspension

- Bent damper rod
- Worn or damaged engine mount bushings
- High tire pressure

Rear suspension noisy

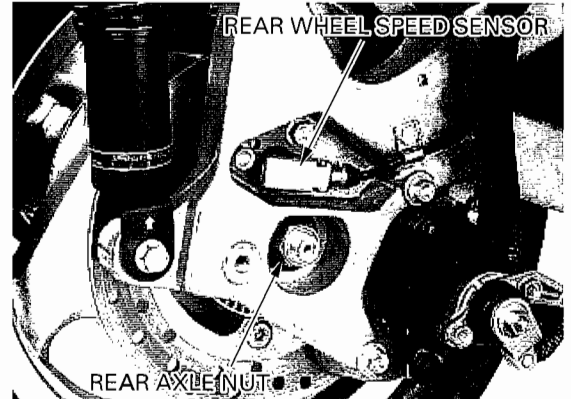
- Loose mounting fasteners
- Faulty shock absorber
- Weak rear suspension mount bushings

REAR WHEEL/SWINGARM

REMOVAL

Remove the muffler (page 2-13).
Remove the rear wheel speed sensor (ABS type only: page 21-21).

Loosen the rear axle nut.
Support the scooter securely on its center stand.

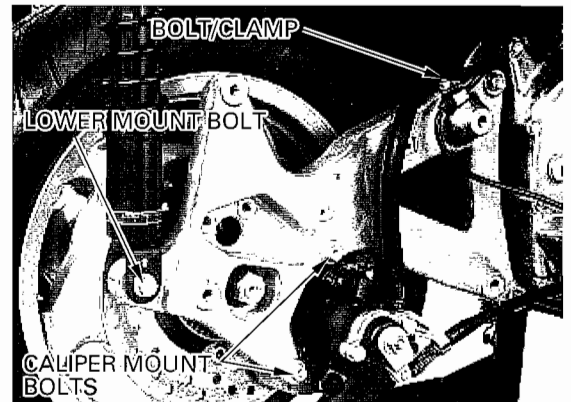


Remove the bolt and brake hose clamp from the swingarm.

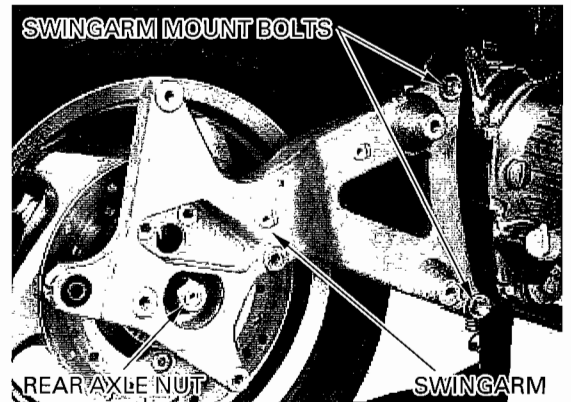
Support the brake caliper so it does not hang from the brake hose. Do not twist the brake hose. Do not operate the brake lever after removing the brake caliper.

Remove the rear brake caliper mount bolts and rear brake caliper.

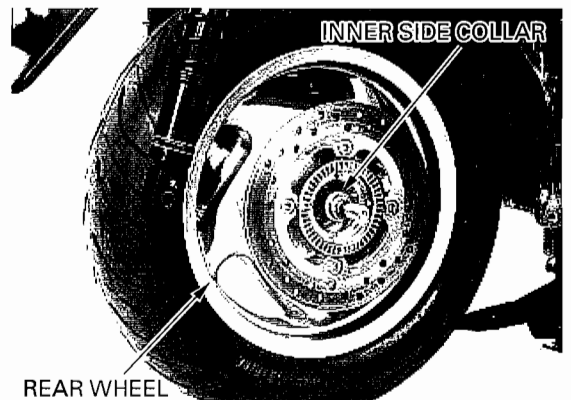
Remove the rear shock absorber lower mount bolt.



Remove the rear axle nut.
Remove the swingarm mount bolts and swingarm.



Remove the inner side collar and rear wheel.



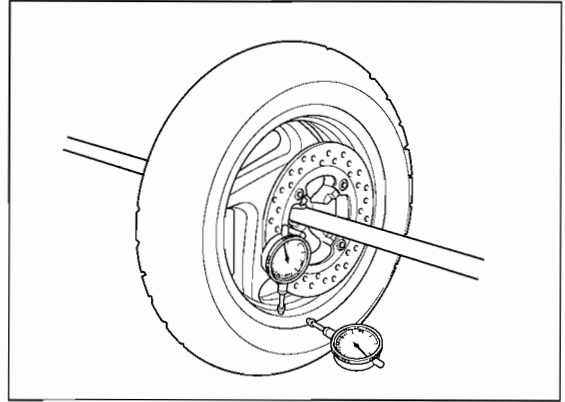
REAR WHEEL/SUSPENSION

INSPECTION

WHEEL

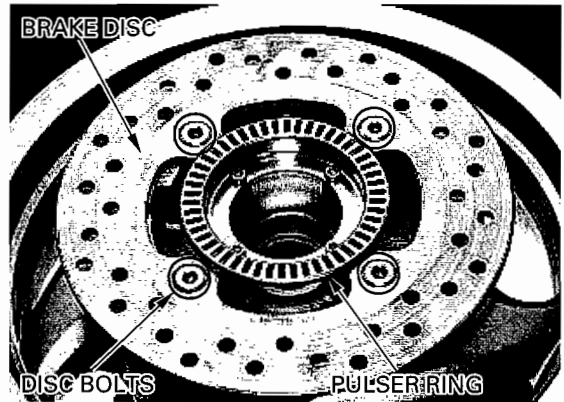
Check the wheel rim runout using a dial indicator. Actual runout is 1/2 the total indicator reading.

SERVICE LIMITS: Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)



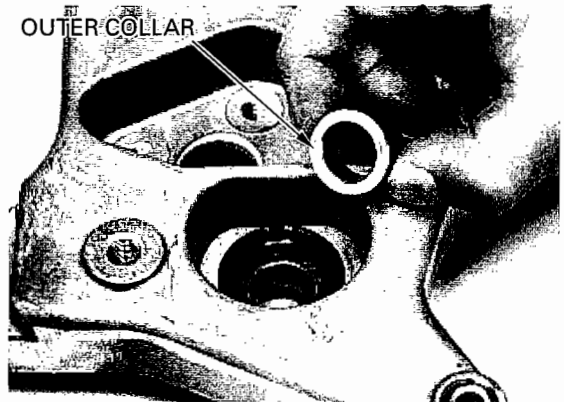
DISASSEMBLY

Remove the pulser ring (ABS type only: page 21-21).
Remove the brake disc bolts and rear brake disc.

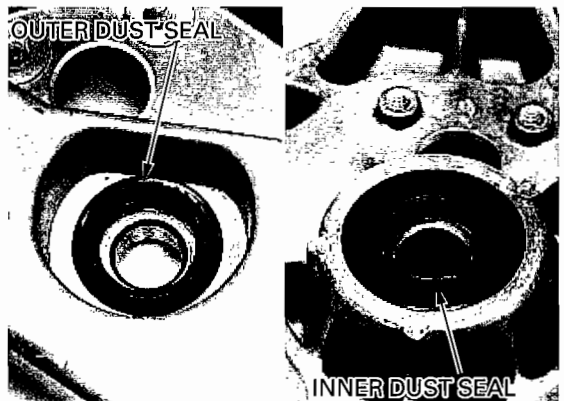


SWINGARM BEARING REPLACEMENT

Remove the outer collar from the swingarm.



Remove the outer dust seal and inner dust seal from the swingarm.

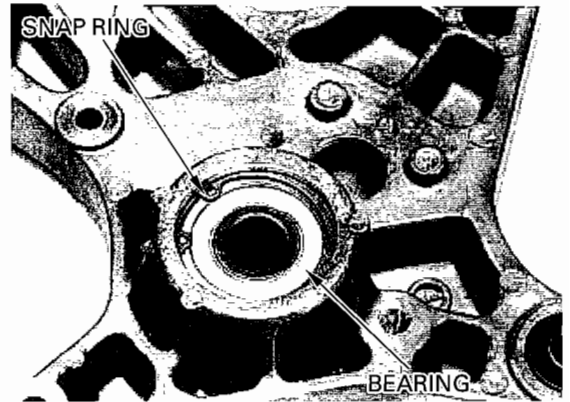


Remove the snap ring.

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

Remove and discard the bearing if the race does not turn smoothly and quietly, or if it fits loosely in the swingarm.

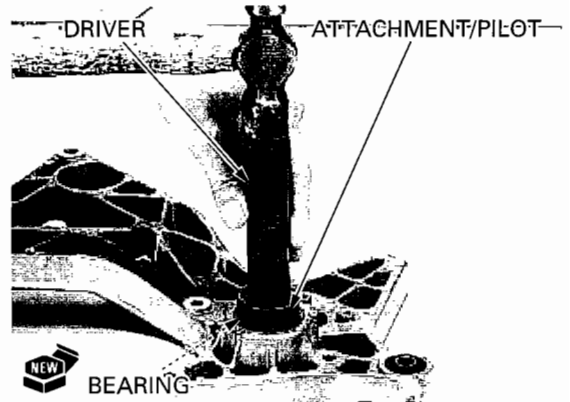
Remove the bearing from the swingarm.



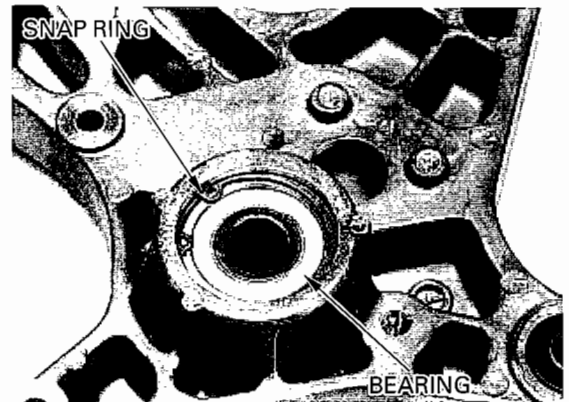
Drive in a new bearing squarely until it is fully seated, using the special tools.

TOOLS:

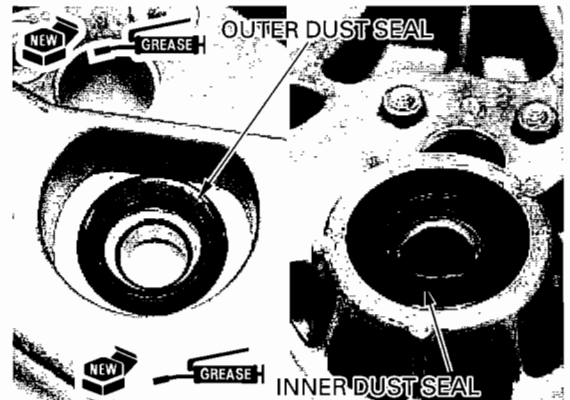
Driver	07749-0010000
Attachment, 42 × 47 mm	07746-0010300
Pilot, 17 mm	07746-0040400



Install the snap ring to the groove of the swingarm securely.



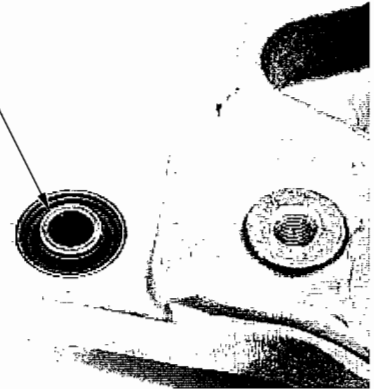
Apply grease to the new dust seal lips and install them to the swingarm until they are flush with the swingarm surfaces.



REAR WHEEL/SUSPENSION

Check the bushing for wear or damage.

BUSHING



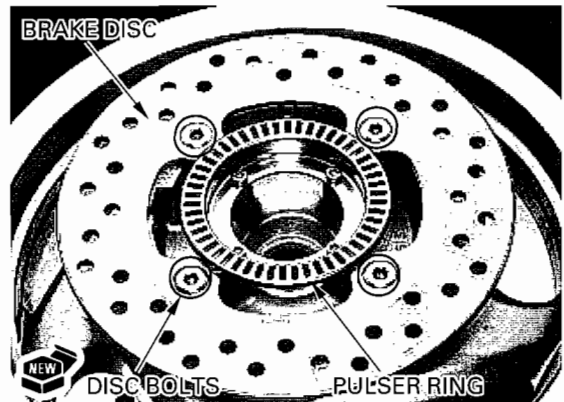
ASSEMBLY

Install the brake disc onto the wheel hub with the marked side facing out.

Install new brake disc bolts and tighten them to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m , 31 lbf·ft)

Install the pulser ring (ABS type only: page 21-21).



INSTALLATION

Install the rear wheel onto the final gear shaft, aligning the splines.

Install the inner side collar.
Apply grease to the 3-mm groove in the final gear shaft.

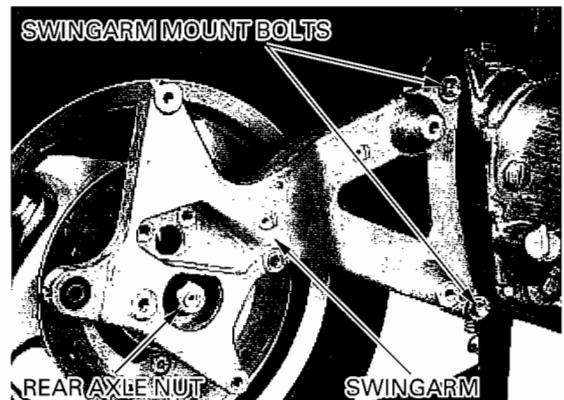


Install the swingarm and mount bolts.
Tighten the mount bolts to the specified torque.

TORQUE: 49 N·m (5.0 kgf·m , 36 lbf·ft)

Install and tighten the rear axle nut to the specified torque.

TORQUE: 118 N·m (12.0 kgf·m , 87 lbf·ft)



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

TORQUE: 39 N·m (4.0 kgf·m , 29 lbf·ft)

Install the rear brake caliper to the swingarm.
Install and tighten new rear brake caliper mount bolts to the specified torque.

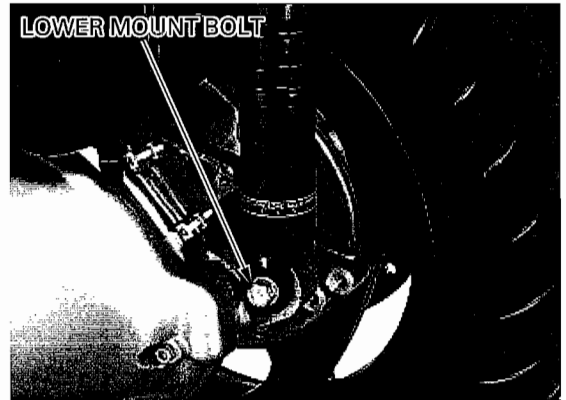
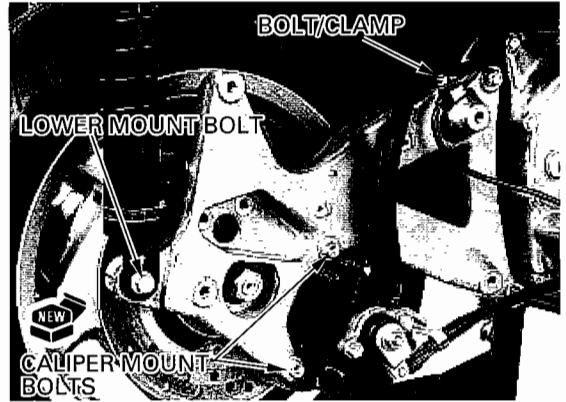
TORQUE: 31 N·m (3.2 kgf·m , 23 lbf·ft)

Install the brake hose clamp to the swingarm and tighten the bolt securely.

Install the rear wheel speed sensor (ABS type only: page 21-21).

Install the muffler (page 2-13).

After installation, check the clearance between the pulser ring and wheel speed sensor (ABS type only: page 21-21).



REAR SHOCK ABSORBER

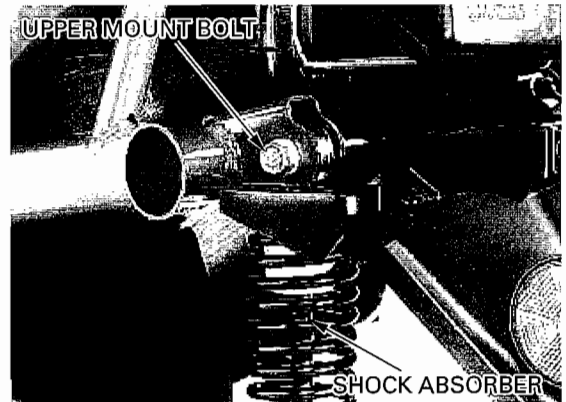
REMOVAL

Remove the body cover (page 2-5).

Support the scooter securely on its center stand.
Support the engine unit securely with a hoist or equivalent.

Remove the rear shock absorber lower mount bolt.

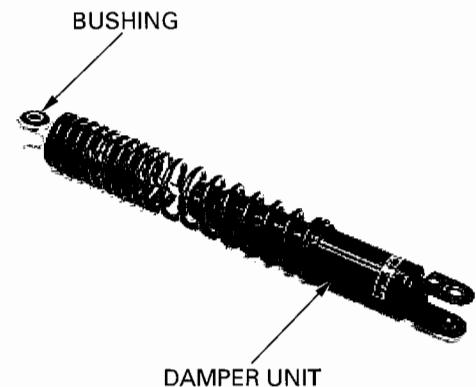
Remove the rear shock absorber upper mount bolt and shock absorber.



INSPECTION

Check the damper unit for leakage or other damage.
Check the upper joint bushing for wear or damage.

Replace the shock absorber assembly if necessary.



REAR WHEEL/SUSPENSION

INSTALLATION

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

TORQUE: 39 N·m (4.0 kgf·m , 29 lbf·ft)

Install and tighten the lower mount bolt to the specified torque.

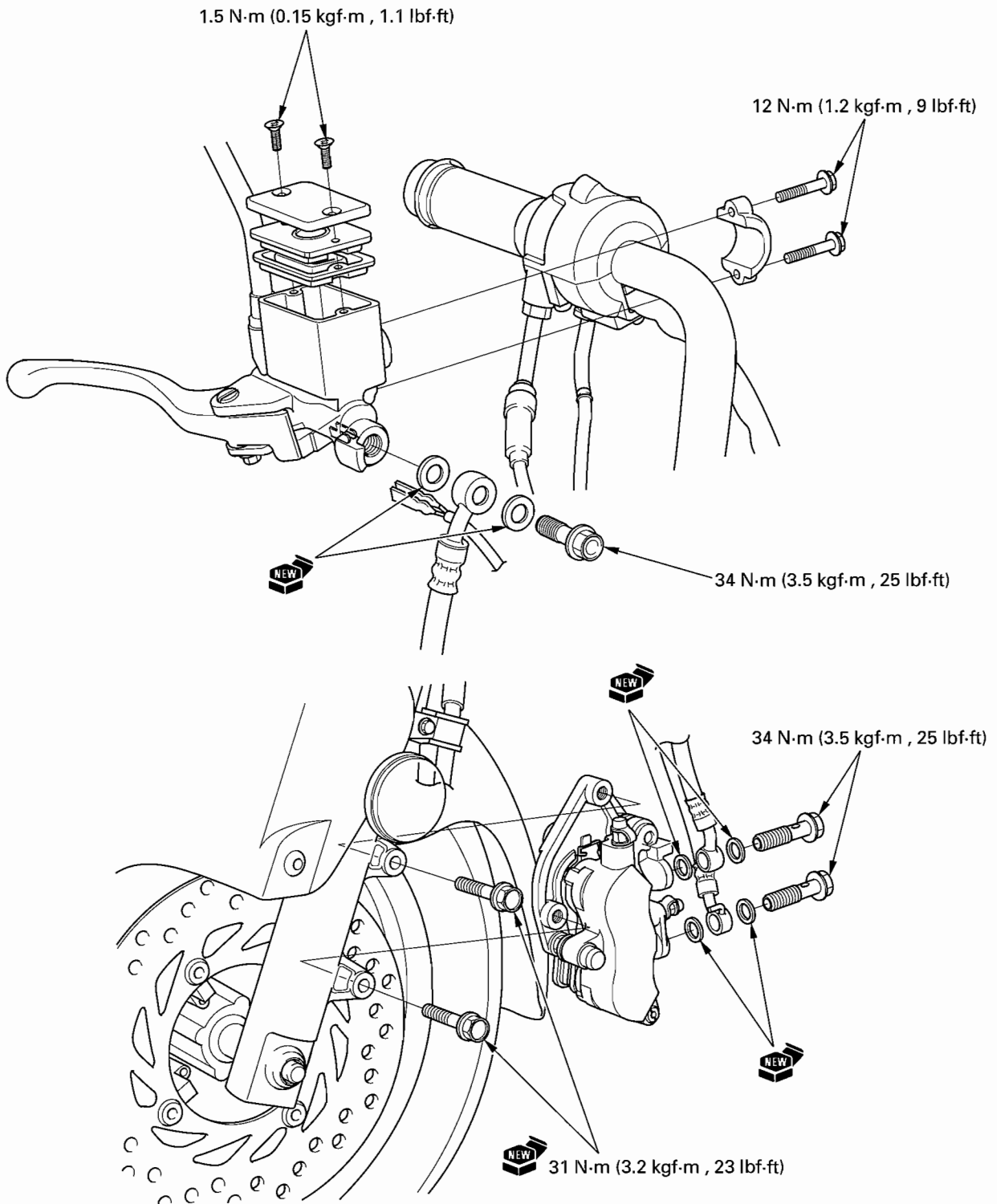
TORQUE: 39 N·m (4.0 kgf·m , 29 lbf·ft)

Install the body cover (page 2-6).



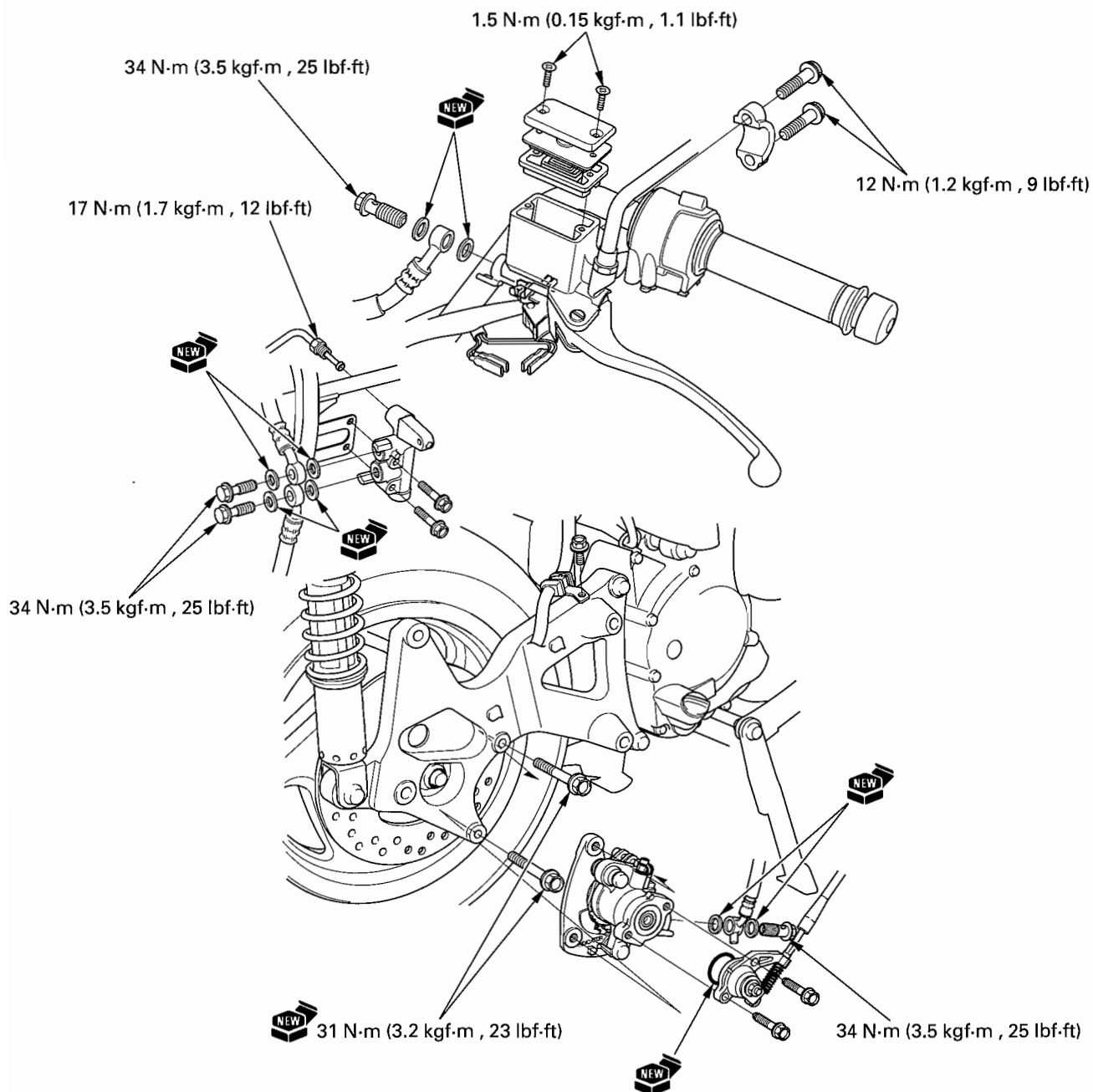
MEMO

HYDRAULIC BRAKE



16. HYDRAULIC BRAKE

SERVICE INFORMATION	16-2	REAR MASTER CYLINDER	16-17
TROUBLESHOOTING	16-3	DELAY VALVE	16-22
BRAKE FLUID REPLACEMENT/ AIR BLEEDING	16-4	FRONT BRAKE CALIPER	16-23
BRAKE PAD/DISC	16-9	REAR BRAKE CALIPER	16-27
FRONT MASTER CYLINDER	16-13	PARKING BRAKE	16-33



HYDRAULIC BRAKE

SERVICE INFORMATION

GENERAL

⚠ CAUTION

Frequent inhalation of brake pad dust, regardless of material composition could be hazardous to your health.

- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

- A contaminated brake disc or pad reduces stopping power. Discard contaminated parts and clean a contaminated disc with a high quality brake degreasing agent.
- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.
- This section covers maintenance of the front and rear hydraulic brake system.
- Never allow contaminations (e.g., dirt, water) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid as they may not be compatible.
- Always check brake operation before riding the vehicle.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Front	Specified brake fluid	Honda DOT 4 Brake Fluid	—————	
	Brake disc thickness	3.8 – 4.2 (0.15 – 0.17)	3.5 (0.14)	
	Brake disc runout	—————	0.30 (0.012)	
	Master cylinder I.D.	11.000 – 11.043 (0.4331 – 0.4348)	11.055 (0.4352)	
	Master piston O.D.	10.957 – 10.984 (0.4314 – 0.4324)	10.945 (0.4309)	
	Caliper cylinder I.D.	Upper	27.000 – 27.050 (1.0630 – 1.0650)	27.060 (1.0654)
		Middle	22.650 – 22.700 (0.8917 – 0.8937)	22.710 (0.8941)
		Lower	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
	Caliper piston O.D.	Upper	26.935 – 26.968 (1.0604 – 1.0617)	26.910 (1.0594)
		Middle	22.585 – 22.618 (0.8892 – 0.8905)	22.560 (0.8882)
Lower		25.335 – 25.368 (0.9974 – 0.9987)	25.320 (0.9968)	
Rear	Specified brake fluid	Honda DOT 4 Brake Fluid	—————	
	Brake disc thickness	4.8 – 5.2 (0.19 – 0.20)	4.0 (0.16)	
	Brake disc runout	—————	0.30 (0.012)	
	Master cylinder I.D.	14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)	
	Master piston O.D.	13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)	
	Caliper cylinder I.D.	33.960 – 34.010 (1.3370 – 1.3390)	34.020 (1.3394)	
	Caliper piston O.D.	33.878 – 33.928 (1.3338 – 1.3357)	33.870 (1.3335)	

TORQUE VALUES

Brake caliper bleeder	5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)	
Brake pad pin	18 N·m (1.8 kgf·m , 13 lbf·ft)	
Brake pad pin plug	2.5 N·m (0.25 kgf·m , 1.8 lbf·ft)	
Master cylinder reservoir cap screw	1.5 N·m (0.15 kgf·m , 1.1 lbf·ft)	
Brake lever pivot bolt	5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)	
Brake lever pivot nut	5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)	
Brake light switch screw	1.2 N·m (0.12 kgf·m , 0.9 lbf·ft)	
Master cylinder holder bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Brake hose oil bolt	34 N·m (3.5 kgf·m , 25 lbf·ft)	
Brake pipe nut	17 N·m (1.7 kgf·m , 12 lbf·ft)	
Front caliper mount bolt	31 N·m (3.2 kgf·m , 23 lbf·ft)	ALOC bolt: replace with a new one.
Front caliper body B bolt	32 N·m (3.3 kgf·m , 24 lbf·ft)	ALOC bolt: replace with a new one.
Front caliper pin bolt	23 N·m (2.3 kgf·m , 17 lbf·ft)	Apply a locking agent to the threads.
Front caliper bracket pin bolt	13 N·m (1.3 kgf·m , 9 lbf·ft)	Apply a locking agent to the threads.
Rear caliper mount bolt	31 N·m (3.2 kgf·m , 23 lbf·ft)	ALOC bolt: replace with a new one.
Rear caliper bolt	23 N·m (2.3 kgf·m , 17 lbf·ft)	
Rear caliper pin bolt	27 N·m (2.8 kgf·m , 20 lbf·ft)	

TOOLS

Snap ring pliers	07914-SA50001
Brake spring compressor	07HAE-SG00100

TROUBLESHOOTING

Brake lever soft or spongy

- Air in the hydraulic system
- Low brake fluid level
- Clogged fluid passage
- Contaminated brake disc/pad
- Warped/deformed brake disc
- Worn brake disc/pad
- Sticking/worn master cylinder piston
- Contaminated master cylinder
- Contaminated caliper
- Caliper not sliding properly
- Leaking hydraulic system
- Worn caliper piston seal
- Worn master cylinder piston cups
- Bent brake lever

Brake lever hard

- Clogged/restricted brake system
- Sticking/worn caliper piston
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever

Brake drag

- Contaminated brake disc/pad
- Worn brake disc/pad
- Warped/deformed brake disc
- Caliper not sliding properly

BRAKE FLUID REPLACEMENT/ AIR BLEEDING

NOTICE

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled. When using a commercially available brake bleeder, follow the manufacturer's operating instructions.

BRAKE FLUID DRAINING

Make sure the master cylinder is parallel to the ground before removing the reservoir cover.

FRONT:

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

Connect a bleed hose to the upper bleed valve.

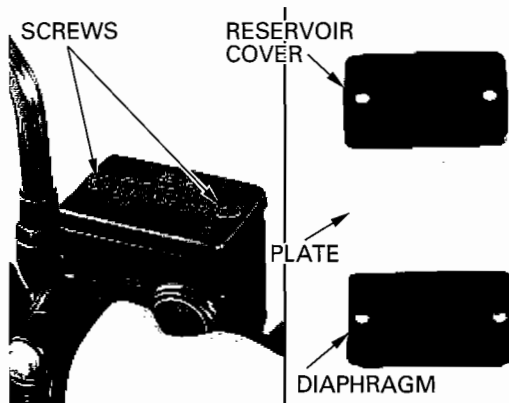
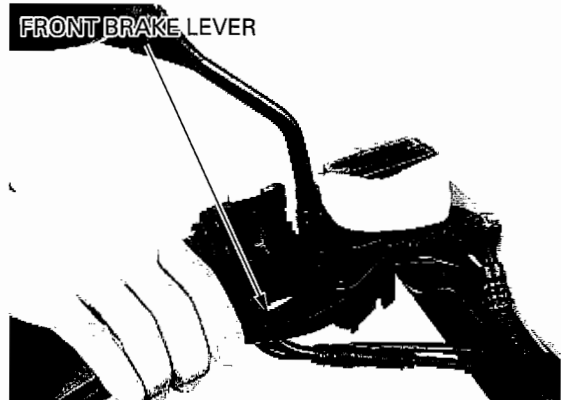
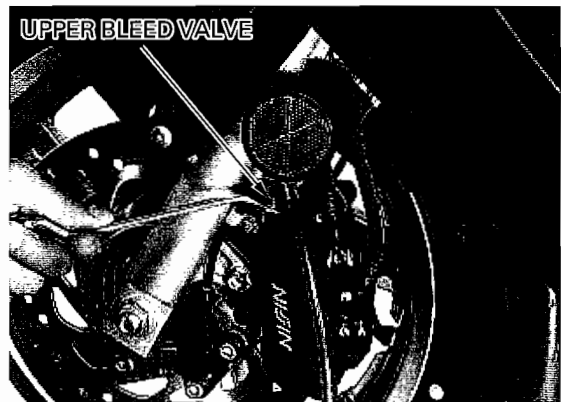
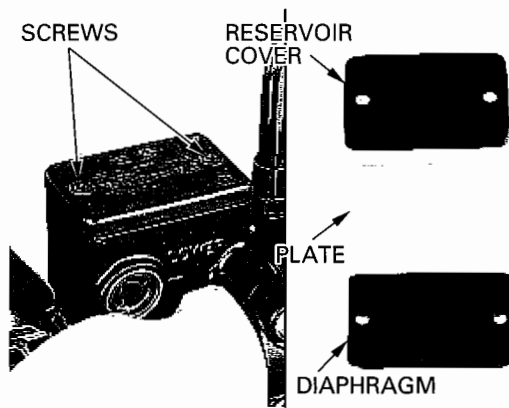
Loosen the upper bleed valve and pump the brake lever.

Stop operating the brake when no more fluid flows out of the upper bleed valve.

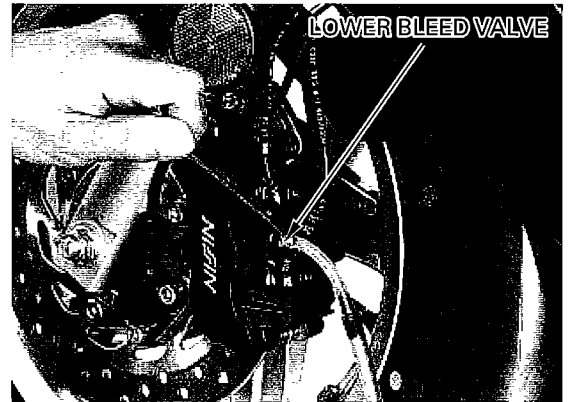
REAR (LINKED):

Remove the muffler (page 2-14).

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



Connect a bleed hose to the front caliper lower bleed valve.



Loosen the front caliper lower bleed valve and pump the brake lever.
Stop operating the brake when no more fluid flows out of the front caliper lower bleed valve.

Tighten the front caliper lower bleed valve securely.



Connect a bleed hose to the rear caliper bleed valve.

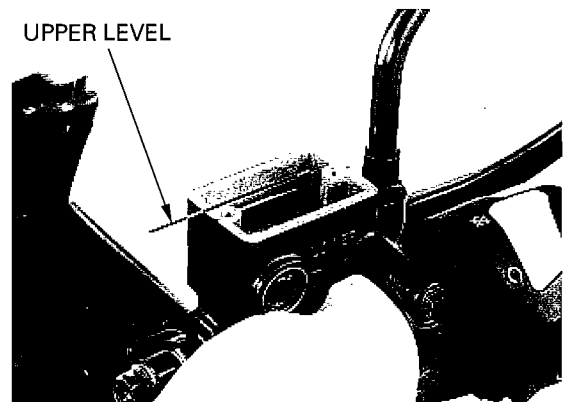
In the same manner as at the caliper bleed valve (above procedure), drain the brake fluid from the rear caliper bleed valve.



BRAKE FLUID FILLING/AIR BLEEDING

- *Do not mix different types of fluid since they are not compatible.*

Fill the master cylinder with DOT 4 brake fluid to the upper level.



HYDRAULIC BRAKE

Connect a commercially available brake bleeder to the front caliper upper bleed valve.

Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.

When using a brake bleeding tool, follow the manufacturer's operating instructions.

If air enters the bleeder from around the bleed valve threads, seal the threads with teflon tape. Pump the brake bleeder and loosen the front caliper upper bleed valve. Add fluid when the fluid level in the master cylinder is low to prevent drawing air into the system. Repeat the above procedures until no air bubbles appear in the plastic hose.

Close the front caliper upper bleed valve and operate the front brake lever. If it is still spongy, bleed the system again.

If a brake bleeder is not available, perform the following procedure.

Pressurize the system with the lever until there are no air bubbles in the fluid flowing out of the small hole in the reservoir. There should be resistance when the lever is pulled.

Do not release the brake lever until the bleed valve has been closed.

1. Pump the brake lever several times, then squeeze the brake lever all the way and loosen the bleed valve 1/4 of a turn. Wait several seconds and close the bleed valve.
2. Release the brake lever slowly until the bleed valve has been closed.
3. Repeat steps 1 and 2 until there are no air bubbles in the bleed hose.

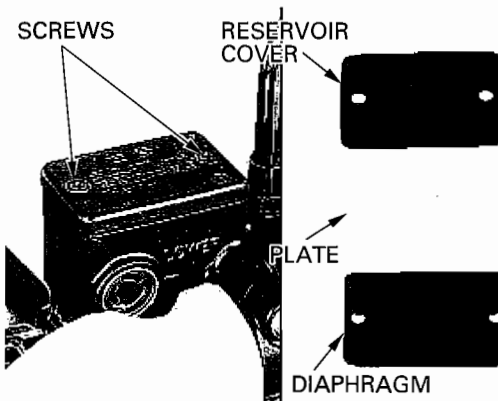
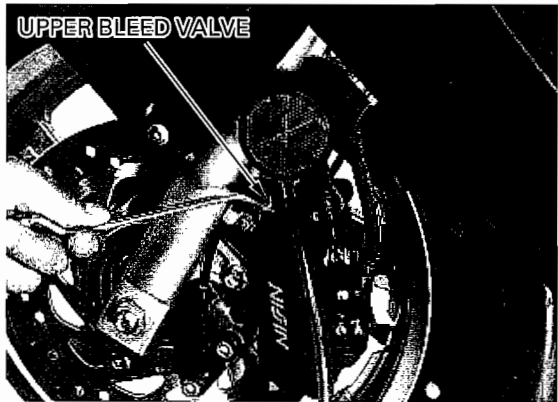
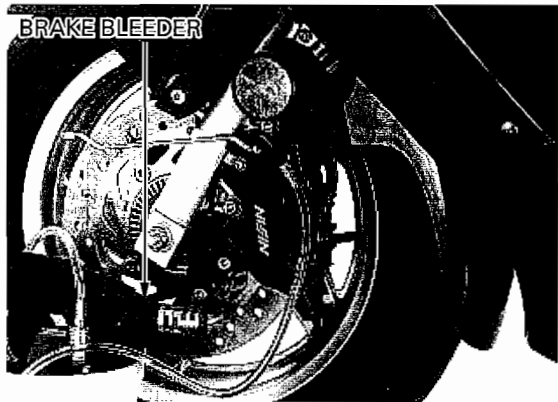
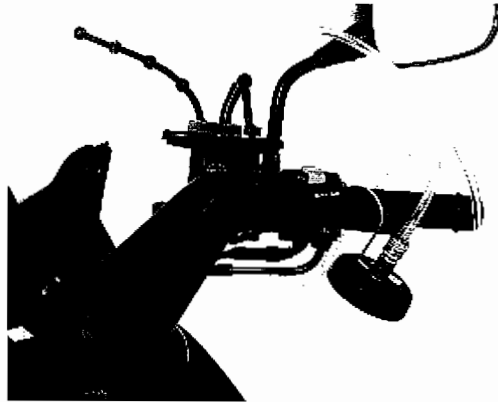
After bleeding the air completely, tighten the bleed valves to the specified torque.

TORQUE: 5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)

Fill the reservoir to the casting ledge with DOT 4 brake fluid to the upper level.

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

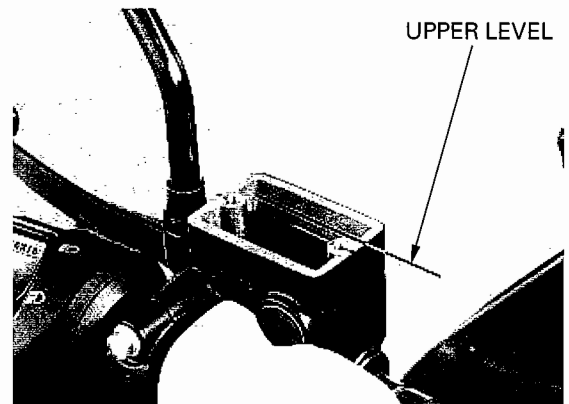
TORQUE: 1.5 N·m (0.15 kgf·m , 1.1 lbf·ft)



REAR (LINKED): FLUID FEEDING

Fill the master cylinder with DOT 4 brake fluid to the upper level.

Operate the brake lever several times to bleed any air from the master cylinder.

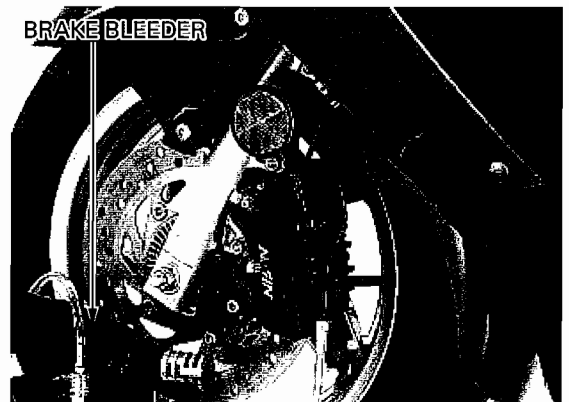


- (1) Connect a commercially available brake bleeder to the front caliper lower bleed valve.

If air enters the bleeder from around the bleed valve threads, seal the threads with teflon tape.

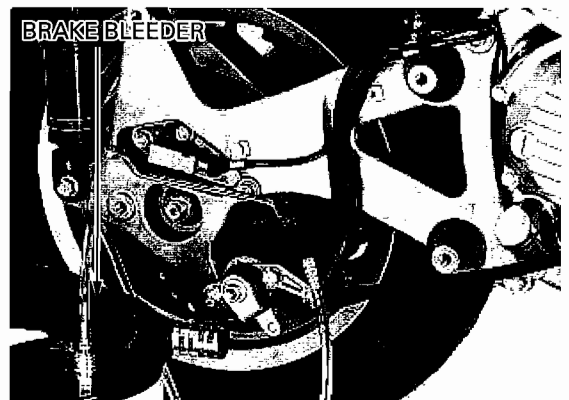
1. Pump the brake bleeder and loosen the front caliper upper bleed valve. Add fluid when the fluid level in the master cylinder is low to prevent drawing air into the system.
2. Repeat the above procedures until a sufficient amount of fluid flows out from the caliper lower bleed valve with no bubbles.

It is not a problem if the fluid flowing out from the lower bleed valve contains air bubbles because the lines will be bled in later steps.



- (2) Connect a commercially available brake bleeder to the rear caliper bleed valve.
Repeat steps 1 and 2 for rear caliper bleed valve.

Next air bleed the system (page 16-8).



HYDRAULIC BRAKE

If a brake bleeder is not available, perform the following procedure.

Do not release the brake lever until the bleed valve has been closed.

- (1) Connect a bleed hose to the front caliper lower bleed valve.

1. Pump the brake lever five to ten times quickly, then squeeze the brake lever all the way and loosen the front caliper lower bleed valve and loosen the bleed valve 1/4 of a turn. Wait several seconds and close the bleed valve.

Release the brake lever slowly and wait several seconds after it reaches the end of its travel.

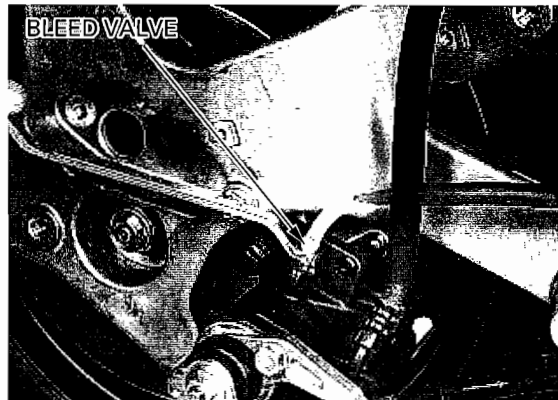
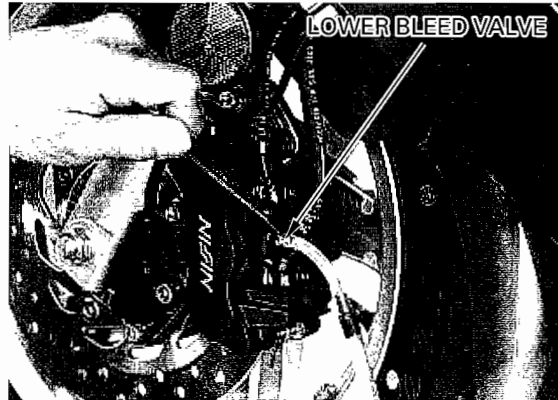
2. Repeat the above procedure until sufficient amount of fluid flows out from the caliper lower bleed valve.

It is not a problem if the fluid flowing out from the lower bleed valve contains air bubbles because the lines will be bled in later steps.

- (2) Connect a bleed hose to the rear caliper bleed valve.

Repeat steps 1 and 2 for rear caliper bleed valve.

Next air bleed the system (see below).



AIR BLEEDING

- (1) Connect a bleed hose to the rear caliper bleed valve.

1. Pump the brake lever five to ten times quickly, then squeeze the brake lever all the way and loosen the front caliper lower bleed valve and loosen the bleed valve 1/4 of a turn. Wait several seconds and close the bleed valve.

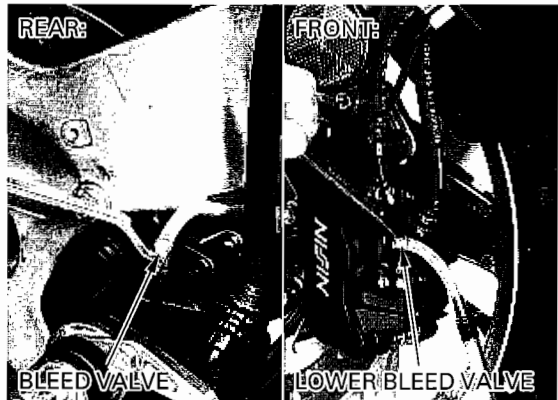
Release the brake lever slowly and wait several seconds after it reaches the end of its travel.

2. Repeat the above procedures until air bubbles do not appear in the transparent hose.

- (2) Connect a bleed hose to the front caliper lower bleed valve.

Repeat steps 1 and 2 for front caliper upper bleed valve.

Note that you may feel strong resistance on the rear (combined) brake lever during pumping to bleed air from the caliper. This symptom is caused by the delay valve function. Be sure to squeeze the brake lever fully on this side.



After there are no more air bubbles in the fluid, repeat air bleeding procedure about two or three times at each bleed valve.

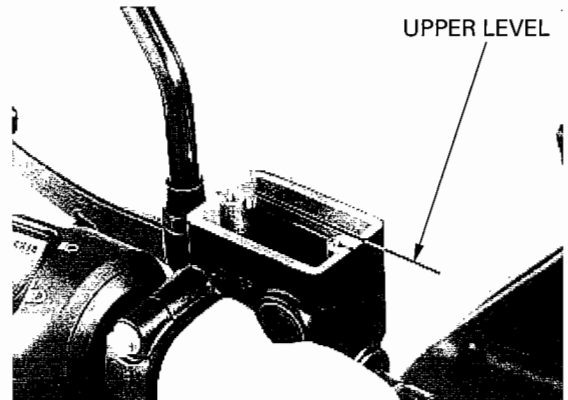
Make sure the bleed valves are closed and then operate the brake lever. If it still feels spongy, bleed the system again.

After bleeding the air completely, tighten the bleed valves to the specified torque.

TORQUE: 5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)

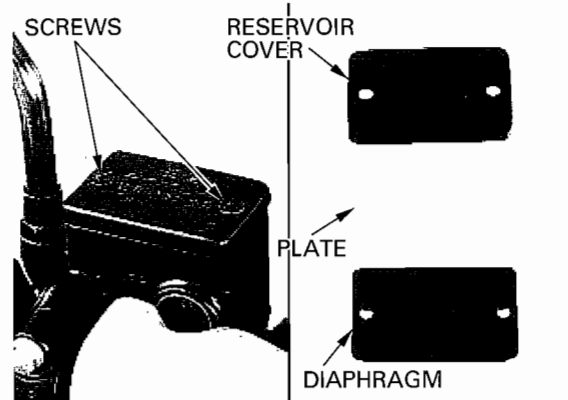


Fill the reservoir to the casting ledge with DOT 4 brake fluid to the upper level.



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

TORQUE: 1.5 N·m (0.15 kgf·m , 1.1 lbf·ft)

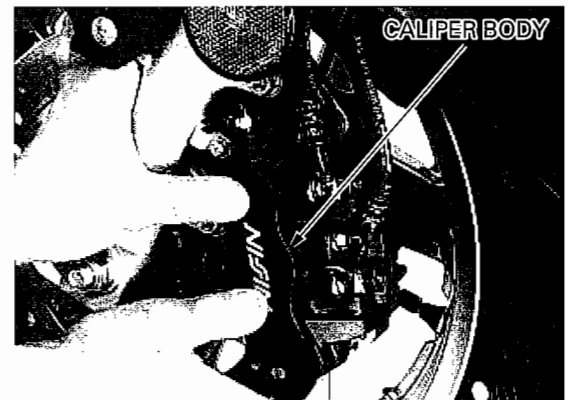


BRAKE PAD/DISC

BRAKE PAD REPLACEMENT

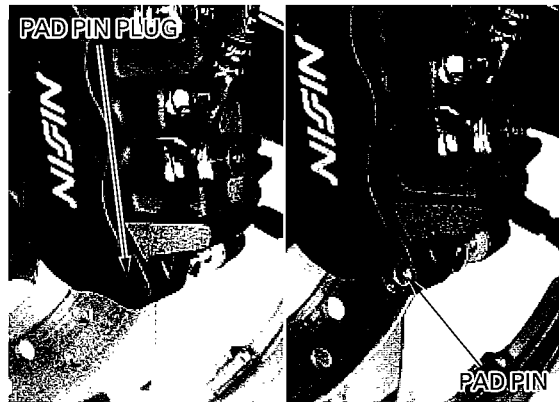
Always replace the brake pads in pairs to ensure even disc pressure.

FRONT: Push the caliper pistons all the way in by pushing the caliper body inward to provide clearance for new pads.



HYDRAULIC BRAKE

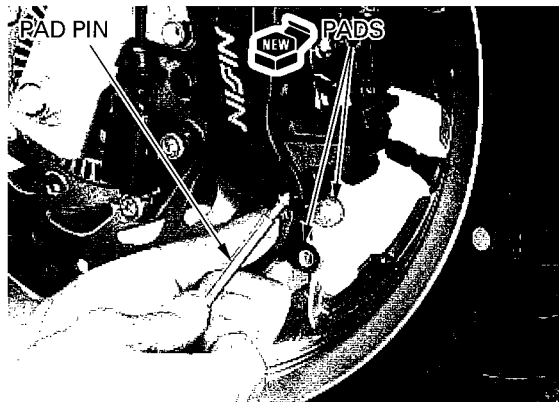
Remove the pad pin plug and loosen the pad pin.



Remove the pad pin and the brake pads.

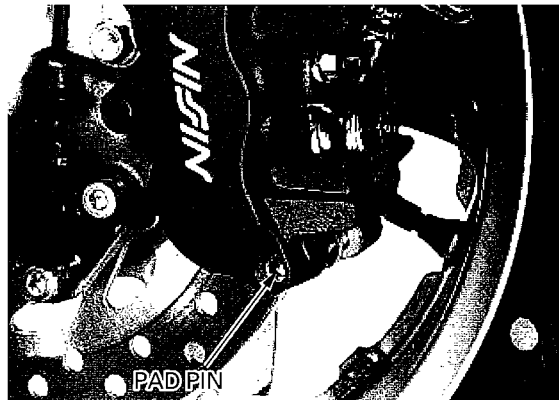
Make sure the pad spring is installed in position. Install new pads so the ends rest on the pad retainer on the bracket properly.

Install the pad pin by pushing the pads against the pad spring to align the pad pin holes in the pads and caliper.

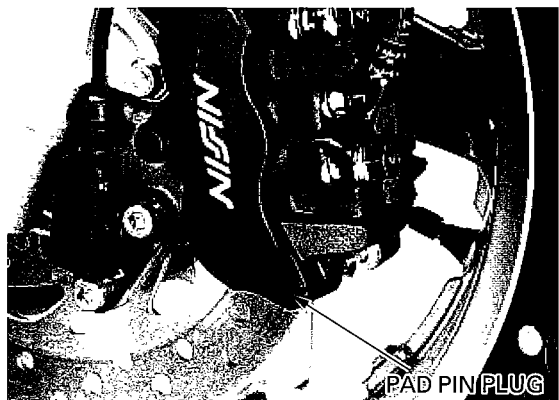


Tighten the pad pin to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m , 13 lbf·ft)

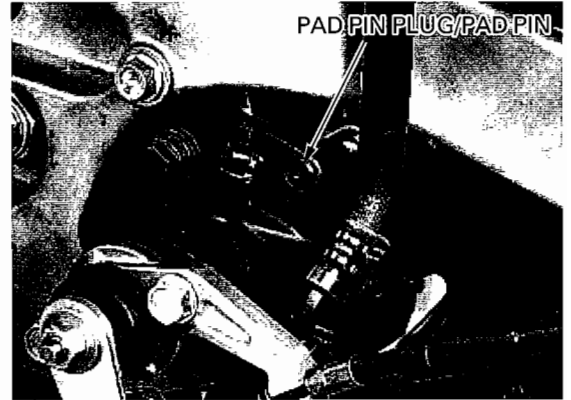


Install the pad pin plug securely.

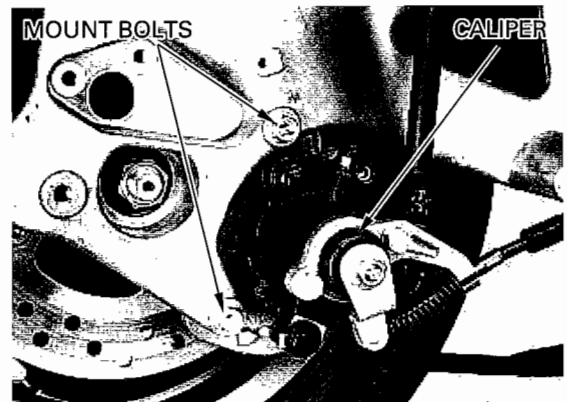


Always replace the brake pads in pairs to ensure even disc pressure.

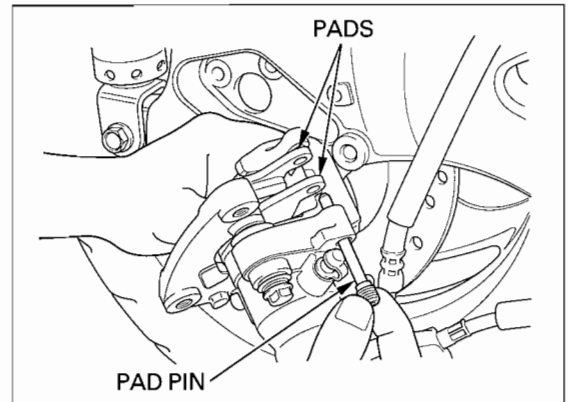
REAR:
Remove the muffler (page 2-14).
Remove the pad pin plug and loosen the pad pin.



Remove the mount bolts and rear caliper from the swingarm.



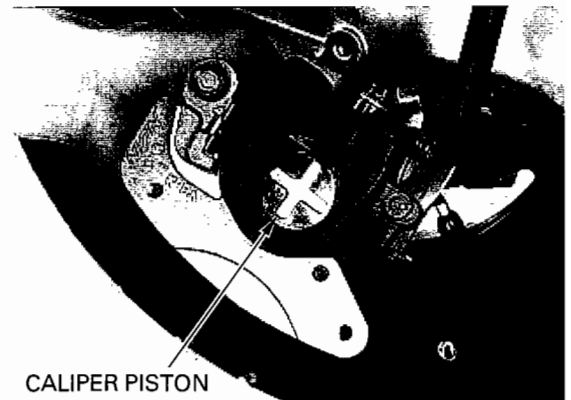
Remove the pad pin and brake pads.



Clean the inside of the caliper especially around the caliper piston.

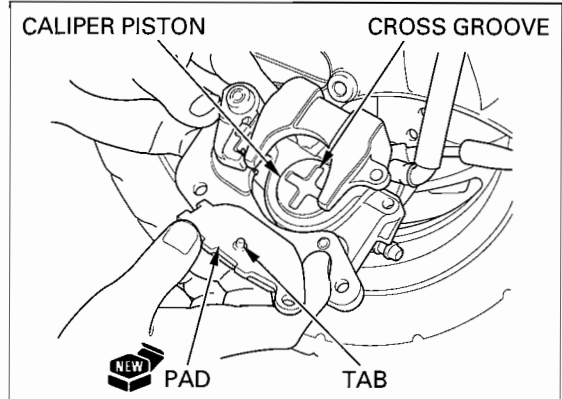
Be careful not to damage the caliper piston.

Turn in the caliper piston clockwise to the caliper body.
Make sure the pad spring is installed in position.



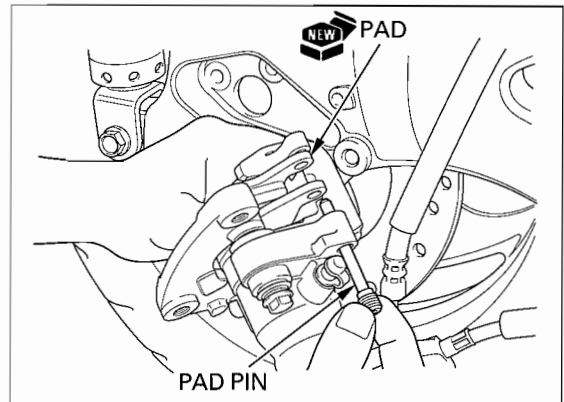
HYDRAULIC BRAKE

Install a new pad (caliper piston side) so the end rests on the pad retainer on the bracket properly and align the tab on the pad with the cross groove in the caliper piston.



Install a new pad (bracket side) so the end rests on the pad retainer on the bracket properly.

Install the pad pin by pushing the pads against the pad spring to align the pad pin holes in the pads and caliper.



Be careful not to damage the brake pads.

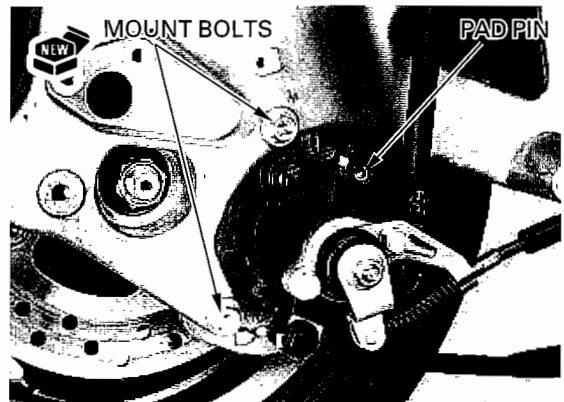
Install the rear caliper to the swingarm while inserting the brake disc between the pads.

Install and tighten new rear caliper mount bolts to the specified torque.

TORQUE: 31 N·m (3.2 kgf·m , 23 lbf·ft)

Tighten the pad pin to the specified torque.

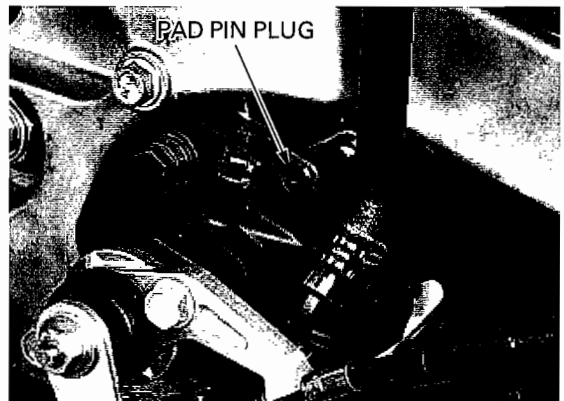
TORQUE: 18 N·m (1.8 kgf·m , 13 lbf·ft)



Install and tighten the pad pin plug to the specified torque.

TORQUE: 2.5 N·m (0.25 kgf·m , 1.8 lbf·ft)

Install the muffler (page 2-13).



BRAKE DISC INSPECTION

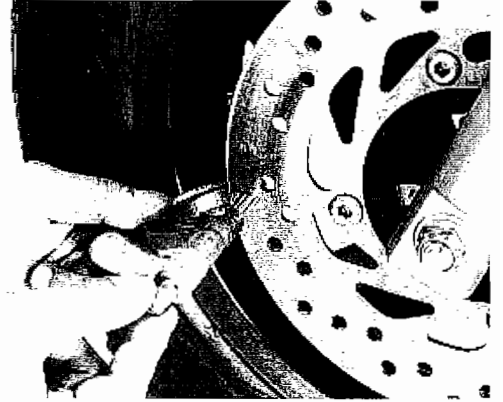
Visually inspect the brake disc for damage or cracks.

Measure the brake disc thickness.

SERVICE LIMITS: Front: 3.5 mm (0.14 in)

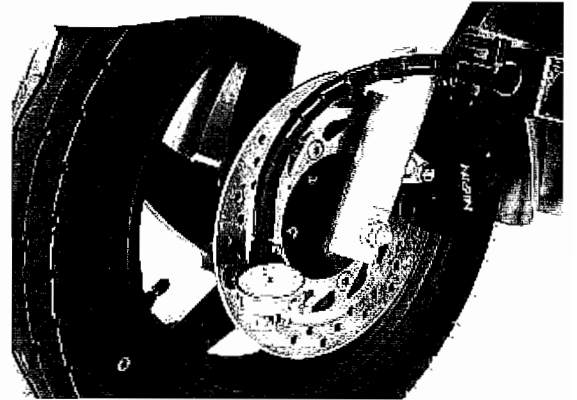
Rear: 4.0 mm (0.16 in)

Replace the brake disc if the smallest measurement is less than the service limit.



Measure the brake disc warpage.

SERVICE LIMIT: 0.30 mm (0.012 in)



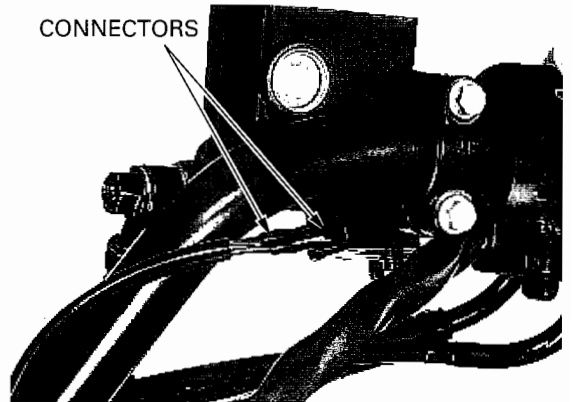
FRONT MASTER CYLINDER

REMOVAL

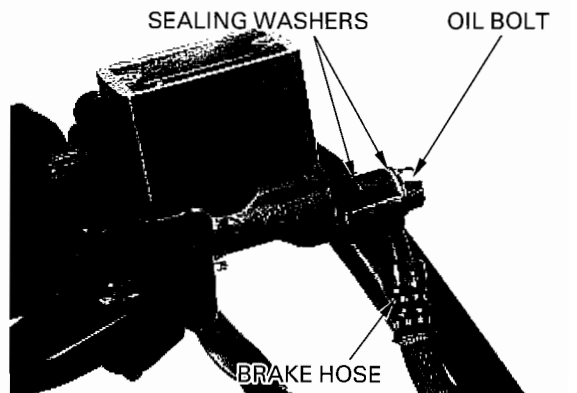
When removing the brake hose bolt, cover the end of the hose to prevent contamination. Secure the hose to prevent fluid from leaking out.

Remove the handlebar cover (page 2-14).
Remove the rearview mirror (page 14-16).
Drain the front brake hydraulic system (page 16-4).

Disconnect the brake light switch connectors.

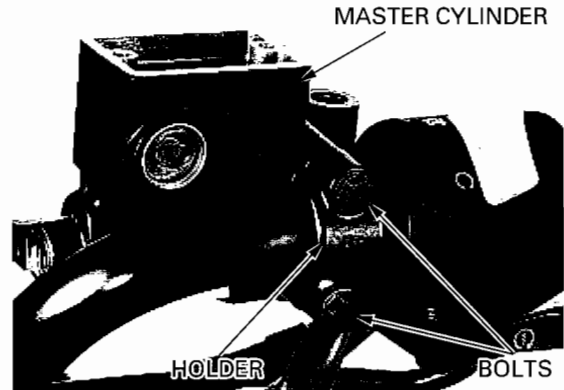


Remove the brake hose oil bolt, sealing washers and brake hose eyelet.



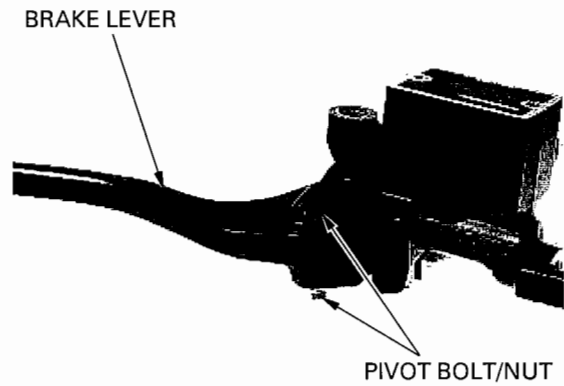
HYDRAULIC BRAKE

Remove the bolts from the master cylinder holder and remove the master cylinder assembly.

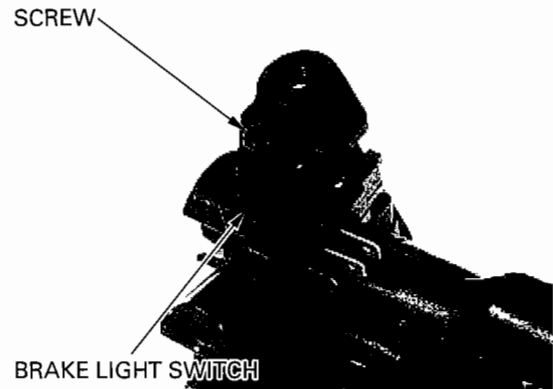


DISASSEMBLY

Remove the brake lever pivot bolt and nut.
Remove the brake lever.



Remove the screw and brake light switch.



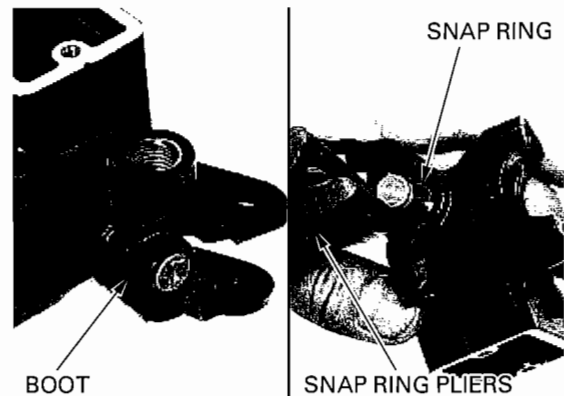
Remove the boot.

Remove the snap ring from the master cylinder body using the special tool as shown.

TOOL:
Snap ring pliers 07914-SA50001

Remove the master piston and spring.

Clean the inside of the cylinder and reservoir with brake fluid.



INSPECTION

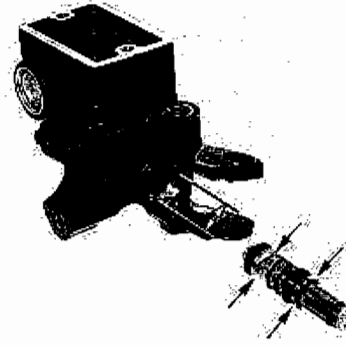
Check the piston boot, primary cup and secondary cup for fatigue or damage.
 Check the master cylinder and piston for abnormal scratches.

Measure the master cylinder I.D..

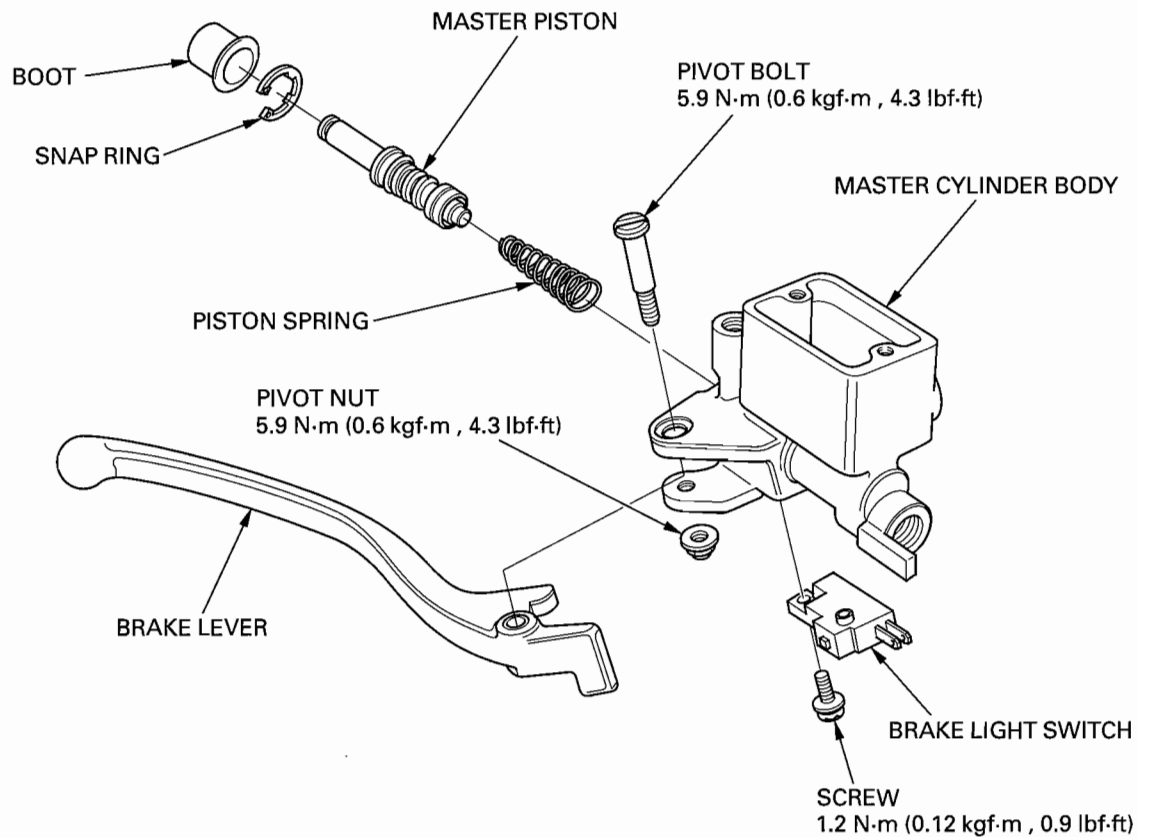
SERVICE LIMIT: 11.055 mm (0.4352 in)

Measure the master cylinder piston O.D..

SERVICE LIMIT: 10.945 mm (0.4309 in)



ASSEMBLY



NOTICE

Replace the piston, spring, snap ring and boot as a set; do not substitute individual parts.

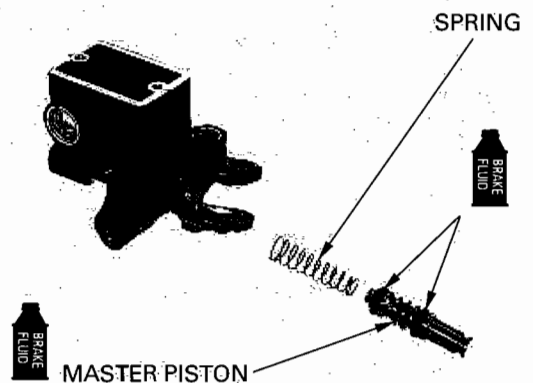
Coat all parts with clean brake fluid before assembly.

Dip the piston in brake fluid.

Install the spring to the piston.

When installing the cups, do not allow the lips to turn inside out.

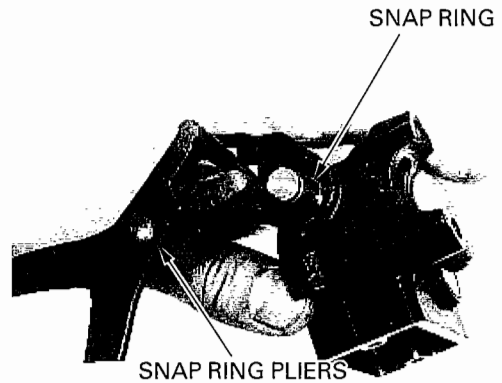
Install the piston assembly into the master cylinder.



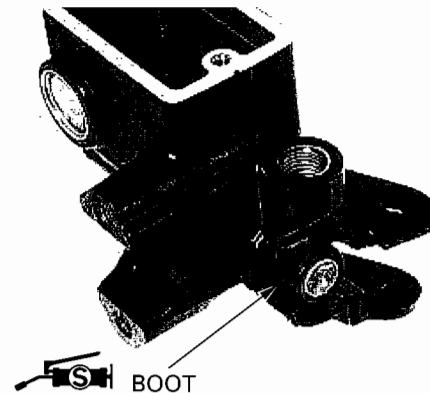
HYDRAULIC BRAKE

Be certain the snap ring is firmly seated in the groove.
Install the snap ring using the special tool.

TOOL:
Snap ring pliers 07914-SA50001

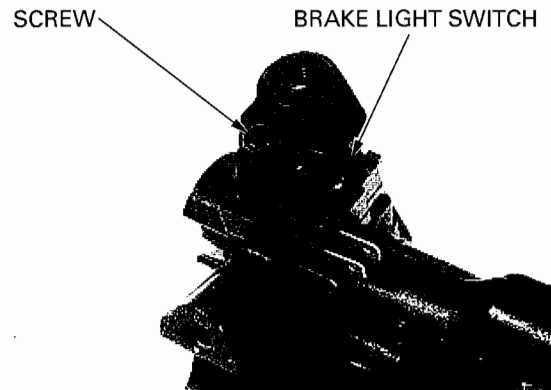


Apply silicone grease to the inside of the boot.
Install the boot.



Install the brake light switch and tighten the screw to the specified torque.

TORQUE: 1.2 N·m (0.12 kgf·m , 0.9 lbf·ft)



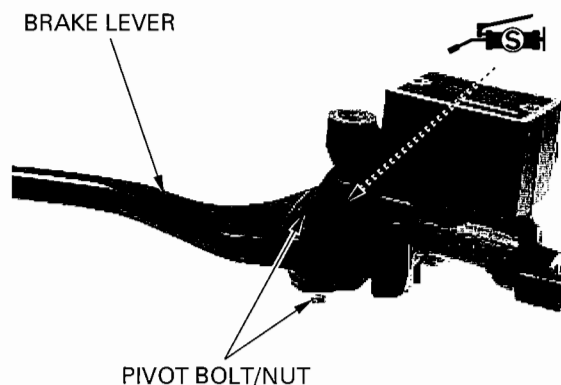
Apply silicone grease to the master piston tip.
Install the brake lever.

Apply silicone grease to the brake lever pivot bolt sliding surface.
Install and tighten the pivot bolt to the specified torque.

TORQUE: 5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)

Install and tighten the pivot nut to the specified torque.

TORQUE: 5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)

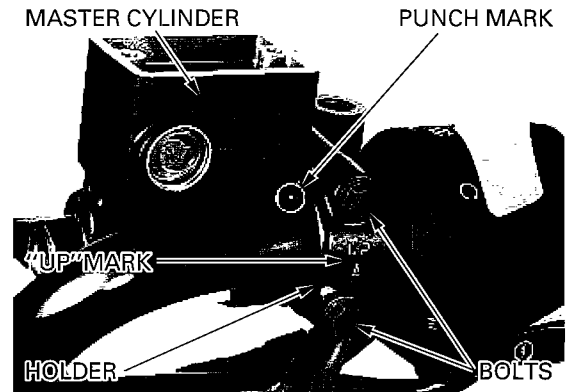


INSTALLATION

Place the master cylinder assembly on the handlebar.
Align the end of the master cylinder with the punch mark on the handlebar.

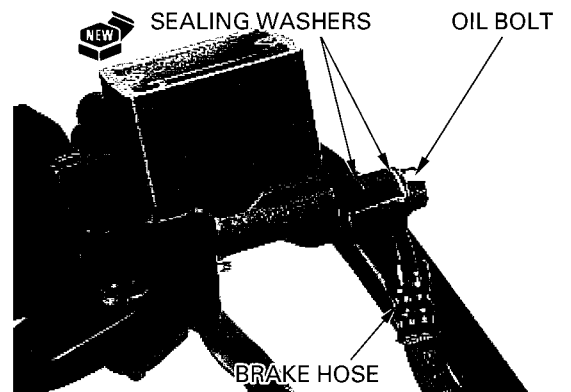
Install the master cylinder holder with the "UP" mark facing up.
Tighten the upper bolt first, then the lower bolt.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)



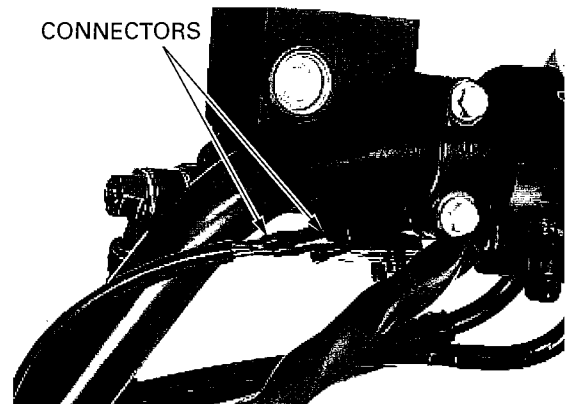
Rest the brake hose eyelet against the stopper.
Install the brake hose eyelet with the oil bolt and new sealing washers.
Tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m , 25 lbf·ft)



Connect the brake light switch connectors.

Fill the reservoir to the upper level and bleed the brake system (page 16-4).
Install the rearview mirror (page 14-22).
Install the handlebar cover (page 2-14).



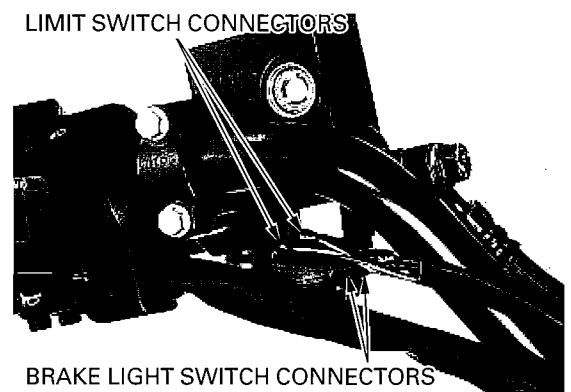
REAR MASTER CYLINDER

REMOVAL

When removing the brake hose bolt, cover the end of the hose to prevent contamination. Secure the hose to prevent fluid from leaking out.

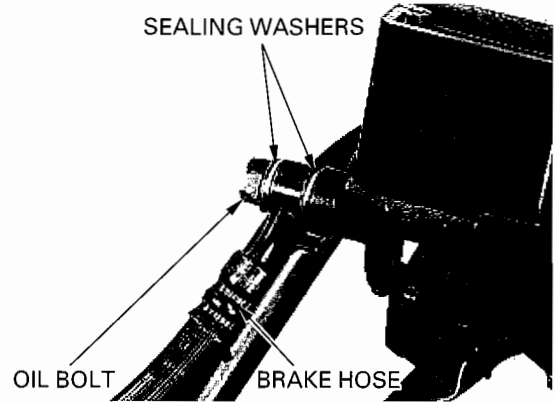
Remove the handlebar cover (page 2-14).
Remove the rearview mirror (page 14-16).
Drain the front brake hydraulic system (page 16-4).

Disconnect the brake light switch connectors.
Disconnect the limit switch connectors.

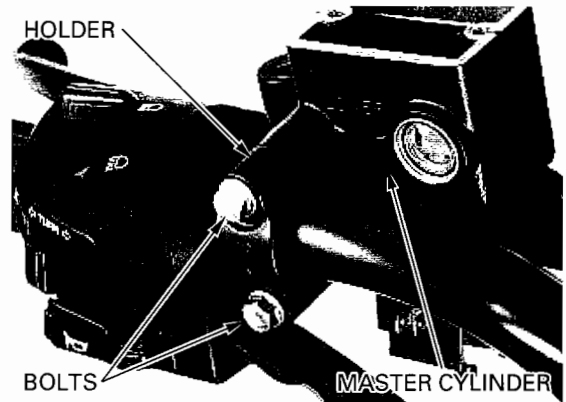


HYDRAULIC BRAKE

Remove the brake hose oil bolt, sealing washers and brake hose eyelet.

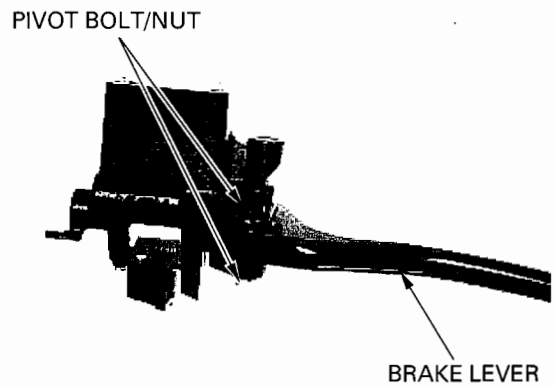


Remove the bolts from the master cylinder holder and remove the master cylinder assembly.

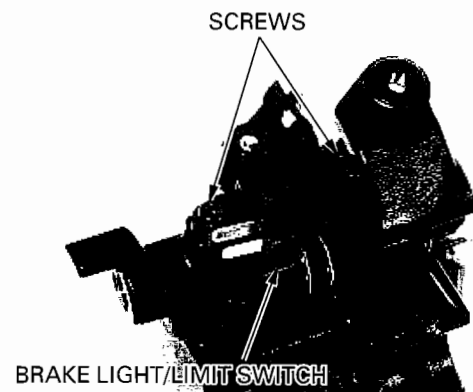


DISASSEMBLY

Remove the brake lever pivot bolt and nut.
Remove the brake lever.



Remove the screws and brake light/limit switch.



Remove the boot.

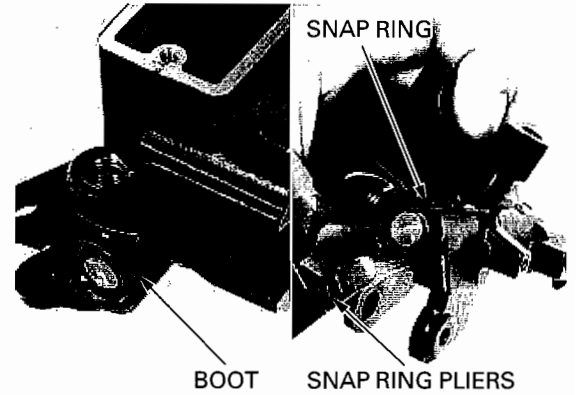
Remove the snap ring from the master cylinder body using the special tool as shown.

TOOL:

Snap ring pliers 07914-SA50001

Remove the master piston, cup and spring.

Clean the inside of the cylinder and reservoir with brake fluid.



INSPECTION

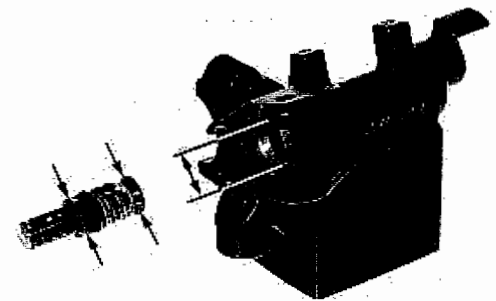
Check the piston boot, primary cup and secondary cup for fatigue or damage.
Check the master cylinder and piston for abnormal scratches.

Measure the master cylinder I.D..

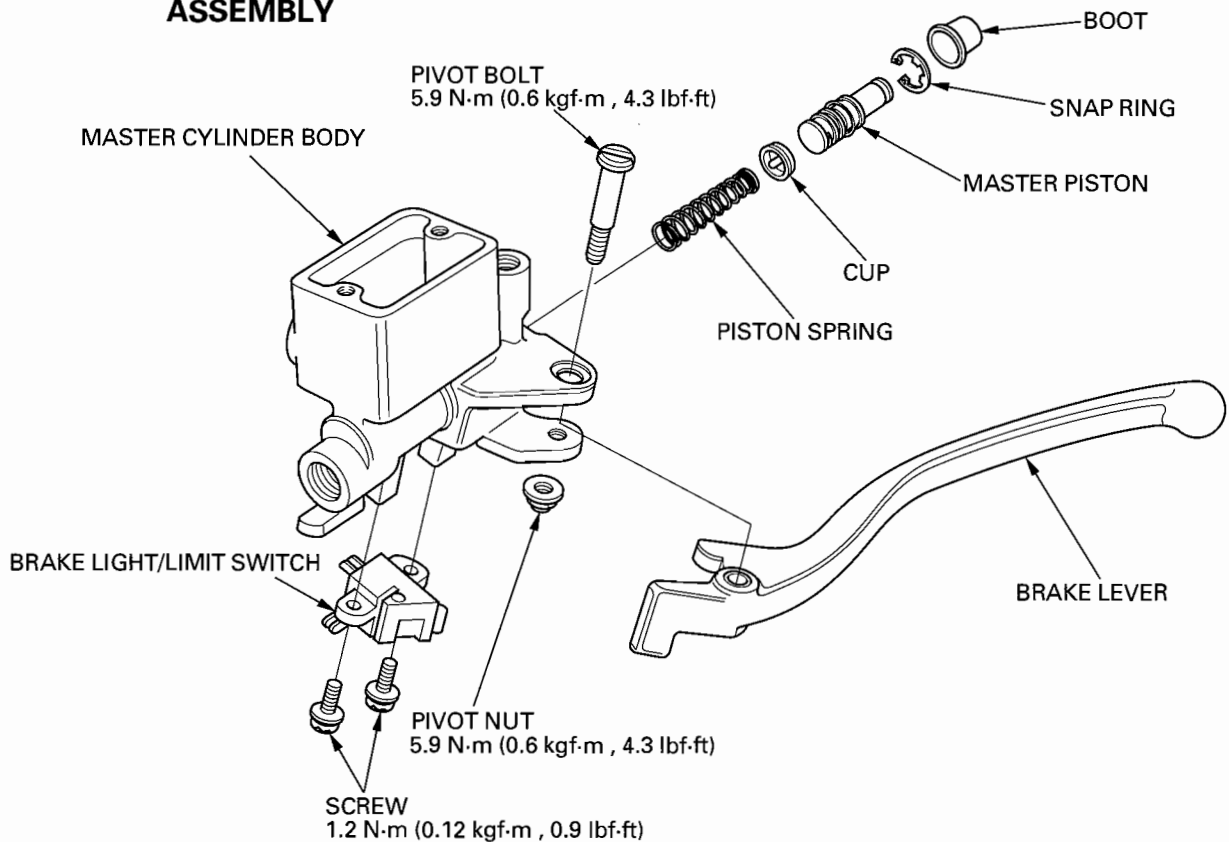
SERVICE LIMIT: 14.055 mm (0.5533 in)

Measure the master cylinder piston O.D..

SERVICE LIMIT: 13.945 mm (0.5490 in)



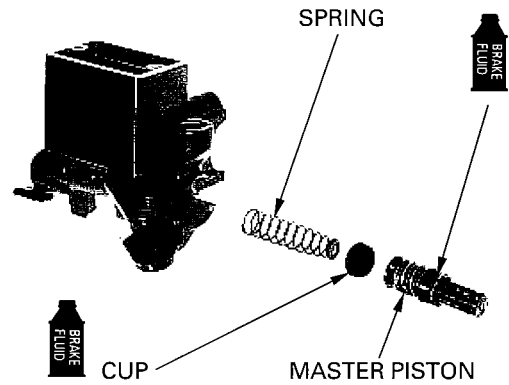
ASSEMBLY



HYDRAULIC BRAKE

Replace the piston, spring, snap ring and boot as a set; do not substitute individual parts.

Coat all parts with clean brake fluid before assembly.
Dip the piston in brake fluid.
Install the spring and cup to the piston.
When installing the cups, do not allow the lips to turn inside out.
Install the piston assembly into the master cylinder.

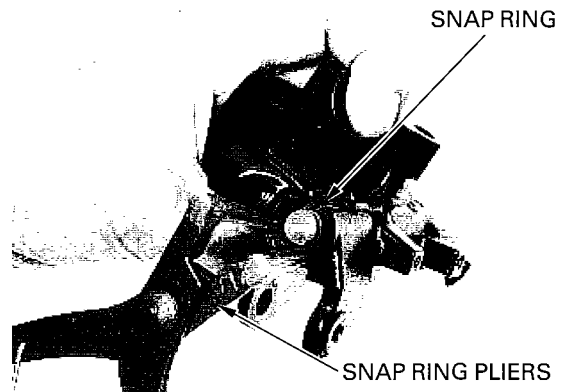


Be certain the snap ring is firmly seated in the groove.
Install the snap ring using a special tool.

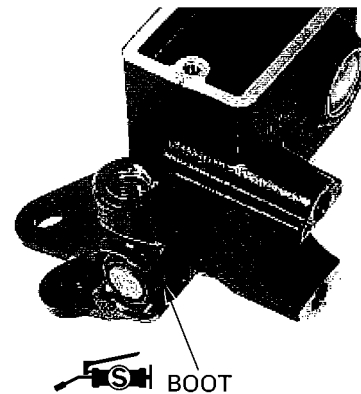
TOOL:

Snap ring pliers

07914-SA50001

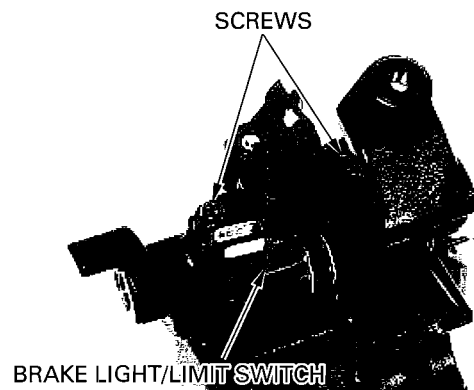


Apply silicone grease to the inside of the boot.
Install the boot.



Install the brake light/limit switch and tighten the screws to the specified torque.

TORQUE: 1.2 N·m (0.12 kgf·m, 0.9 lbf·ft)



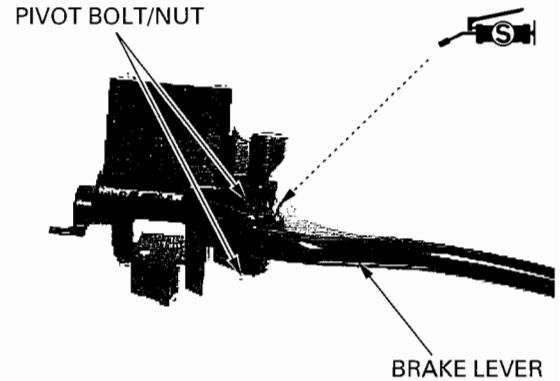
Apply silicone grease to the master piston tip.
Install the brake lever.

Apply silicone grease to the brake lever pivot bolt sliding surface.
Install and tighten the pivot bolt to the specified torque.

TORQUE: 5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)

Install and tighten the pivot nut to the specified torque.

TORQUE: 5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)

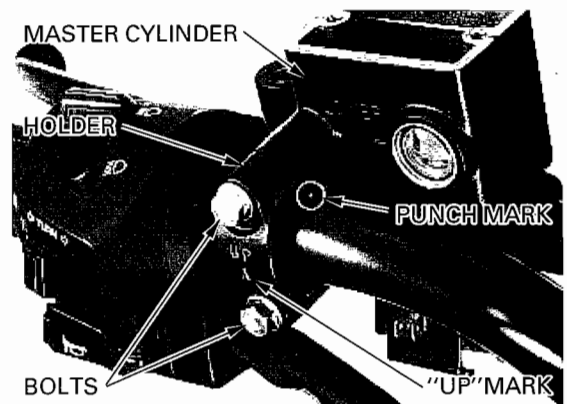


INSTALLATION

Place the master cylinder assembly on the handlebar.
Align the end of the master cylinder with the punch mark on the handlebar.

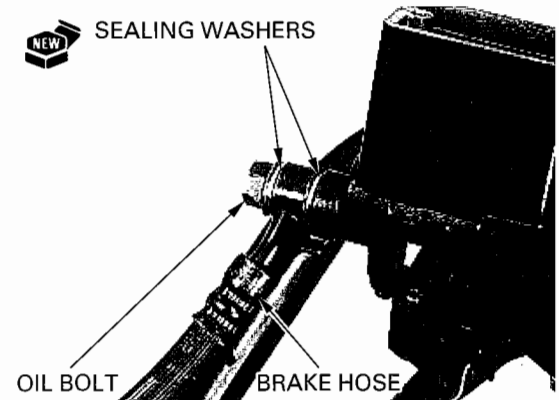
Install the master cylinder holder with the "UP" mark facing up.
Tighten the upper bolt first, then the lower bolt.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)



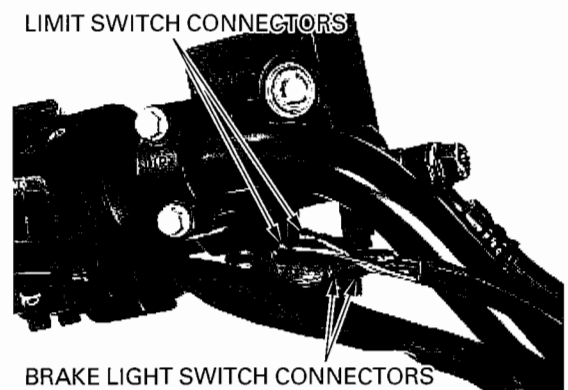
Rest the brake hose eyelet against the stopper.
Install the brake hose eyelet with the oil bolt and new sealing washers.
Tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m , 25 lbf·ft)



Connect the brake light switch connectors.
Connect the limit switch connectors.

Fill the reservoir to the upper level and bleed the brake system (page 16-4).
Install the rearview mirror (page 14-22).
Install the handlebar cover (page 2-14).



DELAY VALVE

REMOVAL

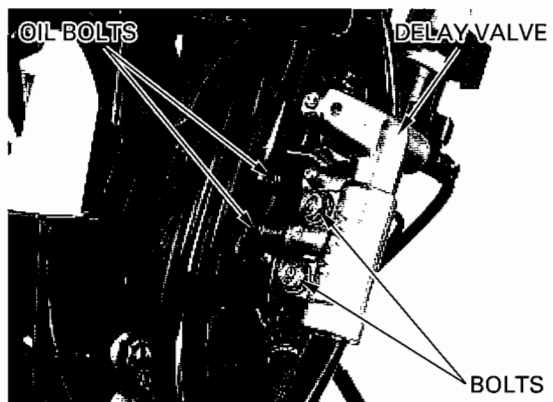
When removing the brake hose bolt, cover the end of the hose to prevent contamination. Secure the hose to prevent fluid from leaking out.

Remove the front cover (page 2-11).
Remove the inner cover (page 2-13).
Drain the front brake hydraulic system (page 16-4).

Loosen the nuts and brake pipe.



Loosen the brake hose oil bolts.
Remove the bolts and delay valve.



Remove the brake hose oil bolts, sealing washers and brake hose eyelets.

Installation is in the reverse order of removal.

NOTE:

- At installation, replace the sealing washers with new ones.
- Tighten the brake hose bolt with the hose eyelet against the stopper on the delay valve.

TORQUE:

Brake pipe nut: 17 N·m (1.7 kgf·m , 12 lbf·ft)

Brake hose bolt: 34 N·m (3.5 kgf·m , 25 lbf·ft)



Fill the reservoir the upper level and bleed the brake system (page 16-4).

Install the front cover (page 2-12).

Install the inner cover (page 2-13).

FRONT BRAKE CALIPER

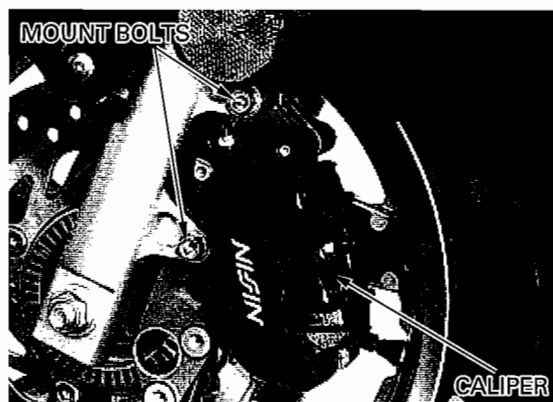
REMOVAL

Drain the front brake hydraulic system (page 16-4).
 Remove the brake pads (page 16-9).
 Remove the front wheel speed sensor (ABS type only; page 21-22).

Remove the oil bolts, sealing washers and brake hoses from the brake caliper.



Remove the mount bolts and front brake caliper.

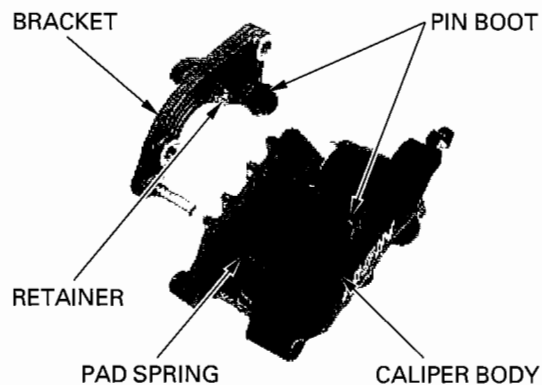


DISASSEMBLY

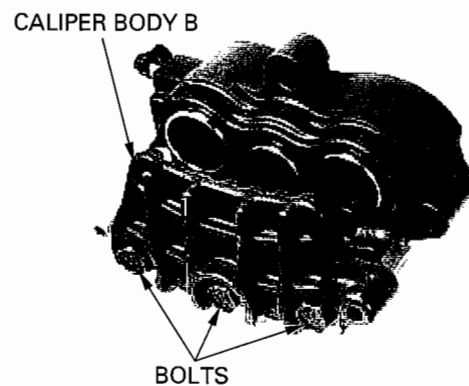
Remove the caliper bracket from the caliper body.

Remove the pin boot and retainer from the bracket.

Remove the pin boot and pad spring from the caliper body.



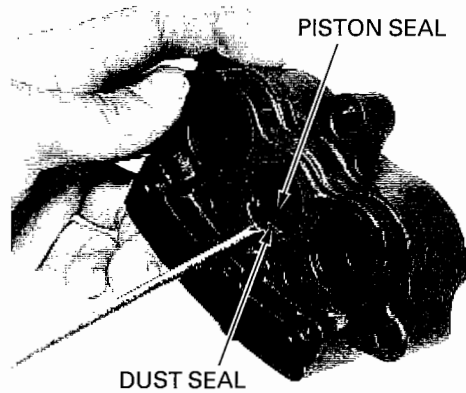
Remove the bolts and caliper body B.



HYDRAULIC BRAKE

Do not use high pressure air or bring the nozzle too close to the inlet. Place the shop towel over the pistons. Position the caliper body with the pistons down and apply small squirts of air pressure to the fluid inlets to remove the pistons.

Be careful not to damage the piston sliding surface. Push the dust seals and piston seals in and lift them out. Clean the seal grooves, caliper pistons and caliper piston sliding surfaces with clean brake fluid.



INSPECTION

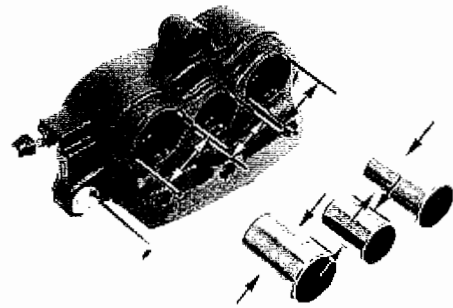
Check the caliper cylinder and pistons for scoring, scratches or damage.

Measure the caliper cylinder I.D..

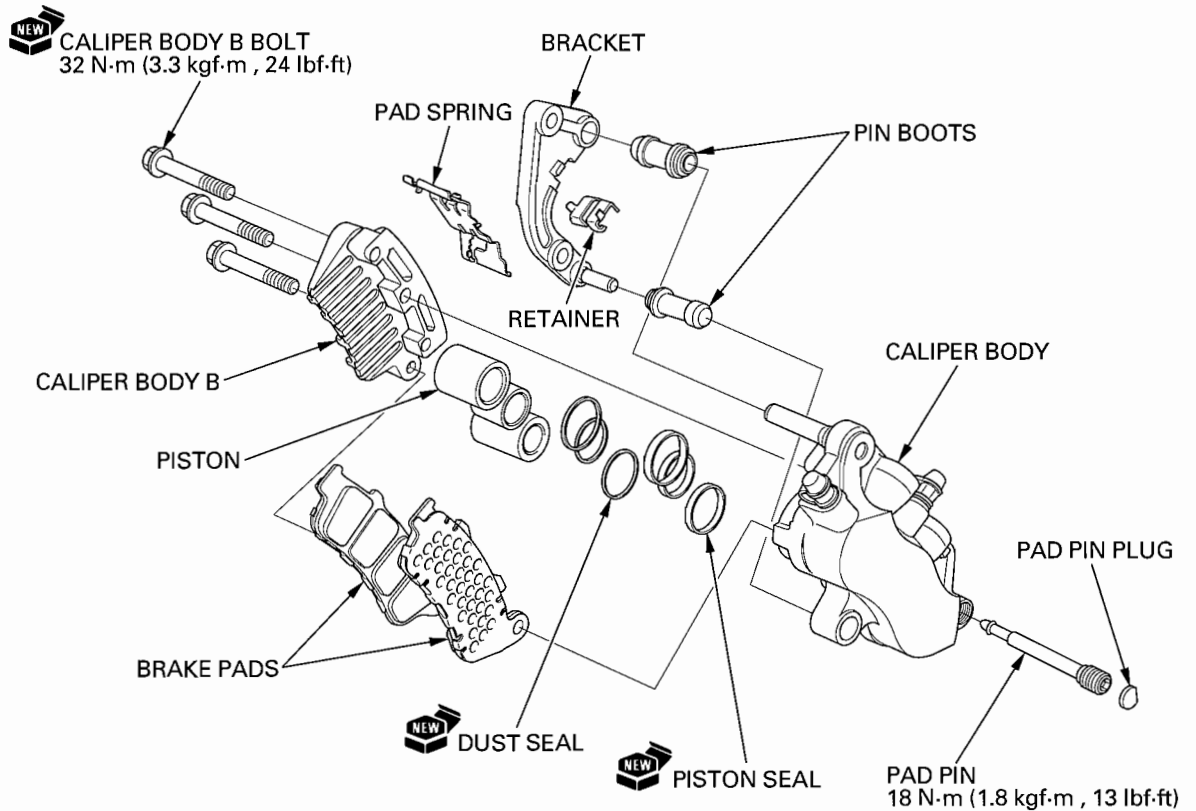
SERVICE LIMITS: Upper: 27.060 mm (1.0654 in)
Middle: 22.710 mm (0.8941 in)
Lower: 25.460 mm (1.0024 in)

Measure the caliper piston O.D..

SERVICE LIMITS: Upper: 26.910 mm (1.0594 in)
Middle: 22.560 mm (0.8882 in)
Lower: 25.320 mm (0.9968 in)



ASSEMBLY

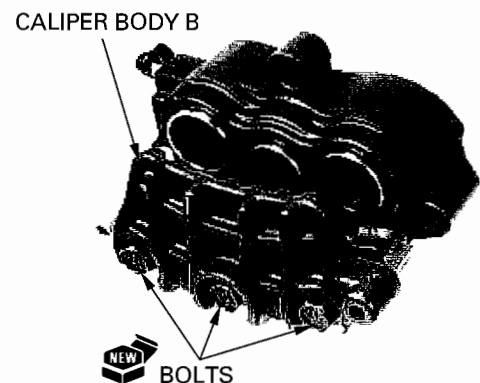
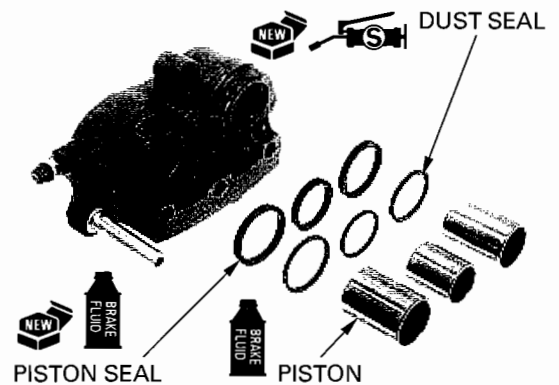


Replace the dust seal and piston seal with a new one.
 Replace the caliper and bracket pin boots if they are worn, deteriorated or damaged.
 Apply silicone grease to the boot inner surface.
 Make sure each part is free from the dust or dirt before reassembly.

Coat a new piston seal with clean brake fluid.
 Coat a new dust seal with silicone grease.
 Install the piston seal and dust seal into the groove of the caliper body.
 Coat the caliper piston with clean brake fluid and install them into the caliper cylinder with their closed ends facing the caliper.

Install the caliper body B.
 Install and tighten new caliper body B bolts to the specified torque.

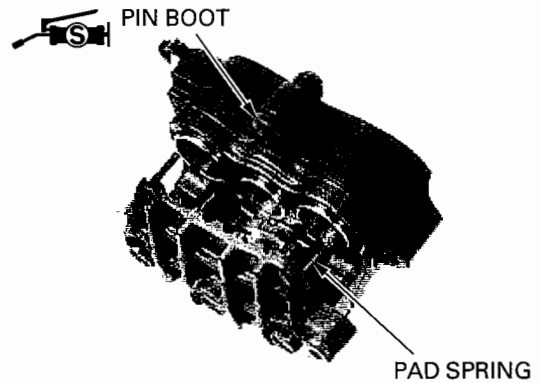
TORQUE: 32 N·m (3.3 kgf·m , 24 lbf·ft)



HYDRAULIC BRAKE

Install the pad spring into the caliper body as shown.

Apply silicone grease to the inside of the boot.
Install the boot to the caliper.

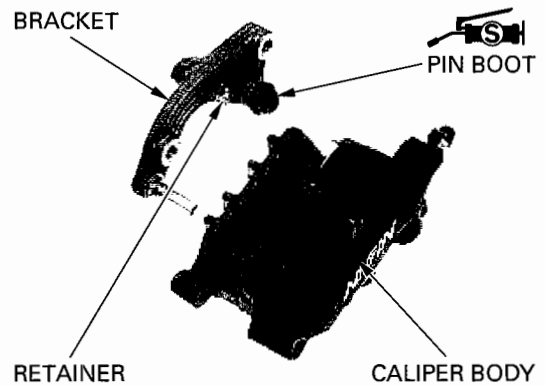


Apply silicone grease to the inside of the boot.
Install the boot to the caliper bracket.

Install the retainer to the caliper bracket.

Install the caliper bracket to the caliper.

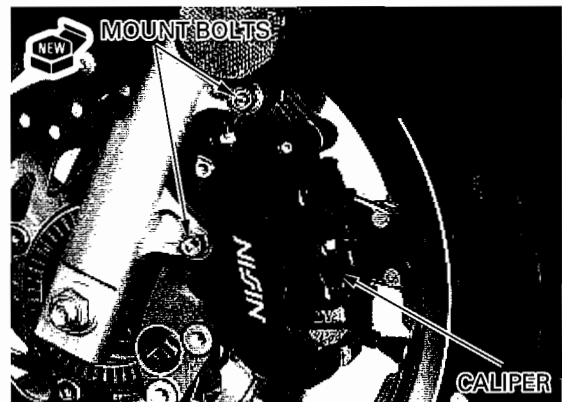
If the front caliper bracket is replaced, check the clearance between the pulser ring and wheel speed sensor (ABS type: page 21-22).



INSTALLATION

Install the front caliper onto the fork leg.
Install and tighten new front caliper mount bolts to the specified torque.

TORQUE: 31 N·m (3.2 kgf·m , 23 lbf·ft)



Install the brake hose eyelets to the caliper body with new sealing washers and oil bolts.
Push the brake hose eyelet to the stopper on the caliper, then tighten the oil bolts to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m , 25 lbf·ft)

Install the brake pads (page 16-10).
Fill and bleed the hydraulic system (page 16-5, 7).
Install the front wheel speed sensor (ABS type only: page 21-22).

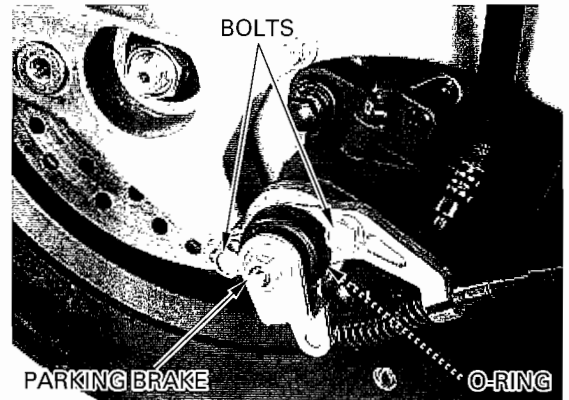


REAR BRAKE CALIPER

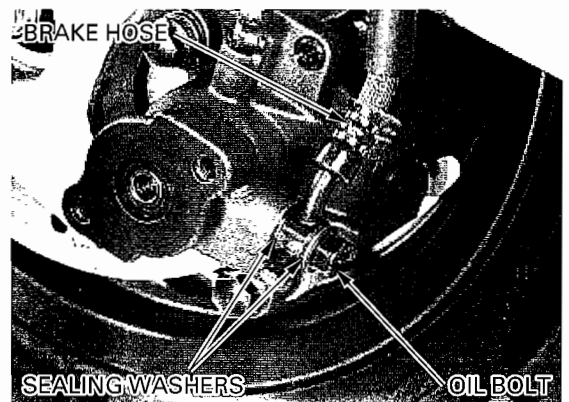
REMOVAL

Remove the muffler (page 2-14).
 Drain the front brake hydraulic system (page 16-4).

Do not disassemble the parking brake. Remove the bolts and parking brake.
 Remove the O-ring.



Remove the oil bolt, sealing washers and brake hose from the brake caliper.

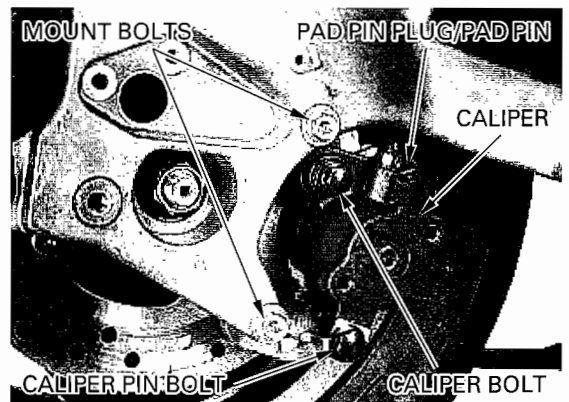


Remove the pad pin plug and loosen the pad pin.

Loosen the caliper bolt and caliper pin bolt.

Remove the mount bolts and rear brake caliper from the swingarm.

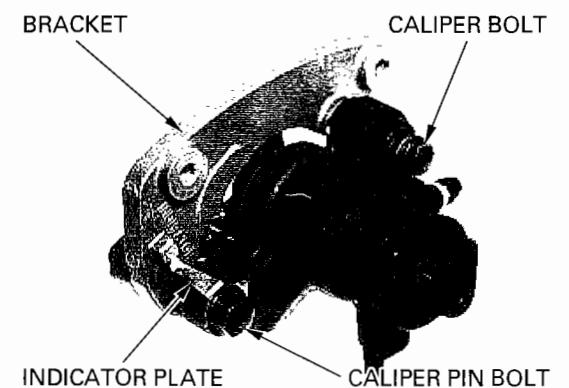
Remove the brake pad (page 16-11).



DISASSEMBLY

Remove the caliper bolt, caliper pin bolt and indicator plate.

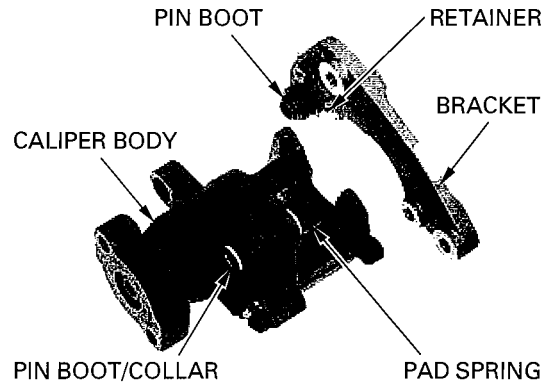
Remove the caliper bracket from the caliper body.



HYDRAULIC BRAKE

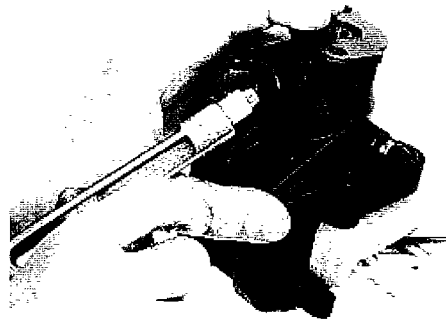
Remove the pin boot, collar and pad spring from the caliper body.

Remove the pin boot and retainer from the bracket.



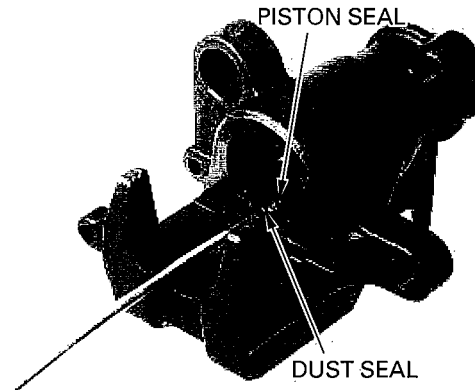
Do not use high pressure air or bring the nozzle too close to the inlet.

Place a shop towel over the piston. Position the caliper body with the piston down and apply small squirts of air pressure to the fluid inlet to remove the piston.



Be careful not to damage the piston sliding surface.

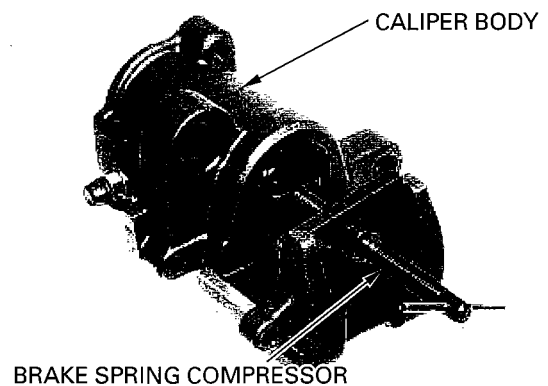
Push the dust seal and piston seal in and lift them out.



To prevent loss of tension, do not compress adjust spring B more than necessary. Be careful not to damage the caliper cylinder inner surface.

Compress adjust spring B using the brake spring compressor.

TOOL:
Brake spring compressor 07HAE-SG00100



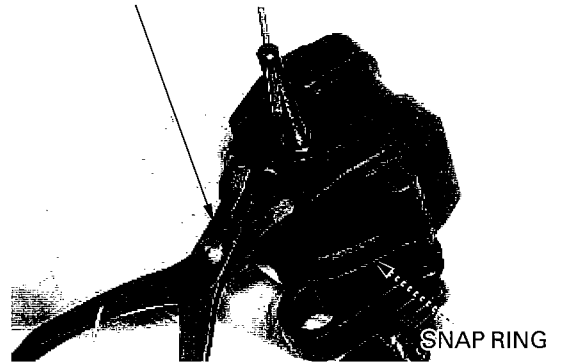
Remove the snap ring from the caliper body using the special tool as shown.

TOOL:

Snap ring pliers

07914-SA50001

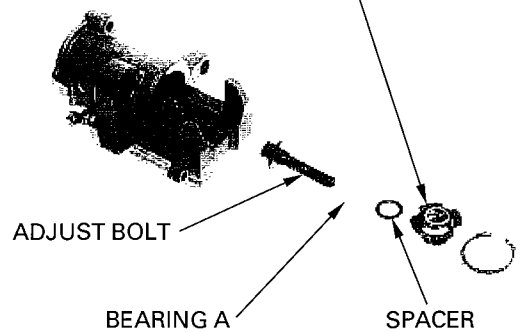
SNAP RING PLIERS



Remove adjust spring B/spring guide, spacer, bearing A and the adjust bolt from the caliper body.

Clean the seal grooves, caliper piston and caliper piston sliding surfaces with clean brake fluid.

ADJUST SPRING B/SPRING GUIDE



INSPECTION

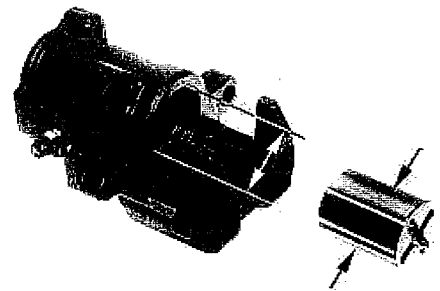
Check the caliper cylinder and piston for scoring, scratches or damage.

Measure the caliper cylinder I.D..

SERVICE LIMIT: 34.020 mm (1.3394 in)

Measure the caliper piston O.D..

SERVICE LIMIT: 33.870 mm (1.3335 in)



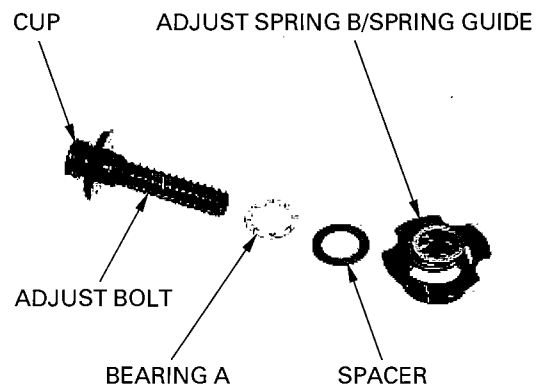
Check adjust spring B/spring guide for scoring, scratches, damage or spring broken.

Check the spacer for scoring, scratches or damage.

Check the bearing A for scoring, scratches or damage.

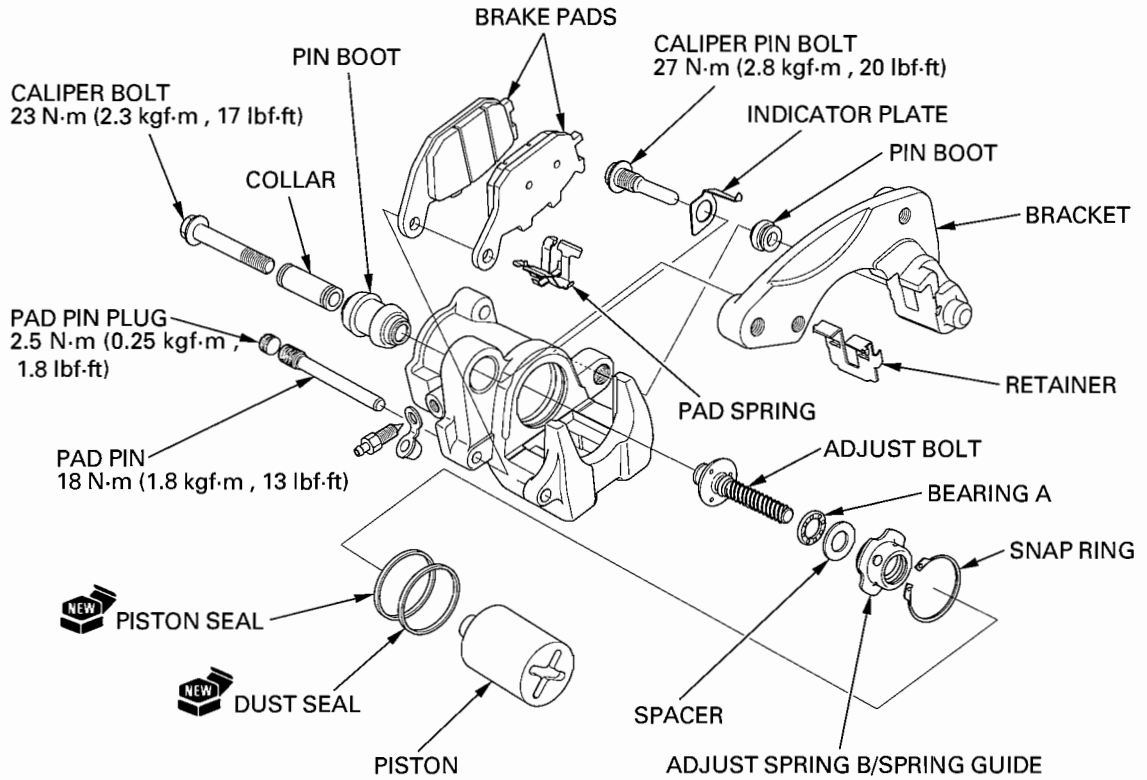
Check the cup of the adjust bolt for scoring, scratches or damage.

Replace them if necessary.



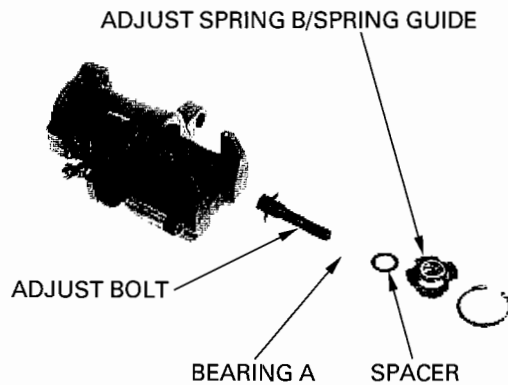
HYDRAULIC BRAKE

ASSEMBLY



Replace the dust seal and piston seal with a new one.
 Replace the caliper and bracket pin boots if they are worn, deteriorated or damaged.
 Apply silicone grease to the boot inner surface.
 Make sure each part is free from the dust or dirt before reassembly.

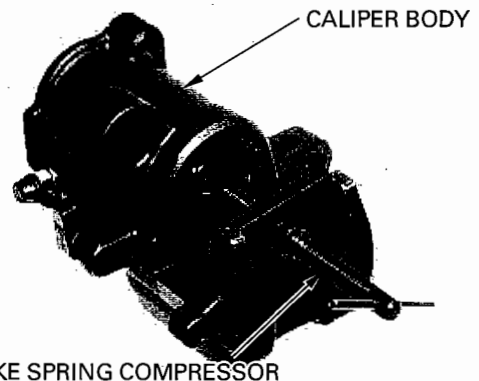
Install the adjust bolt, bearing A, spacer and adjust spring B/spring guide to the caliper body.



To prevent loss of tension, do not compress adjust spring B more than necessary. Be careful not to damage the caliper cylinder inner surface.

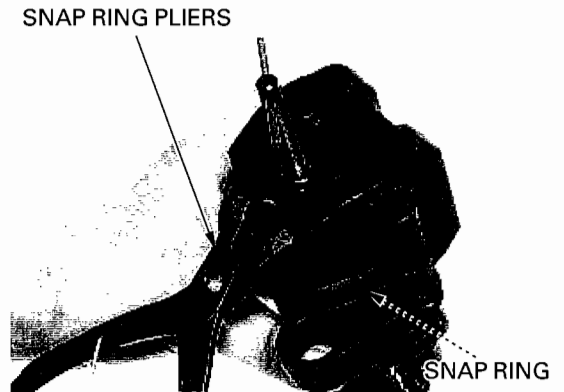
Compress the adjust spring B using the brake spring compressor.

TOOL:
Brake spring compressor 07HAE-SG00100

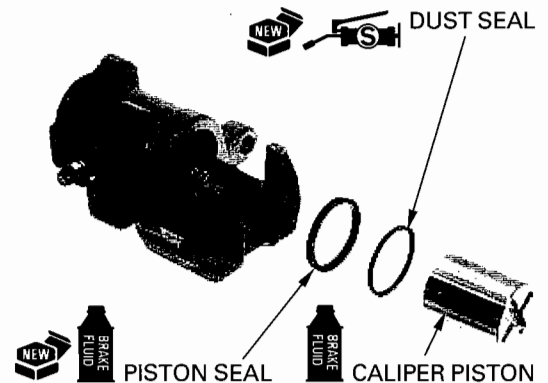


Be certain the snap ring is firmly seated in the groove.
Install the snap ring using the special tool.

TOOL:
Snap ring pliers 07914-SA50001



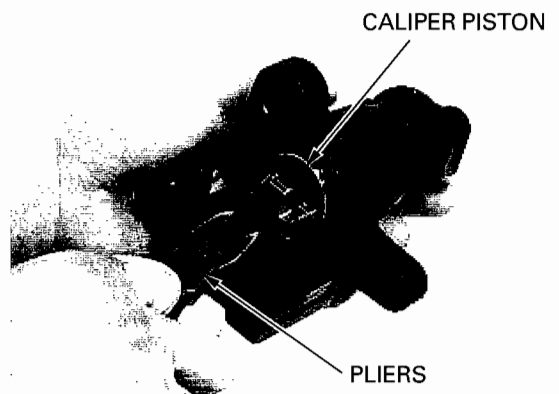
Coat a new piston seal with clean brake fluid.
Coat a new dust seal with silicone grease.
Install the piston seal and dust seal into the groove of the caliper body.
Coat the caliper piston with clean brake fluid and set it to the caliper cylinder with the cross groove side facing the pad.



Be careful not to damage the caliper piston.

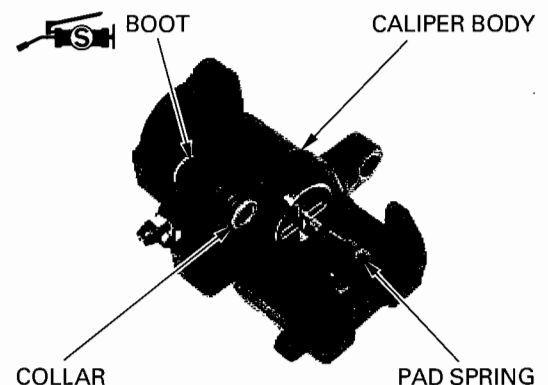
Set the pliers or equivalent to the cross groove on the caliper piston as shown.

Turn in the caliper piston clockwise to the caliper body.



Install the pad spring into the caliper body as shown.

Apply silicone grease to the inside of the boot.
Install the boot on the caliper.
Install the collar on the boot.

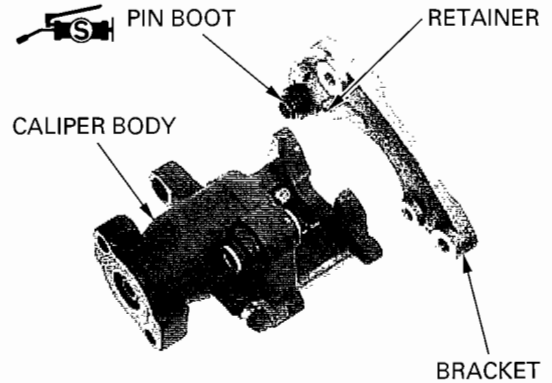


HYDRAULIC BRAKE

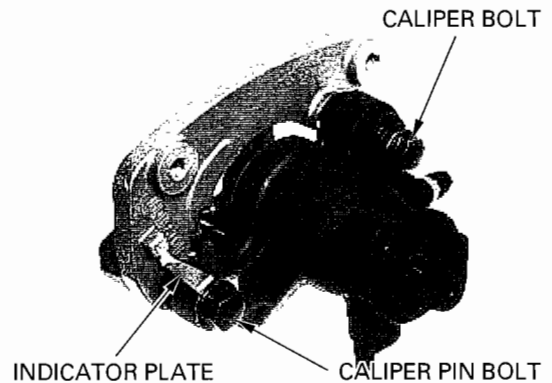
Apply silicone grease to the inside of the boot.
Install the boot to the caliper bracket.

Install the retainer to the caliper bracket.

Install the caliper bracket to the caliper.



Install the indicator plate.
Temporarily install the caliper bolt and caliper pin bolt.



INSTALLATION

Install the brake pad (page 16-12).

Install the rear caliper onto the swingarm.
Install and tighten new rear caliper mount bolts to the specified torque.

TORQUE: 31 N·m (3.2 kgf·m , 23 lbf·ft)

Tighten the caliper bolt to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m , 17 lbf·ft)

Tighten the caliper pin bolt to the specified torque.

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

Tighten the pad pin to the specified torque.

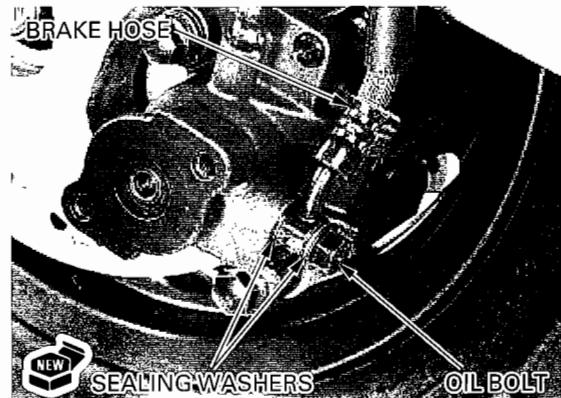
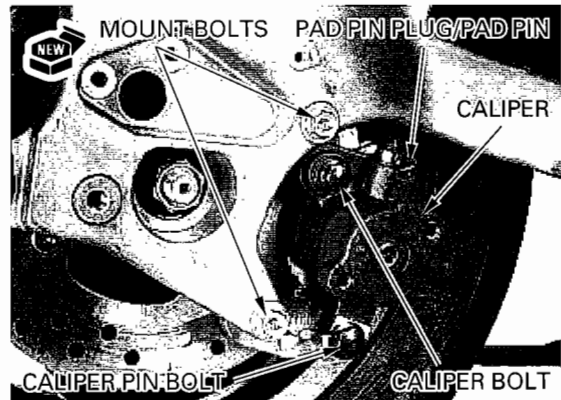
TORQUE: 18 N·m (1.8 kgf·m , 13 lbf·ft)

Tighten the pad pin plug to the specified torque.

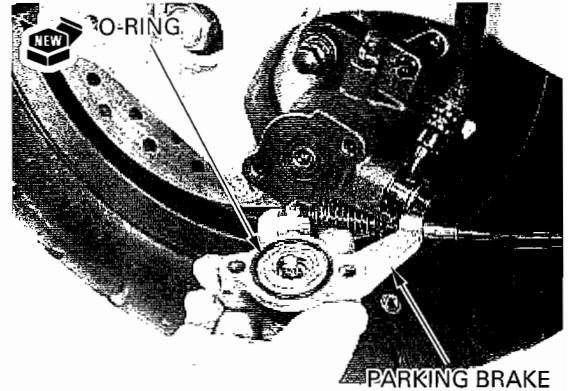
TORQUE: 2.5 N·m (0.25 kgf·m , 1.8 lbf·ft)

Install the brake hose eyelet to the caliper body with new sealing washers and an oil bolt.
Push the stopper on the brake hose eyelet to the caliper, then tighten the oil bolts to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m , 25 lbf·ft)

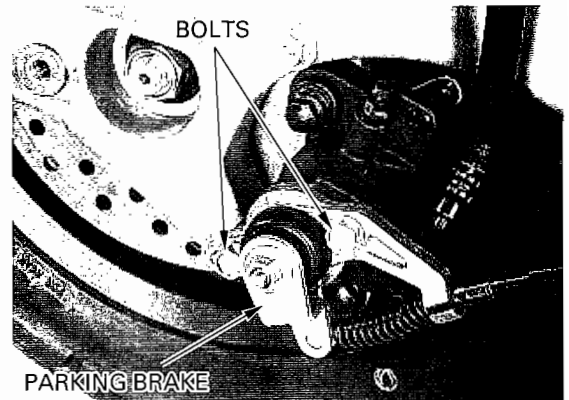


Install a new O-ring into the groove on the parking brake.



Install the parking brake and tighten the bolts securely.

Fill and bleed the hydraulic system (page 16-7).
Install the muffler (page 2-14).



PARKING BRAKE

ADJUSTMENT

Place the scooter on its center stand.
Release the parking brake lever lock.
Pull the parking brake lever one notch.



Loosen the lock nut.
Turn in the adjust bolt until you feel resistance when turning the rear wheel with your hand.
Hold the adjust bolt and tighten the lock nut securely.

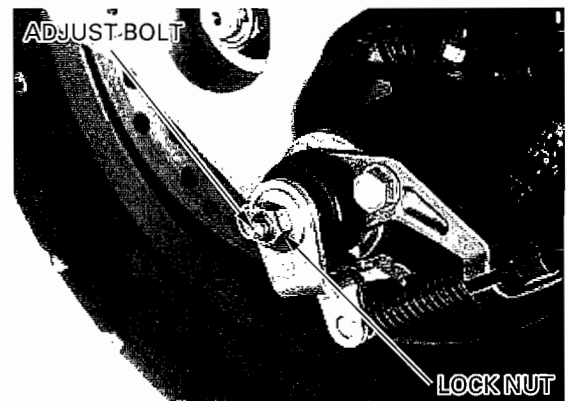
Release the parking brake lever lock.
Make sure the rear wheel turns smoothly.

Pull the parking brake lever slowly and check the lever stroke.

STANDARD: 2–4 notches

ALL STROKE: 6 notches

If out of specification, adjust again.



HYDRAULIC BRAKE

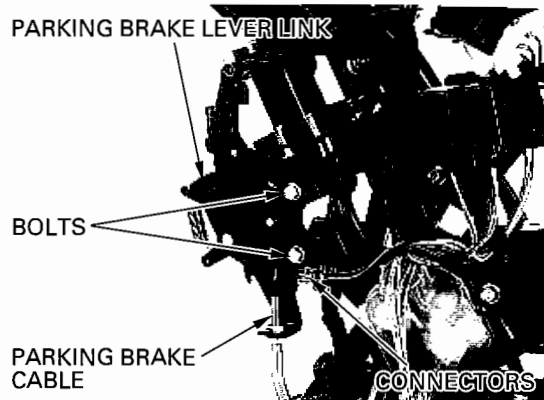
REMOVAL/INSTALLATION

PARKING BRAKE LEVER LINK

Remove the inner cover (page 2-13).

Loosen the lock nut and disconnect the parking brake cable from the parking brake lever link.
Disconnect the parking brake switch connectors.
Remove the bolts and the parking brake lever link.

Installation is in the reverse order of removal.

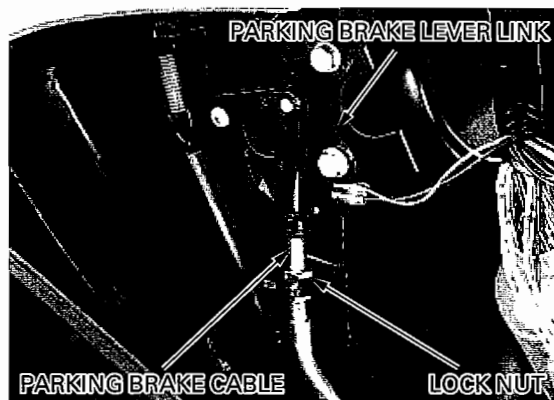


PARKING BRAKE CABLE

Remove the front cover (page 2-11).

Remove the right floor skirt (page 2-4).

Loosen the lock nut and disconnect the parking brake cable from the parking brake lever link.



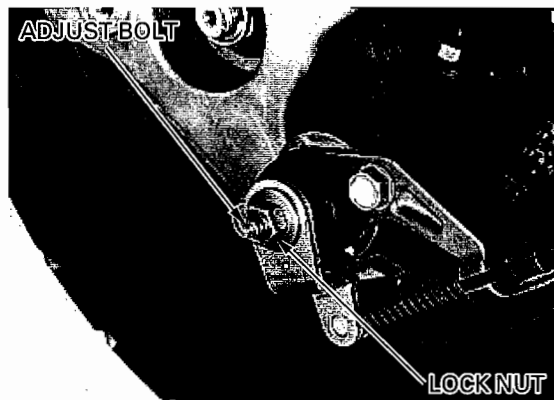
Disconnect the parking brake cable from the parking brake.

Remove the spring.

Remove the parking brake cable from the clamp (page 1-18).

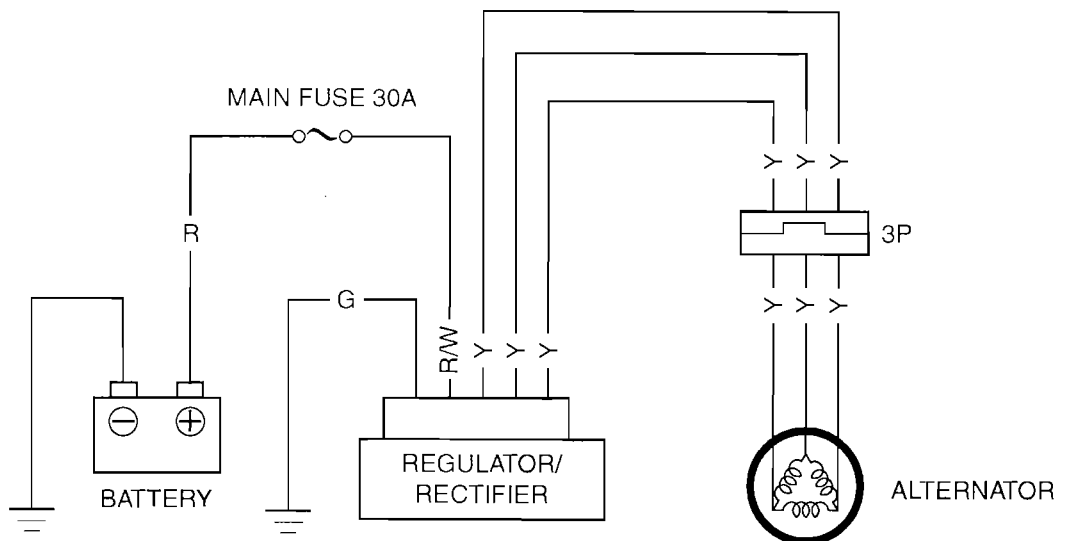
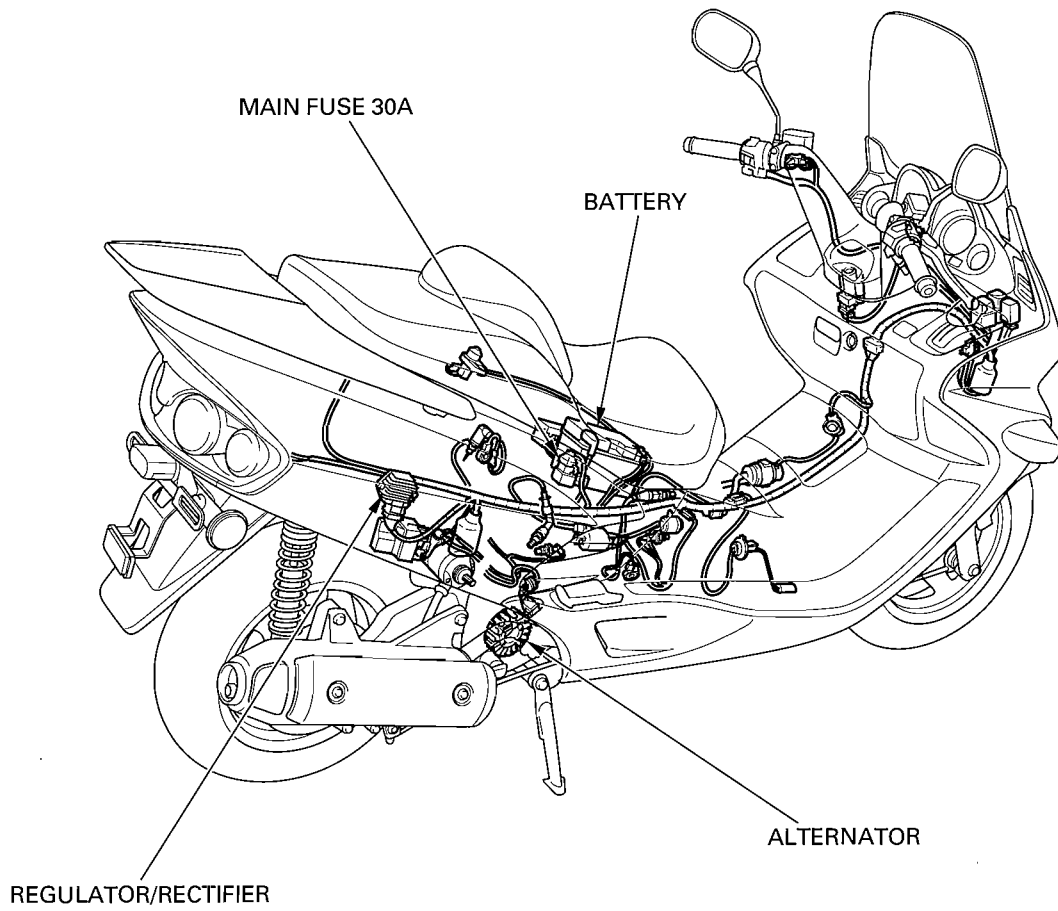
Installation is in the reverse order of removal.

Route the parking brake cable correctly (page 1-18).



MEMO

BATTERY/CHARGING SYSTEM



- Y...YELLOW
- G...GREEN
- R...RED
- W...WHITE

17. BATTERY/CHARGING SYSTEM

SERVICE INFORMATION	17-1	CHARGING SYSTEM INSPECTION	17-7
TROUBLESHOOTING	17-3	ALTERNATOR CHARGING COIL	17-8
BATTERY	17-4	REGULATOR/RECTIFIER	17-8

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 physician immediately, **KEEP OUT OF REACH OF CHILDREN.**

- Always turn off the ignition switch to “OFF” before disconnecting any electrical component.
- 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.
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry place.
- For a battery remaining in a shorted vehicle, disconnect the negative battery cable from the battery.
- The battery caps should not be removed. Attempting to remove the sealing caps from the cells may damage the battery.
- The maintenance free battery must be replaced when it reaches the end of its service life.
- The battery can be damaged if overcharged or undercharged, or if left discharged for long period. These same conditions contribute to shortening the “life span” of the battery. Even under normal use, the performance of the battery deteriorates after 2–3 years.
- Battery voltage may recover after battery charging, but under heavy load, the battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and taillight on for long periods of time without riding the vehicle.
- The battery self-discharges when the vehicle 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 17-3).
- For alternator service, refer to section 12.

BATTERY/CHARGING SYSTEM

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 again
- 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 testers Operation Manual for the recommended battery testing procedure.

The recommended battery tester puts a "load" on the battery so that the actual battery condition of the load can be measured.

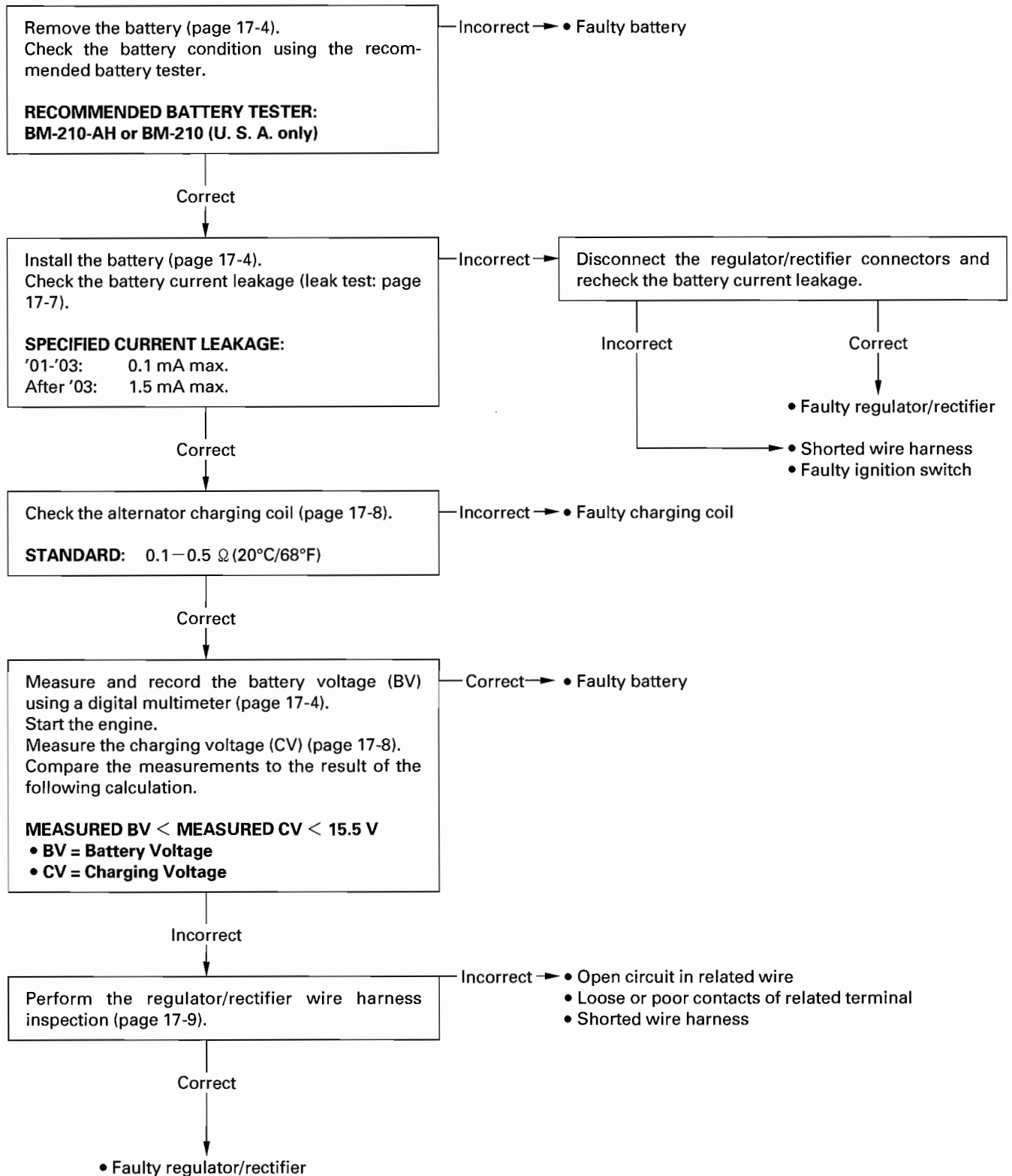
Recommended battery tester BM-210-AH or BM-210 (U. S. A. only)

SPECIFICATIONS

ITEM		STANDARD	
Battery	Capacity	12V-11 (10) Ah	
	Current leakage	'01-'03	0.1 mA max.
		After '03	1.5 mA max.
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	1.1 A/5 – 10 h
Quick		5.5 A/0.5 h	
Alternator	Capacity	'01-'03	0.29 kW/5,000 rpm
		After '03	0.40 kW/5,000 rpm
	Charging coil resistance (20°C/68°F)	0.1 – 0.5 Ω	

TROUBLESHOOTING

Battery is damaged or weak

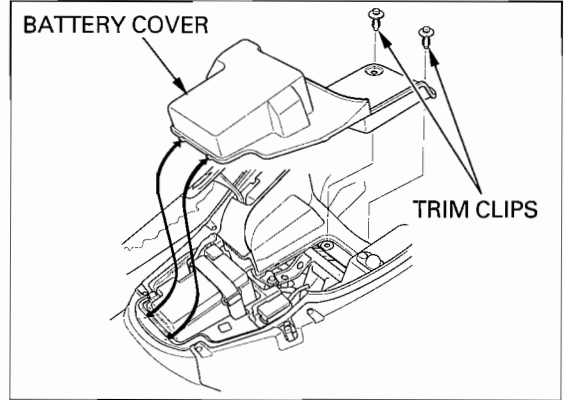


BATTERY

REMOVAL/INSTALLATION

Unlock and open the seat (page 2-3).
Turn the ignition switch to "OFF".

Remove the trim clips and battery cover.

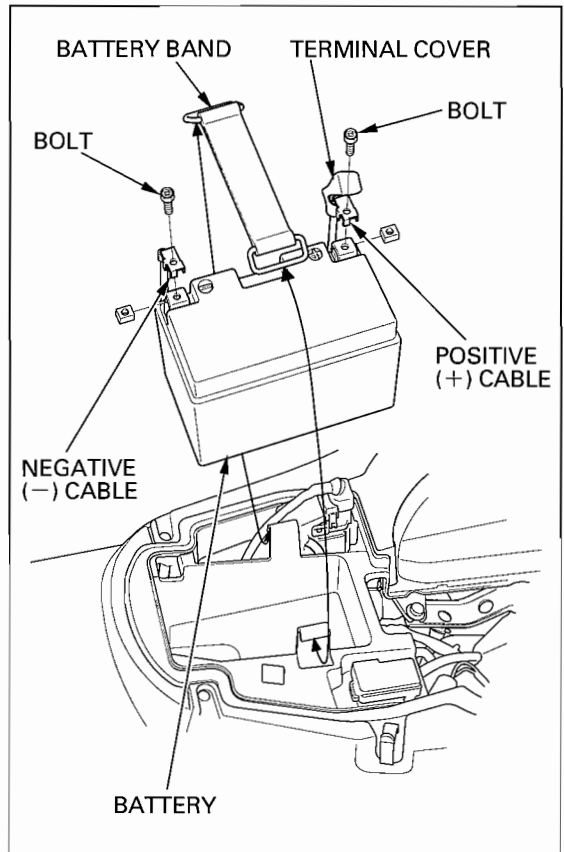


With the ignition switch turned to "OFF", disconnect the negative (-) cable first, then remove the terminal cover and disconnect the positive (+) cable.

Remove the battery band and battery.

Installation is in the reverse order of removal.

After connecting the battery cables, coat the terminals with grease.



VOLTAGE INSPECTION

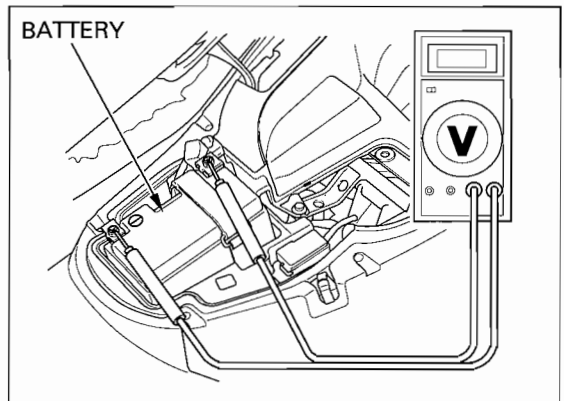
Remove the battery cover (see above).

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

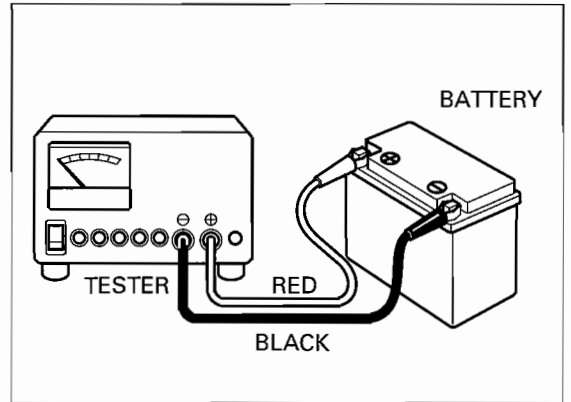
- Always clear the work area of flammable materials such as gasoline, brake fluid, electrolyte, or cloth towels when operating the tester, since the heat generated by the tester may cause a fire.

Remove the battery.

Securely connect the tester's positive (+) cable first, then connect the negative (-) cable.

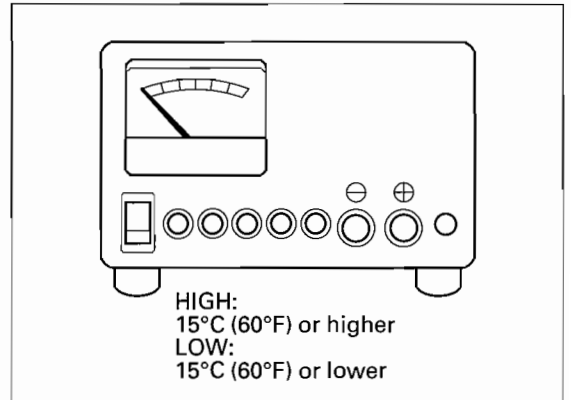
TOOL:

Battery tester BM-210-AH or BM-210 (U.S.A. only)



For accurate test results, be sure the tester's cables and clamps are in good working condition and that a secure connection can be made at the battery.

Set the temperature switch to "HIGH" or "LOW" depending on the ambient temperature.

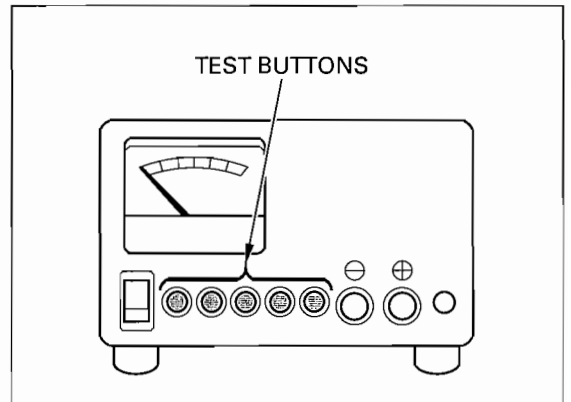


For the first check, DO NOT charge the battery before testing; test it in an "as is" condition.

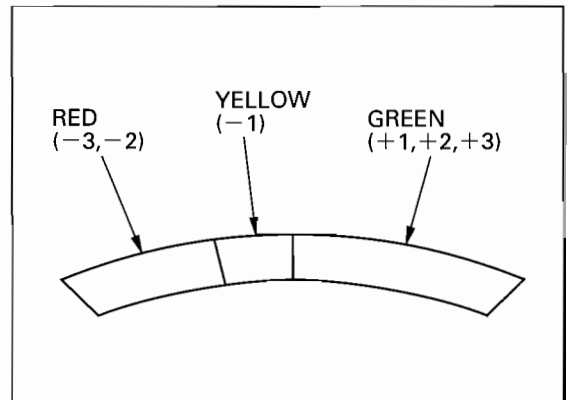
Push in the appropriate test button for 3 seconds and read the condition of the battery on the meter.

To avoid damaging the tester, only test batteries with an amperage rating of less than 30 Ah. Tester damage can result from overheating when:

- The test button is pushed in for more than 3 seconds.
- The tester is used without being allowed to cool for at least 1 minute when testing more than one battery.
- More than ten consecutive tests are performed without allowing at least a 30-minute cool-down period.



The result of a test on the meter scale is relative to the amp. hour rating of the battery. ANY BATTERY READING IN THE GREEN ZONE IS OK. Batteries should only be charged if they register in the YELLOW or RED zone.



BATTERY CHARGING

Remove the battery (page 17-4).

- Clean the battery terminals and position the battery as far away from the charger as the leads will permit.
- Do not place batteries below the charger—gases from the battery may corrode and damage the charger.
- Do not place batteries on top of the charger. Be sure the air vents are not blocked.

TOOL:

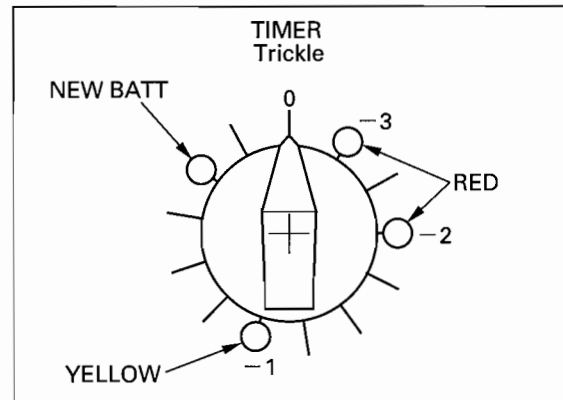
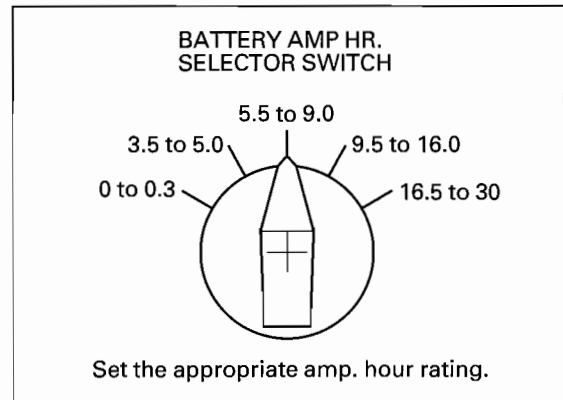
Christie battery charger MC1012/2 (U. S. A. only)

1. Turn the Power Switch to the OFF position.
2. Set the battery Amp. Hr. Selector Switch for the size of the battery being charged.
3. Set the Timer to the position indicated by the Honda Battery Tester; RED-3, RED-2 or YELLOW 1.
If you are charging a new battery, set the switch to the NEW BATT position.
4. Attach the clamps to the battery terminals: RED to Positive, BLACK to Negative.

Connect the battery cables only when the Power Switch is OFF.

5. Turn the Power Switch to the ON position.
6. When the timer reaches the "Trickle" position, the charging cycle is complete. Turn the Power Switch OFF and disconnect the clamps.
7. Let the battery cool for at least ten minutes or until gassing subsides after charging.
8. Retest the battery using the Honda Battery Tester and recharge if necessary using the above steps.

The charger will automatically switch to the "Trickle" mode after the set charging time has elapsed.



CHARGING SYSTEM INSPECTION

Remove the battery cover (page 17-4).

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.

When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow out the fuse in the tester. While measuring current, do not turn the ignition switch to "ON". A sudden surge of current may blow out the fuse in the tester.

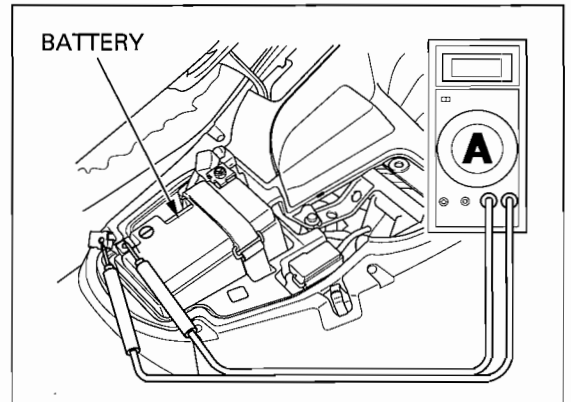
SPECIFIED CURRENT LEAKAGE:

'01-'03: 0.1 mA max.

After '03: 1.5 mA max.

If current leakage exceeds the specified value, a shorted circuit is likely.

Locate the short by disconnecting connections one by one and measuring the current.



CHARGING VOLTAGE INSPECTION

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; stop the engine.

Connect the multimeter between the positive and negative terminals of the battery.

To prevent a short, make absolutely certain which are the positive and negative terminals or cables.

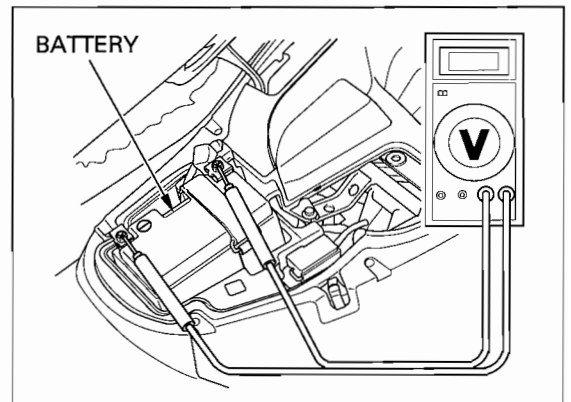
With the headlight on Hi beam, restart the engine.

Measure the voltage on the multimeter when the engine runs at 5,000 rpm.

STANDARD:

Measured BV < Measured CV < 15.5V

- BV= Battery Voltage
- CV= Charging Voltage

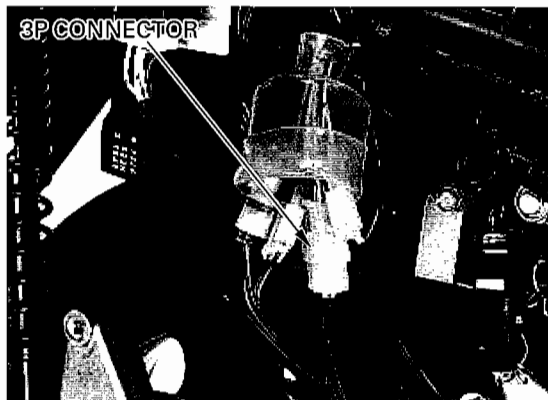


ALTERNATOR CHARGING COIL

INSPECTION

Remove the body cover (page 2-5).

Disconnect the alternator 3P connector.



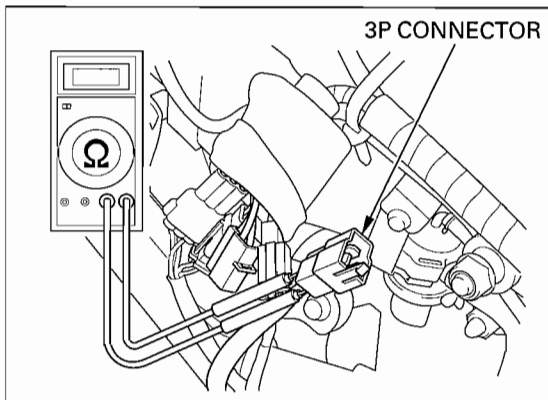
Measure the resistance between the Yellow wire terminals of the alternator side connector.

STANDARD: 0.1–0.5 Ω (20C°/68°F)

Check for continuity between each Yellow wire terminal of the alternator 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 section 12 for alternator stator replacement.



REGULATOR/RECTIFIER

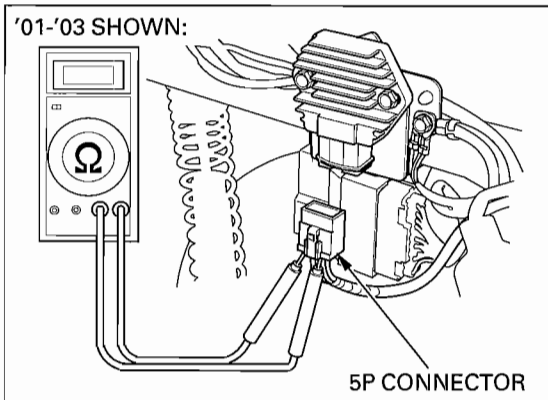
WIRE HARNESS INSPECTION

Remove the body cover (page 2-5).

Disconnect the regulator/rectifier 5P connector.

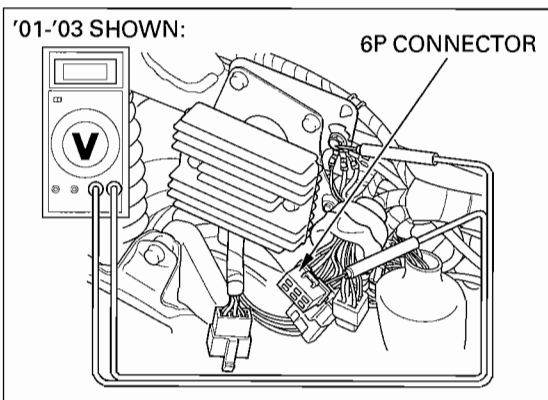
After '03: Disconnect the regulator/rectifier 6P and 3P connectors.

Check the connector for loose contacts of corroded terminals.



BATTERY LINE

Measure the voltage between the Red/white wire terminal and ground. There should be battery voltage at all times.



BATTERY/CHARGING SYSTEM

GROUND LINE

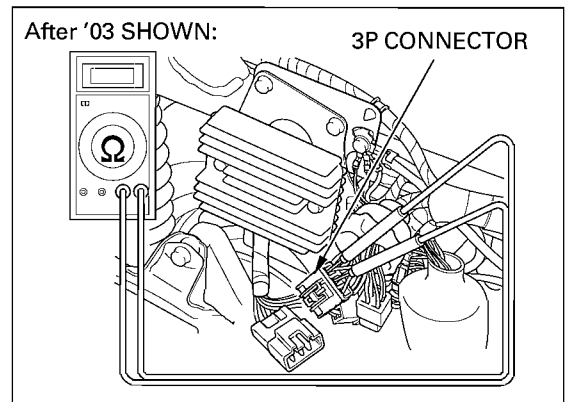
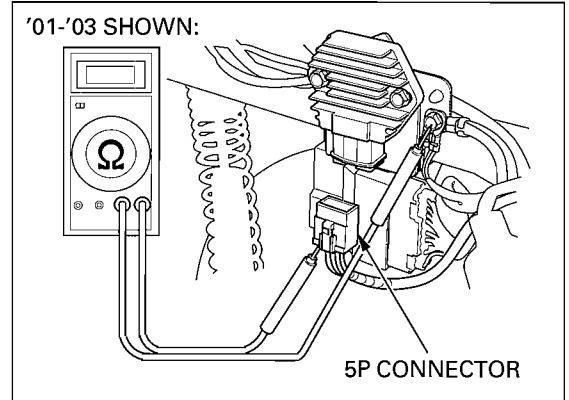
Check the continuity between the Green wire terminal and ground.
There should be continuity at all times.

CHARGING COIL LINE

Measure the resistance between the Yellow wire terminals.

STANDARD: 0.1–0.5 Ω (20C°/68°F)

Check for continuity between each Yellow wire terminal and ground.
There should be no continuity.



REMOVAL/INSTALLATION

Remove the body cover (page 2-5).

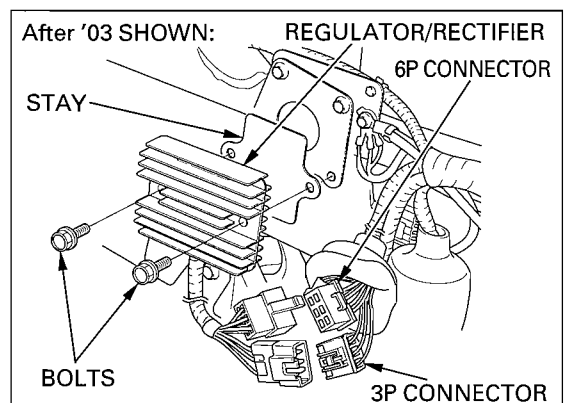
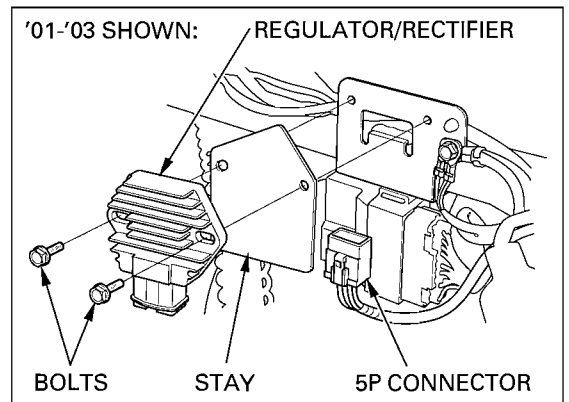
Disconnect the regulator/rectifier 5P connector.

Remove the bolts, regulator and stay.

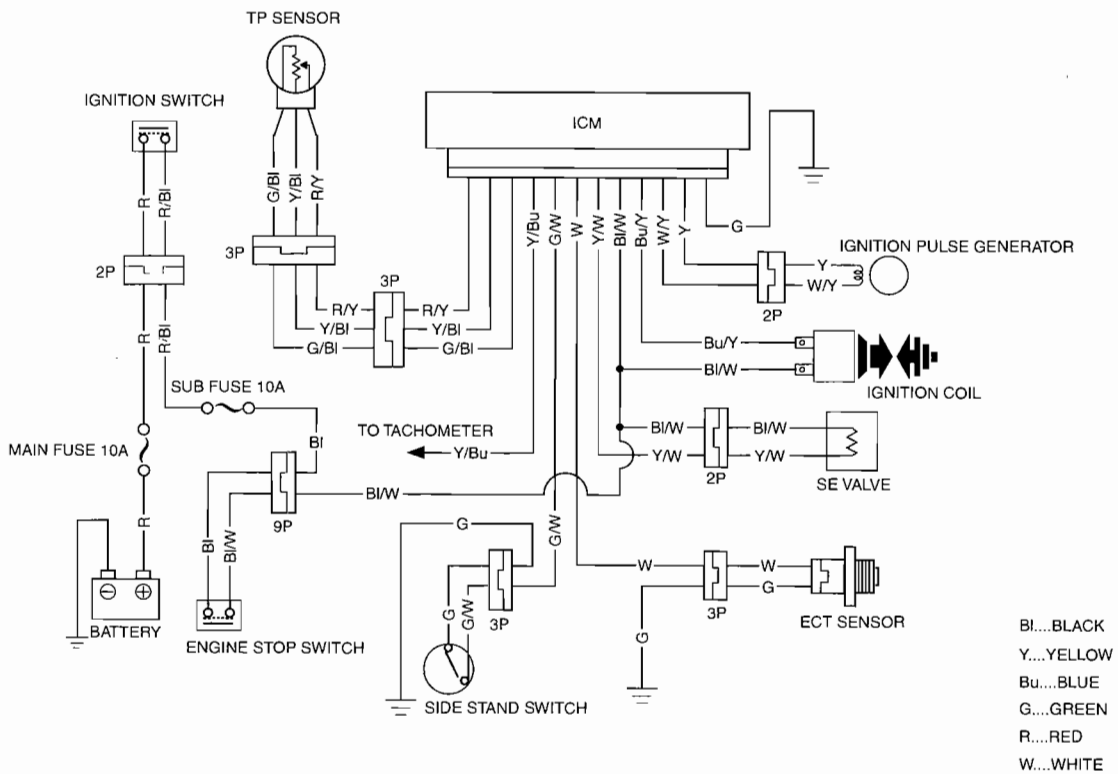
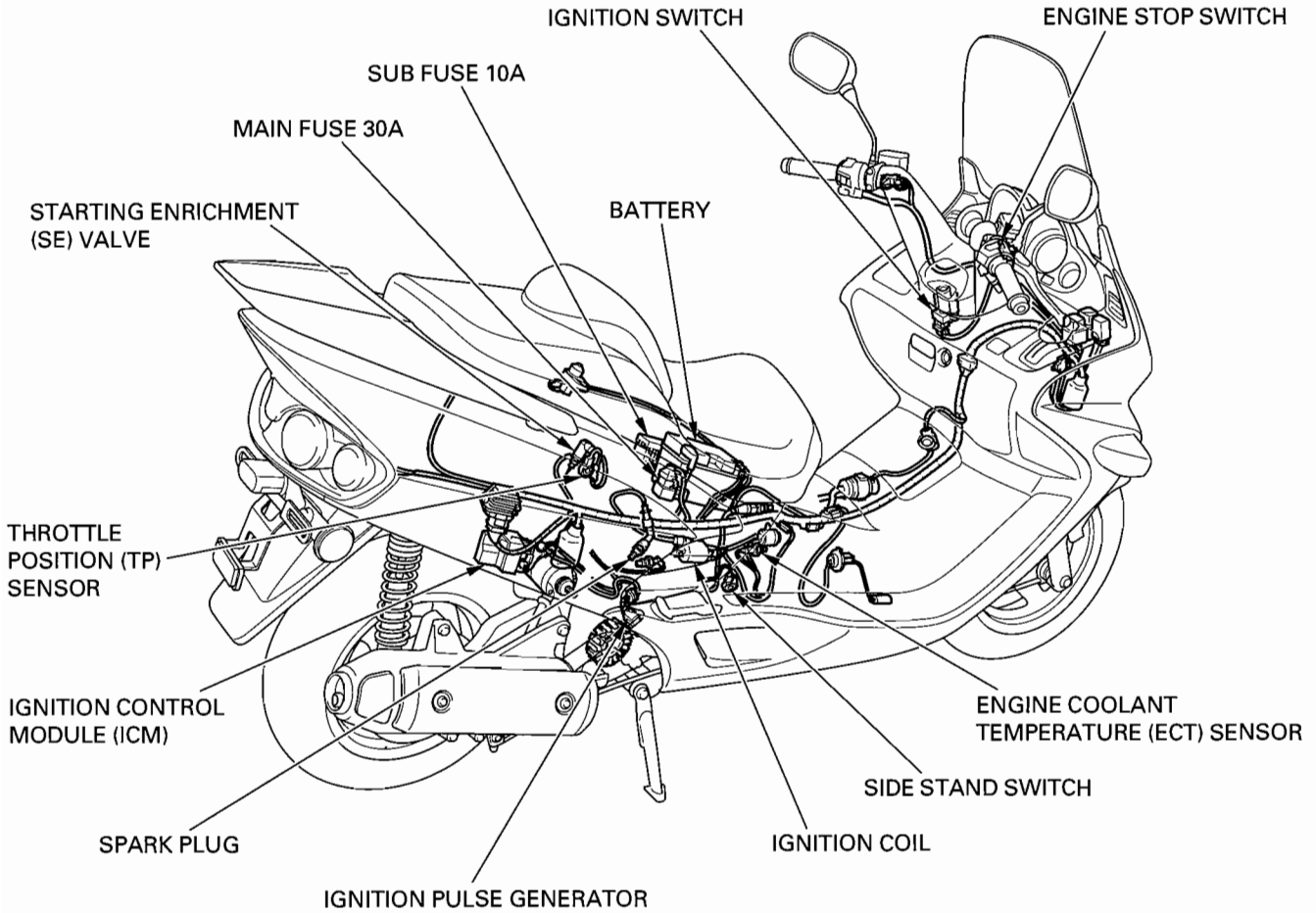
After '03: Disconnect the regulator/rectifier 6P and 3P connectors.

Remove the bolts, regulator/rectifier and cover.

Installation is in the reverse order of removal.



IGNITION SYSTEM



18. IGNITION SYSTEM

SERVICE INFORMATION	18-1	IGNITION TIMING	18-5
TROUBLESHOOTING	18-2	THROTTLE POSITION (TP) SENSOR	18-6
IGNITION SYSTEM INSPECTION	18-3	ECT SENSOR	18-8
IGNITION COIL	18-5		

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 18-2.
- The ignition timing cannot be adjusted since the Ignition Control Module (ICM) is factory preset.
- The ICM may be damaged if dropped. Also, if the connector is disconnected when current is flowing, the excessive voltage may damage the ICM. Always turn the ignition switch to "OFF" before servicing.
- A faulty ignition system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- Do not remove the throttle position (TP) sensor from the carburetor. Removing the throttle position (TP) sensor can cause it to get out of position resulting in improper ignition timing. If throttle position (TP) sensor replacement is necessary, replace the carburetor as an assembly.
- 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.
- 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 engine stop switch inspection, refer to Section 20.
- For ignition pulse generator (alternator stator) removal/installation, refer to Section 12.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	Standard	DPR7EA-9 (NGK), X22EPR-U9 (DENSO)
	For cold climate/below 5°C/41°F	DPR6EA-9 (NGK), X20EPR-U9 (DENSO)
	For extended high speed riding	DPR8EA-9 (NGK), X24EPR-U9 (DENSO)
Spark plug gap		0.80–0.90 mm (0.031–0.035 in)
Ignition coil peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		11° BTDC at idle
Coolant temperature sensor resistance	At 20°C (68°F)	2–3 Ω
	At 80°C (176°F)	200–400 Ω
Throttle position (TP) sensor	resistance (20°C/68°F)	4–6k Ω
	Input voltage	4.6–5.4 V

18

TORQUE VALUES

Timing hole cap	5.9 N·m (0.6 kgf·m , 4.3 lbf·ft)
ECT sensor	15 N·m (1.5 kgf·m , 11 lbf·ft)

TOOLS

Peak voltage tester (Ignition mate:
MTP07-0286, U.S.A. only) or
Peak voltage adapter

07HGJ-0020100 with a commercially available digital multimeter
(impedance 10 MΩ/DCV minimum)

IGNITION SYSTEM

TROUBLESHOOTING

- Inspect the following before diagnosing the system.
 - Faulty spark plug
 - Loose spark plug cap or spark plug wire connection
 - Water in the spark plug cap (leaking the ignition coil secondary voltage)
- Temporarily exchange the ignition coil with a known-good one and perform the spark test. If a spark is present, the exchanged ignition coil is faulty.

NO SPARK AT SPARK PLUG

Unusual condition		Probable cause (Check in numerical order)
Ignition coil primary voltage	No initial voltage with ignition and engine stop switches on. (Other electrical components are normal.)	1. Faulty engine stop switch. 2. An open circuit in the Black/white wire between the ignition coil and engine stop switch. 3. Loose primary terminal or an open circuit in primary coil. 4. Faulty ICM (in the case when the initial voltage is normal while disconnecting ICM connector).
	Initial voltage is normal, but it drops down to 2–4 V while cranking the engine.	1. Incorrect peak voltage adaptor connections. 2. Undercharged battery. 3. No voltage between the Black/white (+) and body ground (–) at the ICM multi-connector or loose ICM connection. 4. An open circuit or loose connection in the Green wire. 5. An open circuit or loose connection in Blue/yellow wire between the ignition coils and ICM. 6. Short circuit in the ignition primary coil. 7. Faulty side stand switch. 8. An open circuit or loose connection in No. 7 related circuit wires (Green/white and Green wires). 9. Faulty ignition pulse generator (measure the peak voltage). 10. Faulty ICM (in case when above No. 1–9 are normal).
	Initial voltage is normal, but no peak voltage while cranking the engine.	1. Faulty peak voltage adaptor connections. 2. Faulty peak voltage adaptor. 3. Faulty ICM (in case when above No. 1, 2 are normal).
	Initial voltage is normal, but peak voltage is lower than the standard value.	1. The multimeter impedance is too low; below 10 M Ω /DCV. 2. Cranking speed is too low (battery under-charged). 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 ICM (in case when above No. 1–3 are normal).
	Initial and peak voltage are normal, but does not spark.	1. Faulty spark plug or leaking ignition coil secondary current ampere. 2. Faulty ignition coil.
Ignition pulse generator	Peak voltage is lower than the standard value.	1. The multimeter impedance is too low; below 10 M Ω /DCV. 2. Cranking speed is too low (battery under-charged). 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 ICM (in case when above No. 1–3 are normal).
	No peak voltage.	1. Faulty peak voltage adaptor. 2. Faulty ignition pulse generator.

IGNITION SYSTEM INSPECTION

If there is no spark at the plug, check all connections for loose or poor contact before measuring the peak voltage.

Use the recommended digital multimeter or commercially available digital multimeter with an impedance of 10 M Ω /DCV minimum.

The display value differs depending upon the internal impedance of the multimeter.

Connect the peak voltage adapter to the digital multimeter.

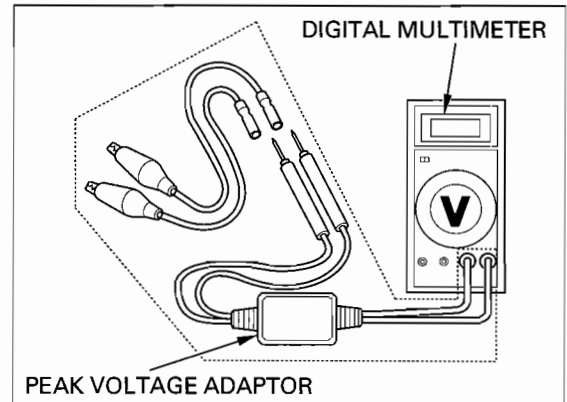
TOOLS:

Peak voltage tester

(Ignition mate: MTP07-0286, U. S. A. only) or

Peak voltage adapter 07HGJ-0020100

with commercially available digital multimeter (impedance 10 M Ω /DCV minimum)



IGNITION COIL PRIMARY PEAK VOLTAGE

Remove the body cover (page 2-5).

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 in the cylinder.

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.

With the ignition coil primary wire connected, connect the peak voltage adapter to the ignition coil.

CONNECTION:

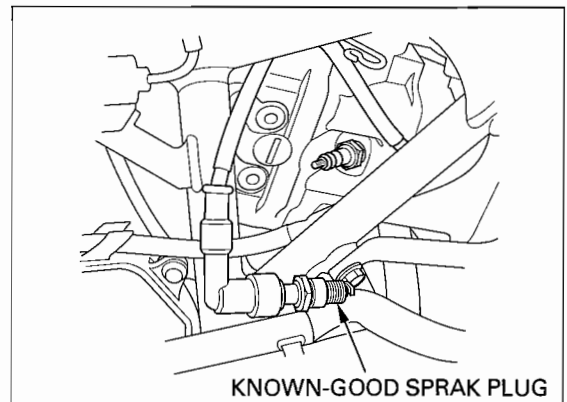
Black/white (-) – Body ground (+)

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

Check for initial voltage at this time.

The battery voltage should be measured.

If the initial voltage cannot be measured, check the power supply circuit (refer to the troubleshooting, page 18-2).

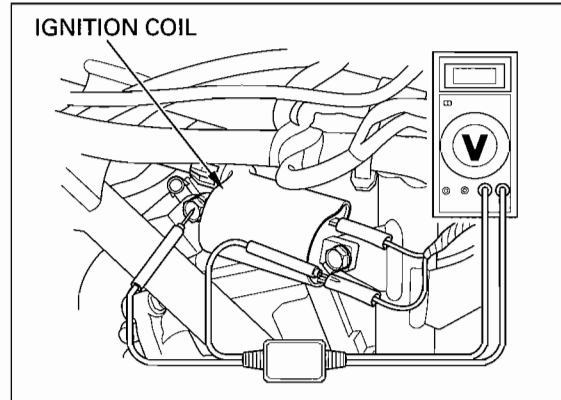


IGNITION SYSTEM

Avoid touching the spark plug and tester probes to prevent electric shock.
Crank the engine with the starter motor and read the ignition coil primary peak voltage.

PEAK VOLTAGE: 100 V minimum

If the peak voltage is abnormal, check for an open circuit or poor connection in Black/white wires.
If no defects are found in the harness, refer to the troubleshooting chart on page 18-2.



IGNITION PULSE GENERATOR PEAK VOLTAGE

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

Remove the body cover (page 2-5).

Disconnect the ICM 22P black connector.
Connect the peak voltage adapter probes to the connector terminals of the wire harness side.

TOOLS:

Peak voltage tester
(Ignition mate: MTP07-0286, U.S.A. only) or
Peak voltage adapter 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum)

CONNECTION: White/yellow (+) – Yellow (–)

Retract the side stand.
Turn the ignition switch to "ON" and the engine stop switch to "O".
Avoid touching the tester probes to prevent electric shock.
Crank the engine with the starter motor and read the ignition pulse generator peak voltage.

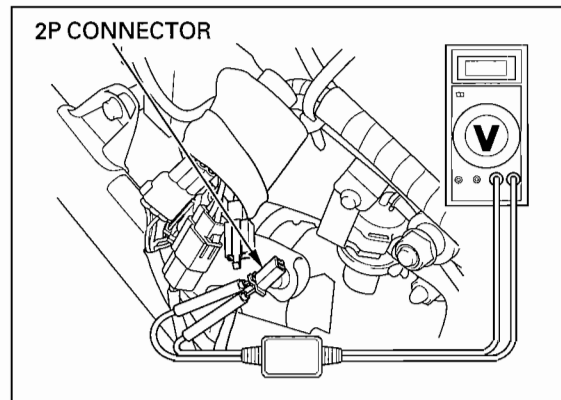
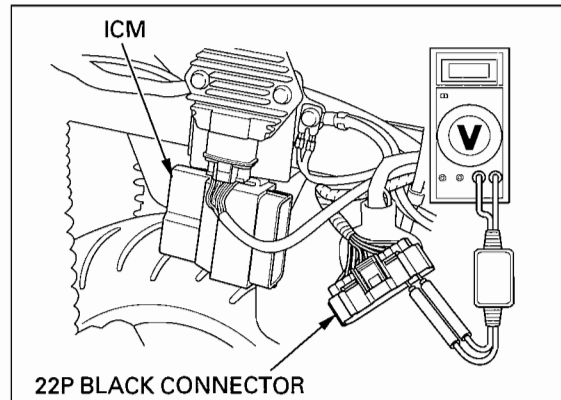
PEAK VOLTAGE: 0.7 V minimum

If the peak voltage measured is abnormal, recheck the following:
Disconnect the ignition pulse generator 2P connector.

Connect the peak voltage adapter to the terminals of the ignition pulse generator side and recheck the peak voltage.

If the peak voltage at the ICM 22P black connector is abnormal and peak voltage at the ignition pulse generator 2P connector is normal, check for poorly connected connectors or a broken wire harness.

If the peak voltage is abnormal at both connectors, follow the checks described in the troubleshooting on page 18-2.

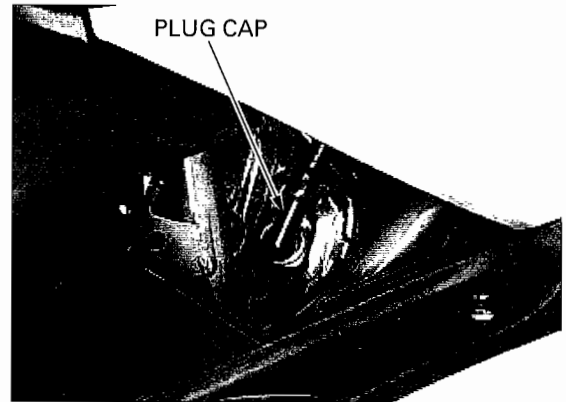


IGNITION COIL

REMOVAL/INSTALLATION

Remove the body cover (page 2-5).
 Remove the lower luggage box (page 2-8).
 Disconnect the spark plug cap from the spark plug (page 3-6).

Remove the spark plug wire from the clamp.



Disconnect the ignition coil primary connectors.
 Remove the bolts and the ignition coil.

Installation is in the reverse order of removal.

Route the spark plug wire and ignition coil primary connectors properly (page 1-18).

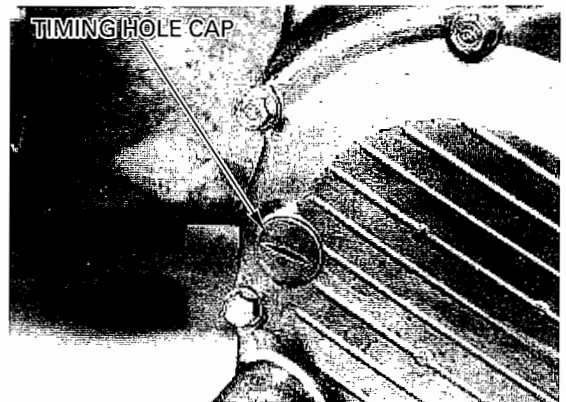


IGNITION TIMING

The ignition timing is factory preset and only needs to be checked when an electrical system component is replaced.

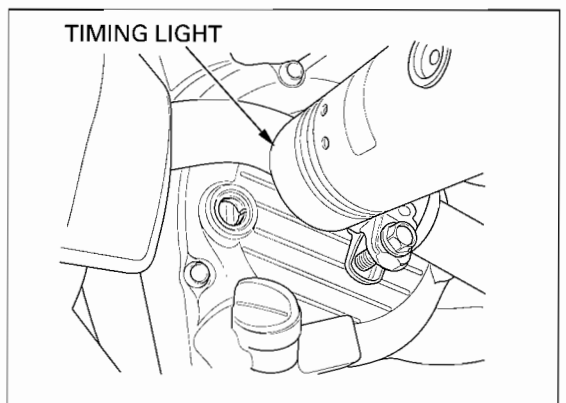
Warm up the engine to normal operating temperature.
 Stop the engine.

Remove the timing hole cap.



Read the manufacturer's instruction for timing light operation.

Attach the timing light to the spark plug wire.
 Start the engine and let it idle (1,500 rpm).



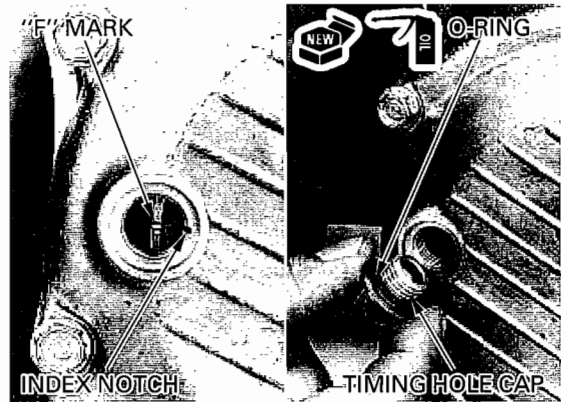
IGNITION SYSTEM

The timing is correct if the "F" mark on the flywheel aligns with the index notch on the right crankcase cover at 1,500 rpm.

If the ignition timing is incorrect, inspect the ICM and ignition pulse generator.

Apply engine oil to the timing hole cap threads, seating surface and new O-ring.
Tighten the timing hole cap to the specified torque.

TORQUE: 5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)



THROTTLE POSITION (TP) SENSOR OPERATION INSPECTION

Do not remove the throttle sensor from the carburetor. If throttle position (TP) sensor replacement is necessary, replace the carburetor as an assembly

Remove the battery cover (page 17-4).

Start the engine.

Disconnect the throttle position (TP) sensor 3P connector when the engine speed $4,500 \pm 200$ rpm (throttle angle is about 10°). The engine speed should increase.



SYSTEM INSPECTION

Remove the body cover (page 2-5).

Disconnect the ICM 22P black connector.

Check the 22P black connector for loose contacts or corroded terminals.

Measure the resistance between the Yellow/black and Green/black wire terminals of the wire harness side connector.

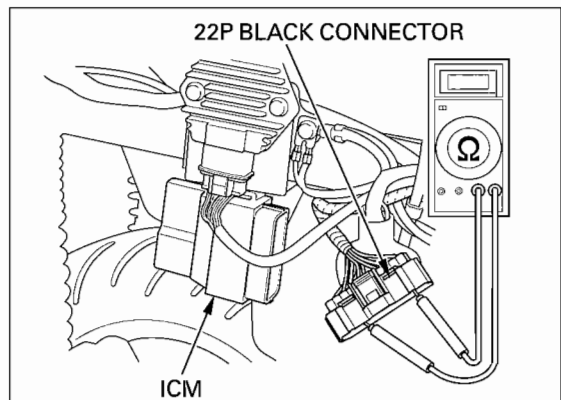
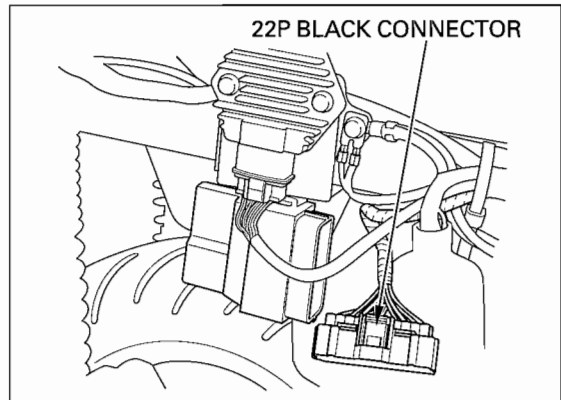
STANDARD: 4–6k Ω (20°C/68°F)

Measure the resistance between the Green/black and Red/yellow wire terminals of the wire harness side connector at the following throttle positions.

Full open – Fully closed position: Resistance decreases

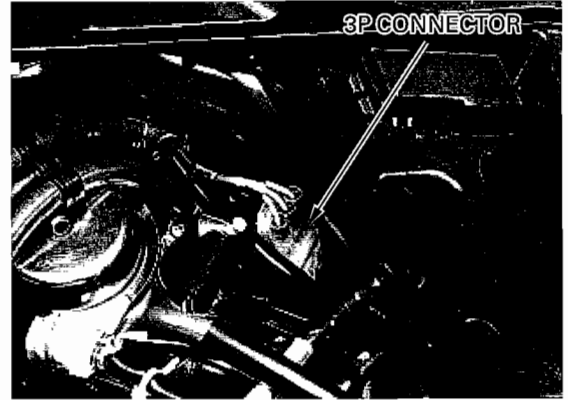
Full closed – Fully open position: Resistance increases

If the measurements are abnormal, inspect the following (page 18-7).



Disconnect the throttle position (TP) sensor 3P connector.

Check the 3P connector for loose contacts or corroded terminals.



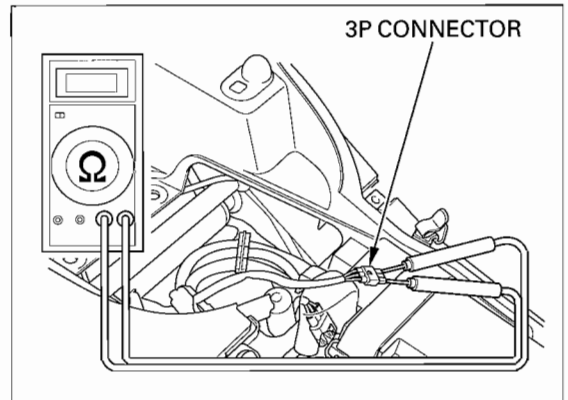
Measure the resistance between the Yellow/black and Green/black wire terminals of the sensor side connector.

STANDARD: 4–6k Ω (20°C/68°F)

Measure the resistance between the Green/black and Red/yellow wire terminals of the sensor side connector.

Full open – Fully closed position: Resistance decreases

Full closed – Fully open position: Resistance increases



If the measurements are abnormal, replace the carburetor assembly (section 5).

If the measurement at the ICM 22P black connector is abnormal and the one at the throttle position (TP) sensor 3P connector is normal, check for open or short circuit, or loose or poor connections in the wire harness.

INPUT VOLTAGE INSPECTION

Remove the battery cover (page 17-4).

Disconnect the throttle position (TP) sensor 3P connector.

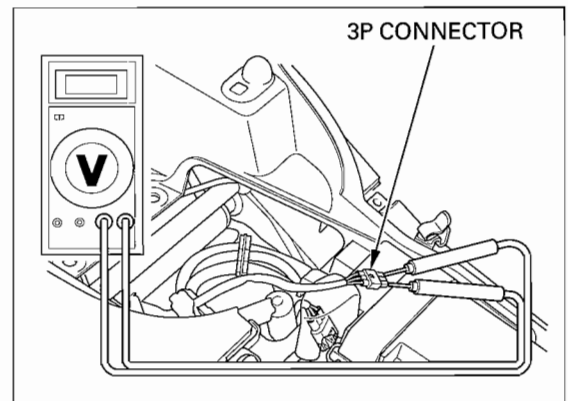


Turn the ignition switch to “ON” and engine stop switch to “O”.

Measure the input voltage between the Yellow/black (+) and Green/black (–) wire terminals of the wire harness side connector.

STANDARD: 4.6–5.4 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 ICM connector contact.



ECT SENSOR

CONTINUITY INSPECTION

Remove the body cover (page 2-5).
Remove the step floor (page 2-8).

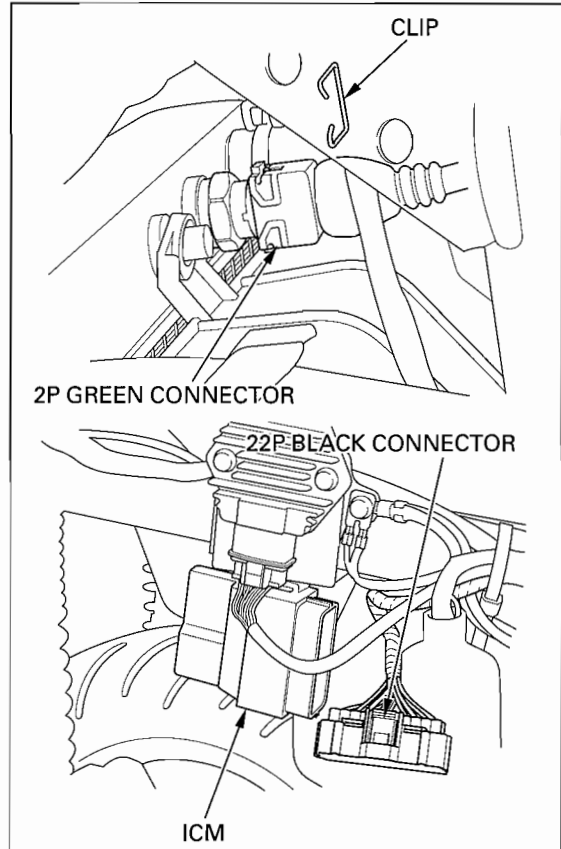
Remove the clip and disconnect the ECT sensor 2P green connector.

Disconnect the ICM 22P black connector.

Check for continuity of the White wire terminal between the ECT sensor 2P green connector and ICM 22P black connector.

Check for continuity of the Green wire terminal between the ECT sensor 2P green connector and ICM 22P black connector.

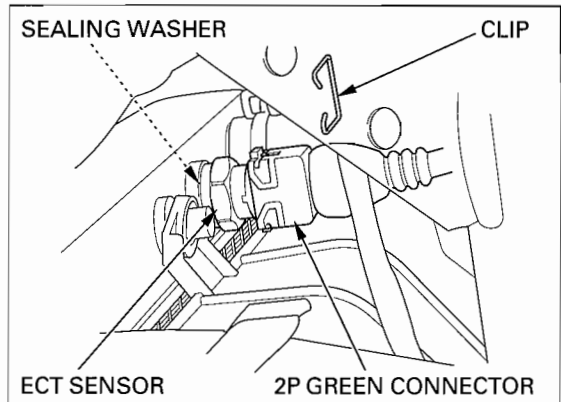
There should be continuity between the same color wires, and no continuity between the different color wires.



UNIT INSPECTION

Drain the coolant (page 6-5).

Remove the clip and disconnect the ECT sensor 2P green connector.
Remove the ECT sensor and sealing washer from the radiator.



Keep all flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.

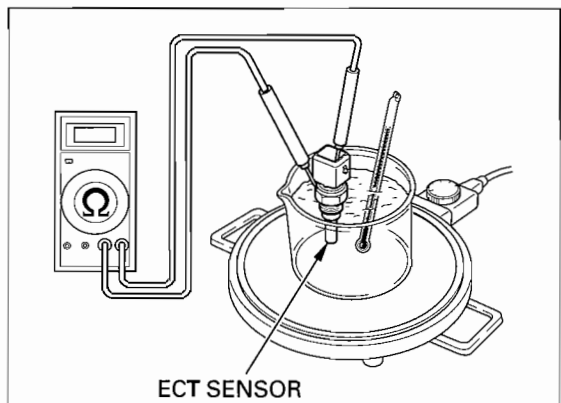
Suspend the ECT sensor in a pan of coolant (1:1 mixture) on an electric heating element and measure the resistance between the ECT sensor terminals and body as the coolant heats up.

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 an incorrect reading. Do not let the thermometer to ECT sensor touch the pan.

STANDARD: 2–3 Ω (20°C/68°F)
200–400 Ω (80°C/178°F)

If the resistance is out of the above range, replace the ECT sensor.

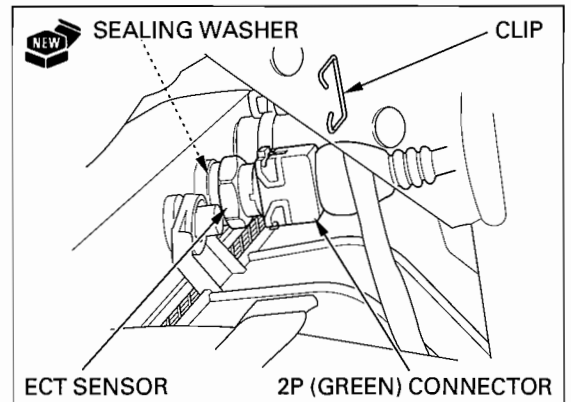


Install the ECT sensor with a new sealing washer to the radiator.
Tighten the ECT sensor to the specified torque.

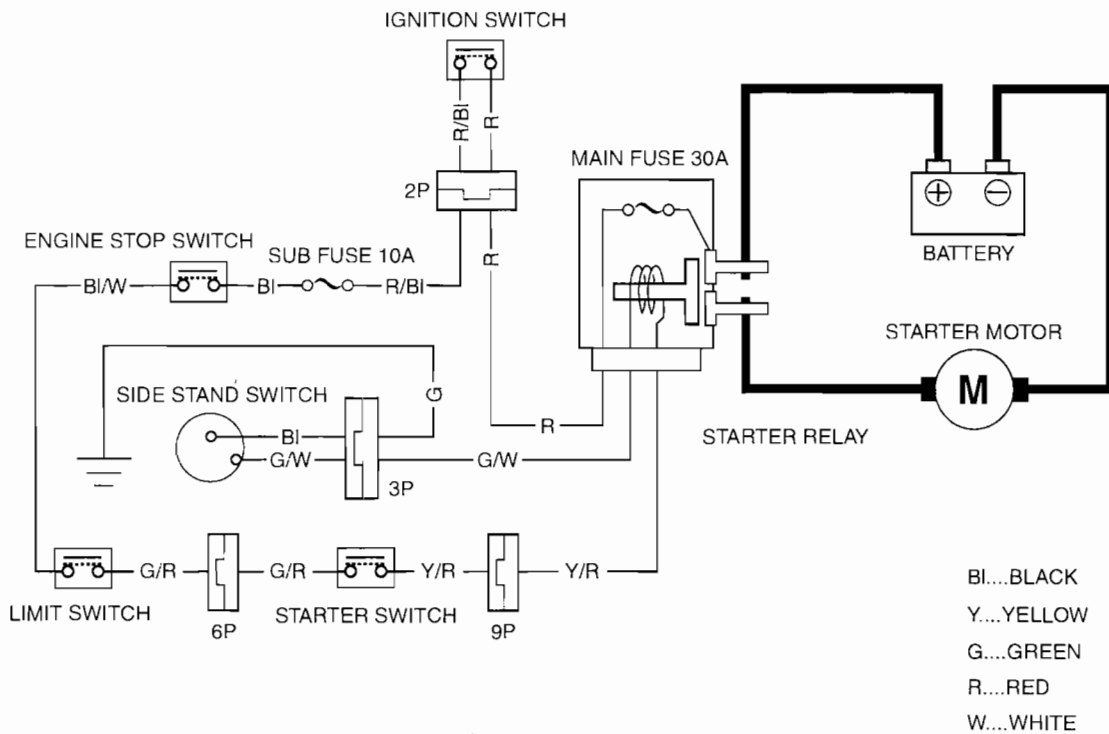
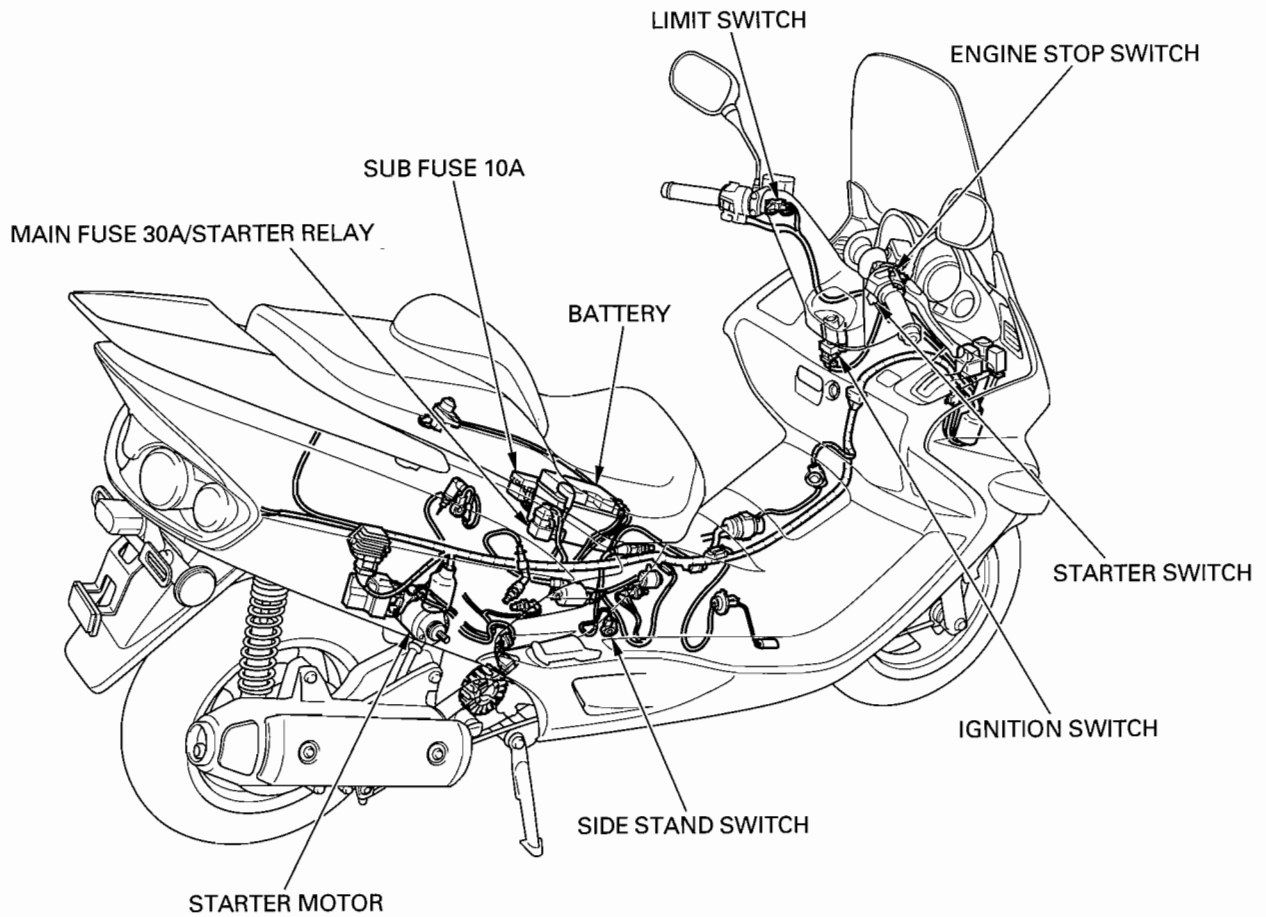
TORQUE: 15 N·m (1.5 kgf·m , 11 lbf·ft)

Connect the ECT sensor 2P green connector and install the clip securely.

Fill and bleed the cooling system (page 6-5).
Install the floor board (page 2-8).



ELECTRIC STARTER



19. ELECTRIC STARTER

SERVICE INFORMATION	19-1	STARTER MOTOR	19-4
TROUBLESHOOTING	19-2	STARTER RELAY SWITCH	19-11

SERVICE INFORMATION

GENERAL

- Always turn the ignition switch to "OFF" before servicing the starter motor. The motor could suddenly start, causing serious injury.
- The starter motor can be serviced with the engine in the frame.
- When checking the starter system, always follow the steps in the troubleshooting flow chart (page 19-2).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- If the current flows through the starter motor while the engine is not cranking over, the starter motor may be damaged.
- See section 12 for starter clutch servicing.
- See section 20 for following components:
 - Ignition switch
 - Starter switch
 - Side stand switch
 - Limit switch

SPECIFICATIONS

Unit: mm (in)

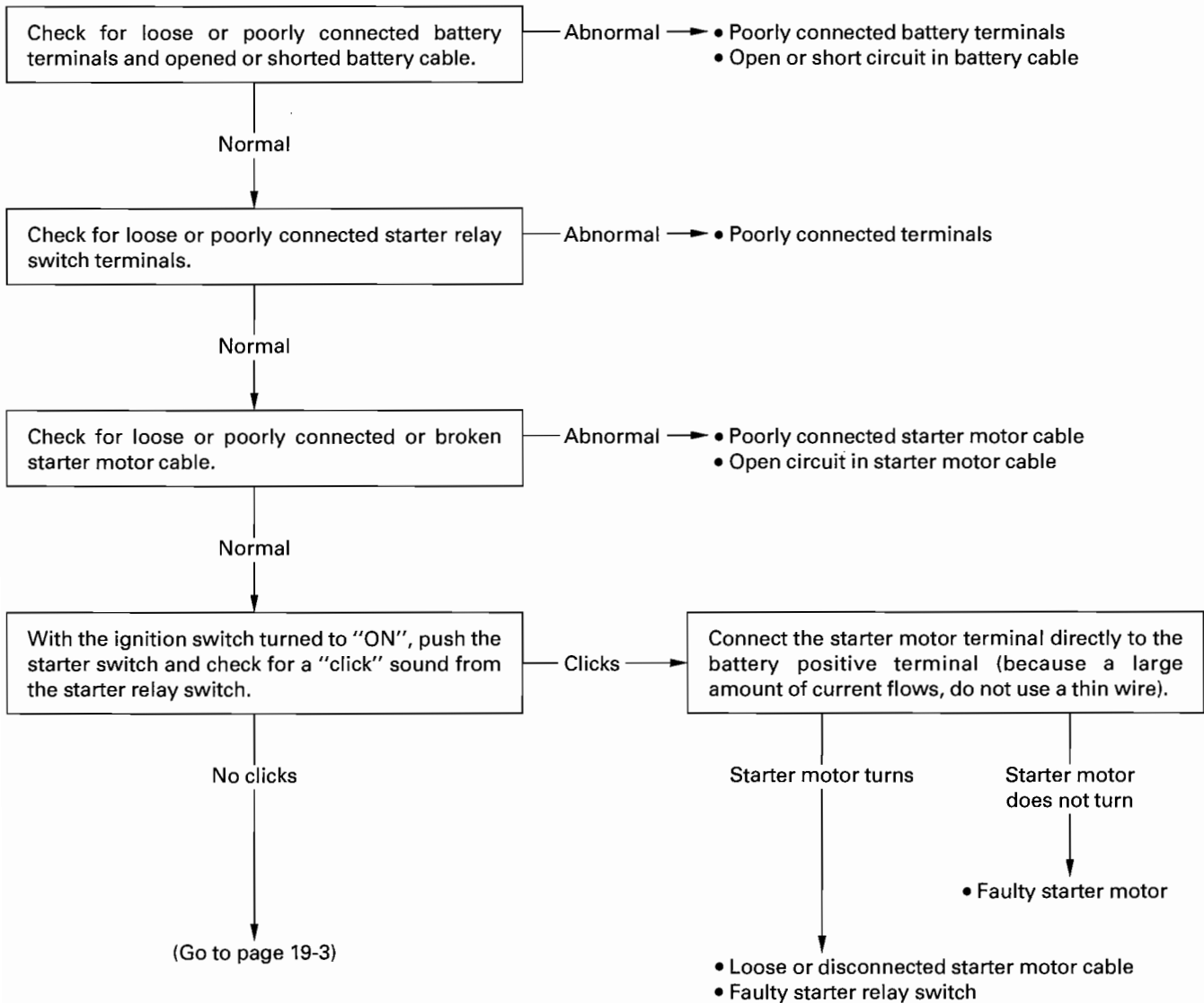
ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.5 (0.49)	8.5 (0.33)

TROUBLESHOOTING

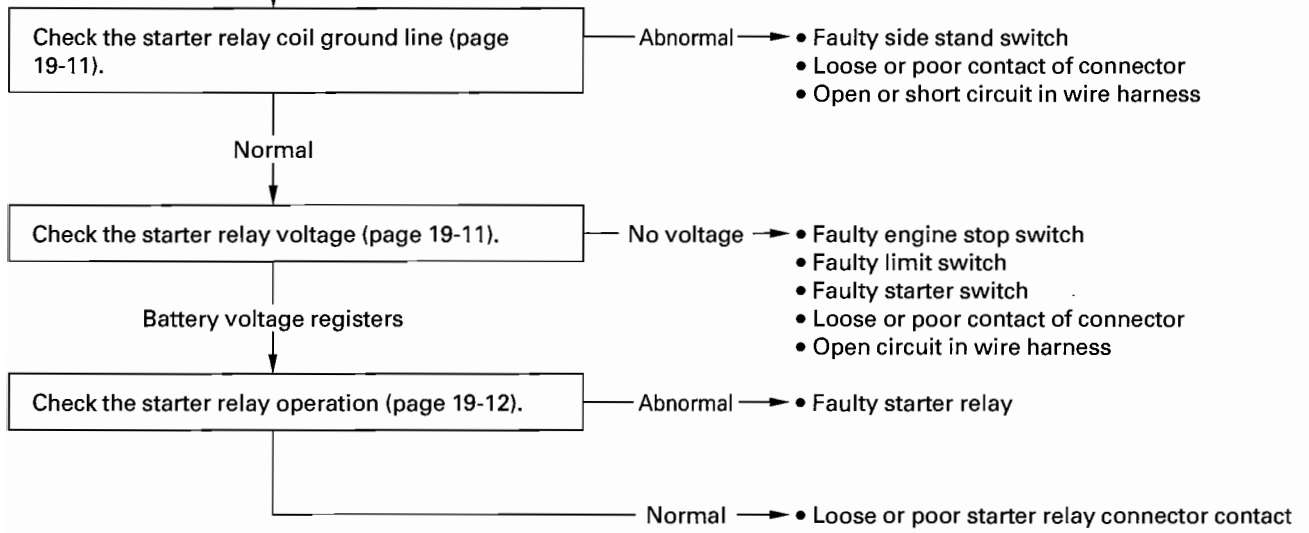
NOTE:

- Check for the following before troubleshooting.
 - Blown main fuse (30 A) and sub fuse (10 A)
 - Loose battery and starter motor cable
 - Discharged battery
- The starter motor can turn with the following conditions:
 - Ignition switch turned to "ON"
 - Engine stop switch to "O"
 - Rear brake lever fully squeezed
 - Side stand retracted
 - Starter switch pushed

Starter motor will not turn



(Continued from page 19-2)



ELECTRIC STARTER

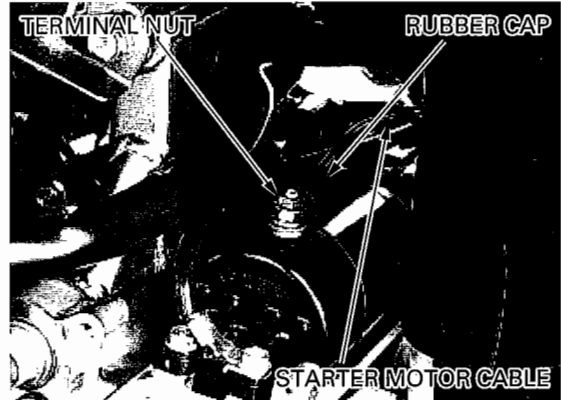
STARTER MOTOR

REMOVAL

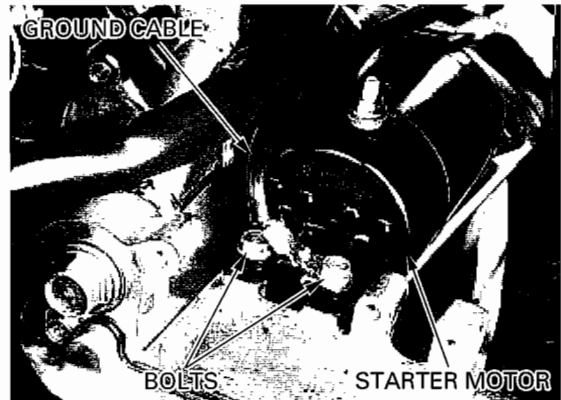
Remove the air cleaner housing (page 5-3).

Turn the ignition switch to "OFF".

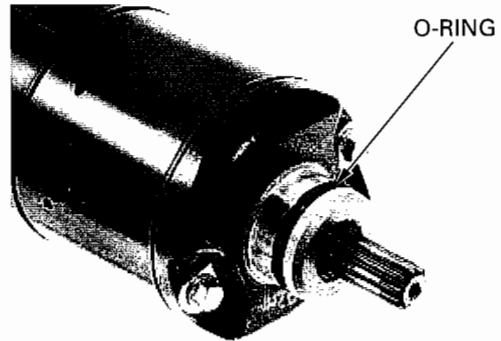
Pull back the rubber cap and remove the terminal nut to disconnect the starter motor cable.



Remove the bolts, ground cable and starter motor.



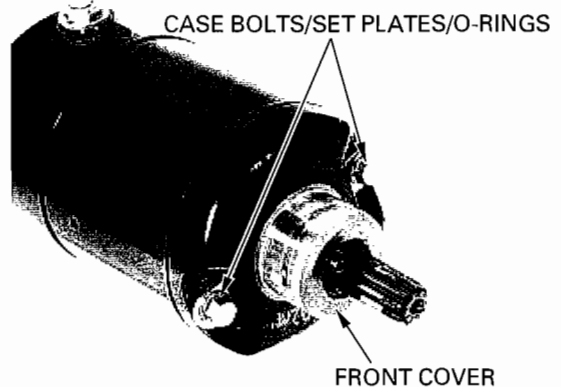
Remove the O-ring from the groove on the starter motor.



DISASSEMBLY

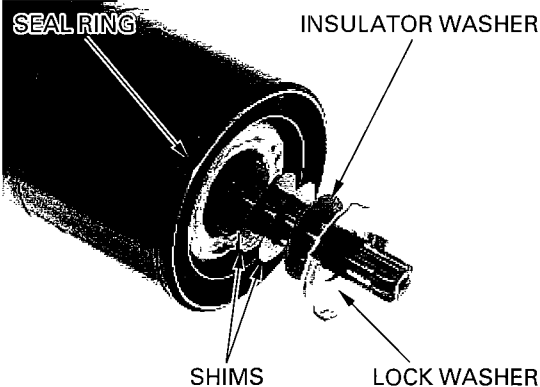
Remove the starter motor case bolts, set plates and O-rings.

Remove the front cover.



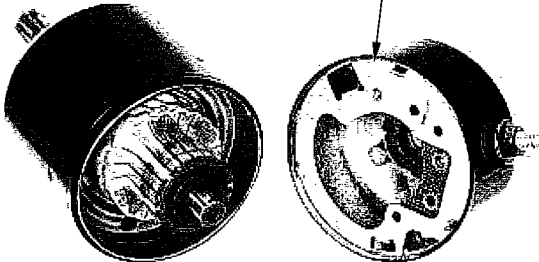
Record the location and number of shims.

- Remove the following:
- Lock washer
 - Insulator washer
 - Shims
 - Seal ring



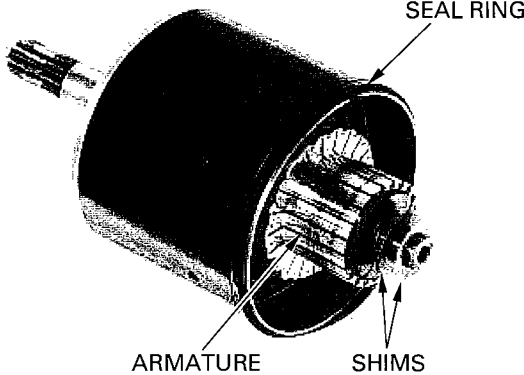
- Rear cover assembly

REAR COVER ASSEMBLY



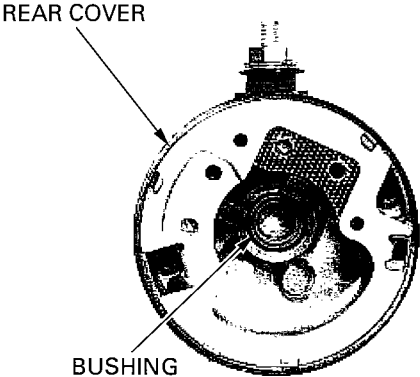
Record the location and number of shims.

- Shims
- Seal ring
- Armature



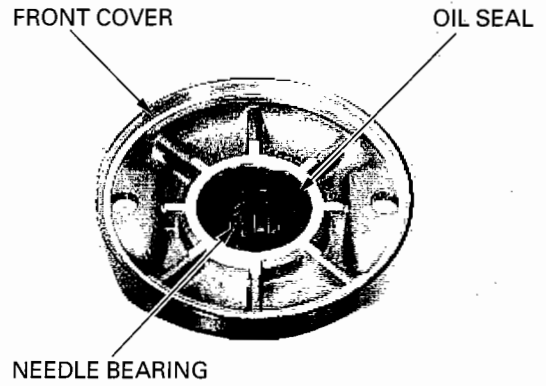
INSPECTION

Check the bushing in the rear cover for wear or damage.

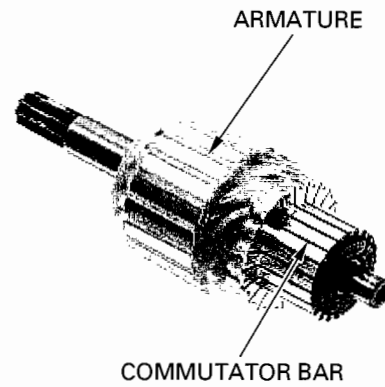


ELECTRIC STARTER

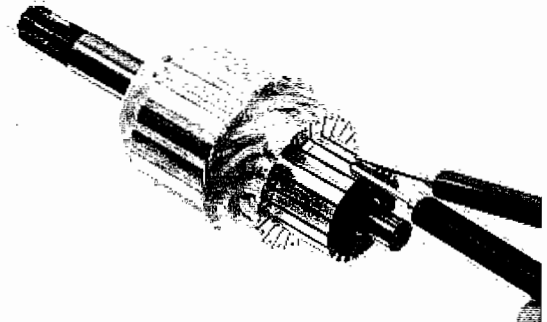
Check the oil seal and needle bearing in the front cover for deterioration, wear or damage.



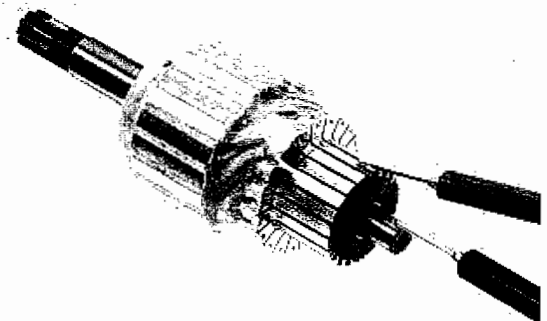
Do not use emery or sand paper on the commutator bar. Check the commutator bars of the armature for discoloration.



Check for continuity between pairs of commutator bars.
There should be continuity.

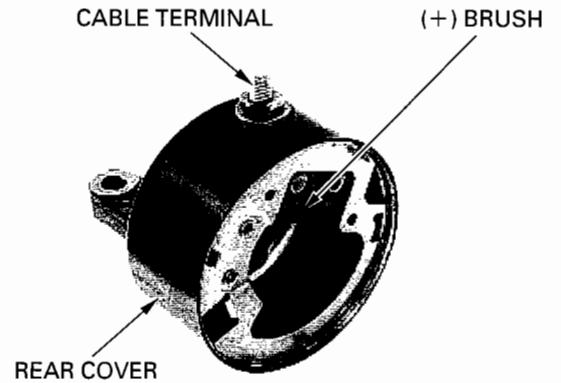


Check for continuity between each commutator bar and the armature shaft.
There should be no continuity.



Check for continuity between the insulated (+) brush and cable terminal.
There should be continuity.

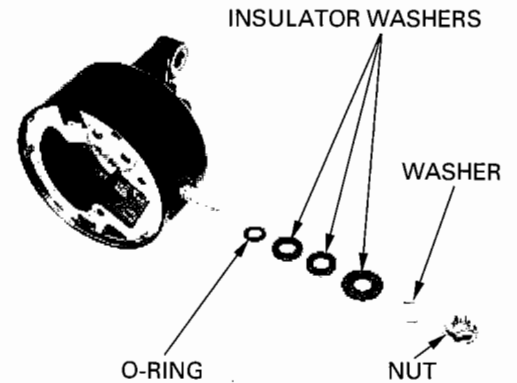
Check for continuity between the insulated (+) brush and rear cover.
There should be no continuity.



REAR COVER DISASSEMBLY

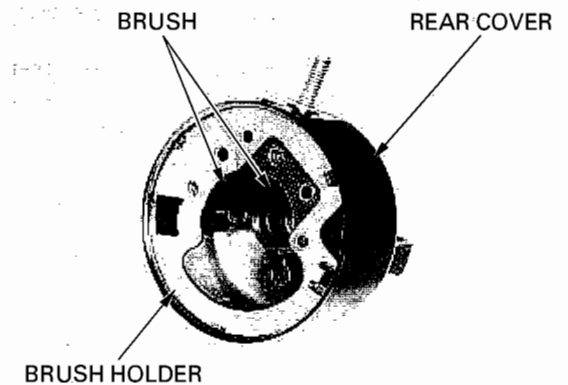
Remove the following:

- Nut
- Washer
- Insulator washers
- O-ring



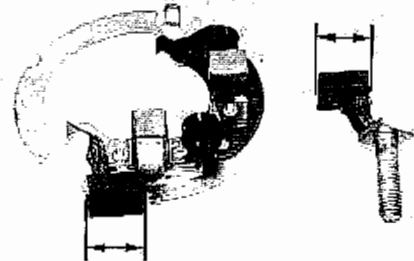
- Brush holder
- Brush

Remove the brushes from the brush holder.



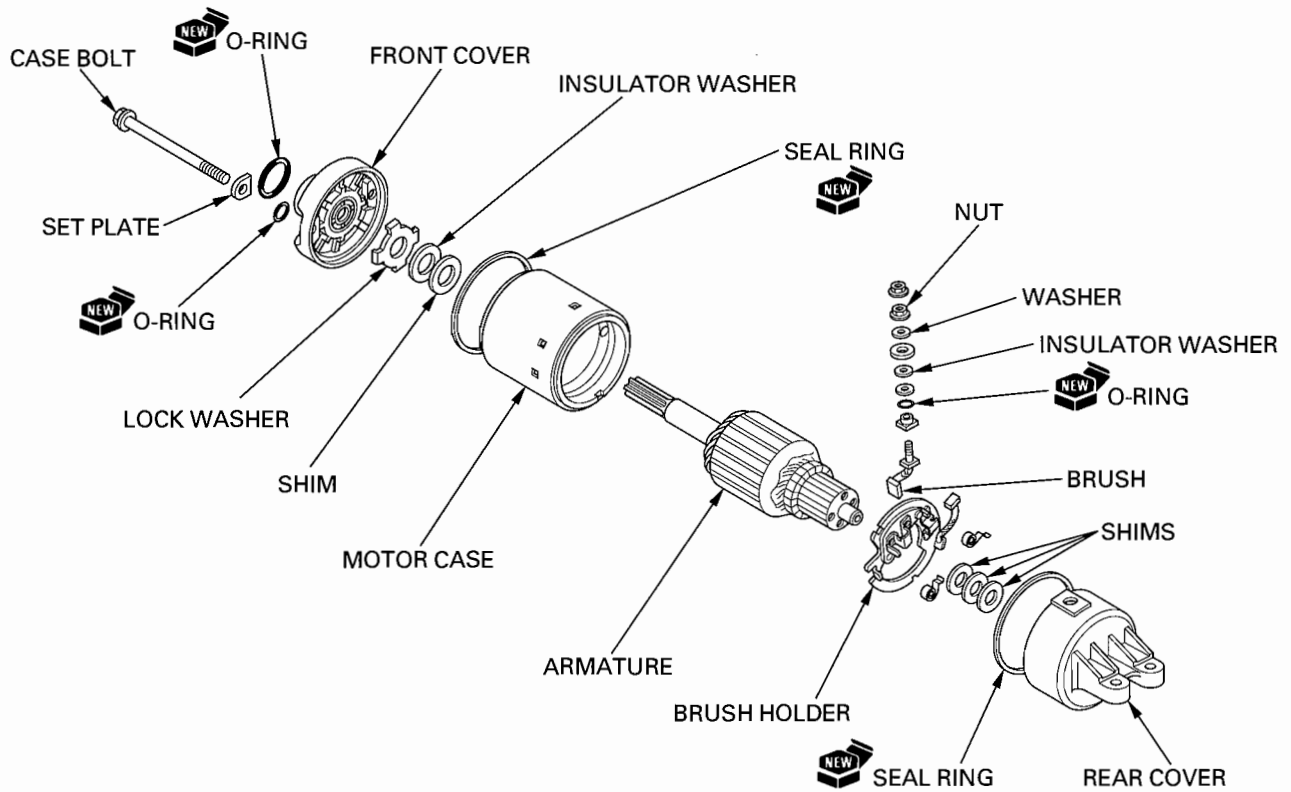
Measure the brush length.

SERVICE LIMIT: 8.5 mm (0.33 in)



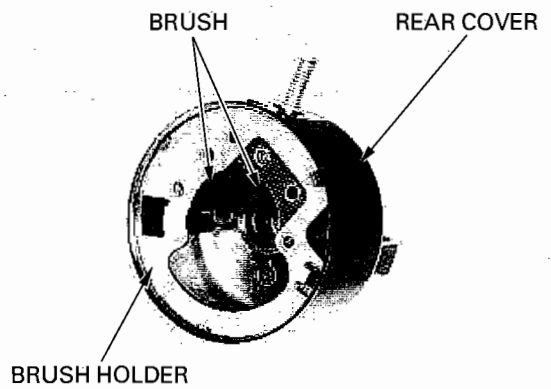
ELECTRIC STARTER

ASSEMBLY



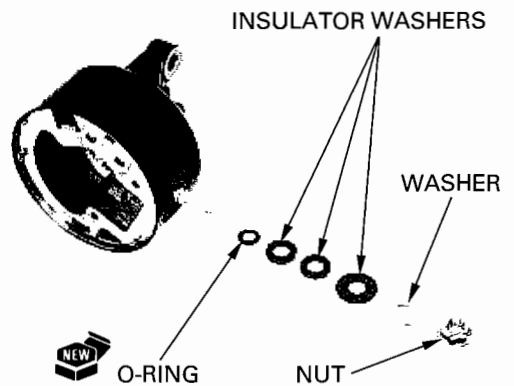
Install the brushes into the brush holder.

Install the brush holder assembly into the rear cover by aligning the tab of the holder with the groove in the rear cover.



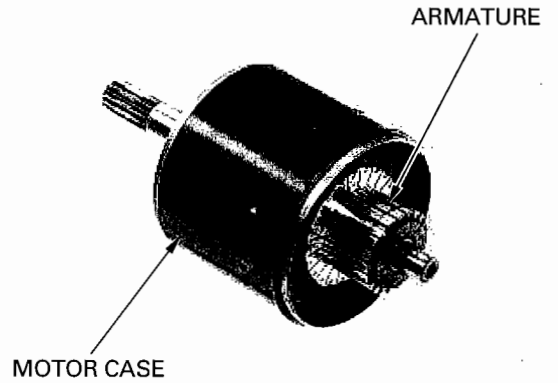
Install the following:

- New O-ring
- Insulator washers
- Washer
- Nut



Hold the armature coil shaft, or the armature might be drawn out by the magnet.

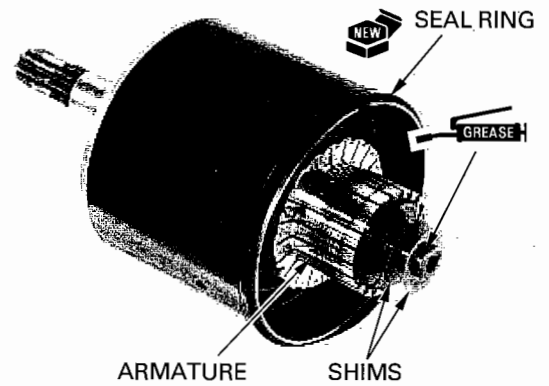
Install the armature in the motor case.



Install the shims to the armature coil in the correct positions as recorded.

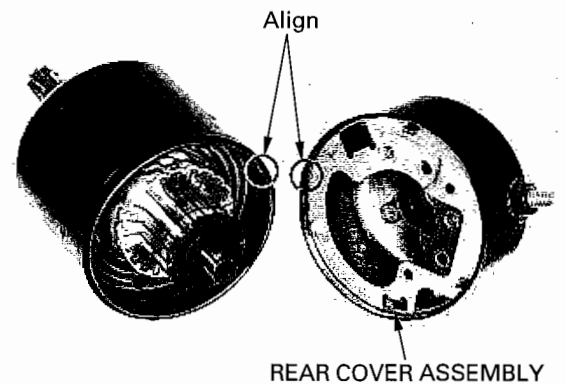
Install the seal ring on the motor case.

Apply grease to the armature shaft.

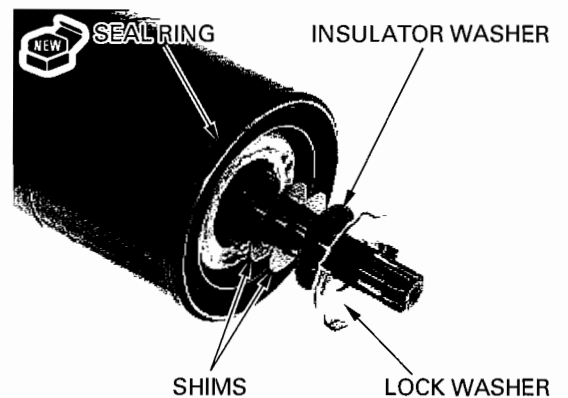


Assemble the motor case and rear cover, aligning the tab on the brush holder with the groove on the motor case.

Make sure the index lines on the rear cover and motor case align.

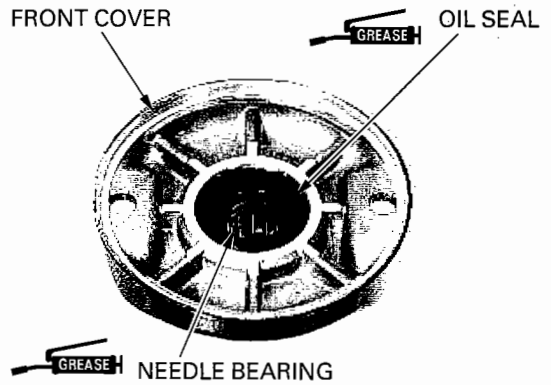


Install the shims, insulator washer and lock washer to the armature coil in the correct positions as recorded.



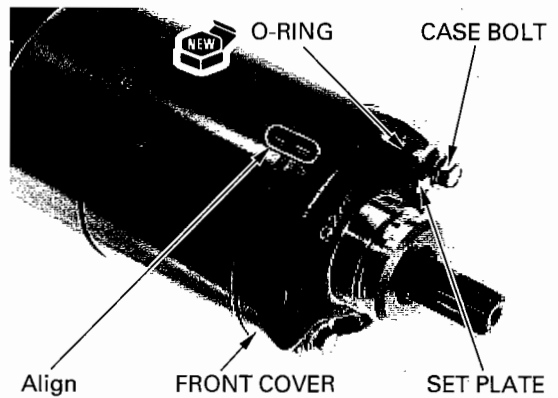
ELECTRIC STARTER

Apply grease to the dust seal lip and needle bearing in the front cover.



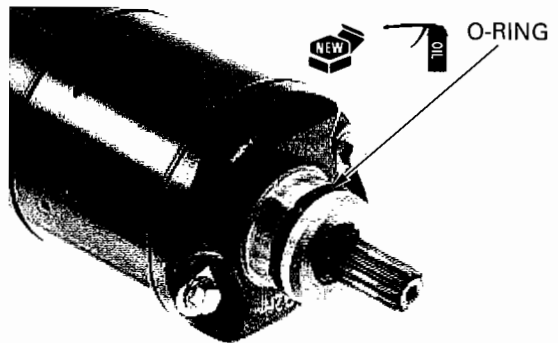
Align the index lines on the front cover and motor case.

Install the set plates and new O-rings onto the motor case bolts.
Install the motor case bolts and tighten them.

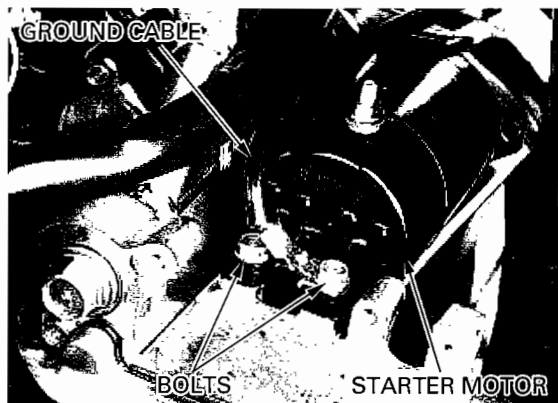


INSTALLATION

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

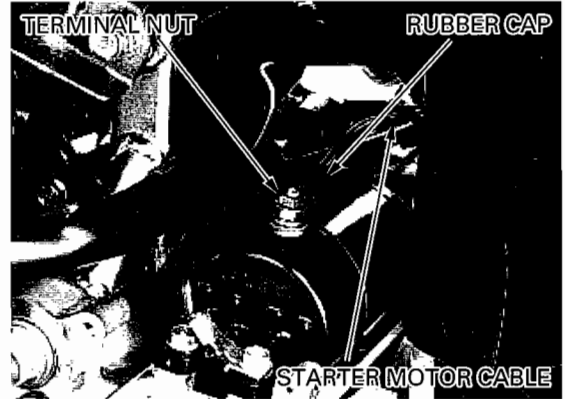


Install the starter motor into the crankcase.
Install the bolts with the ground cable terminal and tighten them securely.



Connect the starter motor cable to the motor terminal with the terminal nut and tighten it. Install the rubber cap over the motor terminal securely.

Install the air cleaner housing (page 5-4).



STARTER RELAY SWITCH

INSPECTION

Remove the battery cover (page 17-4).

Retract the side stand.

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

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

The coil is normal if the starter relay switch clicks.

If you don't hear the switch "click" inspect the relay switch using the procedure below.

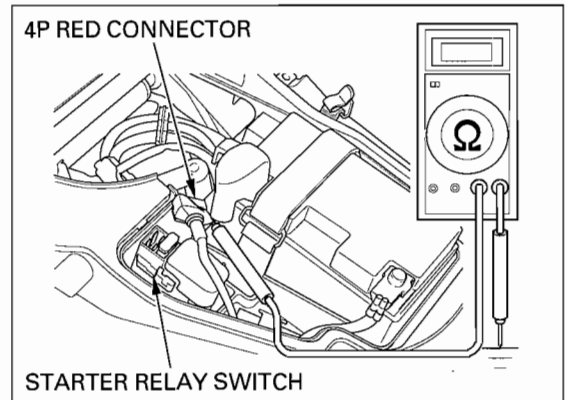


GROUND LINE INSPECTION

Disconnect the starter relay switch 4P red connector.

Check for continuity between the Green/white wire (ground line) terminal and ground.

There should be no continuity with the side stand lowered, and there should be continuity with the side stand retracted.

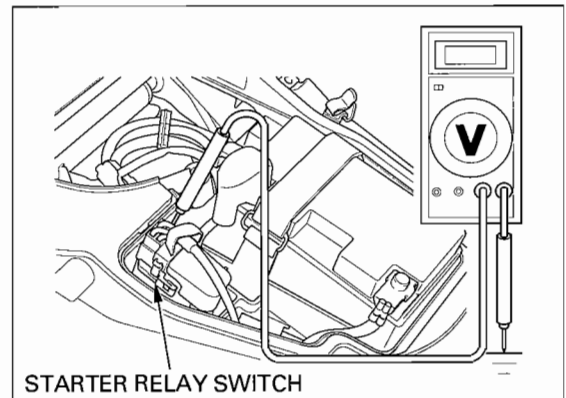


VOLTAGE INSPECTION

Connect the starter relay switch 4P red connector. Turn the ignition switch to "ON" and engine stop switch to "O".

Measure the starter relay switch Yellow/red connector (+) and ground.

If the battery voltage appears only when the rear brake lever is squeezed fully and starter switch is pushed, the circuit is normal.



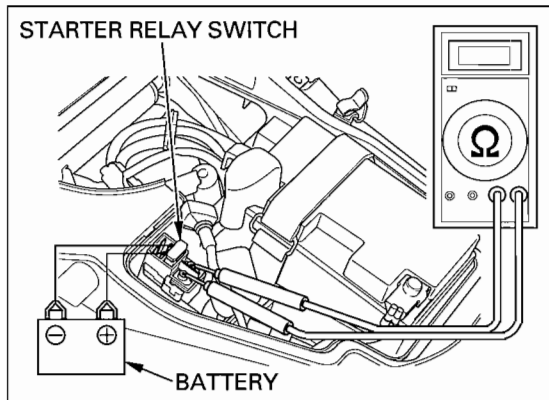
ELECTRIC STARTER

CONTINUITY INSPECTION

Disconnect the starter relay switch 4P red connector and cables.

Connect a fully charged 12-V battery positive wire to the relay switch Yellow/red wire terminal and negative wire to the Green/white wire terminal.

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



REMOVAL/INSTALLATION

Remove the battery cover (page 17-4).

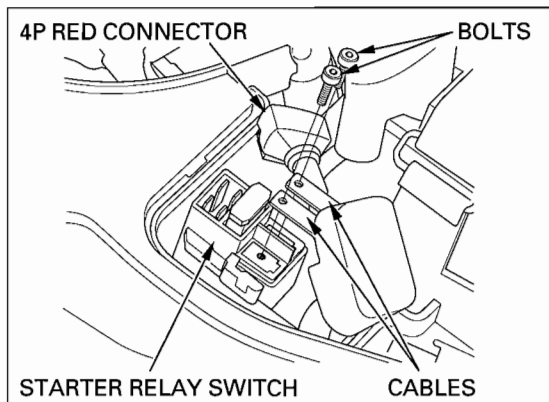
Disconnect the starter relay switch 4P red connector.

Remove the socket bolts.

Disconnect the battery cable and starter motor cable from the starter relay switch.

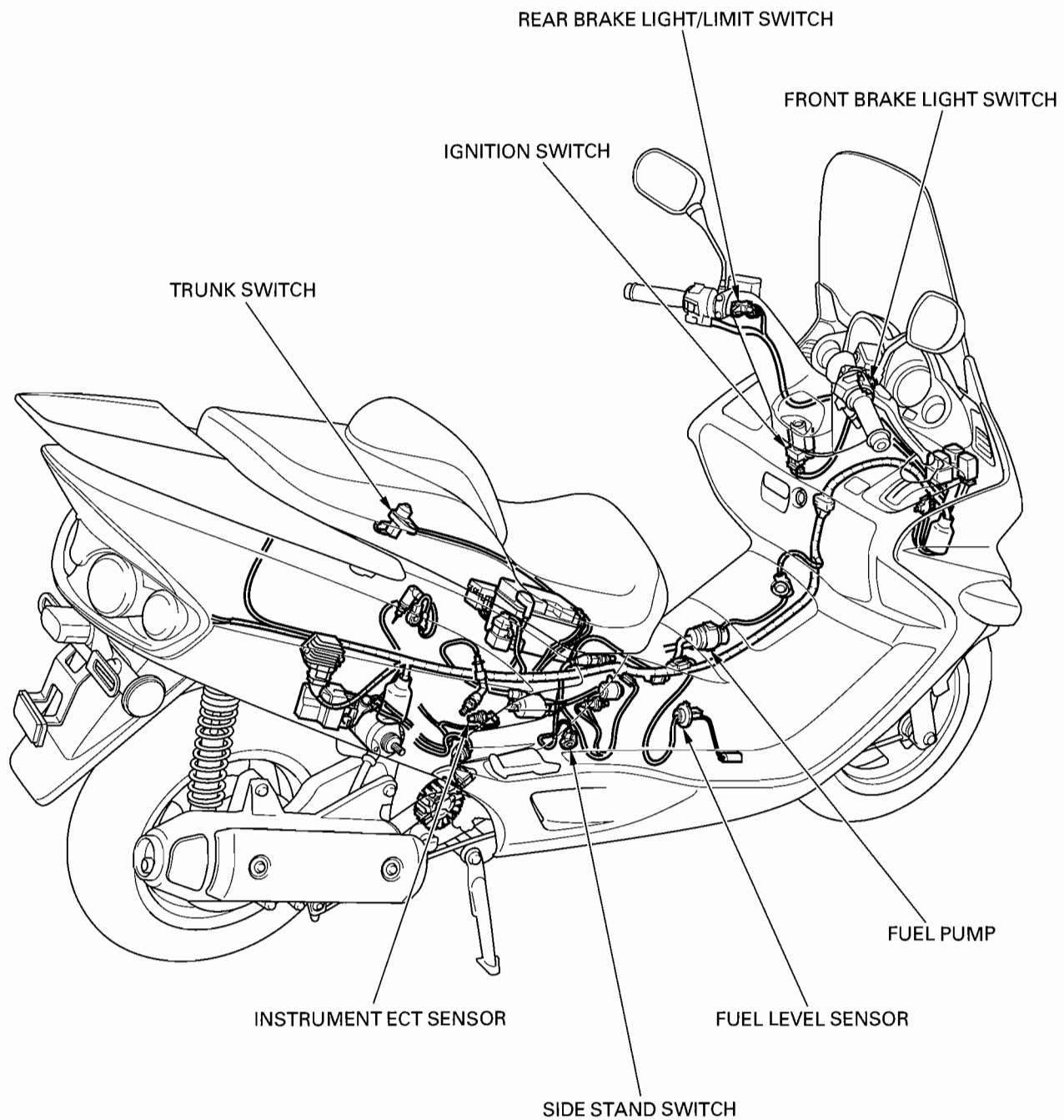
Remove the starter relay switch from the tabs on the upper luggage box.

Installation is in the reverse order of removal.



MEMO

LIGHTS/METERS/SWITCHES



20. LIGHTS/METERS/SWITCHES

SERVICE INFORMATION	20-1	FAN MOTOR SWITCH	20-12
BULB REPLACEMENT	20-3	COOLANT TEMPERATURE GAUGE/ INSTRUMENT ECT SENSOR	20-13
COMBINATION METER	20-5	FUEL PUMP	20-15
LIMIT SWITCH	20-9	FUEL GAUGE/FUEL LEVEL SENSOR	20-17
BRAKE LIGHT SWITCH	20-10	SIDE STAND SWITCH	20-19
IGNITION SWITCH	20-10	HORN	20-20
HANDLEBAR SWITCH	20-11		
TRUNK SWITCH	20-12		

SERVICE INFORMATION

GENERAL

NOTICE

The halogen bulb becomes very hot while the head light is on, and remains hot for a while after it is turned off. Be sure to let it cool down before servicing.

- Use an electric heating element to heat the water/coolant mixture for the fan motor switch inspection. Keep all flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.
- Note the following when replacing the halogen headlight bulb.
 - Wear clean gloves while replacing the bulb. Do not put fingerprints on the headlight bulb, as they may create hot spots on the bulb and cause it to fail.
 - If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
 - Be sure to install the dust cover after replacing the 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 motorcycle.
- Route the wires and cables properly after servicing each component (page 1-18).

LIGHTS/METERS/SWITCHES

SPECIFICATIONS

ITEM		SPECIFICATIONS	
Bulbs	Headlight	12V-55W × 2	
	Brake/tail light	12V-21/5W × 2	
	Front turn signal/running light	12V-21/5W × 2	
	Rear turn signal light	12V-21W × 2	
	License light	12V-5W	
	Instrument light	12V-1.7W × 3	
	Turn signal indicator	12V-3W × 2	
	High beam indicator	12V-1.7W	
	Parking indicator	12V-1.7W	
	Luggage box instrument light	12V-3.4W	
Fuse	Main fuse	30A	
	Sub fuse	LBS type	15A × 2, 10 A × 3
		ABS type	30A, 20A, 15A × 2, 10 A × 4
Fan motor switch	Start to close (ON)	98 – 102 °C (208 – 216 °F)	
	Stop to open	91 – 99 °C (196 – 210 °F)	
Thermosensor resistance	at 80°C/176°F	47 – 57 Ω	
	at 120°C/248°F	14 – 18 Ω	
Fuel pump flow capacity	Minimum 500 cm ³ (16.9 US oz, 17.6 Imp oz)/minute at 13 V		

TORQUE VALUES

Thermosensor	9.8 N·m (1.0 kgf·m , 7 lbf·ft)	Apply sealant to the threads. (Do not apply to the sensor head.)
Fan motor switch	17 N·m (1.7 kgf·m , 12 lbf·ft)	
Side stand switch bolt	9.8 N·m (1.0 kgf·m , 7 lbf·ft)	

TOOLS

Peak voltage tester (Ignition mate: MTP07-0286, U. S. A. only) or Peak voltage adapter	07HGJ-0020100	with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)
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BULB REPLACEMENT

HEADLIGHT

⚠ CAUTION

The halogen bulb becomes very hot while the headlight is ON, and remains hot for a while after it is turned off. Be sure to let it cool down before servicing.

Disconnect the headlight 3P connector from the headlight bulb and remove the dust cover.

Unhook the retainer and remove the bulb from the headlight case.

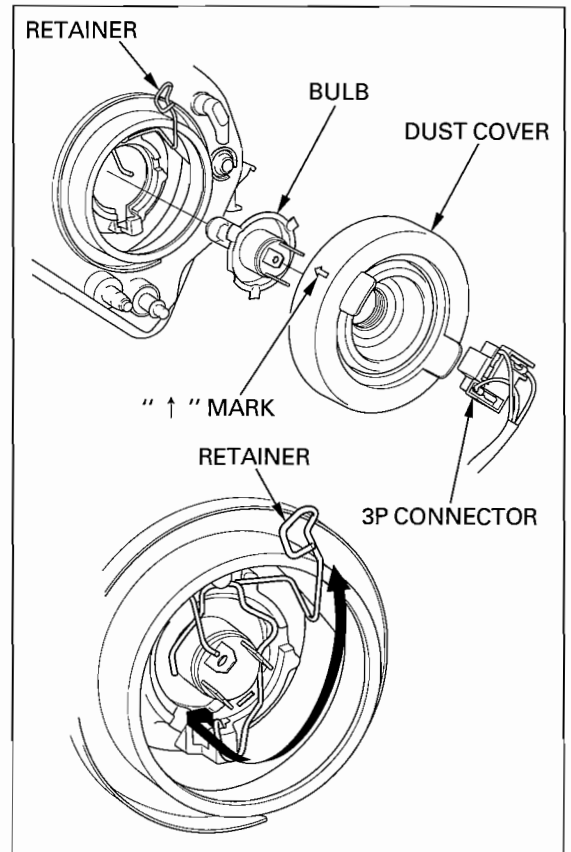
NOTICE

Avoid touching the halogen headlight bulb. Fingerprints can create hot spots that cause a bulb to break.

Install a new bulb in the headlight case, by aligning the bulb tab with the case groove.

Hook the retainer.

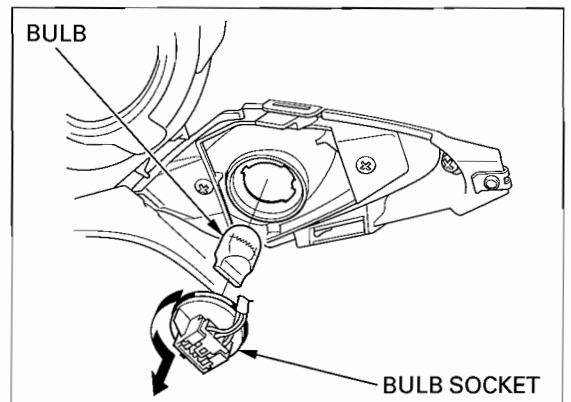
Install the dust cover properly onto the headlight with the " ↑ " mark facing up and connect the headlight 3P connector.



FRONT TURN SIGNAL/RUNNING LIGHT

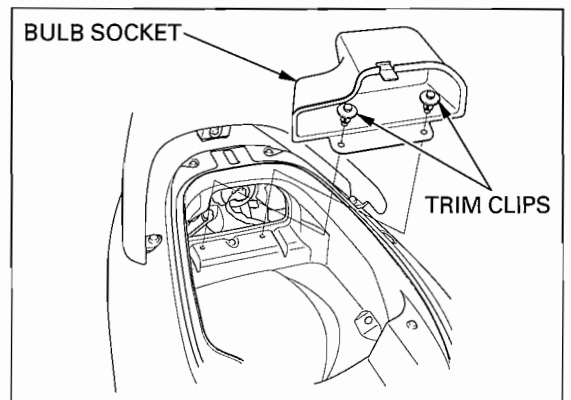
Turn the bulb socket counterclockwise to remove it. Remove the bulb and replace it with a new one.

Installation is in the reverse order of removal.



REAR TURN SIGNAL, BRAKE/TAIL LIGHT

Unlock and open the seat. Remove the trim clips and maintenance lid.

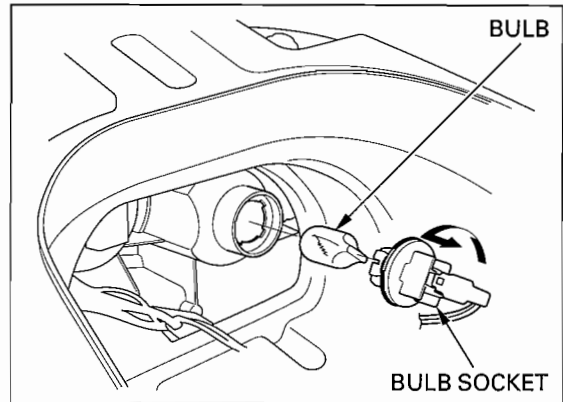


LIGHTS/METERS/SWITCHES

REAR TURN SIGNAL

Turn the bulb socket counterclockwise to remove it. Remove the bulb and replace with a new one.

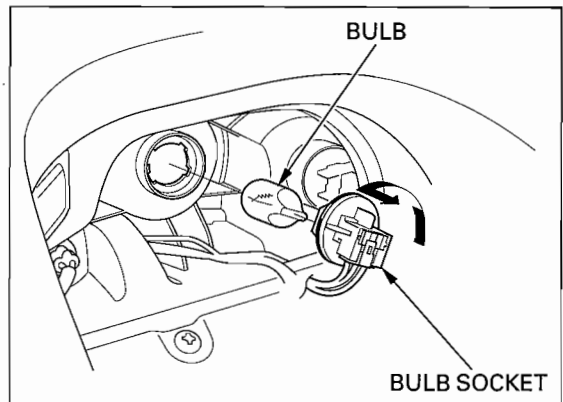
Install in the reverse order of removal.



BRAKE/TAIL LIGHT

Turn the bulb socket counterclockwise to remove it. Remove the bulb and replace it with a new one.

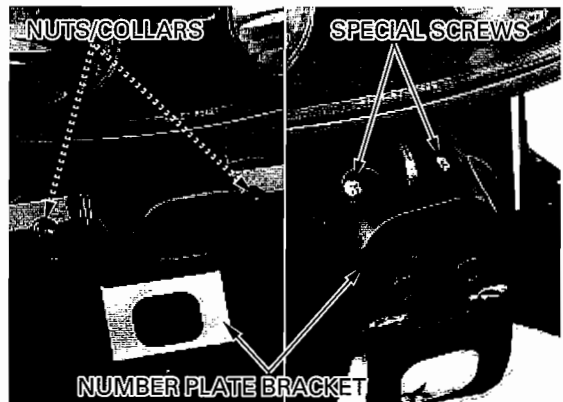
Installation is in the reverse order of removal.



LICENSE LIGHT

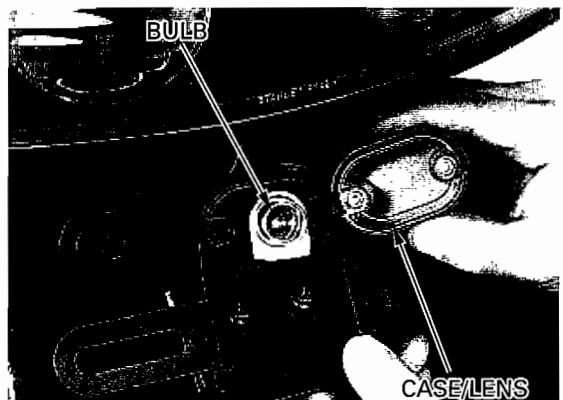
Remove the nuts, collars and number plate bracket.

Remove the special screws.



Remove the license light case and lens. Turn the bulb counterclockwise to remove it and replace it with a new one.

Installation is in the reverse order of removal.



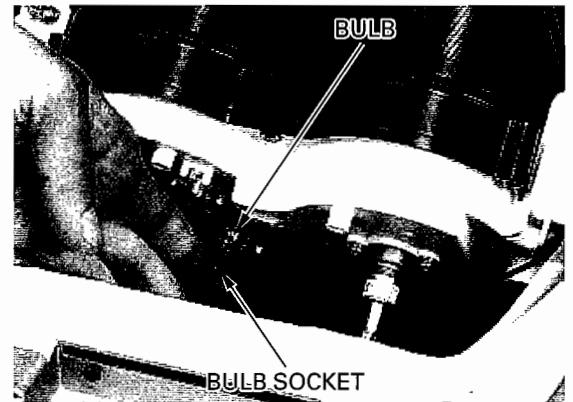
INDICATOR AND METER

Remove the front meter visor (page 2-10).

Remove the valve socket.
Remove the bulb from the bulb socket.

Installation is in the reverse order of removal.

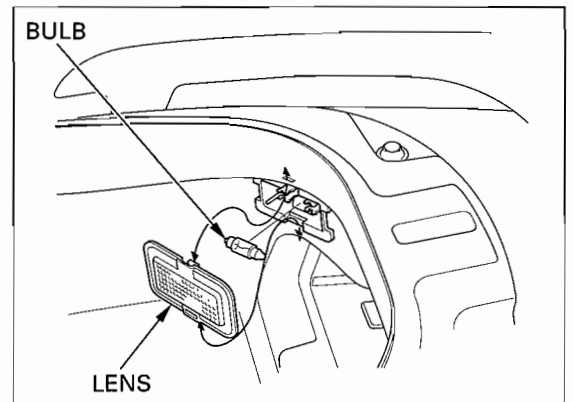
Install the front meter visor (page 2-10).



LUGGAGE BOX INSTRUMENT LIGHT

Unlock and open the seat.
Remove the luggage box instrument light lens and bulb.

Installation is in the reverse order of removal.

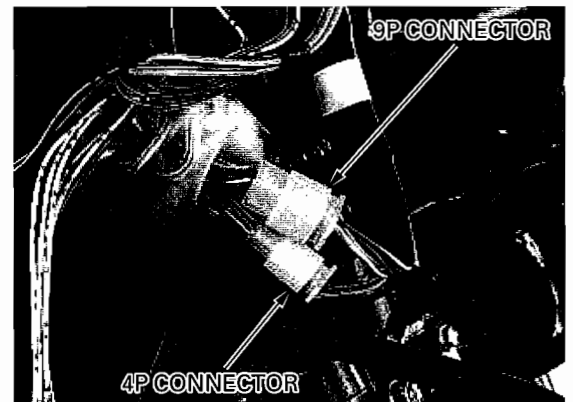


COMBINATION METER

TACHOMETER INSPECTION

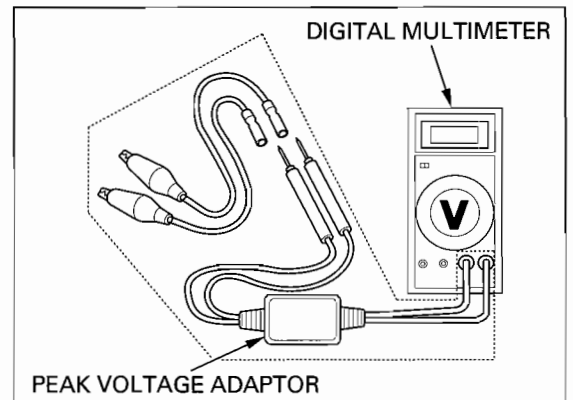
Remove the front cover (page 2-10).

Disconnect the combination meter 9P and 4P connector.
Check the combination meter 9P and 4P connector for loose contacts or corroded terminals.



Use the recommended digital multimeter or a commercially available digital multimeter with an impedance of 10 M Ω /DCV minimum.
Connect the peak voltage adapter to the digital multimeter.

TOOLS:
Peak voltage tester
(Ignition mate: MTP07-0286, U. S. A. only) or
Peak voltage adapter 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum)



LIGHTS/METERS/SWITCHES

Connect the peak voltage adapter probes to the 9P connector terminals of the wire harness side.

CONNECTION:

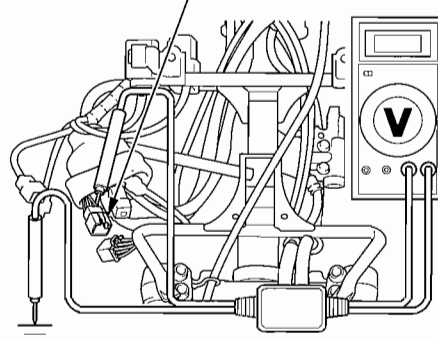
Yellow/blue (+) – Body ground (–)

Start the engine and read the tachometer input voltage.

PEAK VOLTAGE: 10.5 V minimum

If the value is normal, replace the tachometer.
If the measured value is below 10.5 V, replace the ICM.

9P CONNECTOR (YELLOW/BLUE TERMINAL)



If the value is 0 V, perform the following:

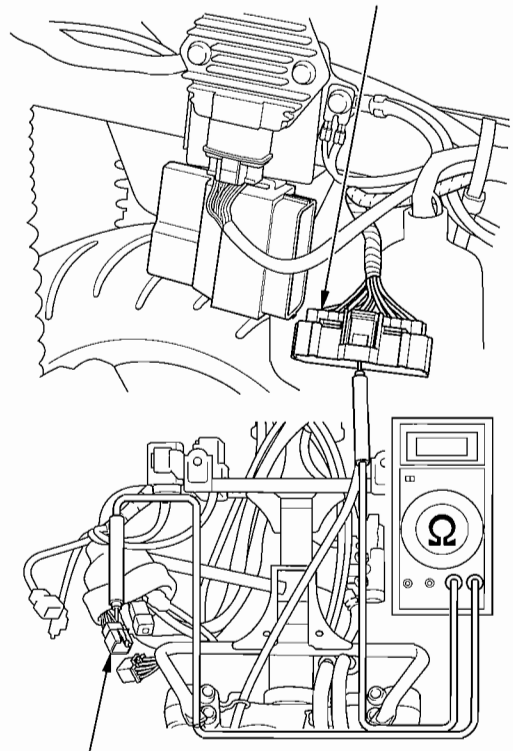
Remove the body cover (page 2-5) and disconnect the ICM 22P black connector.

Check for continuity between the tachometer 9P connector and the ICM 22P black connector Yellow/blue terminal.

If there is no continuity, check the wire harness for an open circuit.

If there is continuity, replace the tachometer unit.

22P BLACK CONNECTOR (YELLOW/BLUE TERMINAL)

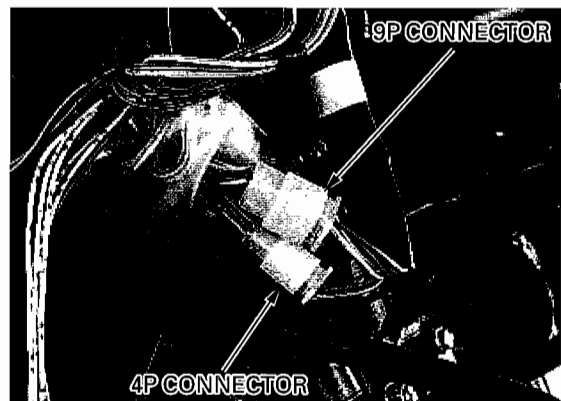


9P CONNECTOR (YELLOW/BLUE TERMINAL)

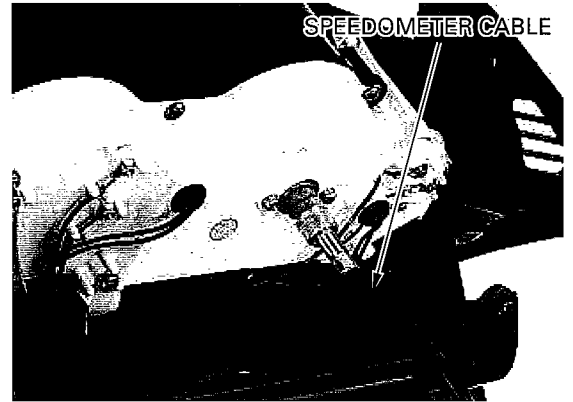
REMOVAL/INSTALLATION

Remove the front cover (page 2-10).

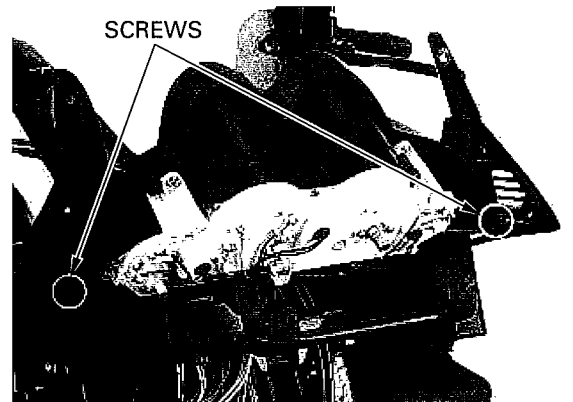
Disconnect the combination meter 9P and 4P connectors.



Disconnect the speedometer cable from the combination meter.



Remove the screws.

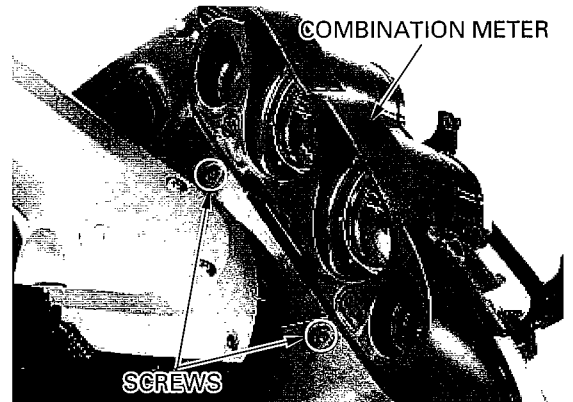


Remove the screws and combination meter.

Installation is in the reverse order of removal.

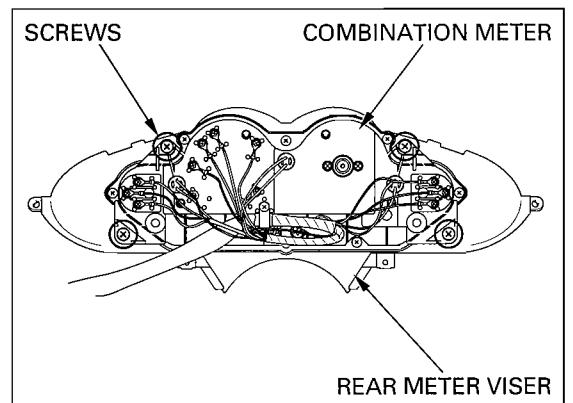
Route the cables and wire harness properly (page 1-18).

Install the front cover (page 2-11).



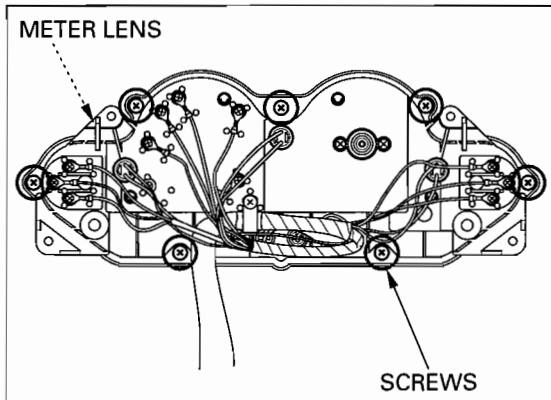
DISASSEMBLY

Remove the screws and rear meter visor.

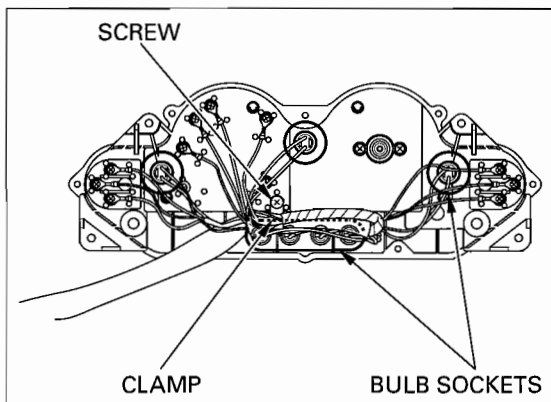


LIGHTS/METERS/SWITCHES

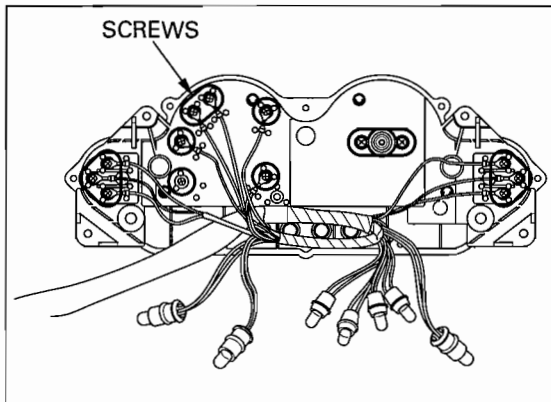
Remove the screws and combination meter lens.



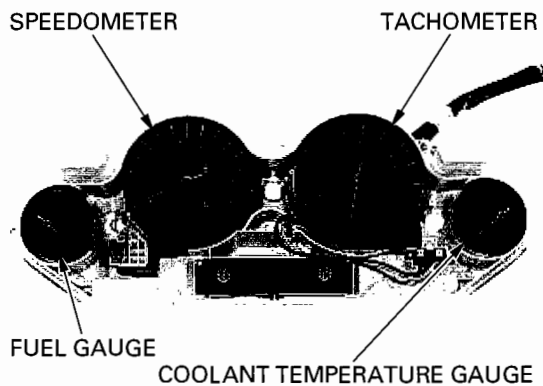
Remove the meter light bulb sockets and indicator bulb sockets.
Remove the screw and clamp.



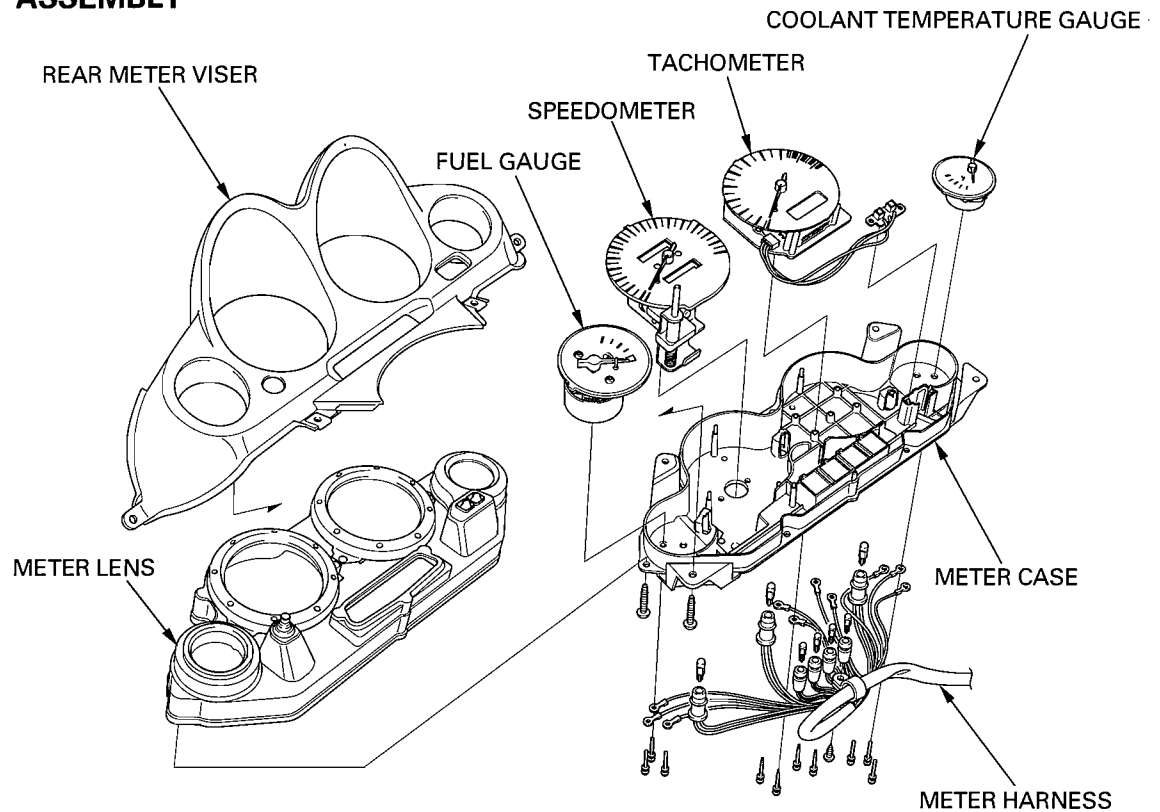
Remove the screws.



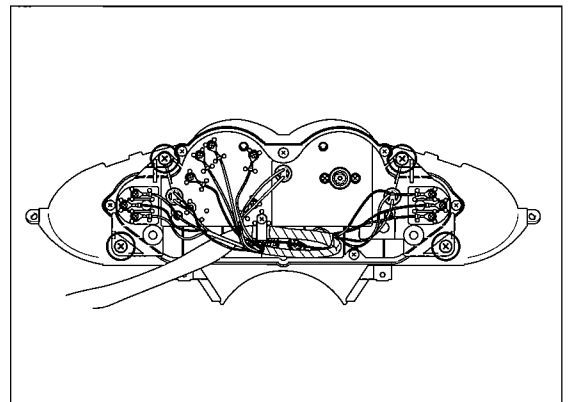
Remove the tachometer, speedometer, fuel gauge and coolant temperature gauge from the meter case.



ASSEMBLY

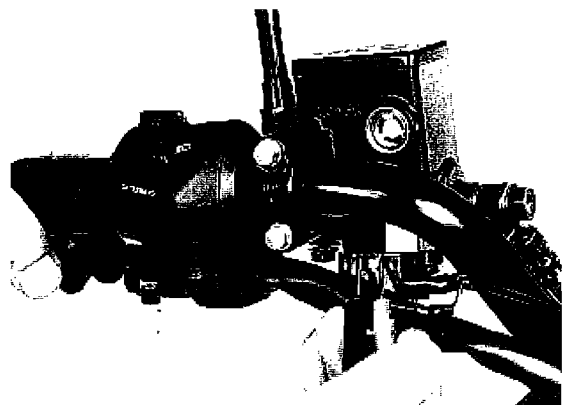


Assembly is in the reverse order of disassembly.
 Route the meter harness properly (as shown).
 Install the combination meter (page 20-7).



LIMIT SWITCH

Remove the handlebar cover (page 2-13).
 Disconnect the limit switch connectors and check for continuity between the switch terminals.
 There should be continuity with the rear brake lever squeezed, and there should be no continuity with the rear brake lever released.
 Install the handlebar cover (page 2-13).

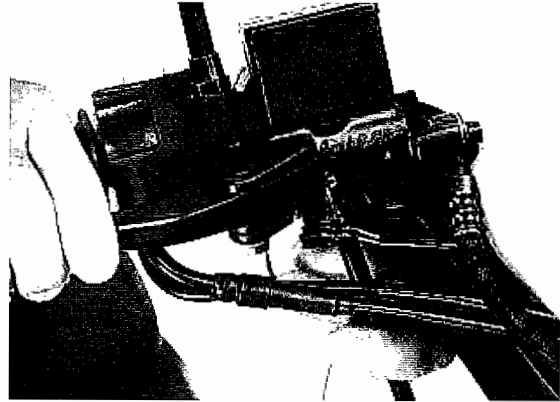


BRAKE LIGHT SWITCH

FRONT

Disconnect the front brake light switch connectors and check for continuity between the switch terminals.

There should be continuity with the front brake lever squeezed, and there should be no continuity with the front brake released.



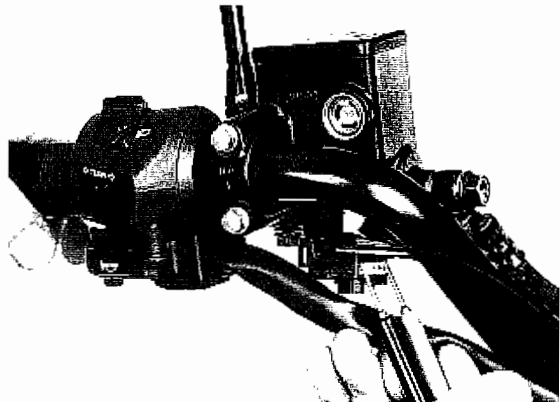
REAR

Remove the handlebar cover (page 2-13).

Disconnect the rear brake light switch connectors and check for continuity between the switch terminals.

There should be continuity with the rear brake lever squeezed, and there should be no continuity with the rear brake released.

Install the handlebar cover (page 2-13).



IGNITION SWITCH

INSPECTION

Remove the front cover (page 2-10).

Disconnect the ignition switch 2P connector and check for continuity at the switch side connector terminals. Continuity should exist between the color code wires as follows:

	BAT1	BAT2
LOCK		
OFF		
ON	○ ——— ○	
COLOR	Red	Red/black



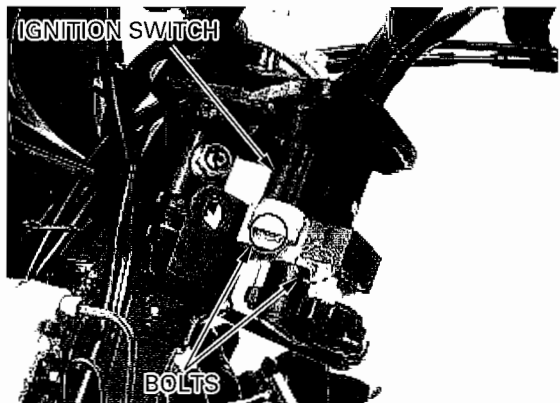
REMOVAL/INSTALLATION

Remove the steering handle (page 14-16).

Disconnect the ignition switch 2P connector. Remove the bolts and ignition switch.

After '03 only. Remove the ignition switch wire from handlebar post.

Installation is in the reverse order of removal.



HANDLEBAR SWITCH

INSPECTION

Remove the front cover (page 2-10).

RIGHT HANDLEBAR SWITCH

Disconnect the right handlebar switch 9P brown connector and check for continuity at the switch side connector terminals.

Continuity should exist between the color code wires as follows:

STARTER/LIGHTING SWITCH

	BAT2	HL	ST1	ST2
FREE	○	○		
PUSH			○	○
COLOR	BI/R	Br/W	G/R	Y/R

ENGINE STOP SWITCH

	BAT4	IGN
OFF		
RUN	○	○
CORD COLOR	BI	BI/W

LEFT HANDLEBAR SWITCH

Disconnect the left handlebar switch 9P green and 6P green connectors and check for continuity at the switch side connector terminals.

Continuity should exist between the color code wires as follows:

HORN SWITCH

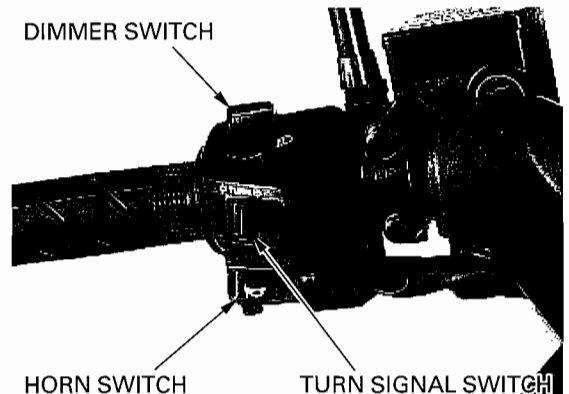
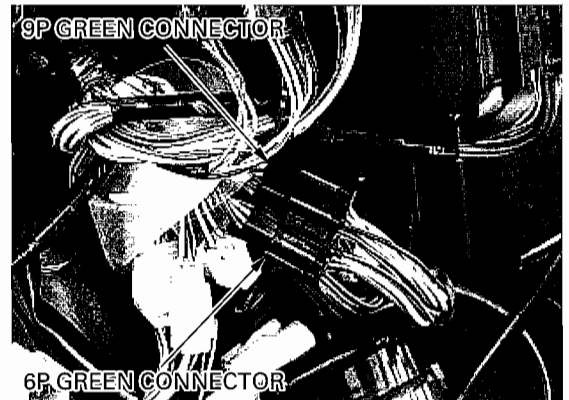
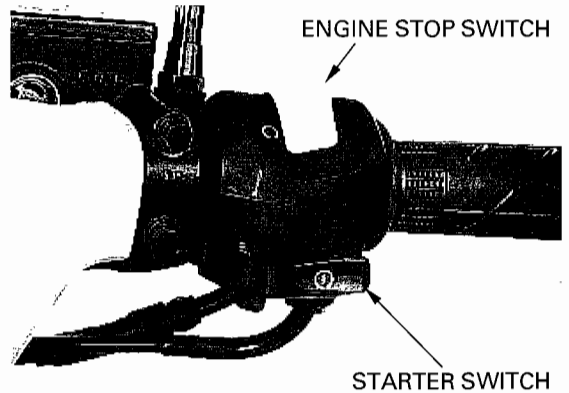
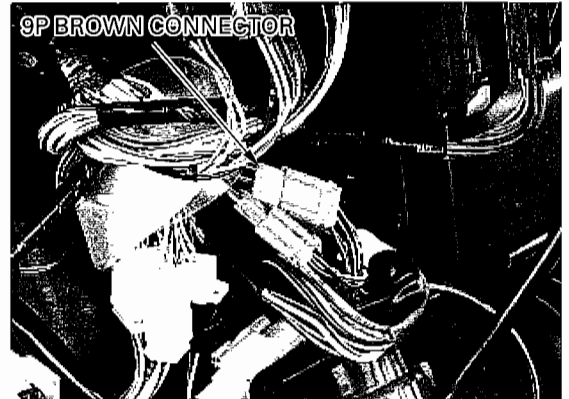
	BAT3	HO
FREE		
PUSH	○	○
COLOR	BI/Br	Lg

TURN SIGNAL SWITCH

	Turn signal			Position		
	W	R	L	PO	PRO	LPO
R	○	○		○		○
N				○	○	○
L	○		○	○	○	
COLOR	Gr	SB	O	BI/Br	SB/W	O/W

DIMMER SWITCH

	HI	HL	LO
Lo		○	○
(N)	○	○	○
Hi	○	○	
COLOR	Bu	Bu/W	W



TRUNK SWITCH

INSPECTION

Remove the body cover (page 2-5).

Disconnect the trunk switch connector and check for continuity between the switch terminal and body ground.

There should be no continuity with the trunk switch pushed, and there should be continuity with the trunk switch released.

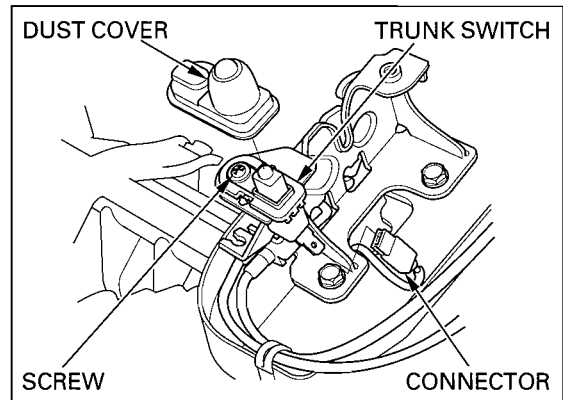
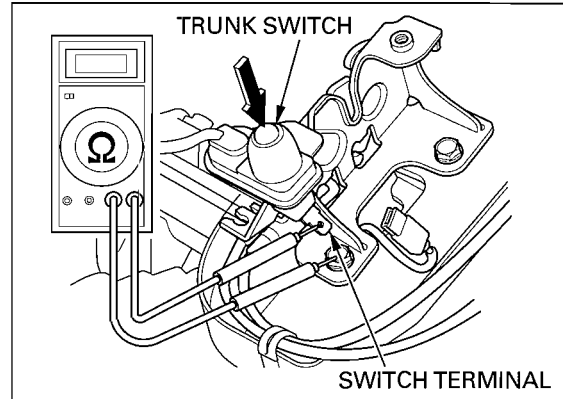
REMOVAL/INSTALLATION

Remove the body cover (page 2-5).

Disconnect the trunk switch connector.
Remove the dust cover.
Remove the screw and trunk switch.

Installation is in the reverse order of removal.

Install the body cover (page 2-5).



FAN MOTOR SWITCH

INSPECTION

Remove the under cover (page 2-12).

FAN MOTOR DOES NOT STOP

Turn the ignition switch to "OFF", disconnect the connector from the fan motor switch and turn the ignition switch to "ON" again.

If the fan motor does not stop, check for a shorted wire between the fan motor and switch.

If the fan motor stops, the fan motor switch is faulty.

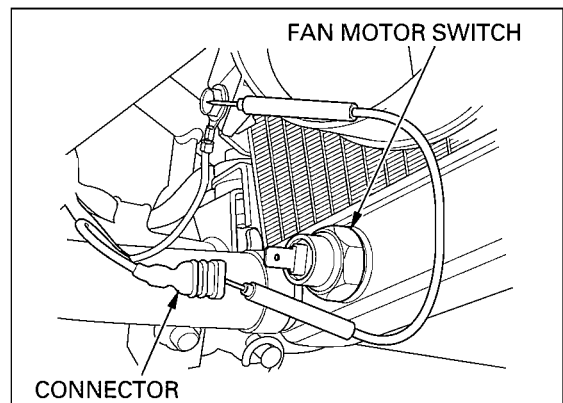
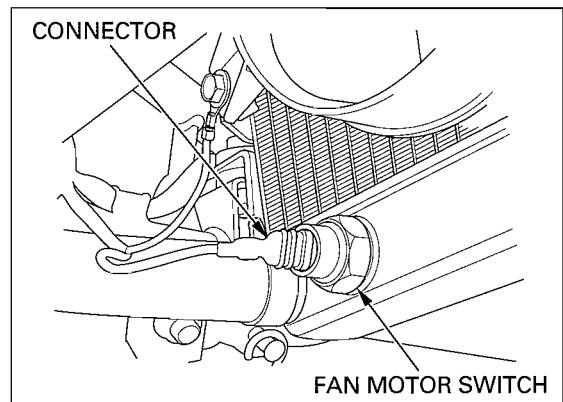
FAN MOTOR DOES NOT START

Before testing, check for a blown fan motor fuse.
Warm up the engine to operating temperature.

Disconnect the connector from the fan motor switch and ground the connector to the body ground.

Turn the ignition switch to "ON" and check the fan motor.

If the motor starts, check the connection at the fan motor switch terminal. If it is OK, the fan motor switch is faulty.



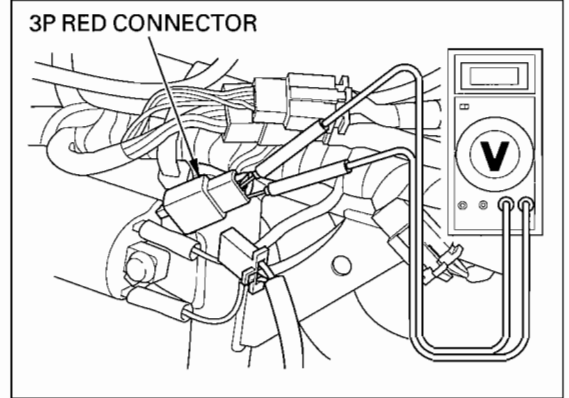
If the fan motor does not start, remove the floor board (page 2-8) and disconnect the fan motor switch 3P red connector.

Check for voltage between the Blue (+) and Green (-) terminals at the fan motor switch 3P (Red) connector of the main wire harness side with the ignition switch turned to "ON".

There should be battery voltage.

If there is battery voltage, replace the fan motor (page 6-13).

If there is no voltage, check for an open circuit in Black/blue and Green wires.



REMOVAL/INSTALLATION

Drain the coolant (page 6-5).

Remove the under cover (page 2-12).

Disconnect the fan motor switch connector and remove the fan motor switch from the radiator.

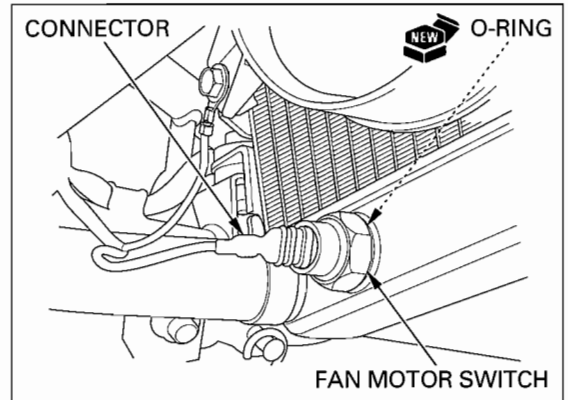
Install a new O-ring onto the fan motor switch. Install and tighten the fan motor switch to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m , 12 lbf·ft)

Connect the fan motor switch connector.

Fill and bleed the cooling system (page 6-5).

Install the under cover (page 2-12).

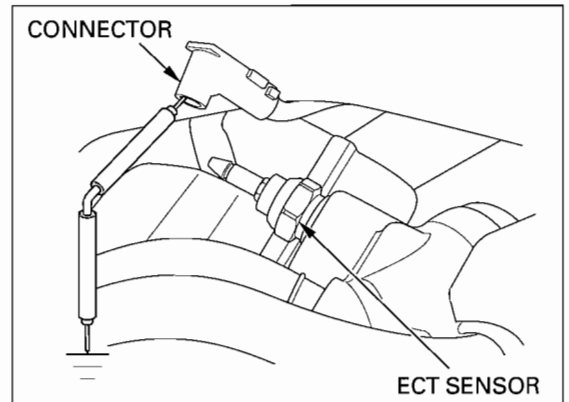


**COOLANT TEMPERATURE GAUGE/
INSTRUMENT ECT SENSOR**

SYSTEM INSPECTION

Remove the lower luggage box (page 2-8).

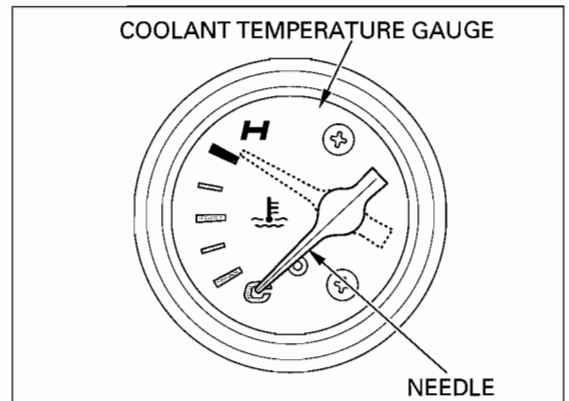
Disconnect the instrument ECT sensor connector and ground the connector terminal to the body with a jumper wire.



Immediately turn the ignition switch to "OFF" when the needle moves to "H" (hot) to prevent damage to the gauge.

Turn the ignition switch to "ON" and check the coolant temperature gauge needle. The needle should move to "H".

If the needle moves, check the thermosensor (see below).



LIGHTS/METERS/SWITCHES

If the needle does not move, check the following:

Remove the front cover (page 2-10).

Check the open circuit in Green/blue line between the gauge and thermosensor with the combination meter 9P connector is connected.

If there is no continuity, replace the main wire harness.

Disconnect the combination meter 9P connector. Check for voltage between the Black/brown (+) and Green/black (-) terminals at the combination meter 9P connector of the main wire harness side with the ignition switch turned to "ON".

If there is no voltage, check for an open circuit in the Black/brown and Green/black wires.

THERMOSENSOR INSPECTION

Remove the lower luggage box (page 2-8).
Drain the coolant (page 6-5).

Disconnect the ECT sensor connector and remove the ECT sensor from the cylinder head.

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 terminals 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 bottom of the sensor.
- Keep the temperature constant for 3 minutes before testing. A sudden change of temperature will result in an incorrect reading. Do not let the thermometer or ECT sensor touch the pan.

STANDARD: 47–57 Ω (80°C/178°F)
14–18 Ω (120°C/248°F)

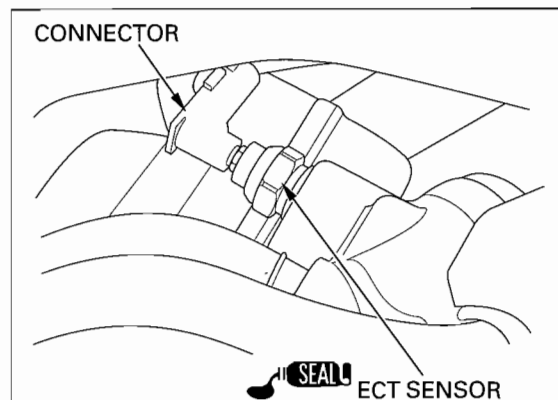
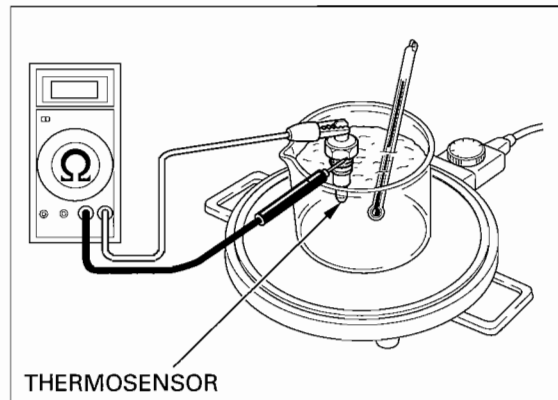
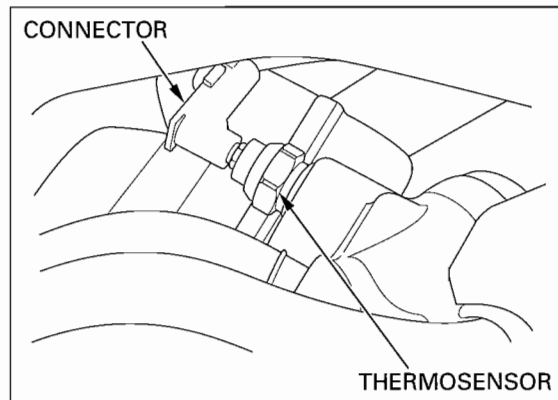
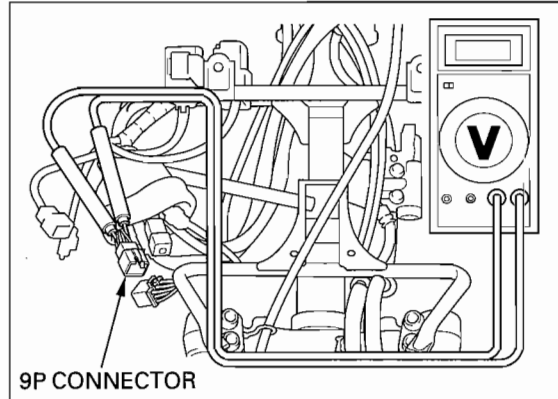
If the resistance is out of above range, replace the ECT sensor.

Apply sealant to the ECT sensor threads. Do not apply sealant to the sensor head.
Install the ECT sensor.

TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

Connect the thermosensor connector.

Fill and bleed the cooling system (page 6-5).
Install the lower luggage box (page 2-8).



Keep all flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.

FUEL PUMP

SYSTEM INSPECTION

Remove the step floor (page 2-8).

Disconnect the fuel pump 4P connector.
Check for battery voltage between the Black/white (+) terminal and ground (-) of the wire harness side 4P connector.

There should be battery voltage with the ignition switch turned to "ON" and engine stop switch to "O".

If there is no voltage, check for open circuit or loose connection in the Black/white wire.

If there is battery voltage, check for continuity between the Black and Green terminals of the pump side 4P connector.

If there is continuity, the fuel pump is faulty.
If there is no continuity, check for continuity between the Green terminal of the pump side 4P connector and ground. There should be continuity.

If there is no continuity, check for an open circuit or loose connection in the Green wire.

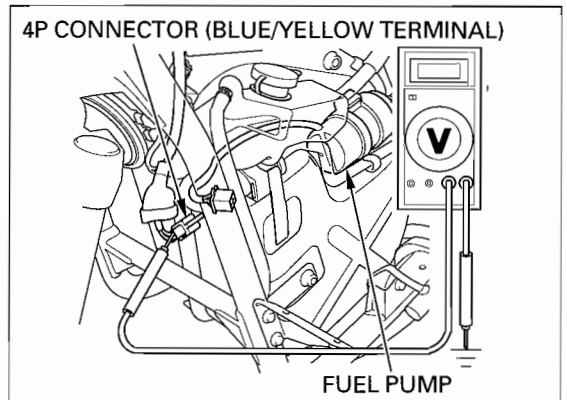
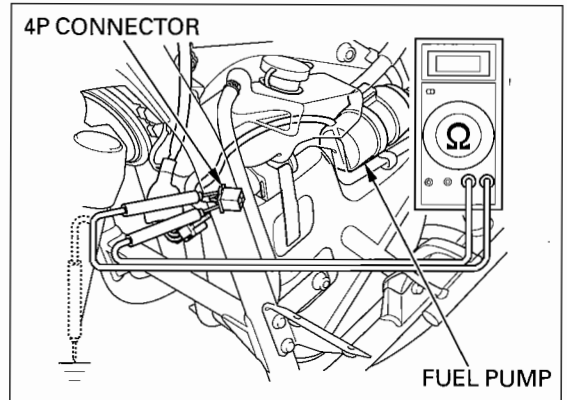
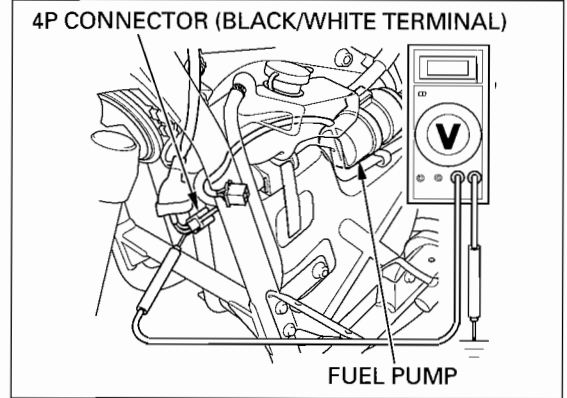
If there is continuity, check for battery voltage.

Check for battery voltage between the Blue/yellow (+) terminal of the main wire harness side 4P connector and ground (-).

There should be battery voltage with the ignition switch turned to "ON" and the engine stop switch to "O" position.

If there is no battery voltage, check for an open circuit or loose connection in the Blue/yellow wire.
If there is battery voltage, replace the fuel pump.

Install the step floor (page 2-8).



DISCHARGE VOLUME INSPECTION

Remove the floor board (page 2-8).

Short the Black and Black/white terminals of the fuel pump 4P connector with the suitable jumper wire.

Disconnect the fuel hose from the carburetor. Hold a graduated beaker under the fuel hose.

Turn the engine stop switch to "O".
Turn the ignition switch to "ON" and let the fuel flow into the beaker for 5 seconds, then turn the ignition switch to "OFF".

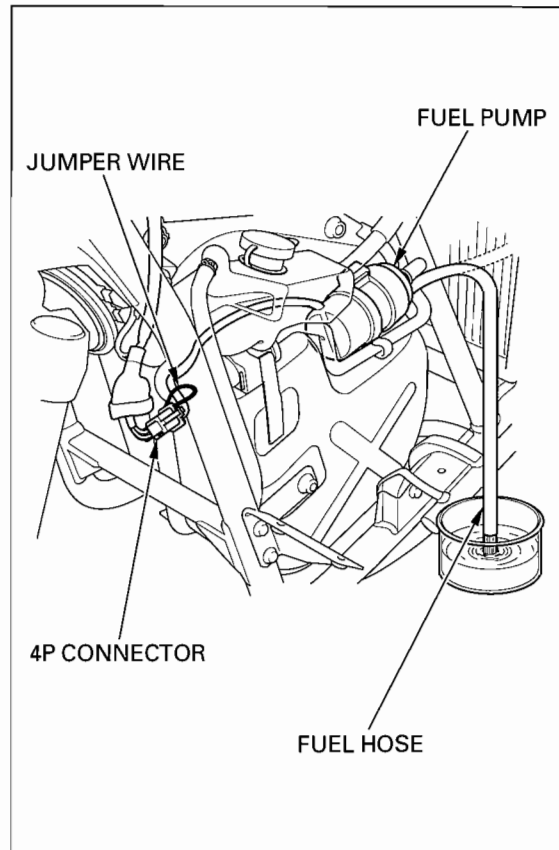
Multiply the amount in the beaker by 12 to determine the fuel pump flow capacity per minute.

FUEL PUMP FLOW CAPACITY:

500 cm³ (16.9 US oz, 17.6 Imp oz)
minimum/minute

If out of specification, replace the fuel pump.

Install the floor board (page 2-8).



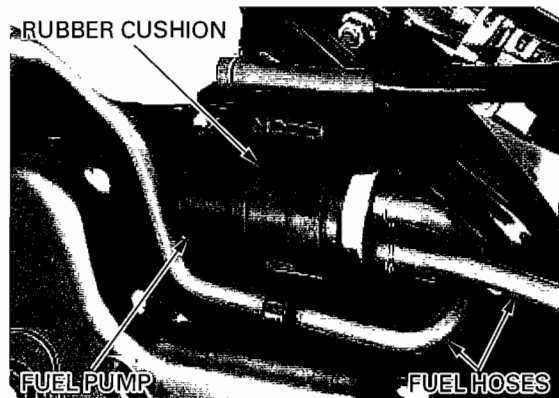
REMOVAL/INSTALLATION

Remove the floor board (page 2-8).

Disconnect the fuel pump 4P connector.

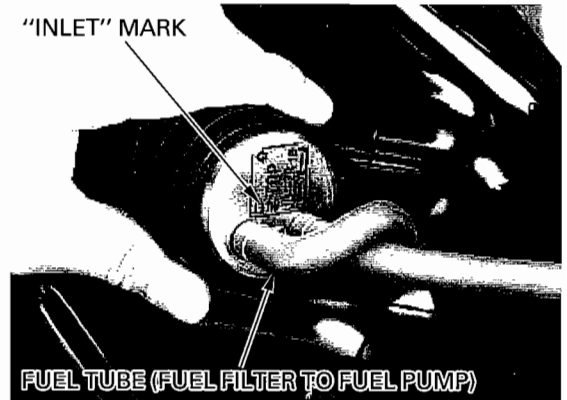


Disconnect the fuel hoses from the fuel pump. Unhook the rubber cushion from the tabs on the fuel tank and remove the fuel pump.



Installation is in the reverse order of removal.

Connect the fuel hose (fuel filter to fuel pump) to the "INLET" mark side on the fuel pump.
Route the hoses and wire properly (page 1-18).



FUEL GAUGE/FUEL LEVEL SENSOR SYSTEM INSPECTION

Remove the floor board (page 2-8).

Disconnect the fuel level sensor 3P connector. Short the Yellow/white and Green/black terminals of the fuel level sensor 3P connector with a suitable jumper wire.

Turn the ignition switch to "ON" and check the fuel gauge needle. The needle should move to "F".

If the needle moves, check the fuel level sensor (page 20-18).

If the needle does not move, check the following:

Remove the front cover (page 2-10).

Disconnect the combination meter 9P connector.

Check for an open circuit in Yellow/white and Blue/white terminal between the combination meter 9P connector and fuel level sensor 3P connector.

If there is no continuity, replace the main wire harness.

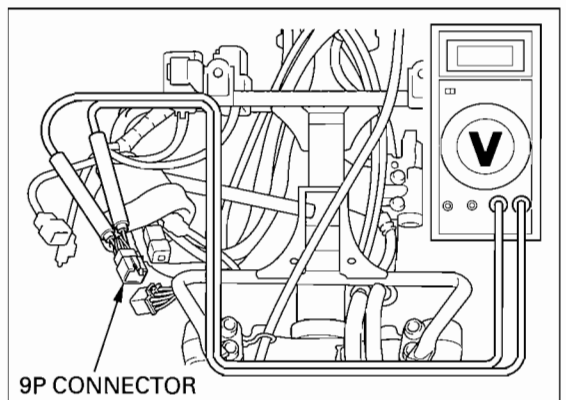
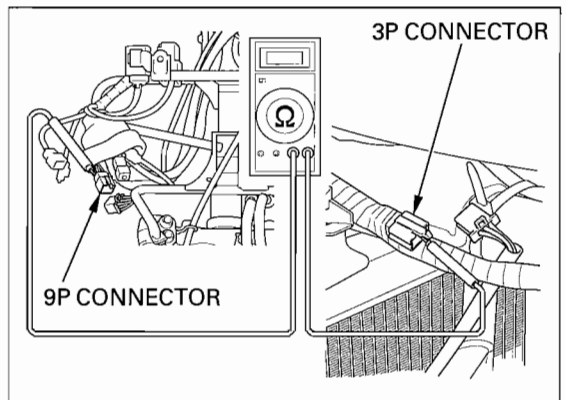
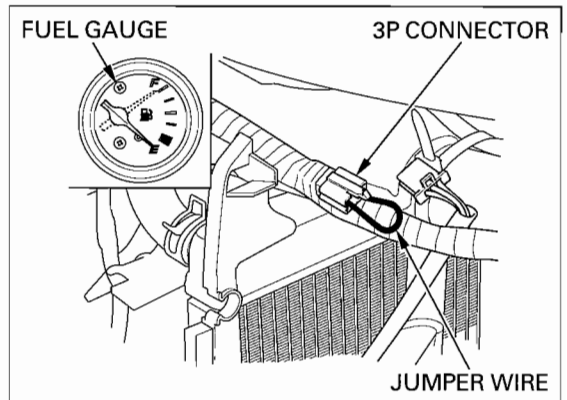
Disconnect the fuel level sensor 3P connector.

Measure the voltage between the Black/brown (+) and Yellow/white (-) [and Blue/white (-)] terminals with the ignition switch turned to "ON" at the combination meter 9P connector wire harness side.

There should be battery voltage.

If there is no voltage, check for an open circuit in the Black/brown and Green/black wires.

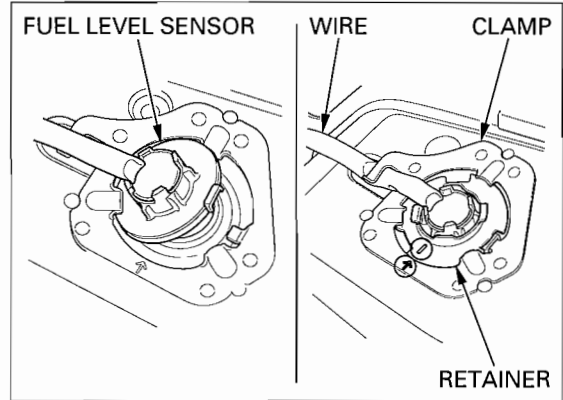
Install the floor board (page 2-8).



FUEL LEVEL SENSOR INSPECTION

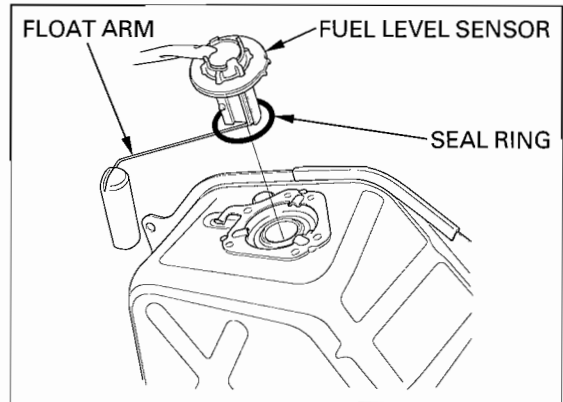
Remove the fuel tank (page 5-24).

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.

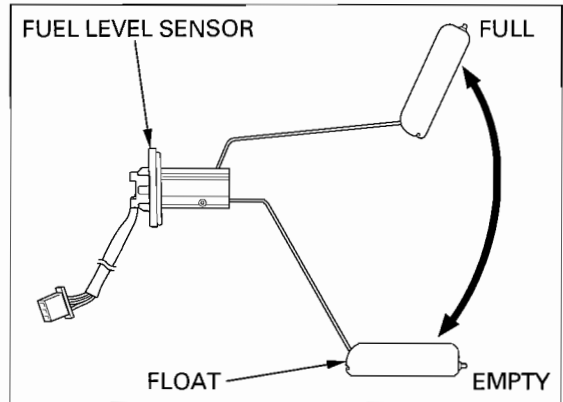


Measure the resistance between the connector terminals with the float upper (full) and lower (empty) positions.

Unit: Ω (20°C/68°F)

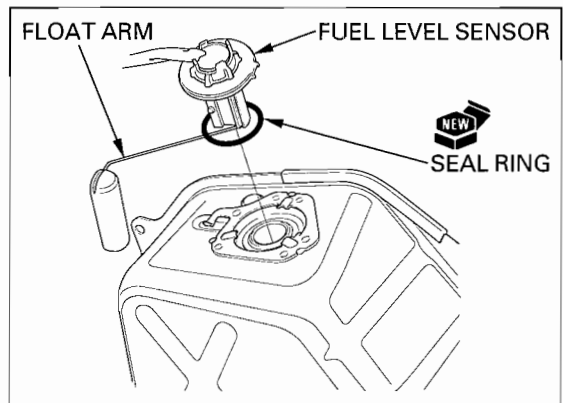
FLOAT POSITION	EMPTY	FULL
Green/black – Yellow/white	400 – 700	30 – 45
Yellow/white – Blue/white	450 – 750	450 – 750

Replace the fuel level sensor if it is out of specification.



Install a new seal ring onto the fuel tank.

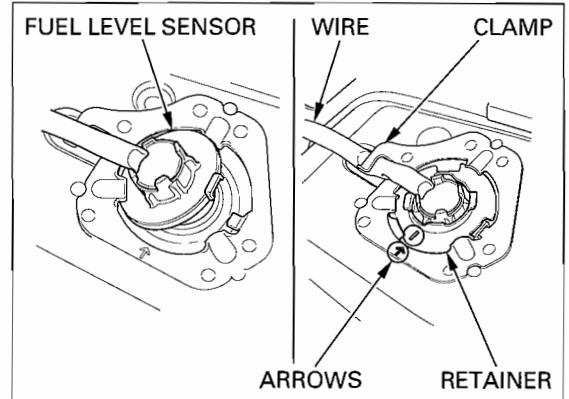
Install the fuel level sensor into the fuel tank, being careful not to deform or damage the float arm.



Align the groove on the fuel level sensor with the tab on the fuel tank.
 Install the retainer aligning the 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 fuel tank (page 5-25).



SIDE STAND SWITCH

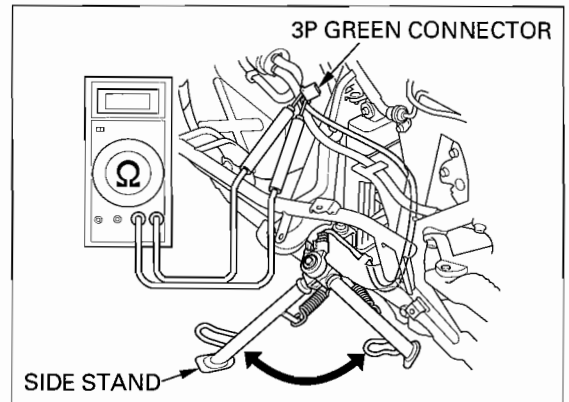
INSPECTION

Remove the floor board (page 2-8).

Disconnect the side stand switch 3P green connector.
 Check for continuity at the switch side of the 3P green connector.

There should be continuity with the side stand retracted.

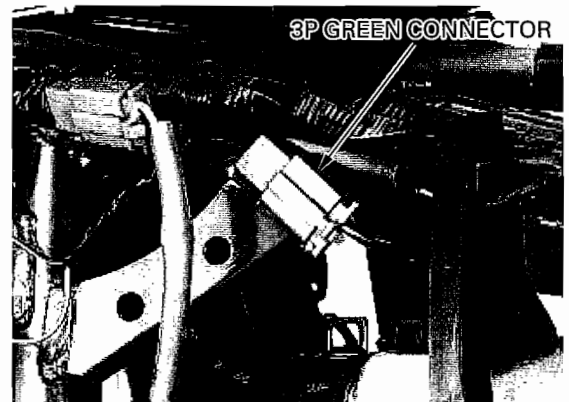
There should be no continuity with the side stand applied.



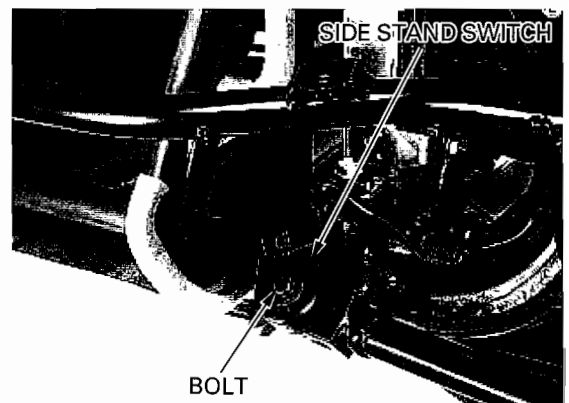
REMOVAL

Remove the floor board (page 2-8).
 Remove the left floor skirt (page 2-4).

Disconnect the side stand switch 3P green connector.

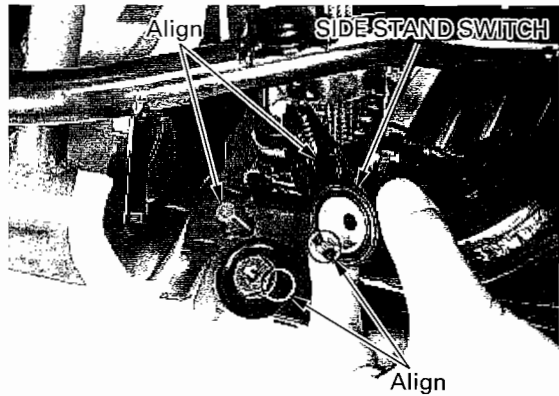


Remove the bolt and side stand switch from the side stand pivot.



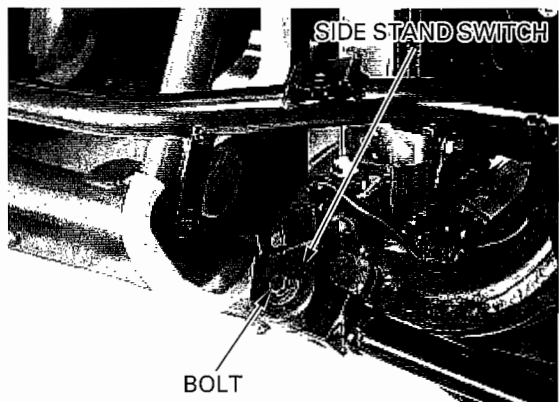
LIGHTS/METERS/SWITCHES

Install the side stand switch aligning the switch pin with the side stand hole and the switch groove with the bracket pin.



Secure the side stand switch with the bolt.

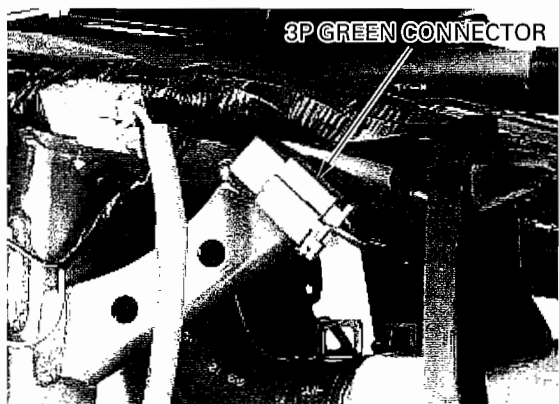
TORQUE: 9.8 N·m (1.0 kgf·m , 7 lbf·ft)



Route the side stand switch wire properly (page 1-18).

Connect the side stand switch 3P green connector.

Install the left floor skirt (page 2-4).
Install the floor board (page 2-8).



HORN

INSPECTION

Remove the front cover (page 2-10).

Disconnect the horn connectors from the horn.

Connect a 12-V battery to the horn terminals.
The horn is normal if it sounds when the 12-V battery is connected across the horn terminals.

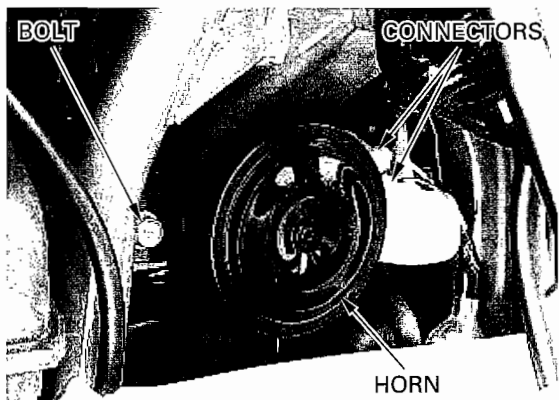
REMOVAL/INSTALLATION

Remove the front cover (page 2-10).

Disconnect the horn connectors from the horn.
Remove the bolt from the horn.

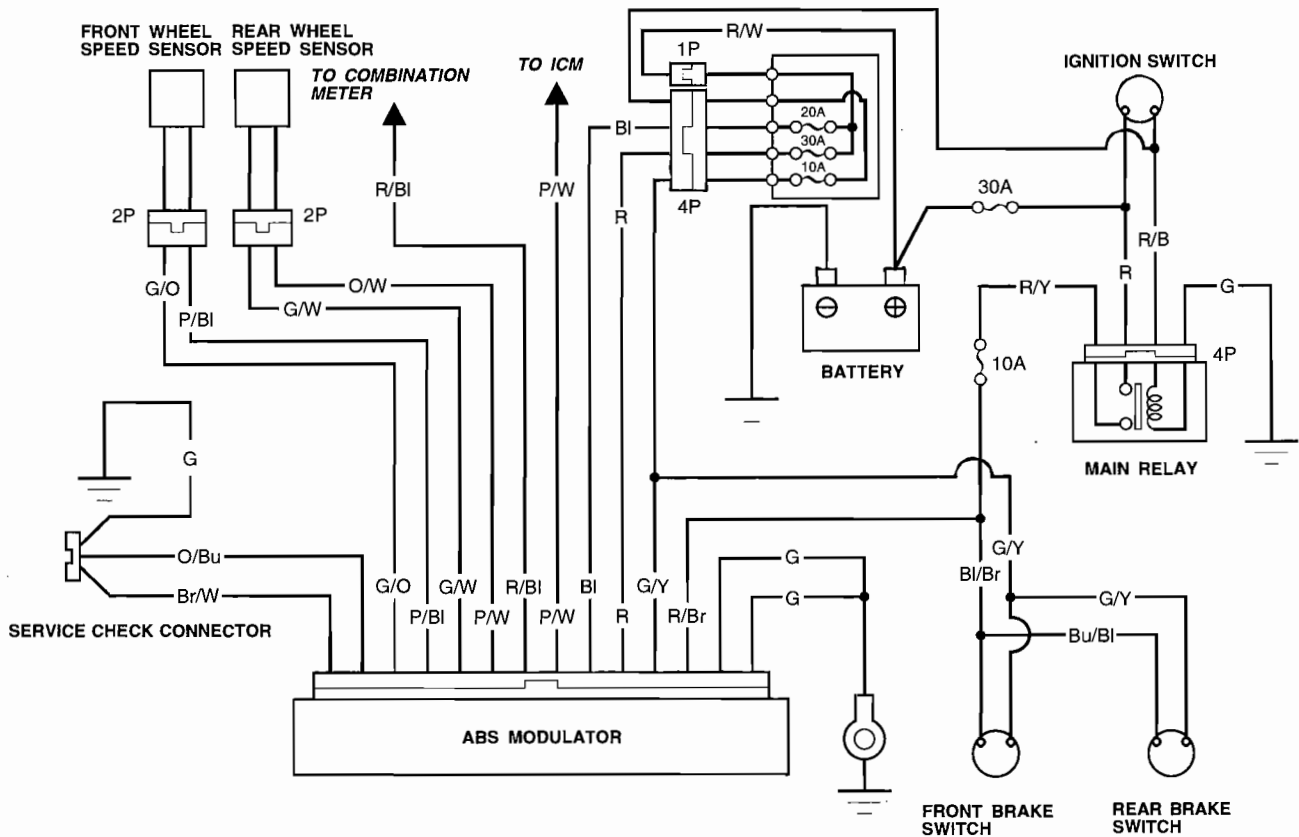
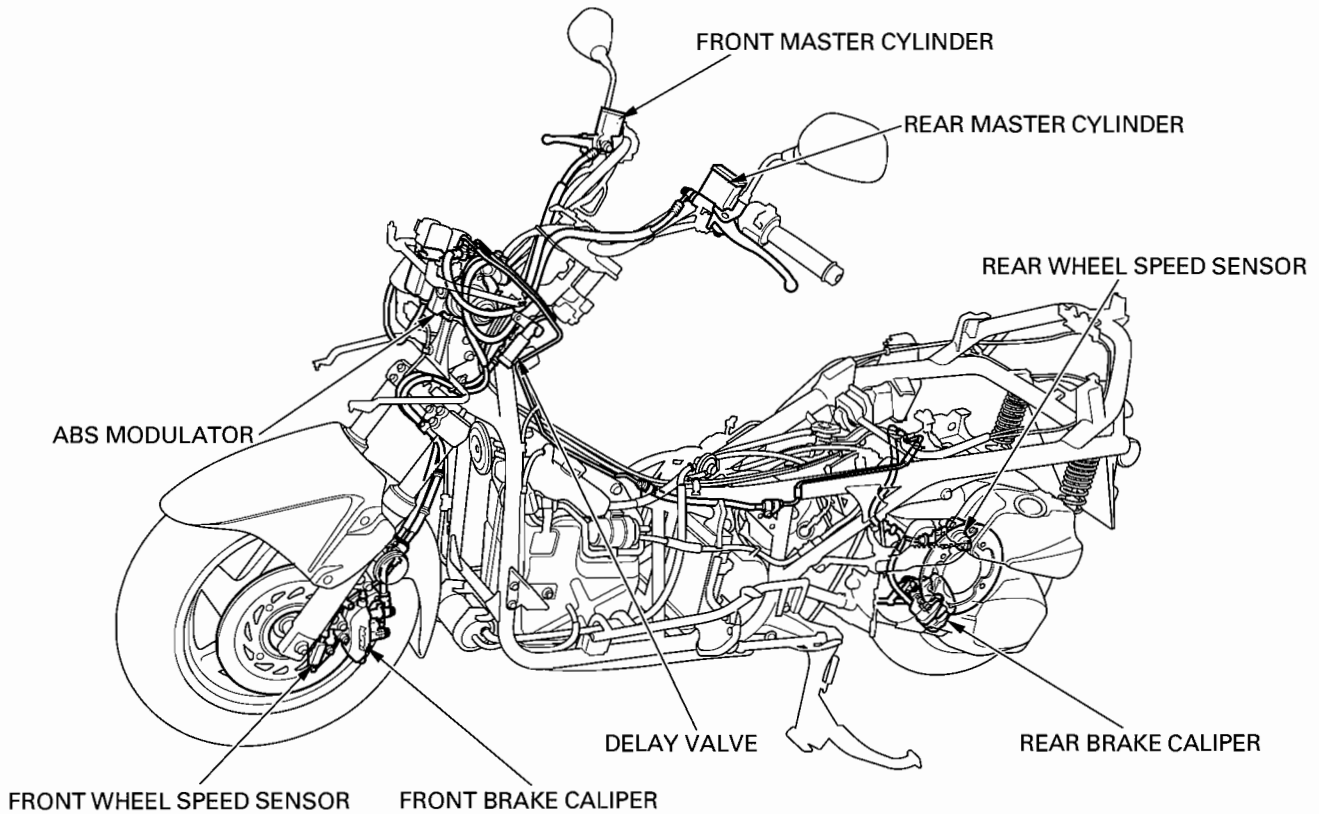
Installation is in the reverse order of removal.

Install the front cover (page 2-10).



MEMO

ABS (Anti-lock Brake System)



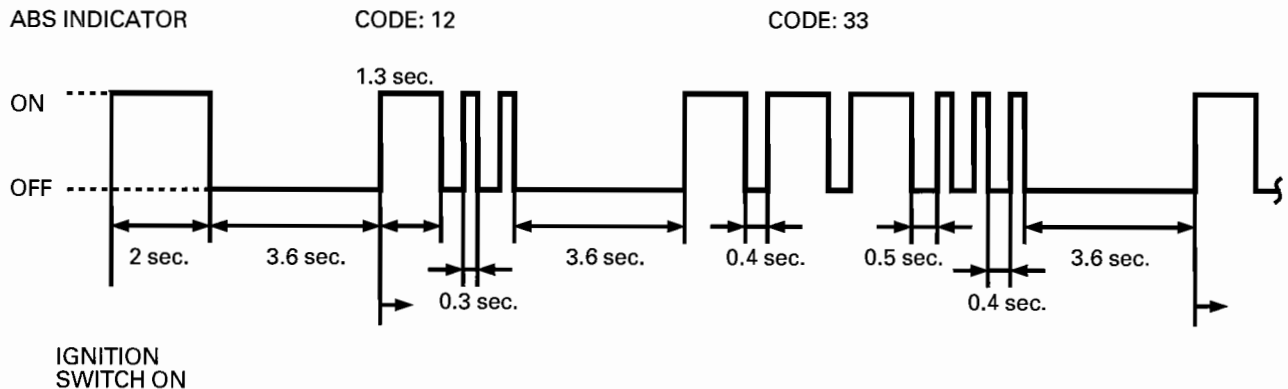
21. ABS (Anti-lock Brake System)

SERVICE INFORMATION	21-1	FRONT WHEEL SPEED SENSOR	21-22
ABS (Anti-lock Brake System)	21-2	REAR WHEEL SPEED SENSOR	21-23
FRONT PULSER RING	21-21	ABS MODULATOR	21-25
REAR PULSER RING	21-21		

SERVICE INFORMATION

GENERAL

- ABS (Anti-lock Brake System) is equipped with the self-diagnostic system described.
- When checking the ABS, always follow the steps in the troubleshooting flow chart (page 21-4 thru 21-20).
- The ABS indicator light blinks in the following cases.
 - Front or rear wheel turning when other side wheel stops
 - Noise pulse
 - The ABS operates long time
- When more than one failure occurs, the indicator shows the blinks in the order of lowest number to highest number (for example: see below).
- The ABS indicator denotes the failure codes (the number of blinks from 11 to 81).



- After troubleshooting, clear the problem code (page 21-3).

TORQUE VALUES

Front pulser ring Torx bolt	7.8 N·m (0.8 kgf·m , 5.8 lbf·ft)	ALOC bolt: replace with a new one.
Front wheel speed sensor bolt	15 N·m (1.5 kgf·m , 11 lbf·ft)	
Rear pulser ring Torx bolt	7.8 N·m (0.8 kgf·m , 5.8 lbf·ft)	ALOC bolt: replace with a new one.
Rear wheel speed sensor bolt	15 N·m (1.5 kgf·m , 11 lbf·ft)	
ABS modulator mount nut	9.8 N·m (1.0 kgf·m , 7 lbf·ft)	

ABS (Anti-lock Brake System)

SELF-DIAGNOSIS PROCEDURE (After 10km/h running, ABS indicator comes ON or blinks)

Turn the ignition switch to "ON".
Make sure the ABS indicator comes on.
Start the engine and ride the scooter and raise the vehicle speed to approximately 10 km/h.

The ABS normal, if the ABS indicator go OFF.

If the ABS indicator does not go off, perform the following:

1. Turn the ignition switch to "OFF".

Remove the maintenance lid (page 20-4).

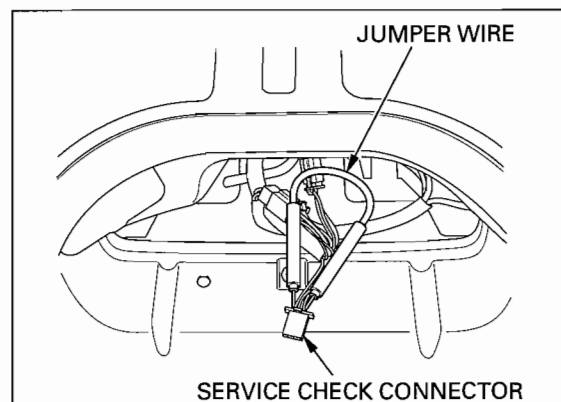
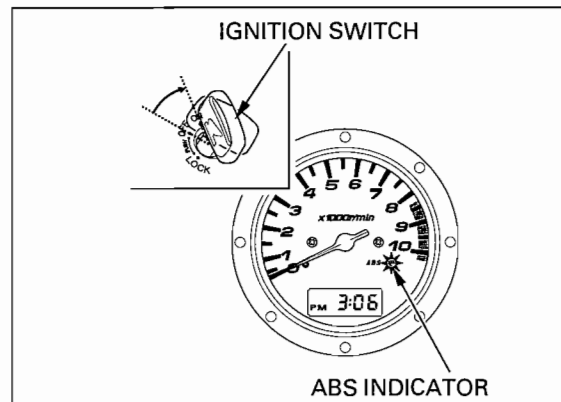
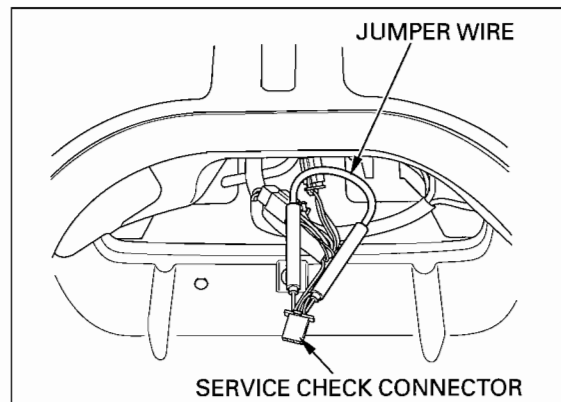
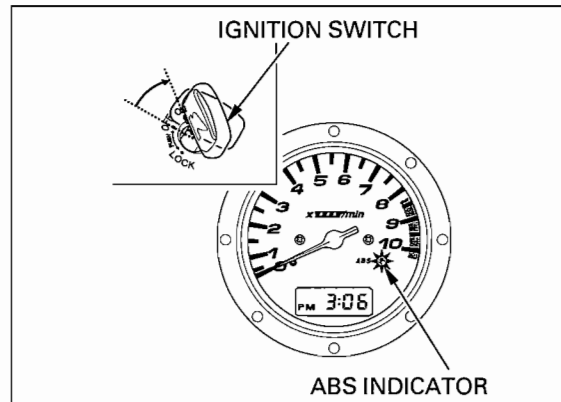
Short the ABS service check connector terminals with a jumper wire.

TERMINALS: Blown/white—Green

2. Do not squeeze the brake lever.
Turn the ignition switch to "ON".
Read and record how many times the indicator blinks, and determine the cause of the problem (page 21-4).

3. Turn the ignition switch to "OFF".

Remove the jumper wire from the ABS service check connector.



SELF-DIAGNOSIS MEMORY RESET PROCEDURE

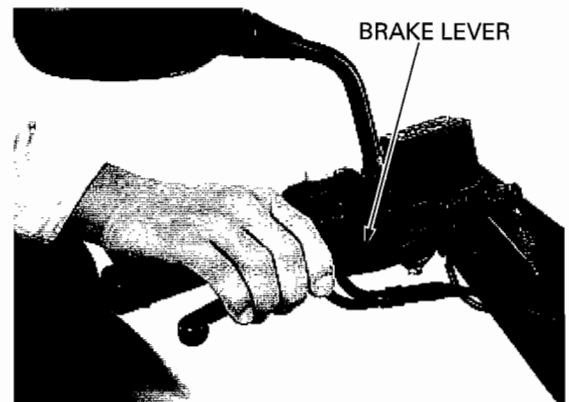
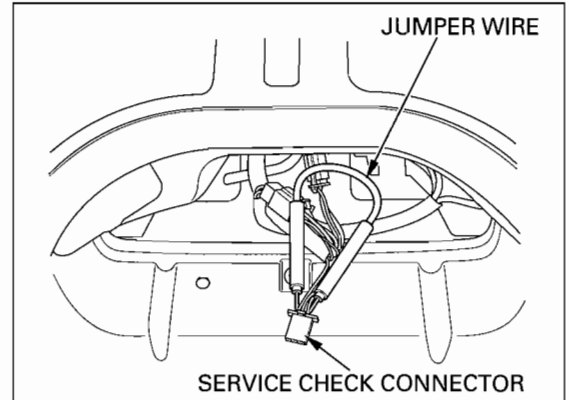
1. Turn the ignition switch to "OFF".

Remove the maintenance lid (page 20-4).

Short the ABS service check connector terminals with a jumper wire.

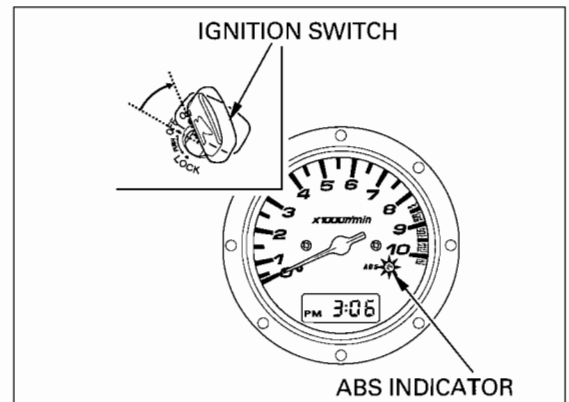
TERMINALS: Blown/white—Green

2. Squeeze the brake lever and turn the ignition switch to "ON".
3. Release the brake lever when the ABS indicator goes off.
4. Squeeze the brake lever when the ABS indicator comes on.
5. Release the brake lever when the ABS indicator goes off.



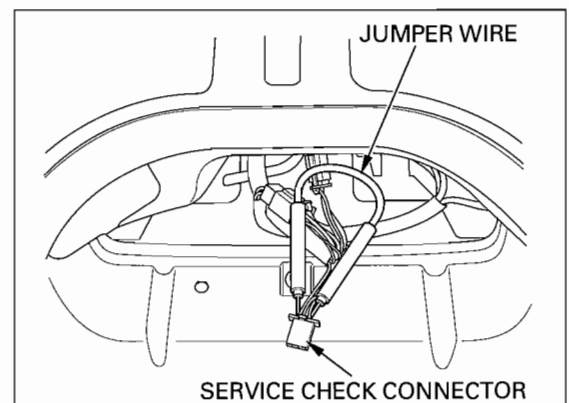
6. Check that the ABS indicator blinks two times.

If the ABS indicator does not blink two times, the self-diagnostic memory has not been erased.



7. Turn the ignition switch to "OFF".

Remove the jumper wire from the ABS service check connector.



ABS (Anti-lock Brake System)

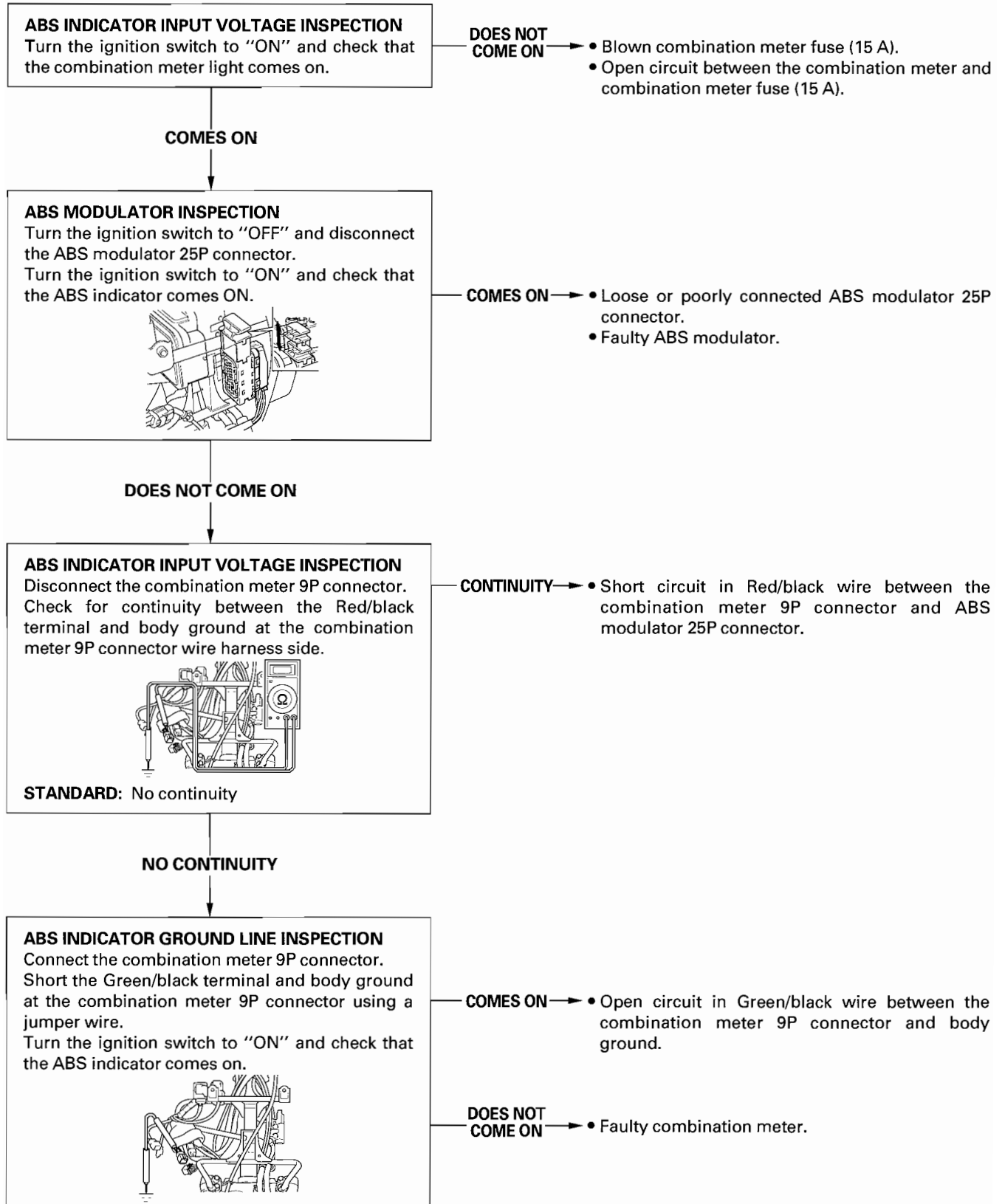
ABS INDICATOR FAILURE CODE

Number of ABS Indicator blinks	Problem/Symptoms	(1)	(2)	Cause	Refer to page
No blinks	ABS indicator does not come on				21-5
Stays lit	ABS indicator does not go off				21-6
Blinks	ABS indicator blinks				21-9
11	Front wheel speed sensor	●	●	• Open or short circuit in wheel speed sensor wire.	21-10, 13
13	Rear wheel speed sensor	●	●	• Short circuit between the speed sensor wire terminals	
12	Front wheel speed sensor		●	• When front wheel speed is 10 km/h, no pulse at rear speed sensor	21-12, 15
14	Rear wheel speed sensor		●	• Short circuit between the wheel speed sensor wire terminals • Input noise pulse.	
21	Front pulser ring		●	• Pulser ring is damaged or cracked.	21-16
23	Rear pulser ring		●	• Incorrect clearance between wheel speed sensor and pulser ring.	
31	Solenoid valve	●	●	• Faulty ABS modulator	21-17
32					
33					
34					
37					
38					
41	Front wheel lock		●	• The wheel locks while riding the scooter.	21-17
43	Rear wheel lock		●		
51	Motor & pump lock		●	• The motor & pump locks when ignition switch is turned to "ON".	21-18
52	Motor & pump off troubleshooting		●	• When the motor relay is on, the motor & pump check voltage is below 4.5V.	21-19
53	Motor & pump on troubleshooting	●	●	• When the motor relay is off, the motor & pump check voltage is above 3V.	21-19
54	Failsafe relay troubleshooting	●		• When the failsafe relay is on, the solenoid valve terminal voltage is below 2.5V. • When the failsafe relay is off, the solenoid valve terminal voltage is above 7.4V.	21-19
61	Failsafe relay voltage inspection	●	●	• Pre-start self diagnosis is abnormal.	21-20
62	Failsafe relay voltage inspection		●	• Self diagnosis is abnormal.	21-20
71	Tire size inspection		●	• Incorrect tire size.	21-20
81	CPU troubleshooting	●	●	• Faulty ABS modulator.	21-20

(1) Prestart inspection: While the engine starts.

(2) Ordinary inspection: While the prestart inspection is stopped and the ignition switch is turned to "OFF".

ABS INDICATOR NOT BLINKS

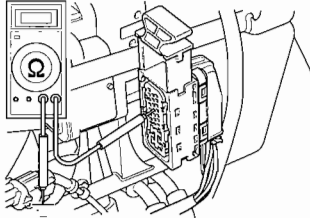


ABS (Anti-lock Brake System)

ABS INDICATOR STAYS LIT

SERVICE CHECK CONNECTOR SHORT CIRCUIT INSPECTION

Disconnect the ABS modulator 25P connector. Check for continuity between the Brown/white terminal and body ground at the ABS modulator 25P connector wire harness side.



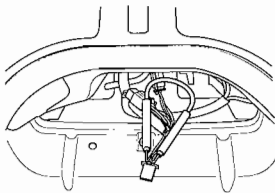
STANDARD: No continuity

CONTINUITY → • Short circuit in the Brown/white wire between the service check connector and ABS modulator 25P connector.

DOES NOT COME ON

SERVICE CHECK CONNECTOR OPEN CIRCUIT INSPECTION

Short the service check connector terminals using a jumper wire. Check for continuity between the Brown/white terminal and body ground at the ABS modulator 25P connector wire harness side.



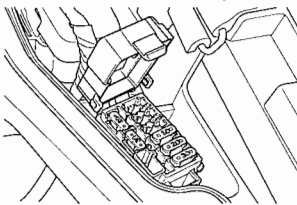
STANDARD: No continuity

CONTINUITY → • Open circuit in the Brown/white wire between the service check connector and ABS modulator 25P connector.
• Open circuit in ground line.

NO CONTINUITY

FAIL SAFE RELAY FUSE (20A) INSPECTION

Remove the jumper wire from the service check connector terminals. Check for a blown fail safe relay fuse (20A) on the fuse box.

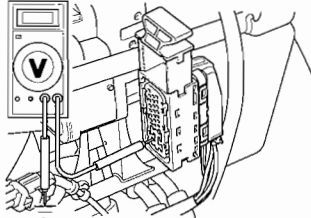


ABNORMAL → • Replace the fail safe relay (20A) and inspect again.

NORMAL

FAIL SAFE RELAY LINE OPEN CIRCUIT INSPECTION

Disconnect the ABS modulator 25P connector. Measure the voltage between the Black terminal and body ground at the ABS modulator 25P connector wire harness side.



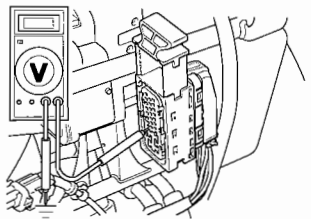
STANDARD: Battery voltage

NO VOLTAGE → • Open circuit in the Black wire between the fail safe relay fuse (20A) and ABS modulator 25P connector.

BATTERY VOLTAGE

ABS MODULATOR INPUT VOLTAGE OPEN CIRCUIT INSPECTION

Turn the ignition switch to "ON". Measure the voltage between the Black/brown terminal and body ground at the ABS modulator 25P connector wire harness side.



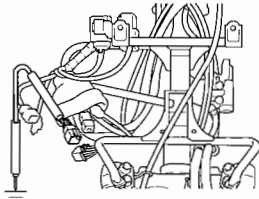
STANDARD: Battery voltage

NO VOLTAGE → • Open circuit in the Black/brown wire between the fuse box and ABS modulator 25P connector.

BATTERY VOLTAGE

COMBINATION METER INSPECTION

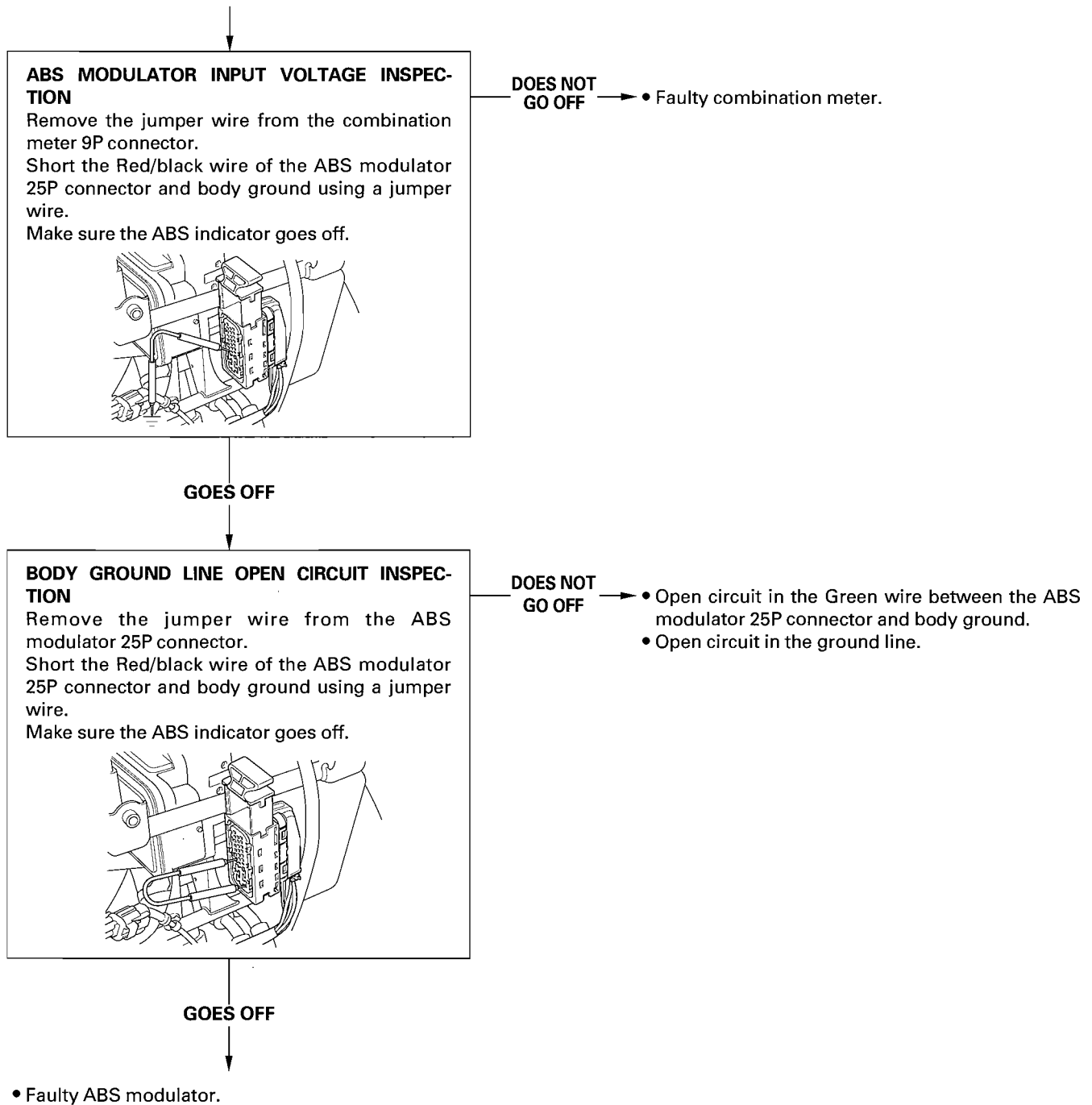
Short the Red/black wire of the combination meter 9P connector and body ground using a jumper wire. Make sure the ABS indicator goes off.



DOES NOT GO OFF → • Faulty combination meter.

GOES OFF

ABS (Anti-lock Brake System)

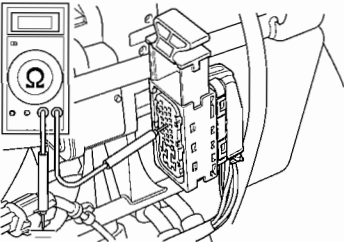


ABS INDICATOR BLINKS

Check the service check connector for proper connection.

DOES NOT COME ON

SERVICE CHECK CONNECTOR SHORT CIRCUIT INSPECTION
Disconnect the ABS modulator 25P connector. Check for continuity between the Brown/white terminal and body ground at the ABS modulator 25P connector wire harness side.



STANDARD: No continuity

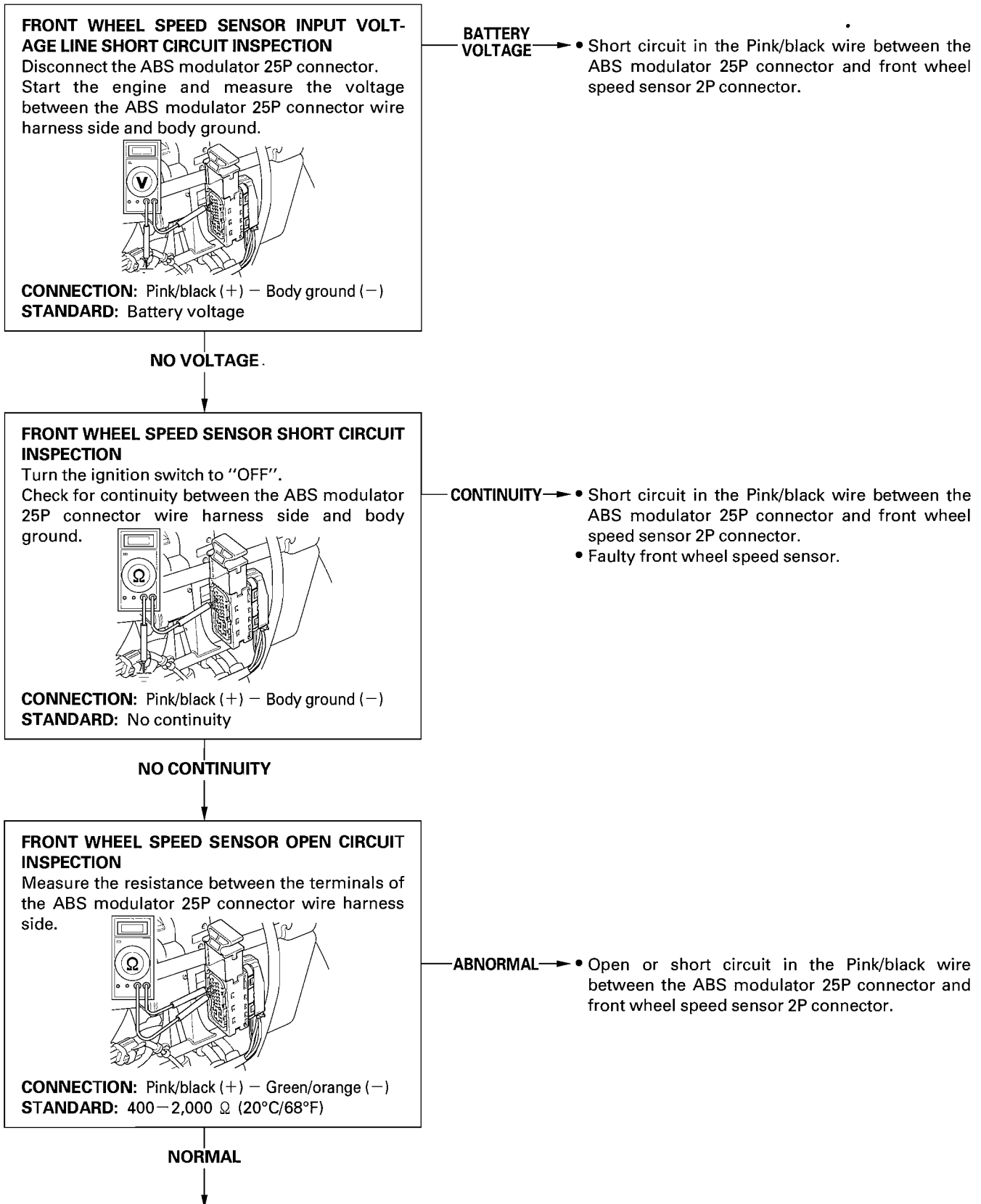
CONTINUITY → • Short circuit in the Brown/white wire between the service check connector and ABS modulator 25P connector.

NO CONTINUITY

• Faulty ABS modulator.

ABS (Anti-lock Brake System)

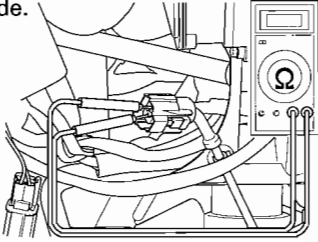
ABS INDICATOR 11 BLINKS (FRONT WHEEL SPEED SENSOR)



FRONT WHEEL SPEED SENSOR INSPECTION

Disconnect the front wheel speed sensor 2P connector.

Measure the resistance between the terminals of the front wheel speed sensor 2P connector sensor side.



CONNECTION: Pink/black (+) – Green/orange (-)

STANDARD: 400 – 2,000 Ω (20°C/68°F)

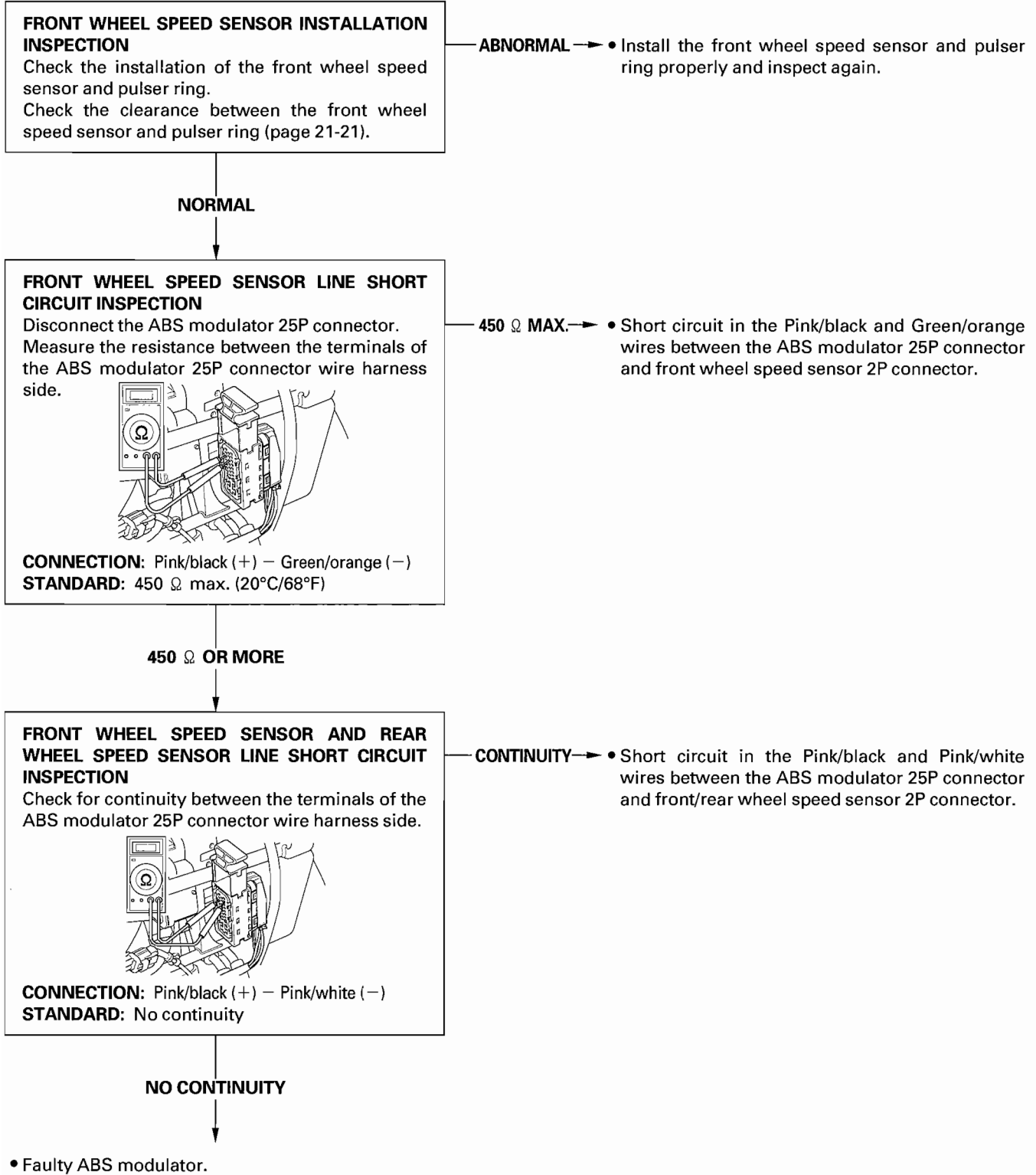
ABNORMAL → • Faulty front wheel speed sensor.

NORMAL

• Faulty ABS modulator.

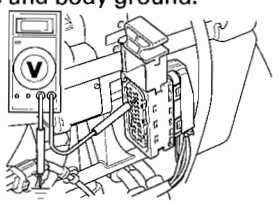
ABS (Anti-lock Brake System)

ABS INDICATOR 12 BLINKS (FRONT WHEEL SPEED SENSOR)



ABS INDICATOR 13 BLINKS (REAR WHEEL SPEED SENSOR)

REAR WHEEL SPEED SENSOR INPUT VOLTAGE LINE SHORT CIRCUIT INSPECTION
 Disconnect the ABS modulator 25P connector. Start the engine and measure the voltage between the ABS modulator 25P connector wire harness side and body ground.

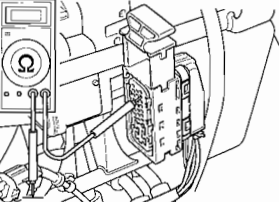


CONNECTION: Pink/white (+) – Body ground (-)
STANDARD: Battery voltage

BATTERY VOLTAGE → • Short circuit in the Pink/white wire between the ABS modulator 25P connector and rear wheel speed sensor 2P connector.

NO VOLTAGE

REAR WHEEL SPEED SENSOR SHORT CIRCUIT INSPECTION
 Turn the ignition switch to "OFF". Check for continuity between the ABS modulator 25P connector wire harness side and body ground.

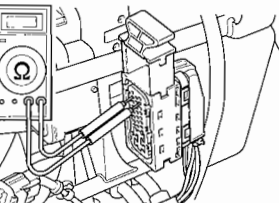


CONNECTION: Pink/white (+) – Body ground (-)
STANDARD: No continuity

CONTINUITY → • Short circuit in the Pink/white wire between the ABS modulator 25P connector and rear wheel speed sensor 2P connector.
 • Faulty rear wheel speed sensor.

NO CONTINUITY

REAR WHEEL SPEED SENSOR OPEN CIRCUIT INSPECTION
 Measure the resistance between the terminals of the ABS modulator 25P connector wire harness side.



CONNECTION: Pink/white (+) – Green/white (-)
STANDARD: 400–2,000 Ω (20°C/68°F)

ABNORMAL → • Open or short circuit in the Pink/white wire between the ABS modulator 25P connector and rear wheel speed sensor 2P connector.

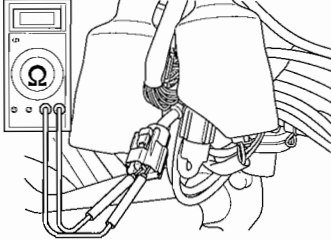
NORMAL

ABS (Anti-lock Brake System)

REAR WHEEL SPEED SENSOR INSPECTION

Disconnect the rear wheel speed sensor 2P connector.

Measure the resistance between the terminals of the rear wheel speed sensor 2P connector sensor side.



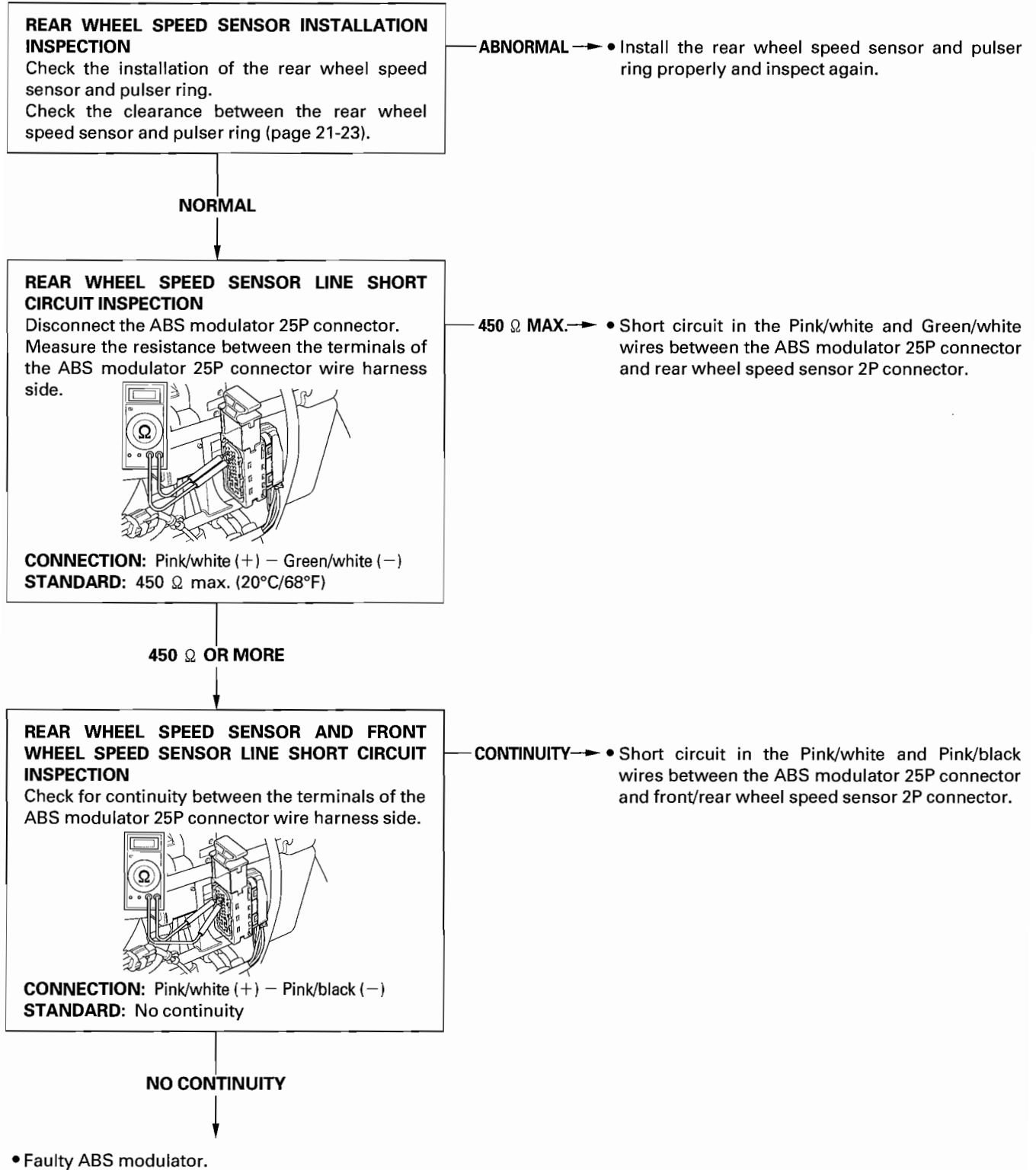
CONNECTION: Pink/white (+) – Green/white (-)
STANDARD: 400–2,000 Ω (20°C/68°F)

ABNORMAL → • Faulty rear wheel speed sensor.

NORMAL

• Faulty ABS modulator.

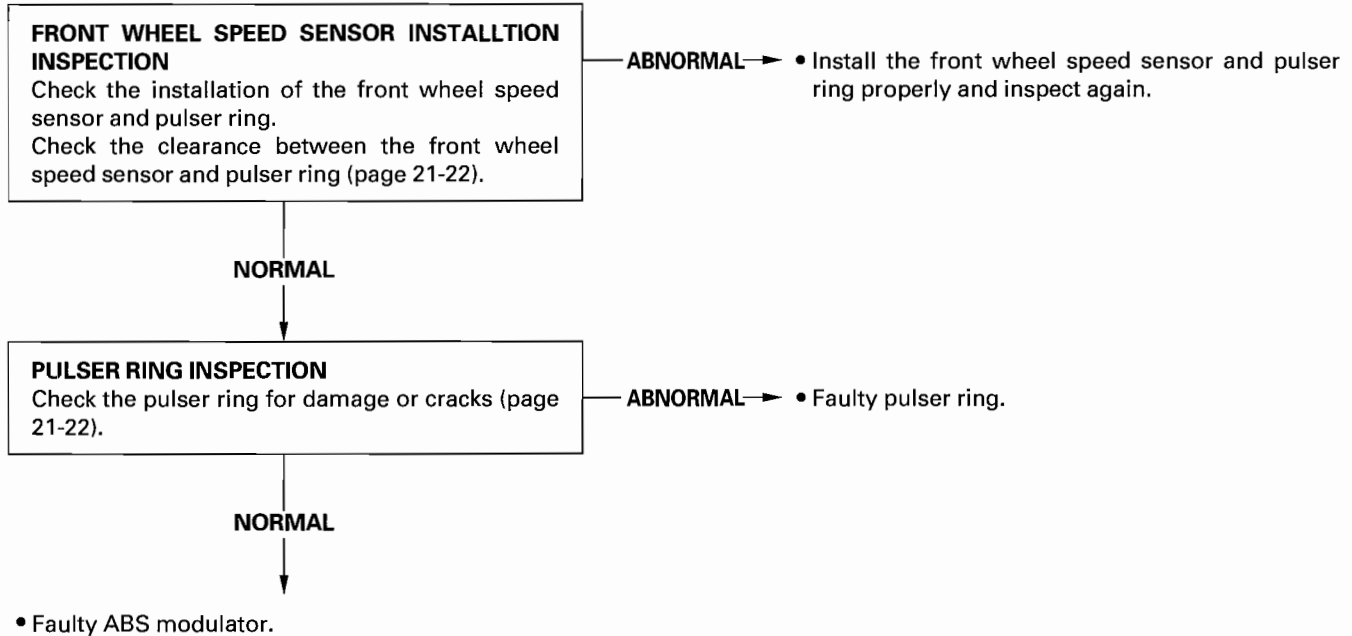
ABS INDICATOR 14 BLINKS (REAR WHEEL SPEED SENSOR)



ABS (Anti-lock Brake System)

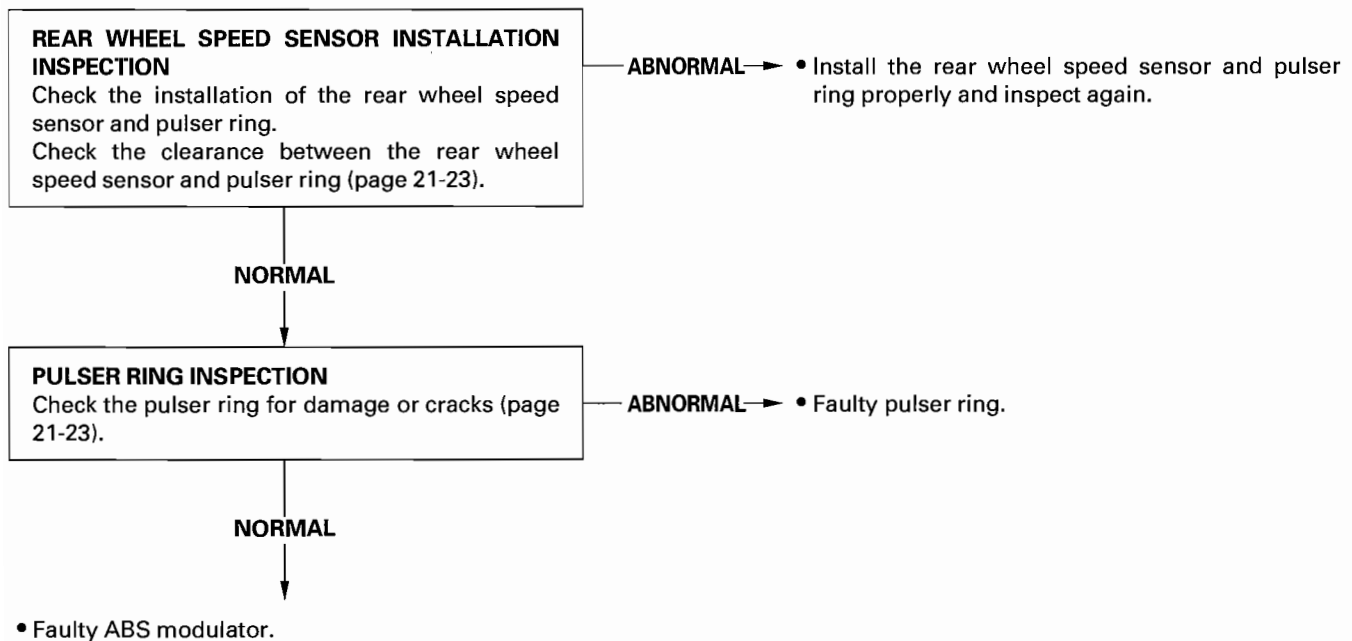
ABS INDICATOR 21 BLINKS (FRONT PULSER RING)

- Before troubleshooting, reset the self-diagnosis memory (page 21-3). Then start the engine and ride the scooter until the vehicle speed reaches 30 km/h or more. Make sure the ABS indicator comes on. Operate the self-diagnosis system (page 21-2) and Check that the ABS indicator blinks 21 times.



ABS INDICATOR 23 BLINKS (REAR PULSER RING)

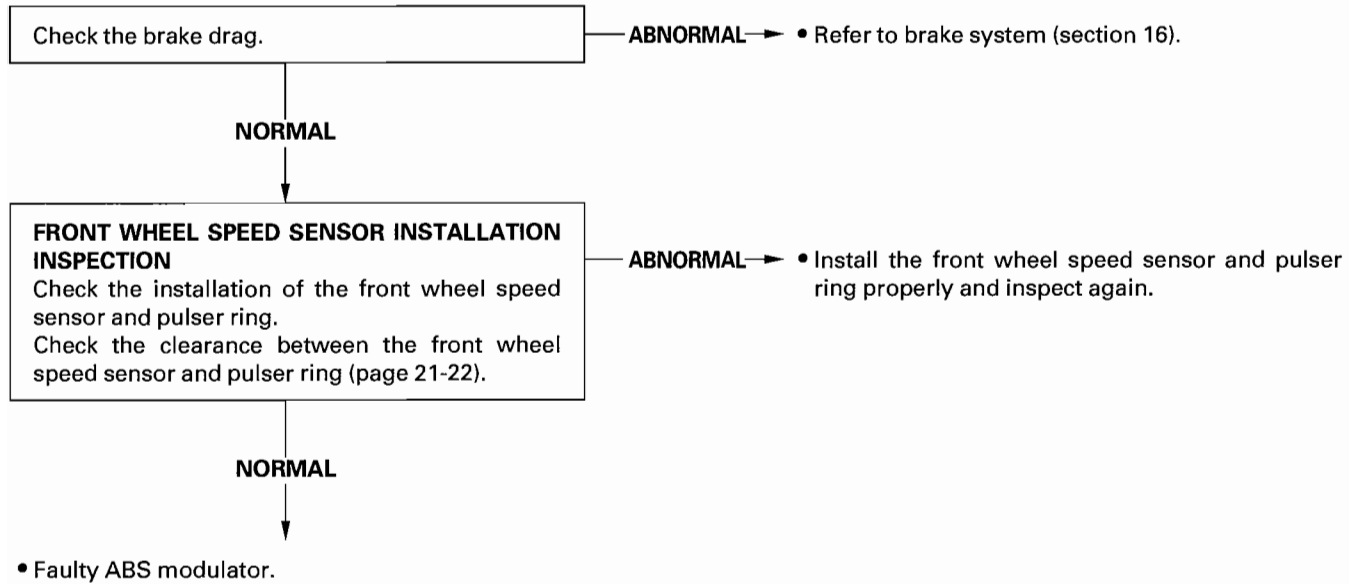
- Before troubleshooting, reset the self-diagnosis memory (page 21-3). Then start the engine and drive the scooter until the vehicle speed reaches 30 km/h or more. Make sure the ABS indicator comes on. Operate the self-diagnosis system (page 21-2) and check that the ABS indicator blinks 23 times.



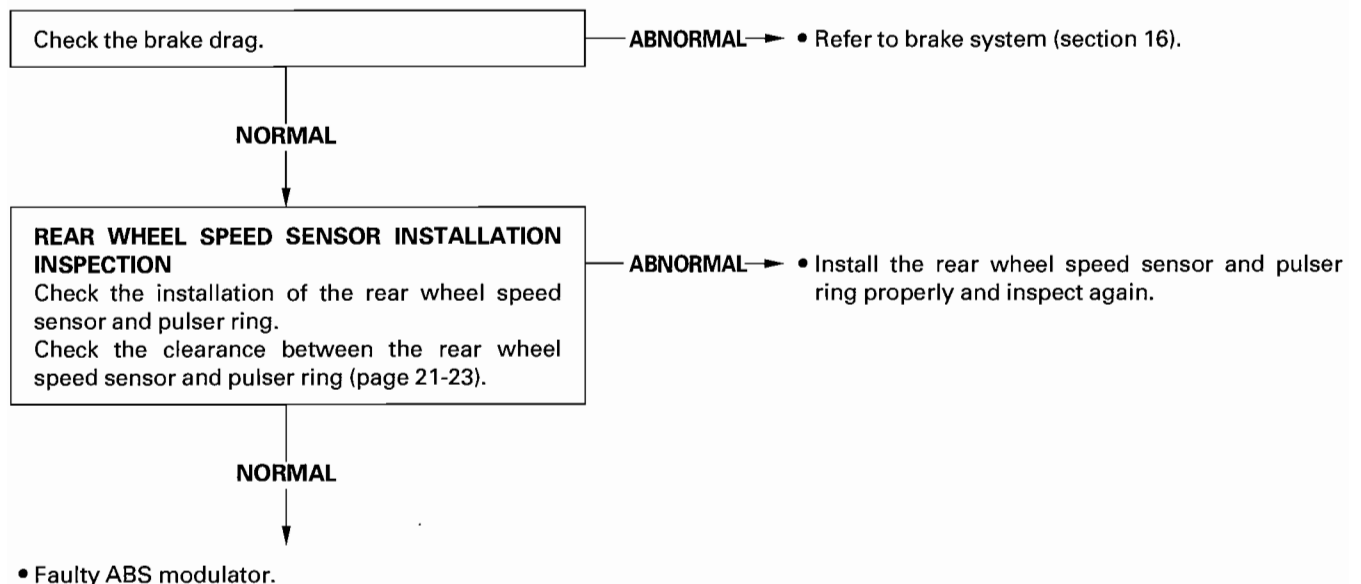
ABS INDICATOR 31, 32, 33, 34, 37 AND 38 BLINKS (SOLENOID VALVE)

- Reset the self-diagnosis memory (page 21-3) and turn the ignition switch to ON. Check that the ABS indicator comes on. Operate the self-diagnosis system (page 21-2) and Check that the ABS indicator blinks 31, 32, 33, 34, 37 and 38 times. If the ABS indicator blinks 31, 32, 33, 34, 37 and 38 times, replace the ABS modulator.

ABS INDICATOR 41 BLINKS (FRONT WHEEL LOCK)



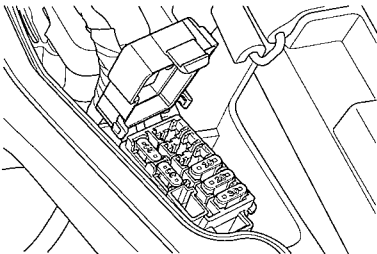
ABS INDICATOR 43 BLINKS (REAR WHEEL LOCK)



ABS (Anti-lock Brake System)

ABS INDICATOR 51 BLINKS (MOTOR & PUMP LOCK)

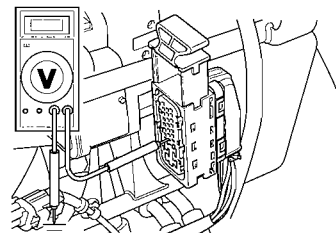
ABS MOTOR FUSE (30A) INSPECTION
Check for a blown ABS motor fuse (30A) on the fuse box.



— **ABNORMAL** —→ • Replace the ABS motor fuse (30A) and inspect again.

NORMAL

ABS MOTOR LINE OPEN CIRCUIT INSPECTION
Disconnect the ABS modulator 25P connector. Measure the voltage between the ABS modulator 25P connector wire harness side and body ground.



CONNECTION: Red (+) – Body ground (-)
STANDARD: Battery voltage

— **NO VOLTAGE** —→ • Open circuit in the Red wire between the ABS motor fuse (30A) and ABS modulator 25P connector.

BATTERY VOLTAGE

Reset the self-diagnosis memory (page 21-3). Then start the engine and drive the scooter until the vehicle speed reaches 10km/h or more. Check that the ABS indicator comes on. Operate the self-diagnosis system (page 21-2) and Check the ABS indicator blinks 51 times.

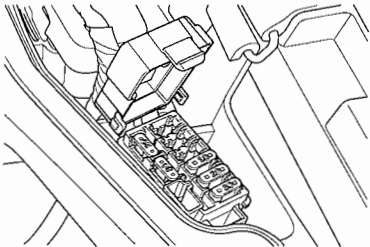
— **51 BLINKS** —→ • Faulty ABS modulator.

NO BLINKS

• ABS is normal.

ABS INDICATOR 52 BLINKS (MOTOR & PUMP OFF)

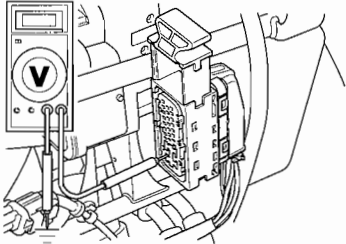
ABS MOTOR FUSE (30A) INSPECTION
 Check for a blown ABS motor fuse (30A) on the fuse box.



ABNORMAL → • Replace the ABS motor fuse (30A) and inspect again.

NORMAL

ABS MOTOR LINE OPEN CIRCUIT INSPECTION
 Disconnect the ABS modulator 25P connector. Measure the voltage between the ABS modulator 25P connector wire harness side and body ground.



CONNECTION: Red (+) – Body ground (–)
STANDARD: Battery voltage

NO VOLTAGE → • Open circuit in the Red wire between the ABS motor fuse (30A) and ABS modulator 25P connector.

BATTERY VOLTAGE

• Faulty ABS modulator.

ABS INDICATOR 53 BLINKS (MOTOR & PUMP ON)

- Reset the self-diagnosis memory (page 21-3). Then start the engine and drive the scooter until the vehicle speed reaches 10km/h or more. Check that the ABS indicator blinks. Operate the self-diagnosis system (page 21-2) and check that the ABS indicator blinks 53 times. If the ABS indicator blinks 53 times, replace the ABS modulator.

ABS INDICATOR 54 BLINKS (FAILSAFE RELAY)

- Reset the self-diagnosis memory (page 21-3). Then start the engine and drive the scooter until the vehicle speed reaches 10km/h or more. Check that the ABS indicator comes on. Operate the self-diagnosis system (page 21-2) and check that the ABS indicator blinks 54 times. If the ABS indicator blinks 54 times, replace the ABS modulator.

ABS (Anti-lock Brake System)

ABS INDICATOR 61 AND 62 BLINKS (FAILSAFE RELAY VOLTAGE)

- Reset the self-diagnosis memory (page 21-3). Then start the engine and ride the scooter until the vehicle speed reaches 10 km/h or more. Check that the ABS indicator comes on or blinks.
Operate the self-diagnosis system (page 21-2) and check that the ABS indicator blinks 61 and 62 times.
If the ABS indicator blinks 61 and 62 times, replace the ABS modulator.

ABS INDICATOR 71 BLINKS (INCORRECT TIRE SIZE)

- Reset the self-diagnosis memory (page 21-3). Then start the engine and ride the scooter until the vehicle speed reaches 10 km/h or more. Check that the ABS indicator blinks.
Operate the self-diagnosis system (page 21-2) and check that the ABS indicator blinks 71 times.
If the ABS indicator blinks 71 times, check the tire pressure or tire size.

ABS INDICATOR 81 BLINKS (CPU)

- Reset the self-diagnosis memory (page 21-3). Then start the engine and ride the scooter until the vehicle speed reaches 10 km/h or more. Check that the ABS indicator comes on.
Operate the self-diagnosis system (page 21-2) and check that the ABS indicator blinks 81 times.
If the ABS indicator blinks 81 times, replace the ABS modulator.

FRONT PULSER RING

REMOVAL/INSTALLATION

Remove the front wheel (page 14-3).

Remove the torx bolts and pulser ring.

Check the pulser ring for damage or cracks.
Replace the pulser ring if necessary.

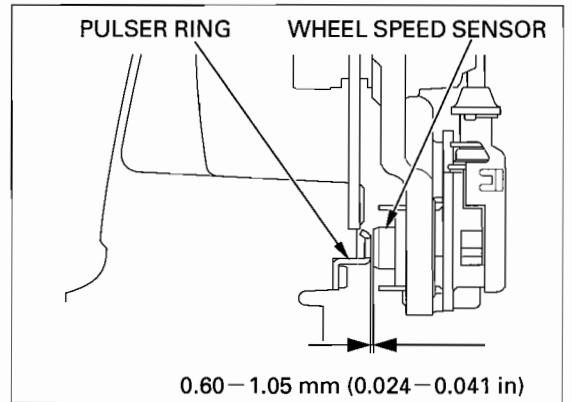
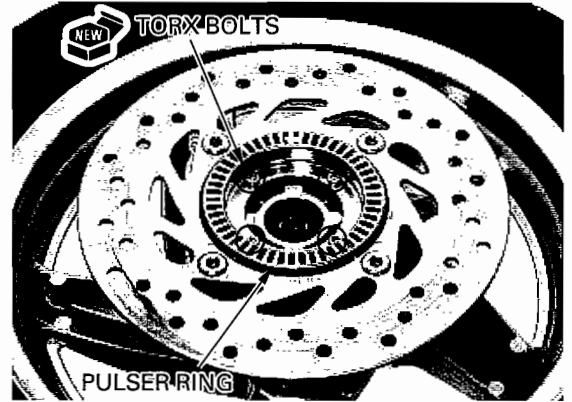
Install the pulser ring with new torx bolts.

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

Install the front wheel (page 14-7).

Check the clearance between the pulser ring and wheel speed sensor.

CLEARANCE: 0.60–1.05 mm (0.024–0.041 in)



REAR PULSER RING

REMOVAL/INSTALLATION

Remove the rear wheel (page 15-3).

Remove the torx bolts and pulser ring.

Check the pulser ring for damage or cracks.
Replace the pulser ring if necessary.

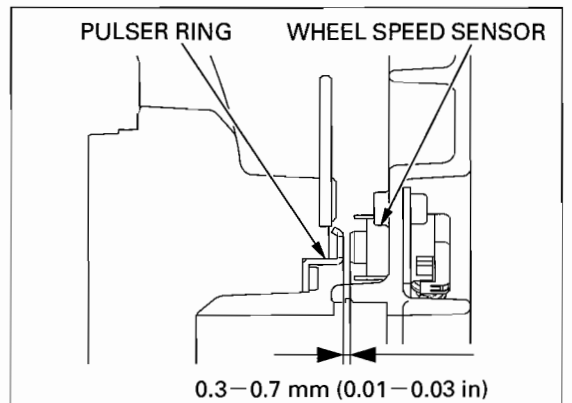
Install the pulser ring with the new torx bolts.

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

Install the rear wheel (page 15-6).

Check the clearance between the pulser ring and wheel speed sensor.

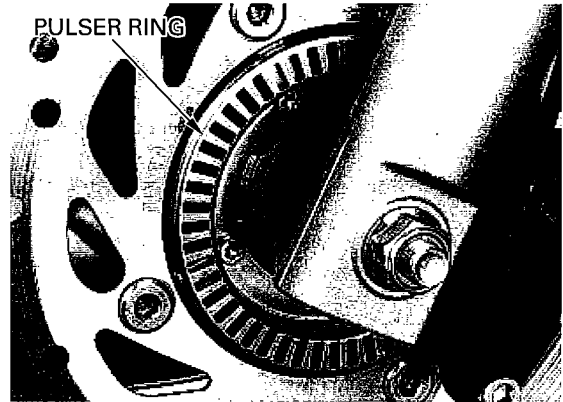
CLEARANCE: 0.3–0.7 mm (0.01–0.03 in)



FRONT WHEEL SPEED SENSOR

INSPECTION

Check the pulser ring for damage or cracks.
Replace the pulser ring if necessary (page 21-21).



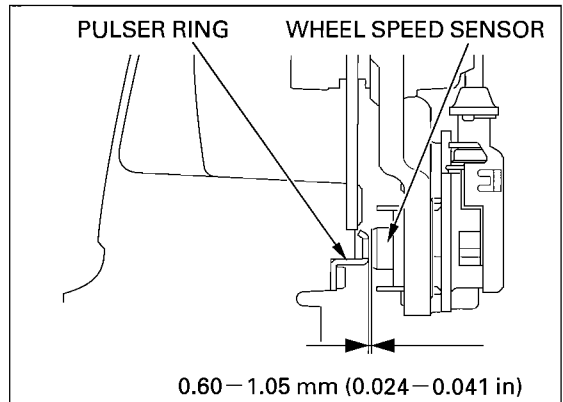
Check the clearance between the pulser ring and wheel speed sensor.

CLEARANCE: 0.60 – 1.05 mm (0.024 – 0.041 in)

If out of specification, check the front wheel bearing for wear or damage and the front wheel speed sensor installation.

If the following parts are replaced, check the clearance between the pulser ring and wheel speed sensor.

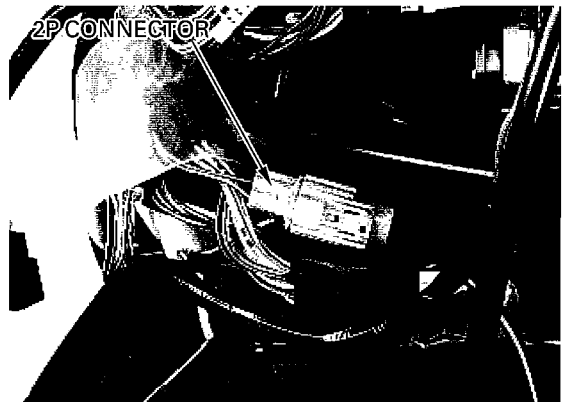
- Front wheel component parts
- Front fork bottom case
- Front caliper bracket
- Front wheel speed sensor/Front pulser ring
- Front axle collar



REMOVAL/INSTALLATION

Remove the front cover (page 2-10).

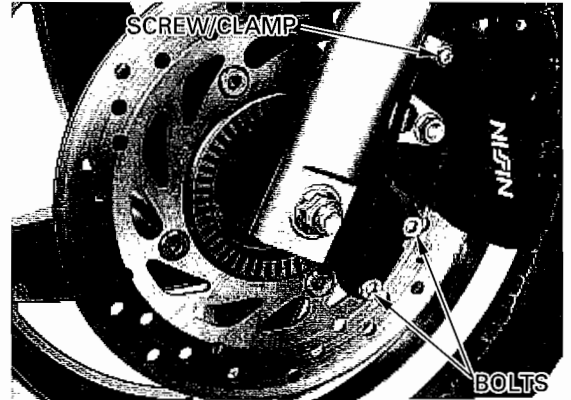
Disconnect the front wheel speed sensor 2P connector.



Remove the front wheel speed sensor wire from the clamps.

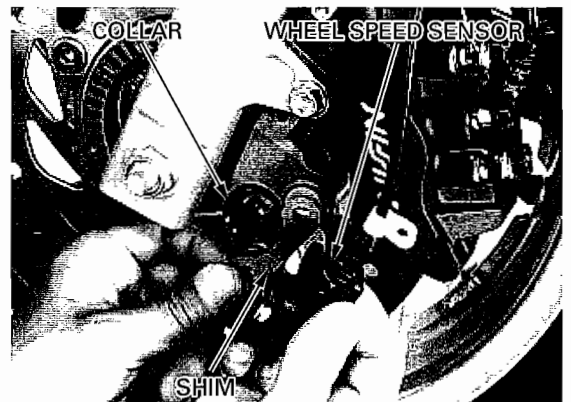


Remove the screw and clamp.
Remove the bolts and front wheel speed sensor and shim (for applicable scooter only).



Remove the collar.

Check the front wheel speed sensor for damage or cracks.
Check the collar for wear or damage.



Route the wire harness properly (page 1-18).

Installation is in the reverse order of removal.

TORQUE: 15 N·m (1.5 kgf·m , 11 lbf·ft)

After installation, check the clearance between the pulser ring and wheel speed sensor (page 21-22).

REAR WHEEL SPEED SENSOR

INSPECTION

Check the clearance between the pulser ring and wheel speed sensor.

CLEARANCE: 0.3–0.7 mm (0.01–0.03 in)

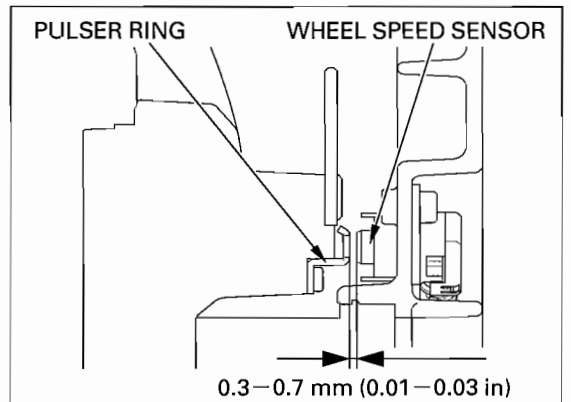
If out of specification, check the driveshaft bearing for wear or damage and the rear wheel speed sensor installation.

If the following parts are replaced, check the clearance between the pulser ring and wheel speed sensor.

- Swingarm
- Rear wheel speed sensor/Rear pulser ring
- Rear axle collar

Remove the swingarm (page 15-3).

Check the pulser ring for damage or cracks.
Replace the pulser ring if necessary. (page 21-21).



ABS (Anti-lock Brake System)

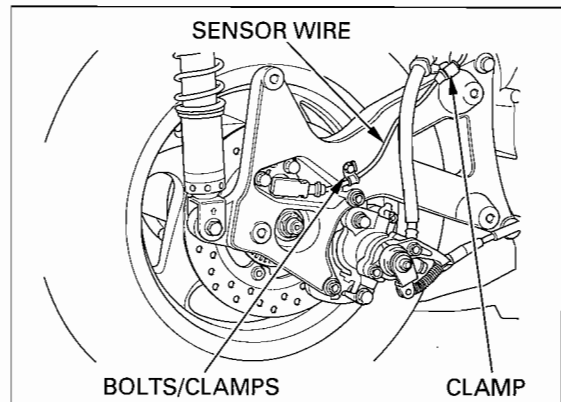
REMOVAL/INSTALLATION

Remove the body cover (page 2-5).

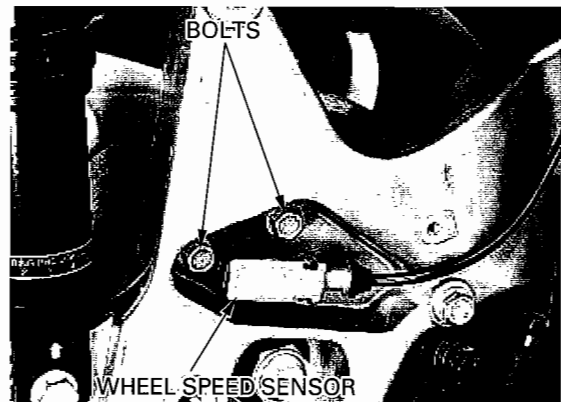
Disconnect the rear wheel speed sensor 2P connector.



Remove the rear wheel speed sensor wire from the clamp.
Remove the bolt and clamp.



Remove the bolts and rear wheel speed sensor.



Remove the collar.

Check the rear wheel speed sensor for damage or cracks.
Check the collar for wear or damage.

Route the wire harness properly (page 1-18).

Installation is in the reverse order of removal.

TORQUE: 15 N·m (1.5 kgf·m , 11 lbf·ft)

After installation, check the clearance between the pulser ring and wheel speed sensor (page 21-23).

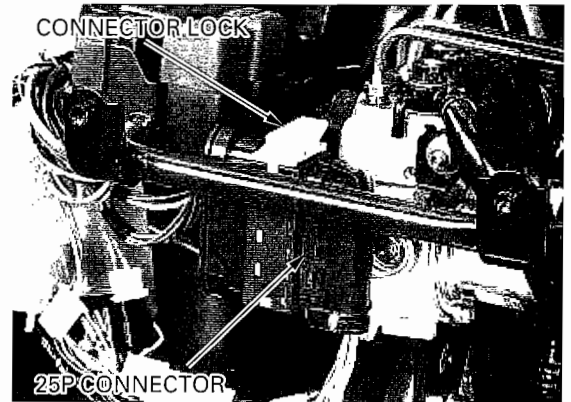


ABS MODULATOR

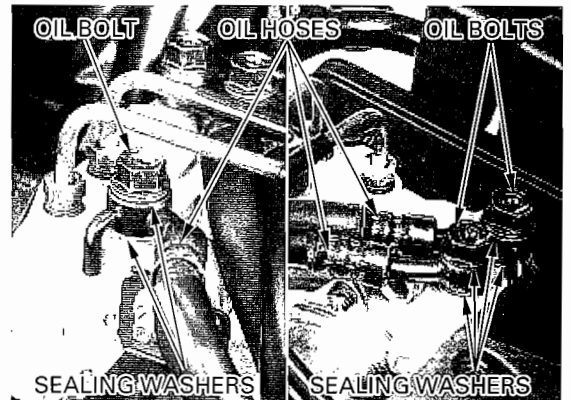
REMOVAL

Remove the front cover (page 2-10).
Drain the front brake hydraulic system (page 16-4).

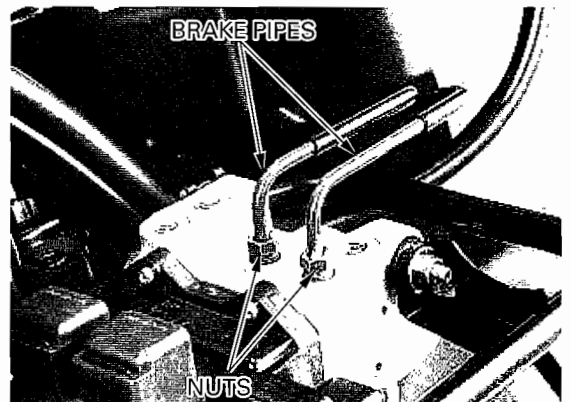
Pull up the ABS modulator 25P connector lock and disconnect the ABS modulator 25P connector.



Remove the oil bolts, sealing washers and brake hoses from the ABS modulator.



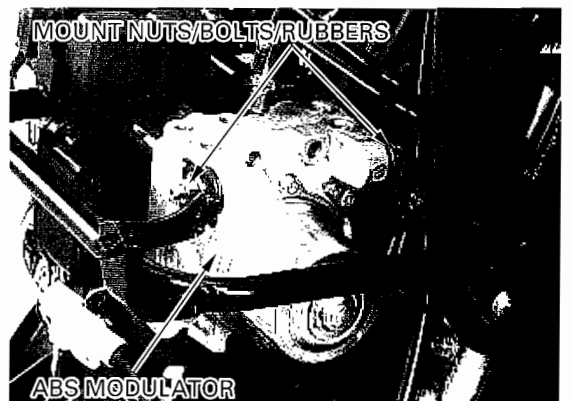
Loosen the brake pipe nuts and disconnect the brake pipes from the ABS modulator.



Loosen the ABS modulator mount nuts.

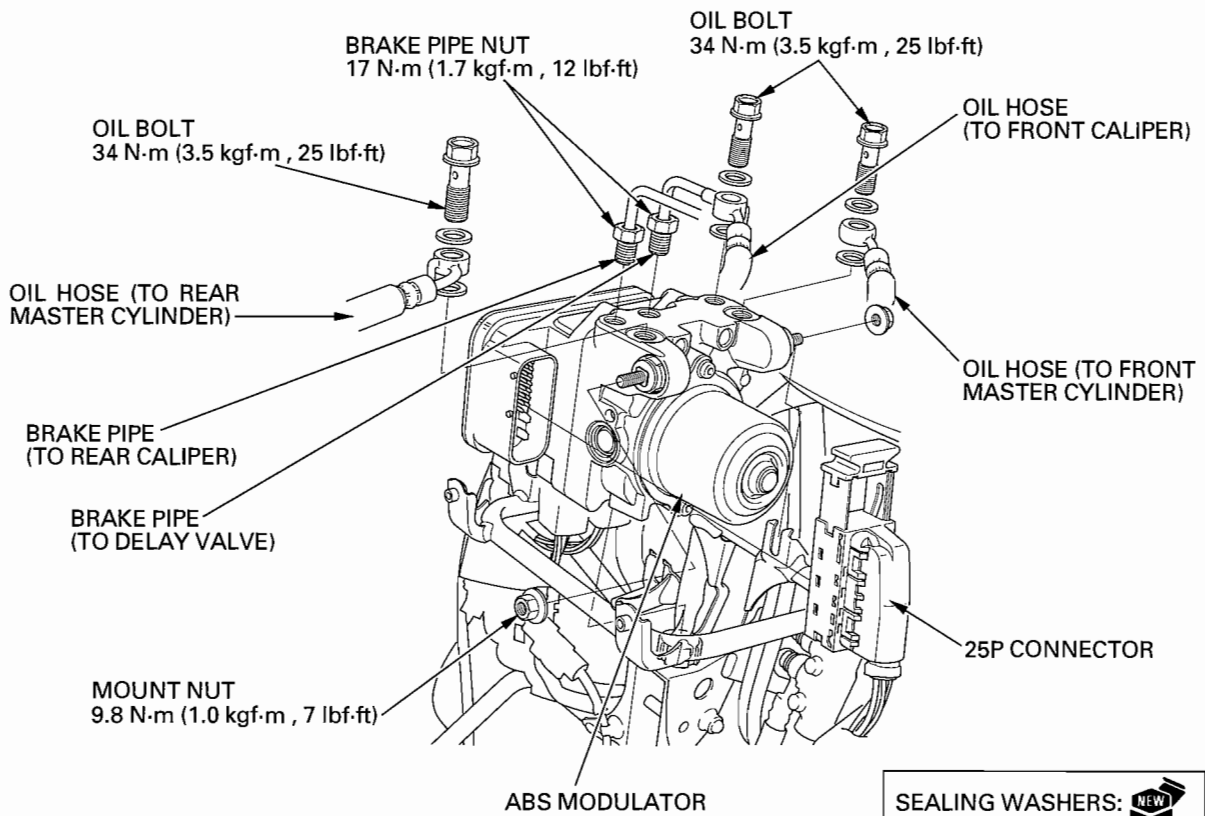
Be careful not to damage the brake pipes.

Remove the ABS modulator.
Remove the mount bolts, rubber mounts from the ABS modulator.



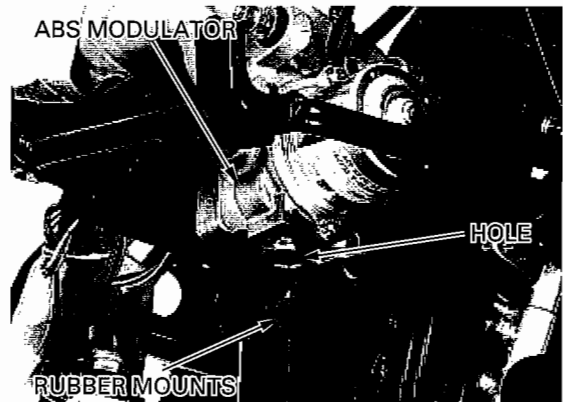
ABS (Anti-lock Brake System)

INSTALLATION



Install the mount bolts and rubber mounts from the ABS modulator.

Install the ABS modulator to the frame aligning the hole on the ABS modulator with the rubber mounts on the frame.



To reduce the amount of time it takes to bleed the brake system, pre-fill the ABS modulator with brake fluid before attaching the brake pipe and hoses.

Tighten the ABS modulator mount nuts to the specified torque.

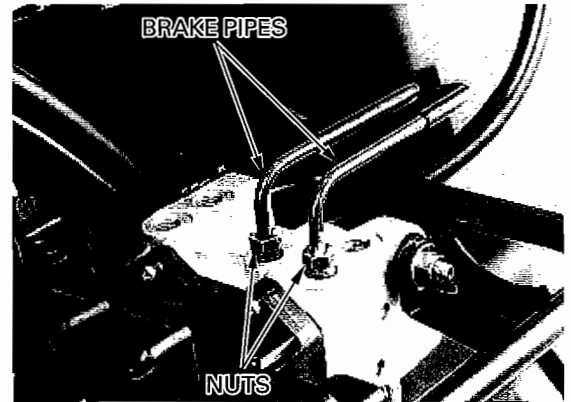
TORQUE: 9.8 N·m (1.0 kgf·m , 7 lbf·ft)



ABS (Anti-lock Brake System)

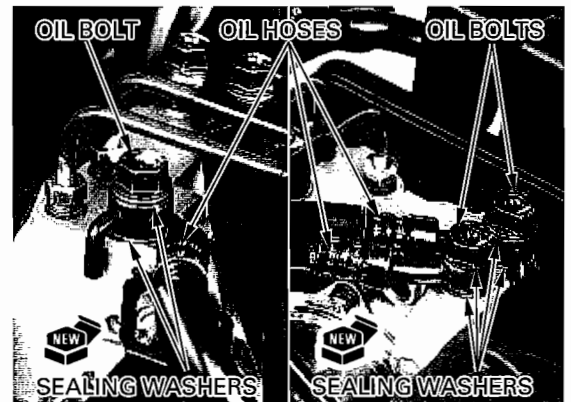
Install the brake pipes to the ABS modulator properly and tighten the nuts to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m , 12 lbf·ft)



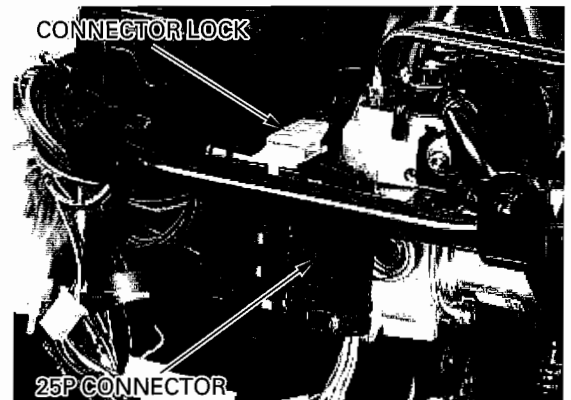
Install the brake hose eyelet to the ABS modulator with new sealing washers and oil bolts. Push the stopper on the brake hose eyelet to the ABS modulator (to the rear master cylinder and front caliper), then tighten the oil bolts to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m , 25 lbf·ft)



Connect the ABS modulator 25P connector and push down the ABS modulator 25P connector lock securely.

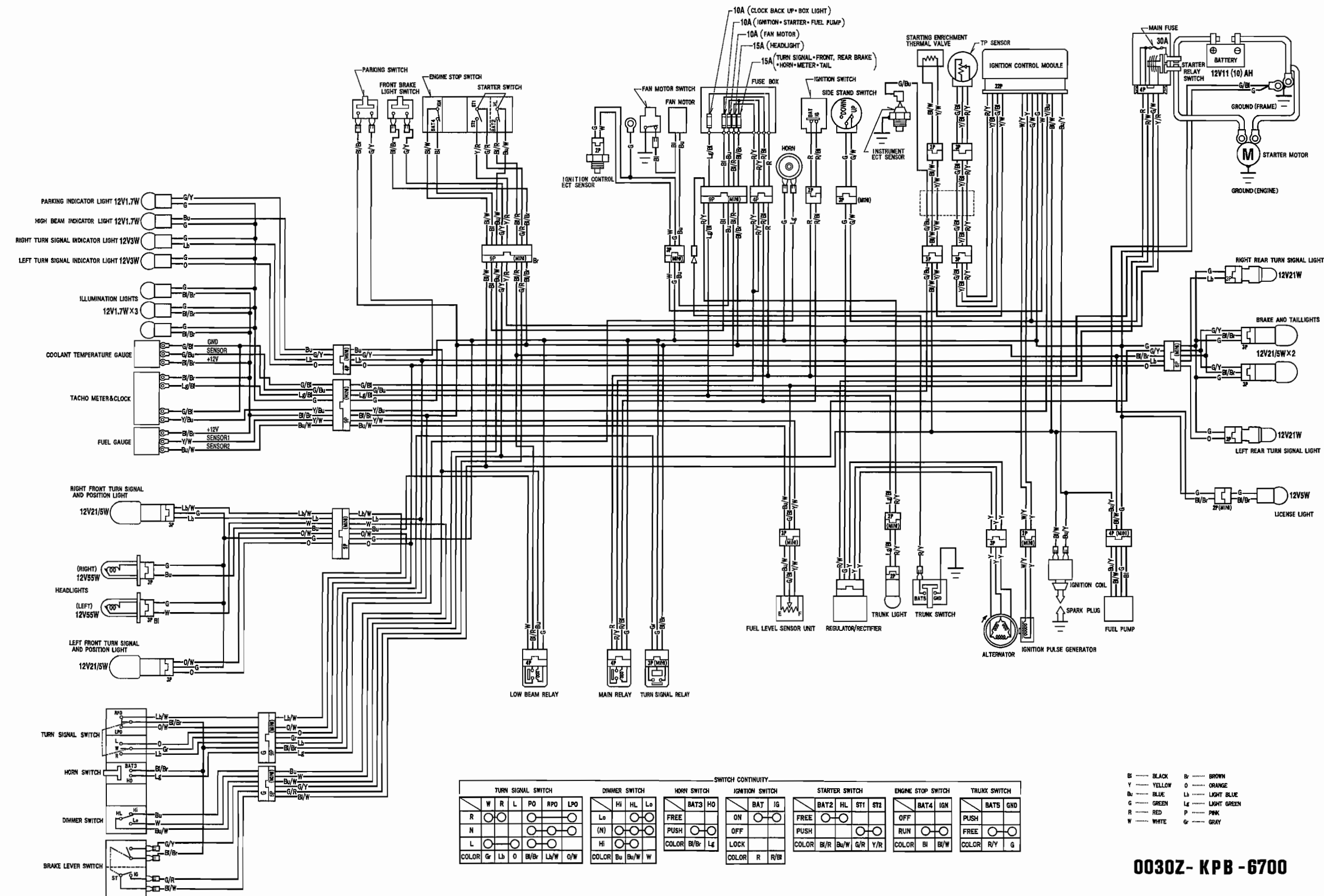
Fill and bleed the hydraulic system (page 16-5).
Install the front cover (page 2-10).



MEMO



'01 - '03 STANDARD TYPE



SWITCH CONTINUITY

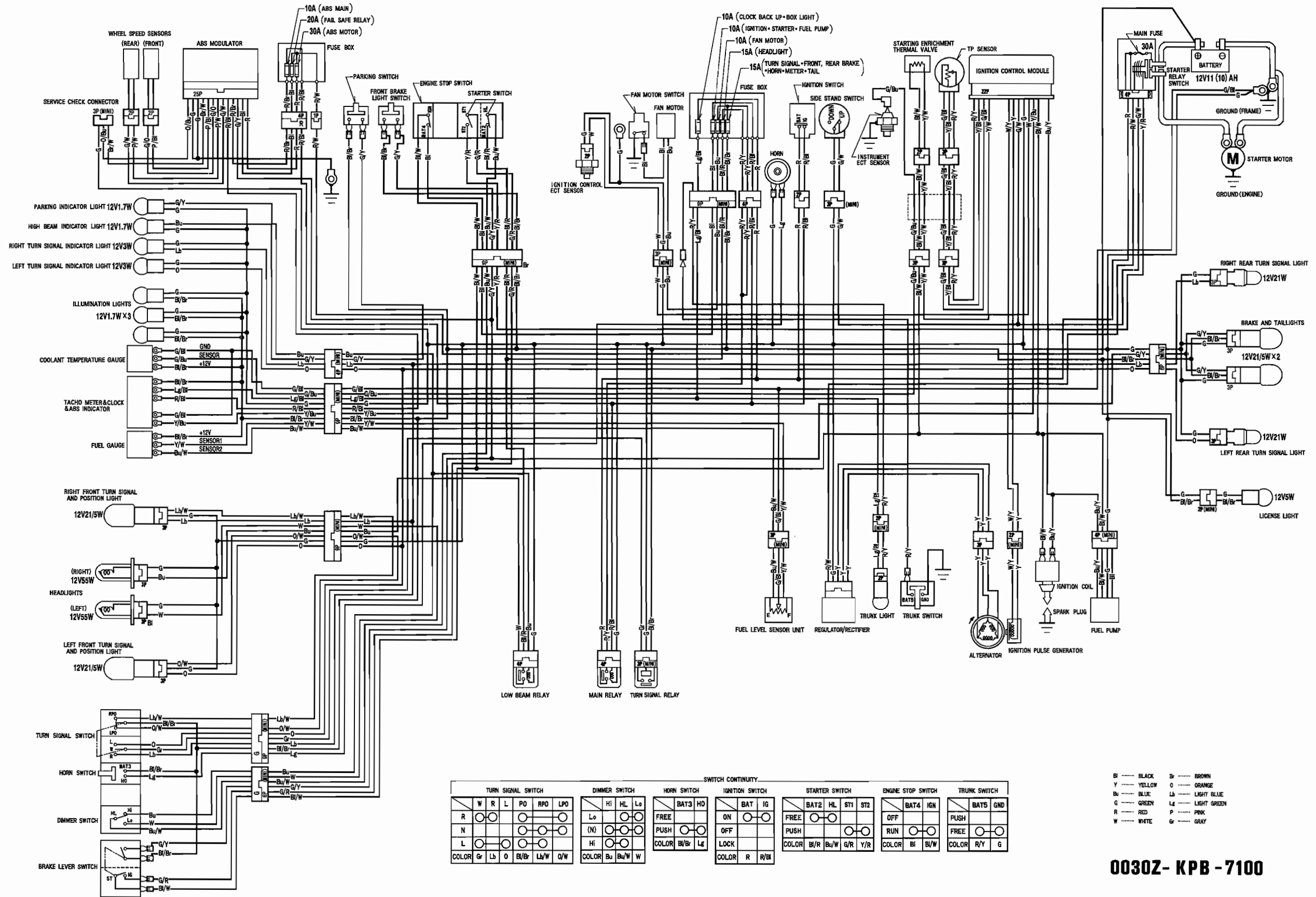
TURN SIGNAL SWITCH						DIMMER SWITCH			HORN SWITCH		IGNITION SWITCH		STARTER SWITCH				ENGINE STOP SWITCH		TRUNK SWITCH								
R	W	R	L	PO	RPO	LPO	Lo	Hi	HL	Lo	BAT3	HO	BAT	IG	BAT2	HL	ST1	ST2	BAT4	IGN	BATS	GND					
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○					
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○					
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○					
COLOR	Gr	Lb	O	B/Br	Lb/W	O/W	COLOR	Bu	Bu/W	W	COLOR	B/Br	Lg	COLOR	R	R/Bl	COLOR	B/R	Bu/W	G/R	Y/R	COLOR	Bl	B/W	COLOR	R/Y	G

- Bl --- BLACK
- Y --- YELLOW
- Bu --- BLUE
- G --- GREEN
- R --- RED
- W --- WHITE
- B --- BROWN
- O --- ORANGE
- Lb --- LIGHT BLUE
- Lg --- LIGHT GREEN
- P --- PINK
- Gr --- GRAY

0030Z- KPB - 6700

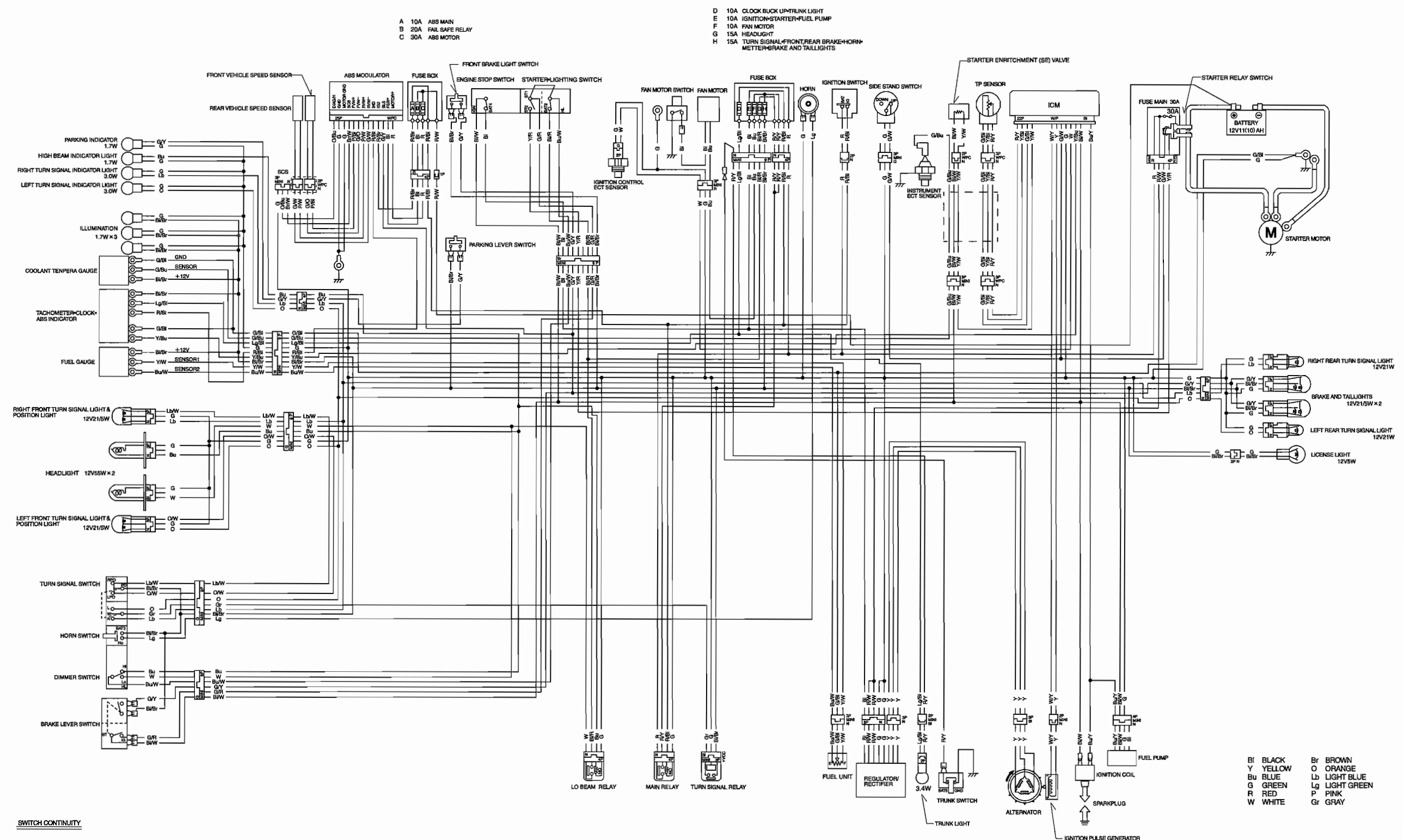
WIRING DIAGRAMS

'01 - '03 ABS TYPE



0030Z-KPB-7100

After '03 STANDARD TYPE



- A 10A ABS MAIN
- B 20A FAIL SAFE RELAY
- C 30A ABS MOTOR
- D 10A CLOCK/BUCK UP/TRUNK LIGHT
- E 10A IGNITION-STARTER-FUEL PUMP
- F 10A FAN MOTOR
- G 15A HEADLIGHT
- H 15A TURN SIGNAL-FRONT, REAR BRAKE+HORN-METTER-BRAKE AND TAILLIGHTS

SWITCH CONTINUITY

TURN SIGNAL SWITCH						DIMMER SWITCH		HORN SWITCH		IGNITION SWITCH		STARTER/LIGHTING SWITCH				ENGINE STOP SWITCH		TRUNK SWITCH				
W	R	L	PO	RPO	LPO	Lo	Hi	Lo	Hi	BAT	IG	BAT2	HL	ST1	ST2	BAT4	IGN	BATS	GND			
R										ON		FREE				FLN		PUSH				
						(N)				OFF		PUSH				OFF		FREE				
						HI				LOCK		COLOR	B/R	Bu/W	G/R	Y/R	FLN		FREE			
										COLOR	R	P/RS	COLOR	B/R	Bu/W	G/R	Y/R	FREE		COLOR	R/Y	G

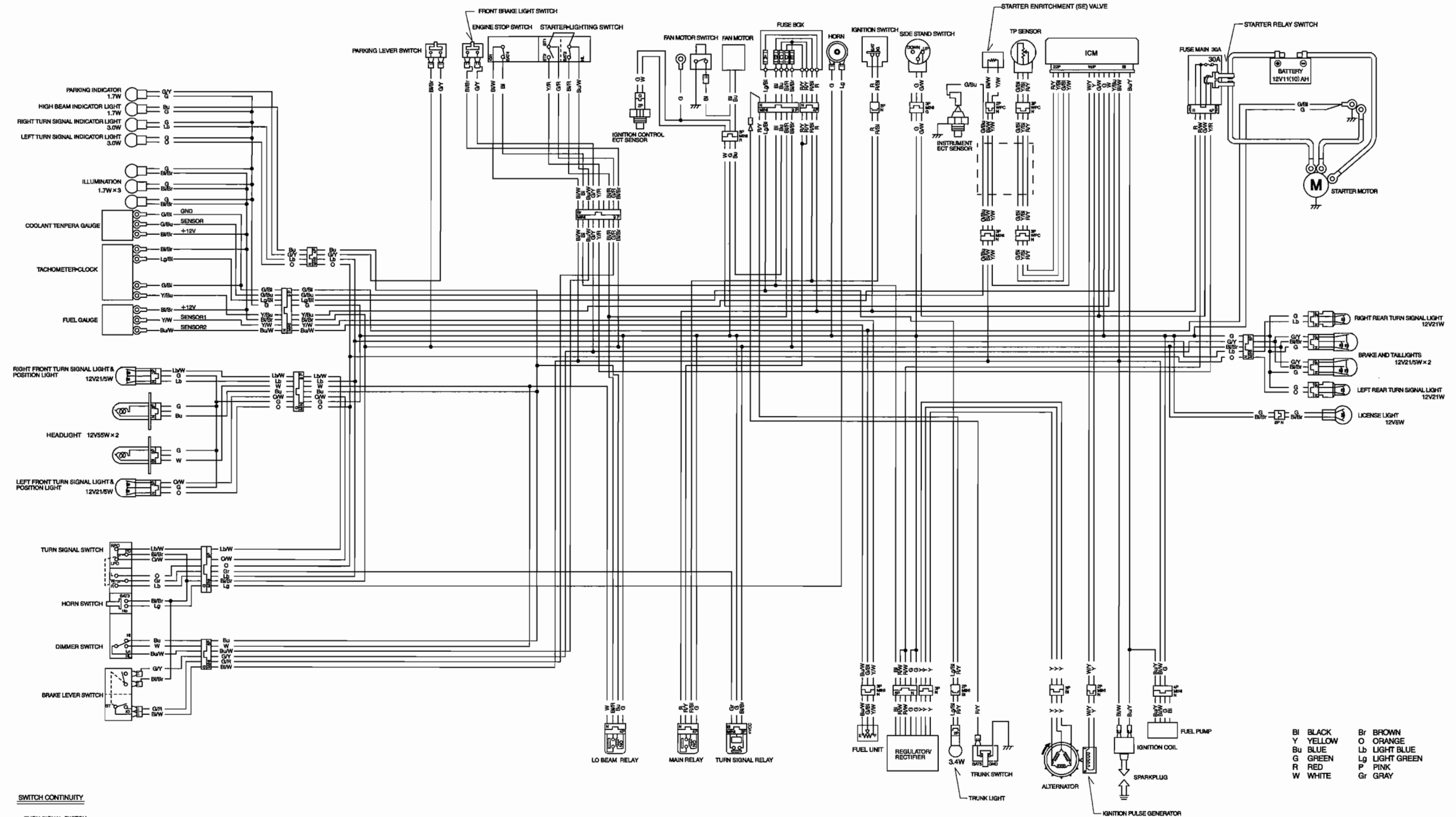
- Bl BLACK
- Y YELLOW
- Bu BLUE
- G GREEN
- R RED
- W WHITE
- Br BROWN
- O ORANGE
- Lb LIGHT BLUE
- Lg LIGHT GREEN
- P PINK
- Gr GRAY

0030Z-KSZ-7500

WIRING DIAGRAMS

After '03 ABS TYPE

- A 10A CLOCK BUCK UP/TRUNK LIGHT
- B 10A IGNITION-STARTER-FUEL PUMP
- C 10A FAN MOTOR
- D 15A HEADLIGHT
- E 15A TURN SIGNAL-FRONT/REAR BRAKE-HORN-METER-BRAKE AND TAILLIGHTS



- Bl BLACK
- Y YELLOW
- Bu BLUE
- G GREEN
- R RED
- W WHITE
- Br BROWN
- O ORANGE
- Lb LIGHT BLUE
- Lg LIGHT GREEN
- P PINK
- Gr GRAY

SWITCH CONTINUITY

TURN SIGNAL SWITCH						DIMMER SWITCH			HORN SWITCH		IGNITION SWITCH		STARTER-LIGHTING SWITCH				ENGINE STOP SWITCH		TRUNK SWITCH						
	W	R	L	PO	LPO	HI	W	HL	Lo		BAT3	Ho		BAT	IG	BAT2	HL	ST1	ST2		BAT4	IGN	BAT5	GND	
R	○	○								FREE			ON			FREE				OFF			PUSH		
N										PUSH			OFF			PUSH				FLN			FREE		
L			○			HI				COLOR B/W	Lg		LOCK			COLOR B/W	Bu/W	Gr	Y/R	COLOR Bl	B/W				
	Gr	Lb	O	B/W	Lb/W	Q/W	COLOR Bu	Bu/W	W				COLOR R	F/Bl						COLOR R/V	G				

0030Z-KSZ-7700

23. TECHNICAL FEATURES

AUTO ADJUST BRAKE LOCK REAR
CALIPER

23-1

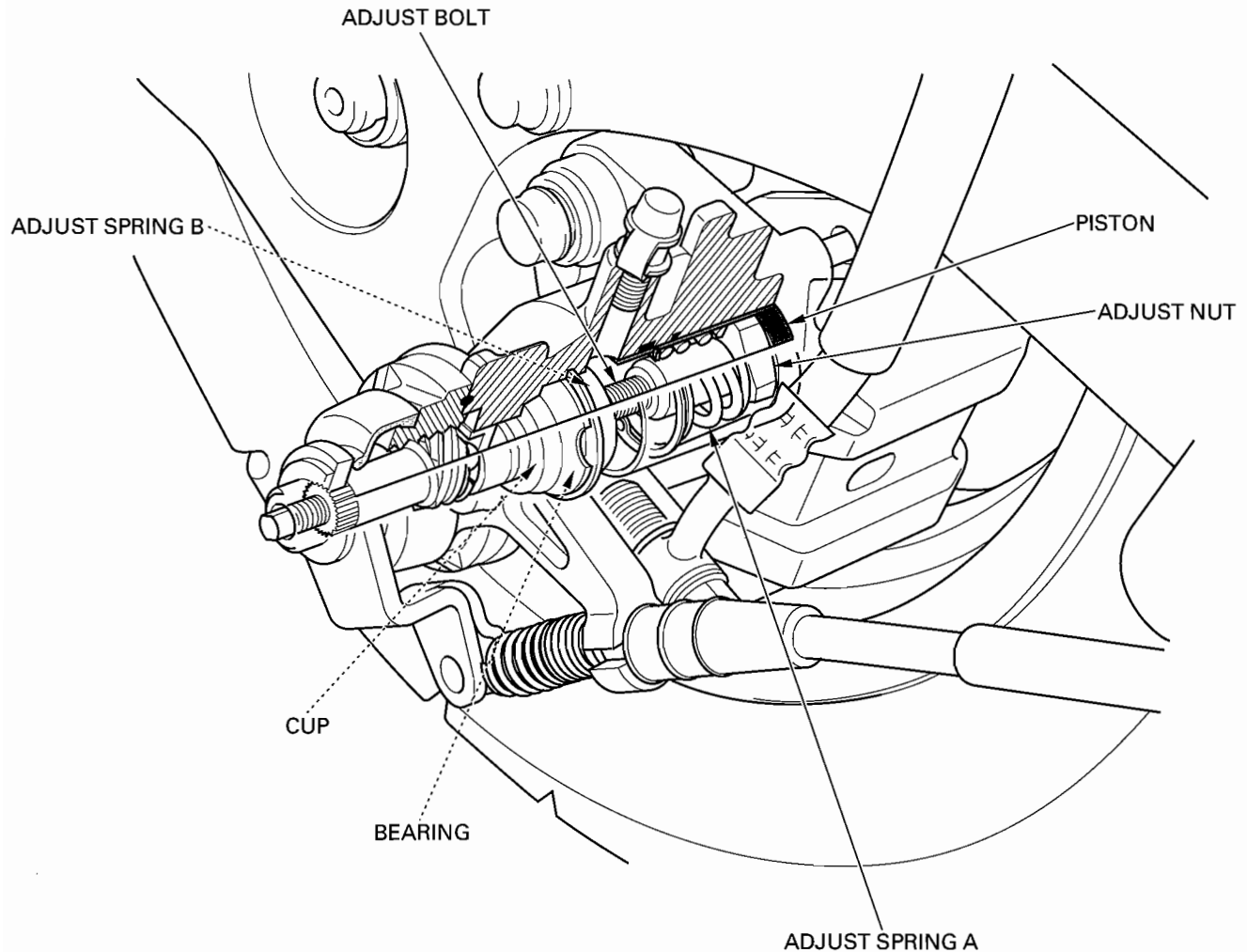
ABS (Anti-lock Brake System)

23-5

AUTO ADJUST BRAKE LOCK REAR CALIPER

SUMMARY

NSS 250 rear caliper has a parking brake mechanism and an auto adjust mechanism.



AUTO ADJUST MECHANISM

The auto adjust mechanism keeps the pad clearance fixed.

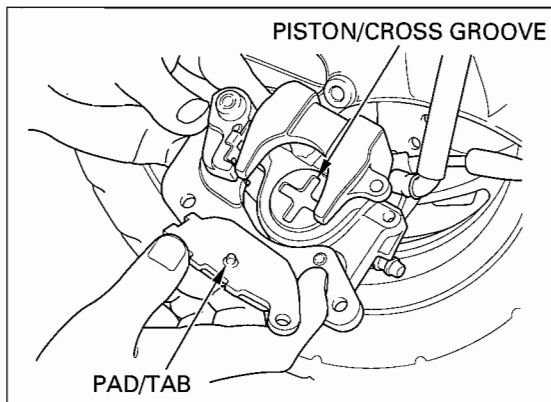
CONSTRUCTION

The auto adjust mechanism consists of the following parts:

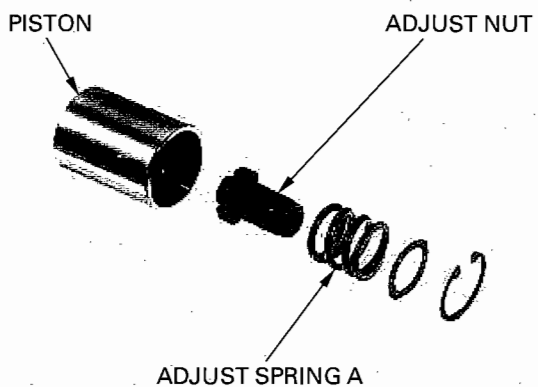
- Piston: When the brake pressure increases, the piston slides in the caliper cylinder and pushes the pad.
- Adjust nut: Adjusts the pad clearance with the adjust bolt.
- Adjust spring A: Prevents the pad clearance from overadjusting.
- Bearing: Adjusts pad clearance smoothly.
- Adjust spring B: Prevents the adjust bolt from turning.
- Adjust bolt: Adjusts the pad clearance with the adjust nut.
- Cup: Seals the brake fluid.

TECHNICAL FEATURES

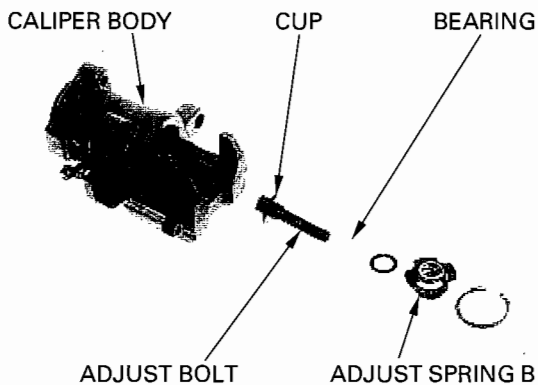
The tab on the brake pad must engage with the cross groove in the piston.
The piston cannot turn when the brake is applied.



Do not disassembly the piston assembly. The groove on the inside of the piston must align with the tabs on the adjust nut during installation. The adjust nut cannot turn when the brake is applied.



Adjust spring B presses the adjust bolt into the clutch surface of the caliper body inside. During auto adjusting, the adjust bolt turns smoothly against the bearing.



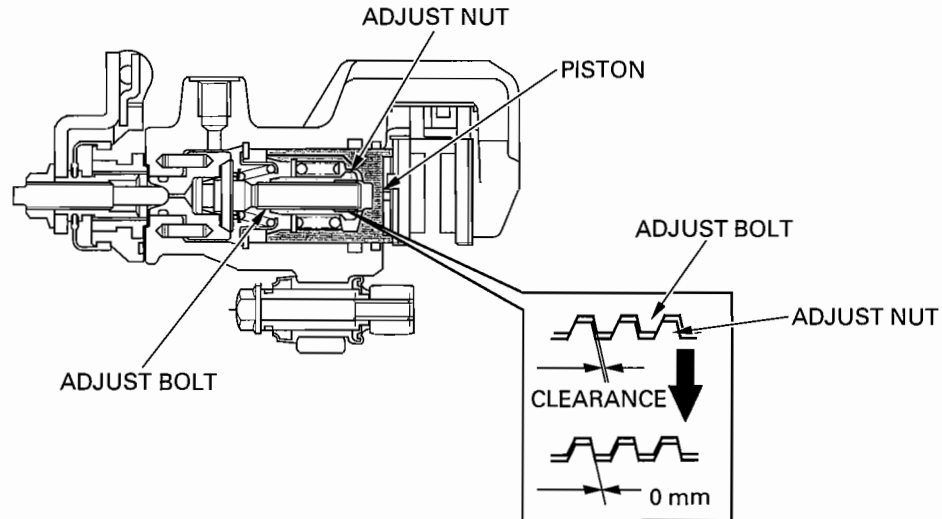
OPERATION

Brake pads with no wear:

The adjust nut in the piston and the adjust bolt are threaded together. The clearance between the adjust nut and bolt threads is 0.45 mm.

When the rear brake lever is squeezed, the brake fluid pressure appear from the master cylinder is applied to rear brake piston.

The brake fluid pressure pushes the piston against the pad. The piston slides (0.45 mm) or less taking up the thread clearance and contacting the pad in the caliper body. The pads press against the brake disc and braking power is applied.



Worn Brake pads:

1. The brake fluid pressure pushes the piston against the pad. The piston slides the length of the thread clearance (0.45 mm) to the pad in the caliper body. When the thread clearance is 0 mm, the adjust bolt and piston are pressed together by brake fluid pressure.

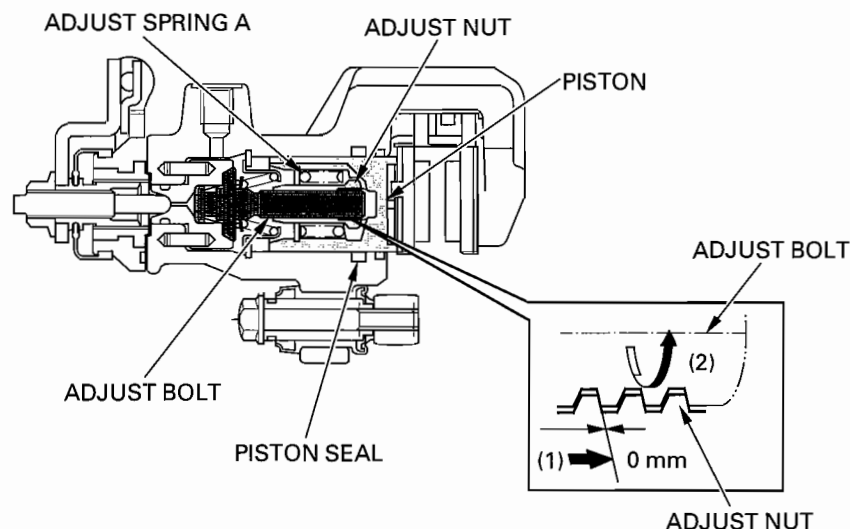
If the pad clearance is greater than the thread clearance (0.45 mm), the piston force causes the piston to press the pad and turn the adjust bolt.

The piston cannot turn because the cross groove of the piston and the tab on the pad are connected. The piston force turns the adjust bolt.

2. The adjust bolt turns out from the adjust nut as the pad wears.

3. When the pad clearance is 0 mm, adjust spring A separates the piston and adjusting bolt by applying pressure to the adjusting nut thereby maintaing thread clearance at 0.45 mm. The piston force is eliminated from the adjust bolt because the thread clearance remains 0.45 mm.

The adjust bolt stops turning out from the adjusting nut and the piston returns by piston seal resilience.



TECHNICAL FEATURES

PARKING BRAKE MECHANISM

The parking brake is cable operated. The hydraulic system does not function when the parking brake is applied.

OPERATION

The parking brake lever and the arm of the rear caliper are connected by the parking brake cable.

When the parking brake lever is pulled, the arm is turned by the parking brake cable.

The turning force of the arm is converted to the sliding force of the push rod by the shaft and brake lock.

The push rod presses the sleeve piston and adjust bolt directly.

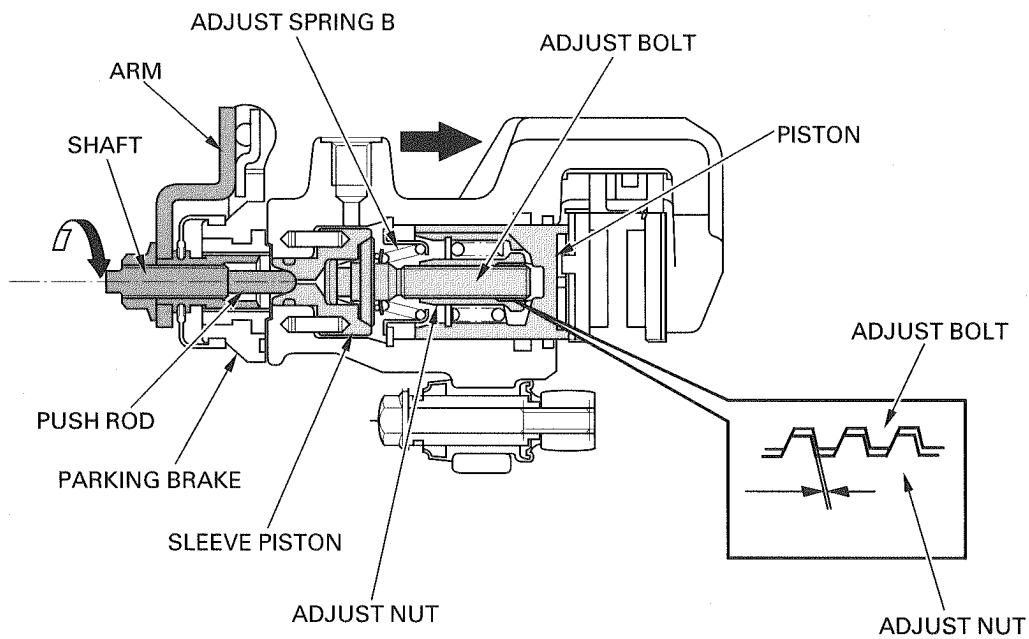
The adjust bolt presses the piston directly because the adjusting nut and piston are assembled (page 22-2).

The piston presses the pad and parking brake force is applied.

When the parking brake lever is released, the arm and push rod return by spring pressure.

The sleeve piston and adjust bolt return by the adjust spring B.

The piston returns by piston seal resilience.



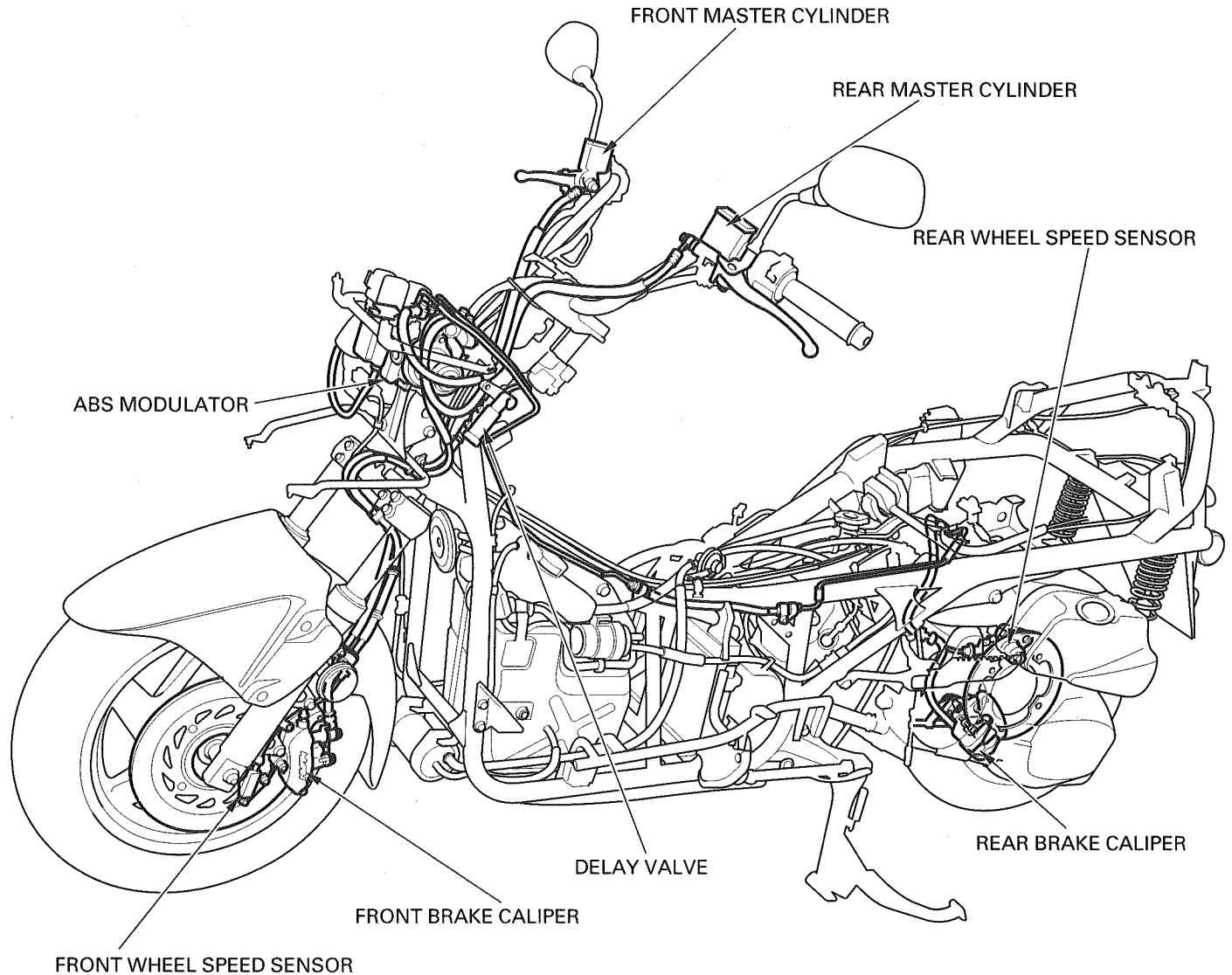
ABS (Anti-lock Brake System)

SUMMARY

The Anti-lock Brake System (ABS) is designed to help prevent wheel lock up during hard braking or braking on loose or slippery surfaces. ABS momentarily reduces the brake caliper fluid pressure when the wheels are about to lock. When the system senses that the tendency for wheel lock is reduced, brake caliper fluid pressure is restored. ABS repeats this cycle as required for secure brake performance with minimum possibility of wheel lock.

When the ABS control unit detects a problem in the system, the ABS stops its function and switches to the ordinary brake system.

ABS LOCATION



TECHNICAL FEATURES

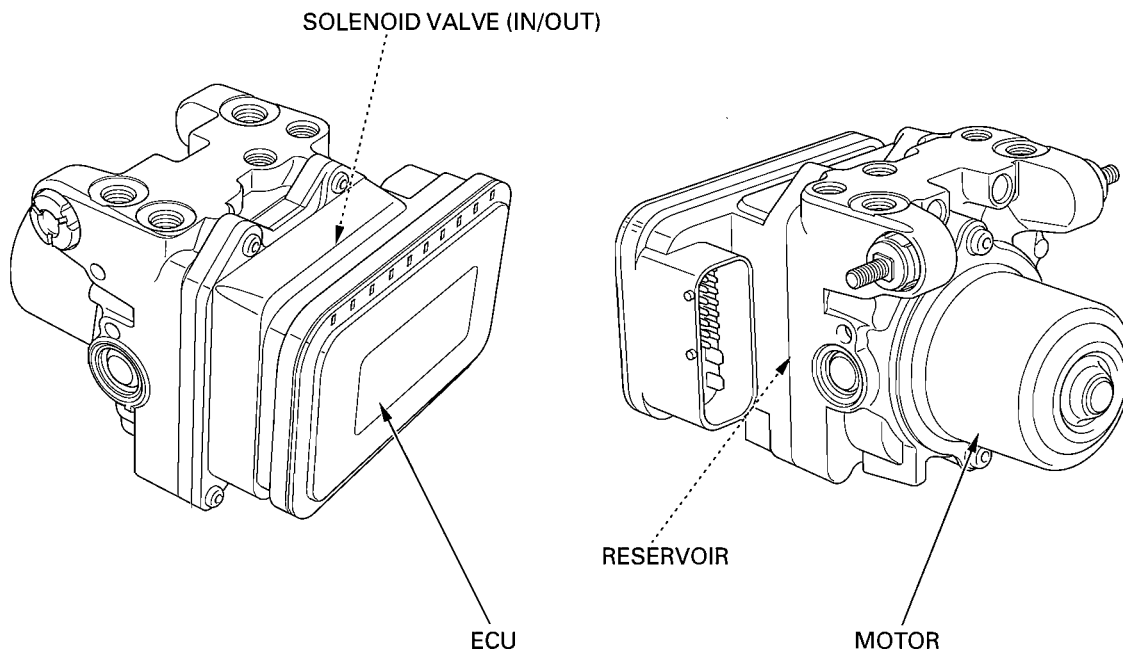
		Function
Wheel speed sensor/ pulser ring		Inputs pulse signals, generated proportional to the rotating speed of the pulser ring, in the control unit.
ABS modulator		Controls ABS.
1.	Motor & pump	Adjusts the caliper fluid pressure.
2.	Reservoir	When the fluid pressure decreases, fluid flows back to the reservoir.
3.	Solenoid valve (IN)	Controls the brake line (master cylinder to caliper)
4.	Solenoid valve (OUT)	Controls the brake line (reservoir to caliper)
5.	ECU	Controls ABS by computing the input signal of each sensor and switch.
Indicator		Blinks or stays on when a problem occurs in the ABS

ABS MODULATOR

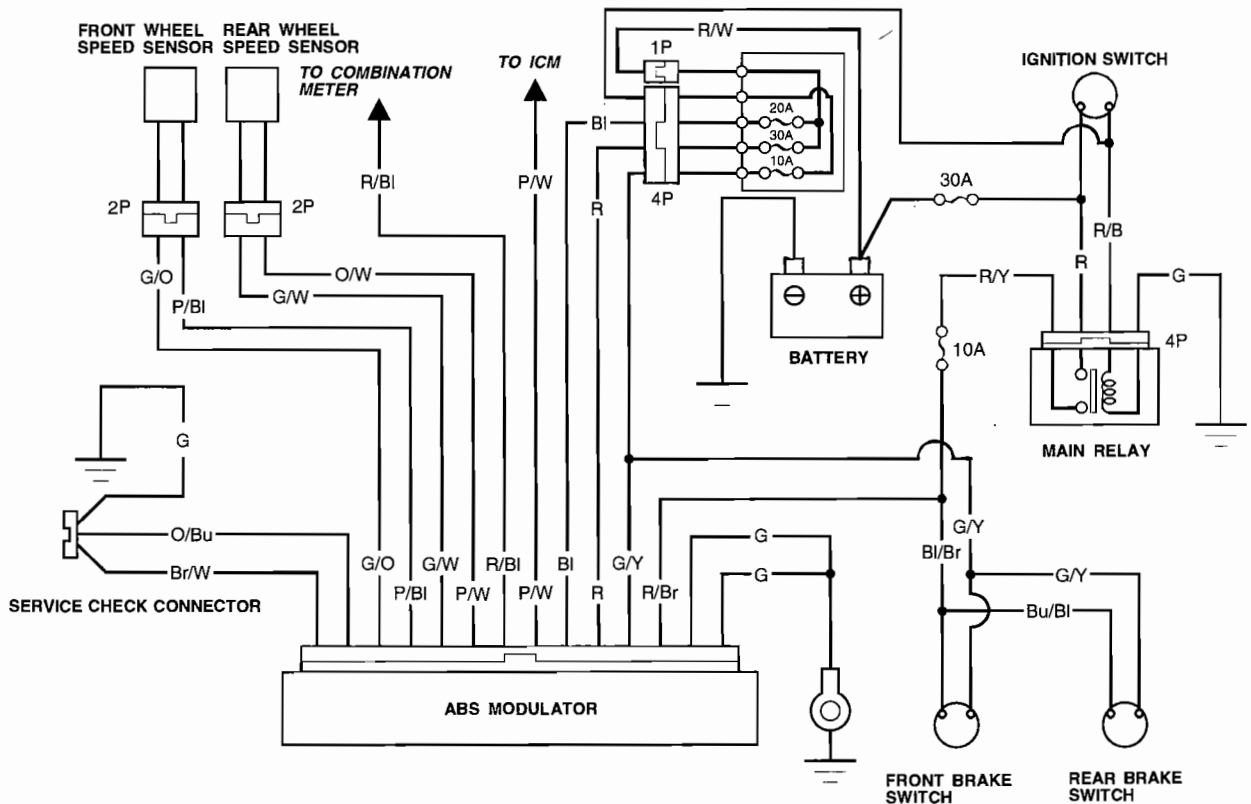
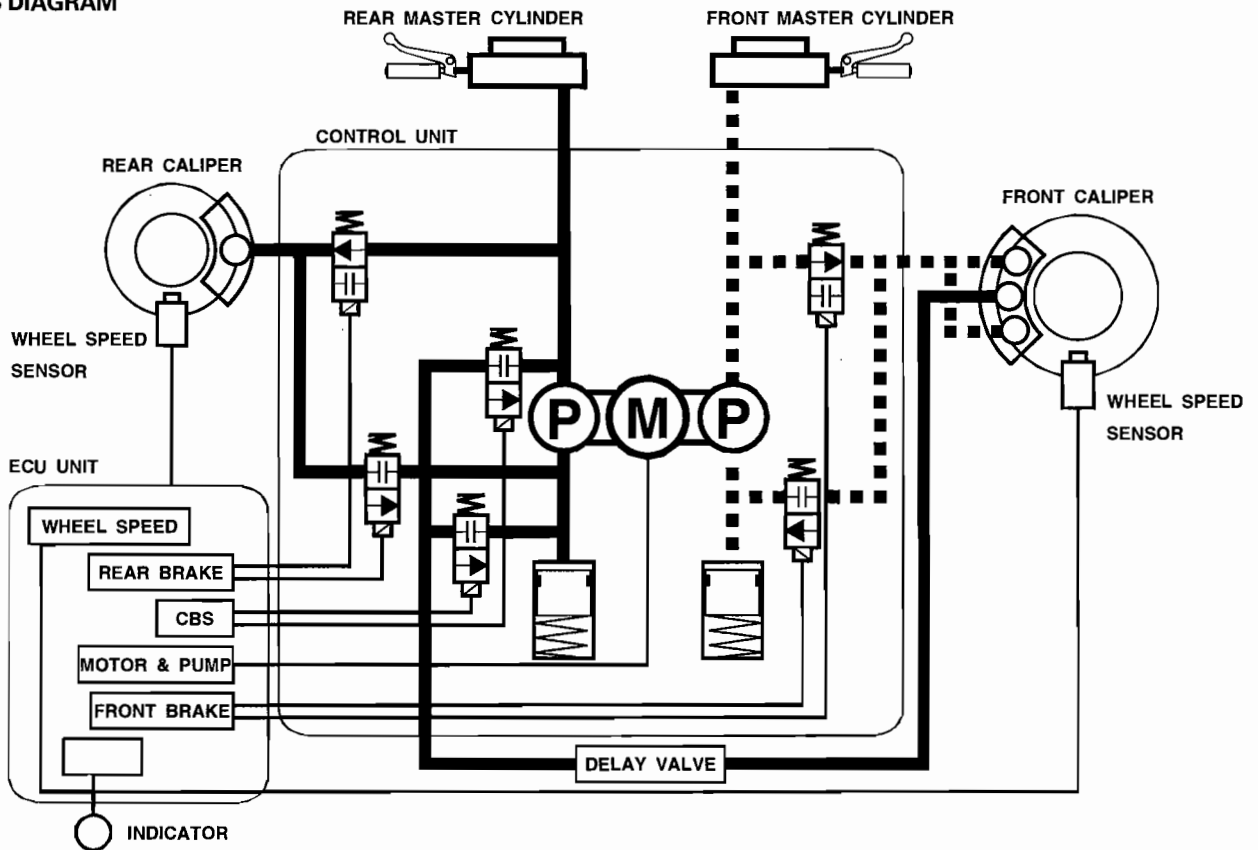
The modulator controls and supplies the brake fluid that is essential for ABS operation. The ABS modulator is a sealed type containing the brake fluid and constituent parts, and is maintenance free. Additionally, the modulator is compact and well suited for motorcycles.

The ABS modulator consists of the following parts.

- Motor & pump
- Reservoir
- Solenoid valve (IN/OUT)
- ECU



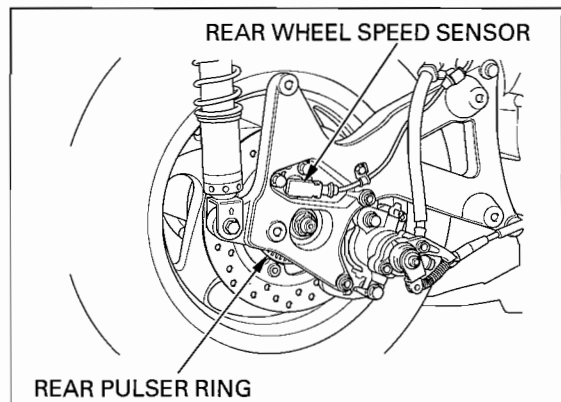
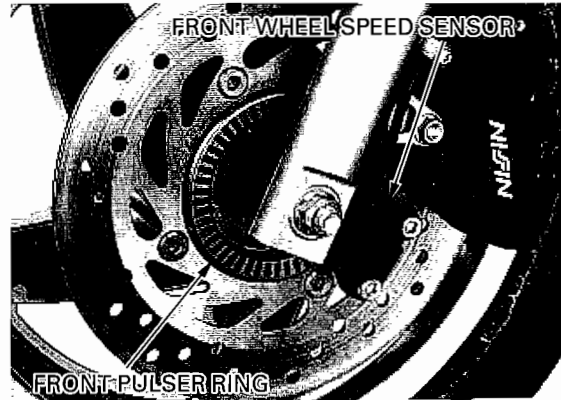
ABS DIAGRAM



SYSTEM CONSTRUCTION

WHEEL SPEED SENSOR/PULSER RING

The wheel speed sensor is an inductive sensor that detects the front/rear wheel speed. Consisting of the permanent magnet and coils, the sensor is connected to the ABS modulator. When the grooves on the outer surface of the pulser ring that rotates together with the front/rear wheel passes across the wheel speed sensor, pulse signals are generated at the sensor. The ECU of the ABS modulator detects the wheel speed as it receives the pulse signals, because the frequency of the signal increases proportionally to the wheel speed.



MOTOR and PUMP

The motor and pump is built into the ABS modulator. When the ECU sends signals to activate the motor and pump, the motor and pump bleed brake fluid to the reservoir to decrease the fluid pressure smoothly. At same time, the motor and pump sends brake fluid to the master cylinder and allows the rider to know that the ABS is operating (kick-back).

RESERVOIR

The reservoir is built into the ABS modulator. When the ABS decreases the fluid pressure to the calipers, the reservoir stores the fluid that was bled from the circuit.

The reservoir consists of a piston and spring.

SOLENOID VALVE (IN/OUT)

The solenoid valve is built into the ABS modulator. When the ABS is working, the solenoid valves control the brake lines.

1. Solenoid valve (IN):

The electrical signal from the ECU is not recorded and the brake fluid passage opens.

The electrical signal from the ECU is recorded the brake fluid passage closes.

2. Solenoid valve (OUT):

The electrical signal from the ECU is not recorded and the brake fluid passage closes.

The electrical signal from the ECU is recorded and the brake fluid passage opens.

ECU

The ECU is built into the ABS modulator. The ECU controls the ABS by computing the input signal of each sensor and switch.

ABS FUNCTION

ABS BASIC FUNCTION

The ABS automatically controls wheel lock-up during braking to help the driver control the scooter under many conditions.

The ECU consists of two systems that monitor each other: the main ECU and sub ECU.

The ECU detects the wheel speed as it receives the signal from each wheel speed sensor. When the ECU senses that the wheels are about to lock, it controls the caliper fluid pressure by activating the solenoid valves, motor and pump.

SELF-DIAGNOSIS FUNCTION

When the engine starts, the ECU detects the hydraulic circuit condition by activating the motor and pump and solenoid valves. The ABS indicator blinks when an abnormality is detected in the circuit.

When the circuit is normal, the ABS indicator stays on indicating that the ECU is in the stand-by mode for the speed sensor signal. The speed sensor sends signal to the ECU after the scooter starts moving (approximately 10 km/h or above). The ABS indicator goes off when the ECU receives signals from the speed sensor and the speed sensor system is as normal.

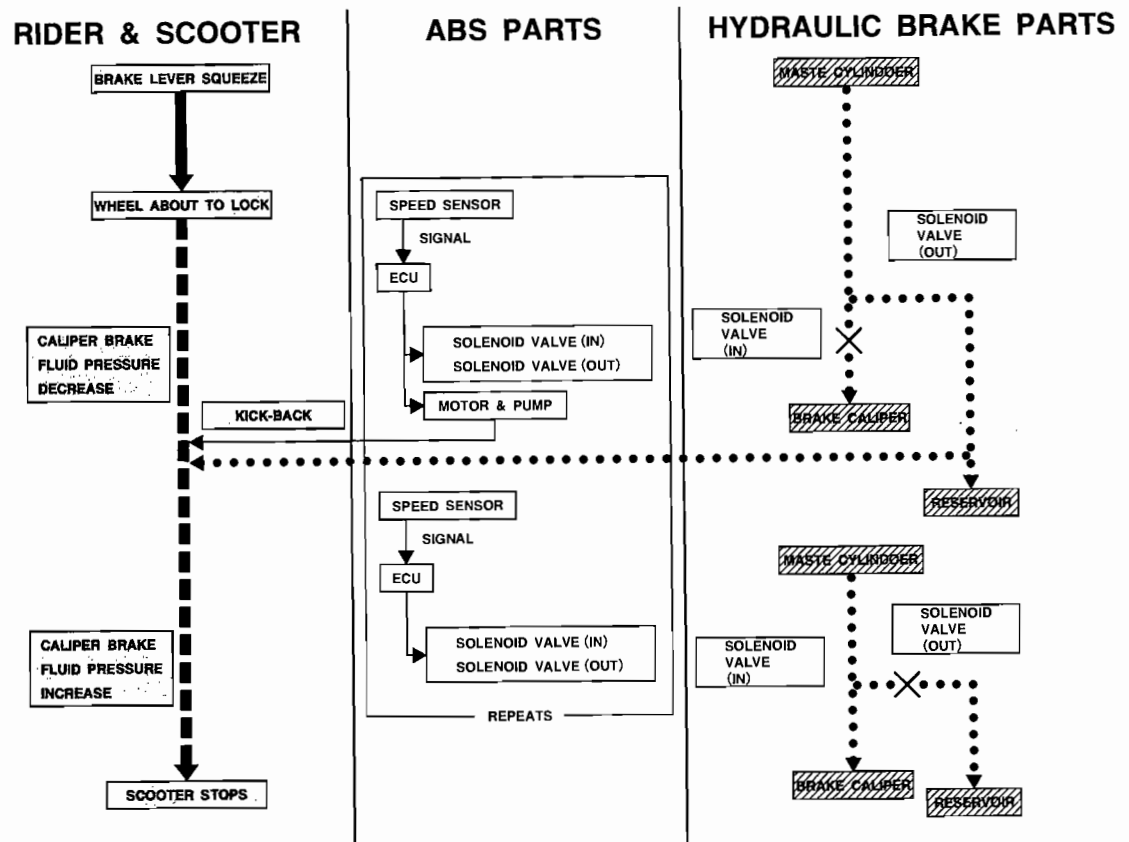
The ECU also monitors the basic function while the scooter is running.

When it detects a problem with the system; it turns on the ABS indicator and stops the system immediately. When the ECU detects a problem while the ABS is active, it stops the system and the ABS indicator either stays lit or blinks, notifying the rider of the problem and that the system has been deactivated.

FAIL SAFE FUNCTION

When the ECU detects a problem in the system by the self-diagnosis function, the ECU activates the ABS fail-safe relay and shuts off the ground circuits of the solenoid valves to stop the solenoid valves. The ABS stops its function when the system is faulty, and then switches to the normal brake system.

OPERATION



TECHNICAL FEATURES

Fluid pressure control

Operation	Caliper fluid pressure	Solenoid valve (IN)		Solenoid valve (OUT)	
		Signal	Passage	Signal	Passage
Pressure decrease	Decrease	ON	Closed	ON	Open
Pressure hold	Hold	ON	Closed	OFF	Closed
Pressure increase	Increase	OFF	Open	OFF	Closed

KICK-BACK

When the fluid pressure decreases, the motor and pump sends brake fluid to the master cylinder to indicate the rider that the ABS has been activated.

WHEN ABS IS WORKING:

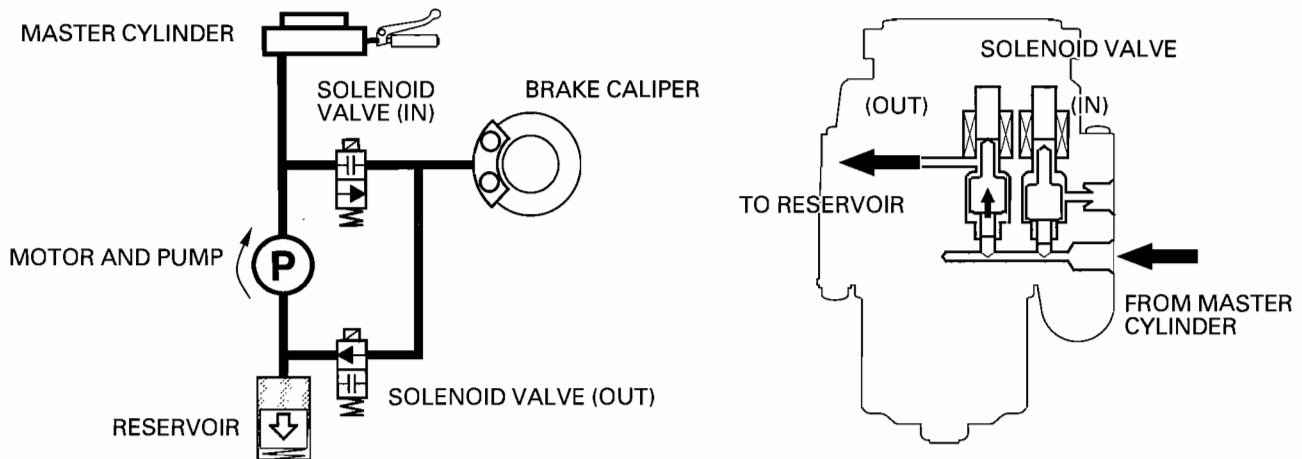
Pressure decrease:

When the ECU detects that the wheel is about to lock, the ECU sends signals to activate the motor and pump, to open the solenoid valve (OUT) and to close the solenoid valve (IN). The brake fluid from the master cylinder piston cannot flow to the caliper.

The brake fluid in the caliper flows into the reservoir, compressing the spring under the diaphragm of the reservoir.

The motor and pump causes brake fluid to flow through the reservoir and causes kick-back to the master cylinder.

The caliper fluid pressure then lowers.

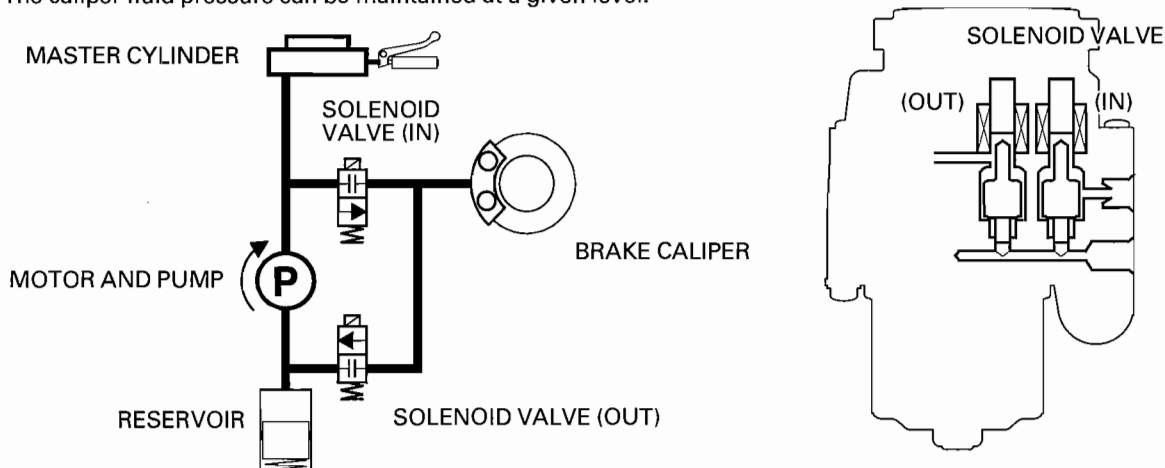


Pressure hold:

When the caliper fluid pressure is maintained, the ECU sends signals to close the solenoid valve (OUT) and to close the solenoid valve (IN). The brake fluid from the master cylinder piston cannot flow to the caliper.

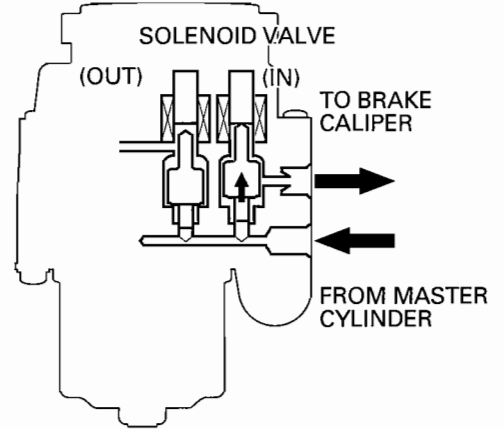
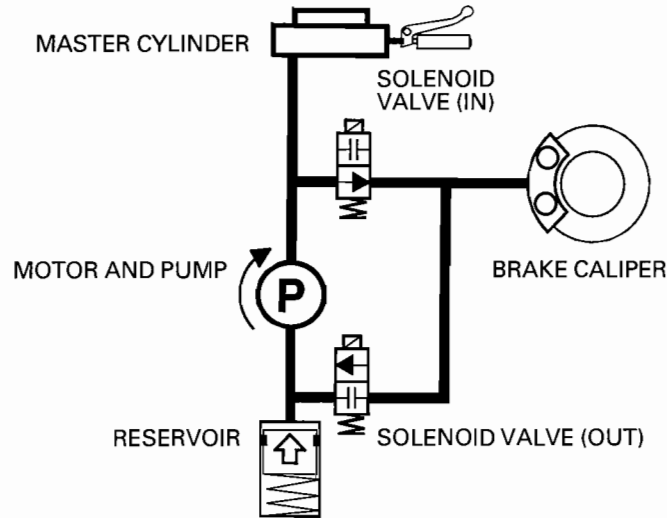
The brake fluid in the caliper cannot flow into the reservoir.

The caliper fluid pressure can be maintained at a given level.



Pressure increase:

When the pressure increases, the ECU sends signals to close the solenoid valve (OUT) and to open the solenoid valve (IN). The brake fluid from the master cylinder piston flows to the caliper. The brake fluid in the caliper cannot flow into the reservoir. The brake system restores normal brake operation.

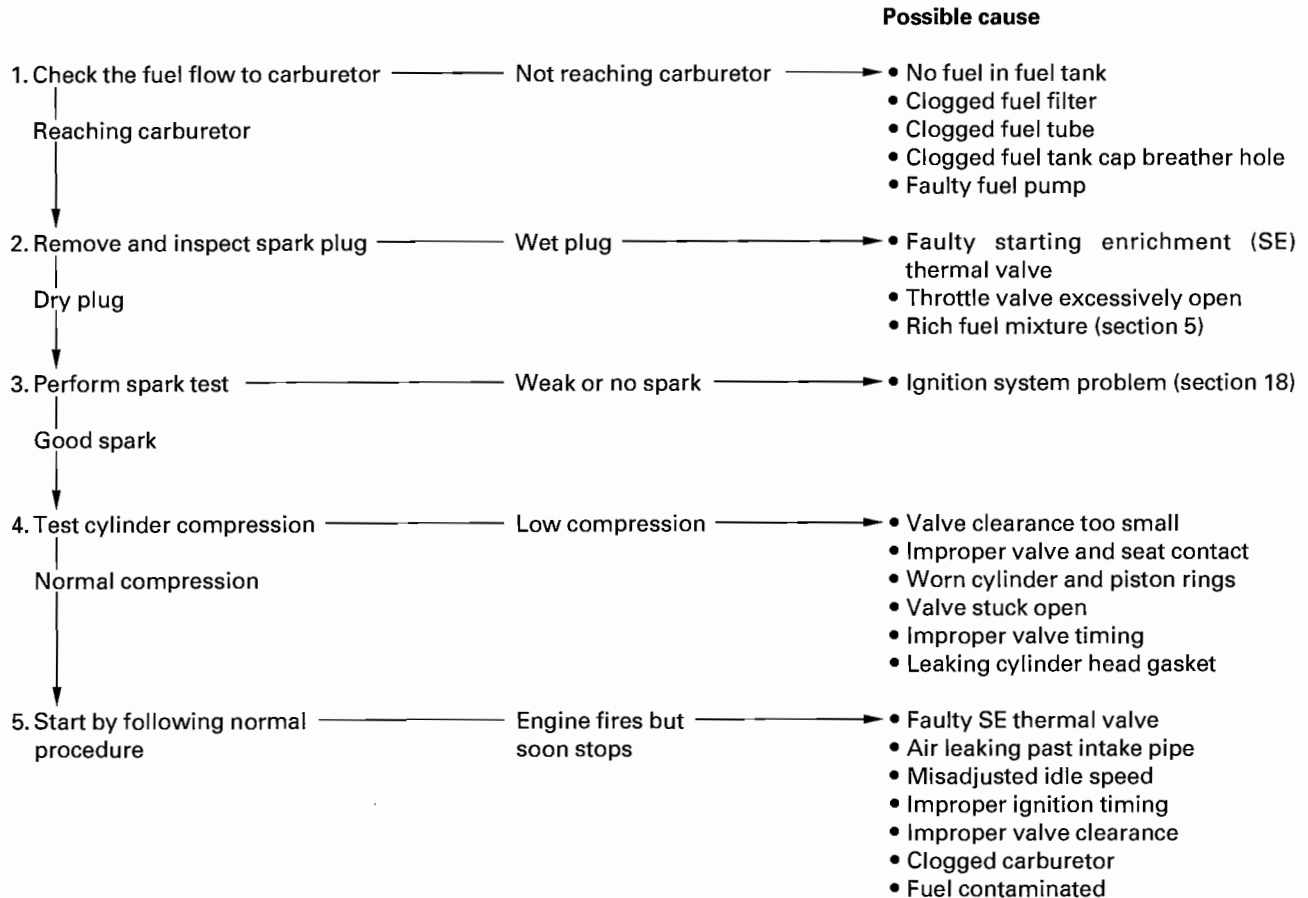


MEMO

24. TROUBLESHOOTING

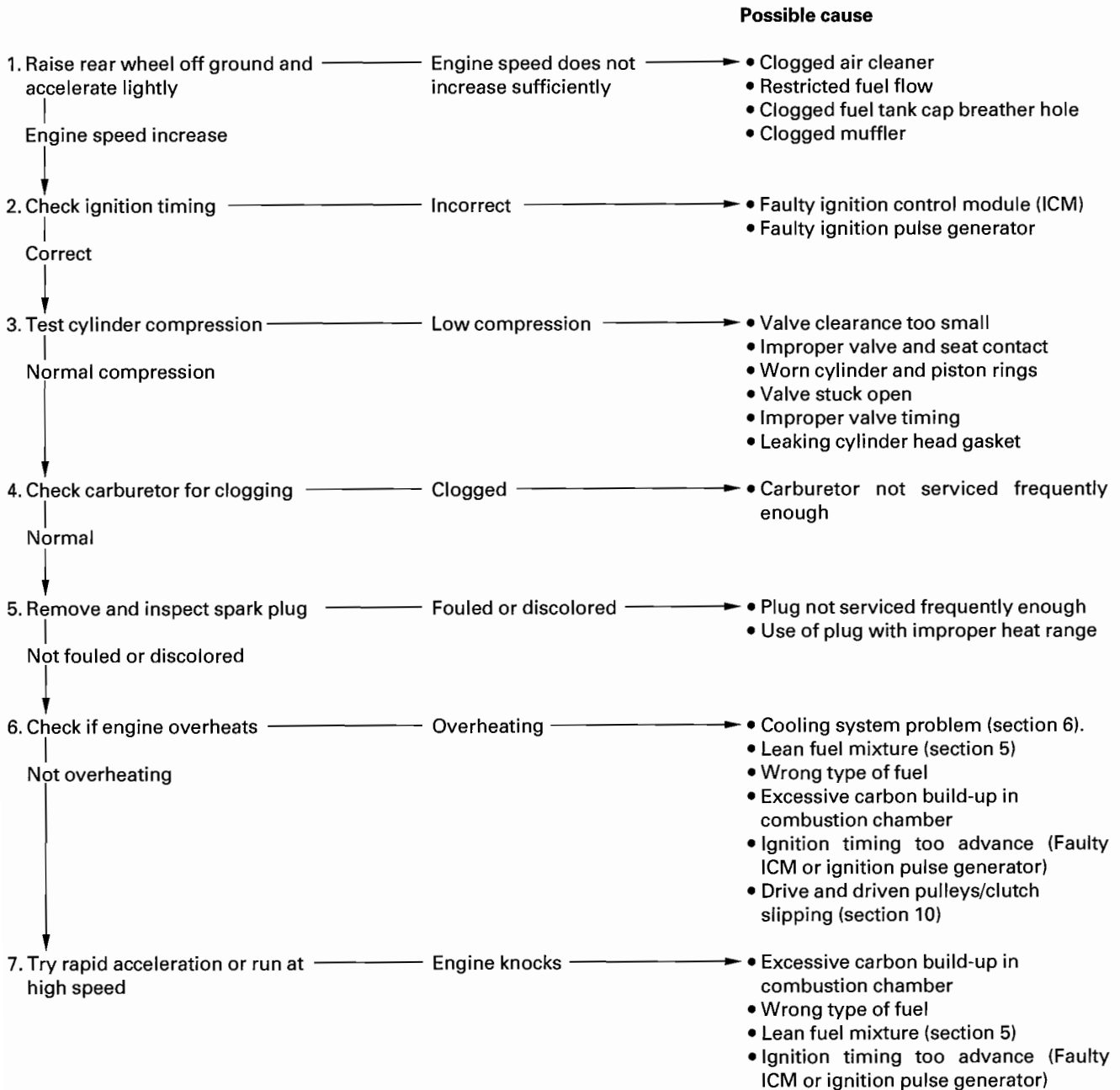
ENGINE DOES NOT START OR IS HARD TO START	24-1	POOR PERFORMANCE AT LOW AND IDLE SPEEDS	24-3
ENGINE LACKS POWER	24-2	POOR PERFORMANCE AT HIGH SPEED	24-4

ENGINE DOES NOT START OR IS HARD TO START

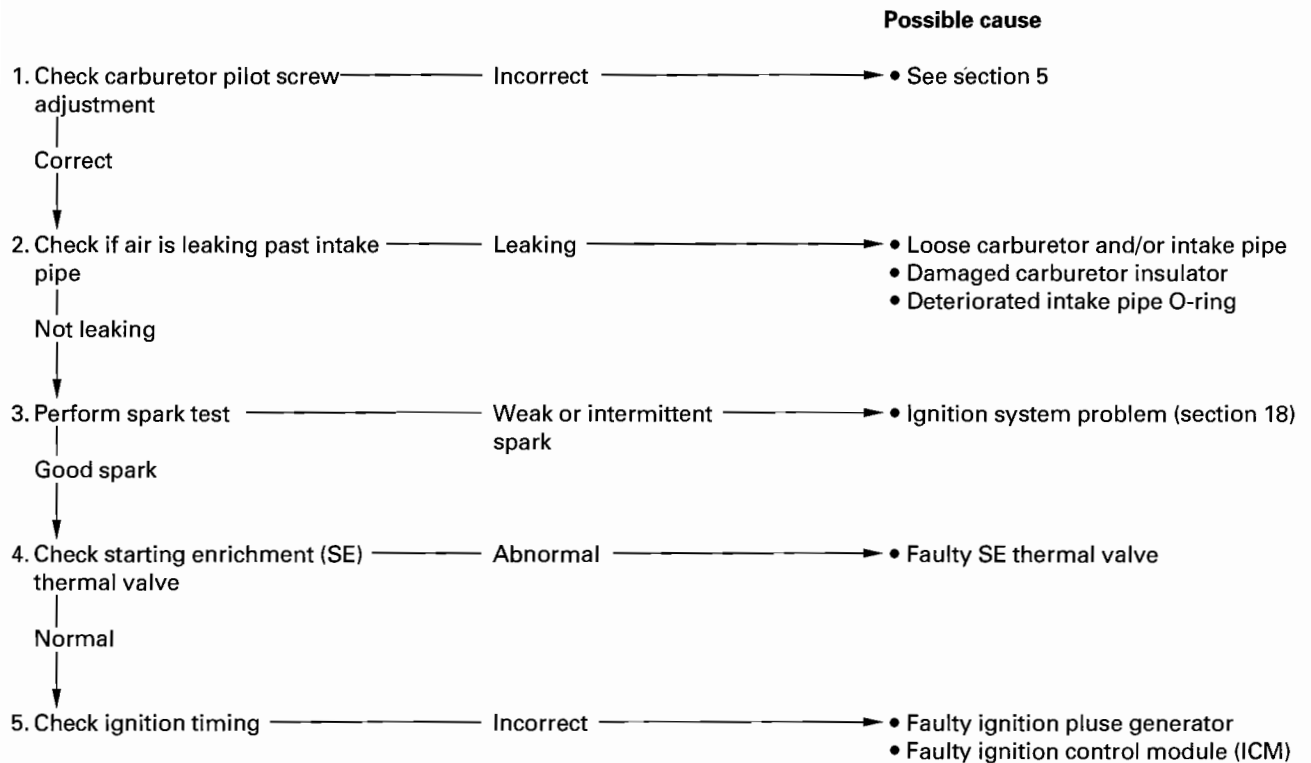


TROUBLESHOOTING

ENGINE LACKS POWER

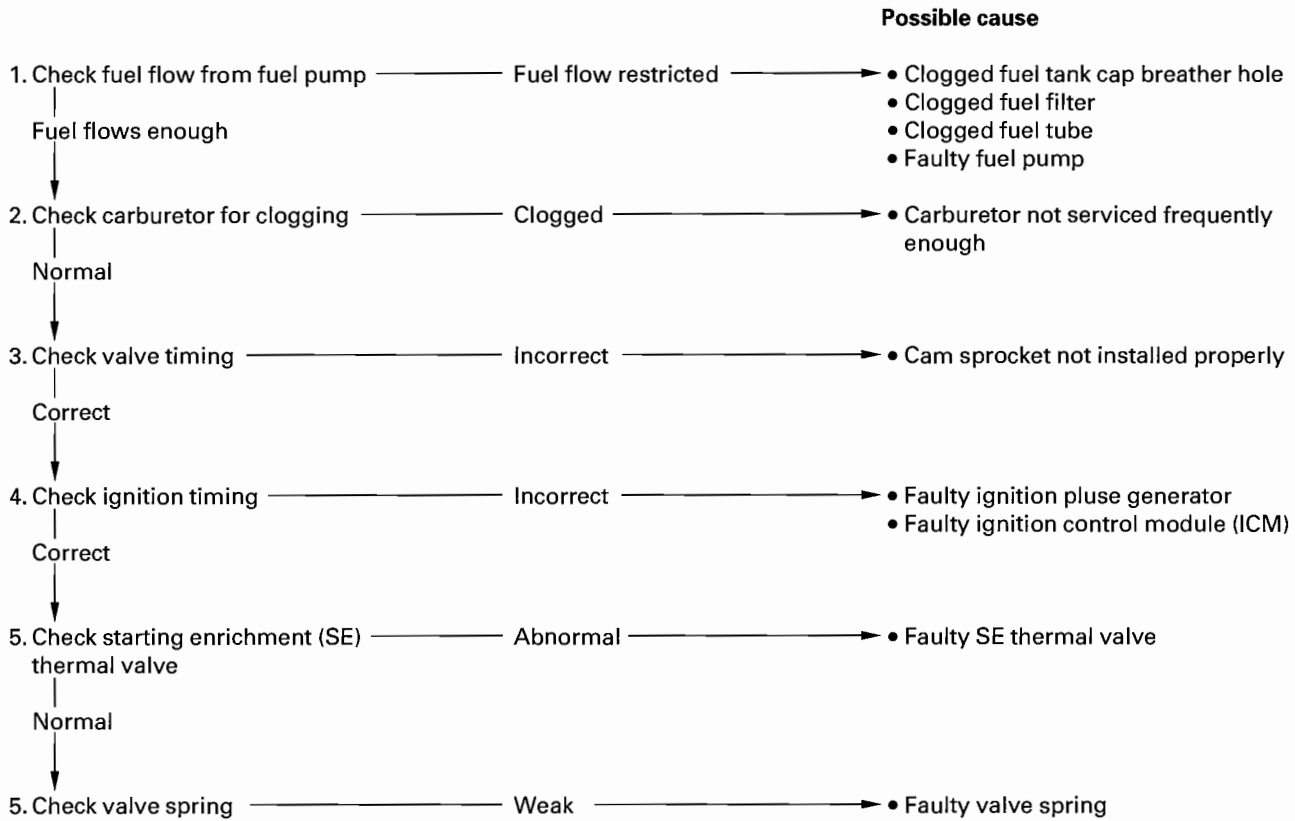


POOR PERFORMANCE AT LOW AND IDLE SPEEDS



TROUBLESHOOTING

POOR PERFORMANCE AT HIGH SPEED



25. INDEX

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